# Semiconductors, Printed Circuit Boards, Other Electronic Components: 2001

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SUMMARY OF FINDINGS

During 2001, the total value of shipments of semiconductors, printed cirucit boards, and other electronic components was $117,564.9 million. This represents a 28.7-percent decrease from the revised 2000 total of $164,853.6 million. The 2001 data include electron tubes and parts, $2,978.1 million, a decrease of 30.8 percent from 2000; printed circuit boards, $8,944.9 million, a decrease of 24.8 percent from 2000; semiconductors and related devices, $55,149.2 million, a decrease of 35.6 percent over the revised total from 2000. Capacitors decreased 31.2 percent to $1,917.3 million; resistors decreased by 27.4 percent to $712.9 million; coils and transformers had a 26.7-percent decrease to $1,259.8 million; electronic connectors was $4,627.0 million in 2001, compared to $5,931.7 million in 2000, a decrease of 22.0 percent; and other electronic components decreased to $41,975.7 million, from a revised 2000 total of $51,629.0 million, a decrease of 18.7 percent.

For general CIR information, explanation of general terms and historical note, see the appendix.

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U S C E N S U S B U R E A U

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Economics and Statistics Administration
U.S. CENSUS BUREAU

Table 1. Value of Shipments of Semiconductors, Printed Circuit Boards, and Other Electronic Components by Class of Product: 1996 to 2001
[Value in million of dollars]

| Product code | Product description | 2001 | 2000 | 1999 | 1998 | 1997 | 1996 |
|---|---|---|---|---|---|---|---|
| 3344111 | Transmittal, industrial, and special-purpose electron tubes (except X-ray) | 654.0 | 702.8 | 672.9 | 629.5 | 655.9 | 611.4 |
| 3344114 | Receiving type electron tubes and cathode ray picture tubes | 2,226.3 | 3,457.5 | 3,578.5 | 3,367.1 | 3,433.6 | 3,272.0 |
| 3344117 | Electron tube parts | 97.8 | 143.5 | 136.4 | 146.6 | 161.0 | 153.1 |
| 3344120 | Printed circuit boards | 8,944.9 | 11,891.8 | 9,149.9 | 8,473.2 | 8,702.4 | 8,216.8 |
| 3344131 | Integrated microcircuits (semiconductor networks) | 47,119.2 | 73,663.7 | 62,868.4 | 57,643.5 | 57,019.4 | 52,639.3 |
| 3344134 | Transistors | 785.9 | 1,569.3 | 993.7 | 887.0 | 1,500.2 | 945.9 |
| 3344137 | Diodes and rectifiers | 398.4 | 620.6 | 1,038.3 | 907.6 | 1,190.5 | 861.4 |
| 334413A | Other semiconductor devices | 6,845.6 | 9,757.0 | 11,745.4 | 11,055.8 | 10,262.3 | 10,976.1 |
| 3344140 | Capacitors for electronic applications | 1,917.3 | 2,786.1 | 2,035.1 | 1,946.9 | 2,098.7 | 1,653.4 |
| 3344150 | Resistors | 712.9 | 981.7 | 970.6 | 944.6 | 993.4 | 911.9 |
| 3344160 | Coils, transformers, reactors, and chokes for electronic applications | 1,259.8 | 1,718.8 | 1,422.5 | 1,368.3 | 1,425.7 | 1,435.6 |
| 3344171 | Coaxial connectors | 505.2 | 805.0 | 630.5 | 590.3 | 581.0 | 656.9 |
| 3344174 | Cylindrical connectors | 661.6 | 725.3 | 549.5 | 579.5 | 554.9 | 642.5 |
| 3344177 | Rack and panel connectors | 350.8 | 531.7 | 391.4 | 745.6 | 657.9 | 530.7 |
| 334417A | Printed circuit connectors | 1,064.8 | 1,810.8 | 1,375.8 | 1,124.8 | 1,276.5 | 1,095.3 |
| 334417D | Other connectors, including parts | 2,044.6 | 2,058.9 | 2,041.2 | 1,973.1 | 2,208.8 | 1,617.1 |
| 3344191 | Filters (except microwave) and piezoelectric devices | 941.2 | 1,167.9 | 857.5 | 797.5 | 814.7 | 719.3 |
| 3342207 | Microwave components and devices | 1,510.5 | 2,435.1 | 1,621.6 | 1,580.7 | 1,439.8 | 1,251.4 |
| 3344194 | Transducers, electrical/electronic input or output | 1,437.6 | 1,519.3 | 1,330.7 | 1,372.7 | 1,219.6 | 1,104.8 |
| 3344197 | Switches, mechanical types for electronic circuitry | 774.0 | 902.6 | 883.4 | 882.5 | 791.2 | 738.0 |
| 334418A | Printed circuit assemblies | 30,712.9 | 37,272.5 | 30,090.9 | 26,046.5 | 27,040.2 | 24,937.3 |
| 334419D | All other electronic components, n.e.c. | 6,599.5 | 8,331.6 | 7,275.7 | 7,322.4 | 7,484.7 | 7,199.1 |

n.e.c. Not elsewhere classified.

Table 2. Quantity and Value of Shipments of Semiconductors, Printed Circuit Boards, and Other Electronic Components: 2001 and 2000
[Quantity in thousands of units. Values in thousands of dollars]

| Product code | Product description | No. of cos. | 2001 Quantity | 2001 Value | | 2000 Quantity | | 2000 Value |
|---|---|---|---|---|---|---|---|---|
| 334411 | Electron tubes | (NA) | (X) | 2,978,123 | | (X) | | 4,303,752 |
| 3344111 | Transmittal, industrial, and special-purpose electron tubes (except X-ray) | 31 | (X) | 654,023 | | (X) | | 702,797 |
| | Power and special-purpose tubes: | | | | | | | |
| 3344111105 | High vacuum tubes, including triodes, multigrid external and internal anodes, diodes, and other | 6 | 76 | 68,881 | | 85 | | 69,282 |
| 3344111110 | Gas and vapor tubes, including ignitrona, gas duplexers, spark gaps, and other | 9 | 668 | 33,085 | | 648 | | 31,796 |
| 3344111115 | Klystrons, including amplifier, reflex, and other | 5 | (D) | (D) | | 298 | | 55,274 |
| 3344111120 | Magnetrons, incuding pulsed, fixed, tunable, cross-field, continuous wave, and other | 4 | (D) | (D) | | 17 | | 43,729 |
| | Traveling wave tubes (TWT): | | | | | | | |
| | Forward wave: | | | | | | | |
| 3344111222 | Continuous wave (CW) | 4 | 3,518 | 105,727 | r/ | 3,013 | r/ | 89,600 |
| 3344111232 | Pulsed power | 5 | 1,206 | 84,856 | r/ | 1,150 | r/ | 90,033 |
| 3344111265 | Backward wave | - | - | - | | - | | - |
| 3344111340 | Light sensing tubes | 7 | 80 | 98,333 | | 95 | | 103,832 |
| 3344111360 | Light emitting devices, including storage tubes all sizes, cathode ray tubes, color and monochrome (industrial and military), special display devices, including alphanumeric readout tubes, figure indicating tubes, and other | 8 | 205 | 59,107 | | 1,564 | | 118,006 |
| 3344111370 | Miscellaneous special-purpose tubes (reference cavities, radiation detection (geiger, neutron counters, etc.), beam deflection, decade counters, orbital beam, vacuum gauges, vacuum capacitors, switches, relays, etc. | 8 | (X) | 106,664 | | (X) | | 101,245 |
| 3344114 | Receiving type electron tubes and cathode ray picture tubes | (NA) | (X) | 2,226,278 | | (X) | | 3,457,465 |
| 3344114005 | Receiving type electron tubes, all types, including rebuilt | 1 | (D) | (D) | | (D) | | (D) |
| | Television tubes, including any defective tube that has been rebuilt: | | | | | | | |
| | Color having a video display diagonal of: | | | | | | | |
| 3344114010 | 50 cm and under (20 inches and under) 1/ | 5 | (D) | (D) | | (D) | | (D) |
| 3344114015 | Over 50 cm, but not exceeding 63 cm (21 through 25 inches) 1/ | 1 | 11,369 | 670,982 | | 16,822 | | 1,211,165 |
| 3344114020 | Exceeding 63 cm (26 inches and over) | 6 | 10,634 | 1,459,506 | r/ | 14,246 | r/ | 2,172,259 |
| 3344114025 | Other, including rebuilt color and new and rebuilt black and white | 5 | (D) | (D) | | (D) | | (D) |
| 3344117030 | Electron tube parts (except glass blanks): bases, getters, cathodes, headers, guns | 16 | (X) | 97,822 | | (X) | | 143,490 |
| 334412 | Printed-circuit (wiring) boards | 520 | (X) | 8,944,884 | | (X) | | 11,891,839 |
| 3344120105 | Single-sided glass printed | 253 | (X) | 222,764 | | (X) | r/ | 285,240 |
| 3344120210 | Double-sided glass printed | 344 | (X) | 1,055,599 | | (X) | r/ | 1,417,667 |
| 3344120315 | Multilayer glass printed | 337 | (X) | 5,056,997 | | (X) | r/ | 6,647,974 |
| 3344120420 | Single-sided flex printed | 46 | (X) | 404,162 | | (X) | r/ | 609,519 |
| 3344120425 | Double-sided flex printed | 43 | (X) | 113,163 | | (X) | r/ | 179,543 |
| 3344120430 | Multilayer flex and rigid/flex printed | 52 | (X) | 224,123 | | (X) | r/ | 224,918 |
| 3344120432 | Back-bared flex printed boards | - | (X) | - | | (X) | | - |
| 3344120433 | Sculptured flex printed boards | - | (X) | - | | (X) | | - |
| 3344120435 | All paper/mat/composite printed boards | 12 | (X) | 15,068 | | (X) | r/ | 29,442 |
| 3344120440 | Other substitute printed boards | 64 | (X) | 1,256,442 | | (X) | r/ | 1,634,685 |
| 3344120545 | Receipts for contract work on printed circuit boards (etching, dip-soldering, imprinting, etc.), but not printed board assembly | 64 | (X) | 596,566 | | (X) | r/ | 862,851 |
| 334413 | Semiconductors and related devices | (NA) | (X) | 55,149,199 | | (X) | | 85,610,702 |
| 3344131 | Monolithic integrated circuits | 195 | 16,183,318 | 47,119,219 | | 22,031,952 | | 73,663,688 |
| | Monolithic integrated circuits, digital, nonsilicon (e.g., gallium arsendide): | | | | | | | |
| 3344131036 | Memory | 4 | (D) | (D) | | (D) | | (D) |
| 3344131048 | Logic and other | 10 | 134,047 | 645,380 | r/ | 234,132 | r/ | 1,119,558 |
| | Monolithic integrated circuits, digital, silicon: | | | | | | | |
| | Bipolar transistors, memory: | | | | | | | |
| 3344131015 | Static read-write random access (SRAM) 2/ | 6 | (D) | (D) | | (D) | | (D) |
| 3344131021 | Other memory 2/ | 4 | 13,309 | 79,664 | | 5,853 | | 9,198 |
| | Other bipolar transistors, including logic: | | | | | | | |
| 3344131024 | Transistor-transistor logic (TTL) | 13 | 149,069 | 542,191 | | 232,553 | | 238,148 |
| 3344131032 | Other, including emitter couple logic (ECL) | 9 | (D) | (D) | | (D) | | (D) |
| | Metal oxide semiconductor (MOS) field effect transistors: | | | | | | | |
| | Volatile memory DRAMS (dynamic read-write random access): | | | | | | | |
| 3344131068 | Not over 3 MB 3/ | 5 | (D) | (D) | | (D) | | (D) |

