

N-CHANNEL POWER MOSFET MEM4N60

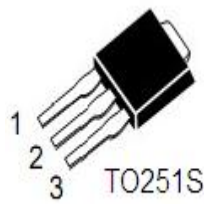
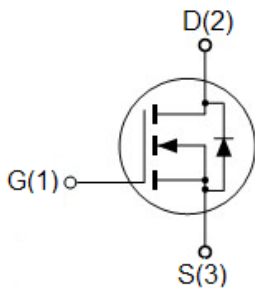
General Description

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

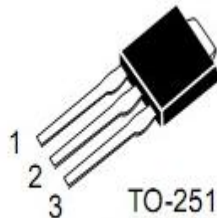
Features

- 600V, 4A
- $R_{DS(ON)}=2.3\Omega@V_{GS}=10V$
- LOW CRSS
- FAST SWITCHING
- PACKAGE :TO251,TO251S,TO252,TO-220F

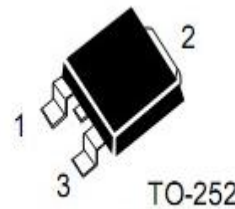
Pin Configuration



MEM4N60THDG



MEM4N60THG



MEM4N60K3G



MEM4N60A3G

Maximum Ratings ($T_A=25^\circ\text{C}$)

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

Thermal Characteristics

Parameter	Symbol	Package	TYP	Unit
Thermal Resistance, Junction-to-Case	R θ JC	TO-220F	3.8	°C/W
		TO-252	2.2	

Electrical Characteristics

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	I _S	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	C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz	-	676	-	pF
Output Capacitance	C _{oss}		-	92.1	-	
Reverse Transfer Capacitance	C _{rss}		-	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	Q _g	V _{DS} = 300V, V _{GS} = 10V, I _D = 4A		15.6	-	nC
Gate-Source Charge	Q _{gs}		-	3.16	-	
Gate-Drain Charge	Q _{gd}		-	6.76	-	

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

Typical performance characteristics

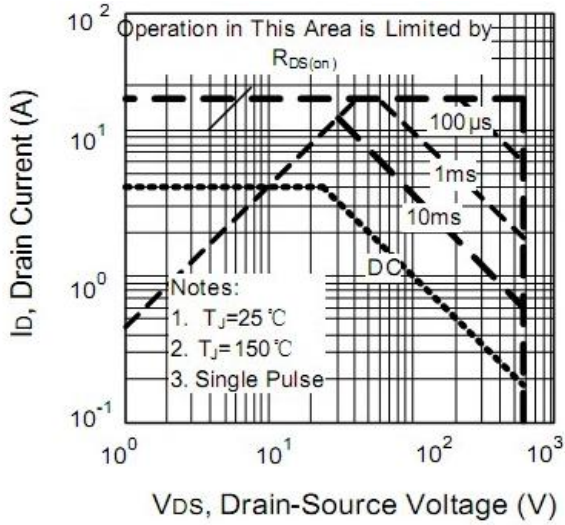


Figure 1 Maximum Safe Operating Area

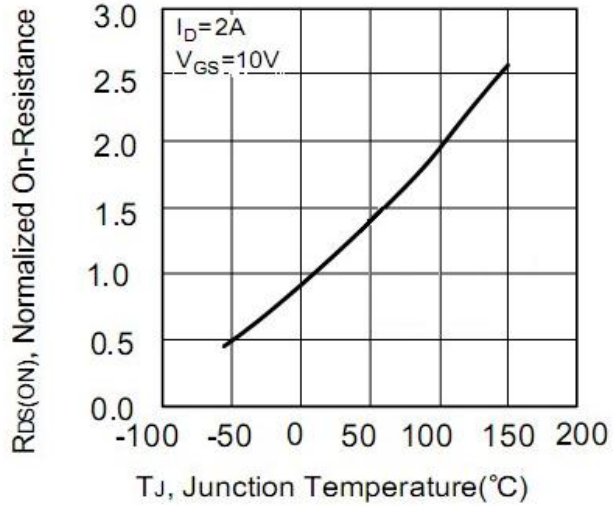


Figure 2. Normalized On-Resistance Variation with Temperature

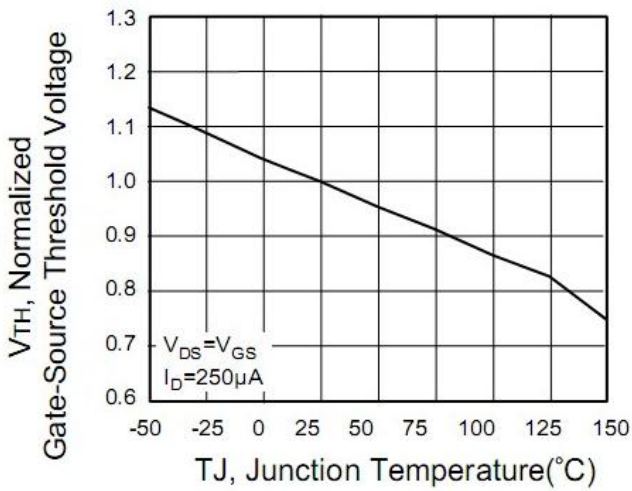


Figure 3. Gate Threshold Variation with Temperature

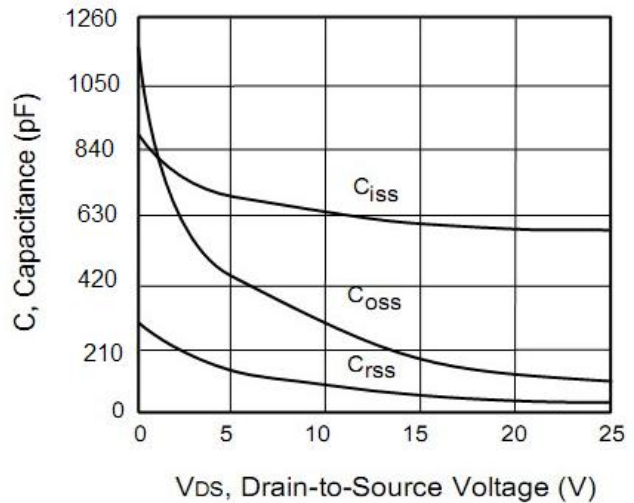


Figure 4. Capacitance Characteristics

