

DEPARTMENT OF COMMERCE**Bureau of Industry and Security**

15 CFR Parts 732, 734, 736, 740, 742, 744, 746, 748, 758, 770, 772, and 774

[Docket No. 240321–0084]

RIN 0694–A194

Implementation of Additional Export Controls: Certain Advanced Computing Items; Supercomputer and Semiconductor End Use; Updates and Corrections; and Export Controls on Semiconductor Manufacturing Items; Corrections and Clarifications

AGENCY: Bureau of Industry and Security, Department of Commerce.

ACTION: Interim final rule; request for comments; technical corrections.

SUMMARY: On October 25, 2023, the Bureau of Industry and Security (BIS) published in the *Federal Register* the interim final rules (IFR), “Export Controls on Semiconductor Manufacturing Items” (SME IFR) and “Implementation of Additional Export Controls: Certain Advanced Computing Items; Supercomputer and Semiconductor End Use; Updates and Corrections” (AC/S IFR). This rule corrects inadvertent errors in those rules and makes additional clarifications for the two rules.

DATES:

Effective date: This rule is effective April 4, 2024.

Comment due date: Comments for revisions, corrections, and clarifications in this rule must be received by BIS no later than April 29, 2024.

ADDRESSES: Comments on the corrections, revisions, and clarification in this rule may be submitted to the Federal rulemaking portal (www.regulations.gov). The *regulations.gov* ID for this rule is: BIS–2023–0016. Please refer to RIN 0694–AJ23 in all comments.

All filers using the portal should use the name of the person or entity submitting the comments as the name of their files, in accordance with the instructions below. Anyone submitting business confidential information should clearly identify the business confidential portion at the time of submission, file a statement justifying nondisclosure and referring to the specific legal authority claimed, and provide a non-confidential version of the submission.

For comments submitted electronically containing business confidential information, the file name of the business confidential version

should begin with the characters “BC.” Any page containing business confidential information must be clearly marked “BUSINESS CONFIDENTIAL” on the top of that page. The corresponding non-confidential version of those comments must be clearly marked “PUBLIC.” The file name of the non-confidential version should begin with the character “P.” Any submissions with file names that do not begin with either a “BC” or a “P” will be assumed to be public and will be made publicly available through <https://www.regulations.gov>. Commenters submitting business confidential information are encouraged to scan a hard copy of the non-confidential version to create an image of the file, rather than submitting a digital copy with redactions applied, to avoid inadvertent redaction errors which could enable the public to read business confidential information.

See the respective rules for detailed instructions on how to submit comments.

- *SME IFR:* www.regulations.gov, docket number BIS–2023–0016–0001 (ref. 0694–AJ23)
- *AC/S IFR:* www.regulations.gov, docket number BIS–2022–0025–0052 (ref. 0694–A194)

FOR FURTHER INFORMATION CONTACT:

- For general questions, contact Regulatory Policy Division, Office of Exporter Services, Bureau of Industry and Security, U.S. Department of Commerce at 202–482–2440 or by email: RPD2@bis.doc.gov.

- For Category 3 technical questions, contact Carlos Monroy at 202–482–3246 or RPD2@bis.doc.gov.

- For Category 4 or 5 technical questions, contact Aaron Amundson at 202–482–0707 or RPD2@bis.doc.gov.

SUPPLEMENTARY INFORMATION:

Background

On October 17, 2023, BIS released interim final rules (IFR) “Export Controls on Semiconductor Manufacturing Items” (SME IFR) (88 FR 73424, October 25, 2023) and “Implementation of Additional Export Controls: Certain Advanced Computing Items; Supercomputer and Semiconductor End Use; Updates and Corrections” (AC/S IFR) (88 FR 73458, October 25, 2023). This rule corrects inadvertent errors contained in these rules as described below and makes additional clarifications.

I. Corrections for “Implementation of Additional Export Controls: Certain Advanced Computing Items; Supercomputer and Semiconductor End Use; Updates and Corrections” (AC/S IFR) (88 FR 73458, October 25, 2023)

A. Non-CCL Corrections

A.1. Revisions to § 740.2

In § 740.2 paragraph (a)(9)(ii) introductory text, there is an incorrect citation to § 740.10(a)(3)(v), which should read § 740.10(a)(2)(iv), which prohibits exports and reexports of replacement parts to a destination specified in Country Group E:1. BIS is removing the referenced citation, because whether the specific paragraph is cited here or not, the regulatory text’s reference to § 740.10 is sufficient to indicate a restriction on the use of License Exception RPL. In addition, not citing to the specific paragraph will avoid the need for future corrections if the paragraph is moved again in License Exception RPL. The paragraph is also amended to reference License Exception Advanced Computing Authorized (ACA). Lastly, this paragraph is amended to add a reference to entities headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, wherever located, thereby clarifying that exports, reexports, or transfers (in-country) of the items specified in § 740.2(a)(9)(ii)(A) or (B) may only be made through the license exceptions specified therein, including License Exception NAC/ACA.

A.2. Revisions to § 740.8 Notified Advanced Computing (NAC) and Advanced Computing Authorized (ACA)

This rule revises the header of § 740.8 to reference License Exception ACA in addition to License Exception NAC. BIS has separated License Exception NAC into two separate license exceptions that will reside in the same section of the EAR § 740.8: Notified Advanced Computing (NAC) will authorize exports and reexports of specified items to Macau and destinations in Country Group D:5 and entities headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, wherever located, that require a notification to BIS, while Advanced Computing Authorized (ACA) will authorize exports, reexports, and transfers (in-country) of specified items to destinations in Country Group D:1 or D:4 (except Macau and destinations specified in Country Group D:5) that do

not require a notification to BIS. License Exception ACA will also authorize transfers (in-country) to Macau and destinations in Country Group D:5, and entities headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, that do not require a notification to BIS. Please note that all license exceptions are also subject to the restrictions in § 740.2 and part 746 of the EAR, which would remove eligibility for embargoed and sanctioned countries, *e.g.*, Belarus, Cuba, Russia, Iran, and Syria.

In paragraph (a) introductory text, this rule updates the scope of License Exceptions NAC and ACA with regard to types of shipments, country scope, and scope of coverage for the respective license exceptions.

Paragraph (a)(1) is amended to clarify that all exports, reexports, or transfers (in-country) made pursuant to License Exceptions NAC or ACA require a written purchase order unless specifically exempted. The last sentence of paragraph (a)(1) is amended to indicate that while exports or reexports of commercial samples are not subject to the purchase order requirement, such transactions *may* be obligated to comply with paragraph (a)(2) and removes the phrase “are obligated to comply.” This change is necessary because for example, commercial sample shipments to a D:1 country under License Exception ACA would not require a notification, but such a shipment to Macau or a destination specified in Country Group D:5 under License Exception NAC would require notification.

Unlike the written purchase order requirement in paragraph (a)(1), which is required for all exports, reexports, and transfers (in-country) made under License Exceptions NAC or ACA unless specifically exempted, the notification requirement in paragraph (a)(2) only applies in specific circumstances related to License Exception NAC.

Paragraph (a)(2) is newly divided into two sections. In paragraph (a)(2)(i), this rule clarifies that the NAC notification requirement applies not only to exports or reexports to Macau or a destination specified in Country Group D:5, but also to entities headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, wherever located. The NAC notification requirement does not apply to: exports or reexports to destinations in Country Group D:1 or D:4 (except Macau or destinations specified in Country Group D:5 or to an entity headquartered in or with an ultimate parent headquartered in those

destinations) or transfers (in-country) within any destination, which are under the scope of License Exception ACA.

In paragraph (a)(2)(ii), this rule clarifies the circumstances when one NAC notification will cover multiple exports or reexports. You may submit one NAC notification that will cover multiple exports or reexports when: the export or reexport made under License Exception NAC is to the same end user and for the same item(s) and as long as the total dollar value and quantity of the shipments do not exceed the amounts stated on the notification. This rule also clarifies that for notifications that cover multiple shipments: the dollar value and quantity on the notification do not need to match the dollar value and quantity on the purchase order submitted to BIS; the notification’s quantity and dollar value amounts may be estimates of future sales; and prior to export or reexport you must have a purchase order for every shipment made against the NAC notification.

This rule also adds a new paragraph (a)(3) to clarify that for ECCNs 5A002.z, 5A004.z, or 5D002.z, all License Exception Encryption commodities, software, and technology (ENC) requirements under § 740.17 of the EAR must also be met for eligibility under License Exceptions NAC or ACA. This assures that certain processes and procedures outlined under License Exception ENC are not circumvented with the use of License Exceptions NAC or ACA.

Paragraph (b) is amended to add references to License Exception ACA. Paragraph (b)(1) is also renumbered as paragraph (b) consistent with the changes to paragraph (b)(2) described below.

Paragraph (b)(2) restriction to use NAC or ACA by or for military end uses/users is removed because it is redundant to paragraph (b)(1) (now paragraph (b)), because that paragraph already states that, except for only § 744.23(a)(3), NAC or ACA cannot be used if there is a license requirement under part 744 or 746.

In paragraph (c) “NAC Prior notification procedures,” this rule makes a clarification to paragraph (c)(1) to specify that the NAC notification submitted in SNAP-R must include certain technical specs for performance capacity, such as Total Processing Performance (TPP), performance density, as well as a data sheet or other documentation showing the intended design goal and how it is marketed, to allow for BIS to determine if the item in question otherwise meets the criteria for an item eligible for License Exception NAC.

In paragraph (c)(2) “Action by BIS,” this rule corrects and clarifies the NAC notification process. The AC/S IFR stated that BIS would notify you if you may use NAC. However, this rule clarifies that after the notification has been registered in SNAP-R and within twenty-five calendar days, BIS will inform you if a license is required. If BIS has not contacted you, then System for Tracking Export License Applications (STELA) (<https://snapr.bis.doc.gov/stela>) will, on the twenty-fifth calendar day following the date of registration, provide either confirmation that you can use License Exception NAC and a NAC confirmation number to be submitted in AES or confirmation that you cannot use License Exception NAC and you must apply for a license to continue with the transaction.

Also in paragraph (c)(2) “Action by BIS,” this correction rule removes the last sentence that stated, “License Exception NAC eligibility does not exempt you from other licensing requirements under the EAR, such as those based on “knowledge” of a prohibited end use or end user as referenced in general prohibition five (part 736 of the EAR) and set forth in part 744 of the EAR,” because it does not speak to a BIS action.

In paragraph (c)(3) “Status of pending NAC notification requests,” this rule moves the third sentence about steps BIS will take to inform you about the use of NAC, to paragraph (c)(2), because it concerns an action by BIS. In addition, this rule clarifies the last sentence by adding “of NAC status” so that the sentence now reads, “BIS may alternatively provide such confirmation of NAC status by email, telephone, fax, courier service, or other means.”

This rule adds a new paragraph (c)(4) to inform the public of three events that would delay the processing of a NAC notification and temporarily stop the twenty-five day processing clock. If there is a lapse in appropriations funding, then BIS would stop the processing of these notifications until funding has been restored. If BIS experiences a catastrophic event, such as an extreme weather event that impacts government services, then the processing of notifications would be delayed. If for some reason BIS experiences some multi-day processing system failure, then it would not be able to continue processing the NAC notification. In such an event, BIS would post a notification to the public on the BIS website.

A.3. Revisions to § 744.23

This rule amends paragraph (c) of § 744.23 to state that License Exceptions

in § 740.2(a)(9)(i) and (ii) of the EAR may overcome the license requirements imposed by § 744.23(a)(4) and (a)(3)(i) of the EAR, respectively. BIS is making this change to harmonize with other provisions in the EAR authorizing the use of certain license exceptions. Changes to § 744.23(a)(4) are discussed in section II.B of this rule.

BIS is also amending paragraph (d) to segregate the various license review policies into new paragraphs for easier readability. Paragraph (d) retains the factors that BIS will take into account as well as the applicability of contract sanctity. New paragraph (d)(1) indicates a presumption of denial for Macau and destinations in Country Group D:5 and any entity headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, unless either paragraph (d)(2) or (3) applies. New paragraph (d)(2) indicates a presumption of approval for end users headquartered in the United States or a destination specified in Country Group A:5 or A:6, that are not majority-owned by an entity headquartered in either Macau or a destination specified in Country Group D:5. New paragraph (d)(3)(i) provides a case-by-case policy for items specified in ECCN 3A090, 4A090, 3A001.z, 4A003.z, 4A004.z, 4A005.z, 5A002.z, 5A004.z, 5A992.z, 5D002.z, or 5D992.z, except for items designed or marketed for use in a datacenter and meeting the parameters of 3A090.a. These items are less sensitive integrated circuits and computers that do not warrant a presumption of denial license review policy. New paragraph (d)(3)(ii) now indicates a case-by-case review policy for SME subject to the license requirements of § 744.23, when there is SME not subject to the license requirements of § 744.23 that performs the same function as the SME that is subject to the license requirements of § 744.23. Case-by-case policy is appropriate for such items because denying the license may not further national security when there is an option for SME that is not subject to the license requirement and performs the same function. Lastly, there is a case-by-case policy in paragraph (d)(3)(iii) for items not specified in paragraph (d)(1) or (2) or (d)(3)(i) or (ii).

A.4. Revisions to § 744.6 Restrictions on Specific Activities of “U.S. Persons”

BIS is adding EUV masks (ECCN 3B001.j) and associated software and technology to the control in paragraph (c)(2)(iii) for SME, because it was unintentionally excluded from controls. EUV masks are required for lithography

and lithography is a critical technology for advance-node IC production.

This rule reformats the license review policy in paragraph (e)(3) by cascading the paragraphs for easier readability. BIS is also adding a new exception from the presumption of denial license review policy that is added by this rule in paragraph (e)(3)(ii)(A), which is a case-by-case policy for items specified in ECCN 3A090, 4A090, 3A001.z, 4A003.z, 4A004.z, 4A005.z, 5A002.z, 5A004.z, 5A992.z, 5D002.z, or 5D992.z, except for items designed or marketed for use in a datacenter and meeting the parameters of 3A090.a. These items are less sensitive integrated circuits and computers, *i.e.*, not “advanced-node integrated circuits” or computers containing “advanced-node integrated circuits”, that do not warrant a presumption of denial license review policy. There is also another new exception from the presumption of denial policy in paragraph (e)(3)(ii)(B) that sets forth a case-by-case review policy for activities involving an item subject to the license requirements of paragraph (c)(2) where there is an item that performs the same function as an item meeting the license requirements of paragraph (c)(2). Lastly, paragraph (e)(3)(ii)(C) clarifies that there is a case-by-case policy for all other applications not specified in paragraphs (e)(3)(i) or (e)(ii)(A) or (B).

B. Correction to Model Certification in Supplement No. 1 to Part 734

In supplement no. 1 to part 734—Model Certification for Purposes of the FDP Rule, this rule revises the model criteria included under paragraph (b)(2)(viii) for consistency with the country scope specified in § 734.9(i)(2), which specifies the country scope applies to the People’s Republic of China (PRC) and Macau. This rule removes the reference to Macau or a destination specified in Country Group D:5 in paragraph (b)(2)(viii) of supplement no. 1 to part 734 and replaces that with the correct country scope of the PRC and Macau for consistency with § 734.9(i)(2).

C. Correction to § 742.15(a)

Because there was an error in amendatory instruction 21 in the AC/S IFR, this rule revises § 742.15(a)(1), licensing requirements for Encryption items, by adding back the third sentence, which had been inadvertently removed in the AC/S IFR, and removing the last sentence of that paragraph, which repeats the sentence before.

D. Removing References to Note 4 to 3A090

In ECCN 3A090, this rule makes a correction to Note 3 to 3A090 to remove a reference to Note 4 to 3A090 because that note does not exist. During the drafting process of the AC/S IFR, ECCN 3A090 included a Note 4 that was subsequently removed prior to the AC/S IFR being published. The cross reference to Note 4 in Note 3 in the Related Controls paragraph in 4A090 was not updated at the time Note 4 to 3A090 was removed. For the same reason, this rule revises the Related Controls paragraph in the following ten ECCNs to remove references to Note 4 to 3A090. Specifically, this rule corrects the Related Controls paragraphs under 3A001, 4A003, 4A004, 4A005, 4A090, 5A002, 5A992, 5A004, 5D002 and 5D992 to remove the cross reference to Note 4 to 3A090. These cross references to the non-existent Note 4 to 3A090 do not cause a substantive issue, but may cause confusion for exporters, reexporters, or transferors, so this rule corrects that in each of these ECCNs.

E. Restoring Controls for ECCNs That Contain .z Paragraphs

This rule restores controls in the license requirement table of ECCNs 3A001, 3D001, 3E001, 4A003, 4A004, 4A005, 4D001, 4E001, 5A002, 5A004, 5D002, and 5E002, by removing the exceptions for .z paragraphs from the national security (NS), missile technology, nuclear proliferation, and/or crime control license requirement paragraphs. Prior to the AC/S IFR, these items were controlled for NS, missile technology, nuclear proliferation, and/or crime control reasons, however, when the .z paragraphs were added, items that contained either 3A090 or 4A090 items were only controlled for RS reasons, which changed the country scope of the license requirements for these items. For example, in ECCN 4A003, there is a license requirement for NS reasons for exports, reexports, or transfers (in-country) to destinations specified in NS column 1 (NS:1), which is a worldwide control, except for Canada. However, if the commodity specified in ECCN 4A003, such as a computer, contained an integrated circuit specified in ECCN 3A090, then it only required a license for RS reasons to destinations in Country Groups D:1, D:4, and D:5 that are not also in Country Groups A:5 or A:6, which would in essence implement a decontrol for these computers to many destinations, including those specified in Country Group A:5 and A:6. Therefore, this rule restores the other reasons for control for

items that meet the specifications in .z paragraphs of these ECCNs.

F. Maintaining the Status Quo for License Exception Eligibility for Certain Destinations

The addition of .z paragraphs to certain ECCNs was intended to make it easier for exporters, reexporters, and transferors of items subject to certain end-use controls to more easily distinguish those items from other items controlled under the same ECCNs. It was not intended to affect the control status or license exception availability of those other items. As a conforming change to the restoration of controls for .z paragraphs (explained in the section above), and in order to retain the status quo for EAR license exception eligibility when not restricted by § 740.2(a)(9)(ii), this rule adds a new note to the License Exception section of each of the ECCNs that have or impose controls on .z items: 3A001, 3D001, 3E001, 4A003, 4A004, 4A005, 4D001, 4E001, 5A002, 5A992, 5A004, 5D002, 5D992, 5E002, and 5E992. The new note refers the public to see § 740.2(a)(9)(ii) of the EAR for license exception restrictions for .z ECCNs, because only the license exceptions in § 740.2(a)(9)(ii) may be used for exports, reexports, or transfers (in-country) of .z ECCNs to destinations specified in Country Groups D:1, D:4, or D:5 (excluding any destination also specified in Country Groups A:5 or A:6) or to an entity headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, wherever located. When destined elsewhere, all other applicable license exceptions may be used unless otherwise restricted.

BIS is making these changes to ensure the .z paragraphs will not be used to circumvent regime controls under the respective .z ECCNs (for instance, by inserting a chip to make the item a .z item and thereby eligible for License Exceptions NAC or ACA, provided the export, reexport, or transfer (in-country) also otherwise meet the applicable terms and conditions of License Exceptions NAC or ACA). However, BIS also does not want the addition of a .z paragraph under one of the respective .z ECCNs to otherwise narrow the scope of license exception eligibility that applied to these items prior to the addition of the .z paragraphs to these respective ECCNs, unless the destination is specified in Country Group D:1, D:4 or D:5 (excluding destinations in Country Group A:5 or A:6), or to an entity headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, wherever located.

License Exception STA eligibility is preserved for .z ECCNs by removing restrictions under STA restriction paragraphs for .z ECCNs. However, like all license exception use for .z ECCNs, STA may not overcome the license exception restrictions in § 740.2(a)(9)(ii) of the EAR.

G. Revisions to 3A001

This rule adds four new .z paragraphs to ECCN 3A001 to make a distinction of those paragraphs controlled for NS:1, RS:1, MT:1, and NP:1 reasons. Paragraph 3A001.z.1 is added to control “Monolithic Microwave Integrated Circuit” (“MMIC”) amplifiers described in 3A001.b.2 and discrete microwave transistors in 3A001.b.3, except those 3A001.b.2 and b.3 items being exported or reexported for use in civil telecommunications applications and that also meet or exceed the performance parameters in ECCN 3A090, which are controlled under the NS:1, RS:1, RS (§ 742.6(a)(6)(iii) of the EAR), MT:1, and AT:1 license requirements paragraphs. Paragraph 3A001.z.2 is added to control commodities that are described in 3A001.a.1.a when usable in “missiles” that also meet or exceed the performance parameters in ECCN 3A090; and to 3A001.a.5.a when “designed or modified” for military use, hermetically sealed and rated for operation in the temperature range from below -54°C to above $+125^{\circ}\text{C}$ and that also meet or exceed the performance parameters in ECCN 3A090. Corresponding changes are made to the NS:2, RS (§ 742.6(a)(6)(iii) of the EAR), MT:1, and AT:1 license requirements paragraphs. Paragraph 3A001.z.3 is added to control pulse discharge capacitors described in 3A001.e.2 and superconducting solenoidal electromagnets in 3A001.e.3 that meet or exceed the technical parameters in 3A201.a and 3A201.b, respectively and that also meet or exceed the performance parameters in 3A090, which are controlled under the NS:2, RS (§ 742.6(a)(6)(iii) of the EAR), NP:1, and AT:1 license requirements. Paragraph 3A001.z.4 is added to control all other commodities specified in ECCN 3A001 that meet or exceed the parameters of ECCN 3A090.

This rule also fixes typos to ECCN 3A001 paragraphs .b.11.b and .c.1.b.2.

H. Revisions to ECCN 3D001

The NS license requirement paragraph in the License Requirements section of ECCN 3D001 is corrected by restoring NS:1 license requirements to software for commodities controlled by

3A001.z by adding 3A001.z to the NS:1 licensing paragraph.

I. Revision to ECCN 3E001 License Requirements and Reasons for Control

In 3E001, this rule adds RS to the reason for control paragraph and the exception clauses for 3A001.z are removed from the NS:1, MT:1, and NP:1 license requirement paragraphs to restore those controls for commodities controlled in ECCN 3A001 that also meet or exceed the parameters in ECCN 3A090.

J. Addition of Missing Paragraph 4A090.b

In ECCN 4A090, BIS inadvertently reserved paragraph 4A090.b. This correction rule adds 4A090.b to control computers, “electronic assemblies,” and “components” containing integrated circuits, any of which meets or exceeds the limits in 3A090.b. The rule also amends the technical note in this ECCN to clarify the use of the term computers. The NAC/ACA eligibility paragraph for ECCN 4A090 already includes text that makes such commodities eligible for NAC/ACA.

K. Revisions to ECCN 4E001

In 4E001.a, this rule removes an incorrect phrase “or “software” controlled under 4D001 (for 4A090)” because software for 4A090 is controlled in ECCN 4D090, not 4D001.

L. Revisions to ECCN 5D002 and 5D992

This rule corrects the Related Control paragraphs of ECCN 5D002 and 5D992 by replacing the references to non-existent paragraphs 3D001.z and 4D001.z with correct references to “ECCNs 3D001 as it applies to “software” for commodities controlled by 3A001.z and 3A090 and 4D001 as it applies to “software” for commodities controlled by 4A003.z, 4A004.z, and 4A005.z.”

M. Revisions to ECCN 5E992 and 5E002

This rule corrects the Reason for Control paragraph in the License Requirement section of ECCN 5E992 and 5E002 by adding “RS” to indicate the regional stability license requirements in the License Requirements table.

N. Revision to Supplement No. 6 to Part 774—Sensitive List

In paragraphs 3(iv) and (v), this rule removes the phrase “and equipment described under 3A002.g.2 that are controlled under 3A002.z” because BIS decided against adding a 3A002.z paragraph, so none was created.

