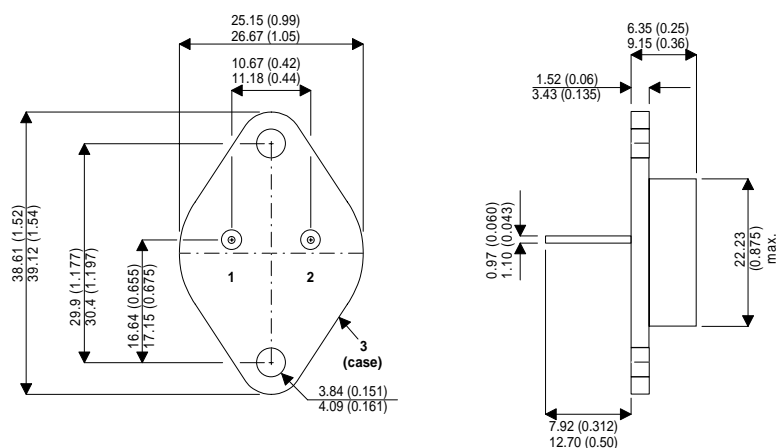


TO-3 (TO-204AA) Package Outline.  
Dimensions in mm (inches)



Pin 1 – Gate

Pin 2 – Source

Case – Drain

**N-CHANNEL  
ENHANCEMENT MODE  
HIGH VOLTAGE  
POWER MOSFETS**

**$V_{DSS}$  500V**

**$I_{D(cont)}$  21A**

**$R_{DS(on)}$  0.27 $\Omega$**

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

$V_{DSS}$	Drain – Source Voltage	500	V
$I_D$	Continuous Drain Current	21	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	84	A
$V_{GS}$	Gate – Source Voltage	$\pm 20$	V
$P_D$	Total Power Dissipation @ $T_{case} = 25^{\circ}\text{C}$	300	W
	Derate Linearly	2.4	W/ $^{\circ}\text{C}$
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to 150	$^{\circ}\text{C}$
$T_L$	Lead Temperature : 0.063" from Case for 10 Sec.	300	

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

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain – Source Breakdown Voltage	$V_{GS} = 0\text{V}, I_D = 1\text{mA}$	500			V
$I_{DSS}$	Zero Gate Voltage Drain Current ( $V_{GS} = 0\text{V}$ )	$V_{DS} = V_{DSS}$			25	$\mu\text{A}$
		$V_{DS} = 0.8V_{DSS}, T_C = 125^{\circ}\text{C}$			250	
$I_{GSS}$	Gate – Source Leakage Current	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$			$\pm 100$	nA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2		4	V
$I_{D(ON)}$	On State Drain Current <sup>2</sup>	$V_{DS} > I_{D(ON)} \times R_{DS(ON)}$ Max $V_{GS} = 10\text{V}$	21			A
$R_{DS(ON)}$	Drain – Source On State Resistance <sup>2</sup>	$V_{GS} = 10\text{V}, I_D = 13\text{A}$			0.27	$\Omega$
		$V_{GS} = 10\text{V}, I_D = 21\text{A}$			0.31	

1) Repetitive Rating: Pulse Width limited by maximum junction temperature.

2) Pulse Test: Pulse Width < 380 $\mu\text{s}$ , Duty Cycle < 2%

**DYNAMIC CHARACTERISTICS**

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$		2890		pF
$C_{oss}$	Output Capacitance	$V_{DS} = 25V$		590		
$C_{rss}$	Reverse Transfer Capacitance	$f = 1MHz$		230		
$Q_g$	Total Gate Charge <sup>3</sup>	$V_{GS} = 10V$		140	190	nC
$Q_{gs}$	Gate – Source Charge	$V_{DD} = 0.5 V_{DSS}$		18	27	
$Q_{gd}$	Gate – Drain (“Miller”) Charge	$I_D = I_D [Cont.] @ 25^\circ C$		75	135	
$t_{d(on)}$	Turn-on Delay Time	$V_{GS} = 15V$		19	35	ns
$t_r$	Rise Time	$V_{DD} = 0.5 V_{DSS}$		43	120	
$t_{d(off)}$	Turn-off Delay Time	$I_D = I_D [Cont.] @ 25^\circ C$		85	130	
$t_f$	Fall Time	$R_G = 1.8\Omega$		56	98	

**SOURCE – DRAIN DIODE RATINGS AND CHARACTERISTICS**

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	(Body Diode)			21	A
$I_{SM}$	Pulsed Source Current <sup>1</sup>	(Body Diode)			84	
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS} = 0V, I_S = -I_D [Cont.]$			1.8	V
$t_{rr}$	Reverse Recovery Time	$I_S = -I_D [Cont.], di_S / dt = 100A/\mu s$			580	ns
$Q_{rr}$	Reverse Recovery Charge	$I_S = -I_D [Cont.], di_S / dt = 100A/\mu s$			8.1	$\mu C$

**THERMAL CHARACTERISTICS**

	Characteristic	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Junction to Case			0.42	$^\circ C/W$
$R_{\theta JA}$	Junction to Ambient			30	

1) Repetitive Rating: Pulse Width limited by maximum junction temperature.

2) Pulse Test: Pulse Width < 380 $\mu s$ , Duty Cycle < 2%

3) See MIL-STD-750 Method 3471



CAUTION — Electrostatic Sensitive Devices. Anti-Static Procedures Must Be Followed.