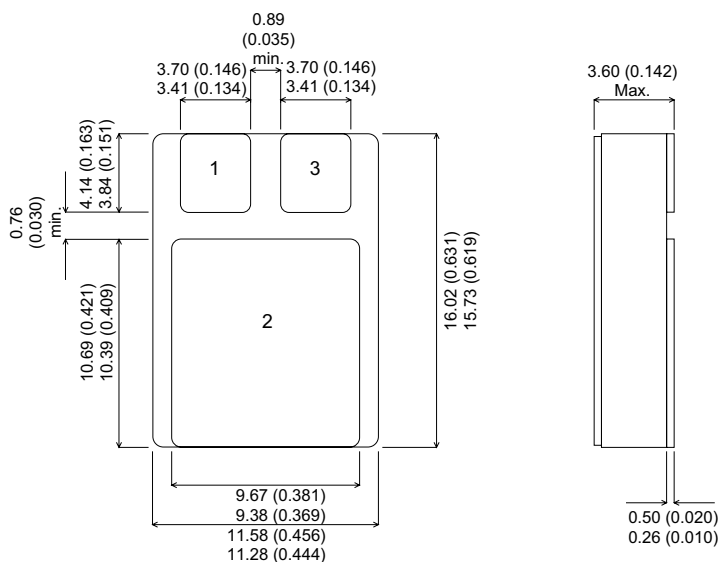


**MECHANICAL DATA**

Dimensions in mm (inches)


**N-CHANNEL  
POWER MOSFET**

$V_{DSS}$             **100V**  
 $I_{D(cont)}$         **13.9A**  
 $R_{DS(on)}$         **0.077Ω**

**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 ( $V_{GS} = 0, T_{case} = 25^{\circ}C$ )	22A
$I_D$	Continuous Drain Current ( $V_{GS} = 0, T_{case} = 100^{\circ}C$ )	13.9A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	88A
$P_D$	Power Dissipation @ $T_{case} = 25^{\circ}C$	75W
	Linear Derating Factor	0.6W/ $^{\circ}C$
$E_{AS}$	Single Pulse Avalanche Energy <sup>2</sup>	250mJ
dv/dt	Peak Diode Recovery <sup>3</sup>	5.5V/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	1.67 $^{\circ}C/W$
$R_{\theta J-PCB}$	Thermal Resistance Junction to PCB (Typical)	4 $^{\circ}C/W$

**Notes**

 1) Pulse Test: Pulse Width  $\leq 300ms, \delta \leq 2\%$ 

 2) @  $V_{DD} = 25V, L \geq 0.8mH, R_G = 25\Omega, Peak I_L = 22A, Starting T_J = 25^{\circ}C$ 

 3) @  $I_{SD} \leq 22A, di/dt \leq 170A/\mu s, V_{DD} \leq BV_{DSS}, T_J \leq 150^{\circ}C, SUGGESTED R_G = 9.1\Omega$ 
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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	$V_{GS} = 0$ $I_D = 1\text{mA}$	100			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$ Temperature Coefficient of Breakdown Voltage	Reference to $25^{\circ}\text{C}$ $I_D = 1\text{mA}$		0.13		$\text{V}/^{\circ}\text{C}$
$R_{DS(on)}$ Static Drain – Source On–State Resistance <sup>1</sup>	$V_{GS} = 10\text{V}$ $I_D = 13.9\text{A}$			0.077	$\Omega$
	$V_{GS} = 10\text{V}$ $I_D = 22\text{A}$			0.125	
$V_{GS(th)}$ Gate Threshold Voltage	$V_{DS} = V_{GS}$ $I_D = 250\mu\text{A}$	2		4	V
$g_{fs}$ Forward Transconductance <sup>1</sup>	$V_{DS} \geq 15\text{V}$ $I_{DS} = 13.9\text{A}$	9.1			$\text{S}(\bar{v})$
$I_{DSS}$ 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	$V_{GS} = 0$		1660		pF
$C_{oss}$ Output Capacitance	$V_{DS} = 25\text{V}$		550		
$C_{rss}$ Reverse Transfer Capacitance	$f = 1\text{MHz}$		120		
$Q_g$ Total Gate Charge <sup>1</sup>	$V_{GS} = 10\text{V}$ $I_D = 22\text{A}$ $V_{DS} = 0.5BV_{DSS}$	30		59	nC
$Q_{gs}$ Gate – Source Charge <sup>1</sup>	$I_D = 22\text{A}$	2.4		12	nC
$Q_{gd}$ Gate – Drain (“Miller”) Charge <sup>1</sup>	$V_{DS} = 0.5BV_{DSS}$	12		30.7	
$t_{d(on)}$ Turn–On Delay Time	$V_{DD} = 50\text{V}$ $I_D = 22\text{A}$ $R_G = 9.1\Omega$			21	ns
$t_r$ Rise Time				145	
$t_{d(off)}$ Turn–Off Delay Time				64	
$t_f$ Fall Time				105	
<b>SOURCE – DRAIN DIODE CHARACTERISTICS</b>					
$I_S$ Continuous Source Current				22	A
$I_{SM}$ Pulse Source Current <sup>2</sup>				88	
$V_{SD}$ Diode Forward Voltage	$I_S = 22\text{A}$ $T_J = 25^{\circ}\text{C}$ $V_{GS} = 0$			1.5	V
$t_{rr}$ Reverse Recovery Time	$I_F = 22\text{A}$ $T_J = 25^{\circ}\text{C}$			400	ns
$Q_{rr}$ Reverse Recovery Charge	$d_i / d_t \leq 100\text{A}/\mu\text{s}$ $V_{DD} \leq 50\text{V}$			2.9	$\mu\text{C}$
$t_{on}$ 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.