



## DESCRIPTION

AM0460H is available in a TO-220, TO-220F, TO-251 and TO-252 packages.

## FEATURES

- 600V/4A,  
 $R_{DS(ON)} = 1.5\Omega(\text{max.}) @ V_{GS} = 10V$   
 $V_{DS@T_J, \text{max}} = 700V (\text{typ.})$
- 100% UIS +  $R_g$  Tested
- Reliable and Rugged
- Avalanche Rated
- Available in a TO-220, TO-220F, TO-251 and TO-252 packages.

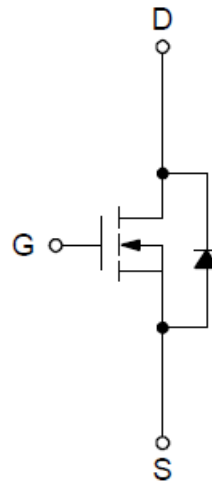
## ORDERING INFORMATION

Package Type	Part Number	
TO-220 SPQ: 50pcs/Tube	T3	AM0460HT3U
		AM0460HT3VU
TO-220F SPQ: 50pcs/Tube	T3F	AM0460HT3FU
		AM0460HT3FVU
TO-251 SPQ: 75pcs/Tube	TS3	AM0460HTS3U
		AM0460HTS3VU
TO-252 SPQ: 2,500pcs/Reel	D	AM0460HDR
		AM0460HDVR
Note	V: Halogen free Package R: Tape & Reel U: Tube	
AiT provides all RoHS products		

## APPLICATION

- AC/DC Power Conversion in Switched Mode Power Supplies (SMPS).
- Uninterruptible Power Supply (UPS),
- Adapter.

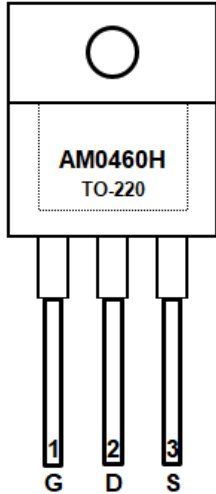
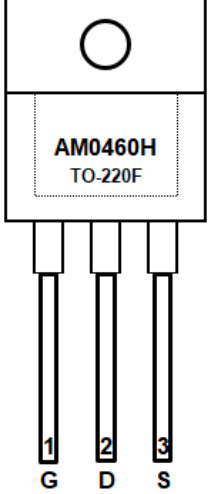
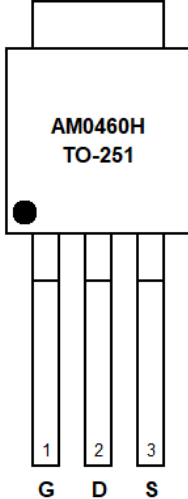
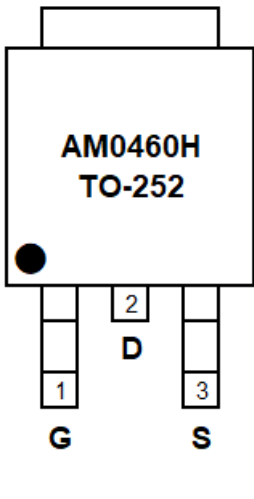
## PIN DESCRIPTION



N-Channel MOSFET



**PIN DESCRIPTION**

 <p>Top View</p>	 <p>Top View</p>	
 <p>Top View</p>	 <p>Top View</p>	
Pin #	Symbol	Function
1	G	Gate
2	D	Drain
3	S	Source



## ABSOLUTE MAXIMUM RATINGS

T<sub>A</sub> = 25°C, unless otherwise noted

V <sub>DSS</sub> , Drain-Source Voltage		600V
V <sub>GSS</sub> , Gate-Source Voltage		±30V
T <sub>J</sub> , Maximum Junction Temperature		150°C
T <sub>STG</sub> , Storage Temperature Range		-55°C~+150°C
I <sub>S</sub> , Diode Continuous Forward Current		4A <sup>NOTE1</sup>
I <sub>DP</sub> , Pulse Drain Current Tested	T <sub>C</sub> =25°C	10A <sup>NOTE2</sup>
I <sub>D</sub> , Continuous Drain Current	T <sub>C</sub> =25°C	4A <sup>NOTE1</sup>
	T <sub>C</sub> =100°C	2.5A <sup>NOTE1</sup>
P <sub>D</sub> , Maximum Power Dissipation for TO-220/TO-251/TO-252	T <sub>C</sub> =25°C	65.8W
	T <sub>C</sub> =100°C	26.3W
P <sub>D</sub> , Maximum Power Dissipation for TO-220F	T <sub>C</sub> =25°C	25W
	T <sub>C</sub> =100°C	10W
R <sub>θJC</sub> , Thermal Resistance-Junction to Case for TO-220/TO-251/TO-252		1.9°C/W
R <sub>θJC</sub> , Thermal Resistance-Junction to Case for TO-220F		5°C/W
R <sub>θJA</sub> , Thermal Resistance-Junction to Ambient		62.5°C/W
<b>Drain-Source Avalanche Ratings</b>		
dv/dt <sup>NOTE3</sup> , MOSFET dv/dt ruggedness		50V/ns
E <sub>AS</sub> <sup>NOTE4</sup> , Avalanche Energy, Single Pulsed		17.5mJ
I <sub>AR</sub> <sup>NOTE5</sup> , Avalanche Current		0.5A
E <sub>AR</sub> <sup>NOTE5</sup> , Repetitive Avalanche Energy		0.06mJ