II. “Export Controls on Semiconductor Manufacturing Items” (SME IFR) (88 FR 73424, October 25, 2023)

A. Corrections to ECCN 3B001 and 3B991

In ECCN 3B001, this rule corrects the scientific unit in paragraphs d.4.d.2 by replacing 13.33 kPa with 13.33 Pa; and in paragraph d.5 replacing 450 Mpa with 450 MPa. In paragraph f.1.b.2.b, this rule replaces 2.4 nm with 2.40 nm for consistency with how the other numbers are listed in paragraph f.1.b.2. In paragraph o.2, this rule adds a missing “or” after cobalt (Co) and before tungsten.

In ECCN 3B001, this rule corrects the scope of items subject to § 742.4(a)(4) national security controls and § 742.6(a)(6)(i) regional stability controls by adding ECCN 3B001.j “Mask “substrate blanks” with multilayer reflector structure consisting of molybdenum and silicon . . .” and being ““Specially designed” for “Extreme Ultraviolet” (“EUV”) lithography” and compliant with SEMI Standard P37. BIS inadvertently left this paragraph outside the scope of §§ 740.2(a)(9)(i), 742.4(a)(4), 742.6(a)(6)(i), 744.6(c)(2)(iii), and 744.23(a)(4) of the EAR and ECCN 3D002 heading and license requirements table.

The heading of 3B991 is corrected to remove the reference to ECCN 3B090, which was removed from the CCL by the SME IFR.

B. Revision of § 744.23(a)(4)

BIS is revising the scope of the exceptions for masks in § 744.23(a)(4)(i), because it unintentionally excepted EUV masks in 3B001.j, as well as equipment in 3B991.b.2. Therefore, the exceptions are narrowed to include 3B001.h, and 3B991.b.2.a through .b.

BIS received several comments asking for clarification on the application of § 744.23(a)(4) to the incorporation of CCL-listed items into foreign-made items that are themselves destined for the “development” or “production” of specified SME in Macau or a destination specified in Country Group D:5, because other paragraphs in § 744.23 included incorporation provisions, but this one did not. The definition of “production” in § 772.1 of the EAR includes the term integration, which BIS believes already captures the physical incorporation of one item into another or the joining of two items. That being said, BIS is revising § 744.23(a)(4) by adding a new paragraph (a)(4)(ii) to distinguish between direct exports, reexports, and transfers (in-country) in (a)(4)(i) and indirect exports, reexports, transfers (in-

country) in (a)(4)(ii) for the “development” or “production,” by an entity headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5. This revision is being done to address concerns about continued support for indigenous “development” and “production” of front-end integrated circuit “production” equipment in Macau and destinations in Country Group D:5 countries—and by companies headquartered in those countries. Consistent with BIS’s revised topic responses addressing “incorporation,” paragraph (a)(4)(ii) requires a license for the export, reexport, or transfer (in-country) of any item subject to the EAR and specified on the CCL to any destination when there is “knowledge” that (A) the item is for “development” or “production” of a foreign-made item, whether subject to the EAR or not, that is specified in an ECCN listed in paragraph (a)(4)(i); (B) when the foreign-made item is for “development” or “production” of any initial or subsequent foreign-made item, whether subject to the EAR or not, specified in an ECCN listed in paragraph (a)(4)(i); and (C) the “development” or “production” is by an entity headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5. BIS is taking this step to address certain scenarios where the initial exporter, reexporter, or transferor has “knowledge” that its items subject to the EAR and specified on the CCL will ultimately support the indigenous “development” or “production” of SME in Macau and destinations specified in Country Group D:5. At the same time, BIS has limited the scope of this control to circumstances involving the “development” or “production” of front-end SME items by entities that are headquartered in, or whose ultimate parent company is headquartered in, Macau or a destination specified in Country Group D:5. BIS also adds a new Note 2 to explain that, to the extent new paragraph (a)(4)(ii) controls the “development” or “production” of front-end SME produced at the direction of entities headquartered outside of Macau or Country Group D:5 destinations, the Temporary General License (TGL) in General Order 4, Supplement No. 1 to Part 736, is available, provided the other requirements of that section are satisfied. Further, for clarity, BIS notes that this clarification does not control the use of items subject to the EAR for the “development” or “production” of

foreign-made items outside of Macau or Country Group D:5 destinations that are ultimately destined for the “development” or “production” of CCL Category 3A items, and not the 3B or related 3D and 3E items specified in (a)(4)(i). Rather, this scenario is addressed under § 744.23(a)(2), which is the subject of extensive discussion in the revised topic responses, described below in Section C.

Even though new paragraph (a)(4)(ii) excludes the need to evaluate whether the foreign-made item that the exported, reexported, or transferred item is being integrated into is subject to the EAR, it does not eliminate the need to assess separately whether any foreign-made item is subject to the EAR under other provisions, including the De Minimis Rule or Foreign Direct Product Rule, which may impose other independent license requirements.

C. Clarification to BIS Responses to Certain Public Comment Topics

BIS received a number of comments asking for clarification to responses to four topics in the SME IFR. For ease of reference, BIS provides copies of the original topics below, numbered as they were in the SME IFR.

Topic 45: A commenter asked BIS to clarify whether a license would be required under § 744.23(a)(4) (former § 744.23(a)(2)(v)) to export an item subject to the EAR to a third party Original Equipment Manufacturer (OEM) in a third country, where there is “knowledge” at the time of the export that the item would be incorporated into a foreign-made 3B991 item (not subject to the EAR) by the OEM in the third country, and that the OEM would then send the 3B991 item to a manufacturer of Category 3 items in China. This commenter noted that § 744.23(a) does not expressly state that the “End Use Scope” includes the end use of the item into which the exported item is incorporated, and this differs from other EAR provisions, such as the foreign direct product (FDP) rules under §§ 734.9 and 744.23(a)(1)(ii)(B), which expressly include “incorporated into” as part of the end-use scope.

BIS response: Paragraph (a) of § 744.23 requires a license for items subject to the EAR when “you have “knowledge” at the time of export, reexport, or transfer (in-country) that the item is destined for a destination, end use, or type of end user described in paragraphs (a)(1) through (4) of this section.” While paragraphs (a)(2) through (4) apply to Category 3 items (among others), paragraph (a)(2) is specific to the “development” and “production” of “advanced-node

integrated circuits,” paragraph (a)(3) is specific to advanced computing items, and paragraph (a)(4) applies to the “development” and “production” of certain Category 3 “production” equipment. As the license requirements for § 744.23(a)(2) through (4) each cover different circumstances, the license requirements for § 744.23(a)(2) through (3) are distinct from the license requirements of § 744.23(a)(4).

The EAR defines “production” as including all production stages such as integration. As noted in response to Topic 19 in the SME IFR, “[a]uthorization would be required if there is “knowledge” at the time of export, reexport, or transfer (in-country) that an item on the CCL will ultimately be used (including by incorporation into another item such as a “part” or “component”) in the “development” or “production” of specified Group 3B ECCN equipment in Macau or a destination specified in Country Group D:5.” Thus, paragraph (a)(4) of § 744.23 does require a license to export, reexport, or transfer (in-country) an item specified on the Commerce Control List (CCL) for the “production” of certain equipment, components, assemblies, and accessories specified in Category 3, even when the export, reexport, or transfer (in-country) is to a third party OEM in a country other than Macau or a destination specified in Country Group D:5 when there is “knowledge” that the export, reexport or transfer (in-country) is for the “production” of semiconductor production equipment specified in the ECCNs enumerated in § 744.23(a)(4)(i), and is by an entity headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5.

Paragraphs (a)(2) and (3) only apply when there is “knowledge” that the item is destined to the production of certain integrated circuits—“advanced-node integrated circuits” and advanced computing items (including integrated circuits described in ECCNs 3A001.z and 3A090)—not the equipment to produce integrated circuits described in paragraph (a)(4). The party incorporating the item must still determine whether the foreign-made item is subject to the EAR under the *de minimis* or foreign-direct product (FDP) rules. See §§ 734.4 and 734.9 of the EAR; see also supplement no. 2 to part 734—Guidelines for *De Minimis* Rules (“Part 744 of the EAR should not be used to identify controlled U.S. content for purposes of determining the applicability of the *de minimis* rules.”). Refer to BIS’s responses to Topics 46, 47, and 49 in this Section and Topic 19

of the SME IFR for additional guidance on the topic of incorporation or integration under § 744.23(a)(2) and (4). In addition, exporters may not self-blind or disregard “knowledge” that the transaction is structured to avoid a license requirement. For example, an exporter may not ignore readily available information that the customer will integrate the exported item into an item destined for Macau or a Country Group D:5 destination for the production of equipment and items specified in § 744.23(a)(4)(i).

Topic 46: A commenter asked BIS to confirm how far back up the supply chain the licensing obligation extends for an export of an item to a third party for use in developing or producing a whole new foreign-made item that will only later be used in the development or production of ICs at a covered facility (*i.e.*, a facility where “advanced-node integrated circuits” are produced). This commenter described a scenario in which someone exports an item to produce a foreign-made item, which will be used to produce another foreign-made item, which will later be used at a covered fabrication facility, and asked whether the original export is caught by the new licensing obligations if there is knowledge that this supply chain will ultimately result in the creation of an item used to produce ICs at a covered fabrication facility. The commenter further inquired about the transfer outside the United States of items subject to the EAR to produce foreign-made items when only a small percentage of the foreign-made items will be for use at a covered fabrication facility. Specifically, the commenter asked whether BIS takes the position that 100% of all such transfers require a license by the foreign parties even when only an unknown small percentage will be used in the production of items that will ultimately be destined to covered fabrication facilities.

BIS response: BIS notes that § 744.23(a)(2) does not prohibit transactions involving the incorporation, as it pertains to *de minimis* rules, or integration of items subject to the EAR into foreign-made items, assuming such incorporation does not separately trigger a license requirement (*e.g.*, under § 734.9 (Foreign Direct Product (FDP) Rules) or § 744.23). In any case, the reexporter or transferor must separately assess whether a license would be required to reexport or transfer (in-country) the foreign-made item under § 734.4 (*De Minimis* Rule), including for items ineligible for *de minimis* under § 734.4(a), or other provisions of the EAR. However, if an

OEM restructures its supply chain to avoid a license requirement, then a license would still be required under § 744.23(a)(2), without which such restructuring indicates an attempt to evade or otherwise violate the EAR.

With respect to the commenter’s second question about in-country transfers of items that are not intended for incorporation into foreign-made items, but rather direct use in a prohibited end use, a license would be required for the portion or percentage of items for which there is “knowledge” that the items are destined for use in a prohibited end use. This is true at any point in the supply chain at which such “knowledge” exists. In the case of Category 3B, 3C, 3D, and 3E items subject to the EAR, a license could also be required under § 744.23(a)(2)(ii), even if the production technology node of the “facility” at which they will be used is unknown.

Topic 47: A commenter noted that clarification of § 744.23(a)(2)(iv), which has been redesignated as paragraph (a)(2)(ii) in the SME and AC/S IFRs, is needed if this imposes an affirmative duty to know or otherwise be subject to a license requirement. The commenter asks whether this means that a license is required when a company is exporting products to China and cannot confirm whether the semiconductor fabrication facility is producing products that meet the specified criteria in paragraphs (a)(2)(iii)(A) through (C), which has been redesignated as a part 772 defined term “advanced-node ICs” in the SME and AC/S IFRs.

BIS response: Yes, if the exporter, reexporter, or transferor has “knowledge” that an item identified in § 744.23(a)(2)(iv) (*i.e.*, Category 3B, 3C, 3D and 3E items), which was redesignated as paragraph (a)(2)(ii) in the SME IFR, will be used in the “development” or “production” of integrated circuits (ICs) in Macau or a destination specified in Country Group D:5, but does not have “knowledge” of whether such ICs are or will be “advanced-node integrated circuits,” a license is required.

This BIS response would also apply to a similar scenario in which an exporter, reexporter, or transferor has positive “knowledge” that their 3B/C/D/E products are used by some number of entities engaged in legacy development/production, but they do not know how 100% of their product is used (*e.g.*, because they are an upstream distributor and cannot keep track of all of it). A license is required to ship 100% of the items, unless the exporter, reexporter, or transferor can determine which items of the 100% will not be used in the

“development” or “production” of ICs in Macau or a destination specified in Country Group D:5, which would be excluded from the license requirement under § 744.23(a)(2)(iv), redesignated as paragraph (a)(2)(ii) in the SME IFR. Note that this response assumes the upstream transactions involve items that will be used directly in a prohibited end use, and not incorporated into foreign-made items. A license would not necessarily be required to ship an item destined for incorporation into a foreign-made item, assuming, *e.g.*, that the exporter has not self-blinded or possesses “knowledge” that the transaction is structured to avoid a license requirement. As described in response to Topics 45, 46, and 49, absent such “knowledge,” subsequent incorporation is addressed by other provisions of the EAR. See § 734.4 (*De Minimis* Rule) and § 734.9 (Foreign Direct Product (FDP) Rules); see also § 770.2(a)(2) (“An anti-friction bearing or bearing system physically incorporated in a segment of a machine or in a complete machine prior to shipment loses its identity as a bearing.”) and § 770.2(b)(1) (describing components that do not require a license “provided that the [items] are normal and usual components of the machine or equipment or that the physical incorporation is not used as a device to evade the requirement for a license.”); BIS, Advisory Opinion dated September 14, 2009 (addressing the “second incorporation principle”), available at <https://www.bis.doc.gov/index.php/documents/advisory-opinions/531-second-incorporation-rule/file>.

Topic 49: A commenter requested BIS clarify whether it would be sufficient under § 744.6 to have an end user certify that the exported item will not be used in “the “development” or “production” in China of any “parts,” “components,” or “equipment” specified under ECCN 3B001, 3B002, 3B090, 3B611, 3B991, or 3B992.

BIS response: BIS interprets this comment to refer to the end-use control under § 744.23(a)(4) (former § 744.23(a)(2)(v)), as there is no U.S. person control under § 744.6(c)(2) with the characteristics described by the commenter. Sufficient due diligence will vary depending on the specific facts of a transaction. Exporters, reexporters, and transferors may not self-blind or structure transactions to avoid a license requirement. However, BIS distinguishes between self-blinding or structuring to avoid a license requirement and the established legitimate incorporation of items subject to the EAR into foreign-made items, consistent with the requirements and

prohibitions of the *De Minimis* Rule and FDP Rules. See BIS’s responses to Topics 45, 46, and 47 for additional guidance on this question.

D. Clarification of § 744.23(d) To Improve Understanding

This rule revises § 744.23(d) (License review standards) for clarity to address a question BIS has received on the two exceptions that are specified for the presumption of denial license review policy included in the SME IFR by making the following changes. This rule removes the last sentence of paragraph (d), which specified general provisions that apply to all license reviews under paragraph (d) and redesignates that as the first sentence of paragraph (d) introductory text. Because this text applies to all of paragraph (d) it will be clearer to include this as the introductory text to paragraph (d). The license review policy is split into three new paragraphs: (d)(1) presumption of denial policy; (d)(2) presumption of approval policy; and (d)(3) case-by-case policy, which consists of three paragraphs.

Paragraph (d)(1) (Presumption of denial) is revised by adding “entity headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5,” which aligns with the destination-based presumption of denial policy for Macau and destinations in Country Group D:5.

This rule also adds new paragraph (d)(2) as the first exception, which specifies that license applications for end users headquartered in the United States or a destination in Country Group A:5 or A:6, that are not majority-owned by an entity headquartered in either Macau or a destination specified in Country Group D:5 are reviewed under a presumption of approval. The SME IFR included this exception, but redesignating this exception into its own paragraph will make it easier to understand.

This rule also adds a new paragraph (d)(3) (Case-by-case), to move the case-by-case license review policy that was included in the SME IFR into its own paragraph for ease of reference. In addition, BIS is adding in new paragraph (d)(3)(i) a case-by-case policy for certain enumerated items, excluding items designed or marketed for use in a datacenter and meeting the parameters of ECCN 3A090.a. This rule adds under new paragraph (d)(3)(ii), a case-by-case policy for license applications for when there is a foreign-made item available that is not subject to the license requirements in § 744.23 and performs the same function as the item subject to

the EAR. Lastly, for clarity and as a conforming change, this rule adds the phrase “not specified in paragraphs (d)(1), (2), or (3)(i) or (ii)” at the end of new paragraph (d)(3)(iii) to clarify that the case-by-case license review policy applies to all other license applications that are not already addressed in paragraph (d)(1) or (2) or (d)(3)(i) or (ii).

Savings Clause

Shipments of items removed from license exception eligibility or eligibility for export, reexport or transfer (in-country) without a license as a result of this regulatory action that were on dock for loading, on lighter, laden aboard an exporting carrier, or en route aboard a carrier to a port of export, on April 4, 2024, pursuant to actual orders for exports, reexports and transfers (in-country) to a foreign destination, may proceed to that destination under the previous license exception eligibility or without a license so long as they have been exported, reexported or transferred (in-country) before May 6, 2024. Any such items not actually exported, reexported or transferred (in-country) before midnight, on May 6, 2024, require a license in accordance with this interim final rule.

Export Control Reform Act of 2018

On August 13, 2018, the President signed into law the John S. McCain National Defense Authorization Act for Fiscal Year 2019, which included the Export Control Reform Act of 2018 (ECRA) (codified, as amended, at 50 U.S.C. 4801–4852). ECRA provides the legal basis for BIS’s principal authorities and serves as the authority under which BIS issues this rule.

Rulemaking Requirements

1. Executive Orders 12866, 13563, and 14094 direct agencies to assess all costs and benefits of available regulatory alternatives and, if regulation is necessary, to select regulatory approaches that maximize net benefits (including potential economic, environmental, public health and safety effects and distributive impacts and equity). Executive Order 13563 emphasizes the importance of quantifying both costs and benefits and of reducing costs, harmonizing rules, and promoting flexibility. This interim final rule has been designated a “significant regulatory action” under Executive Order 12866.

2. Notwithstanding any other provision of law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork

Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*) (PRA), unless that collection of information displays a currently valid Office of Management and Budget (OMB) Control Number.

This rule involves the following OMB-approved collections of information subject to the PRA:

- 0694–0088, “Multi-Purpose Application,” which carries a burden hour estimate of 29.4 minutes for a manual or electronic submission;
- 0694–0096 “Five Year Records Retention Period,” which carries a burden hour estimate of less than 1 minute;
- 0694–0122, “Licensing Responsibilities and Enforcement;” and
- 0607–0152 “Automated Export System (AES) Program,” which carries a burden hour estimate of 3 minutes per electronic submission.

The AC/S IFR will affect the collection under control number 0694–0088, for the multipurpose application because of the addition of the notification requirement for exports and reexports to China in order to use new License Exception Notified Advanced Computing (NAC) under § 740.8 of the EAR. BIS estimates that License Exception NAC notification will result in an increase of 3,000 multi-purpose applications submitted annually to BIS and an increase of 950 burden hours under this collection. BIS also anticipates the submission annually of 200 license applications as a result of the revision to license requirements included in the AC/S IFR, but because the original estimate that was included in the October 7 IFR (*i.e.*, that BIS estimates that these new controls under the EAR imposed by the October 7 IFR would result in an increase of 1,700 license applications submitted annually to BIS) was higher than the actual number of license applications BIS has received over the first year of the October IFR changes being in place, BIS did not anticipate any changes in these estimates as a result of the changes included in the AC/S IFR for license applications submitted to BIS as a result of the AC/S IFR with the one exception of the increase in burden hours for the License Exception NAC notifications, which was not accounted for in the October 7 IFR because License Exception NAC was not part of the EAR at that time.

The AC/S IFR will affect the information collection under control number 0607–0152, for filing EEI in AES because this rule adds § 758.1(g)(5) to impose a requirement for identifying .z items by “items” level classification in the EEI filing in AES. This change is not anticipated to result in a change in

the burden under this collection because filers are already required to provide a description in the Commodity description block in the EEI filing in AES. This regulation also involves a collection previously approved by the OMB under control number 0694–0122, “Licensing Responsibilities and Enforcement” because this rule under the revision to § 758.6(a)(2) will require the ECCN(s) for any 3A001.z, 3A090, 4A003.z, 4A004.z, 4A005.z, 4A090, 5A002.z, 5A004.z, 5A992.z to be included on the commercial invoice, similar to the previous requirement to include the “600 series” and 9x515 ECCNs on the commercial invoice. BIS does not anticipate a change in the total burden hours associated with the PRA and OMB control number 0694–0122 as a result of this rule.

Additional information regarding these collections of information—including all background materials—can be found at <https://www.reginfo.gov/public/do/PRAMain> by using the search function to enter either the title of the collection or the OMB Control Number.

3. This rule does not contain policies with federalism implications as that term is defined in Executive Order 13132.

4. Pursuant to section 1762 of ECRA (50 U.S.C. 4821), this action is exempt from the Administrative Procedure Act (APA) (5 U.S.C. 553) requirements for notice of proposed rulemaking, opportunity for public participation, and delay in effective date. While section 1762 of ECRA provides sufficient authority for such an exemption, this action is also independently exempt from these APA requirements because it involves a military or foreign affairs function of the United States (5 U.S.C. 553(a)(1)). However, BIS is not only accepting comments on both the SME and AC/S IFRs, but has in this rule extended the comment period by 30 days for both rules.

5. Because a notice of proposed rulemaking and an opportunity for public comment are not required to be given for this rule by 5 U.S.C. 553, or by any other law, the analytical requirements of the Regulatory Flexibility Act, 5 U.S.C. 601, *et seq.*, are not applicable. Accordingly, no regulatory flexibility analysis is required, and none has been prepared.

List of Subjects

15 CFR Parts 732 and 748

Administrative practice and procedure, Exports, Reporting and recordkeeping requirements.

15 CFR Part 734

Administrative practice and procedure, Exports, Inventions and patents, Research, Science and technology.

15 CFR Parts 740 and 758

Administrative practice and procedure, Exports, Reporting and recordkeeping requirements.

15 CFR Part 742

Exports, Terrorism.

15 CFR Part 744

Exports, Reporting and recordkeeping requirements, Terrorism.

15 CFR Parts 746 and 774

Exports, Reporting and recordkeeping requirements.

15 CFR Parts 736, 770, and 772

Exports.

For the reasons stated in the preamble, parts 732, 734, 736, 740, 742, 744, 746, 748, 758, 770, 772, and 774 of the Export Administration Regulations (15 CFR parts 730 through 774) are amended as follows:

PART 734—SCOPE OF THE EXPORT ADMINISTRATION REGULATIONS

- 1. The authority citation for part 734 continues to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.*; 50 U.S.C. 1701 *et seq.*; E.O. 12938, 59 FR 59099, 3 CFR, 1994 Comp., p. 950; E.O. 13020, 61 FR 54079, 3 CFR, 1996 Comp., p. 219; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783; E.O. 13637, 78 FR 16129, 3 CFR, 2014 Comp., p. 223; Notice of November 1, 2023, 88 FR 75475.

- 2. Supplement no. 1 to part 734 is amended by revising paragraph (b)(2)(viii) to read as follows:

Supplement No. 1 to Part 734—Model Certification for Purposes of the FDP Rule

* * * * *

(b) * * *

(2) * * *

(viii) Country and end-use scope of § 734.9(i)(2), *i.e.*, used in the design, “development,” “production,” operation, installation (including on-site installation), maintenance (checking), repair, overhaul, or refurbishing of, a “supercomputer” located in or destined to the People’s Republic of China (PRC) or Macau; or incorporated into, or used in the “development,” or “production,” of any “part,” “component,” or “equipment” that will be used in a

“supercomputer” located in or destined to the PRC or Macau;

* * * * *

PART 740—LICENSE EXCEPTIONS

■ 3. The authority citation for part 740 continues to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.*; 50 U.S.C. 1701 *et seq.*; 22 U.S.C. 7201 *et seq.*; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783.

