

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... 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.

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	5	A
V_{RRM}	Range	60 to 100	V
I_{FSM}	$t_p = 5 \mu s$ sine	1900	A
V_F	5 Apk, $T_J = 125 \text{ }^\circ\text{C}$	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 $T_C = 119 \text{ }^\circ\text{C}$, 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}	$T_J = 25 \text{ }^\circ\text{C}$, $I_{AS} = 1.0 \text{ A}$, $L = 15 \text{ mH}$	7.5	mJ
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by, T_J maximum $V_A = 1.5 \times V_R$ 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	

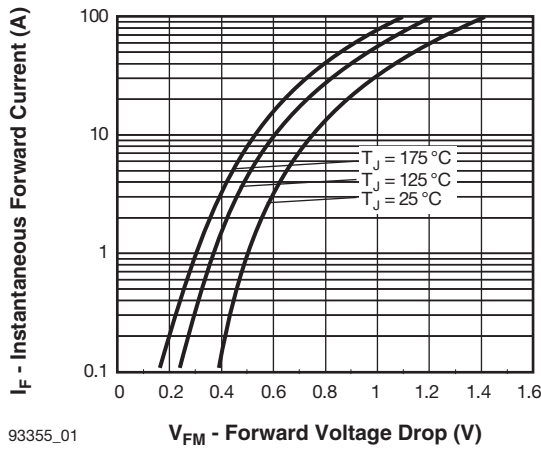


Fig. 1 - Maximum Forward Voltage Drop Characteristics

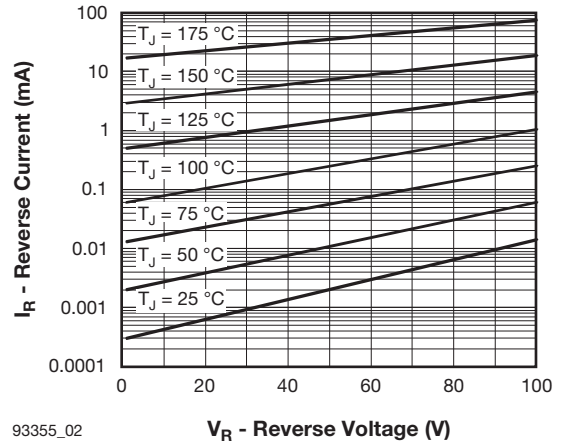


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

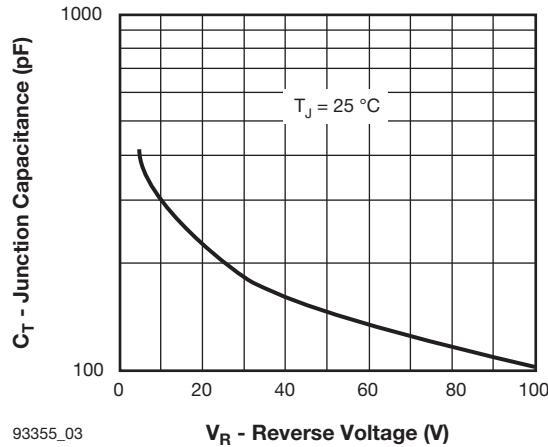


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