Continued

Table 2. Quantity and Value of Shipments of Semiconductors, Printed Circuit Boards, and Other Electronic Components: 2001 and 2000
[Quantity in thousands of units. Values in thousands of dollars]

| Product code | Product description | No. of cos. | 2001 Quantity | 2001 Value | | 2000 Quantity | | 2000 Value |
|---|---|---|---|---|---|---|---|---|
| 3344131070 | Over 3 MB but not over 15 MB 3/ | 5 | 5,212 | 11,272 | | 85,636 | | 548,666 |
| 3344131072 | Over 15 MB | 9 | 738,783 | 2,268,498 | | (D) | | (D) |
| | Volatile memory SRAMS (static read-write random access): | | | | | | | |
| 3344131082 | Not over 40 k 4/ | 3 | (D) | (D) | | 121,295 | r/ | 153,865 |
| 3344131084 | Over 40 k but not over 80 k 4/ | 4 | 36,316 | 57,338 | | 31,121 | r/ | 74,658 |
| 3344131086 | Over 80 k | 17 | 145,790 | 1,080,849 | | 270,279 | | 1,668,550 |
| | Nonvolatile EEPROMs (electrically erasable programable read-only memory): | | | | | | | |
| 3344131092 | Not over 80 k 5/ | 9 | (D) | (D) | | (D) | | (D) |
| 3344131094 | Over 80 k 5/ | 9 | 948,113 | 1,069,118 | | 1,370,756 | | 1,044,234 |
| 3344131079 | Nonvolatile EPROMs (erasable, except electrically, programable read-only memory) | 11 | 150,853 | 416,318 | r/ | 224,072 | r/ | 628,830 |
| 3344131080 | Other nonvolatile memory | 11 | 632,351 | 2,995,598 | r/ | 863,946 | r/ | 4,682,480 |
| | Other, including microprocessors, controllers, application specific integrated circuits (ASICs), and programable logic arrays (PLAs): | | | | | | | |
| 3344131054 | Microprocessors having an internal data bus of 8 bits or less | 14 | 734,320 | 718,708 | | 1,220,798 | | 990,577 |
| 3344131057 | Microprocessors having an internal data bus of 16 bits | 11 | 120,596 | 1,027,624 | | 190,694 | | 1,370,425 |
| 3344131060 | Microprocessors having an internal data bus of 32 bits or more | 18 | (D) | (D) | | (D) | | (D) |
| 3344131033 | Other (microcontrollers, ASICs, PLAs, etc.) | 31 | 1,208,759 | 6,150,468 | r/ | 1,846,487 | | 9,377,869 |
| | Other digital, silicon, including bipolar combined with MOS: | | | | | | | |
| 3344131039 | Complementary BiMOS (BiCMOS) | 6 | 3,080,761 | 894,149 | | (D) | | (D) |
| 3344131042 | Other complementary BiMOS (BiCMOS), including logic | 15 | 333,822 | 445,301 | r/ | 1,137,224 | r/ | 833,186 |
| 3344131045 | Other digital silicon ICs | 19 | 1,064,855 | 1,708,911 | | 3,048,557 | | 2,901,202 |
| | Nondigital silicon monolithic integrated circuits (e.g., linear,analog): | | | | | | | |
| 3344131062 | Radio frequency | 7 | 136,527 | 306,150 | | (D) | | (D) |
| 3344131003 | Other, analog | 27 | 2,174,523 | 1,907,136 | r/ | 3,038,257 | | 3,148,169 |
| 3344131006 | Other, including mixed signal (analog and digital), logic | 16 | 485,001 | 977,462 | | 542,893 | | 1,012,248 |
| 3344131009 | Other, including mixed signal (analog and digital), other | 20 | 721,358 | 2,460,440 | r/ | 893,574 | r/ | 3,621,532 |
| | Hybrid integrated circuits: | | | | | | | |
| 3344131018 | Radio frequency | 24 | 282,995 | 654,320 | | 367,571 | | 340,083 |
| 3344131051 | Other | 48 | 153,898 | 756,194 | r/ | 227,336 | r/ | 860,846 |
| 3344131012 | Other | 50 | 702,146 | 2,616,017 | r/ | 937,907 | r/ | 3,521,134 |
| 3344134 | Transistors | 32 | (X) | 785,912 | | (X) | | 1,569,335 |
| 3344134005 | Signal (less than 1 watt dissipation) | 16 | (X) | 50,892 | | (X) | | (D) |
| 3344134010 | Power (1 watt or greater dissipation) | 28 | (X) | 735,020 | | (X) | r/ | 1,569,335 |
| 3344137 | Diodes and rectifiers | 49 | 363,209 | 398,449 | | 490,887 | | 620,644 |
| 3344137010 | Signal diodes and assemblies thereof (maxium current 0.5 amps) | 17 | 20,885 | 11,165 | | 31,752 | | 15,164 |
| 3344137015 | Semiconductor rectifiers/power diodes and assemblies thereof (current rating greater than 0.5 amps) | 31 | 142,985 | 161,597 | | 147,634 | | 149,191 |
| 3344137025 | Zener diodes (voltage regulator and voltage reference diodes) 6/ | 21 | (D) | (D) | | (D) | | (D) |
| 3344137005 | Selenium rectifiers 6/ | 4 | 109,583 | 87,877 | | 137,680 | | 73,403 |
| 3344137020 | Microwave diodes (mixers, detectors, varactors, parametric, harmonic generators, etc.) | 10 | 89,756 | 137,810 | | 173,821 | | 382,886 |
| 334413A | Other semiconductor devices | 176 | (X) | 6,845,619 | | (X) | | 9,757,035 |
| | Light-sensitive and light-emitting devices: | | | | | | | |
| 334413A005 | Solar cells | 16 | (X) | 122,069 | | (X) | | 123,792 |
| 334413A010 | Photovoltaic modules | 13 | (X) | 142,794 | | (X) | | 122,818 |
| | Light-emitting diodes (LEDs): | | | | | | | |
| 334413A015 | Discrete, infrared and laser | 21 | (X) | 390,152 | | (X) | r/ | 291,499 |
| 334413A020 | Alpha or numeric displays | 7 | (X) | (D) | | (X) | | (D) |
| 334413A025 | Photodiodes, including infrared detectors | 19 | (X) | 205,421 | | (X) | r/ | 210,916 |
| 334413A030 | Optical coupled isolators, including sensors and emitters | 6 | (X) | (D) | | (X) | | (D) |
| 334413A035 | Other light sensitive and light-emitting devices, including photovoltaic devices and photoelectric-magnetic devices | 13 | (X) | 241,845 | | (X) | r/ | 416,626 |
| | Other semiconductor devices: | | | | | | | |
| 334413A040 | Thyristors (SCRs, triacs, PNPN diodes) | 7 | (X) | 96,235 | | (X) | | (D) |
| 334413A050 | All other semiconductor devices (tunnel diodes, thermoelectric semiconductor junctions, metal-oxide varistors, solidstate transducers, and special semiconductor devices, n.e.c.) | 16 | (X) | 671,743 | | (X) | | (D) |

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Table 2. Quantity and Value of Shipments of Semiconductors, Printed Circuit Boards, and Other Electronic Components: 2001 and 2000
[Quantity in thousands of units. Values in thousands of dollars]

