

### GENERAL DESCRIPTION

The CM1117 series of adjustable and fixed voltage regulators are designed to provide 1A for applications requiring high efficiency. All internal circuitry is designed to operated down to 800mV input to output differential and the dropout voltage is fully specified as a function of load current.

The CM1117 offers current limiting and thermal protection. The on chip trimming adjusts the reference voltage accuracy to 1%.

### FEATURES

- ◆ Three Terminal Adjustable or Fixed Voltages: 1.8V, 2.5V, 3.3V, and adjustable.
- ◆ Output Current of 1A
- ◆ Low dropout voltage: 1V Typ.
- ◆ Line Regulation: 0.2% Max
- ◆ Load Regulation: 0.4% Max
- ◆ Fast Transient Response
- ◆ Thermal Protection
- ◆ SOT-223 and TO-252 package available

### APPLICATIONS

- ◆ High Efficiency Linear Regulators
- ◆ Post Regulators for Switching Supplies
- ◆ Battery Chargers
- ◆ Active SCSI Terminators
- ◆ Post Regulator for Switching DC/DC Converter
- ◆ Battery Powered Instrumentation

### PIN CONFIGURATION



### ORDERING INFORMATION

Package Type		Operating Temperature Range (T <sub>A</sub> )	Output Voltage
TO-252	SOT-223		
CM1117DCN252	CM1117DCM223	0 ~ +70	1.8V
CM1117KCN252	CM1117KCM223	0 ~ +70	2.5V
CM1117SCN252	CM1117SCM223	0 ~ +70	3.3V
CM1117CN252	CM1117CM223	0 ~ +70	ADJ.
CM1117GDCN252*	CM1117GDCM223*	0 ~ +70	1.8V
CM1117GKCN252*	CM1117GKCM223*	0 ~ +70	2.5V
CM1117GSCN252*	CM1117GSCM223*	0 ~ +70	3.3V
CM1117GCN252*	CM1117GCM223*	0 ~ +70	ADJ.

\*Note: G : Suffix for Pb Free Product

### ABSOLUTE MAXIMUM RATINGS

Input Voltage ..... +12V  
 Operating Junction Temperature Range,  $T_J$  ..... 0 to +125  
 Storage Temperature ..... -65 to +150  
 Lead Temperature (10 sec.) ..... 260

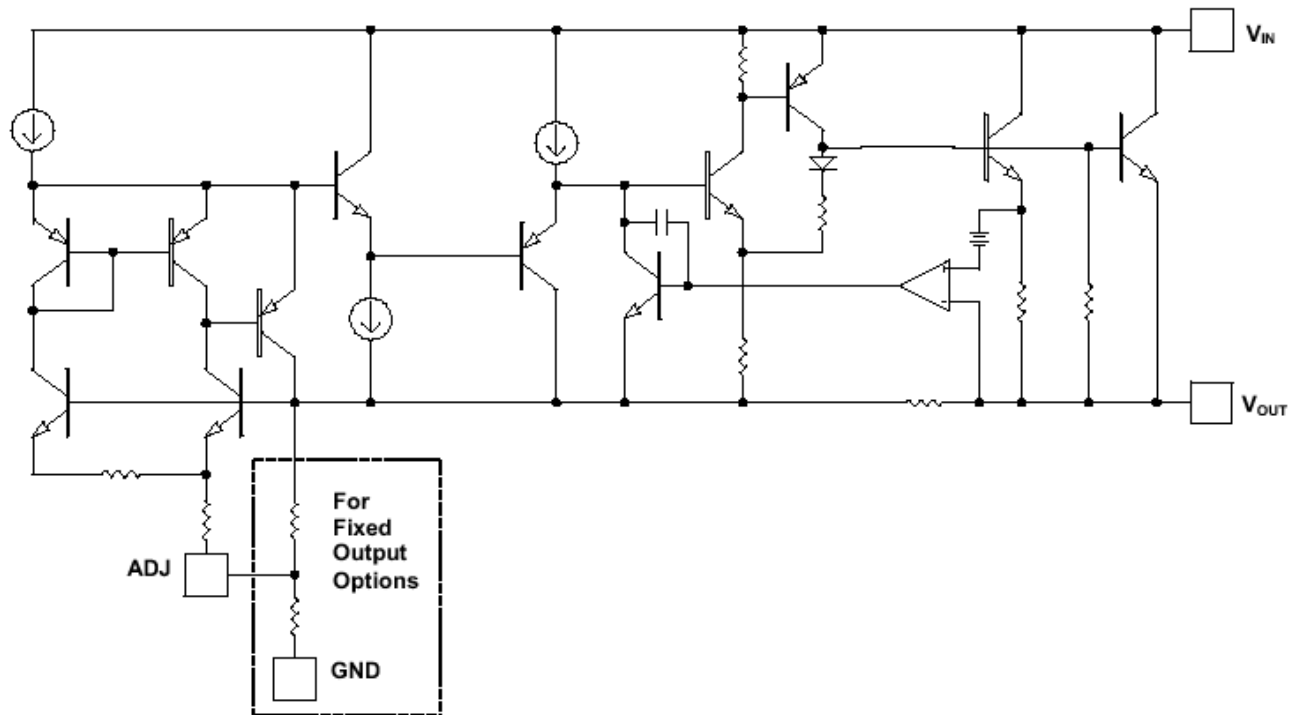
### RESOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min.	Typ.	Max	Units
Input Voltage	$V_{IN}$	2.7		7	V