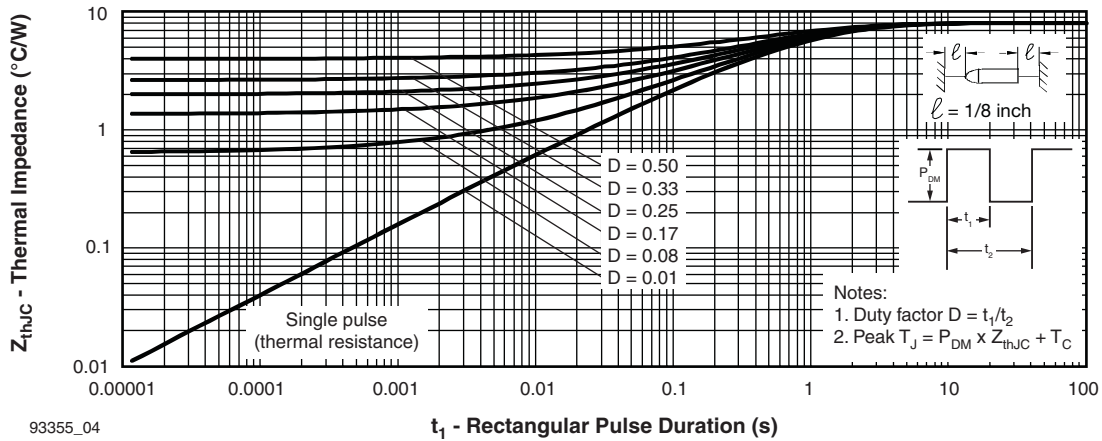
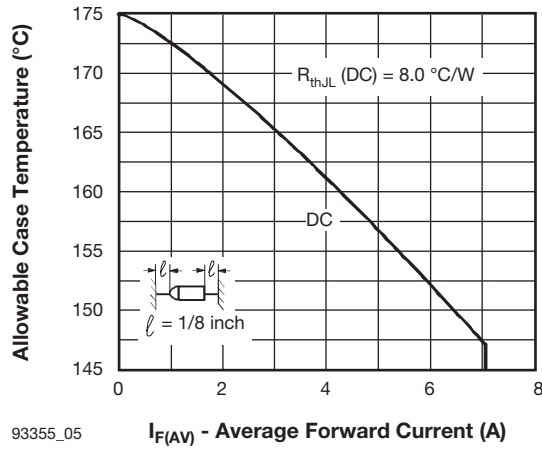
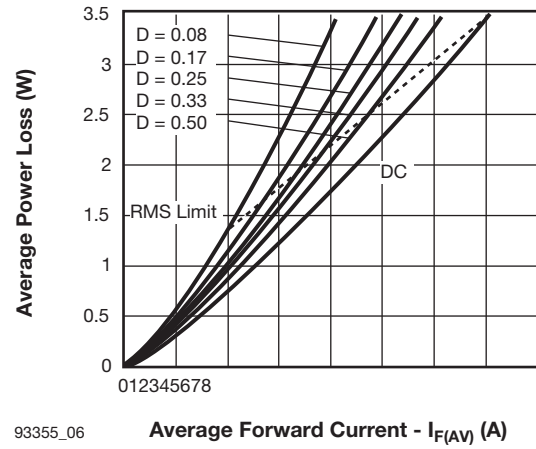


Fig. 4 - Maximum Thermal Impedance Z_{thJL} Characteristics



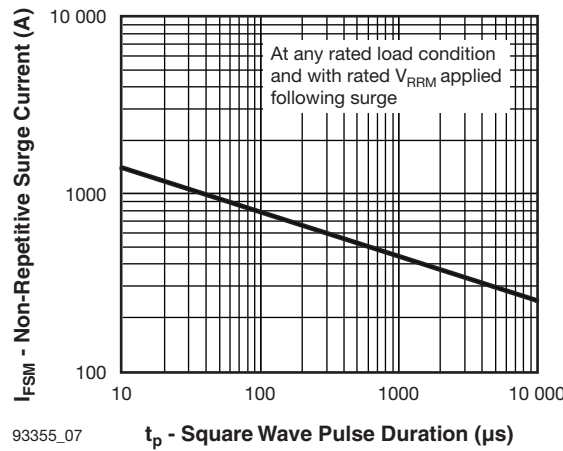
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Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current



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Fig. 6 - Forward Power Loss Characteristics



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Fig. 7 - Maximum Non-Repetitive Surge Current

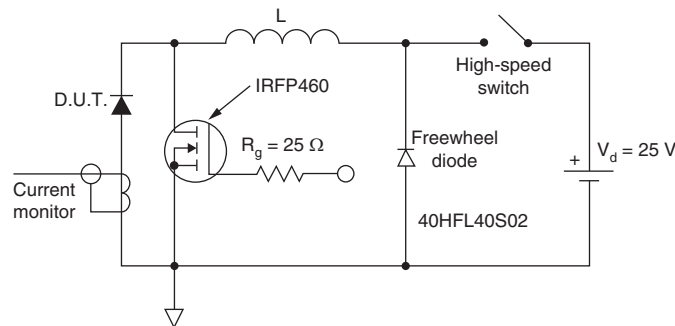
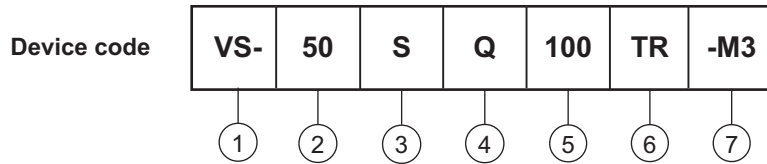


Fig. 8 - Unclamped Inductive Test Circuit



ORDERING INFORMATION TABLE



- 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
SPIICE model	www.vishay.com/doc?95394



Axial DO-204AR

DIMENSIONS in millimeters (inches)





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