



MILITARY VERSION

5 AMP POSITIVE VOLTAGE REGULATOR

O INPUT SAFE AREA PROTECTION LIMI CHRRENT LIMITING AMPLIFIER OUTPUT SENSE

FEATURES

- Low Dropout Performance
- Fixed or Adjustable Voltages
- Fixed Output Voltages of 3.3V, 5V & 12V
- Adjustable Output Voltage Range From 1.2V
- Line Regulation 0.015% / V Typical.
- Load Regulation 0.01% Typical.
- Available in Hermetically Sealed TO-3, SMD1 and TO-257 (isolated & non-isolated) Packages.
- Military Temperature Range (–55 to +150°C)

DEVICE ⁽¹⁾	PACKAGE
LM1084MK-XX	TO-3
LM1084MG-XX	TO-257
LM1084MIG-XX	Isolated TO-257
LM1084MSM-XX	SMD1

Note

1) -XX = Voltage Option: 3.3, 5 or 12 -XX = Left blank for Adjustable Option.

DESCRIPTION

THERMAL

VOLTAGE REGULATION **AMPLIFIER**

The LT1084 voltage regulators are monolithic integrated circuits designed for use in applications requiring a well regulated positive output voltage with low input-output differential voltage.

VREF

Features include full power usage of up to 5A load current, internal current limiting and thermal shutdown. Safe area protection on the die is also included, providing protection of the series pass Darlington transistor under most conditions.

The hermetically sealed TO-3 packages are utilised for high reliablitiy and low thermal resistance, whilst the SMD1 package is designed for surface mount applications.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C unless otherwise stated)

$\overline{V_{IN}}$	Input – Output Voltage Differential			35V
P_{D}	Power Dissipation			Internally limited *
$R_{\theta JC}$	Thermal Resistance Junction To Case	TO-3 TO-3	Control Power	0.76°C / W 2.3°C / W
$R_{\theta JC}$	Thermal Resistance Junction To Case	SMD1 SMD1	Control Power	0.79°C / W 4.0°C / W
$R_{ heta JC}$	Thermal Resistance Junction To Case	TO-257 TO-257	Control Power	0.79°C / W 4.0°C / W
T_J	Operating Junction Temperature Range		Control Power	−55 to 150°C −55 to 200°C
T_{STG}	Storage Temperature Range			−65 to 150°C
T _{LEAD}	Lead Temperature (for 10 sec.)			300°C

^{*} These ratings are only applicable for power dissipations of 30 Watts over a limited range of V_{IN} – V_{OUT}.

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Issue 1



LM1084M

MILITARY VERSION

ELECTRICAL CHARACTERISTICS (T_J = 25°C Unless otherwise stated) LM1084MK & LM1084MSM

		Output						
	Parameter	Voltage	Test Conditions 1,2		Min.	Тур.	Max.	Unit
		3.3	$V_{IN} - V_{OUT} = 6.3V$	I _O = 10mA	3.267	3.3	3.333	
		0.0	$I_O = 10$ mA to 5A	T _J = Over Temp ³	3.234	3.3	3.366	
V _O ⁴	Output Voltage	5	$V_{IN} - V_{OUT} = 8V$	$I_O = 10mA$	4.95	5	5.05	l v
VO	Output Voltage)	$I_O = 10$ mA to 5A	T _J = Over Temp ³	4.90	5	5.10	
		12	$V_{IN} - V_{OUT} = 15V$	I _O = 10mA	11.88	12	12.12	
		12	$I_O = 10$ mA to 5A	T _J = Over Temp ³	11.76	12	12.24	
V _{REF} ⁴	Reference Voltage	ADJ.	$V_{IN} - V_{OUT} = V_O + 3V$	I _O = 10mA	1.238	1.25	1.262	V
V REF	helerence voltage	ADJ.	I _O = 10mA to 5A	T _J = Over Temp ³	1.225	1.25	1.270]
			$V_{IN} - V_{OUT} = 1.5 \text{ to } 15V$	T _J = 25°C		0.015	0.2	%
DEC 4	4 L: D L:		I _O = 10mA	T _J = Over Temp ³		0.035		7
ned _(LINE) .	4 Line Regulation		$V_{IN} - V_{OUT} = 1.5 \text{ to } 35V$ $T_{J} = \text{Over Temp } ^{3}$	I _O = 10mA		0.05	0.5	%
DEC 4	Load Description		$V_{IN} - V_{OUT} = 3V$	T _J = 25°C		0.1	0.3	0/
REG _(LOAD) ⁴ Load Regulation			$V_{IN} - V_{OUT} = 3V$	T _J = Over Temp ³		0.2	0.4	 %
V _D	Dropout Voltage		ΔV_{OUT} , $\Delta V_{REF} = 1\%$	T _J = Over Temp ³		1.3	1.5	V
1	Current Limit		$V_{IN} - V_{OUT} = 5V$	T _J = Over Temp ³	5.5	6.5		A
I _{CL}	Current Limit		V _{IN} – V _{OUT} = 25V	T _J = Over Temp ³	0.3		0.6] ^
IQ	Quiescent Current		$V_{IN} - V_{OUT} = 35V$	T _J = Over Temp ³			10	mA
REG _(THERM)	Thermal Regulation		t _p = 30ms	T _J = 25°C		0.002	0.01	% / W
	Adjust Pin Current		T _J = 25°C			55		T
I _{PIN}	Adjust Pin Current		T _J = Over Temp ³				120	⊣ μΑ
ΔI_{PIN}	Adjust Pin Current	Change	T _J = Over Temp ³			0.2	5	μΑ
_	Tamparatura Ctabili	+. ,	$V_{IN} - V_{OUT} = 5V$	I _O = 0.5A		0.5		0/
T _S T ₀	Temperature Stabili	ıy	T _J = Over Temp ³			0.5		%
I _O Minimum Load Currer		ront	$V_{IN} - V_{OUT} = 25V$	I _O = 0.5A		F	10	- A
		CIIL	T _J = Over Temp ³			5	10	mA
V _N	RMS Output Noise	5	T _J = 25°C			0.003		%V _O
D	Dipple Dejection De	utio 6	$V_{IN} - V_{OUT} = 3V$	I _O = 3A	60	75		AD.
ΠA	R _A Ripple Rejection Rati		T _J = Over Temp ³		60	/ 75		dB

