Key components for
ACTIVE SAFETY

THE VISHAY ADVANTAGE
AEC Qualifications
High-Temperature Performance
Low Profile
High Reliability
Long Life

Enhanced Electrical Braking (EEB)
Electronic Stability Program (ESP)
Vehicle Stability Control (VSC)
Electrical Parking Brake (EPB)
Integrated Parking Brake (IPB)
Advanced Driver Assistance System (ADAS)
**Enhanced Electrical Braking (EEB)**

**RESISTORS**
- Thin Film Resistors, 4.7 Ω to 3.01 MΩ, 0402 to 1210 Case Sizes, 50 V to 200 V
  - **TNPW e3**
    - Excellent stability |ΔR/R| ≤ 0.05 % after 1000 h at 70 °C, 0402 to 1210 case sizes

**MOSFETs**
- N-Channel MOSFETs in 8 mm x 8 mm PowerPAK®, 40 V, 160 A, 1.2 mΩ
  - **SQJQ100EL**
    - AEC-Q101 qualified, 100 % UIS and RG tested with up to 175 °C operation
    - Ultra-low $R_{DS(on)}$, thermally enhanced

**INDUCTORS**
- Power SMD IHLP® Storage Inductors, 0.22 µH to 22µH
  - **IHLP5050FD-5A**
    - Soft saturation, high rated current, temperature up to 155 °C

**RESISTORS**
- Power Metal Strip® SMD Resistors, 4-Terminal, Low Value (Down to 0.0001 Ω)
  - **WSK1216**
    - High power rating of 3 W to 5 W with TCR of 20 ppm/K
    - Very low resistance values, 0.0001 Ω to 0.004 Ω, with tolerance of 1 %

**NON-LINEAR RESISTORS**
- SMD Glass-Protected NTC Thermistors
  - **NTCS...e3**
    - Standard series, AEC-Q200 compliant
    - Glass-protected with soft terminations

**INDUCTORS**
- SMD Low-Profile, High-Current IHLP® Inductors, 0.22 µH to 33 µH
  - **IHLP-3232DZ-5A**
    - High-temperature (up to +155 °C), high-current shielded inductors

**INDUCTORS**
- Low-Profile, High-Current IHLP® Inductors
  - **IHLP-4040DZ-5A**
    - Excellent high-current performance for noise filters
    - High-temperature operation up to 155 °C

**CERAMIC CAPACITORS**
- AEC-Q200 Qualified, Broad Range of Sizes and Working Voltages, COG (NPO), X7R, and X8R
  - **VJ...31X RoHS Automotive MLCCs**
    - RoHS and Green compliant parts available
    - AgPd termination available for epoxy bonding

**ALUMINUM CAPACITORS**
- SMD Aluminum Capacitors, High Temperature Up to 150 °C, Low ESR
  - **260 CLA-V**
    - High ripple current up to 1400 mA at 150 °C, capacitance up to 3300 µF
    - Usefull life up to 2000 h at 150 °C, high vibration capability

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## Electronic Stability Program (ESP)
### Vehicle Stability Control (VSC)

### ALUMINUM CAPACITORS
SMD Aluminum Capacitors, High Temperature Up to 150 °C, Low ESR

**260 CLA-V**
- High ripple current up to 1400 mA at 150 °C, capacitance up to 3300 µF
- Useful life up to 2000 h at 150 °C, high vibration capability

### RESISTORS
SMD Thick Film Resistors, High Stability, Sulfur-Resistant

**RCA0603**
- TCR = 50 ppm/K to 200 ppm/K

### MOSFETs
N-Channel MOSFETs in 8 mm x 8 mm PowerPAK®, 40 V, 160 A, 1.2 mΩ

**SQJ100EL**
- AEC-Q101 qualified, 100 % UIS and RG tested with up to 175 °C operation
- Ultra-low $R_{DS(on)}$, thermally enhanced PowerPAK® 8x8L replaces D²PAK in less than half of the area

### MOSFETs
Dual N-Channel MOSFETs in 8 mm x 8 mm PowerPAK®, 40 V, 100 A, 3.9 mΩ

**SQJQ900E**
- AEC-Q101 qualified, 100 % UIS and RG tested with up to 175 °C operation
- High power density dual PowerPAK® 8x8L offers significant reduction in PCB area

### RESISTORS
Power Metal Strip® SMD Resistors, Wide Terminal, 1 mΩ to 3 mΩ, 1 W

**WSL0612**
- Low EMF, high temperature up to 170 °C

### MOSFETs
N-Channel MOSFETs in 5 mm x 6 mm PowerPAK® SO-8L Rated at 40 V, 3.0 mΩ

**SQJA46EP**
- AEC-Q101 qualified, 100 % UIS and RG tested with up to 175 °C operation
- Thermally enhanced PowerPAK® SO-8L replaces DPAK in less than half of the area

### RESISTORS
1A, 200 V FRED Pt® Hyperfast Rectifiers

**VS-1EFH02HM3**
- Hyperfast recovery time, $t_r = 25$ ns, reduced $Q_r$, and soft recovery
- DO-219AB (SMF) package, high $T_j$ of 175 °C

