

ZXSBMR16PT8

MR16: Schottky bridge rectifier plus freewheel diode

Summary

Schottky Bridge and Freewheel diode for use in MR16 LED Drive

Internal Ambient Temperature = 90°C MAX*

$V_R = 13.2V_{RMS}$; $I_F = 0.4A_{AVG}$; $I_R = 10\mu A$

*within MR16 circuit enclosure

Description

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.

Key benefits

- Compact surface mount solution and reduced component count in MR16 LED drive circuit

Features

- Optimized bridge and freewheel diode for use in MR16 LED diode circuitry
- Low VF and low reverse leakage current

Ordering information

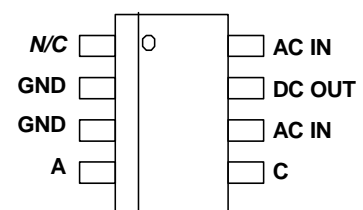
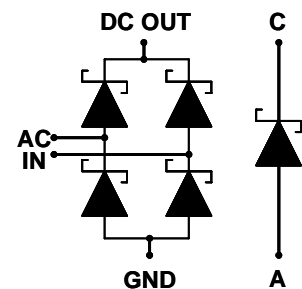
Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXSBMR16PT8TA	7	12	1000

Device marking

ZXSB
MR16P



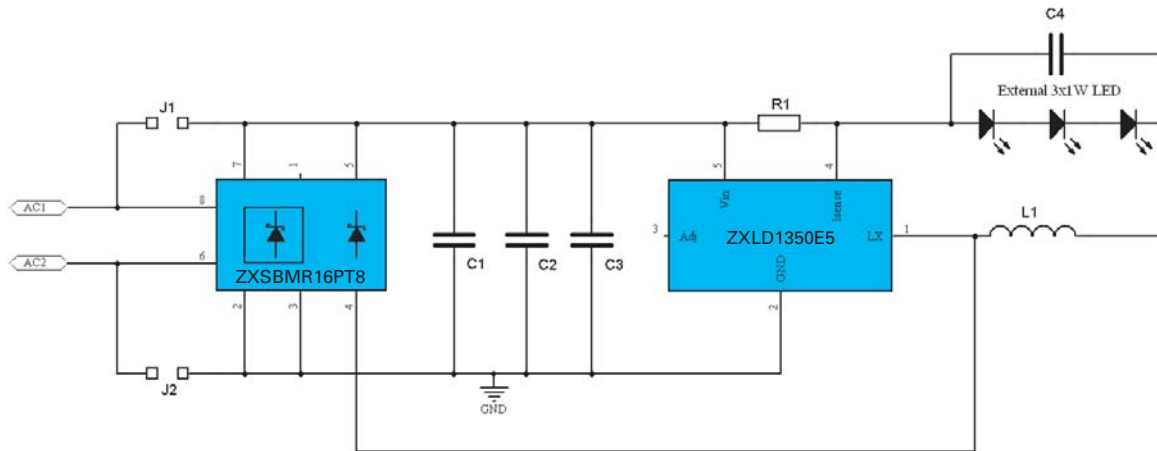
SM8



Pinout - top view

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Application Schematic from DN86



Absolute maximum ratings

Parameter	Symbol	Value	Unit
Bridge			
Maximum repetitive reverse voltage	V _{RRM}	40	V
Maximum RMS bridge input voltage	V _{RMS}	13.2	V
Average rectified forward current ^{(a)(b)}	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
Package			
Power dissipation at T _{amb} =25°C ^(a)	P _D	1	W
Storage temperature range	T _{stg}	-55 to +150	°C
Junction temperature forward dissipation only	T _j	150	°C
Junction temperature reverse dissipation ^{(a)(b)(c)}	T _j	125	°C
MR16 LED internal ambient temperature ^(d)	T _{amb}	90	°C

Thermal characteristics

Parameter	Symbol	Limit	Unit
Junction to ambient ^(a)	R _{θJA}	125	°C/W

NOTES:

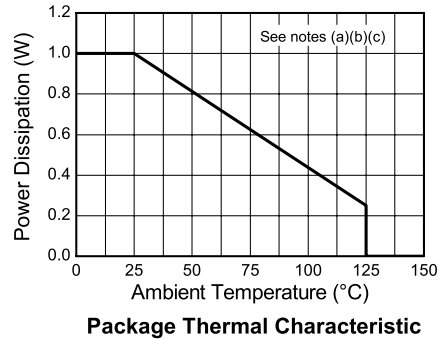
(a) For a bridge mounted on 1.6mm FR4 PCB with minimum copper pads and track dimensions in still air.

