

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~4.0V).

■ Features

- Output voltage range (fixed) : 1.8V, 2.5V, 3.3V, 5.0V
(adj.) : 1.3V~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

- SCSI terminator
- 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~+125	°C
Storage temperature	Tstg	-40~+150	°C
Thermal resistance junction to case	Rθjc	16	°C/W
Thermal resistance junction to ambient	Rθja	158 (SOT-223) 70 (TO-252-3)	°C/W
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

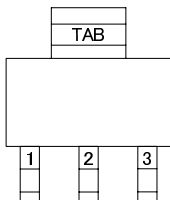
ELM1117 x G - x x - S
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 a b c d e

- Adj. version

ELM1117 x G - S
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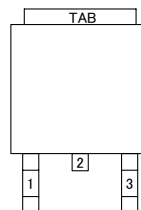
■ Pin configuration

SOT-223 (TOP VIEW)



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

TO-252-3 (TOP VIEW)

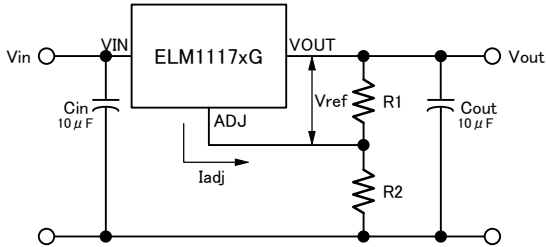


Pin No.	Pin name
1	ADJ/GND
2/TAB	VOUT
3	VIN

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Typical application

- Adjustable type

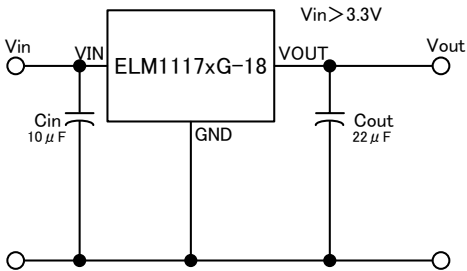


$$V_o = V_{ref}(1 + R_2/R_1) + I_{adj} \times R_2$$

* We recommend to use Min. 10µF tantalum condenser.

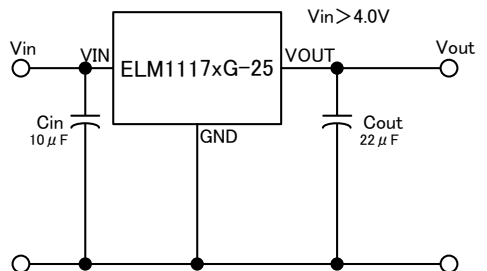
- Fixed type

Vout=1.8V



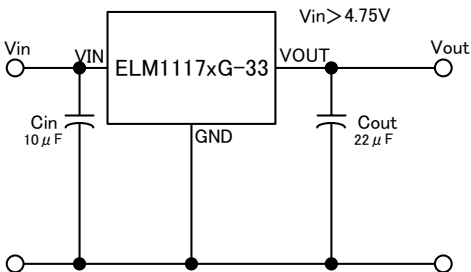
* We recommend to use Min. 10µF tantalum condenser.

Vout=2.5V



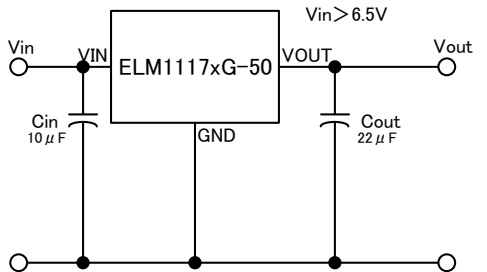
* We recommend to use Min. 10µF tantalum condenser.

Vout=3.3V



* We recommend to use Min. 10µF tantalum condenser.

Vout=5.0V



* We recommend to use Min. 10µF tantalum condenser.

