

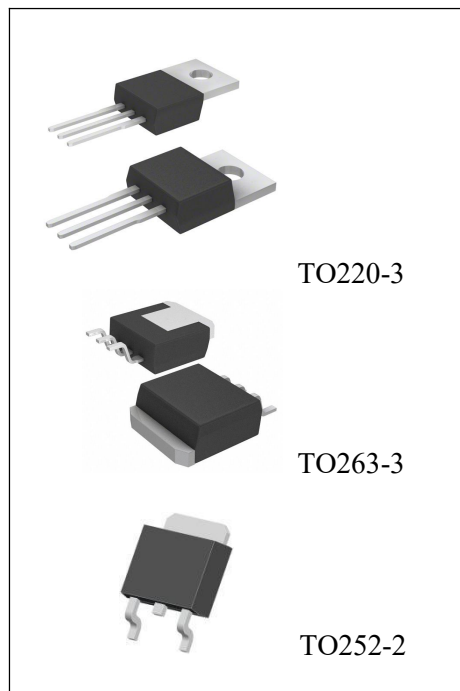
D1084

5A Low Dropout Positive Adjustable Regulator

General Description

The D1084 is a low dropout three terminal regulator with 5A 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, 5.0V and ADJ. Dropout is guaranteed at a maximum of 1.5V at maximum output current. Its low dropout voltage and fast transient response make it ideal for low voltage microprocessor applications. Internal current and thermal limiting provides protection against any overload condition that would create excessive junction temperatures.

The D1084 Series regulators are available in the popular industry standard TO220-3, TO252-2 and TO263-3 packages.



Features

- Dropout Voltage 1.4V at 5A Output Current.
- Fast Transient Response.
- Line Regulation typically at 0.015%.
- Load Regulation typically at 0.1%.
- Internal Thermal and Current Limiting.
- Adjustable Output Voltage or Fixed 1.5V, 1.8V, 3.3V, 5.0V, ADJ.

Package Information

Part NO.	Package Description	Package Marking	Package Option
D1084TYY	TO220-3	CHMC D1084TYY SXXXX	50/Tube
D1084SYY	TO263-3	CHMC D1084SYY SXXXX	50/Tube 800/Reel
D1084BYY	TO252-2	CHMC D1084BYY SXXXX	70/Tube 2500/Reel

CHMC: Trademark D1084TYY/D1084SYY/D1084BYY: Part NO. (YY: Output Voltage)

YY: 15-1.5V/18-1.8V/25-2.5V/33-3.3V/50-5.0V/AD-ADJ

SXXXX: Lot NO.

Applications

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

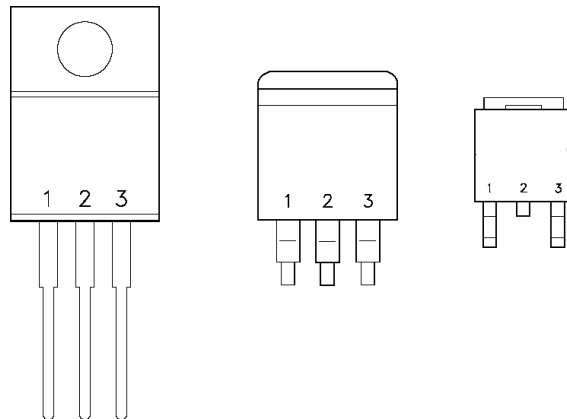
Pin Configuration

1 : GND(Adj.) : Power Ground (Providing $V_{REF} = 1.25V$ (typ.) for adjustable V_{OUT} .

$V_{REF} = V_{OUT} - V_{ADJ}$ and $I_{ADJ} = 55 \mu A$ (typ.))

