

1. Stroboscopic capability with either beam-blanking or detector strobing; *and*
2. An electron spectrometer for voltage measurement with a resolution of less than 0.5 V;

NOTE:

1032.9.d. does not embargo scanning electron microscopes, *except* when specially designed and instrumented for the non-contactive probing of powered-up semiconductor devices.

1033. Materials

1033. 1. Hetero-epitaxial materials consisting of a "substrate" with stacked epitaxially grown multiple layers of:
 - a. Silicon;
 - b. Germanium; or
 - c. III/V compounds of gallium or indium;

Technical Note:

III/V compounds are polycrystalline or binary or complex monocrystalline products consisting of elements of groups IIIA and VA of Mendeleev's periodic classification table (gallium arsenide, gallium-aluminium arsenide, indium phosphide, etc.).

1033. 2. Resist materials, as follows, and "substrates" coated with embargoed resists:
 - a. Positive resists with a spectral response optimized for use below 370 nm;
 - b. All resists, for use with electron beams or ion beams, with a sensitivity of 0.01 microcoulomb/mm² or better;
 - c. All resists, for use with X-rays, with a sensitivity of 2.5 mJ/mm² or better;
 - d. All resists optimized for surface imaging technologies, including silylated resists;

Technical Note:

Silylation techniques are defined as processes incorporating oxidation of the resist surface to enhance performance for both wet and dry developing.

1033. 3. Metal-organic compounds of aluminium, gallium or indium, having a purity (metal basis) better than 99.999%;
1033. 4. Hydrides of phosphorus, arsenic or antimony, having a purity better than 99.999%, even diluted in neutral gases;

NOTE:

1033.4. does not embargo hydrides containing 20% molar or more of rare gases or hydrogen.

1034. Software

1034. 1. "Software" specially designed for the "development" or "production" of equipment embargoed by 1031.1.b. to 1031.2.h. or 1032.;
2. "Software" specially designed for the "use" of "stored programme controlled" equipment embargoed by 1032.;
3. Computer-aided-design (CAD) "software" for semiconductor devices or integrated circuits, having any of the following:
 - a. Design rules or circuit verification rules;
 - b. Simulation of the physically laid out circuits; or
 - c. Lithographic processing simulators for design;

Technical Note:

A lithographic processing simulator is a "software" package used in the design phase to define the sequence of lithographic, etching and deposition steps for translating masking patterns into specific topographical patterns in conductors, dielectrics or semiconductor material.

NOTE:

1034.3. does not embargo "software" specially designed for schematic entry, logic simulation, placing and routing, layout verification or pattern generation tape;

N.B.:

Libraries, design attributes or associated data for the design of semiconductor devices or integrated circuits are considered as technology.

1035. Technology

1035. 1. Technology according to the General Technology Note for the "development" or "production" of equipment or materials embargoed by 1031., 1032. or 1033.;

NOTE:

1035.1. does not embargo technology for the "development" or "production" of:

- a. Microwave transistors operating at frequencies below 31 GHz;
- b. Integrated circuits embargoed by 1031.1.a.3. to 11., having both of the following characteristics:
 1. Using technology of one micrometre or more, and
 2. Not incorporating multi-layer structures.

N.B.:

This Note does not preclude the export of multilayer technology for devices incorporating a maximum of two metal layers and two polysilicon layers.

2. Other technology for the "development" or "production" of:
 - a. Vacuum microelectronic devices;
 - b. Hetero-structure semiconductor devices such as high electron mobility transistors (HEMT), hetero-bipolar transistors (HBT), quantum well or super lattice devices;
 - c. "Superconductive" electronic devices;

NOTE:

Governments may permit, as administrative exceptions, the shipment to the People's Republic of China of:

- a. Epitaxial reactors embargoed by 1032.1.a. for use in silicon semiconductor manufacturing, except those specially designed for metal-organic deposition;
- b. Instrument "frequency synthesisers" or synthesised signal generators embargoed by 1031.2.b. or 1031.2.d.2., and specially designed components or accessories therefor, having:
 1. A synthesised output frequency of 2.6 GHz or less; and
 2. A "frequency switching time" of 0.3 ms or more;
- c. Analogue instrumentation magnetic tape recorders embargoed by 1031.2.a.1, provided all of the following conditions are met:
 1. Bandwidths do not exceed:
 - a. 4 MHz per track; or
 - b. 2 MHz per track and have up to 42 tracks;
 2. Tape speed does not exceed 6.1 m/s;
 3. They are not designed for underwater use;
 4. They are not ruggedised for military use; and
 5. Recording density does not exceed 653.2 magnetic flux sine waves per mm;
- d. Positive resists not optimized for photolithography at a wavelength of less than 365 nm, provided they are not embargoed by 1033.2.b. to d.

1040. COMPUTERS

NOTES:

1. Computers, related equipment or "software" performing telecommunications or "local area network" functions must also be evaluated against the performance characteristics of Category 1050 (Telecommunications).

N.B.:

1. Control units which directly interconnect the buses or channels of central processing units, "main storage" or disk controllers are not regarded as telecommunications equipment described in Category 1050 (Telecommunications).
2. For the embargo status of "software" which provides routing or switching of "datagram" or "fast select" packets (i.e., packet by packet route selection) or of "software" specially designed for packet switching, see Category 1050 (Telecommunications).
2. Computers, related equipment or "software" performing cryptographic, cryptanalytic, certifiable multi-level security or certifiable user isolation functions, or which limit electromagnetic compatibility (EMC), must also be evaluated against the performance characteristics in Category 1150 ("Information Security").

1041. Equipment, Assemblies and Components

1041. 1. Electronic computers and related equipment, as follows, and "assemblies" and specially designed components therefor:
 - a. Specially designed to have either of the following characteristics:
 1. Rated for operation at an ambient temperature below 228 K (-45°C) or above 343 K (70°C); *or*
- NOTE:**
- 1041.1.a.1. does not apply to computers specially designed for civil automobile or railway engine applications.
 2. Radiation-hardened to exceed any of the following specifications: