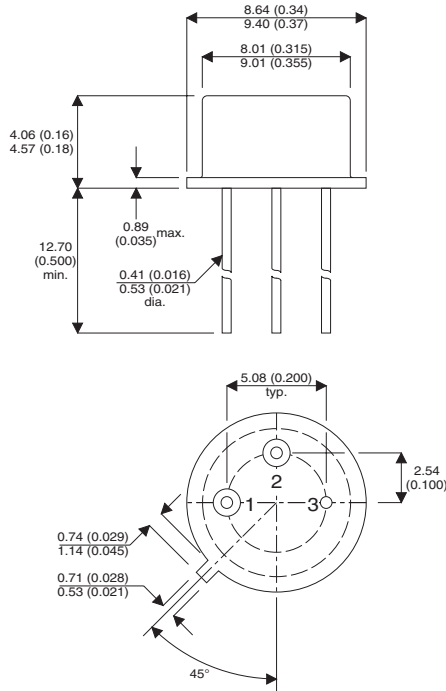


**MECHANICAL DATA**

Dimensions in mm (inches)



**TO39 – Package (TO205AF)**

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

**N-CHANNEL ENHANCEMENT POWER MOSFET**

**$BV_{DSS}$     400V**  
 **$I_D$         3.0A**  
 **$R_{DS(on)}$    1.0 $\Omega$**

**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 ( $V_{GS} = 10V, T_{case} = 25^\circ C$ )	3A
$I_D$	Continuous Drain Current ( $V_{GS} = 10V, T_{case} = 100^\circ C$ )	2A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	12A
$P_D$	Power Dissipation @ $T_{case} = 25^\circ C$	25W
	Linear Derating Factor	0.20W/ $^\circ C$
$dv/dt$	Peak Diode Recovery <sup>3</sup>	4V/ns
$T_J, T_{stg}$	Operating and Storage Temperature Range	-55 to 150 $^\circ C$
$R_{\theta JC}$	Thermal Resistance Junction to Case	5.0 $^\circ C/W$
$R_{\theta JCA}$	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
<b>STATIC ELECTRICAL RATINGS</b>					
$BV_{DSS}$	Drain – Source Breakdown Voltage	$V_{GS} = 0$ $I_D = 1\text{mA}$	400		V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Temperature Coefficient of Breakdown Voltage	Reference to $25^{\circ}\text{C}$ $I_D = 1\text{mA}$		0.37	$\text{V}/^{\circ}\text{C}$
$R_{DS(on)}$	Static Drain to Source	$V_{GS} = 10\text{V}$ $I_D = 2\text{A}$		1	$\Omega$
	On–State Resistance	$V_{GS} = 10\text{V}$ $I_D = 3\text{A}$		1.15	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$ $I_D = 250\mu\text{A}$	2	4	V
$g_{fs}$	Forward Transconductance	$V_{DS} \geq 15\text{V}$ $I_{DS} = 2\text{A}$	2		$\text{S}(\bar{\nu})$
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 0.8 \times \text{Max Rating}$		25	$\mu\text{A}$
		$V_{GS} = 0$ $T_J = 125^{\circ}\text{C}$		250	
$I_{GSS}$	Forward Gate – Source Leakage	$V_{GS} = 20\text{V}$		100	nA
$I_{GSS}$	Reverse Gate – Source Leakage	$V_{GS} = -20\text{V}$		-100	
<b>DYNAMIC CHARACTERISTICS</b>					
$C_{iss}$	Input Capacitance	$V_{GS} = 0$		620	pF
$C_{oss}$	Output Capacitance	$V_{DS} = 25\text{V}$		200	
$C_{rss}$	Reverse Transfer Capacitance	$f = 1\text{MHz}$		75	
$Q_g$	Total Gate Charge	$V_{GS} = 10\text{V}$ $I_D = 3\text{A}$ $V_{DS} = \text{Max Rating} \times 0.5$	19.1	33	nC
$Q_{gs}$	Gate – Source Charge		1	5.8	
$Q_{gd}$	Gate – Drain (“Miller”) Charge		6.7	19.9	
$t_{d(on)}$	Turn–On Delay Time	$V_{DD} = 200\text{V}$ $V_{GS} = 10\text{V}$ $I_D = 3\text{A}$ $R_G = 7.5\Omega$		30	ns
$t_r$	Rise Time			35	
$t_{d(off)}$	Turn–Off Delay Time			55	
$t_f$	Fall Time			35	
<b>SOURCE – DRAIN DIODE CHARACTERISTICS</b>					
$I_S$	Continuous Source Current			3	A
$I_{SM}$	Pulse Source Current <sup>2</sup>			12	
$V_{SD}$	Diode Forward Voltage	$I_S = 3.0\text{A}$ $T_J = 25^{\circ}\text{C}$ $V_{GS} = 0$		1.4	V
$t_{rr}$	Reverse Recovery TimeReverse	$I_F = 3.0\text{A}$ $T_J = 25^{\circ}\text{C}$ $d_i / d_t \leq 100\text{A}/\mu\text{s}$ $V_{DD} \leq 50\text{V}$		700	ns
$Q_{rr}$	Recovery Charge			6.2	
$t_{on}$	Forward Turn–On Time			Negligible	$\mu\text{C}$
<b>PACKAGE CHARACTERISTICS</b>					
$L_D$	Internal Drain Inductance (from centre of drain pad to die)		5		nH
$L_S$	Internal Source Inductance (from centre of source pad to end of source bond wire)		15		

- 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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