LD1085

3A Low Dropout Positive Regulator

GENERAL DESCRIPTION

The LD1085 is a low dropout three terminal regulator with 3A output current capability. The output voltage is adjustable with the use of a resistor divider or fixed 1.5V/1.8V/2.5V/3.3V/5V. Dropout voltage is guaranteed to be at maximum of 1.5V with the maximum output current. Its low dropout voltage and fast transient response make it ideal for low voltage microprocessor applications. Current limit and thermal protection provide protection against any overload condition that would create excessive junction temperatures.

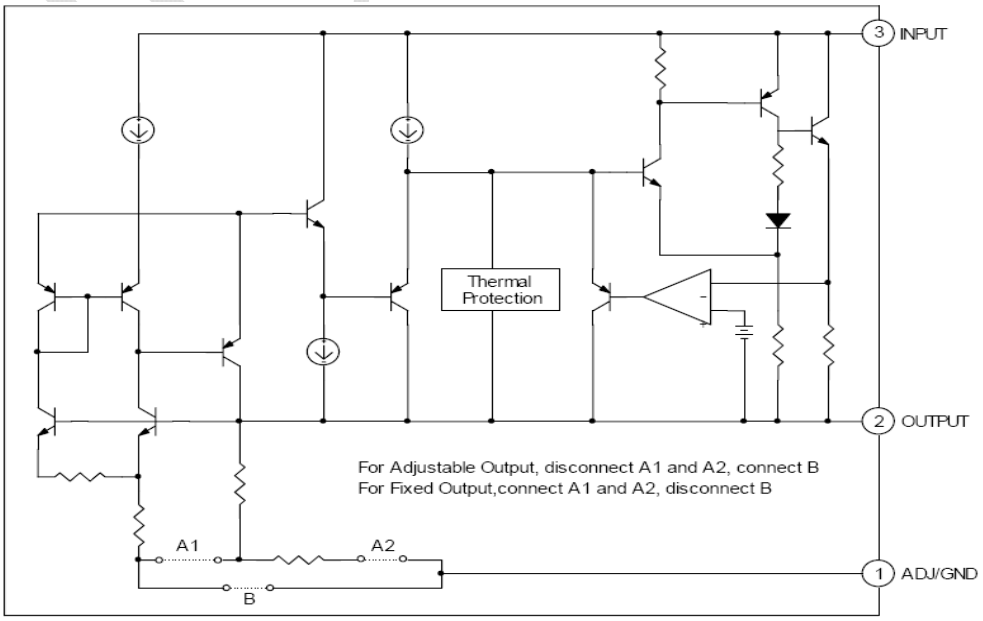
FEATURES

- 1.5V Max. Dropout Voltage at 3A Output Current.
- Fast Transient Response.
- Extremely Tight Line and Load Regulation.
- Current Limiting and Thermal Protection.
- Adjustable Output Voltage or Fixed 1.5V, 1.8V,2.5V,3.3V,5.0V.

APPLICATIONS

- Mother Board I/O Power Supplies
- Microprocessor Power Supplies.
- High Current Regulator
- Post Regulator for Switching Supply.
- Notebook Computers

BLOCK DIAGRAM



PIN DESCRIPTIONS

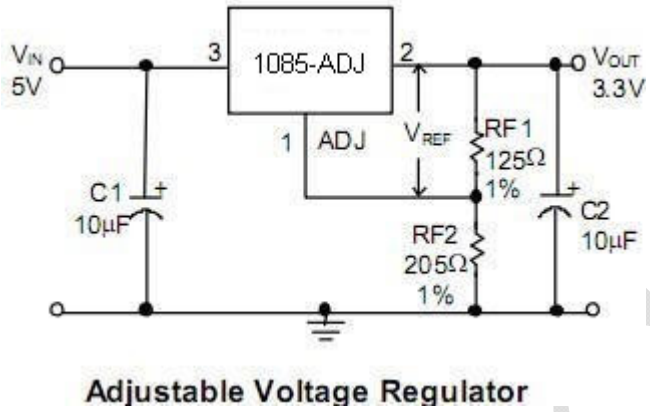
ADJ PIN - Providing VREF=1.25V (typ.) for adjustable VOUT. VREF=VOUT-VADJ and IADJ=60u A (typ.)

