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Vishay Intertechnology, Inc.

# *Automotive*

*(Exterior Lighting)*



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





**Automotive**

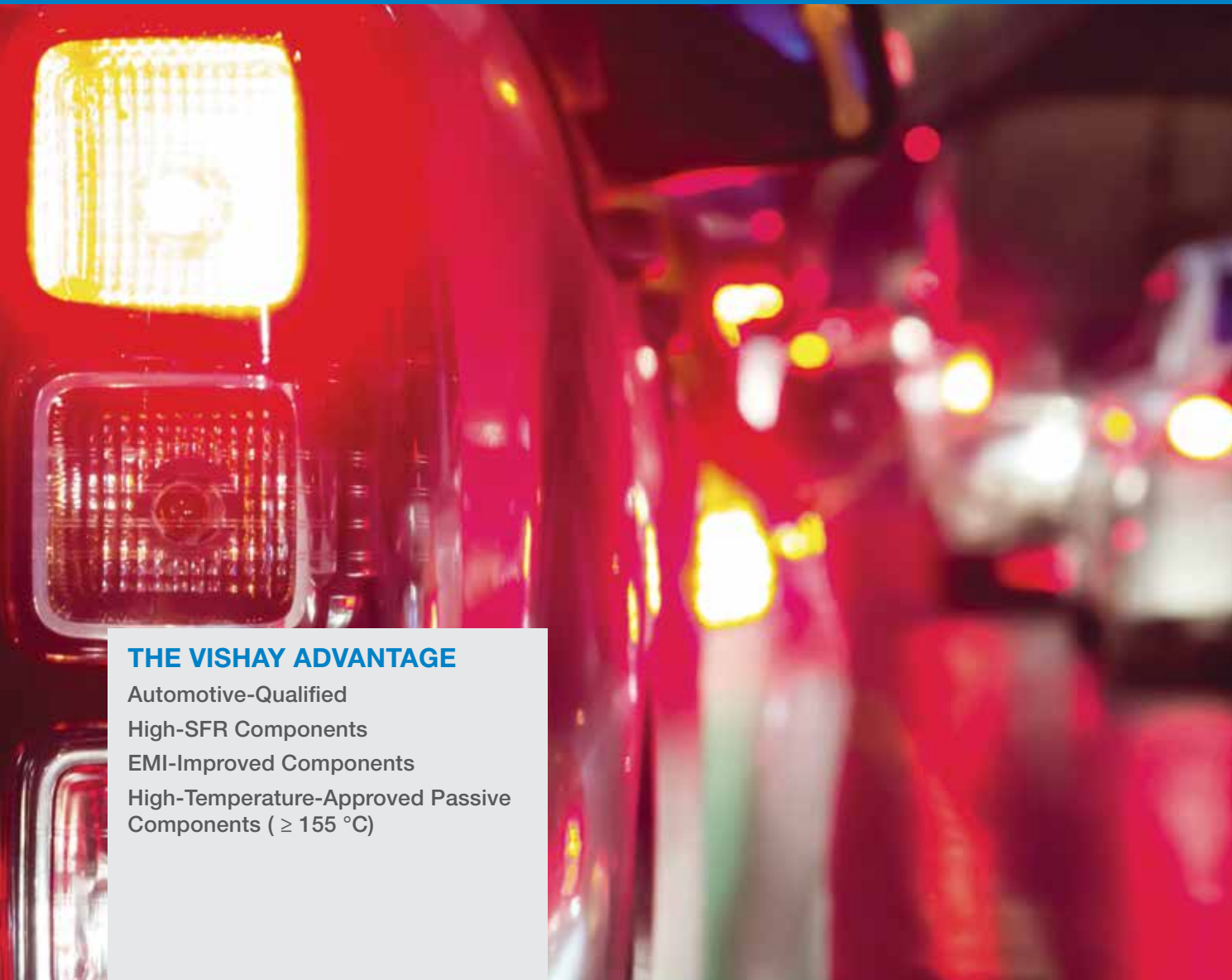
## Exterior Lighting

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

For inquiries, please contact your local sales representative.

