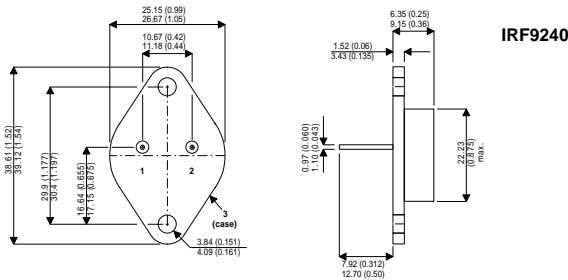


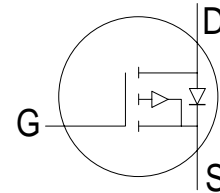
**MECHANICAL DATA**

Dimensions in mm (inches)

**P-CHANNEL  
POWER MOSFET**

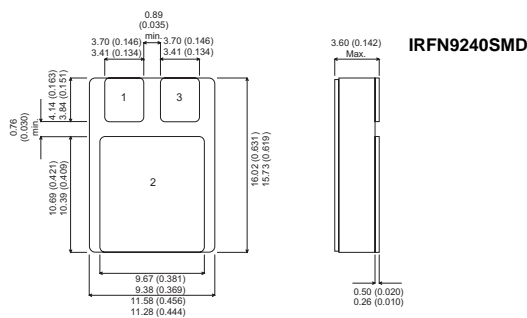


**IRF9240**



**TO-3 Package (TO-204AA)**

Pin 1 – Gate      Pin 2 – Source      Pin 3 – Drain



**IRFN9240SMD**

**SMD1 (TO276AB)**

Pin 1 – Gate      Pin 2 – Drain      Pin 3 – Source

**FEATURES**

- P-CHANNEL POWER MOSFET
- HIGH VOLTAGE
- INTEGRAL PROTECTION DIODE
- AVAILABLE IN TO-3 (TO-204AA) AND CERAMIC SURFACE MOUNT SMD1 (TO276AB) PACKAGE

**Note:** IRF9240SMD also available with pins 1 and 3 reversed on SMD 1 package.

**ABSOLUTE MAXIMUM RATINGS** ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

$V_{DSS}$	Drain – Source Voltage	-200V
$V_{DGR}$	Drain – Gate Voltage ( $R_{GS} = 20K\Omega$ )	-200V
$V_{GS}$	Gate – Source Voltage	$\pm 20V$
$I_D$	Continuous Drain Current	-11A
	@ $T_{case} = 25^{\circ}C$	
	@ $T_{case} = 100^{\circ}C$	-7.0A
$I_{DM}$	Pulsed Drain Current	-44A
$P_D$	Max. Power Dissipation	125W
	Linear Derating Factor	1W / $^{\circ}C$
$T_j$	Operating Junction and	
$T_{stg}$	Storage Temperature Range	-55 to 150 $^{\circ}C$

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

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Issue 2

**ELECTRICAL RATINGS** ( $T_{case} = 25^{\circ}\text{C}$  unless otherwise stated)

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain – Source Breakdown Voltage	$V_{GS} = 0V, I_D = -1mA$	-200			V
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-2		-4	V
$I_{GSS}$	Gate – Source Leakage Current (forward)	$V_{GS} = -20V$			-100	nA
	Gate – Source Leakage Current (reverse)	$V_{GS} = 20V$			100	nA
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = -160V, V_{GS} = 0V$			-25	$\mu A$
		$V_{DS} = -160V$ $V_{GS} = 0V, T_{case} = 125^{\circ}\text{C}$			-1	mA
$I_{D(ON)}$	On State Drain Current <sup>1</sup>	$V_{DS} > I_{D(ON)} \times R_{DS(ON)} \text{ Max}$ $V_{GS} = -10V$	-11			A
$R_{DS(ON)}$	Static Drain – Source On-State Resistance	$V_{GS} = -10V, I_D = -7A$		0.35	0.5	$\Omega$
$g_{fs}$	Forward Transconductance <sup>1</sup>	$V_{DS} > I_{D(ON)} \times R_{DS(ON)} \text{ Max}$ $I_D = -7A$	4	6		S
$C_{iss}$	Input capacitance	$V_{GS} = 0V$		1200		pF
$C_{oss}$	Output capacitance	$V_{DS} = -25V$		570		
$C_{rSS}$	Reverse transfer capacitance	$f = 1MHz$		81		
$Q_g$	Total Gate Charge	$V_{GS} = -10V$	28		60	nC
$Q_{gs}$	Gate – Source Charge	$I_D = -11A$	3.0		15	
$Q_{gd}$	Gate – Drain (“Miller”) Charge	$V_{DS} = -100V$	4.5		38	
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = -100V$ $I_D = -11A$ $Z_O = 9.1\Omega$			35	ns
$t_r$	Rise Time				85	
$t_{d(off)}$	Turn-off Delay Time				85	
$t_f$	Fall Time				65	
$L_D$	Internal Drain Inductance			5.0		nH
$L_S$	Internal Source Inductance			12.5		nH

**THERMAL CHARACTERISTICS**

	Characteristic	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Junction to Case			1.0	$^{\circ}\text{C/W}$
$R_{\theta JA}$	Junction to Ambient (TO-3 package only)			30	$^{\circ}\text{C/W}$
$T_L$	Max. Lead Temperature 0.063” from case for 10 sec. (TO-3 package only)		300		$^{\circ}\text{C}$

**SOURCE – DRAIN DIODE RATINGS AND CHARACTERISTICS**

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current (Body Diode)				-11	A
$I_{SM}$	Pulsed Source Current <sup>1</sup> (Body Diode)				-44	
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS} = 0V, I_S = -11A$ $T_{case} = 25^{\circ}\text{C}$			-4.6	V
$t_{rr}$	Reverse Recovery Time	$I_F = -11A, di_F / dt = 100A/\mu s$ $T_j = 25^{\circ}\text{C}$		270		ns
$Q_{rr}$	Reverse Recovery Charge	$I_F = -11A, di_F / dt = 100A/\mu s$ $T_j = 25^{\circ}\text{C}$		2.0		$\mu C$

1) Pulse Test: Pulse Width < 300 $\mu$ S, Duty Cycle  $\leq$  2% 2) Repetitive Rating: Pulse Width limited by maximum junction temperature.

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