1. DESCRIPTION

The XLM1117 is a series of low dropout voltage regulators which can provide up to 1A of output current.The XLM1117 is available in six fixed voltage,1.2,1.5,1.8,2.5,3.3 and 5.0V.On chip precision trimming adjusts the output voltage to within ±2%. On-chip thermal limiting provides protection against any combination of overload and ambient temperatures that would create excessive junction temperatures.

The XLM1117 series is available in SOT-223 and TO-252 packages. A minimum of 10uF tantalum capacitor is required at the output to improve the transient response and stability.

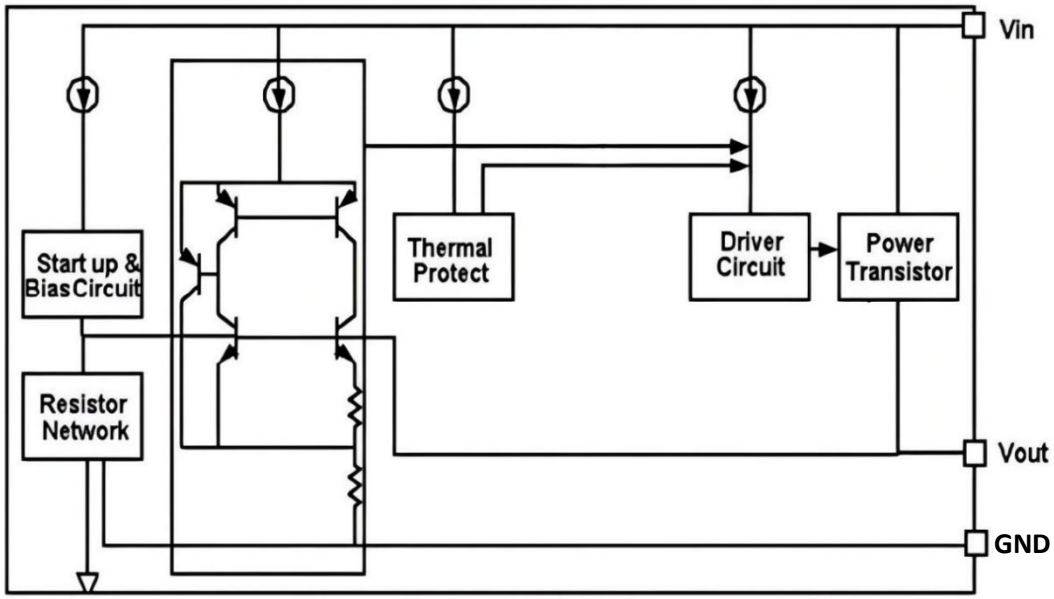
2. FEATURES

- Low Dropout Voltage.
- Load regulation:0.5% Max.
- Optimized for Low Voltage
- On-chip thermal limiting
- Maximum Input Voltage: 18V
- Fixed 1.2V,1.5V,1.8V,2.5V,3.3V,5.0V
- Standard SOT-223,TO-252 Packages

3. APPLICATIONS

- Post Regulator for switching DC/DC Converter
- High Efficiency Linear Regulator
- Battery Chargers
- PC Add on Card
- Motherboard clock supplies
- LCD Monitorr
- Set-top Box

4. BLOCK DIAGRAM



5. PIN DESCRIPTION.



SOT-223



TO-252

1.GND 2.VOUT 3.VIN

6. ABSOLUTE MAXIMUM RATINGS(T_A=25℃,unless otherwise specified)

PARAMETER	SYMBOL	VALUE	UNIT
Input Voltage in appication	V_{IN}	18	V
DC Output Current	I_{OUT}	$P_D/(V_{IN}-V_{OUT})$	mA
Operating Junction Temperature Range	T_J	-40 to 85	℃
Thermal Resistance (SOT-223)	$R_{\theta JA}$	135	℃/W
Thermal Resistance (TO-252-3)		100	
Maximum Power Dissipation (SOT-223)	P_D	750	mW
Maximum Power Dissipation (TO-252-3)		1000	

7. ELECTRICAL CHARACTERISTICS

(V_{IN}=<7V,T_J=25°C,unless otherwise Specified. The denotes specifications which apply over the specified operating temperature range.)

