DESCRIPTION

AM1160AH is available in TO-220, TO-220F and TO-251 packages.

FEATURES

- 600V/11A,
  $R_{DS(ON)}$= 0.36Ω(max.) @ V_{GS}= 10V
  V_{DS}@T_J, max=700V (typ.)
- Reliable and Rugged
- Avalanche Rated
- 100% UIS + R_g Tested
- Available in TO-220, TO-220F and TO-251 packages.

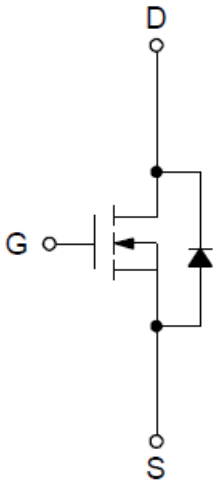
ORDERING INFORMATION

Package Type	Part Number	
TO-220 SPQ: 50pcs/Tube	T3	AM1160AHT3U
		AM1160AHT3VU
TO-220F SPQ: 50pcs/Tube	T3F	AM1160AHT3FU
		AM1160AHT3FVU
TO-251 SPQ: 75pcs/Tube	TS3	AM1160AHTS3U
		AM1160AHTS3VU
Note	V: Halogen free Package U: Tube	
AiT provides all RoHS products		

APPLICATION

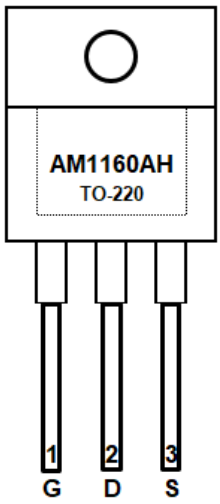
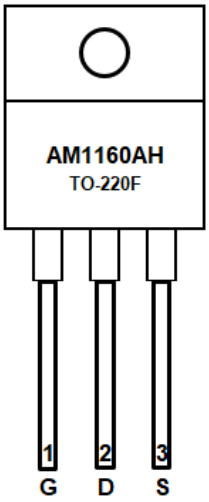
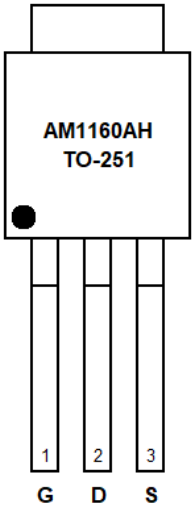
- AC/DC Power Conversion in Switched Mode Power Supplies (SMPS).
- Uninterruptible Power Supply (UPS),
- Adapter.

PIN DESCRIPTION



N-Channel MOSFET

PIN DESCRIPTION

 Top View	 Top View	 Top View

Pin #	Symbol	Function
1	G	Gate
2	D	Drain
3	S	Source

ABSOLUTE MAXIMUM RATINGS

T_A = 25℃, unless otherwise noted

V_{DSS}, Drain-Source Voltage		600V
V_{GSS}, Gate-Source Voltage		±30V
T_J, Maximum Junction Temperature		150℃
T_{STG}, Storage Temperature Range		-55℃~+150℃
I_S, Diode Continuous Forward Current		11A[NOTE1]
I_{DP}[NOTE2], Pulse Drain Current Tested	T_C=25°C	44A[NOTE1]
I_D, Continuous Drain Current	T_C=25°C	11A[NOTE1]
	T_C=100°C	7A[NOTE1]
P_D, Maximum Power Dissipation for TO-220/TO-251	T_C=25°C	113W
	T_C=100°C	45W
P_D, Maximum Power Dissipation for TO-220F	T_C=25°C	31W
	T_C=100°C	12.5W
$R_{\theta JC}$, Thermal Resistance-Junction to Case for TO-220/TO-251		1.1°C/W
$R_{\theta JC}$, Thermal Resistance-Junction to Case for TO-220F		4°C/W
$R_{\theta JA}$, Thermal Resistance-Junction to Ambient		62.5°C/W
Drain-Source Avalanche Ratings		
dv/dt[NOTE3], MOSFET dv/dt Ruggedness		50V/ns
E_{AS}[NOTE4], Avalanche Energy, Single Pulsed		144mJ
I_{AR}[NOTE5], Avalanche Current		1.9A
E_{AR}[NOTE5], Repetitive Avalanche Energy		0.34mJ

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: Pulse width limited by safe operating area.

