COMPONENTS FOR THE INTERNET OF THINGS

BUILD VISHAY into your DESIGN

+ Touching the Human Body
+ In the Home
VISHAY and the INTERNET of THINGS (IoT)

Vishay has stepped up to the challenges of the Internet of Things (IoT) with a broad portfolio of unique passive and active solutions. These best-in-class components are optimally suited for the “Things” being controlled and monitored through IoT applications.
Vishay offers many best-in-class components for equipment in IoT categories.

**Categories**

**Touching The Human Body**

- Biometric Monitoring ......................................................... 02
- Clip-On / Pocket-Worn Devices ........................................ 03
- Fitbands .................................................................................. 04
- Patient Monitoring ............................................................... 05
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**In The Home**

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What is Biometric Monitoring?

Biometrics refers to metrics related to human characteristics and traits. Using distinctive, measurable characteristics, biometric identifiers are often categorized as physiological and include fingerprint, palm veins, face recognition, DNA, palm print, hand geometry, iris, and retina recognition.

CERAMIC CAPACITORS

MLCC Hi Q Capacitors

Ultra-stable dielectric low dissipation factor (DF) capacitors using robust design build with wet process. Non magnetic copper or epoxy bondable available.

OPTOELECTRONICS

VSMY7850X01

High-power SurfLight™ emitter with 850 nm peak wavelength and 170 mW/sr intensity at 1 A forward current, 780 mW/sr at 5 A forward current.

ICs

SiP32431

1.0 A slew rate controlled load switch with reverse blocking in SC70-6 and TDFN4 1.2 mm x 1.6 mm packages. Industry's lowest operating current (only 50 pA).

OPTOELECTRONICS

VSMY98545

High-power SurfLight™ emitter with 850 nm peak wavelength. Radiant intensity of 350 mW/sr at 1 A and 1600 mW/sr at 5 A pulsed. Radiant power of 660 mW in a compact package.

INDUCTORS

IHLP-2020CZER4R7M01

Low-profile, high-current IHLP® inductors. Compact composite for high-efficiency DC/DC conversion. High-frequency operation up to 5 MHz for excellent saturation.

OPTOELECTRONICS

TFBS4711

Infrared transceiver with data rate up to 115.2 kbit/s, idle current of 70 μA, shutdown current of 10 nA, transmit range of 1 meter, in small 1.9 mm x 3 mm x 6 mm (H x L x W) package.
# Clip-On / Pocket-Worn Devices

**What are Clip-On / Pocket-Worn Devices?**
Clip-on and pocket-worn devices measure steps in our day, analyze our sleeping patterns, track the whereabouts of friends and loved ones, or monitor health and safety of those most vulnerable.

<table>
<thead>
<tr>
<th>RESISTORS</th>
<th>MCT0603 / MCS0402</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional and precision chip resistors with excellent stability. CECC approved and sulfur resistant.</td>
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<tr>
<th>RESISTORS</th>
<th>CRCW0201 …e3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead (Pb)-free commodity thick film chip resistors in a very small 0.6 mm x 0.3 mm package for high-volume commercial product applications.</td>
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<tr>
<th>CERAMIC CAPACITORS</th>
<th>MLCC RF Capacitors</th>
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<tbody>
<tr>
<td>Excellent power handling capabilities in sizes from 0402 to 3838. Non magnetic copper or epoxy bondable available and lead bearing for hi-rel applications.</td>
<td></td>
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<table>
<thead>
<tr>
<th>TANTALUM CAPACITORS</th>
<th>T55</th>
</tr>
</thead>
<tbody>
<tr>
<td>vPolyTan™ polymer tantalum capacitors. High-capacitance, low-ESR polymer tantalum capacitors for stable electrical performance over temperature and voltage.</td>
<td></td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>ESD DIODES</th>
<th>VESD05A4A-HS4</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESD protection diode in LLP1010-6L ultra compact package with low package height &lt; 0.4 mm. ESD protection acc. IEC 61000-4-2; ± 30 kV contact and air discharge.</td>
<td></td>
</tr>
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<tr>
<th>MLCC CAPACITORS</th>
<th>MLCC Hi Q Capacitors</th>
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<tr>
<th>ICs</th>
<th>SiP32458</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 mΩ smart load switch designed for 1.5 V to 5.5 V operation in compact WSCP6 package.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ICs</th>
<th>DG2501</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultra-low power quad SPST switches optimized for sensors in portables/wearable technology with power consumption &lt; 0.01 μW for superior switching characteristics in a compact WSCP16 package.</td>
<td></td>
</tr>
</tbody>
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<table>
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<tr>
<th>MOSFETs</th>
<th>Si8457DB</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-channel 12 V (D-S) MOSFET using TrenchFET® Gen III for extremely low on-resistance. MICRO FOOT® ultra-small 1.6 mm x 1.6 mm outline, ultra-thin 0.6 mm height package.</td>
<td></td>
</tr>
</tbody>
</table>
## Fitbands

