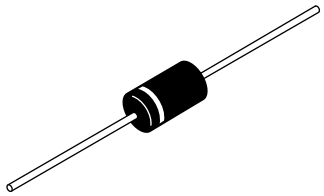
Schottky Rectifier, 5 A



DO-204AR

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

RoHS COMPLIANT
HALOGEN FREE Available

DESCRIPTION

The VS-50SQ... axial leaded 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.

PRODUCT SUMMARY	
Package	DO-204AR
$I_{F(AV)}$	5 A
V_R	60 V, 80 V, 100 V
V_F at I_F	0.52 V
I_{RM} max.	7.0 mA at 125 °C
T_J max.	175 °C
Diode variation	Single die
E_{AS}	7.5 mJ

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	5	A
V_{RRM}	Range	60 to 100	V
I_{FSM}	t_p = 5 µs sine	1900	A
V_F	5 Apk, T_J = 125 °C	0.52	V
T_J	Range	- 55 to 175	°C

VOLTAGE RATINGS					
PARAMETER	SYMBOL	VS-50SQ060 VS-50SQ060-M3	VS-50SQ080 VS-50SQ080-M3	VS-50SQ100 VS-50SQ100-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 = 119 °C, rectangular waveform		5	A
Maximum peak one cycle non-repetitive surge current See fig. 7	I_{FSM}	5 µs sine or 3 µs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	1900	
		10 ms sine or 6 ms rect. pulse		290	
Non-repetitive avalanche energy	E_{AS}	T_J = 25 °C, I_{AS} = 1.0 A, L = 15 mH		7.5	mJ
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 µs Frequency limited by, T_J maximum V_A = 1.5 x V_R typical		1.0	A

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	V_{FM} (1)	5 A	T_J = 25 °C	0.66	V
		10 A		0.77	
		5 A	T_J = 125 °C	0.52	
		10 A		0.62	
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 body		10	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 lead	R_{thJL}	DC operation; see fig. 4 1/8" lead length	8.0	°C/W
Typical thermal resistance, junction to air	R_{thJA}		44	
Approximate weight			1.4	g
			0.049	oz.
Marking device		Case style DO-204AR (JEDEC)	50SQ060	
			50SQ080	
			50SQ100	