/GND PIN- Power ground.

VOUT PIN - Adjustable output voltage.

VIN PIN - Power Input.

TYPICAL APPLICATION CIRCUIT



Adjustable Voltage Regulator

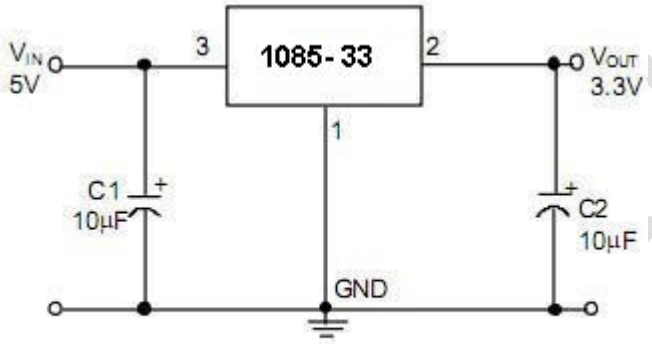
$V_{REF}=V_{OUT}$ - V_{ADJ}=1.25V (typ.)

$V_{OUT}=V_{REF}$ x (1+RF2/RF1)+ I_{ADJ} x RF2

I_{ADJ}=60uA (typ.)

(1) C1 needed if device is far away from filter capacitors.

(2) C2 required for stability.



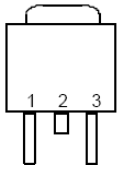
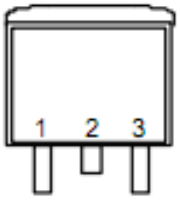
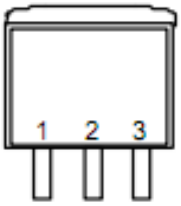
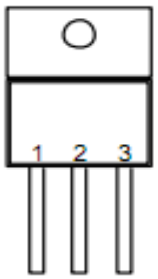
Fixed Voltage Regulator

ORDERING INFORMATION

LD1085 □□ C □

Package Type
E:TO-252
M:TO-263-2
T:TO-220
MA:TO-263-3

Output Voltage
ADJ:adj
15:1.5V
18:1.8V
25:2.5V
33:3.3V
50:5.0V

ORDER NUMBER	PIN CONFIGURATION
LD1085CE (TO-252)	FRONT VIEW 1: ADJ (GND) 2: VOUT (TAB) 3: VIN 
LD1085CM (TO-263-2)	FRONT VIEW 1: ADJ (GND) 2: VOUT (TAB) 3: VIN 
LD1085CMA (TO-263-3)	FRONT VIEW 1: ADJ (GND) 2: VOUT (TAB) 3: VIN 
LD1085CT (TO-220)	FRONT VIEW 1: ADJ (GND) 2: VOUT (TAB) 3: VIN 

ABSOLUTE MAXIMUM RATINGS

Input Voltage(Note 1)..... .... 30V

Operating Junction Temperature Range .... -20°C~ 125°C

Storage Temperature Range .... - 65°C ~ 150°C

Thermal Resistance Junction to Case TO-252 .... 15°C/W

TO-263-3, TO263-2, TO-220..... .... 6°C /W

Thermal Resistance Junction to Ambient TO-252 .... 100°C/W

(Assume no ambient airflow, no heatsink) TO-263-2 ... . 60°C /W

TO-263-3 ... . 60°C /W

TO-220 ... . 50°C /W

Lead Temperature (Soldering) 10 sec. .... 260°C

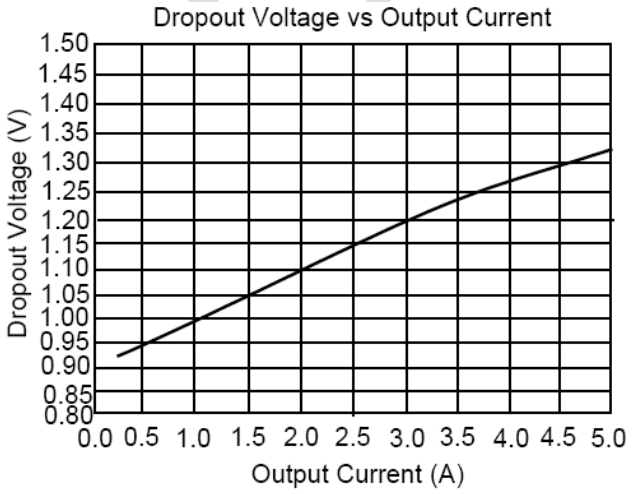
Note 1: Although the devices maximum operating voltage is limited, The devices are guaranteed to withstand transient input voltages up to 30V. For input voltages greater than the maximum operating input voltage some degradation of specifications will occur. For input/output voltage differentials greater than12V, a minimum external load of 5mA is required to maintain regulation.