**What is a Fitband?**

Worn on the wrist, fitbands track physical activity to monitor and record fitness metrics.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Resistors</strong></td>
<td></td>
</tr>
<tr>
<td>CRCW0201…e3</td>
<td>Lead (Pb)-free commodity thick film chip resistors in a very small package size of 0.6 mm x 0.3 mm for high volume commercial product applications.</td>
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</tr>
<tr>
<td>RCWE</td>
<td>Thick film surface-mount chip resistors with extremely low resistance values from 0.01 Ω to 0.99 Ω, tolerance of 1 %, and high-power 2X power capacity.</td>
</tr>
<tr>
<td><strong>Optoelectronics</strong></td>
<td></td>
</tr>
<tr>
<td>TEMD510FX01</td>
<td>Ambient light sensor with analog output with peak sensitivity at 540 nm with a 7.5 mm² detector chip in a low-profile package.</td>
</tr>
<tr>
<td>VEMD5010X01</td>
<td>High-sensitivity PIN photodiode in leadless low-profile 0.8 mm high package, with 7.5 mm² sensitive area and daylight blocking filter.</td>
</tr>
<tr>
<td><strong>MOSFETs</strong></td>
<td></td>
</tr>
<tr>
<td>Si8817DB</td>
<td>Industry leading p-channel 20 V (D-S) MOSFET with max R_DS(on) 78 mΩ in smallest 0.8 mm x 0.8 mm chipscale package with 0.4 mm height.</td>
</tr>
<tr>
<td>SiB441EDK</td>
<td>Industry leading p-channel 12 V (D-S) MOSFET with max R_DS(on) down to 25.5 mΩ in 1.6 mm x 1.6 mm PowerPAK SC-70 package.</td>
</tr>
<tr>
<td><strong>Diodes</strong></td>
<td></td>
</tr>
<tr>
<td>VBUS05A1-SD0</td>
<td>Low-capacitance bidirectional symmetrical (BiSy) single line ESD-protection diode in ultra-compact package.</td>
</tr>
<tr>
<td><strong>Non linear resistors</strong></td>
<td></td>
</tr>
<tr>
<td>NTCS0402</td>
<td>SMD NTC thermistors with glass protected flex terminations and AEC-Q200 compliant.</td>
</tr>
<tr>
<td><strong>ICs</strong></td>
<td></td>
</tr>
<tr>
<td>DG2501</td>
<td>Ultra-low power quad SPST switches optimized for sensors in portables/wearable technology with power consumption &lt; 0.01 μW for superior switching characteristics in a compact WCSP16 package.</td>
</tr>
<tr>
<td><strong>MLCC capacitors</strong></td>
<td></td>
</tr>
<tr>
<td>VJ0201</td>
<td>High capacitance per unit size in C06, X5R and X7R dielectrics. Miniaturized case sizes for board space savings and better ESL performance.</td>
</tr>
<tr>
<td><strong>Tantalum capacitors</strong></td>
<td></td>
</tr>
<tr>
<td>298D / 298W</td>
<td>Solid tantalum chip capacitors. MICROtan®, and extended range MICROtan® in small case sizes for space constrained designs.</td>
</tr>
</tbody>
</table>
What is Patient Monitoring?
Wireless health systems for the next level of healthcare delivery. RPM (remote patient monitoring) devices support healthcare away from the hospital and into the patient’s home.

