

3A Low Dropout Positive Regulator

FEATURES

- Dropout Voltage 1.3V 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 and 3.3V.
- Standard 3-Pin Power Packages.

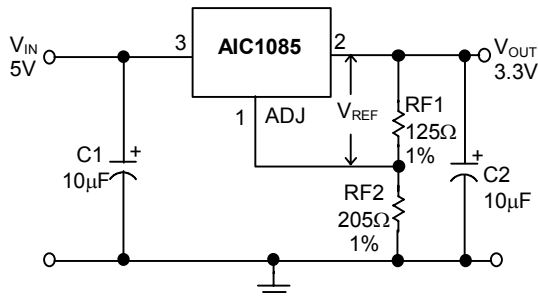
APPLICATIONS

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

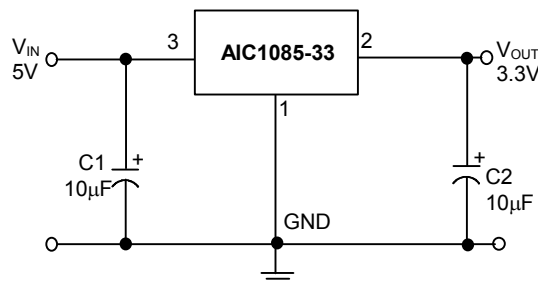
DESCRIPTION

The AIC1085 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 and 3.3V. Dropout voltage is guaranteed to be at a maximum of 1.4V with the maximum output current. Its low dropout voltage and fast transient response make it ideal for low voltage microprocessor applications. Current limiting and thermal protection provides protection against any overload condition that would create excessive junction temperatures.

TYPICAL APPLICATION CIRCUIT



Adjustable Voltage Regulator



Fixed Voltage Regulator

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

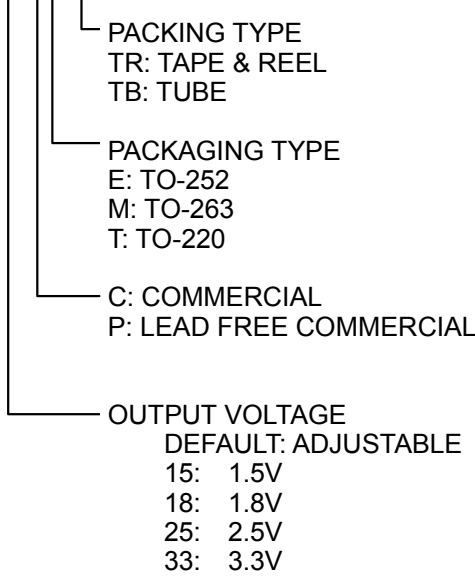
$$V_{OUT} = V_{REF} \times \left(1 + \frac{RF2}{RF1}\right) + I_{ADJ} \times RF2$$

$$I_{ADJ} = 55\mu A \text{ (typ.)}$$

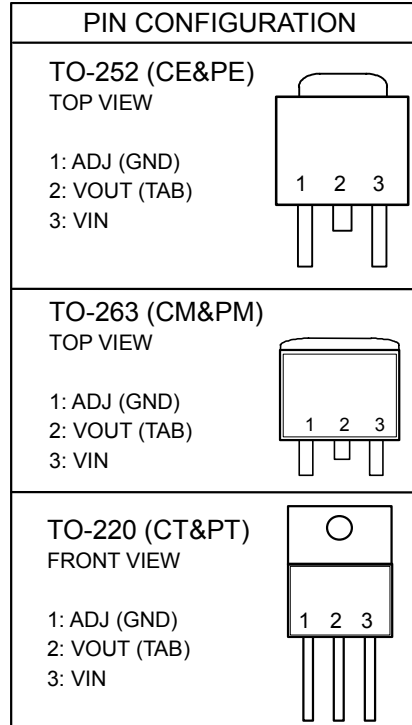
- (1) C1 needed if device is far away from filter capacitors.
- (2) C2 required for stability.

