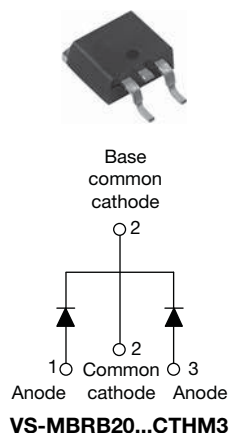
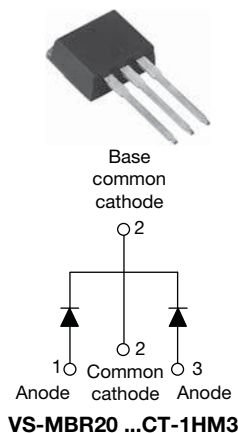


High Performance Schottky Rectifier, 2 x 10 A

TO-263AB (D²PAK)

TO-262AA


FEATURES

- 150 °C T_J operation
- Low forward voltage drop
- High frequency operation
- Center tap D²PAK and TO-262 packages
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified, meets JESD 201 class 1 whisker test
- Material categorization: for definitions of compliance please see www.vishay.com/doc299912



RoHS
COMPLIANT
HALOGEN
FREE

PRODUCT SUMMARY

Package	TO-263AB (D ² PAK), TO-262AA
I _{F(AV)}	2 x 10 A
V _R	80 V, 100 V
V _F at I _F	0.70 V
I _{RM}	6 mA at 125 °C
T _J max.	150 °C
Diode variation	Common cathode
E _{AS}	24 mJ

DESCRIPTION

This center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
I _{F(AV)}	Rectangular waveform (per device)	20	A
I _{FRM}	T _C = 133 °C (per leg)	20	
V _R		80 to 100	V
I _{FSM}	t _p = 5 μs sine	850	A
V _F	10 A _{pk} , T _J = 125 °C	0.70	V
T _J	Range	-55 to +150	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-MBRB2080CTHM3 VS-MBR2080CT-1HM3	VS-MBRB2090CTHM3 VS-MBR2090CT-1HM3	VS-MBRB20100CTHM3 VS-MBR20100CT-1HM3	UNITS
Maximum DC reverse voltage	V _R	80	90	100	V
Maximum working peak reverse voltage	V _{RWM}				

**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current per leg per device	$I_{F(AV)}$	$T_C = 133\text{ }^{\circ}\text{C}$, rated V_R	10 20	A
Peak repetitive forward current per leg	I_{FRM}	Rated V_R , square wave, 20 kHz, $T_C = 133\text{ }^{\circ}\text{C}$	20	
Non-repetitive peak surge current	I_{FSM}	5 μs sine or 3 μs rect. pulse Following any rated load condition and with rated V_{RRM} applied	850	
		Surge applied at rated load conditions half wave, single phase, 60 Hz	150	
Peak repetitive reverse surge current	I_{RRM}	2.0 μs , 1.0 kHz	0.5	
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25\text{ }^{\circ}\text{C}$, $I_{AS} = 2\text{ A}$, $L = 12\text{ mH}$	24	mJ

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum forward voltage drop	$V_{FM}^{(1)}$	10 A	0.80	V
		20 A	0.95	
		10 A	0.70	
		20 A	0.85	
Maximum instantaneous reverse current	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$	0.10	mA
		$T_J = 125\text{ }^{\circ}\text{C}$	6	
Threshold voltage	$V_{F(TO)}$	$T_J = T_J$ maximum	0.433	V
Forward slope resistance	r_t		15.8	m Ω
Maximum junction capacitance	C_T	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^{\circ}\text{C}$	400	pF
Typical series inductance	L_S	Measured from top of terminal to mounting plane	8.0	nH
Maximum voltage rate of change	dV/dt	Rated V_R	10 000	V/ μs

Note(1) Pulse width < 300 μs , duty cycle < 2 %**THERMAL - MECHANICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range	T _J		-55 to +150	°C
Maximum storage temperature range	T _{Stg}		-65 to +150	
Maximum thermal resistance, junction to case per leg	R _{thJC}	DC operation	2.0	°C/W
Typical thermal resistance, case to heatsink	R _{thCS}	Mounting surface, smooth and greased	0.50	
Maximum thermal resistance, junction to ambient	R _{thJA}	DC operation	50	
Approximate weight			2	g
			0.07	oz.
Mounting torque	minimum	Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style D ² PAK	MBRB2090CTH	
			MBRB2080CTH	
			MBRB20100CTH	
		Case style TO-262	MBR2090CT-1H	
			MBR2080CT-1H	
			MBR20100CT-1H	

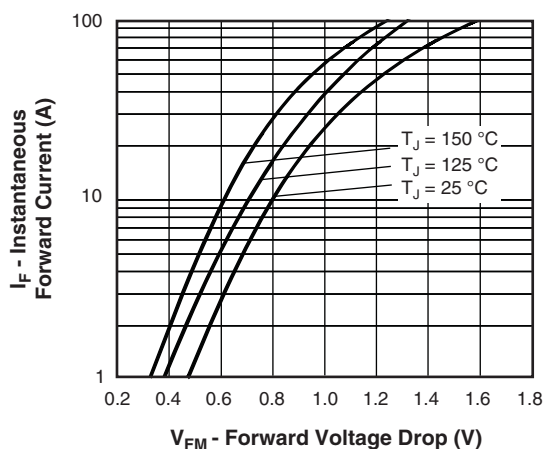


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

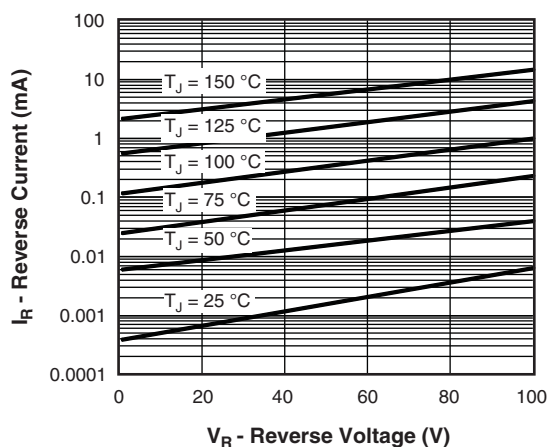


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

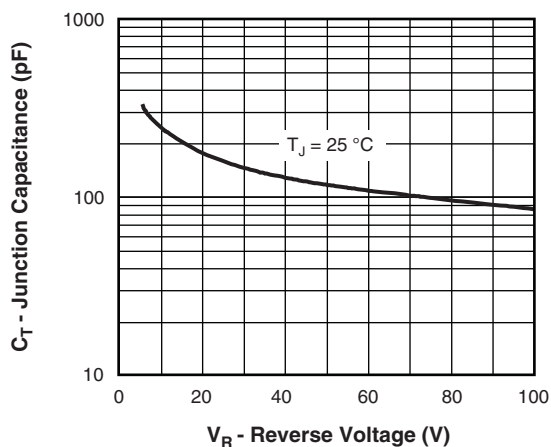


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

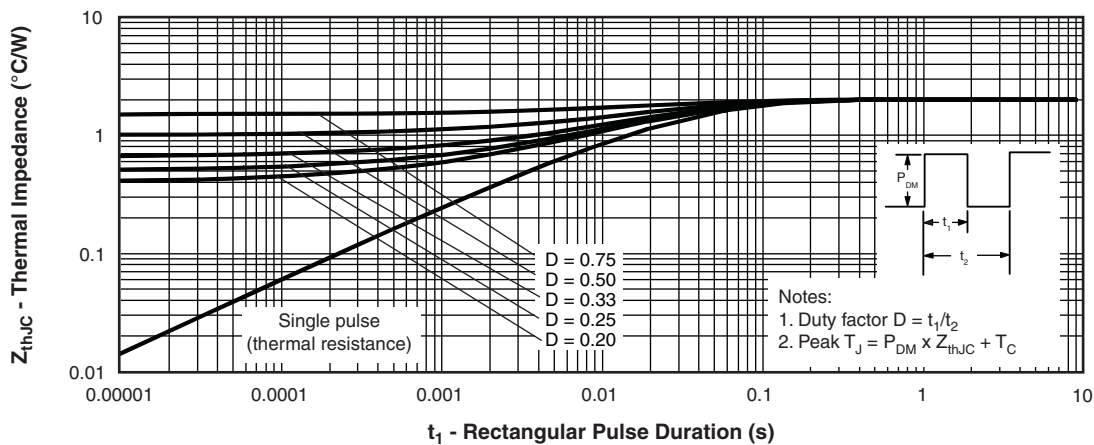


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

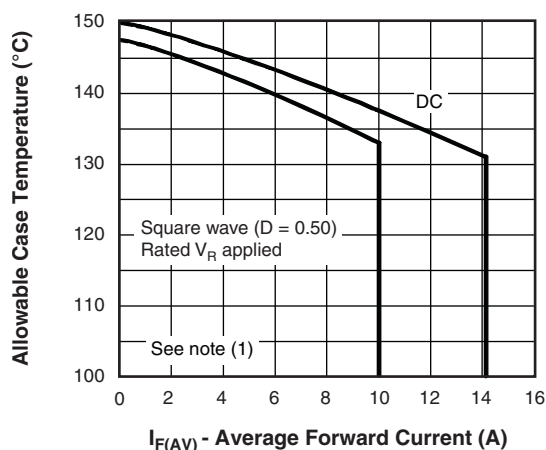


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

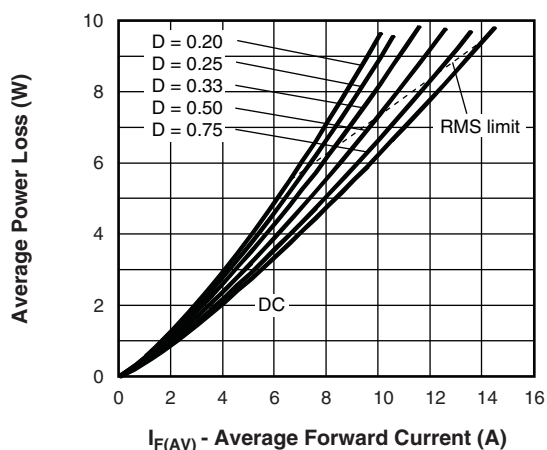


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

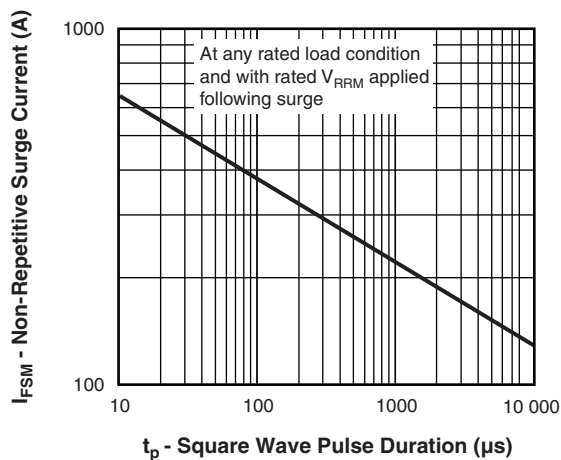


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$;
 P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 P_{dREV} = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = Rated V_R



ORDERING INFORMATION TABLE

Device code	VS-	MBR	B	20	100	CT	-1	L	H	M3
	1	2	3	4	5	6	7	8	9	10
1	Vishay Semiconductors product									
2	Essential part number									
3	- B = D²PAK 7 None - None = TO-262 7 = -1									
4	Current rating (20 = 20 A)									
5	Voltage ratings									
6	CT = common cathode									
7	- None = D²PAK 3 = B -1 = TO-262 3 None									
