Analog | Discrete Logic | Mixed-Signal

diodes.com
OVERVIEW
Diodes Incorporated is a leading global design and manufacturer of discrete, analog, mixed-signal, and logic semiconductors. Its global footprint includes sales offices worldwide and manufacturing locations in China, Taiwan, and Europe. A focus on product innovation, cost reduction and customer service has made Diodes Incorporated an industry leader.

DISCRETE
Diodes Incorporated provides product designers with a broad range of discrete semiconductor components that are renowned for their quality, reliability and high-performance. Combining leading-edge silicon and packaging technologies, Diodes provides a broad portfolio of benchmark performing discrete semiconductors.

ANALOG AND POWER MANAGEMENT IC
The best analog and power management ICs provide circuit designers with the most advantageous combination of efficiency, functionality and package size. Diodes’ Analog ICs include industry-standard devices as well as differentiated ASSPs. Its power management devices incorporate leading-edge topologies to meet the markets’ efficiency and standby power requirements.

CONNECTIVITY AND TIMING
Diodes is a leading designer and manufacturer of essential solutions for the timing, switching, bridging and conditioning of high-speed signals required by today’s ever-increasing speed- and bandwidth-demanding applications. Its serial connectivity solutions cover a broad range of protocols including PCIe, SATA, SAS 2.0/3.0, HDMI, DisplayPort, USB 2.0/3.0/3.1/Type-C®, Thunderbolt® and 10GE. Diodes provides a full-timing portfolio including crystals and crystal oscillators as well as clock ICs covering kHz to GHz with jitter in the low femtoseconds.

LOGIC
Diodes’ logic portfolio covers single and dual-gate logic, the ubiquitous standard logic, universal level shifters/ transmitters, analog switches and advanced interface logic (UARTs) offering the right operating voltages and driving capabilities for today’s applications.

USB Type-C® and USB-C® are trademarks of the USB Implementers Forum. Thunderbolt is a trademark of Intel Corporation or its subsidiaries in the U.S. and/or other countries.
...across a wide range of existing and emerging applications

MARKETS
As part of its global footprint Diodes Incorporated is focused on these high-growth, high-volume markets:

AUTOMOTIVE
Diodes offers a wide portfolio of automotive-compliant products targeted at high-growth, high-reliability applications such as automotive LED lighting (DRL, headlamps and rear clusters). Additionally, Diodes offers connected driving (merging of infotainment, telematics, and ADAS) and BLDC motors.

Diodes’ Automotive-compliant products, designed and tested in-house, are qualified to automotive standards AEC-Q100/101/200 and are manufactured in facilities that have been audited to IATF16949/VDA6.3 manufacturing routes. These parts are fully supported by Production Part Approval Process (PPAP) documentation and are specific change controlled.

COMMUNICATIONS
Diodes offers highly effective products to enhance the solution in areas such as telecom infrastructure, wireless networks and connected devices. A broad portfolio of MOSFETs, rectifiers, protection devices, high-speed signal switches and multiplexers provides for highly efficient and cost-effective solutions to be developed.

COMPUTER
By addressing the key requirements of the computing industry—speed, power efficiency, cost effectiveness and reliability—Diodes’ broad portfolio of products are used in all areas of notebooks, motherboards, printers, servers, storage and adaptors with leading-edge solutions for USB Type-C connectivity.

CONSUMER
Cost-effective solutions and a high-volume logistic capability, position Diodes to effectively deliver discrete, analog, mixed-signal, and logic solutions to this fast-moving market sector.

INDUSTRIAL
Diodes’ extensive portfolio of bipolar and MOSFET transistors, diodes, standard analog, and power management ICs ensure that in harsh industrial environments, the management-of-power is at its most reliable and effective for the required long-term usage requirements.

For embedded applications, Diodes offers a wide variety of products including specialized timing products like processor-specific XO and clocks, as well as PCIe and USB solutions.
Discrete

**MOSFET**
- N- and P-Channel from Small-Signal to Power MOSFETs
- 8V to 950V in Single, Dual, Complementary and H-Bridge (Quad) Configurations
- Packages from the tiny DFN0604 to the PowerDI5060
- Self-Protected IntelliFET, Smart Load Switches, Shielded-Gate Trench and Lateral (LD-MOS) Technologies
- Automotive-compliant portfolio qualified to AEC-Q101

