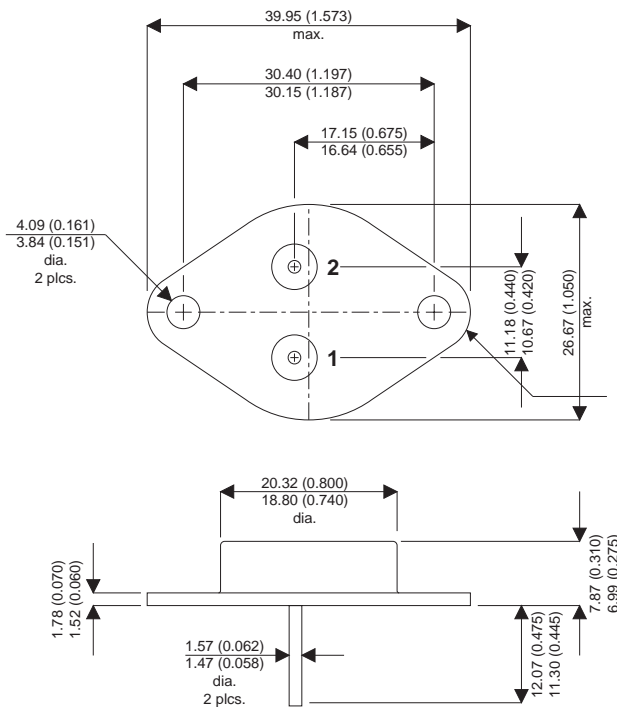


**MECHANICAL DATA**

Dimensions in mm (inches)



**TO-3 Metal Package**

Pin 1 – Gate      Pin 2 – Source      Case – Drain

**N-CHANNEL  
POWER MOSFET**

$V_{DSS}$             **100V**  
 $I_{D(cont)}$         **38A**  
 $R_{DS(on)}$         **0.055Ω**

**FEATURES**

- HERMETICALLY SEALED TO-3 METAL PACKAGE
- SIMPLE DRIVE REQUIREMENTS
- SCREENING OPTIONS AVAILABLE

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

$V_{GS}$	Gate – Source Voltage	$\pm 20V$
$I_D$	Continuous Drain Current ( $V_{GS} = 0, T_{case} = 25^{\circ}C$ )	38A
$I_D$	Continuous Drain Current ( $V_{GS} = 0, T_{case} = 100^{\circ}C$ )	24A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	152A
$P_D$	Power Dissipation @ $T_{case} = 25^{\circ}C$	150W
	Linear Derating Factor	1.2W/ $^{\circ}C$
$E_{AS}$	Single Pulse Avalanche Energy <sup>2</sup>	150mJ
$I_{AR}$	Avalanche Current <sup>2</sup>	38A
$E_{AR}$	Repetitive Avalanche Energy <sup>2</sup>	15mJ
dv/dt	Peak Diode Recovery <sup>3</sup>	5.5V/ns
$T_J, T_{stg}$	Operating and Storage Temperature Range	-55 to +150 $^{\circ}C$
$T_L$	Lead Temperature 1.6mm (0.63") from case for 10 sec.	300 $^{\circ}C$

**Notes**

- 1) Pulse Test: Pulse Width  $\leq 300\mu s$ ,  $\delta \leq 2\%$
- 2) @  $V_{DD} = 50V, L \geq 160\mu H, R_G = 25\Omega$ , Peak  $I_L = 38A$ , Starting  $T_J = 25^{\circ}C$
- 3) @  $I_{SD} \leq 38A, di/dt \leq 300A/\mu s, V_{DD} \leq BV_{DSS}, T_J \leq 150^{\circ}C$ , Suggested  $R_G = 2.35\Omega$