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage 10mA≤I_{OUT}≤1A,V_{IN}=V_{OUT}+2V					V
	XLM1117-1.2	1.176	1.20	1.224	
	XLM1117-1.5	1.470	1.50	1.530	
	XLM1117-1.8	1.764	1.80	1.836	
	XLM1117-2.5	2.450	2.50	2.550	
	XLM1117-3.3	3.234	3.30	3.366	
	XLM1117-5.0	4.90	5.0	5.1	
Line regulation[1,2]	(V_{OUT}+1.5V)≤V_{IN}≤12V,I_{OUT}=10mA		0.15	0.30	%
Load regulation[1,2]	(V_{IN}-V_{OUT})=2V, 10mA≤I_{OUT}≤1A		0.20	0.50	
Dropout voltage	V_{REF}=1%,I_{OUT}=1A		1.30	1.40	V
Current limit	(V_{IN}-V_{OUT})=2V		1.2		A
Minimum load current	1.5V≤(V_{IN}-V_{OUT})≤12V		3	10	mA
Quiescent current	V_{IN}=V_{OUT}+1.25V		3	10	
Ripple rejection	f=120Hz, C_{OUT}=22uF Tantalum	60	70		dB
	(V_{IN}-V_{OUT})=3V,I_{OUT}=1A				
Thermal regulation	T_A=25°C,30ms pulse		0.008	0.04	%/W
Temperature stability			0.5		%
Long-term stability	T_A=85°C, 1000hrs.		0.5	1.5	
RMS output noise (% of V_{OUT})	T_A=25°C,10Hz≤f≤10kHz		0.003		
Thermal resistance, junction to case	SOT-223		20		°C/W
	TO-252-3		15		
Thermal shutdown	Junction temperature		150		°C
Thermal shutdown hysteresis			10		

Notes:

1.See thermal regulation specifications for changes in output voltage due to heating effects.Load and line regulation are me asured at a constant junction temperature by low duty cycle pulse testing.

2.Line and load regulation are guaranteed up to the maximum power dissipation.Power dissipation is determined by i nput/output differential and the output current.Guaranteed maximum output power will not be available over the full input/ o utput voltage range.

3.Output current must be limited to meet the absolute maximum ratings of the part.

8. TYPICAL CHARACTERISTICS

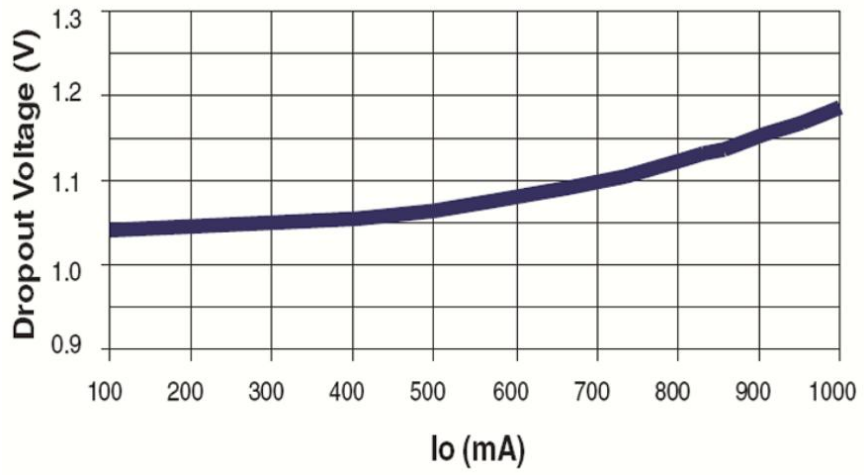


Figure.1: Dropout Voltage vs Output Current
XLM1117-3.3, V_{IN}=4.8V, CouT=2.2uF

9. TYPICAL APPLICATION CIRCUIT

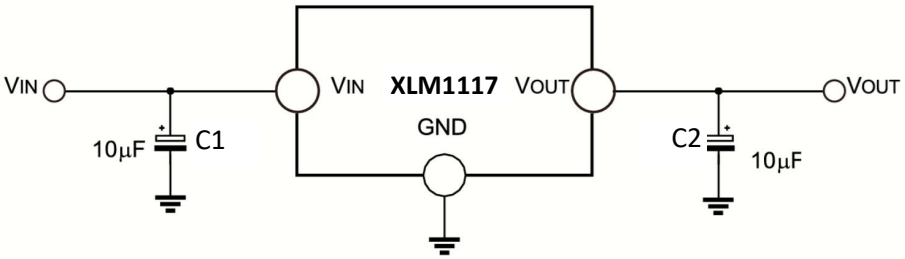


Figure 2. Typical Fixed Output Voltage

Application Tip for the XLM1117 :

1. For all application circuits, it is recommended to use a 10μF tantalum capacitor as the input bypass capacitor C1.

2. To ensure the stability of the circuit, a 10μF or 22μF tantalum capacitor C2 is connected to the output terminal

10. INPUT BYPASS CAPACITOR

An input capacitor is recommended.A 10μF tantalum on the input is a suitable input bypassing for almost all applications.