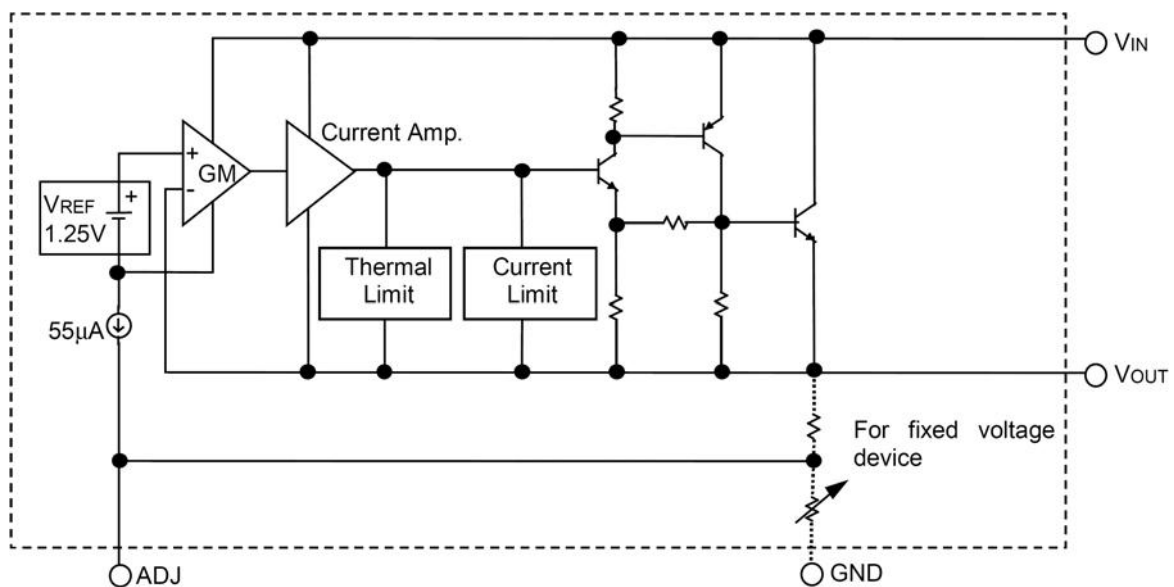
2 : OUTPUT : Adjustable output voltage

3 : INPUT : Power input



D1084(TO220-3) D1084(TO263-3) D1084(TO252-2)

Functional Block Diagram



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

Characteristic		Value	Unit
Vin pin to ADJ/GND pin		15	V
Thermal Resistance Junction to Case, θ_{JC}	TO220-3	3	$^{\circ}\text{C}/\text{W}$
	TO263-3	3	
	TO252-2	12.5	
Thermal Resistance Junction to Ambient, θ_{JA}	TO220-3	50	$^{\circ}\text{C}/\text{W}$
	TO263-3	60	
	TO252-2	100	
Lead Temperature (Soldering, 10 Seconds)		260	$^{\circ}\text{C}$
Storage Temperature		-65 ~ +150	$^{\circ}\text{C}$

Recommended Operating Conditions

Characteristic		Value	Unit
Vin pin to ADJ/GND pin		12	V
Operating Junction Temperature		0 ~ 125	$^{\circ}\text{C}$

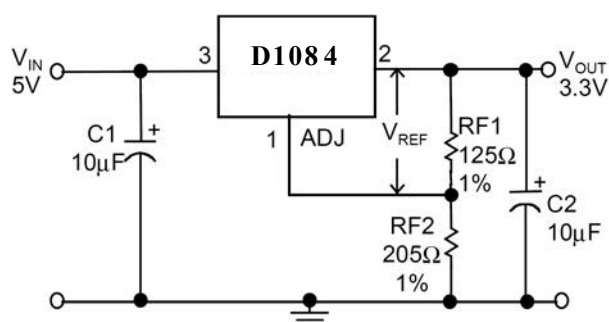
Electrical Characteristics (unless otherwise specified: $V_{IN}=5\text{ V}$, $T_J=25\text{ }^{\circ}\text{C}$, $I_o=10\text{ mA}$)

