N-CHANNEL POWER MOSFET MEM4N60

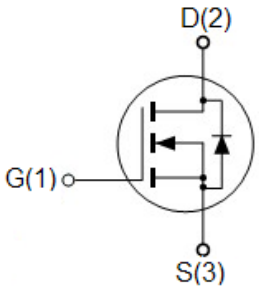
General Description

- Switching regulator application.
- High voltage and high speed.
- Switching application.

Features

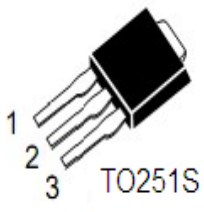
- 600V，4A
- RDS(ON)=2.3Ω@VGS=10V
- LOW CRSS
- FAST SWITCHING
- PACKAGE :TO251,TO251S,TO252,TO-220F

Pin Configuration

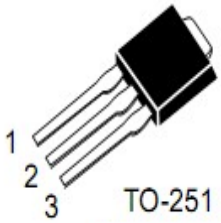


Application

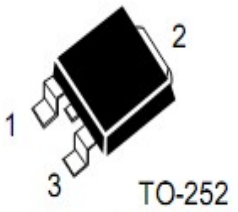
- Power switching application
- Load switching



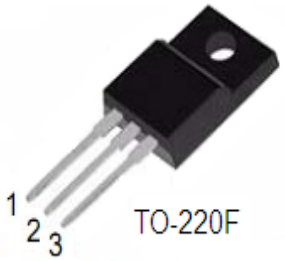
MEM4N60THDG



MEM4N60THG



MEM4N60K3G



MEM4N60A3G

Maximum Ratings(Ta=25℃)

Parameter		Symbol	Ratings		Unit
Drain-Source Voltage		V_{DSS}	600V		V
Gate-Source Voltage		V_{GSS}	±30		V
Drain Current	T_A=25℃	I_D	4		A
	T_A=100℃		2.4		
Pulsed Drain Current[1,2]		I_{DM}	16		A
Total Power Dissipation	T_A=25℃	Pd	TO-251	41	W
			TO-220F	33	
			TO-252	57	
Operating Temperature Range		T_{Opr}	-55-150		℃
Storage Temperature Range		T_{stg}	-55-150		℃

Thermal Characteristics

Parameter	Symbol	Package	TYP	Unit
Thermal Resistance,Junction-to-Case	RθJC	TO-220F	3.8	℃/W
		TO-252	2.2	

Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	600	650	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250uA	2.0	2.8	4.0	V
Gate-Body Leakage	I_{GSS}	V_{DS}=0V，V_{GS}=30V	-	1.1	100	nA
		V_{DS}=0V，V_{GS}=-30V	-	0.1	-100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=600V V_{GS}=0V	-	0.1	20	uA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=2A	-	1.85	2.3	Ω
Forward Transconductance	g_{FS}	V_{DS} =15V, I_D= 2A	-	3.2	10	S
Drain-Source Diode Forward Continuous Current	Is	V_{GS}=0V	-	-	4	A
Source-drain (diode forward) voltage	V_{SD}	V_{GS}=0V,I_S=2A		0.85	1.4	V
Dynamic Characteristics						
Input Capacitance	Ciss	V_{DS} = 25 V, V_{GS} = 0 V, f = 1 MHz	-	676	-	pF
Output Capacitance	Coss		-	92.1	-	
Reverse Transfer Capacitance	Crss		-	19.7	-	
Switching Characteristics						
Turn-On Delay Time	td(on)	V_{DD} = 300 V, R_G = 10Ω V_{GS} = 10V, I_D = 4A	-	21.8	-	ns
Rise Time	tr		-	13.2	-	
Turn-Off Delay Time	td(off)		-	46.8	-	
Fall-Time	tf		-	12.6	-	
Total Gate Charge	Qg	V_{DS} = 300V, V_{GS} = 10V, I_D = 4A		15.6	-	nc
Gate-Source Charge	Qgs		-	3.16	-	
Gate-Drain Charge	Qgd		-	6.76	-	

Notes :

1、Repetitive rating, pulse width limited by junction temperature.

2、Pulse width <300us , duty cycle <2%.

3、I_{SD}=4.0A di/dt≤100A/us,V_{DD}≤BV_{DSS}, T_J≤=150℃.