| Product code | Product description | No. of cos. | 2001 Quantity | 2001 Value | 2000 Quantity | | 2000 Value |
|---|---|---|---|---|---|---|---|
| | Semiconductor parts: | | | | | | |
| | Chips and wafers: | | | | | | |
| 334413A055 | For integrated circuits (IC's) | 39 | (X) | 3,278,985 | (X) | r/ | 4,406,006 |
| 334413A060 | For discrete semiconductors | 36 | (X) | 270,284 | (X) | r/ | 465,285 |
| 334413A065 | All other semiconductor parts (headers, packages, heat sinks, other accessories, etc.) | 48 | (X) | 1,342,049 | (X) | r/ | 1,543,373 |
| 334414 | Capacitors | 99 | (X) | 1,917,334 | (X) | | 2,786,102 |
| | Paper, plastic (film), metalized, and dual (film/paper) dielectric capacitors, fixed: | | | | | | |
| | AC types: | | | | | | |
| 3344140103 | Less than 300 volts | 18 | 16,355 | 28,623 | 18,118 | | 34,662 |
| 3344140106 | 300 volts to 599 volts | 19 | 36,243 | 74,232 | 43,013 | | 80,150 |
| 3344140109 | 600 volts to 999 volts | 14 | 2,955 | 6,487 | 4,923 | | 11,937 |
| 3344140112 | 1,000 volts or over | 11 | 1,054 | 8,920 | 1,054 | | 10,459 |
| | Capacitors having a reactive power handling capacity of 0.5 kVAR or less: | | | | | | |
| | Dc types/other: | | | | | | |
| 3344140215 | Axial lead | 20 | 23,134 | 39,306 | 39,762 | | 46,846 |
| 3344140218 | Radial lead | 9 | 38,410 | 16,644 | 69,162 | | 29,758 |
| 3344140221 | Chips and other leaded devices | 1 | (D) | (D) | (D) | | (D) |
| 3344140331 | Tantalum electrolytic 7/ | 11 | (D) | (D) | (D) | | (D) |
| 3344140333 | Other leaded (molded axial and molded radial) 7/ | 2 | 329,158 | 178,887 | 1,671,087 | | 430,441 |
| | Aluminum electrolytic: | | | | | | |
| 3344140436 | Less than 18 mm through 35 mm | 5 | (D) | (D) | (D) | | (D) |
| 3344140439 | Small can style (over 35mm through 51 mm) | 5 | 707 | 2,715 | 628 | | 3,192 |
| 3344140442 | Other can style (over 51 mm) | 6 | 9,974 | 70,112 | 10,867 | | 69,327 |
| 3344140445 | Ac motor start | 1 | (D) | (D) | (D) | | (D) |
| 3344140550 | Ceramic dielectric, single layer | 8 | 105,133 | 16,894 | 175,353 | | 24,677 |
| | Ceramic dielectric, multilayer: | | | | | | |
| 3344140555 | Axial leads and radial leads | 10 | 89,422 | 49,383 | 4,582,874 | | 184,604 |
| 3344140560 | Chips | 19 | 33,674,799 | 593,170 | 60,307,577 | | 927,096 |
| | Other: | | | | | | |
| 3344140663 | Mica dielectric | 8 | 10,127 | 8,478 | 10,635 | | 8,937 |
| 3344140666 | All other fixed | 20 | 130,953 | 87,021 | 240,252 | | 109,913 |
| | Variable: | | | | | | |
| 3344140769 | Mica, ceramic or glass dielectric 8/ | 5 | (D) | (D) | (D) | | (D) |
| 3344140772 | Other 8/ | 6 | 20,142 | 45,065 | 21,446 | | 47,339 |
| 3344140875 | Parts of capacitors, including unfinished chips for further finishing and assembly | 13 | (X) | (D) | (X) | r/ | 663,770 |
| 334415 | Resistors | 93 | (X) | 712,861 | (X) | | 981,667 |
| 3344150104 | Fixed carbon resistors, composition or film types | 11 | 39,287 | 14,751 | 49,876 | | 18,983 |
| | Other fixed resistors (power capacity 20W or less): | | | | | | |
| | Surface mounted, having two terminals: | | | | | | |
| 3344150208 | Flat resistor chips 9/ | 22 | (D) | (D) | 459,642 | | 82,160 |
| 3344150212 | Cylindrical leadless resistors, including metal film, metal oxide, and thick cermet film 9/ | 7 | 385,551 | 81,485 | (D) | | (D) |
| | Surface mounted, having more than two terminals (resistor networks): | | | | | | |
| 3344150216 | Dual-in-line package | 7 | 84,774 | 23,517 | 180,243 | | 44,674 |
| 3344150220 | Other, including flat packs | 10 | 4,259 | 6,978 | 13,384 | | 14,458 |
| | Resistors, having two leads: | | | | | | |
| 3344150224 | Wirewound | 21 | 73,177 | 62,201 | 109,295 | | 74,832 |
| 3344150228 | Other, including metal film, metal oxide, and thick cermet film | 17 | 347,980 | 72,329 | 558,980 | | 100,650 |
| | Resistor networks, having more than two leads: | | | | | | |
| 3344150232 | Single-in-line | 17 | 54,233 | 32,930 | 108,342 | | 47,398 |
| 3344150236 | Dual-in-line | 8 | 17,525 | 5,942 | 30,782 | | 11,284 |
| 3344150240 | Other | 11 | 58,306 | 50,427 | 67,650 | | 65,627 |
| | Variable, nonwirewound: | | | | | | |
| | Trimmers: | | | | | | |
| 3344150344 | Single-turn, carbon and other film 10/ | 5 | (D) | (D) | (D) | | (D) |
| 3344150348 | Multiturn, carbon and other film 10/ | 4 | 9,701 | 13,179 | 12,654 | | 21,036 |
| 3344150359 | Potentiometers, precision and panel type | 12 | 18,905 | 96,577 | 16,560 | | 82,855 |
| | Variable, wirewound: | | | | | | |
| 3344150468 | Variable wirewound (except potentiometers), including nonprecision and trimmers 11/ | 2 | (D) | (D) | (D) | | (D) |
| 3344150469 | Potentiometers, precision and panel type 11/ | 11 | 5,827 | 21,990 | 2,186 | | 23,794 |
| | Miscellaneous: | | | | | | |
| 3344150576 | Varistors | 7 | (D) | (D) | (D) | | (D) |
| 3344150580 | Thermistors, bead type, disc, rod | 13 | (D) | (D) | 469,363 | | 131,748 |
| 3344150684 | Parts for resistors | 9 | (X) | 114,153 | (X) | r/ | 161,687 |
| 334416 | Coils, transformers, reactors, and chokes for electronic applications | 241 | (X) | 1,259,841 | (X) | | 1,718,769 |
| 3344160020 | Audio frequency (AF) transformers | 78 | 19,954 | 76,524 | 65,608 | | 145,433 |
| 3344160025 | Low frequency (LF) chokes | 91 | 16,494 | 67,574 | 26,799 | | 108,687 |

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Table 2. Quantity and Value of Shipments of Semiconductors, Printed Circuit Boards, and Other Electronic Components: 2001 and 2000
[Quantity in thousands of units. Values in thousands of dollars]

| Product code | Product description | No. of cos. | 2001 Quantity | 2001 Value | | 2000 Quantity | | 2000 Value |
|---|---|---|---|---|---|---|---|---|
| 3344160030 | Plate and filament transformers, including autotransformers (except toroidal) | 59 | 11,920 | 110,672 | | 13,192 | | 132,677 |
| 3344160035 | Pulse transformers, computer, and other types | 83 | 41,930 | 124,065 | | 45,730 | | 160,647 |
| 3344160005 | Radio frequency (RF) chokes | 37 | 39,735 | 28,216 | | 61,237 | | 43,714 |
| 3344160010 | Radio frequency (RF) coils | 40 | 159,060 | 78,818 | | 221,488 | | 108,186 |
| 3344160015 | Intermediate frequency (IF) transformers | 40 | 35,265 | 73,193 | | 76,021 | | 123,316 |
| 3344160040 | Television transformers and reactors (horizontal output, vertical deflection, focus coils, deflection yokes, etc.) | 21 | 15,724 | 118,918 | | 18,818 | | 171,408 |
| 3344160045 | Toroidal windings (transformers and reactors) (except complete magnetics amplifiers) | 111 | 269,380 | 175,234 | | 188,416 | | 239,636 |
| 3344160050 | Other (balun coils, permeability tuning devices, etc.) | 92 | (X) | 406,627 | | (X) | r/ | 485,065 |
| 334417 | Electronic connectors | (NA) | (X) | 4,626,981 | | (X) | | 5,931,670 |
| 3344171 | Coaxial (RF) connectors | 54 | 587,645 | 505,240 | | 929,437 | | 804,981 |
| 3344171005 | Miniature (BNC, PNC, MHB) | 25 | 101,284 | 82,910 | r/ | 112,938 | | 149,847 |
| 3344171010 | Subminiature (SMA, SMB, SMC) | 31 | 118,360 | 130,860 | | 104,605 | r/ | 166,314 |
| 3344171015 | Other standard and precision | 44 | 368,001 | 291,470 | | 711,894 | | 488,820 |
| 3344174 | Cylindrical connectors | 48 | 209,444 | 661,608 | | 268,911 | | 725,323 |
| 3344174005 | Heavy duty and standard | 35 | 167,865 | 421,377 | r/ | 216,120 | r/ | 453,449 |
| 3344174010 | Miniature | 17 | 13,713 | 84,700 | | 17,217 | | 103,812 |
| 3344174015 | Subminiature | 16 | 27,866 | 155,531 | r/ | 35,574 | r/ | 168,062 |
| 3344177 | Rack and panel (rectangular) connectors | 46 | 1,005,372 | 350,753 | | 1,226,980 | | 531,659 |
| 3344177005 | Integral shell, Mil-C-22857 (8434) and similar types | 27 | 555,053 | 134,961 | r/ | 520,513 | r/ | 146,928 |
| | Subminiature: | | | | | | | |
| 3344177010 | Ribbon, including planar cable type 12/ | 7 | (D) | (D) | | (D) | | (D) |
| 3344177015 | D-Subminiature, including planar cable type 12/ | 18 | 431,212 | 143,224 | | 680,834 | | 295,798 |
| 3344177020 | Microminiatures | 13 | 19,107 | 72,568 | r/ | 25,633 | r/ | 88,933 |
| 334417A | Printed circuit connectors | 63 | 4,243,053 | 1,064,806 | | 4,810,835 | | 1,810,796 |
| 334417A005 | Card insertion types | 35 | 173,085 | 100,801 | r/ | 260,239 | r/ | 159,191 |
| | Two-piece types: | | | | | | | |
| 334417A010 | Post, header and receptacle type | 38 | 3,609,729 | 441,456 | | 3,804,326 | | 786,073 |
| 334417A015 | Other two-piece types | 33 | 460,239 | 522,549 | r/ | 746,270 | r/ | 865,532 |
| 334417D | Other connectors, including parts | 111 | (X) | 2,044,574 | | (X) | | 2,058,911 |
| 334417D005 | Hermetic sealed (except single-contact and coaxial types) | 23 | 211,663 | 164,702 | | 212,002 | | 172,999 |
| 334417D010 | Plate module types | 6 | (D) | (D) | | 10,022 | | 36,875 |
| 334417D015 | Fiber optic connectors | 15 | 114,147 | 657,030 | | (D) | | (D) |
| 334417D030 | Other planar cable (flat conductor or ribbon cable), excluding rack and panel (rectangular types) | 28 | (D) | (D) | | 349,128 | | 477,708 |
| 334417D020 | Miscellaneous special purpose | 69 | 1,500,974 | 981,067 | | 2,192,108 | | 1,187,441 |
| 334417D025 | Parts for connectors (connectors shipped but still requiring further manufacture) | 24 | (X) | 120,227 | | (X) | r/ | 183,888 |
| 334419 | Electronic components and subassemblies, n.e.c. | (NA) | (X) | 41,975,586 | | (X) | | 51,629,018 |
| 3344191 | Filters (except microwave) and piezoelectric devices | 118 | 311,160 | 941,177 | | 379,037 | | 1,167,880 |
| 33441911 | Filters (except microwave) | (NA) | 127,262 | 296,639 | | 177,349 | | 357,147 |
| 3344191105 | Mechanical, excluding optical lenses (germanium silicon, fused quartz, rock salt, and other) | 7 | 615 | 37,614 | | 677 | | 45,211 |
| | Radio frequency interference/electro magnetic interference (RFI/EMI) control filters: | | | | | | | |
| 3344191110 | Ceramic dielectric | 14 | 47,298 | 95,589 | | 145,478 | | 151,104 |
| 3344191115 | Combination or other dielectric | 17 | 76,308 | 128,830 | r/ | 27,515 | r/ | 115,379 |
| 3344191120 | Electronic wave filters (LC band and high pass) | 20 | 3,041 | 34,606 | r/ | 3,679 | r/ | 45,453 |
| 33441912 | Piezoelectric devices | (NA) | 183,898 | 644,538 | | 201,688 | | 810,733 |
| | Oscillator crystals: | | | | | | | |
| 3344191225 | AT-cut | 27 | 3,173 | 32,058 | | 10,338 | | 51,987 |
| 3344191230 | Other | 9 | 51,258 | 69,100 | | 52,471 | | 66,114 |
| | Crystal oscillators: | | | | | | | |
| 3344191235 | Oven | 8 | 271 | 42,421 | | 360 | | 43,625 |
| 3344191240 | TCXO/VCXO | 13 | 4,222 | 76,317 | | 2,308 | | 40,107 |
| 3344191245 | Hybrid | 14 | 4,762 | 56,538 | | 9,263 | | 69,892 |
| 3344191250 | Other | 9 | 4,576 | 74,537 | r/ | 4,911 | r/ | 70,851 |
| | Crystal filters: | | | | | | | |
| 3344191255 | Monolithic, including filter crystals and/or monolithic filter units not assembled into filters 13/ | 5 | (D) | (D) | | 691 | | 9,054 |
| 3344191260 | Packaged AT-cut, including monolithic, tandem monolithic, and resonator filter assemblies 13/ | 5 | 573 | 13,159 | | 71 | | 2,569 |
| 3344191265 | Other | 9 | 80,374 | 77,089 | | 76,111 | | 128,259 |
| | Crystal blanks: | | | | | | | |
| 3344191270 | AT-cut | 8 | 4,747 | 10,754 | | 5,863 | | 11,471 |
| 3344191275 | Other | 18 | 29,942 | 192,565 | r/ | 39,301 | r/ | 316,804 |
| 3342207 | Microwave components and devices (except antenna), tubes, and semiconductors | 121 | (X) | 1,510,493 | | (X) | | 2,435,128 |
| 3342207005 | Ferrite, including yttrium garnets, microwave components (circulators, isolators, phase shifters, attenuators, equalizers, limiters, mixers, etc.) | 37 | (X) | 355,237 | | (X) | | 1,073,373 |

