International Rectifier

90SQ... SERIES

SCHOTTKY RECTIFIER

9 Amp

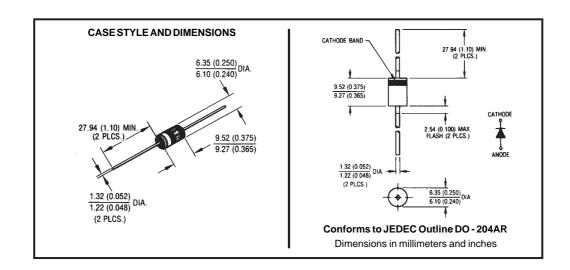
Major Ratings and Characteristics

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Characteristics		90SQ	Units
I _{F(AV)}	Rectangular waveform	9	А
V _{RRN}	range	35 to 45	V
I _{FSM}	@ tp = 5 μs sine	2150	А
V _F	@ 9 Apk, T _J =125°C	0.42	V
Т	range	-55 to 150	°C

Description/Features

The 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.

- 150° CT operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



Voltage Ratings

Part number	90SQ035	90SQ040	90SQ045
V _R Max. DC Reverse Voltage (V)	0.5	40	45
V _{RWM} Max. Working PeakReverse Voltage (V)	35	40	45

Absolute Maximum Ratings

	Parameters	90SQ	Units	Conditions		
I _{F(AV)}	Max.AverageForwardCurrent *SeeFig.5	9	А	50% duty cycle @ T _C =69° C, rec	tangularwaveform	
I _{FSM}	Max.PeakOneCycleNon-Repetitive	2150	_	5μs Sine or 3μs Rect. pulse	Following any rated load condition and	
	SurgeCurrent*SeeFig.7	340	A	10ms Sine or 6ms Rect. pulse	with rated V _{RRM} applied	
E _{AS} Non-RepetitiveAvalancheEnergy		12	mJ	T _J =25 °C, I _{AS} =1.8 Amps, L=7.4 mH		
I _{AR}	RepetitiveAvalancheCurrent	1.8	Α	Currentdecayinglinearlytozeroin1µsec		
				Frequency limited by T _J max. V _A	$_{\Lambda} = 1.5 \mathrm{x} \mathrm{V}_{\mathrm{R}} \mathrm{typical}$	

Electrical Specifications

Parameters		90SQ	Units	Conditions		
V _{FM}	Max. Forward Voltage Drop (1)	0.48	V	@ 9A	T _ 25 °C	
	* See Fig. 1	0.57	V	@ 18A	T _J = 25 °C	
		0.42	V	@ 9A	T _. = 125 °C	
		0.52	V	@ 18A	1,1 128 8	
I _{RM}	Max. Reverse Leakage Current (1)	1.75	mA	$T_J = 25 ^{\circ}\text{C}$	$V_p = \text{rated } V_p$	
	* See Fig. 2	70	mA	T _J = 125 °C	V _R - rated V _R	
C _T	Max. Junction Capacitance	900	pF	$V_R = 5V_{DC}$, (te	/ _R = 5V _{DC} , (test signal range 100Khz to 1Mhz) 25 °C	
L _s	Typical Series Inductance	10.0	nΗ	Measured lead to lead 5mm from body		
dv/dt	Max. Voltage Rate of Change	10,000	V/ µs			
	(Rated V _R)					

⁽¹⁾ Pulse Width < 300µs, Duty Cycle < 2%

Thermal-Mechanical Specifications

	Parameters	90SQ	Units	Conditions
T _J	Max.JunctionTemperatureRange	-55to 150	°C	
T _{stg}	Max.StorageTemperatureRange	-55to150	°C	
R _{thJL}	Max.ThermalResistanceJunction toLead	8.0	°C/W	DCoperation *See Fig. 4 1/8inchleadleangth
R _{thJA}	TypicalThermalResistance, Junction to Air	44	°C/W	
wt	ApproximateWeight	1.4(0.049)	g(oz.)	
	Case Style	DO-204AR		JEDEC

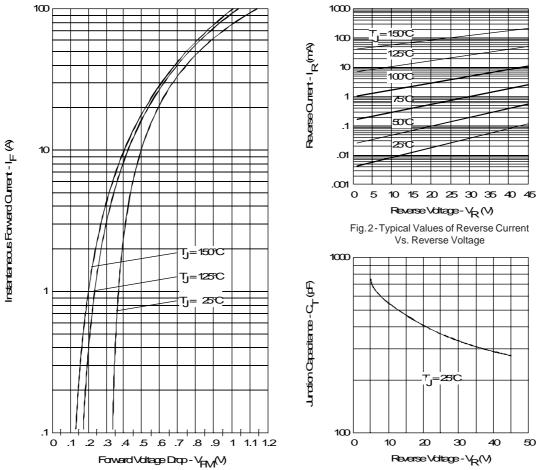


Fig. 1 - Maximum Forward Voltage Drop Characteristics

Fig. 3-Typical Junction Capacitance Vs. Reverse Voltage

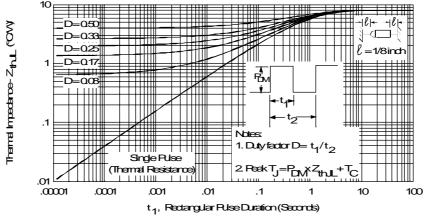


Fig. 4-Maximum Thermal Impedance $Z_{th,JL}$ Characteristics

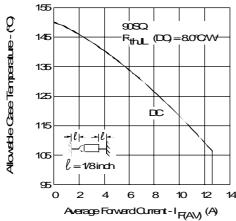


Fig. 5-Maximum Allowable Case Temperature
Vs. Average Forward Current

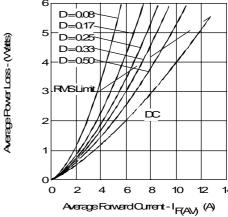
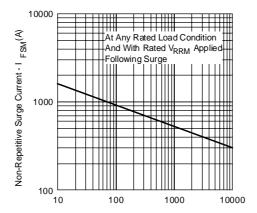


Fig. 6-Forward Power Loss Characteristics



 $\label{eq:Square Wave Pulse Duration - tp} \textbf{ (microsec)}$ $\label{eq:Square Wave Pulse Duration - tp} \textbf{ (microsec)}$ $\label{eq:Square Wave Pulse Duration - tp} \textbf{ (microsec)}$

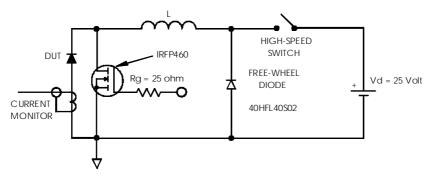


Fig. 8 - Unclamped Inductive Test Circuit