■ 4. Section 740.2 is amended by revising paragraphs (a)(9)(i) and (a)(9)(ii) introductory text to read as follows:

§ 740.2 Restrictions on all License Exceptions.

* * * * *

(a) * * *

(9) (i) The item is controlled under ECCN 3B001.a.4, c, d, f.1.b, j to p, 3B002.b or c, or associated software and technology in ECCN 3D001, 3D002, 3D003, or 3E001 and is being exported, reexported, or transferred (in-country) to or within either Macau or a destination specified in Country Group D:5 of supplement no. 1 to this part, and the license exception is other than License Exception GOV, restricted to eligibility under the provisions of § 740.11(b).

(ii) The item is identified in paragraph (a)(9)(ii)(A) or (B) of this section, is being exported, reexported, or transferred (in-country) to or within a destination specified in Country Group D:1, D:4, or D:5, excluding any destination also specified in Country Groups A:5 or A:6, or to an entity headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, wherever located, and the license exception is other than: TMP, restricted to eligibility under the provisions of § 740.9(a)(6); NAC/ACA, under the provisions of § 740.8; RPL, under the provisions of § 740.10; GOV, restricted to eligibility under the provisions of § 740.11(b); or TSU under the provisions of § 740.13(a) and (c). Items restricted to eligibility only for the foregoing license exceptions are:

* * * * *

■ 5. Section 740.8 is revised to read as follows:

§ 740.8 Notified Advanced Computing (NAC) and Advanced Computing Authorized (ACA).

(a) *Eligibility requirements.* License Exception NAC authorizes the export and reexport of any item classified in ECCN 3A090, 4A090, 3A001.z, 4A003.z, 4A004.z, 4A005.z, 5A002.z, 5A004.z, 5A992.z, 5D002.z, or 5D992.z, except for items designed or marketed for use in a

datacenter and meeting the parameters of 3A090.a, to Macau and Country Group D:5 or an entity headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, wherever located. License Exception ACA authorizes the export, reexport, and transfer (in-country) of any item classified in ECCN 3A090, 4A090, 3A001.z, 4A003.z, 4A004.z, 4A005.z, 5A002.z, 5A004.z, 5A992.z, 5D002.z, or 5D992.z, except for items designed or marketed for use in a datacenter and meeting the parameters of 3A090.a, to or within any destination specified in Country Groups D:1 and D:4 (except Macau, a destination in Country Group D:5, or an entity headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, wherever located), as well as transfers (in-country) within Macau and destinations in Country Group D:5. These license exceptions may be used provided the export, reexport, or transfer (in-country) meets all of the applicable criteria identified under this paragraph (a) and none of the restrictions in paragraph (b) of this section.

(1) *Written purchase order.* Prior to any exports, reexports, and transfers (in-country) made pursuant to License Exceptions NAC or ACA you must obtain a written purchase order unless specifically exempted in this paragraph. Commercial samples are not subject to this purchase order requirement, but such transactions may be obligated to comply with paragraph (a)(2) of this section.

(2) *NAC Notification to BIS—(i) Notification requirement.* Prior to any exports or reexports to Macau or a destination specified in Country Group D:5 or to an entity headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, wherever located, the exporter or reexporter must notify BIS in accordance with the procedures set forth in paragraph (c) of this section.

(ii) *Multiple exports and reexports.* For multiple exports or reexports under License Exception NAC to the same end user and for the same item(s), the exporter or reexporter need only notify BIS prior to the first export or reexport, as long as the total dollar value and quantity of the shipments do not exceed the amounts stated on the notification. The dollar value and quantity on the notification do not need to match the dollar value and quantity on the purchase order; the notification's quantity and dollar value amounts may be based on estimates of future sales.

However, prior to export or reexport you must have a purchase order for every shipment made against the NAC notification. BIS will provide further information on the notification process in the policy guidance tab on the BIS website.

(3) *In relation to License Exception ENC and ECCNs 5A002.z, 5A004.z, or 5D002.z.* For exports, reexports, or transfer (in-country) of ECCNs 5A002.z, 5A004.z, or 5D002.z, all License Exception Encryption commodities, software, and technology (ENC) requirements under § 740.17 of this part must also be met for eligibility under License Exceptions NAC or ACA.

(b) *Restrictions.* No exports, reexports, or transfers (in-country) may be made under License Exception NAC or ACA that are subject to a license requirement under part 744 or 746 of the EAR, except for a license required under § 744.23(a)(3) for reexports or exports to any destination other than those specified in Country Groups D:1, D:4, or D:5 (excluding any destination also specified in Country Groups A:5 or A:6) for an entity that is headquartered in, or whose ultimate parent company is headquartered in, either Macau or a destination specified in Country Group D:5.

(c) *NAC Prior notification procedures—(1) Procedures.* At least twenty-five calendar days prior to exports or reexports using License Exception NAC, you must provide prior notification under License Exception NAC by submitting a completed application in SNAP–R in accordance with § 748.1 of the EAR. The following blocks must be completed, as appropriate: Blocks 1, 2, 3, 4, 5 (by marking box 5 export license or reexport license), 9, 14, 16, 17, 18, 19, 21, 22(a), (d), (e), (f), (g), (h), (i), (j), 23, 24, and 25 according to the instructions described in supplement no. 1 to part 748 of the EAR. Box 9 under special purpose must include NAC. The application must include certain information to allow for BIS to determine if the item in question otherwise meets the criteria for an item eligible for License Exception NAC. Required information to include in the NAC submission is as follows:

(i) Total Processing Performance of the item, as defined in ECCN 3A090;

(ii) Performance density of the item, as defined in ECCN 3A090; and

(iii) Data sheet or other documentation showing how the item is designed and marketed (in particular, whether it is designed or marketed for datacenter use).

(2) *Action by BIS for NAC notifications.* After the notification has

been registered in SNAP–R and within twenty-five calendar days after registration, BIS will inform you if a license is required. If BIS has not contacted you, then System for Tracking Export License Applications (STELA) (<https://snapr.bis.doc.gov/stela>) will, on the twenty-fifth calendar day following the date of registration, provide either confirmation that you can use License Exception NAC and a NAC confirmation number to be submitted in AES or confirmation that you cannot use License Exception NAC and you must apply for a license to continue with the transaction.

(3) *Status of pending NAC notification requests.* Log into BIS’s STELA for information about the status of your pending NAC notification or to verify the status in BIS’s Simplified Network Applications Processing Redesign (SNAP–R) System. STELA will provide the date the NAC notification is registered. BIS may alternatively provide such confirmation of NAC status by email, telephone, fax, courier service, or other means.

(4) *Actions that delay processing of NAC notifications.* Below are circumstances that will delay the processing of your NAC notification, *i.e.*, temporarily stop the twenty-five day processing clock for NAC notification:

- (i) Lapse in appropriations.
- (ii) Catastrophic event (*e.g.*, an extreme weather event that impacts government services).
- (iii) Multi-day processing system failure.

* * * * *

PART 742—CONTROL POLICY—CCL BASED CONTROLS

■ 6. The authority citation for part 742 is revised to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.*; 50 U.S.C. 1701 *et seq.*; 22 U.S.C. 3201 *et seq.*; 42 U.S.C. 2139a; 22 U.S.C. 7201 *et seq.*; 22 U.S.C. 7210; Sec. 1503, Pub. L. 108–11, 117 Stat. 559; E.O. 12058, 43 FR 20947, 3 CFR, 1978 Comp., p. 179; E.O. 12851, 58 FR 33181, 3 CFR, 1993 Comp., p. 608; E.O. 12938, 59 FR 59099, 3 CFR, 1994 Comp., p. 950; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783; Presidential Determination 2003–23, 68 FR 26459, 3 CFR, 2004 Comp., p. 320; Notice of November 1, 2023, 88 FR 75475 (November 3, 2023).

■ 7. Section 742.4 is amended by revising paragraph (a)(4) to read as follows:

§ 742.4 National security.

- (a) * * *

(4) *Certain semiconductor manufacturing equipment and associated software and technology.* A license is required for exports, reexports, and transfers (in-country) to or within either Macau or a destination specified in Country Group D:5 in supplement no. 1 to part 740 of the EAR of items specified in 3B001.a.4, c, d, f.1.b, j to p; 3B002.b and c; 3D001 (for 3B001.a.4, c, d, f.1.b, j to p, 3B002.b and c); 3D002 (for 3B001 a.4, c, d, f.1.b, j to p, 3B002.b and c); or 3E001 (for 3B001.a.4, c, d, f.1.b, j to p, 3B002.b and c). The license requirements in this paragraph (a)(4) do not apply to deemed exports or deemed reexports.

* * * * *

■ 8. Section 742.6 is amended by revising paragraph (a)(6)(i) to read as follows:

§ 742.6 Regional stability.

- (a) * * *
- (6) * * *

(i) *Exports, reexports, transfers (in-country) to or within Macau or Country Group D:5.* A license is required for items specified in ECCNs 3B001.a.4, c, d, f.1.b, j to p, 3B002.b and c; and associated software and technology in 3D001 (for 3B001.a.4, c, d, f.1.b, j to p, 3B002.b and c), 3D002 (for 3B001.a.4, c, d, f.1.b, j to p, 3B002.b and c), and 3E001 (for 3B001.a.4, c, d, f.1.b, j to p, 3B002.b and c) being exported, reexported, or transferred (in-country) to or within Macau or a destination specified in Country Group D:5 in supplement no. 1 to part 740 of the EAR.

* * * * *

■ 9. Section 742.15 is amended by revising paragraph (a)(1) to read as follows:

§ 742.15 Encryption items.

- (a) * * *

(1) *Licensing requirements.* A license is required to export or reexport encryption items (“EI”) classified under ECCN 5A002, 5A004, 5D002.a, .c.1 or .d (for equipment and “software” in ECCNs 5A002 or 5A004, 5D002.c.1); or 5E002 for “technology” for the “development,” “production,” or “use” of commodities or “software” controlled for EI reasons in ECCNs 5A002, 5A004 or 5D002, and “technology” classified under 5E002.b to all destinations, except Canada. Refer to part 740 of the EAR, for license exceptions that apply to certain encryption items, and to § 772.1 of the EAR for definitions of encryption items and terms. Most encryption items may be exported under the provisions of License Exception

ENC set forth in § 740.17 of the EAR. Following classification or self-classification, items that meet the criteria of Note 3 to Category 5—Part 2 of the Commerce Control List (the “mass market” note), are classified under ECCN 5A992 or 5D992 and are no longer subject to this Section (see § 740.17 of the EAR). Before submitting a license application, please review License Exception ENC to determine whether this license exception is available for your item or transaction. For exports, reexports, or transfers (in-country) of encryption items that are not eligible for a license exception, you must submit an application to obtain authorization under a license or an Encryption Licensing Arrangement.

* * * * *

PART 744—CONTROL POLICY: END-USER AND END-USE BASED

■ 10. The authority citation for part 744 is revised to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.*; 50 U.S.C. 1701 *et seq.*; 22 U.S.C. 3201 *et seq.*; 42 U.S.C. 2139a; 22 U.S.C. 7201 *et seq.*; 22 U.S.C. 7210; E.O. 12058, 43 FR 20947, 3 CFR, 1978 Comp., p. 179; E.O. 12851, 58 FR 33181, 3 CFR, 1993 Comp., p. 608; E.O. 12938, 59 FR 59099, 3 CFR, 1994 Comp., p. 950; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13099, 63 FR 45167, 3 CFR, 1998 Comp., p. 208; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783; E.O. 13224, 66 FR 49079, 3 CFR, 2001 Comp., p. 786; ; Notice of September 7, 2023, 88 FR 62439 (September 11, 2023), Notice of November 1, 2023, 88 FR 75475.

■ 11. Section 744.6 is amended by revising paragraphs (c)(2)(iii) and (e)(3) to read as follows:

§ 744.6 Restrictions on specific activities of “U.S. persons.”

* * * * *

- (c) * * *
- (2) * * *

(iii) *Semiconductor manufacturing equipment.* To or within either Macau or a destination specified in Country Group D:5, any item not subject to the EAR and meeting the parameters of ECCNs 3B001.a.4, c, d, f.1.b, j to p; 3B002.b and c; 3D001 (for 3B001.a.4, c, d, f.1.b, j to p, 3B002.b and c); 3D002 (for 3B001 a.4, c, d, f.1.b, j to p, 3B002.b and c); or 3E001 (for 3B001.a.4, c, d, f.1.b, j to p, 3B002.b and c) regardless of end use or end user.

* * * * *

- (e) * * *

(3) Applications for licenses submitted pursuant to the notice of a license requirement set forth in paragraph (c)(2) of this section will be reviewed in accordance with the policies described in paragraphs (e)(1)

through (3) of this section. License review will take into account factors including technology level, customers, compliance plans, and contract sanctity.

(i) *Presumption of denial.*

Applications will be reviewed with a presumption of denial for Macau and destinations specified in Country Group D:5 and entities headquartered or whose ultimate parent is headquartered in Macau or destinations specified in Country Group D:5, unless paragraph (e)(3)(ii) of this section applies.

(ii) *Case-by-case.* Applications will be reviewed with a case-by-case policy for license applications that meet either of the following conditions:

(A) For items specified in ECCN 3A090, 4A090, 3A001.z, 4A003.z, 4A004.z, 4A005.z, 5A002.z, 5A004.z, 5A992.z, 5D002.z, or 5D992.z, except for items designed or marketed for use in a datacenter and meeting the parameters of 3A090.a;

(B) For activities involving an item subject to the license requirements of paragraph (c)(2) of this section where there is an item not subject to the license requirements of paragraph (c)(2) that performs the same function as an item meeting the license requirements of paragraph (c)(2); or

(C) For all other applications not specified in paragraph (e)(3)(i) or (e)(3)(ii)(A) or (B) of this section.

■ 12. Section 744.23 is amended by revising paragraphs (a)(4), (c), and (d) to read as follows:

§ 744.23 “Supercomputer,” “advanced-node integrated circuits,” and semiconductor manufacturing equipment end use controls.

* * * * *

(a) * * *

(4) *Semiconductor manufacturing equipment (SME) and “components,” “assemblies,” and “accessories.”* A license is required for export, reexport, or transfer (in-country) if either paragraph (a)(4)(i) or (ii) of this section applies.

(i) *Directly destined to Macau and Country Group D:5.* Any item subject to the EAR and specified on the CCL when destined to or within either Macau or a destination specified in Country Group D:5 for the “development” or “production” of “front-end integrated circuit “production” equipment” and “components,” “assemblies,” and “accessories” therefor specified in ECCN 3B001 (except 3B001.g and .h), 3B002, 3B611, 3B991 (except 3B991.b.2.a through .b), 3B992, or associated “software” and “technology” in 3D or 3E of the CCL.

(ii) *Indirect exports, reexports, or transfers (in-country).* Any item subject

to the EAR and specified on the CCL for export, reexport, or transfer (in-country), if all of the following apply:

(A) The item is for “development” or “production” of a foreign-made item, whether subject to the EAR or not, that is specified in an ECCN listed in paragraph (i);

(B) When the foreign-made item is for “development” or “production” of any initial or subsequent foreign-made item, whether subject to the EAR or not, specified in an ECCN listed in paragraph (a)(4)(i) of this section; and

(C) The “development” or “production” is by an entity headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5.

Note 1 to paragraph (a)(4): Front-end integrated circuit “production” equipment includes equipment used in the production stages from a blank wafer or substrate to a completed wafer or substrate (*i.e.*, the integrated circuits are processed but they are still on the wafer or substrate). If there is a question at the time of export, reexport, or transfer (in-country) about whether equipment is used in front-end integrated circuit “production,” you may submit an advisory opinion request to BIS pursuant to § 748.3(c) of the EAR for clarification.

Note 2 to paragraph (a)(4): For transactions involving “development” or “production” in Macau or a destination specified in Country Group D:5 by an entity that is headquartered in Macau or a destination specified in Country Group D:5, but the “development” or “production” is undertaken at the direction of an entity headquartered in the United States or a destination specified in Country Group A:5 or A:6, refer to General Order No. 4 in Supp. No. 1 to Part 736 (Temporary General License—Less restricted SME “parts,” “components,” or “equipment”).

* * * * *

(c) *License exceptions.* No license exceptions may overcome the prohibition described in paragraph (a) of this section, except the prohibitions in paragraphs (a)(4) and (a)(3)(i) of this section may be overcome by license exceptions in § 740.2(a)(9)(i) or (ii) of the EAR, respectively.

(d) *License review standards.* License review will consider several factors including technology level, customers, compliance plans, and contract sanctity.

(1) *Presumption of denial.*

Applications will be reviewed with a presumption of denial for Macau and destinations specified in Country Group

D:5 and any entity headquartered in, or with an ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, unless either paragraph (d)(2) or (3) applies.

(2) *Presumption of approval.*

Applications will be reviewed with a presumption of approval for end users headquartered in the United States or a destination specified in Country Group A:5 or A:6, that are not majority-owned by an entity headquartered in either Macau or a destination specified in Country Group D:5.

(3) *Case-by-case.* There is a case-by-case license review policy for license applications that meet one of the following conditions:

(i) For items specified in ECCN 3A090, 4A090, 3A001.z, 4A003.z, 4A004.z, 4A005.z, 5A002.z, 5A004.z, 5A992.z, 5D002.z, or 5D992.z, except for items designed or marketed for use in a datacenter and meeting the parameters of 3A090.a;

(ii) For items subject to the license requirements of this section where there is a foreign-made item that is not subject to the license requirements of this section and performs the same function as an item subject to the EAR license requirements of this section; or

(iii) For all other applications not specified in paragraph (d)(1) or (2) or (d)(3)(i) or (ii).

PART 774—THE COMMERCE CONTROL LIST

■ 13. The authority citation for part 774 continues to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.*; 50 U.S.C. 1701 *et seq.*; 10 U.S.C. 8720; 10 U.S.C. 8730(e); 22 U.S.C. 287c, 22 U.S.C. 3201 *et seq.*; 22 U.S.C. 6004; 42 U.S.C. 2139a; 15 U.S.C. 1824; 50 U.S.C. 4305; 22 U.S.C. 7201 *et seq.*; 22 U.S.C. 7210; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783.

■ 14. Supplement no. 1 to part 774 is amended by revising ECCNs 3A001, 3A090, 3B001, 3B991, 3D001, 3D002, 3E001, 4A003, 4A004, 4A005, 4A090, 4D001, 4E001, 5A002, 5A992, 5A004, 5D002, 5D992, 5E002, and 5E992 to read as follows:

Supplement No. 1 to Part 774—The Commerce Control List

* * * * *

3A001 Electronic items as follows (see List of Items Controlled).

Reason for Control: NS, RS, MT, NP, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)	Control(s)	Country chart (see Supp. No. 1 to part 738)	the destinations listed in Country Group A:5 or A:6 (See Supplement No.1 to part 740 of the EAR).
NS applies to “Monolithic Microwave Integrated Circuit” (“MMIC”) amplifiers in 3A001.b.2 and discrete microwave transistors in 3A001.b.3, except those 3A001.b.2 and b.3 items being exported or reexported for use in civil telecommunications applications; and 3A001.z.1.	NS Column 1.	NP applies to pulse discharge capacitors in 3A001.e.2 and superconducting solenoidal electromagnets in 3A001.e.3 that meet or exceed the technical parameters in 3A201.a and 3A201.b, respectively; and 3A001.z.3.	NP Column 1.	List of Items Controlled
NS applies to entire entry.	NS Column 2.	AT applies to entire entry.	AT Column 1.	<i>Related Controls:</i> (1) See Category XV of the USML for certain “space-qualified” electronics and Category XI of the USML for certain ASICs, ‘transmit/receive modules,’ or ‘transmit modules’ ‘subject to the ITAR’ (see 22 CFR parts 120 through 130). (2) See also 3A090, 3A101, 3A201, 3A611, 3A991, and 9A515.
RS applies “Monolithic Microwave Integrated Circuit” (“MMIC”) amplifiers in 3A001.b.2 and discrete microwave transistors in 3A001.b.3, except those 3A001.b.2 and b.3 items being exported or reexported for use in civil telecommunications applications; and 3A001.z.1.	RS Column 1.	Reporting Requirements: See § 743.1 of the EAR for reporting requirements for exports under 3A001.b.2 or b.3 under License Exceptions, and Validated End-User authorizations.		<i>Related Definitions:</i> ‘Microcircuit’ means a device in which a number of passive or active elements are considered as indivisibly associated on or within a continuous structure to perform the function of a circuit. For the purposes of integrated circuits in 3A001.a.1, 5×10^3 Gy(Si) = 5×10^5 Rads (Si); 5×10^6 Gy (Si)/s = 5×10^8 Rads (Si)/s.
RS applies to 3A001.z.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.	License Requirements: See § 744.17 of the EAR for additional license requirements for microprocessors having a processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating “information security” functionality, and associated “software” and “technology” for the “production” or “development” of such microprocessors.		<i>Items:</i>
MT applies to 3A001.a.1.a when usable in “missiles”; and to 3A001.a.5.a when “designed or modified” for military use, hermetically sealed and rated for operation in the temperature range from below -54°C to above $+125^\circ\text{C}$; and 3A001.z.2.	MT Column 1.	List Based License Exceptions (See Part 740 for a Description of All License Exceptions)		Note 1: Integrated circuits include the following types:
		LVS: N/A for MT, NP; N/A for “Monolithic Microwave Integrated Circuit” (“MMIC”) amplifiers in 3A001.b.2, discrete microwave transistors in 3A001.b.3, and 3A001.z.1, except those that are being exported or reexported for use in civil telecommunications applications.		—“Monolithic integrated circuits”; —“Hybrid integrated circuits”; —“Multichip integrated circuits”; —Film type integrated circuits, including silicon-on-sapphire integrated circuits”; —“Optical integrated circuits”; —“Three dimensional integrated circuits”; —“Monolithic Microwave Integrated Circuits” (“MMICs”).
		Yes for: \$1500: 3A001.c \$3000: 3A001.b.1, b.2 (exported or reexported for use in civil telecommunications applications), b.3 (exported or reexported for use in civil telecommunications applications), b.9, .d, .e, .f, .g, and z.1 (exported or reexported for use in civil telecommunications applications).		a.1. Integrated circuits designed or rated as radiation hardened to withstand any of the following:
		\$5000: 3A001.a (except a.1.a and a.5.a when controlled for MT), b.4 to b.7, and b.12.		a.1.a. A total dose of 5×10^3 Gy (Si), or higher;
		GBS: Yes for 3A001.a.1.b, a.2 to a.14 (except a.5.a when controlled for MT), b.2 (exported or reexported for use in civil telecommunications applications), b.8 (except for “vacuum electronic devices” exceeding 18 GHz), b.9., b.10, .g, .h, .i, and z.1 (exported or reexported for use in civil telecommunications applications).		a.1.b. A dose rate upset of 5×10^6 Gy (Si)/s, or higher; or
		NAC/ACA: Yes, for 3A001.z. Note: See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for ECCN 3A001.z.		a.1.c. A fluence (integrated flux) of neutrons (1 MeV equivalent) of 5×10^{13} n/cm ² or higher on silicon, or its equivalent for other materials;
		Special Conditions for STA		Note: 3A001.a.1.c does not apply to Metal Insulator Semiconductors (MIS).
		STA: License Exception STA may not be used to ship any item in 3A001.b.2 or b.3, except those that are being exported or reexported for use in civil telecommunications applications, to any of		a.2. “Microprocessor microcircuits,” “microcomputer microcircuits,” microcontroller microcircuits, storage integrated circuits manufactured from a compound semiconductor, analog-to-digital converters, integrated circuits that contain analog-to-digital converters and store or process the digitized data, digital-to-analog converters, electro-optical or “optical integrated circuits” designed for “signal processing”, field programmable logic devices, custom integrated circuits for which either the function is unknown or the control status of the equipment in which the integrated circuit will be used in unknown, Fast Fourier Transform (FFT) processors, Static Random-Access Memories (SRAMs), or ‘non-volatile memories,’ having any of the following:
				Technical Note: For the purposes of 3A001.a.2, ‘non-volatile memories’ are memories with data retention over a period of time after a power shutdown.
				a.2.a. Rated for operation at an ambient temperature above 398 K (+125 °C);
				a.2.b. Rated for operation at an ambient temperature below 218 K (– 55 °C); or

a.2.c. Rated for operation over the entire ambient temperature range from 218 K (−55 °C) to 398 K (+125 °C);

Note: 3A001.a.2 does not apply to integrated circuits designed for civil automobile or railway train applications.

a.3. “Microprocessor microcircuits”, “microcomputer microcircuits” and microcontroller microcircuits, manufactured from a compound semiconductor and operating at a clock frequency exceeding 40 MHz;

Note: 3A001.a.3 includes digital signal processors, digital array processors and digital coprocessors.

a.4. [Reserved]

a.5. Analog-to-Digital Converter (ADC) and Digital-to-Analog Converter (DAC) integrated circuits, as follows:

a.5.a. ADCs having any of the following:

a.5.a.1. A resolution of 8 bit or more, but less than 10 bit, with a “sample rate” greater than 1.3 Giga Samples Per Second (GSPS);

a.5.a.2. A resolution of 10 bit or more, but less than 12 bit, with a “sample rate” greater than 600 Mega Samples Per Second (MSPS);

a.5.a.3. A resolution of 12 bit or more, but less than 14 bit, with a “sample rate” greater than 400 MSPS;

a.5.a.4. A resolution of 14 bit or more, but less than 16 bit, with a “sample rate” greater than 250 MSPS; or

a.5.a.5. A resolution of 16 bit or more with a “sample rate” greater than 65 MSPS;

N.B.: For integrated circuits that contain analog-to-digital converters and store or process the digitized data see 3A001.a.14.

