



Vishay Intertechnology, Inc.

Industrial

(Detection and Initial Safety Devices)



One of the World's Largest Manufacturers of
Discrete Semiconductors and Passive Components





Industrial

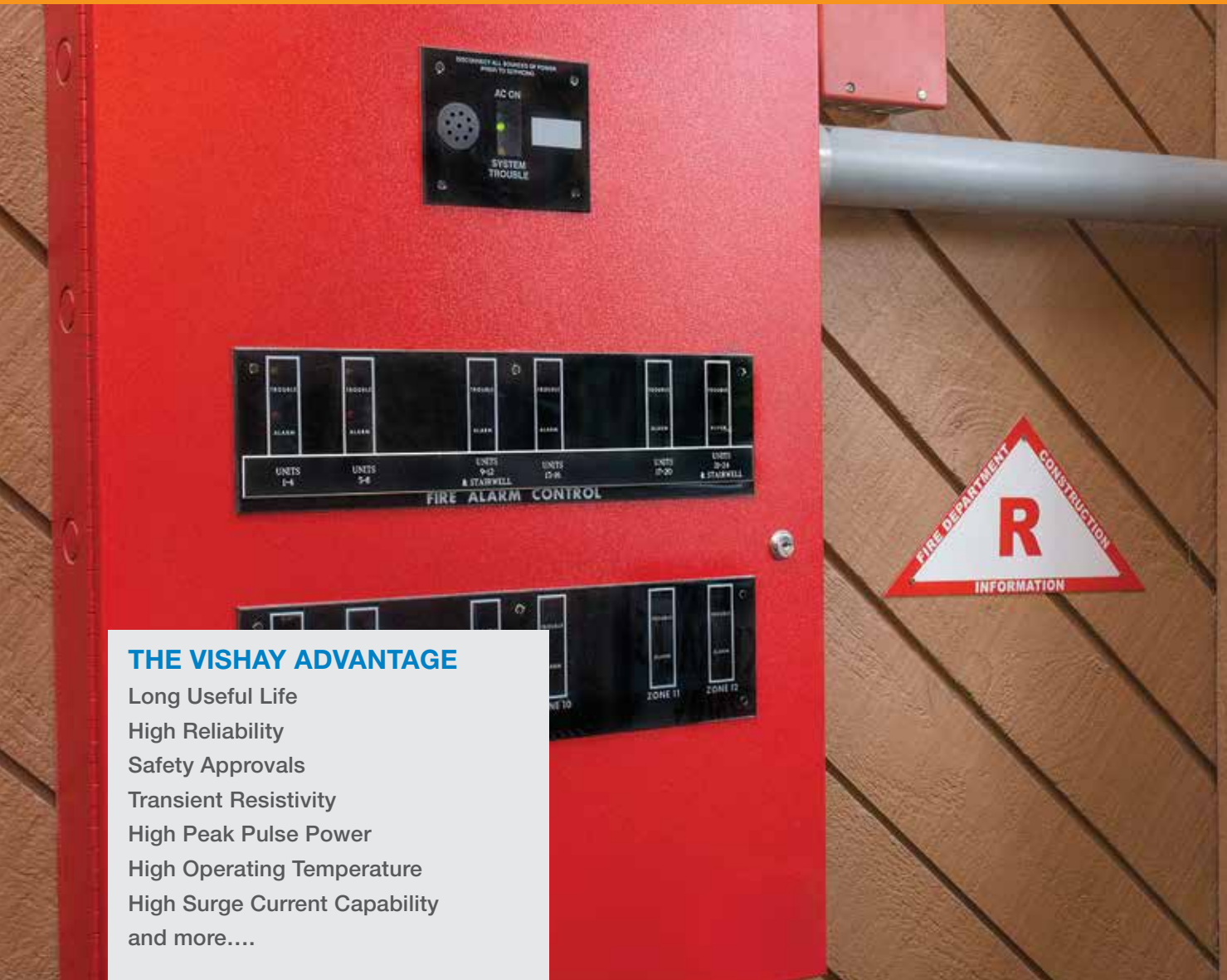
Detection and Initial Safety Devices

| | |
|--------------|---|
| Smoke | 2 |
| Flame / Fire | 3 |
| Gas | 4 |
| Heat | 5 |
| Water | 6 |
| Radiation | 7 |

More information on the Engineer's Toolbox, including product datasheet links, can be found at www.vishay.com/ref/et3.

