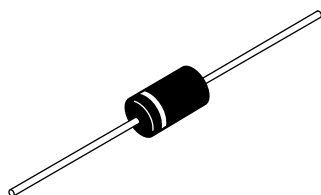




## Schottky Rectifier, 5 A



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](http://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 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
$I_{FSM}$	$t_p = 5 \mu s$ 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

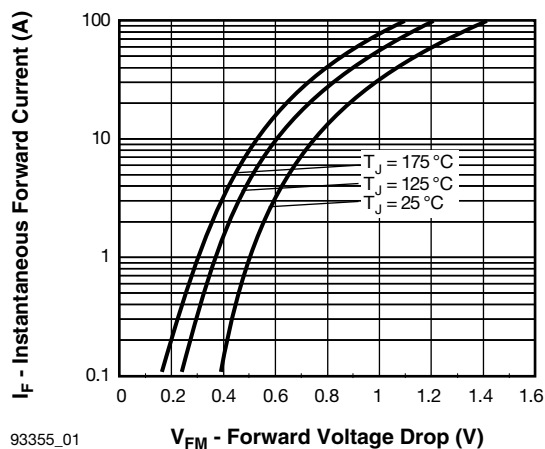
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 119$ °C, rectangular waveform	5	A
Maximum peak one cycle non-repetitive surge current See fig. 7	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	1900	
		10 ms sine or 6 ms rect. pulse	290	
Non-repetitive avalanche energy	$E_{AS}$	$T_J = 25$ °C, $I_{AS} = 1.0$ A, $L = 15$ mH	7.5	mJ
Repetitive avalanche current	$I_{AR}$	Current decaying linearly to zero in 1 $\mu s$ 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	$T_J = 25\text{ }^{\circ}\text{C}$	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	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = \text{Rated } V_R$	0.55	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

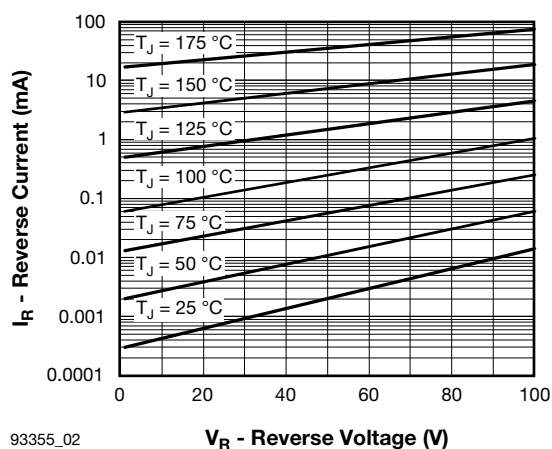
**Note**
<sup>(1)</sup> Pulse width < 300  $\mu$ s, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T <sub>J</sub> , T <sub>Stg</sub>		- 55 to 175	°C
Maximum thermal resistance, junction to lead	R <sub>thJL</sub>	DC operation; see fig. 4 1/8" lead length	8.0	°C/W
Typical thermal resistance, junction to air	R <sub>thJA</sub>		44	
Approximate weight			1.4	g
			0.049	oz.
Marking device		Case style DO-204AR (JEDEC)	50SQ060	
			50SQ080	
			50SQ100	



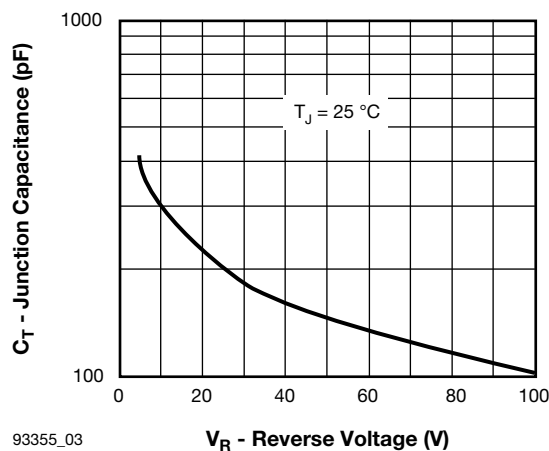
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Fig. 1 - Maximum Forward Voltage Drop Characteristics



