

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
- Compliant to RoHS Directive 2002/95/EC
- Designed and qualified for commercial level
- Halogen-free according to IEC 61249-2-21 definition (-M3 only)



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

DESCRIPTION

The VS-50SQ...G... axial lead 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	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-50SQ060G VS-50SQ060G-M3	VS-50SQ080G VS-50SQ080G-M3	VS-50SQ100G VS-50SQ100G-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, 46 μs square pulse		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

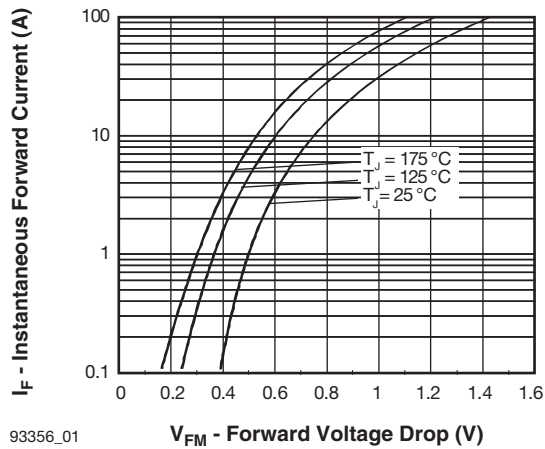


ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	5 A	$T_J = 25\text{ }^\circ\text{C}$	0.66	V
		10 A		0.77	
		5 A	$T_J = 125\text{ }^\circ\text{C}$	0.52	
		10 A		0.62	
Maximum reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	0.15	mA
		$T_J = 125\text{ }^\circ\text{C}$		7	
Maximum junction capacitance	C_T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^\circ\text{C}$		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

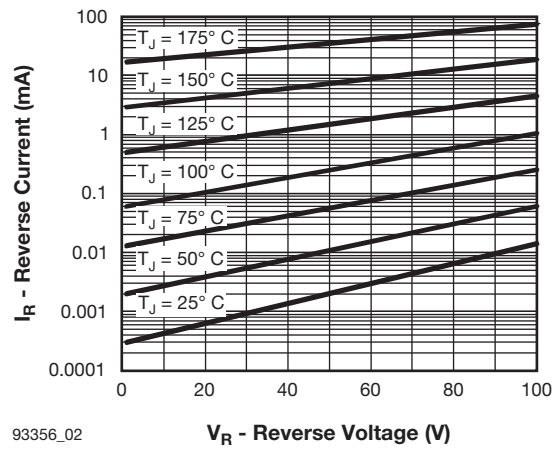
Note

(1) Pulse width < 300 μs , duty cycle < 2 %

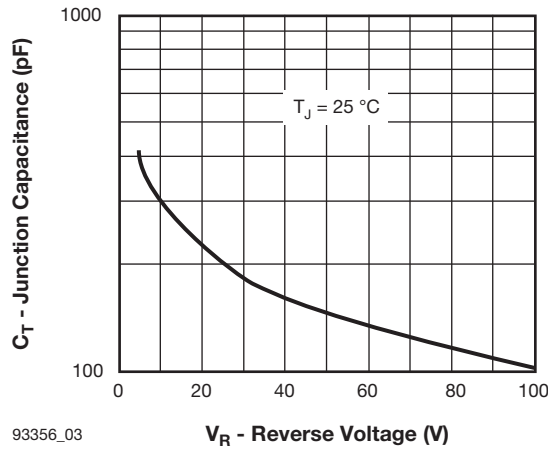
THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}			- 55 to 175	$^\circ\text{C}$
Maximum thermal resistance, junction to lead	R_{thJL}	DC operation; see fig. 4 1/8" lead length		8.0	$^\circ\text{C/W}$
Typical thermal resistance, junction to air	R_{thJA}			44	
Approximate weight				1.4	g
				0.049	oz.
Marking device		Case style DO-204AR (JEDEC)		50SQ060G	
				50SQ080G	
				50SQ100G	