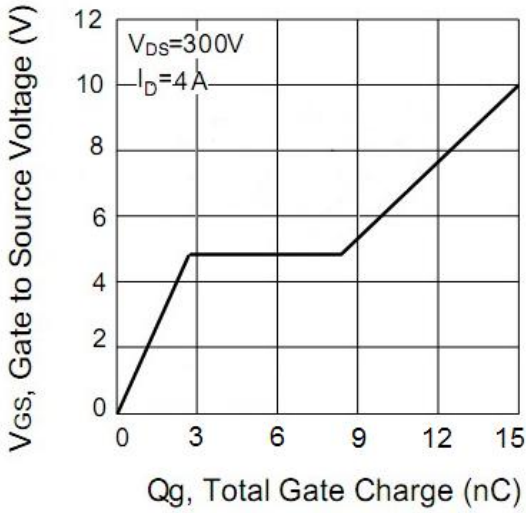


Figure 5. Gate Charge Characteristics

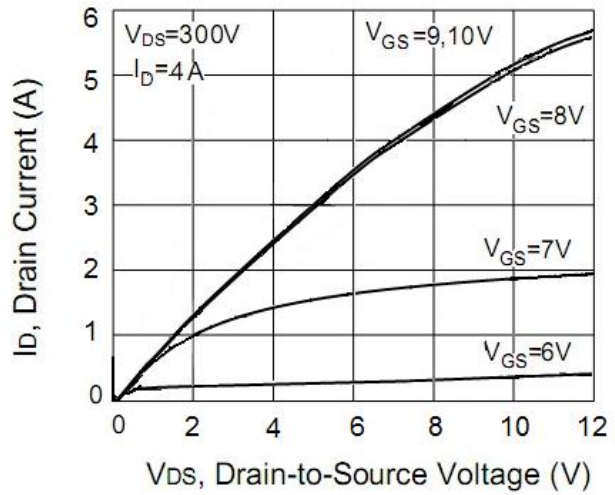


Figure 6. On-State Characteristics

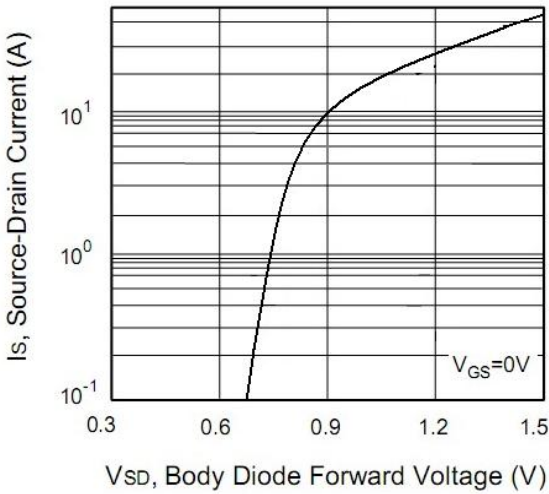


Figure 7. Body Diode Forward Voltage Variation with Source Current

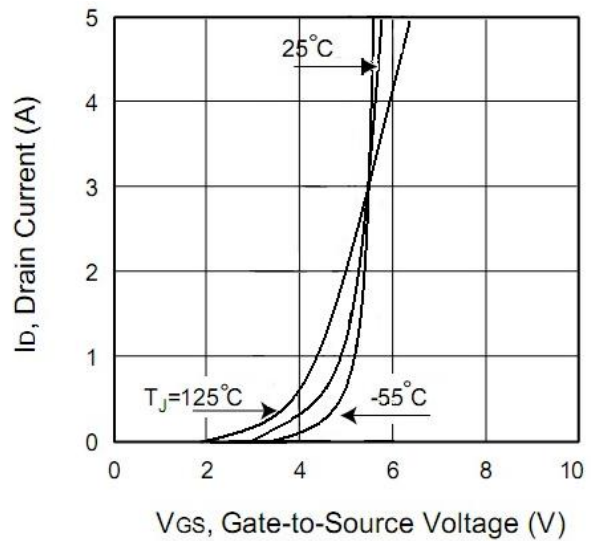


Figure 8. Transfer Characteristics

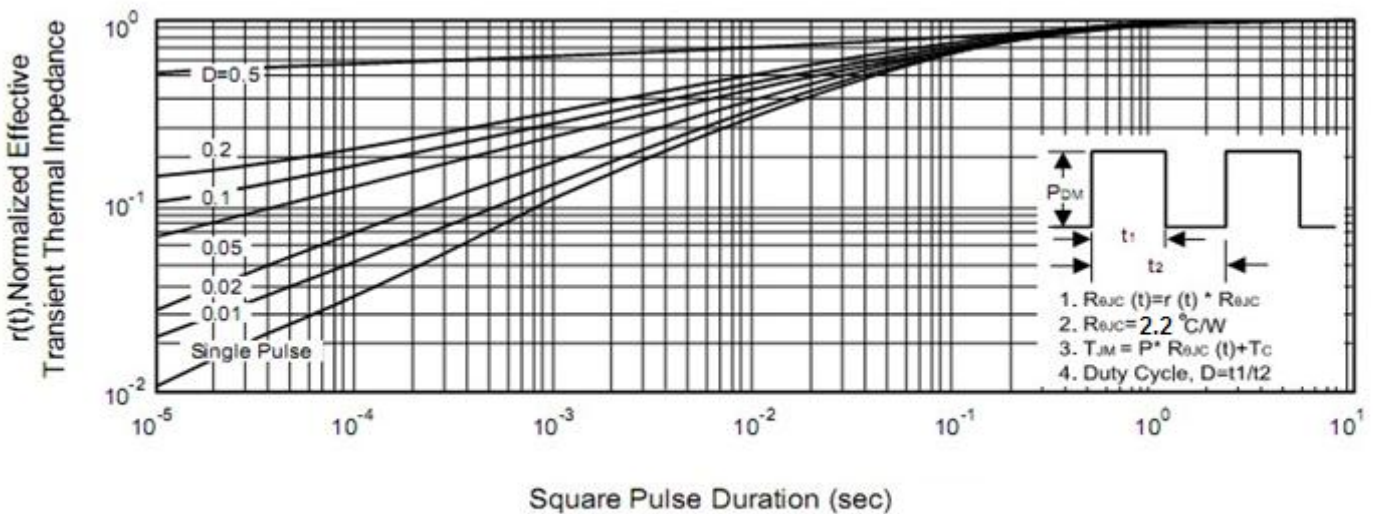
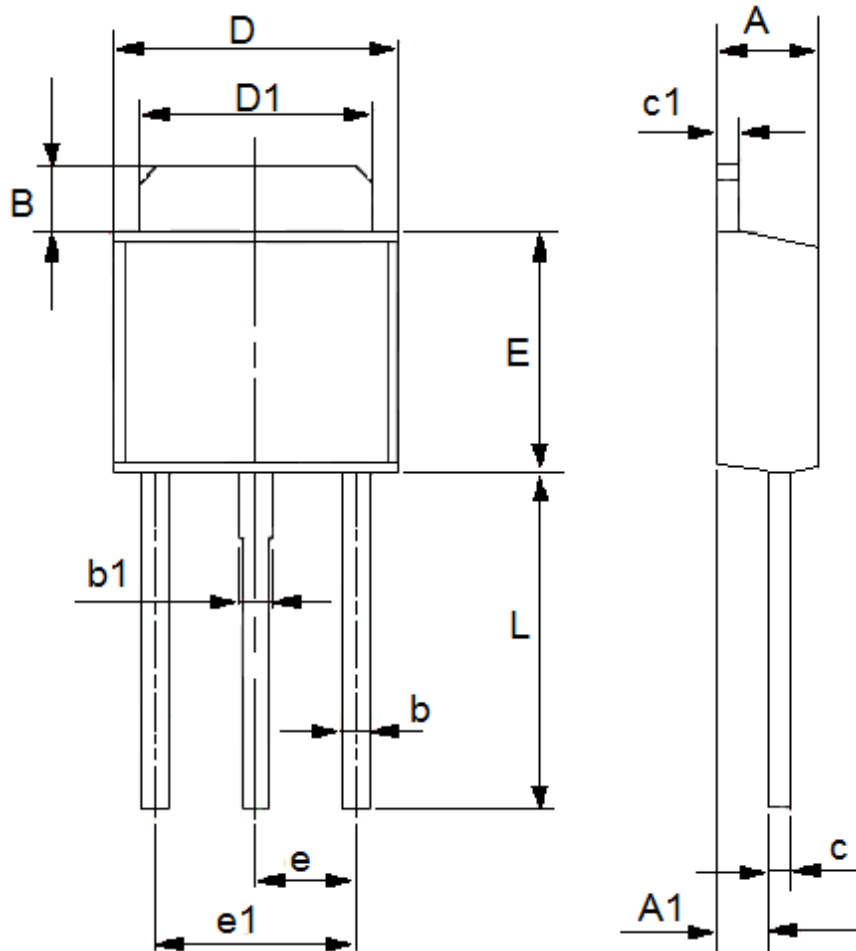


