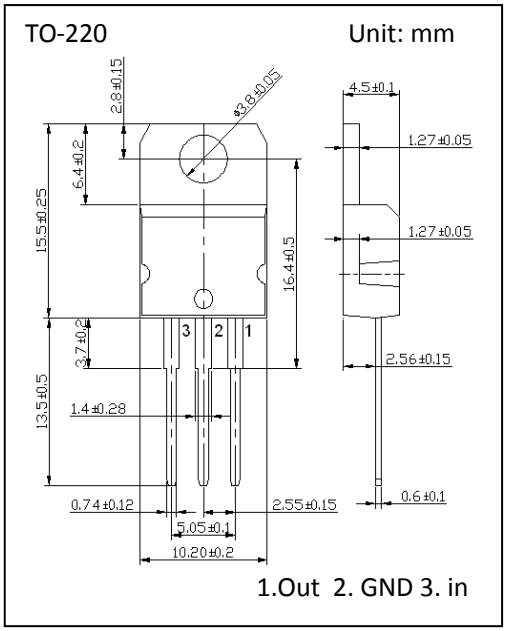
3-Terminal 1A Positive Voltage Regulator

LM78XX



Description

The HOPERF LM78XX is integrated linear positive regulator with three terminals. The LM78XX offer several fixed output voltages making them useful in wide range of applications. When used as a zener diode/resistor combination replacement, the LM78XX usually results in an effective output impedance improvement of two orders of magnitude, lower quiescent current.

The LM78XX is available in the TO-220 packages.

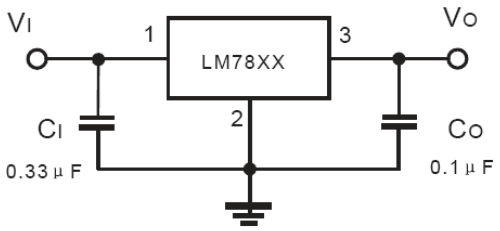
Features

- Output Current of 1A
- Output Voltage Tolerance of 5%
- Internal thermal overload protection
- Internal Short-Circuit Limited
- No External Component
- Output Voltage 5V, 6V, 8V, 9V, 12V
- Offer in plastic TO-220
- Direct Replacement for LM78XX

Applications

- Post regulator for switching DC/DC converter
- Bias supply for analog circuits

Typical Application



Ordering Information

Device	Operating Voltage	Output voltage
LM7805	7 to 20	5v
LM7806	8 to 20	6v
LM7808	10.5 to 23	8v
LM7809	11.5 to 24	9v
LM7812	14.5 to 27	12v

Absolute Maximum Ratings (Operating temperature range applies unless otherwise specified)

Parameter	Symbol	Rating	Unit
Input Voltage	V_I	35	V
Operating Junction Temperature Range	T_{OPR}	-55 ～+125	℃
Storage Temperature Range	T_{STG}	-65 ～+150	℃

Electrical Characteristics (LM7805)

(V_I=10V, I_O=500mA, 0 ℃ ≤T_J≤125 ℃, unless otherwise specified.)

Parameter	Symbol	Conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_O	T_J = 25 ℃	4.8	5.0	5.2	V
Line Regulation	ΔV_O	V_I = 7V to 25V T_J = 25 ℃		3	100	mV
		V_I = 8V to 12V T_J = 25 ℃		1	50	
Load Regulation	ΔV_O	I_O = 5mA to 1A, 25 ℃		15	100	mV
		I_O = 250mA to 750mA, 25 ℃		5	50	
Ripple Rejection	RR	V_I = 8V to 18V, f=120Hz	62	78		dB
Output Noise Voltage	V_N	F= 10Hz to 100Hz T_J = 25 ℃		40		μV
Dropout Voltage	V_D	T_J = 25 ℃		2.0		V
Quiescent Current		T_J = 25 ℃		4.2		mA
Quiescent Current Change	ΔI_Q	V_I = 7V to 25V, T_J = 25 ℃			1.3	mA
		I_O = 5mA to 750mA, T_J = 25 ℃			0.5	

Electrical Characteristics (LM7806)

(V_I=11V, I_O=500mA, 0 ℃ ≤T_J≤125 ℃, unless otherwise specified.)