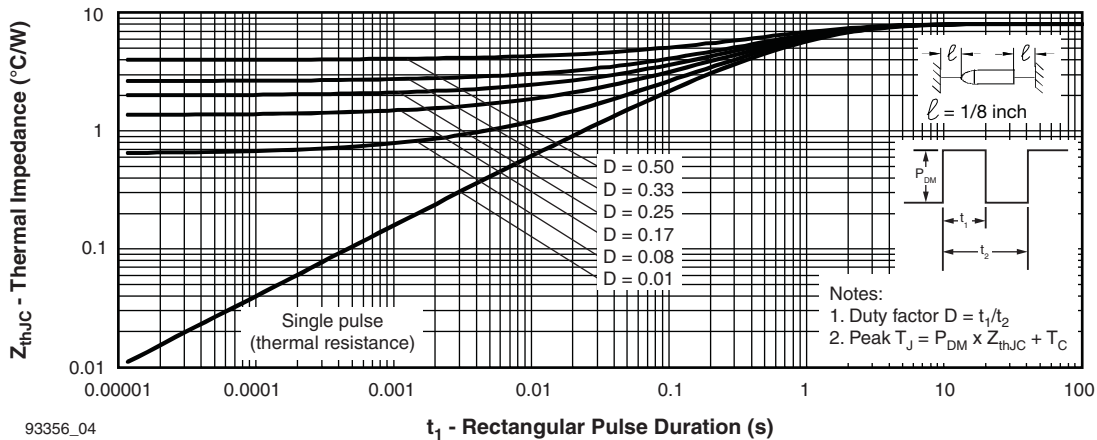
93356_01 **V_{FM} - Forward Voltage Drop (V)**
Fig. 1 - Maximum Forward Voltage Drop Characteristics



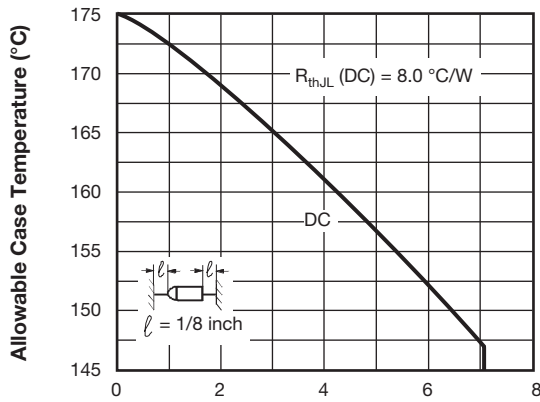
93356_02 **V_R - Reverse Voltage (V)**
Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage



93356_03 **V_R - Reverse Voltage (V)**
Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

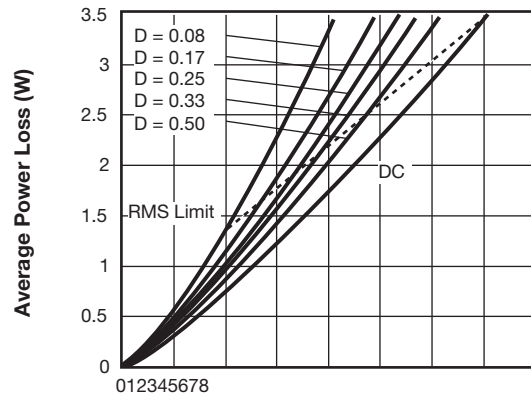


93356_04 **t₁ - Rectangular Pulse Duration (s)**
Fig. 4 - Maximum Thermal Impedance Z_{thJL} Characteristics