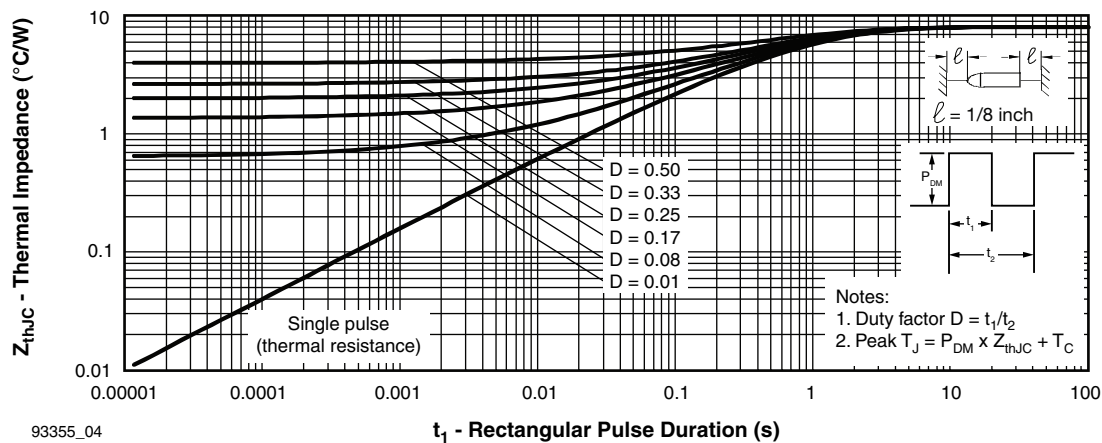
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Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage



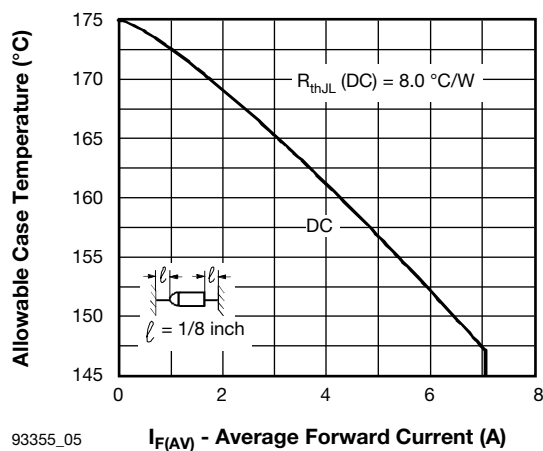
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Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage



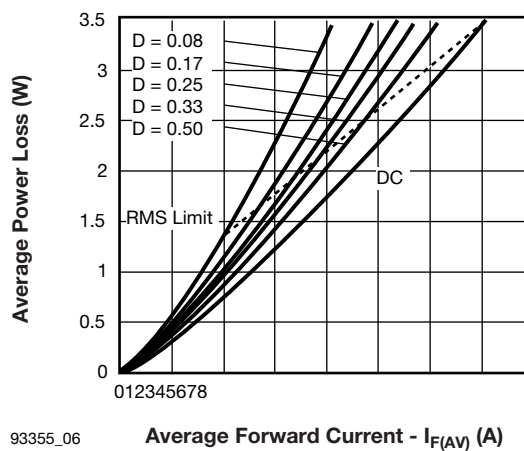
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Fig. 4 - Maximum Thermal Impedance  $Z_{thJL}$  Characteristics



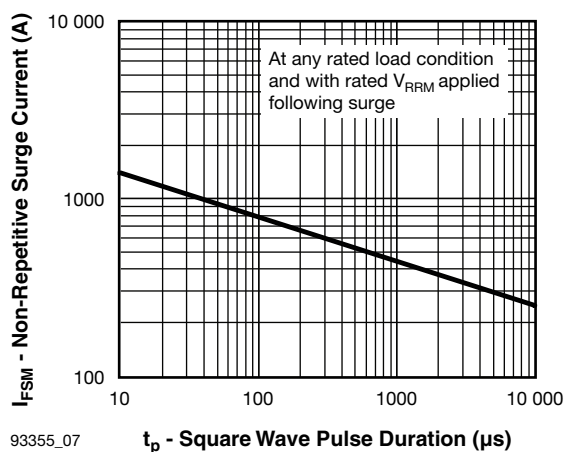
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Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current