ORDERING INFORMATION

AIC1085-XXXXXX



Example: AIC1085-15CETR
 → 1.5V version in TO-252 Package & Taping & Reel Packing Type
 AIC1085-15PMTR
 → 1.5V version in TO-263 Lead Free Package & Taping & Reel Packing Type



ABSOLUTE MAXIMUM RATINGS

VIN pin to ADJ/ GND pin.....	7V
Operating Temperature Range	-40°C to 85°C
Storage Temperature Range.....	-65°C to 150°C
Maximum Junction Temperature.....	125°C
Lead Temperature (Soldering, 10 sec).....	260°C
Thermal Resistance Junction to Case TO-252.....	12.5°C/W
TO-263, TO-220.....	3°C /W
Thermal Resistance Junction to Ambient TO-252.....	100°C/W
(Assume no ambient airflow, no heatsink) TO-263.....	60°C /W
TO-220.....	50°C /W

Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

■ TEST CIRCUIT

Refer to TYPICAL APPLICATION CIRCUIT.

■ ELECTRICAL CHARACTERISTICS

($V_{IN}=5V$, $T_J=25^{\circ}C$, $I_O=10mA$, unless otherwise specified) (Note1)

PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Reference Voltage ($V_{OUT}-V_{ADJ}$)	AIC1085 (ADJ)	1.238	1.25	1.262	V
Output Voltage	AIC1085-15, $V_{IN}=5V$	1.48	1.50	1.52	V
	AIC1085-18, $V_{IN}=5V$	1.78	1.80	1.82	
	AIC1085-25, $V_{IN}=5V$	2.47	2.50	2.53	
	AIC1085-33, $V_{IN}=5V$	3.26	3.30	3.34	
Line Regulation	ADJ: $2.65V \leq V_{IN} \leq 7V$, $V_{OUT}=1.25V$		0.015	0.2	%
	Fix : $V_{OUT}+1.4V \leq V_{IN} \leq 7V$				
Load Regulation	$10mA < I_O < 3A$			0.6	%
Dropout Voltage	$\Delta V_{OUT}, \Delta V_{REF}=1\%$ $10mA \leq I_O \leq 3A$		1.3	1.4	V
Current Limit		3	4		A
GND Current (Fix)	$2.65V \leq V_{IN} \leq 7V$		11.5	14	mA
Adjusted Pin Current (I_{ADJ})	$2.65V \leq V_{IN} \leq 7V$		55	120	μA
Adjusted Pin Current Change (ΔI_{ADJ})	$2.65V \leq V_{IN} \leq 7V$		0.2	5	μA
Temperature Stability	$I_O=0.5A$		0.5		%
Minimum Load Current			5	10	mA
RMS Output Noise (% of V_{OUT})	$10Hz \leq f \leq 10KHz$		0.003		%
Ripple Rejection Ratio	120Hz input ripple $C_{OUT}=25\mu F$ $(V_{IN}-V_{OUT})=3V$	60	72		dB

Note 1: Specifications are production tested at $T_A=25^{\circ}C$. Specifications over the $-40^{\circ}C$ to $85^{\circ}C$ operating temperature range are assured by design, characterization and correlation with Statistical Quality Controls (SQC).

