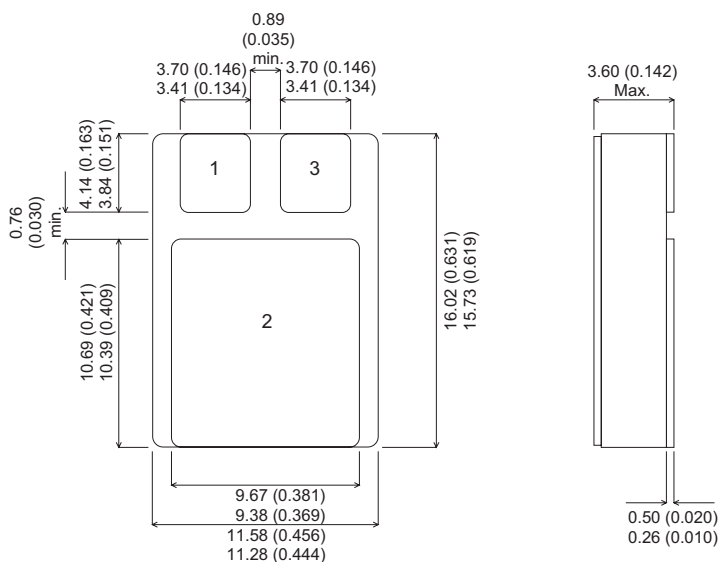


MECHANICAL DATA

Dimensions in mm (inches)



P-CHANNEL
POWER MOSFET

V_{DSS} **-100V**
 $I_{D(cont)}$ **-18A**
 $R_{DS(on)}$ **0.20Ω**

FEATURES

- HERMETICALLY SEALED SURFACE MOUNT PACKAGE
- SMALL FOOTPRINT – EFFICIENT USE OF PCB SPACE
- SIMPLE DRIVE REQUIREMENTS
- LIGHTWEIGHT
- HIGH PACKING DENSITIES

SMD1 (TO-276AB)

Pad 1 – Source Pad 2 – Drain Pad 3 – Gate

Note: IRF9140SMD also available with pins 1 and 3 reversed.

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

V_{GS}	Gate – Source Voltage	$\pm 20V$
I_D	Continuous Drain Current ($V_{GS} = -10V, T_{case} = 25^{\circ}C$)	-18A
I_D	Continuous Drain Current ($V_{GS} = -10V, T_{case} = 100^{\circ}C$)	-11A
I_{DM}	Pulsed Drain Current ¹	-72A
P_D	Power Dissipation @ $T_{case} = 25^{\circ}C$	125W
	Linear Derating Factor	1.0W/ $^{\circ}C$
E_{AS}	Single Pulse Avalanche Energy ²	500mJ
dv/dt	Peak Diode Recovery ³	-5.0V/ns
T_J, T_{stg}	Operating and Storage Temperature Range	300 $^{\circ}C$
$R_{\theta JC}$	Thermal Resistance Junction to Case	1.0 $^{\circ}C/W$

Notes

- 1) Pulse Test: Pulse Width $\leq 300ms, \delta \leq 2\%$
- 2) @ $V_{DD} = -25V, L \geq 3.1mH, R_G = 25\Omega, Peak I_L = -18A, V_{GS} = -10V, Starting T_J = 25^{\circ}C$
- 3) @ $I_{SD} \leq -18A, di/dt \leq -100A/\mu s, V_{DD} \leq BV_{DSS}, T_J \leq 150^{\circ}C, SUGGESTED R_G = 9.1\Omega$

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.

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit		
STATIC ELECTRICAL RATINGS							
BV_{DSS}	Drain – Source Breakdown Voltage	$V_{GS} = 0$	$I_D = -1\text{mA}$	-100		V	
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Temperature Coefficient of Breakdown Voltage	Reference to 25°C $I_D = -1\text{mA}$			-0.087	$\text{V}/^{\circ}\text{C}$	
$R_{DS(on)}$	Static Drain – Source On–State Resistance ¹	$V_{GS} = -10\text{V}$	$I_D = -11\text{A}$		0.20	Ω	
		$V_{GS} = -10\text{V}$	$I_D = -18\text{A}$		0.22		
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$	$I_D = -250\mu\text{A}$	-2		-4	V
g_{fs}	Forward Transconductance ¹	$V_{DS} \geq -15\text{V}$	$I_{DS} = -11\text{A}$	6.2			$\text{S}(\overline{5})$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0$	$V_{DS} = 0.8BV_{DSS}$			-25	μA
			$T_J = 125^{\circ}\text{C}$				
I_{GSS}	Forward Gate – Source Leakage	$V_{GS} = -20\text{V}$				-100	nA
I_{GSS}	Reverse Gate – Source Leakage	$V_{GS} = 20\text{V}$				100	
DYNAMIC CHARACTERISTICS							
C_{iss}	Input Capacitance	$V_{GS} = 0$			1400		pF
C_{oss}	Output Capacitance	$V_{DS} = -25\text{V}$			600		
C_{rss}	Reverse Transfer Capacitance	$f = 1\text{MHz}$			200		
Q_g	Total Gate Charge ¹	$V_{GS} = -10\text{V}$	$I_D = -18\text{A}$			60	nC
		$V_{DS} = 0.5BV_{DSS}$					
Q_{gs}	Gate – Source Charge ¹	$I_D = -18\text{A}$				13	nC
Q_{gd}	Gate – Drain (“Miller”) Charge ¹	$V_{DS} = 0.5BV_{DSS}$				35.2	
$t_{d(on)}$	Turn–On Delay Time	$V_{DD} = -50\text{V}$				35	ns
t_r	Rise Time	$I_D = -18\text{A}$				85	
$t_{d(off)}$	Turn–Off Delay Time	$R_G = 9.1\Omega$				85	
t_f	Fall Time					65	
SOURCE – DRAIN DIODE CHARACTERISTICS							
I_S	Continuous Source Current					-18	A
I_{SM}	Pulse Source Current ²					-72	
V_{SD}	Diode Forward Voltage	$I_S = -18\text{A}$	$T_J = 25^{\circ}\text{C}$			-4.2	V
		$V_{GS} = 0$					
t_{rr}	Reverse Recovery Time	$I_F = -18\text{A}$	$T_J = 25^{\circ}\text{C}$			280	ns
Q_{rr}	Reverse Recovery Charge	$d_i / d_t \leq -100\text{A}/\mu\text{s}$		$V_{DD} \leq -50\text{V}$		3.6	μC
t_{on}	Forward Turn–On Time					negligible	

Notes

- 1) Pulse Test: Pulse Width $\leq 300\text{ms}$, $\delta \leq 2\%$
- 2) Repetitive Rating – Pulse width limited by maximum junction temperature.

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