Figure 9 Normalized Effective Transient Thermal Impedance With Pulse Duration

Package Information

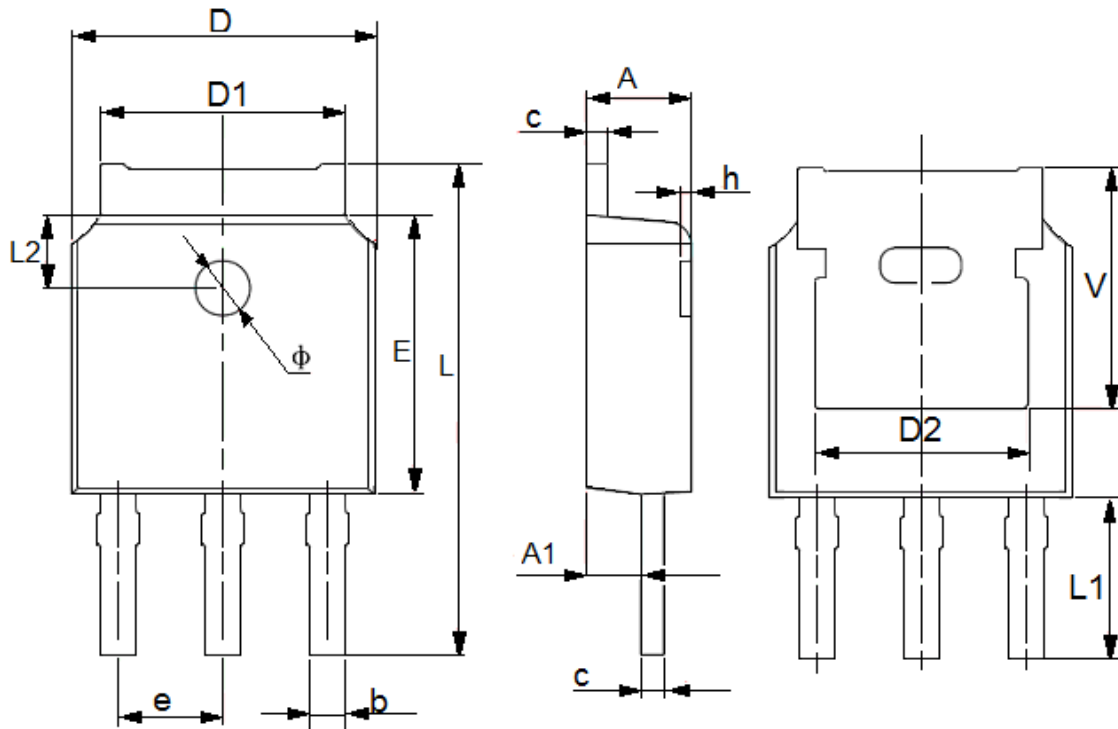
NOTE: (A)、(B)、(C) ...on behalf of the different shapes of the size, the difference is not large, the company random delivery. These sizes are in line with our product requirements, please rest assured that the use of.

