



AUTOMOTIVE GRADE

Overview of Automotive Grade Products

AUTOMOTIVE GRADE PRODUCTS



DISCRETE SEMICONDUCTORS

- MOSFETs
- Optoelectronics

PASSIVE COMPONENTS

- Capacitors
 - Aluminum
 - Tantalum
 - Ceramic
 - Film
- Resistors
 - Film
 - Wirewound
 - Power Metal Strip®
 - Thick Film Power
- Inductors
 - IHLP
 - IHTH





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Program Description

Vishay has incorporated key automotive industry quality initiatives into an Automotive Grade Product line. The goal is zero defects. The requirements cover design, qualification, and manufacturing, and are used to continuously improve Vishay products and processes. Products fulfilling the Vishay Automotive Grade requirements, described below, earn our Automotive Grade stamp on their datasheets.

Design

- **Robust Design Policy:** New and modified products are designed using design rules, DFMEA, and lessons learned. The design rules ensure Automotive Grade Products are robust through manufacturing and assembly. Testing to failure confirms that design margins meet the demands of automotive use.
- **Safe Launch:** Vishay's Safe Launch Policy ensures everything from design through production roll-out happens according to plan. Process corner evaluation, yield analysis, process capability review, and reliability testing are all incorporated.

Qualification

- **AEC-Q100-, AEC-Q101-, AEC-Q200-Qualified:** Automotive Grade Products are qualified to the latest AEC qualification standards and presented for approval using PPAP.

Manufacturing

- **TS16949 Facility:** All Automotive Grade Products are produced in facilities certified to TS16949.
- **Maverick Lot Program:** The Maverick Lot Program employs Part Average Testing (PAT), Statistical Yield Limit (SYL), and Statistical Bin Limit (SBL) according to AEC-Q001 and AEC-Q002 to identify statistically different parts and lots.
- **Periodic Verification to AEC Requirements:** Product families are verified to AEC Stress Test Qualification standards every two years.

Continuous Improvement

- **Error Proofing:** Error proofing is performed during the entire process to identify and eliminate potential causes of defects.
- **Lessons Learned/Look Across:** All continual improvement actions are linked to lessons learned and look across programs to ensure improvement everywhere in the Company.





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Automotive Grade Product Table

| Discrete Semiconductors AEC-Q101 Qualified | Description / Families | | Packages |
|---|--|---------------------------|---|
| MOSFETs | <ul style="list-style-type: none"> N-channel and p-channel TrenchFET® power MOSFETs (avalanche-rated cell density process, very low on-resistance, optimized logic-level and standard-level types) | | PowerPAK® 1212-8, PowerPAK SO-8L, DPAK (TO-252), TO-262, TO-263, TO-220, reverse DPAK, bare die, SO-8, TSOP-6, SOT-23, SC-70, SQ |
| Optoelectronics | <ul style="list-style-type: none"> LED - full color palette including white Infrared Emitters – 830 nm, 850 nm, 870 nm, 890 nm, and 940 nm Photodiodes, phototransistors – peak sensitivity matches emitters; 400 nm to 1100 nm, 790 nm to 970 nm Ambient Light Sensors – peak sensitivity of 540 nm Optical Sensors – reflective sensors, slotted interrupters | | PLCC-2, PLCC-4, Little Star®, TELUX, 1206, 0805, 0603, 1.8 mm gullwing, reverse gullwing, PLCC-4 multicolor, MiniLED, custom packages |
| Passive Components AEC-Q200 Qualified | Description / Families | | Packages |
| CAPACITORS | | | |
| Aluminum Electrolytic | <ul style="list-style-type: none"> Very high lifetime, high ripple current, low ESR, high temperature up to 150 °C, low impedance | | |
| | | - Radial | 146 RTI, 140 RTM, 150 RMI, 152 RMH |
| | | - SMD | 160 CLA, 146 CTI, 140 CRH, 150 CRZ |
| Tantalum | TP3 | High performance, Low ESR | Cases A, B, C, D, and E |
| | TH3 | High temperature: 150 °C | Cases A, B, C, D, and E |
| | TH4 | High temperature: 175 °C | Cases B, C, and D |
| Ceramic Multilayer | <ul style="list-style-type: none"> MLCC <ul style="list-style-type: none"> Matte tin and AgPd terminations, 10 V to 3000 V_{DC} Excellent ESD performance: 100 V (0805, 10 nF) up to 22 kV ESD, 200 V (0805, 10 nF) up to 25 kV ESD MLC | | SMD (VJ...31 and VJ...34 automotive series) Leaded (mono axial A...V. and mono radial K...V. series) |
| Film Capacitor | <ul style="list-style-type: none"> MKT DC lacquered radial MKT DC potted radial MKP RFI Y2 potted radial MKT RFI X2 potted radial MKP DC-Link potted radial | | 5 mm - 27.5 mm : BFC2 365-366-367-368-369-467-468-469 10 mm - 27.5 mm: MKT 1820 7.5 mm - 27.5 mm: BFC2 338 6 15 mm - 27.5 mm: F1772-2 310V X2 (<= 470 nF) 27.5 mm - 52.5 mm: MKP 1848 DC-Link |



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WORLDWIDE SALES CONTACTS

THE AMERICAS

UNITED STATES

VISHAY AMERICAS
ONE GREENWICH PLACE
SHELTON, CT 06484
UNITED STATES
PH: +1-402-563-6866
FAX: +1-402-563-6296

ASIA

SINGAPORE

VISHAY INTERTECHNOLOGY ASIA PTE LTD.
37A TAMPINES STREET 92 #07-00
SINGAPORE 528886
PH: +65-6788-6668
FAX: +65-6788-0988

P.R. CHINA

VISHAY CHINA CO., LTD.
15D, SUN TONG INFOPORT PLAZA
55 HUAI HAI WEST ROAD
SHANGHAI 200030
P.R. CHINA
PH: +86-21-5258 5000
FAX: +86-21-5258 7979

JAPAN

VISHAY JAPAN CO., LTD.
SHIBUYA PRESTIGE BLDG. 4F
3-12-22, SHIBUYA
SHIBUYA-KU
TOKYO 150-0002
JAPAN
PH: +81-3-5466-7150
FAX: +81-3-5466-7160

EUROPE

GERMANY

VISHAY ELECTRONIC GMBH
DR.-FELIX-ZANDMAN-PLATZ 1
95100 SELB
GERMANY
PH: +49-9287-71-0
FAX: +49-9287-70435

FRANCE

VISHAY S.A.
199, BD DE LA MADELEINE
06003 NICE, CEDEX 1
FRANCE
PH: +33-4-9337-2727
FAX: +33-4-9337-2726

UNITED KINGDOM

VISHAY LTD.
SUITE 6C, TOWER HOUSE
ST. CATHERINE'S COURT
SUNDERLAND ENTERPRISE PARK
SUNDERLAND SR5 3XJ
UNITED KINGDOM
PH: +44-191-516-8584
FAX: +44-191-549-9556