8	- None = tube (50 pieces) - L = tape and reel (left oriented - for D²PAK only) - R = tape and reel (right oriented - for D²PAK only)									
9	H = AEC-Q101 qualified									
10	M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free									

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-MBRB2080CTHM3	50	1000	Antistatic plastic tube
VS-MBRB2090CTHM3	50	1000	Antistatic plastic tube
VS-MBRB20100CTHM3	50	1000	Antistatic plastic tube
VS-MBRB2080CTLHM3	800	800	13" diameter reel
VS-MBRB2090CTLHM3	800	800	13" diameter reel
VS-MBRB20100CTLHM3	800	800	13" diameter reel
VS-MBRB2080CTRH3	800	800	13" diameter reel
VS-MBRB2090CTRH3	800	800	13" diameter reel
VS-MBRB20100CTRH3	800	800	13" diameter reel
VS-MBRB2080CT-1HM3	50	1000	Antistatic plastic tube
VS-MBRB2090CT-1HM3	50	1000	Antistatic plastic tube
VS-MBRB20100CT-1HM3	50	1000	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS		
Dimensions	TO-263AB (D ² PAK)	www.vishay.com/doc?95046
	TO-262AA	www.vishay.com/doc?95419
Part marking information	TO-263AB (D ² PAK)	www.vishay.com/doc?95444
	TO-262AA	www.vishay.com/doc?95443
Packaging information	TO-263AB (D ² PAK)	www.vishay.com/doc?95032