NOTE3: V_{DS}=480V, I_D=11A.

NOTE4: I_D=1.9A, V_{DD}=50V, T_J=25°C.

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

ELECTRICAL CHARACTERISTICS

T_A = 25℃, unless otherwise noted

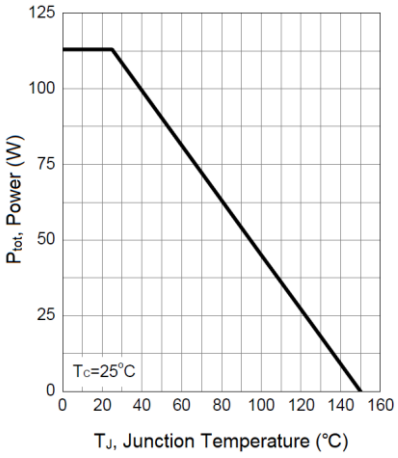
Parameter	Symbol	Conditions	Min	Typ.	Max	Units
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	600	-	-	V
		T_J =150°C	-	700	-	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=480V, V_{GS}=0V	-	-	1	μA
		T_J =150°C	-	-	200	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.5	3.5	4.5	V
Gate Leakage Current	I_{GSS}	V_{GS}=±30V, V_{DS}=0V	-	-	±100	nA
Drain-Source On-state Resistance	$R_{DS(ON)}$ NOTE6	V_{GS}=10V, I_D=4A	-	0.3	0.36	Ω
Diode Characteristics						
Diode Forward Voltage	V_{SD} NOTE6	I_{SD}=11A, V_{GS}=0V	-	0.9	1.3	V
Reverse Recovery Time	t_{rr}	I_{SD}=11A, V_R=360V, dI_{SD}/dt=100A/μs	-	252	-	ns
Reverse Recovery Charge	Q_{rr}		-	2.85	-	μC
Peak Reverse Recovery Current	I_{rm}		-	23	-	A
Dynamic CharacteristicsNOTE7						
Gate Resistance	R_G	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	2	-	Ω
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, Frequency=1.0MHz	-	820	1080	pF
Output Capacitance	C_{oss}		-	720	-	
Reverse Transfer Capacitance	C_{rss}		-	16	-	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=400V, R_L=36Ω, I_{DS}=11A, V_{GEN}=10V, R_G=6Ω	-	11	-	ns
Turn-on Rise Time	t_r		-	27	-	
Turn-off Delay Time	$t_{d(off)}$		-	26	-	
Turn-off Fall Time	t_f		-	24	-	
Gate Charge CharacteristicsNOTE7						
Total Gate Charge	Q_g	V_{DS}=480V, V_{GS}=10V, I_{DS}=4A	-	23.5	31	nC
Gate-Source Charge	Q_{gs}		-	6	-	
Gate-Drain Charge	Q_{gd}		-	11	-	

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

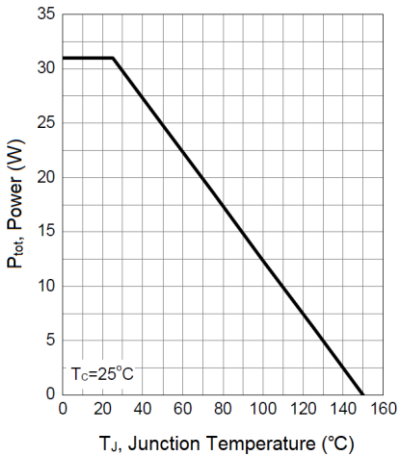
NOTE7: Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS

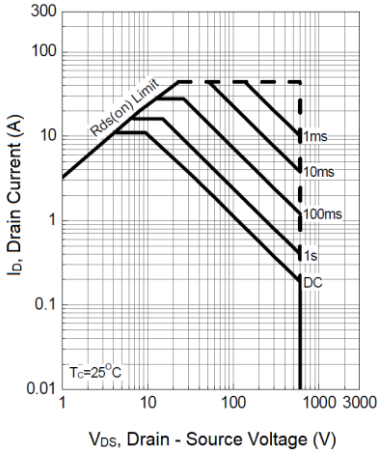
1. Power Dissipation: TO-220/TO-251



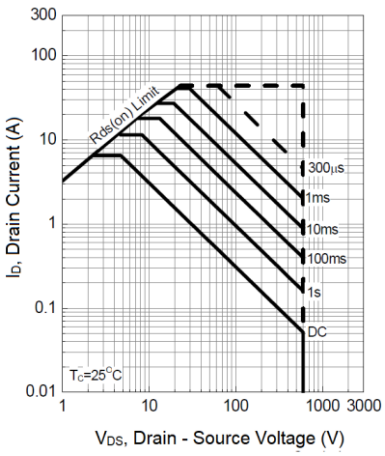
2. Power Dissipation: TO-220F



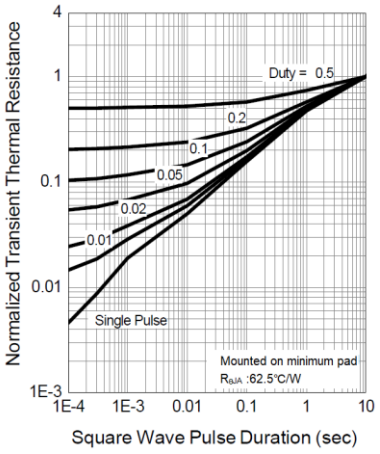
3. Safe Operation Area : TO-220/TO-251



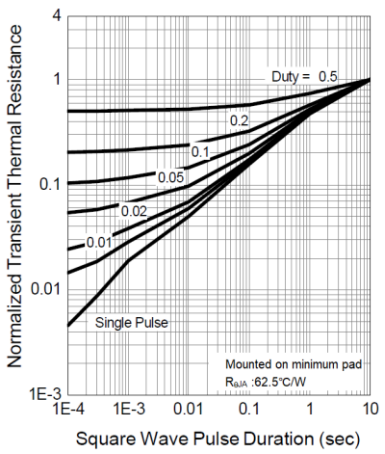
4. Safe Operation Area : TO-220F



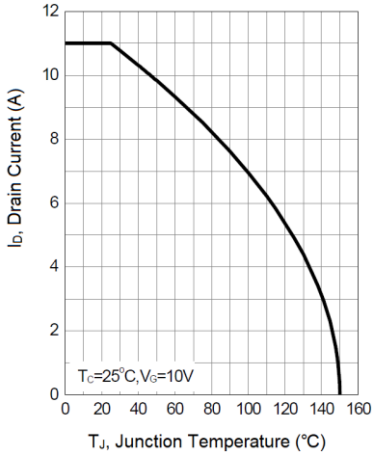
5. Thermal Transient Impedance: TO-220/TO-251



