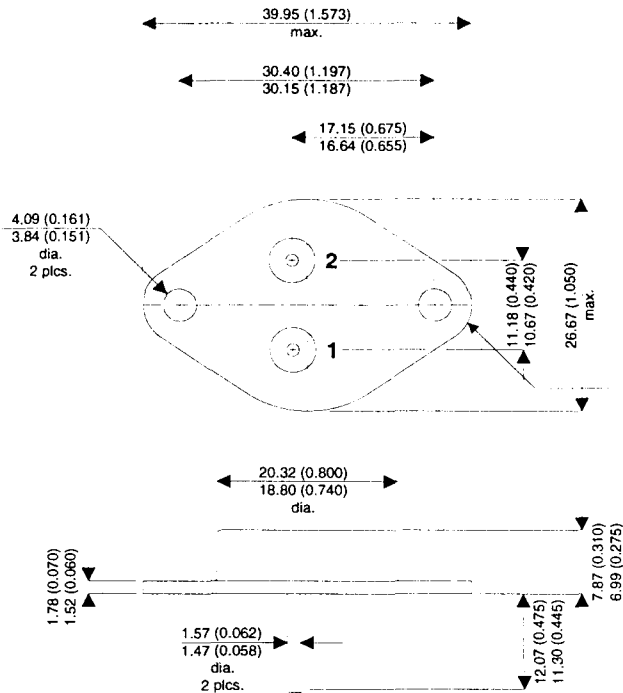


MECHANICAL DATA

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
 $R_{DS(on)}$ 0.40Ω

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	±20V
V_{DS}	Drain – Source Voltage	500V
V_{DGR}	Drain – Gate Voltage $R_{GS} = 20k\Omega$	500V
I_D	Continuous Drain Current ($V_{GS} = 0, T_{case} = 25^{\circ}C$)	13A
I_D	Continuous Drain Current ($V_{GS} = 0, T_{case} = 100^{\circ}C$)	8A
I_{DM}	Pulsed Drain Current ¹	52A
P_D	Power Dissipation @ $T_{case} = 25^{\circ}C$	150W
	Linear Derating Factor	1.2W/°C
I_{LM}	Inductive Current Clamped $L = 100\mu H$	52
T_J, T_{stg}	Operating and Storage Temperature Range	-55 to +150°C
T_L	Lead Temperature 1.6mm (0.63") from case for 10 sec.	300°C

Notes

1) Repetitive Rating. Pulse width limited by maximum junction temperature.

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	$V_{\text{GS}} = 0$ $I_{\text{D}} = 250\mu\text{A}$	500		V	
$I_{\text{D(on)}}$	On State Drain Current	$V_{\text{DS}} > I_{\text{D(on)}} \times R_{\text{DS(on)max.}}$ $V_{\text{GS}} = 10\text{V}$	13		A	
$R_{\text{DS(on)}}$	Static Drain – Source On–State Resistance ¹	$V_{\text{GS}} = 10\text{V}$ $I_{\text{D}} = 7\text{A}$		0.3	0.4 Ω	
$V_{\text{GS(th)}}$	Gate Threshold Voltage	$V_{\text{DS}} = V_{\text{GS}}$ $I_{\text{D}} = 250\mu\text{A}$	2		4 V	
g_{fs}	Forward Transconductance ¹	$V_{\text{DS}} > I_{\text{D(on)}} \times R_{\text{DS(on)max.}}$ $I_{\text{D}} = 7\text{A}$	6	11	S (∇)	
I_{DSS}	Zero Gate Voltage Drain Current	$V_{\text{GS}} = 0$ $V_{\text{DS}} = 0.8BV_{\text{DSS}}$ $T_{\text{J}} = 125^{\circ}\text{C}$		250	μA	
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	nA	
DYNAMIC CHARACTERISTICS						
C_{iss}	Input Capacitance	$V_{\text{GS}} = 0$		200	3000	pF
C_{oss}	Output Capacitance	$V_{\text{DS}} = 25\text{V}$		400	600	
C_{rss}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		100	200	
Q_{g}	Total Gate Charge	$V_{\text{GS}} = 10\text{V}$		82	120	nC
Q_{gs}	Gate – Source Charge	$I_{\text{D}} = 16\text{A}$		40		
Q_{gd}	Gate – Drain (“Miller”) Charge	$V_{\text{DS}} = 0.8BV_{\text{DSS}}$		42		
$t_{\text{d(on)}}$	Turn–On Delay Time	$V_{\text{DD}} = 210\text{V}$ $I_{\text{D}} = 7\text{A}$ $R_{\text{G}} = 4.7\Omega$			35	ns
t_{r}	Rise Time				50	
$t_{\text{d(off)}}$	Turn–Off Delay Time				150	
t_{f}	Fall Time				70	
SOURCE – DRAIN DIODE CHARACTERISTICS						
I_{S}	Continuous Source Current			13	A	
I_{SM}	Pulse Source Current ²			52		
V_{SD}	Diode Forward Voltage ¹	$I_{\text{S}} = 13\text{A}$ $V_{\text{GS}} = 0$ $T_{\text{J}} = 25^{\circ}\text{C}$		1.4	V	
t_{rr}	Reverse Recovery Time	$I_{\text{F}} = 13\text{A}$ $T_{\text{J}} = 25^{\circ}\text{C}$		1300	ns	
Q_{rr}	Reverse Recovery Charge ¹	$d_{\text{i}} / d_{\text{t}} = 100\text{A}/\mu\text{s}$ $V_{\text{DD}} \leq 50\text{V}$		7.4	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			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.