Characteristics		Symbol	Test conditions	Min	Typ	Max	Unit
Reference voltage		V_{REF}	D1084(Adj.) $T_J=25\text{ }^{\circ}\text{C}$ $10\text{ mA} \leq I_o \leq I_{FULL\text{ LOAD}}$, $1.5\text{ V} \leq (V_{IN}-V_{OUT}) \leq 25\text{ V}$	1.225	1.25	1.275	V
			D1084(Adj.) $0\text{ }^{\circ}\text{C} \leq T_J \leq 125\text{ }^{\circ}\text{C}$ $10\text{ mA} \leq I_o \leq I_{FULL\text{ LOAD}}$ $1.5\text{ V} \leq (V_{IN}-V_{OUT}) \leq 25\text{ V}$	1.212	1.25	1.287	
Output Voltage	D1084-1.5	V_{out}	$V_{IN}=5\text{ V}$	1.470	1.50	1.530	V
	D1084-1.8		$V_{IN}=5\text{ V}$	1.764	1.80	1.836	
	D1084-2.5		$V_{IN}=5\text{ V}$	2.450	2.50	2.550	
	D1084-3.3		$V_{IN}=5\text{ V}$	3.234	3.30	3.366	
	D1084-5.0		$V_{IN}=5\text{ V}$	4.900	5.00	5.100	
Line regulation		$REG_{(LINE)}$	$4.75 \leq V_{IN} \leq 5.25$, $T_J=25\text{ }^{\circ}\text{C}$		0.015	0.2	%
			$0\text{ }^{\circ}\text{C} \leq T_J \leq 125\text{ }^{\circ}\text{C}$		0.035	0.2	
Load regulation		$REG_{(LOAD)}$	$T_J=25\text{ }^{\circ}\text{C}$, $0 \leq I_o \leq I_{FULL\text{ LOAD}}$		0.1	0.3	%
			$0\text{ }^{\circ}\text{C} \leq T_J \leq 125\text{ }^{\circ}\text{C}$ $0 \leq I_o \leq I_{FULL\text{ LOAD}}$		0.2	0.4	
Dropout voltage		V_D	ΔV_{OUT} , $\Delta V_{REF} = 1\%$, $\pm 2\% \leq I_o \leq \pm 3\%$ $0\text{ }^{\circ}\text{C} \leq T_J \leq 125\text{ }^{\circ}\text{C}$		1.3	1.5	V
Current limit		I_{CL}	$4.75 \leq V_{IN} \leq 5.25$ $0\text{ }^{\circ}\text{C} \leq T_J \leq 125\text{ }^{\circ}\text{C}$	6.0	7.5		A

Continued

Characteristics	Symbol	Test conditions	Min	Typ	Max	Unit
Adjust pin current	I_{ADJ}	$4.75 \leq V_{IN} \leq 5.25$ $\pm\%2 \leq I_o \leq \pm\%3$ $0^\circ C \leq T_J \leq 125^\circ C$		55	120	μA
Temperature stability		$I_o=0.5A$ $0^\circ C \leq T_J \leq 125^\circ C$		0.5		%
Adjusted pin current change	ΔI_{ADJ}	$4.75 \leq V_{IN} \leq 5.25$ $\pm\%2 \leq I_o \leq \pm\%3$ $0^\circ C \leq T_J \leq 125^\circ C$		0.2	5.0	μA
Minimum load current	I_o	$0^\circ C \leq T_J \leq 125^\circ C$		5	10	mA
RMS output noise	V_N	$10Hz \leq f \leq 10kHz$		0.003 of V_{OUT}		%
Ripple rejection ratio	R_A	120Hz input ripple, $C_{OUT} = 25\mu F$ $V_{IN} - V_{OUT} = 3V$	60	72		dB