ELM1117xG Bipolar 1A LDO Voltage regulator

■ 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	$\Delta V_{out} / \Delta V_{in}$	Iout=10mA, Vin=(Vout+1.5V)~15V		0.5	2.0	%
Load regulation	$\Delta V_{out} / \Delta I_{out}$	Iout=10mA~1A, Vin-Vout=2V		0.5	2.5	%
Dropout voltage	Vdif	Iout=1A, $\Delta V_{ref}=1\%$		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, Co=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	$\Delta V_{out} / \Delta V_{in}$	Iout=10mA, Vin=3.3V~15V		0.5	2.0	%
Load regulation	$\Delta V_{out} / \Delta I_{out}$	Iout=10mA~1A, Vin-Vout=2V		0.5	2.0	%
Dropout voltage	Vdif	Iout=1A, $\Delta V_{ref}=1\%$		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, Co=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	$\Delta V_{out} / \Delta V_{in}$	Iout=10mA, Vin=4.0V~15V		0.5	2.0	%
Load regulation	$\Delta V_{out} / \Delta I_{out}$	Iout=10mA~1A, Vin-Vout=2V		0.5	2.0	%
Dropout voltage	Vdif	Iout=1A, $\Delta V_{ref}=1\%$		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, Co=22μF	60	72		dB

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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	$\Delta V_{out} / \Delta V_{in}$	Iout=10mA, Vin=4.8V~15V		0.5	2.0	%
Load regulation	$\Delta V_{out} / \Delta I_{out}$	Iout=10mA~1A, Vin-Vout=2V		0.5	2.0	%
Dropout voltage	Vdif	Iout=1A, $\Delta V_{ref}=1\%$		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, Co=22μF	60	72		dB

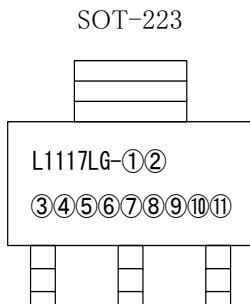
Vout=5.0V (ELM1117 x G - 50 - S)

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	$\Delta V_{out} / \Delta V_{in}$	Iout=10mA, Vin=6.5V~15V		0.5	1.0	%
Load regulation	$\Delta V_{out} / \Delta I_{out}$	Iout=10mA~1A, Vin-Vout=2V		0.5	1.0	%
Dropout voltage	Vdif	Iout=1A, $\Delta V_{ref}=1\%$		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, Co=22μF	60	72		dB

■ Marking

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

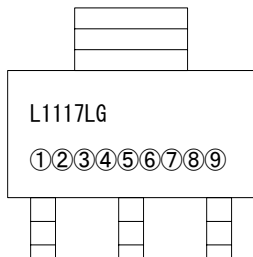


- L : LDO
- 1117 : Product No.code
- L : PKG type (SOT-223)
- G : Pb-Free package mark
- ①, ② : Output voltage (e.g. : 3,3=3.3V)
- ③~⑪ : Production code

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- SOT-223 package : ELM1117LG (Adjustable type)

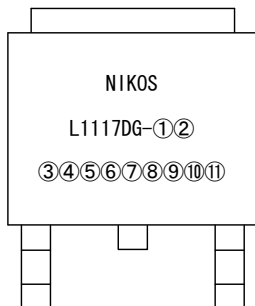
SOT-223



L : LDO
 1117 : Product No.code
 L : PKG type (SOT-223)
 G : Pb-Free package mark
 ①~⑨ : Production code

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

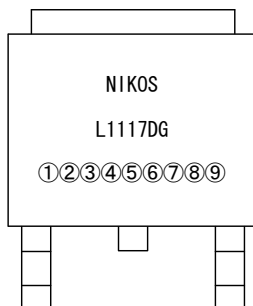
TO-252-3



L : LDO
 1117 : Product No.code
 D : PKG type (TO-252-3)
 G : Pb-Free package mark
 ① , ② : Output voltage (e.g. : 3,3=3.3V)
 ③~⑪ : Production code

