

BUREAU OF INDUSTRY AND SECURITY

UPDATE CONFERENCE ON EXPORT CONTROLS AND POLICY

MARCH 18-20, 2025



Updates on Semiconductor Controls

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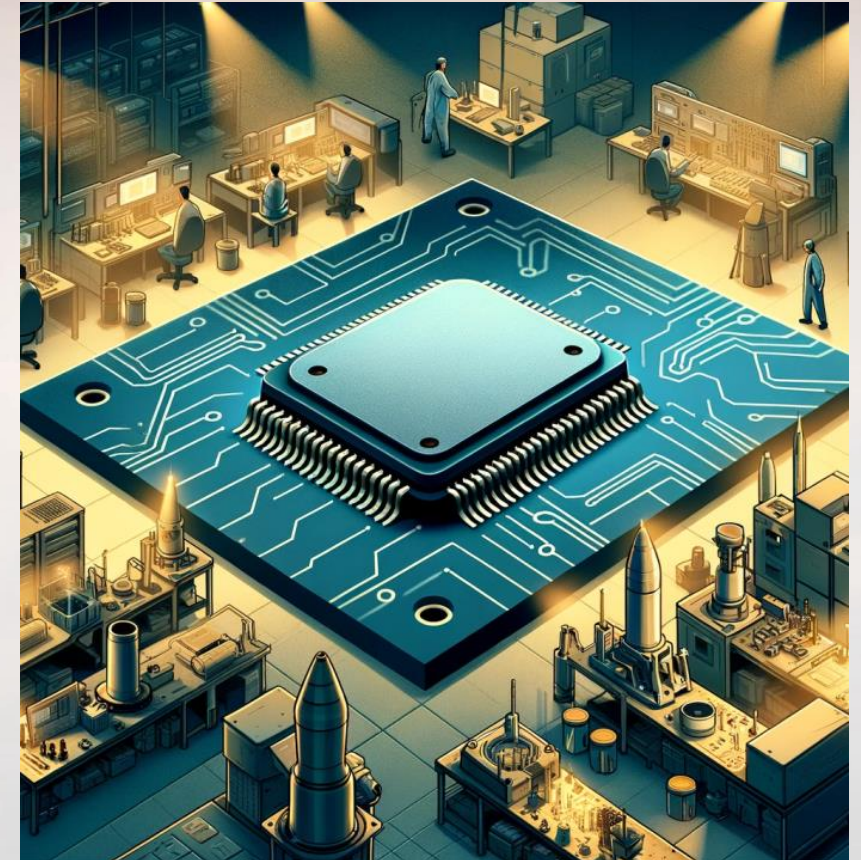
Rule Title (aka)	Pub. Date	Effective and Compliance Date	End of Public Comment Period Date
Implementation of Additional Export Controls: Certain Advanced Computing Items; Supercomputer and Semiconductor End Use; Updates and Corrections; and Export Controls on Semiconductor Manufacturing Items; Corrections and Clarifications (C&C Rule)	04/04/2024 89 FR 23876	4/4/2024	04/29/2024
Commerce Control List Additions and Revisions; Implementation of Controls on Advanced Technologies Consistent with Controls Implemented by International Partners (Quantum & Semiconductor Rule – Q&S rule)	9/06/2024 89 FR 72926	9/6/2024 Compliance: 11/5/2024	11/5/2024
Foreign-Produced Direct Product Rule Additions, and Refinements to Controls for Advanced Computing and Semiconductor Manufacturing Items (FN5 Rule)	12/05/2024 89 FR 96790	12/02/2024	03/14/2025
Implementation of Additional Due Diligence Measures for Advanced Computing Integrated Circuits; Amendments and Clarifications; and Extension of Comment Period (FDD Rule)	1/16/2025 90 FR 5298	01/16/2025 Compliance: 01/31/2025	3/14/2025

