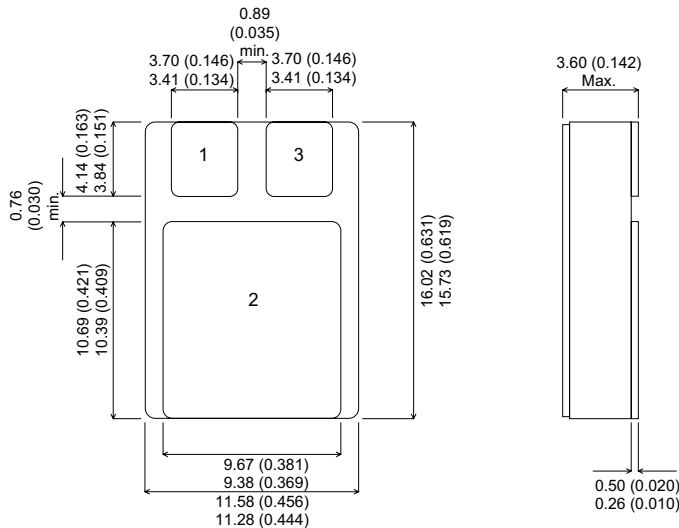


**MECHANICAL DATA**

Dimensions in mm (inches)

**N-CHANNEL  
POWER MOSFET** $V_{DSS}$  100V $I_{D(cont)}$  13.9A $R_{DS(on)}$  0.077 $\Omega$ **FEATURES**

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

**SMD1 – 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 <sup>1</sup>	88A
$P_D$	Power Dissipation @ $T_{case} = 25^{\circ}C$	75W
	Linear Derating Factor	0.6W/ $^{\circ}C$
$E_{AS}$	Single Pulse Avalanche Energy <sup>2</sup>	250mJ
dv/dt	Peak Diode Recovery <sup>3</sup>	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](mailto: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	
<b>STATIC ELECTRICAL RATINGS</b>						
$BV_{DSS}$	Drain – Source Breakdown Voltage	$V_{GS} = 0$	$I_D = 1\text{mA}$	100	V	
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Temperature Coefficient of Breakdown Voltage	Reference to $25^{\circ}\text{C}$ $I_D = 1\text{mA}$		0.13	$\text{V}/^{\circ}\text{C}$	
$R_{DS(on)}$	Static Drain – Source On–State Resistance <sup>1</sup>	$V_{GS} = 10\text{V}$	$I_D = 13.9\text{A}$		0.077	
		$V_{GS} = 10\text{V}$	$I_D = 22\text{A}$		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 <sup>1</sup>	$V_{DS} \geq 15\text{V}$	$I_{DS} = 13.9\text{A}$	9.1		$\text{S}(\bar{v})$
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS} = 0$	$V_{DS} = 0.8BV_{DSS}$ $T_J = 125^{\circ}\text{C}$		25	$\mu\text{A}$
					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	nA
<b>DYNAMIC CHARACTERISTICS</b>						
$C_{iss}$	Input Capacitance	$V_{GS} = 0$		1660		pF
$C_{oss}$	Output Capacitance	$V_{DS} = 25\text{V}$		550		
$C_{rss}$	Reverse Transfer Capacitance	$f = 1\text{MHz}$		120		
$Q_g$	Total Gate Charge <sup>1</sup>	$V_{GS} = 10\text{V}$	$I_D = 22\text{A}$	30	59	nC
$Q_{gs}$	Gate – Source Charge <sup>1</sup>	$I_D = 22\text{A}$		2.4	12	nC
$Q_{gd}$	Gate – Drain (“Miller”) Charge <sup>1</sup>	$V_{DS} = 0.5BV_{DSS}$		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	
<b>SOURCE – DRAIN DIODE CHARACTERISTICS</b>						
$I_S$	Continuous Source Current				22	A
$I_{SM}$	Pulse Source Current <sup>2</sup>				88	
$V_{SD}$	Diode Forward Voltage	$I_S = 22\text{A}$	$T_J = 25^{\circ}\text{C}$		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	$\mu\text{C}$
$t_{on}$	Forward Turn–On Time			Negligible		
<b>PACKAGE CHARACTERISTICS</b>						
$L_D$	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.