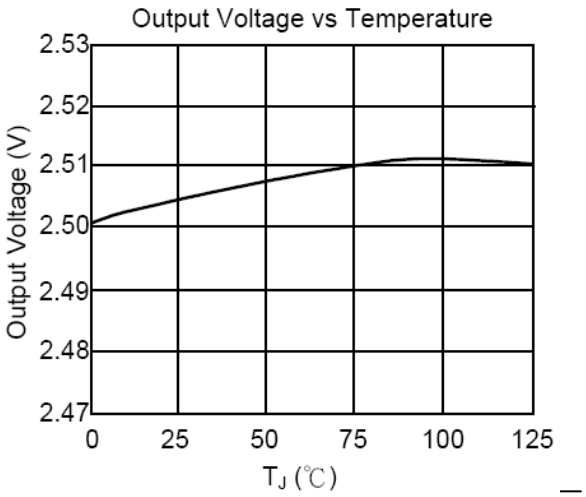
ELECTRICAL CHARACTERISTICS

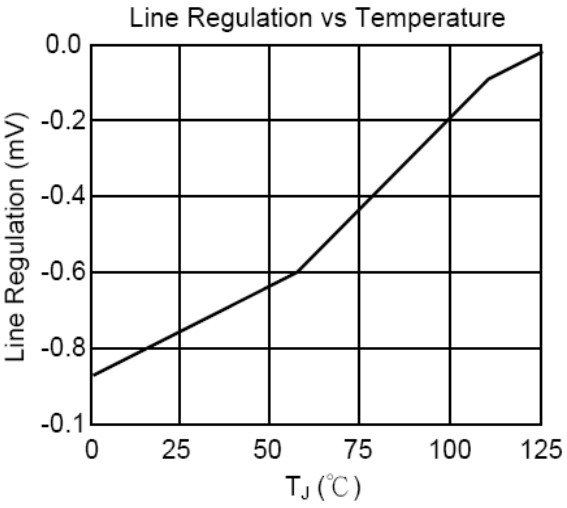
(VIN≤10V, TJ=25°C, IO=10mA, Unless otherwise specified)

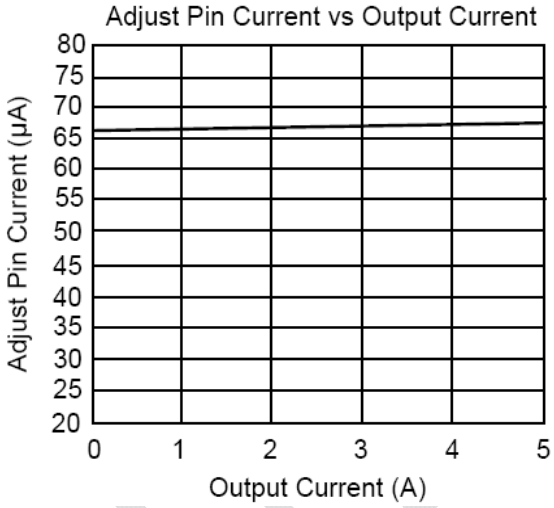
PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Reference Voltage	LD1085 (ADJ) 1.5V≤ V_{IN}-V_{OUT} ≤8V	1.225	1.25	1.275	V
Output Voltage	LD1085-15 LD1085-18 LD1085-25 LD1085-33 LD1085-50	1.470 1.764 2.450 3.235 4.90	1.50 1.80 2.50 3.30 5.00	1.530 1.836 2.550 3.365 5.10	V
Line Regulation	1.5V≤V_{IN}-V_{OUT}≤10V		0.02	0.5	%
Load Regulation	10mA < I_O < 3A			1	%
Dropout Voltage	I_{OUT}=3A,△V_{OUT}= 1%V_{OUT}		1.3	1.5	V
Current Limit	V_{IN}-V_{OUT} =3V	5.1			A
Adjusted Pin Current	I_O=10mA~3A 1.5V≤ V_{IN}-V_{OUT} ≤10V		60	120	uA
Adjusted Pin Current Change(△I_{ADJ})	I_O=10mA~3A 1.5V≤ V_{IN}-V_{OUT} ≤10V		0.2	5	uA
Temperature Stability	I_O=10mA		0.5		%
Minimum Load Current	1.5V≤ V_{IN}-V_{OUT} ≤10V		5	10	mA
RMS Output Noise (% of V_{OUT})	10Hz ≤f ≤10KHz		0.003		%
Ripple Rejection Ratio	120Hz input ripple C_{OUT}=25Uf (V_{IN} -V_{OUT})=3V		60	72	dB