C&C Rule: Correction and Clarification Rule

- § 740.8 Notified Advanced Computing (NAC)
- License review policy for Gray Zone chips
- SME § 744.23 (a)(4) new end use/user control for incorporation to prevent indigenous production of SME
- Removing EUV mask substrates (3B001.j), and EUV mask making equipment (3B991.b.2) from the SME license requirement parenthetical exceptions
- Clarification to BIS responses to certain public comment topics 45, 46, 47, and 49

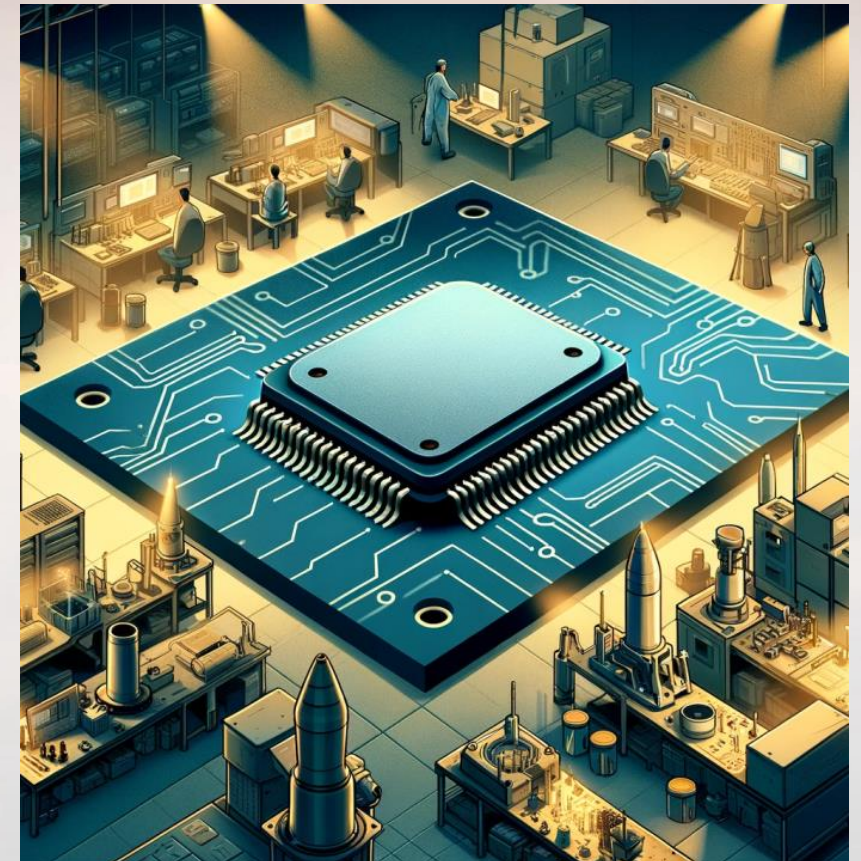
Q&S: New Semiconductor Mfg. ECCNs

- **3B903** Scanning Electron Microscope (SEM) equipment designed for imaging semiconductor devices or integrated circuits.
- **3C907** Epitaxial materials consisting of a “substrate” having at least one epitaxially grown layer and containing other specified materials.
- **3C908** Fluorides, hydrides, chlorides, of silicon or germanium, containing other specified materials.
- **3C909** Silicon, silicon oxides, germanium or germanium oxides, containing any other specified materials.



Q&S: New Semiconductor Mfg. ECCNs

- **3B001.c.1.a** Isotropic dry etching equipment
- **3B001.c.1.c** Anisotropic dry etching equipment
- **3B001.q** (“EUV” masks and “EUV” reticles designed for integrated circuits, not specified by 3B001.g, and having a mask “substrate blank” specified by 3B001.j).
- **3D907** “Software” designed to extract “GDSII” or equivalent standard layout data and perform layer-to-layer alignment from SEM images, and generate multi-layer “GDSII” data or the circuit netlist.
- **3E905** “Technology” according to the General Technology Note for the “development” or “production” of integrated circuits or devices, using “Gate all-around Field-Effect Transistor (“GAAFET”) structures.