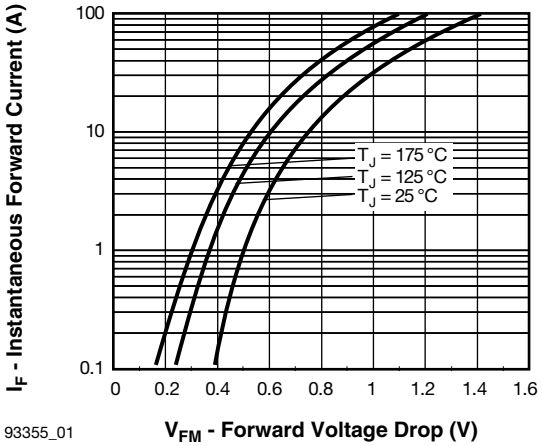


Fig. 1 - Maximum Forward Voltage Drop Characteristics

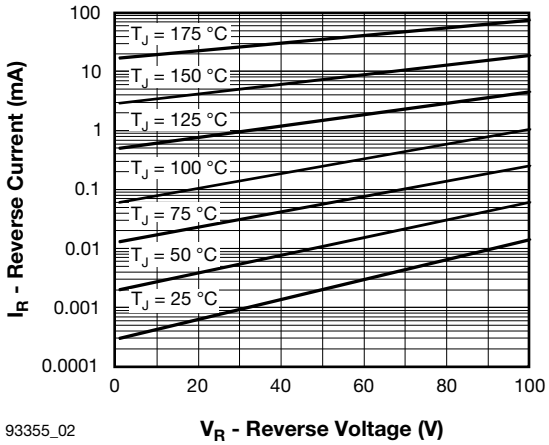


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

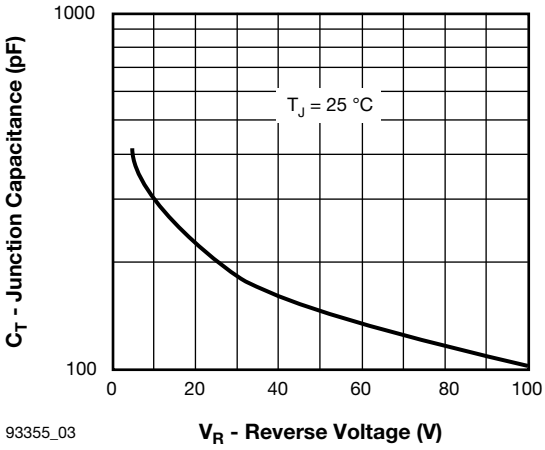


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

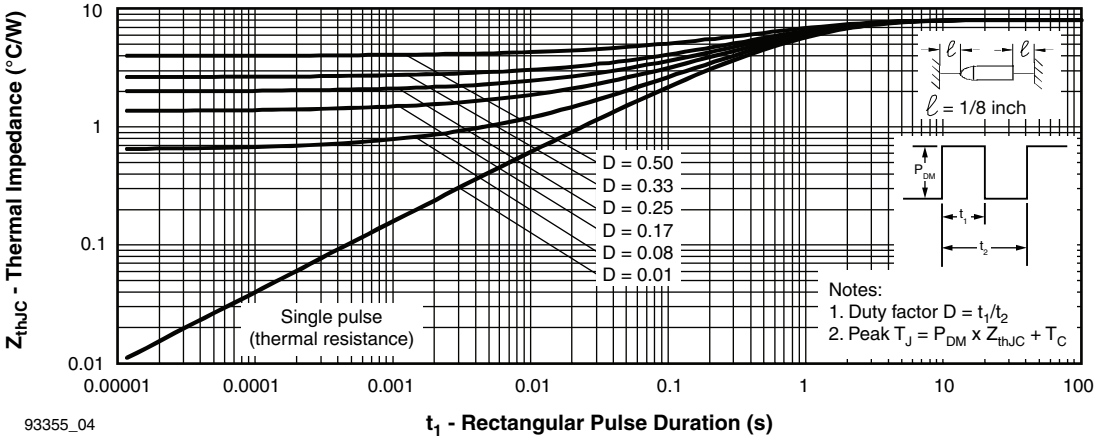


Fig. 4 - Maximum Thermal Impedance Z_{thJL} Characteristics

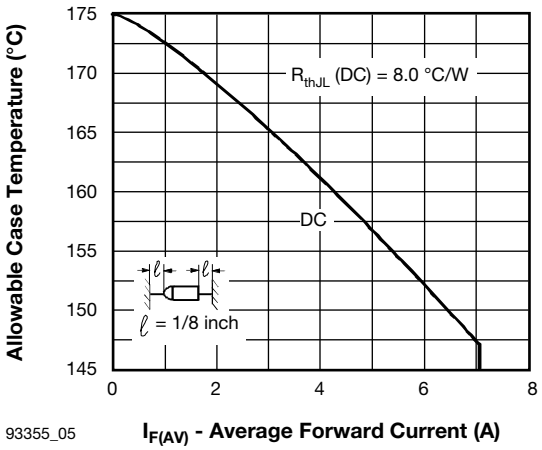


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

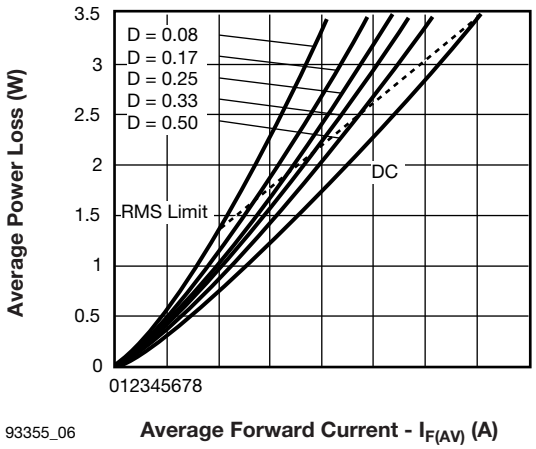


Fig. 6 - Forward Power Loss Characteristics

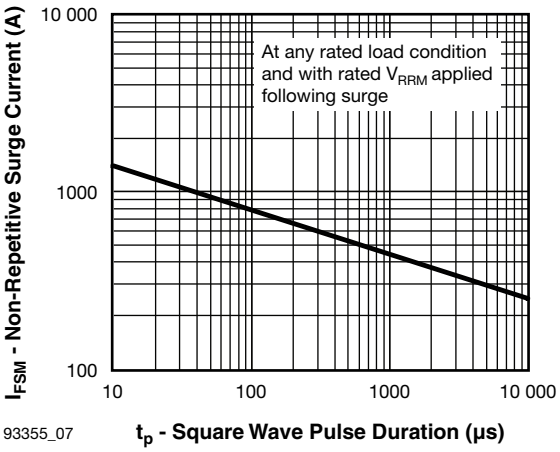


Fig. 7 - Maximum Non-Repetitive Surge Current

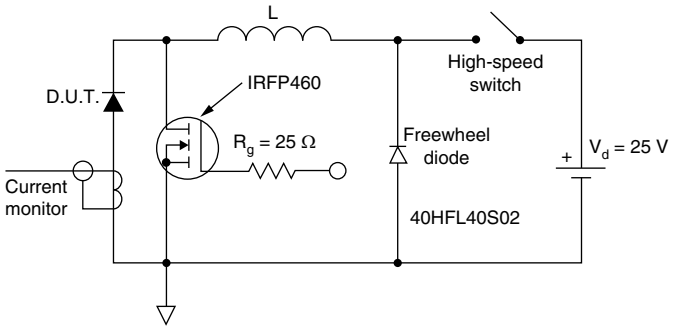
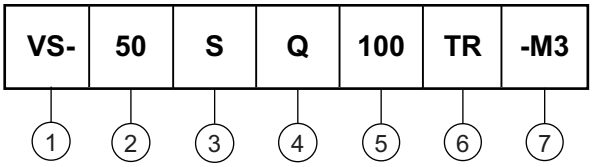


Fig. 8 - Unclamped Inductive Test Circuit

ORDERING INFORMATION TABLE

Device code



1 - Vishay Semiconductors product

2 - 50 = Current x 10

3 - S = DO-204AR

4 - Q = Schottky Q series

5 - Voltage rating — 060 = 60 V, 080 = 80 V, 100 = 100 V