## Key components for EXTERIOR LIGHTING



### THE VISHAY ADVANTAGE

- Automotive-Qualified
- High-SFR Components
- EMI-Improved Components
- High-Temperature-Approved Passive Components ( $\geq 155\text{ }^{\circ}\text{C}$ )

**LED Headlight Units**



**Day Lighting**



**LED Fog Lighting**



**Rear and Signal LED Lights**







# LED Headlight Units




DIODES

**Surface-Mount TRANSZORB® Transient Voltage Suppressors**

[P6SMB36CA](#)

- AEC-Q101 qualified
- 600 W peak pulse power capability with a 10/1000  $\mu$ s waveform




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 °C




INDUCTORS

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

[IHLP-2525CZ-5A](#)

- Compact size and high current, low saturation for noise filtering



RESISTORS

**Power Metal Strip® SMD Resistors, Very High Power (to 3 W), Low Value (to 0.0005  $\Omega$ )**

[WSLP](#)

- Very high power rating to 3 W in WSLP0603 to WSLP2512 size packages
- Extremely low resistance values from 0.0005  $\Omega$  to 0.1  $\Omega$  and tolerance of 1 %



RESISTORS

**Low-Ohmic, Wide-Terminal Thin Film Chip Resistors**

[NCW0406 AT](#)

- Power handling up to 300 mW, extreme thermocycling robustness up to 3000 cycles
- Available from 0.33  $\Omega$  to 0.91  $\Omega$  with TCR of 50 ppm/K and 1 % tolerance




RESISTORS

**Pulse-Proof, High-Power Thick Film Chip Resistors**

[CRCW...HP e3](#)

- Excellent pulse load capability
- Enhanced power rating




MOSFETs

**Automotive N-Channel 100 V (D-S) 175 °C MOSFET**

[SQJ402EP](#)

- Medium-voltage ThunderFET technology, AEC-Q101 qualified, maximum  $R_{DS(on)}$  11 m $\Omega$
- Thermally enhanced PowerPAK SO-8L packaging




INDUCTORS

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

[IHLP-4040DZ-5A](#)

- High current, low DCR, low saturation for excellent noise suppression



MOSFETs

**Automotive N-Channel 100 V (D-S) 175 °C MOSFET**

[SQJ488EP](#)

- Medium-voltage ThunderFET® technology, AEC-Q101 qualified, maximum  $R_{DS(on)}$  21 m $\Omega$
- Thermally enhanced PowerPAK® SO-8L packaging




RECTIFIERS

**High Current Density Surface-Mount Trench MOS Barrier Schottky Rectifier**

[V8P10HM3](#)

- Trench MOS Schottky technology
- AEC-Q101 qualified



RESISTORS

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

[RCWE](#)

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




NON-LINEAR RESISTORS

**SMD Glass Protected NTC Thermistors**

[NTCS...e3](#)

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



View datasheets for these products [www.vishay.com/ref/et3au6a](http://www.vishay.com/ref/et3au6a)



# Day Lighting



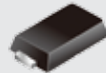
TANTALUM CAPACITORS

**Solid Tantalum Surface-Mount Chip Capacitors, TANTAMOUNT® Molded Case, Automotive Grade** 

[TP3](#)

- High-performance molded tantalum capacitor, AEC-Q200 qualified
- Automotive applications: motor control, body electronics, dash board


RECTIFIERS

**Surface-Mount Schottky Barrier Rectifiers** 

[MSS2P3](#)

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

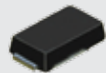
INDUCTORS

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

[IHLP-2525CZ-5A](#)

- Compact size and high current, low saturation for noise filtering


DIODES

**High Power Density Surface-Mount PAR® Transient Voltage Suppressors** 

[TPSMP](#)

- AEC-Q101 qualified,  $T_j = 185\text{ }^\circ\text{C}$  capability suitable for automotive requirements
- Very low profile – typical height of 1.0 mm

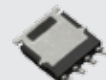
NON-LINEAR RESISTORS

**SMD Glass Protected NTC Thermistors** 

[NTCS...e3](#)

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


MOSFETS

**Automotive N-Channel 100 V (D-S) 175 °C MOSFET** 

[SQJ402EP](#)

- Medium-voltage ThunderFET® technology, AEC-Q101 qualified, maximum  $R_{DS(on)}$  11 mΩ
- Thermally enhanced PowerPAK® SO-8L packaging


RESISTORS

**Power Metal Strip® Resistors, Low Value (Down to 0.0005 Ω), Surface Mount** 

[WSL2010](#)

