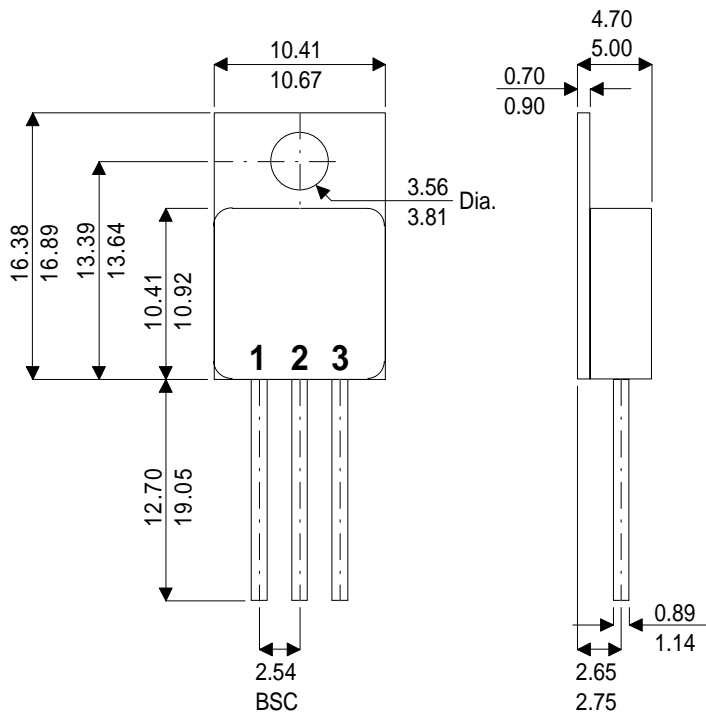


**MECHANICAL DATA**

Dimensions in mm (inches)



**TO-220 – Metal Package**

Pin 1 – Gate      Pin 2 – Drain      Pin 3 – Source

**P-CHANNEL  
MOS  
TRANSISTOR**

$V_{DSS}$	<b>-50V</b>
$I_{D(cont)}$	<b>13.2A</b>
$R_{DS(on)}$	<b>0.15Ω</b>

**FEATURES**

- P CHANNEL
- REPETITIVE AVALANCHE RATED
- DYNAMIC dv/dt RATING
- FAST SWITCHING
- EASE OF PARALLELING
- SIMPLE DRIVE REQUIREMENTS

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

$V_{GS}$	Gate – Source Voltage	$\pm 20V$
$I_D$	Continuous Drain Current ( $V_{GS} = -10V, T_{case} = 25^{\circ}C$ )	13.2A
$I_D$	Continuous Drain Current ( $V_{GS} = -10V, T_{case} = 100^{\circ}C$ )	8.3A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	53A
$P_D$	Power Dissipation @ $T_{case} = 25^{\circ}C$	45W
	Linear Derating Factor	0.36W/ $^{\circ}C$
$T_J$	Operating Junction Temperature	-55 to +150 $^{\circ}C$
$T_{STG}$	Storage Temperature Range	-55 to +150 $^{\circ}C$
$R_{\theta JC}$	Thermal Resistance Junction to Case	2.8 $^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	80 $^{\circ}C/W$

**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	$V_{GS} = 0$ $I_D = -250\mu\text{A}$	-50			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$ Temperature Coefficient of Breakdown Voltage	Reference to $25^{\circ}\text{C}$ $I_D = -1\text{mA}$		-0.060		V/ $^{\circ}\text{C}$
$R_{DS(on)}$ Static Drain – Source On Resistance <sup>1</sup>	$V_{GS} = -10\text{V}$ $I_D = 9.3\text{A}$			0.15	$\Omega$
$V_{GS(th)}$ Gate Threshold Voltage	$V_{DS} = V_{GS}$ $I_D = -250\mu\text{A}$	-2		-4	V
$g_{fs}$ Forward Transconductance <sup>1</sup>	$V_{DS} = -40\text{V}$ $I_D = 9.3\text{A}$	3.1			S
$I_{DSS}$ Zero Gate Voltage Drain Current	$V_{DS} = -60\text{V}$ $V_{GS} = 0$			-100	$\mu\text{A}$
	$V_{DS} = -48\text{V}$ $V_{GS} = 0$ $T_J = 125^{\circ}\text{C}$			-500	
$I_{GSS}$ Forward Gate – Source Leakage	$V_{GS} = -20\text{V}$			-100	nA
$I_{GSS}$ Reverse Gate – Source Leakage	$V_{GS} = 20\text{V}$			100	
<b>DYNAMIC CHARACTERISTICS</b>					
$C_{iss}$ Input Capacitance	$V_{GS} = 0$		900		pF
$C_{oss}$ Output Capacitance	$V_{DS} = -25\text{V}$		570		
$C_{rss}$ Reverse Transfer Capacitance	$f = 1\text{MHz}$		140		
$Q_g$ Total Gate Charge <sup>1</sup>	$I_D = 13.2\text{A}$			39	nC
$Q_{gs}$ Gate – Source Charge <sup>1</sup>	$V_{DS} = -48\text{V}$			10	
$Q_{gd}$ Gate – Drain (“Miller”) Charge <sup>1</sup>	$V_{GS} = -10\text{V}$			15	
$t_{d(on)}$ Turn–On Delay Time <sup>1</sup>	$V_{DD} = -30\text{V}$			18	nS
$t_r$ Rise Time <sup>1</sup>	$I_D = 13.2\text{A}$			170	
$t_{d(off)}$ Turn–Off Delay Time <sup>1</sup>	$R_G = 12\Omega$			32	
$t_f$ Fall Time <sup>1</sup>	$R_D = 1.5\Omega$			96	
<b>SOURCE – DRAIN DIODE CHARACTERISTICS</b>					
$I_S$ Continuous Source Current (Body Diode)				13.2	A
$I_{SM}$ Pulse Source Current <sup>2</sup> (Body Diode)				53	
$V_{SD}$ Diode Forward Voltage <sup>1</sup>	$I_S = -18\text{A}$ $T_J = 25^{\circ}\text{C}$ $V_{GS} = 0$			-6.3	V
$t_{rr}$ Reverse Recovery Time <sup>1</sup>	$I_F = -18\text{A}$ $T_J = 25^{\circ}\text{C}$		120	250	ns
$Q_{rr}$ Reverse Recovery Charge <sup>1</sup>	$d_i / d_t = 100\text{A}/\mu\text{s}$		0.47	1.1	$\mu\text{C}$
<b>PACKAGE CHARACTERISTICS</b>					
$L_D$ Internal Drain Inductance (from 6mm down lead to centre of drain bond pad)			4.5		nH
$L_S$ Internal Source Inductance (from 6mm down lead to centre of source bond pad)			7.5		

**Notes**

- 1) Pulse Test: Pulse Width  $\leq 300\text{ms}$ ,  $\delta \leq 2\%$
- 2) Repetitive Rating – Pulse width limited by maximum junction temperature.