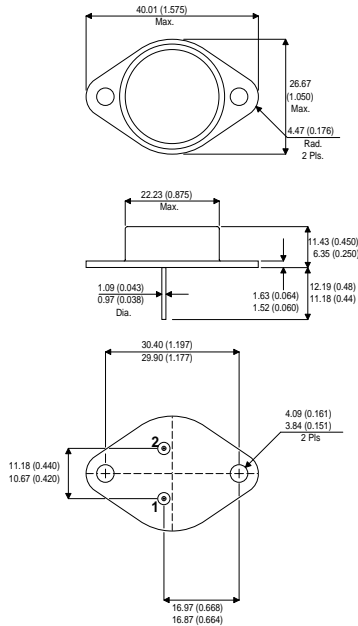


MECHANICAL DATA

Dimensions in mm (inches)



TO-3 Metal Package

Pin 1 – Gate Pin 2 – Source Case – Drain

**N-CHANNEL
POWER MOSFET**

V_{DSS} **500V**
 $I_{D(cont)}$ **4.5A**
 $R_{DS(on)}$ **1.5Ω**

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 ($V_{GS} = 0, T_{case} = 25^{\circ}C$)	4.5A
I_D	Continuous Drain Current ($V_{GS} = 0, T_{case} = 100^{\circ}C$)	3A
I_{DM}	Pulsed Drain Current ¹	18A
P_D	Power Dissipation @ $T_{case} = 25^{\circ}C$	75W
	Linear Derating Factor	0.6W/ $^{\circ}C$
E_{AS}	Single Pulse Avalanche Energy ²	1.1mJ
I_{AR}	Avalanche Current ²	4.5A
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) @ $V_{DD} = 50V$, $L \geq 100\mu H$, $R_G = 25\Omega$, Peak $I_L = 4.5A$, Starting $T_J = 25^{\circ}C$
- 3) @ $I_{SD} \leq 4.5A$, $di/dt \leq 75A/\mu s$, $V_{DD} \leq BV_{DSS}$, $T_J \leq 150^{\circ}C$, Suggested $R_G = 7.5\Omega$

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit	
STATIC ELECTRICAL RATINGS						
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 ¹	$V_{GS} = 10V$	$I_D = 3A$		Ω	
		$V_{GS} = 10V$	$I_D = 4.5A$			
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$	$I_D = 250mA$	2	4	V
g_{fs}	Forward Transconductance ¹	$V_{DS} \geq 15V$	$I_{DS} = 3A$	2.7		S (Ω)
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0$	$V_{DS} = 0.8BV_{DSS}$ $T_J = 125^{\circ}C$		25	μA
					250	
I_{GSS}	Forward Gate – Source Leakage	$V_{GS} = 20V$			100	nA
I_{GSS}	Reverse Gate – Source Leakage	$V_{GS} = -20V$			-100	
DYNAMIC CHARACTERISTICS						
C_{iss}	Input Capacitance	$V_{GS} = 0$			610	pF
C_{oss}	Output Capacitance	$V_{DS} = 25V$			135	
C_{rss}	Reverse Transfer Capacitance	$f = 1MHz$			65	
Q_g	Total Gate Charge	$V_{GS} = 10V$		16	40	nC
Q_{gs}	Gate – Source Charge	$I_D = 4.5A$		2	6	
Q_{gd}	Gate – Drain (“Miller”) Charge	$V_{DS} = 0.5BV_{DSS}$		8	20	
$t_{d(on)}$	Turn–On Delay Time	$V_{DD} = 250V$ $I_D = 4.5A$ $R_G = 7.5\Omega$			30	ns
t_r	Rise Time				40	
$t_{d(off)}$	Turn–Off Delay Time				80	
t_f	Fall Time				30	
SOURCE – DRAIN DIODE CHARACTERISTICS						
I_S	Continuous Source Current				4.5	A
I_{SM}	Pulse Source Current ²				18	
V_{SD}	Diode Forward Voltage ¹	$I_S = 4.5A$	$T_J = 25^{\circ}C$		1.4	V
t_{rr}	Reverse Recovery Time	$I_F = 4.5A$	$T_J = 25^{\circ}C$		900	ns
Q_{rr}	Reverse Recovery Charge ¹	$d_i / d_t \leq 100A/\mu s$		$V_{DD} \leq 50V$	7	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						
$R_{\theta JC}$	Thermal Resistance Junction – Case				1.67	$^{\circ}C/W$
$R_{\theta CS}$	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.