(b) Supply 12V RMS with capacitive bridge load.

(c) Maximum bridge operating junction temperature must be reduced with increased reverse bias voltage to maintain unconditional thermal stability.

(d) Refer to Design Note DN86

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Electrical characteristics per diode (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

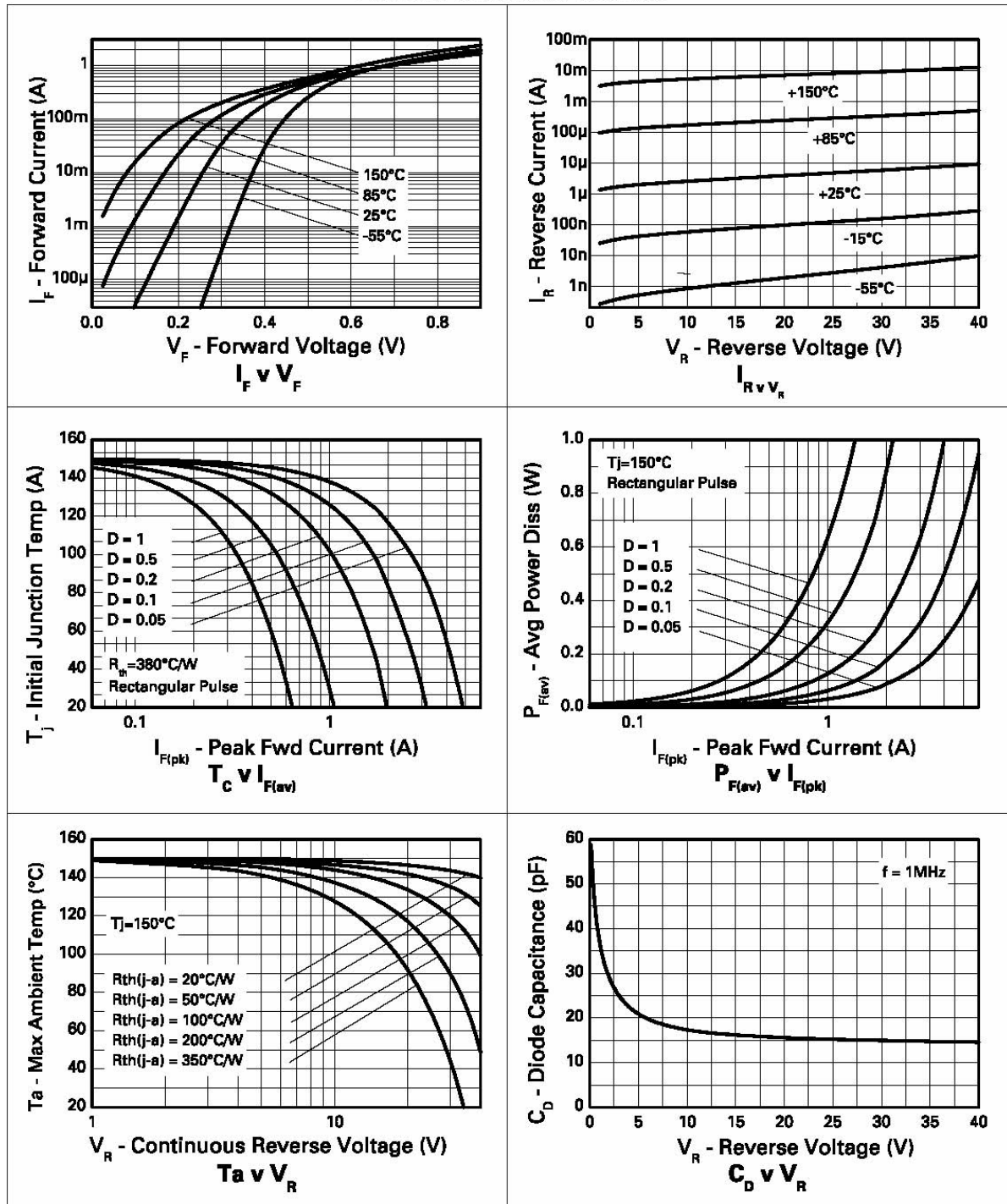
Schottky diode characteristics						
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Reverse breakdown voltage	$V_{(BR)R}$	40			V	$I_R=200\mu\text{A}$
Forward voltage	V_F		305	360	mV	$I_F=50\text{mA}^{(*)}$
			355	410	mV	$I_F=100\text{mA}^{(*)}$
			405	470	mV	$I_F=250\text{mA}^{(*)}$
			485	550	mV	$I_F=500\text{mA}^{(*)}$
			570	660	mV	$I_F=750\text{mA}^{(*)}$
			640	750	mV	$I_F=1\text{A}^{(*)}$
			415		mV	$I_F=500\text{mA}^{(*)}, T_a = 100^{\circ}\text{C}$
Reverse current	I_R		6	10	μA	$V_R=30\text{V}$
			370		μA	$V_R=30\text{V}, T_a = 85^{\circ}\text{C}$
Diode capacitance	C_D		16		pF	$f=1\text{MHz}, V_R=30\text{V}$
Reverse recovery time	t_{rr}		3		ns	Switched from $I_F = 500\text{mA}$ to $V_R = 5.5\text{V}$
Reverse recovery charge	Q_{rr}		210		pC	Measured @ $I_R 50\text{mA}$. $di/dt = 500\text{mA/ns}$. $R_{source} = 6\Omega; R_{load} = 10\Omega$

