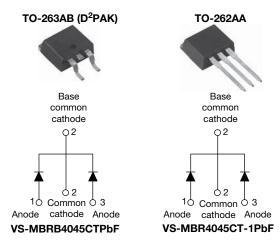


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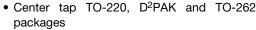
High Performance Schottky Rectifier, 2 x 20 A

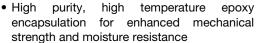


PRODUCT SUMMARY				
Package	D ² PAK, TO-262			
I _{F(AV)}	40 A			
V_{R}	45 V			
V _F at I _F	0.58 V			
I _{RM} max.	95 mA at 125 °C			
T_J max.	150 °C			
Diode variation	Single die			
E _{AS}	20 mJ			

FEATURES

- 150 °C T_J operation
- Low forward voltage drop
- High frequency operation







- 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
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

DESCRIPTION

The 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)	40	Δ.		
I _{FRM}	T _C = 118 °C (per leg)	40	_ A		
V _{RRM}		45	V		
I _{FSM}	t _p = 5 μs sine	900	A		
V _F	20 A _{pk} , T _J = 125 °C	0.58	V		
TJ	Range	-65 to +150	°C		

VOLTAGE RATINGS				
PARAMETER	SYMBOL	VS-MBRB4045CTPbF VS-MBR4045CT-1PbF	UNITS	
Maximum DC reverse voltage	V_{R}	45	V	
Maximum working peak reverse voltage	V_{RWM}	45	V	

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	PARAMETER SYMBOL TEST CONDITIONS		TIONS	VALUES	UNITS
Maximum average per leg		T _C = 118 °C, rated V _R		20	
forward current per device	I _{F(AV)}			40	
Peak repetitive forward current per leg	I _{FRM}	Rated V _R , square wave, 20 kHz, T _C = 118 °C		40	Α
Maximum peak one cycle non-repetitive	etitive I _{FSM}	5 µs sine or 3 µs rect. pulse	Following any rated load condition and with rated	900	
peak surge current per leg		10 ms sine or 6 ms rect. pulse	V _{RRM} applied	210	
Non-repetitive avalanche energy per leg	E _{AS}	$T_J = 25$ °C, $I_{AS} = 3$ A, $L = 4.4$ mH	ł	20	mJ
Repetitive avalanche current per leg	I _{AR}	Current decaying linearly to zero Frequency limited by T _J maximu		3	Α

Revision: 15-Jul-14 Document Number: 94311



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ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CO	NDITIONS	VALUES	UNITS
		20 A	T 05 °C	0.60	V
Maximum forward voltage drop	V (1)	40 A	T _J = 25 °C	0.78	
Maximum forward voltage drop	V _{FM} ⁽¹⁾	20 A	T 405.00	0.58	
		40 A	T _J = 125 °C	0.75	
	I _{RM} ⁽¹⁾	T _J = 25 °C		1	mA
Maximum instantaneous reverse current		T _J = 100 °C	Rated DC voltage	50	
Tovordo darront		T _J = 125 °C		95	
Maximum junction capacitance	C _T	V _R = 5 V _{DC} (test signal rang	ge 100 kHz to 1 MHz), 25 °C	900	pF
Typical series inductance	L _S	Measured from top of terminal to mounting plane 8.0		8.0	nH
Maximum voltage rate of change	dV/dt	Rated V _R		10 000	V/µs

Note

 $^{^{(1)}}$ Pulse width < 300 μ s, duty cycle < 2 %

THERMAL - MECHANICAL	SPECIFIC	ATIONS			
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Maximum junction temperature range	T_J		-65 to +150	°C	
Maximum storage temperature range	T _{Stg}		-65 to +175	C	
Maximum thermal resistance, junction to case per leg	R _{thJC}	DC operation	1.5		
Typical thermal resistance, case to heatsink	R _{thCS}	R _{thCS} Mounting surface, smooth and greased (Only for TO-220)		°C/W	
Maximum thermal resistance, junction to ambient	R _{thJA}	DC operation (For D ² PAK and TO-262)	50		
Approximate weight			2	g	
Approximate weight			0.07	OZ.	
May unting targets minimum		New Life Sealerd Heavenille	6 (5)	kgf · cm	
Mounting torque maximum		Non-lubricated threads	12 (10)	(lbf \cdot in)	
Marking daying		Case style D ² PAK	MBRB4	1045CT	
Marking device		Case style TO-262	MBR40	45CT-1	





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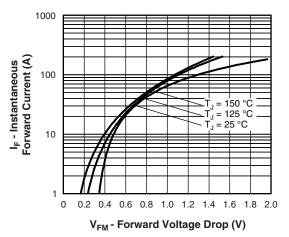