Stress beyond above listed "Absolute Maximum Ratings" may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1: limited by maximum junction temperature.

NOTE2: Bond wire current limit.

NOTE3: V<sub>DS</sub>=480V, I<sub>D</sub>=4A.

NOTE4: I<sub>D</sub>=0.5A, V<sub>DD</sub>=50V, T<sub>J</sub>=25°C.

NOTE5: Repetitive Rating: Pulse width is limited by maximum junction temperature.



## ELECTRICAL CHARACTERISTICS

T<sub>A</sub> = 25°C, unless otherwise noted

Parameter	Symbol	Conditions	Min	Typ.	Max	Units
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	600	-	-	V
		T <sub>J</sub> =150°C	-	700	-	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =480V, V <sub>GS</sub> =0V	-	-	1	μA
		T <sub>J</sub> =150°C	-	-	200	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.5	3.5	4.5	V
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±30V, V <sub>DS</sub> =0V	-	-	±100	nA
Drain-Source On-state Resistance	R <sub>DS(ON)</sub> NOTE6	V <sub>GS</sub> =10V, I <sub>D</sub> =2A	-	1.3	1.5	Ω
<b>Diode Characteristics</b>						
Diode Forward Voltage	V <sub>SD</sub> NOTE6	I <sub>SD</sub> =4A, V <sub>GS</sub> =0V	-	0.96	1.3	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>SD</sub> =4A, V <sub>R</sub> = 360V, dI <sub>SD</sub> /dt=100A/μs	-	132	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>		-	0.75	-	nC
Peak Reverse Recovery Current	I <sub>rm</sub>		-	9	-	A
<b>Dynamic Characteristics</b> <sup>NOTE7</sup>						
Gate Resistance	R <sub>G</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	-	4.2	-	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, Frequency=1.0MHz	-	215	280	pF
Output Capacitance	C <sub>oss</sub>		-	220	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	2	-	
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =400V, I <sub>DS</sub> =4A, V <sub>GEN</sub> =10V, R <sub>G</sub> =100Ω	-	8.5	-	ns
Turn-on Rise Time	t <sub>r</sub>		-	20	-	
Turn-off Delay Time	t <sub>d(off)</sub>		-	16	-	
Turn-off Fall Time	t <sub>f</sub>		-	16	-	
<b>Gate Charge Characteristics</b> <sup>NOTE7</sup>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =480V, V <sub>GS</sub> =10V, I <sub>DS</sub> =2A	-	12.5	16.3	nC
Gate-Source Charge	Q <sub>gs</sub>		-	3.3	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	4.5	-	

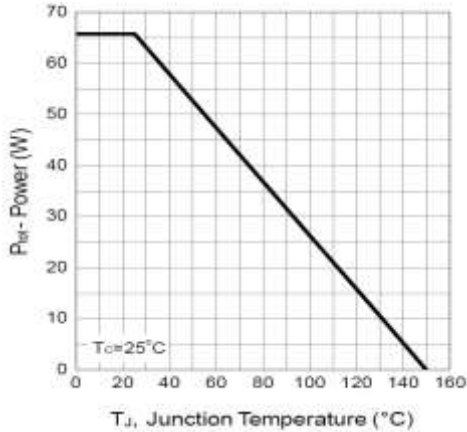
NOTE6: Pulse test; pulse width≤300μs, duty cycle≤2%.

NOTE7: Guaranteed by design, not subject to production testing.

