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Semiconductor and Advanced Computing Export Control Rules Modifying and Reinforcing the Restrictions Initially Released on October 7, 2022

On October 17, 2023, the Department of Commerce's Bureau of Industry and Security (BIS) released three rules to update the export controls issued on October 7, 2022, for advanced computing semiconductors, semiconductor manufacturing equipment, and items that support supercomputing applications and end-uses. We provide a top-line analysis of each of the following rules in turn:

1. Advanced Computing Chips Interim Final Rule
2. Semiconductor Manufacturing Items Interim Final Rule
3. Additions to the Entity List Final Rule

As these interim final rules (IFR) have staged implementation, the export controls released October 7, 2022, remain in effect until superseded on the effective dates outlined below.

I. Advanced Computing Chips Rule

The IFR on advanced computing items and supercomputer and semiconductor end uses as described below is effective November 17, 2023. Comments will be due no later than December 18, 2023.

The IFR retains the stringent PRC-wide licensing requirements imposed in the October 7, 2022 rule and makes the following updates:

Control Parameter Changes

The IFR removes the "interconnect bandwidth" as a parameter for identifying restricted chips under Export Control Classification Number (ECCN) 3A090. It instead restricts the export of chips if they exceed either of two parameters in ECCN 3A090:

1. The preexisting performance threshold set in the October 7 rule; or
2. A new "performance density threshold," which is designed to preempt future workarounds such as "simply purchasing a larger number of smaller datacenter AI chips which, if combined, would be equally powerful as restricted chips."

License Requirements

- **Regional Stability Controls** – Expands license requirements for advanced integrated circuits (IC) (i.e., ECCN 3A090) and associated technology and software to apply to any destination in Country Groups D:1, D:4, or D:5 that is also not specified in Country Groups A:5 or A:6. This would include Afghanistan, Armenia, Azerbaijan, Bahrain, Belarus, Burma, Cambodia, Central African Republic, China, Democratic Republic of Congo, Cuba, Egypt, Eritrea, Georgia, Haiti, Iran, Iraq, Jordan, Kazakhstan, North Korea, Kuwait, Kyrgyzstan, Laos, Lebanon, Libya, Macau, Moldova, Mongolia, Oman, Pakistan, Qatar, Russia, Saudi Arabia, Somalia, Republic of South Sudan, Sudan, Syria, Tajikistan, Turkmenistan, United Arab Emirates, Uzbekistan, Venezuela, Vietnam, Yemen and Zimbabwe.
  - License applications to or within destinations other than Macau and Country Group D:5 (except for items destined to an entity headquartered in, or whose ultimate parent company is headquartered in, either Macau or a destination specified in Country Group D:5) will be reviewed on a presumption of approval basis.
    - Country Group D:5 includes Afghanistan, Belarus, Burma, Cambodia, Central African Republic, China, Democratic Republic of Congo, Cuba, Cyprus, Eritrea, Haiti, Iran, Iraq, North Korea, Lebanon, Libya, Russia, Somalia, Republic of South Sudan, Sudan, Syria, Venezuela and Zimbabwe.
  - License applications to or within Macau and destinations in Country Group D:5 (including China) will be reviewed on a presumption of denial basis.
- **Foreign Direct Product Rule** – Imposes a worldwide licensing requirement for the export of controlled chips through a revised Foreign Direct Product Rule when the item is to or for any company:
  - That is headquartered in any destination subject to a US arms embargo (including China) or Macau (i.e., Country Group D:5 or Macau), or
  - Whose ultimate parent company is headquartered in those countries, to prevent firms from countries of concern from securing controlled chips through their foreign subsidiaries and branches.
- **End Use Controls** – Expands the license requirement pursuant to the Supercomputer and Semiconductor End Use Control to apply to exports, reexports or transfers (in country) of specified commodities to any destination in Country Groups D:1, D:4, or D:5 that is also not specified in Country Groups A:5 or A:6, when you have "knowledge" that the item is destined for any entity that is headquartered in, or whose ultimate parent company is headquartered in, either Macau or a destination specified in Country Group D:5 (including China).
  - This expanded end-use control is intended to ensure the export control rules are not undermined by entities setting up cloud or data servers in other countries to allow these headquartered companies of concern to continue to train their AI models.

