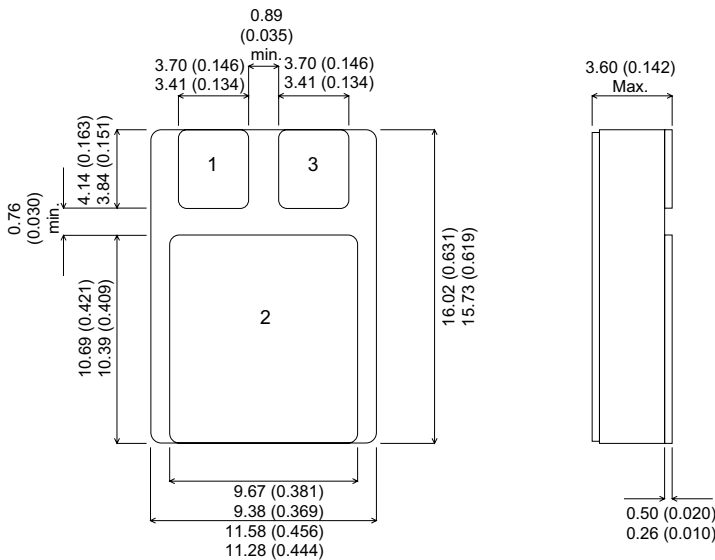


MECHANICAL DATA

Dimensions in mm (inches)



N-CHANNEL POWER MOSFET

V_{DSS} **200V**
 $I_{D(cont)}$ **13.9A**
 $R_{DS(on)}$ **0.180 Ω**

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°C unless otherwise stated)

V_{GS}	Gate – Source Voltage	±20V
I_D	Continuous Drain Current ($V_{GS} = 0$, $T_{case} = 25^\circ C$)	13.9A
I_D	Continuous Drain Current ($V_{GS} = 0$, $T_{case} = 100^\circ C$)	8.8A
I_{DM}	Pulsed Drain Current ¹	56A
P_D	Power Dissipation @ $T_{case} = 25^\circ C$	75W
	Linear Derating Factor	0.6W/°C
E_{AS}	Single Pulse Avalanche Energy ²	450mJ
dv/dt	Peak Diode Recovery ³	5.0V/ns
T_J, T_{stg}	Operating and Storage Temperature Range	–55 to 150°C
T_L	Package Mounting Surface Temperature (for 5 sec)	300°C
$R_{\theta JC}$	Thermal Resistance Junction to Case	1.67°C/W
$R_{\theta J-PCB}$	Thermal Resistance Junction to PCB (Typical)	4°C/W

Notes

- 1) Pulse Test: Pulse Width $\leq 300ms$, $\delta \leq 2\%$
- 2) @ $V_{DD} = 50V$, $L \geq 1.5mH$, $R_G = 25\Omega$, Peak $I_L = 22A$, Starting $T_J = 25^\circ C$
- 3) @ $I_{SD} \leq 13.9A$, $di/dt \leq 150A/\mu s$, $V_{DD} \leq BV_{DSS}$, $T_J \leq 150^\circ C$, 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
STATIC ELECTRICAL RATINGS					
BV_{DSS} Drain – Source Breakdown Voltage	$V_{GS} = 0$ $I_D = 1\text{mA}$	200			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$ Temperature Coefficient of Breakdown Voltage	Reference to 25°C $I_D = 1\text{mA}$		0.29		$\text{V}/^{\circ}\text{C}$
$R_{DS(on)}$ Static Drain – Source On–State Resistance ¹	$V_{GS} = 10\text{V}$ $I_D = 8.8\text{A}$			0.180	Ω
	$V_{GS} = 10\text{V}$ $I_D = 13.9\text{A}$			0.250	
$V_{GS(th)}$ Gate Threshold Voltage	$V_{DS} = V_{GS}$ $I_D = 250\mu\text{A}$	2		4	V
g_{fs} Forward Transconductance ¹	$V_{DS} \geq 15\text{V}$ $I_{DS} = 8.8\text{A}$	6.1			$\text{S}(\bar{v})$
I_{DSS} Zero Gate Voltage Drain Current	$V_{GS} = 0$ $V_{DS} = 0.8BV_{DSS}$ $T_J = 125^{\circ}\text{C}$			25	μA
				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	
DYNAMIC CHARACTERISTICS					
C_{iss} Input Capacitance	$V_{GS} = 0$		1300		pF
C_{oss} Output Capacitance	$V_{DS} = 25\text{V}$		400		
C_{rss} Reverse Transfer Capacitance	$f = 1\text{MHz}$		130		
Q_g Total Gate Charge ¹	$V_{GS} = 10\text{V}$ $I_D = 13.9\text{A}$ $V_{DS} = 0.5BV_{DSS}$	32		60	nC
Q_{gs} Gate – Source Charge ¹	$I_D = 13.9\text{A}$	2.2		10.6	nC
Q_{gd} Gate – Drain (“Miller”) Charge ¹	$V_{DS} = 0.5BV_{DSS}$	14.2		37.6	
$t_{d(on)}$ Turn–On Delay Time	$V_{DD} = 100\text{V}$ $I_D = 13.9\text{A}$ $R_G = 9.1\Omega$			20	ns
t_r Rise Time				152	
$t_{d(off)}$ Turn–Off Delay Time				58	
t_f Fall Time				67	
SOURCE – DRAIN DIODE CHARACTERISTICS					
I_S Continuous Source Current				13.9	A
I_{SM} Pulse Source Current ²				56	
V_{SD} Diode Forward Voltage	$I_S = 13.9\text{A}$ $T_J = 25^{\circ}\text{C}$ $V_{GS} = 0$			1.5	V
t_{rr} Reverse Recovery Time	$I_F = 13.9\text{A}$ $T_J = 25^{\circ}\text{C}$			500	ns
Q_{rr} Reverse Recovery Charge	$d_i / d_t \leq 100\text{A}/\mu\text{s}$ $V_{DD} \leq 50\text{V}$			5.3	μC
t_{on} Forward Turn–On Time		Negligible			
PACKAGE CHARACTERISTICS					
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.