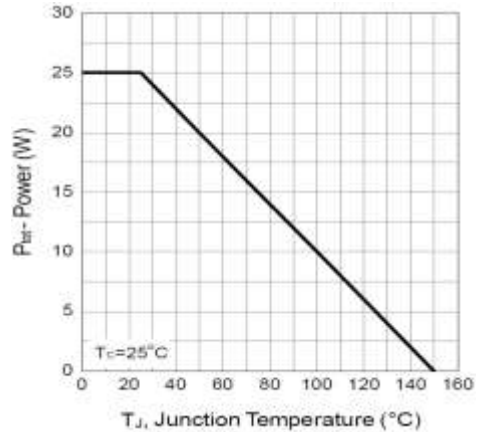


## TYPICAL CHARACTERISTICS

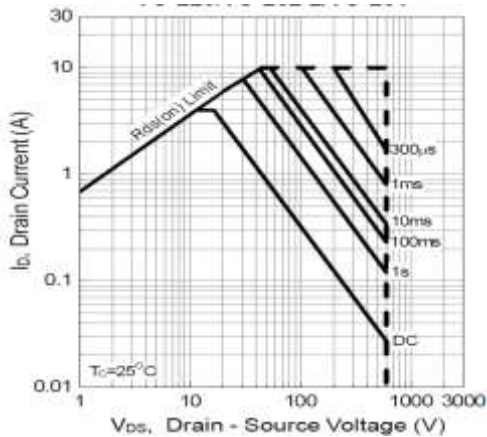
1. Power Dissipation for TO-220/TO-251/TO-252



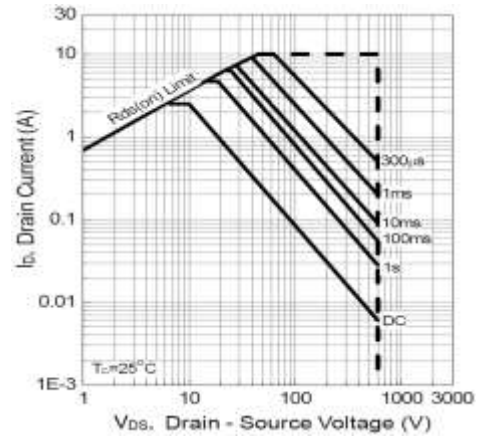
2. Power Dissipation for TO-220F



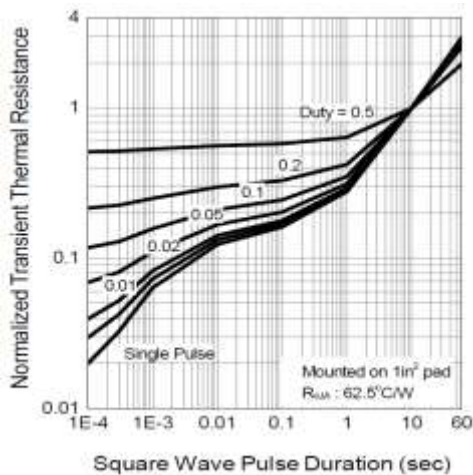
3. Safe Operation Area for TO-220/TO-251/TO-252