TYPICAL PERFORMANCE CHARACTERISTICS

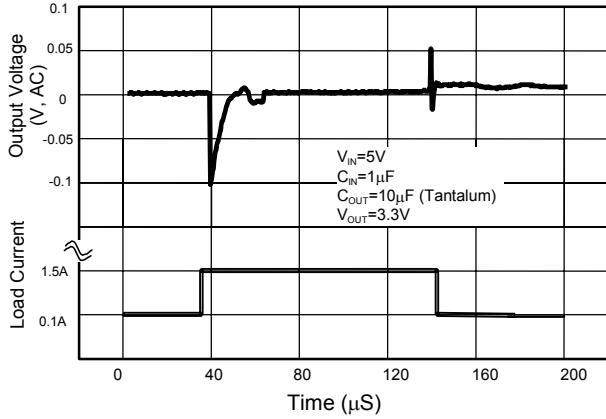


Fig. 1 Load Transient Response

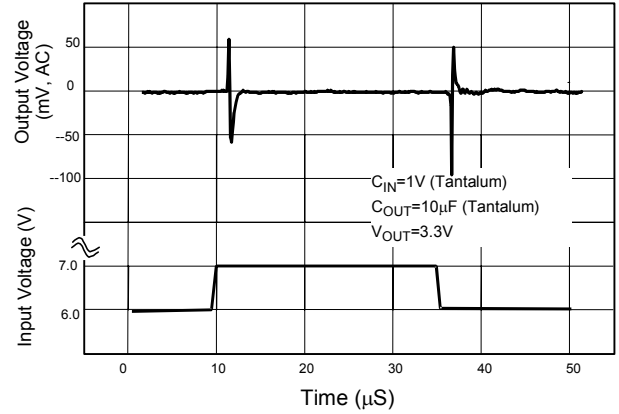


Fig. 2 Line Transient Response

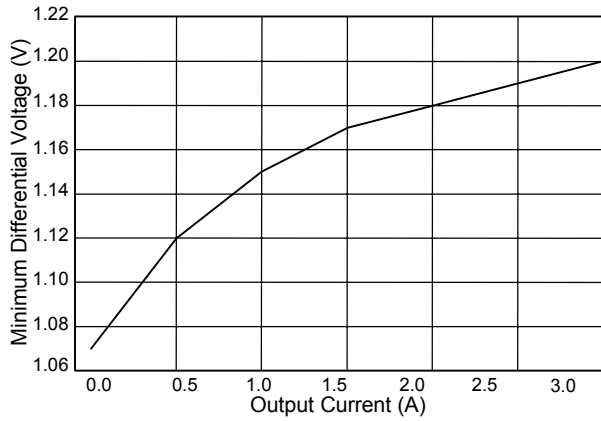


Fig. 3 Dropout Voltage ($V_{OUT}=3.3V$)

