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Schottky Barrier Rectifier

MBR8170TFS

This Schottky rectifier is high performance device in μ8−FL package. The lower forward voltage, less leakage current, and small junction capacitance are suitable to high switching frequency high density DC to DC conversion application. Offering higher avalanche energy capability for Oring or reverse protection application. The μ8−FL package provides an excellent thermal performance, less land area of board space, and low profile.

Features

- Lower Forward Voltage Drop
- Less Leakage Current in High Temperature
- Small Junction Capacitance for High Switching Frequency
- Higher Avalanche Energy Capability
- 175°C Operating Junction Temperature
- Good Alternative Solution of SMA and SMB Package
- Small Footprint − Land Area: 12.5 mm^2
- Low Profile − Maximum Height of 1.1 mm
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Mechanical Characteristics:

- Case: Molded Epoxy
- Epoxy Meets UL 94 V−0 @ 0.125 in
- Weight: 95 mg (Approximately)
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Maximum for 10 Seconds
- MSL 1

Applications

- High Switching Frequency DC/DC Converter
- 2nd Rectifier
- Freewheeling Diode used with Inductive Load
- Oring / Reverse Protection

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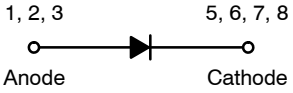
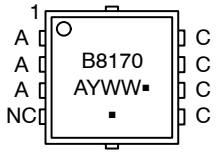
SCHOTTKY RECTIFIER
8 AMPERE
170 VOLTS



WDFN8
(μ8FL)
CASE 511AB
FLAT LEAD

MARKING DIAGRAM



B8170 = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb−Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
MBR8170TFSTAG	WDFN8 (Pb−Free)	1500/Tape & Reel Pin1 Upper Left
MBR8170TFSTWG	WDFN8 (Pb−Free)	5000/Tape & Reel Pin1 Upper Left
MBR8170TFSTBG	WDFN8 (Pb−Free)	1500/Tape & Reel Pin1 Upper Right
MBR8170TFSTXG	WDFN8 (Pb−Free)	5000/Tape & Reel Pin1 Upper Right

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage		V_{RRM} V_{RWM} V_R	170	V
Continuous Forward Current (T_C = 162°C, DC)		$I_{F(DC)}$	8	A
Peak Repetitive Forward Current (T_C = 159°C, Square Wave, Duty = 0.5)		I_{FRM}	16	A
Non−Repetitive Peak Surge Current	Sinusoidal Halfwave, 8.3 ms	I_{FSM}	140	A
	Square wave, 1 ms		200	
	Square wave, 100 μs		330	
Non−Repetitive Avalanche Energy (T_J = 25°C)		E_{AS}	72	mJ
Storage Temperature Range		T_{stg}	−65 to +175	°C
Operating Junction Temperature Range (Note 1)		T_J	−55 to +175	°C
ESD Rating (Human Body Model)			3B	
ESD Rating (Machine Model)			M4	

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. The heat generated must be less than the thermal conductivity from Junction−to−Ambient $dP_D/dT_J < 1/R_{\theta JA}$
   The reliability may be affected by leakage current when device operates near to rated voltage and maximum junction temperature.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Ambient (Note 2)	$R_{\theta JA}$	70	°C/W
Thermal Resistance, Junction−to−Case Bottom (Note 2)	$R_{\theta JCB}$	2.4	°C/W
Thermal Characterization, Junction−to−Case Top (Note 2)	ψ_{JCT}	4.3	°C/W
Thermal Characterization, Junction−to−Lead of Cathode (Note 2)	ψ_{JLC}	2.5	°C/W