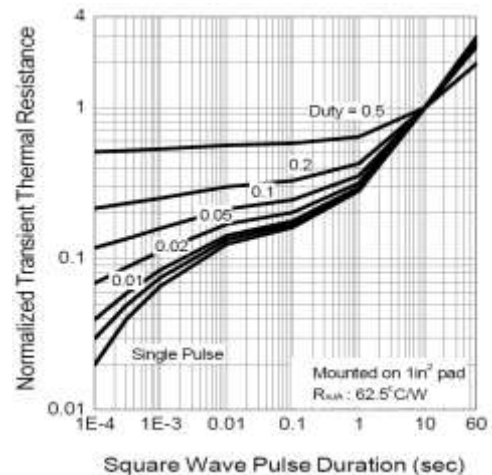
4. Safe Operation Area for TO-220F



5. Thermal Transient Impedance:  
TO-220/TO-251/TO-252

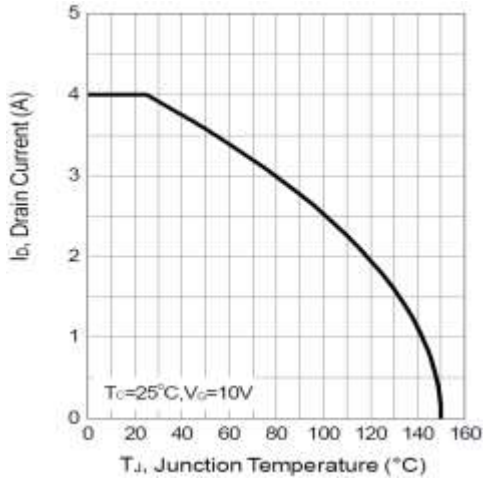


6. Thermal Transient Impedance: TO-220F

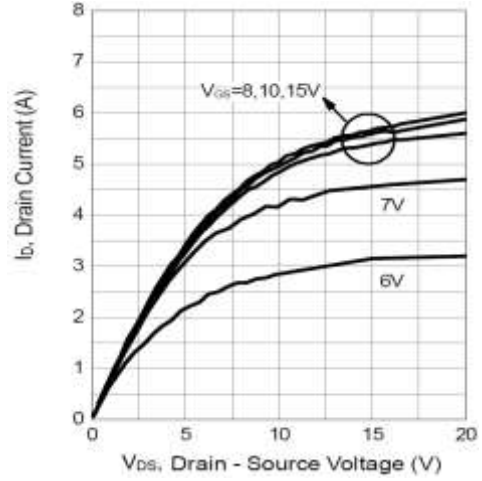




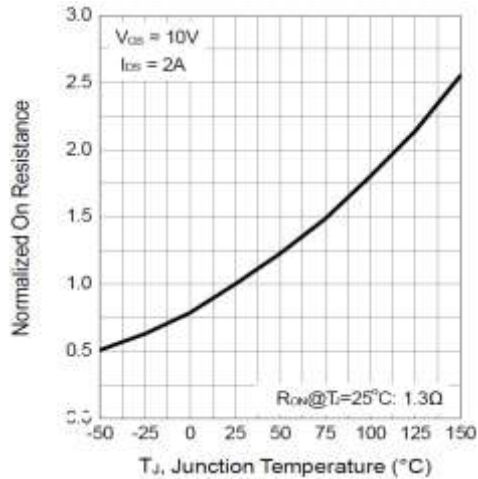
7. Drain Current



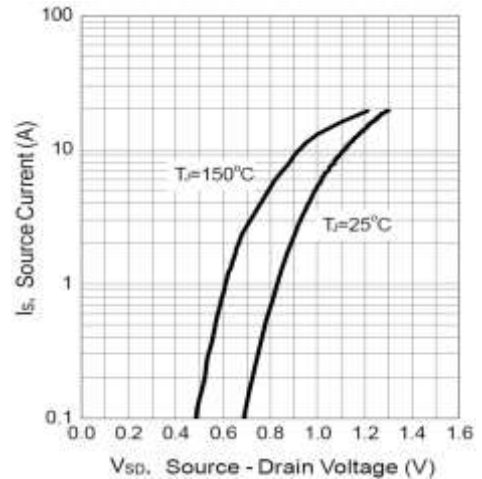
8. Output Characteristics



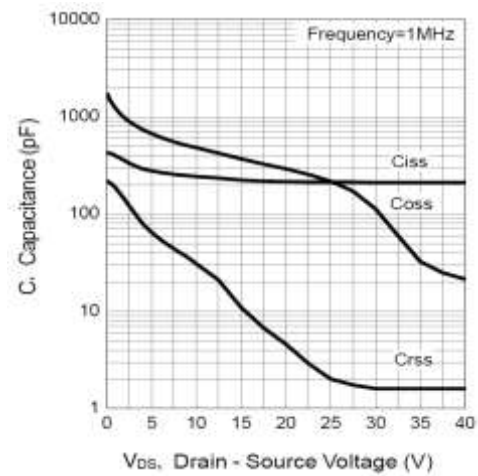
9. Drain-Source On Resistance



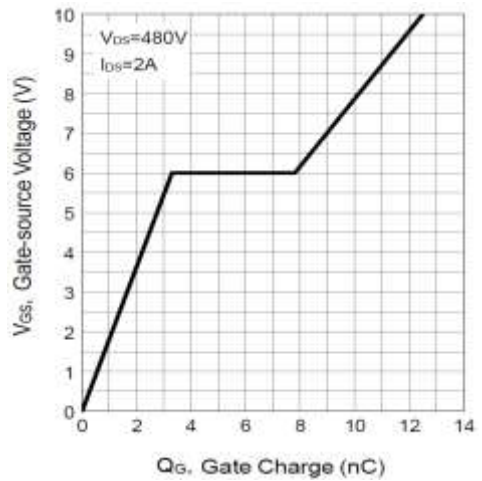
