# ZXSBMR16PT8

**SCHOTTKY BRIDGE RECTIFIER PLUS FREEWHEEL DIODE**

## Product Summary

- Schottky Bridge and Freewheel diode for use in MR16 LED Drive
- Internal Ambient Temperature = 90°C MAX within MR16 circuit enclosure
- $V_R$ = 13.2$V_{RMS}$
- $I_F$ = 0.4$A_{AVG}$
- $I_R$ = 10µA

## Description and Applications

This low leakage Schottky bridge and freewheel diode have been specifically designed for the MR16 LED driver solution alongside ZXLD1350E5 as described in Design Note DN86.

## Features and Benefits

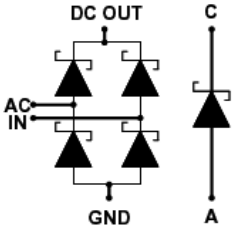
- Compact surface mount solution and reduced component count in MR16 LED drive circuit
- Optimized bridge and freewheel diode for use in MR16 LED diode circuitry
- Low $V_F$ and low reverse leakage current
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

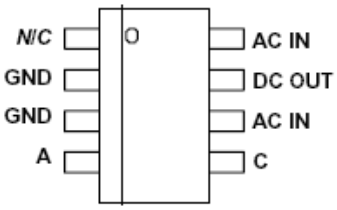
- Case: SM-8
- Case Material: TBD
- Moisture Sensitivity: TBD
- Terminals: TBD
- Weight: TBD grams (approximate)

SM-8


Top View




Device Circuit



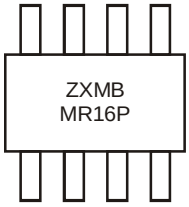

Top View
Pin-Out

## Ordering Information (Note 1)

| Device | Packaging | Shipping |
|---|---|---|
| ZXSBMR16PT8TA | SM-8 | 1000/Tape & Reel |

Notes: 1. For Packaging Details, go to our website at http://www.diodes.com.

## Marking Information




ZXSBMR16P = Product Type Marking Code

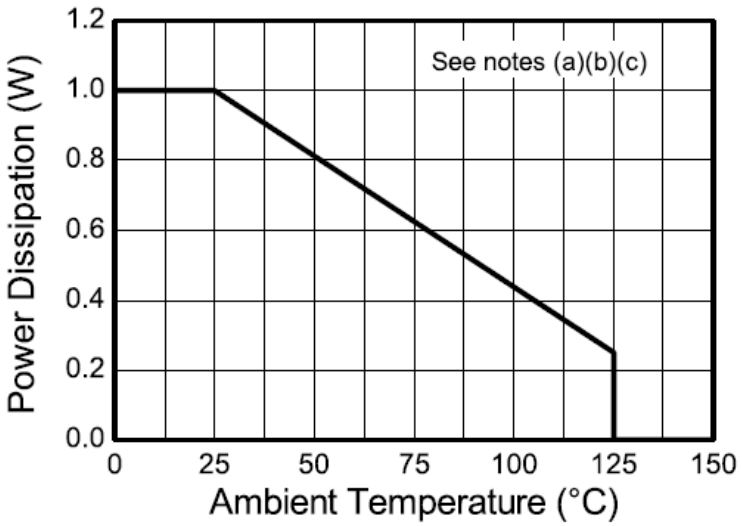
## Maximum Ratings @$T_A$ = 25°C unless otherwise specified

