

LM1084

CHIP LOW DROPOUT POSITIVE REGULATOR 5A

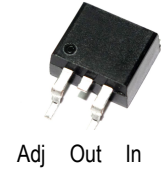
DRAWING

Features

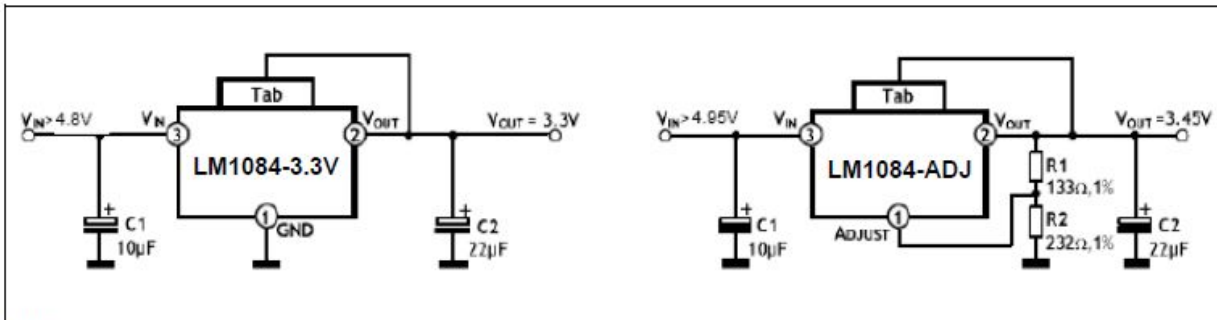
- ◆ Output Current -5.0A
- ◆ Maximum Input Voltage-12V
- ◆ Adjustable Output Voltage or Fixed
- ◆ 1.5V,1.8V,2.5V,2.85V,3.3V,3.6V,3.6V,5V
- ◆ Current Limiting and Thermal Protection
- ◆ TO-263-2L Package

Applications

- ◆ Post Regulator for Switching DC/DC Converter
- ◆ High Efficiency Liner Regulators
- ◆ Battery Charger



Test & Typical Application Circuit



Note

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

$$V_{REF} = V_{OUT} - V_{ADJ} = 1.25V(\text{Typ.}) \quad I_{ADJ} = 55\mu A(\text{Typ.})$$

$$V_{OUT} = V_{REF} \times (1 + R2/R1) + I_{ADJ} \times R2$$

Absolute Maximum Ratings

Power Dissipation	Internally Limited
Junction Temperature	150°C
Storage Temperature Range	-65°C to 150°C
Storage Temperature Range	-65°C to 150°C

Operating Ratings

Power Dissipation	Internally Limited
Junction Temperature Range	-10°C to 125°C

Electrical Characteristics

Typical and limits appearing in normal type apply for  $t_j = +25^\circ\text{C}$ .

Limits appearing in Boldface type apply over the entire junction temperature range operation.

Symbol	Parameter	Conditions	Min	Typ	Max	Units
$V_{OUT}$	(Output Voltage) LM1084-Adj	$I_{OUT} = 10\text{mA}, V_{IN} = 4.25\text{V}$	1.237	1.250	1.263	V
		$0 \leq I_{OUT} \leq I_{FULL\ LOAD},$ $2.75\text{V} \leq V_{IN} \leq 10\text{V}$	1.232	1.250	1.268	
			1.225	1.250	1.275	
	LM1084-1.5	$I_{OUT} = 10\text{mA}, V_{IN} = 4.5\text{V}$	1.485	1.500	1.515	
		$0 \leq I_{OUT} \leq I_{FULL\ LOAD},$ $3.0\text{V} \leq V_{IN} \leq 10\text{V}$	1.478	1.500	1.522	
			1.470	1.500	1.530	
	LM1084-1.8	$I_{OUT} = 10\text{mA}, V_{IN} = 4.8\text{V}$	1.782	1.800	1.818	
		$0 \leq I_{OUT} \leq I_{FULL\ LOAD},$ $3.3\text{V} \leq V_{IN} \leq 10\text{V}$	1.773	1.800	1.827	
			1.764	1.800	1.836	
	LM1084-2.5	$I_{OUT} = 10\text{mA}, V_{IN} = 5.5\text{V}$	2.475	2.500	2.525	
		$0 \leq I_{OUT} \leq I_{FULL\ LOAD},$ $4.0\text{V} \leq V_{IN} \leq 10\text{V}$	2.463	2.500	2.537	
			2.450	2.500	2.550	
	LM1084-2.85	$I_{OUT} = 10\text{mA}, V_{IN} = 5.85\text{V}$	2.820	2.850	2.880	
		$0 \leq I_{OUT} \leq I_{FULL\ LOAD},$ $4.35\text{V} \leq V_{IN} \leq 10\text{V}$	2.805	2.850	2.895	
			2.790	2.850	2.910	
	LM1084-3.3	$I_{OUT} = 10\text{mA}, V_{IN} = 6.3\text{V}$	3.270	3.300	3.330	
		$0 \leq I_{OUT} \leq I_{FULL\ LOAD},$ $4.8\text{V} \leq V_{IN} \leq 10\text{V}$	3.250	3.300	3.350	
			3.235	3.300	3.365	
	LM1084-3.6	$I_{OUT} = 10\text{mA}, V_{IN} = 6.6\text{V}$	3.564	3.600	3.636	
		$0 \leq I_{OUT} \leq I_{FULL\ LOAD},$ $5.1\text{V} \leq V_{IN} \leq 10\text{V}$	3.546	3.600	3.654	
			3.528	3.600	3.672	
	LM1084-5.0	$I_{OUT} = 10\text{mA}, V_{IN} = 8.0\text{V}$	4.950	5.000	5.050	
		$0 \leq I_{OUT} \leq I_{FULL\ LOAD},$ $6.5\text{V} \leq V_{IN} \leq 10\text{V}$	4.925	5.000	5.075	
			4.900	5.000	5.100	