10. Source-Drain Diode Forward



11. Capacitance

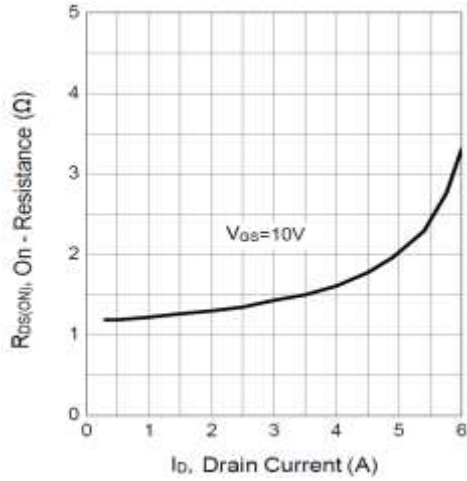


12. Gate Charge

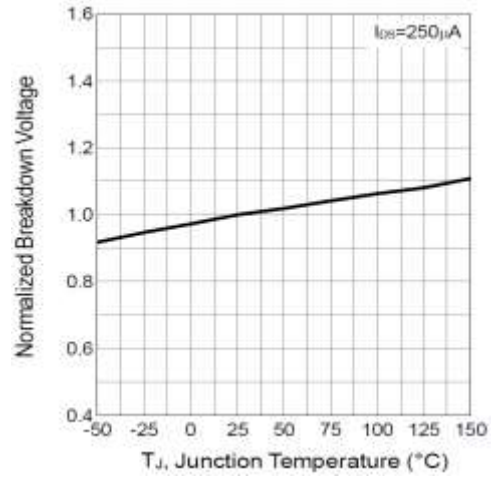




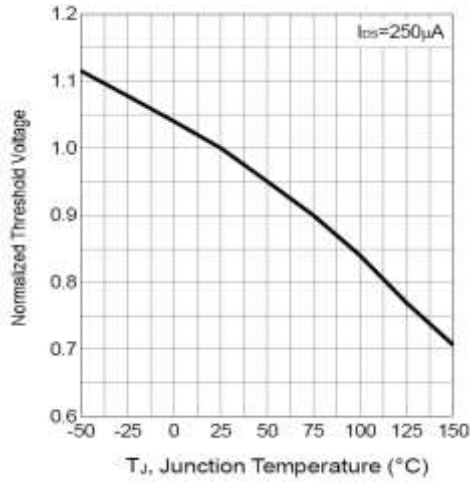
13. Drain-Source On Resistance



14.  $BV_{DSS}$  vs. Junction Temperature

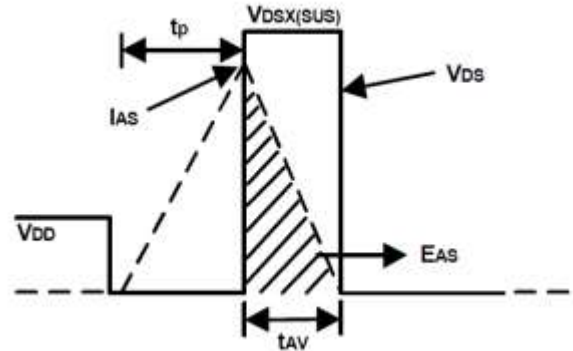
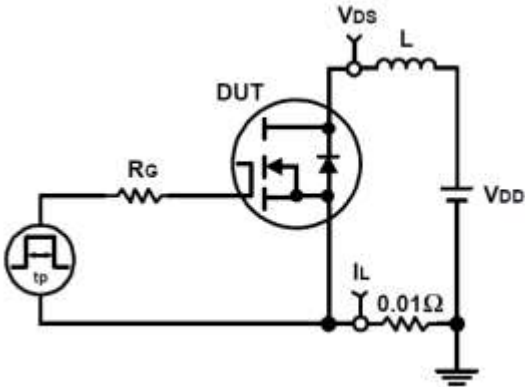


15.  $V_{GS(th)}$  vs. Junction Temperature

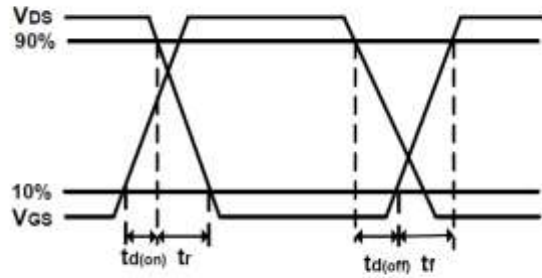
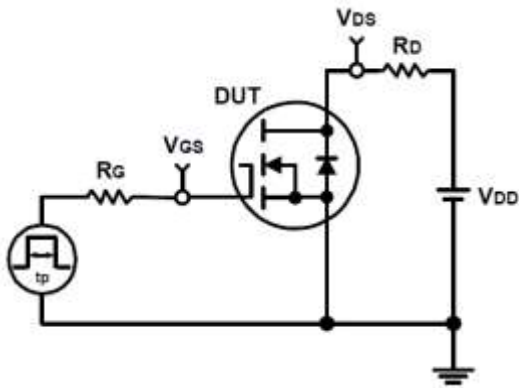




