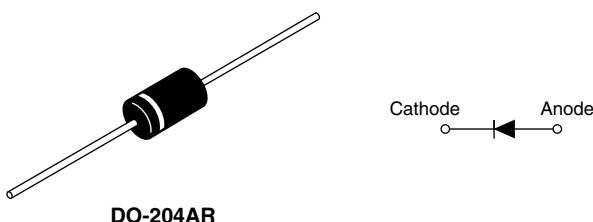


Schottky Rectifier, 5 A



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

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, $T_J = 125$ °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			
					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 $V_A = 1.5 \times V_R$ typical			1.0	A		

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	5 A	$T_J = 25^\circ\text{C}$	0.66	V	
		10 A		0.77		
		5 A	$T_J = 125^\circ\text{C}$	0.52		
		10 A		0.62		
Maximum reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$T_J = 25^\circ\text{C}$	$V_R = \text{Rated } V_R$	0.55	mA	
		$T_J = 125^\circ\text{C}$		7		
Maximum junction capacitance	C_T	$V_R = 5 \text{ V}_{\text{DC}}$, (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/ μ s	

Note

(1) Pulse width < 300 μ s, 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		Case style DO-204AR (JEDEC)	1.4	g
			0.049	oz.
Marking device		Case style DO-204AR (JEDEC)	50SQ060	
			50SQ080	
			50SQ100	

