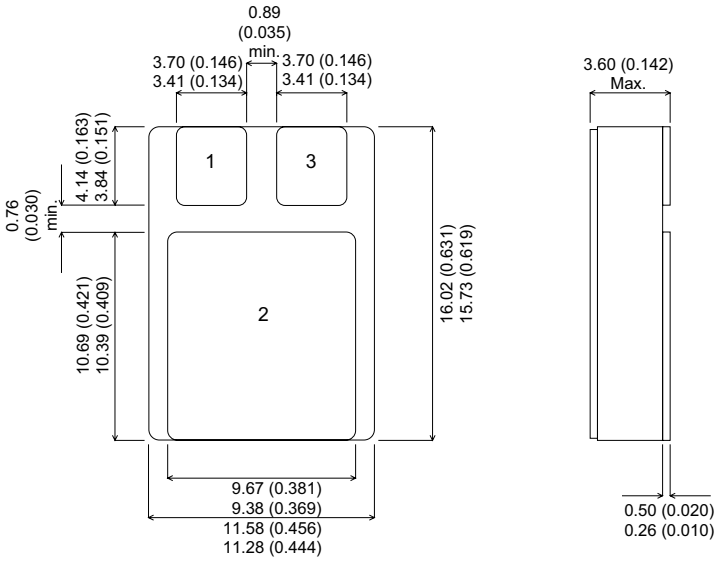
IRFN054SMD

MECHANICAL DATA
Dimensions in mm (inches)



SMD1

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

N–CHANNEL POWER MOSFET

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

FEATURES

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

Note: IRFxxxSM 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°C)	45A
I_D	Continuous Drain Current	(V_{GS} = 0 , T_{case} = 100°C)	28A
I_{DM}	Pulsed Drain Current [1]		180A
P_D	Power Dissipation @ T_{case} = 25°C		100W
	Linear Derating Factor		0.8W/°C
E_{AS}	Single Pulse Avalanche Energy [2]		480mJ
dv/dt	Peak Diode Recovery [3]		4.5V/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		1.25°C/W
$R_{\theta J–PCB}$	Thermal Resistance Junction to PCB (Typical)		3°C/W

Notes

1) Pulse Test: Pulse Width ≤ 300ms, δ ≤ 2%
2) @ V_{DD} = 25V , L ≥ 0.3mH , R_G = 25Ω , Peak I_L = 45A , Starting T_J = 25°C
3) @ I_{SD} ≤ 45A , di/dt ≤ 200A/μs , V_{DD} ≤ BV_{DSS} , T_J ≤ 125°C , SUGGESTED R_G = 2.35Ω

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SEME LAB

IRFN054SMD

ELECTRICAL CHARACTERISTICS (T_{amb} = 25°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 = 1mA	60			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Temperature Coefficient of Breakdown Voltage	Reference to 25°C, I_D = 1mA		0.68		V/°C
$R_{DS(on)}$	Static Drain – Source On–State Resistance [1]	V_{GS} = 10V I_D = 28A			0.027	Ω
		V_{GS} = 10V I_D = 45A			0.031	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS} I_D = 250µA	2		4	V
g_{fs}	Forward Transconductance [1]	V_{DS} ≥ 15V I_{DS} = 28A	20			S(℧)
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS} = 0 V_{DS} = 0.8BV_{DSS}			25	µA
		T_J = 125°C			250	
I_{GSS}	Forward Gate – Source Leakage	V_{GS} = 20V			100	nA
I_{GSS}	Reverse Gate – Source Leakage	V_{GS} = –20V			–100	
	DYNAMIC CHARACTERISTICS					
C_{iss}	Input Capacitance	V_{GS} = 0		4600		pF
C_{oss}	Output Capacitance	V_{DS} = 25V		2000		
C_{rss}	Reverse Transfer Capacitance	f = 1MHz		340		
Q_g	Total Gate Charge [1]	V_{GS} = 10V I_D = 45A, V_{DS} = 0.5BV_{DSS}	80		180	nC
Q_{gs}	Gate – Source Charge [1]	I_D = 45A	20		45	nC
Q_{gd}	Gate – Drain (“Miller”) Charge [1]	V_{DS} = 0.5BV_{DSS}	34		105	
$t_{d(on)}$	Turn–On Delay Time	V_{DD} = 30V, I_D = 45A, R_G = 2.35Ω			33	ns
t_r	Rise Time				180	
$t_{d(off)}$	Turn–Off Delay Time				100	
t_f	Fall Time				100	
	SOURCE – DRAIN DIODE CHARACTERISTICS					
I_S	Continuous Source Current				45	A
I_{SM}	Pulse Source Current [2]				180	
V_{SD}	Diode Forward Voltage	I_S = 45A T_J = 25°C, V_{GS} = 0			2.5	V
t_{rr}	Reverse Recovery Time	I_F = 45A T_J = 25°C			280	ns
Q_{rr}	Reverse Recovery Charge	d_i / d_t ≤ 100A/µs V_{DD} ≤ 50V			2.2	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 ≤ 300ms, δ ≤ 2%

2) Repetitive Rating – Pulse width limited by maximum junction temperature.

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