**Avalanche Test Circuit and Waveforms**



**Switching Time Test Circuit and Waveforms**

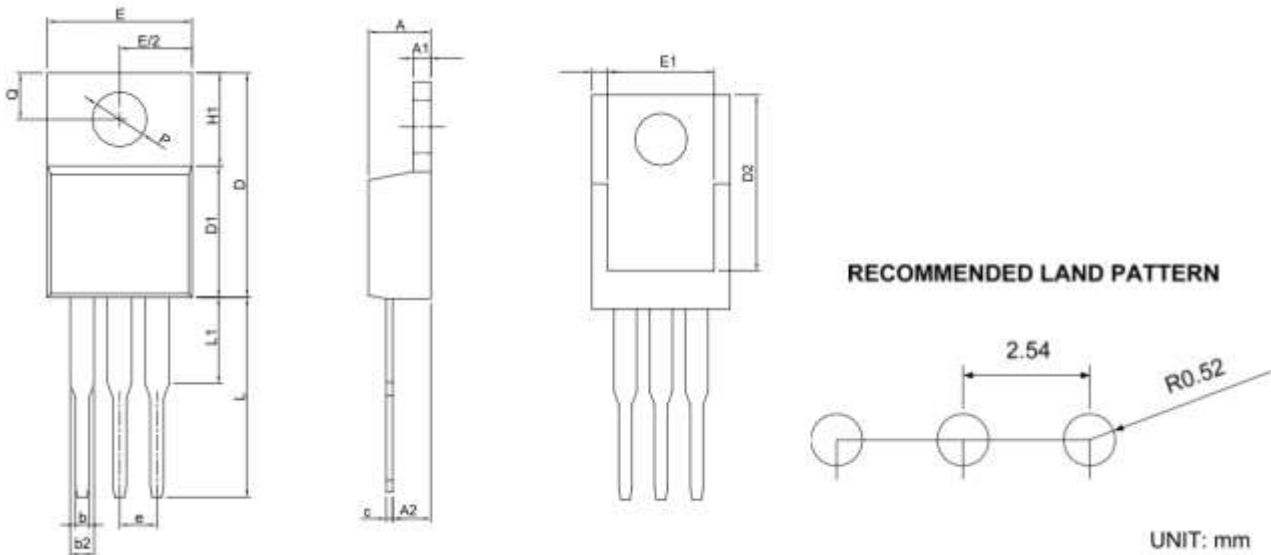






**PACKAGE INFORMATION**

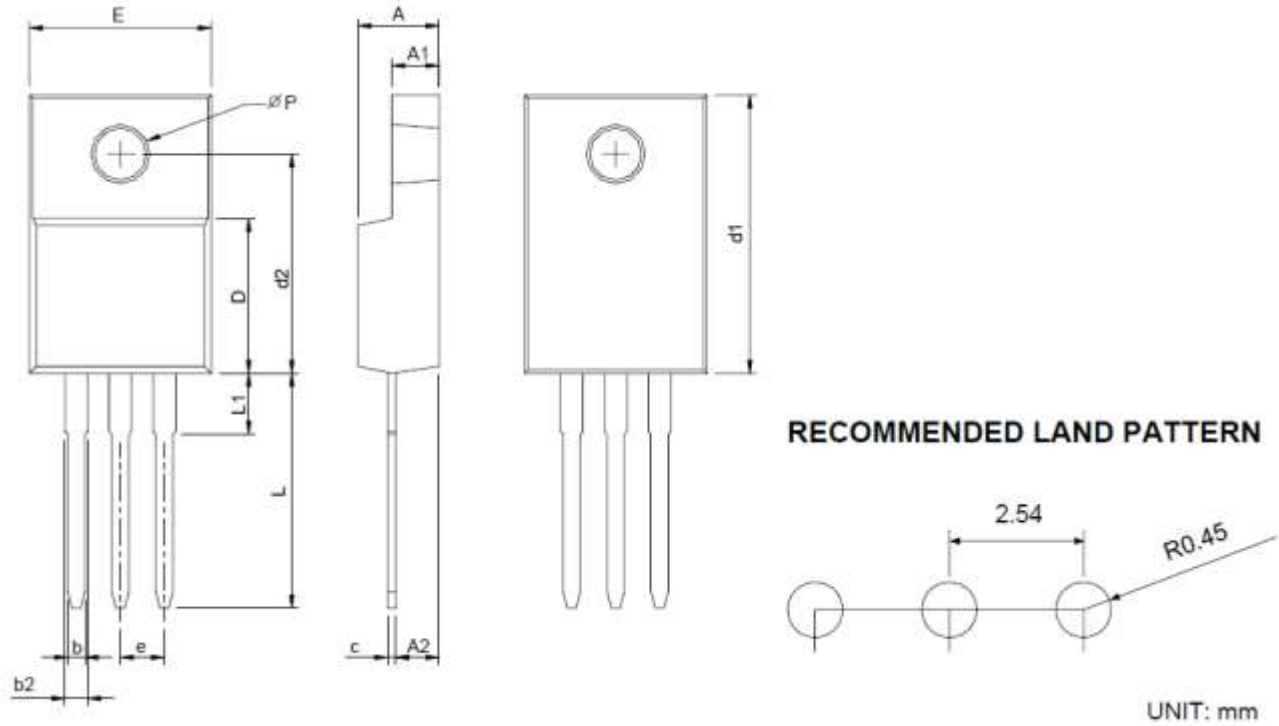
Dimension in TO-220 (Unit: mm)