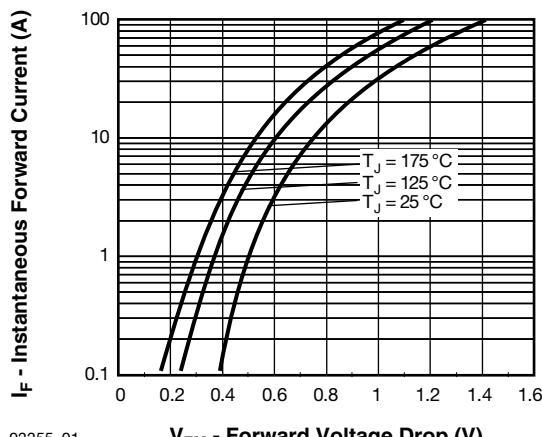

93355_01 **V_{FM} - Forward Voltage Drop (V)**

Fig. 1 - Maximum Forward Voltage Drop Characteristics

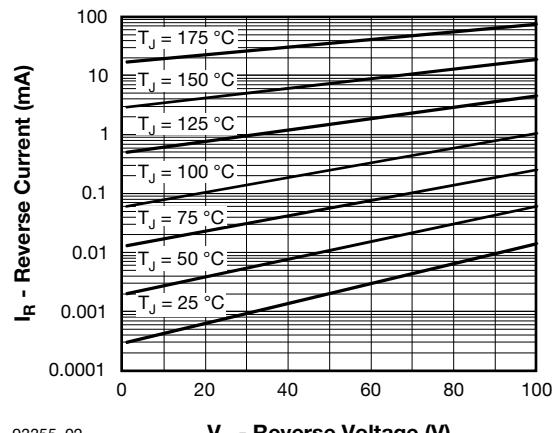

93355_02 **V_R - Reverse Voltage (V)**

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

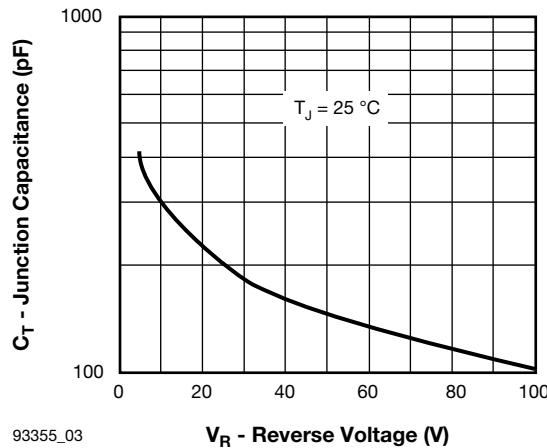

93355_03 **V_R - Reverse Voltage (V)**

Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

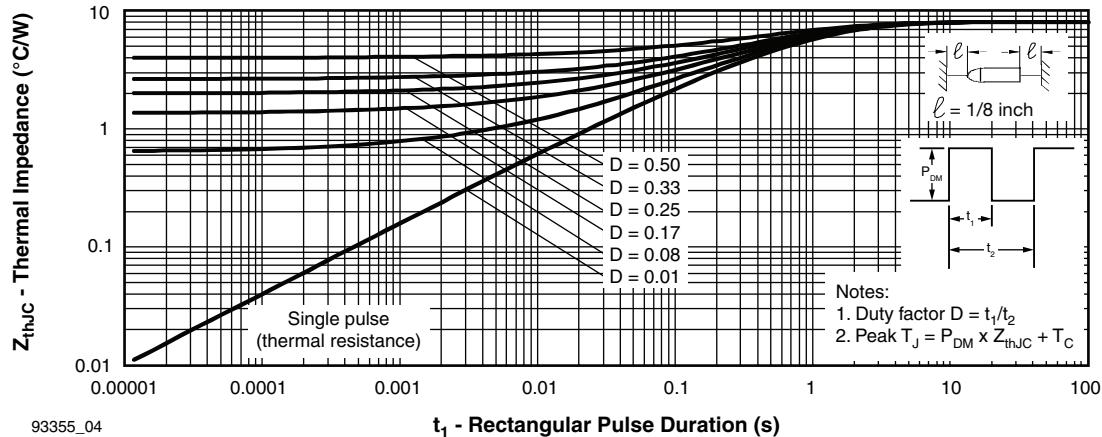
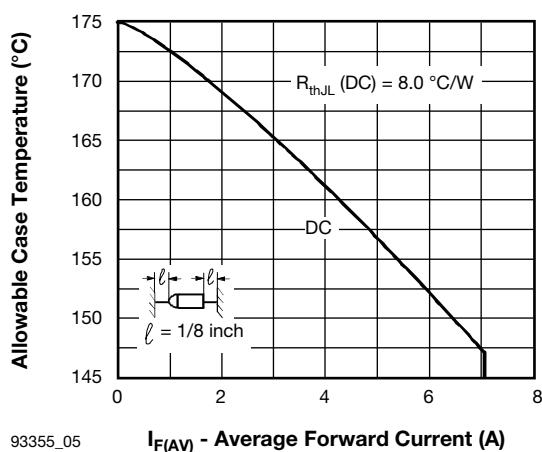

93355_04 **t₁ - Rectangular Pulse Duration (s)**

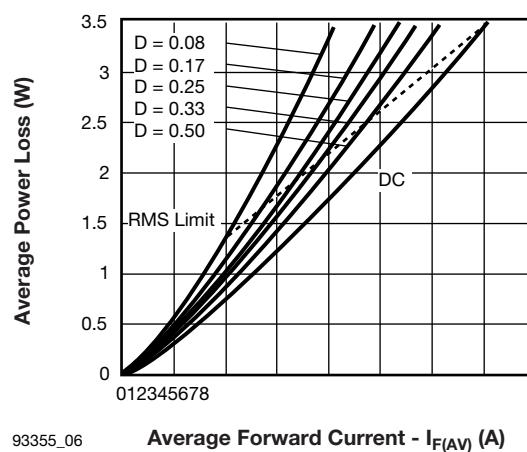
Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics



93355_05

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

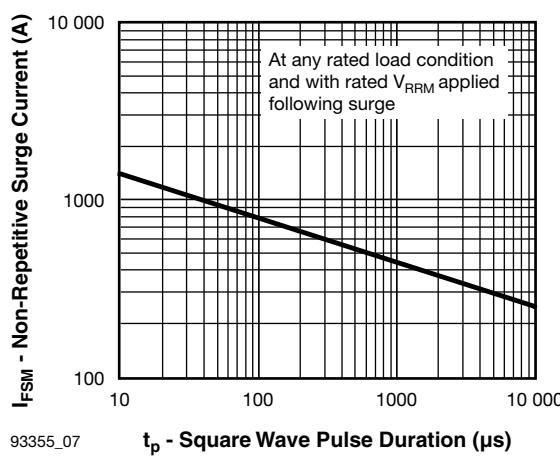
Fig. 5 - Maximum Allowable Case Temperature vs.
Average Forward Current



93355_06

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

Fig. 6 - Forward Power Loss Characteristics



93355_07

t_p - Square Wave Pulse Duration (μs)

Fig. 7 - Maximum Non-Repetitive Surge Current

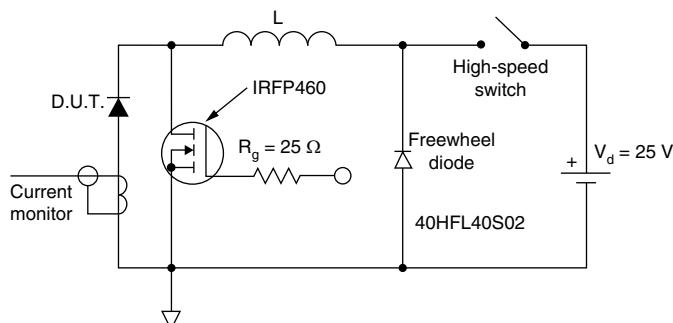


Fig. 8 - Unclamped Inductive Test Circuit

ORDERING INFORMATION TABLE

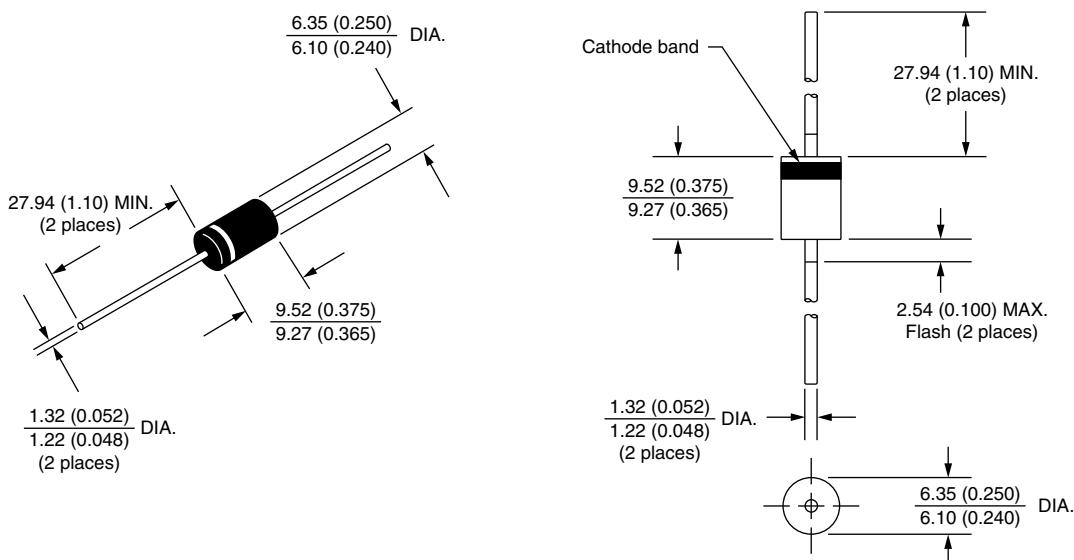
Device code	VS-	50	S	Q	100	TR	-M3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
[1]	- Vishay Semiconductors product						
[2]	- 50 = Current x 10						
[3]	- S = DO-204AR						
[4]	- Q = Schottky Q series						
[5]	- Voltage rating						
[6]	- TR = Tape and reel package						
	None = Bulk package						
[7]	- Environmental 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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