### TANTALUM CAPACITORS
Solid Tantalum Surface-Mount Chip Capacitors, Molded Case, Automotive Grade

**TH3 / TH4**
- High-temperature molded tantalum capacitors, HI-TMP®, TH4 = up to 175 °C, TH3 = up to 150 °C

### INDUCTORS
Low-Profile, High-Current IHLP® Inductors

**IHLP-2525CZ-5A**
- Excellent high-temperature performance for DC/DC converter input and output filters

**IHLP-4040DZ-5A**
- Excellent high-current performance for noise filters
- High-temperature operation up to 155 °C

### CERAMIC CAPACITORS
AEC-Q200 Qualified, Broad Range of Sizes and Working Voltages, C0G (NPO), X7R, and X8R

**VJ...31X RoHS Automotive MLCCs**
- RoHS and Green compliant parts available
- Ag/Pd termination available for epoxy bonding

### INDUCTORS
Low-Profile, High-Current IHLP® Inductors

**IHLP-4040DZ-5A**
- Excellent high-current performance for noise filters
- High-temperature operation up to 155 °C
### Electrical Parking Brake (EPB)

**Integrated Parking Brake (IPB)**

**Aluminum Capacitors**
- **260 CLA-V**
  - High ripple current up to 1400 mA at 150 °C, capacitance up to 3300 µF
  - Useful life up to 2000 h at 150 °C, high vibration capability

**Resistors**
- **WSK1216**
  - High power rating of 3 W to 5 W with TCR of 20 ppm/K
  - Very low resistance values, 0.0001 Ω to 0.004 Ω, with tolerance of 1%

**MOSFETs**
- **SQJQ100EL**
  - AEC-Q101 qualified, 100 % UIS and RG tested with up to 175 °C operation
  - Ultra-low R\(_{DS(on)}\), thermally enhanced PowerPAK® 8x8L replaces DPAK in less than half of the area

**Inductors**
- **IHLP-6767GZ-5A**
  - Lowest DCR/µH in this package size
  - High temperature up to 155 °C, shielded construction

**Ceramic Capacitors**
- **VJ...31X RoHS Automotive MLCCs**
  - RoHS and Green compliant parts available
  - AgPd termination available for epoxy bonding

**Tantalum Capacitors**
- **TH3 / TH4**
  - High-temperature molded tantalum capacitors, HI-TMP®, TH4 = up to 175 °C, TH3 = up to 150 °C

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# Advanced Driver Assistance System (ADAS)

## MOSFETs
**Dual N-Channel MOSFETs in 5 mm x 6 mm PowerPAK®, 40 V, 11 mΩ / 22 mΩ**

**SQJ942EP**
- AEC-Q101 qualified, 100 % UIS and RG tested with up to 175 °C operation
- Optimized for high-frequency DC/DC applications, lower switching losses

**Dual N-Channel MOSFETs in 5 mm x 6 mm PowerPAK®, 12 V, 2.7 mΩ / 7.4 mΩ**

**SQJ202EP**
- AEC-Q101 qualified, 100 % UIS and RG tested with up to 175 °C operation
- Low-voltage, high-frequency synchronous buck applications, lower switching losses

## INDUCTORS
**Low-Profile, High-Current IHLP® Inductors**

**IHLP-1616BZ-A1**
- Shielded construction, lowest DCR/µH in this package size
- Excellent DC/DC energy storage up to 5 MHz

**Low-Profile, High-Current IHLP® Inductors**

**IHLP-2525CZ-5A**
- Excellent high-temperature performance for DC/DC converter input and output filters

## DIODES
**SMD Power ESD Diodes, Up to ± 30 kV, I<sub>FSM</sub> = 50 A**

**SMFxx**
- SMF package: 3.5 mm x 1.9 mm
- Breakdown voltage = 6.4 V to 64.4 V

## OPTOELECTRONICS
**Integrated Proximity and Ambient Light Sensors with I²C Interface**

**VCNL4020X01**
- Low-profile QFN SMD package, 16 bit resolution, proximity distance up to 200 mm
- Suitable for extended detection range, gesture function with external emitters

## RECTIFIERS
**Surface-Mount Schottky Barrier Rectifiers**

**MSS1P4**
- Very low profile - typical height of 0.65 mm
- AEC-Q101 qualified

## RESISTORS
**Precision Thin Film Resistor Arrays, Superior Moisture Resistivity, TCR ± 0.05**

**ACAS 0606 AT**
- Arbitrary resistance ratio up to 1:20, superior tracking stability over lifetime
- Relative TCR down to ± 5 ppm/K (tracking), AEC-Q200 qualified

## TANTALUM CAPACITORS
**Solid Tantalum Chip Capacitors, High CV Leadframeless Molded, Automotive Grade**

**TP8**
- Smallest AEC-Q200 qualified tantalum capacitors with case sizes as small as 0603

## CERAMIC CAPACITORS
**AEC-Q200 Qualified, Broad Range of Sizes and Working Voltages, C0G (NPO), X7R, and X8R**

**VJ...31X RoHS Automotive MLCCs**
- RoHS and Green compliant parts available
- AgPd termination available for epoxy bonding

## INDUCTORS
**High-Curent SMD Inductors with E-Field Shielding and 155 °C Operating Temperature**

**IHLE-3232DD-5A**
- Excellent EMI protection, double-shielded