Q&S: Summary of Exclusions and General License Authorizations

- **742.4(a)(5)(ii)(A) and 742.6(a)(10)(ii)(A)** Grandfather clause - covers existing employees - Deemed exports/reexports of all technology/software (except GAAFET 3E905) to most destinations (except D:1/D:5)
- **742.4(a)(5)(ii)(B) and 742.6(a)(10)(ii)(B)** deemed export/reexports going forward, e.g., new employees or an existing employee getting access to different technology.
- **General Licenses in General Order No. 6 authorizations**
 - (f)(1) Actual exports/reexports/transfers of GAAFET technology (3E905) for A:5 and A:6 countries
 - (f)(2) GAAFET technology (3E905) deemed exports/reexport for D:1/5 FN existing employees (grandfather clause)
 - (f)(2) Quantum technology/software deemed exports/reexports for D:1/5 FNs going forward.

FN5 Rule

- Controls on **24 new types of tools** and revisions to existing Cat. 3 Export Control Classification Numbers (ECCNs)
- Two new Foreign Direct Product rules and related *de minimis* rules:
 - FN5 FDP** for fabs of concern
 - SME FDP** for Macau and D:5 Countries (including concept of “contains”)
- High Bandwidth Memory (HBM) controls
- **New Dynamic random-access memory (DRAM) integrated circuit parameters**
- National Security and Regional Stability Controls
- **New Country List – Supp. No. 4 to part 742**
- § 740.25 License Exception High Bandwidth Memory (**HBM**) [AES C71]
- § 740.26 License Exception Restricted Fabrication “Facility” (**RFF**) [AES C72]
- TGL Revisions [AES C65]
- **Eight new Red Flags**
- **Software key access** clarification

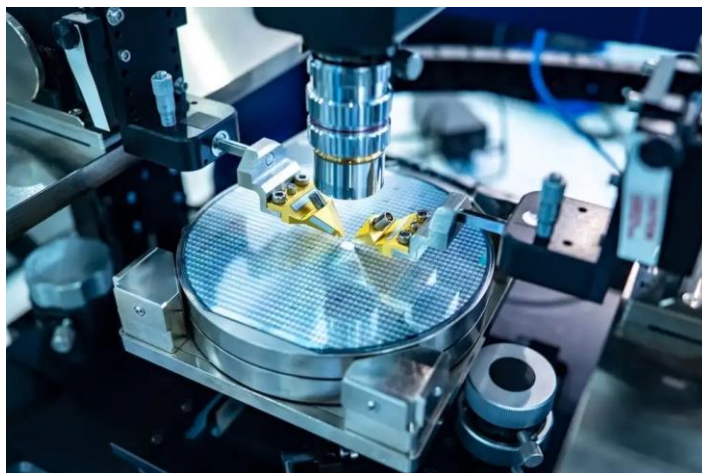
New Red Flags

- **Red flag 22** foreign government requires a license to export the item, and the nature of the end user raises questions about whether the exporter, reexporter, or transferor would have been granted a license for the item
- **Red flag 26** export, export from abroad, reexport, or transfer of a foreign-produced item described in Category 3B ECCN in FN5 or SME FDP and contains at least one IC, then there is a red flag that the foreign-produced item meets the product scope of that Entity List FDP rule.
- **Red flag 27** identifies a scenario where the end user is a “facility” that is connected to a “facility” where “production” of “advance compute integrated circuits” occurs.
"Unless the Red Flag is resolved through an Advisory Opinion, the two buildings are treated as a single “facility” for purposes of § 744.23 of the EAR."

