

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.

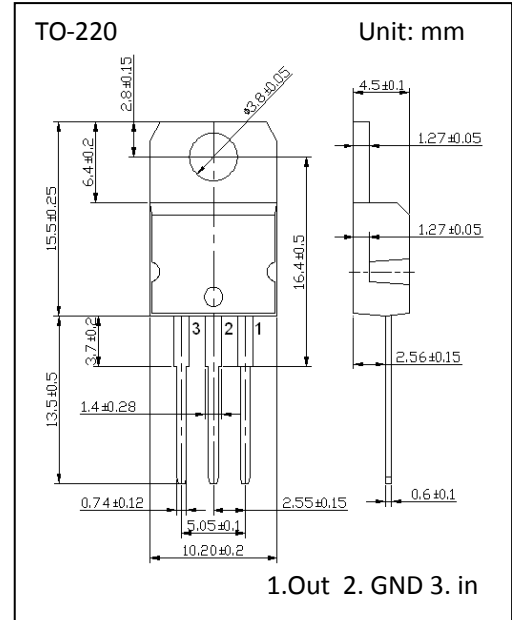
The LM78XX is available in the TO-220 packages.

Features

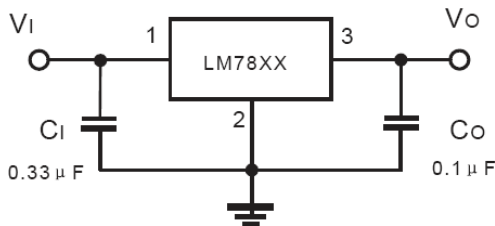
- Output Current of 1A
- Output Voltage Tolerance of 5%
- Internal thermal overload protection
- Internal Short-Circuit Limited
- No External Component
- Output Voltage 5V, 6V, 8V, 9V, 12V
- Offer in plastic TO-220
- Direct Replacment for LM78XX

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	Vi	35	V
Operating Junction Temperature Range	TOPR	-55 ~ +125	°C
Storage Temperature Range	TSTG	-65 ~ +150	°C

Electrical Characteristics (LM7805)

($V_I=10V$, $I_O=500mA$, $0\text{ }^\circ\text{C} \leq T_J \leq 125\text{ }^\circ\text{C}$, unless otherwise specified.)

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

Electrical Characteristics (LM7806)

($V_I=11V$, $I_O=500mA$, $0\text{ }^\circ\text{C} \leq T_J \leq 125\text{ }^\circ\text{C}$, unless otherwise specified.)

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

Electrical Characteristics (LM7808)

($V_I=14V$, $I_O=500mA$, $0\text{ }^\circ\text{C} \leq T_J \leq 125\text{ }^\circ\text{C}$, unless otherwise specified.)

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

Electrical Characteristics (LM7809)

($V_I=16V$, $I_O=500mA$, $0\text{ }^{\circ}C \leq T_J \leq 125\text{ }^{\circ}C$, unless otherwise specified.)

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

Electrical Characteristics (LM7812)

($V_I=19V$, $I_O=500mA$, $0\text{ }^{\circ}C \leq T_J \leq 125\text{ }^{\circ}C$, unless otherwise specified.)

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

HOPE MICROELECTRONICS CO.,LTD

Add:4/F, Block B3, East Industrial Area,
Huaqiaocheng, Shenzhen, Guangdong, China

Tel: 86-755-86096602

Fax: 86-755-86096587

Email: sales@hoperf.com

Website: <http://www.hoperf.com>

<http://www.hoperf.cn>

<http://hoperf.en.alibaba.com>

This document may contain preliminary information and is subject to change by Hope Microelectronics without notice. Hope Microelectronics assumes no responsibility or liability for any use of the information contained herein. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Hope Microelectronics or third parties. The products described in this document are not intended for use in implantation or other direct life support applications where malfunction may result in the direct physical harm or injury to persons. NO WARRANTIES OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MECHANICAL FITNESS FOR A PARTICULAR PURPOSE, ARE OFFERED IN THIS DOCUMENT.

©2006, HOPE MICROELECTRONICS CO.,LTD. All rights reserved.