

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)



RoHS
COMPLIANT
HALOGEN
FREE
Available

DESCRIPTION

The VS-50SQ...G... 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-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	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**

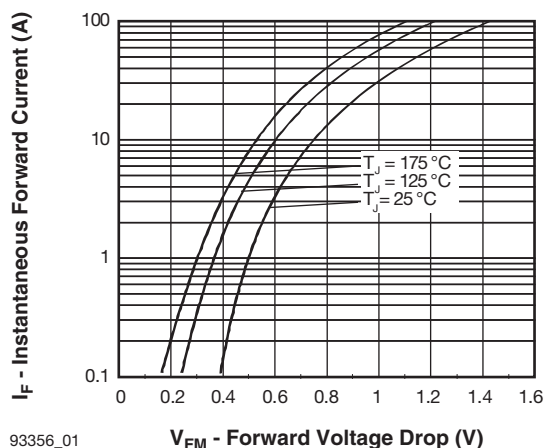
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	5 A	$T_J = 25\text{ }^{\circ}\text{C}$	0.66	V
		10 A		0.77	
		5 A	$T_J = 125\text{ }^{\circ}\text{C}$	0.52	
		10 A		0.62	
Maximum reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$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

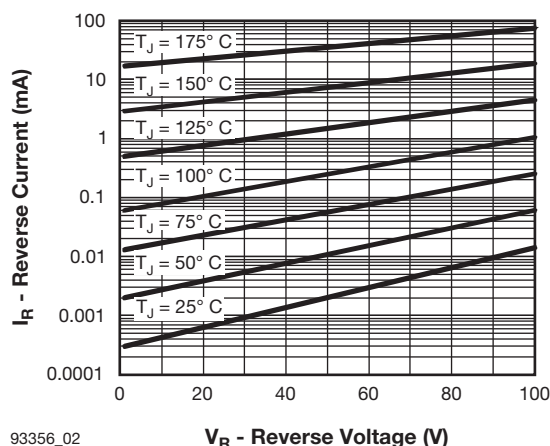
THERMAL - MECHANICAL SPECIFICATIONS

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	



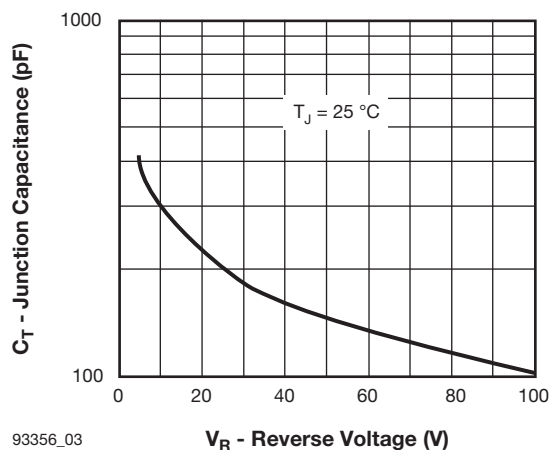
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Fig. 1 - Maximum Forward Voltage Drop Characteristics



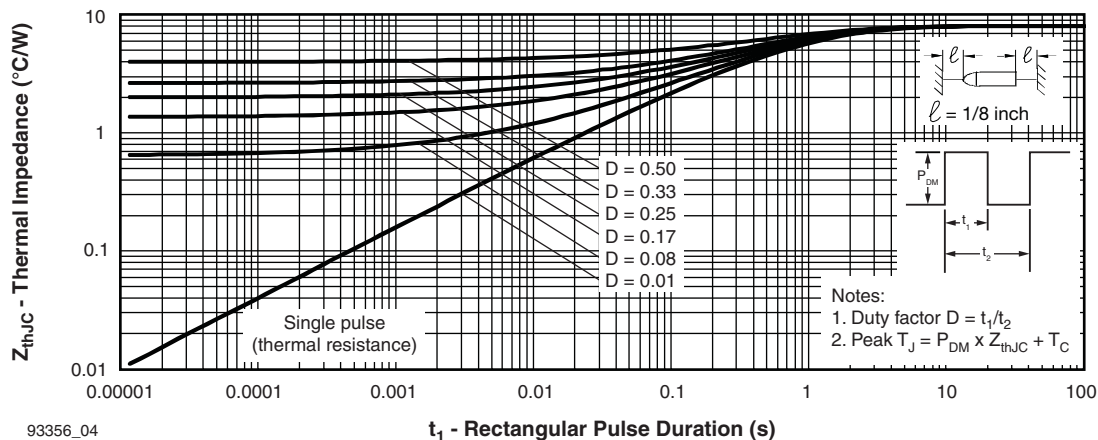
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Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage



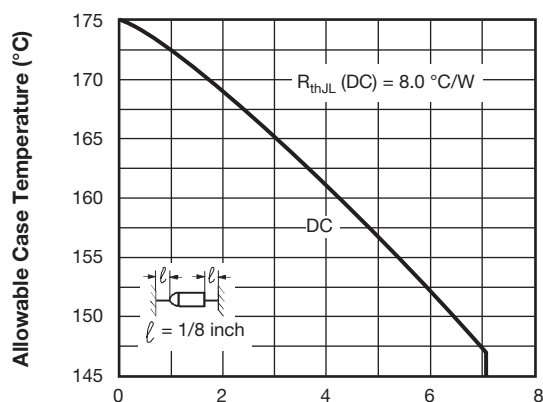
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Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage



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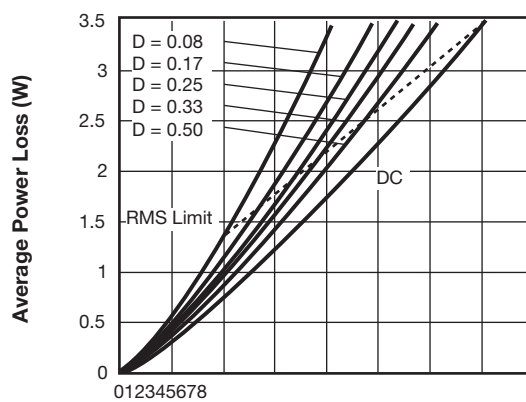
Fig. 4 - Maximum Thermal Impedance Z_{thJL} Characteristics



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 $I_{F(AV)}$ - Average Forward Current (A)

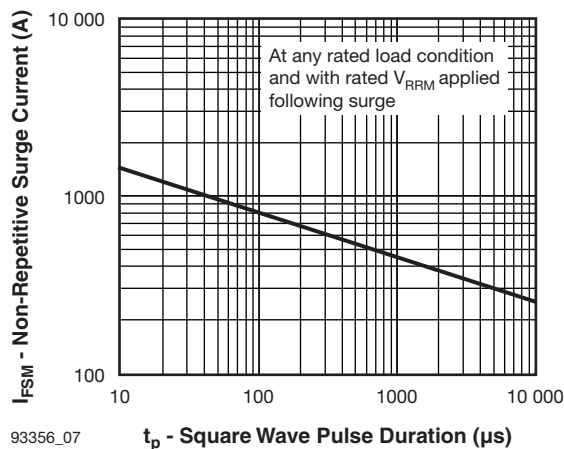
Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current



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Average Forward Current - $I_{F(AV)}$ (A)

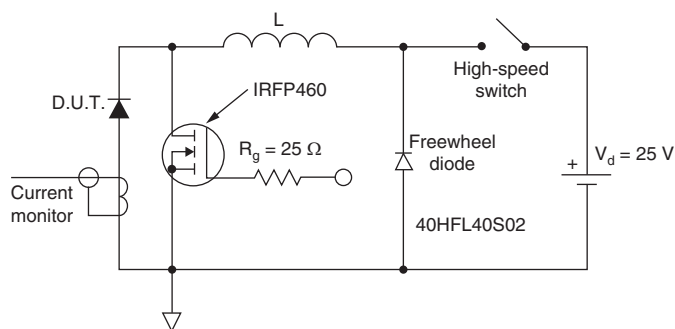
Fig. 6 - Forward Power Loss Characteristics



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 t_p - Square Wave Pulse Duration (μ s)

Fig. 7 - Maximum Non-Repetitive Surge Current



**ORDERING INFORMATION TABLE**

Device code	VS-	50	S	Q	100	G	TR	-M3
	①	②	③	④	⑤	⑥	⑦	⑧

- 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

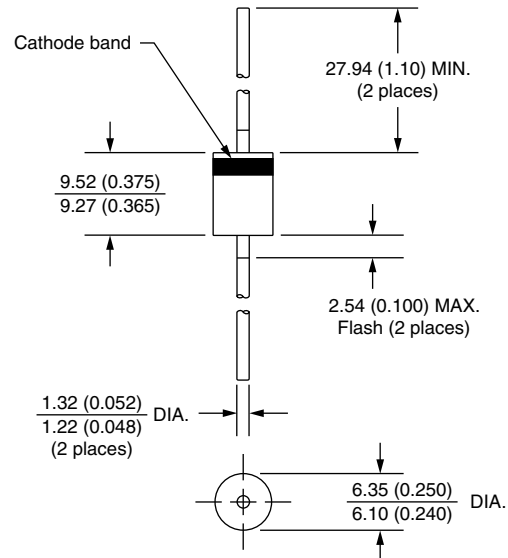
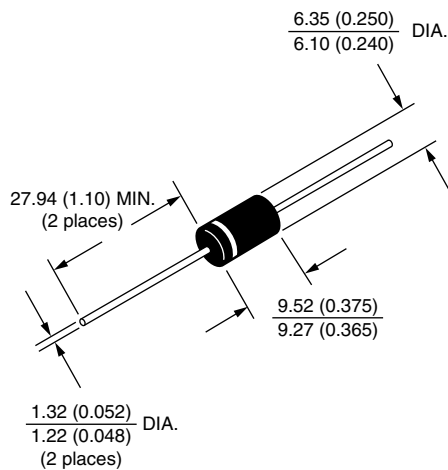
ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-50SQ060G	300	300	Bulk
VS-50SQ060GTR	1500	1500	Tape and reel
VS-50SQ060G-M3	300	300	Bulk
VS-50SQ060GTR-M3	1500	1500	Tape and reel
VS-50SQ080G	300	300	Bulk
VS-50SQ080GTR	1500	1500	Tape and reel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