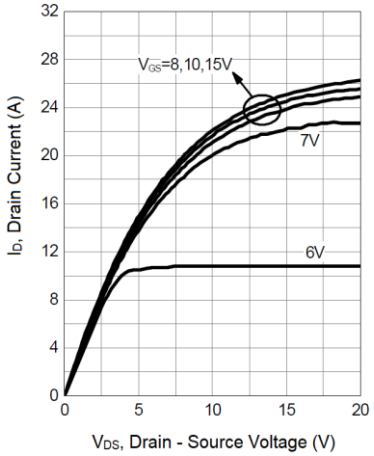
6. Thermal Transient Impedance: TO-220F



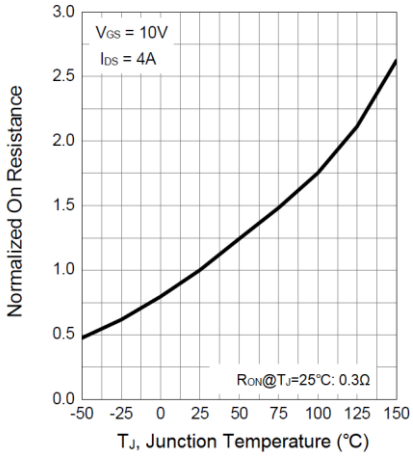
7. Drain Current



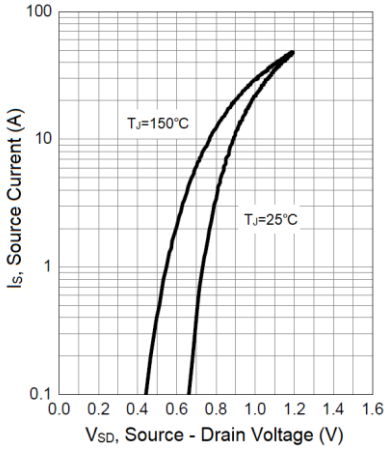
8. Output Characteristics



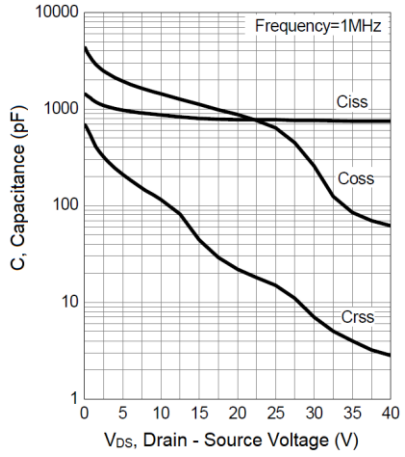
9. Drain-Source On Resistance



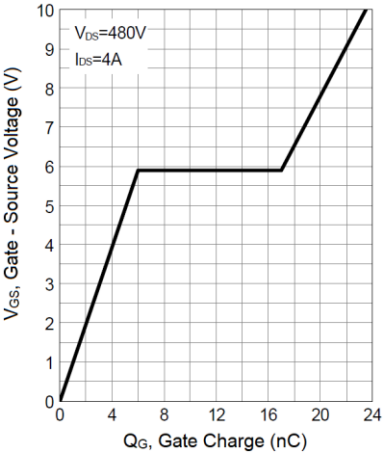
10. Source-Drain Diode Forward