**Bipolar Transistors**
- Technology leadership up to 900V
- Very low $V_{CE(sat)}$ for either higher current handling or reduced temperature operation
- Excellent gain hold at high peak currents for improved driving of MOSFETs or IGBTs
- NPN, PNP, single, dual, complementary, matched, pre-bias darlington and special function transistors
- Wide selection of package options to cover most application needs
- Automotive-compliant portfolio qualified to AEC-Q101

**IGBT**
- Field-Stop Trench technology
- 650V and 1200V rating
- Continuous current specified to 60A
- Low conduction, high ruggedness and high speed options
- Available in ITO220AB and TO247 packages

**Diodes and Rectifiers**
- Switching diodes—single, dual, triple, quad
- Zener diodes—tolerances as tight as ±2.0%
- Low leakage diodes—$I_D < 5nA$
- Schottky diodes and rectifiers with fast switching speed in single, dual and quad configurations
- Standard, Fast and Ultra-fast Recovery Rectifiers
- Bridge rectifiers up to 1000V
- Automotive-compliant portfolio qualified to AEC-Q101

**SBR** (Super Barrier Rectifier)
- Industry leading rectifier with ultra-low forward voltage ($V_F$) and reverse leakage ($I_R$)
- Low $V_F$ for higher efficiency
- Reduced high temperature $I_R$ gives immunity to thermal runaway
- Voltage ratings to 400V
- Current ratings to 60A
- Broad range of packages from DFN1006 to TO220
- Automotive-compliant portfolio qualified to AEC-Q101

**Protection Devices**
- TVS for ESD protection up to 30kV on datalines including USB, HDMI, DVI, PCI
- Low-capacitance TVS down to 0.2pF for high-speed
- Available in footprints down to 0.6 x 0.3mm
- General purpose Zener TVS from 18W to 3kW
- Thyristor surge protection devices up to 100A
- Automotive-compliant portfolio qualified to AEC-Q101

SBR is a registered trademark of Diodes Incorporated.
AC-DC products for offline and IOT power supplies
- Primary-side regulation (PSR) controllers and switchers
- High-voltage non-isolated buck switchers
- High-efficiency green mode PWM and QR controllers
- CC and CV controllers for secondary side regulation
- Synchronous MOSFET Controllers and Rectifiers
- Offline, low standby and optimized transient response IoT power converters

DC-DC Switching Regulators
- Buck, Buck-Boost and Boost options
- Wide voltage input range
- Low quiescent current and high efficiency at light load
- Best-in-class EMI design
- High power-density small footprint solutions
- Easy-to-use with less external component count and simple PCB layout

Load and USB Switches
- USB Type-A/B/C/PD and HDMI port over-current protection
- High-side power supply load switches for 1.4 to 5.5V rails
- Up to 6A output current limit in single or dual channel support by fixed or adjustable configuration
- Active-high or low enable with reverse-current, over-current, over-voltage, over-temp, and surge protection
- UL Recognized and IEC 60950-1 CB Scheme Certified

GATE and Load Drivers
- Wide portfolio of products rated up to 600V
- Half-bridge and High-side/low-side configured for driving n-channel MOSFETs or IGBTs
- Inverting and non-inverting, dual or single low-side drivers
- 3-phase Gate Drivers
- Small footprint relay driver solutions
- Industry standard ULN200xA peripheral drivers

Li-ion Battery Protection IC
- Supports broad single-cell Li-Ion/Li polymer battery applications
- Dedicated Diodes’ process ensures battery safety
- Small footprint with co-packaged low R_DSON MOSFET
- Automotive manufacturing flow ensures high quality

LED Lighting and IoT Power Solutions
- Automotive-compliant LED drivers qualified to AEC-Q100
- Innovative, reliable, low standby and cost-effective connected lighting and IoT power solutions
- High-performance DC-DC and linear LED drivers for industrial and commercial LED lighting applications
- 0.5% channel-to-channel matching multiple channel LCD backlight LED drivers
- Small footprint, low thermal and high power density packages

Power Management
Sensors
- Omnipolar, unipolar, latch and linear Hall sensor products
- Wide input voltage ranges from 1.6-28VIN to cover battery-powered, industrial, and automotive applications
- Micropower, ultra-low noise and ultra-low switch point drift
- Automotive-compliant families qualified to AEC-Q100

Low Dropout Voltage Regulators
- Ultra-low IQ, low-dropout and ultra-small footprint
- High PSRR, wide input voltage selection with fixed/adjustable output voltages
- Tight tolerance over commercial and industrial temperature ranges
- Automotive-compliant families qualified to AEC-Q100