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

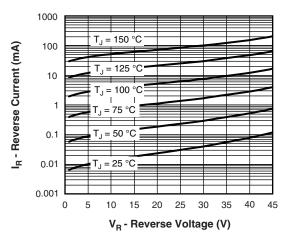


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

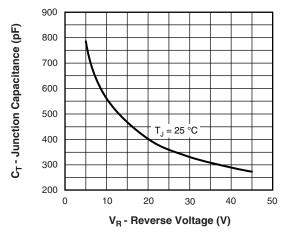


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

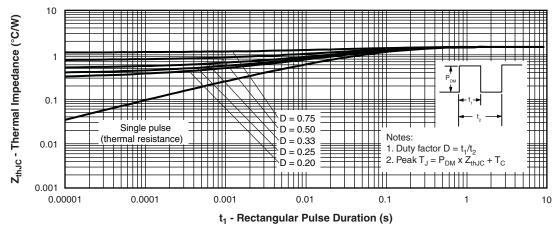


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

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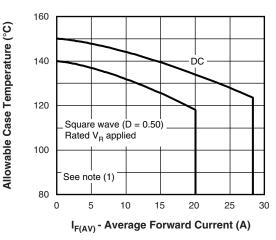


Fig. 5 - Maximum Allowable Case Temperature vs.
Average Forward Current

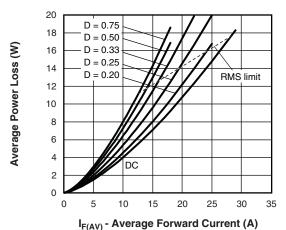


Fig. 6 - Forward Power Loss Characteristics

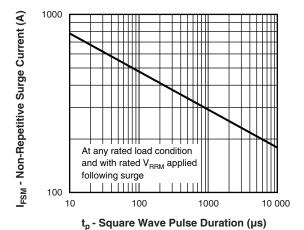


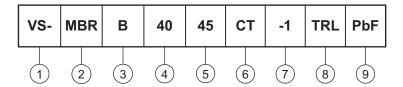
Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

Vishay Semiconductors

ORDERING INFORMATION TABLE

Device code



- 1 Vishay Semiconductors product
- 2 Essential part number
- **3** • B = D²PAK **7** None
 - None = TO-262 7 = -1
- Current rating (40 = 40 A)
- 5 Voltage rating (45 = 45 V)
- 6 CT = essential part number
- 7 • None = D²PAK **3** = B
 - -1 = TO-262 **3** None
- None = tube (50 pieces)
 - TRL = tape and reel (left oriented for D²PAK only)
 - TRR = tape and reel (right oriented for D²PAK only)
- 9 • PbF = lead (Pb)-free (for TO-262 and D²PAK tube)
 - P = lead (Pb)-free (for D²PAK TRR and TRL)

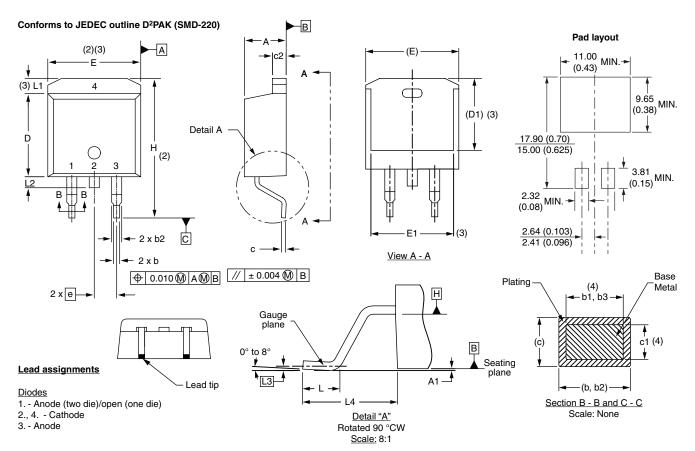
LINKS TO RELATED DOCUMENTS				
Dimensions	www.vishay.com/doc?95014			
Part marking information	www.vishay.com/doc?95008			
Packaging information	www.vishay.com/doc?95032			
SPICE model	www.vishay.com/doc?95296			



Vishay High Power Products

D²PAK, TO-262

DIMENSIONS FOR D²PAK in millimeters and inches



	MILLIM	IETERS	INC	HES	
SYMBOL	MIN.	MAX.	MIN.	MAX.	NOTES
Α	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
С	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	MILLIM	ETERS	INC	HES	NOTES
STINIBUL	MIN.	MAX.	MIN.	MAX.	NOTES
D1	6.86	8.00	0.270	0.315	3
Е	9.65	10.67	0.380	0.420	2, 3
E1	7.90	8.80	0.311	0.346	3
е	2.54 BSC		0.100 BSC		
Н	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

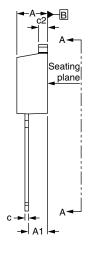
(7) Outline conforms to JEDEC outline TO-263AB

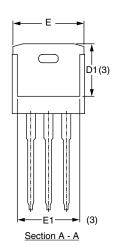
Vishay High Power Products

D²PAK, TO-262



DIMENSIONS FOR TO-262 in millimeters and inches





⊕ 0.010**⋒**|A**⋒**|B

Lead assignments



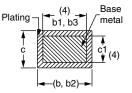
Diodes

-3 x b2 --3 x b

1. - Anode (two die)/open (one die)

2., 4. - Cathode

3. - Anode



Section B - B and C - C Scale: None

SYMBOL	MILLIM	ETERS	INC	NOTEO	
	MIN.	MAX.	MIN.	MAX.	NOTES
Α	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
С	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
Е	9.65	10.67	0.380	0.420	2, 3
E1	7.90	8.80	0.311	0.346	3
е	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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Vishay

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Revision: 13-Jun-16 1 Document Number: 91000