

Schottky Rectifier, 9 A



DO-204AR



FEATURES

- 150 °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

PRODUCT SUMMARY

Package	DO-204AR
I _{F(AV)}	9 A
V _R	30 V, 35 V, 40 V, 45 V
V _F at I _F	0.42 V
I _{RM} max.	70 mA at 125 °C
T _J max.	150 °C
Diode variation	Single die
E _{AS}	12 mJ

DESCRIPTION

The VS-90SQ... axial leaded Schottky rectifier series has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150 °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	9	A
V _{RRM}	Range	30 to 45	V
I _{FSM}	t _p = 5 μs sine	2150	A
V _F	9 Apk, T _J = 125 °C	0.42	V
T _J	Range	- 55 to 150	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-90SQ030 VS-90SQ030-M3	VS-90SQ035 VS-90SQ035-M3	VS-90SQ040 VS-90SQ040-M3	VS-90SQ045 VS-90SQ045-M3	UNITS
Maximum DC reverse voltage	V _R	30	35	40	45	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 = 69 °C, rectangular waveform	9	A
Maximum peak one cycle non-repetitive surge current See fig. 7	I _{FSM}	5 μs sine or 3 μs rect. pulse	2150	
		10 ms sine or 6 ms rect. pulse	340	
Non-repetitive avalanche energy	E _{AS}	T _J = 25 °C, I _{AS} = 1.8 A, L = 7.4 mH	12	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	1.8	A



ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	V _{FM} ⁽¹⁾	9 A	T _J = 25 °C	0.48	V
		18 A		0.57	
		9 A	T _J = 125 °C	0.42	
		18 A		0.52	
Maximum reverse leakage current See fig. 2	I _{RM} ⁽¹⁾	T _J = 25 °C	V _R = Rated V _R	1.75	mA
		T _J = 125 °C		70	
Maximum junction capacitance	C _T	V _R = 5 V _{DC} , (test signal range 100 kHz to 1 MHz) 25 °C		900	pF
Typical series inductance	L _S	Measured lead to lead 5 mm from body		10.0	nH
Maximum voltage rate of change	dV/dt	Rated V _R		10 000	V/μs

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 150	$^{\circ}\text{C}$
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)	90SQ030	
			90SQ035	
			90SQ040	
			90SQ045	