4、L=10mH,V_{DD}=50V,I_D=4.0A,R_G=25Ω,Starting T_J=25℃

Typical performance characteristics

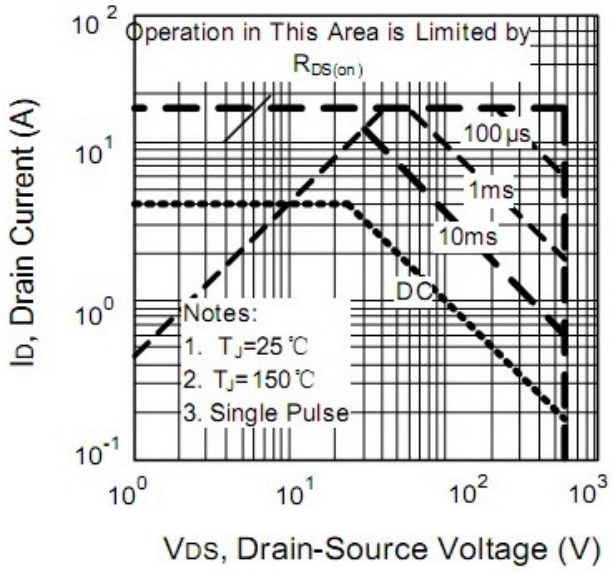


Figure 1 Maximum Safe Operating Area

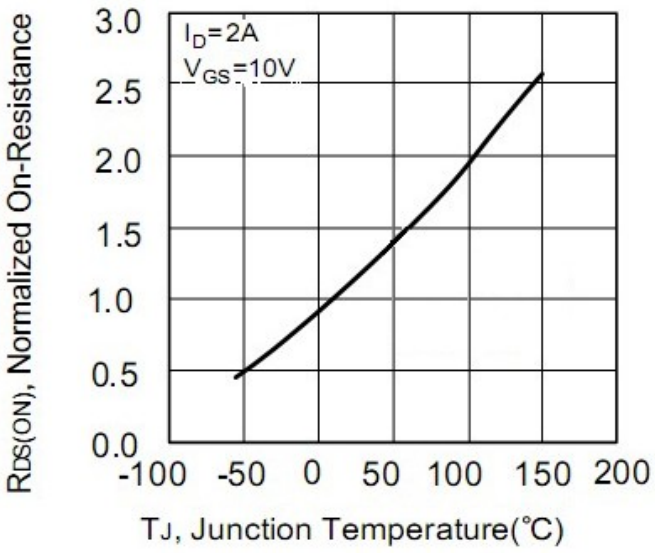


Figure 2. Normalized On-Resistance Variation with Temperature