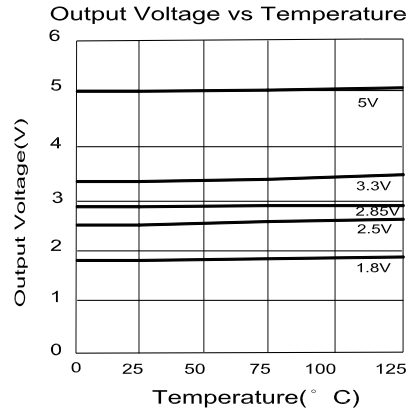
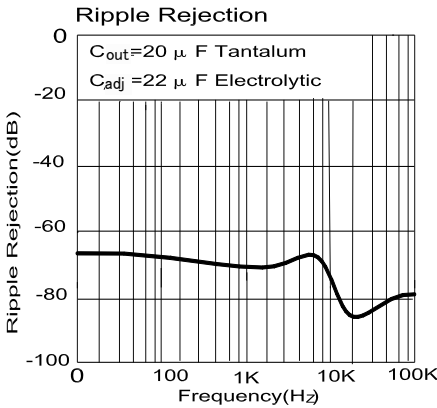
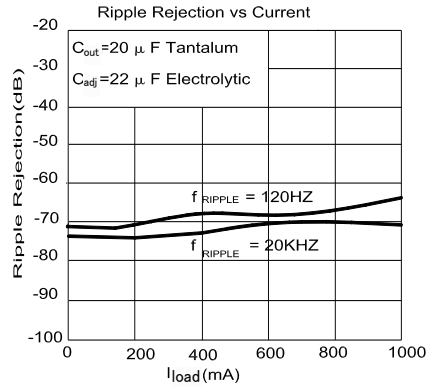
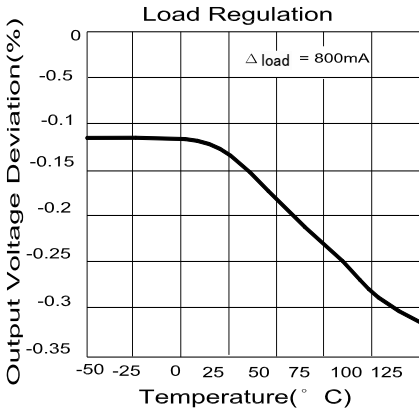
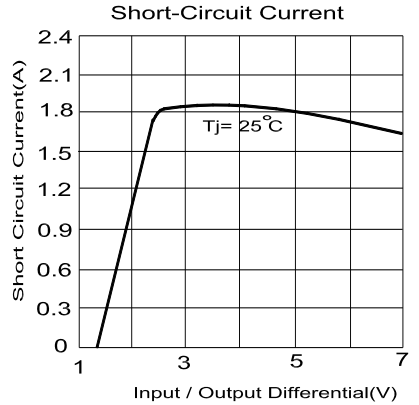
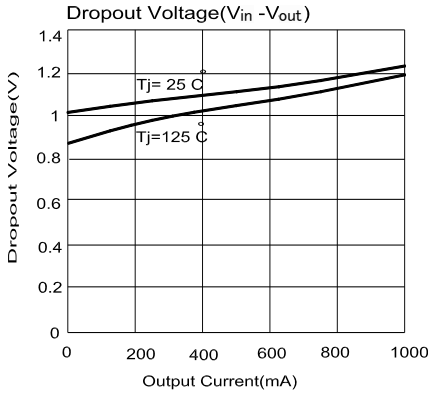
- TO-252-3 package : ELM1117DG (Adjustable type)

TO-252-3

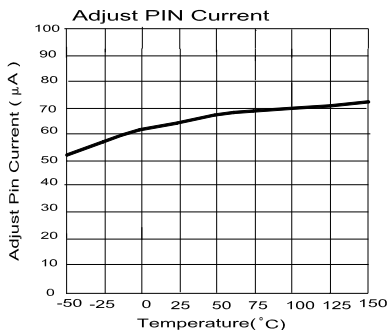


L : LDO
 1117 : Product No.code
 D : PKG type (TO-252-3)
 G : Pb-Free package mark
 ①~⑨ : Production code