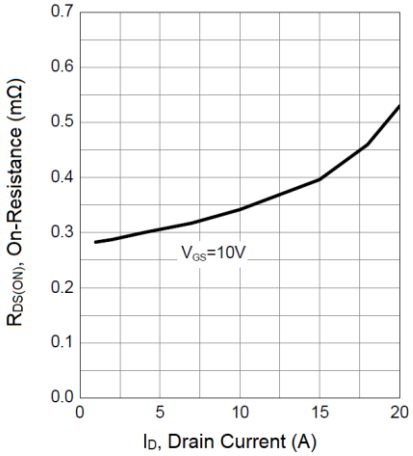
11. Capacitance



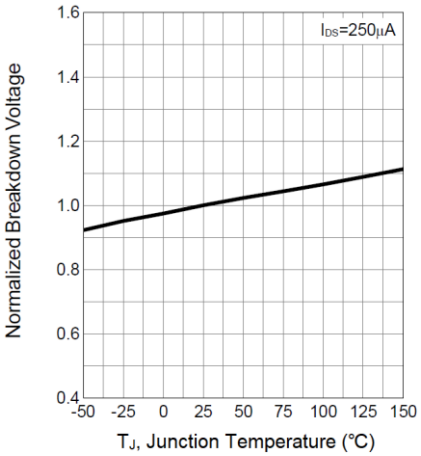
12. Gate Charge



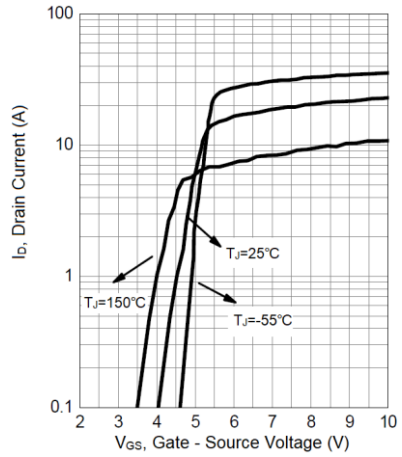
13. Drain-Source On Resistance



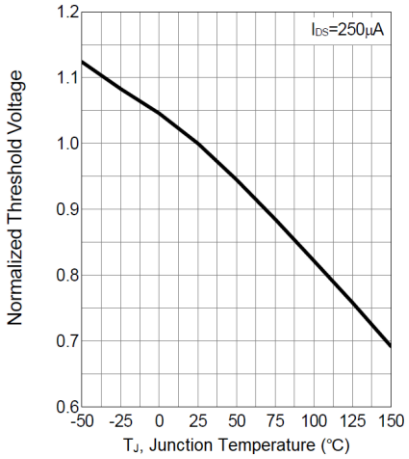
14. BV_{DSS} vs. Junction Temperature



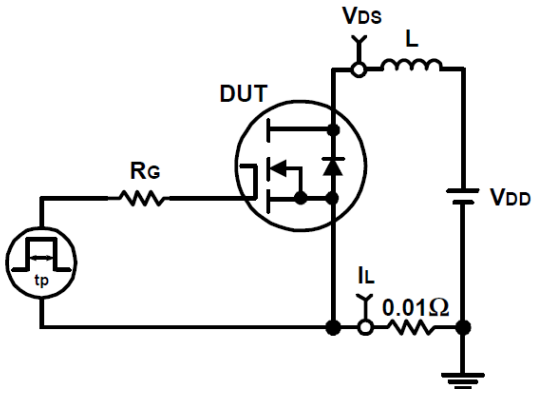
15. Transfer Characteristics