- Package Type:TO-251 (A)



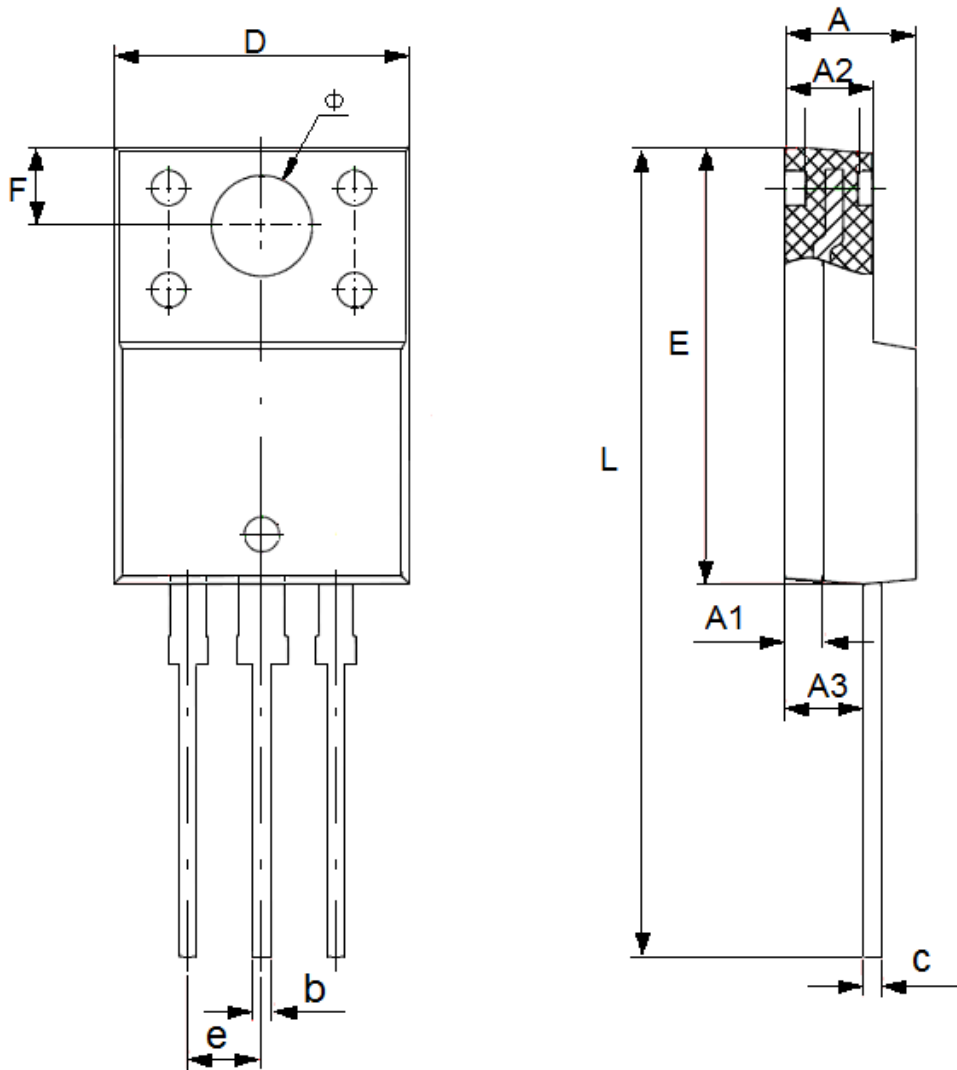
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.2	2.5	0.0866	0.0984
A1	1.05	1.35	0.0413	0.0531
B	1.3	1.65	0.0512	0.065
b	0.5	0.75	0.0197	0.0295
b1	0.7	0.95	0.0276	0.0374
D	6.3	6.7	0.2480	0.2638
D1	5.2	5.4	0.2047	0.2126
E	5.3	5.8	0.2087	0.2283
e	2.3(TYP)		0.0906(TYP)	
e1	4.6(TYP)		0.1811(TYP)	
L	7.5	8.25	0.2953	0.3248
c	0.5(TYP)		0.0197(TYP)	
c1	0.5(TYP)		0.0197(TYP)	