For inquiries, please contact your local sales representative.

Key components for DETECTION AND INITIAL SAFETY DEVICES



THE VISHAY ADVANTAGE

- Long Useful Life
- High Reliability
- Safety Approvals
- Transient Resistivity
- High Peak Pulse Power
- High Operating Temperature
- High Surge Current Capability
- and more....

Smoke



Flame / Fire



Gas



Heat



Water



Radiation





Smoke



MOSFETs

N-Channel 60 V (D-S) MOSFET[2N7002K](#)

- TrenchFET® technology, maximum $R_{DS(on)}$ 2 Ω
- Popular SOT-23 packaging



OPTOELECTRONICS

High-Power Infrared Emitting Diode with Peak Wavelength of 940 nm in a T-1 $\frac{3}{4}$ Package[TSAL6100](#)

- Typical radiant intensity of 170 mW/sr at $I_F = 100$ mA, 1450 mW/sr at $I_F = 1$ mA
- Angle of half intensity: $\phi = \pm 10^\circ$



DIODES

Small-Signal Zener Diodes[MMSZ5258](#)

- AEC-Q101 qualified
- ESD capability according to AEC-Q101



FUSES

Thin Film Chip Fuses[MFU0603FF](#)

- Very quick acting fuse characteristics
- Outstanding stability of fusing characteristics



OPTOELECTRONICS

High-Speed and High-Sensitivity PIN Photodiodes in a Miniature SMD Package[VEMD2023X01](#)

- Daylight blocking filter matches perfectly with 830 nm to 950 nm IR emitters
- Angle of half sensitivity of $\pm 35^\circ$ in a gullwing or reverse gullwing package



NON-LINEAR RESISTORS

SMD 0603, Glass Protected NTC Thermistors[NTCS0603](#)

- Standard series, AEC-Q200 compliant
- Glass protected with soft terminations



INDUCTORS

High-Current, Surface-Mount Inductors – Non-Shielded[IDCP-2218](#)

- Low cost filtering and DC/DC conversion inductor



RESISTORS

Professional Thin Film Chip Resistors[MCS 0402](#)

- Best in class surge handling capability, excellent overall stability class 0.5
- CECC approved acc. EN 140401-801, sulfur resistant



TANTALUM CAPACITORS

Solid Tantalum Surface-Mount Chip Capacitors, TANTAMOUNT®, Molded Case[293D](#)

- Molded tantalum capacitor, standard industrial grade
- General purpose capacitor



RESISTORS

Thick Film Surface-Mount Chip Resistors, Wraparound, Extremely Low Value[RCWE](#)

- Low resistance values from 0.01 Ω to 0.99 Ω and tolerance of 1 %
- Thick film construction with 2x power capacity



OPTOELECTRONICS

High-Power SurfLight™ Emitter with 850 nm Peak Wavelength[VSMY2850G](#)

- SMD gullwing and reverse gullwing package with dimensions of 2.3 mm x 2.3 mm x 2.8 mm
- Radiant intensity of 100 mW/sr with angle of half intensity: $\phi = \pm 10^\circ$



NON-LINEAR RESISTORS

VDR Metal Oxide Varistors Standard[VDRS..](#)

- Standard over-voltage surge protector
- UL recognized





Flame / Fire



CERAMIC CAPACITORS

Radial Leaded Multilayer Ceramic Capacitors

[K Series](#)

- High capacitance value in small size
- Rated voltages: 50 V, 100 V, 200 V, and 500 V



OPTOELECTRONICS

High-Power SurfLight™ Emitter with 850 nm Peak Wavelength

[VSMY2850G](#)

- SMD gullwing and reverse gullwing package with dimensions of 2.3 mm x 2.3 mm x 2.8 mm
- Radiant intensity of 100 mW/sr with angle of half intensity: $\phi = \pm 10^\circ$



CERAMIC CAPACITORS

Body Sizes: 0402 to 3838, Excellent Power Handling Capabilities

[MLCC RF Capacitors](#)

- Non-magnetic available with copper or epoxy bondable terminations
- Lead-bearing terminations available for hi-rel applications



