ELM1117xG Bipolar 1A LDO Voltage regulator

■General description

ELM1117xG is bipolar LDO three terminal voltage regulator. This series includes thermal shutdown protection and short circuit current limiter. ELM1117 series is available in fixed version (ELM1117xG-xx Vout:1.8V, 2.5V, 3.3V, 5.0V) and adjustable version (ELM1117xG Vout:1.3V to 4.0V).

■Features

- Output voltage range (fixed) : 1.8V, 2.5V, 3.3V, 5.0V
  (adj.) : 1.3V to 4.0V
- Line regulation : Typ.0.5%
- Load regulation : Typ.0.5%
- LDO voltage : 1.2V typical at up to 1.0A
- Package : SOT-223, TO-252-3

■Application

- Linear regulator
- Battery chargers
- Microcontrollers

■Maximum absolute ratings

Parameter	Symbol	Limit	Unit
Power supply voltage	Vcc	15	V
Power dissipation	Pd	Internally limited	W
Operating junction temperature	Top	0 to +125	°C
Storage temperature	Tstg	-40 to +150	°C
Thermal resistance junction to case	Rθjc	16	°C/W
Thermal resistance junction to ambient	Rθja	158 (SOT-223)	°C/W
		70 (TO-252-3)	
Lead temperature (soldering 10s.)	Tlead	260	°C

■Selection guide

ELM1117xG-xx-S, ELM1117xG-S

Symbol		
a	Package	L: SOT-223 D: TO-252-3
b	Product version	G
c, d	Output voltage	18: Vout=1.8V 25: Vout=2.5V 33: Vout=3.3V 50: Vout=5.0V
e	Taping direction	S: Refer to PKG file

- Fixed version

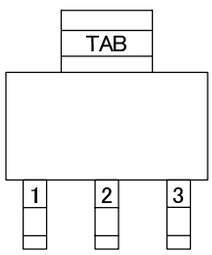
ELM1117 x G - x x - S
↑ ↑ ↑ ↑ ↑
a b c d e

- Adj. version

ELM1117 x G - S
↑ ↑ ↑
a b e

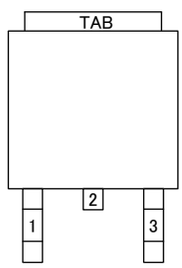
■Pin configuration

SOT-223(TOP VIEW)



Pin No.	Pin name
1	ADJ/GND
2/TAB	VOUT
3	VIN

TO-252-3(TOP VIEW)

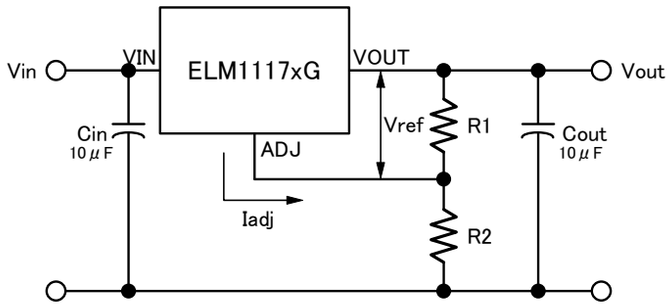


Pin No.	Pin name
1	ADJ/GND
2/TAB	VOUT
3	VIN

■Typical application

• Adjustable type

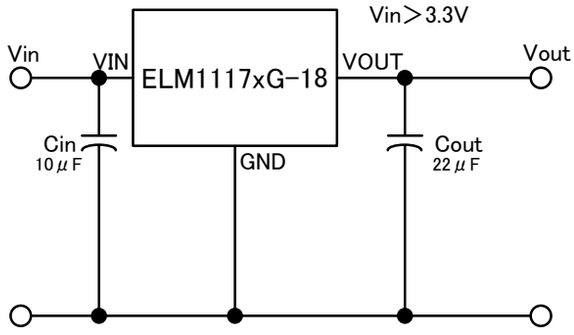
Vout=Vref (1+R2/R1)+Iadj×R2



∗ We recommend using min. 10μF tantalum capacitor.