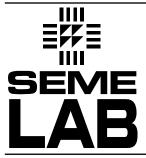
- Test Conditions unless otherwise stated: V_{IN} = 1.5 to 35V, or Maximum Input, whichever is less. $I_O = 10$ mA to 5A.
- These specifications are only applicable for power dissipations of 45 Watts over a limited range of $V_{IN} V_{OUT}$.
- Over Temp. = Over specified Junction Temperature Range (See Absolute Maximum Ratings).
- Low duty cycle pulse test with Kelvin connections required. Changes in output voltage are covered under the specification for thermal regulation.
- Bandwidth of 10Hz to 10kHz.

6. 120Hz input ripple, 15V = 64dB min. C_{OUT} $(C_{ADJ}) = 25\mu F$. Semelab PIc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

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LM1084M

MILITARY VERSION

ELECTRICAL CHARACTERISTICS (T_J = 25°C Unless otherwise stated)

LM1084MG

	Parameter	Output Voltage	Test Conditions 1,2		Min.	Тур.	Max.	Unit
			$V_{IN} - V_{OUT} = 6.3V$	I _O = 10mA	3.267	3.3	3.333	
		3.3	I _O = 10mA to 5A	T _J = Over Temp ³	3.234	3.3	3.366	1
., ,	0	_	$V_{IN} - V_{OUT} = 8V$	I _O = 10mA	4.95	5	5.05	1
V _O ⁴	Output Voltage	5	I _O = 10mA to 5A	T _J = Over Temp ³	4.90	5	5.10	-
		10	$V_{IN} - V_{OUT} = 15V$	I _O = 10mA	11.88	12	12.12	1
		12	I _O = 10mA to 5A	T _J = Over Temp ³	11.76	12	12.24	1
V 4	Deference Voltage	4D.I	$V_{IN} - V_{OUT} = V_O + 3V$	I _O = 10mA	1.238	1.25	1.262	V
V _{REF} ⁴	Reference Voltage	ADJ.	I _O = 10mA to 5A	T _J = Over Temp ³	1.225	1.25	1.270]
			$V_{IN} - V_{OUT} = 1.5 \text{ to } 15V$	T _J = 25°C		0.015	0.2	%
DEC 4	A Line De Lii		I _O = 10mA	T _J = Over Temp ³		0.035		7 %
REG _(LINE)	REG _(LINE) ⁴ Line Regulation		$V_{IN} - V_{OUT} = 1.5 \text{ to } 35V$ $T_{J} = \text{Over Temp } ^{3}$	I _O = 10mA		0.05	0.5	%
DEC 4	Lood Domilation		$V_{IN} - V_{OUT} = 3V$	T _J = 25°C		0.4	0.5	0/
REG _(LOAD)	Load Regulation		$V_{IN} - V_{OUT} = 3V$	T _J = Over Temp ³		0.7	0.6	%
V_D	Dropout Voltage		ΔV_{OUT} , $\Delta V_{REF} = 1\%$	T _J = Over Temp ³		1.3	1.5	V
1	Current Limit		$V_{IN} - V_{OUT} = 5V$	T _J = Over Temp ³	5.5	6.5		
I _{CL}			$V_{IN} - V_{OUT} = 25V$	T _J = Over Temp ³	0.3		0.6] ^
IQ	Quiescent Current		$V_{IN} - V_{OUT} = 35V$	T _J = Over Temp ³			10	mA
REG _(THERM)	Thermal Regulation		t _p = 30ms	$T_J = 25^{\circ}C$		0.002	0.01	% / W
1	Adjust Pin Current		$T_J = 25^{\circ}C$			55		μΑ
I _{PIN}	Adjust i iii Guireit		T _J = Over Temp ³				120	μΑ
ΔI_{PIN}	Adjust Pin Current (Change	T _J = Over Temp ³			0.2	5	μΑ
T _S	Tomporaturo Stabili	tv	$V_{IN} - V_{OUT} = 5V$	I _O = 0.5A		0.5		%
'S	Temperature Stability		T _J = Over Temp ³			0.5		/0
1-	Minimum Load Cur	ont	$V_{IN} - V_{OUT} = 25V$	I _O = 0.5A		5	10	mA
I _O Minimum Load Current			T _J = Over Temp ³			J		'''^
V _N	RMS Output Noise	5	$T_J = 25^{\circ}C$			0.003		%V _O
R _A	Ripple Rejection Ra	ntio ⁶	$V_{IN} - V_{OUT} = 3V$ $T_{J} = Over Temp 3$	I _O = 3A	60	75		dB