FN5 FDP Rule	Product Scope			Destination/End User/End Use "knowledge"
	Input - software or technology "subject to the EAR" used to produce foreign-produced item	Input – U.S.-origin software or technology used to produce ("direct product") a plant or major component of a plant that produces the foreign-produced item, or such a foreign-produced commodity is contained in foreign-produced item	Output – foreign-produced item Includes 3B SME that contains any product of the plant/major component	
Footnote 5 – 734.9(e)(3)	ECCN 3D001 (for 3B commodities), 3D901 (for 3B903), 3D991 (for 3B991 and 3B992), 3D993, 3D994, 3E001 (for 3B commodities), 3E901 (for 3B903), 3E991 (for 3B991 and 3B992), 3E993, or 3E994	ECCN 3D001 (for 3B commodities), 3D901, 3D991 (for 3B991 and 3B992), 3D992, 3D993, 3D994, 3E001 (for 3B commodities), 3E901 (for 3B903), 3E991 (for 3B991 and 3B992), 3E992, 3E993, or 3E994 Section 734.9(e)(3)	ECCN 3B001 (except 3B001.a.4, c, d, f.1, f.5, f.6, g, h, k to n, p.2, p.4, r), 3B002 (except 3B002.c), 3B903, 3B991 (except 3B991.b.2.a through 3B991.b.2.b), 3B992, 3B993, or 3B994	"Knowledge" that: 1. The FDP will be incorporated into any "part," "component," or "equipment" produced, purchased, or ordered by any FN5 entity or by an entity located at a "facility" in Macau/D:5 where the "production" of logic or DRAM "advanced-node integrated circuits" occurs; OR 2. A FN5 entity or an entity located at a "facility" located in Macau/D:5 of supplement no. 1 to part 740 where the "production" of logic or DRAM "advanced-node integrated circuits" occurs is party to transaction

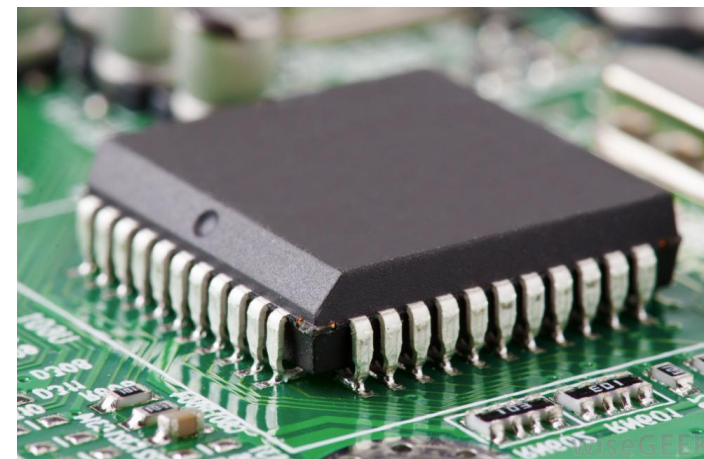


INPUT: US-Origin
ECCN 3D001 (for 3B
commodities), 3D901 (for
3B903), 3D991 (for 3B991
and 3B992), 3D993,
3D994, 3E001 (for 3B
commodities), 3E901 (for
3B903), 3E991 (for 3B991
and 3B992), 3E993, or
3E994



INPUT/OUTPUT: ECCN 3B001 (except
3B001.a.4, c, d, f.1, f.5, f.6, g, h, k to n,
p.2, p.4, r), 3B002 (except 3B002.c),
3B903, 3B991 (except 3B991.b.2.a
through 3B991.b.2.b), 3B992, 3B993,
or 3B994

**Subject to
the EAR!**



INPUT: Any product
of the 3B SME



OUTPUT: SME that contains the
output of the foreign SME

License Requirements for Items Subject to the EAR Under FN5 FDP



Entity HQ	<i>Reexport/Export from Abroad from Supp. 4</i>	<i>Reexport/Export from Abroad from A:5, not in Supp. 4</i>	<i>Reexport/Export from Abroad from Non-A:5</i>	<i>Transfers (in-country) (D:5/Macau)</i>
Supp. 4⁵	No BIS license required for ECCNs in Lists 1-3	List 1 ECCNs – D:5/Macau ⁶ List 2 ECCNs – FN5 ⁶	List 1 ECCNs – D:5/Macau List 2 ECCNs – FN5	List 1 ECCNs – All end-users List 2 ECCNs – FN5
Non-Supp. 4 (and not D:5/Macau)	No BIS license required for ECCNs in Lists 1-3	List 1 ECCNs – D:5/Macau ⁶ List 2 ECCNs – FN5 ⁶	List 1 ECCNs – D:5/Macau List 3 ECCNs – FN5	List 1 ECCNs – All end-users List 3 ECCNs – FN5
D:5/Macau⁷	List 1 – D:5/Macau List 3 – FN5	List 1 ECCNs – D:5/Macau List 3 ECCNs – FN5	List 1 ECCNs – D:5/Macau List 3 ECCNs – FN5	List 1 ECCNs – All end-users List 3 ECCNs – FN5