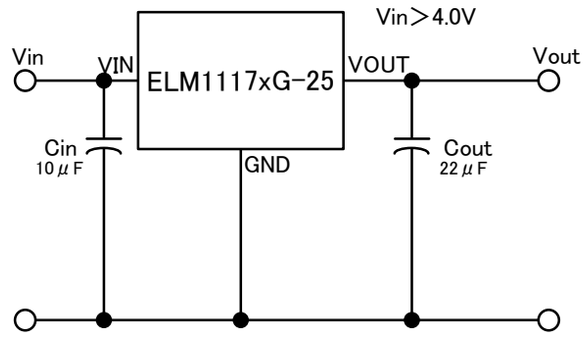
• Fixed type

Vout=1.8V



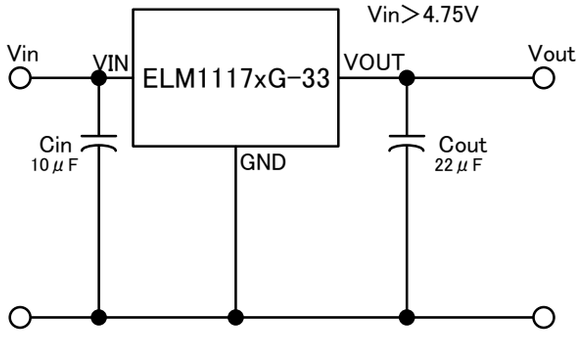
∗ We recommend using min. 10μF tantalum capacitor.

Vout=2.5V



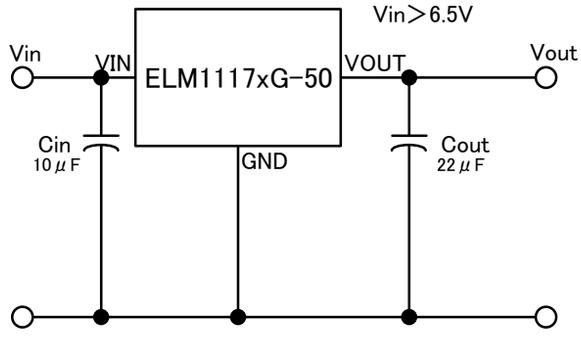
∗ We recommend using min. 10μF tantalum capacitor.

Vout=3.3V



∗ We recommend using min. 10μF tantalum capacitor.

Vout=5.0V



∗ We recommend using min. 10μF tantalum capacitor.

■Electrical characteristics

Vout=Adjustable(ELM1117 x G - S) Top=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Output voltage	Vout	Iout=10mA, Vin=5.0V	0.98Vout	Vout	1.02Vout	V
Reference voltage	Vref	Iout=10mA, Vin=5V	1.23	1.25	1.27	V
Line regulation	ΔVout/ΔVin	Iout=10mA, Vin=(Vout+1.5V) to 15V		0.5	2.0	%
Load regulation	ΔVout/ΔIout	Iout=10mA to 1A, Vin-Vout=2V		0.5	2.5	%
Dropout voltage	Vdif	Iout=1A, ΔVref=1%		1.20	1.45	V
Current limit	Ilim	Vin-Vout=2V	1.1	1.2		A
Min.load current	Il (min)	1.5V≤(Vin-Vout)≤5.75V		10		mA
Adjust Pin current	Iadj			55	100	μA
RMS output noise	Vn			Vout× 0.003%		mV
Ripple rejection ratio	RR	f=120Hz, Vin=5V, Iout=1A, Cout=22μF	60	72		dB