<table>
<thead>
<tr>
<th>RESISTORS</th>
<th>TNPW0402 …e3</th>
<th>High-stability thin film flat chip resistors with excellent overall stability, endurance &lt; 0.05 %, TCR down to 10 ppm/K. AEC-Q200 qualified, sulfur resistant, and halogen free.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESISTORS</td>
<td>P (Sizes 0302 to 2512)</td>
<td>High-precision wraparound thin film chip resistors with low TCR down to 5 ppm/°C and tight tolerance down to 0.01 %. Sulfur resistant.</td>
</tr>
<tr>
<td>ICs</td>
<td>DG2037</td>
<td>Low-voltage, low R(on) (down to 3 Ω), dual SPST analog switch in cost-effective SOT-23-8 and MSOP-8 packages.</td>
</tr>
<tr>
<td>MOSFETS</td>
<td>SIA906EDJ</td>
<td>Dual n-channel 20-V (D-S) MOSFET with TrenchFET technology. Low maximum R(ON) down to 0.046 mΩ at VGS = 4.5 V in compact 2 mm x 2 mm PowerPAK SC-70 package.</td>
</tr>
<tr>
<td>DIODES</td>
<td>VBUS052CD-FAH</td>
<td>2-line bus-port ESD-protection with flow through design. Low load capacitance at C = 0.8 pF in compact LLP1713-7L package.</td>
</tr>
<tr>
<td>CERAMIC CAPACITORS</td>
<td>MLCC RF Capacitors</td>
<td>Excellent power handling capabilities in sizes from 0402 to 3838. Non magnetic copper or epoxy bondable available and lead bearing for high-rel.</td>
</tr>
<tr>
<td>DISPLAYS</td>
<td>LCD, Color TFT, OLED</td>
<td>High-quality displays offer excellent human to machine interface solutions using standard and custom display modules and high brightness options for LCD, OLED, and color TFT.</td>
</tr>
<tr>
<td>OPTOELECTRONICS</td>
<td>TFDU4101</td>
<td>115.2 kbit/s infrared transceiver in an SMD package measuring 9.7 mm × 4.7 mm × 4 mm, capable of surface-mount soldering in side or top view orientation.</td>
</tr>
<tr>
<td>NON LINEAR RESISTORS</td>
<td>NTCS0805E3</td>
<td>SMD 0805 NTC thermistors with glass protected flex terminations and tolerance on R25 down to 1 %.</td>
</tr>
<tr>
<td>CERAMIC CAPACITORS</td>
<td>Hi-Rel MLCCs</td>
<td>MIL-PRF-55681 qualified facility. Reliability testing done on maintenance basis with multiple screening options and customized certification available.</td>
</tr>
<tr>
<td>IC’s</td>
<td>SiC403A</td>
<td>microBUCK® 6 A, 28 V integrated buck regulator with programmable LDO. Offers a scalable design with 10 A and 15 A parts in the same footprint.</td>
</tr>
</tbody>
</table>
**What is a Smartwatch?**
The next generation of wristwatch. Computerized functionality providing mobile apps, games, media players, phone, cameras, even video recording. And it tells you the time.

<table>
<thead>
<tr>
<th>RESISTORS</th>
<th>NON LINEAR RESISTORS</th>
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<tbody>
<tr>
<td><strong>MCT0603 / MCS0402</strong></td>
<td><strong>NTCS0402</strong></td>
</tr>
<tr>
<td>Professional and precision chip resistors with excellent stability. CECC approved and sulfur resistant.</td>
<td>SMD glass protected NTC thermistors with glass protected flex terminations. AEC-Q200 compliant.</td>
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<tr>
<th>MOSFETS</th>
<th>INDUCTORS</th>
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<tbody>
<tr>
<td><strong>Si8805EDB</strong></td>
<td><strong>IWAS and Custom Rx Coils</strong></td>
</tr>
<tr>
<td>Low on-resistance, guaranteed with gate voltages down to 1.2 V. In industry-smallest 0.8 mm by 0.8 mm chipscale package with 0.4 mm height</td>
<td>Wireless charging receiving coil/shield with thin, high-efficiency, low saturation Rx coils. Custom designs available.</td>
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<tr>
<th>RECTIFIERS</th>
<th>INDUCTORS</th>
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<tbody>
<tr>
<td><strong>MSS2P2</strong></td>
<td><strong>IFSC</strong></td>
</tr>
<tr>
<td>Surface-mount schottky barrier rectifiers in low-profile AEC-Q101 package.</td>
<td>Low-profile, high-current inductors for DC/DC converter filtering.</td>
</tr>
</tbody>
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<tr>
<th>DIODE</th>
<th>TANTALUM CAPACITORS</th>
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<tr>
<td><strong>VBUS05A1-SD0</strong></td>
<td><strong>298D / 298W</strong></td>
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<td>Low-capacitance bidirectional symmetrical (BiSy) single line ESD protection diode in ultra-compact package</td>
<td>Solid tantalum chip capacitors. MICROTAN® and extended range MICROTAN® in small case sizes for space constrained designs.</td>
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<tr>
<td><strong>VCNL4020</strong></td>
<td><strong>SiP32461</strong></td>
</tr>
<tr>
<td>Fully integrated proximity and ambient light sensor with I²C interface. 16-bit resolution, proximity range of up to 20 cm with programmable thresholds</td>
<td>50 mΩ, slew rate controlled load switch in WCSP package.</td>
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<tr>
<th>OPTOELECTRONICS</th>
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<tr>
<td><strong>TEMD6200FX01</strong></td>
<td></td>
</tr>
<tr>
<td>Ambient light sensor with high-speed and high-sensitivity. PIN photodiode output.</td>
<td></td>
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</table>
### What are Smart Glasses?