Application Circuit



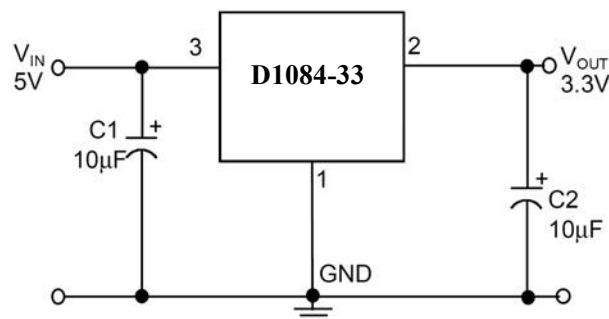
Adjustable Voltage Regulator

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

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

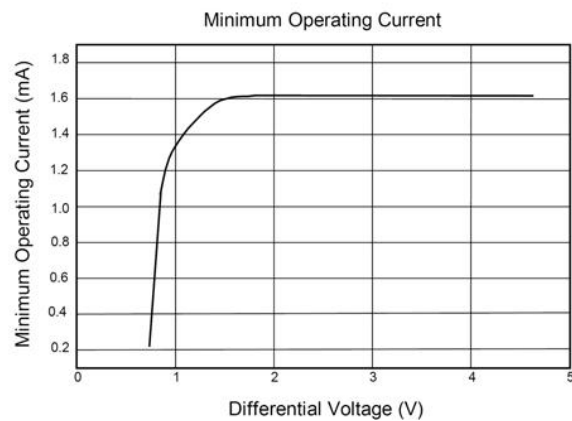
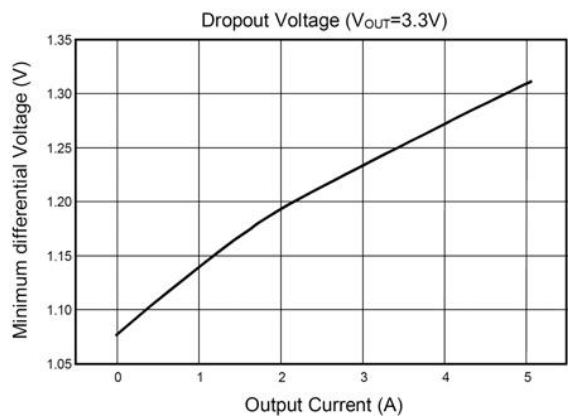
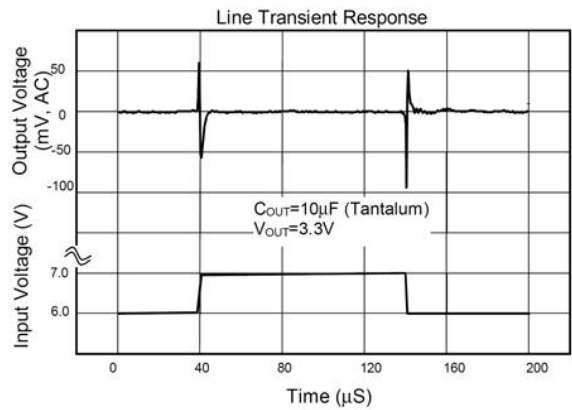
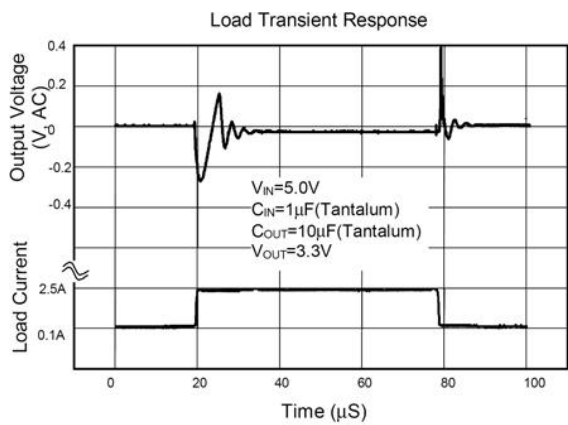
$$I_{ADJ} = 55\mu A \text{ (typ.)}$$

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



Fixed Voltage Regulator

Characteristics Curves



Outline Dimensions

TO220-3

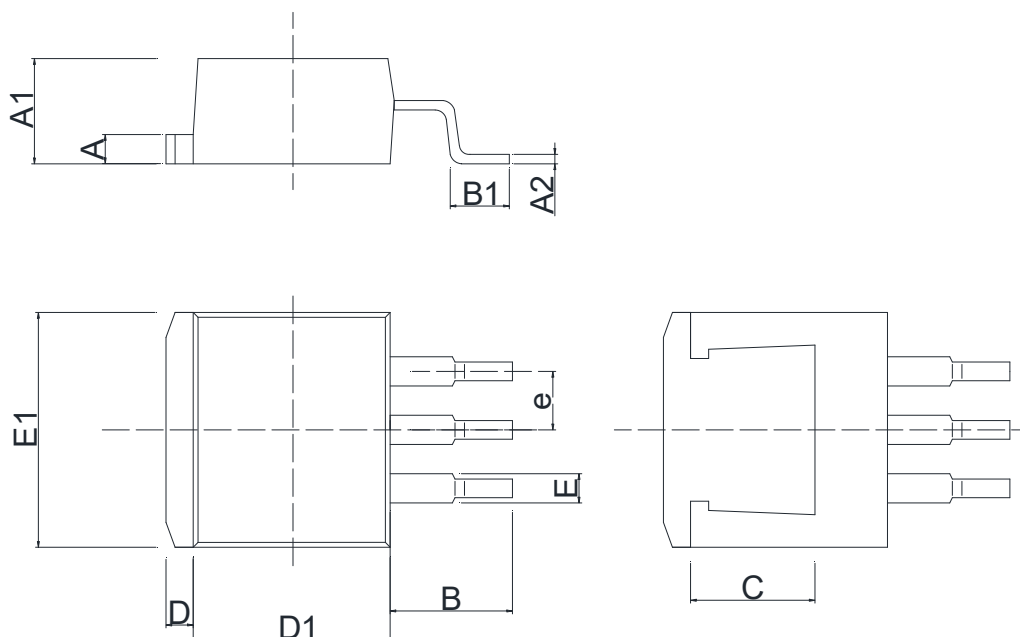
Unit:mm

The image shows a technical drawing of a TO220-3 package. It includes a side view at the top and a top view at the bottom. The side view shows the package's profile with dimensions A (total height), A1 (lead height), and A2 (lead thickness). The top view shows the package's footprint with dimensions B (lead width), B1 (lead length), D (package width), D1 (lead width), E (package length), E1 (lead length), E2 (lead length), and e (lead spacing). A circular feature is shown in the center of the package body.