Op-Amps and Comparators
- Industry-standard general-purpose op-amps and comparators, AS3xx/LM290x series
- Industry-standard low-voltage general-purpose op-amps and comparators, LMV3, AZV8 and AZV3 series
- Single, dual and quad configurations
- Automotive-compliant LM290xQ family qualified to AEC-Q100

Voltage References and Shunt Regulators
- LM4040/1 equivalents with automotive-compliant versions
- Extra-low knee current 1.2V, 2.5, 3.3, 4.096V and 5V shunt references
- 2.5V, 1.24V TL/TLV431 equivalent shunt regulators
- 0.6V single and dual shunt regulators
- Extra-low knee current AP431S shunt regulator

Current Monitors
- Simple high-side current measurement without upsetting 0V reference point
- ZXCT108x high-side current monitors with operation up to 60V
- Simple SOT23 micropower current monitors
- ZXCT1xxxQ automotive-compliant high-side current monitors qualified to AEC-Q100

Audio Amplifiers
- Output powers from 1.5W to 30W/channel
- Low-EMI filterless design, anti-sat. and power limit features improve audio quality with lower solution cost
- Booster converter integrated for Dynamic/Piezo/Ceramic speaker load in wireless speaker, IoT, security or mobile apps
- High-quality headphone amplifier for headset, gaming or TV/monitor apps
- Automotive-compliant versions qualified to AEC-Q100
Connectivity, Timing & Logic

Switches/MUX
- Data rates up to 20Gbps
- High-speed signal multiplexer switches (USB, PCIe, USB-C, CE/10G, HDMI, DP, Mipi, SAS, SATA, Thunderbolt)
- High-speed crossbar switches
- LVDS Receivers/Transceivers
- Audio switch, bus switch, VGA switch
- USB charging controller

Signal Integrity (ReDrivers/Repeaters)
- PCIe Linear ReDrivers
- 10Gbps Ethernet Linear ReDrivers
- USB 3.0/3.1 Linear ReDrivers
- SATA 2.0/3.0 ReDrivers
- SAS 3.0 Linear Combo ReDrivers
- HDMI/Display Port ReDrivers
- 10Gbps USB Gen 3/3.2 Type-C and DP-ALT ReDrivers
- Automotive-compliant ReDrivers qualified to AEC-Q100

PCle Switches/Bridges/UARTs
- PCIe Packet Switches
- PCIe-PCI/PCIX Bridges
- PCIe, PCI, I²C, SPI, 8-Bit to UART
- PCIe to USB/PCIe
- Automotive-compliant Packet Switches Qualified to AEC-Q100

Timing
- Timing IC (Clock Generators, Buffers, SSSS)
- Less than 0.3ps clock generators
- As low as 0.01ps additive jitter Buffer families
- PCIe Gen1/2/3/4 clocks
- Automotive-compliant Timing ICs qualified to AEC-Q100
- Crystals and crystal oscillators (XO, VCXO, TCXO)
- Ultra-low jitter XO with less than 100fs RMS jitter
- Automotive-compliant Crystals and XO qualified to AEC-Q200
- Real-Time Clocks (RTC)

General Logic
- Single-gate, dual-gate, standard logic and shift registers
- Eight technology families: LV, LVC/E, AHC/T, AUP, HC/T
- DFN0808, DFN1010, DFN1410, QFN4525, SOT25/26/353/363/553, SO-14/-16, TSSOP-14/-16/-20
- Automotive-compliant single-gate logic 74LVC1GxxQ
- Universal Level Shifter/Voltage Translators
  - Automotive-compliant versions available

Special Logic
- Analog Switches
- Registers and Multiplexers
- Buffers, Transceivers and Line Drivers
- I/O Expanders
- I²C Mux
- I²C Hot Swappable IC
- Industry-standard Microprocessor Supervisors/Reset Generators
Diodes Incorporated’s discrete, analog, mixed-signal and logic products provide our customers with leading-edge solutions for next generation systems.

Discrete products include bipolar transistors, MOSFETs, diodes and rectifiers, protection products and functional specific arrays.

Analog and mixed-signal products cover these main areas: power management ICs, standard linear, LED drivers, sensors, signal switching, signal integrity, connectivity and timing products.

Diodes Incorporated’s logic products includes single-gate, dual-gate and standard logic gates as well as level translators, analog switches, registers and multiplexers.