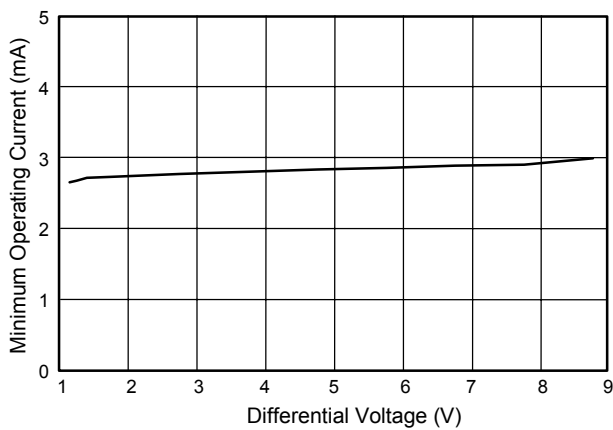
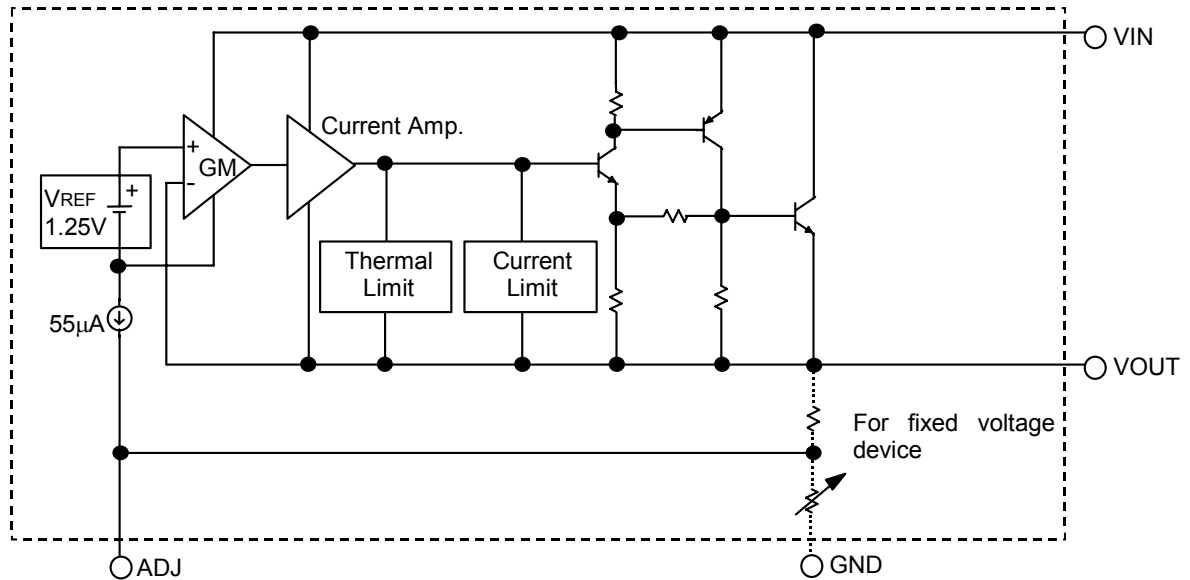
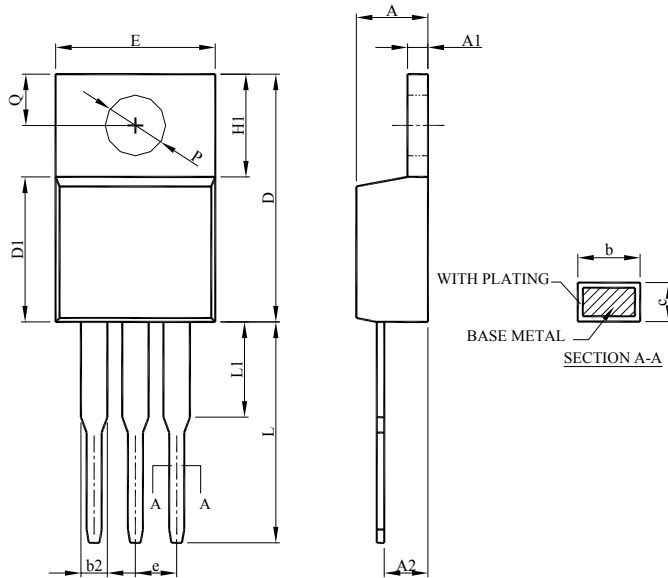