ECCN List Key:

List 1: ECCN 3B001.a.4, c, d, f.1, f.5, f.6, k to n, p.2, p.4, r, 3B002.c

List 2: ECCN 3B993

List 3: ECCN 3B001 (except **List 1** and 3B001.g and .h), 3B002 (except 3B002.c), 3B611, 3B903, 3B991 (except 3B991.b.2.a and 3B991.b.2.b), 3B992, 3B993, 3B994.

⁵Supplement No. 4 to Part 742 includes: Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom.

⁷See §742.4(a)(4)(ii)(B) and (C); §744.11(a)(2)(v)(A)(1).

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Licensing Requirements for Foreign-Produced Commodities

Outside the US That Are Specific to:

- (i) **Footnote 5** Fabs AND
- (ii) Unlisted Fabs in Macau/D5 That **Produce “Advanced Node” Logic or DRAM**

¹ 3B001 (except 3B001.a.4, c, d, f.1, f.5, f.6, g, h, k to n, p.2, p.4, r), 3B002 (except 3B002.c), 3B611, 3B903, 3B991 (except 3B991.b.2.a through 3B991.b.2.b), 3B992, 3B993, or 3B994

	From Argentina, India, S. Korea, or Türkiye to FN5 Entity or Advanced Fab	From non-A5 countries (e.g., Israel, Singapore, or Taiwan) to FN5 Entity or Advanced Fab	From Supp. No. 4 countries (e.g., JP, NL, or DE) to FN5 Entity or Advanced Fab	Transfer within China to FN5 Entity or Advanced Fab
HQ'd in US or that has ultimate parent company in US	License required for only 3B993 (if the commodity is not subject to equivalent controls by the relevant country). 744.11(a)(2)(v)(A)(2)	License required for all FN5 / Advanced Fab ECCNs. ¹ 744.11(a)(2)(v)(A)(3)(i)		License required for all FN5 / Advanced Fab ECCNs. ¹ 744.11(a)(2)(v)(A)(4)(i)
HQ'd in, or with ultimate parent in Supp 4 countries		License required for only 3B993. 744.11(a)(2)(v)(A)(3)(ii)	No EAR license required. (744.11(a)(2)(v)(A) provides the exclusive license requirements	License required for only 3B993. 744.11(a)(2)(v)(A)(4)(ii)
HQ'd in, or with ultimate parent in, Taiwan, Singapore, Israel, S. Korea, India or other non- Supp 4 countries		License required for all FN5 / Advanced Fab ECCNs. ¹ 744.11(a)(2)(v)(A)(3)(i)	for items within the scope of 734.9(e)(3))	License required for all FN5 / Advanced Fab ECCNs. ¹ 744.11(a)(2)(v)(A)(4)(i)
Macau/D5 HQ'd or ultimate parent in Macau/D5	License required for all FN5 / Advanced Fab ECCNs. ¹ 744.11(a)(2)(v)(A)(1), (4)(i)			

Logic or DRAM Adv ICs: Ineligible for *De minimis*

§734.4(a)(9) **For items related to the Footnote 5 FDP rule**, there is no *de minimis* level for an item meeting the parameters in ECCNs specified in Category 3B (except 3B001.a.4, c, d, f.1, f.5, f.6, k to n, p.2, p.4, r, or 3B002.c) of the Commerce Control List (CCL) in supplement no. 1 to part 774 of the EAR, when the commodity contains a U.S.-origin integrated circuit specified under Category 3, 4, or 5 of the CCL, and the commodity is destined:

- **For an entity with a Footnote 5** designation in the license requirement column of the Entity List in supplement no. 4 to part 744 of the EAR, or
- **To an end-user “facility”** located in Macau or a destination specified in Country Group D:5 when there is “knowledge” that the commodities will be used in the “production” of logic or DRAM “advanced-node integrated circuits.”

