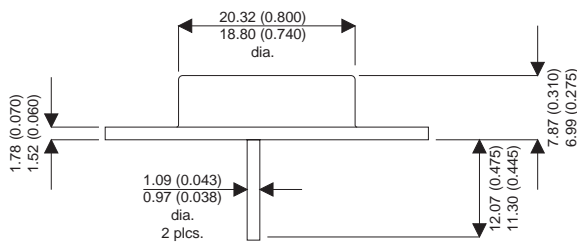
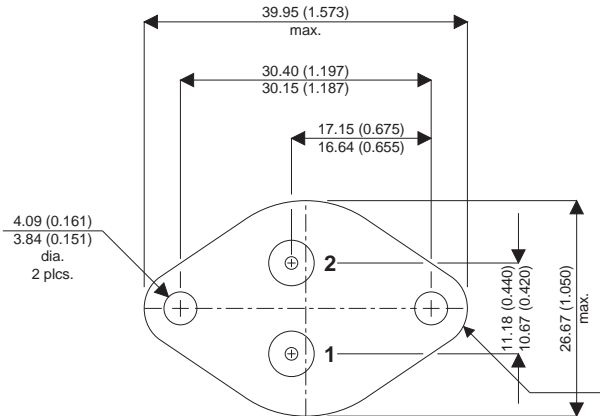


MECHANICAL DATA

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 ¹	48A
P_D	Power Dissipation @ $T_{case} = 25^{\circ}C$	150W
	Linear Derating Factor	1.2W/ $^{\circ}C$
E_{AS}	Single Pulse Avalanche Energy ²	8.0mJ
I_{AR}	Avalanche Current ²	12A
dv/dt	Peak Diode Recovery ³	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 ($T_{\text{case}} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
STATIC ELECTRICAL RATINGS					
BV_{DSS} Drain – Source Breakdown Voltage	$V_{\text{GS}} = 0$ $I_{\text{D}} = 1\text{mA}$	500			V
$\Delta BV_{\text{DSS}} / \Delta T_{\text{J}}$ Temperature Coefficient of Breakdown Voltage	Reference to 25°C $I_{\text{D}} = 1\text{mA}$		0.78		$\text{V}/^{\circ}\text{C}$
$R_{\text{DS(on)}}$ Static Drain – Source On-State Resistance ¹	$V_{\text{GS}} = 10\text{V}$ $I_{\text{D}} = 7.75\text{A}$			0.4	Ω
	$V_{\text{GS}} = 10\text{V}$ $I_{\text{D}} = 12\text{A}$			0.5	
$V_{\text{GS(th)}}$ Gate Threshold Voltage	$V_{\text{DS}} = V_{\text{GS}}$ $I_{\text{D}} = 250\text{mA}$	2		4	V
g_{fs} Forward Transconductance ¹	$V_{\text{DS}} \geq 15\text{V}$ $I_{\text{DS}} = 7.75\text{A}$	5.5			S ($\bar{\cup}$)
I_{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	μA
				250	
I_{GSS} Forward Gate – Source Leakage	$V_{\text{GS}} = 20\text{V}$			100	nA
I_{GSS} Reverse Gate – Source Leakage	$V_{\text{GS}} = -20\text{V}$			-100	
DYNAMIC CHARACTERISTICS					
C_{iss} Input Capacitance	$V_{\text{GS}} = 0$		2700		pF
C_{oss} Output Capacitance	$V_{\text{DS}} = 25\text{V}$		600		
C_{riss} Reverse Transfer Capacitance	$f = 1\text{MHz}$		240		
Q_{g} Total Gate Charge	$V_{\text{GS}} = 10\text{V}$	55		120	nC
Q_{gs} Gate – Source Charge	$I_{\text{D}} = 12\text{A}$	5		19	
Q_{gd} Gate – Drain (“Miller”) Charge	$V_{\text{DS}} = 0.5BV_{\text{DSS}}$	27		70	
$t_{\text{d(on)}}$ Turn-On Delay Time	$V_{\text{DD}} = 250\text{V}$ $I_{\text{D}} = 12\text{A}$ $R_{\text{G}} = 2.35\Omega$			35	ns
t_{r} Rise Time				190	
$t_{\text{d(off)}}$ Turn-Off Delay Time				170	
t_{f} Fall Time				130	
SOURCE – DRAIN DIODE CHARACTERISTICS					
I_{S} Continuous Source Current				12	A
I_{SM} Pulse Source Current ²				48	
V_{SD} Diode Forward Voltage ¹	$I_{\text{S}} = 12\text{A}$ $T_{\text{J}} = 25^{\circ}\text{C}$ $V_{\text{GS}} = 0$			1.7	V
t_{rr} Reverse Recovery Time	$I_{\text{F}} = 12\text{A}$ $T_{\text{J}} = 25^{\circ}\text{C}$			1600	ns
Q_{rr} Reverse Recovery Charge ¹	$d_i / d_t \leq 100\text{A}/\mu\text{s}$ $V_{\text{DD}} \leq 50\text{V}$			14	μC
t_{on} Forward Turn-On Time			Negligible		
PACKAGE CHARACTERISTICS					
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		
THERMAL CHARACTERISTICS					
$R_{\theta\text{JC}}$ Thermal Resistance Junction – Case				1.0	$^{\circ}\text{C}/\text{W}$
$R_{\theta\text{CS}}$ 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.