- Low TCR element (< 20 ppm) results in accurate current sensing in application
- Power Metal Strip construction offers high reliability in critical applications


OPTOELECTRONICS

**Little Star® 1 W Power SMD LED White** 

[VLMW712U2U3XV](#)

- Luminous intensity up to 113 lm in a compact 6.0 mm x 6.0 mm x 1.5 mm surface-mount package
- White color coordinates of 0.33 (X), 0.33 (Y) with a 120° viewing angle


RECTIFIERS

**High Current Density Surface-Mount Schottky Barrier Rectifier** 

[SS2P4](#)

- AEC-Q101 qualified
- Very low profile – typical height of 1.0 mm


RESISTORS

**Pulse-Proof, High-Power Thick Film Chip Resistors** 

[CRCW...HP e3](#)

- Excellent pulse load capability
- Enhanced power rating


MOSFETS

**Automotive N-Channel 100 V (D-S) 175 °C MOSFET** 

[SQJ488EP](#)

- Medium-voltage ThunderFET technology, AEC-Q101 qualified, maximum  $R_{DS(on)}$  21 mΩ
- 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

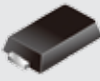
View datasheets for these products [www.vishay.com/ref/et3au6b](http://www.vishay.com/ref/et3au6b)

# LED Fog Lighting



**RECTIFIERS**

**Surface-Mount Schottky Barrier Rectifiers**




[MSS1P6HM3](#)

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

**INDUCTORS**

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




[IHLP-2020CZ-5A](#)

- Compact size and high current, low saturation for noise filtering
- Up to 155 °C continuous operation

**OPTOELECTRONICS**

**Little Star® 1 W Power SMD LED White**




[VLMW712U2U3XV](#)

- Luminous intensity up to 113 lm in a compact 6.0 mm x 6.0 mm x 1.5 mm surface-mount package
- White color coordinates of 0.33 (X), 0.33 (Y) with a 120° viewing angle

**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,  $T_j = 185\text{ °C}$  capability suitable for automotive requirements
- 400 W peak pulse power capability with a 10/1000 μs waveform

**RESISTORS**

**Pulse-Proof, High-Power Thick Film Chip Resistors**




[CRCW...HP e3](#)

- Excellent pulse load capability
- Enhanced power rating

**MOSFETs**

**Automotive N-Channel 40 V (D-S) 175 °C MOSFET**




[SQJ858AEP](#)

- TrenchFET® Gen III technology, AEC-Q101 qualified, maximum  $R_{DS(on)}$  6.3 mΩ
- Thermally enhanced PowerPAK® SO-8L packaging

**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

**NON-LINEAR RESISTORS**

**SMD Glass Protected NTC Thermistors**



[NTCS...e3](#)

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

**RESISTORS**

**Professional Thin Film MELF Resistors**



[MMB0207](#)

- Unrivaled surge handling capability, ultimate stability over lifetime
- AEC-Q200 qualified, approved acc. EN 140401-803, sulfur resistant, GREEN product

**INDUCTORS**

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



[IHLP-1616BZ-5A](#)

- Very small size, high-current operation for DC/DC conversion and noise filtering

View datasheets for these products  
[www.vishay.com/ref/et3au6c](http://www.vishay.com/ref/et3au6c)



## Rear and Signal LED Lights



View datasheets for these products  
[www.vishay.com/ref/et3au6d](http://www.vishay.com/ref/et3au6d)