6 - TR = Tape and reel package
None = Bulk package

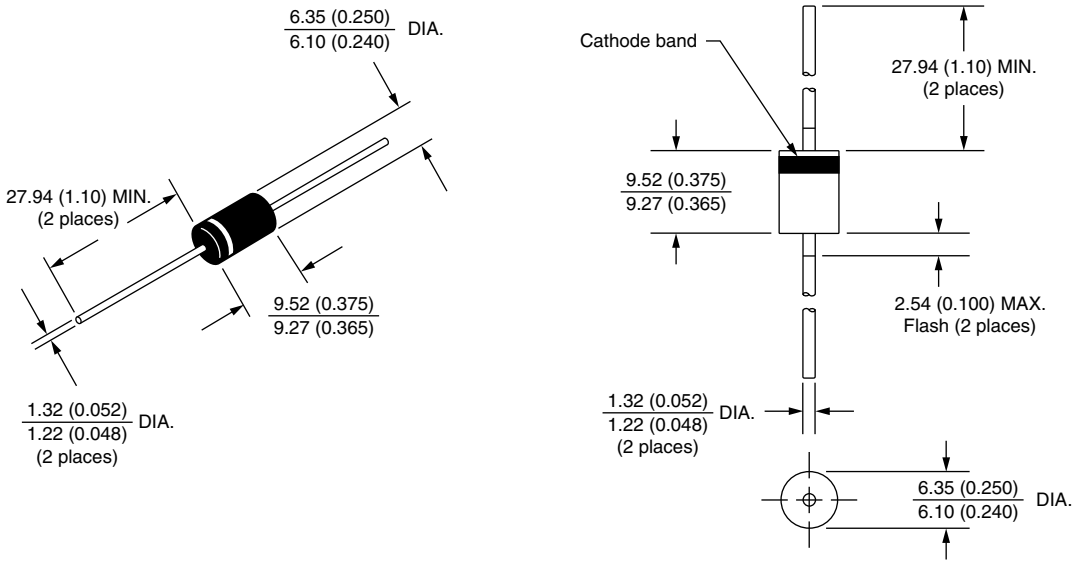
7 - Environmental digit
- None = Lead (Pb)-free and RoHS compliant
- -M3 = Halogen-free, RoHS compliant, and terminations lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	**QUANTITY PER T/R**	**MINIMUM ORDER QUANTITY**	**PACKAGING DESCRIPTION**
VS-50SQ060	300	300	Bulk
VS-50SQ060TR	1500	1500	Tape and reel
VS-50SQ060-M3	300	300	Bulk
VS-50SQ060TR-M3	1500	1500	Tape and reel
VS-50SQ080	300	300	Bulk
VS-50SQ080TR	1500	1500	Tape and reel
VS-50SQ080-M3	300	300	Bulk
VS-50SQ080TR-M3	1500	1500	Tape and reel
VS-50SQ100	300	300	Bulk
VS-50SQ100TR	1500	1500	Tape and reel
VS-50SQ100-M3	300	300	Bulk
VS-50SQ100TR-M3	1500	1500	Tape and reel

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95243
Part marking information	www.vishay.com/doc?95325
Packaging information	www.vishay.com/doc?95338
SPICE model	www.vishay.com/doc?95394

Axial DO-204AR

DIMENSIONS in millimeters (inches)



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