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>STATIC ELECTRICAL RATINGS</b>					
$BV_{\text{DSS}}$ Drain – Source Breakdown Voltage	$V_{\text{GS}} = 0$ $I_{\text{D}} = 1\text{mA}$	100			V
$\Delta BV_{\text{DSS}} / \Delta T_{\text{J}}$ Temperature Coefficient of Breakdown Voltage	Reference to $25^{\circ}\text{C}$ $I_{\text{D}} = 1\text{mA}$		0.13		$\text{V}/^{\circ}\text{C}$
$R_{\text{DS(on)}}$ Static Drain – Source On-State Resistance <sup>1</sup>	$V_{\text{GS}} = 10\text{V}$ $I_{\text{D}} = 24\text{A}$			0.055	$\Omega$
	$V_{\text{GS}} = 10\text{V}$ $I_{\text{D}} = 38\text{A}$			0.065	
$V_{\text{GS(th)}}$ Gate Threshold Voltage	$V_{\text{DS}} = V_{\text{GS}}$ $I_{\text{D}} = 250\text{mA}$	2		4	V
$g_{\text{fs}}$ Forward Transconductance <sup>1</sup>	$V_{\text{DS}} \geq 15\text{V}$ $I_{\text{DS}} = 24\text{A}$	9			S ( $\bar{\cup}$ )
$I_{\text{DSS}}$ Zero Gate Voltage Drain Current	$V_{\text{GS}} = 0$ $V_{\text{DS}} = 0.8BV_{\text{DSS}}$ $T_{\text{J}} = 125^{\circ}\text{C}$			25	$\mu\text{A}$
				250	
$I_{\text{GSS}}$ Forward Gate – Source Leakage	$V_{\text{GS}} = 20\text{V}$			100	nA
$I_{\text{GSS}}$ Reverse Gate – Source Leakage	$V_{\text{GS}} = -20\text{V}$			-100	
<b>DYNAMIC CHARACTERISTICS</b>					
$C_{\text{iss}}$ Input Capacitance	$V_{\text{GS}} = 0$		3700		pF
$C_{\text{oss}}$ Output Capacitance	$V_{\text{DS}} = 25\text{V}$		1100		
$C_{\text{riss}}$ Reverse Transfer Capacitance	$f = 1\text{MHz}$		200		
$Q_{\text{g}}$ Total Gate Charge	$V_{\text{GS}} = 10\text{V}$	50		125	nC
$Q_{\text{gs}}$ Gate – Source Charge	$I_{\text{D}} = 38\text{A}$	8		22	
$Q_{\text{gd}}$ Gate – Drain (“Miller”) Charge	$V_{\text{DS}} = 0.5BV_{\text{DSS}}$	25		65	
$t_{\text{d(on)}}$ Turn-On Delay Time	$V_{\text{DD}} = 50\text{V}$ $I_{\text{D}} = 38\text{A}$ $R_{\text{G}} = 2.35\Omega$			35	ns
$t_{\text{r}}$ Rise Time				190	
$t_{\text{d(off)}}$ Turn-Off Delay Time				170	
$t_{\text{f}}$ Fall Time				130	
<b>SOURCE – DRAIN DIODE CHARACTERISTICS</b>					
$I_{\text{S}}$ Continuous Source Current				38	A
$I_{\text{SM}}$ Pulse Source Current <sup>2</sup>				152	
$V_{\text{SD}}$ Diode Forward Voltage <sup>1</sup>	$I_{\text{S}} = 38\text{A}$ $T_{\text{J}} = 25^{\circ}\text{C}$ $V_{\text{GS}} = 0$			1.8	V
$t_{\text{rr}}$ Reverse Recovery Time	$I_{\text{F}} = 38\text{A}$ $T_{\text{J}} = 25^{\circ}\text{C}$			500	ns
$Q_{\text{rr}}$ Reverse Recovery Charge <sup>1</sup>	$d_{\text{i}} / d_{\text{t}} \leq 100\text{A}/\mu\text{s}$ $V_{\text{DD}} \leq 50\text{V}$			2.9	$\mu\text{C}$
$t_{\text{on}}$ Forward Turn-On Time		Negligible			
<b>PACKAGE CHARACTERISTICS</b>					
$L_{\text{D}}$ Internal Drain Inductance (measured from 6mm down drain lead to centre of die)			5.0		nH
$L_{\text{S}}$ Internal Source Inductance (from 6mm down source lead to source bond pad)			13		
<b>THERMAL CHARACTERISTICS</b>					
$R_{\theta\text{JC}}$ Thermal Resistance Junction – Case				0.83	$^{\circ}\text{C}/\text{W}$
$R_{\theta\text{CS}}$ Thermal Resistance Case – Sink			0.12		
$R_{\theta\text{JA}}$ Thermal Resistance Junction – Ambient				30	

**Notes**

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