The next wave in wearable computers. Offering heads-up display (HUD) or augmented reality (AR) with transparent overlay of projected digital images.

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<tr>
<td><strong>MCT0603 / MCS0402</strong></td>
<td><strong>TL0</strong></td>
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<tr>
<td>Professional and precision chip resistors with excellent stability. CECC approved and sulfur resistant.</td>
<td>Solid tantalum Microtan® chip capacitors. High-CV leadframeless molded low-profile devices for space constrained designs.</td>
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<th>RECTIFIERS</th>
<th>NON LINEAR RESISTORS</th>
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<td><strong>IFSC</strong></td>
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<tr>
<td>Fully integrated proximity and ambient light sensor with PC interface. 16-bit resolution, proximity range of up to 20 cm with programmable thresholds.</td>
<td>Low-profile, high-current inductors for DC/DC converter filtering.</td>
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<tr>
<td><strong>TEM6200FX01</strong></td>
<td><strong>DG9451</strong></td>
</tr>
<tr>
<td>Ambient light sensor with high-speed and high-sensitivity PIN photodiode output.</td>
<td>8-channel, dual 4-channel, triple 2-channel multiplexers.</td>
</tr>
</tbody>
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<thead>
<tr>
<th>OPTOELECTRONICS</th>
<th>ENERGY STORAGE CAPACITORS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VSMY3850 / VSMG3700</strong></td>
<td><strong>196 HVC ENYCAP™</strong></td>
</tr>
<tr>
<td>High-speed infrared emitting diode. 850 nm, SurfLight™ surface emitter technology with high radiant intensity of 17 mW/Sr.</td>
<td>Hybrid storage capacitors with extremely small profile and high energy density. Instant rechargeable, suitable for solar power charging.</td>
</tr>
</tbody>
</table>
Vishay has developed a number of software support tools to assist design engineers. These include SPICE models, and custom calculators. The full list of support tools can be found at http://www.vishay.com/how/design-support-tools/

Here are a few examples:

- **Ohm’s Law Calculator**
- **IHLP® Inductor Loss Calculator Tool**
- **Optical Sensor Current Estimator**
Smart Meters

What are Smart Meters?
Remotely record and monitor energy consumption within the home with the ability to reduce load and disconnect-reconnect in emergencies.

RESISTORS
Z300-C
Axial cemented wirewound resistors with high voltage surge (up to 12 kV) capability and non flammable cement coating.

FILM CAPACITORS
F1772S
Interference suppression film capacitor, class X2, MKT 310 Vdc, high stability grade. Withstanding 85 °C / 85 % RH for 1000 h at 240 Vdc.

MOSFETS
SiHD7N60E
E Series 600 V Power MOSFET with maximum RDS(on) of 600 mΩ and continuous current of 7 A in popular DPAK package.

DIODES
SMAJxx
Surface-mount TRANSZORB transient voltage suppressors with 400 W peak pulse power capability with a 10/1000 μs waveform. AEC-Q101 qualified.

RESISTORS
WSMS
Power Metal Strip® meter shunt resistor with very low resistance value (down to 0.0001 Ω) offering high accuracy for smart meter applications.

RESISTORS
MM / SMM
Thin film Mini-MELF resistors with unrivaled surge handling capability for ultimate stability over lifetime. AEC-Q200 qualified, approved acc. EN 140401-803, sulfur resistant, and Vishay Green.

OPTOELECTRONICS
VOW2611
10 MΩ widebody high-speed, high-isolation optocoupler with > 10 mm creepage/clearance.