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	3.56	4.83	0.140	0.190
A1	0.51	1.40	0.020	0.055
A2	2.03	2.92	0.080	0.115
b	0.38	1.02	0.015	0.040
b2	1.14	1.78	0.045	0.070
c	0.36	0.61	0.014	0.024
D	14.22	16.51	0.560	0.650
D1	8.38	9.30	0.330	0.366
D2	12.19	13.65	0.480	0.537
E	9.65	10.67	0.380	0.420
E1	6.86	8.89	0.270	0.350
e	2.54 BSC		0.100 BSC	
H1	5.84	6.86	0.230	0.270
L	12.70	14.73	0.500	0.580
L1	-	6.35	-	0.250
P	3.53	4.09	0.139	0.161
Q	2.54	3.43	0.100	0.135



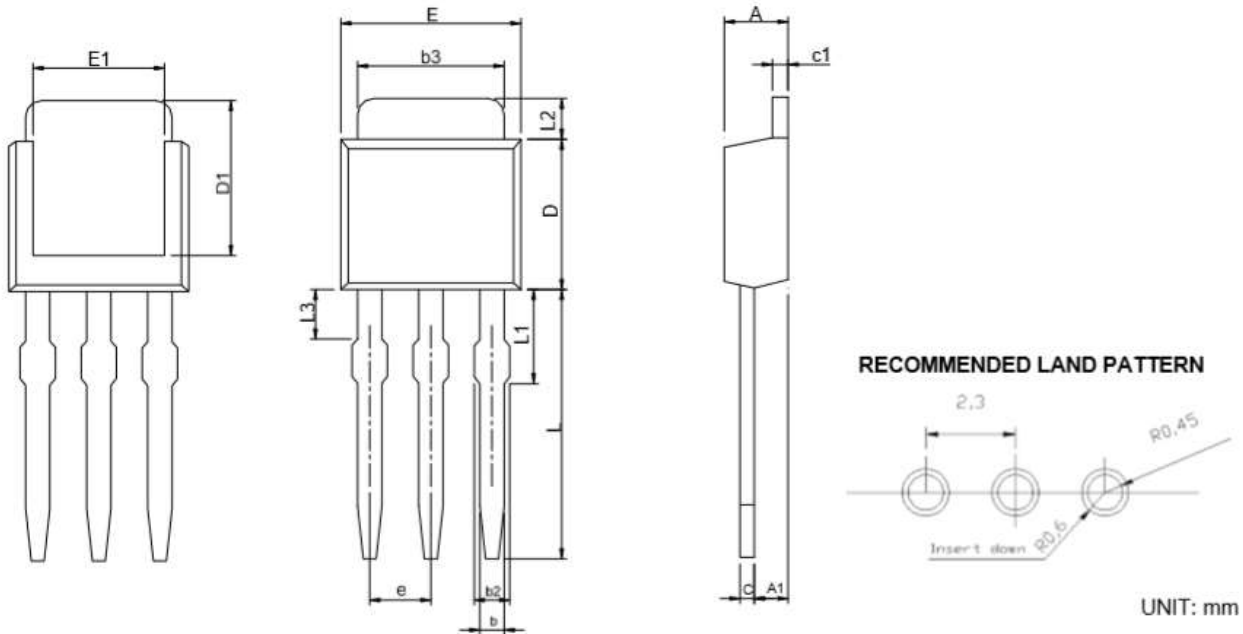
Dimension in TO-220F Package (Unit: mm)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.20	4.80	0.165	0.189
A1	2.34	3.20	0.092	0.126
A2	2.10	2.90	0.083	0.114
b	0.50	0.90	0.020	0.035
b2	0.91	1.90	0.035	0.075
c	0.30	0.80	0.012	0.031
D	8.10	9.40	0.319	0.370
d1	14.50	16.50	0.571	0.650
d2	12.10	12.90	0.476	0.508
E	9.70	10.70	0.382	0.421
e	2.54 BSC		0.100 BSC	
L	13.00	14.50	0.512	0.570
L1	1.60	4.00	0.063	0.157
P	3.00	3.60	0.118	0.142