<p>RESISTORS</p> <p><b>Pulse-Proof, High-Power Thick Film Chip Resistors</b></p>  <p><a href="#">CRCW...HP e3</a></p> <ul style="list-style-type: none"> <li>• Excellent pulse load capability</li> <li>• Enhanced power rating</li> </ul>	<p>MOSFETs</p> <p><b>Automotive N-Channel 40 V (D-S) 175 °C MOSFET</b></p>  <p><a href="#">SQS484EN</a></p> <ul style="list-style-type: none"> <li>• Classic TrenchFET® technology, AEC-Q101 qualified, maximum <math>R_{DS(on)}</math> 9 mΩ</li> <li>• Thermally enhanced PowerPAK® 1212-8 is 1/3 the size of an SO-8</li> </ul>	<p>INDUCTORS</p> <p><b>Low-Profile, High-Current IHLP® Inductors</b></p>  <p><a href="#">IHLP-1212AB-5A</a></p> <ul style="list-style-type: none"> <li>• Extremely small size, high-current filter and energy storage</li> </ul>
<p>RECTIFIERS</p> <p><b>Surface-Mount Schottky Barrier Rectifiers</b></p>  <p><a href="#">MSS1P6HM3</a></p> <ul style="list-style-type: none"> <li>• Very low profile – typical height of 0.65 mm</li> <li>• AEC-Q101 qualified</li> </ul>	<p>NON-LINEAR RESISTORS</p> <p><b>SMD Glass Protected NTC Thermistors</b></p>  <p><a href="#">NTCS...e3</a></p> <ul style="list-style-type: none"> <li>• Standard series, AEC-Q200 compliant</li> <li>• Glass protected with soft terminations</li> </ul>	<p>MOSFETs</p> <p><b>Automotive P-Channel 60 V (D-S) 175 °C MOSFET</b></p>  <p><a href="#">SQ2309ES</a></p> <ul style="list-style-type: none"> <li>• Classic TrenchFET technology, AEC-Q101 qualified, maximum <math>R_{DS(on)}</math> 335 mΩ</li> <li>• Popular SOT-23 packaging</li> </ul>
<p>INDUCTORS</p> <p><b>Low-Profile, High-Current Coupled Inductor</b></p>  <p><a href="#">IHCL-4040DZ-5A</a></p> <ul style="list-style-type: none"> <li>• Unique 2-coil design coupled inductor in a composite IHLP-style package</li> <li>• Optimized for SEPIC circuits for high efficiency and compact size</li> </ul>	<p>DIODES</p> <p><b>High Power Density Surface-Mount PAR® Transient Voltage Suppressors</b></p>  <p><a href="#">TPSMP</a></p> <ul style="list-style-type: none"> <li>• AEC-Q101 qualified, <math>T_j = 185</math> °C capability suitable for automotive requirements</li> <li>• Very low profile – typical height of 1.0 mm</li> </ul>	<p>RESISTORS</p> <p><b>Thick Film Surface-Mount Chip Resistors, Wraparound and Extremely Low Value</b></p>  <p><a href="#">RCWE</a></p> <ul style="list-style-type: none"> <li>• Low resistance values from 0.01 Ω to 0.976 Ω and tolerance of 1 %</li> <li>• Thick film construction with 2x power capacity</li> </ul>
<p>OPTOELECTRONICS</p> <p><b>PLCC-2 Plus, High Luminous Output White LED</b></p>  <p><a href="#">VLMW51Q2R3</a></p> <ul style="list-style-type: none"> <li>• Luminous intensity up to 51.7 lm in a compact 3.5 mm x 3.5 mm x 1.2 mm surface-mount package</li> <li>• White color coordinates of 0.33 (X), 0.33 (Y) with a 120° viewing angle</li> </ul>	<p>INDUCTORS</p> <p><b>Low-Profile, High-Current IHLP Inductors</b></p>  <p><a href="#">IHLP-1616BZ-5A</a></p> <ul style="list-style-type: none"> <li>• Very small size, high-current operation for DC/DC conversion and noise filtering</li> </ul>	<p>MOSFETs</p> <p><b>Automotive P-Channel 40 V (D-S) 175 °C MOSFET</b></p>  <p><a href="#">SQS401EN</a></p> <ul style="list-style-type: none"> <li>• Classic TrenchFET technology, AEC-Q101 qualified, maximum <math>R_{DS(on)}</math> 29 mΩ</li> <li>• Thermally enhanced PowerPAK 1212-8 is 1/3 the size of an SO-8</li> </ul>



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## ***ABOUT TTI, INC.***

TTI Inc., a subsidiary of Berkshire Hathaway, is a world leading specialist distributor of connectors and passive, electromechanical and discrete components. TTI's philosophy is "Lead by Design", and the company differentiates itself by focusing on people, parts and processes. The company's aim is to become the distributor of choice for customers and suppliers in Europe alike by introducing new product technologies and by stocking broad and deep across its franchise base. TTI employs sophisticated inventory management processes which ensure that the company can react immediately to changes in component demand due to fluctuating markets and supply chains. For further information about TTI, please refer to: [www.ttieurope.com](http://www.ttieurope.com).



**A WORLD OF  
SOLUTIONS**

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