OPTOELECTRONICS

PIN Photodiode with High Speed and High Radiant Sensitivity

[BPV22NF](#)

- Daylight blocking filter matched with IR emitters operating at wavelength 870 nm to 950 nm
- Large radiant sensitive area of 7.5 mm², angle of half sensitivity: $\phi = \pm 60^\circ$



DISPLAYS

High-Quality Displays Offer Excellent Human-to-Machine Interface Solutions

[LCD, Color TFT, OLED](#)

- Standard or customized glass / modules for specific applications and monitoring
- Low cost options for LCD / OLED / TFT for industrial applications



RESISTORS

Professional Thin Film Chip Resistors

[MCT0603-AT](#)

- Best in class surge handling capability, excellent overall stability class 0.5
- CECC approved acc. EN 140401-801, sulfur resistant



NON-LINEAR RESISTORS

NTC Thermistors, 2-Point Mini Chip Sensor, Flexible Leads

[NTCLE305E4](#)

- Miniature insulated leads
- AEC-Q200 compliant, fast response time for exposed mounting



OPTOELECTRONICS

Optocoupler with Phototransistor Output and Trigger Current of $I_F = 1$ mA[VOL618A](#)

- High current transfer ratio, and high isolation voltage of 5000 V_{RMS}
- Operating temp. from -55 °C to +110 °C in a 4-pin LSOP, mini-flat package



FILM CAPACITORS

Interference Suppression Film Capacitor, Class X2, MKT 310 V_{AC}, High Stability Grade[F1772S](#)

- RFI X2 film capacitors for continuous across the line and series impedance app.
- Withstanding 85 °C / 85 % RH for 1000 h at 240 V_{AC}



ICs

1.0 A Slew Rate Controlled Load Switch with Reverse Blocking in SC70-6 and TDFN4 1.2 mm x 1.6 mm

[SiP32431](#)

- 1.5 V to 5.5 V input voltage range, very low $R_{DS(on)}$, typ. 105 mΩ at 5 V
- Slew rate controlled turn-on time: 100 μs, low quiescent current < 1 μA



TANTALUM CAPACITORS

vPolyTan™ Solid Tantalum Surface-Mount Chip Capacitors, Molded Case, High-Performance Polymer Type

[T55 Series](#)

- Ultra-low ESR
- Moisture sensitivity level 3



OPTOELECTRONICS

High Sensitivity PIN Photodiode in Leadless Low-Profile Package

[VEMD5110X01](#)

- 0.8 mm height SMD photodiode featuring a chip with a 7.5 mm² sensitive area
- Daylight blocking filter matched with IR emitters operating at wavelength 870 nm to 950 nm





Gas



RECTIFIERS

Surface-Mount Glass Passivated Ultrafast Rectifier[EGF1T](#)

- Avalanche surge energy capability
- Low switching losses, high efficiency

CERAMIC CAPACITORS

Axial Leaded Multilayer Ceramic Capacitors[A Series](#)

- High capacitance value in small size
- Rated voltages: 50 V, 100 V, 200 V, and 500 V

ICs

Enhanced Versions of Vishay's Quad SPST CMOS Analog Switches[DG444B, DG445B](#)

- Supports single and dual power operation, rail to rail signal switching capable
- 10 pA / typical low leakage and 1 pC charge injection

OPTOELECTRONICS

Optocoupler with Phototransistor Output and Trigger Current of $I_F = 1$ mA[VOL618A](#)

- High current transfer ratio, and high isolation voltage of 5000 V_{RMS}
- Operating temp. from -55 °C to +110 °C in a 4-pin LSOP, mini-flat package

MOSFETs

N-Channel 600 V Power MOSFET[IRFR1N60APBF](#)

- Rugged planar technology, maximum $R_{DS(on)}$ 7 Ω
- Popular DPAK packaging, maximum continuous current of 1.4 A

CERAMIC CAPACITORS

Ultra-Stable Dielectric Formulation, Low Dissipation Factor (DF)[MLCC High Q Capacitors](#)

- Robust design build with wet process and noble metal electrodes

RESISTORS

High-Precision Wraparound Thin Film Chip Resistors[P0805](#)

