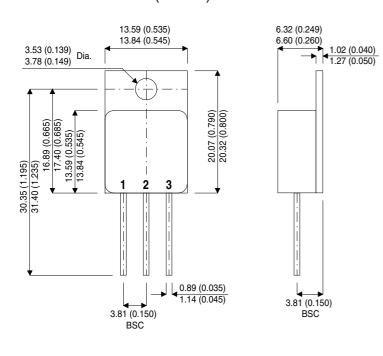




#### MECHANICAL DATA

Dimensions in mm (inches)



### TO-254AA - Isolated Metal Package

Pin 1 – Drain

Pin 2 - Source

Pin 3 - Gate

# **N-CHANNEL POWER MOSFET**

 $V_{DSS}$ **200V** I<sub>D(cont)</sub> 27.4A

R<sub>DS(on)</sub>  $0.100\Omega$ 

### **FEATURES**

- N-CHANNEL MOSFET
- HIGH VOLTAGE
- INTEGRAL PROTECTION DIODE
- HERMETIC ISOLATED TO-254 PACKAGE
- SIDE TAB & TABLESS PACKAGE **OPTIONS AVAILABLE**
- SCREENING OPTIONS AVAILABLE

### **ABSOLUTE MAXIMUM RATINGS** (T<sub>C</sub> = 25°C unless otherwise stated)

$\overline{V_{GS}}$	Gate – Source Voltage	±20V		
$I_{D}$	Continuous Drain Current @ $V_{GS} = 10V$ , $T_C = 25^\circ$		27.4A	
		@ $V_{GS} = 10V$ , $T_{C} = 100^{\circ}C$	17A	
$I_{DM}$	Pulsed Drain Current		110A	
$P_{D}$	Max. Power Dissipation	@ T <sub>C</sub> = 25°C	150W	
	Linear Derating Factor		1.2W / °C	
IL	Avalanche Current , Clamped 1	27.4A		
dv / dt	Peak Diode Recovery <sup>2</sup>	5.5V / ns		
$R_{ heta JC}$	Thermal Resistance Junction - C	0.83°C / W		
$R_{ hetaJA}$	Thermal Resistance Junction – A	48°C / W		
$R_{\theta CS}$	Thermal Resistance Case – Sink	0.21°C / W typ.		
$T_J$ , $T_STG$	Operating Junction and Storage 1	−55 to 150°C		
TL	Lead Temperature (1.6mm from c	300°C		

- 1)
- $V_{DD}$  = 25V , Starting T<sub>J</sub> = 25°C , L  $\geq$  1mH , R<sub>G</sub> = 25 $\Omega$  , Peak I<sub>L</sub> = 27.4A I<sub>SD</sub>  $\leq$  27.4A , di/dt  $\leq$  190A /  $\mu S$  , V<sub>DD</sub>  $\leq$  BV<sub>DSS</sub> , T<sub>J</sub>  $\leq$  150°C , Suggested R<sub>G</sub> = 2.35 $\Omega$ 2)

