



Vishay Intertechnology, Inc.

Transportation (Off-Road Equipment)



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





Transportation Off-Road Equipment

Pedal Position Controls	2
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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 OFF-ROAD EQUIPMENT



THE VISHAY ADVANTAGE

AEC Qualifications
Robust Design
High Reliability
Durability
Long Life
and more...

Pedal Position Controls



Steering Controls



Panel Controls





Pedal Position Controls



OPTOELECTRONICS

Subminiature Dual-Channel Transmissive Optical Sensor with Deep Slot for Turn-and-Push Encoding



[TCUT1600X01](#)

- Resolve direction and speed with dual-channel transmissive (interrupter) sensor
- High slot height for turn-and-push sensing

RESISTORS

High-Stability Thin Film Flat Chip Resistors



[TNPW e3](#)

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

SENSORS

Throttle Position Sensor in Hall Effect Technology, Hollow and D-Shaft Versions



[981 HE](#)

- Accurate linearity down to ± 0.5 %, hollow and d-shaft versions available
- Spring-loaded types available, dedicated to applications in harsh environments

RESISTORS

Precision Automotive Thin Film Chip Resistors, AEC-Q200 Qualified, 2 kV ESD Rating



[PAT](#)

- Moisture-resistant tantalum nitride film and added silicon nitride layer for ESD
- Wide resistance range from 2.5 Ω to 3 M Ω with tolerance down to ± 0.1 %

MOSFETs

Automotive P-Channel 60 V (D-S) 175 $^{\circ}$ C MOSFET



[SQJ461EP-T1-GE3](#)

- TrenchFET[®] technology, AEC-Q101 qualified, maximum $R_{DS(on)}$ 16 m Ω
- Thermally enhanced PowerPAK[®] SO-8L packaging

RESISTORS

Thick Film Surface-Mount Chip Resistors, Wraparound and Extremely Low Value



[RCWE](#)

- Low resistance values from 0.01 Ω to 0.976 Ω and tolerance of 1 %
- Thick film construction with 2x power capacity

DIODES

Surface-Mount PAR[®] Transient Voltage Suppressors



[TPSMA](#)

- AEC-Q101 qualified, $T_J = 185$ $^{\circ}$ C capability suitable for automotive requirements
- 400 W peak pulse power capability with a 10/1000 μ s waveform

NON-LINEAR RESISTORS

SMD 0603, Glass Protected NTC Thermistors



[NTCS0603](#)

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

CERAMIC CAPACITORS

AEC-Q200 Qualified, Broad Range of Sizes and Working Voltages, C0G (NP0), X7R, and X8R