### THERMAL INFORMATION

Parameter		Maximum	Unit
Thermal Resistance ( $\theta_{jc}$ )	SOT-223	50	/W
	TO-252	50	
Thermal Resistance ( $\theta_{ja}$ )	SOT-223	100	/W
	TO-252	80	
Internal Power Dissipation ( $P_D$ ) ( $T = 100^\circ\text{C}$ , No Heatsink )	SOT-223	900	mW
	TO-252	1500	
Maximum Junction Temperature		150	
Maximum Lead Temperature (10 Sec)		300	

### BLOCK DIAGRAM



### ELECTRICAL CHARACTERISTICS

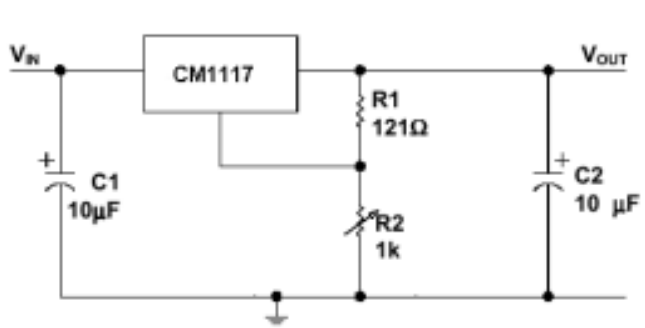
Electrical Characteristics at  $I_{OUT} = 10\text{mA}$ , and  $T_J = +25^\circ\text{C}$ ; unless otherwise noted

