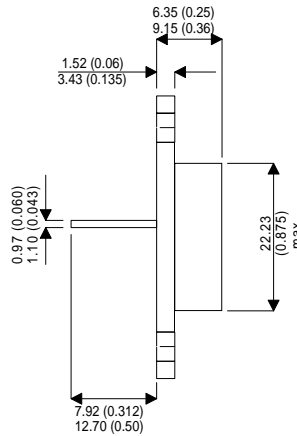
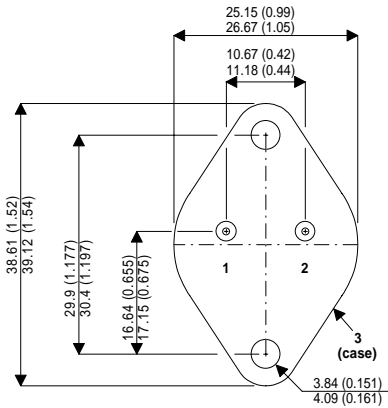
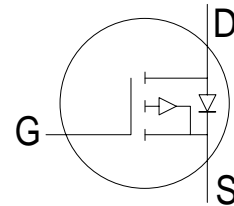


MECHANICAL DATA



**P-CHANNEL
POWER MOSFET**



TO-3 Package

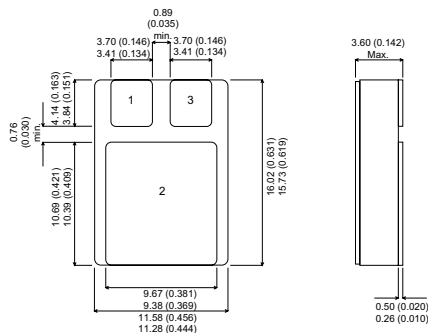
Pin 1 – Gate

Pin 2 – Source

Pin 3 – Drain

FEATURES

- P-CHANNEL POWER MOSFET
- HIGH VOLTAGE
- INTEGRAL PROTECTION DIODE
- AVAILABLE IN TO-3 (TO-204AA) AND CERAMIC SURFACE MOUNT PACKAGES



SMD1

Pin 1 – Gate

Pin 2 – Source

Pin 3 – Drain

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

TO-3 — TO-3 (TO-204AA) Metal Package
TO-220 SM — TO-220 Ceramic Surface Mount Package

ABSOLUTE MAXIMUM RATINGS ($T_{case} = 25^{\circ}C$ unless otherwise stated)

V_{DSS}	Drain – Source Voltage	-200V
V_{DGR}	Drain – Gate Voltage ($R_{GS} = 20K\Omega$)	-200V
V_{GS}	Gate – Source Voltage	$\pm 20V$
I_D	Continuous Drain Current	@ $T_{case} = 25^{\circ}C$ -11A @ $T_{case} = 100^{\circ}C$ -7.0A
I_{DM}	Pulsed Drain Current	-44A
P_D	Max. Power Dissipation	@ $T_{case} = 25^{\circ}C$ 125W
	Linear Derating Factor	(TO 3 package only) 1W / $^{\circ}C$
I_{LM}	Inductive Current , Clamped	-44A
T_j	Operating Junction and	(TO 3 package only) -55 to 150 $^{\circ}C$
T_{stg}	Storage Temperature Range	

ELECTRICAL RATINGS ($T_{case} = 25^{\circ}C$ unless otherwise stated)

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain – Source Breakdown Voltage	$V_{GS} = 0V, I_D = -250\mu A$	-200			V
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-2		-4	V
I_{GSS}	Gate – Source Leakage Current (forward)	$V_{GS} = -20V$			-100	nA
	Gate – Source Leakage Current (reverse)	$V_{GS} = 20V$			100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = \text{Max. Rating}, V_{GS} = 0V$			-250	μA
		$V_{DS} = 0.8 \times \text{Max. Rating}$ $V_{GS} = 0V, T_{case} = 125^{\circ}C$			-1000	μA
$I_{D(ON)}$	On State Drain Current ¹	$V_{DS} > I_{D(ON)} \times R_{DS(ON)} \text{ Max}$ $V_{GS} = -10V$	-11			A
$R_{DS(ON)}$	Static Drain – Source On-State Resistance	$V_{GS} = -10V, I_D = -6A$		0.35	0.5	Ω
g_{fs}	Forward Transconductance ¹	$V_{DS} > I_{D(ON)} \times R_{DS(ON)} \text{ Max}$ $I_D = -6A$	4	6		S
C_{iss}	Input capacitance	$V_{GS} = 0V$		1100	1300	pF
C_{oss}	Output capacitance	$V_{DS} = -25V$		375	450	
C_{rss}	Reverse transfer capacitance	$f = 1\text{MHz}$		150	250	
Q_g	Total Gate Charge	$V_{GS} = -15V$		70	90	nC
Q_{gs}	Gate – Source Charge	$I_D = -22A$		55		
Q_{gd}	Gate – Drain (“Miller”) Charge	$V_{DS} = 0.8 \times \text{Max. Rating}$		15		
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = 0.5 \times BV_{DSS}$ $I_D = -6A$ $Z_O = 4.7\Omega$		20	30	ns
t_r	Rise Time			10	15	
$t_{d(off)}$	Turn-off Delay Time			12	18	
t_f	Fall Time			8	12	
L_D	Internal Drain Inductance			5.0		nH
L_S	Internal Source Inductance			12.5		nH

THERMAL CHARACTERISTICS

	Characteristic	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Junction to Case (TO-3 package only)			1.0	$^{\circ}C/W$
$R_{\theta CS}$	Case to Sink (TO-3 package only)		0.1		$^{\circ}C/W$
$R_{\theta JA}$	Junction to Ambient			30	$^{\circ}C/W$
T_L	Max. Lead Temperature 0.063” from case for 10 sec. (TO-3 package only)		300		$^{\circ}C$

SOURCE – DRAIN DIODE RATINGS AND CHARACTERISTICS

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current (Body Diode)				-11	A
I_{SM}	Pulsed Source Current ¹ (Body Diode)				-44	
V_{SD}	Diode Forward Voltage ²	$V_{GS} = 0V, I_S = -11A$ $T_{case} = 25^{\circ}C$			-4.6	V
t_{rr}	Reverse Recovery Time	$I_F = -11A, di_F / dt = 100A/\mu s$ $T_j = 150^{\circ}C$		270		ns
Q_{rr}	Reverse Recovery Charge	$I_F = -11A, di_F / dt = 100A/\mu s$ $T_j = 150^{\circ}C$		2.0		μC

1) Pulse Test: Pulse Width < 300 μs , Duty Cycle $\leq 2\%$

2) Repetitive Rating: Pulse Width limited by maximum junction temperature.

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