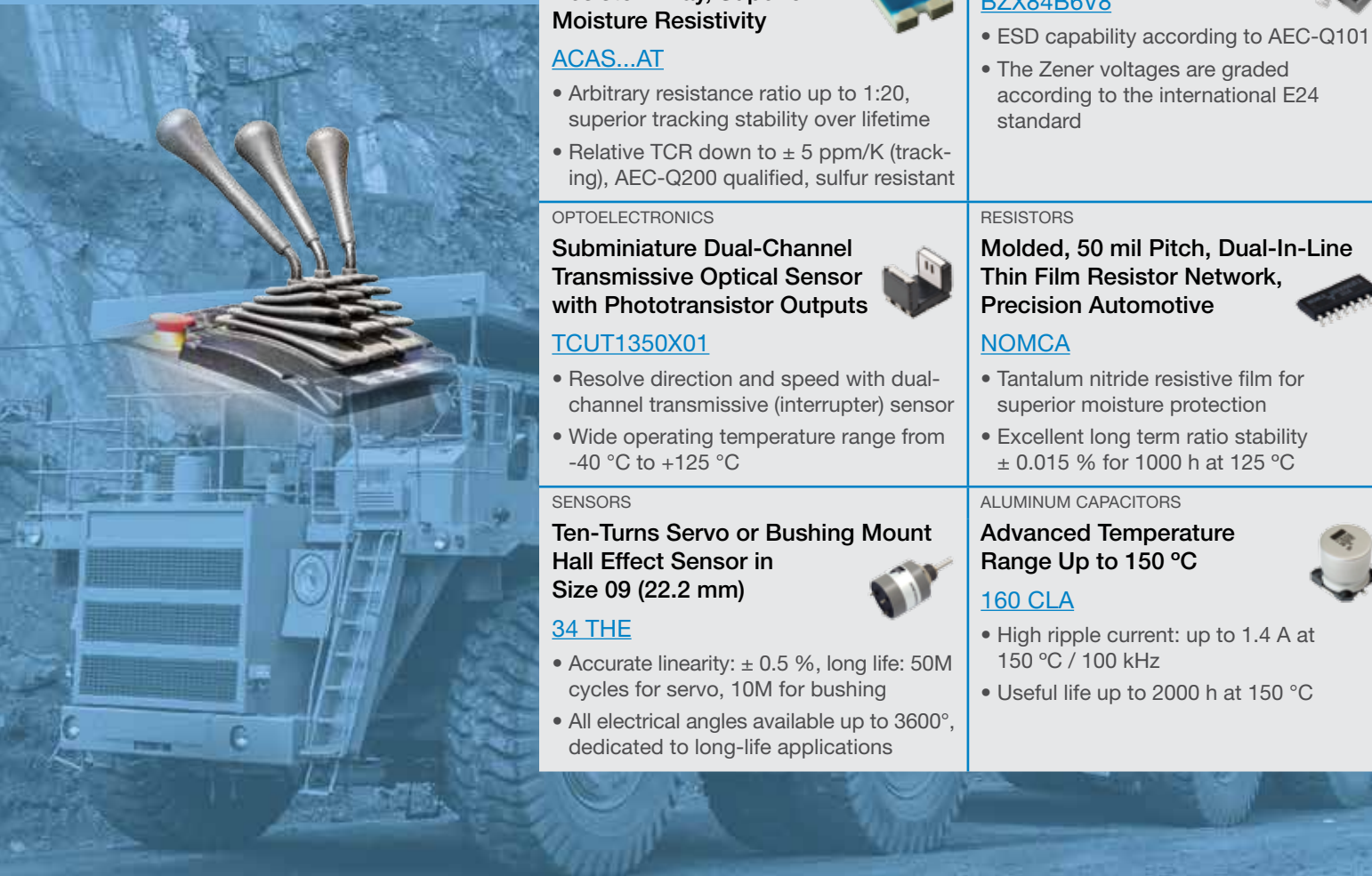


[VJ....31/VJ....34 Automotive MLCC](#)

- RoHS and GREEN compliant parts available
- AgPd termination available for epoxy bonding

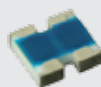


Steering Controls



RESISTORS

Precision Thin Film Chip Resistor Array, Superior Moisture Resistivity



[ACAS...AT](#)

- Arbitrary resistance ratio up to 1:20, superior tracking stability over lifetime
- Relative TCR down to ± 5 ppm/K (tracking), AEC-Q200 qualified, sulfur resistant

DIODES

Small-Signal Zener Diodes



[BZX84B6V8](#)

- ESD capability according to AEC-Q101
- The Zener voltages are graded according to the international E24 standard

TANTALUM CAPACITORS

Solid Tantalum Chip Capacitors, High CV Leadframeless Molded, Automotive Grade



[TP8](#)

- Smallest AEC-Q200-qualified tantalum capacitor with case sizes as small as 0603
- Perfect for space-constrained designs

OPTOELECTRONICS

Subminiature Dual-Channel Transmissive Optical Sensor with Phototransistor Outputs



[TCUT1350X01](#)

- Resolve direction and speed with dual-channel transmissive (interrupter) sensor
- Wide operating temperature range from -40°C to $+125^{\circ}\text{C}$