- 1. Test Conditions unless otherwise stated: $V_{IN} = 1.5$ to 35V, or Maximum Input, whichever is less. $I_O = 10$ mA to 5A.
- These specifications are only applicable for power dissipations of 45 Watts over a limited range of V_{IN} V_{OLIT}.
- Over Temp. = Over specified Junction Temperature Range (See Absolute Maximum Ratings).
- Low duty cycle pulse test with Kelvin connections required. Changes in output voltage are covered under the specification for thermal regulation.
- Bandwidth of 10Hz to 10kHz.

6. 120Hz input ripple, 15V = 64dB min. C_{OUT} $(C_{ADJ}) = 25\mu F$. Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its semelab encourages customers to verify that datasheets are current before placing orders.

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LM1084M

MILITARY VERSION

ELECTRICAL CHARACTERISTICS

 $(T_J = 25^{\circ}C \text{ Unless otherwise stated})$ LM1084MIG

		Output						
	Parameter	Voltage	Test Conditions 1,2		Min.	Тур.	Max.	Unit
		3.3	$V_{IN} - V_{OUT} = 6.3V$	I _O = 10mA	3.267	3.3	3.333	
		5.	$I_O = 10$ mA to 5A	T _J = Over Temp ³	3.234	3.3	3.366]
V _O ⁴	Output Voltage	5	$V_{IN} - V_{OUT} = 8V$	I _O = 10mA	4.95	5	5.05] _v
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Output Voltage	,	$I_O = 10$ mA to 5A	T _J = Over Temp ³	4.90	5	5.10] '
		12	$V_{IN} - V_{OUT} = 15V$	I _O = 10mA	11.88	12	12.12]
		12	$I_O = 10$ mA to 5A	T _J = Over Temp ³	11.76	12	12.24	
V _{REF} ⁴	Reference Voltage	ADJ.	$V_{IN} - V_{OUT} = V_O + 3V$	I _O = 10mA	1.231	1.25	1.268	\rfloor_{v}
V REF	Tiererence voltage	ADO.	$I_O = 10$ mA to 5A	T _J = Over Temp ³	1.219	1.25	1.281	
			$V_{IN} - V_{OUT} = 1.5 \text{ to } 15V$	T _J = 25°C		0.015	0.2	- %
BEG 4	Line Regulation		I _O = 10mA	T _J = Over Temp ³		0.035		76
TILO(LINE)	REG _(LINE) ⁴ Line Regulation		$V_{IN} - V_{OUT} = 1.5 \text{ to } 35V$ $T_{.I} = \text{Over Temp } ^3$	I _O = 10mA		0.05	0.5	%
			$V_{IN} - V_{OUT} = 3V$	T _{.1} = 25°C		0.7	1.25	
REG _(LOAD) ⁴	REG _(LOAD) ⁴ Load Regulation		$V_{IN} - V_{OUT} = 3V$	T _{.I} = Over Temp ³		0.8	1.65	- %
V _D	Dropout Voltage		ΔV_{OUT} , $\Delta V_{REF} = 1\%$	T _J = Over Temp ³		1.3	1.5	V
	0		$V_{IN} - V_{OUT} = 5V$	T _J = Over Temp ³	5.5	6.5		
I _{CL}	Current Limit		$V_{IN} - V_{OUT} = 25V$	T _J = Over Temp ³	0.3		0.6	A
IQ	Quiescent Current		$V_{IN} - V_{OUT} = 35V$	T _J = Over Temp ³			10	mA