Technical Notes: For the purposes of 3A001.a.5.a:

1. A resolution of n bit corresponds to a quantization of 2^n levels.

2. The resolution of the ADC is the number of bits of the digital output that represents the measured analog input. Effective Number of Bits (ENOB) is not used to determine the resolution of the ADC.

3. For “multiple channel ADCs”, the “sample rate” is not aggregated and the “sample rate” is the maximum rate of any single channel.

4. For “interleaved ADCs” or for “multiple channel ADCs” that are specified to have an interleaved mode of operation, the “sample rates” are aggregated and the “sample rate” is the maximum combined total rate of all of the interleaved channels.

a.5.b. Digital-to-Analog Converters (DAC) having any of the following:

a.5.b.1. A resolution of 10-bit or more but less than 12-bit, with an ‘adjusted update rate’ of exceeding 3,500 MSPS; or

a.5.b.2. A resolution of 12-bit or more and having any of the following:

a.5.b.2.a. An ‘adjusted update rate’ exceeding 1,250 MSPS but not exceeding 3,500 MSPS, and having any of the following:

a.5.b.2.a.1. A settling time less than 9 ns to arrive at or within 0.024% of full scale from a full scale step; or

a.5.b.2.a.2. A ‘Spurious Free Dynamic Range’ (SFDR) greater than 68 dBc (carrier) when synthesizing a full scale analog signal of 100 MHz or the highest full scale analog signal frequency specified below 100 MHz; or

a.5.b.2.b. An ‘adjusted update rate’ exceeding 3,500 MSPS;

Technical Notes: For the purposes of 3A001.a.5.b:

1. ‘Spurious Free Dynamic Range’ (SFDR) is defined as the ratio of the RMS value of the carrier frequency (maximum signal component) at the input of the DAC to the RMS value of the next largest noise or harmonic distortion component at its output.

2. SFDR is determined directly from the specification table or from the characterization plots of SFDR versus frequency.

3. A signal is defined to be full scale when its amplitude is greater than -3 dBfs (full scale).

4. ‘Adjusted update rate’ for DACs is:

a. For conventional (non-interpolating) DACs, the ‘adjusted update rate’ is the rate at which the digital signal is converted to an analog signal and the output analog values are changed by the DAC. For DACs where the interpolation mode may be bypassed (interpolation factor of one), the DAC should be considered as a conventional (non-interpolating) DAC.

b. For interpolating DACs (oversampling DACs), the ‘adjusted update rate’ is defined as the DAC update rate divided by the smallest interpolating factor. For interpolating DACs, the ‘adjusted update rate’ may be referred to by different terms including:

- input data rate
- input word rate
- input sample rate
- maximum total input bus rate
- maximum DAC clock rate for DAC clock input.

a.6. Electro-optical and “optical integrated circuits”, designed for “signal processing” and having all of the following:

a.6.a. One or more than one internal “laser” diode;

a.6.b. One or more than one internal light detecting element; and

a.6.c. Optical waveguides;

a.7. ‘Field programmable logic devices’ having any of the following:

a.7.a. A maximum number of single-ended digital input/outputs of greater than 700; or

a.7.b. An ‘aggregate one-way peak serial transceiver data rate’ of 500 Gb/s or greater;

Note: 3A001.a.7 includes:

—Complex Programmable Logic Devices (CPLDs);

—Field Programmable Gate Arrays (FPGAs);

—Field Programmable Logic Arrays (FPLAs);

—Field Programmable Interconnects (FPICs).

N.B.: For integrated circuits having field programmable logic devices that are combined with an analog-to-digital converter, see 3A001.a.14.

Technical Notes: For the purposes of 3A001.a.7:

1. Maximum number of digital input/outputs in 3A001.a.7.a is also referred to as maximum user input/outputs or maximum available input/outputs, whether the integrated circuit is packaged or bare die.

2. ‘Aggregate one-way peak serial transceiver data rate’ is the product of the peak serial one-way transceiver data rate times the number of transceivers on the FPGA.

a.8. [Reserved]

a.9. Neural network integrated circuits;

a.10. Custom integrated circuits for which the function is unknown, or the control status of the equipment in which the integrated circuits will be used is unknown to the manufacturer, having any of the following:

a.10.a. More than 1,500 terminals;

a.10.b. A typical “basic gate propagation delay time” of less than 0.02 ns; or

a.10.c. An operating frequency exceeding 3 GHz;

a.11. Digital integrated circuits, other than those described in 3A001.a.3 to 3A001.a.10 and 3A001.a.12, based upon any compound semiconductor and having any of the following:

a.11.a. An equivalent gate count of more than 3,000 (2 input gates); or

a.11.b. A toggle frequency exceeding 1.2 GHz;

a.12. Fast Fourier Transform (FFT) processors having a rated execution time for an N -point complex FFT of less than $(N \log_2 N)/20,480$ ms, where N is the number of points;

Technical Note: For the purposes of 3A001.a.12, when N is equal to 1,024 points, the formula in 3A001.a.12 gives an execution time of 500 μ s.

a.13. Direct Digital Synthesizer (DDS) integrated circuits having any of the following:

a.13.a. A Digital-to-Analog Converter (DAC) clock frequency of 3.5 GHz or more and a DAC resolution of 10 bit or more, but less than 12 bit; or

a.13.b. A DAC clock frequency of 1.25 GHz or more and a DAC resolution of 12 bit or more;

Technical Note: For the purposes of 3A001.a.13, the DAC clock frequency may be specified as the master clock frequency or the input clock frequency.

a.14. Integrated circuits that perform or are programmable to perform all of the following:

a.14.a. Analog-to-digital conversions meeting any of the following:

a.14.a.1. A resolution of 8 bit or more, but less than 10 bit, with a “sample rate” greater than 1.3 Giga Samples Per Second (GSPS);

a.14.a.2. A resolution of 10 bit or more, but less than 12 bit, with a “sample rate” greater than 1.0 GSPS;

a.14.a.3. A resolution of 12 bit or more, but less than 14 bit, with a “sample rate” greater than 1.0 GSPS;

a.14.a.4. A resolution of 14 bit or more, but less than 16 bit, with a “sample rate” greater than 400 Mega Samples Per Second (MSPS); or

a.14.a.5. A resolution of 16 bit or more with a “sample rate” greater than 180 MSPS; and

a.14.b. Any of the following:

a.14.b.1. Storage of digitized data; or

a.14.b.2. Processing of digitized data;

N.B. 1: For analog-to-digital converter integrated circuits see 3A001.a.5.a.

N.B. 2: For field programmable logic devices see 3A001.a.7.

Technical Notes: For the purposes of 3A001.a.14:

1. A resolution of n bit corresponds to a quantization of 2^n levels.

2. The resolution of the ADC is the number of bits of the digital output of the ADC that

represents the measured analog input. Effective Number of Bits (ENOB) is not used to determine the resolution of the ADC.

3. For integrated circuits with non-interleaving “multiple channel ADCs”, the “sample rate” is not aggregated and the “sample rate” is the maximum rate of any single channel.

4. For integrated circuits with “interleaved ADCs” or with “multiple channel ADCs” that are specified to have an interleaved mode of operation, the “sample rates” are aggregated and the “sample rate” is the maximum combined total rate of all of the interleaved channels.

b. Microwave or millimeter wave items, as follows:

Technical Note: For the purposes of 3A001.b, the parameter peak saturated power output may also be referred to on product data sheets as output power, saturated power output, maximum power output, peak power output, or peak envelope power output.

b.1. “Vacuum electronic devices” and cathodes, as follows:

Note 1: 3A001.b.1 does not control “vacuum electronic devices” designed or rated for operation in any frequency band and having all of the following:

a. Does not exceed 31.8 GHz; and

b. Is “allocated by the ITU” for radio-communications services, but not for radio-determination.

Note 2: 3A001.b.1 does not control non-“space-qualified” “vacuum electronic devices” having all the following:

a. An average output power equal to or less than 50 W; and

b. Designed or rated for operation in any frequency band and having all of the following:

1. Exceeds 31.8 GHz but does not exceed 43.5 GHz; and

2. Is “allocated by the ITU” for radio-communications services, but not for radio-determination.

b.1.a. Traveling-wave “vacuum electronic devices,” pulsed or continuous wave, as follows:

b.1.a.1. Devices operating at frequencies exceeding 31.8 GHz;

b.1.a.2. Devices having a cathode heater with a turn on time to rated RF power of less than 3 seconds;

b.1.a.3. Coupled cavity devices, or derivatives thereof, with a “fractional bandwidth” of more than 7% or a peak power exceeding 2.5 kW;

b.1.a.4. Devices based on helix, folded waveguide, or serpentine waveguide circuits, or derivatives thereof, having any of the following:

b.1.a.4.a. An “instantaneous bandwidth” of more than one octave, and average power (expressed in kW) times frequency (expressed in GHz) of more than 0.5;

b.1.a.4.b. An “instantaneous bandwidth” of one octave or less, and average power (expressed in kW) times frequency (expressed in GHz) of more than 1;

b.1.a.4.c. Being “space-qualified”; or

b.1.a.4.d. Having a gridded electron gun;

b.1.a.5. Devices with a “fractional bandwidth” greater than or equal to 10%, with any of the following:

b.1.a.5.a. An annular electron beam;

b.1.a.5.b. A non-axisymmetric electron beam; or

b.1.a.5.c. Multiple electron beams;

b.1.b. Crossed-field amplifier “vacuum electronic devices” with a gain of more than 17 dB;

b.1.c. Thermionic cathodes, designed for “vacuum electronic devices,” producing an emission current density at rated operating conditions exceeding 5 A/cm² or a pulsed (non-continuous) current density at rated operating conditions exceeding 10 A/cm²;

b.1.d. “Vacuum electronic devices” with the capability to operate in a ‘dual mode.’
Technical Note: For the purposes of 3A001.b.1.d, ‘dual mode’ means the “vacuum electronic device” beam current can be intentionally changed between continuous-wave and pulsed mode operation by use of a grid and produces a peak pulse output power greater than the continuous-wave output power.

b.2. “Monolithic Microwave Integrated Circuit” (“MMIC”) amplifiers that are any of the following:

N.B.: For “MMIC” amplifiers that have an integrated phase shifter see 3A001.b.12.

b.2.a. Rated for operation at frequencies exceeding 2.7 GHz up to and including 6.8 GHz with a “fractional bandwidth” greater than 15%, and having any of the following:

b.2.a.1. A peak saturated power output greater than 75 W (48.75 dBm) at any frequency exceeding 2.7 GHz up to and including 2.9 GHz;

b.2.a.2. A peak saturated power output greater than 55 W (47.4 dBm) at any frequency exceeding 2.9 GHz up to and including 3.2 GHz;

b.2.a.3. A peak saturated power output greater than 40 W (46 dBm) at any frequency exceeding 3.2 GHz up to and including 3.7 GHz; or

b.2.a.4. A peak saturated power output greater than 20 W (43 dBm) at any frequency exceeding 3.7 GHz up to and including 6.8 GHz;

b.2.b. Rated for operation at frequencies exceeding 6.8 GHz up to and including 16 GHz with a “fractional bandwidth” greater than 10%, and having any of the following:

b.2.b.1. A peak saturated power output greater than 10 W (40 dBm) at any frequency exceeding 6.8 GHz up to and including 8.5 GHz; or

b.2.b.2. A peak saturated power output greater than 5 W (37 dBm) at any frequency exceeding 8.5 GHz up to and including 16 GHz;

b.2.c. Rated for operation with a peak saturated power output greater than 3 W (34.77 dBm) at any frequency exceeding 16 GHz up to and including 31.8 GHz, and with a “fractional bandwidth” of greater than 10%;

b.2.d. Rated for operation with a peak saturated power output greater than 0.1 nW (–70 dBm) at any frequency exceeding 31.8 GHz up to and including 37 GHz;

b.2.e. Rated for operation with a peak saturated power output greater than 1 W (30 dBm) at any frequency exceeding 37 GHz up to and including 43.5 GHz, and with a “fractional bandwidth” of greater than 10%;

b.2.f. Rated for operation with a peak saturated power output greater than 31.62

mW (15 dBm) at any frequency exceeding 43.5 GHz up to and including 75 GHz, and with a “fractional bandwidth” of greater than 10%;

b.2.g. Rated for operation with a peak saturated power output greater than 10 mW (10 dBm) at any frequency exceeding 75 GHz up to and including 90 GHz, and with a “fractional bandwidth” of greater than 5%; or

b.2.h. Rated for operation with a peak saturated power output greater than 0.1 nW (–70 dBm) at any frequency exceeding 90 GHz;

Note 1: [Reserved]

Note 2: The control status of the “MMIC” whose rated operating frequency includes frequencies listed in more than one frequency range, as defined by 3A001.b.2.a through 3A001.b.2.h, is determined by the lowest peak saturated power output control threshold.

Note 3: Notes 1 and 2 following the Category 3 heading for product group A. Systems, Equipment, and Components mean that 3A001.b.2 does not control “MMICs” if they are “specially designed” for other applications, e.g., telecommunications, radar, automobiles.

b.3. Discrete microwave transistors that are any of the following:

b.3.a. Rated for operation at frequencies exceeding 2.7 GHz up to and including 6.8 GHz and having any of the following:

b.3.a.1. A peak saturated power output greater than 400 W (56 dBm) at any frequency exceeding 2.7 GHz up to and including 2.9 GHz;

b.3.a.2. A peak saturated power output greater than 205 W (53.12 dBm) at any frequency exceeding 2.9 GHz up to and including 3.2 GHz;

b.3.a.3. A peak saturated power output greater than 115 W (50.61 dBm) at any frequency exceeding 3.2 GHz up to and including 3.7 GHz; or

b.3.a.4. A peak saturated power output greater than 60 W (47.78 dBm) at any frequency exceeding 3.7 GHz up to and including 6.8 GHz;

b.3.b. Rated for operation at frequencies exceeding 6.8 GHz up to and including 31.8 GHz and having any of the following:

b.3.b.1. A peak saturated power output greater than 50 W (47 dBm) at any frequency exceeding 6.8 GHz up to and including 8.5 GHz;

b.3.b.2. A peak saturated power output greater than 15 W (41.76 dBm) at any frequency exceeding 8.5 GHz up to and including 12 GHz;

b.3.b.3. A peak saturated power output greater than 40 W (46 dBm) at any frequency exceeding 12 GHz up to and including 16 GHz; or

b.3.b.4. A peak saturated power output greater than 7 W (38.45 dBm) at any frequency exceeding 16 GHz up to and including 31.8 GHz;

b.3.c. Rated for operation with a peak saturated power output greater than 0.5 W (27 dBm) at any frequency exceeding 31.8 GHz up to and including 37 GHz;

b.3.d. Rated for operation with a peak saturated power output greater than 1 W (30 dBm) at any frequency exceeding 37 GHz up to and including 43.5 GHz;

b.3.e. Rated for operation with a peak saturated power output greater than 0.1 nW (−70 dBm) at any frequency exceeding 43.5 GHz; or

b.3.f. Other than those specified by 3A001.b.3.a to 3A001.b.3.e and rated for operation with a peak saturated power output greater than 5 W (37.0 dBm) at all frequencies exceeding 8.5 GHz up to and including 31.8 GHz;

Note 1: *The control status of a transistor in 3A001.b.3.a through 3A001.b.3.e, whose rated operating frequency includes frequencies listed in more than one frequency range, as defined by 3A001.b.3.a through 3A001.b.3.e, is determined by the lowest peak saturated power output control threshold.*

Note 2: *3A001.b.3 includes bare dice, dice mounted on carriers, or dice mounted in packages. Some discrete transistors may also be referred to as power amplifiers, but the status of these discrete transistors is determined by 3A001.b.3.*

b.4. Microwave solid state amplifiers and microwave assemblies/modules containing microwave solid state amplifiers, that are any of the following:

b.4.a. Rated for operation at frequencies exceeding 2.7 GHz up to and including 6.8 GHz with a “fractional bandwidth” greater than 15%, and having any of the following:

b.4.a.1. A peak saturated power output greater than 500 W (57 dBm) at any frequency exceeding 2.7 GHz up to and including 2.9 GHz;

b.4.a.2. A peak saturated power output greater than 270 W (54.3 dBm) at any frequency exceeding 2.9 GHz up to and including 3.2 GHz;

b.4.a.3. A peak saturated power output greater than 200 W (53 dBm) at any frequency exceeding 3.2 GHz up to and including 3.7 GHz; or

b.4.a.4. A peak saturated power output greater than 90 W (49.54 dBm) at any frequency exceeding 3.7 GHz up to and including 6.8 GHz;

b.4.b. Rated for operation at frequencies exceeding 6.8 GHz up to and including 31.8 GHz with a “fractional bandwidth” greater than 10%, and having any of the following:

b.4.b.1. A peak saturated power output greater than 70 W (48.45 dBm) at any frequency exceeding 6.8 GHz up to and including 8.5 GHz;

b.4.b.2. A peak saturated power output greater than 50 W (47 dBm) at any frequency exceeding 8.5 GHz up to and including 12 GHz;

b.4.b.3. A peak saturated power output greater than 30 W (44.77 dBm) at any frequency exceeding 12 GHz up to and including 16 GHz; or

b.4.b.4. A peak saturated power output greater than 20 W (43 dBm) at any frequency exceeding 16 GHz up to and including 31.8 GHz;

b.4.c. Rated for operation with a peak saturated power output greater than 0.5 W (27 dBm) at any frequency exceeding 31.8 GHz up to and including 37 GHz;

b.4.d. Rated for operation with a peak saturated power output greater than 2 W (33 dBm) at any frequency exceeding 37 GHz up to and including 43.5 GHz, and with a “fractional bandwidth” of greater than 10%;

b.4.e. Rated for operation at frequencies exceeding 43.5 GHz and having any of the following:

b.4.e.1. A peak saturated power output greater than 0.2 W (23 dBm) at any frequency exceeding 43.5 GHz up to and including 75 GHz, and with a “fractional bandwidth” of greater than 10%;

b.4.e.2. A peak saturated power output greater than 20 mW (13 dBm) at any frequency exceeding 75 GHz up to and including 90 GHz, and with a “fractional bandwidth” of greater than 5%; or

b.4.e.3. A peak saturated power output greater than 0.1 nW (−70 dBm) at any frequency exceeding 90 GHz; or

b.4.f. [Reserved]

N.B.:

1. For “MMIC” amplifiers see 3A001.b.2.

2. For ‘transmit/receive modules’ and ‘transmit modules’ see 3A001.b.12.

3. For converters and harmonic mixers, designed to extend the operating or frequency range of signal analyzers, signal generators, network analyzers or microwave test receivers, see 3A001.b.7.

Note 1: [Reserved]

Note 2: *The control status of an item whose rated operating frequency includes frequencies listed in more than one frequency range, as defined by 3A001.b.4.a through 3A001.b.4.e, is determined by the lowest peak saturated power output control threshold.*

b.5. Electronically or magnetically tunable band-pass or band-stop filters, having more than 5 tunable resonators capable of tuning across a 1.5:1 frequency band (f_{\max}/f_{\min}) in less than 10 ms and having any of the following:

b.5.a. A band-pass bandwidth of more than 0.5% of center frequency; or

b.5.b. A band-stop bandwidth of less than 0.5% of center frequency;

b.6. [Reserved]

b.7. Converters and harmonic mixers, that are any of the following:

b.7.a. Designed to extend the frequency range of “signal analyzers” beyond 90 GHz;

b.7.b. Designed to extend the operating range of signal generators as follows:

b.7.b.1. Beyond 90 GHz;

b.7.b.2. To an output power greater than 100 mW (20 dBm) anywhere within the frequency range exceeding 43.5 GHz but not exceeding 90 GHz;

b.7.c. Designed to extend the operating range of network analyzers as follows:

b.7.c.1. Beyond 110 GHz;

b.7.c.2. To an output power greater than 31.62 mW (15 dBm) anywhere within the frequency range exceeding 43.5 GHz but not exceeding 90 GHz;

b.7.c.3. To an output power greater than 1 mW (0 dBm) anywhere within the frequency range exceeding 90 GHz but not exceeding 110 GHz; or

b.7.d. Designed to extend the frequency range of microwave test receivers beyond 110 GHz;

b.8. Microwave power amplifiers containing “vacuum electronic devices” controlled by 3A001.b.1 and having all of the following:

b.8.a. Operating frequencies above 3 GHz;

b.8.b. An average output power to mass ratio exceeding 80 W/kg; and

b.8.c. A volume of less than 400 cm³;

Note: *3A001.b.8 does not control equipment designed or rated for operation in any frequency band which is “allocated by the ITU” for radio-communications services, but not for radio-determination.*

b.9. Microwave Power Modules (MPM) consisting of, at least, a traveling-wave “vacuum electronic device,” a “Monolithic Microwave Integrated Circuit” (“MMIC”) and an integrated electronic power conditioner and having all of the following:

b.9.a. A “turn-on time” from off to fully operational in less than 10 seconds;

b.9.b. A volume less than the maximum rated power in Watts multiplied by 10 cm³/W; and

b.9.c. An “instantaneous bandwidth” greater than 1 octave ($f_{\max} > 2f_{\min}$) and having any of the following:

b.9.c.1. For frequencies equal to or less than 18 GHz, an RF output power greater than 100 W; or

b.9.c.2. A frequency greater than 18 GHz;

Technical Notes: *For the purposes of 3A001.b.9:*

1. *To calculate the volume in 3A001.b.9.b, the following example is provided: for a maximum rated power of 20 W, the volume would be: $20 \text{ W} \times 10 \text{ cm}^3/\text{W} = 200 \text{ cm}^3$.*

2. *The ‘turn-on time’ in 3A001.b.9.a refers to the time from fully-off to fully operational, i.e., it includes the warm-up time of the MPM.*

b.10. Oscillators or oscillator assemblies, specified to operate with a single sideband (SSB) phase noise, in dBc/Hz, less (better) than $-(126 + 20\log_{10}F - 20\log_{10}f)$ anywhere within the range of 10 Hz $\leq f \leq 10$ kHz;

Technical Note: *For the purposes of 3A001.b.10, F is the offset from the operating frequency in Hz and f is the operating frequency in MHz.*

b.11. ‘Frequency synthesizer’ “electronic assemblies” having a “frequency switching time” as specified by any of the following:

b.11.a. Less than 143 ps;

b.11.b. Less than 100 μ s for any frequency change exceeding 2.2 GHz within the synthesized frequency range exceeding 4.8 GHz but not exceeding 31.8 GHz;

b.11.c. [Reserved]

b.11.d. Less than 500 μ s for any frequency change exceeding 550 MHz within the synthesized frequency range exceeding 31.8 GHz but not exceeding 37 GHz;

b.11.e. Less than 100 μ s for any frequency change exceeding 2.2 GHz within the synthesized frequency range exceeding 37 GHz but not exceeding 75 GHz;

b.11.f. Less than 100 μ s for any frequency change exceeding 5.0 GHz within the synthesized frequency range exceeding 75 GHz but not exceeding 90 GHz; or

b.11.g. Less than 1 ms within the synthesized frequency range exceeding 90 GHz;

Technical Note: *For the purposes of 3A001.b.11, a ‘frequency synthesizer’ is any kind of frequency source, regardless of the actual technique used, providing a multiplicity of simultaneous or alternative output frequencies, from one or more outputs, controlled by, derived from or disciplined by a lesser number of standard (or master) frequencies.*

N.B.: For general purpose “signal analyzers”, signal generators, network analyzers and microwave test receivers, see 3A002.c, 3A002.d, 3A002.e and 3A002.f, respectively.

b.12. ‘Transmit/receive modules,’ ‘transmit/receive MMICs,’ ‘transmit modules,’ and ‘transmit MMICs,’ rated for operation at frequencies above 2.7 GHz and having all of the following:

b.12.a. A peak saturated power output (in watts), P_{sat} , greater than 505.62 divided by the maximum operating frequency (in GHz) squared [$P_{\text{sat}} > 505.62 \text{ W} * \text{GHz}^2 / f_{\text{GHz}}^2$] for any channel;

b.12.b. A “fractional bandwidth” of 5% or greater for any channel;

b.12.c. Any planar side with length d (in cm) equal to or less than 15 divided by the lowest operating frequency in GHz [$d \leq 15 \text{ cm} * \text{GHz} * N / f_{\text{GHz}}$] where N is the number of transmit or transmit/receive channels; and

b.12.d. An electronically variable phase shifter per channel.