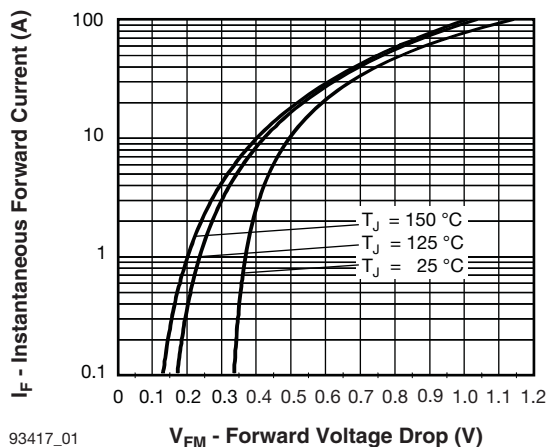


Fig. 1 - Maximum Forward Voltage Drop Characteristics

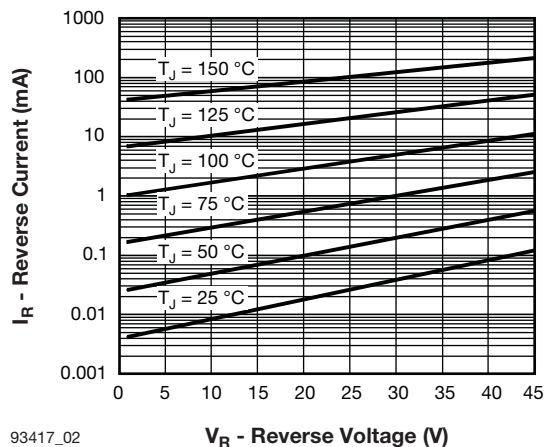


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

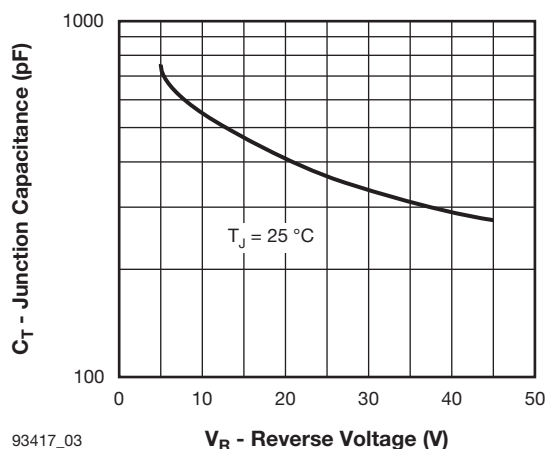


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

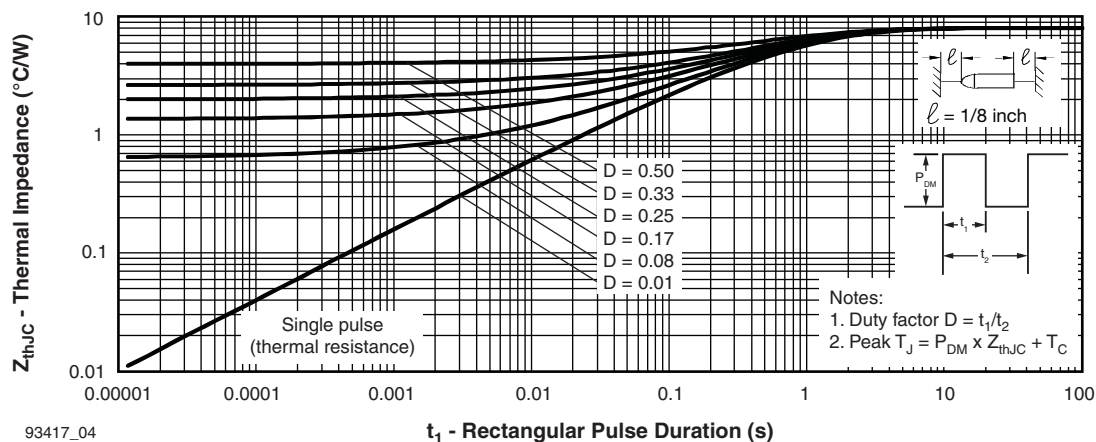


Fig. 4 - Maximum Thermal Impedance Z_{thJL} Characteristics

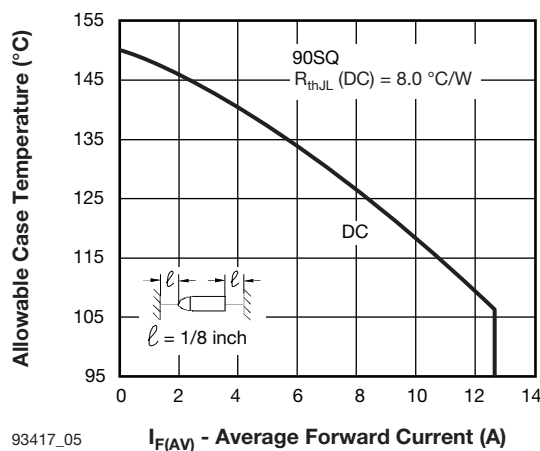


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

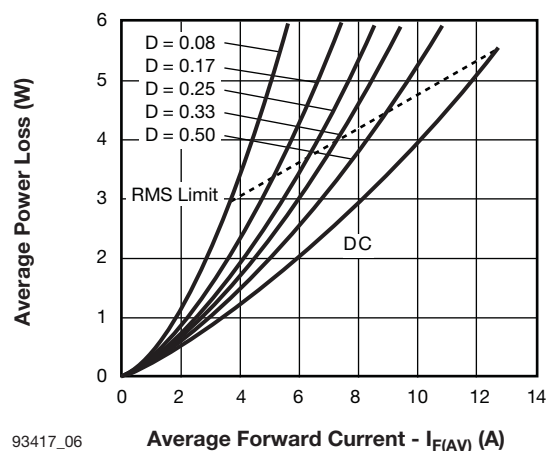


Fig. 6 - Forward Power Loss Characteristics

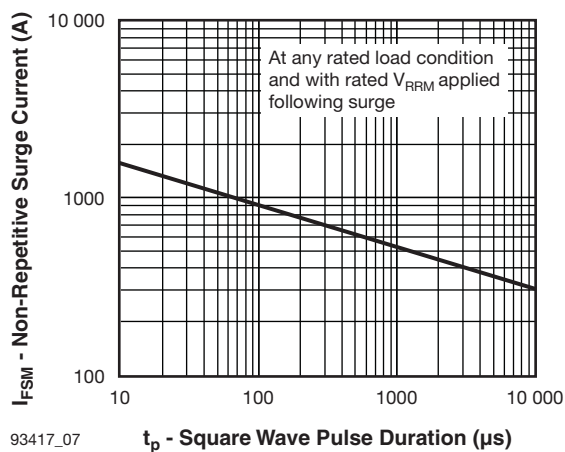


Fig. 7 - Maximum Non-Repetitive Surge Current

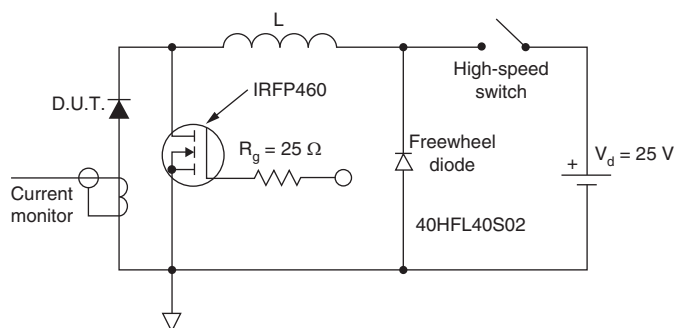


Fig. 8 - Unclamped Inductive Test Circuit



ORDERING INFORMATION TABLE

Device code	VS-	90	S	Q	045	TR	-M3
	1	2	3	4	5	6	7
1	Vishay Semiconductors product						