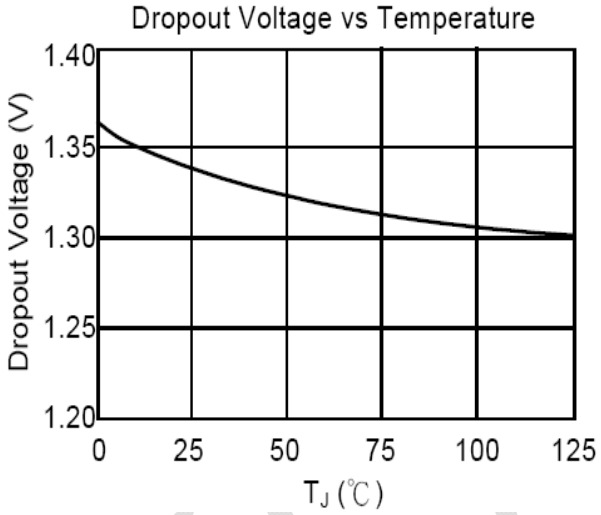
TYPICAL PERFORMANCE CHARACTERISTICS

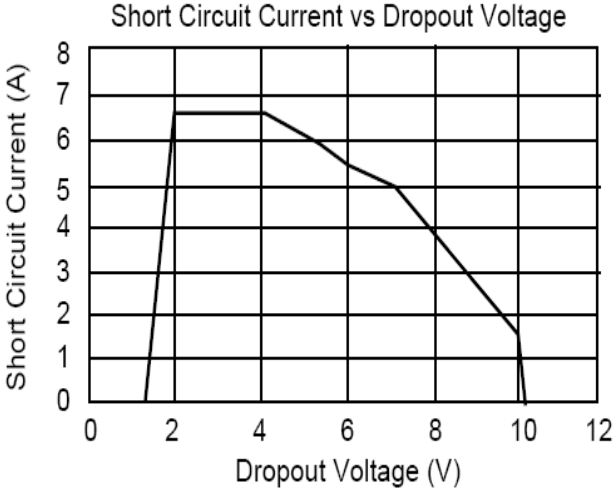


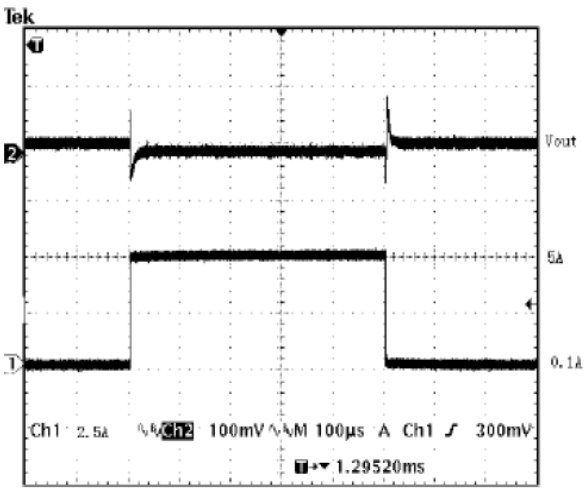






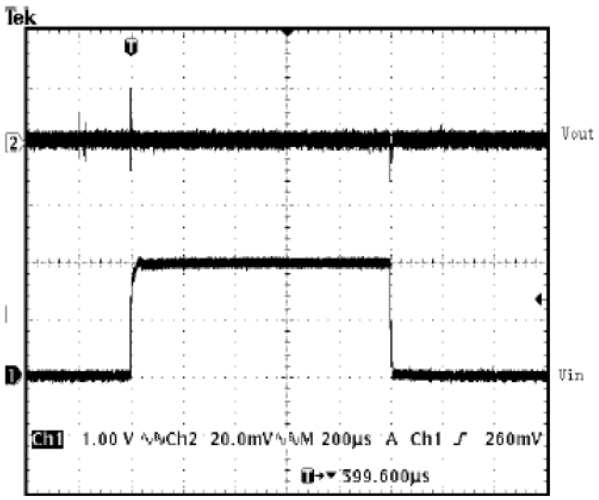