D²PAK

DIMENSIONS in millimeters and inches

Conforms to JEDEC® outline D²PAK (SMD-220)



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190	
A1	0.00	0.254	0.000	0.010	
b	0.51	0.99	0.020	0.039	
b1	0.51	0.89	0.020	0.035	4
b2	1.14	1.78	0.045	0.070	
b3	1.14	1.73	0.045	0.068	4
c	0.38	0.74	0.015	0.029	
c1	0.38	0.58	0.015	0.023	4
c2	1.14	1.65	0.045	0.065	
D	8.51	9.65	0.335	0.380	2

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
D1	6.86	8.00	0.270	0.315	3
E	9.65	10.67	0.380	0.420	2, 3
E1	7.90	8.80	0.311	0.346	3
e	2.54 BSC		0.100 BSC		
H	14.61	15.88	0.575	0.625	
L	1.78	2.79	0.070	0.110	
L1	-	1.65	-	0.066	3
L2	1.27	1.78	0.050	0.070	
L3	0.25 BSC		0.010 BSC		
L4	4.78	5.28	0.188	0.208	

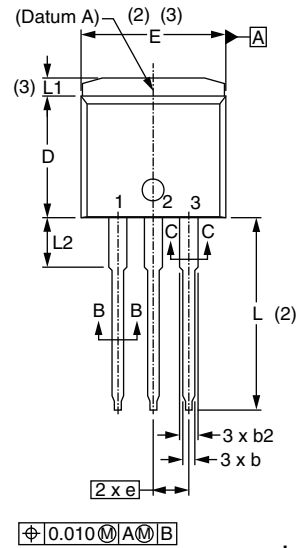
Notes

- (1) Dimensioning and tolerancing per ASME Y14.5 M-1994
- (2) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1
- (4) Dimension b1 and c1 apply to base metal only
- (5) Datum A and B to be determined at datum plane H
- (6) Controlling dimension: inch
- (7) Outline conforms to JEDEC® outline TO-263AB

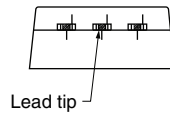
TO-262

DIMENSIONS in millimeters and inches

Modified JEDEC outline TO-262



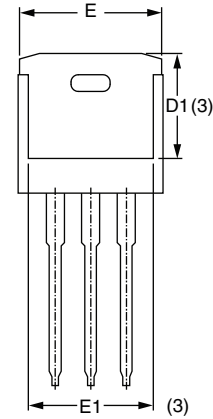
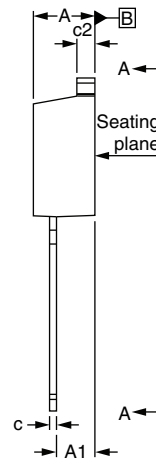
± 0.010 (M) (A) (B)



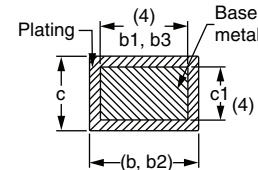
Lead assignments

Diodes

1. - Anode (two die)/open (one die)
2. - Cathode
3. - Anode



Section A - A



Section B - B and C - C

Scale: None

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190	
A1	2.03	3.02	0.080	0.119	
b	0.51	0.99	0.020	0.039	
b1	0.51	0.89	0.020	0.035	4
b2	1.14	1.78	0.045	0.070	
b3	1.14	1.73	0.045	0.068	4
c	0.38	0.74	0.015	0.029	
c1	0.38	0.58	0.015	0.023	4
c2	1.14	1.65	0.045	0.065	
D	8.51	9.65	0.335	0.380	2
D1	6.86	8.00	0.270	0.315	3
E	9.65	10.67	0.380	0.420	2, 3
E1	7.90	8.80	0.311	0.346	3
e	2.54 BSC		0.100 BSC		
L	13.46	14.10	0.530	0.555	
L1	-	1.65	-	0.065	3
L2	3.56	3.71	0.140	0.146	

Notes

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1
- (4) Dimension b1 and c1 apply to base metal only
- (5) Controlling dimension: inches
- (6) Outline conform to JEDEC TO-262 except A1 (maximum), b (minimum) and D1 (minimum) where dimensions derived the actual package outline



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