REG _(THERM)	Thermal Regulation		t _p = 30ms	T _J = 25°C		0.002	0.01	% / W
	Adjust Dia Current		$T_J = 25^{\circ}C$			55		
I _{PIN}	Adjust Pin Current		T _J = Over Temp ³				120	- μ A
ΔI_{PIN}	Adjust Pin Current	Change	T _J = Over Temp ³			0.2	5	μА
_	Tomporatura Stabili	+.,	$V_{IN} - V_{OUT} = 5V$	I _O = 0.5A		0.5		%
T _S	Temperature Stabili	ty	T _J = Over Temp ³			0.5		70
	Minimum Load Curr	ont	$V_{IN} - V_{OUT} = 25V$	I _O = 0.5A		5	10	
I _O Minimum Load Cu		ent	$T_J = Over Temp 3$			5	10	mA
V _N	RMS Output Noise	5	$T_J = 25^{\circ}C$			0.003		%V _O
D.	Ripple Rejection Po	utio 6	$V_{IN} - V_{OUT} = 3V$	I _O = 3A	60	75		dB
R _A	Ripple Rejection Ratio ⁶		$T_J = Over Temp 3$		UU	/3		ub

- Test Conditions unless otherwise stated: V_{IN} = 1.5 to 35V, or Maximum Input, whichever is less. $I_O = 10$ mA to 5A.
- These specifications are only applicable for power dissipations of 45 Watts over a limited range of $V_{IN} V_{OUT}$.
- Over Temp. = Over specified Junction Temperature Range (See Absolute Maximum Ratings).
- Low duty cycle pulse test with Kelvin connections required. Changes in output voltage are covered under the specification for thermal regulation.
- Bandwidth of 10Hz to 10kHz.

6. 120Hz input ripple, 15V = 64dB min. C_{OUT} $(C_{ADJ}) = 25\mu F$. Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its semelab encourages customers to verify that datasheets are current before placing orders.

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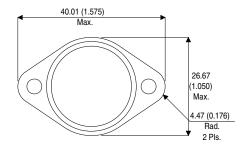
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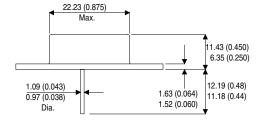


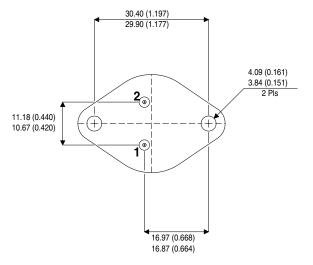


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K Package (TO-3)







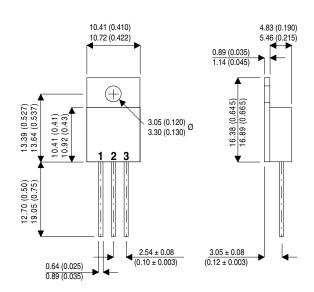
LM1084MK

Pin Fixed		Adjustable			
1	COMMON	ADJUST			
2	INPUT	INPUT			
	Case is OUTPUT				

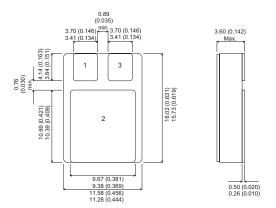
LM1084MG

Pin	Fixed	Adjustable	
1	COMMON	ADJUST	
2	OUTPUT	OUTPUT	
3	INPUT	INPUT	
Case is OUTPUT			

G & IG Packages (TO-257)



SMD1 Package



LM1084MSM

Pin	Fixed	Adjustable
1	COMMON	ADJUST
2	OUTPUT	OUTPUT
3	INPUT	INPUT

LM1084MIG

Pin	Fixed	Adjustable		
1	COMMON	ADJUST		
2	OUTPUT	OUTPUT		
3	INPUT	INPUT		
	Case is ISOLATED			

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