Continued

Table 2. Quantity and Value of Shipments of Semiconductors, Printed Circuit Boards, and Other Electronic Components: 2001 and 2000
[Quantity in thousands of units. Values in thousands of dollars]

| Product code | Product description | No. of cos. | 2001 Quantity | 2001 Value | | 2000 Quantity | | 2000 Value |
|---|---|---|---|---|---|---|---|---|
| | Microwave devices, other than ferrite and solid state: | | | | | | | |
| 3342207010 | Attenuators (dummy loads, high- and low-power terminations, etc.) | 36 | (X) | 136,097 | | (X) | r/ | 165,223 |
| 3342207015 | Cavities (amplifier cavities, coaxial tuned cavities, etc.) | 16 | (X) | 59,488 | | (X) | | 51,946 |
| 3342207020 | Couplers (directional couplers, hybrid junctions, etc.) | 28 | (X) | 57,571 | | (X) | | 62,164 |
| 3342207025 | Reactive microwave components, n.e.c. | 36 | (X) | 225,175 | | (X) | r/ | 271,518 |
| 3342207030 | Switches, coaxial and waveguide | 31 | (X) | 84,942 | | (X) | r/ | 78,891 |
| 3342207035 | Rigid waveguide and fittings (bend and twists, couplings, flanges, other simple waveguide components, n.e.c.) | 20 | (X) | 62,157 | | (X) | | 54,705 |
| 3342207040 | Flexible waveguides and fittings | 13 | (X) | 35,747 | | (X) | | 50,108 |
| 3342207045 | Other microwave components (except ferrite devices) (coaxial to waveguide and other transitions, duplexers and diplexers, holders and mounts, linear and circular polarizers, magnetron test plumbing, rotary joints and sector scan joints, mixer arrays, shutters, tuners, windows, etc.) | 37 | (X) | 263,804 | | (X) | | 291,422 |
| 3342207050 | Microwave subassemblies, including parametric amplifiers and other solid-state assemblies | 24 | (X) | 230,275 | | (X) | r/ | 335,778 |
| 3344194 | Transducers, electrical/electronic I/O, n.e.c. | 90 | 168,248 | 1,437,570 | | 152,739 | | 1,519,270 |
| 3344194005 | Electroacoustic (sonar, ultrasonic, vibration*, etc.) | 15 | 35,348 | 152,654 | | 19,619 | | 127,259 |
| | Electromechanical: | | | | | | | |
| 3344194010 | Accelerometers* | 11 | 11,005 | 179,690 | | 5,781 | | 177,424 |
| 3344194015 | Pressure* | 38 | 65,335 | 550,598 | | 62,266 | r/ | 580,968 |
| 3344194020 | Strain gauges and other mechanical* | 22 | 1,711 | 125,450 | | 1,871 | | 156,405 |
| 3344194025 | Thermoelectric (pyrometers, thermocouples*, etc.) | 8 | 2,712 | 64,950 | | 2,772 | | 65,901 |
| 3344194030 | Other (optical, chemical, magnetic, nuclear*, etc.) | 25 | 52,137 | 364,228 | r/ | 60,430 | r/ | 411,313 |
| 3344197 | Switches, mechanical types for electronic circuitry | 78 | (X) | 774,000 | | (X) | | 902,575 |
| 3344197020 | Slide, including rocker, miniature and subminiature* | 12 | (X) | 34,510 | | (X) | r/ | 47,001 |
| 3344197025 | Rotary selector, including lever and jog-lever, miniature and subminiature* | 17 | (X) | 57,942 | | (X) | | 65,107 |
| 3344197030 | Keyboard* | 10 | (X) | (D) | | (X) | r/ | 55,746 |
| 3344197035 | Pushbutton* | 22 | (X) | 66,022 | | (X) | r/ | 95,201 |
| 3344197040 | Snap-action* | 12 | (X) | 39,272 | | (X) | r/ | 47,999 |
| 3344197045 | Thumbwheel* | 3 | (X) | (D) | | (X) | r/ | 10,717 |
| 3344197015 | Membrane | 17 | (X) | 95,745 | | (X) | r/ | 110,753 |
| 3344197005 | Toggle standard type 14/ | 8 | (X) | (D) | | (X) | | (D) |
| 3344197010 | Toggle miniature and subminiature 14/ | 6 | (X) | 45,294 | | (X) | | 57,011 |
| 3344197050 | DIP | 8 | (X) | (D) | | (X) | | 54,782 |
| 3344197055 | Other | 39 | (X) | 358,112 | | (X) | r/ | 358,258 |
| 334418A | Printed circuit assemblies (loaded boards, subassemblies and modules) 15/ | 758 | (X) | 30,712,895 | | (X) | | 37,272,519 |
| 334418A005 | Computer and peripheral printed board assemblies 15/ | 265 | (X) | 11,170,750 | | (X) | r/ | 14,189,451 |
| 334418A010 | Communications printed board assemblies 15/ | 252 | (X) | 9,094,359 | | (X) | r/ | 10,880,133 |
| 334418A015 | Industrial process control board assemblies 15/ | 219 | (X) | 1,115,058 | | (X) | r/ | 1,132,385 |
| 334418A020 | Instrumentation printed board assemblies (except industrial process) 15/ | 189 | (X) | 2,181,651 | | (X) | r/ | 2,458,563 |
| 334418A025 | Search and detection printed board assemblies 15/ | 55 | (X) | 100,768 | | (X) | | 103,980 |
| 334418A030 | Consumer electronics, printed board assemblies 15/ | 137 | (X) | 556,420 | | (X) | r/ | 578,641 |
| 334418A035 | Other electronics, printed board assemblies, including office equipment and point of sales 15/ | 299 | (X) | 6,493,889 | | (X) | r/ | 7,929,366 |
| 334419D | Electronic components and subassemblies, n.e.c. | 534 | (X) | 6,599,451 | | (X) | | 8,331,646 |
| | Antenna systems (except structural towers sold separately): | | | | | | | |
| 334419D108 | Home antenna | 10 | 19,430 | 223,923 | r/ | 30,552 | r/ | 306,914 |
| 334419D110 | Auto antenna | 8 | (D) | (D) | r/ | 17,014 | r/ | 59,226 |
| 334419D115 | Antenna acessories, sold separately (pedestals, drives, passive reflectors, rotators, radomes, etc.) | 10 | (X) | 13,949 | | (X) | r/ | 13,620 |
| 334419D220 | Delay lines (distributed constant, lumped constant, magnetostrictive, ultrasonic, etc.) | 13 | 3,366 | 33,621 | | 7,895 | | 51,661 |
| 334419D325 | Oscillators (except instrumentation and crystal types) | 21 | 16,702 | 234,364 | | 19,053 | | 282,908 |
| 3342203051 | Magnetic recording and reproducing heads, including audio, video, digital and instrumentation | 11 | (D) | (D) | | (D) | | (D) |

Continued

Table 2. Quantity and Value of Shipments of Semiconductors, Printed Circuit Boards, and Other Electronic Components: 2001 and 2000
[Quantity in thousands of units. Values in thousands of dollars]

| Product code | Product description | No. of cos. | 2001 Quantity | 2001 Value | 2000 Quantity | | 2000 Value |
|---|---|---|---|---|---|---|---|
| | Static power supply converters for electronic applications, sold separately: | | | | | | |
| 334419D530 | Regulated | 63 | 33,420 | 1,204,582 | 49,149 | | 1,760,856 |
| 334419D535 | Other (unregulated, variable frequency, ac, dc, converters and inverters, vibrator, etc.) | 44 | (X) | 488,257 | (X) | r/ | 709,199 |
| 334419D640 | Electronic cable harnesses and cable assemblies | 257 | (X) | 2,288,000 | (X) | r/ | 2,719,442 |
| 334419D745 | Cryogenic cooling devices (cryostats, etc.) for infrared detectors, masers | 3 | (X) | 15,372 | (X) | | 14,150 |
| 334419D850 | Liquid crystal displays (LCD) and other liquid devices | 15 | (X) | 49,813 | (X) | | 80,306 |
| 334419D955 | Magnetic cores | 14 | (X) | 180,972 | (X) | r/ | 275,335 |
| | Electronic parts, n.e.c. and specialized electronic hardware: | | | | | | |
| | Sockets for electronic component insertion: | | | | | | |
| 334419DA65 | Integrated circuit sockets | 16 | (X) | 67,456 | (X) | | 143,190 |
| 334419DA60 | Other, including tube, relay, discrete semiconductors, ac and dc converters and inverters, etc. | 18 | (X) | 45,270 | (X) | r/ | 55,174 |
| 336322C119 | Electronic control modular chips for motor vehicles | 4 | (X) | 128,327 | (X) | | (D) |
| 334419D870 | All other electronic parts and specialized electronic hardware, n.e.c. | 133 | (X) | 1,338,910 | (X) | | 1,565,899 |
| | Electronic research, development, testing, and evaluation (receipts or billings, not reported as shipments of specific products): | | | | | | |
| 99980 42 | Systems | 17 | (X) | 111,532 | (X) | r/ | 118,018 |
| 99980 43 | Equipment and subassemblies | 27 | (X) | 223,403 | (X) | | 241,045 |
| 99980 44 | Component parts | 25 | (X) | 67,711 | (X) | | 155,958 |
| 99980 46 | Basic scientific electronic research | 17 | (X) | 94,507 | (X) | | 74,514 |
| 99980 47 | Design and engineering services | 64 | (X) | (D) | (X) | | 486,280 |
| 99980 48 | Software | 6 | (X) | (D) | (X) | | (D) |
| 99980 49 | Testing | 12 | (X) | 7,824 | (X) | r/ | 7,109 |
| 99980 50 | Supplies and accessories sold with components | 7 | (X) | 6,686 | (X) | r/ | 15,164 |

*Similar products are collected on Current Industrial Report series MA335A, "Switchgear and Industrial Controls," and MA335K, "Wiring Devices and Supplies." - Represents zero. D Withheld to avoid disclosing data for individual companies. NA Not available. n.e.c. Not elsewhere r/Revised by 5 percent or more from previously published data. X Not applicable.