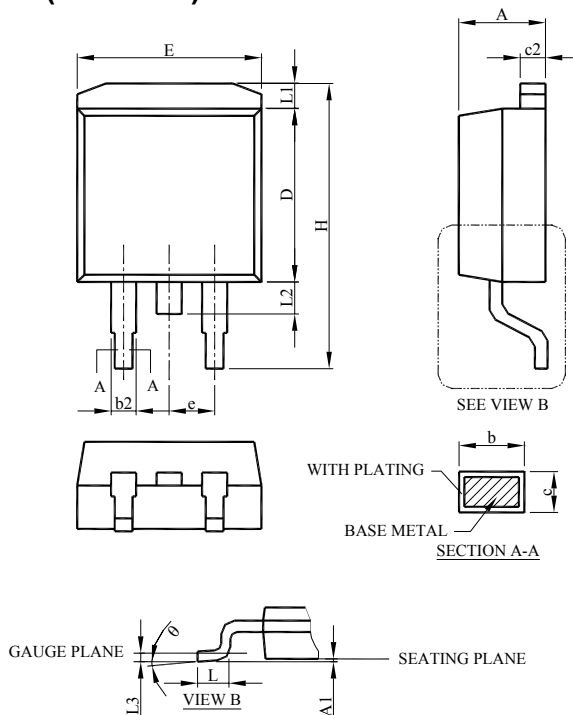
Fig. 4 Minimum Operating Current

■ BLOCK DIAGRAM

■ PIN DESCRIPTIONS

- ADJ PIN - Providing $V_{REF}=1.25V$ (typ.) for adjustable V_{OUT} . $V_{REF}=V_{OUT}-V_{ADJ}$ and $I_{ADJ}=55\mu A$ (typ.)
- GND PIN -Power Ground.
- VOUT PIN - Adjustable output voltage.
- VIN PIN - Power Input.

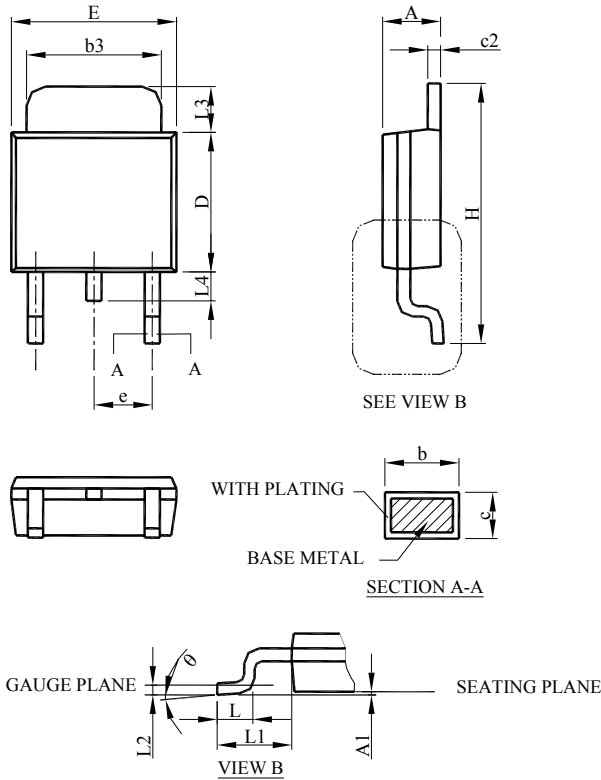
PHYSICAL DIMENSIONS
TO-220 (unit: mm)


SYMBOL	TO-220	
	MILLIMETERS	
	MIN.	MAX.
A	3.56	4.82
A1	0.51	1.39
A2	2.04	2.92
b	0.38	1.01
b2	1.15	1.77
c	0.35	0.61
D	14.23	16.51
D1	8.38	9.02
E	9.66	10.66
e	2.54 BSC	
H1	5.85	6.85
L	12.70	14.73
L1	--	6.35
P	3.54	4.08
Q	2.54	3.42

TO-263 (unit: mm)


SYMBOL	TO-263-3L	
	MILLIMETERS	
	MIN.	MAX.
A	4.06	4.83
A1	0.00	0.25
b	0.51	0.99
b2	1.14	1.78
c	0.38	0.74
c2	1.14	1.65
D	8.38	9.65
E	9.65	10.67
e	2.54 BSC	
H	14.61	15.88
L	1.78	2.79
L1	--	1.68
L2	--	1.78
L3	0.25 BSC	
θ	0°	8°

● TO-252 (unit: mm)



SYMBOL	TO-252-3L	
	MILLIMETERS	
	MIN.	MAX.
A	2.19	2.38
A1	0.00	0.13
b	0.64	0.89
b3	4.95	5.46
c	0.46	0.61
c2	0.46	0.89
D	5.33	6.22
E	6.35	6.73
e	2.28 BSC	
H	9.40	10.41
L	1.40	1.78
L1	2.67 REF	
L2	0.51 BSC	
L3	0.89	2.03
L4	--	1.02
θ	0°	8°

Note:

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