Technical Notes: For the purposes of 3A001.b.12:

1. A ‘transmit/receive module’ is a multifunction “electronic assembly” that provides bi-directional amplitude and phase control for transmission and reception of signals.

2. A ‘transmit module’ is an “electronic assembly” that provides amplitude and phase control for transmission of signals.

3. A ‘transmit/receive MMIC’ is a multifunction “MMIC” that provides bi-directional amplitude and phase control for transmission and reception of signals.

4. A ‘transmit MMIC’ is a “MMIC” that provides amplitude and phase control for transmission of signals.

5. 2.7 GHz should be used as the lowest operating frequency (f_{GHz}) in the formula in 3A001.b.12.c for transmit/receive or transmit modules that have a rated operation range extending downward to 2.7 GHz and below [$d \leq 15 \text{ cm} * \text{GHz} * N / 2.7 \text{ GHz}$].

6. 3A001.b.12 applies to ‘transmit/receive modules’ or ‘transmit modules’ with or without a heat sink. The value of d in 3A001.b.12.c does not include any portion of the ‘transmit/receive module’ or ‘transmit module’ that functions as a heat sink.

7. ‘Transmit/receive modules’ or ‘transmit modules,’ ‘transmit/receive MMICs’ or ‘transmit MMICs’ may or may not have N integrated radiating antenna elements where N is the number of transmit or transmit/receive channels.

c. Acoustic wave devices as follows and “specially designed” “components” therefor:

c.1. Surface acoustic wave and surface skimming (shallow bulk) acoustic wave devices, having any of the following:

c.1.a. A carrier frequency exceeding 6 GHz;

c.1.b. A carrier frequency exceeding 1 GHz, but not exceeding 6 GHz and having any of the following:

c.1.b.1. A ‘frequency side-lobe rejection’ exceeding 65 dB;

c.1.b.2. A product of the maximum delay time and the bandwidth (time in μs and bandwidth in MHz) of more than 100;

c.1.b.3. A bandwidth greater than 250 MHz; or

c.1.b.4. A dispersive delay of more than 10 μs ; or

c.1.c. A carrier frequency of 1 GHz or less and having any of the following:

c.1.c.1. A product of the maximum delay time and the bandwidth (time in μs and bandwidth in MHz) of more than 100;

c.1.c.2. A dispersive delay of more than 10 μs ; or

c.1.c.3. A ‘frequency side-lobe rejection’ exceeding 65 dB and a bandwidth greater than 100 MHz;

Technical Note: For the purposes of 3A001.c.1, ‘frequency side-lobe rejection’ is the maximum rejection value specified in data sheet.

c.2. Bulk (volume) acoustic wave devices that permit the direct processing of signals at frequencies exceeding 6 GHz;

c.3. Acoustic-optic “signal processing” devices employing interaction between acoustic waves (bulk wave or surface wave) and light waves that permit the direct processing of signals or images, including spectral analysis, correlation or convolution;

Note: 3A001.c does not control acoustic wave devices that are limited to a single band pass, low pass, high pass or notch filtering, or resonating function.

d. Electronic devices and circuits containing “components,” manufactured from “superconductive” materials, “specially designed” for operation at temperatures below the “critical temperature” of at least one of the “superconductive” constituents and having any of the following:

d.1. Current switching for digital circuits using “superconductive” gates with a product of delay time per gate (in seconds) and power dissipation per gate (in watts) of less than 10^{-14} J; or

d.2. Frequency selection at all frequencies using resonant circuits with Q-values exceeding 10,000;

e. High energy devices as follows:

e.1. ‘Cells’ as follows:

e.1.a. ‘Primary cells’ having any of the following at 20 °C:

e.1.a.1. ‘Energy density’ exceeding 550 Wh/kg and a ‘continuous power density’ exceeding 50 W/kg; or

e.1.a.2. ‘Energy density’ exceeding 50 Wh/kg and a ‘continuous power density’ exceeding 350 W/kg;

e.1.b. ‘Secondary cells’ having an ‘energy density’ exceeding 350 Wh/kg at 20 °C;

Technical Notes:

1. For the purposes of 3A001.e.1, ‘energy density’ (Wh/kg) is calculated from the nominal voltage multiplied by the nominal capacity in ampere-hours (Ah) divided by the mass in kilograms. If the nominal capacity is not stated, energy density is calculated from the nominal voltage squared then multiplied by the discharge duration in hours divided by the discharge load in Ohms and the mass in kilograms.

2. For the purposes of 3A001.e.1, a ‘cell’ is defined as an electrochemical device, which has positive and negative electrodes, an electrolyte, and is a source of electrical energy. It is the basic building block of a battery.

3. For the purposes of 3A001.e.1.a, a ‘primary cell’ is a ‘cell’ that is not designed to be charged by any other source.

4. For the purposes of 3A001.e.1.b, a ‘secondary cell’ is a ‘cell’ that is designed to be charged by an external electrical source.

5. For the purposes of 3A001.e.1.a, ‘continuous power density’ (W/kg) is calculated from the nominal voltage multiplied by the specified maximum continuous discharge current in ampere (A) divided by the mass in kilograms. ‘Continuous power density’ is also referred to as specific power.

Note: 3A001.e does not control batteries, including single-cell batteries.

e.2. High energy storage capacitors as follows:

e.2.a. Capacitors with a repetition rate of less than 10 Hz (single shot capacitors) and having all of the following:

e.2.a.1. A voltage rating equal to or more than 5 kV;

e.2.a.2. An energy density equal to or more than 250 J/kg; and

e.2.a.3. A total energy equal to or more than 25 kJ;

e.2.b. Capacitors with a repetition rate of 10 Hz or more (repetition rated capacitors) and having all of the following:

e.2.b.1. A voltage rating equal to or more than 5 kV;

e.2.b.2. An energy density equal to or more than 50 J/kg;

e.2.b.3. A total energy equal to or more than 100 J; and

e.2.b.4. A charge/discharge cycle life equal to or more than 10,000;

e.3. “Superconductive” electromagnets and solenoids, “specially designed” to be fully charged or discharged in less than one second and having all of the following:

Note: 3A001.e.3 does not control “superconductive” electromagnets or solenoids “specially designed” for Magnetic Resonance Imaging (MRI) medical equipment.

e.3.a. Energy delivered during the discharge exceeding 10 kJ in the first second;

e.3.b. Inner diameter of the current carrying windings of more than 250 mm; and

e.3.c. Rated for a magnetic induction of more than 8 T or “overall current density” in the winding of more than 300 A/mm²;

e.4. Solar cells, cell-interconnect-coverglass (CIC) assemblies, solar panels, and solar arrays, which are “space-qualified,” having a minimum average efficiency exceeding 20% at an operating temperature of 301 K (28 °C) under simulated ‘AM0’ illumination with an irradiance of 1,367 Watts per square meter (W/m²);

Technical Note: For the purposes of 3A001.e.4, ‘AM0’, or ‘Air Mass Zero’, refers to the spectral irradiance of sun light in the earth’s outer atmosphere when the distance between the earth and sun is one astronomical unit (AU).

f. Rotary input type absolute position encoders having an “accuracy” equal to or less (better) than 1.0 second of arc and “specially designed” encoder rings, discs or scales therefor;

g. Solid-state pulsed power switching thyristor devices and ‘thyristor modules’, using either electrically, optically, or electron radiation controlled switch methods and having any of the following:

g.1. A maximum turn-on current rate of rise (di/dt) greater than 30,000 A/ μs and off-state voltage greater than 1,100 V; or

g.2. A maximum turn-on current rate of rise (di/dt) greater than 2,000 A/μs and having all of the following:

g.2.a. An off-state peak voltage equal to or greater than 3,000 V; and

g.2.b. A peak (surge) current equal to or greater than 3,000 A;

Note 1: 3A001.g. includes:

- Silicon Controlled Rectifiers (SCRs)
-Electrical Triggering Thyristors (ETTs)
-Light Triggering Thyristors (LTTs)
-Integrated Gate Commutated Thyristors (IGCTs)
-Gate Turn-off Thyristors (GTOs)
-MOS Controlled Thyristors (MCTs)
-Solidtrons

Note 2: 3A001.g does not control thyristor devices and 'thyristor modules' incorporated into equipment designed for civil railway or 'civil aircraft' applications.

Technical Note: For the purposes of 3A001.g, a 'thyristor module' contains one or more thyristor devices.

h. Solid-state power semiconductor switches, diodes, or 'modules', having all of the following:

h.1. Rated for a maximum operating junction temperature greater than 488 K (215 °C);

h.2. Repetitive peak off-state voltage (blocking voltage) exceeding 300 V; and

h.3. Continuous current greater than 1 A.

Technical Note: For the purposes of 3A001.h, 'modules' contain one or more solid-state power semiconductor switches or diodes.

Note 1: Repetitive peak off-state voltage in 3A001.h includes drain to source voltage, collector to emitter voltage, repetitive peak reverse voltage and peak repetitive off-state blocking voltage.

Note 2: 3A001.h includes:

- Junction Field Effect Transistors (JFETs)
-Vertical Junction Field Effect Transistors (VFETs)
-Metal Oxide Semiconductor Field Effect Transistors (MOSFETs)
-Double Diffused Metal Oxide Semiconductor Field Effect Transistor (DMOSFET)
-Insulated Gate Bipolar Transistor (IGBT)
-High Electron Mobility Transistors (HEMTs)
-Bipolar Junction Transistors (BJTs)
-Thyristors and Silicon Controlled Rectifiers (SCRs)
-Gate Turn-Off Thyristors (GTOs)
-Emitter Turn-Off Thyristors (ETOs)
-PiN Diodes
-Schottky Diodes

Note 3: 3A001.h does not apply to switches, diodes, or 'modules', incorporated into equipment designed for civil automobile, civil railway, or 'civil aircraft' applications.

i. Intensity, amplitude, or phase electro-optic modulators, designed for analog signals and having any of the following:

i.1. A maximum operating frequency of more than 10 GHz but less than 20 GHz, an optical insertion loss equal to or less than 3 dB and having any of the following:

i.1.a. A 'half-wave voltage' ('Vπ') less than 2.7 V when measured at a frequency of 1 GHz or below; or

i.1.b. A 'Vπ' of less than 4 V when measured at a frequency of more than 1 GHz; or

i.2. A maximum operating frequency equal to or greater than 20 GHz, an optical insertion loss equal to or less than 3 dB and having any of the following:

i.2.a. A 'Vπ' less than 3.3 V when measured at a frequency of 1 GHz or below; or

i.2.b. A 'Vπ' less than 5 V when measured at a frequency of more than 1 GHz.

Note: 3A001.i includes electro-optic modulators having optical input and output connectors (e.g., fiber-optic pigtails).

Technical Note: For the purposes of 3A001.i, a 'half-wave voltage' ('Vπ') is the applied voltage necessary to make a phase change of 180 degrees in the wavelength of light propagating through the optical modulator.

j. through y. [Reserved]

z. Any commodity described in 3A001 that meets or exceeds the performance parameters in 3A090, as follows:

z.1. 'Monolithic Microwave Integrated Circuit' ('MMIC') amplifiers described in 3A001.b.2 and discrete microwave transistors in 3A001.b.3 that also meet or exceed the performance parameters in ECCN 3A090, except those 3A001.b.2 and b.3 items being exported or reexported for use in civil telecommunications applications;

z.2. Commodities that are described in 3A001.a.1.a when usable in 'missiles' that also meet or exceed the performance parameters in ECCN 3A090; and to 3A001.a.5.a when 'designed or modified' for military use, hermetically sealed and rated for operation in the temperature range from below -54 °C to above +125 °C and that also meet or exceed the performance parameters in ECCN 3A090;

z.3. Pulse discharge capacitors described in 3A001.e.2 and superconducting solenoidal electromagnets in 3A001.e.3 that meet or exceed the technical parameters in 3A201.a and 3A201.b, respectively and that also meet or exceed the performance parameters in ECCN 3A090; or

z.4. All other commodities specified in this ECCN that meet or exceed the performance parameters of ECCN 3A090.

* * * * *

3A090 Integrated circuits as follows (see List of Items Controlled).

License Requirements

Reason for Control: RS, AT

Table with 2 columns: Control(s) and Country Chart (see Supp. No. 1 to part 738). Row 1: RS applies to entire entry. To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.

Table with 2 columns: Control(s) and Country Chart (see Supp. No. 1 to part 738). Row 1: AT applies to entire entry. AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: N/A

GBS: N/A

NAC/ACA: Yes, for 3A090.a, if the item is not designed or marketed for use in datacenters and has a 'total processing performance' of 4800 or more; yes, for 3A090.b, if the item is designed or marketed for use in datacenters.

List of Items Controlled

Related Controls: (1) See ECCNs 3D001, 3E001, 5D002.z, and 5D992.z for associated technology and software controls. (2) See ECCNs 3A001.z, 5A002.z, 5A004.z, and 5A992.z.

Related Definitions: N/A

Items:

a. Integrated circuits having one or more digital processing units having either of the following:

a.1. A 'total processing performance' of 4800 or more, or

a.2. A 'total processing performance' of 1600 or more and a 'performance density' of 5.92 or more.

b. Integrated circuits having one or more digital processing units having either of the following:

b.1. A 'total processing performance' of 2400 or more and less than 4800 and a 'performance density' of 1.6 or more and less than 5.92, or

b.2. A 'total processing performance' of 1600 or more and a 'performance density' of 3.2 or more and less than 5.92.

Note 1 to 3A090: Integrated circuits specified by 3A090 include graphical processing units (GPUs), tensor processing units (TPUs), neural processors, in-memory processors, vision processors, text processors, co-processors/accelerators, adaptive processors, field-programmable logic devices (FPLDs), and application-specific integrated circuits (ASICs). Examples of integrated circuits are in the Note to 3A001.a.

Note 2 to 3A090: 3A090 does not apply to items that are not designed or marketed for use in datacenters and do not have a 'total processing performance' of 4800 or more. For integrated circuits that are not designed or marketed for use in datacenters and that have a 'total processing performance' of 4800 or more, see license exceptions NAC and ACA.

Note 3 to 3A090: For ICs that are excluded from ECCN 3A090 under Note 2 or 3 to 3A090, those ICs are also not applicable for classifications made under ECCNs 3A001.z, 4A003.z, 4A004.z, 4A005.z, 4A090, 5A002.z, 5A004.z, 5A992.z, 5D002.z, or 5D992.z because those other CCL classifications are based on the incorporation of an IC that meets the control parameters under ECCN 3A090 or otherwise meets or exceeds the control parameters or ECCNs 3A090 or 4A090. See the Related Controls paragraphs of 3A001.z, 4A003.z, 4A004.z, 4A005.z,

4A090, 5A002.z, 5A004.z, 5A992.z, 5D002.z, or 5D992.z.

Technical Notes:

1. 'Total processing performance' ('TPP') is $2 \times \text{MacTOPS} \times \text{'bit length of the operation'}$, aggregated over all processing units on the integrated circuit.

a. For purposes of 3A090, 'MacTOPS' is the theoretical peak number of Tera (10^{12}) operations per second for multiply-accumulate computation ($D = A \times B + C$).

b. The 2 in the 'TPP' formula is based on industry convention of counting one multiply-accumulate computation, $D = A \times B + C$, as 2 operations for purpose of datasheets. Therefore, $2 \times \text{MacTOPS}$ may correspond to the reported TOPS or FLOPS on a datasheet.

c. For purposes of 3A090, 'bit length of the operation' for a multiply-accumulate computation is the largest bit-length of the inputs to the multiply operation.

d. Aggregate the TPPs for each processing unit on the integrated circuit to arrive at a total. $\text{TPP} = \text{TPP}_1 + \text{TPP}_2 + \dots + \text{TPP}_n$ (where n is the number of processing units on the integrated circuit).

2. The rate of 'MacTOPS' is to be calculated at its maximum value theoretically possible. The rate of 'MacTOPS' is assumed to be the highest value the manufacturer claims in annual or brochure for the integrated circuit. For example, the 'TPP' threshold of 4800 can be met with 600 tera integer operations (or 2×300 'MacTOPS') at 8 bits or 300 tera FLOPS (or 2×150 'MacTOPS') at 16 bits. If the IC is designed for MAC computation with multiple bit lengths that achieve different 'TPP' values, the highest 'TPP' value should be evaluated against parameters in 3A090.

3. For integrated circuits specified by 3A090 that provide processing of both sparse and dense matrices, the 'TPP' values are the values for processing of dense matrices (e.g., without sparsity).

4. 'Performance density' is 'TPP' divided by 'applicable die area'. For purposes of 3A090, 'applicable die area' is measured in millimeters squared and includes all die area of logic dies manufactured with a process node that uses a non-planar transistor architecture.

* * * * *

3B001 Equipment for the manufacturing of semiconductor devices, materials, or related equipment, as follows (see List of Items Controlled) and "specially designed" "components" and "accessories" therefor.

License Requirements

Reason for Control: NS, RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
NS applies to 3B001.a.1 to a.3, b, e, f.1.a, f.2 to f.4, g to i.	NS Column 2.

Control(s)	Country chart (see Supp. No. 1 to part 738)
NS applies to 3B001.a.4, c, d, f.1.b, j to p.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.4(a)(4) of the EAR.
RS applies to 3B001.a.4, c, d, f.1.b, j to p.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.6(a)(6) of the EAR.
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: \$500, except semiconductor manufacturing equipment specified in 3B001.a.4, c, d, f.1.b, j to p.

GBS: Yes, except a.3 (molecular beam epitaxial growth equipment using gas sources), .e (automatic loading multi-chamber central wafer handling systems only if connected to equipment controlled by 3B001.a.3, or .f), and .f (lithography equipment).

List of Items Controlled

Related Controls: See also 3B991

Related Definitions: N/A
Items:

a. Equipment designed for epitaxial growth as follows:

a.1. Equipment designed or modified to produce a layer of any material other than silicon with a thickness uniform to less than $\pm 2.5\%$ across a distance of 75 mm or more;

Note: 3B001.a.1 includes atomic layer epitaxy (ALE) equipment.

a.2. Metal Organic Chemical Vapor Deposition (MOCVD) reactors designed for compound semiconductor epitaxial growth of material having two or more of the following elements: aluminum, gallium, indium, arsenic, phosphorus, antimony, or nitrogen;

a.3. Molecular beam epitaxial growth equipment using gas or solid sources;

a.4. Equipment designed for silicon (Si), carbon doped silicon, silicon germanium (SiGe), or carbon doped SiGe epitaxial growth, and having all of the following:

a.4.a. Multiple chambers and maintaining high vacuum (equal to or less than 0.01 Pa) or inert environment (water and oxygen partial pressure less than 0.01 Pa) between process steps;

a.4.b. At least one preclean chamber designed to provide a surface preparation means to clean the surface of the wafer; and
a.4.c. An epitaxial deposition operating temperature of 685 °C or below;

b. Semiconductor wafer fabrication equipment designed for ion implantation and having any of the following:

b.1. [Reserved]

b.2. Being designed and optimized to operate at a beam energy of 20 keV or more and a beam current of 10 mA or more for hydrogen, deuterium, or helium implant;

b.3. Direct write capability;

b.4. A beam energy of 65 keV or more and a beam current of 45 mA or more for high energy oxygen implant into a heated semiconductor material "substrate"; or

b.5. Being designed and optimized to operate at beam energy of 20 keV or more and a beam current of 10 mA or more for silicon implant into a semiconductor material "substrate" heated to 600 °C or greater;

c. Etch equipment.
c.1. Equipment designed for dry etching as follows:

c.1.a. Equipment designed or modified for isotropic dry etching, having a largest 'silicon germanium-to-silicon (SiGe:Si) etch selectivity' of greater than or equal to 100:1; or

c.1.b. Equipment designed or modified for anisotropic etching of dielectric materials and enabling the fabrication of high aspect ratio features with aspect ratio greater than 30:1 and a lateral dimension on the top surface of less than 100 nm, and having all of the following:

c.1.b.1. Radio Frequency (RF) power source(s) with at least one pulsed RF output; and

c.1.b.2. One or more fast gas switching valve(s) with switching time less than 300 milliseconds; or

c.1.c. Equipment designed or modified for anisotropic dry etching, having all of the following:

c.1.c.1. Radio Frequency (RF) power source(s) with at least one pulsed RF output;

c.1.c.2. One or more fast gas switching valve(s) with switching time less than 300 milliseconds; and

c.1.c.3. Electrostatic chuck with twenty or more individually controllable variable temperature elements;

c.2. Equipment designed for wet chemical processing and having a largest 'silicon germanium-to-silicon (SiGe:Si) etch selectivity' of greater than or equal to 100:1;

Note 1: 3B001.c includes etching by 'radicals', ions, sequential reactions, or non-sequential reaction.

Note 2: 3B001.c.1.c includes etching using RF pulse excited plasma, pulsed duty cycle excited plasma, pulsed voltage on electrodes modified plasma, cyclic injection and purging of gases combined with a plasma, plasma atomic layer etching, or plasma quasi-atomic layer etching.

Technical Notes:

1. For the purposes of 3B001.c, 'silicon germanium-to-silicon (SiGe:Si) etch selectivity' is measured for a Ge concentration of greater than or equal to 30% (Si_{0.70}Ge_{0.30}).