1/Product code 3344114010 is combined with product code 3344114015 to avoid disclosing data for individual companies.
2/Product code 3344131015 is combined with product code 3344131021 to avoid disclosing data for individual companies.
3/Product code 3344131068 is combined with product code 3344131070 to avoid disclosing data for individual companies.
4/Product code 3344131082 is combined with product code 3344131084 to avoid disclosing data for individual companies.
5/Product code 3344131092 is combined with product code 3344131094 to avoid disclosing data for individual companies.
6/Product code 3344137025 is combined with product code 3344137005 to avoid disclosing data for individual companies.
7/Product code 3344140331 is combined with product code 3344140333 to avoid disclosing data for individual companies.
8/Product code 3344140769 is combined with product code 3344140772 to avoid disclosing data for individual companies.
9/Product code 3344150208 is combined with product code 3344150212 to avoid disclosing data for individual companies.
10/Product code 3344150344 is combined with product code 3344150348 to avoid disclosing data for individual companies.
11/Product code 3344150468 is combined with product code 3344150469 to avoid disclosing data for individual companies.
12/Product code 3344177010 is combined with product code 3344177015 to avoid disclosing data for individual companies.
13/Product code 3344191255 is combined with product code 3344191260 to avoid disclosing data for individual companies.
14/Product code 3344197005 is combined with product code 3344197010 to avoid disclosing data for individual companies.
15/These data are collected on two Current Industrial Report forms, MA334R, "Computers and Office and Accounting Machines," and MA334Q, "Semiconductors, Printed Circuit Boards, and Other Electronic Components."

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Table 3. Shipments, Exports, and Imports of Semiconductors, Printed Circuit Boards, and Other Electronic Components: 2001
[Values in Thousands]

| Product code | Product description | Manufactures' shipments (value, f.o.b. plant) | Exports of domestic merchandise (value at port) 1/ | Imports for consumption 2/ |
|---|---|---|---|---|
| 3344111105 | High vacuum tubes | 68,881 | 51,088 | 16,815 |
| 3344111110 | Gas and vapor tubes | 33,085 | 6,191 | 404 |
| 3344111115 | Klystrons, including amplifier, reflex, and other | (D) | 40,709 | 113,268 |
| 3344111120 | Magnetrons, incuding pulsed, fixed, tunable, cross-field, continuous wave and other | (D) | 9,374 | 28,146 |
| 3344111340 | Light sensing tubes | 98,333 | 57,766 | 87,019 |
| 3344114005 | Receiving type electron tubes, including rebuilt | (D) | 9,359 | 6,757 |
| 3344114010, 015, 020, 025 | Television tubes, color and black and white, new and rebuilt | (D) | 1,775,447 | 274,345 |
| 3344117030 | Electron tube parts (except glass blanks) | 97,822 | 133,101 | 280,869 |
| 3344120105, 210, 315, 420, 425, 430, 432, 433, 435, 440 | Printed circuit boards | 8,944,884 | 2,088,749 | 2,205,317 |
| 3344131048 | Monolithic integrated circuits, digital (except memory and silicon) | 645,380 | 420,275 | 70,699 |
| 3344131036 | Monolithic integrated circuits, digital, memory (except silicon) | (D) | 318,928 | 197,978 |
| 3344131015 | Monolithic integrated circuits, digital, silicon, bipolar transistors, memory, static random access memory (SRAM) 3/ | (D) | 32,921 | 1,354 |
| 3344131021 | Monolithic integrated circuits, digital, silicon, bipolar transistors, memory (except static random access memory (SRAM)) 3/ | 79,664 | 15,995 | 7,265 |
| 3344131024 | Monolithic integrated circuits, digital, silicon, bipolar transistors (except memory, transistor-transistor logic (TTL)) | 542,191 | 30,764 | 37,446 |
| 3344131032 | Monolithic integrated circuits, digital, silicon, bipolar transistors, including emitter coupled logic (ECL) (except memory, n.e.c.) | (D) | 116,941 | 208,816 |
| | Monolithic integrated circuits, digital, silicon, metal oxide (MOS) field effect transistors: | | | |
| 3344131068, 070, 072 | With volatile memory (DRAM) | 2,279,770 | 1,729,138 | 2,720,124 |
| 3344131082, 084, 086 | With volatile memory (SRAM) | 1,138,187 | 1,155,598 | 1,102,538 |
| 3344131092, 094 | Except volatile memory, electrically (EEPROM) | 1,069,118 | 411,807 | 1,781,672 |
| 3344131079 | Except volatile memory (except electrically (EEPROM)) | 416,318 | 164,477 | 157,690 |
| 3344131080 | Except volatile memory, n.e.c. | 2,995,598 | 532,471 | 749,435 |
| | Monolithic integrated circuits, digital, silicon, metal oxide (MOS) field effect transistors (except memory type): | | | |
| 3344131054 | Microprocessors 8 bits or less | 718,708 | 17,621 | 834,353 |
| 3344131057 | Microprocessors 16 bits | 1,027,624 | 45,898 | 473,491 |
| 3344131060 | Microprocessors 32 bits or more | (D) | 1,383,769 | 3,157,972 |
| 3344131033 | Other (microcontrollers, ASICs PLAs, etc.) | 6,150,468 | 1,757,448 | 6,556,282 |
| 3344131039 | Monolithic integrated circuits, digital, silicon, metal oxide (MOS) field effect transistors, complementary BiMOS, memory type | 894,149 | 20,755 | 51,306 |
| 3344131042 | Monolithic integrated circuits, digital, silicon, metal oxide (MOS) field effect transistors, complementary BiMOS (except memory type) | 445,301 | 123,635 | 230,870 |
| 3344131045 | Monolithic integrated circuits, digital, silicon, metal oxide (MOS) field effect transistors, complementary BiMOS, n.e.c., including logic type (except memory types) | 1,708,911 | 311,664 | 392,648 |
| 3344131062, 003, 006, 009 | Monolithic integrated circuits, nondigital, silicon, including linear, analog, radio frequency, etc | 5,651,188 | 2,613,118 | 3,968,102 |
| 3344131018, 051 | Hybrid integrated circuits | 1,410,514 | 668,228 | 656,416 |
| 3344140331 | Capacitors, fixed, tantalum electrolytic, metal case, dipped, chips, including foil and wet 4/ | (D) | 101,178 | 285,361 |
| 3344140333 | Capacitors, fixed, tantalum electrolytic, n.e.c., including leaded 4/ | 178,887 | 62,847 | 101,353 |

Continued

Table 3. Shipments, Exports, and Imports of Semiconductors, Printed Circuit Boards, and Other Electronic Components: 2001
[Values in Thousands]

| Product code | Product description | Manufactures' shipments (value, f.o.b. plant) | Exports of domestic merchandise (value at port) 1/ | Imports for consumption 2/ |
|---|---|---|---|---|
| 3344140436 | Capacitors, fixed, aluminum electrolytic, not exceeding 35 mm | (D) | 53,821 | 218,809 |
| 3344140439, 442, 445 | Capacitors, fixed, aluminum electrolytic, over 35 mm | (D) | 12,730 | 33,583 |
| 3344140550 | Capacitors, fixed, ceramic dielectric, single layer | 16,894 | 44,633 | 39,543 |
| 3344140555 | Capacitors, fixed, ceramic dielectric, multilayer, axial leads and radial leads | 49,383 | 99,879 | 97,456 |
| 3344140560 | Capacitors, fixed, ceramic dielectric, multilayer, chips | 593,170 | 356,257 | 493,756 |
| 3344140663 | Capacitors, fixed, mica dielectric | 8,478 | 1,969 | 2,523 |
| 3344140666 | Capacitors, fixed, n.e.c. | 87,021 | 294,171 | 77,034 |
| 3344140769 | Capacitors, variable, mica/ceramic/glass dielectric 5/ | (D) | 11,209 | 3,385 |
| 3344140772 | Capacitors, variable, n.e.c. 5/ | 45,065 | 52,983 | 22,263 |
| 3344140875 | Capacitors, parts, including unfinished chips for further finishing | (D) | 195,201 | 42,728 |
| 3344140103 | Capacitors, fixed, ac type, less than 300 volts | 28,623 | 13,033 | 17,712 |
| 3344140106 | Capacitors, fixed, ac type, 300-599 volts | 74,232 | 982 | 38,464 |
| 3344140109 | Capacitors, fixed, ac type, 600-999 volts | 6,487 | 231 | 2,421 |
| 3344140112 | Capacitors, fixed, ac type, 1,000 volts or more | 8,920 | 9,187 | 1,255 |
| 3344140215 | Capacitors, fixed, dc type, axial | 39,306 | 590 | 2,570 |
| 3344140218 | Capacitors, fixed, dc type, radial | 16,644 | 3,523 | 53,539 |
| 3344140221 | Capacitors, fixed, dc type, chips and other leaded | (D) | 16,696 | 21,441 |
| 3344134005 | Transistors, signal, less than 1 watt dissipation | 50,892 | 131,321 | 263,785 |
| 3344134010 | Transistors, signal, 1 watt or greater dissipation | 735,020 | 281,504 | 802,614 |
| 3344137010 | Signal diodes and assemblies | 11,165 | 17,323 | 33,907 |
| 3344137025 | Zener diodes | (D) | 44,438 | 76,112 |
| 3344137015, 005 | Diodes and rectifiers, n.e.c. | (D) | 237,802 | 387,261 |
| 3344137020 | Microwave diodes | 137,810 | 60,858 | 40,177 |
| 334413A005 | Solar cell | 122,069 | 232,226 | 118,713 |
| 334413A015, 020 | Light-emitting diodes | (D) | 297,066 | 714,011 |
| 334413A030 | Optical coupled isolators | (D) | 51,935 | 156,624 |
| 334413A035 | Other light-sensitive and light-emitting devices | 241,845 | 280,609 | 244,131 |
| 334413A040 | Thyristors, SCR's, triacs, and PNPN diodes | 96,235 | 44,542 | 154,911 |
| 334413A055 | Chips and wafers for integrated circuits | 3,278,985 | 16,686,127 | 2,425,652 |
| 334413A060 | Chips and wafers for discrete semiconductors | 270,284 | 1,366,645 | 182,206 |
| 334413A065 | Other semiconductor parts | 1,342,049 | 353,957 | 231,153 |
| 3344150104 | Carbon resistors, fixed, composition or film types, designed for surface mounting (SMD) by contact, having two terminals, cylindrical leadless having two leads, carbon composition, and carbon film | 14,751 | 23,858 | 23,264 |
| 3344150208, 212 | Carbon resistors, fixed, with a power capacity of 20 watts or less, surface mounted (SMD), having two terminals, flat resistor chips, and cylindrical leadless resistors | 81,485 | 33,450 | 118,102 |
| 3344150216, 220 | Carbon resistors, fixed, with a power capacity of 20 watts or less, surface mounted (SMD), having more than two terminals, resistor, resistor-capacitor networks | 30,495 | 17,005 | 17,455 |
| 3344150224 | Resistors, fixed, with a power capacity of 20 watts or less, wirebound, having two leads | 62,201 | 19,435 | 31,477 |
| 3344150228 | Resistors, fixed, with a power capacity of 20 watts or less, other than wirebound, having two leads | 72,329 | 33,643 | 56,898 |
| 3344150232, 236, 240 | Resistors, fixed, with a power capacity of 20 watts or less, resistor networks, having more than two leads | 89,299 | 42,919 | 28,376 |
| 3344150468, 469 | Resistors, variable, wirewound, including rheostats and potentiometers, for a power handling capacity not exceeding 20 watts | 21,990 | 12,893 | 21,076 |
| 3344150344, 348, 359, 576, 580 | Resistors, variable, n.e.c. | (D) | 239,547 | 269,067 |
| 3344150684 | Resistors, parts | 114,153 | 54,640 | 59,870 |
| 3344191225, 230, 235, 240, 245, 250, 255, 260, 265 | Piezoelectric devices (except crystal blanks) | 441,219 | 193,553 | 457,702 |
| 3344191270, 275 | Piezoelectric devices, crystal blanks | 203,319 | 10,621 | 8,572 |
| 3344160040 | Television transformers and reactors | 118,918 | 15,479 | 99,348 |