Vout=1.8V(ELM1117 x G - 18 - S) Top=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Output voltage	Vout	Iout=10mA, Vin=5.0V	1.760	1.800	1.836	V
Line regulation	ΔVout/ΔVin	Iout=10mA, Vin=3.3V to 15V		0.5	2.0	%
Load regulation	ΔVout/ΔIout	Iout=10mA to 1A, Vin-Vout=2V		0.5	2.0	%
Dropout voltage	Vdif	Iout=1A, ΔVref=1%		1.20	1.45	V
Current limit	Ilim	Vin-Vout=2V	1.1	1.2		A
Quiescent current	Iq			5	10	mA
RMS output noise	Vn			Vout× 0.003%		mV
Ripple rejection ratio	RR	f=120Hz, Vin=5V, Iout=1A, Cout=22μF	60	72		dB

Vout=2.5V(ELM1117 x G - 25 - S) Top=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Output voltage	Vout	Iout=10mA, Vin=5.0V	2.450	2.500	2.550	V
Line regulation	ΔVout/ΔVin	Iout=10mA, Vin=4.0V to 15V		0.5	2.0	%
Load regulation	ΔVout/ΔIout	Iout=10mA to 1A, Vin-Vout=2V		0.5	2.0	%
Dropout voltage	Vdif	Iout=1A, ΔVref=1%		1.20	1.45	V
Current limit	Ilim	Vin-Vout=2V	1.1	1.2		A
Quiescent current	Iq			5	10	mA
RMS output noise	Vn			Vout× 0.003%		mV
Ripple rejection ratio	RR	f=120Hz, Vin=5V, Iout=1A, Cout=22μF	60	72		dB

Vout=3.3V(ELM1117 x G - 33 - S) Top=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Output voltage	Vout	Iout=10mA, Vin=5.0V	3.234	3.300	3.367	V
Line regulation	ΔVout/ΔVin	Iout=10mA, Vin=4.8V to 15V		0.5	2.0	%
Load regulation	ΔVout/ΔIout	Iout=10mA to 1A, Vin-Vout=2V		0.5	2.0	%
Dropout voltage	Vdif	Iout=1A, ΔVref=1%		1.20	1.45	V
Current limit	Ilim	Vin-Vout=2V	1.1	1.2		A
Quiescent current	Iq			5	10	mA
RMS output noise	Vn			Vout× 0.003%		mV
Ripple rejection ratio	RR	f=120Hz, Vin=5V, Iout=1A, Cout=22μF	60	72		dB

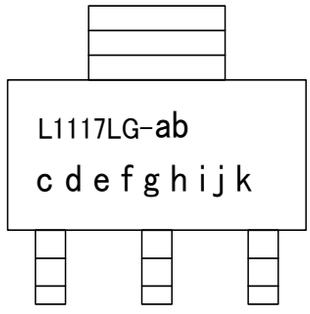
Vout=5.0V(ELM1117 x G - 50 -S) Top=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Output voltage	Vout	Iout=10mA, Vin=8.0V	4.900	5.000	5.100	V
Line regulation	ΔVout/ΔVin	Iout=10mA, Vin=6.5V to 15V		0.5	1.0	%
Load regulation	ΔVout/ΔIout	Iout=10mA to 1A, Vin-Vout=2V		0.5	1.0	%
Dropout voltage	Vdif	Iout=1A, ΔVref=1%		1.20	1.45	V
Current limit	Ilim	Vin-Vout=2V	1.1	1.2		A
Quiescent current	Iq			5	10	mA
RMS output noise	Vn			Vout× 0.003%		mV
Ripple rejection ratio	RR	f=120Hz, Vin=5V, Iout=1A, Cout=22μF	60	72		dB

■Marking

• SOT-223 package : ELM1117LG-xx(Fixed type)

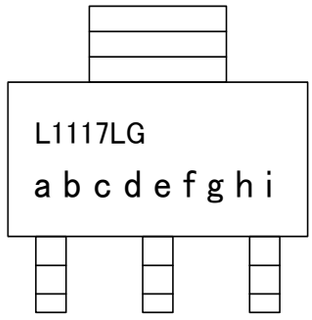
SOT-223



L : LDO
1117 : Product No.code
L : PKG type (SOT-223)
G : Pb-Free package mark
a, b : Output voltage (e.g. : 33=3.3V)
c to k : Production code