Vin=5.5V, Vout=2.5V Io=100mA to 5A Cin=Cout=100μF(tan)

Load Transient Response

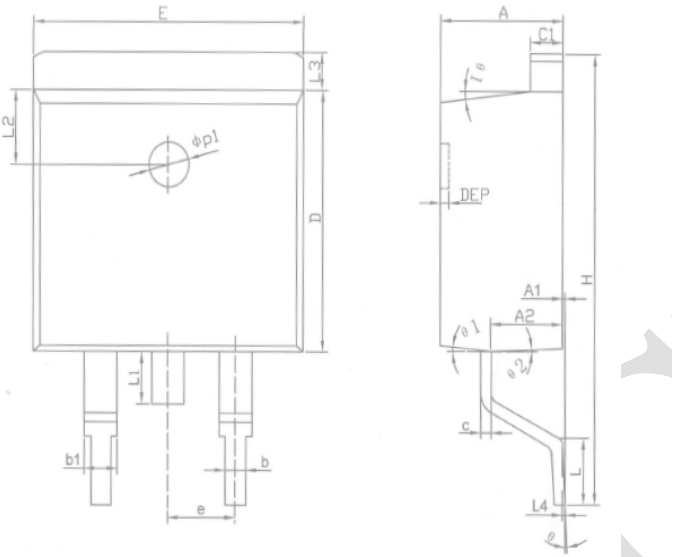


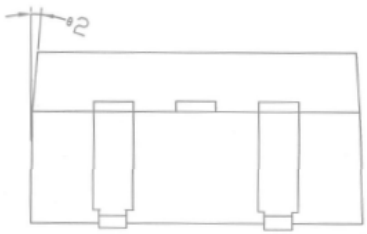
Vin=4.5V to 6.5V Vout=2.5V Io=200mA Cin=Cout=100μF(tan)