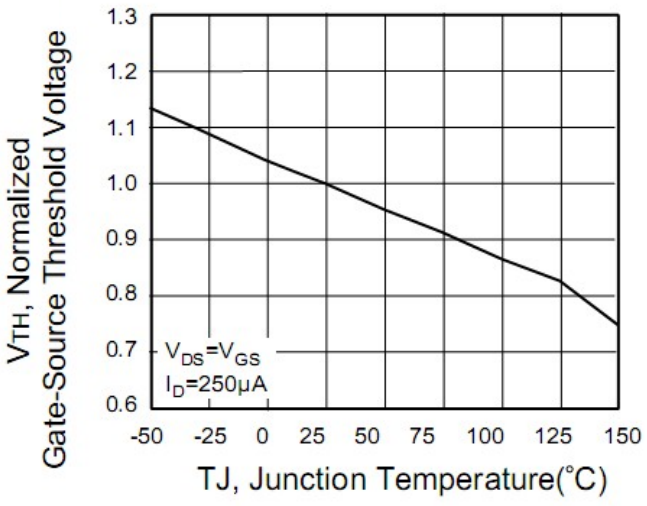


Figure 3. Gate Threshold Variation with Temperature

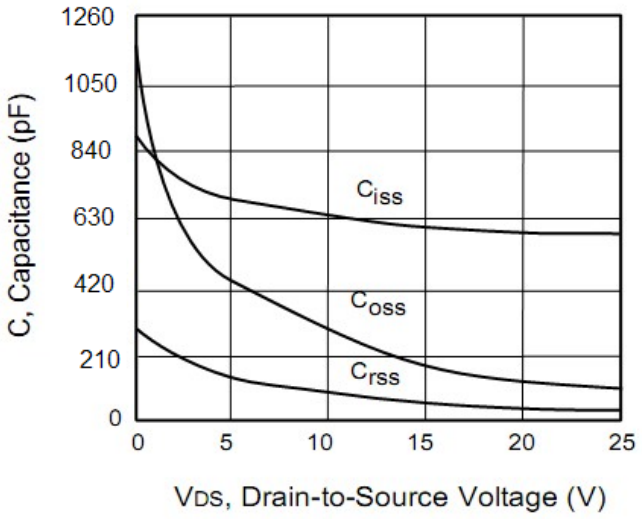


Figure 4. Capacitance Characteristics

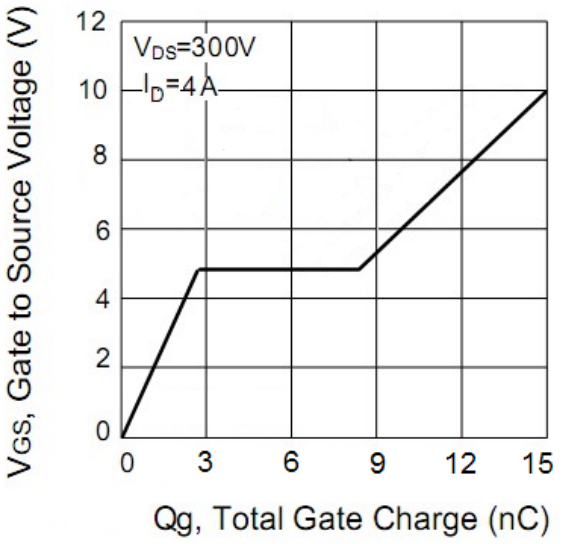


Figure 5. Gate Charge Characteristics

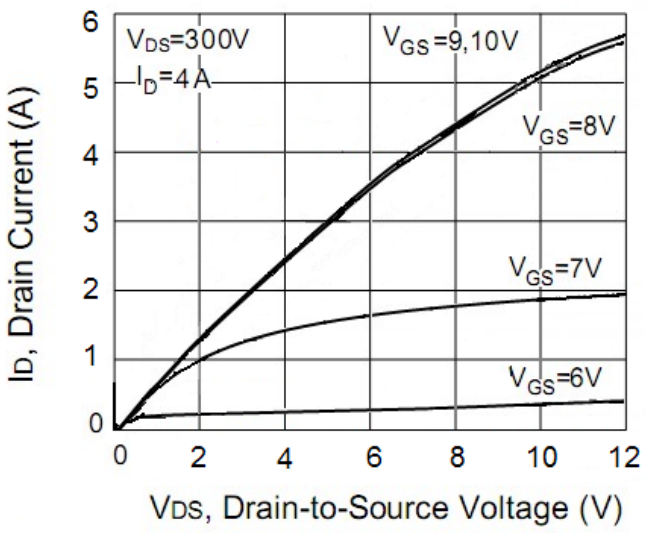