• SOT-223 package : ELM1117LG(Adjustable type)

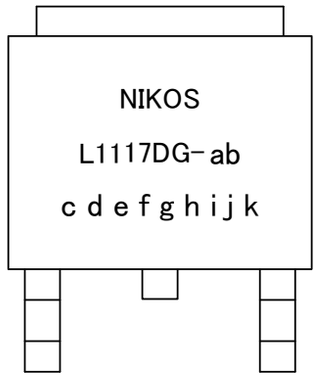
SOT-223



L : LDO
1117 : Product No.code
L : PKG type (SOT-223)
G : Pb-Free package mark
a to i : Production code

• TO-252-3 package : ELM1117DG-xx(Fixed type)

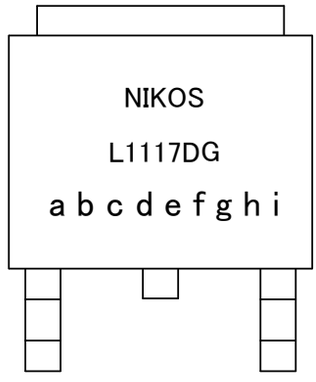
TO-252-3



L : LDO
1117 : Product No.code
D : PKG type (TO-252-3)
G : Pb-Free package mark
a, b : Output voltage (e.g. : 33=3.3V)
c to k : Production code

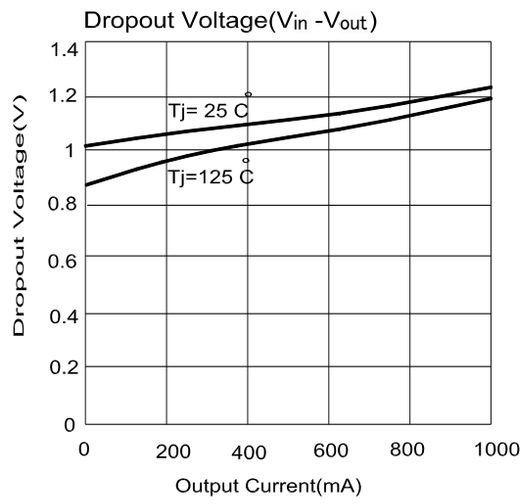
• TO-252-3 package : ELM1117DG(Adjustable type)