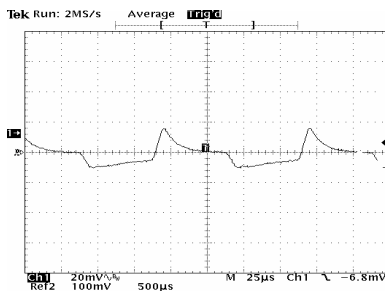
Typical characteristics



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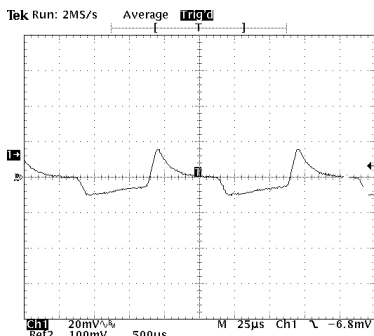
Load Transient



$V_{\text{out}}=1.8\text{V}, V_{\text{in}}=3.3\text{V}, I_{\text{out}}=105\text{mA}/800\text{mA}$

$C_{\text{in}}=10\mu\text{F}, C_{\text{out}}=10\mu\text{F}$

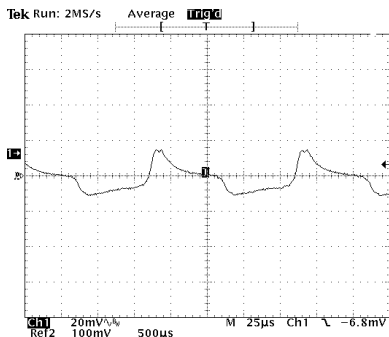
Load Transient



$V_{\text{out}}=2.5\text{V}, V_{\text{in}}=4\text{V}, I_{\text{out}}=105\text{mA}/800\text{mA}$

$C_{\text{in}}=10\mu\text{F}, C_{\text{out}}=10\mu\text{F}$

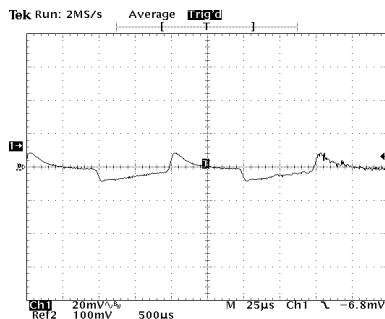
Load Transient



$V_{\text{out}}=3.3\text{V}, V_{\text{in}}=4.8\text{V}, I_{\text{out}}=105\text{mA}/800\text{mA}$

$C_{\text{in}}=10\mu\text{F}, C_{\text{out}}=10\mu\text{F}$

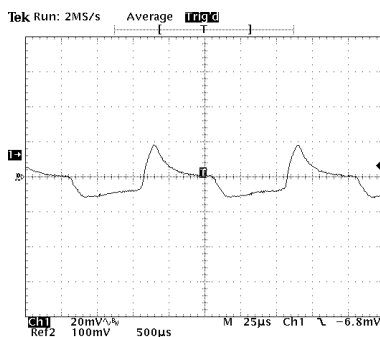
Load Transient



$V_{\text{out}}=2.85\text{V}, V_{\text{in}}=4.35\text{V}, I_{\text{out}}=105\text{mA}/800\text{mA}$

$C_{\text{in}}=10\mu\text{F}, C_{\text{out}}=10\mu\text{F}$

Load Transient



$V_{\text{out}}=5\text{V}, V_{\text{in}}=6.5\text{V}, I_{\text{out}}=105\text{mA}/800\text{mA}$

$C_{\text{in}}=10\mu\text{F}, C_{\text{out}}=10\mu\text{F}$