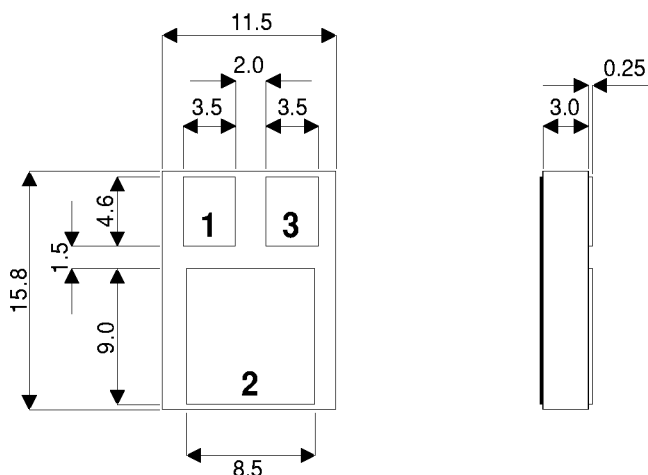


MECHANICAL DATA

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

TO-220SM – Surface Mount Package

Pad 1 – Source

Pad 2 – Drain

Pad 3 – Gate

Note: IRFxxxSM 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 ¹	88A
P_D	Power Dissipation @ $T_{case} = 25^{\circ}C$	75W
	Linear Derating Factor	0.6W/ $^{\circ}C$
E_{AS}	Single Pulse Avalanche Energy ²	250mJ
dv/dt	Peak Diode Recovery ³	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 $R_G = 9.1\Omega$

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	$V_{GS} = 0$ $I_D = 1\text{mA}$	100			V
ΔBV_{DSS} Temperature Coefficient of Breakdown Voltage	Reference to 25°C $I_D = 1\text{mA}$		0.13		V/ $^{\circ}\text{C}$
$R_{DS(on)}$ Static Drain – Source On–State Resistance ¹	$V_{GS} = 10\text{V}$ $I_D = 13.9\text{A}$			0.077	Ω
	$V_{GS} = 10\text{V}$ $I_D = 22\text{A}$			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 ¹	$V_{DS} \geq 15\text{V}$ $I_{DS} = 13.9\text{A}$	9.1			S($\bar{\sigma}$)
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	$V_{GS} = 0$		1660		pF
C_{oss} Output Capacitance	$V_{DS} = 25\text{V}$		550		
C_{riss} Reverse Transfer Capacitance	$f = 1\text{MHz}$		120		
Q_g Total Gate Charge ¹	$V_{GS} = 10\text{V}$ $I_D = 22\text{A}$ $V_{DS} = 0.5BV_{DSS}$	30		59	nC
Q_{gs} Gate – Source Charge ¹	$I_D = 22\text{A}$	2.4		12	nC
Q_{gd} Gate – Drain (“Miller”) Charge ¹	$V_{DS} = 0.5BV_{DSS}$	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	
SOURCE – DRAIN DIODE CHARACTERISTICS					
I_S Continuous Source Current				22	A
I_{SM} Pulse Source Current ²				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	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.