● Package Type: TO-251 (S)



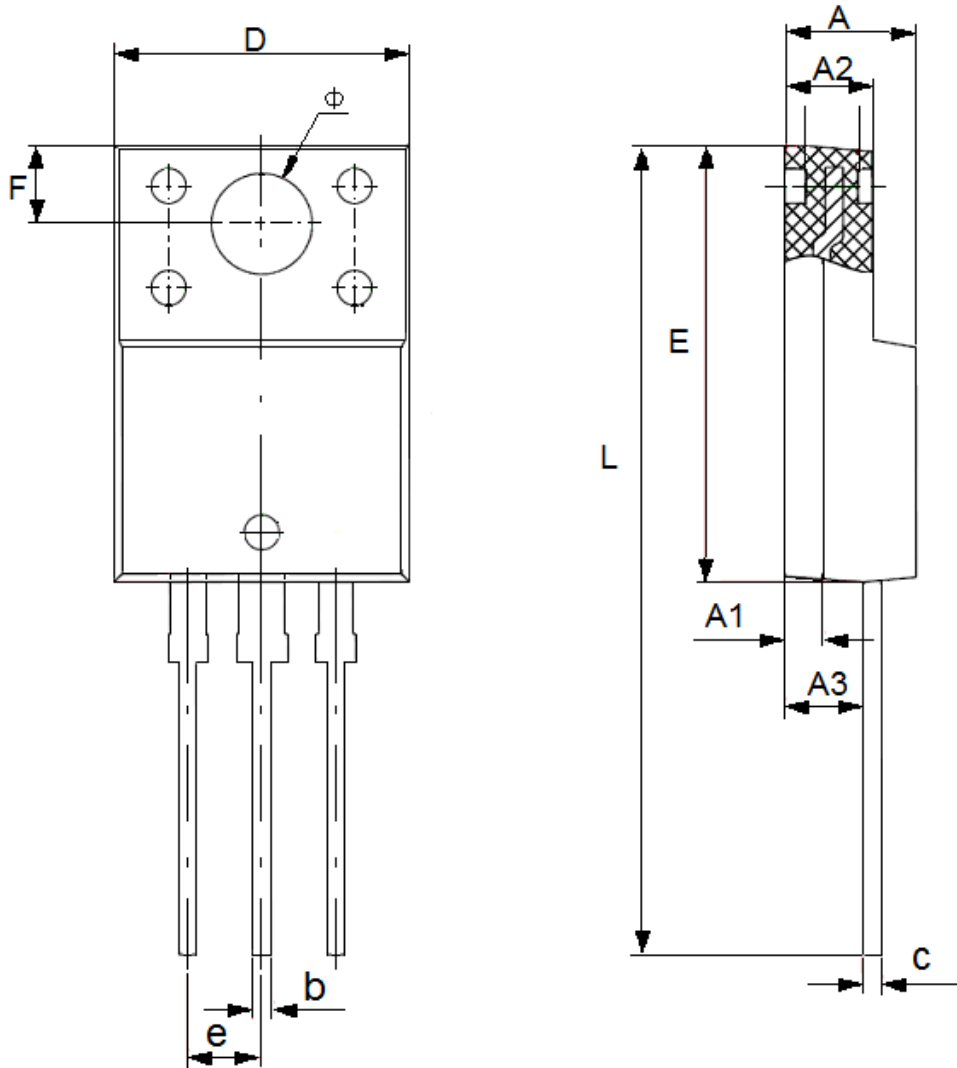
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.2	2.4	0.0866	0.0945
A1	0.86	1.16	0.0339	0.0457
b	0.66	0.86	0.026	0.0339
c	0.46	0.58	0.0181	0.0228
D	6.5	6.7	0.256	0.2638
D1	5.1	5.46	0.2008	0.215
D2	4.83(TYP)		0.1902(TYP)	
E	6	6.2	0.2362	0.2441
e	2.186	2.386	0.0861	0.0939
L	10.4	11	0.4094	0.4331
L1	3.3	3.7	0.1299	0.1457
L2	1.6(TYP)		0.063(TYP)	
h	0	0.3	0	
φ	1.1	1.3	0.0433	0.0118
V	5.35(TYP)		0.2106(TYP)	

