Semiconductors

Discrete semiconductors (diodes, transistors, and optoelectronic components) typically perform a single function in electronic circuits, such as switching, amplifying, rectifying, and transmitting electrical signals. Semiconductors are referred to as “active” components because they require power to function.

**Siliconix**

**MOSFETs**

Metal-oxide-semiconductor field-effect transistors (MOSFETs) function as solid-state switches to control power. For example, they turn off specific functions of notebook computers and cell phones when these functions are not in use, thereby extending battery life. They also help convert power into levels required by other components. Vishay offers low- and high-voltage Siliconix TrenchFET® and planar MOSFETs in innovative package formats to switch and manage power very efficiently.

**Integrated Circuits (ICs)**

Integrated circuits combine the functions of multiple semiconductor and passive components on a single chip. IC products from Vishay are focused on analog signal switching and routing, power conversion, and power management. They are used in end products such as notebook and desktop computers, cell phones, and fixed telecom systems. Switchmode and linear regulators, MOSFET drivers, bus interface devices, and analog switches and multiplexers are included in the Vishay IC portfolio.

**Vishay Semiconductors**

**Optoelectronics**

Optoelectronic components emit light, detect light, or do both. Types include infrared data communications devices (IRDCs) for two-way data transfer, optocouplers and solid state relays for circuit isolation, IR emitters and IR receivers for one-way remote controls (as used in television sets, for example), optical sensors for detection, LEDs for light sources, and 7-segment displays.

**Rectifiers**

Rectifiers convert alternating current (AC) into direct current (DC), a unidirectional current required for operation of many electronic systems. For example, a bridge rectifier is used in a clock radio to change the AC voltage from a wall outlet to a specific DC voltage. Vishay’s patented TMBS™ rectifiers reduce power losses and improve efficiency in computing, telecommunications, and other applications.

**Diodes and Thyristors**

Diodes and thyristors are semiconductor components that allow voltage to be conducted in only one direction. Both types of devices are used in a wide range of electronic systems to route, switch, and block RF, analog, and power signals. The Vishay Semiconductors diode portfolio includes Schottky, switching, PIN, sinterglass, and rectifier devices as well as products for transient voltage suppression, ESD protection, and EMI filtering.

**Modules and Assemblies**

Advanced micromodules and other assemblies combine several components into a single package. For example, products in Vishay’s FunctionPAK® dc-to-dc converter family combine up to 20 components such as power MOSFETs, integrated circuits, and passive components in a single 15-mm by 15-mm package for energy-efficient dc-to-dc power management solutions. Other power modules combining multiple diodes and thyristors address a host of applications in end products ranging from motor drives to line-frequency welding machines. For automotive and industrial applications, subassembly solutions deliver an optimal degree of integration and functionality.

**RF Transistors**

RF transistors amplify analog or digital signals. They are designed specifically to handle small-signal radio frequencies in the front ends of radios, television sets, mobile phones, and other devices to amplify antenna signals.

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The products shown on these two pages correspond to the pie chart titled REVENUE BY PRODUCT GROUP 2006. Vishay’s Siliconix group includes MOSFETs and ICs. Vishay Semiconductors includes optoelectronics, rectifiers, diodes and thyristors, and RF transistors. Vishay’s Resistors/Inductors group includes resistive products and magnetics. The Capacitors group encompasses several types of capacitors. Measurements Group includes strain gages and instruments, transducers, systems, and PhotoStress® products.
### Passive Components

Passive components (resistors, capacitors, inductors, transducers) do not require a power supply to handle the signals that pass through them. They are used to store electrical charges, to limit or resist electrical current, and to help in filtering, surge suppression, measurement, timing, and tuning applications.

#### Resistors/Inductors

**Resistive Products**

Resistors restrict current flow. Vishay manufactures many different types of resistive products, including single (discrete) resistors based on foil, thin film, thick film, metal oxide film, carbon film, and wirewound technologies, as well as resistor networks and arrays, in which multiple resistors are combined in a single package. Vishay also manufactures thermistors and varistors, which are used to suppress voltage increases due to temperature and voltage changes. Resistors are used in all electronic circuits.

**Magnetics**

Inductors and transformers are categorized as magnetics. Inductors use an internal magnetic field to change AC current phase and resist AC current. Inductor applications include controlling AC current and voltage and filtering out unwanted electrical signals. Transformers (two inductors on a common core of magnetic material) increase or decrease AC voltage or AC currents.

#### Capacitors

Capacitors store energy and discharge it when needed. Applications include power conversion, DC-linking, frequency conversion, bypass, decoupling, and filtering. Types of capacitors manufactured by Vishay include tantalum (both solid and wet), ceramic (both multilayer chip and disc), film, power, heavy-current, and aluminum, as well as high-performance, high-precision, silicon-based RF capacitors. Capacitors are used in almost all electronic circuits.

#### Measurements Group

**Strain Gages and Instruments**

Strain gages are sensors used to detect stress and other physical forces. They are widely used in weighing, process control, force measurement, and other systems. Related instruments are used to measure, display, and record the information detected by strain gages.

**Systems**

Systems use transducers and instruments to control process weighing in food, chemical, and pharmaceutical plants. Force measurement systems are used to control web tension in paper mills, roller force in steel mills, and cable tension in winch controls. On-board weighing systems are installed in logging and waste-handling trucks. Special scale systems are used for aircraft weighing and portable truck weighing.

**Transducers**

Load-cell-type transducers measure weight. For example, in a digital bathroom scale, small strain gages are attached to a transducer that is hidden beneath the platform of the scale. A person's weight pressing down on the transducer causes the strain gage to issue a signal to the electronic system that displays the weight in pounds or kilograms.

**PhotoStress®**

PhotoStress coatings and instruments use a unique optical process to reveal and measure the distribution of stresses in structures under live load conditions. They are used to improve structural design in aerospace, automotive, military, civil engineering, industrial, and medical applications.