2. For the purposes of 3B001.c Note 1 and 3B001.d.14, 'radical' is defined as an atom, molecule, or ion that has an unpaired electron in an open electron shell configuration.

d. Semiconductor manufacturing deposition equipment, as follows:

d.1. Equipment designed for cobalt (Co) electroplating or cobalt electroless-plating deposition processes;

Note: 3B001.d.1 controls semiconductor wafer processing equipment.

d.2. Equipment designed for:

d.2.a. Chemical vapor deposition of cobalt (Co) fill metal; or

d.2.b. Selective bottom-up chemical vapor deposition of tungsten (W) fill metal;

d.3. Equipment designed to fabricate a metal contact by multistep processing within a single chamber by performing all of the following:

d.3.a. Deposition of a tungsten layer, using an organometallic compound, while maintaining the wafer substrate temperature greater than 100 °C and less than 500 °C; and

d.3.b. A plasma process using hydrogen (H₂), including hydrogen and nitrogen (H₂ + N₂) or ammonia (NH₃);

d.4. Equipment or systems designed for multistep processing in multiple chambers or stations and maintaining high vacuum (equal to or less than 0.01 Pa) or inert environment between process steps, as follows:

d.4.a. Equipment designed to fabricate a metal contact by performing the following processes:

d.4.a.1. Surface treatment plasma process using hydrogen (H₂), including hydrogen and nitrogen (H₂ + N₂) or ammonia (NH₃), while maintaining the wafer substrate at a temperature greater than 100 °C and less than 500 °C;

d.4.a.2. Surface treatment plasma process using oxygen (O₂) or ozone (O₃), while maintaining the wafer substrate at a temperature greater than 40 °C and less than 500 °C; and

d.4.a.3. Deposition of a tungsten layer while maintaining the wafer substrate temperature greater than 100 °C and less than 500 °C;

d.4.b. Equipment designed to fabricate a metal contact by performing the following processes:

d.4.b.1. Surface treatment process using a remote plasma generator and an ion filter; and

d.4.b.2. Deposition of a cobalt (Co) layer selectively onto copper (Cu) using an organometallic compound;

Note: This control does not apply to equipment that is non-selective.

d.4.c. Equipment designed to fabricate a metal contact by performing all the following processes:

d.4.c.1. Deposition of a titanium nitride (TiN) or tungsten carbide (WC) layer, using an organometallic compound, while maintaining the wafer substrate at a temperature greater than 20 °C and less than 500 °C;

d.4.c.2. Deposition of a cobalt (Co) layer using a physical sputter deposition technique and having a process pressure greater than 133.3 mPa and less than 13.33 Pa, while maintaining the wafer substrate at a temperature below 500 °C; and

d.4.c.3. Deposition of a cobalt (Co) layer using an organometallic compound and having a process pressure greater than 133.3 Pa and less than 13.33 kPa, while maintaining the wafer substrate at a temperature greater than 20 °C and less than 500 °C;

d.4.d. Equipment designed to fabricate copper (Cu) interconnects by performing all of the following processes:

d.4.d.1. Deposition of a cobalt (Co) or ruthenium (Ru) layer using an organometallic compound and having a process pressure greater than 133.3 Pa and less than 13.33 kPa, while maintaining the wafer substrate at a temperature greater than 20 °C and less than 500 °C; and

d.4.d.2. Deposition of a copper layer using a physical vapor deposition technique and having a process pressure greater than 133.3 mPa and less than 13.33 Pa, while maintaining the wafer substrate at a temperature below 500 °C;

d.5. Equipment designed for plasma enhanced chemical vapor deposition of carbon hard masks more than 100 nm thick and with stress less than 450 MPa;

d.6. Atomic Layer Deposition (ALD) equipment designed for area selective deposition of a barrier or liner using an organometallic compound;

Note: 3B001.d.6 includes equipment capable of area selective deposition of a barrier layer to enable fill metal contact to an underlying electrical conductor without a barrier layer at the fill metal via interface to an underlying electrical conductor.

d.7. Equipment designed for Atomic Layer Deposition (ALD) of tungsten (W) to fill an entire interconnect or in a channel less than 40 nm wide, while maintaining the wafer substrate at a temperature less than 500 °C.

d.8. Equipment designed for Atomic Layer Deposition (ALD) of 'work function metal' having all of the following:

d.8.a. More than one metal source of which one is designed for an aluminum (Al) precursor;

d.8.b. Precursor vessel designed and enabled to operate at a temperature greater than 30 °C; and

d.8.c. Designed for depositing a 'work function metal' having all of the following:

d.8.c.1. Deposition of titanium-aluminum carbide (TiAlC); and

d.8.c.2. Enabling a work function greater than 4.0eV;

Technical Note: For the purposes of 3B001.d.8, 'work function metal' is a material that controls the threshold voltage of a transistor.

d.9. Spatial Atomic Layer Deposition (ALD) equipment having a wafer support platform that rotates around an axis having any of the following:

d.9.a. A spatial plasma enhanced atomic layer deposition mode of operation;

d.9.b. A plasma source; or

d.9.c. A plasma shield or means to confine the plasma to the plasma exposure process region;

d.10. Equipment designed for Atomic Layer Deposition (ALD) or Chemical Vapor Deposition (CVD) of plasma enhanced of low fluorine tungsten (FW) (fluorine (F) concentration less than 10¹⁹ atoms/cm³) films;

d.11. Equipment designed to deposit a metal layer, in a vacuum (equal to or less than 0.01 Pa) or inert gas environment, and having all of the following:

d.11.a. A Chemical Vapor Deposition (CVD) or cyclic deposition process for depositing a tungsten nitride (WN) layer, while maintaining the wafer substrate at a temperature greater than 20 °C and less than 500 °C; and

d.11.b. A Chemical Vapor Deposition (CVD) or cyclic deposition process for depositing a tungsten (W) layer having a process pressure greater than 133.3 Pa and less than 53.33 kPa, while maintaining the wafer substrate at a temperature greater than 20 °C and less than 500 °C.

d.12. Equipment designed for depositing a metal layer, in a vacuum (equal to or less than 0.01 Pa) or inert gas environment, and having any of the following:

d.12.a. Selective tungsten (W) growth without a barrier; or

d.12.b. Selective molybdenum (Mo) growth without a barrier;

d.13. Equipment designed for depositing a ruthenium layer (Ru) using an organometallic compound, while maintaining the wafer substrate at a temperature greater than 20 °C and less than 500 °C;

d.14. Equipment designed for deposition assisted by remotely generated 'radicals', enabling the fabrication of a silicon (Si) and carbon (C) containing film, and having all of the following properties of the deposited film:

d.14.a. A dielectric constant (k) of less than 5.3;

d.14.b. An aspect ratio greater than 5:1 in features with lateral openings of less than 70 nm; and

d.14.c. A feature-to-feature pitch of less than 100 nm;

d.15. Equipment designed for void free plasma enhanced deposition of a low-k dielectric layer in gaps between metal lines less than 25 nm and having an aspect ratio greater than or equal to 1:1 with a less than 3.3 dielectric constant;

d.16. Equipment designed for deposition of a film, containing silicon and carbon, and having a dielectric constant (k) of less than 5.3, into lateral openings having widths of less than 70 nm and aspect ratios greater than 5:1 (depth: width) and a feature-to-feature pitch of less than 100 nm, while maintaining the wafer substrate at a temperature greater than 400 °C and less than 650 °C, and having all of the following:

d.16.a. Boat designed to hold multiple vertically stacked wafers;

d.16.b. Two or more vertical injectors; and

d.16.c. A silicon source and propene are introduced to a different injector than a nitrogen source or an oxygen source;

e. Automatic loading multi-chamber central wafer handling systems having all of the following:

e.1. Interfaces for wafer input and output, to which more than two functionally different 'semiconductor process tools' controlled by 3B001.a.1, 3B001.a.2, 3B001.a.3 or 3B001.b are designed to be connected; and

e.2. Designed to form an integrated system in a vacuum environment for 'sequential multiple wafer processing';

Note: 3B001.e does not control automatic robotic wafer handling systems "specially designed" for parallel wafer processing.

Technical Notes:

1. For the purposes of 3B001.e, 'semiconductor process tools' refers to modular tools that provide physical processes for semiconductor production that are functionally different, such as deposition, implant or thermal processing.

2. For the purposes of 3B001.e, 'sequential multiple wafer processing' means the capability to process each wafer in different 'semiconductor process tools', such as by transferring each wafer from one tool to a second tool and on to a third tool with the automatic loading multi-chamber central wafer handling systems.

f. Lithography equipment as follows:
 f.1. Align and expose step and repeat (direct step on wafer) or step and scan (scanner) equipment for wafer processing using photo-optical or X-ray methods and having any of the following:

f.1.a. A light source wavelength shorter than 193 nm; or
 f.1.b. A light source wavelength equal to or longer than 193 nm and having all of the following:

f.1.b.1. The capability to produce a pattern with a "Minimum Resolvable Feature size" (MRF) of 45 nm or less; and

f.1.b.2. Having any of the following:

f.1.b.2.a. A maximum 'dedicated chuck overlay' value of less than or equal to 1.50 nm; or

f.1.b.2.b. A maximum 'dedicated chuck overlay' value greater than 1.50 nm but less than or equal to 2.40 nm;

Technical Notes: For the purposes of 3B001.f.1.b:

1. The 'Minimum Resolvable Feature size' (MRF), i.e., resolution, is calculated by the following formula:

(an exposure light source wavelength in nm) x (K factor)

MRF = -----

maximum numerical aperture

where, for the purposes of 3.B.1.f.1.b, the K factor = 0.25 'MRF' is also known as resolution.

2. 'Dedicated chuck overlay' is the alignment accuracy of a new pattern to an existing pattern printed on a wafer by the same lithographic system. 'Dedicated chuck overlay' is also known as single machine overlay.

f.2. Imprint lithography equipment capable of production features of 45 nm or less;

Note: 3B001.f.2 includes:

- Micro contact printing tools
- Hot embossing tools
- Nano-imprint lithography tools
- Step and flash imprint lithography (S-FIL) tools

f.3. Equipment "specially designed" for mask making having all of the following:

f.3.a. A deflected focused electron beam, ion beam or "laser" beam; and

f.3.b. Having any of the following:

f.3.b.1. A Full-Width Half-Maximum (FWHM) spot size smaller than 65 nm and an image placement less than 17 nm (mean + 3 sigma); or

f.3.b.2. [Reserved]

f.3.b.3. A second-layer overlay error of less than 23 nm (mean + 3 sigma) on the mask;

f.4. Equipment designed for device processing using direct writing methods, having all of the following:

f.4.a. A deflected focused electron beam; and

f.4.b. Having any of the following:

f.4.b.1. A minimum beam size equal to or smaller than 15 nm; or

f.4.b.2. An overlay error less than 27 nm (mean + 3 sigma);

g. Masks and reticles, designed for integrated circuits controlled by 3A001;

h. Multi-layer masks with a phase shift layer not specified by 3B001.g and designed to be used by lithography equipment having a light source wavelength less than 245 nm;

Note: 3B001.h. does not control multi-layer masks with a phase shift layer designed for the fabrication of memory devices not controlled by 3A001.

N.B.: For masks and reticles, "specially designed" for optical sensors, see 6B002.

i. Imprint lithography templates designed for integrated circuits by 3A001;

j. Mask "substrate blanks" with multilayer reflector structure consisting of molybdenum and silicon, and having all of the following:

j.1. "Specially designed" for "Extreme Ultraviolet" ("EUV") lithography; and

j.2. Compliant with SEMI Standard P37;

k. Equipment designed for ion beam deposition or physical vapor deposition of a multi-layer reflector for "EUV" masks;

l. "EUV" pellicles;

m. Equipment for manufacturing "EUV" pellicles;

n. Equipment designed for coating, depositing, baking, or developing photoresist formulated for "EUV" lithography;

o. Annealing equipment, operating in a vacuum (equal to or less than 0.01 Pa) environment, performing any of the following:

o.1. Reflow of copper (Cu) to minimize or eliminate voids or seams in copper (Cu) metal interconnects; or

o.2. Reflow of cobalt (Co) or tungsten (W) fill metal to minimize or eliminate voids or seams;

p. Removal and cleaning equipment as follows:

p.1. Equipment designed for removing polymeric residue and copper oxide (CuO) film and enabling deposition of copper (Cu) metal in a vacuum (equal to or less than 0.01 Pa) environment;

p.2. Single wafer wet cleaning equipment with surface modification drying; or

p.3. Equipment designed for dry surface oxide removal preclean or dry surface decontamination.

Note to 3B001.p.1 and p.3: These controls do not apply to deposition equipment.

* * * * *

3B991 Equipment not controlled by 3B001, for the manufacture of electronic "parts," "components," and materials, and "specially designed" "parts," "components," and "accessories" therefor.

License Requirements

Reason for Control: AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
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AT applies to entire entry.	AT Column 1.
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List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: N/A

GBS: N/A

List of Items Controlled

Related Controls: N/A

Related Definitions: 'Sputtering' is an overlay coating process wherein positively charged ions are accelerated by an electric field towards the surface of a target (coating material). The kinetic energy of the impacting ions is sufficient to cause target surface atoms to be released and deposited on the substrate. (**Note:** Triode, magnetron or radio frequency sputtering to increase adhesion of coating and rate of deposition are ordinary modifications of the process.)

Items:

a. Equipment "specially designed" for the manufacture of electron tubes, optical elements and "specially designed" "parts" and "components" therefor controlled by 3A001 or 3A991;

b. Equipment "specially designed" for the manufacture of semiconductor devices, integrated circuits and "electronic assemblies", as follows, and systems incorporating or having the characteristics of such equipment:

Note: 3B991.b also controls equipment used or modified for use in the manufacture of other devices, such as imaging devices, electro-optical devices, acoustic-wave devices.

b.1. Equipment for the processing of materials for the manufacture of devices, "parts" and "components" as specified in the heading of 3B991.b, as follows:

Note: 3B991 does not control quartz furnace tubes, furnace liners, paddles, boats (except "specially designed" caged boats), bubblers, cassettes or crucibles "specially designed" for the processing equipment controlled by 3B991.b.1.

b.1.a. Equipment for producing polycrystalline silicon and materials controlled by 3C001;

b.1.b. Equipment "specially designed" for purifying or processing III/V and II/VI semiconductor materials controlled by 3C001, 3C002, 3C003, 3C004, or 3C005 except crystal pullers, for which see 3B991.b.1.c below;

b.1.c. Crystal pullers and furnaces, as follows:

Note: 3B991.b.1.c does not control diffusion and oxidation furnaces.

b.1.c.1. Annealing or recrystallizing equipment other than constant temperature furnaces employing high rates of energy transfer capable of processing wafers at a rate exceeding 0.005 m² per minute;

b.1.c.2. "Stored program controlled" crystal pullers having any of the following characteristics:

b.1.c.2.a. Rechargeable without replacing the crucible container;

b.1.c.2.b. Capable of operation at pressures above 2.5 x 10⁵ Pa; or

b.1.c.2.c. Capable of pulling crystals of a diameter exceeding 100 mm;

b.1.d. "Stored program controlled" equipment for epitaxial growth having any of the following characteristics:

b.1.d.1. Capable of producing silicon layer with a thickness uniform to less than ± 2.5% across a distance of 200 mm or more;

b.1.d.2. Capable of producing a layer of any material other than silicon with a thickness

uniformity across the wafer of equal to or better than $\pm 3.5\%$; or

b.1.d.3. Rotation of individual wafers during processing;

b.1.e. Molecular beam epitaxial growth equipment;

b.1.f. Magnetically enhanced 'sputtering' equipment with "specially designed" integral load locks capable of transferring wafers in an isolated vacuum environment;

b.1.g. Equipment "specially designed" for ion implantation, ion-enhanced or photo-enhanced diffusion, having any of the following characteristics:

b.1.g.1. Patterning capability;

b.1.g.2. Beam energy (accelerating voltage) exceeding 200 keV;

b.1.g.3. Optimized to operate at a beam energy (accelerating voltage) of less than 10 keV; or

b.1.g.4. Capable of high energy oxygen implant into a heated "substrate";

b.1.h. "Stored program controlled" equipment for the selective removal (etching) by means of anisotropic dry methods (e.g., plasma), as follows:

b.1.h.1. Batch types having either of the following:

b.1.h.1.a. End-point detection, other than optical emission spectroscopy types; or

b.1.h.1.b. Reactor operational (etching) pressure of 26.66 Pa or less;

b.1.h.2. Single wafer types having any of the following:

b.1.h.2.a. End-point detection, other than optical emission spectroscopy types;

b.1.h.2.b. Reactor operational (etching) pressure of 26.66 Pa or less; or

b.1.h.2.c. Cassette-to-cassette and load locks wafer handling;

Notes: 1. "Batch types" refers to machines not "specially designed" for production processing of single wafers. Such machines can process two or more wafers simultaneously with common process parameters, e.g., RF power, temperature, etch gas species, flow rates.

2. "Single wafer types" refers to machines "specially designed" for production processing of single wafers. These machines may use automatic wafer handling techniques to load a single wafer into the equipment for processing. The definition includes equipment that can load and process several wafers but where the etching parameters, e.g., RF power or end point, can be independently determined for each individual wafer.

b.1.i. "Chemical vapor deposition" (CVD) equipment, e.g., plasma-enhanced CVD (PECVD) or photo-enhanced CVD, for semiconductor device manufacturing, having either of the following capabilities, for deposition of oxides, nitrides, metals or polysilicon:

b.1.i.1. "Chemical vapor deposition" equipment operating below 10^5 Pa; or

b.1.i.2. PECVD equipment operating either below 60 Pa (450 millitorr) or having automatic cassette-to-cassette and load lock wafer handling;

Note: 3B991.b.1.i does not control low pressure "chemical vapor deposition" (LPCVD) systems or reactive "sputtering" equipment.

b.1.j. Electron beam systems "specially designed" or modified for mask making or

semiconductor device processing having any of the following characteristics:

b.1.j.1. Electrostatic beam deflection;

b.1.j.2. Shaped, non-Gaussian beam profile;

b.1.j.3. Digital-to-analog conversion rate exceeding 3 MHz;

b.1.j.4. Digital-to-analog conversion accuracy exceeding 12 bit; or

b.1.j.5. Target-to-beam position feedback control precision of 1 micrometer or finer;

Note: 3B991.b.1.j does not control electron beam deposition systems or general purpose scanning electron microscopes.

b.1.k. Surface finishing equipment for the processing of semiconductor wafers as follows:

b.1.k.1. "Specially designed" equipment for backside processing of wafers thinner than 100 micrometer and the subsequent separation thereof; or

b.1.k.2. "Specially designed" equipment for achieving a surface roughness of the active surface of a processed wafer with a two-sigma value of 2 micrometer or less, total indicator reading (TIR);

Note: 3B991.b.1.k does not control single-side lapping and polishing equipment for wafer surface finishing.

b.1.l. Interconnection equipment which includes common single or multiple vacuum chambers "specially designed" to permit the integration of any equipment controlled by 3B991 into a complete system;

b.1.m. "Stored program controlled" equipment using "lasers" for the repair or trimming of "monolithic integrated circuits" with either of the following characteristics:

b.1.m.1. Positioning accuracy less than ± 1 micrometer; or

b.1.m.2. Spot size (kerf width) less than 3 micrometer.

b.2. Masks, mask "substrates," mask-making equipment and image transfer equipment for the manufacture of devices, "parts" and "components" as specified in the heading of 3B991, as follows:

Note: The term "masks" refers to those used in electron beam lithography, X-ray lithography, and ultraviolet lithography, as well as the usual ultraviolet and visible photo-lithography.

b.2.a. Finished masks, reticles and designs thereof, except:

b.2.a.1. Finished masks or reticles for the production of unembargoed integrated circuits; or

b.2.a.2. Masks or reticles, having both of the following characteristics:

b.2.a.2.a. Their design is based on geometries of 2.5 micrometer or more; and

b.2.a.2.b. The design does not include special features to alter the intended use by means of production equipment or "software";

b.2.b. Mask "substrates" as follows:

b.2.b.1. Hard surface (e.g., chromium, silicon, molybdenum) coated "substrates" (e.g., glass, quartz, sapphire) for the preparation of masks having dimensions exceeding $125 \text{ mm} \times 125 \text{ mm}$; or

b.2.b.2. "Substrates" "specially designed" for X-ray masks;

b.2.c. Equipment, other than general purpose computers, "specially designed" for computer aided design (CAD) of semiconductor devices or integrated circuits;

b.2.d. Equipment or machines, as follows, for mask or reticle fabrication:

b.2.d.1. Photo-optical step and repeat cameras capable of producing arrays larger than $100 \text{ mm} \times 100 \text{ mm}$, or capable of producing a single exposure larger than $6 \text{ mm} \times 6 \text{ mm}$ in the image (i.e., focal) plane, or capable of producing line widths of less than 2.5 micrometer in the photoresist on the "substrate";

b.2.d.2. Mask or reticle fabrication equipment using ion or "laser" beam lithography capable of producing line widths of less than 2.5 micrometer; or

b.2.d.3. Equipment or holders for altering masks or reticles or adding pellicles to remove defects;

Note: 3B991.b.2.d.1 and b.2.d.2 do not control mask fabrication equipment using photo-optical methods which was either commercially available before the 1st January, 1980, or has a performance no better than such equipment.

b.2.e. "Stored program controlled" equipment for the inspection of masks, reticles or pellicles with:

b.2.e.1. A resolution of 0.25 micrometer or finer; and

b.2.e.2. A precision of 0.75 micrometer or finer over a distance in one or two coordinates of 63.5 mm or more;

Note: 3B991.b.2.e does not control general purpose scanning electron microscopes except when "specially designed" and instrumented for automatic pattern inspection.

b.2.f. Align and expose equipment for wafer production using photo-optical or X-ray methods, e.g., lithography equipment, including both projection image transfer equipment and step and repeat (direct step on wafer) or step and scan (scanner) equipment, capable of performing any of the following functions:

Note: 3B991.b.2.f does not control photo-optical contact and proximity mask align and expose equipment or contact image transfer equipment.

b.2.f.1. Production of a pattern size of less than 2.5 micrometer;

b.2.f.2. Alignment with a precision finer than ± 0.25 micrometer (3 sigma);

b.2.f.3. Machine-to-machine overlay no better than ± 0.3 micrometer; or

b.2.f.4. A light source wavelength shorter than 400 nm;

b.2.g. Electron beam, ion beam or X-ray equipment for projection image transfer capable of producing patterns less than 2.5 micrometer;

Note: For focused, deflected-beam systems (direct write systems), see 3B991.b.1.j or b.10.

b.2.h. Equipment using "lasers" for direct write on wafers capable of producing patterns less than 2.5 micrometer.

b.3. Equipment for the assembly of integrated circuits, as follows:

b.3.a. "Stored program controlled" die bonders having all of the following characteristics:

b.3.a.1. "Specially designed" for "hybrid integrated circuits";

b.3.a.2. X-Y stage positioning travel exceeding $37.5 \times 37.5 \text{ mm}$; and

b.3.a.3. Placement accuracy in the X-Y plane of finer than ± 10 micrometer;

b.3.b. “Stored program controlled” equipment for producing multiple bonds in a single operation (e.g., beam lead bonders, chip carrier bonders, tape bonders);

b.3.c. Semi-automatic or automatic hot cap sealers, in which the cap is heated locally to a higher temperature than the body of the package, “specially designed” for ceramic microcircuit packages controlled by 3A001 and that have a throughput equal to or more than one package per minute.

Note: 3B991.b.3 does not control general purpose resistance type spot welders.

b.4. Filters for clean rooms capable of providing an air environment of 10 or less particles of 0.3 micrometer or smaller per 0.02832 m³ and filter materials therefor.

* * * * *

3D001 “Software” “specially designed” for the “development” or “production” of commodities controlled by 3A001.b to 3A002.h, 3A090, or 3B (except 3B991 and 3B992).

License Requirements

Reason for Control: NS, RS, AT

<i>Control(s)</i>	<i>Country chart (see Supp. No. 1 to part 738)</i>
NS applies to “software” for commodities controlled by 3A001.b to 3A001.h, 3A001.z, and 3B (except 3B001.a.4, c, d, f.1.b, j to p, 3B002.b and c).	NS Column 1.
NS applies to “software” for commodities controlled by 3B001.a.4, c, d, f.1.b, j to p, 3B002.b and c.	To or within destinations specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR or Macau. See § 742.4(a)(4) of the EAR.
RS applies to “software” for commodities controlled by 3A001.z and 3A090.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
AT applies to entire entry.	AT Column 1.