2. Assume 600 mm^2, 1 oz. copper bond pad on a FR4 board.

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Typ	Max	Unit
Instantaneous Forward Voltage	V_F			V
(I_F = 4 A, T_J = 25°C)		0.76	–	
(I_F = 4 A, T_J = 125°C)		0.61	–	
(I_F = 8 A, T_J = 25°C)		0.82	0.89	
(I_F = 8 A, T_J = 125°C)		0.68	0.73	
Instantaneous Reverse Current	I_R			
(V_R = Rated DC Voltage, T_J = 25°C)		0.2	30	μA
(V_R = Rated DC Voltage, T_J = 125°C)		0.3	2	mA
Junction Capacitance	C_J			pF
(V_R = 1 V, T_J = 25°C, f = 1 MHz)		237	–	

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

TYPICAL CHARACTERISTICS

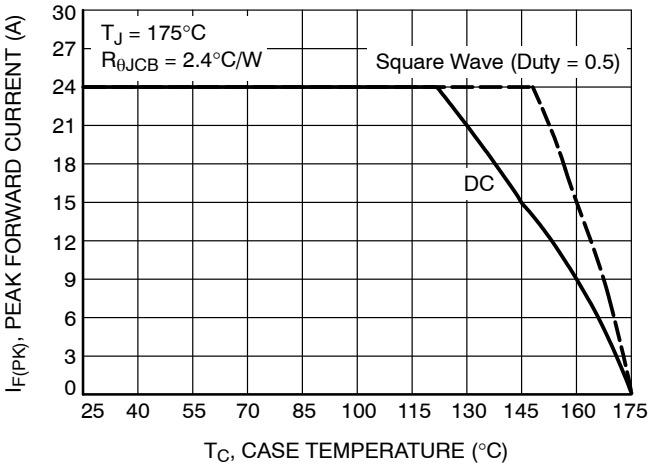


Figure 1. Forward Current Derating of Case Temperature

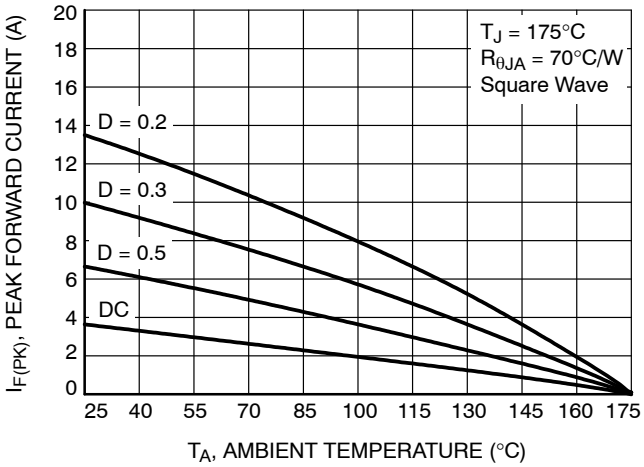


Figure 2. Forward Current Derating of Ambient Temperature

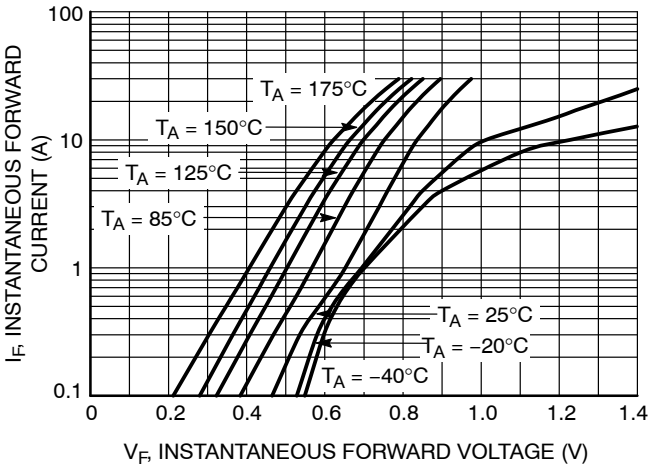


Figure 3. Typical Forward Characteristics

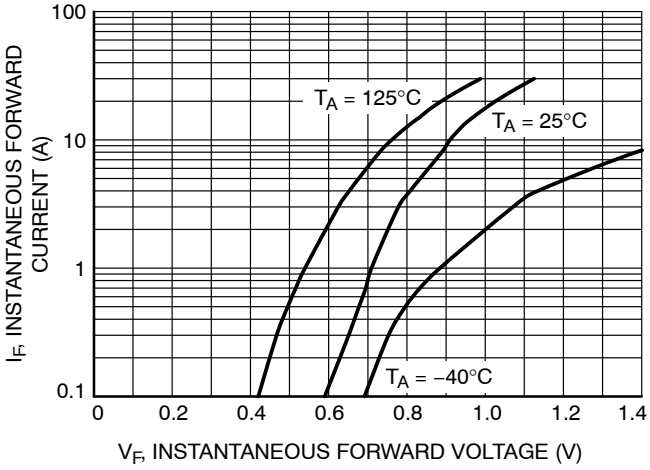


Figure 4. Maximum Forward Characteristics

