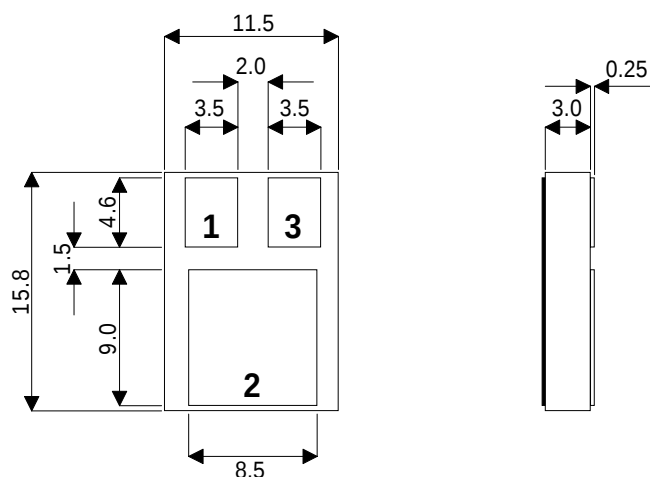


MECHANICAL DATA

Dimensions in mm (inches)


TO-220SM – Surface Mount Package

Pad 1 – Gate

Pad 2 – Drain

Pad 3 – Source

Note: IRFNxxx also available with pins 1 and 3 reversed.

**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

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 $R_G = 9.1\Omega$
Semelab plc. Telephone +44(0)1455 556565. Fax +44(0)1455 552612.

E-mail: sales@semelab.co.uk

Website: <http://www.semelab.co.uk>

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 = 1mA	100			V
ΔBV _{DSS} ΔT _J	Temperature Coefficient of Breakdown Voltage	Reference to 25°C I _D = 1mA			0.13		V/°C
R _{DS(on)}	Static Drain – Source On–State Resistance ¹	V _{GS} = 10V	I _D = 13.9A			0.077	Ω
		V _{GS} = 10V	I _D = 22A			0.125	
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} = 13.9A	9.1			S(̄v)
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 V _{DS} = 25V f = 1MHz			1660		pF
C _{oss}	Output Capacitance				550		
C _{rss}	Reverse Transfer Capacitance				120		
Q _g	Total Gate Charge ¹	V _{GS} = 10V I _D = 22A V _{DS} = 0.5BV _{DSS}		30		59	nC
Q _{gs}	Gate – Source Charge ¹	I _D = 22A		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} = 50V I _D = 22A R _G = 9.1Ω				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 = 22A V _{GS} = 0	T _J = 25°C			1.5	V
t _{rr}	Reverse Recovery Time	I _F = 22A	T _J = 25°C			400	ns
Q _{rr}	Reverse Recovery Charge	d _i / d _t ≤ 100A/μs V _{DD} ≤ 50V				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.