11. OUTPUT CAPACITOR

XLM1117 requires a capacitor from V_{OUT} to GND to provide compensation feedback to the internal gain stage. This is to ensure stability at the output terminal. Typically, a 10 μ F tantalum or 50 μF aluminum electrolytic is sufficient.

Note: It is important that the ESR for this capacitor does not exceed 0.5 Ω.

The output capacitor does not have a theoretical upper limit and increasing its value will increase stability. C_{OUT}=100 μF or more is typical for high current regulator design.

12. THERMAL PROTECTION

XLM1117 has thermal protection which limits junction temperature to 150°C.However, device functionality is only guaranteed to a maximum junction temperature of +125°C . The power dissipation and junction temperature for XLM1117 in TO-252-3 package are given by

$$P_D = (V_{IN} - V_{OUT}) * I_{OUT}$$

$$T_{JUNCTION} = T_{AMBIENT} + (P_D * R_{\theta JA})$$

Note:$T_{JUNCTION}$ must not exceed 125℃

13. THERMAL CONSIDERATION

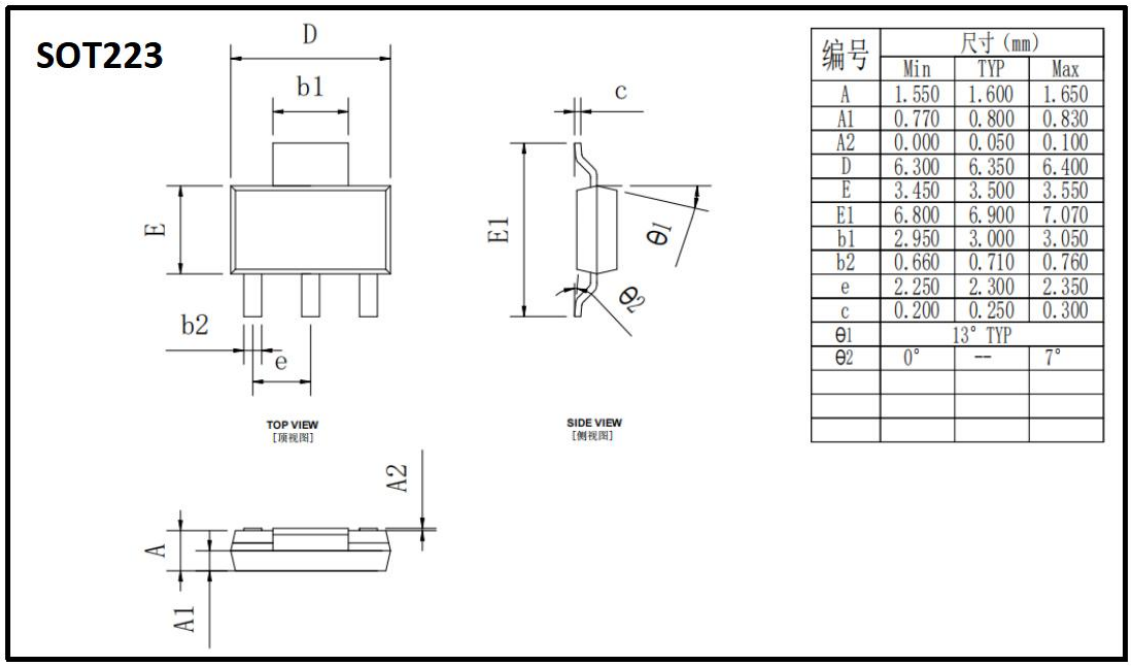
The XLM1117 series contain thermal limiting circuitry designed to protect itself from over-temperature conditions.Even for normal load conditions,maximum junction temperature ratings must not be exceeded.As mention in thermal protection section,we need to consider all sources of thermal resistance between junction and ambient.It includes junction-to case,case-to-heat-sink interface,and heat sink thermal resistance itself.Junction-to-case thermal resistance is specified from the IC junction to the bottom of the case directly below the die.Proper mounting is required to ensure the best possible thermal flow from this area of the package to the heat sink.The case of all devices in this series is electrically connected to the output.Therefore, if the case of the device must be electrically isolated,a thermally conductive spacer is recomme