NON LINEAR RESISTORS
VDRH14-VDRH20
VDR metal oxide varistors high surge resistor with extended operating temperature to 125°C. UL recognized up to 105°C (selected types).

OPTOELECTRONICS
VSMB2020X01
High-speed and high-power infrared emitting diodes with peak wavelength of 940 nm, radiant intensity of 40 mW/sr at If = 100 mA, 15 ns rise/fall time, and angle of half intensity of ± 12°.

INDUCTORS
IDCP2218
High-current, surface mount non-shielded inductors with low cost filtering and DC/DC conversion.

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MLCC Hi Q Capacitors
Ultra-stable dielectric low dissipation factor (DF) capacitors using robust design build with wet process. Non magnetic copper or epoxy bondable available.

ICs
SIP32419/SIP32429
28 V, 56 mΩ, load switch with programmable current limit and slew rate control. Simplifies design while increasing reliability of the circuit.

In The Home

(LoT)

What are Smart Meters?
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**Lighting Controls**

**What are Lighting Controls?**
Control and monitor lighting in the home for safety and energy savings.

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<tr>
<th>Category</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESISTORS</td>
<td>VR25</td>
<td>High-ohmic (100K - 22 MΩ), high-voltage metal glaze lead-ed resistors with continuous voltage of 1600 V and pulse loading capacity of 7 kV in small 0207 package.</td>
</tr>
<tr>
<td>RESISTORS</td>
<td>HVW</td>
<td>Carbon film (metal alloy) resistors. Special purpose, high-voltage up to 15 kV with wide value range of 1 kΩ to 200 MΩ.</td>
</tr>
<tr>
<td>RESISTORS</td>
<td>PR01/02/03</td>
<td>High-power metal film leaded resistors with power ratings of 1 W, 2 W, and 3 W. Non flammable lacquer coating in small package with various lead forming options.</td>
</tr>
<tr>
<td>MOSFETS</td>
<td>SiHD7N60E</td>
<td>E Series 600 V power MOSFET with maximum R_DS(on) of 600 mΩ and continuous current of 7 A in popular DPAK package.</td>
</tr>
<tr>
<td>RECTIFIERS</td>
<td>VT10200C</td>
<td>Trench MOS barrier Schottky rectifier with low forward voltage drop and low power losses.</td>
</tr>
<tr>
<td>OPTOELECTRONICS</td>
<td>TEMT6200FX01</td>
<td>Ambient light sensor in miniature 0805 package with phototransistor output. Wavelength of peak sensitivity of 550 nm and linearity over operating temperature range of -40 to +100 °C.</td>
</tr>
<tr>
<td>FILM CAPACITORS</td>
<td>MKP385</td>
<td>Single metallized AC and pulse capacitors. MKP radial plotted type. Low loss dielectric, small dimensions for high density packaging.</td>
</tr>
<tr>
<td>OPTOELECTRONICS</td>
<td>VO4157</td>
<td>Zero crossing phototriac optocoupler. 5000 V/μs dV/dt minimum with 800 V blocking voltage, 300 mA on-state output current, and 1.6 mA trigger current with VISO of 5300 V.</td>
</tr>
<tr>
<td>OPTOELECTRONICS</td>
<td>VO2223A</td>
<td>Power phototriac optocoupler with optically coupled phototriac driving a power triac, load current of 1 A peak and 5300 V of input to output isolation in a DIP-8 package.</td>
</tr>
<tr>
<td>NON LINEAR RESISTORS</td>
<td>PTCCL...</td>
<td>PTC thermistors for overload protection with best current/size ratio. UL recognized.</td>
</tr>
</tbody>
</table>

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White Goods
Air Conditioners

What are White Goods?
Control and monitor the home environment to maximize comfort and efficiency.

Air Conditioners

- **MOSFETS**
  - **SUP85N10-10**
    - N-channel 100-V (D-S) 175 °C MOSFET with TrenchFET technology. Max $R_{DS(on)}$ down to 10 mΩ in popular TO-220 package.

- **IRFIPZ34G**
  - P-channel 60 V (D-S) MOSFET with rugged planar technology for maximum $R_{DS(on)}$ 140 mΩ and continuous current of -12 A in TO-220 FullPAK package.