Line Transient Response

PACKAGE INFORMATION

TO-263-2



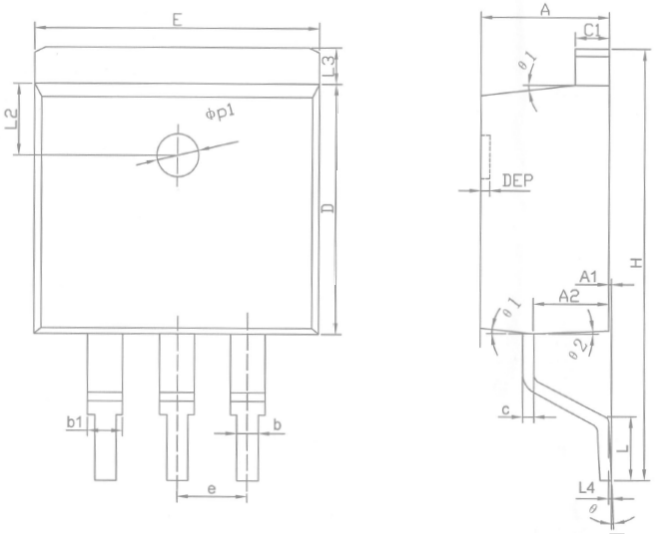


COMMON DIMENSIONS

SYMBOL	MILLIMETER			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185
A1	0	0.10	0.25	0	0.004	0.010
A2	2.59	2.69	2.79	0.102	0.106	0.110
b	0.77	-	0.90	0.030	-	0.035
b1	1.23	-	1.36	0.048	-	0.054
c	0.34	-	0.47	0.013	-	0.019
C1	1.22	-	1.32	0.048	-	0.052
D	8.60	8.70	8.80	0.338	0.343	0.346
E	10.06	10.16	10.26	0.396	0.4	0.404
e	2.54BSC			0.1BSC		
H	14.70	15.10	15.50	0.579	0.594	0.610
L	2.00	2.30	2.60	0.079	0.090	0.102
L3	1.17	1.27	1.40	0.046	0.050	0.055
L1	-	-	1.70	-	-	0.067
L4	0.25BSC			0.01BSC		
L2	2.50REF			0.098REF		
θ	0°	-	8°	0°	-	8°
θ1	5°	7°	9°	5°	7°	9°
θ2	1°	3°	5°	1°	3°	5°
DEP	0.05	0.10	0.20	0.002	0.004	0.008
Φp1	1.40	1.50	1.60	0.055	0.059	0.063

NOTES:
1.ALL DIMENSIONS REFER TO JEDEC STANDARD TO263-2L DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS

TO-263-3

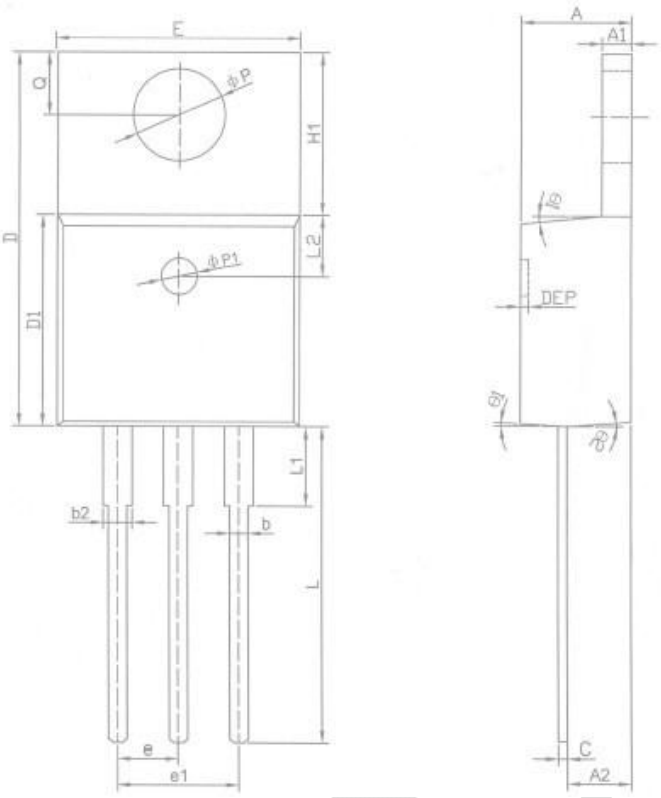


COMMON DIMENSIONS

SYMBOL	MILLIMETER			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185
A1	0	0.10	0.25	0	0.004	0.010
A2	2.59	2.69	2.79	0.102	0.106	0.110
b	0.77	–	0.90	0.030	–	0.035
b1	1.23	–	1.36	0.048	–	0.054
c	0.34	–	0.47	0.013	–	0.019
c1	1.22	–	1.32	0.048	–	0.052
D	8.60	8.70	8.80	0.338	0.343	0.346
E	10.06	10.16	10.26	0.396	0.4	0.404
e	2.54BSC			0.1BSC		
H	14.70	15.10	15.50	0.579	0.594	0.610
L	2.00	2.30	2.60	0.079	0.090	0.102
L3	1.17	1.27	1.40	0.046	0.050	0.055
L4	0.25BSC			0.01BSC		
L2	2.50REF			0.098REF		
θ	0°	–	8°	0°	–	8°
θ1	5°	7°	9°	5°	7°	9°
θ2	1°	3°	5°	1°	3°	5°
DEP	0.05	0.10	0.20	0.002	0.004	0.008
φp1	1.40	1.50	1.60	0.055	0.059	0.063