Continued

Table 3. Shipments, Exports, and Imports of Semiconductors, Printed Circuit Boards, and Other Electronic Components: 2001
[Values in Thousands]

| Product code | Product description | Manufactures' shipments (value, f.o.b. plant) | Exports of domestic merchandise (value at port) 1/ | Imports for consumption 2/ |
|---|---|---|---|---|
| 3344160020, 030, 035, 010, 015, 045, 050 | Coils, transformers, reactors, and chokes for electronic applications, n.e.c. | 1,045,133 | 321,934 | 842,412 |
| 3344171000 | Connectors coaxial | 505,240 | 138,851 | 186,573 |
| 3344174000 | Connectors, cylindrical | 661,608 | 31,274 | 109,503 |
| 3344177000 | Connectors, rack and panel | 350,753 | 26,625 | 53,174 |
| 334417A000 | Connectors, printed circuit | 1,064,806 | 346,874 | 366,670 |
| 334419D108, 110, 115 | Antenna systems (except structural towers, sold separately) | (D) | 46,914 | 51,136 |
| 3342203051 | Magnetic recording and reproducing heads | (D) | 9,456 | 7,921 |
| 3344197025 | Switches, rotary selector | 57,942 | 30,442 | 13,785 |
| 3344197035 | Switches, pushbutton | 66,022 | 83,549 | 126,475 |
| 3344197020 | Switches, slide, including rocker, miniature and subminiature | 34,510 | 4,750 | 20,677 |
| 3344197040 | Switches, snap-action | 39,272 | 16,362 | 101,432 |
| 3344197030, 045, 015, 005, 010, 050, 055 | Switches, other | (D) | 708,035 | 1,002,622 |

D Withheld to avoid disclosing data for individual companies. n.e.c. Not specified by kind.

1/Source: Census Bureau report EM 545, U.S. Exports.

2/Source: Census Bureau report IM 145, General imports for Consumption.

3/Manufacturers' shipments for "Monolithic integrated circuits, digital, silicon, bipolar transitors, memory, static random memory (SRAM)" and "Monolithic integrated circuits, digital, silicon, bipolar transistors, memory (except static random access memory (SRAM))" are combined to avoid disclosing data for individual companies.

4/Manufacturers' shipments for "Capacitors, fixed, tantalum electrolytic, metal case, dipped, chips, including foil and wet," and "Capacitors, fixed, tantalum electrolytic, n.e.c., including leaded" are combined to avoid disclosing data for individual companies.

5/Manufacturers' shipments for "Capacitors, variable, mica/ceramic/glass dielectric" and "Capacitors, variable, n.e.c." are combined to avoid disclosing data for individual companies.

Continued

Table 4. Comparison of North American Industry Classification System (NAICS)-Based Product Codes with Schedule B Export Codes, and HTSUSA Import Codes: 2001

| Product code | Product description | Export code | Import code |
|---|---|---|---|
| 3344114005 | Receiving-type electron tubes | 8540.81.0000 | 8540.81.0000 |
| 3344114010, 015, 015, 020, 025 | Television tubes, color, black and white, new and rebuilt | 8540.11.0035<br>8540.11.0070<br>8540.11.0080<br>8540.12.0000 | 8540.11.1030<br>8540.11.1040<br>8540.11.1050<br>8540.11.1055<br>8540.11.1065<br>8540.11.1080<br>8540.11.2401<br>8540.11.2801<br>8540.11.3000<br>8540.11.4401<br>8540.11.4801<br>8540.11.5000<br>8540.12.1040<br>8540.12.1080<br>8540.12.2001<br>8540.12.5040<br>8540.12.5080<br>8540.12.7000 |
| 3344111110 | Gas and vapor tubes | 8540.89.0020 | 8540.89.0020 |
| 3344111115 | Klystrons, including amplifiers, reflex, and other | 8540.72.0000<br>8540.79.0000 | 8540.72.0000<br>8540.79.0000 |
| 3344111120 | Magnetrons, including pulsed, fixed, tunable, cross-field, continuous wave and other | 8540.71.2000<br>8540.71.4000 | 8540.71.2000<br>8540.71.4000 |
| 3344111340 | Light-sensing tubes | 8540.20.2000<br>8540.20.4000<br>8540.89.0060 | 8540.20.2040<br>8540.20.2080<br>8540.20.4000<br>8540.89.0060 |
| 3344111105 | High vacuum tubes, including triodes, multigrid external and internal anodes, diodes and others | 8540.89.0040<br>8540.89.0080 | 8540.89.0040<br>8540.89.0080 |
| 3344117030 | Electron tube parts (except glass blanks) | 8540.91.2000<br>8540.91.4000<br>8540.99.0000 | 8540.91.1500<br>8540.91.2000<br>8540.91.5000<br>8540.99.8000 |
| 3344131036 | Monolithic integrated circuits, digital, memory (except silicon) | 8542.13.8092<br>8542.13.8096 | 8542.13.8092<br>8542.13.8096 |
| 3344131048 | Monolithic integrated circuits, digital (except memory and silicon) | 8542.13.8010 | 8542.13.8010 |
| 3344131015 | Monolithic integrated circuits, digital, silicon, bipolar transistors, memory, SRAM | 8542.14.8004 | 8542.14.8004 |

Continued

Table 4. Comparison of North American Industry Classification System (NAICS)-Based Product Codes with Schedule B Export Codes, and HTSUSA Import Codes: 2001

| Product code | Product description | Export code | Import code |
|---|---|---|---|
| 3344131021 | Monolithic integrated circuits, digital, silicon, bipolar transistors, memory (except SRAM)..... | 8542.14.8007 | 8542.14.8007 |
| 3344131024 | Monolithic integrated circuits, digital, silicon, bipolar transistors (except memory, transistor-transistor logic (TTL))..... | 8542.14.8011 | 8542.14.8011 |
| 3344131032 | Monolithic integrated circuits, digital, silicon, bipolar transistors, including emitter coupled logic (ECL), (except memory, n.e.c.)..... | 8542.14.8012<br>8542.14.8017 | 8542.14.8012<br>8542.14.8017 |
| 3344131068, 070, 072 | Monolithic integrated circuits, digital, silicon, metal oxide (MOS) field effect transistors volatile memory, (DRAM)..... | 8542.13.8012<br>8542.13.8025 | 8542.13.8026<br>8542.13.8029<br>8542.13.8030<br>8542.13.8031<br>8542.13.8032 |
| 3344131082, 084, 086 | Monolithic integrated circuits, digital, silicon, metal oxide (MOS) field effect transistors volatile memory (SRAM)..... | 8542.13.8043<br>8542.13.8044 | 8542.13.8043<br>8542.13.8045<br>8542.13.8049 |
| 3344131092, 094 | Monolithic integrated circuits, digital, silicon, metal oxide (MOS) field effect transistors (except volatile memory (EEPROM))..... | 8542.13.8056 | 8542.13.8051<br>8542.13.8052<br>8542.13.8057 |
| 3344131079 | Monolithic integrated circuits, digital, silicon, metal oxide (MOS) field effect transistors (except volatile memory (EEPROM))..... | 8542.13.8061 | 8542.13.8058<br>8542.13.8059<br>8542.13.8060 |
| 3344131080 | Monolithic integrated circuits, digital, silicon, metal oxide (MOS) field effect transistors (except volatile memory, n.e.c.)..... | 8542.13.8065 | 8542.13.8065 |
| 3344131054 | Monolithic integrated circuits, digital, silicon, metal oxide (MOS) field effect transistors, (except memory type, including microprocessors having an internal data bus of 8 bits or less)..... | 8542.13.8066 | 8542.13.8066 |
| 3344131057 | Monolithic integrated circuits, digital, silicon, metal oxide (MOS) field effect transistors (except memory type, including microprocessors having an internal data bus of 16 bits)..... | 8542.13.8067 | 8542.13.8067 |

