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Vishay Semiconductors

High Performance Schottky Rectifier, 19 A



PRIMARY CHARACTERISTICS								
I _{F(AV)}	19 A							
V_{R}	15 V							
V _F at I _F	0.32 V							
I _{RM} max.	522 mA at 100 °C							
T _J max.	125 °C							
E _{AS}	6.75 mJ							
Package	TO-220AC 2L							
Circuit configuration	Single							

FEATURES

- 125 °C T_{.1} operation (V_R < 5 V)
- Optimized for OR-ing applications
- Ultralow forward voltage drop
- High frequency operation



- Guard ring for enhanced ruggedness and long term reliability
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- 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-19TQ015... Schottky rectifier has been optimized for ultralow forward voltage drop specifically for the OR-ing of parallel power supplies. The proprietary barrier technology allows for reliable operation up to 125 °C junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

MAJOR RATINGS AND CHARACTERISTICS									
SYMBOL CHARACTERISTICS VALUES UN									
I _{F(AV)}	Rectangular waveform	19	Α						
V _{RRM}		15	V						
I _{FSM}	$t_p = 5 \mu s sine$	700	Α						
V _F	19 A _{pk} , T _J = 75 °C	0.32	V						
T _J	Range	-55 to +125	°C						

VOLTAGE RATINGS							
PARAMETER	SYMBOL	VS-19TQ015-M3	UNITS				
Maximum DC reverse voltage V _R		15	V				
Maximum working peak reverse voltage	V_{RWM}	15	V				

ABSOLUTE MAXIMUM RATINGS								
PARAMETER	SYMBOL	TEST COND	TEST CONDITIONS					
Maximum average forward current See fig. 5	I _{F(AV)}	50 % duty cycle at T _C = 80 °C,	19					
Maximum peak one cycle non-repetitive surge current	l	5 µs sine or 3 µs rect. pulse	Following any rated load condition and with rated	700	Α			
See fig. 7	IFSM	10 ms sine or 6 ms rect. pulse	V _{RRM} applied	330				
Non-repetitive avalanche energy	E _{AS}	T _J = 25 °C, I _{AS} = 1.50 A, L = 6 i	6.75	mJ				
Repetitive avalanche current	I _{AR}	Current decaying linearly to zer Frequency limited by T _J maxim	1.50	Α				



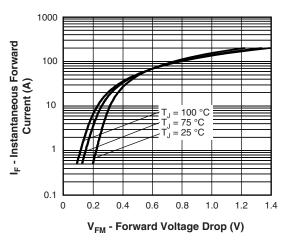
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ELECTRICAL SPECIFICATIONS								
PARAMETER	SYMBOL	TEST CO	TEST CONDITIONS					
		19 A	T _J = 25 °C	0.36				
Maximum forward voltage drop), (1)	38 A	1j=25 C	0.46	V			
See fig. 1	V _{FM} ⁽¹⁾	19 A	T _{.1} = 75 °C	0.32	V			
		38 A	1j=75 C	0.43				
		T _J = 100 °C, V _R = 12 V	465					
Maximum reverse leakage current	I _{RM} ⁽¹⁾	T _J = 100 °C, V _R = 5 V	285	mΛ				
See fig. 2	'RM '''	T _J = 25 °C	V _R = Rated V _R	10.5	mA .			
		T _J = 100 °C	v _R = nateu v _R	522				
Maximum junction capacitance	C _T	V _R = 5 V _{DC} (test signal rang	2000	pF				
Typical series inductance	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 µs, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS								
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS				
Maximum junction temperature range	TJ		-55 to 125	°C				
Maximum storage temperature range	T _{Stg}		-55 to 150	J				
Maximum thermal resistance, junction to case	R _{thJC}	DC operation See fig. 4	1.50	°C/W				
Typical thermal resistance, case to heatsink	R _{thCS}	Mounting surface, smooth and greased	0.50	0/ **				
Approximate weight			2	g				
Approximate weight			0.07	OZ.				
Mounting torque minimum			6 (5)	kgf · cm				
maximum			12 (10)	(lbf · in)				
Marking device		Case style 2L TO-220AC	19TC	015				