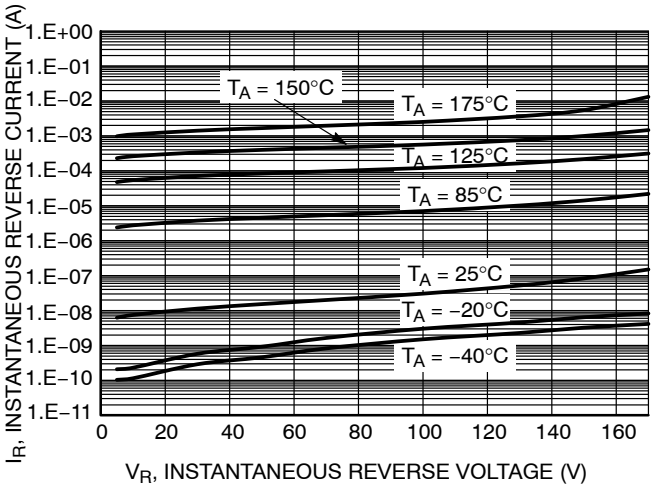


Figure 5. Typical Reverse Characteristics

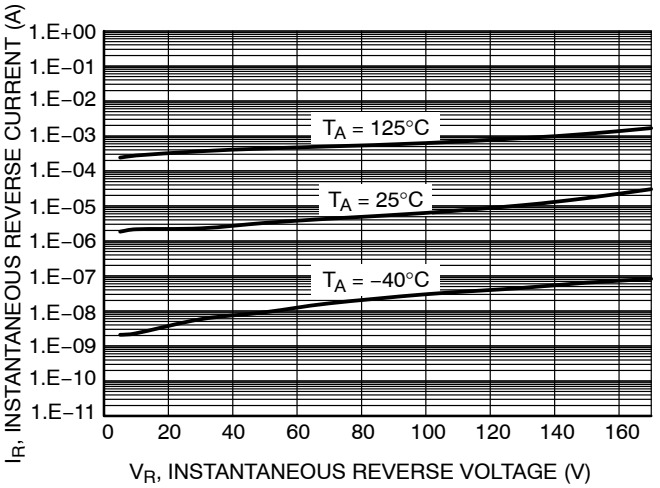


Figure 6. Maximum Reverse Characteristics

TYPICAL CHARACTERISTICS

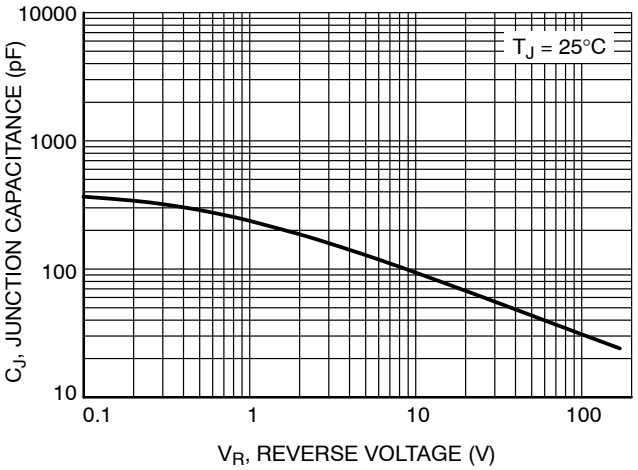


Figure 7. Typical Junction Capacitance

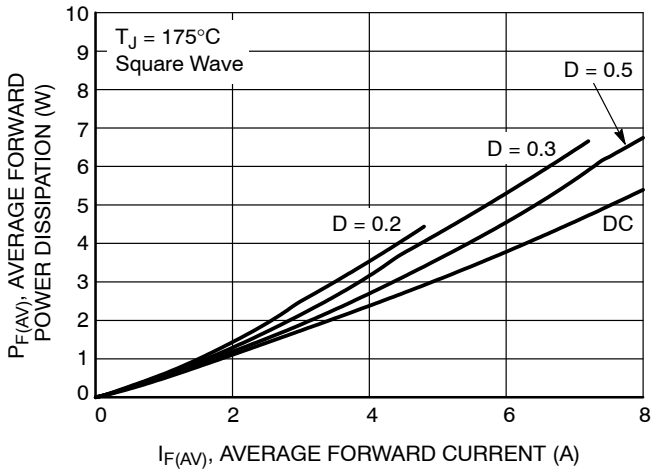


Figure 8. Average Forward Power Dissipation

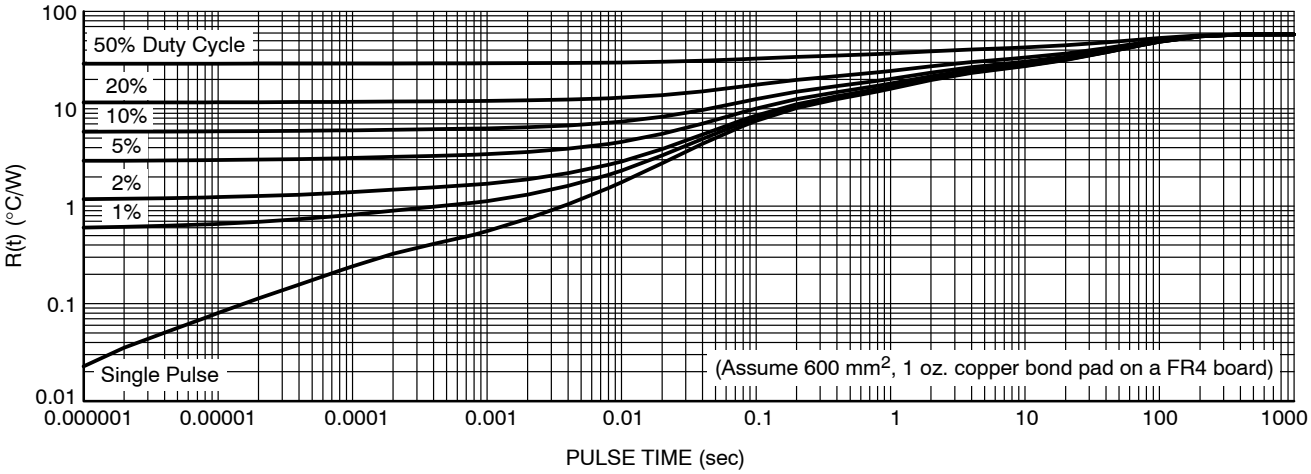
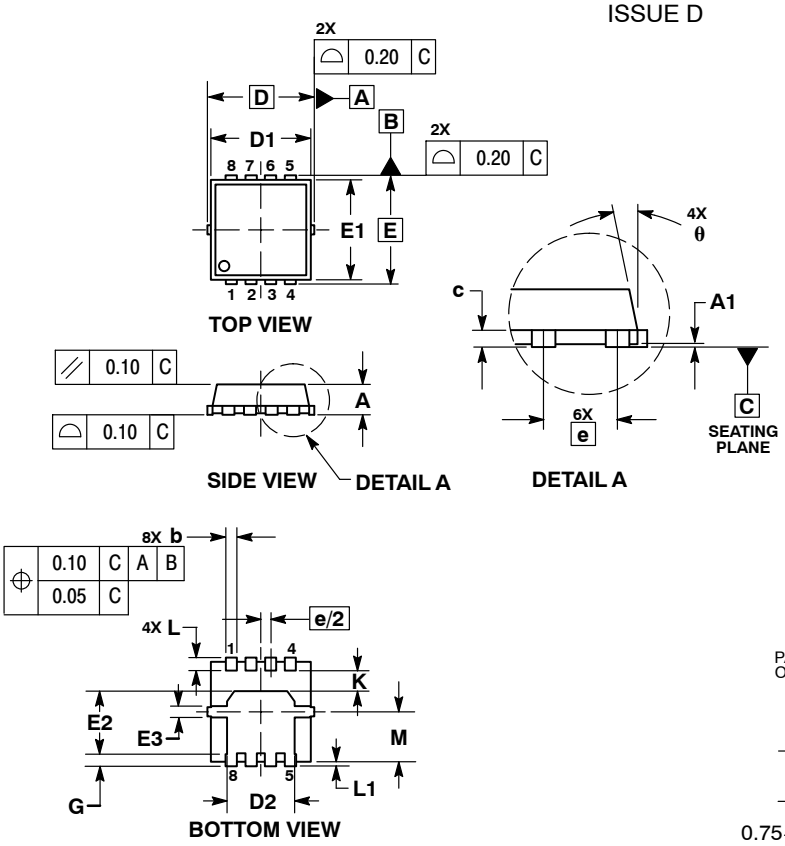