Figure 6. On-State Characteristics

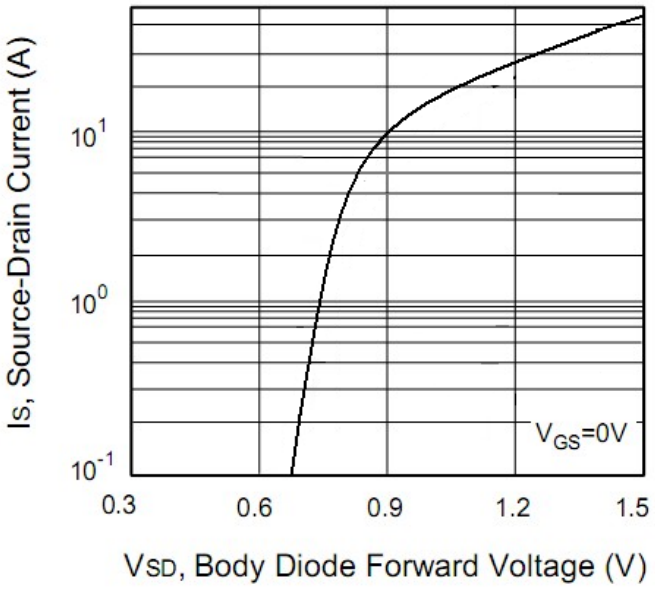


Figure 7. Body Diode Forward Voltage Variation with Source Current

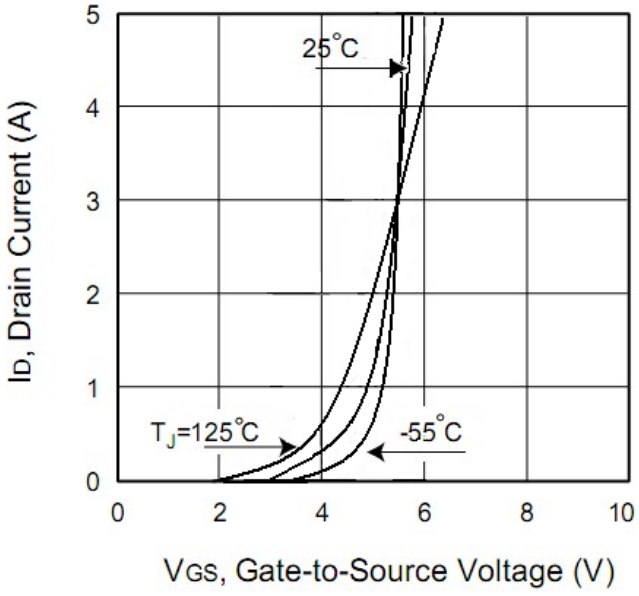


Figure 8. Transfer Characteristics

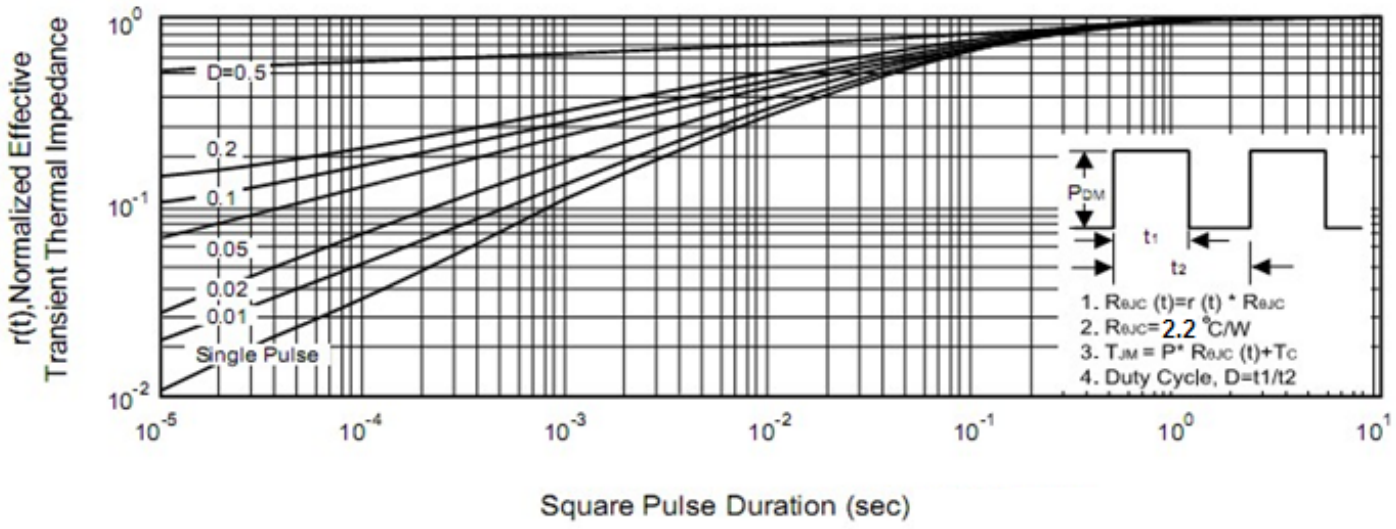
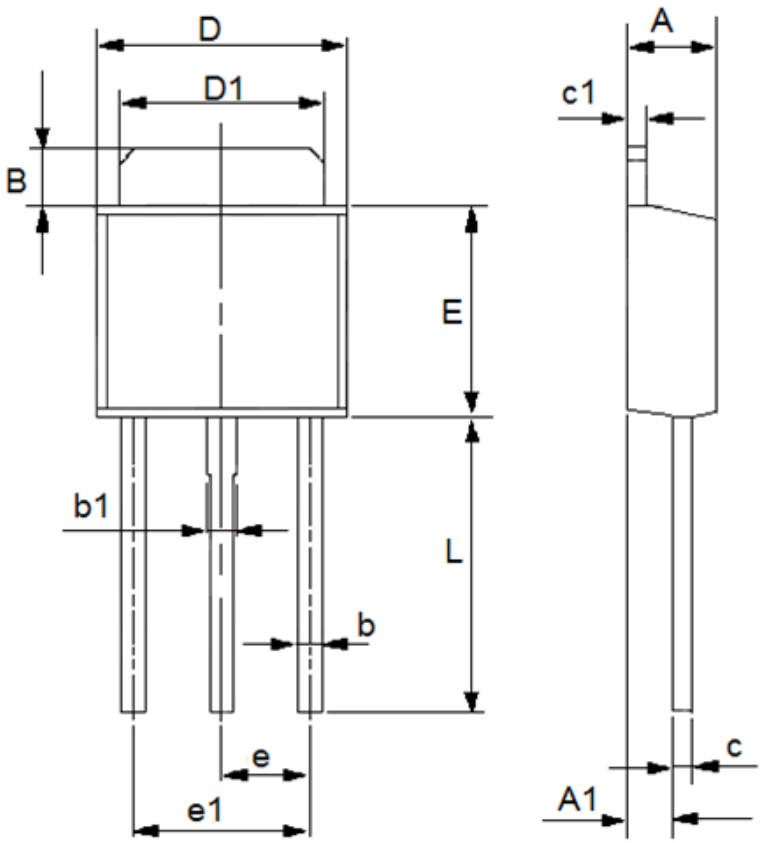