- **FILM CAPACITORS**
  - **MKP1848C**

- **DIODES**
  - **P6KE200A**
    - TRANSZORB® transient voltage suppressors. 600 W peak pulse power capability with 10/1000 μs waveform. AEC-Q101 qualified

- **INDUCTORS**
  - **IMC1812**
    - Wirewound, surface-mount, molded RF inductors for high-frequency filtering

- **NON LINEAR RESISTORS**
  - **NTCLP450..**
    - NTC thermistor sensors. Miniature pipe sensor with fast time response against industry standards.

- **RECTIFIERS**
  - **PB3510**
    - Enhanced isoCink+™ bridge rectifiers with enhanced high-current density single in-line and UL recognition (file number E312394).

- **RESISTORS**
  - **CMA0204**
    - High pulse load MELF resistors with ESD capability to 6 kV. Up to 4 kV single pulse capability. Advanced carbon technology. Sulfur resistant, Vishay Green.

  - **WSHM2818**
    - Power Metal Strip® resistors with very high power rating of 7 W. Low resistance values, 0.001 Ω to 0.10 Ω, with tolerance of 1 % in small 2818 package.

  - **FEP30JP**
    - Dual common cathode ultrafast recovery rectifier with low switching losses and high efficiency.

  - **WSR**
    - Power Metal Strip® resistors with high power ratings to 5 W and low values down to 0.001 Ω in 4527 surface-mount package.

  - **OPTOELECTRONICS**
    - **TSOP34xxxR**
      - IR receiver with industry leading range of 45 m, directivity of ± 45°, and 38 kHz carrier frequency in copper leadframe for high humidity / saline atmospheres.
## Washing Machines

### ALUMINUM CAPACITORS

**093PMG-Si**
Miniaturized general-purpose snap-in power aluminum capacitors with useful life of 2000 h at 85°C.

### CERAMIC CAPACITORS

**VJ OMD Series**
Internal design reduces risk of shorts caused by board flex. Polymer termination available for intensive board flex requirements and 100 % voltage conditioning available up to 630 Vdc rating.

### MOSFETS

**IRFBE20**
N-channel 800-V (D-S) Power MOSFET built on rugged planar technology. Max RDS(on) of 6.5 Ω and maximum continuous current of 1.8 A. Available in popular TO-220 package.

**Si2307CDS**
P-channel 30-V (D-S) MOSFET using TrenchFET technology. Max RDS(on) down to 88 mΩ in popular SOT-23 package.

### NON LINEAR RESISTORS

**NTCS0603**
SMD 0603 NTC thermistors with glass protected flex terminations. AEC-Q200 compliant.

### OPTOELECTRONICS

**VO615A**
Phototransistor output optocoupler with broad operating temperature range of - 55 °C to + 110 °C and 6 kV peak transient overvoltage protection in a 4-pin DiP or SMD package. VDE, BSI, FIMKO, UL certified.

**VCNL4020**
Fully integrated proximity and ambient light sensor with I²C interface.

**VO615A**
Phototransistor output optocoupler with broad operating temperature range of - 55 °C to + 110 °C and 6 kV peak transient overvoltage protection in a 4-pin DiP or SMD package. VDE, BSI, FIMKO, UL certified.

**VR25**
High-ohmic (100K - 22 MΩ), high-voltage metal glaze leaded resistors with continuous voltage of 1600 V and pulse loading capacity of 7 kV in small 0207 package.

### RECTIFIERS

**GSIB2560-E3**
Single-phase, single in-line bridge rectifiers with UL recognition and high surge current capability.

**AC03...CS**
Cemented fusible wirewound safety resistors with 3 W, UL 1412 approved, non-flammable cement coating, and surge handling of 4 kV.

### FILM CAPACITORS

**MKP339**
Interference suppression film capacitors, MKP radial potted type, RFI X2 for standard across-the-line applications.

---

### What are White Goods?
Control and monitor the home environment to maximize safety and energy savings.
**White Goods**

**Induction Cooking**

What are White Goods?
Control and monitor the home environment to maximize safety and energy savings.

**Induction Cooking**

**CERAMIC CAPACITORS**

**VY1**
AC line rated ceramic disc capacitors. Class X1, 760 V<sub>ac</sub>, and class Y1, 500 V<sub>ac</sub>. X1/Y1 safety rating according to IEC 60384-14 (3rd edition) for highest reliability and lifetime over operating temperature range of -40 °C to +125 °C.