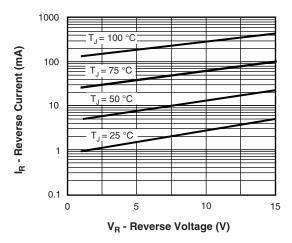


Fig. 1 - Maximum Forward Voltage Drop Characteristics

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

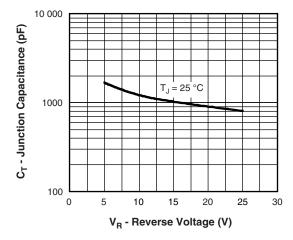


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

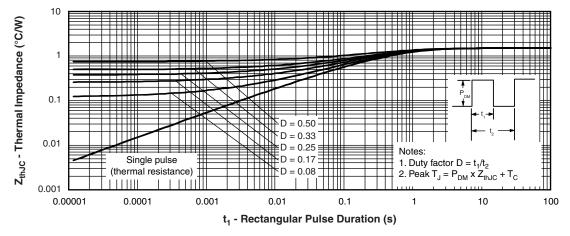


Fig. 4 - Maximum Thermal Impedance ZthJC Characteristics

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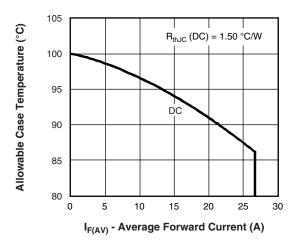


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

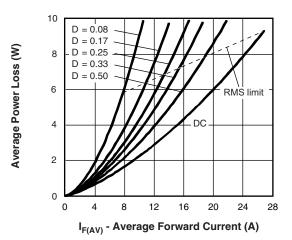


Fig. 6 - Forward Power Loss Characteristics

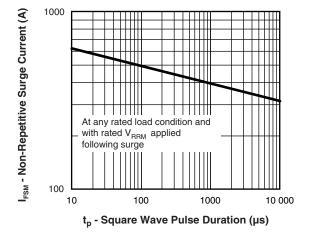


Fig. 7 - Maximum Non-Repetitive Surge Current

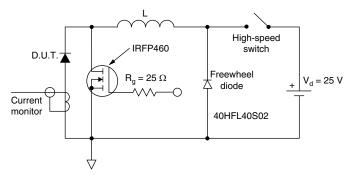


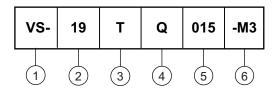
Fig. 8 - Unclamped Inductive Test Circuit



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ORDERING INFORMATION TABLE

Device code



- 1 Vishay Semiconductors product
- 2 Current rating (19 = 19 A)
- 3 Package:

T = TO-220

- 4 Schottky "Q" series
 - Voltage rating (015 = 15 V)
- 6 Environmental digit

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

ORDERING INFORMATION (Example)								
PREFERRED P/N BASE QUANTITY PACKAGING DESCRIPTION								
VS-19TQ015-M3	50	Antistatic plastic tubes						

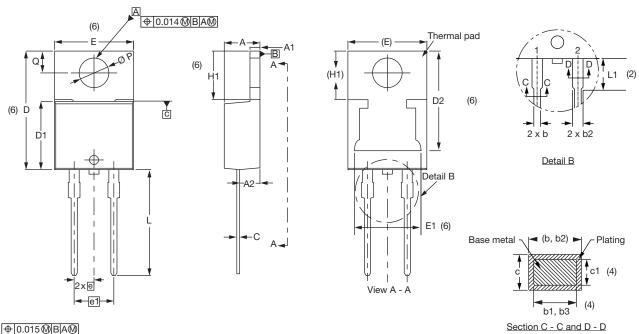
LINKS TO RELATED DOCUMENTS							
Dimensions	www.vishay.com/doc?96156						
Part marking information	www.vishay.com/doc?95391						
SPICE model	www.vishay.com/doc?96005						

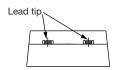


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2L TO-220AC

DIMENSIONS in millimeters and inches





Conforms to JEDEC® outline TO-220AC

SYMBOL	MILLIMETERS		INCHES		NOTES		SYMBOL	MILLIN	IETERS	INC	HES	NOTES
STWIBOL	MIN.	MAX.	MIN.	MAX.	NOTES	NOTES	STWIBOL	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
c1	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
- 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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