License Exceptions

- **Notified Advanced Computing** – The IFR creates a new Notified Advanced Computing (NAC) license exception for consumer grade-ICs with AI capabilities that are below the restricted thresholds. The license exception is for:
  - ICs designed or marketed for use in datacenters; or
  - ICs not designed or marketed for use in datacenters that do have a "total processing performance" of 4800 or more.

  For exports and reexports of these items, pursuant to the NAC license exception, to Macau and destinations identified as subject to a US arms embargo (i.e., Country Group D:5, including China), the IFR implements a notification process whereby the US government will determine within 25 days whether the transaction may proceed under the license exception or instead require a license.
- Consumer Communication Devices – Introduces an exemption that will permit the export of certain low-level commodities for consumer applications by revising the Consumer Communications Devices (CCD) license exception.

Additional Updates

- Due Diligence – Creates new red flags and additional due diligence requirements to help foundries identify restricted chip designs from countries of concern. This will make it easier for foundries to assess whether foreign parties are attempting to circumvent the controls by illicitly fabbing restricted chips.
- Temporary General License – The IFR establishes a temporary general license (TGL) to continue or engage in integration, assembly (mounting), inspection, testing, quality assurance and distribution of certain advanced computing items when the ultimate end use of such items is outside of the expanded destinations now subject to license requirements and by entities not headquartered, or whose ultimate parent is not headquartered, in those destinations.
- Request for Public Comment – Includes a request for public comments on multiple topics, including risks associated with infrastructure as a service (IaaS) providers, the application of controls on deemed exports and deemed reexports, additional compliance guidance that could be provided to foundries receiving chip designs, and how to more precisely define key terms and parameters in the regulation.

II. Semiconductor Manufacturing Items Interim Final Rule

The IFR on semiconductor manufacturing items as described below is effective November 17, 2023, except for the TGL described below that is effective upon publication in the Federal Register. Comments will be due no later than December 18, 2023.

Key changes made from the October 7, 2022, rule include:

- **License Requirements** – Expanding license requirements for semiconductor manufacturing equipment to apply to additional countries beyond China and Macau, to 21 other countries for which the US maintains an arms embargo (i.e., Country Group D:5).
- **Semiconductor Manufacturing Equipment Controls** – Imposing controls on additional types of semiconductor manufacturing equipment. Specifically, the IFR removes ECCN 3B090 and replaces and expands its provisions in ECCNs 3B001 and 3B002. The newly listed subparagraphs in these ECCNs impose licensing requirements on the following illustrative list of items:
  - Equipment designed for silicon (Si), carbon doped silicon, silicon germanium (SiGe), or carbon doped SiGe epitaxial growth with specified parameters
  - Equipment designed for dry etching
  - Equipment designed for wet chemical processing and having a largest "silicon germanium-to-silicon etch selectivity" ratio of greater than or equal to 100:1
  - Advanced fabrication equipment designed for metal deposition of the barrier layer, linear layer, seed layer, or cap layer of metal interconnects
  - Spatial atomic layer deposition (ALD) equipment having a wafer support platform that rotates around an axis having any of the following – a spatial plasma enhanced ALD mode of operation, a plasma source, or a plasma shield or means to confine the plasma to the plasma exposure process region
  - Equipment designed for ALD or chemical vapor deposition (CVD) of plasma enhanced low fluorine tungsten films
  - Equipment designed to deposit a metal layer and maintain a specified vacuum or inert gas environment
  - Equipment designed for depositing a metal layer and maintaining a specified vacuum or inert gas environment
  - Equipment designed for depositing a ruthenium (Ru) layer using an organometallic compound, while maintaining the wafer substrate at a specified temperature
  - Equipment assisted by remotely generated radicals enabling the fabrication of a silicon and carbon containing film having specified properties
  - Equipment designed for void free plasma enhanced deposition of a low-k dielectric layer in gaps between metal lines with specified parameters
  - Equipment designed for ion beam deposition or physical vapor deposition of multilayer reflector for extreme ultraviolet (EUV) masks, EUV pellicles, or equipment for manufacturing EUV pellicles
  - Equipment designed for coating, depositing, baking or developing photoresist formulated for EUV lithography
  - Semiconductor wafer fabrication annealing equipment with specified parameters