NOTES:

(*) Measured under pulsed conditions. Pulse width = $300\mu\text{s}$; duty cycle $\leq 2\%$.

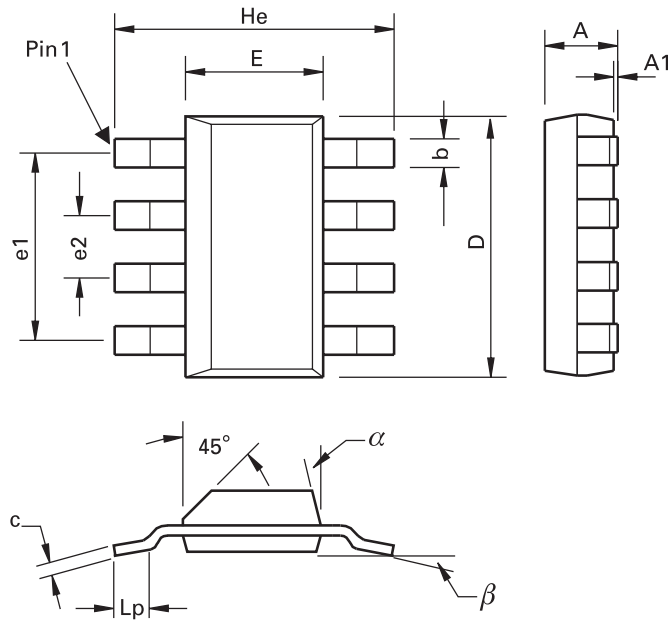
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Typical characteristics single diode



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Package outline - SM8



DIM	Millimeters			Inches			DIM	Millimeters			Inches		
	Min.	Max.	Typ.	Min.	Max.	Typ.		Min.	Max.	Typ.	Min.	Max.	Typ.
A	-	1.7	-	-	0.067	-	e1	-	-	4.59	-	-	0.1807
A1	0.02	0.1	-	0.0008	0.004	-	e2	-	-	1.53	-	-	0.0602
b	-	-	0.7	-	-	0.0275	He	6.7	7.3	-	0.264	0.287	-
c	0.24	0.32	-	0.009	0.013	-	Lp	0.9	-	-	0.035	-	-
D	6.3	6.7	-	0.248	0.264	-	α	-	15°	-	-	15°	-
E	3.3	3.7	-	0.130	0.145	-	β	-	-	10°	-	-	10°

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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