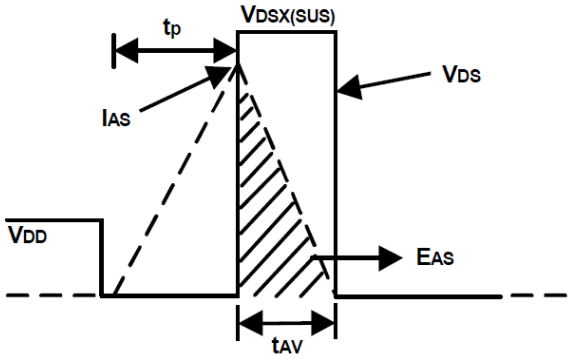


16. Gate Threshold Voltage

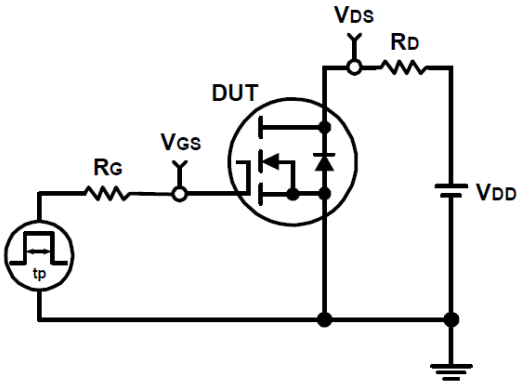


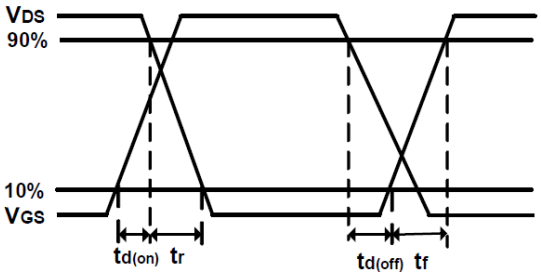
Avalanche Test Circuit and Waveforms





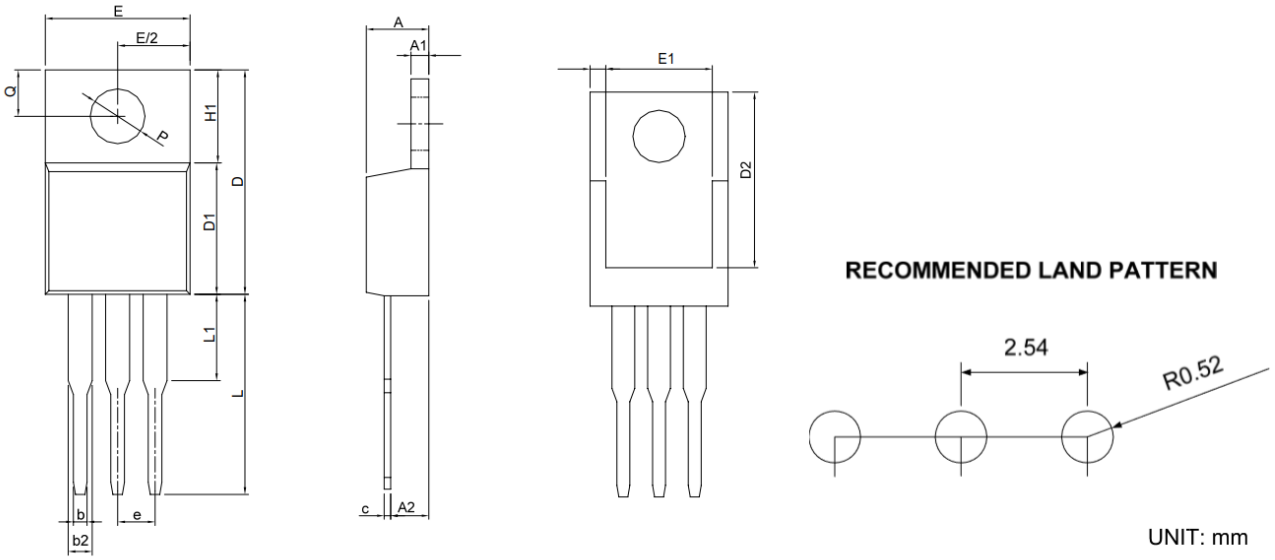
Switching Time Test Circuit and Waveforms





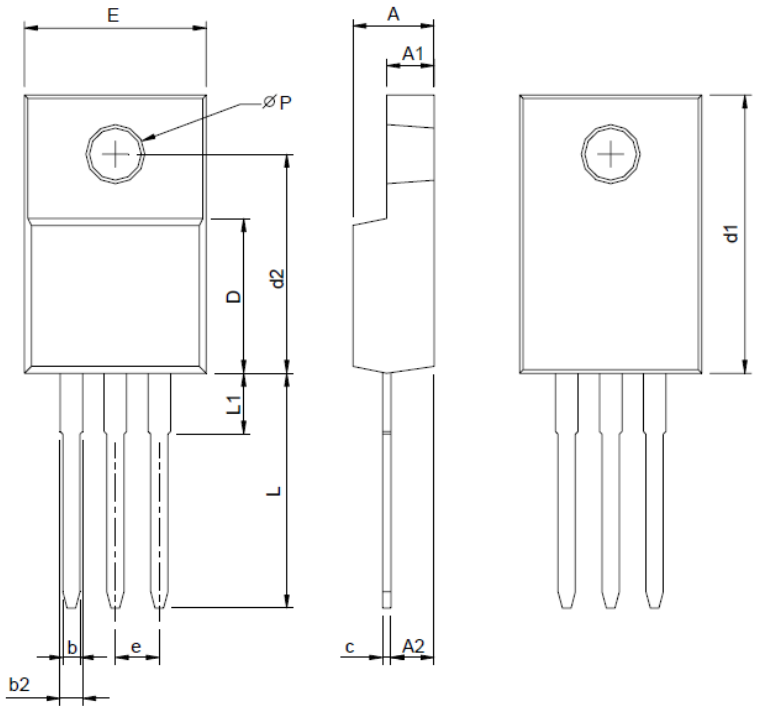
PACKAGE INFORMATION

Dimension in TO-220 (Unit: mm)