14. ORDERING INFORMATION

Ordering Information

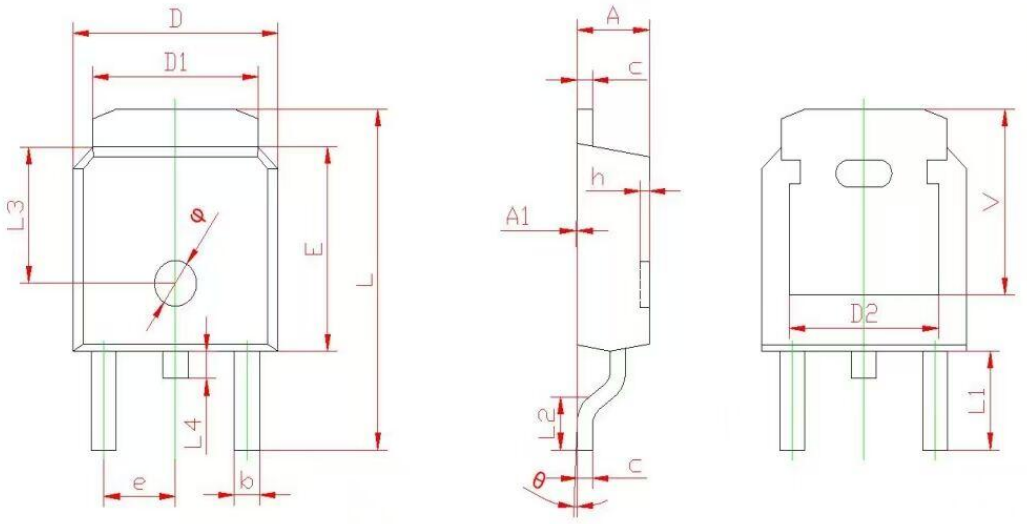
Part Number	Device Making	Package type	Body size (mm)	Temperate (°C)	MSL	Transpo Rt	Package Quantit
XLM1117MPX-1.2	1117-1.2	SOT-223	6.35*3.50	-40 to +85	MSL3	T&R	2500
XLM1117MPX-1.5	1117-1.5	SOT-223	6.35*3.50	-40 to +85	MSL3	T&R	4000
XLM1117MPX-1.8	1117-1.8	SOT-223	6.35*3.50	-40 to +85	MSL3	T&R	4000
XLM1117MPX-2.5	1117-2.5	SOT-223	6.35*3.50	-40 to +85	MSL3	T&R	4000
XLM1117MPX-3.3	1117-3.3	SOT-223	6.35*3.50	-40 to +85	MSL3	T&R	4000
XLM1117MPX-5.0	1117-5.0	SOT-223	6.35*3.50	-40 to +85	MSL3	T&R	4000
XLM1117IDTX-1.8	XL1117-1.8	TO-252-3	6.70*6.20	-40 to +85	MSL3	T&R	2500
XLM1117IDTX-2.5	XL1117-2.5	TO-252-3	6.70*6.20	-40 to +85	MSL3	T&R	2500
XLM1117IDTX-3.3	XL1117-3.3	TO-252-3	6.70*6.20	-40 to +85	MSL3	T&R	2500
XLM1117IDTX-5.0	XL1117-5.0	TO-252-3	6.70*6.20	-40 to +85	MSL3	T&R	2500

15. DIMENSIONAL DRAWINGS



编号	尺寸（mm）		
	Min	TYP	Max
A	1.550	1.600	1.650
A1	0.770	0.800	0.830
A2	0.000	0.050	0.100
D	6.300	6.350	6.400
E	3.450	3.500	3.550
E1	6.800	6.900	7.070
b1	2.950	3.000	3.050
b2	0.660	0.710	0.760
e	2.250	2.300	2.350
c	0.200	0.250	0.300
θ1	13° TYP		
θ2	0°	--	7°

TO-252 PACKAGE OUTLINE DIMENSIONS



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	0.660	**0.860**	0.026	0.034
c	0.460	**0.580**	0.018	0.023
D	6.500	**6.700**	0.256	0.264
D1	5.100	**5.460**	0.201	0.215
D2	4.800 REF		0.189 REF	
E	6.000	**6.200**	0.236	0.244
e	2.186	**2.386**	0.086	0.094
L	9.800	**10.400**	0.386	0.409
L1	2.900 REF		0.114 REF	
L2	1.400	**1.700**	0.055	0.067
L3	4.00 REF		0.157 REF	
L4	0.600	**1.000**	0.024	0.039
φ	1.200	**1.400**	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	**0.300**	0.000	0.012
V	5.500 REF		0.217 REF	