- Low TCR down to 5 ppm/°C (-55 °C to +155 °C), tight tolerance down to 0.01 %
- Sulfur resistant, failure rate E7 level, from 10R up to 200M for P series

FILM CAPACITORS

Interference Suppression Film Capacitor – Class X2, Axial MKT 253 V_{AC}[F1773](#)

- RFI X2 film capacitors for continuous across the line and series impedance apps
- Withstanding 85 °C / 85 % RH for 1000 h at 240 V_{AC}

RESISTORS

Professional Thin Film Chip Resistors[MCS0402...e3](#)

- Best in class surge handling capability, excellent overall stability class 0.5
- CECC approved acc. EN 140401-801, sulfur resistant

MOSFETs

N-Channel 25 V (D-S) MOSFET[SiR808DP](#)

- Halogen-free according to IEC 61249-2-21 definition
- Optimized for high-side synchronous rectification

ALUMINUM CAPACITORS

Double Layer Aluminum Capacitors[196DLC](#)

- Energy storage for backup of CMOS in all fields of electronics
- Unlimited charge and discharge cycle numbers

FILM CAPACITORS

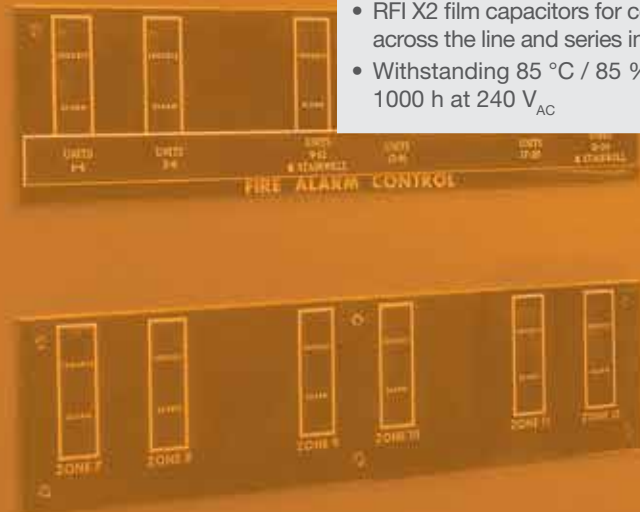
Metallized Polypropylene Film Capacitor, Related Document: IEC 60384-16[MKP1841](#)

- High-voltage, high-current, and high-pulse operations

View datasheets for these products
www.vishay.com/ref/et3in3c



Heat



RESISTORS

Thin Film Mini-MELF Resistors

[SMM0204...e3](#)

- Unrivalled surge handling capability, ultimate stability over lifetime
- Automotive Grade quality, halogen-free, GREEN product



FILM CAPACITORS

Interference Suppression Film Capacitor, Class X2 MKT 310 V_{AC}, High Stability Grade[F1772S](#)

- RFI X2 film capacitors for continuous across the line and series impedance apps
- Withstanding 85 °C / 85 % RH for 1000 h at 240 V_{AC}



ICs

1.0 A Slew Rate Controlled Load Switch with Reverse Blocking in SC70-6 and TDFN4

1.2 mm x 1.6 mm

[SiP32431](#)

- Industry's lowest operating current (only 50 pA)
- Ideal for battery operated equipment

OPTOELECTRONICS

Optocoupler with Phototransistor Output; ATEX Certified for Explosive Environments

[CNY65Exi](#)

- ATEX certificate: PTB 03 ATEX 2033 U, Gas: II (1) G (EX ia) IIC, Dust: II (1) D (EX ia) IIIC
- V_{ISO} of 11 600 V_{peak} for 1 minute



CERAMIC CAPACITORS

IEC 60384-14:2005, CAN/CSA/cCSAus, and ANSI/UL CB Certificates

[MLCC SMD Safety Capacitor](#)

- Surface-mount design: simpler assembly and reduced board space requirement
- Available in NP0 (C0G) or X7R dielectrics



RESISTORS

High-Stability, High-Temperature 230 °C Thin Film Wraparound Chip Resistors

[PHT \(Sizes 0402 to 2010\)](#)

- Operating temp. up to 215 °C, low TCR down to 15 ppm/°C (-55 °C to +215 °C)
- Sulfur resistant, from 10R up to 7.5M, tight tolerance down to 0.05 %