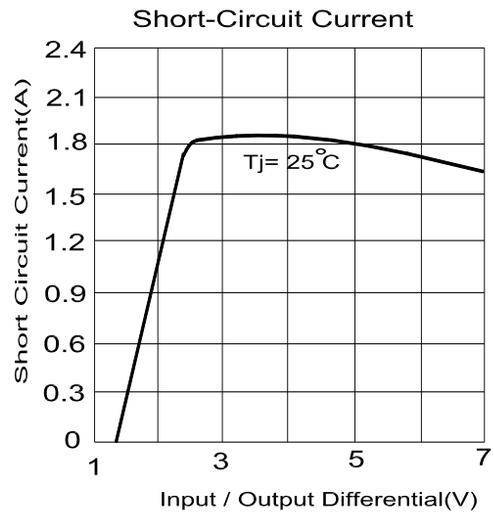
TO-252-3

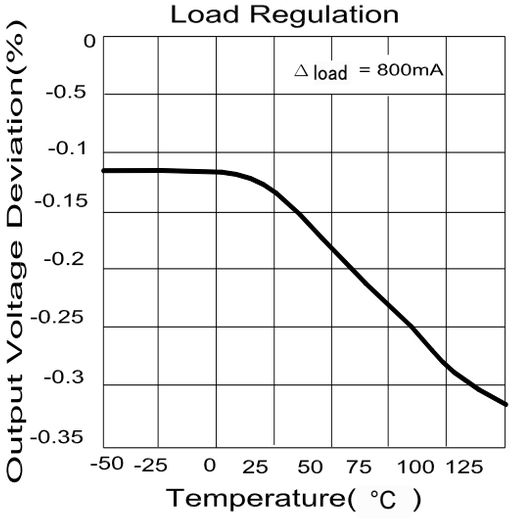


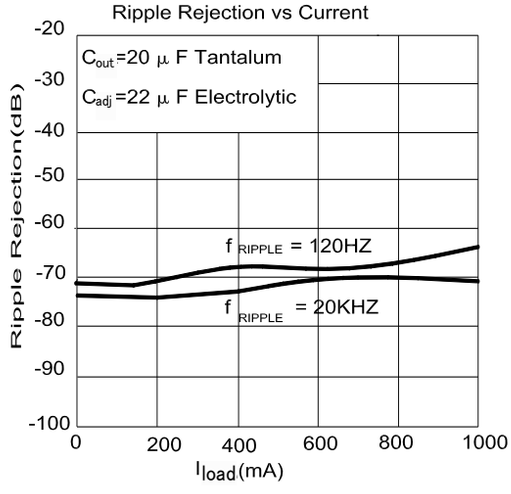
L : LDO
1117 : Product No.code
D : PKG type (TO-252-3)
G : Pb-Free package mark
a to i : Production code

