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 = 10µA

***within MR16 circuit enclosure**

SM8

Description

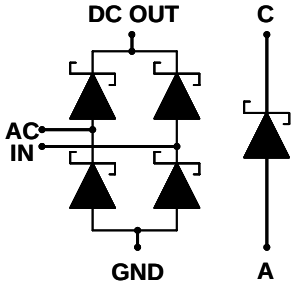
This low leakage Schottky bridge and freewheel diode have been specifically designed for the MR16 LED driver solution alongside ZXLD1350E5 as described in Design Note DN86.

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

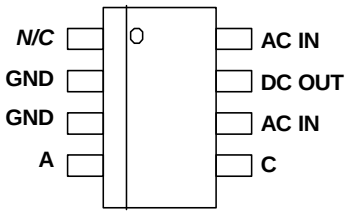


Ordering information

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

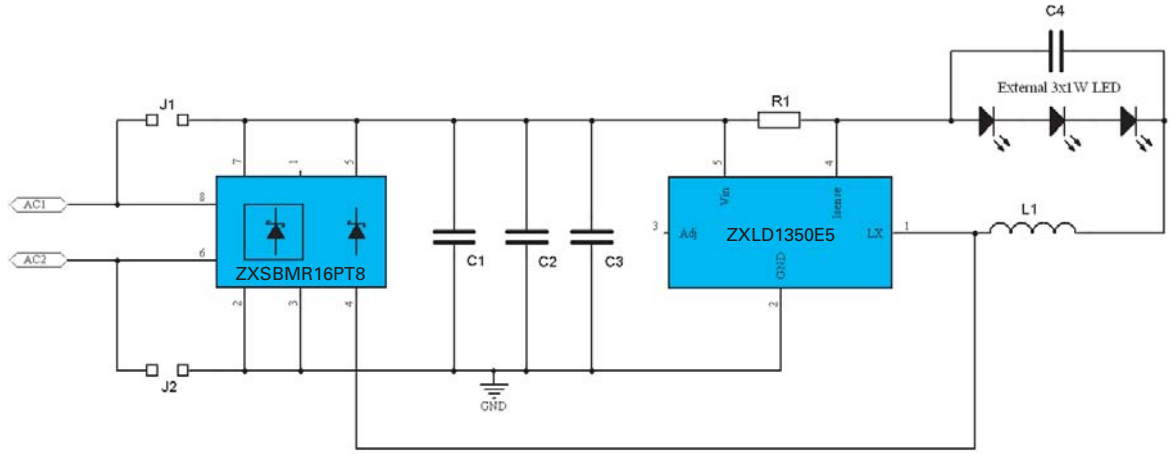
Device marking

ZXSB
MR16P



Pinout - top view

Application Schematic from DN86



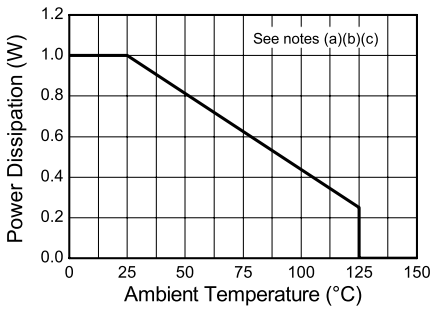
Absolute maximum ratings

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 t=≤10ms	I_{FSM}	13 3.5	A A
Package			
Power dissipation at T_{amb}=25°C[a]	P_D	1	W
Storage temperature range	Tstg	-55 to +150	°C
Junction temperature forward dissipation only	Tj	150	°C
Junction temperature reverse dissipation[a][b][c]	Tj	125	°C
MR16 LED internal ambient temperature[d]	T_{amb}	90	°C

Thermal characteristics

Parameter	Symbol	Limit	Unit
Junction to ambient[a]	$R_{\Theta JA}$	125	°C/W

NOTES:
(a) For a bridge mounted on1.6mm 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