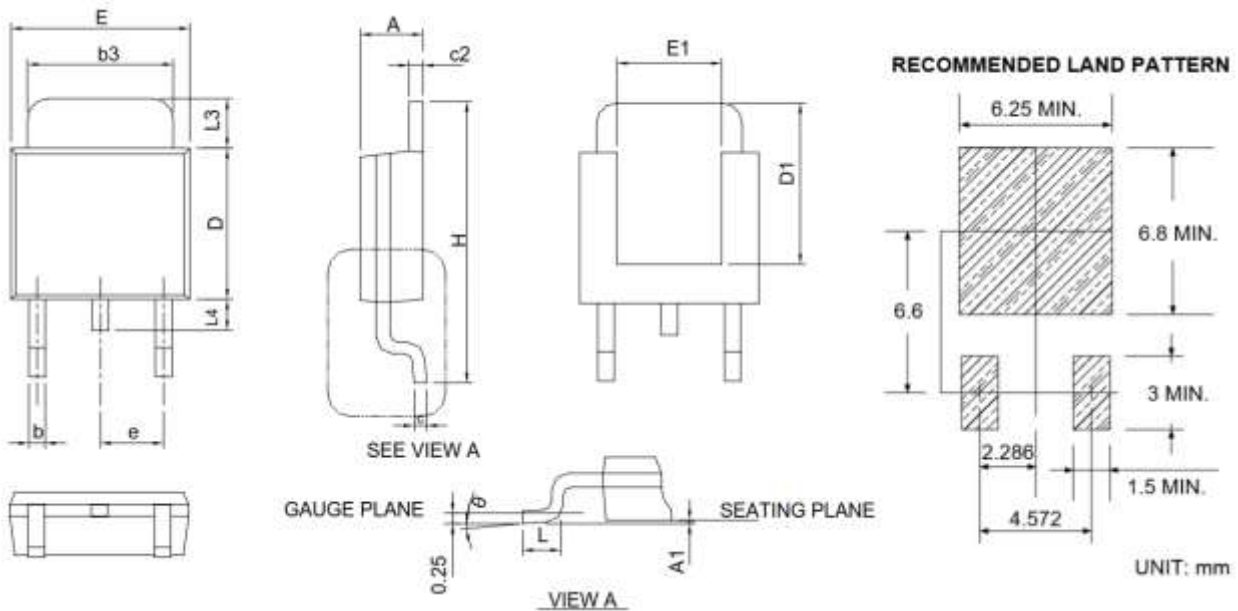
Dimension in TO-251 (Unit: mm)



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.184	2.388	0.086	0.094
A1	0.890	1.143	0.035	0.045
b	0.635	0.890	0.025	0.035
b2	0.910	1.143	0.036	0.045
b3	4.953	5.460	0.195	0.215
c	0.457	0.610	0.018	0.024
c1	0.457	0.890	0.018	0.035
D	5.334	6.223	0.210	0.245
D1	5.207	-	0.205	-
E	6.350	6.730	0.250	0.265
E1	4.320	-	0.170	-
e	2.29 BSC		0.090 BSC	
L	7.000	9.650	0.280	0.380
L1	1.905	2.290	0.075	0.090
L2	0.890	1.270	0.035	0.050
L3	1.143	1.520	0.045	0.060



Dimension in TO-252 (Unit: mm)



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.18	2.39	0.086	0.094
A1	-	0.13	-	0.005
b	0.50	0.89	0.020	0.035
b3	4.95	5.46	0.195	0.215
c	0.46	0.61	0.018	0.024
c2	0.46	0.89	0.018	0.035
D	5.33	6.22	0.210	0.245
D1	4.57	6.00	0.180	0.236
E	6.35	6.73	0.250	0.265
E1	3.81	6.00	0.150	0.236
e	2.29 BSC		0.090 BSC	
H	9.40	10.41	0.370	0.410
L	0.90	1.78	0.035	0.070
L3	0.89	2.03	0.035	0.080
L4	-	1.02	-	0.040
θ	0°	8°	0°	8°



## IMPORTANT NOTICE

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