Symbol	Parameter	Conditions	Min	Typ	Max	Units
$\Delta V_{OUT}$	(Line Regulation) LM1084-Adj	$I_{OUT}=10mA, 2.75V \leq V_{IN} \leq 10V$	-	-	0.3	%
			-	-	0.4	
	LM1084-1.5	$I_{OUT}=10mA, 3.0V \leq V_{IN} \leq 10V$	-	-	6	mV
			-	-	10	
	LM1084-1.8	$I_{OUT}=10mA, 3.3V \leq V_{IN} \leq 10V$	-	-	6	
			-	-	10	
	LM1084-2.5	$I_{OUT}=10mA, 4.0V \leq V_{IN} \leq 10V$	-	-	6	
			-	-	10	
	LM1084-2.85	$I_{OUT}=10mA, 4.35V \leq V_{IN} \leq 10V$	-	-	6	
			-	-	10	
	LM1084-3.3	$I_{OUT}=10mA, 4.8V \leq V_{IN} \leq 10V$	-	-	6	
			-	-	10	
	LM1084-3.6	$I_{OUT}=10mA, 5.1V \leq V_{IN} \leq 10V$	-	-	6	
			-	-	10	
LM1084-5.0	$I_{OUT}=10mA, 6.5V \leq V_{IN} \leq 10V$	-	-	6		
		-	-	10		
$\Delta V_{OUT}$	(Load Regulation) LM1084-Adj	$V_{IN}=4.25V, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$	-	-	0.3	%
			-	-	0.4	
	LM1084-1.5	$V_{IN}=5.0V, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$	-	-	12	mV
	LM1084-1.8		-	-	20	
	LM1084-2.5		-	-	15	
	LM1084-2.85		-	-	20	
	LM1084-3.3	$V_{IN}=5.0V, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$	-	-	15	
			-	-	20	
	LM1084-3.6	$V_{IN}=5.3V, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$	-	-	15	
			-	-	25	
LM1084-5.0	$V_{IN}=8.0V, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$	-	-	20		
		-	-	35		
$\Delta V$	Dropout Voltage	$\Delta V_{REF}=1\%, I_{OUT}=5A$	-	-	1.5	V
$I_{O(MIN)}$	Minimum Load Current	$V_{IN}=10V$	-	-	10	mA
$I_{LIMIT}$	Current Limit	$V_{IN}=6.25V$	5.5	-	-	A
$I_{ADJ}$	Adjust Pin Current	$V_{IN}=2.75/10V, I_{OUT}=10mA$	-	-	120	uA
$\Delta I_{ADJ}$	Adjust Pin Current Change	$I_{OUT}=10mA/5A, V_{IN}=2.75/10V$	-	-	5	uA
RR	Ripple Rejection	$F_{ripple}=120Hz, C_{out}=25\mu F$ Tantalum, $I_{out}=5A; V_{IN}=4.25V$	60	-	-	dB
S	Temperature Stability		-	0.5	-	%