- Equipment designed for removing polymeric residue and copper oxide film and enabling deposition of copper metal in a vacuum (equal to or less than 0.01 Pa) environment
  - Single wafer wet cleaning equipment with surface modification drying
  - Equipment designed for dry surface oxide removal preclean or dry surface decontamination
  - Inspection equipment meeting the parameters of ECCN 3B002
- US Person Controls – Refining and better focusing the US persons restrictions while codifying previously existing agency guidance, to ensure US companies cannot provide support to advanced PRC semiconductor manufacturing while avoiding unintended impacts.
  - The changes are intended to better capture relevant advanced-node IC production "facilities" beyond only a clean room or production floor. This would include facilities where important late-stage product engineering and early-stage manufacturing steps occur, as well as development and product engineering activities at R&D fabrication facilities that may not engage in volume manufacturing of ICs.
  - BIS specifically added exclusions for:
    - "Back-end" production steps, such as assembly, test or packaging steps that do not alter the technology level of an IC, consistent with its FAQ published on January 25, 2023; and
    - US persons employed or working on behalf of a company headquartered in the United States or a destination specified in Country Group A:5 or A:6 and not majority-owned by an entity that is headquartered in Macau or a destination specified in Country Group D:5.

The IFR adds a new TGL to provide Semiconductor Manufacturing Equipment (SME) producers in the United States and countries in Country Groups A:5 and A:6 additional time to identify alternative sources of supply outside of arms-embargoed countries, or to acquire individually validated licenses.

III. Additions to the Entity List Final Rule

BIS added 13 entities, outlined below, to the Entity List under the destination of China. These entities were added for being involved in the development of advanced computing ICs and have also been designated with a footnote 4. The footnote 4 designation will restrict exports, reexports or transfers (in country) to these entities or when these entities are a party to the transaction under the Entity List Foreign Direct Product Rule implemented in the October 7, 2022, export controls.

These entities include:

- Beijing Biren Technology Development Co. Ltd.
- Guangzhou Biren Integrated Circuit Co. Ltd.
- Hangzhou Biren Technology Development Co. Ltd.
- Light Cloud (Hangzhou) Technology Co. Ltd.
- Moore Thread Intelligent Technology (Beijing) Co. Ltd.
- Moore Thread Intelligent Technology (Chengdu) Co. Ltd.
- Moore Thread Intelligent Technology (Shanghai) Co. Ltd.
- Shanghai Biren Information Technology Co. Ltd.
- Shanghai Biren Integrated Circuit Co. Ltd.
- Shanghai Biren Intelligent Technology Co. Ltd.
- Superburning Semiconductor (Nanjing) Co. Ltd.
- Suzhou Xinyan Holdings Co. Ltd.
- Zhuhai Biren Integrated Circuit Co. Ltd.

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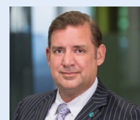

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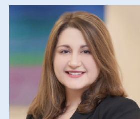

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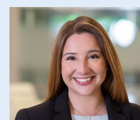

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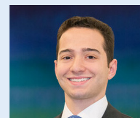

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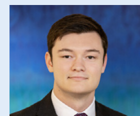

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