**MOSFETS**

**SiHB15N60E**
E Series 600 V n-channel MOSFET. High-performance, high-voltage technology with maximum R<sub>ds(on)</sub> 280 mΩ, maximum continuous current of 15 A, in popular D²PAK package.

**MOSFETs**

**Si2307CDS**
P-channel 30-V (D-S) MOSFET with TrenchFET technology. Max R<sub>ds(on)</sub> down to 88 mΩ in popular SOT-23 package.

**OPTOELECTRONICS**

**VCNL4010**
Fully integrated proximity and ambient light sensor with I<sub>C</sub> interface. 16-bit resolution, proximity range of up to 20 cm with programmable thresholds.

**RESISTORS**

**AC03**
Cemented wirewound resistors. Non flammable cement coating, power to 3 W, excellent pulse handling capability with good size to power ratio and various lead forming options.

**MOSFETs**

**Si2307CDS**
P-channel 30 V (D-S) MOSFET with TrenchFET technology for max R<sub>ds(on)</sub> down to 88 mΩ in SOT-23 package.

**DIODES**

**BAT54 / MMSZ5242B**
Small-signal Schottky diode (BAT54), and Zener diode (MMSZ5242B), featuring very low turn-on voltages and AEC-Q101 qualifications.

**FILM CAPACITORS**

**MKP1839HQ**
AC and pulse metallized polypropylene film capacitors. MKP axial type for low building height and precision applications down to ± 1 %.

**NON LINEAR RESISTORS**

**NTCALUG01A**
NTC thermistors, standard lug for robust surface temperature sensor. AEC-Q200 compliant, UL recognized.

**OPTOELECTRONICS**

**6N136**
1 MΩ high-speed optocoupler with photodiode-to-transistor output. Transmit signal frequency of 2 MHz and isolation test voltage of 5300 V<sub>rms</sub>.
# White Goods

## Refrigerators / Freezers

What are White Goods?
Control and monitor the home environment to maximize safety and energy savings.

### Refrigerators / Freezers

<table>
<thead>
<tr>
<th>Component Type</th>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIODES</td>
<td>BAT54S</td>
<td>Small-signal Schottky diodes, single and dual, featuring very low turn-on voltage. AEC-Q101 qualified.</td>
</tr>
<tr>
<td>DIODES</td>
<td>VJ222DY182XXUSTX1</td>
<td>Robust design build with wet process. IEC 60384-14:2005, CAN/CSA/cCSAus, and ANSI/UL CB certificates. Surface-mount design for simpler assembly and reduced board space requirements.</td>
</tr>
<tr>
<td>NON LINEAR RESISTORS</td>
<td>NTCACAPE3...</td>
<td>NTC thermistors, double insulated refrigerator sensors.</td>
</tr>
<tr>
<td>RESISTORS</td>
<td>AC03</td>
<td>Cemented wirewound resistors. Non flammable cement coating, power ratings to 3 W, excellent pulse handling capability with good size to power ratio, and various lead forming options.</td>
</tr>
<tr>
<td>RESISTORS</td>
<td>AC09...CS</td>
<td>Cemented fusible wirewound safety resistors. Power rating to 5 W, UL 1412 approved, non flammable cement coating for surge handling of 6 kW. Safe and silent fusing to prevent flame or explosion.</td>
</tr>
<tr>
<td>CERAMIC CAPACITORS</td>
<td>VY1</td>
<td>AC line rated ceramic disc capacitors. Class X1, 760 V, and class Y1, 500 V, X1/Y1 safety rating according to IEC 60384-14 (3rd edition) for highest reliability and lifetime over operating temperature of -40 °C to +125 °C.</td>
</tr>
<tr>
<td>FILM CAPACITORS</td>
<td>MKP339</td>
<td>Interference suppression film capacitors, MKP radial potted type, RFI X2 for standard across-the-line applications.</td>
</tr>
<tr>
<td>RECTIFIERS</td>
<td>MURS160-M3</td>
<td>Surface-mount ultrafast plastic rectifier with low switching losses, ultrafast reverse recovery time, and high efficiency.</td>
</tr>
<tr>
<td>OPTOELECTRONICS</td>
<td>VO615A</td>
<td>Phototransistor output optocoupler with broad operating temperature range of -55 °C to +110 °C and 6 kV peak transient overvoltage protection in a 4-pin DIP or SMD package. VDE, BSI, FIMKO, UL certified.</td>
</tr>
<tr>
<td>MOSFETs</td>
<td>IRF740B</td>
<td>High-voltage 400 V VDS MOSFET with dynamic dV/dt rating, repetitive avalanche rated, fast switching, ease of paralleling, and simple drive requirements.</td>
</tr>
<tr>
<td>MOSFETs</td>
<td>SI9407BDY</td>
<td>P-channel 60 V (D-S) MOSFET using classic TrenchFET® technology with maximum R_{DS(on)} down to 120 mΩ in popular SO-8 package.</td>
</tr>
<tr>
<td>MOSFETs</td>
<td>Si9407BDY</td>
<td>P-channel 60 V (D-S) MOSFET using classic TrenchFET® technology with maximum R_{DS(on)} down to 120 mΩ in popular SO-8 package.</td>
</tr>
<tr>
<td>RESISTORS</td>
<td>WSL2512</td>
<td>Power Metal Strip® resistors. Surface-mount with extremely low resistance values from 0.0005 Ω to 0.5 Ω, tolerance of 1 %, and high power of 1 W in 2512 size.</td>
</tr>
<tr>
<td>RECTIFIERS</td>
<td>MURS160-M3</td>
<td>Surface-mount ultrafast plastic rectifier with low switching losses, ultrafast reverse recovery time, and high efficiency.</td>
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What are Domestic Robots?