Figure 9 Normalized Effective Transient Thermal Impedance With Pulse Duration

Package Information

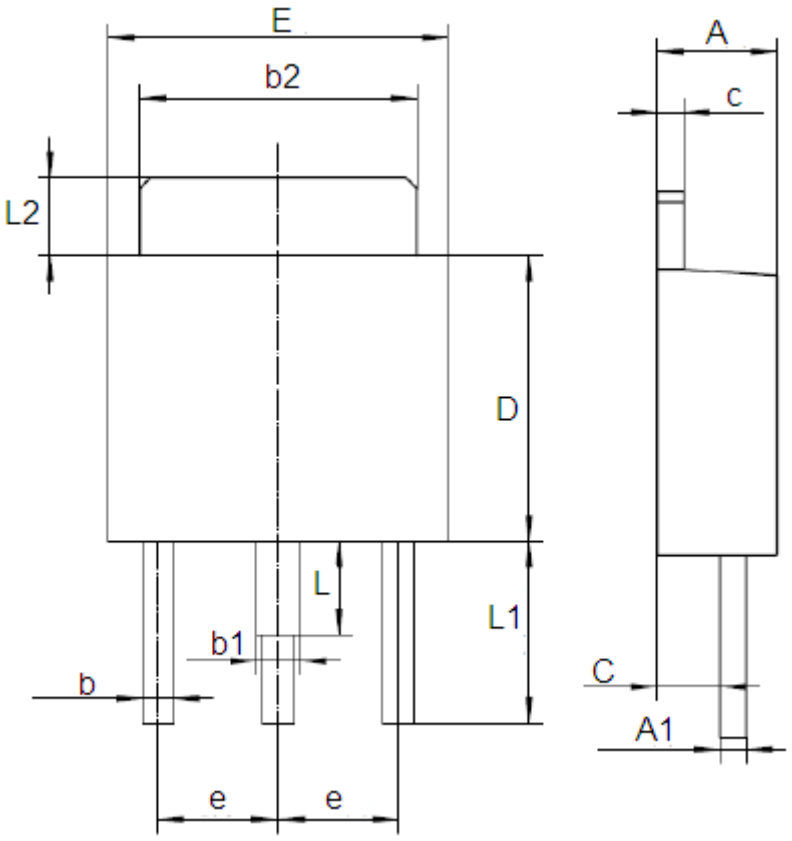
NOTE:（ A)、(B)、(C）…on behalf of the different shapes of the size, the difference is not large, the company random delivery. These sizes are in line with our product requirements, please rest assured that the use of.