Continued

Table 4. Comparison of North American Industry Classification System (NAICS)-Based Product Codes with Schedule B Export Codes, and HTSUSA Import Codes: 2001

| Product code | Product description | Export code | Import code |
|---|---|---|---|
| 3344131060 | Monolithic integrated circuits, digital, silicon, metal oxide (MOS) field effect transistors (except memory type, including microprocessors having an internal data bus of 32 bits)..... | 8542.13.8068 | 8542.13.8068 |
| 3344131033 | Monolithic integrated circuits, digital, silicon, metal oxide (MOS) field effect transistors, (except memory type: controllers, application specific intergrated circuits and programmable logic arrays (except microprocessors)..... | 8542.13.8072 | 8542.13.8072 |
| 3344131039 | Monolithic integrated circuits, digital, silicon, other than metal oxide (MOS) field effect transistors, complementary BiMOS, memory type..... | 8542.19.8073 | 8542.19.8073 |
| 3344131042 | Monolithic integrated circuits, digital, silicon, other than metal oxide (MOS) field effect transistors, complementary BiMOS, n.e.c., including logic type (except memory types)..... | 8542.19.8078 | 8542.19.8078 |
| 3344131045 | Monolithic integrated circuits, digital, silicon, other than metal oxide (MOS) field effect transistors, complementary BiMOS, n.e.c., including logic type (except memory types)..... | 8542.19.8079 | 8542.19.8079 |
| 3344131062, 003, 006, 009 | Monolithic integrated circuits, nondigital, inc. linear, analog, radio frequency, etc..... | 8542.30.0040<br>8542.30.0060<br>8542.30.0065<br>8542.30.0080<br>8542.30.0090 | 8542.30.0040<br>8542.30.0060<br>8542.30.0065<br>8542.30.0080<br>8542.30.0090 |
| 3344131018, 051 | Hybrid integrated circuits..... | 8542.40.0075<br>8542.40.0095 | 8542.40.0075<br>8542.40.0095 |
| 3344140331 | Capacitors, fixed, tantalum electrolytic, metal case, including foil and wet, dipped and chips..... | 8532.21.0020<br>8532.21.0040<br>8532.21.0050 | 8532.21.0020<br>8532.21.0040<br>8532.21.0050 |
| 3344140333 | Capacitors, fixed, tantalum electrolytic, n.e.c., including leaded (molded axial and molded radial)..... | 8532.21.0080 | 8532.21.0080 |
| 3344140436 | Capacitors, fixed, aluminum electrolytic, not exceeding 35 mm..... | 8532.22.0020<br>8532.22.0040 | 8532.22.0020<br>8532.22.0040 |
| 3344140439, 442, 445 | Capacitors, fixed, aluminum electrolytic, over 35 mm..... | 8532.22.0055<br>8532.22.0085 | 8532.22.0055<br>8532.22.0085 |

Continued

Table 4. Comparison of North American Industry Classification System (NAICS)-Based Product Codes with Schedule B Export Codes, and HTSUSA Import Codes: 2001

| Product code | Product description | Export code | Import code |
|---|---|---|---|
| 3344140550 | Capacitors, fixed, ceramic dialectric, single layer..... | 8532.23.0020<br>8532.23.0040<br>8532.23.0060 | 8532.23.0020<br>8532.23.0040<br>8532.23.0060 |
| 3344140555 | Capacitors, fixed, ceramic dialectric, multilayer axial leads and radial leads..... | 8532.24.0040<br>8532.24.0060 | 8532.24.0040<br>8532.24.0060 |
| 3344140560 | Capacitors, fixed, ceramic dialectric, multilayer chips..... | 8532.24.0020 | 8532.24.0020 |
| 3344140663 | Capacitors, fixed, mica dielectric..... | 8532.29.0020 | 8532.29.0020 |
| 3344140666 | Capacitors, fixed, n.e.c. ..... | 8532.29.0040 | 8532.29.0040 |
| 3344140769 | Capacitors, variable, mica/ceramic/glass dielectric..... | 8532.30.0010 | 8532.30.0010 |
| 3344140772 | Capacitors, variable, n.e.c. ..... | 8532.30.0090 | 8532.30.0090 |
| 3344140875 | Capacitors, parts, including unfinished chips for further finishing and assembly..... | 8532.90.0000 | 8532.90.0000 |
| 3344140103 | Capacitors, fixed, paper, plastic(film), metalized, and dual film/paper dielectric, ac types, less than 300 volts..... | 8532.25.0010 | 8532.25.0010 |
| 3344140106 | Capacitors, fixed, paper, plastic(film), metalized, and dual film/paper dielectric, ac types, 300 volts to 599 volts..... | 8532.25.0020 | 8532.25.0020 |
| 3344140109 | Capacitors, fixed, paper, plastic(film), metalized, and dual film/paper dielectric, ac types, 600 volts to 999 volts..... | 8532.25.0030 | 8532.25.0030 |
| 3344140112 | Capacitors fixed, paper, plastic(film), metalized, and dual film/paper dielectric, ac types, 1000 volts or over..... | 8532.25.0040 | 8532.25.0040 |
| 3344140215 | Capacitors, fixed, paper, plastic(film), metalized, and dual film/paper dielectric, dc types, axial lead..... | 8532.25.0060 | 8532.25.0060 |
| 3344140218 | Capacitors, fixed, paper, plastic(film), metalized, and dual film/paper dielectric, dc types, radial lead..... | 8532.25.0070 | 8532.25.0070 |
| 3344140221 | Capacitors, fixed, paper, plastic(film), metalized, and dual film/paper dielectric, dc types, chips and other leaded devices..... | 8532.25.0050<br>8532.25.0080 | 8532.25.0080 |
| 3344134005 | Transistors, signal, less than 1 watt dissipation..... | 8541.21.0080 | 8541.21.0075<br>8541.21.0095 |

Continued

Table 4. Comparison of North American Industry Classification System (NAICS)-Based Product Codes with Schedule B Export Codes, and HTSUSA Import Codes: 2001

| Product code | Product description | Export code | Import code |
|---|---|---|---|
| 3344134010 | Transistors, power, 1 watt or greater dissipation..... | 8541.29.0080 | 8541.29.0075<br>8541.29.0095 |
| 3344137025 | Zener diodes..... | 8541.10.0050 | 8541.10.0050 |
| 3344137020 | Microwave diodes..... | 8541.10.0060 | 8541.10.0060 |
| 3344137010 | Signal diodes and assemblies..... | 8541.10.0070 | 8541.10.0070 |
| 3344137015, 005 | Diodes and rectifiers, n.e.c. ..... | 8541.10.0080 | 8541.10.0080 |
| 334413A005 | Solar cell..... | 8541.40.6020<br>8541.40.6030 | 8541.40.6020<br>8541.40.6030 |
| 334413A015, 020 | Light-emitting diodes..... | 8541.40.2000 | 8541.40.2000 |
| 334413A030 | Optical coupled isolators, including sensors and emitters..... | 8541.40.8000 | 8541.40.8000 |
| 334413A040 | Thyristors, SCR's, triacs, and PNPN diodes..... | 8541.30.0080 | 8541.30.0080 |
| 334413A035 | Other light-sensitive and light-emitting devices..... | 8541.40.7080<br>8541.40.9500 | 8541.40.7080<br>8541.40.9500 |
| 334413A060 | Chips and wafers for discrete semiconductors..... | 8541.10.0040<br>8541.21.0040<br>8541.29.0040<br>8541.30.0040<br>8541.40.6010<br>8541.40.7040<br>8541.50.0040<br>8541.50.0080 | 8541.10.0040<br>8541.21.0040<br>8541.29.0040<br>8541.30.0040<br>8541.40.6010<br>8541.40.7040<br>8541.50.0040<br>8541.50.0080 |
| 334413A055 | Chips and wafers for integrated circuits..... | 8542.13.8005<br>8542.13.8010<br>8542.14.8001<br>8542.14.8002<br>8542.19.8001<br>8542.19.8002<br>8542.30.0040 | 8542.13.8005<br>8542.13.8010<br>8542.14.8001<br>8542.14.8002<br>8542.19.8001<br>8542.19.8002<br>8542.30.0040 |
| 334413A065 | Semiconductor parts, n.e.c., including headers, packages, heat sinks, accessories, etc. ..... | 8541.90.0000 | 8541.90.0000 |
| 3344150104 | Resistors, fixed, carbon, composition or film types, designed for surface mounting (SMD) by contact, having two terminals, cylindrical leadless having two leads, carbon composition, and carbon film..... | 8533.10.0042<br>8533.10.0070 | 8533.10.0042<br>8533.10.0060<br>8533.10.0065 |

Continued

Table 4. Comparison of North American Industry Classification System (NAICS)-Based Product Codes with Schedule B Export Codes, and HTSUSA Import Codes: 2001

| Product code | Product description | Export code | Import code |
|---|---|---|---|
| 3344150208, 212 | Resistors, fixed, with a power capacity of 20 watts or less, surface mounted (SMD), having two terminals, including bith flat resistor chips, and cylindrical leadless resistors..... | 8533.21.0045 | 8533.21.0030<br>8533.21.0040 |
| 3344150216, 220 | Resistors, fixed, with a power capacity of 20 watts or less, surface mounted (SMD), having more than two terminals: resistor, resistor-capacitor networks..... | 8533.21.0025 | 8533.21.0010<br>8533.21.0020 |
| 3344150224 | Resistors, fixeds, with a power capacity of 20 watts or less, wirewound, having two leads..... | 8533.21.0080 | 8533.21.0080 |
| 3344150228 | Resistors, fixed, with a power capacity of 20 watts or less, other than wirewound, having two leads..... | 8533.21.0090 | 8533.21.0090 |
| 3344150232, 236, 240 | Resistors, fixed, with a power capacity of 20 watts or less: resistor networks, having more than two leads | 8533.10.0020<br>8533.10.0057<br>8533.21.0075 | 8533.10.0020<br>8533.10.0057<br>8533.21.0050<br>8533.21.0060<br>8533.21.0070 |
| 3344150468, 469 | Resistors, variable, wirewound, including rheostats and potentiometers, for a power handling capacity not exceeding 20 watts..... | 8533.31.0000 | 8533.31.0000 |
| 3344150344, 348, 359, 579, 580 | Resistors, variable, n.e.c. ..... | 8533.40.0080 | 8533.40.8050<br>8533.40.8060<br>8533.40.8070 |
| 3344150684 | Resistors, parts ..... | 8533.90.0000 | 8533.90.4000<br>8533.90.8000 |
| 3344191225, 230, 235, 240, 245, 250, 255, 260, 265 | Piezoelectric devices (except crystal blanks)..... | 8541.60.0025<br>8541.60.0060<br>8541.60.0080 | 8541.60.0010<br>8541.60.0020<br>8541.60.0030<br>8541.60.0050<br>8541.60.0060<br>8541.60.0080 |
| 3344191270, 275 | Piezoelectric devices, crystal blanks..... | 7104.10.0000 | 7104.10.0000 |
| 3344120105, 210, 315, 420, 425, 430, 432, 433, 435, 440 | Printed circuit boards..... | 8534.00.0020<br>8534.00.0040<br>8534.00.0050<br>8534.00.0070<br>8534.00.0080<br>8534.00.0085<br>8534.00.0095 | 8534.00.0020<br>8534.00.0040<br>8534.00.0050<br>8534.00.0070<br>8534.00.0080<br>8534.00.0085<br>8534.00.0095 |