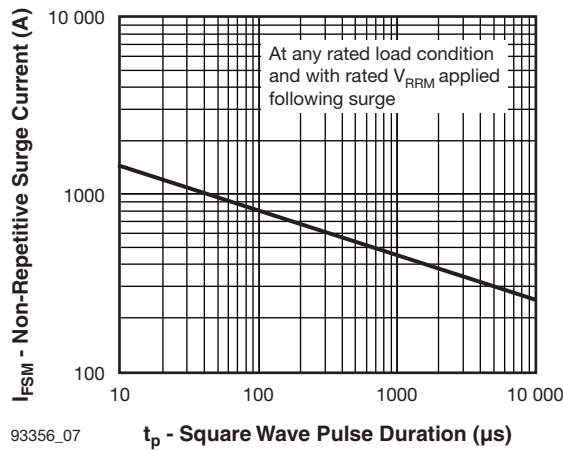
93356_05 **I_{F(AV)} - Average Forward Current (A)**

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



93356_06 **Average Forward Current - I_{F(AV)} (A)**

Fig. 6 - Forward Power Loss Characteristics



93356_07 **t_p - Square Wave Pulse Duration (µs)**

Fig. 7 - Maximum Non-Repetitive Surge Current

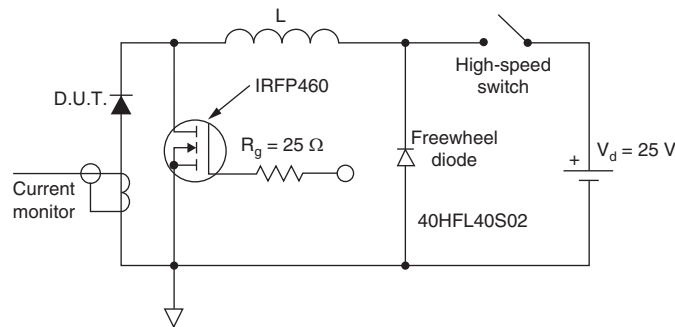
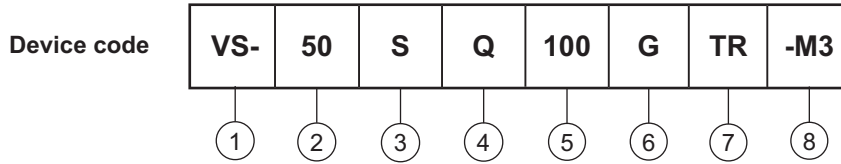


Fig. 8 - Unclamped Inductive Test Circuit



ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Current rating (5 A)
- 3** - S = DO-204AR package
- 4** - Q = Schottky Q.. series
- 5** - Voltage ratings

060 = 60 V
080 = 80 V
100 = 100 V
- 6** - G = Schottky generation
- 7** -
 - None = Bulk package
 - TR = Tape and reel package
- 8** - Environmental digit
 - None = Lead (Pb)-free and RoHS compliant
 - -M3 = Halogen-free, RoHS compliant, and terminations lead (Pb)-free

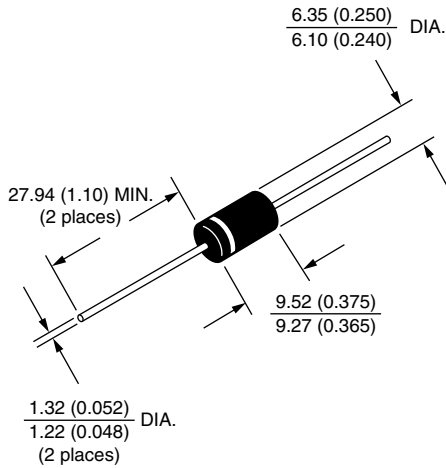
ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-50SQ060G	300	300	Bulk
VS-50SQ060GTR	1500	1500	Tape and reel
VS-50SQ060G-M3	300	300	Bulk
VS-50SQ060GTR-M3	1500	1500	Tape and reel
VS-50SQ080G	300	300	Bulk
VS-50SQ080GTR	1500	1500	Tape and reel
VS-50SQ080G-M3	300	300	Bulk
VS-50SQ080GTR-M3	1500	1500	Tape and reel
VS-50SQ100G	300	300	Bulk
VS-50SQ100GTR	1500	1500	Tape and reel
VS-50SQ100G-M3	300	300	Bulk
VS-50SQ100GTR-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



Axial DO-204AR

DIMENSIONS in millimeters (inches)





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