FDD Rule: Overview



- Revises License Exceptions AIA and ACM
- Adds lists of approved IC designers and approved “OSAT” companies, as well as authorized IC designers in specified destinations
- Adds reporting requirements for “front-end fabricators” producing advanced computing ICs for authorized IC designers, as well as a new “Know Your Customer” (KYC) vetting form
- Revises definition of DRAM, including revising *de minimis* ineligibility and FN5 FDP
- Definitions: Revises 1, Adds 5
- Adds Note 1 to 3A090 to clarify the scope of 3A090.a
- Amends and clarifies the FDP IFR: adds 3B001.f.6 immersion DUV items and Revises 3B99x ECCNs to clarify scope

FDD Rule: Note 1 to 3A090.a

- **Who does it apply to?** “Front-end fabricators” or “OSAT” companies
- **When does it apply?** Exports from abroad, reexports, and transfers of “applicable advanced logic integrated circuit”
- **What does it do?** Presumption that the IC is 3A090.a and subject to license requirements for 3A090.a
- **How can this presumption be overcome?**

Applicable advanced logic integrated circuits are logic integrated circuits produced using the “16/14 nanometer node” or below, or using a non-planar transistor architecture.

Ways to Overcome 3A090.a Presumption

1. If the designer of the “applicable advanced logic integrated circuit” is an **approved or authorized integrated circuit designer**, then a datasheet or other attestation of the ‘total processing performance’ and the ‘performance density’ from the approved or authorized integrated circuit designer **indicating that the IC is not specified in 3A090.a** will overcome the presumption for the “front-end fabricator” or “OSAT” company that the IC is specified in ECCN 3A090.a.

2nd and 3rd Ways to Overcome 3A090.a Presumption



2. If the integrated circuit die is:

Packaged by the “front-end fabricator” at a location outside of Macau or a destination specified in Country Group D:5 in supplement no. 1 to part 740; **OR**

3. If the integrated circuit die is:

Packaged by an approved “OSAT” company listed in supplement no. 7 to part 740 of the EAR, and the attestation of either is one of the following:

