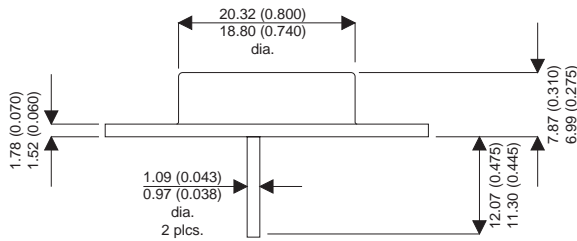
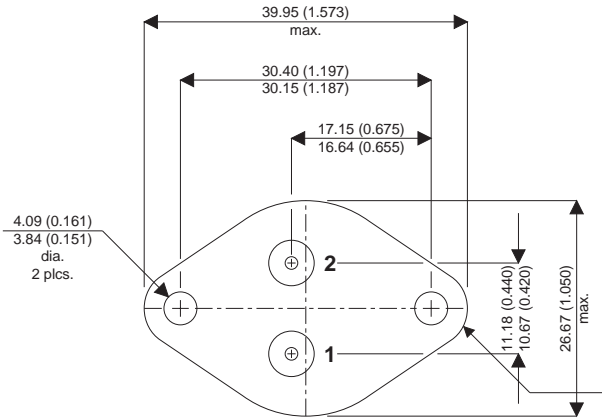


**MECHANICAL DATA**

Dimensions in mm (inches)



**TO-3 Metal Package**

Pin 1 – Gate      Pin 2 – Source      Case – Drain

**N-CHANNEL  
POWER MOSFET**

$V_{DSS}$                     **500V**  
 $I_{D(cont)}$                 **13A**  
 $R_{DS(on)}$                 **0.4Ω**

**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 ( $V_{GS} = 0, T_{case} = 25^{\circ}C$ )	12A
$I_D$	Continuous Drain Current ( $V_{GS} = 0, T_{case} = 100^{\circ}C$ )	7.75A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	48A
$P_D$	Power Dissipation @ $T_{case} = 25^{\circ}C$	150W
	Linear Derating Factor	1.2W/ $^{\circ}C$
$E_{AS}$	Single Pulse Avalanche Energy <sup>2</sup>	8.0mJ
$I_{AR}$	Avalanche Current <sup>2</sup>	12A
dv/dt	Peak Diode Recovery <sup>3</sup>	3.5V/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) @  $V_{DD} = 25V$ ,  $L \geq 480\mu H$ ,  $R_G = 25\Omega$ , Peak  $I_L = 28A$ , Starting  $T_J = 25^{\circ}C$
- 3) @  $I_{SD} \leq 28A$ ,  $di/dt \leq 170A/\mu s$ ,  $V_{DD} \leq BV_{DSS}$ ,  $T_J \leq 150^{\circ}C$ , Suggested  $R_G = 9.1\Omega$

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>STATIC ELECTRICAL RATINGS</b>					
$BV_{DSS}$	Drain – Source Breakdown Voltage	$V_{GS} = 0$ $I_D = 1mA$	500		V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Temperature Coefficient of Breakdown Voltage	Reference to $25^{\circ}C$ $I_D = 1mA$		0.78	$V/^{\circ}C$
$R_{DS(on)}$	Static Drain – Source On-State Resistance <sup>1</sup>	$V_{GS} = 10V$ $I_D = 7.75A$		0.4	$\Omega$
		$V_{GS} = 10V$ $I_D = 12A$		0.5	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$ $I_D = 250mA$	2	4	V
$g_{fs}$	Forward Transconductance <sup>1</sup>	$V_{DS} \geq 15V$ $I_{DS} = 7.75A$	5.5		S ( $\bar{O}$ )
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS} = 0$ $V_{DS} = 0.8BV_{DSS}$ $T_J = 125^{\circ}C$		25 250	$\mu A$
$I_{GSS}$	Forward Gate – Source Leakage	$V_{GS} = 20V$		100	nA
$I_{GSS}$	Reverse Gate – Source Leakage	$V_{GS} = -20V$		-100	
<b>DYNAMIC CHARACTERISTICS</b>					
$C_{iss}$	Input Capacitance	$V_{GS} = 0$		2700	pF
$C_{oss}$	Output Capacitance	$V_{DS} = 25V$		600	
$C_{rss}$	Reverse Transfer Capacitance	$f = 1MHz$		240	
$Q_g$	Total Gate Charge	$V_{GS} = 10V$	55	120	nC
$Q_{gs}$	Gate – Source Charge	$I_D = 12A$	5	19	
$Q_{gd}$	Gate – Drain (“Miller”) Charge	$V_{DS} = 0.5BV_{DSS}$	27	70	
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 250V$ $I_D = 12A$ $R_G = 2.35\Omega$		35	ns
$t_r$	Rise Time			190	
$t_{d(off)}$	Turn-Off Delay Time			170	
$t_f$	Fall Time			130	
<b>SOURCE – DRAIN DIODE CHARACTERISTICS</b>					
$I_S$	Continuous Source Current			12	A
$I_{SM}$	Pulse Source Current <sup>2</sup>			48	
$V_{SD}$	Diode Forward Voltage <sup>1</sup>	$I_S = 12A$ $T_J = 25^{\circ}C$ $V_{GS} = 0$		1.7	V
$t_{rr}$	Reverse Recovery Time	$I_F = 12A$ $T_J = 25^{\circ}C$		1600	ns
$Q_{rr}$	Reverse Recovery Charge <sup>1</sup>	$d_i / d_t \leq 100A/\mu s$ $V_{DD} \leq 50V$		14	$\mu C$
$t_{on}$	Forward Turn-On Time		Negligible		
<b>PACKAGE CHARACTERISTICS</b>					
$L_D$	Internal Drain Inductance (measured from 6mm down drain lead to centre of die)		5.0		nH
$L_S$	Internal Source Inductance (from 6mm down source lead to source bond pad)		13		
<b>THERMAL CHARACTERISTICS</b>					
$R_{\theta JC}$	Thermal Resistance Junction – Case			1.0	$^{\circ}C/W$
$R_{\theta CS}$	Thermal Resistance Case – Sink		0.12		
$R_{\theta JA}$	Thermal Resistance Junction – Ambient			30	

**Notes**

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

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Datasheets for electronics components.