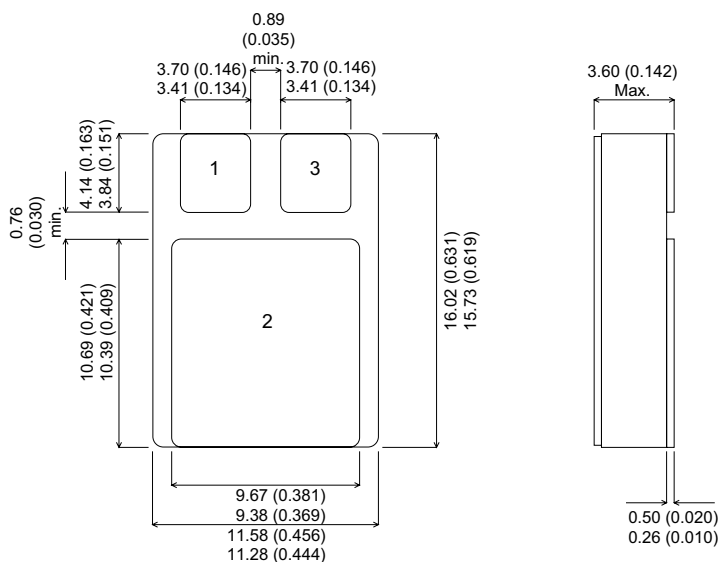


**MECHANICAL DATA**

Dimensions in mm (inches)


**N-CHANNEL  
POWER MOSFET**

$V_{DSS}$	<b>60V</b>
$I_{D(cont)}$	<b>45A</b>
$R_{DS(on)}$	<b>0.027Ω</b>

**FEATURES**

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

**SMD1 PACKAGE**

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

**Note:** IRFNxxx 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 ( $V_{GS} = 0, T_{case} = 25^{\circ}C$ )	45A
$I_D$	Continuous Drain Current ( $V_{GS} = 0, T_{case} = 100^{\circ}C$ )	28A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	180A
$P_D$	Power Dissipation @ $T_{case} = 25^{\circ}C$	100W
	Linear Derating Factor	0.8W/ $^{\circ}C$
$E_{AS}$	Single Pulse Avalanche Energy <sup>2</sup>	480mJ
dv/dt	Peak Diode Recovery <sup>3</sup>	4.5V/ns
$T_J, T_{stg}$	Operating and Storage Temperature Range	-55 to 150 $^{\circ}C$
$T_L$	Package Mounting Surface Temperature (for 5 sec)	300 $^{\circ}C$
$R_{\theta JC}$	Thermal Resistance Junction to Case	1.25 $^{\circ}C/W$
$R_{\theta J-PCB}$	Thermal Resistance Junction to PCB (Typical)	3 $^{\circ}C/W$

**Notes**

- 1) Pulse Test: Pulse Width  $\leq 300ms$ ,  $\delta \leq 2\%$
- 2) @  $V_{DD} = 25V$ ,  $L \geq 0.3mH$ ,  $R_G = 25\Omega$ , Peak  $I_L = 45A$ , Starting  $T_J = 25^{\circ}C$
- 3) @  $I_{SD} \leq 45A$ ,  $di/dt \leq 200A/\mu s$ ,  $V_{DD} \leq BV_{DSS}$ ,  $T_J \leq 125^{\circ}C$ , SUGGESTED  $R_G = 2.35\Omega$

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>STATIC ELECTRICAL RATINGS</b>					
$BV_{DSS}$	Drain – Source Breakdown Voltage	$V_{GS} = 0$ $I_D = 1\text{mA}$	60		V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Temperature Coefficient of Breakdown Voltage	Reference to $25^{\circ}\text{C}$ $I_D = 1\text{mA}$		0.68	$\text{V}/^{\circ}\text{C}$
$R_{DS(on)}$	Static Drain – Source On–State Resistance <sup>1</sup>	$V_{GS} = 10\text{V}$ $I_D = 28\text{A}$		0.027	$\Omega$
		$V_{GS} = 10\text{V}$ $I_D = 45\text{A}$		0.031	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$ $I_D = 250\mu\text{A}$	2	4	V
$g_{fs}$	Forward Transconductance <sup>1</sup>	$V_{DS} \geq 15\text{V}$ $I_{DS} = 28\text{A}$	20		$\text{S}(\bar{v})$
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS} = 0$ $V_{DS} = 0.8BV_{DSS}$ $T_J = 125^{\circ}\text{C}$		25	$\mu\text{A}$
				250	
$I_{GSS}$	Forward Gate – Source Leakage	$V_{GS} = 20\text{V}$		100	nA
$I_{GSS}$	Reverse Gate – Source Leakage	$V_{GS} = -20\text{V}$		-100	
<b>DYNAMIC CHARACTERISTICS</b>					
$C_{iss}$	Input Capacitance	$V_{GS} = 0$		4600	pF
$C_{oss}$	Output Capacitance	$V_{DS} = 25\text{V}$		2000	
$C_{rss}$	Reverse Transfer Capacitance	$f = 1\text{MHz}$		340	
$Q_g$	Total Gate Charge <sup>1</sup>	$V_{GS} = 10\text{V}$ $I_D = 45\text{A}$ $V_{DS} = 0.5BV_{DSS}$	80	180	nC
$Q_{gs}$	Gate – Source Charge <sup>1</sup>	$I_D = 45\text{A}$	20	45	nC
$Q_{gd}$	Gate – Drain (“Miller”) Charge <sup>1</sup>	$V_{DS} = 0.5BV_{DSS}$	34	105	
$t_{d(on)}$	Turn–On Delay Time	$V_{DD} = 30\text{V}$ $I_D = 45\text{A}$ $R_G = 2.35\Omega$		33	ns
$t_r$	Rise Time			180	
$t_{d(off)}$	Turn–Off Delay Time			100	
$t_f$	Fall Time			100	
<b>SOURCE – DRAIN DIODE CHARACTERISTICS</b>					
$I_S$	Continuous Source Current			45	A
$I_{SM}$	Pulse Source Current <sup>2</sup>			180	
$V_{SD}$	Diode Forward Voltage	$I_S = 45\text{A}$ $T_J = 25^{\circ}\text{C}$ $V_{GS} = 0$		2.5	V
$t_{rr}$	Reverse Recovery Time	$I_F = 45\text{A}$ $T_J = 25^{\circ}\text{C}$		280	ns
$Q_{rr}$	Reverse Recovery Charge	$d_i / d_t \leq 100\text{A}/\mu\text{s}$ $V_{DD} \leq 50\text{V}$		2.2	$\mu\text{C}$
$t_{on}$	Forward Turn–On Time		Negligible		
<b>PACKAGE CHARACTERISTICS</b>					
$L_D$	Internal Drain Inductance (from centre of drain pad to die)		0.8		nH
$L_S$	Internal Source Inductance (from centre of source pad to end of source bond wire)		2.8		

**Notes**

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