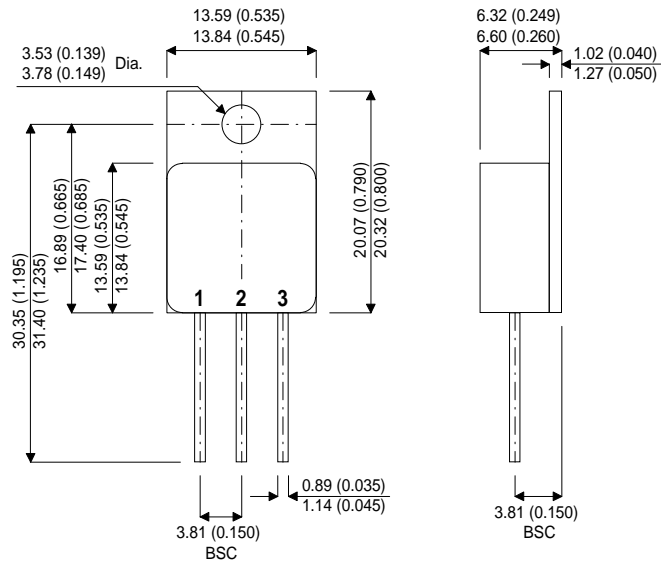


MECHANICAL DATA

Dimensions in mm (inches)



TO-254AA – Metal Package

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

**N-CHANNEL
POWER MOSFET**

V_{DSS} **500V**
 $I_{D(cont)}$ **12A**
 $R_{DS(on)}$ **0.415Ω**

FEATURES

- HERMETICALLY SEALED ISOLATED PACKAGE
- AVALANCHE ENERGY RATING
- SIMPLE DRIVE REQUIREMENTS
- ALSO AVAILABLE IN A SURFACE MOUNT PACKAGE
- EASE OF PARALLELING

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

V_{GS}	Gate – Source Voltage	±20V
I_D	Continuous Drain Current ($V_{GS} = 10V, T_{case} = 25^{\circ}C$)	12A
I_D	Continuous Drain Current ($V_{GS} = 10V, T_{case} = 100^{\circ}C$)	8A
I_{DM}	Pulsed Drain Current ¹	48A
P_D	Power Dissipation @ $T_{case} = 25^{\circ}C$	150W
	Linear Derating Factor	1.2W/°C
E_{AS}	Single Pulse Avalanche Energy ²	750mJ
I_{AR}	Avalanche Current ¹	12A
E_{AR}	Repetitive Avalanche Energy ¹	15mJ
dv/dt	Peak Diode Recovery ³	3.5V/ns
T_J, T_{stg}	Operating and Storage Temperature Range	-55 to 150°C
T_L	Lead Temperature measured ¹ / ₁₆ " (1.6mm) from case for 10 sec.	300°C
$R_{\theta JC}$	Thermal Resistance Junction to Case	0.83°C/W
$R_{\theta CS}$	Thermal Resistance Case to Sink (Typical)	0.21°C/W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	48°C/W

Notes

- 1) Repetitive Rating – Pulse width limited by Maximum Junction Temperature
- 2) @ $V_{DD} = 50V, L \geq 9.4mH, R_G = 25\Omega, Peak I_L = 12A, Starting T_J = 25^{\circ}C$
- 3) @ $I_{SD} \leq 12A, di/dt \leq 130A/\mu s, V_{DD} \leq BV_{DSS}, T_J \leq 150^{\circ}C, Suggested R_G = 2.35\Omega$

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	
ΔBV_{DSS}	Temperature Coefficient of Breakdown Voltage	Reference to 25°C $I_D = 1\text{mA}$		0.68	$\text{V}/^{\circ}\text{C}$	
$R_{DS(on)}$	Static Drain – Source On-State Resistance ²	$V_{GS} = 10\text{V}$	$I_D = 8\text{A}$		Ω	
		$V_{GS} = 10\text{V}$	$I_D = 12\text{A}$	0.515		
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$	$I_D = 250\mu\text{A}$	2	V	
g_{fs}	Forward Transconductance ²	$V_{DS} \geq 15\text{V}$	$I_{DS} = 8\text{A}$	6.5	$\text{S}(\bar{v})$	
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0$	$V_{DS} = 0.8BV_{DSS}$ $T_J = 125^{\circ}\text{C}$	25 250	μA	
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	$V_{GS} = 0$ $V_{DS} = 25\text{V}$ $f = 1\text{MHz}$		2700	pF	
C_{oss}	Output Capacitance			600		
C_{rss}	Reverse Transfer Capacitance			240		
C_{DC}	Drain – Case Capacitance			12		
Q_g	Total Gate Charge	$V_{GS} = 10\text{V}$		55	120	nC
Q_{gs}	Gate – Source Charge	$I_D = 12\text{A}$		5	19	
Q_{gd}	Gate – Drain (“Miller”) Charge	$V_{DS} = 0.5BV_{DSS}$		27	70	
$t_{d(on)}$	Turn– On Delay Time	$V_{DD} = 250\text{V}$ $I_D = 12\text{A}$ $R_G = 2.35\Omega$			35	ns
t_r	Rise Time				190	
$t_{d(off)}$	Turn–Off Delay Time				170	
t_f	Fall Time				130	
SOURCE – DRAIN DIODE CHARACTERISTICS						
I_S	Continuous Source Current				12	A
I_{SM}	Pulse Source Current ¹				48	
V_{SD}	Diode Forward Voltage ²	$I_S = 12\text{A}$	$T_J = 25^{\circ}\text{C}$		1.7	V
		$V_{GS} = 0$				
t_{rr}	Reverse Recovery Time ²	$I_F = 12\text{A}$	$T_J = 25^{\circ}\text{C}$		1600	ns
Q_{rr}	Reverse Recovery Charge ²	$d_i / d_t \leq 100\text{A}/\mu\text{s}$ $V_{DD} \leq 50\text{V}$			14	μC
t_{on}	Forward Turn–On Time				Negligible	
PACKAGE CHARACTERISTICS						
L_D	Internal Drain Inductance Measured from 6mm down drain lead to centre of die			8.7		nH
L_S	Internal Source Inductance Measured from 6mm down source lead to source bond pad			8.7		

Notes

1) Repetitive Rating – Pulse width limited by Maximum Junction Temperature

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

* I_S Current limited by pin diameter.