Typical Performance Characteristics

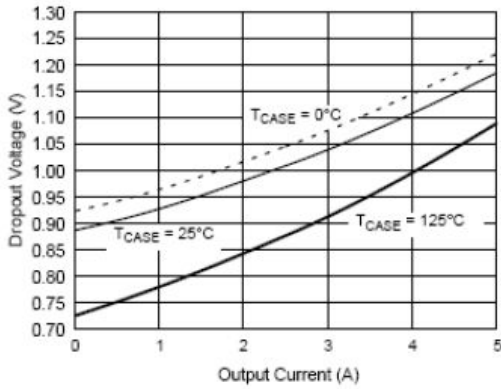


Figure 1. Dropout Voltage vs Output Current

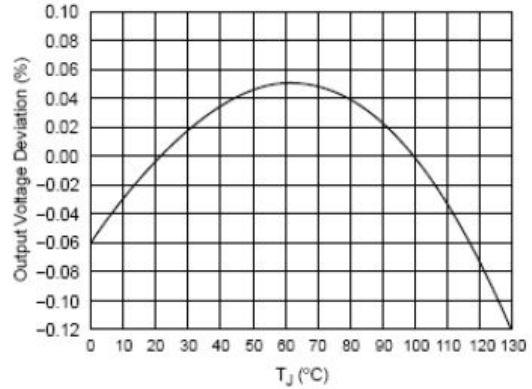


Figure 2. Reference Voltage vs Temperature

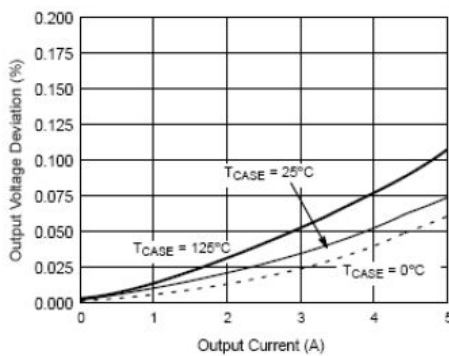


Figure 3. Load Regulation vs. Output Current

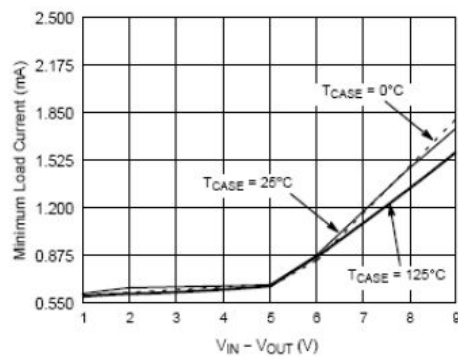


Figure 4. Minimum Load Current

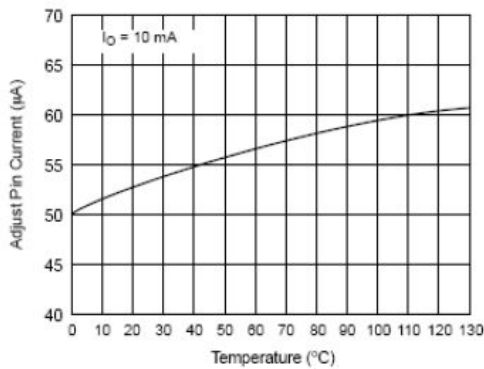


Figure 5. Adjust Pin Current vs Temperature

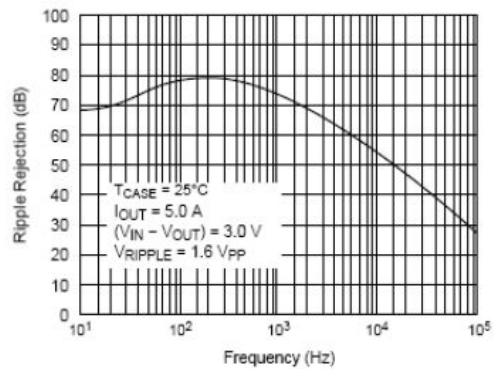


Figure 6. Ripple Rejection vs. Frequency (Fixed Versions)

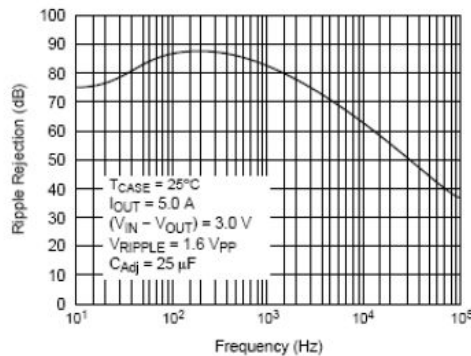


Figure 7. Ripple Rejection vs. Frequency (Adjustable Versions)

Applications Information

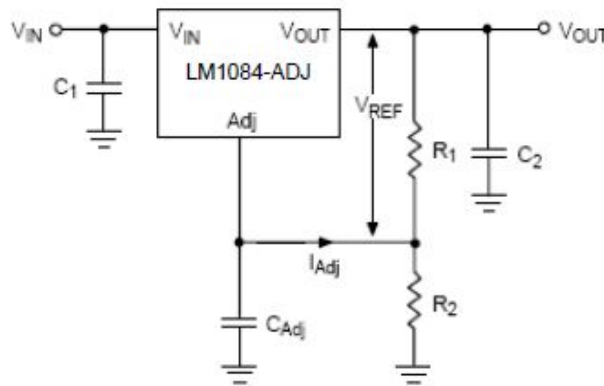


Figure 8. Resistor Divider Scheme for the Adjustable Version

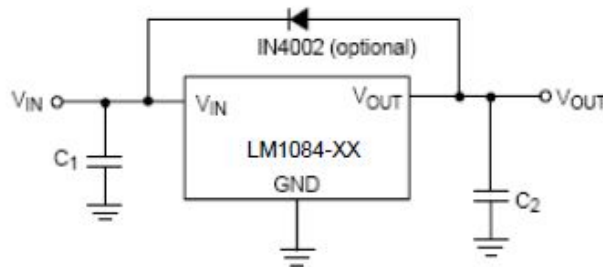


Figure 9. Protection Diode Scheme for Fixed Output Regulators

Mechanical Dimensions