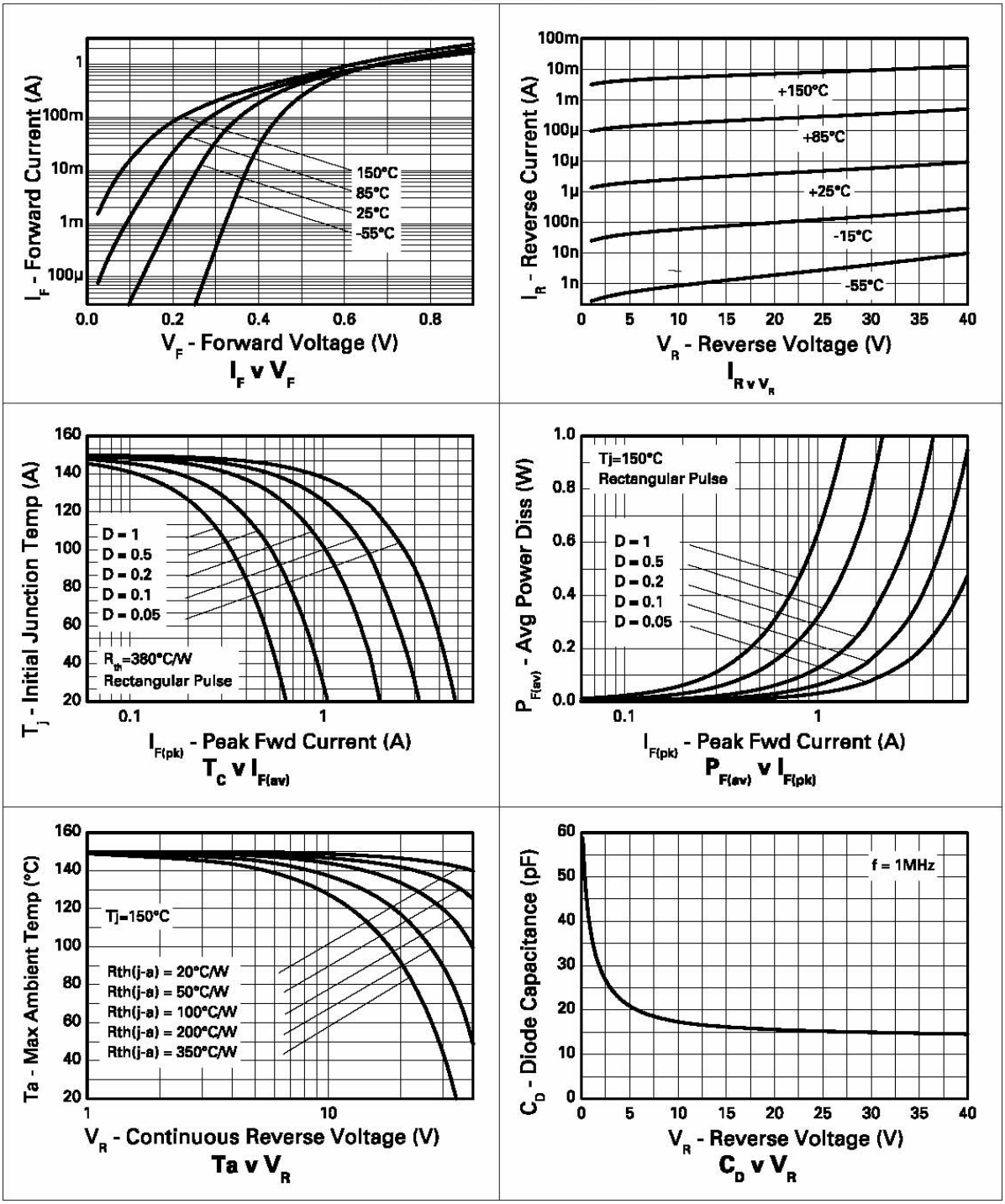
Package Thermal Characteristic

Electrical characteristics per diode (at T_{amb} = 25°C unless otherwise stated)

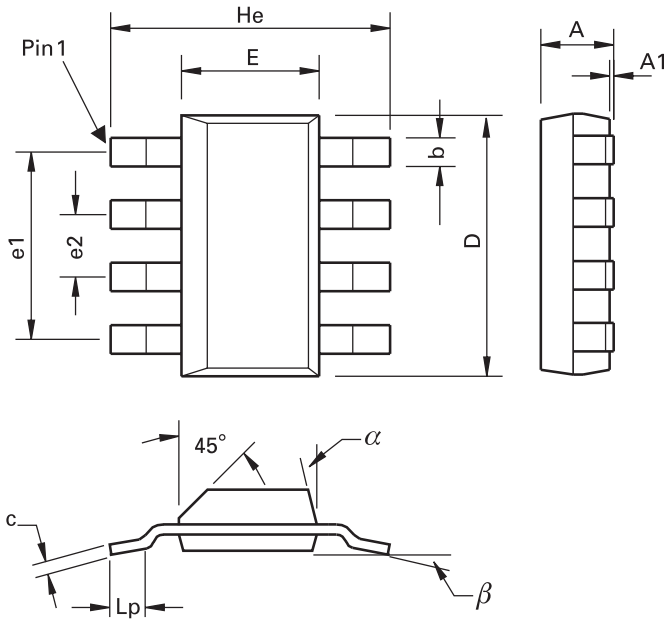
Schottky diode characteristics						
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Conditions**
Reverse breakdown voltage	$V_{(BR)R}$	40			V	I_R=200µA
Forward voltage	V_F		305	360	mV	I_F=50mA (*)
			355	410	mV	I_F=100mA(*)
			405	470	mV	I_F=250mA(*)
			485	550	mV	I_F=500mA(*)
			570	660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

NOTES:
(*) Measured under pulsed conditions. Pulse width = 300µs; duty cycle ≤2%.

Typical characteristics single diode



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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