Parameter	Symbol	Conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_O	T_J = 25 ℃	5.75	6.0	6.25	V
Line Regulation	ΔV_O	V_I = 8V to 25V T_J = 25 ℃		5	120	mV
		V_I = 9V to 25V T_J = 25 ℃		1.5	60	
Load Regulation	ΔV_O	I_O = 5mA to 1A, 25 ℃		14	120	mV
		I_O = 250mA to 750mA, 25 ℃		4	60	
Ripple Rejection	RR	V_I = 9V to 19V, f=120Hz	59	75		dB
Output Noise Voltage	V_N	F= 10Hz to 100Hz T_J = 25 ℃		45		μV
Dropout Voltage	V_D	T_J = 25 ℃		2.0		V
Quiescent Current		T_J = 25 ℃		4.3		mA
Quiescent Current Change	ΔI_Q	V_I = 8V to 25V, T_J = 25 ℃			1.3	mA
		I_O = 5mA to 750mA, T_J = 25 ℃			0.5	

Electrical Characteristics (LM7808)

(V_I=14V, I_O=500mA, 0 ℃ ≤T_J≤125 ℃, unless otherwise specified.)

Parameter	Symbol	Conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_O	T_J = 25 ℃	7.7	8.0	8.3	V
Line Regulation	ΔV_O	V_I = 10.5V to 25V T_J = 25 ℃		6	160	mV
		V_I = 11V to 17V T_J = 25 ℃		2	80	
Load Regulation	ΔV_O	I_O = 5mA to 1A, 25 ℃		12	160	mV
		I_O = 250mA to 750mA, 25 ℃		4	80	
Ripple Rejection	RR	V_I = 11.5V to 21.5V, f=120Hz	55	72		dB
Output Noise Voltage	V_N	F= 10Hz to 100Hz T_J = 25 ℃		52		μV
Dropout Voltage	V_D	T_J = 25 ℃		2.0		V
Quiescent Current		T_J = 25 ℃		4.3		mA
Quiescent Current Change	ΔI_Q	V_I = 10.5V to 25V, T_J = 25 ℃			1	mA
		I_O = 5mA to 750mA, T_J = 25 ℃			0.5	

Electrical Characteristics (LM7809)

(V_I=16V, I_O=500mA, 0℃ ≤T_J≤125 ℃, unless otherwise specified.)

Parameter	Symbol	Conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_O	T_J = 25 ℃	8.6	9.0	9.40	V
Line Regulation	ΔV_O	V_I = 11.5V to 27V T_J = 25 ℃		7	180	mV
		V_I = 13V to 19V T_J = 25 ℃		2	90	
Load Regulation	ΔV_O	I_O = 5mA to 1A, 25 ℃		12	180	mV
		I_O = 250mA to 750mA, 25 ℃		4	90	
Ripple Rejection	RR	V_I = 12V to 19V, f=120Hz	55	70		dB
Output Noise Voltage	V_N	F= 10Hz to 100Hz TJ = 25 ℃		60		μV
Dropout Voltage	V_D	T_J = 25 ℃		2.0		V
Quiescent Current		T_J = 25 ℃		4.3		mA
Quiescent Current Change	ΔI_Q	V_I = 11.5V to 27V, T_J = 25 ℃			1.0	mA
		I_O = 5mA to 750mA, T_J = 25 ℃			0.5	

Electrical Characteristics (LM7812)

(V_I=19V, I_O=500mA, 0℃ ≤T_J≤125 ℃, unless otherwise specified.)

Parameter	Symbol	Conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_O	T_J = 25 ℃	11.50	12	12.5	V
Line Regulation	ΔV_O	V_I = 14.5V to 30V T_J = 25 ℃		10	240	mV
		V_I = 16V to 22V T_J = 25 ℃		3.0	120	
Load Regulation	ΔV_O	I_O = 5mA to 1A, 25 ℃		12	240	mV
		I_O = 250mA to 750mA, 25 ℃		4	120	
Ripple Rejection	RR	V_I = 15V to 25V, f=120Hz	55	71		dB
Output Noise Voltage	V_N	F= 10Hz to 100Hz TJ = 25 ℃		75		μV
Dropout Voltage	V_D	T_J = 25 ℃		2.0		V
Quiescent Current		T_J = 25 ℃		4.3		mA
Quiescent Current Change	ΔI_Q	V_I = 14.5V to 30V, T_J = 25 ℃			1.0	mA
		I_O = 5mA to 750mA, T_J = 25 ℃			0.5	

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