Figure 9. Typical Thermal Characteristics, Junction−to−Ambient

MBR8170TFS

PACKAGE DIMENSIONS

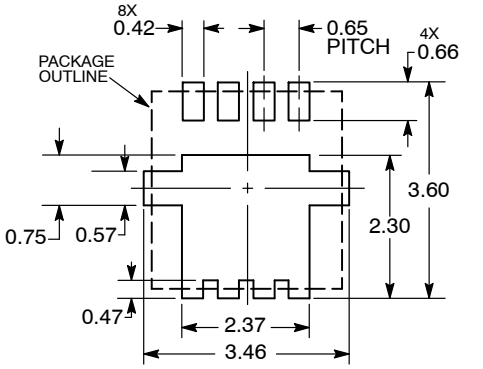
WDFN8 3.3x3.3, 0.65P
CASE 511AB
ISSUE D



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031
A1	0.00	---	0.05	0.000	---	0.002
b	0.23	0.30	0.40	0.009	0.012	0.016
c	0.15	0.20	0.25	0.006	0.008	0.010
D	3.30 BSC			0.130 BSC		
D1	2.95	3.05	3.15	0.116	0.120	0.124
D2	1.98	2.11	2.24	0.078	0.083	0.088
E	3.30 BSC			0.130 BSC		
E1	2.95	3.05	3.15	0.116	0.120	0.124
E2	1.47	1.60	1.73	0.058	0.063	0.068
E3	0.23	0.30	0.40	0.009	0.012	0.016
e	0.65 BSC			0.026 BSC		
G	0.30	0.41	0.51	0.012	0.016	0.020
K	0.65	0.80	0.95	0.026	0.032	0.037
L	0.30	0.43	0.56	0.012	0.017	0.022
L1	0.06	0.13	0.20	0.002	0.005	0.008
M	1.40	1.50	1.60	0.055	0.059	0.063
θ	0 °	---	12 °	0 °	---	12 °

SOLDERING FOOTPRINT*



DIMENSION: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PUBLICATION ORDERING INFORMATION

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