RoHS COMPLIANT

HALOGEN

FREE



Vishay General Semiconductor

Dual High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.52 \text{ V}$ at $I_F = 5 \text{ A}$





PRIMARY CHARACTERISTICS				
I _{F(AV)}	2 x 20 A			
V _{RRM} 170 V				
I _{FSM}	200 A			
V _F at I _F = 20 A	0.68 V			
T _J max.	175 °C			
Package	D ² PAK (TO-263AB)			
Circuit configuration	Common cathode			

FEATURES

- Trench MOS Schottky technology
- · Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

TYPICAL APPLICATIONS

For use in high frequency DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection.

MECHANICAL DATA

Case: D²PAK (TO-263AB)

Molding compound meets UL 94 V-0 flammability rating Base P/N-E3 - RoHS-compliant, commercial grade Base P/N-M3 - halogen-free, RoHS-compliant

Terminals: matte tin plated leads, solderable per

J-STD-002 and JESD 22-B102

E3 and M3 suffix meet JESD 201 class 2 whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)						
PARAMETER			VB40170C	UNIT		
Maximum repetitive peak reverse voltage		V_{RRM}	170	V		
Maximum average forward rectified current (fig. 1)	per device	1	40	А		
	per diode	I _{F(AV)}	20	^		
Peak forward surge current 8.3 ms single half sine-wav	I _{FSM}	200	Α			
Voltage rate of change (rated V _R)	dV/dt	10 000	V/µs			
Operating junction and storage temperature range			-40 to +175	°C		

ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)							
PARAMETER	TEST CO	SYMBOL	TYP.	MAX.	UNIT		
Instantaneous forward voltage per diode	I _F = 5 A	T _A = 25 °C	V _F ⁽¹⁾	0.66	-	V	
	I _F = 10 A			0.75	-		
	I _F = 20 A			0.86	1.20		
	I _F = 5 A	T _A = 125 °C		0.52	-		
	I _F = 10 A			0.59	-		
	I _F = 20 A			0.68	0.76		
Reverse current per diode	V _R = 136 V	T _A = 25 °C		1.3	-	μA	
		T _A = 125 °C	I _R ⁽²⁾	2.2	-	mA	
	V _R = 170 V	T _A = 25 °C] 'R (-)	_	250	μA	
		T _A = 125 °C		4.2	50	mA	

Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

⁽²⁾ Pulse test: pulse width ≤ 5 ms



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THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)					
PARAMETER		SYMBOL	VB40170C	UNIT	
Typical thermal resistance	per diode	R _{θJC} ⁽¹⁾	1.2	°C/W	
	per device		0.85		

Note

 $^{^{(1)}}$ Mounted on infinite heat sink; thermal resistance $R_{\theta JC}$ - junction-to-case

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-263AB	VB40170C-E3/4W	1.38	4W	50/tube	Tube
TO-263AB	VB40170C-E3/8W	1.38	8W	800/reel	Tape and reel
TO-263AB	VB40170C-M3/I	1.38	I	800/reel	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

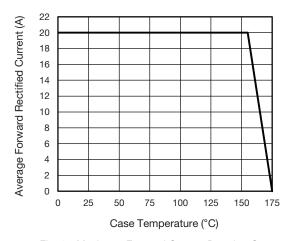


Fig. 1 - Maximum Forward Current Derating Curve

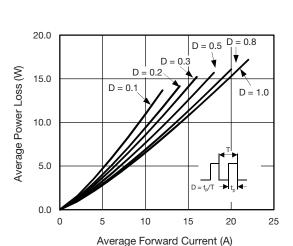


Fig. 2 - Forward Power Loss Characteristics Per Diode

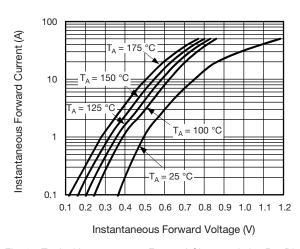
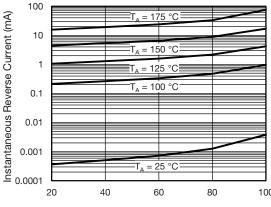


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode



Percent of Rated Peak Reverse Voltage (%)

Fig. 4 - Typical Reverse Characteristics Per Diode



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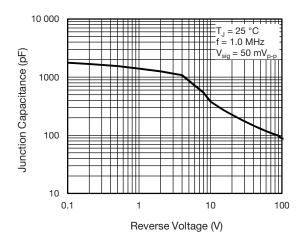


Fig. 5 - Typical Junction Capacitance Per Diode

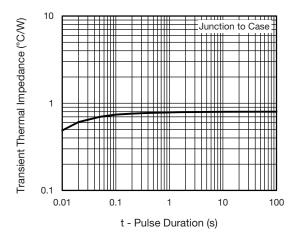


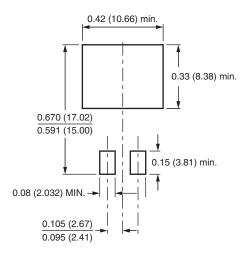
Fig. 6 - Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

D²PAK (TO-263AB)

0.411 (10.45) 0.190 (4.83) 0.380 (9.65) 0.055 (1.40) 0.160 (4.06) 0.245 (6.22) 0.045 (1.14) MIN. 0.055 (1.40) 0.360 (9.14) 0.047 (1.19) 0.320 (8.13) 0.624 (15.85) 0.591 (15.00) 0 to 0.01 (0 to 0.254) 0.110 (2.79) 0.090 (2.29) 0.037 (0.940) 0.021 (0.53) 0.027 (0.686) 0.014 (0.36) 0.105 (2.67) 0.140 (3.56) 0.095 (2.41) 0.205 (5.20) 0.110 (2.79) 0.195 (4.95)

Mounting Pad Layout





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