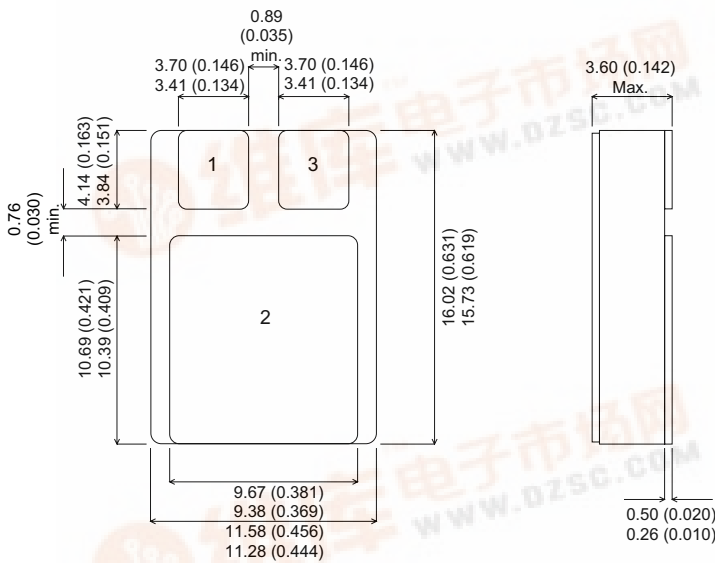




IRF054SMD

MECHANICAL DATA

Dimensions in mm (inches)



SMD1 PACKAGE

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

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: 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 ($V_{GS} = 0$, $T_{case} = 25^\circ C$)	45A
I_D	Continuous Drain Current ($V_{GS} = 0$, $T_{case} = 100^\circ C$)	28A
I_{DM}	Pulsed Drain Current ¹	180A
P_D	Power Dissipation @ $T_{case} = 25^\circ C$	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) @ $V_{DD} = 25V$, $L \geq 0.3mH$, $R_G = 25\Omega$, 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 $R_G = 2.35\Omega$

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	$V_{GS} = 0$	$I_D = 1\text{mA}$	60	V	
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Temperature Coefficient of Breakdown Voltage	Reference to 25°C $I_D = 1\text{mA}$		0.68	$\text{V}/^{\circ}\text{C}$	
$R_{DS(on)}$	Static Drain – Source On–State Resistance ¹	$V_{GS} = 10\text{V}$	$I_D = 28\text{A}$		0.027	Ω
		$V_{GS} = 10\text{V}$	$I_D = 45\text{A}$		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 ¹	$V_{DS} \geq 15\text{V}$	$I_{DS} = 28\text{A}$	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	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	$V_{GS} = 0$			4600	pF
C_{oss}	Output Capacitance	$V_{DS} = 25\text{V}$			2000	
C_{riss}	Reverse Transfer Capacitance	$f = 1\text{MHz}$			340	
Q_g	Total Gate Charge ¹	$V_{GS} = 10\text{V}$	$I_D = 45\text{A}$ $V_{DS} = 0.5BV_{DSS}$	80	180	nC
Q_{gs}	Gate – Source Charge ¹	$I_D = 45\text{A}$		20	45	nC
Q_{gd}	Gate – Drain (“Miller”) Charge ¹	$V_{DS} = 0.5BV_{DSS}$		34	105	
$t_{d(on)}$	Turn–On Delay Time	$V_{DD} = 30\text{V}$ $I_D = 45\text{A}$ $R_G = 2.35\Omega$			33	ns
t_r	Rise Time				180	
$t_{d(off)}$	Turn–Off Delay Time				100	
t_f	Fall Time				100	
SOURCE – DRAIN DIODE CHARACTERISTICS						
I_S	Continuous Source Current				45	A
I_{SM}	Pulse Source Current ²				180	
V_{SD}	Diode Forward Voltage	$I_S = 45\text{A}$ $V_{GS} = 0$	$T_J = 25^{\circ}\text{C}$		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	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.