RESISTORS

Molded, 50 mil Pitch, Dual-In-Line Thin Film Resistor Network, Precision Automotive



[NOMCA](#)

- Tantalum nitride resistive film for superior moisture protection
- Excellent long term ratio stability $\pm 0.015\%$ for 1000 h at 125°C

RECTIFIERS

Surface-Mount Glass Passivated Rectifier



[S1G](#)

- Glass passivated diode technology
- AEC-Q101 qualified

SENSORS

Ten-Turns Servo or Bushing Mount Hall Effect Sensor in Size 09 (22.2 mm)



[34 THE](#)

- Accurate linearity: $\pm 0.5\%$, long life: 50M cycles for servo, 10M for bushing
- All electrical angles available up to 3600° , dedicated to long-life applications

ALUMINUM CAPACITORS

Advanced Temperature Range Up to 150°C



[160 CLA](#)

- High ripple current: up to 1.4 A at 150°C / 100 kHz
- Useful life up to 2000 h at 150°C

NON-LINEAR RESISTORS

NTC Thermistors, SMD 0402, 0603, 0805, and 1206 Chip



[NTHS...](#)

- Standard series
- Glass protected

RESISTORS

Lead (Pb)-Bearing High-Stability Thin Film Chip Resistors



[TNPW](#)

- Excellent overall stability, endurance $< 0.05\%$, resistance range from 10 Ω to 3 M Ω
- SnPb plating with Pb content $> 6\%$, TCR down to 10 ppm/K, tol. down to 0.1 $\%$



Panel Controls

RECTIFIERS

Surface-Mount Ultrafast Rectifier



[US1G](#)

- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C

ALUMINUM CAPACITORS

Aluminum Capacitors SMD (Chip), High Temperature, Low Impedance



[146 CTI](#)

- High temperature up to 125 °C, long life, low impedance, high ripple current
- Soldering according to JEDEC-J-STD-020

OPTOELECTRONICS

Standard SMD LED PLCC-2



[VLMW41R1T1](#)

- Luminous intensity up to 355 mcd with typical color temperature of 5000 K
- White color coordinates of 0.345 (X), 0.352 (Y) with a 120° viewing angle

RESISTORS

Thin Film Mini-MELF Resistors



[SMM0204](#)

- Unrivaled surge handling capability, ultimate stability over lifetime
- AEC-Q200 qualified, sulfur resistant, GREEN product

DIODES

Surface-Mount PAR® Transient Voltage Suppressors



[3KASMC24](#)

- AEC-Q101 qualified, $T_j = 185\text{ °C}$ capability suitable for automotive requirement
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C

INDUCTORS

Low-Profile, High-Current IHLP® Inductors



[IHLP-1616AB](#)

- Extremely small, high-current inductors for DC/DC conversion
- High-efficiency, high-frequency operation

DISPLAYS

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



[LCD, OLED, Color TFT](#)

- Selection of transfective LCD, sunlight-readable OLED, and high-brightness color TFT
- High-visibility displays for use in the transportation industry

RESISTORS

Long-Life Cermet Potentiometer



[P11L](#)

- Long life 2M cycles 12.5 mm square single-turn panel control, versatile options
- Compliant to RoHS, tested according to CECC, value added and custom designs available

OPTOELECTRONICS

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CERAMIC CAPACITORS

AEC-Q200 Qualified, Broad Range of Sizes and Working Voltages, C0G (NP0), X7R, and X8R



[VJ....31/VJ....34 Automotive MLCC](#)

- RoHS and GREEN compliant parts available
- AgPd termination available for epoxy bonding

RESISTORS

Fully Sealed Panel Potentiometer, Military and Professional Grades



[PE30](#)

- Robust 2 W, 19.7 mm axial single-turn panel control
- Compliant to RoHS, tested according to CECC, value added and custom designs available

View datasheets for these products
www.vishay.com/ref/et3tr1c





Vishay Intertechnology, Inc.



A *WORLD OF*
SOLUTIONS