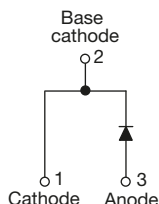


High Performance Schottky Rectifier, 8 A



2L TO-220AC



FEATURES

- 175 °C T_J operation
- Low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- 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 www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

DESCRIPTION

The VS-8TQ... 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.

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	8 A
V_R	60 V, 80 V, 100 V
V_F at I_F	0.58 V
I_{RM} max.	7 mA at 125 °C
T_J max.	175 °C
E_{AS}	7.5 mJ
Package	2L TO-220AC
Circuit configuration	Single

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	8	A
V_{RRM}	Range	60 to 100	V
I_{FSM}	$t_p = 5 \mu s$ sine	850	A
V_F	8 A _{pk} , $T_J = 125$ °C	0.58	V
T_J	Range	-55 to +175	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-8TQ060-M3	VS-8TQ080-M3	VS-8TQ100-M3	UNITS
Maximum DC reverse voltage	V_R	60	80	100	V
Maximum working peak reverse voltage	V_{RWM}				

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current, see fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 157$ °C, rectangular waveform	8	A
Maximum peak one cycle non-repetitive surge current, see fig. 7	I_{FSM}	5 μs sine or 3 μs rect. pulse	850	A
		10 ms sine or 6 ms rect. pulse	230	
Non-repetitive avalanche energy	E_{AS}	$T_J = 25$ °C, $I_{AS} = 0.50$ A, $L = 60$ mH	7.50	mJ
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical	0.50	A



ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	V _{FM} ⁽¹⁾	8 A	T _J = 25 °C	0.72	V
		16 A		0.88	
		8 A	T _J = 125 °C	0.58	
		16 A		0.69	
Maximum reverse leakage current See fig. 2	I _{RM} ⁽¹⁾	T _J = 25 °C	V _R = rated V _R	0.55	mA
		T _J = 125 °C		7	
Maximum junction capacitance	C _T	V _R = 5 V _{DC} (test signal range 100 kHz to 1 MHz) 25 °C		500	pF
Typical series inductance	L _S	Measured lead to lead 5 mm from package body		8	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 and storage temperature range		T _J , T _{Stg}			-55 to +175	°C
Maximum thermal resistance, junction to case		R _{thJC}	DC operation See fig. 4		2.0	°C/W
Typical thermal resistance, case to heatsink		R _{thCS}	Mounting surface, smooth, and greased		0.50	
Approximate weight				2	g	
				0.07	oz.	
Mounting torque	minimum			6 (5)	kgf · cm (lbf · in)	
	maximum			12 (10)		
Marking device		Case style 2L TO-220AC		8TQ060		
				8TQ080		
				8TQ100		

