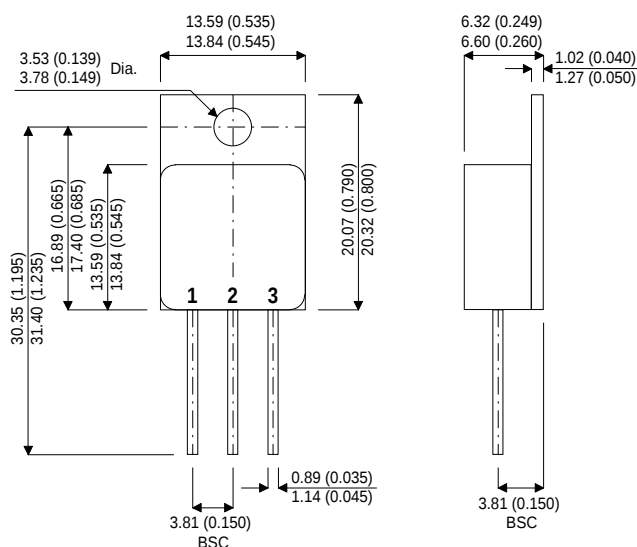


MECHANICAL DATA

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**
 $R_{DS(on)}$ **0.415 Ω**
FEATURES

- HERMETICALLY SEALED ISOLATED PACKAGE
- AVALANCHE ENERGY RATING
- SIMPLE DRIVE REQUIREMENTS
- ALSO AVAILABLE IN TO-220 METAL AND SURFACE MOUNT PACKAGES
- EASE OF PARALLELING

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

V_{GS}	Gate – Source Voltage	$\pm 20V$
I_D	Continuous Drain Current ($V_{GS} = 10V$, $T_{case} = 25^{\circ}C$)	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/ $^{\circ}C$
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 $150^{\circ}C$
T_L	Lead Temperature measured $1/16"$ (1.6mm) from case for 10 sec.	$300^{\circ}C$
$R_{\theta JC}$	Thermal Resistance Junction to Case	0.83 $^{\circ}C/W$
$R_{\theta CS}$	Thermal Resistance Case to Sink (Typical)	0.21 $^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	48 $^{\circ}C/W$

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 = 1mA	500			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Temperature Coefficient of Breakdown Voltage	Reference to 25°C I _D = 1mA			0.68		V/°C
R _{DS(on)}	Static Drain – Source On–State Resistance ²	V _{GS} = 10V	I _D = 8A			0.415	Ω
		V _{GS} = 10V	I _D = 12A			0.515	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS}	I _D = 250μA	2		4	V
g _{fs}	Forward Transconductance ²	V _{DS} ≥ 15V	I _{DS} = 8A	6.5			S(Ω)
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} = 0	V _{DS} = 0.8BV _{DSS}			25	μA
			T _J = 125°C			250	
I _{GSS}	Forward Gate – Source Leakage	V _{GS} = 20V				100	nA
I _{GSS}	Reverse Gate – Source Leakage	V _{GS} = –20V				–100	
DYNAMIC CHARACTERISTICS							
C _{iss}	Input Capacitance	V _{GS} = 0 V _{DS} = 25V f = 1MHz			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} = 10V		55		120	nC
Q _{gs}	Gate – Source Charge	I _D = 12A		5		19	
Q _{gd}	Gate – Drain (“Miller”) Charge	V _{DS} = 0.5BV _{DSS}		27		70	
t _{d(on)}	Turn– On Delay Time	V _{DD} = 250V I _D = 12A R _G = 2.35Ω				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 = 12A V _{GS} = 0	T _J = 25°C			1.7	V
t _{rr}	Reverse Recovery Time ²	I _F = 12A	T _J = 25°C			1600	ns
Q _{rr}	Reverse Recovery Charge ²	d _i / d _t ≤ 100A/μs V _{DD} ≤ 50V				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.