Reporting Requirements

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions, Special Comprehensive Licenses, and Validated End-User authorizations.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: Yes, except for “software” “specially designed” for the “development” or “production” of Traveling Wave Tube

Amplifiers described in 3A001.b.8 having operating frequencies exceeding 18 GHz; or commodities specified in 3A090, 3B001.a.4, c, d, f.1.b, j to p, and 3B002.b and c.

Note: See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for ECCN 3D001 “software” for commodities controlled by 3A001.z and 3A090.

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit “software” “specially designed” for the “development” or “production” of equipment specified by 3A090, 3A002.g.1, 3B001.a.4, a.2, c, d, f.1.b, j to p, or 3B002.b and c to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR).

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

The list of items controlled is contained in the ECCN heading.

3D002 “Software” “specially designed” for the “use” of equipment controlled by 3B001.a to .f and .j to .p, or 3B002.

License Requirements

Reason for Control: NS, RS, AT

<i>Control(s)</i>	<i>Country chart (see Supp. No. 1 to part 738)</i>
NS applies to entire entry, except “software” for 3B001.a.4 c, d, f.1.b, j to p, 3B002.b and c.	NS Column 1.
NS applies to “software” for 3B001.a.4, c, d, f.1.b.j to p, 3B002.b and c.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.4(a)(4) of the EAR.
RS applies to “software” for 3B001.a.4, c, d, f.1.b, j to p, 3B002.b and c.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.6(a)(6) of the EAR.
AT applies to entire entry.	AT Column 1.

License Requirements Note: See § 744.17 of the EAR for additional license requirements for microprocessors having a processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating “information security” functionality, and associated “software” and “technology” for the “production” or “development” of such microprocessors.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: Yes, except N/A for RS.

List of Items Controlled

Related Controls: Also see 3D991.
Related Definitions: N/A
Items:

The list of items controlled is contained in the ECCN heading.

* * * * *

3E001 “Technology” according to the General Technology Note for the “development” or “production” of commodities controlled by 3A (except 3A980, 3A981, 3A991, 3A992, or 3A999), 3B (except 3B991 or 3B992) or 3C (except 3C992).

License Requirements

Reason for Control: NS, MT, NP, RS, AT

<i>Control(s)</i>	<i>Country chart (see Supp. No. 1 to part 738)</i>
NS applies to “technology” for commodities controlled by 3A001, 3A002, 3A003, 3B001 (except 3B001 a.4, c, d, f.1.b, j to p), 3B002 (except 3B002.b and c), or 3C001 to 3C006.	NS Column 1.
NS applies to “technology” for 3B001 a.4, c, d, f.1.b, j to p, 3B002.b and c.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.4(a)(4) of the EAR.
MT applies to “technology” for commodities controlled by 3A001 or 3A101 for MT Reasons.	MT Column 1.
NP applies to “technology” for commodities controlled by 3A001, 3A201, or 3A225 to 3A234 for NP reasons.	NP Column 1.
RS applies to “technology” for commodities controlled in 3A090, when exported from Macau or a destination specified in Country Group D:5.	Worldwide (See § 742.6(a)(6)(ii).

Control(s)	Country chart (see Supp. No. 1 to part 738)	ship or transmit "technology" according to the General Technology Note for the "development" or "production" of components specified by ECCN 3A001.b.2, b.3, commodities specified in 3A090, 3B001.a.4, c, d, f.1.b, j to p, or 3B002.b and c, to any of the destinations listed in Country Group A:5 or A:6 (See Supplement No.1 to part 740 of the EAR).	Control(s)	Country chart (see Supp. No. 1 to part 738)
RS applies to "technology" for commodities controlled by 3A001.z, 3A090.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.	List of Items Controlled <i>Related Controls:</i> (1) "Technology" according to the General Technology Note for the "development" or "production" of certain "space-qualified" atomic frequency standards described in Category XV(e)(9), MMICs described in Category XV(e)(14), and oscillators described in Category XV(e)(15) of the USML are "subject to the ITAR" (see 22 CFR parts 120 through 130). See also 3E101, 3E201 and 9E515. (2) "Technology" for "development" or "production" of "Microwave Monolithic Integrated Circuits" ("MMIC") amplifiers in 3A001.b.2 is controlled in this ECCN 3E001; 5E001.d refers only to that additional "technology" "required" for telecommunications. <i>Related Definition:</i> N/A <i>Items:</i> The list of items controlled is contained in the ECCN heading. Note 1: 3E001 does not control "technology" for equipment or "components" controlled by 3A003. Note 2: 3E001 does not control "technology" for integrated circuits controlled by 3A001.a.3 to a.14 or .z, having all of the following: (a) Using "technology" at or above 0.130 µm; and (b) Incorporating multi-layer structures with three or fewer metal layers. Note 3: 3E001 does not apply to 'Process Design Kits' ('PDKs') unless they include libraries implementing functions or technologies for items specified by 3A001. Technical Note: For the purposes of 3E001 Note 3, a 'Process Design Kit' ('PDK') is a software tool provided by a semiconductor manufacturer to ensure that the required design practices and rules are taken into account in order to successfully produce a specific integrated circuit design in a specific semiconductor process, in accordance with technological and manufacturing constraints (each semiconductor manufacturing process has its particular 'PDK'). * * * * *	RS applies to 4A003.z.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
RS applies to "technology" for commodities controlled by 3B001.a.4, c, d, f.1.b, j to p, 3B002.b and c.	To or within destinations specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR or Macau. See § 742.6(a)(6)(i) of the EAR.		CC applies to "digital computers" for computerized finger-print equipment.	CC Column 1.
AT applies to entire entry.	AT Column 1.		AT applies to entire entry (refer to 4A994 for controls on "digital computers" with a APP >0.0128 but ≤70 WT).	AT Column 1.
License Requirements Note: See § 744.17 of the EAR for additional license requirements for microprocessors having a processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating "information security" functionality, and associated "software" and "technology" for the "production" or "development" of such microprocessors.				
Reporting Requirements				
See § 743.1 of the EAR for reporting requirements for exports under License Exceptions, Special Comprehensive Licenses, and Validated End-User authorizations.				
List Based License Exceptions (See Part 740 for a Description of All License Exceptions)				
TSR: Yes, except N/A for MT, and "technology" for the "development" or "production" of: (a) vacuum electronic device amplifiers described in 3A001.b.8, having operating frequencies exceeding 19 GHz; (b) solar cells, coverglass-interconnect-cells or covered-interconnect-cells (CIC) "assemblies", solar arrays and/or solar panels described in 3A001.e.4; (c) "Monolithic Microwave Integrated Circuit" ("MMIC") amplifiers in 3A001.b.2; (d) discrete microwave transistors in 3A001.b.3; and (e) commodities described in 3A090, 3B001.a.4, c, d, f.1.b, j to p, 3B002.b and c.				
Note: See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for ECCN 3E001 "technology" for commodities controlled by 3A001.z, 3A090.				
Special Conditions for STA				
STA: License Exception STA may not be used to ship or transmit "technology" according to the General Technology Note for the "development" or "production" of equipment specified by ECCNs 3A002.g.1 or 3B001.a.2 to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR). License Exception STA may not be used to				
		Control(s)	Country chart (see Supp. No. 1 to part 738)	
		NS applies to 4A003.b, .c, and .z.1.	NS Column 1.	
		NS applies to 4A003.g, and z.2.	NS Column 2.	
		Note: For all destinations, except those countries in Country Group E:1 or E:2 of Supplement No. 1 to part 740 of the EAR, no license is required (NLR) for computers with an "Adjusted Peak Performance" ("APP") not exceeding 70 Weighted TeraFLOPS (WT) and for "electronic assemblies" described in 4A003.c that are not capable of exceeding an "Adjusted Peak Performance" ("APP") exceeding 70 Weighted TeraFLOPS (WT) in aggregation, except certain transfers as set forth in § 746.3 (Iraq).		
Reporting Requirements				
Special Post Shipment Verification reporting and recordkeeping requirements for exports of computers to destinations in Computer Tier 3 may be found in § 743.2 of the EAR.				
List Based License Exceptions (See Part 740 for a Description of All License Exceptions)				
LVS: \$5000; N/A for 4A003.b, and .c. GBS: Yes, for 4A003.g and "specially designed" "parts" and "components" therefor, exported separately or as part of a system.				
APP: Yes, for computers controlled by 4A003.b, and "electronic assemblies" controlled by 4A003.c, to the exclusion of other technical parameters. See § 740.7 of the EAR.				
NAC/ACA: Yes, for 4A003.z.				
Note 1 to List Based License Exceptions: Related equipment specified under ECCN 4A003.g, z.2, or z.4 are eligible for License Exception GBS if all the following conditions are met:				
<ol style="list-style-type: none"> The related equipment is exported, reexported, or transferred (in-country) as part of a computer system, The computer system is either designated as NLR or eligible for License Exception APP, and The related equipment is eligible for License Exception APP. 				

Note 2: See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for ECCN 4A003.z.

List of Items Controlled

Related Controls: See also ECCNs 4A090, 4A994 and 4A980.

Related Definitions: N/A

Items:

Note 1: 4A003 includes the following:

- ‘Vector processors’ (as defined in Note 7 of the ‘Technical Note on ‘Adjusted Peak Performance’ (‘APP’));
- Array processors;
- Digital signal processors;
- Logic processors;
- Equipment designed for ‘image enhancement.’

Note 2: The control status of the ‘digital computers’ and related equipment described in 4A003 is determined by the control status of other equipment or systems provided:

- a. The ‘digital computers’ or related equipment are essential for the operation of the other equipment or systems;
- b. The ‘digital computers’ or related equipment are not a ‘principal element’ of the other equipment or systems; and

N.B. 1: The control status of ‘signal processing’ or ‘image enhancement’ equipment ‘specially designed’ for other equipment with functions limited to those required for the other equipment is determined by the control status of the other equipment even if it exceeds the ‘principal element’ criterion.

N.B. 2: For the control status of ‘digital computers’ or related equipment for telecommunications equipment, see Category 5, Part 1 (Telecommunications).

- c. The ‘technology’ for the ‘digital computers’ and related equipment is determined by 4E.

a. [Reserved]

b. ‘Digital computers’ having an ‘Adjusted Peak Performance’ (‘APP’) exceeding 70 Weighted TeraFLOPS (WT);

c. ‘Electronic assemblies’ ‘specially designed’ or modified to be capable of enhancing performance by aggregation of processors so that the ‘APP’ of the aggregation exceeds the limit in 4A003.b.;

Note 1: 4A003.c applies only to ‘electronic assemblies’ and programmable interconnections not exceeding the limit in 4A003.b when shipped as unintegrated ‘electronic assemblies.’

Note 2: 4A003.c does not control ‘electronic assemblies’ ‘specially designed’ for a product or family of products whose maximum configuration does not exceed the limit of 4A003.b.

d. to f. [Reserved]

N.B.: For ‘electronic assemblies,’ modules or equipment, performing analog-to-digital conversions, see 3A002.h.

g. Equipment ‘specially designed’ for aggregating the performance of ‘digital computers’ by providing external interconnections which allow communications at unidirectional data rates exceeding 2.0 Gbyte/s per link.

Note: 4A003.g does not control internal interconnection equipment (e.g., backplanes, buses) passive interconnection equipment,

‘network access controllers’ or ‘communication channel controllers’.

h. through y. [Reserved]

z. Commodities specified in this ECCN 4A003 that also meet or exceed the performance parameters in 4A090.

z.1. Commodities specified in 4A003.b or .c that also meet or exceed the performance parameters in ECCN 4A090; or

z.2. Commodities specified in 4A003.g that also meet or exceed the performance parameters in ECCN 4A090.

4A004 Computers as follows (see List of Items Controlled) and ‘specially designed’ related equipment, ‘electronic assemblies’ and ‘components’ therefor.

License Requirements

Reason for Control: NS, RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
NS applies to entire entry.	NS Column 2.
RS applies to 4A004.z.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: \$5000

GBS: N/A

NAC/ACA: Yes, for 4A004.z.

Note: See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for ECCN 4A004.z.

List of Items Controlled

Related Controls: See also ECCN 4A090.

Related Definitions: N/A

Items:

- a. ‘Systolic array computers’;
- b. ‘Neural computers’;
- c. ‘Optical computers’.

Technical Notes:

1. For the purposes of 4A004.a, ‘systolic array computers’ are computers where the flow and modification of the data is dynamically controllable at the logic gate level by the user.

2. For the purposes of 4A004.b, ‘neural computers’ are computational devices designed or modified to mimic the behaviour of a neuron or a collection of neurons, i.e., computational devices which are distinguished by their hardware capability to modulate the weights and numbers of the interconnections of a multiplicity of computational components based on previous data.

3. For the purposes of 4A004.c, ‘optical computers’ are computers designed or

modified to use light to represent data and whose computational logic elements are based on directly coupled optical devices.

d. through y. [Reserved]

z. Commodities that are described in 4A004 and that also meet or exceed the performance parameters in 4A090.

4A005 ‘Systems,’ ‘equipment,’ and ‘components’ therefor, ‘specially designed’ or modified for the generation, command and control, or delivery of ‘intrusion software’ (see List of Items Controlled).

License Requirements

Reason for Control: NS, RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
NS applies to entire entry.	NS Column 1.
RS applies to items controlled by 4A005.z.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
AT applies to entire entry.	AT Column 1.

Reporting Requirements

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions, and Validated End-User authorizations.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: N/A

GBS: N/A

APP: N/A

ACE: Yes, except to Country Group E:1 or E:2. See § 740.22 of the EAR for eligibility criteria.

NAC/ACA: Yes, for 4A005.z.

Note: See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for ECCN 4A005.z.

Special Conditions for STA

STA: License Exception STA may not be used to ship items specified by ECCN 4A005.

List of Items Controlled

Related Controls: (1) Defense articles described in USML Category XI(b), and software directly related to a defense article, are ‘subject to the ITAR’ (see 22 CFR parts 120 through 130). (2) See also ECCN 4A090.

Related Definitions: N/A

Items:

The list of items controlled is contained in the ECCN heading, except for the commodities controlled under 4A005.z.
a. through y. [Reserved]

z. Commodities that are specified in 4A005 that also meet or exceed the performance parameters in 4A090.

4A090 Computers as follows (see List of Items Controlled) and related equipment, "electronic assemblies," and "components" therefor.

License Requirements

Reason for Control: RS, AT

<i>Control(s)</i>	<i>Country chart (see Supp. No. 1 to part 738)</i>
RS applies to entire entry.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: N/A

GBS: N/A

NAC/ACA: Yes, for 4A090, if the item incorporates a 3A090.a IC that is not designed or marketed for use in datacenters and has a 'total processing performance' of 4800 or more, or if the ECCN 4A090 item incorporates a 3A090.b IC, if the item is designed or marketed for use in datacenters.

List of Items Controlled

Related Controls: (1) For associated "software" for commodities in this ECCN, see 4D090, 5D002.z, and 5D992.z and for associated "technology" for commodities in this ECCN, see 4E001. (2) Also ECCNs 4A003.z, 4A004.z, 4A005.z, 5A002.z, 5A004.z, and 5A992.z.

Related Definitions: N/A
Items:

a. Computers, "electronic assemblies," and "components" containing integrated circuits, any of which meets or exceeds the limits in 3A090.a.

b. Computers, "electronic assemblies," and "components" containing integrated circuits, any of which meets or exceeds the limits in 3A090.b.

Technical Note: For purposes of 4A090.a and .b, computers include "digital computers," "hybrid computers," and analog computers.

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4D001 "Software" as follows (see List of Items Controlled).

License Requirements

Reason for Control: NS, RS, CC, AT

<i>Control(s)</i>	<i>Country chart (see Supp. No. 1 to part 738)</i>
NS applies to entire entry.	NS Column 1.
RS applies to "software" for commodities controlled by 4A003.z, 4A004.z, and 4A005.z.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
CC applies to "software" for computerized finger-print equipment controlled by 4A003 for CC reasons.	CC Column 1.
AT applies to entire entry.	AT Column 1.

Reporting Requirements

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions, and Validated End-User authorizations.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: Yes, except for "software" for the "development" or "production" of the following:

- (1) Commodities with an "Adjusted Peak Performance" ("APP") exceeding 29 WT; or
- (2) Commodities controlled by 4A005 or "software" controlled by 4D004.

APP: Yes to specific countries (see § 740.7 of the EAR for eligibility criteria).

ACE: Yes for 4D001.a (for the "development", "production" or "use" of equipment or "software" specified in ECCN 4A005 or 4D004), except to Country Group E:1 or E:2. See § 740.22 of the EAR for eligibility criteria.

Note: See § 740.2(a)(9)(ii) for license exception restrictions for "software" for commodities controlled by 4A003.z, 4A004.z, and 4A005.z.

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit "software" "specially designed" or modified for the "development" or "production" of equipment specified by ECCN 4A001.a.2 or for the "development" or "production" of "digital computers" having an 'Adjusted Peak Performance' ('APP') exceeding 29 Weighted TeraFLOPS (WT) to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR); and may not be used to ship or transmit "software" specified in 4D001.a "specially designed" for the "development" or "production" of equipment specified by ECCN 4A005 to any of the destinations listed in Country Group A:5 or A:6.

List of Items Controlled

Related Controls: N/A

Related Definitions: N/A
Items:

a. "Software" "specially designed" or modified for the "development" or "production", of equipment or "software" controlled by 4A001, 4A003, 4A004, 4A005 or 4D (except 4D090, 4D980, 4D993 or 4D994).

b. "Software", other than that controlled by 4D001.a, "specially designed" or modified for the "development" or "production" of equipment as follows:

b.1. "Digital computers" having an "Adjusted Peak Performance" ("APP") exceeding 24 Weighted TeraFLOPS (WT);

b.2. "Electronic assemblies" "specially designed" or modified for enhancing performance by aggregation of processors so that the "APP" of the aggregation exceeds the limit in 4D001.b.1.

* * * * *

4E001 "Technology" as follows (see List of Items Controlled).

License Requirements

Reason for Control: NS, MT, RS, CC, AT

<i>Control(s)</i>	<i>Country chart (See Supp. No. 1 to part 738)</i>
NS applies to entire entry, except for technology for 4A090 or "software" specified by 4D090.	NS Column 1.
MT applies to "technology" for items controlled by 4A001.a and 4A101 for MT reasons.	MT Column 1.
RS applies to "technology" for commodities controlled by 4A003.z, 4A004.z, 4A005.z, 4A090 or "software" specified by 4D001 (for 4A003.z, 4A004.z, and 4A005.z), 4D090.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
CC applies to "technology" for computerized finger-print equipment controlled by 4A003 for CC reasons.	CC Column 1.
AT applies to entire entry.	AT Column 1.

Reporting Requirements

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions, and Validated End-User authorizations.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: Yes, except for the following:

(1) “Technology” for the “development” or “production” of commodities with an “Adjusted Peak Performance” (“APP”) exceeding 70 WT or for the “development” or “production” of commodities controlled by 4A005 or “software” controlled by 4D004; or

(2) “Technology” for the “development” of “intrusion software”.

APP: Yes to specific countries (see § 740.7 of the EAR for eligibility criteria).

ACE: Yes for 4E001.a (for the “development”, “production” or “use” of equipment or “software” specified in ECCN 4A005 or 4D004) and for 4E001.c, except to Country Group E:1 or E:2. See § 740.22 of the EAR for eligibility criteria.

Note: See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for technology for .z paragraphs under ECCNs 4A003, 4A004, or 4A005 or “software” specified by 4D001 (for 4A003.z, 4A004.z, and 4A005.z).

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit “technology” according to the General Technology Note for the “development” or “production” of any of the following equipment or “software”: a. Equipment specified by ECCN 4A001.a.2; b. “Digital computers” having an ‘Adjusted Peak Performance’ (‘APP’) exceeding 70 Weighted TeraFLOPS (WT); or c. “software” specified in the License Exception STA paragraph found in the License Exception section of ECCN 4D001 to any of the destinations listed in Country Group A:6 (See Supplement No. 1 to part 740 of the EAR); and may not be used to ship or transmit “technology” specified in 4E001.a (for the “development”, “production” or “use” of equipment or “software” specified in ECCN 4A005, 4A090, or “software” specified by 4D004 or 4D090); and 4E001.c to any of the destinations listed in Country Group A:5 or A:6.

List of Items Controlled

Related Controls: N/A
 Related Definitions: N/A
 Items:

a. “Technology” according to the General Technology Note, for the “development”, “production”, or “use” of equipment or “software” controlled by 4A (except 4A980 or 4A994 and “use” of equipment controlled under 4A090) or 4D (except 4D980, 4D993, 4D994 and “use” of software controlled under 4D090).

b. “Technology” according to the General Technology Note, other than that controlled by 4E001.a, for the “development” or “production” of equipment as follows:

b.1. “Digital computers” having an “Adjusted Peak Performance” (“APP”) exceeding 24 Weighted TeraFLOPS (WT);

b.2. “Electronic assemblies” “specially designed” or modified for enhancing performance by aggregation of processors so that the “APP” of the aggregation exceeds the limit in 4E001.b.1.

c. “Technology” for the “development” of “intrusion software.”

Note 1: 4E001.a and 4E001.c do not apply to “vulnerability disclosure” or “cyber incident response”.

Note 2: Note 1 does not diminish national authorities’ rights to ascertain compliance with 4E001.a and 4E001.c.

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Category 5—Telecommunications and “Information Security”

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Category 5—Telecommunications and “Information Security”

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5A002 “Information security” systems, equipment and “components,” as follows (see List of Items Controlled).

License Requirements

Reason for Control: NS, RS, AT, EI

Control(s)	Country chart (See Supp. No. 1 to part 738)
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NS applies to entire entry.	NS Column 1.
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RS applies to items controlled by 5A002.z.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
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AT applies to entire entry.	AT Column 1.
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EI applies to entire entry.	Refer to § 742.15 of the EAR.
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License Requirements Note: See § 744.17 of the EAR for additional license requirements for microprocessors having a processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating “information security” functionality, and associated “software” and “technology” for the “production” or “development” of such microprocessors.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: Yes: \$500 for “components,” N/A for systems and equipment.

GBS: N/A

ENC: Yes for certain EI controlled commodities, see § 740.17 of the EAR for eligibility.

NAC/ACA: Yes, for 5A002.z.

Note: See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for ECCN 5A002.z.

List of Items Controlled

Related Controls: (1) ECCN 5A002.a controls “components” providing the means or functions necessary for “information security.” All such “components” are presumptively “specially designed” and controlled by 5A002.a. (2) See USML

Categories XI (including XI(b)) and XIII(b) (including XIII(b)(2)) for controls on systems, equipment, and components described in 5A002.d or .e that are “subject to the ITAR” (see 22 CFR parts 120 through 130). (3) For “satellite navigation system” receiving equipment containing or employing decryption see 7A005, and for related decryption “software” and “technology” see 7D005 and 7E001. (4) Noting that items may be controlled elsewhere on the CCL, examples of items not controlled by ECCN 5A002.a.4 include the following: (a) An automobile where the only ‘cryptography for data confidentiality’ having a ‘described security algorithm’ is performed by a Category 5—Part 2 Note 3 eligible mobile telephone that is built into the car. In this case, secure phone communications support a non-primary function of the automobile but the mobile telephone (equipment), as a standalone item, is not controlled by ECCN 5A002 because it is excluded by the Cryptography Note (Note 3) (See ECCN 5A992.c). (b) An exercise bike with an embedded Category 5—Part 2 Note 3 eligible web browser, where the only controlled cryptography is performed by the web browser. In this case, secure web browsing supports a non-primary function of the exercise bike but the web browser (“software”), as a standalone item, is not controlled by ECCN 5D002 because it is excluded by the Cryptography Note (Note 3) (See ECCN 5D992.c). (5) After classification or self-classification in accordance with § 740.17(b) of the EAR, mass market encryption commodities that meet eligibility requirements are released from “EI” and “NS” controls. These commodities are designated 5A992.c. (6) See also ECCNs 3A090 and 4A090.