Parameter	Device	Test Conditions	CM1117			Unit
			Min.	Typ.	Max.	
Reference Voltage	CM1117	$I_{OUT} = 10\text{mA}$ , $V_{IN} = 5\text{V}$	1.238	1.250	1.262	V
Output Voltage	CM1117D	$10\text{mA} \leq I_{OUT} \leq 1\text{A}$ , $3.2\text{V} \leq V_{IN} \leq 7\text{V}$	1.764	1.800	1.836	V
	CM1117K	$10\text{mA} \leq I_{OUT} \leq 1\text{A}$ , $4.25\text{V} \leq V_{IN} \leq 7\text{V}$	2.450	2.500	2.550	V
	CM1117S	$10\text{mA} \leq I_{OUT} \leq 1\text{A}$ , $4.75\text{V} \leq V_{IN} \leq 7\text{V}$	3.234	3.300	3.366	V
Line Regulator	Adj. Output	$I_{OUT} = 10\text{mA}$ , $1.5\text{V} \leq V_{IN} \leq 7\text{V}$		0.04	0.20	%
	Fixed Output	$I_{OUT} = 10\text{mA}$ , $V_{OUT} + 1.5\text{V} \leq V_{IN} \leq 7\text{V}$		1.0	6.0	mV
Load Regulation	Adj. Output	$10\text{mA} \leq I_{OUT} \leq 1\text{A}$ , $V_{IN} - V_{OUT} = 3\text{V}$		0.10	0.30	%
	Fixed Output	$10\text{mA} \leq I_{OUT} \leq 1\text{A}$ , $V_{IN} = V_{OUT} + 1.5\text{V}$		1.0	10.0	mV
Dropout Voltage ( $V_{IN} - V_{OUT}$ )	Fixed Output	$I_{OUT} = 10\text{mA}$		1		V
		$I_{OUT} = 1\text{A}$		1.1	1.30	
Current Limit	Fixed Output	$(V_{IN} - V_{OUT}) = 3\text{V}$	1	1.1		A
Minimum Load Current (Note 1)		$V_{IN} \leq 7\text{V}$		5	14	mA
Quiescent Current	Fixed Output	$V_{IN} \leq 7\text{V}$		12	14	mA
Ripple Rejection (Note 2)		$f_o = 120\text{Hz}$ , $1V_{RMS}$ , $I_{OUT} = 400\text{mA}$ , $(V_{IN} - V_{OUT}) = 3\text{V}$	60	75		dB
Thermal Regulation (Note 2)		$T_A = 25^\circ\text{C}$ , 30ms pulse		0.01	0.1	%W
Adjust Pin Current		$I_{OUT} = 10\text{mA}$ , $V_{IN} - V_{OUT} = 2\text{V}$		50	120	$\mu\text{A}$

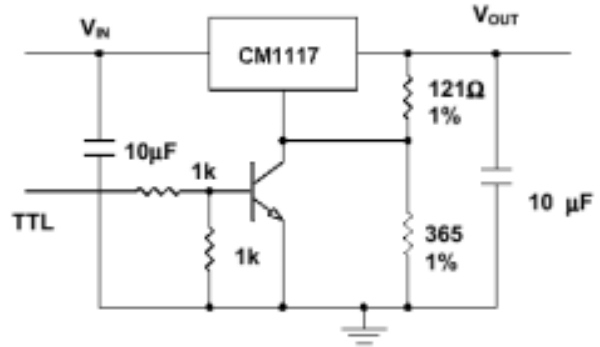
**Note 1:** For the adjustable device, the minimum load current is the minimum current required to maintain regulation. Normally the current in the resistor divider used to set the output voltage is selected to meet the minimum load current requirement.