| Characteristic | | Symbol | Value | Units |
|---|---|---|---|---|
| Maximum Repetitive Reverse Voltage | | $V_{RRM}$ | 40 | V |
| Maximum RMS Bridge Input Voltage | | $V_{RMS}$ | 13.2 | V |
| Average Rectified Forward Current (Notes 2 & 3) | | $I_{F(AV)}$ | 0.4 | A |
| Peak Repetitive Forward Current | | $I_{FPK}$ | 3.5 | A |
| Non Repetitive Forward Current | t ≤ 100µs | $I_{FSM}$ | 13 | A |
| | t ≤ 10ms | | 3.5 | A |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation, $T_A$ = 25°C (Note 2) | $P_D$ | 1 | W |
| Thermal Resistance, Junction to Ambient (Note 2) | $R_{\theta JA}$ | 125 | °C/W |
| Junction Temperature, Forward Dissipation Only | $T_J$ | 150 | °C |
| Junction Temperature, Reverse Dissipation (Notes 2, 3, & 4) | $T_J$ | 125 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 to +150 | °C |
| MR16 LED Internal Ambient Temperature (Note 4) | $T_A$ | 90 | °C |

Notes:
2. For a bridge mounted on1.6mm FR4 PCB with minimum copper pads and track dimensions in still air.
3. Supply 12V RMS with capacitive bridge load.
4. Maximum bridge operating junction temperature must be reduced with increased reverse bias voltage to maintain unconditional thermal stability.
5. Refer to Design Note DN86

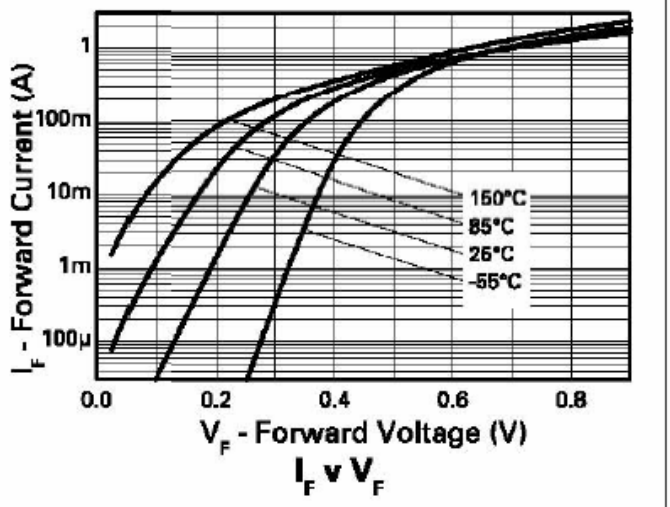



**Package Thermal Characteristic**

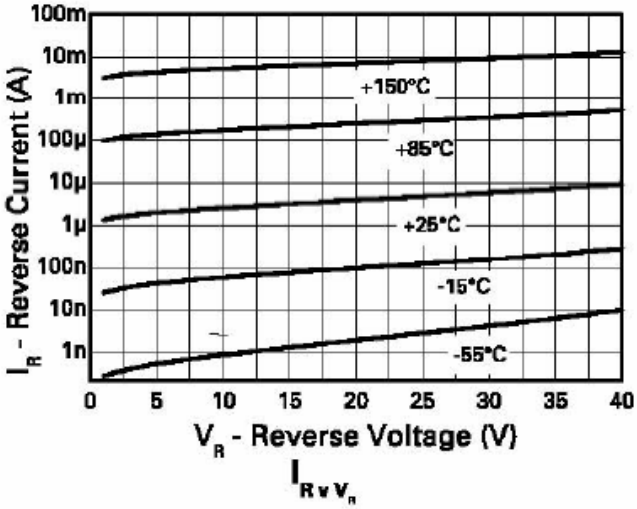
## Electrical Characteristics @$T_A$ = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Reverse Breakdown Voltage | $V_{(BR)R}$ | 40 | - | - | V | $I_R$ = 200μA |
| Forward Voltage (Note 4) | $V_F$ | - | 305 | 360 | mV | $I_F$ = 50mA |
| | | - | 355 | 410 | | $I_F$ = 100mA |
| | | - | 405 | 470 | | $I_F$ = 250mA |
| | | - | 485 | 550 | | $I_F$ = 500mA |
| | | - | 570 | 660 | | $I_F$ = 750mA |
| | | - | 640 | 750 | | $I_F$ = 1A |
| | | - | 415 | - | | $I_F$ = 500mA, $T_A$ = 100°C |
| Reverse Current | $I_R$ | - | 6 | 10 | μA | $V_R$ = 30V |
| | | - | 370 | - | | $V_R$ = 30V, $T_A$ = 85°C |
| Diode Capacitance | $C_D$ | - | 16 | - | pF | f = 1MHz, $V_R$ = 30V |
| Reverse Recovery Time | trr | - | 3 | - | ns | Switched from $I_F$ = 100mA to $I_R$ = 100mA |
| Reverse Recovery Charge | $Q_{rr}$ | - | 210 | - | pC | Measured @ $I_R$ = 10mA di/dt = 500mA/ns. $R_{source}$ = 6Ω; $R_{load}$ = 10Ω |