Related Definitions: N/A

Items:

a. Designed or modified to use ‘cryptography for data confidentiality’ having a ‘described security algorithm’, where that cryptographic capability is usable, has been activated, or can be activated by any means other than secure “cryptographic activation”, as follows:

a.1. Items having “information security” as a primary function;

a.2. Digital communication or networking systems, equipment or components, not specified in paragraph 5A002.a.1;

a.3. Computers, other items having information storage or processing as a primary function, and components therefor, not specified in paragraphs 5A002.a.1 or .a.2;

N.B.: For operating systems see also 5D002.a.1 and .c.1.

a.4. Items, not specified in paragraphs 5A002.a.1 to a.3, where the ‘cryptography for data confidentiality’ having a ‘described security algorithm’ meets all of the following:

a.4.a. It supports a non-primary function of the item; and

a.4.b. It is performed by incorporated equipment or “software” that would, as a standalone item, be specified by ECCNs 5A002, 5A003, 5A004, 5B002 or 5D002.

N.B. to paragraph a.4: See Related Control Paragraph (4) of this ECCN 5A002 for examples of items not controlled by 5A002.a.4.

Technical Notes:

1. For the purposes of 5A002.a, ‘cryptography for data confidentiality’ means “cryptography” that employs digital techniques and performs any cryptographic function other than any of the following:

1.a. “Authentication;”

1.b. Digital signature;

1.c. Data integrity;

1.d. Non-repudiation;

1.e. Digital rights management, including the execution of copy-protected “software;”

1.f. Encryption or decryption in support of entertainment, mass commercial broadcasts or medical records management; or

1.g. Key management in support of any function described in paragraphs 1.a to 1.f of this Technical Note paragraph 1.

2. For the purposes of 5A002.a, ‘described security algorithm’ means any of the following:

2.a. A “symmetric algorithm” employing a key length in excess of 56 bits, not including parity bits;

2.b. An “asymmetric algorithm” where the security of the algorithm is based on any of the following:

2.b.1. Factorization of integers in excess of 512 bits (e.g., RSA);

2.b.2. Computation of discrete logarithms in a multiplicative group of a finite field of size greater than 512 bits (e.g., Diffie-Hellman over Z/pZ); or

2.b.3. Discrete logarithms in a group other than mentioned in paragraph 2.b.2 of this Technical Note in excess of 112 bits (e.g., Diffie-Hellman over an elliptic curve); or

2.c. An “asymmetric algorithm” where the security of the algorithm is based on any of the following:

2.c.1. Shortest vector or closest vector problems associated with lattices (e.g., NewHope, Frodo, NTRUEncrypt, Kyber, Titanium);

2.c.2. Finding isogenies between Supersingular elliptic curves (e.g., Supersingular Isogeny Key Encapsulation); or

2.c.3. Decoding random codes (e.g., McEliece, Niederreiter).

Technical Note: An algorithm described by Technical Note 2.c. may be referred to as being post-quantum, quantum-safe or quantum-resistant.

Note 1: Details of items must be accessible and provided upon request, in order to establish any of the following:

a. Whether the item meets the criteria of 5A002.a.1 to a.4; or

b. Whether the cryptographic capability for data confidentiality specified by 5A002.a is usable without “cryptographic activation.”

Note 2: 5A002.a does not control any of the following items, or specially designed “information security” components therefor:

a. Smart cards and smart card ‘readers/writers’ as follows:

a.1. A smart card or an electronically readable personal document (e.g., token coin, e-passport) that meets any of the following:

a.1.a. The cryptographic capability meets all of the following:

a.1.a.1. It is restricted for use in any of the following:

a.1.a.1.a. Equipment or systems, not described by 5A002.a.1 to a.4;

a.1.a.1.b. Equipment or systems, not using ‘cryptography for data confidentiality’ having a ‘described security algorithm’; or

a.1.a.1.c. Equipment or systems, excluded from 5A002.a by entries b. to f. of this Note; and

a.1.a.2. It cannot be reprogrammed for any other use; or

a.1.b. Having all of the following:

a.1.b.1. It is specially designed and limited to allow protection of ‘personal data’ stored within;

a.1.b.2. Has been, or can only be, personalized for public or commercial transactions or individual identification; and

a.1.b.3. Where the cryptographic capability is not user-accessible;

Technical Note to paragraph a.1.b.1 of Note 2:

For the purposes of 5A002.a Note 2.—a.1.b.1, ‘personal data’ includes any data specific to a particular person or entity, such as the amount of money stored and data necessary for “authentication.”

a.2. ‘Readers/writers’ specially designed or modified, and limited, for items specified by paragraph a.1 of this Note;

Technical Note to paragraph a.2 of Note 2:

For the purposes of 5A002.a Note 2.a.2, ‘readers/writers’ include equipment that communicates with smart cards or electronically readable documents through a network.

b. Cryptographic equipment specially designed and limited for banking use or ‘money transactions’;

Technical Note to paragraph b. of Note 2:

For the purposes of 5A002.a Note 2.b, ‘money transactions’ in 5A002 Note 2 paragraph b. includes the collection and settlement of fares or credit functions.

c. Portable or mobile radiotelephones for civil use (e.g., for use with commercial civil cellular radio communication systems) that are not capable of transmitting encrypted data directly to another radiotelephone or equipment (other than Radio Access Network (RAN) equipment), nor of passing encrypted data through RAN equipment (e.g., Radio Network Controller (RNC) or Base Station Controller (BSC));

d. Cordless telephone equipment not capable of end-to-end encryption where the maximum effective range of unboosted cordless operation (i.e., a single, unrelayed hop between terminal and home base station) is less than 400 meters according to the manufacturer’s specifications;

e. Portable or mobile radiotelephones and similar client wireless devices for civil use, that implement only published or commercial cryptographic standards (except for anti-piracy functions, which may be non-published) and also meet the provisions of paragraphs a.2 to a.4 of the Cryptography Note (Note 3 in Category 5—Part 2), that have been customized for a specific civil industry application with features that do not affect the cryptographic functionality of these original non-customized devices;

f. Items, where the “information security” functionality is limited to wireless “personal area network” functionality implementing only published or commercial cryptographic standards;

g. Mobile telecommunications Radio Access Network (RAN) equipment designed

for civil use, which also meet the provisions of paragraphs a.2 to a.4 of the Cryptography Note (Note 3 in Category 5—Part 2), having an RF output power limited to 0.1W (20 dBm) or less, and supporting 16 or fewer concurrent users;

h. Routers, switches, gateways or relays, where the “information security” functionality is limited to the tasks of “Operations, Administration or Maintenance” (“OAM”) implementing only published or commercial cryptographic standards;

i. General purpose computing equipment or servers, where the “information security” functionality meets all of the following:

i.1. Uses only published or commercial cryptographic standards; and

i.2. Is any of the following:

i.2.a. Integral to a CPU that meets the

provisions of Note 3 in Category 5—Part 2;

i.2.b. Integral to an operating system that is not specified by 5D002; or

i.2.c. Limited to “OAM” of the equipment; or

j. Items specially designed for a ‘connected civil industry application’, meeting all of the following:

j.1. Being any of the following:

j.1.a. A network-capable endpoint device meeting any of the following:

j.1.a.1. The “information security”

functionality is limited to securing ‘non-arbitrary data’ or the tasks of “Operations, Administration or Maintenance” (“OAM”); or

j.1.a.2. The device is limited to a specific ‘connected civil industry application’; or

j.1.b. Networking equipment meeting all of the following:

j.1.b.1. Being specially designed to communicate with the devices specified by paragraph j.1.a. above; and

j.1.b.2. The “information security” functionality is limited to supporting the ‘connected civil industry application’ of devices specified by paragraph j.1.a. above, or the tasks of “OAM” of this networking equipment or of other items specified by paragraph j. of this Note; and

j.2. Where the “information security” functionality implements only published or commercial cryptographic standards, and the cryptographic functionality cannot easily be changed by the user.

Technical Notes:

1. For the purposes of 5A002.a Note 2.j, ‘connected civil industry application’ means a network-connected consumer or civil industry application other than “information security”, digital communication, general purpose networking or computing.

2. For the purposes of 5A002.a Note 2.j.1.a.1, ‘non-arbitrary data’ means sensor or metering data directly related to the stability, performance or physical measurement of a system (e.g., temperature, pressure, flow rate, mass, volume, voltage, physical location, etc.), that cannot be changed by the user of the device.

b. Being a ‘cryptographic activation token’;

Technical Note: For the purposes of 5A002.b, a ‘cryptographic activation token’ is an item designed or modified for any of the following:

1. Converting, by means of “cryptographic activation”, an item not specified by Category 5-Part 2 into an item specified by 5A002.a or 5D002.c.1, and not released by the Cryptography Note (Note 3 in Category 5—Part 2); or

2. Enabling by means of “cryptographic activation”, additional functionality specified by 5A002.a of an item already specified by Category 5—Part 2;

c. Designed or modified to use or perform “quantum cryptography”;

Technical Note: For the purposes of 5A002.c, “quantum cryptography” is also known as Quantum Key Distribution (QKD).

d. Designed or modified to use cryptographic techniques to generate channelizing codes, scrambling codes or network identification codes, for systems using ultra-wideband modulation techniques and having any of the following:

d.1. A bandwidth exceeding 500 MHz; or
d.2. A “fractional bandwidth” of 20% or more;

e. Designed or modified to use cryptographic techniques to generate the spreading code for “spread spectrum” systems, not specified by 5A002.d, including the hopping code for “frequency hopping” systems.

f. through y. [Reserved]

z. Other commodities, as follows:

z.1. Commodities that are described in 5A002.a and that also meet or exceed the performance parameters in 3A090 or 4A090;

z.2. Commodities that are described in 5A002.b and that also meet or exceed the performance parameters in 3A090 or 4A090;

z.3. Commodities that are described in 5A002.c and that also meet or exceed the performance parameters in 3A090 or 4A090;

z.4. Commodities that are described in 5A002.d and that also meet or exceed the performance parameters in 3A090 or 4A090;

z.5. Commodities that are described in 5A002.e and that also meet or exceed the performance parameters in 3A090 or 4A090.

5A992 Equipment not controlled by 5A002 (see List of Items Controlled)

License Requirements

Reason for Control: RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
RS applies to items controlled by 5A992.z.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
AT applies to entire entry.	AT Column 1.

License Requirements Note: See § 744.17 of the EAR for additional license requirements for microprocessors having a

processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating “information security” functionality, and associated “software” and “technology” for the “production” or “development” of such microprocessors.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: N/A

GBS: N/A

NAC/ACA: Yes, for 5A992.z; N/A for all other 5A992 commodities.

Note: See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for ECCN 5A992.z.

List of Items Controlled

Related Controls: See also ECCNs 3A090 and 4A090.

Related Definitions: N/A

Items:

- a. [Reserved]
- b. [Reserved]
- c. Commodities classified as mass market encryption commodities in accordance with § 740.17(b) of the EAR.
- d. through y. [Reserved]
- z. Commodities that are described in 5A992.c and that also meet or exceed the performance parameters in 3A090 or 4A090.

5A004 “Systems,” “equipment” and “components” for defeating, weakening or bypassing “information security,” as follows (see List of Items Controlled).

License Requirements

Reason for Control: NS, RS, AT, EI

Control(s)	Country chart (see Supp. No. 1 to part 738)
NS applies to entire entry.	NS Column 1.
RS applies to items controlled by 5A004.z.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
AT applies to entire entry.	AT Column 1.
EI applies to entire entry.	Refer to § 742.15 of the EAR.

License Requirements: See § 744.17 of the EAR for additional license requirements for microprocessors having a processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating “information security” functionality, and associated “software” and “technology” for the “production” or “development” of such microprocessors.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: Yes: \$500 for “components”.

N/A for systems and equipment.

GBS: N/A

ENC: Yes for certain EI controlled commodities. See § 740.17 of the EAR for eligibility.

NAC/ACA: Yes, for 5A004.z.

Note: See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for ECCN 5A004.z.

List of Items Controlled

Related Controls: (1) ECCN 5A004.a controls “components” providing the means or functions necessary for “information security.” All such “components” are presumptively “specially designed” and controlled by 5A004.a. (2) See also ECCNs 3A090 and 4A090.

Related Definitions: N/A

Items:

- a. Designed or modified to perform ‘cryptanalytic functions.’
Note: 5A004.a includes systems or equipment, designed or modified to perform ‘cryptanalytic functions’ by means of reverse engineering.

Technical Note: For the purposes of 5A004.a, ‘cryptanalytic functions’ are functions designed to defeat cryptographic mechanisms in order to derive confidential variables or sensitive data, including clear text, passwords or cryptographic keys.

b. Items, not specified by ECCNs 4A005 or 5A004.a, designed to perform all of the following:

- b.1. ‘Extract raw data’ from a computing or communications device; and
- b.2. Circumvent “authentication” or authorisation controls of the device, in order to perform the function described in 5A004.b.1.

Technical Note: For the purposes of 5A004.b.1, ‘extract raw data’ from a computing or communications device means to retrieve binary data from a storage medium, e.g., RAM, flash or hard disk, of the device without interpretation by the device’s operating system or filesystem.

Note 1: 5A004.b does not apply to systems or equipment specially designed for the “development” or “production” of a computing or communications device.

Note 2: 5A004.b does not include:

- a. Debuggers, hypervisors;
- b. Items limited to logical data extraction;
- c. Data extraction items using chip-off or JTAG; or
- d. Items specially designed and limited to jail-breaking or rooting.

c. through y. [Reserved]

z. Other commodities, as follows:

z.1. Commodities that are described in 5A004.a and that also meet or exceed the performance parameters in 3A090 or 4A090;

z.2. Commodities that are described in 5A004.b and that also meet or exceed the performance parameters in 3A090 or 4A090.

* * * * *

5D002 “Software” as follows (see List of Items Controlled).

License Requirements

Reason for Control: NS, RS, AT, EI

<i>Control(s)</i>	<i>Country chart (see Supp. No. 1 to part 738)</i>
NS applies to entire entry.	NS Column 1.
RS applies to “software” controlled by 5D002.z.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
AT applies to entire entry.	AT Column 1.
EI applies to “software” in 5D002.a.1, a.3, .b, c.1 and c.3, for commodities or “software” controlled for EI reasons in ECCN 5A002, 5A004 or 5D002.	Refer to § 742.15 of the EAR. Note: <i>Encryption software is controlled because of its functional capacity, and not because of any informational value of such software; such software is not accorded the same treatment under the EAR as other “software”; and for export licensing purposes, encryption software is treated under the EAR in the same manner as a commodity included in ECCN 5A002.</i>

License Requirements Note: See § 744.17 of the EAR for additional license requirements for microprocessors having a processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating “information security” functionality, and associated “software” and “technology” for the “production” or “development” of such microprocessors.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: N/A

ENC: Yes for certain EI controlled software.

See § 740.17 of the EAR for eligibility.

NAC/ACA: Yes, for 5D002.z.

Note: See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for ECCN 5D002.z.

List of Items Controlled

Related Controls: (1) After classification or self-classification in accordance with § 740.17(b) of the EAR, mass market encryption software that meets eligibility requirements is released from “EI” and “NS” controls. This software is designated as 5D992.c. (2) See also ECCNs 3D001 as it applies to “software” for commodities

controlled by 3A001.z and 3A090, and 4D001 as it applies to “software” for commodities controlled by 4A003.z, 4A004.z, and 4A005.z.

Related Definitions: 5D002.a controls “software” designed or modified to use “cryptography” employing digital or analog techniques to ensure “information security.”

Items:

- a. “Software” “specially designed” or modified for the “development,” “production” or “use” of any of the following:
 - a.1. Equipment specified by 5A002 or “software” specified by 5D002.c.1;
 - a.2. Equipment specified by 5A003 or “software” specified by 5D002.c.2; or
 - a.3. Equipment or “software”, as follows:
 - a.3.a. Equipment specified by 5A004.a or “software” specified by 5D002.c.3.a;
 - a.3.b. Equipment specified by 5A004.b or “software” specified by 5D002.c.3.b;
 - b. “Software” having the characteristics of a ‘cryptographic activation token’ specified by 5A002.b;
 - c. “Software” having the characteristics of, or performing or simulating the functions of, any of the following:
 - c.1. Equipment specified by 5A002.a, .c, .d or .e;

Note: *5D002.c.1 does not apply to “software” limited to the tasks of “OAM” implementing only published or commercial cryptographic standards.*

 - c.2. Equipment specified by 5A003; or
 - c.3. Equipment, as follows:
 - c.3.a. Equipment specified by 5A004.a;
 - c.3.b. Equipment specified by 5A004.b.

Note: *5D002.c.3.b does not apply to “intrusion software”.*
 - d. [Reserved]

N.B.: See 5D002.b for items formerly specified in 5D002.d.

e. through y. [Reserved]

z. Other software, as follows:

- z.1. Software that is described in 5D002.a.1, and that also meet or exceed the performance parameters in 3D001 for 3A090 or 4D001 for 4A090;

- z.2. Software that is described in 5D002.a.2, and that also meet or exceed the performance parameters in 3D001 for 3A090 or 4D001 for 4A090;

- z.3. Software that is described in 5D002.a.3a, and that also meet or exceed the performance parameters in 3D001 for 3A090 or 4D001 for 4A090;

- z.4. Software that is described in 5D002.a.3.b, and that also meet or exceed the performance parameters in 3D001 for 3A090 or 4D001 for 4A090;

- z.5. Software that is described in 5D002.b and that also meet or exceed the performance parameters in 3D001 for 3A090 or 4D001 for 4A090;

- z.6. Software that is described in 5D002.c.1 and that also meet or exceed the performance parameters in 3D001 for 3A090 or 4D001 for 4A090;

- z.7. Software that is described in 5D002.c.2 and that also meet or exceed the performance parameters in 3D001 for 3A090 or 4D001 for 4A090;

- z.8. Software that is described in 5D002.c.3.a and that also meet or exceed the

performance parameters in 3D001 for 3A090 or 4D001 for 4A090; or

z.9. Software that is described in 5D002.c.3.b and that also meet or exceed the performance parameters in 3D001 for 3A090 or 4D001 for 4A090.

5D992 “Information Security” “software,” not controlled by 5D002, as follows (see List of Items Controlled).

License Requirements

Reason for Control: RS, AT

<i>Control(s)</i>	<i>Country chart (see Supp. No. 1 to part 738)</i>
RS applies to “software” controlled by 5D992.z.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
AT applies to entire entry.	AT Column 1.

License Requirements Note: See § 744.17 of the EAR for additional license requirements for microprocessors having a processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating “information security” functionality, and associated “software” and “technology” for the “production” or “development” of such microprocessors.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: N/A

NAC/ACA: Yes, for 5D992.z.

Note: See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for ECCN 5D992.z.

List of Items Controlled

Related Controls: (1) This entry does not control “software” designed or modified to protect against malicious computer damage, e.g., viruses, where the use of “cryptography” is limited to authentication, digital signature and/or the decryption of data or files. (2) See also ECCNs 3D001 as it applies to “software” for commodities controlled by 3A001.z and 3A090, and 4D001 as it applies to “software” for commodities controlled by 4A003.z, 4A004.z, and 4A005.z.

Related Definitions: N/A

Items:

- a. [Reserved]
- b. [Reserved]
- c. “Software” classified as mass market encryption software in accordance with § 740.17(b) of the EAR.
- d. through y. [Reserved]
- z. Other software that is described in 5D992 and that also meet or exceed the performance parameters in 3D001 for 3A090 or 4D001 for 4A090.

5E002 “Technology” as follows (see List of Items Controlled).

License Requirements

Reason for Control: NS, RS, AT, EI

Control(s)	Country chart (see Supp. No. 1 to part 738)
NS applies to entire entry.	NS Column 1.
RS applies to “technology” for commodities controlled by 5A002.z or 5A004.z or “software” specified by 5D002 (for 5A002.z or 5A004.z commodities).	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
AT applies to entire entry.	AT Column 1.
EI applies to “technology” in 5E002.a for commodities or “software” controlled for EI reasons in ECCNs 5A002, 5A004 or 5D002, and to “technology” in 5E002.b.	Refer to § 742.15 of the EAR.

License Requirements Notes:

(1) See § 744.17 of the EAR for additional license requirements for microprocessors having a processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating “information security” functionality, and associated “software” and “technology” for the “production” or “development” of such microprocessors.

(2) When a person performs or provides technical assistance that incorporates, or otherwise draws upon, “technology” that was either obtained in the United States or is of U.S.-origin, then a release of the “technology” takes place. Such technical assistance, when rendered with the intent to aid in the “development” or “production” of encryption commodities or software that would be controlled for “EI” reasons under ECCN 5A002, 5A004 or 5D002, may require authorization under the EAR even if the underlying encryption algorithm to be implemented is from the public domain or is not of U.S.-origin.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: N/A

ENC: Yes for certain EI controlled technology. See § 740.17 of the EAR for eligibility.

Note: See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for technology for .z paragraphs under ECCNs 5A002, 5A004 or “software” specified by 5D002 (for 5A002.z or 5A004.z commodities).

List of Items Controlled

Related Controls: See also 5E992. This entry does not control “technology” “required” for the “use” of equipment excluded from control under the Related Controls paragraph or the Technical Notes in ECCN 5A002 or “technology” related to equipment excluded from control under ECCN 5A002.

Related Definitions: N/A
Items:

a. “Technology” according to the General Technology Note for the “development,” “production” or “use” of equipment controlled by 5A002, 5A003, 5A004 or 5B002, or of “software” controlled by 5D002.a, z.1 through z.3, or 5D002.c, z.6 through z.8.

Note: 5E002.a does not apply to “technology” for items specified by 5A004.b, z.3 or z.4, 5D002.a.3.b, z.4, or 5D002.c.3.b.

b. “Technology” having the characteristics of a ‘cryptographic activation token’ specified by 5A002.b, z.2.

Note: 5E002 includes “information security” technical data resulting from procedures carried out to evaluate or determine the implementation of functions, features or techniques specified in Category 5—Part 2.

5E992 “Information Security” “technology” according to the General Technology Note, not controlled by 5E002, as follows (see List of Items Controlled).

License Requirements

Reason for Control: RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
RS applies to “technology” for commodities controlled by 5A992.z or “software” controlled by 5D992.z.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
AT applies to entire entry.	AT Column 1.

License Requirements Note: See § 744.17 of the EAR for additional license requirements for microprocessors having a processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating “information security” functionality, and associated “software” and “technology” for the “production” or “development” of such microprocessors.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: N/A

Note: See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for technology for .z paragraphs under “technology” for commodities controlled by 5A992.z or “software” controlled by 5D992.z.

List of Items Controlled

Related Controls: N/A

Related Definitions: N/A

Items:

a. [Reserved]
b. “Technology”, n.e.s., for the “use” of mass market commodities controlled by 5A992 or mass market “software” controlled by 5D992.

* * * * *

■ 15. Supplement no. 6 to part 774 is amended by revising paragraphs (3)(iv) and (v) to read as follows:

Supplement No. 6 to Part 774— Sensitive List

* * * * *

(3) Category 3

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(iv) 3D001—“Software” “specially designed” for the “development” or “production” of equipment controlled under 3A001.b.2, 3A001.b.3, equipment described under 3A001.b.2 or 3A001.b.3 that are controlled under 3A001.z, and 3A002.g.1.

(v) 3E001—“Technology” according to the General Technology Note for the “development” or “production” of equipment controlled under 3A001.b.2, 3A001.b.3, equipment described under 3A001.b.2 or 3A001.b.3 that are controlled under 3A001.z, and 3A002.g.1.

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Thea D. Rozman Kendler,
Assistant Secretary for Export Administration.

[FR Doc. 2024-07004 Filed 3-29-24; 4:15 pm]

BILLING CODE 3510-33-P