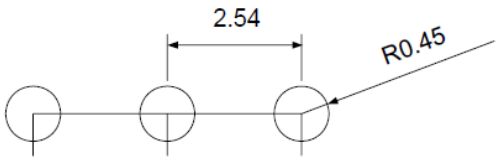


Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	3.56	4.83	0.140	0.190
A1	0.51	1.40	0.020	0.055
A2	2.03	2.92	0.080	0.115
b	0.38	1.02	0.015	0.040
b2	1.14	1.78	0.045	0.070
c	0.36	0.61	0.014	0.024
D	14.22	16.51	0.560	0.650
D1	8.38	9.30	0.330	0.366
D2	12.19	13.65	0.480	0.537
E	9.65	10.67	0.380	0.420
E1	6.86	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)



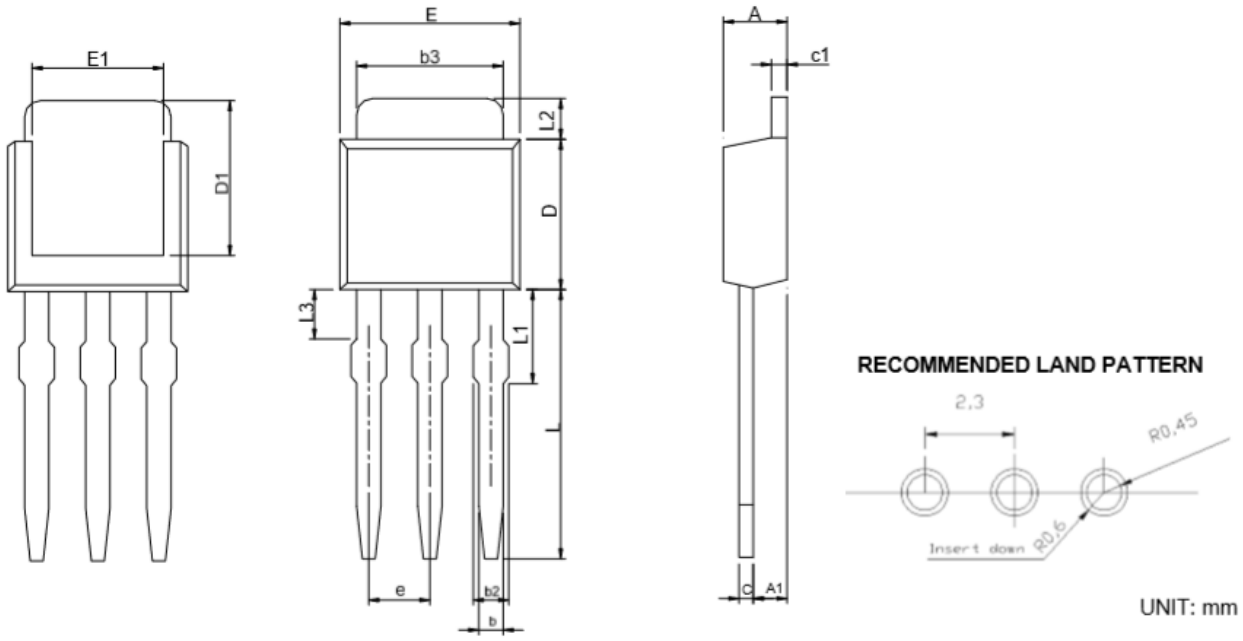
RECOMMENDED LAND PATTERN



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	0.28	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

IMPORTANT NOTICE

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