- **Package Type:TO-251（A）**



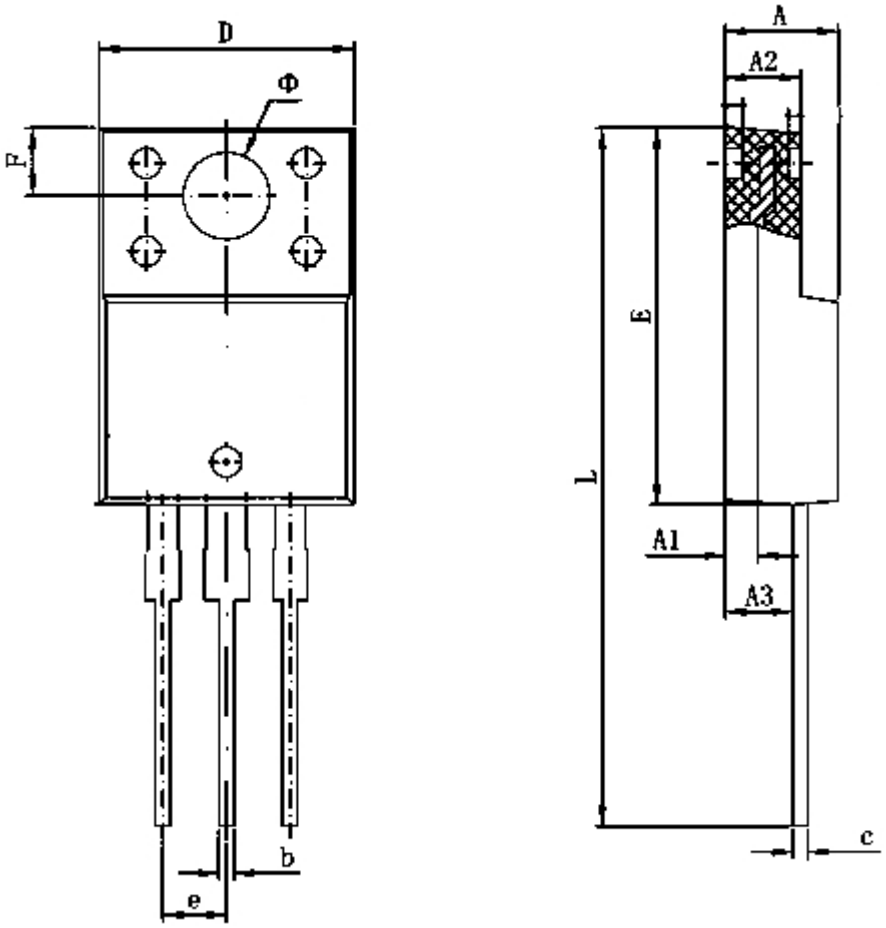
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.2	2.47	0.0866	0.0972
A1	1.05	1.35	0.0413	0.0531
B	1.35	1.65	0.0531	0.065
b	0.5	0.75	0.0197	0.0295
b1	0.7	0.95	0.0276	0.0374
D	6.35	6.68	0.25	0.263
D1	5.2	5.4	0.2047	0.2126
E	5.35	5.75	0.2106	0.2263
e	2.3(TYP)		0.0906(TYP)	
e1	4.6(TYP)		0.1811(TYP)	
L	7.5	8.25	0.2953	0.3248
c	0.5(TYP)		0.0197(TYP)	
c1	0.5(TYP)		0.0197(TYP)	

- **Package Type:TO-251（S）**



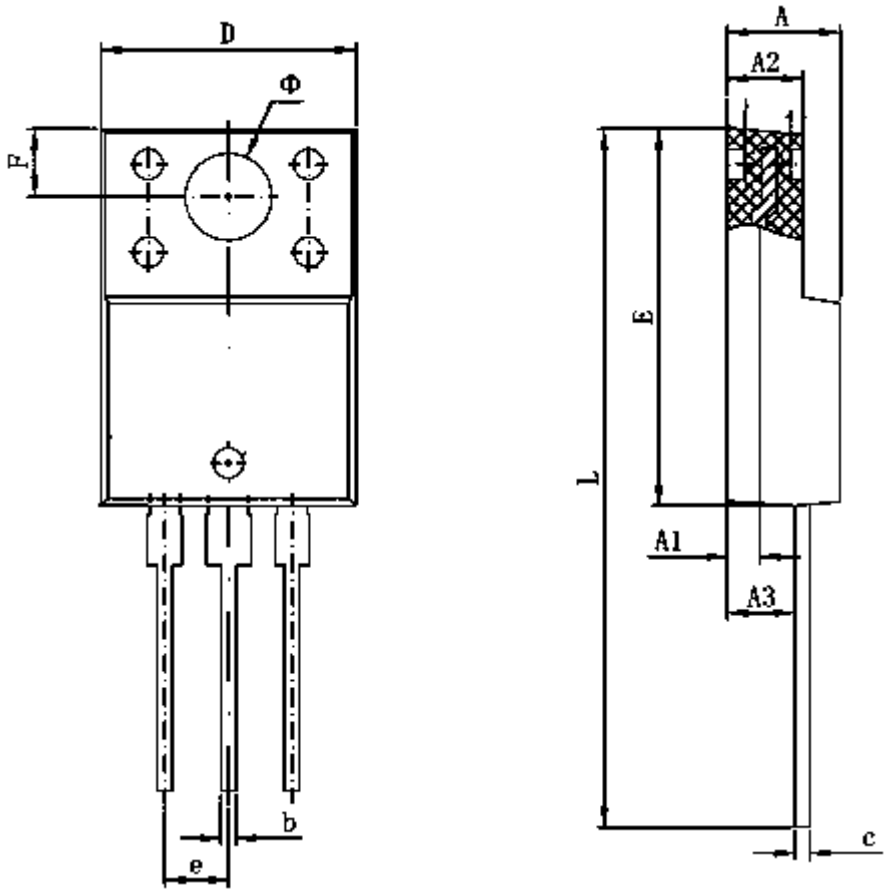
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.3 REF		0.0905 REF	
A1	1.2 REF		0.047 REF	
b	0.6 REF		0.0236 REF	
b1	0.65	0.95	0.0256	0.0374
b2	5.3 REF		0.2087 REF	
c	0.51 REF		0.0201 REF	
D	5.5 REF		0.2165 REF	
E	6.5 REF		0.2559 REF	
e	2.3 REF		0.0905 REF	
L	1.7 REF		0.0669 REF	
L1	3.2	3.7	0.126	0.1457
L2	1.35	1.65	0.053	0.65