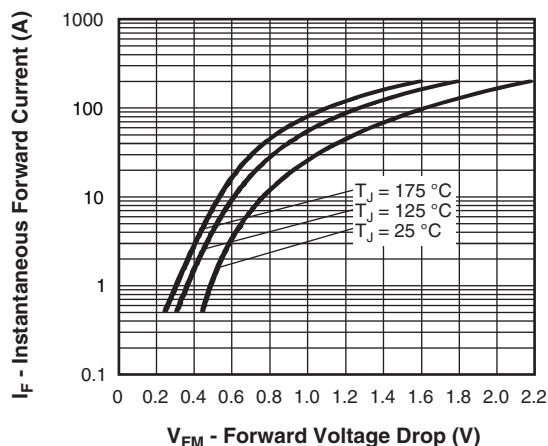


Fig. 1 - Maximum Forward Voltage Drop Characteristics

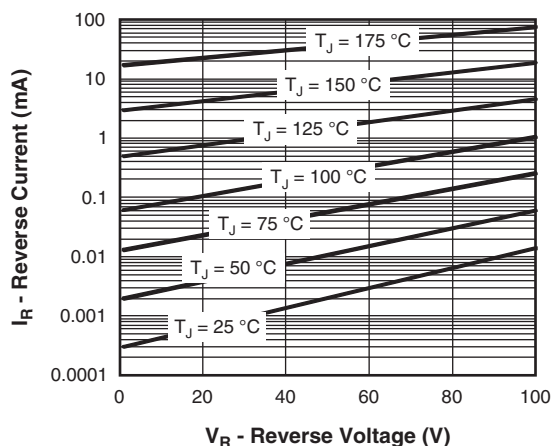


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

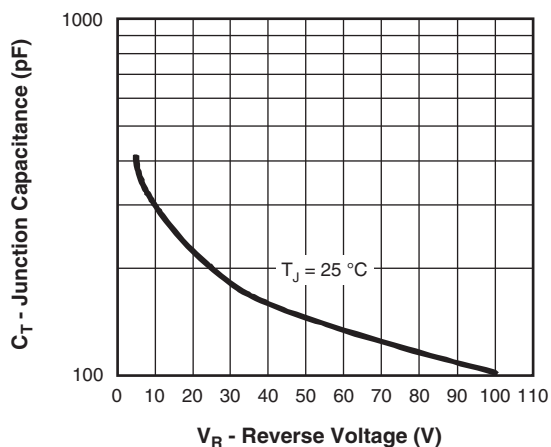


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

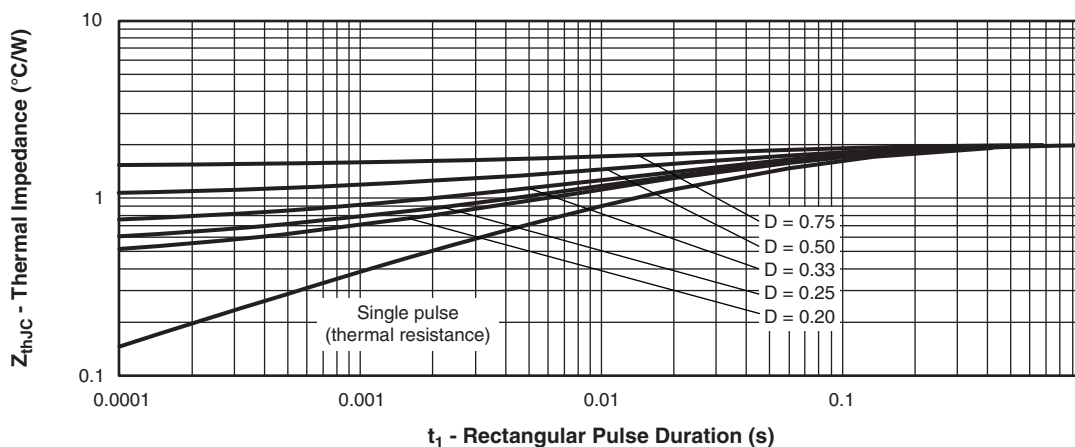


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

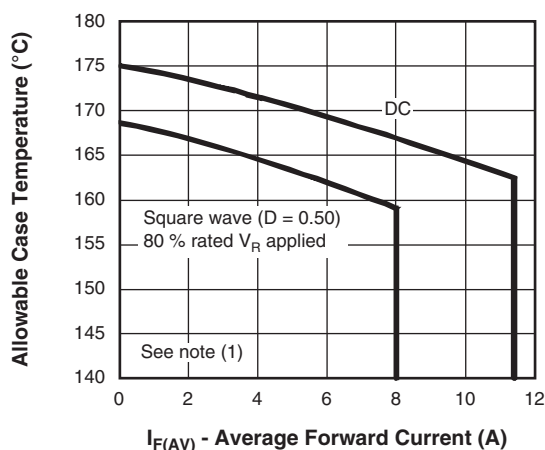


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

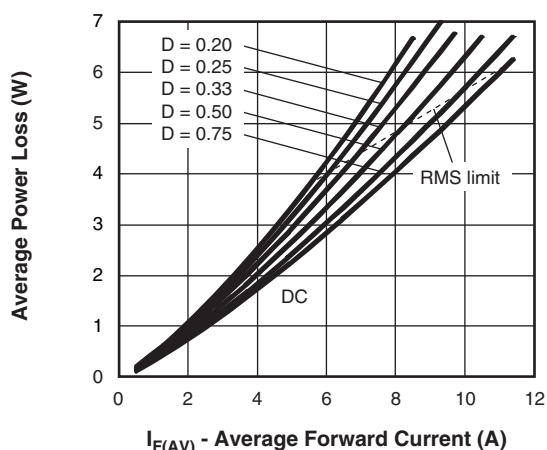


Fig. 6 - Forward Power Loss Characteristics

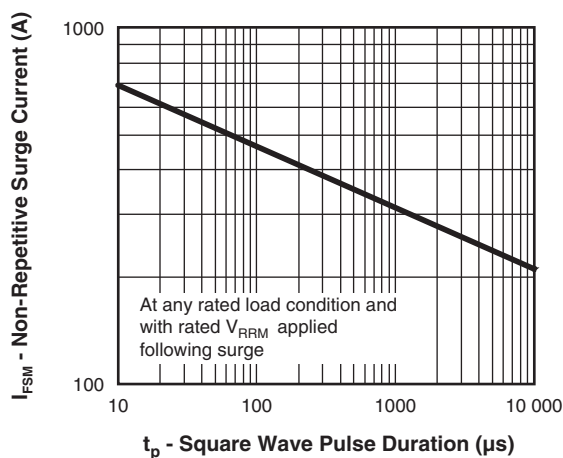


Fig. 7 - Maximum Non-Repetitive Surge Current

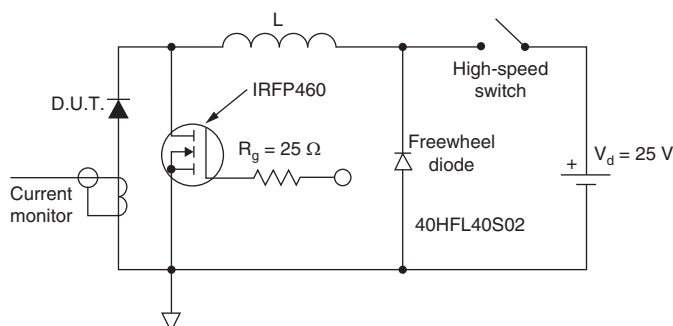


Fig. 8 - Unclamped Inductive Test Circuit

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 $V_{R1} = 80 \%$ rated V_R

**ORDERING INFORMATION TABLE**

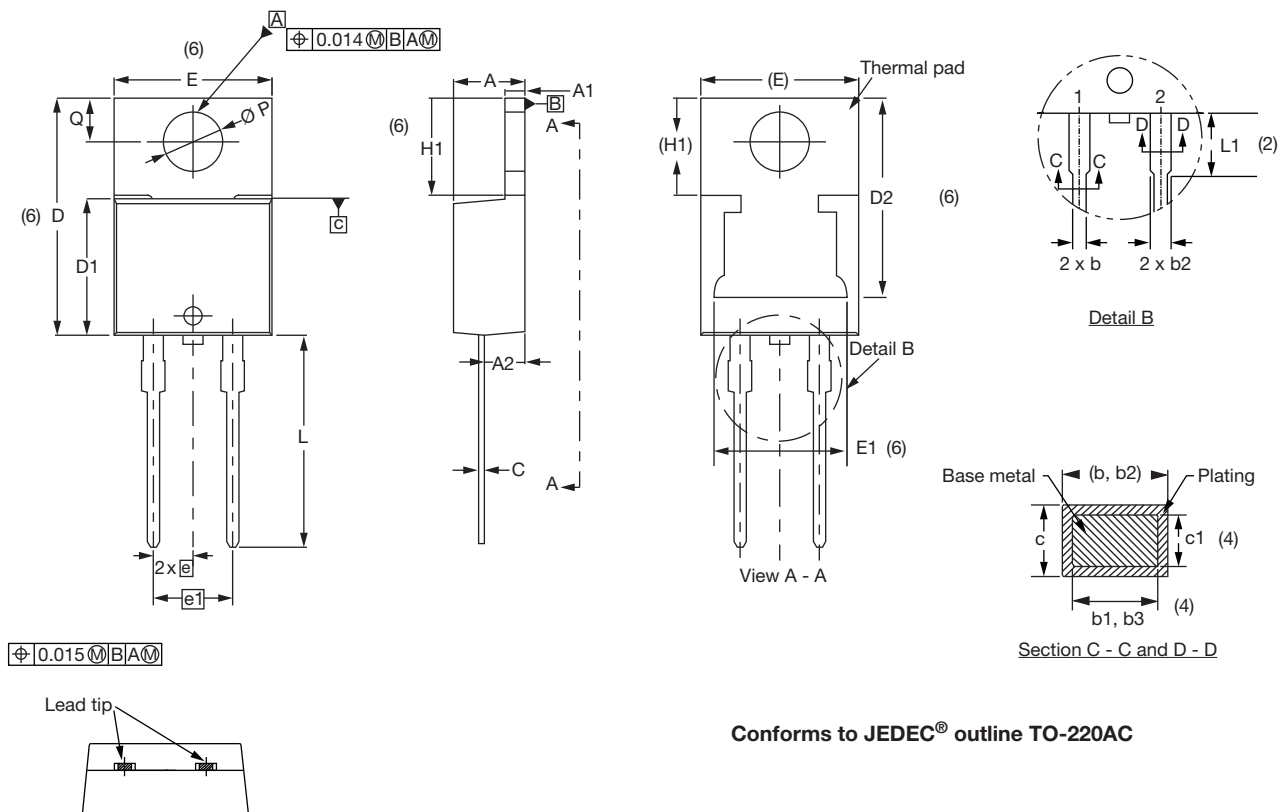
Device code	VS-	8	T	Q	100	-M3
	1	2	3	4	5	6
1	- Vishay Semiconductors product					
2	- Current rating (8 = 8 A)					
3	- Package: T = TO-220					
4	- Schottky "Q" series					
5	- Voltage ratings					
6	- Environmental digit					
	-M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free					

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-8TQ060-M3	50	1000	Antistatic plastic tube
VS-8TQ080-M3	50	1000	Antistatic plastic tube
VS-8TQ100-M3	50	1000	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?96156
Part marking information	www.vishay.com/doc?95391
SPICE model	www.vishay.com/doc?96227

2L TO-220AC

DIMENSIONS in millimeters and inches



Conforms to JEDEC® outline TO-220AC

SYMBOL	MILLIMETERS		INCHES		NOTES		SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.				MIN.	MAX.			
A	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			e	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	
c	0.36	0.61	0.014	0.024			L1	3.32	3.82	0.131	0.150	2
c1	0.36	0.56	0.014	0.022	4		Ø P	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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