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Document Number 3351



# **IRFM250** 2N7225

### **ELECTRICAL CHARACTERISTICS** (T<sub>J</sub> = 25°C unless otherwise stated)

	Parameter	rameter Test Conditions		Min.	Тур.	Max.	Unit
	STATIC ELECTRICAL RATINGS	•	'				
BV <sub>DSS</sub>	Drain – Source Breakdown Voltage	$V_{GS} = 0$	I <sub>D</sub> = 1mA	200			V
$\Delta BV_{DSS}$	Temperature Coefficient of	Reference to 25°C I <sub>D</sub> = 1mA			0.28		V/°C
$\Delta T_{J}$	Breakdown Voltage						
R <sub>DS(on)</sub>	Static Drain - Source On-State	V <sub>GS</sub> = 10V			0.100		
	Resistance <sup>2</sup>	V <sub>GS</sub> = 10V	I <sub>D</sub> = 27.4A			0.105	$ \Omega$
V <sub>GS(th)</sub>	Gate Threshold Voltage	$V_{DS} = V_{GS}$	I <sub>D</sub> = 250μA	2		4	V
9 <sub>fs</sub>	Forward Transconductance <sup>2</sup>	$V_{DS} \ge 15V$	I <sub>DS</sub> = 17A	9			S(Ω)
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>GS</sub> = 0	$V_{DS} = 0.8BV_{DSS}$			25	μΑ
			T <sub>J</sub> = 125°C			250	
I <sub>GSS</sub>	Forward Gate – Source Leakage	V <sub>GS</sub> = 20V				100	T
I <sub>GSS</sub>	Reverse Gate – Source Leakage	$V_{GS} = -20V$	$I_{GS} = -20V$				- nA
	DYNAMIC CHARACTERISTICS	1					
C <sub>iss</sub>	Input Capacitance	V 0			3500		
C <sub>oss</sub>	Output Capacitance	0.0	$V_{GS} = 0$ $V_{DS} = 25V$				pF
C <sub>rss</sub>	Reverse Transfer Capacitance	1					
C <sub>DC</sub>	Drain - Case Capacitance	f = 1MHz		12			
Q <sub>q</sub>	Total Gate Charge	V <sub>GS</sub> = 10V		55		115	
Q <sub>gs</sub>	Gate - Source Charge	$I_{D} = 27.4A$ $V_{DS} = 0.5BV_{DSS}$		8		22	nC
Q <sub>gd</sub>	Gate - Drain ("Miller") Charge			30		60	
t <sub>d(on)</sub>	Turn- On Delay Time	V 100V	V 400V			35	- ns
t <sub>r</sub>	Rise Time	$V_{DD} = 100V$				190	
t <sub>d(off)</sub>	Turn-Off Delay Time	-	$I_D = 27.4A$ Vgs = 10V $R_G = 2.35\Omega$			170	
t <sub>f</sub>	Fall Time	$H_{G} = 2.35\Omega$				130	
	SOURCE - DRAIN DIODE CHARAC	TERISTICS	l.				
I <sub>S</sub>	Continuous Source Current					27.4	_
I <sub>SM</sub>	Pulse Source Current <sup>1</sup>					110	A
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$I_S = 27.4A$ $V_{GS} = 0$	T <sub>J</sub> = 25°C			1.9	V
t <sub>rr</sub>	Reverse Recovery Time <sup>2</sup>	I <sub>F</sub> = 27.4A	T <sub>J</sub> = 25°C			950	ns
Q <sub>rr</sub>	Reverse Recovery Charge <sup>2</sup>	d <sub>i</sub> / d <sub>t</sub> ≤ 100A/μs	s V <sub>DD</sub> ≤ 50V			9.0	μС
t <sub>on</sub>	Forward Turn-On Time				Negligible	<u> </u>	
	PACKAGE CHARACTERISTICS						
L <sub>D</sub>	Internal Drain Inductance Measured from	CE Measured from 6mm down drain lead to centre of die			8.7		n⊔
L <sub>S</sub>	Internal Source Inductance Measured from	om 6mm down source I		8.7		- nH	

<sup>1)</sup> Repetitive Rating – Pulse width limited by Maximum Junction Temperature

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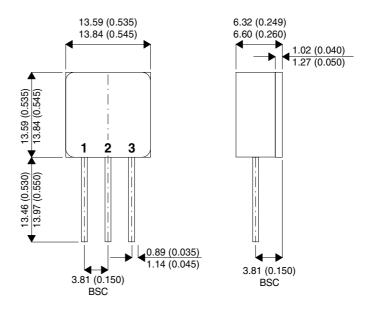
<sup>2)</sup> Pulse Test: Pulse Width  $\leq$  300 $\mu$ s,  $\delta \leq$  2%.



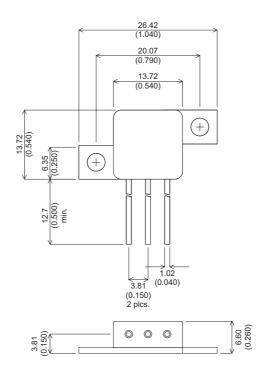


### **PACKAGE OPTIONS**

### **TABLESS**



#### SIDE TAB



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