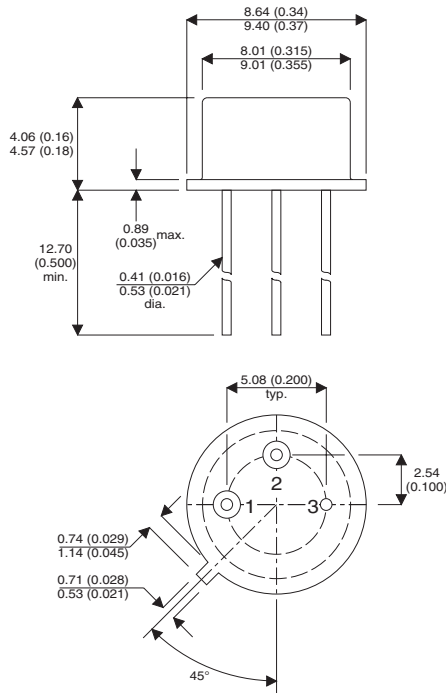


MECHANICAL DATA

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 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 ($V_{GS} = 10V, T_{case} = 25^\circ C$)	3A
I_D	Continuous Drain Current ($V_{GS} = 10V, T_{case} = 100^\circ C$)	2A
I_{DM}	Pulsed Drain Current ¹	12A
P_D	Power Dissipation @ $T_{case} = 25^\circ C$	25W
	Linear Derating Factor	0.20W/ $^\circ C$
dv/dt	Peak Diode Recovery ³	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 $R_G = 7.5\Omega$

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
STATIC ELECTRICAL RATINGS					
BV_{DSS}	Drain – Source Breakdown Voltage	$V_{GS} = 0$ $I_D = 1\text{mA}$	400		V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Temperature Coefficient of Breakdown Voltage	Reference to 25°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	Ω
	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	μA
		$V_{GS} = 0$ $T_J = 125^{\circ}\text{C}$		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	
DYNAMIC CHARACTERISTICS					
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	
SOURCE – DRAIN DIODE CHARACTERISTICS					
I_S	Continuous Source Current			3	A
I_{SM}	Pulse Source Current ²			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	$I_F = 3.0\text{A}$ $T_J = 25^{\circ}\text{C}$ $d_j / d_t \leq 100\text{A}/\mu\text{s}$ $V_{DD} \leq 50\text{V}$		700	ns
Q_{rr}	Recovery Charge			6.2	
t_{on}	Forward Turn–On Time			Negligible	μC
PACKAGE CHARACTERISTICS					
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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