**Note 2:** These parameters, although guaranteed, are not tested in production.

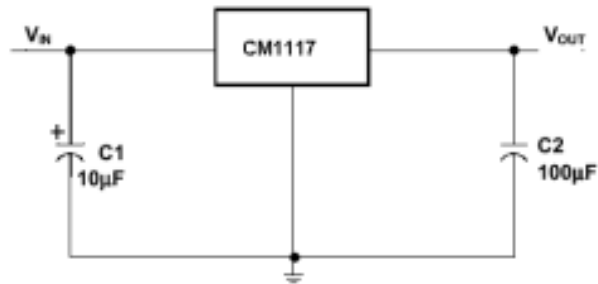
### APPLICATION CIRCUIT



Adjustable Regulator  
 $V_{OUT} = 1.25V (1+R2/R1)$



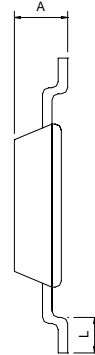
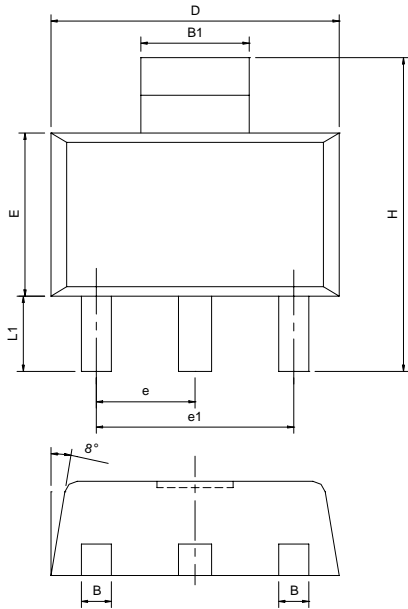
5V Regulator with Shutdown



Fixed Voltage Regulator

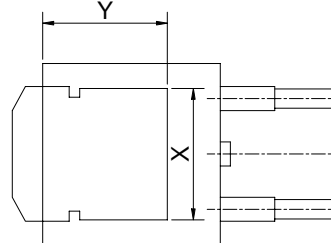
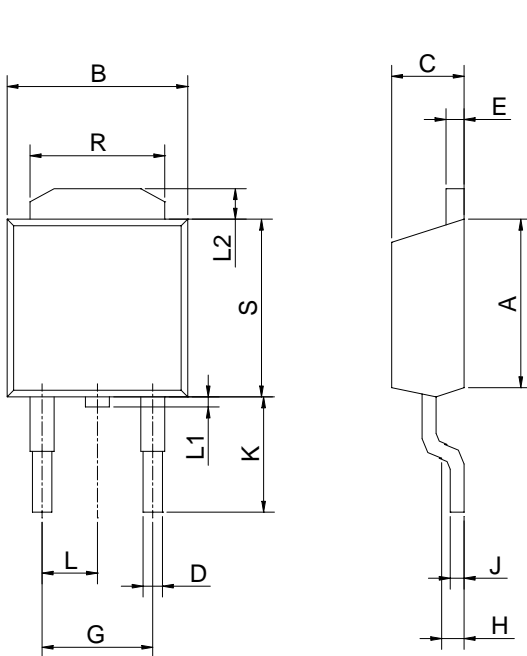
### PACKAGE DIMENSION

#### SOT-223 (M223)



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.50	---	1.80	0.0591	---	0.0709
B	0.60	---	0.838	0.0236	---	0.033
B1	2.895	---	3.15	0.114	---	0.124
D	6.299	---	6.706	0.248	---	0.264
E	3.30	---	3.708	0.1299	---	0.146
e	---	2.30BSC	---	---	0.090BSC	---
e1	---	4.00BSC	---	---	0.157BSC	---
H	6.70	---	7.30	0.2638	---	0.2874
L	---	0.91MAX	---	---	0.036MAX	---
L1	---	2.00MAX	---	---	0.0787MAX	---
θ	---	---	13°	---	---	13°

#### TO-252 (N252)



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	5.97	---	6.35	0.235	---	0.250
B	6.35	---	6.73	0.250	---	0.265
C	2.19	---	2.38	0.086	---	0.094
D	0.69	---	0.88	0.027	---	0.035
E	0.46	---	0.58	0.018	---	0.023
G	4.58BSC			0.180BSC		
H	0.87	---	1.01	0.034	---	0.040
J	0.46	---	0.58	0.018	---	0.023
K	2.60	---	2.89	0.102	---	0.114
L	2.29BSC			0.090BSC		
R	4.45	---	5.46	0.175	---	0.215
S	5.33	---	5.59	0.210	---	0.220
L1	0.84	---	1.02	0.025	---	0.040
L2	1.52	---	2.03	0.060	---	0.080
X	4.12	---	4.56	0.162	---	0.179
Y	5.11	---	5.72	0.201	---	0.225

### IMPORTANT NOTICE

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