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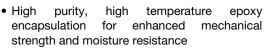
High Performance Schottky Rectifier, 2 x 10 A



PRIMARY CHARACTERISTICS								
I _{F(AV)} 2 x 10 A								
V _R	35 V, 40 V, 45 V							
V _F at I _F	0.57 V							
I _{RM} max.	15 mA at 125 °C							
T _J max.	175 °C							
E _{AS}	13 mJ							
Package	TO-220AB 3L							
Circuit configuration	Common cathode							

FEATURES

- 175 °C T_J operation
- Low forward voltage drop
- · High frequency operation





- Guard ring for enhanced ruggedness and long term reliability
- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

DESCRIPTION

The VS-20CTQ... center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS								
SYMBOL CHARACTERISTICS VALUES								
I _{F(AV)}	Rectangular waveform	20	А					
V _{RRM}	Range	35 to 45	V					
I _{FSM}	$t_p = 5 \mu s sine$	1060	Α					
V _F	10 A _{pk} , T _J = 125 °C (per leg)	0.57	V					
T _J	Range	-55 to +175	°C					

VOLTAGE RATINGS								
PARAMETER SYMBOL VS-20CTQ035-M3 VS-20CTQ040-M3 VS-20CTQ045-M3 UNIT								
Maximum DC reverse voltage	V_R	35	40	45	V			
Maximum working peak reverse voltage V _{RWM}		33	40	45	V			

ABSOLUTE MAXIMUM RATINGS								
PARAMETER	SYMBOL	TEST COND	VALUES	UNITS				
Maximum average forward current see fig. 5	I _{F(AV)}	50 % duty cycle at T _C = 145 °C	20					
Maximum peak one cycle non-repetitive	I _{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated	1060	Α			
surge current per leg, see fig. 7		10 ms sine or 6 ms rect. pulse	V _{RRM} applied	265				
Non-repetitive avalanche energy per leg	E _{AS}	$T_J = 25 ^{\circ}\text{C}, I_{AS} = 2.0 \text{A}, L = 6.5 \text{M}$	13	mJ				
Repetitive avalanche current per leg	I _{AR}	Current decaying linearly to zero Frequency limited by T _J maximo	2.0	Α				



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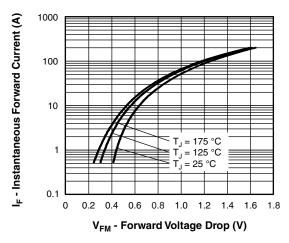
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ELECTRICAL SPECIFICATIONS								
PARAMETER	SYMBOL	TEST CO	VALUES	UNITS				
		10 A	T _{.1} = 25 °C	0.64				
Maximum forward voltage drop per leg) (1)	20 A	1J=25 C	0.76	V			
See fig. 1	V _{FM} ⁽¹⁾	10 A	T _{.1} = 125 °C	0.57				
		20 A	1 1 125 C	0.68				
Maximum reverse leakage current per leg	I _{RM} ⁽¹⁾	T _J = 25 °C	V _R = Rated V _R	2	- mA			
See fig. 2	'RM '''	T _J = 125 °C	v _R = nateu v _R	15				
Maximum junction capacitance per leg	C _T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C		900	pF			
Typical series inductance per leg	L _S	Measured lead to lead 5 m	8.0	nH				
Maximum voltage rate of change	dV/dt	Rated V _R	10 000	V/µs				

Note

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

THERMAL - MECHANICAL SPECIFICATIONS								
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS			
Maximum junction and storage temperature range		T _J , T _{Stg}		-55 to +175	°C			
Maximum thermal resistance, junction to case per leg		B	DC operation See fig. 4	3.25				
Maximum thermal resistance, junction to case per package		R_{thJC}	DC operation	1.63	°C/W			
Typical thermal resistance, case to heatsink		R _{thCS}	Mounting surface, smooth and greased	0.50				
Approximate weight				2	g			
Approximate weight				0.07	OZ.			
Mounting toyour	minimum			6 (5)	kgf ⋅ cm			
Mounting torque maxim				12 (10)	(lbf \cdot in)			
				20CTQ035				
Marking device			Case style TO-220AB 3L	20CTQ040				
				20CTQ045				



1000 100 I_R - Reverse Current (mA) 10 = 150 0.1 T₁ = 50 °C 0.01 0.001 0.0001 30 40 20 25 0 10 V_R - Reverse Voltage (V)

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

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

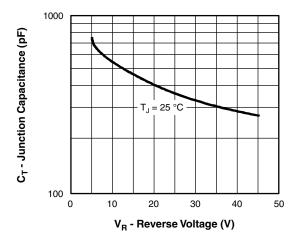


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

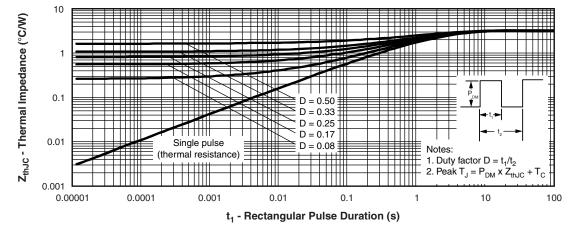


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

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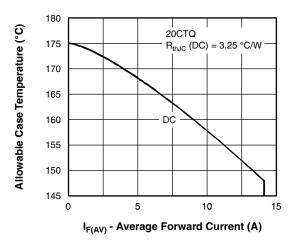