- **Package Type:TO-220F（A）**



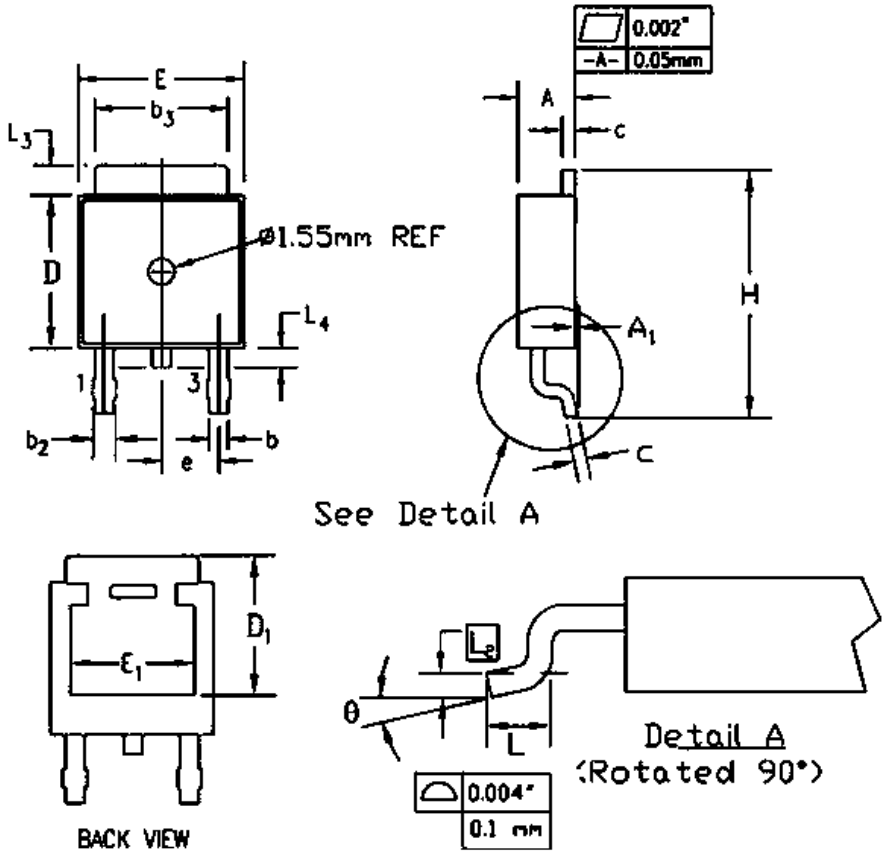
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	4.5	4.9	0.1771	0.1929
A1	0.75	1.05	0.0295	0.0413
A2	2.35	2.75	0.0925	0.1083
A3	2.65	2.85	0.1043	0.1122
b	0.75	0.85	0.0295	0.0334
c	0.45	0.6	0.0177	0.0236
D	10	10.32	0.3937	0.4063
E	15.65	16.05	0.6161	0.6319
e	2.54REF		0.100REF	
F	3.2	3.4	0.1260	0.1338
Φ	3.08	3.28	0.1212	0.1291
L	28.45	29.25	1.1201	1.1516