NOTES:
1.ALL DIMENSIONS REFER TO JEDEC STANDARD TO263-3L DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS

TO-220

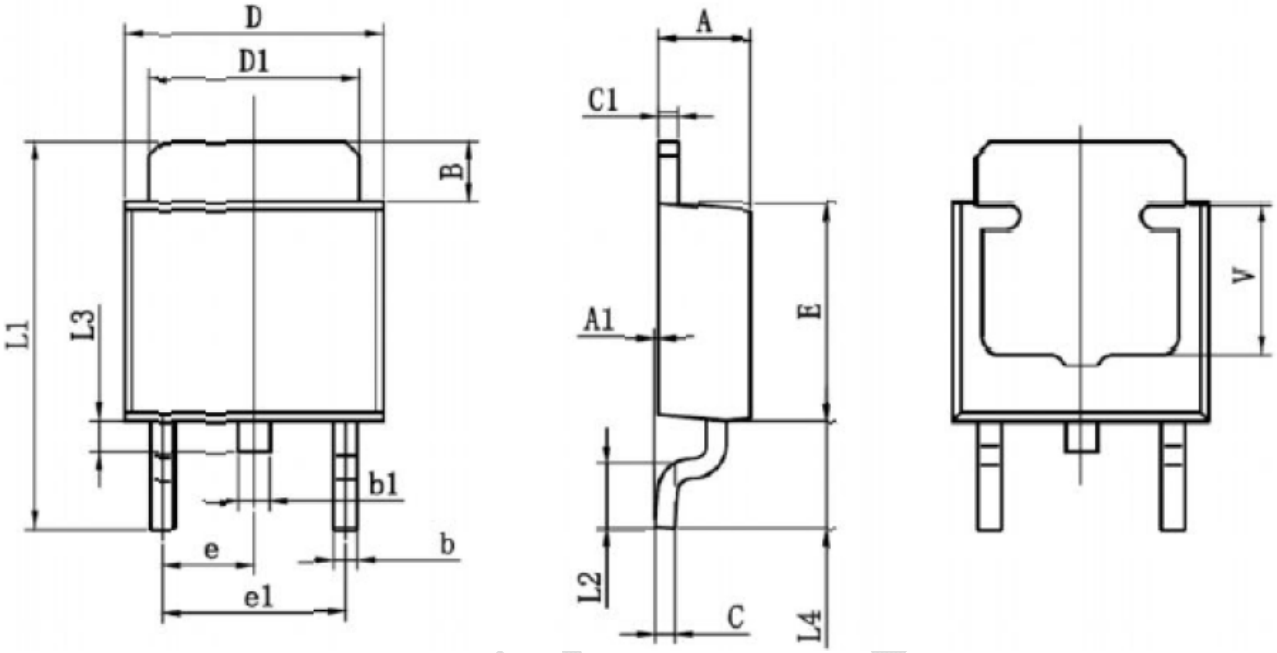


COMMON DIMENSIONS

SYMBOL	MILLIMETER			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185
A1	1.22	–	1.32	0.048	–	0.052
A2	2.59	2.69	2.79	0.102	0.106	0.110
b	0.77	–	0.90	0.030	–	0.035
b2	1.23	–	1.36	0.048	–	0.054
c	0.34	–	0.47	0.013	–	0.019
D	14.70	15.00	15.30	0.579	0.591	0.602
D1	8.60	8.70	8.80	0.338	0.343	0.346
E	10.06	10.16	10.26	0.396	0.400	0.404
e	2.54BSC			0.1BSC		
e1	5.08BSC			0.2BSC		
H1	6.10	6.30	6.50	0.240	0.248	0.256
L	13.15	–	13.57	0.518	–	0.534
L1	–	–	4.35	–	–	0.171
L2	2.50REF			0.098REF		
Φp	3.80	3.84	3.88	0.149	0.151	0.153
Q	2.60	–	2.90	0.102	–	0.114
θ1	5°	7°	9°	5°	7°	9°
θ2	1°	3°	5°	1°	3°	5°
DEP	0.05	0.1	0.2	0.002	0.004	0.008
Φp1	1.4	1.5	1.6	0.055	0.059	0.063

NOTES:
1.ALL DIMENSIONS REFER TO JEDEC STANDARD TO-220AB DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS

TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.014	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300TYP		0.0901TYP	
e1	4.500	4.700	0.177	0.185
L1	9.500	9.900	0.374	0.390
L2	1.400	1.780	0.055	0.070
L3	0.650	0.950	0.026	0.037
L4	2.550	2.900	0.100	0.114
V	3.80REF		0.150REF	