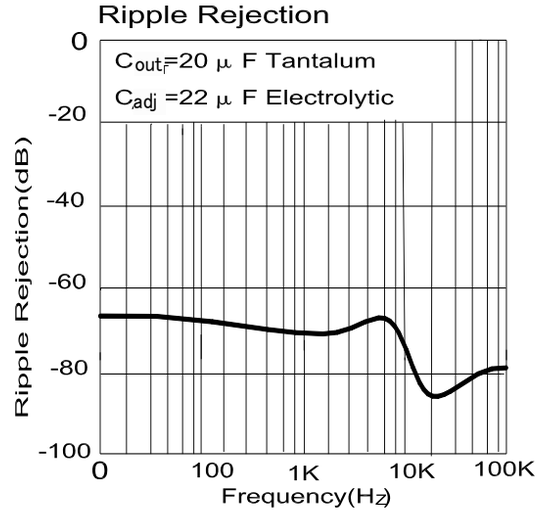
■Typical characteristics

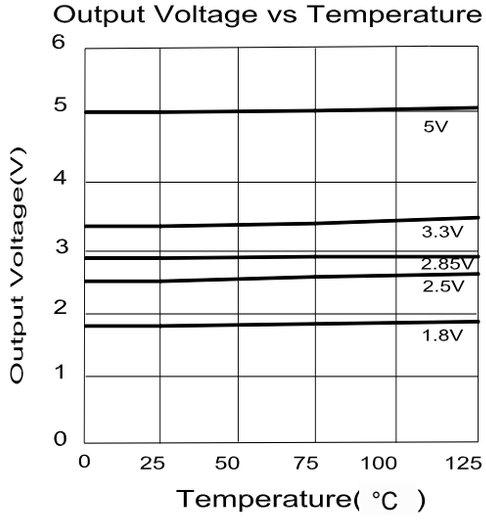


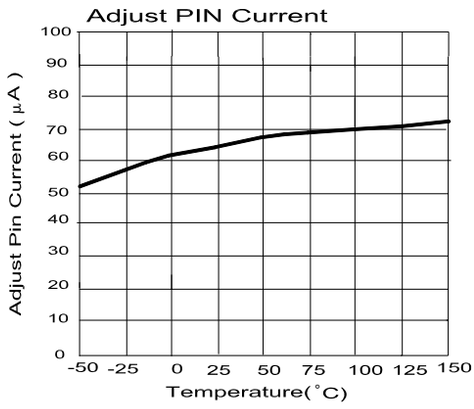




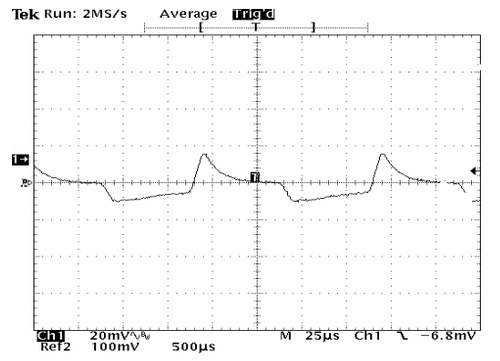








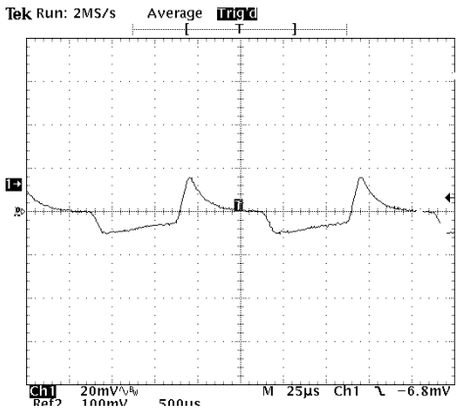
Load Transient



Vout=1.8V,Vin=3.3V,Iout=105mA/800mA

Cin=10μF,Cout=10μF

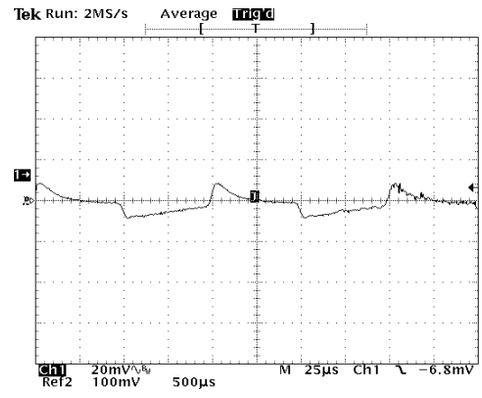
Load Transient



Vout=2.5V,Vin=4V,Iout=105mA/800mA

Cin=10μF,Cout=10μF

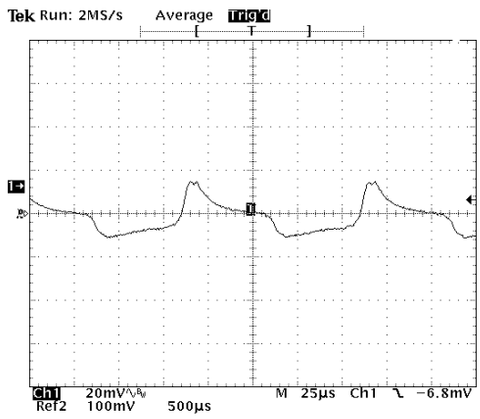
Load Transient



Vout=2.85V,Vin=4.35V,Iout=105mA/800mA

Cin=10μF,Cout=10μF

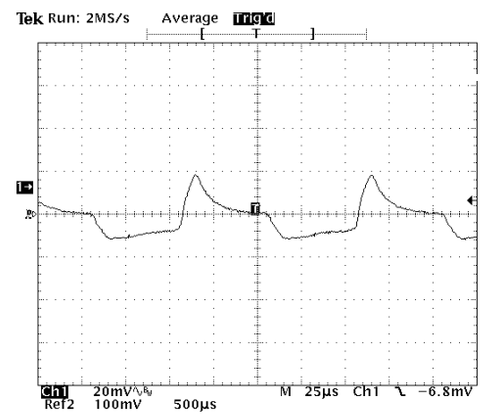
Load Transient



Vout=3.3V,Vin=4.8V,Iout=105mA/800mA

Cin=10μF,Cout=10μF

Load Transient



Vout=5V,Vin=6.5V,Iout=105mA/800mA

Cin=10μF,Cout=10μF