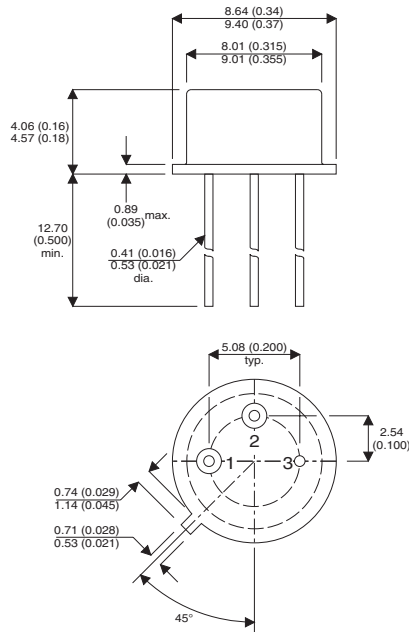


MECHANICAL DATA

Dimensions in mm (inches)



TO39 – Package (TO-205AF)

Underside View

Pin 1 – Source Pin 2 – Gate Pin 3 – Drain

**N-CHANNEL ENHANCEMENT
MODE POWER MOSFET**

BV_{DSS} 500V

$I_{D(cont)}$ 1.5

$R_{DS(on)}$ 3.0 Ω

FEATURES

- AVALANCHE ENERGY RATED
- HERMETICALLY SEALED
- DYNAMIC dv/dt RATING
- SIMPLE DRIVE REQUIREMENTS

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

V_{GS}	Gate – Source Voltage	$\pm 20V$
I_D	Continuous Drain Current ($V_{GS} = 10V$, $T_{case} = 25^{\circ}C$)	1.5A
I_D	Continuous Drain Current ($V_{GS} = 10V$, $T_{case} = 100^{\circ}C$)	1A
I_{DM}	Pulsed Drain Current ¹	6.5A
P_D	Power Dissipation @ $T_{case} = 25^{\circ}C$	20W
	Linear Derating Factor	0.16W/ $^{\circ}C$
E_{AS}	Single Pulse Avalanche Energy ²	0.11mJ
dv/dt	Peak Diode Recovery ³	3.5V/ns
T_J, T_{stg}	Operating and Storage Temperature Range	-55 to 150 $^{\circ}C$
$R_{\theta JC}$	Thermal Resistance Junction to Case	6.25 $^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient	175 $^{\circ}C/W$

Notes

- 1) Pulse Test: Pulse Width $\leq 300\mu s$, $\delta \leq 2\%$
- 2) @ $V_{DD} = 50V$, $L \geq 0.100mH$, $R_G = 25\Omega$, Peak $I_L = 1.5A$, Starting $T_J = 25^{\circ}C$
- 3) @ $I_{SD} \leq 1.5A$, $di/dt \leq 50A/\mu s$, $V_{DD} \leq BV_{DSS}$, $T_J \leq 150^{\circ}C$, SUGGESTED $R_G = 7.5\Omega$

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit	
STATIC ELECTRICAL RATINGS						
BV_{DSS}	Drain – Source Breakdown Voltage	$V_{GS} = 0$	$I_D = 1\text{mA}$	500	V	
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Temperature Coefficient of Breakdown Voltage	Reference to 25°C $I_D = 1\text{mA}$		0.43	$\text{V}/^{\circ}\text{C}$	
$R_{DS(on)}$	Static Drain – Source On-State Resistance	$V_{GS} = 10\text{V}$	$I_D = 1\text{A}$		Ω	
		$V_{GS} = 10\text{V}$	$I_D = 1.5\text{A}$	3		
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$	$I_D = 250\mu\text{A}$	2	V	
g_{fs}	Forward Transconductance	$V_{DS} = 5\text{V}$	$I_{DS} = 1\text{A}$	1	$\text{S}(\bar{v})$	
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0$	$V_{DS} = 0.8BV_{DSS}$ $T_J = 125^{\circ}\text{C}$		25	
					250	
I_{GSS}	Forward Gate – Source Leakage	$V_{GS} = 20\text{V}$			nA	
I_{GSS}	Reverse Gate – Source Leakage	$V_{GS} = -20\text{V}$		-100		
DYNAMIC CHARACTERISTICS						
C_{iss}	Input Capacitance	$V_{GS} = 0$		350	pF	
C_{oss}	Output Capacitance	$V_{DS} = 25\text{V}$		80		
C_{rss}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		35		
Q_g	Total Gate Charge	$V_{GS} = 10\text{V}$	$I_D = 1.5\text{A}$	7.3	16.7	nC
		$V_{DS} = 0.5BV_{DS}$				
Q_{gs}	Gate – Source Charge	$I_D = 1.5\text{A}$		0.1	3	nC
Q_{gd}	Gate – Drain (“Miller”) Charge	$V_{DS} = 0.5BV_{DS}$		3.7	8.7	
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 250\text{V}$			40	ns
t_r	Rise Time	$I_D = 1.5\text{A}$			30	
$t_{d(off)}$	Turn-Off Delay Time	$R_G = 7.5\Omega$			60	
t_f	Fall Time				30	
SOURCE – DRAIN DIODE CHARACTERISTICS						
I_S	Continuous Source Current				1.5	A
I_{SM}	Pulse Source Current ²				6.5	
V_{SD}	Diode Forward Voltage	$I_S = 1.5\text{A}$	$T_J = 25^{\circ}\text{C}$		1.2	V
		$V_{GS} = 0$				
t_{rr}	Reverse Recovery Time	$I_F = 1.5\text{A}$	$T_J = 25^{\circ}\text{C}$		900	ns
Q_{rr}	Reverse Recovery Charge	$d_i / d_t \leq 100\text{A}/\mu\text{s}$		$V_{DD} \leq 50\text{V}$	5.9	μC
t_{on}	Forward Turn-On Time			Negligible		
PACKAGE CHARACTERISTICS						
L_D	Internal Drain Inductance (from centre of drain pad to die)			5.0		nH
L_S	Internal Source Inductance (from centre of source pad to end of source bond wire)			15.0		

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

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