Water

ICs

**1.8 V to 5.5 V, 4 W
Dual SPST Switches**[DG721](#)

- High precision, low-noise signal switching
- Low leakage, charge injection, and parasitic capacitance



CERAMIC CAPACITORS

**Standard Reflow Process Assembly,
High-Reliability Ceramic-Oxide
Body Construction**[Ceramic Chip Antenna](#)

- Frequency range from 400 MHz to 5 GHz
- Wide operating temperature range: -40 °C to +85 °C



RESISTORS

**Professional Thin Film
Chip Resistors**[MCT0603...e3](#)

- Best in class surge handling capability, excellent overall stability class 0.5
- CECC approved acc. EN 140401-801, sulfur resistant



ENERGY STORAGE CAPACITORS

**Hybrid Storage
Capacitors**[196 HVC ENYCAP™](#)

- Power back up for memory controller, industrial PC, real time clock
- Storage device for energy harvesting, emergency light and micro power supplies



DISPLAYS

**High-Quality Displays Offer
Excellent Human-to-Machine
Interface Solutions**[LCD, Color TFT, OLED](#)

- Standard or customized glass / modules for specific applications and monitoring
- Can withstand extensive temperatures and extreme conditions



FILM CAPACITORS

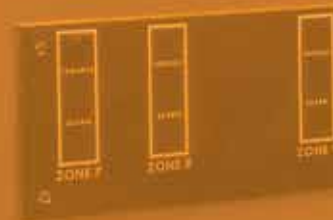
**Interference Suppression Film
Capacitor – Class X2,
Axial MKT 253 V_{AC}**[F1773](#)

- RFI X2 film capacitors for continuous across the line and series impedance apps
- Withstanding 85 °C / 85 % RH for 1000 h at 240 V_{AC}





Radiation



RESISTORS

High-Stability Thin Film Flat Chip Resistors[TNPW...e3](#)

- Excellent overall stability, endurance < 0.05 %, resistance range from 10R to 3M
- AEC-Q200 qualified, sulfur resistant, halogen-free

MOSFETs

Dual P-Channel 30 V (D-S) MOSFET[Si4925DDY](#)

- TrenchFET® technology providing two p-channel devices with maximum $R_{DS(on)}$ of 29 mΩ
- Proven dual SO-8 package

TANTALUM CAPACITORS

Solid-Electrolyte TANTALEX® Capacitors, Axial-Leaded, Molded Case[173D](#)

- Miniature axial leaded solid tantalum capacitors in 5 case sizes
- Laser marked molded flame retardant case

DISPLAYS

High-Quality Displays Offer Excellent Human-to-Machine Interface Solutions[LCD, Color TFT, OLED](#)

- Standard or customized glass / modules for specific applications and monitoring
- Can withstand extensive temperatures and extreme conditions

RESISTORS

Conformal, Single In-Line Thin Film Resistor, Through-Hole Network (Standard)[VTF](#)

- 3 to 10-pin SIP configuration available with resistance values up to 2 MΩ
- Custom networks, schematics avail. with tracking down to 2 ppm/°C, ratio tol. 0.02 %

OPTOELECTRONICS

Infrared Transceiver with Data Rate up to 115.2 kbit/s[TFBS4711](#)

- Small package (H x L x W): 1.9 mm x 3 mm x 6 mm and transmit range of 1 meter
- Idle current: 70 μA, shutdown current: 10 nA, operates from 2.4 V to 5.5 V

FILM CAPACITORS

Interference Suppression Film Capacitor, Class X2 MKT 310 V_{AC} High Stability Grade[F1772S](#)

- RFI X2 film capacitors for continuous across the line and series impedance apps
- Withstanding 85 °C / 85 % RH for 1000 h at 240 V_{AC}

INDUCTORS

Inductors, Commercial, Molded, Shielded, Axial Leaded[IMS05](#)

- Shielded axial RF inductor for high-frequency filtering

RESISTORS

High-Precision Wraparound, Thin Film Chip Resistors[P0805](#)

- Low TCR down to 5 ppm/°C (-55 °C to +155 °C), tight tolerance down to 0.01 %
- Sulfur resistant, failure rate E7 level, from 10R up to 200M for P series



Vishay Intertechnology, Inc.



A *WORLD OF*
SOLUTIONS