A domestic robot, or service robot, is an autonomous robot that is used for household chores.

Robotic Vacuum

MOSFETs

Si7938DP
Dual n-channel 40 V (D-S) MOSFET using TrenchFET® Gen III technology for maximum $R_{DS(on)}$ down to 5.8 mΩ in thermally enhanced PowerPAK® SO-8 package.

DISPLAYS

LCD, Color TFT, OLED
High-quality displays offer excellent Human to Machine interface solutions using standard and custom display modules and high brightness options for LCD, OLED, and color TFT.

OPTOELECTRONICS

VSLB3948
High-speed infrared-emitting diode with peak wavelength of 940 nm in a T-1 clear package. Intensity of 65 mW/sr, $I_l = 100$ mA, angle of half intensity: $\phi = \pm 22^\circ$, and rise / fall time of 15 ns.

OPTOELECTRONICS

TEFT4300
Silicon NPN phototransistor with peak sensitivity of 925 nm, spectral bandwidth from 875 nm to 1000 nm ($\lambda_{0.5}$), angle of half sensitivity of $\pm 30^\circ$, and output current of 3.2 mA at $E_r = 1$ mW/cm²

OPTOELECTRONICS

TSAL6100
High-power infrared-emitting diode with peak wavelength of 940 nm in a T-1 package. Typ. radiant intensity of 170 mW/sr at $I_l = 100$ mA, 1450 mW/sr at $I_l = 1$ mA, and angle of half intensity: $\phi = \pm 10^\circ$.

OPTOELECTRONICS

VO2223A
Power phototriac optocoupler with optically coupled phototriac driving a power triac, load current of 1 A$_{rms}$, and 5300 V of input to output isolation in a DIP-8 package.

DIODES

SMBJ26CA-E3/52
Surface-mount TransZorb® transient voltage suppressors. 600 W peak pulse power capability with a 10/1000 μs waveform. Available in unidirectional and bidirectional.

RECTIFIERS

SS10P6-M3/86A
High-current density surface-mount Schottky barrier rectifier in very low profile (typ. 1.1 mm). AEC-Q101 qualified.

INDUCTORS

IHLP-6767GZ
Low-profile, high-current IHLP® inductors. Large size, low saturation, and high current SMD inductor. DC/DC conversion and filter applications.

CERAMIC CAPACITORS

MLCC SMD Safety Capacitor
IEC 60384-14:2005, CAN/CSA/cCSAus, and ANSI/UL CB certificates. Surface-mount design for simpler assembly and reduced board space requirements. Available in NP0 (C0G) or X7R dielectrics.

OPTOELECTRONICS

TSOP34438
IR receiver modules with industry leading range of 45 m, directivity of $\pm 45^\circ$, minimum irradiance of 0.08 mW/m², and AGC-4 noise suppression.

OPTOELECTRONICS

VO3052
Optocoupler, non-zero crossing phototriac with 1500 V/µs $dv/dt$ minimum, 2000 V/µs typical, 600 V blocking voltage, 100 mA on-state output current, and 10 mA trigger current with VIS0 of 5300 V.

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