● Package Type: TO-220F (A)



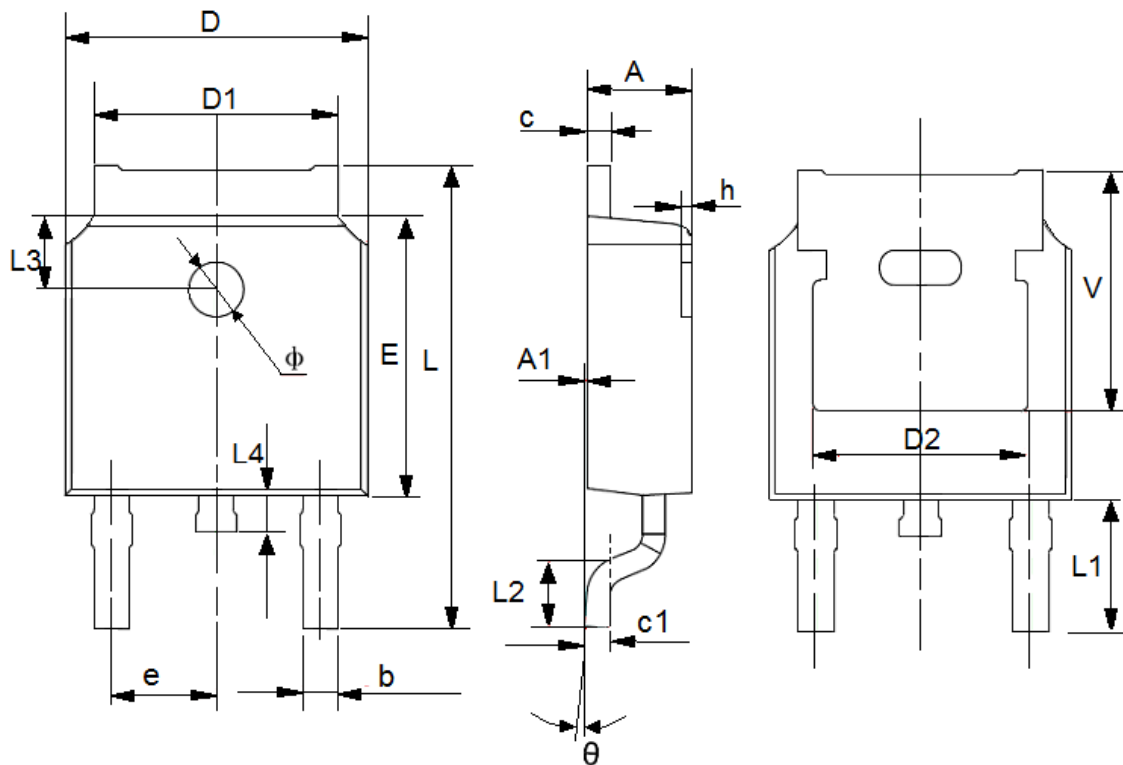
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	4.5	4.9	0.1771	0.1929
A1	0.75	1.05	0.0295	0.0413
A2	2.35	2.75	0.0925	0.1083
A3	2.65	2.85	0.1043	0.1122
b	0.75	0.85	0.0295	0.0334
c	0.45	0.6	0.0177	0.0236
D	10	10.32	0.3937	0.4063
E	15.65	16.05	0.6161	0.6319
e	2.54REF		0.100REF	
F	3.2	3.4	0.1260	0.1338
Φ	3.08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

● Package Type: TO-220F (B)