2	90 = 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						

030 = 30 V
035 = 35 V
040 = 40 V
045 = 45 V

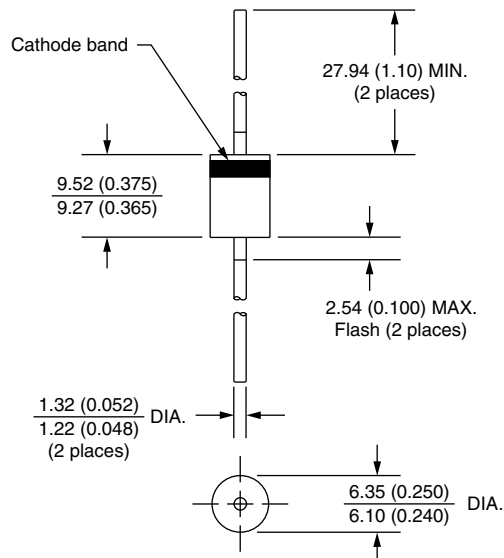
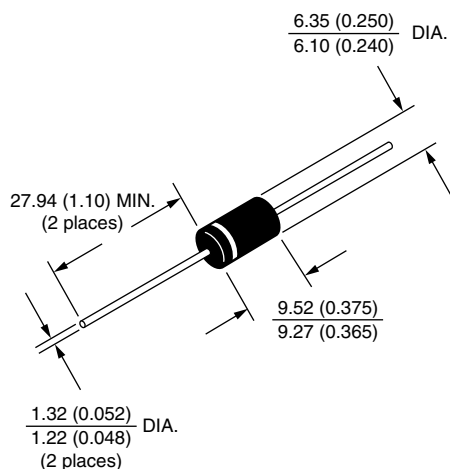
ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-90SQ030	300	300	Bulk
VS-90SQ030TR	1500	1500	Tape and reel
VS-90SQ030-M3	300	300	Bulk
VS-90SQ030TR-M3	1500	1500	Tape and reel
VS-90SQ035	300	300	Bulk
VS-90SQ035TR	1500	1500	Tape and reel
VS-90SQ035-M3	300	300	Bulk
VS-90SQ035TR-M3	1500	1500	Tape and reel
VS-90SQ040	300	300	Bulk
VS-90SQ040TR	1500	1500	Tape and reel
VS-90SQ040-M3	300	300	Bulk
VS-90SQ040TR-M3	1500	1500	Tape and reel
VS-90SQ045	300	300	Bulk
VS-90SQ045TR	1500	1500	Tape and reel
VS-90SQ045-M3	300	300	Bulk
VS-90SQ045TR-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?95332



Axial DO-204AR

DIMENSIONS in millimeters (inches)





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