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.300	4.800	0.169	0.189
A1	0.340	0.600	0.013	0.023
A2	1.220	1.400	0.047	0.055
B	9.460	10.380	0.372	0.408
B1	12.880	13.760	0.507	0.541
D	14.410	15.900	0.567	0.626
D1	8.000	9.000	0.314	0.354
E	9.700	10.400	0.381	0.409
E1	0.700	0.900	0.027	0.036
E2	1.220	1.400	0.048	0.055
e	2.540 (BSC)		0.984 (BSC)	
F	Φ3.800	Φ3.900	Φ0.149	Φ0.153

TO263-3

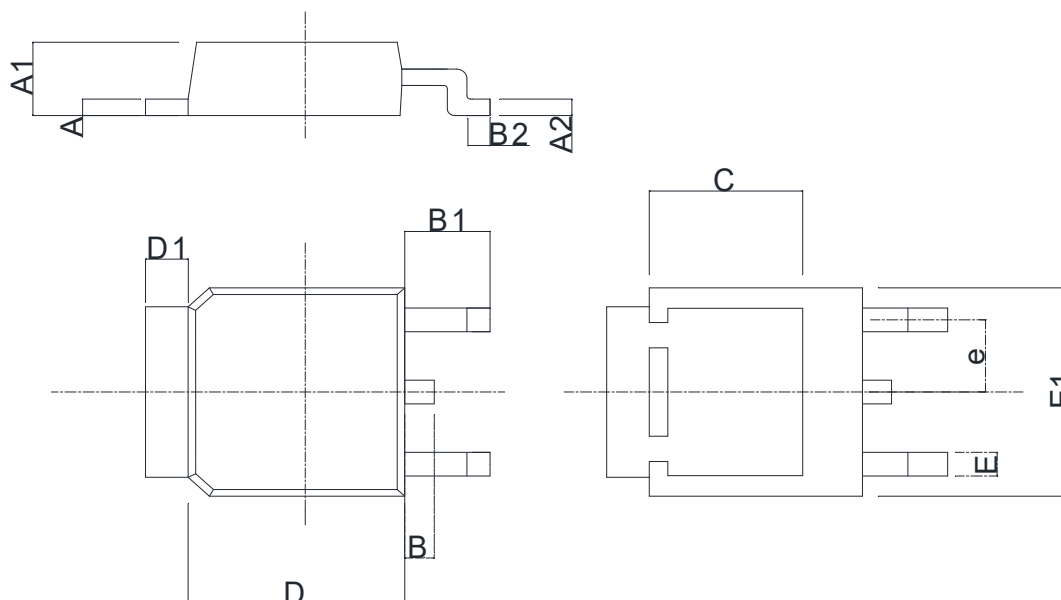
Unit:mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.170	1.370	0.046	0.054
A1	4.470	4.670	0.176	0.184
A2	0.310	0.530	0.012	0.021
B	5.080	5.480	0.200	0.216
B1	2.340	2.740	0.092	0.108
C	5.600 REF		0.220 REF	
D	1.170	1.370	0.046	0.054
D1	8.500	8.900	0.335	0.350
E	1.170	1.370	0.046	0.054
E1	10.010	10.310	0.394	0.406
e	2.540 (BSC)		0.100 (BSC)	

T0252-2

Unit:mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.470	0.570	0.018	0.023
A1	2.220	2.380	0.087	0.094
A2	0.470	0.570	0.018	0.023
B	0.820	0.840	0.032	0.033
B1	2.380	2.480	0.093	0.098
B2	0.500	0.520	0.019	0.021
C	4.250	4.450	0.167	0.176
D	6.000	6.200	0.236	0.245
D1	1.150	1.250	0.045	0.050
E	0.650	0.850	0.025	0.034
E1	6.450	6.750	0.253	0.266
e	2.285 (BSC)		0.090 (BSC)	

Statements

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