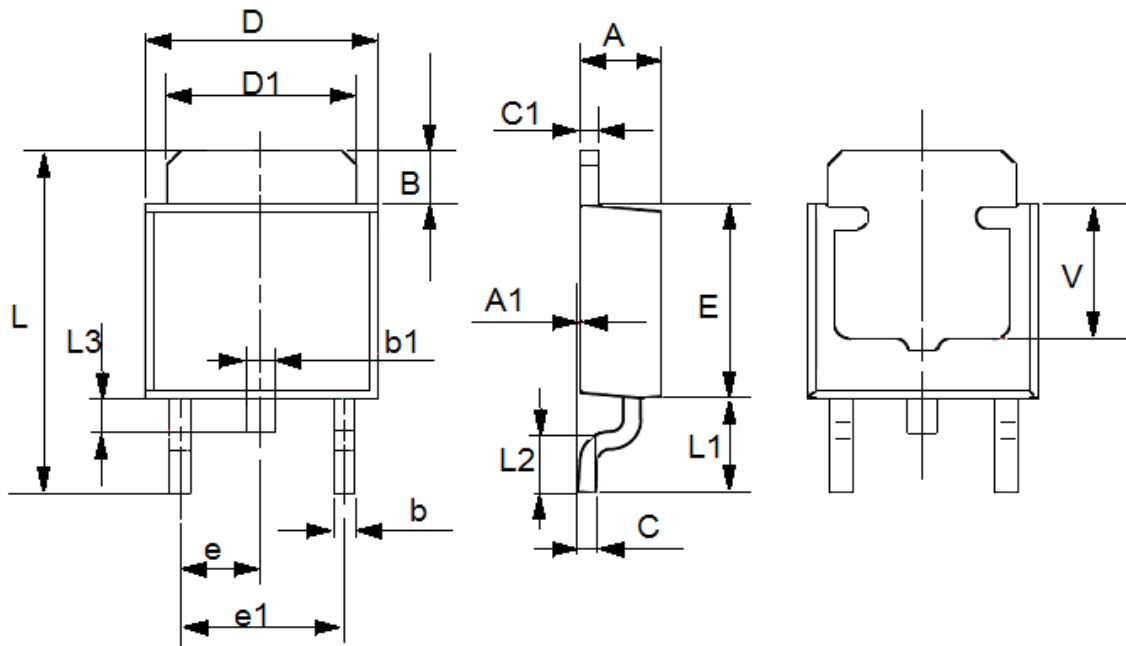
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	4.5	4.9	0.1771	0.1929
A1	0.75	1.05	0.0295	0.0413
A2	2.35	2.75	0.0925	0.1083
A3	2.65	2.9	0.1043	0.1142
b	0.75	0.85	0.0295	0.0334
c	0.45	0.6	0.0177	0.0236
D	10	10.32	0.3937	0.4063
E	15.65	16.15	0.6161	0.6358
e	2.54REF		0.100REF	
F	3.2	3.4	0.1260	0.1338
Φ	3.08	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	2.2	2.4	0.0866	0.0945
A1	0	0.127	0	0.005
b	0.66	0.86	0.026	0.0339
c	0.46	0.58	0.0181	0.0228
c1	0.498	0.6	0.0196	0.0236
D	6.5	6.7	0.2559	0.2638
D1	5.33(TYP)		0.2098(TYP)	
D2	4.83(TYP)		0.1902(TYP)	
E	6	6.2	0.2362	0.2441
e	2.286(TYP)		0.09(TYP)	
L	9.8	10.4	0.3858	0.4094
L1	2.9(TYP)		0.1142(TYP)	
L2	1.4	1.7	0.0551	0.0669
L3	1.6(TYP)		0.063(TYP)	
L4	0.6	1	0.0236	0.0394
h	0	0.3	0	0.0118
φ	1.1	1.3	0.0433	0.0512
V	5.3(TYP)		0.2087(TYP)	
θ	0	8°	0	8°

● Package Type: TO-252 (B)



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.2	2.5	0.0866	0.0984
A1	0	0.127	0	0.005
B	1.15	1.65	0.0453	0.065
b	0.5	0.7	0.0197	0.0276
b1	0.7	0.9	0.0276	0.0354
c	0.5(TYP)		0.0197(TYP)	
c1	0.52(TYP)		0.0205(TYP)	
D	6.3	6.7	0.2480	0.2638
D1	5.3(TYP)		0.2087(TYP)	
E	5.4	5.8	0.2126	0.2283
e	2.3(TYP)		0.0906(TYP)	
e1	4.6(TYP)		0.1811(TYP)	
L	9.3	9.9	0.3661	0.3898
L1	2.35	2.95	0.0925	0.1161
L2	1.4	1.78	0.0551	0.07
L3	0.35	0.95	0.0138	0.0374
V	3.8(TYP)		0.1496(TYP)	

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