Continued

Table 4. Comparison of North American Industry Classification System (NAICS)-Based Product Codes with Schedule B Export Codes, and HTSUSA Import Codes: 2001

| Product code | Product description | Export code | Import code |
|---|---|---|---|
| 3344160040 | Television transformers and reactors (horizontal) output, vertical deflection, focus coils, deflection yokes, etc. | 8529.90.3540<br>8540.91.2000 | 8529.90.3600<br>8540.91.2000 |
| 3344160020, 030, 035, 010, 015, 045, 050 | Coils, transformers, reactors, and chokes for electronic applications, n.e.c. | 8504.31.2000<br>8504.31.4035<br>8504.31.4065<br>8504.31.6000<br>8504.32.0000<br>8504.33.0020<br>8504.33.0040<br>8504.34.0000 | 8504.31.2000<br>8504.31.4035<br>8504.31.4065<br>8504.31.6000<br>8504.32.0000<br>8504.33.0020<br>8504.33.0040<br>8504.34.0000 |
| 3344171000 | Connectors, coaxial | 8536.69.4010 | 8536.69.4010 |
| 3344174000 | Connectors, cylindrical | 8536.69.4020 | 8536.69.4020 |
| 3344177000 | Connectors, rack and panel | 8536.69.4030 | 8536.69.4030 |
| 334417A000 | Connectors, printed circuit | 8536.69.4040 | 8536.69.4040 |
| 334419D108, 110, 115 | Antenna systems (except structural towers sold separately) | 8529.10.2020 | 8529.10.2020 |
| 3342203051 | Magnetic recording and reproducing heads, including audio, video, digital and instrumentation | 8522.90.0010 | 8522.90.5540<br>8522.90.7540 |
| 3344197025 | Rotary selector switches for electronic circuitry, including lever and jog-levers, miniature and subminiature | 8536.50.9020<br>8536.50.9025 | 8536.50.9020 |
| 3344197035 | Pushbutton switches for electronic circuitry | 8536.50.9030<br>8536.50.9035 | 8536.50.9031<br>8536.50.9032<br>8536.50.9033<br>8536.50.9035 |
| 3344197020 | Slide switches, including rocker for electronic circuitry, both miniature and subminiature | 8536.50.9050** | 8536.50.9050** |
| 3344197040 | Snap-action switches for electronic circuitry | 8536.50.9040** | 8536.50.7000**<br>8536.50.9040** |
| 3344197030, 045, 015, 005, 010, 050, 055 | Switches for electronic circuitry, n.e.c. | 8536.50.9045**<br>8536.50.9055<br>8536.50.9065 | 8536.50.9055<br>8536.50.9065 |

** HS codes include switches of product class 36433. n.e.c. Not elsewhere classified.

Continued

# Appendix.
# General CIR Survey Information, Explanation of General Terms and Historical Note

## GENERAL

The CIR program has been providing monthly, quarterly, and annual measures of industrial activity for many years. Since 1904, with its cotton and fats and oils surveys, the CIR program has formed an essential part of an integrated statistical system involving the quinquennial economic census, manufacturing sector, and the annual survey of manufactures. The CIR surveys, however, provide current statistics at a more detailed product level than either of the other two statistical programs.

The primary objective of the CIR program is to produce timely, accurate data on production and shipments of selected products. The data are used to satisfy economic policy needs and for market analysis, forecasting, and decision making in the private sector. The product-level data generated by these surveys are used extensively by individual firms, trade associations, and market analysts in planning or recommending marketing and legislative strategies, particularly if their industry is significantly affected by foreign trade. Although production and shipments information are the two most common data items collected, the CIR program collects other measures also such as inventories, orders, and consumption. These surveys measure manufacturing activity in important commodity areas such as textiles and apparel, chemicals, primary metals, computer and electronic components, industrial equipment, aerospace equipment, and consumer goods.

The CIR program uses a unified data collection, processing, and publication system. The U.S. Census Bureau updates the survey panels for most reports annually and reconciles the estimates to the results of the broader-based annual survey of manufactures and the economic census, manufacturing sector. The manufacturing sector provides a complete list of all producers of the products covered by the CIR program and serves as the primary source for CIR sampling. Where a small number of producers exist, CIR surveys cover all known producers of a product. However, when the number of producers is too large, cutoff and random sampling techniques are used. Surveys are continually reviewed and modified to provide the most up-to-date information on products produced. The CIR program includes a group of mandatory and voluntary surveys. Typically the monthly and quarterly surveys are conducted on a voluntary basis. Those companies that choose not to respond to the voluntary surveys are required to submit a mandatory annual counterpart corresponding to the more frequent survey.

## NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS), 1997

The adoption of the North American Industry Classification System (NAICS) in the 1997 Economic Census has had a major impact on the comparability of current and historic data. Approximately half of the industries in the manufacturing sector of NAICS do not have comparable industries in the Standard Industrial Classification (SIC) system that was used in the past.

While most of the change affecting the manufacturing sector was change within the sector, some industries left manufacturing and others came into manufacturing. Prominent among those that left manufacturing are logging and portions of publishing. Prominent among the industries that came into the manufacturing sector are bakeries, candy stores where candy is made on the premises, custom tailors, makers of custom draperies, and tire retreading. The net effect of the classification changes are such that if the 1997 value of shipments data for all manufacturers were tabulated on an SIC basis, it would be approximately 3 percent higher.

Listed below are the NAICS sectors:

21 Mining
22 Utilities
23 Construction
31-33 Manufacturing
42 Wholesale Trade
44-45 Retail Trade
48-49 Transportation and Warehousing
51 Information
52 Finance and Insurance
53 Real Estate and Rental and Leasing
54 Professional, Scientific, and Technical Services
55 Management of Companies and Enterprises
56 Administrative and Support and Waste Management and Remediation Services
61 Educational Services
62 Health Care and Social Assistance
71 Arts, Entertainment, and Recreation
72 Accommodation and Food Services
81 Other Services (except Public Administration)

(Not listed above are the Agriculture, Forestry, Fishing, and Hunting sector (NAICS 11), partially covered by the census of agriculture conducted by the U.S. Department of Agriculture, and the Public Administration sector (NAICS 92), covered by the census of governments conducted by the Census Bureau.)

The 20 NAICS sectors are subdivided into 96 subsectors (three-digit codes), 313 industry groups (four-digit codes), and, as implemented in the United States, 1170 industries (five- and six-digit codes).

## FUNDING

The Census Bureau funds most of the surveys. However, a number of surveys are paid for either fully or partially by other Federal Government agencies or private trade associations. A few surveys are mandated, but all are authorized by Title 13 of the United States Code.

## RELIABILITY OF DATA

Survey error may result from several sources including the inability to obtain information about all cases in the survey, response errors, definitional difficulties, differences in the interpretation of questions, mistakes in recording or coding the reported data, and other errors of collection, response, coverage, and estimation. These nonsampling errors also occur in complete censuses. Although no direct measurement of the biases due to these nonsampling errors has been obtained, precautionary steps were taken in all phases of the collection, processing, and tabulation of the data in an effort to minimize their influence.

A major source of bias in the published estimates is the imputing of data for nonrespondents, for late reporters, and for data that fail logic edits. Missing figures are imputed based on period-to-period movements shown by reporting firms. A figure is considered to be an impute if the value was not directly reported on the questionnaire, directly derived from other reported items, directly available from supplemental sources, or obtained from the respondent during the analytical review phase. Imputation generally is limited to a maximum of 10 percent for any one data cell. Figures with imputation rates greater than 10 percent are suppressed or footnoted. The imputation rate is not an explicit indicator of the potential error in published figures due to nonresponse, because the actual yearly movements for nonrespondents may or may not closely agree with the imputed movements. The range of difference between the actual and imputed figures is assumed to be small. The degree of uncertainty regarding the accuracy of the published data increases as the percentage of imputation increases. Figures with imputation rates above 10 percent should be used with caution.

## DATA REVISIONS

Statistics for previous years may be revised as the result of corrected figures from respondents, late reports for which imputations were originally made, or other corrections. Data that have been revised by more than 5 percent from previously published data are indicated by footnotes.

## DISCLOSURE

The Census Bureau collects the CIR data under the authority of Title 13, United States Code, which specifies that the information can only be used for statistical purposes and cannot be published or released in any manner that would identify a person, household, or establishment. "D" indicates that data in the cell have been suppressed to avoid disclosure of information pertaining to individual companies.

## EXPLANATION OF GENERAL TERMS

**Capacity.** The maximum quantity of a product that can be produced in a plant in 1 day if operating for 24 hours. Includes the capacity of idle plants until the plant is reported to be destroyed, dismantled, or abandoned.

**Consumption.** Materials used in producing or processing a product or otherwise removing the product from the inventory.

**Exports.** Includes all types of products shipped to foreign countries, or to agents or exporters for reshipment to foreign countries.

**Gross shipments.** The quantity or value of physical shipments from domestic establishments of all products sold, transferred to other establishments of the same company, or shipped on consignment, whether for domestic or export sale or use. Shipments of products purchased for resale are omitted. Shipments of products made under toll arrangements are included.

**Interplant transfers.** Shipments to other domestic plants within a company for further assembly, fabrication, or manufacture.

**Inventories.** The quantity or value of finished goods, work in progress, and materials on hand.

**Machinery in place.** The number of machines of a particular type in place as of a particular date whether the machinery was used for production, prototype, or sampling, or was idle. Machinery in place includes all machinery set up in operating positions.

**Net receipts.** Derived by subtracting the materials held at the end of the previous month from the sum of materials used during the current month.

**Production.** The total volume of products produced, including: products sold; products transferred or added to inventory after adjustments for breakage, shrinkage, and obsolescence, plus any other inventory adjustment; and products that undergo further manufacture at the same establishment.

**Quantities produced and consumed.** Quantities of each type of product produced by a company for internal consumption within that same company.

**Quantity and value of new orders.** The sales value of orders received during the current reporting period for products and services to be delivered immediately or at some future date. Also represents the net sales value of contract change documents that increase or decrease the sales value of the orders to which they are related, when the parties concerned are in substantial agreement as to the amount involved. Included as orders are only those that are supported by binding legal documents such as signed contracts or letter contracts.

**Quantity and value of shipments.** The figures on quantity and value of shipments represent physical shipments of all products sold, transferred to other establishments of the same company, or shipped on consignment, whether for domestic or export sale. The value represents the net sales price, f.o.b. plant, to the customer or branch to which the products are shipped, net of discounts, allowances, freight charges, and returns. Shipments to a company's own branches are assigned the same value as comparable appropriate allocation of company overhead and profit. Products bought and resold without further manufacture are excluded.

**Stocks**. Total quantity of ending finished inventory.

**Unfilled orders (backlog).** Calculated by adding net new orders and subtracting net sales from the backlog at the end of the preceding year.

**HISTORICAL NOTE**

Data on selected electronic and associated products have been collected by the Census Bureau since 1961 on survey MA36N, Selected Electronics and Associated Products. In 1985, survey MA36N was divided into three annual surveys which are presently collected as: MA334P, Communication Equipment, Including Telephone, Telegraph, and Other Electronic Systems and Equipment; MA334Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components; and MA334S, Electromedical Equipment and Irradiation Equipment (Including X-Ray). Historical data may be obtained from Current Industrial Reports available at your local Federal Depository Library.