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

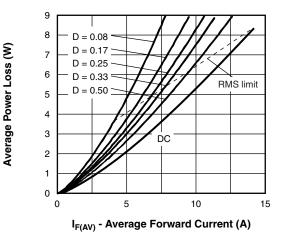


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

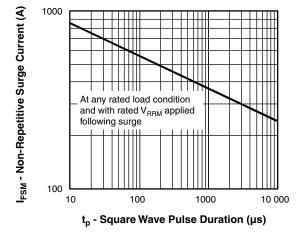


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

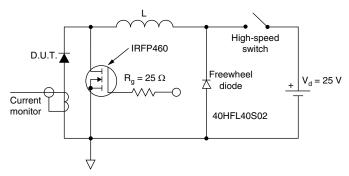


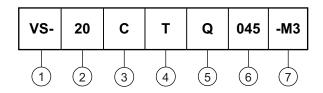
Fig. 8 - Unclamped Inductive Test Circuit

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ORDERING INFORMATION TABLE





1 - Vishay Semiconductors product

2 - Current rating (20 = 20 A)

Circuit configuration

C = Common cathode

4 - Package

T = TO-220

5 - Schottky "Q" series

035 = 35 V

6 - Voltage rating

040 = 40 V 045 = 45 V

7 - Environmental digit

-M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free

ORDERING INFORMATION (Example)								
PREFERRED P/N	BASE QUANTITY	PACKAGING DESCRIPTION						
VS-20CTQ035-M3	50	Antistatic plastic tube						
VS-20CTQ040-M3	50	Antistatic plastic tube						
VS-20CTQ045-M3	50	Antistatic plastic tube						

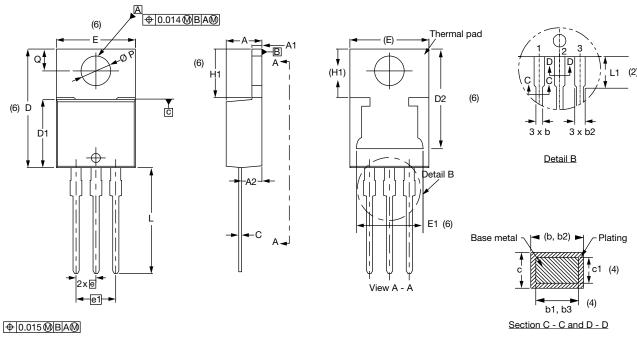
LINKS TO RELATED DOCUMENTS							
Dimensions	www.vishay.com/doc?96154						
Part marking information	www.vishay.com/doc?95028						



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TO-220AB 3L

DIMENSIONS in millimeters and inches



Lead tip	
	-

Conforms to JEDEC® outline TO-220AB

SYMBOL	MILLIMETERS		INCHES		NOTES	NOTES		NOTES		MILLIN	IETERS	INC	HES	NOTES
STWIBUL	MIN.	MAX.	MIN.	MAX.	NOTES	NOTES	SYMBOL	MIN.	MAX.	MIN.	MAX.	NOTES		
Α	4.25	4.65	0.167	0.183			D2	11.68	13.30	0.460	0.524	6, 7		
A1	1.14	1.40	0.045	0.055			E	10.11	10.51	0.398	0.414	3, 6		
A2	2.50	2.92	0.098	0.115			E1	6.86	8.89	0.270	0.350	6		
b	0.69	1.01	0.027	0.040			е	2.41	2.67	0.095	0.105			
b1	0.38	0.97	0.015	0.038	4		e1	4.88	5.28	0.192	0.208			
b2	1.20	1.73	0.047	0.068			H1	6.09	6.48	0.240	0.255	6		
b3	1.14	1.73	0.045	0.068	4		L	13.52	14.02	0.532	0.552			
С	0.36	0.61	0.014	0.024			L1	3.32	3.82	0.131	0.150	2		
с1	0.36	0.56	0.014	0.022	4		ØΡ	3.54	3.91	0.139	0.154			
D	14.85	15.35	0.585	0.604	3		Q	2.60	3.00	0.102	0.118			
D1	8.38	9.02	0.330	0.355										

Notes

- $^{(1)}$ Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Lead dimension and finish uncontrolled in L1
- (3) Dimension D, D1, 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 outermost extremes of the plastic body
- (4) Dimension b1, b3, and c1 apply to base metal only
- (5) Controlling dimensions: inches
- (6) Thermal pad contour optional within dimensions E, H1, D2, and E1
- (7) Outline conforms to JEDEC® TO-220, except D2



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