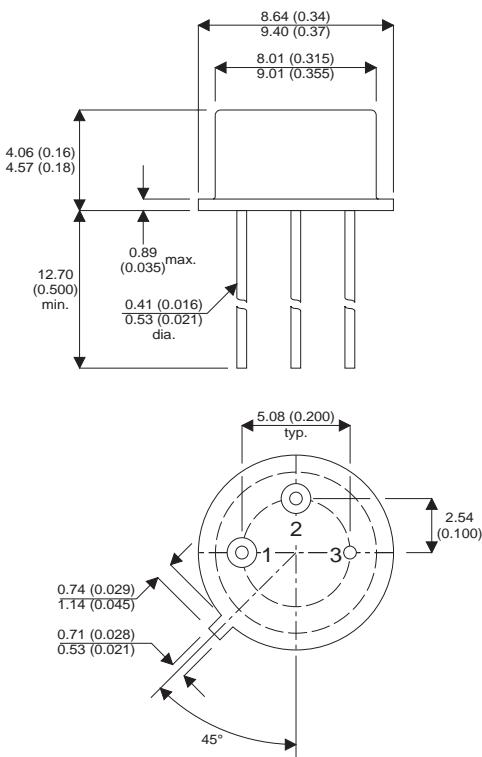


## MECHANICAL DATA

Dimensions in mm (inches)



**TO39 Package (TO-205AF)**

Underside View

Pin 1 - Source

Pin 2 - Gate

Pin 3 - Drain and Case

## N-CHANNEL POWER MOSFET ENHANCEMENT MODE

### FEATURES

- AVALANCHE ENERGY RATING
- SIMPLE DRIVE REQUIREMENTS
- HERMETICALLY SEALED

### APPLICATIONS

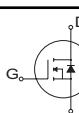
- FAST SWITCHING
- MOTOR CONTROLS
- POWER SUPPLIES

## ABSOLUTE MAXIMUM RATINGS (T<sub>case</sub> = 25°C unless otherwise stated)

V <sub>DS</sub>	Drain Source Voltage	100V
I <sub>D</sub> @ T <sub>case</sub> = 25°C	Continuous Drain Current	6.0A
I <sub>D</sub> @ T <sub>case</sub> = 100°C	Continuous Drain Current	3.5A
I <sub>DM</sub>	Pulsed Drain Current <sup>1</sup>	24A
V <sub>GS</sub>	Gate Source Voltage	±20V
P <sub>D</sub> @ T <sub>case</sub> = 25°C	Maximum Power Dissipation	20W
R <sub>θJ-C</sub>	Thermal Resistance Junction To Case	6.25°C/W
R <sub>θJ-A</sub>	Thermal Resistance Junction To Ambient	175°C/W
T <sub>J</sub> , T <sub>stg</sub>	Operating and Storage Temperature Range	-55 to +150°C
Lead Temperature	( $\frac{1}{16}$ " from case for 10 secs)	300°C

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

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

Parameter	Test Conditions		Min.	Typ.	Max.	Unit
<b>STATIC ELECTRICAL RATINGS</b>						
$BV_{DSS}$	Drain – Source Breakdown Voltage	$V_{GS} = 0$	$I_D = 1.0\text{mA}$	100		V
$V_{GS(th)}^*$	Gate Threshold Voltage	$V_{DS} = V_{GS}$	$I_D = 250\mu\text{A}$	2.0	4.0	
$I_{GSSF}$	Gate Body Leakage Forward	$V_{GS} = 20\text{V}$			100	nA
$I_{GSSR}$	Gate Body Leakage Reverse	$V_{GS} = -20\text{V}$			-100	
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 80\text{V}$	$V_{GS} = 0$ $T_C = 125^\circ C$		25	$\mu\text{A}$
$R_{DS(on)}^*$	Static Drain Source On-State Resistance	$V_{GS} = 10\text{V}$	$I_D = 3.5\text{A}$		0.30	$\Omega$
		$V_{GS} = 10\text{V}$	$I_D = 6.0\text{A}$		0.345	
$g_{fs}^*$	Forward Transconductance	$V_{DS} = 15\text{V}$	$I_{DS} = 3.5\text{A}$	1.5		S (Ω)
<b>DYNAMIC CHARACTERISTICS</b>						
$C_{iss}$	Input Capacitance	$V_{GS} = 0$ $f = 1\text{MHz}$	$V_{DS} = 25\text{V}$		350	
$C_{oss}$	Output Capacitance				150	
$C_{rss}$	Reverse Transfer Capacitance				24	pF
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 50\text{V}$ $R_G = 7.5\Omega$ (MOSFET switching times are essentially independent of operating temperature.)	$I_D = 6.0\text{A}$ $V_{GS} = 10\text{V}$		40	
$t_r$	Rise Time				70	
$t_{d(off)}$	Turn-Off Delay Time				40	ns
$t_f$	Fall Time				70	
$Q_g$	Total Gate Charge	$V_{GS} = 10\text{V}$ $V_{DS} = 50\text{V}$	$I_D = 6.0\text{A}$	7.7	17	
$Q_{gs}$	Gate To Source Charge			0.7	4.0	nC
$Q_{gd}$	Gate To Drain ("Miller") Charge			2.0	7.7	
<b>BODY– DRAIN DIODE RATINGS &amp; CHARACTERISTICS</b>						
$I_S$	Continuous Source Current (Body Diode)	Modified MOS POWER symbol showing the integral P-N junction rectifier.	 $I_S = 6.0\text{A}$ $V_{GS} = 0$ $T_J = 25^\circ C$		6.0	
$I_{SM}$	Source Current (Body Diode)				24	A
$V_{SD}$	Diode Forward Voltage*	$I_S = 6.0\text{A}$	$V_{GS} = 0$		1.8	V
$t_{rr}$	Reverse Recovery Time	$I_F = 6.0\text{A}$	$T_J = 25^\circ C$		240	ns
$Q_{RR}$	Reverse Recovery Charge	$d_i / d_t = 100\text{A}/\mu\text{s}$	$V_{DD} = 50\text{V}$		2.0	$\mu\text{C}$

**Notes**

\* Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ ,  $\delta \leq 2\%$

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