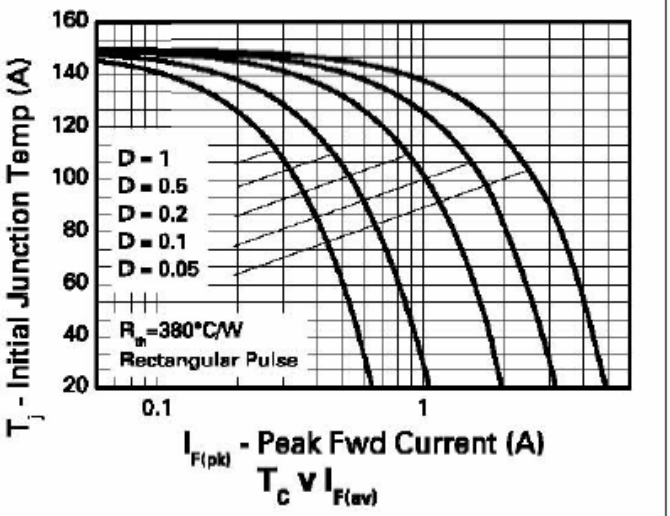
Notes: 4. Measured under pulsed conditions. Pulse width = 300μS. Duty cycle ≤ 2%.



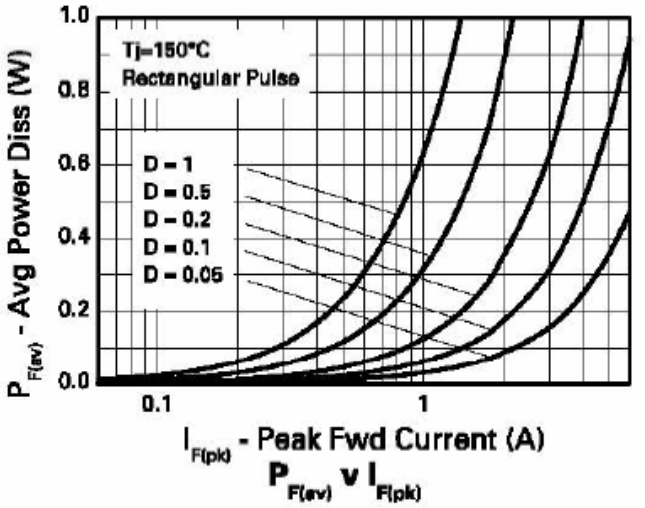

**$I_F$ v $V_F$**



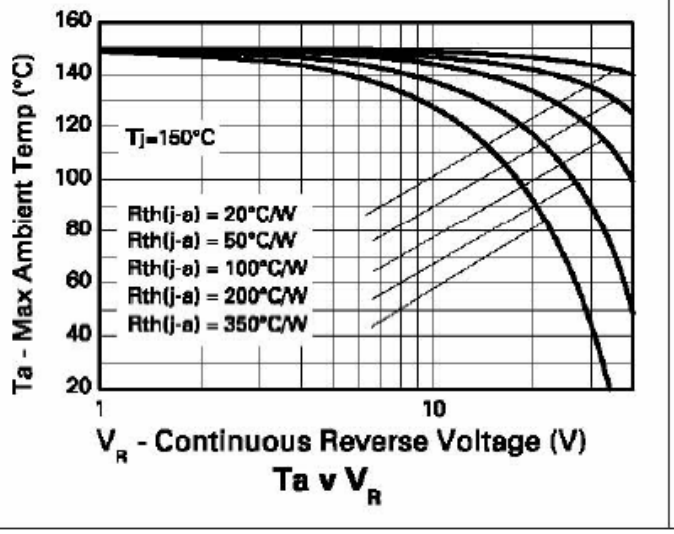

**$I_R$ v $V_R$**



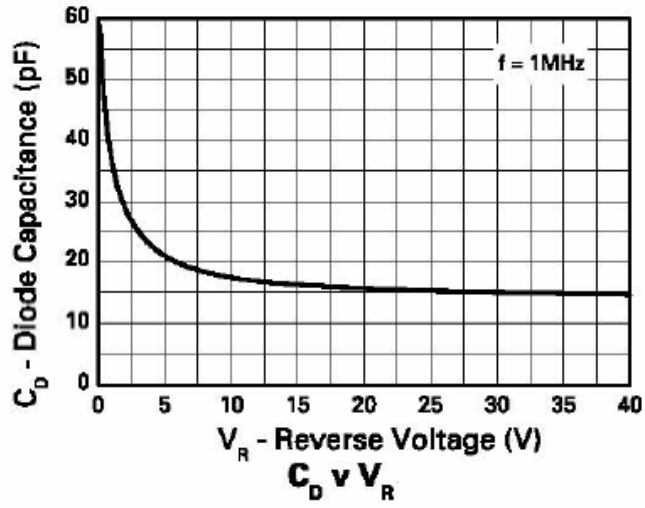

**$T_C$ v $I_{F(av)}$**




**$P_{F(av)}$ v $I_{F(pk)}$**

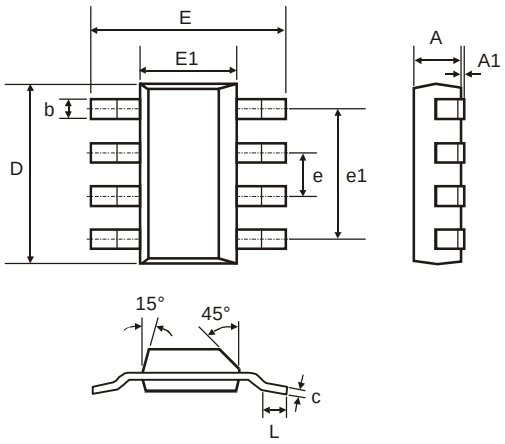



**Ta v $V_R$**



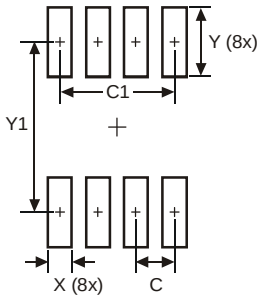

**$C_D$ v $V_R$**

## Package Outline Dimensions




| SM-8 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | – | 1.7 | – |
| **A1** | 0.02 | 0.1 | – |
| **b** | – | 0.7 | – |
| **c** | 0.24 | 0.32 | – |
| **D** | 6.3 | 6.7 | – |
| **e** | – | – | 1.53 |
| **e1** | – | – | 4.59 |
| **E** | 6.7 | 7.3 | – |
| **E1** | 3.3 | 3.7 | – |
| **L** | 0.9 | – | – |
| All Dimensions in mm | | | |

## Suggested Pad Layout




| Dimensions | Value (in mm) |
|---|---|
| **C** | 1.52 |
| **C1** | 4.6 |
| **X** | 0.95 |
| **Y** | 2.80 |
| **Y1** | 6.80 |

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