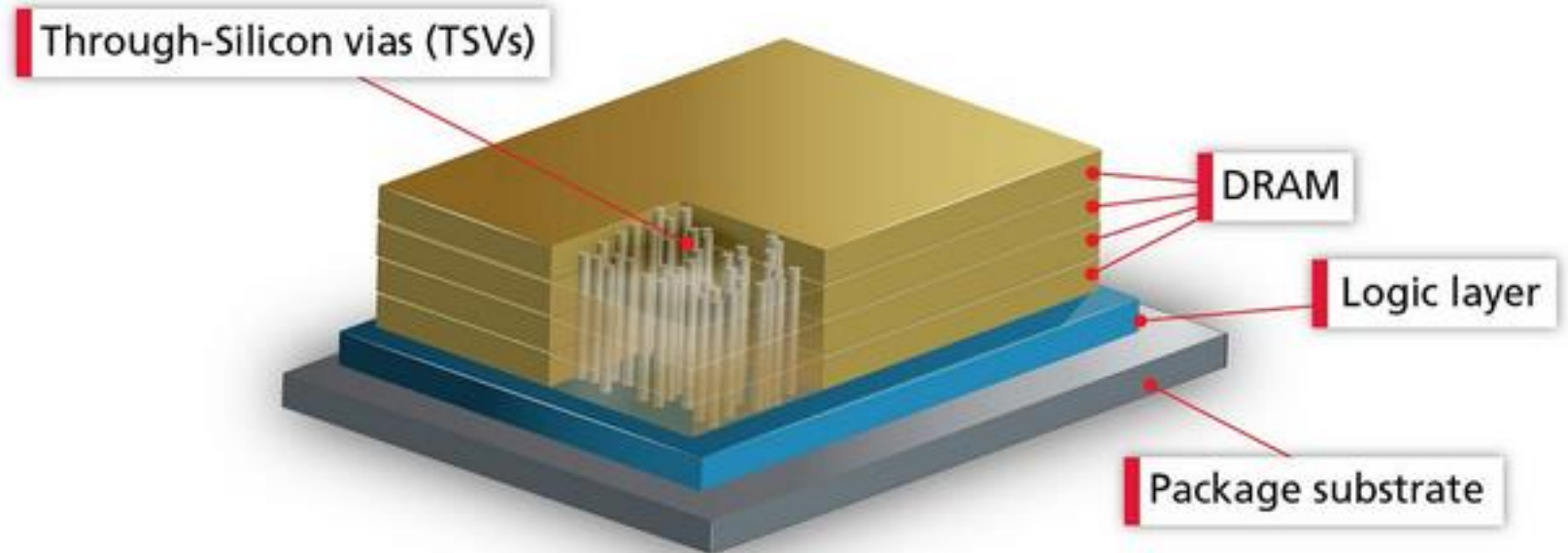
- (a) The “**aggregated approximated transistor count**” of the final packaged IC is below 30 billion transistors, or
- (b) The final packaged IC does not contain high-bandwidth memory and that the “**aggregated approximated transistor count**” of the final packaged IC is below
 - (i) 35 billion transistors for any exports, reexports, or transfers (in-country) completed in **2027**; or
 - (ii) 40 billion transistors for any exports, reexports, or transfers (in-country) completed in **2029** or thereafter

§ 743.9 Reporting Requirements For “Front-end Fabricators”

- *Requirement.* “Front-end fabricators” producing any integrated circuit specified under ECCN 3A090.a or presumed to be specified under ECCN 3A090.a by Note 1 to 3A090 for any authorized integrated circuit designer must submit quarterly reports to BIS in accordance with this section, including:

End-user Know Your Customer (KYC) vetting form included in supplement no. 2 to 743

Dynamic Random- Access Memory



HBM Memory Chip Architecture

12/2024: Away from “half pitch” def., toward HBM focus

Oct 2022

Dynamic random-access memory (DRAM) integrated circuits using a “production” technology node of **18 nanometer half-pitch or less**

Oct 2023

Dynamic random-access memory (DRAM) integrated circuits using a “production” technology node of **18 nanometer half-pitch or less**

...published in the **International Roadmap for Devices and Systems (IRDS)**

Dec 2024

Dynamic random-access memory (DRAM) integrated circuits having:

- (i) A memory cell area of less than **0.0019** μm^2 ; or
- (ii) A memory density greater than **0.288** gigabits per square millimeter

Further align parameters with HBM production

	Cell area (μm^2)	Memory Density (Gb/mm ²)	Best HBM die production
FN5 Rule (Dec '24)	0.0019	0.288	HBM3
FDD Rule (Jan '25)	0.0026	0.20	HBM2

Export controlled
to PRC via
3A090.c

Allowed for
export to PRC for
certain end uses

Need one more parameter to differentiate
HBM2 production from other end uses

Dynamic Random-Access Memory (DRAM)

- Revision to “Advanced-Node Integrated Circuits”
 - (3) Dynamic random-access memory (DRAM) integrated circuits having:
 - (i) A memory cell area of less than 0.0026 μm^2 ;
 - (ii) A memory density greater than 0.20 gigabits per square millimeter; or
 - (iii) More than 3,000 through-silicon vias per die.

A ***through-silicon via (TSV)*** or *through-chip via* is a vertical electrical connection (via) that passes completely *through* a silicon wafer or die.

Consistent with Note 3 to Cat. 3, TSVs included filled or unfilled at the die stage.

- Effect: This revision imposes end-use and U.S. persons controls at DRAM facilities not previously controlled by the definition of DRAM in the FN5 Rule.

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