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Fig. 6 - Forward Power Loss Characteristics



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Fig. 7 - Maximum Non-Repetitive Surge Current

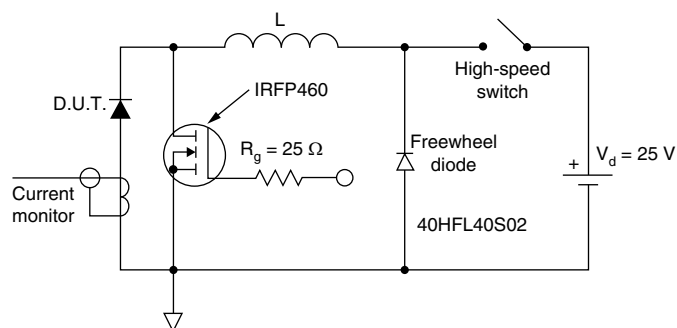


Fig. 8 - Unclamped Inductive Test Circuit

**ORDERING INFORMATION TABLE**

Device code	<b>VS-</b>	<b>50</b>	<b>S</b>	<b>Q</b>	<b>100</b>	<b>TR</b>	<b>-M3</b>
	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

060 = 60 V
080 = 80 V
100 = 100 V

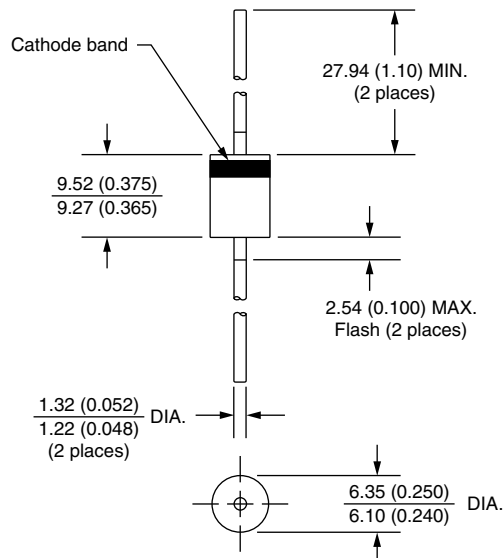
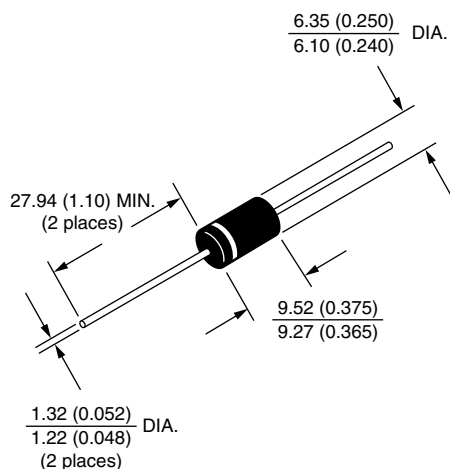
<b>ORDERING INFORMATION (Example)</b>			
<b>PREFERRED P/N</b>	<b>QUANTITY PER T/R</b>	<b>MINIMUM ORDER QUANTITY</b>	<b>PACKAGING DESCRIPTION</b>
VS-50SQ060	300	300	Bulk
VS-50SQ060TR	1500	1500	Tape and reel
VS-50SQ060-M3	300	300	Bulk
VS-50SQ060TR-M3	1500	1500	Tape and reel
VS-50SQ080	300	300	Bulk
VS-50SQ080TR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

<b>LINKS TO RELATED DOCUMENTS</b>	
Dimensions	<a href="http://www.vishay.com/doc?95243">www.vishay.com/doc?95243</a>
Part marking information	<a href="http://www.vishay.com/doc?95325">www.vishay.com/doc?95325</a>
Packaging information	<a href="http://www.vishay.com/doc?95338">www.vishay.com/doc?95338</a>
SPIICE model	<a href="http://www.vishay.com/doc?95394">www.vishay.com/doc?95394</a>



## Axial DO-204AR

**DIMENSIONS** in millimeters (inches)





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