- **Package Type:TO-220F（B）**



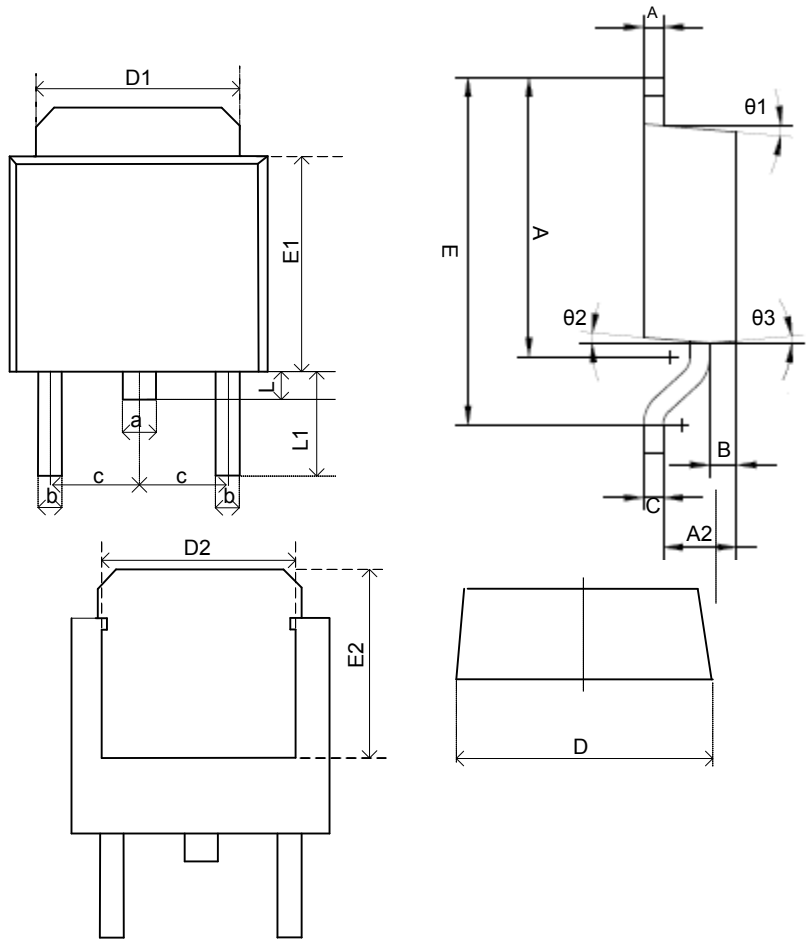
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	4.5	4.9	0.1771	0.1929
A1	0.75	1.05	0.0295	0.0413
A2	2.35	2.75	0.0925	0.1083
A3	2.65	2.9	0.1043	0.1142
b	0.75	0.85	0.0295	0.0334
c	0.45	0.6	0.0177	0.0236
D	10	10.32	0.3937	0.4063
E	15.65	16.15	0.6161	0.6358
e	2.54REF		0.100REF	
F	3.2	3.4	0.1260	0.1338
Φ	3.08	3.28	0.1212	0.1291
L	26.2	29.8	1.0315	1.1732

- **Package Type:TO-252(A)**



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.19	2.38	0.086	0.094
A1	-	0.13	-	0.005
b	0.64	0.89	0.025	0.035
b2	0.84	1.14	0.033	0.045
b3	5.21	5.46	0.205	0.215
c	0.46	0.61	0.018	0.024
D	5.97	6.22	0.235	0.250
D1	5.21	-	0.205	-
E	6.35	6.73	0.250	0.265
E1	4.7	4.9	0.185	0.1929
e	2.2	2.4	0.0866	0.0945
H	9.65	10.41	0.380	0.410
L	1.40	1.78	0.055	0.070
L2	0.51REF		0.020REF	
L3	0.89	1.27	0.035	0.050
L4	0.6	1.01	0.0236	0.040
θ	0°	8°	0°	8°

● **Package Type:TO-252（B）**



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	7.0	7.4	0.2756	0.2913
B	0.6	0.8	0.0236	0.0315
C	0.5REF		0.0197REF	
D	6.5	6.7	0.2559	0.2638
D1	5.3REF		0.2087REF	
D2	4.6	4.8	0.1811	0.189
E	8.8	9.2	0.3464	0.3622
E1	5.4	5.8	0.2126	0.2283
E2	4.78	4.98	0.1882	0.1961
L	0.35	0.95	0.0138	0.0374
L1	2.35	2.95	0.0925	0.1161
a	0.85REF		0.0335REF	
b	0.6	0.8	0.0236	0.0315
c	2.3REF		0.0905REF	
θ1 θ2	5°REF		0.1968°REF	
θ3	0.5° REF		0.0197° REF	

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