

3-Terminal 0.5A Positive Voltage Regulator

LM78MXX

Description

The HOPERF LM78MXX is integrated linear positive regulator with three terminals. The LM78MXX offer several fixed output voltages making them useful in wide range of applications. When used as a zener diode/resistor combination replacement, the LM78MXX usually results in an effective output impedance improvement of two orders of magnitude, lower quiescent current.

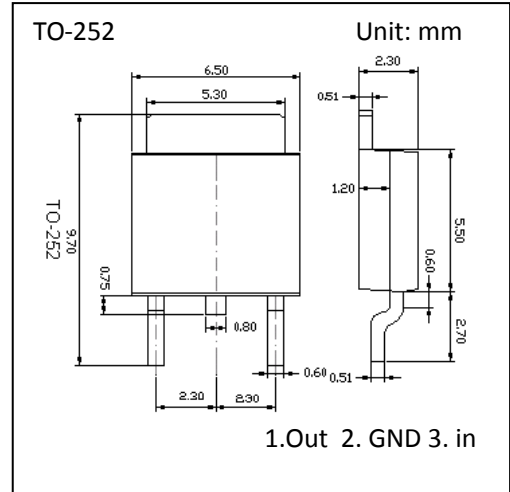
The LM78MXX is available in the TO-252 packages.

Features

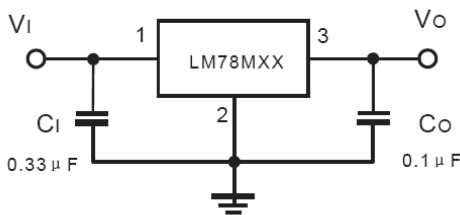
- Output Current of 0.5A
- Output Voltage Tolerance of 5%
- Internal thermal overload protection
- Internal Short-Circuit Limited
- No External Component
- Output Voltage 5V, 6V, 8V, 9V, 12V
- Offer in plastic TO-252
- Direct Replacement for LM78MXX

Applications

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



Typical Application



Ordering Information

Device	Operating Voltage	Output voltage
LM78M05	7 to 20	5v
LM78M06	8 to 20	6v
LM78M08	10.5 to 23	8v
LM78M09	11.5 to 24	9v
LM78M12	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	°C
Storage Temperature Range	T_{STG}	-65 ~ +150	°C

Electrical Characteristics (LM78M05)

($V_I=10V$, $I_O=350mA$, $0\text{ }^\circ\text{C} \leq T_J \leq 125\text{ }^\circ\text{C}$, 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	$V_I = 7V \text{ to } 20V$ $T_J = 25\text{ }^\circ\text{C}$		3	95	mV
		$V_I = 8V \text{ to } 12V$ $T_J = 25\text{ }^\circ\text{C}$		1	45	
Load Regulation	ΔV_O	$I_O = 5mA \text{ to } 500mA$, $25\text{ }^\circ\text{C}$		15	95	mV
		$I_O = 100mA \text{ to } 350mA$, $25\text{ }^\circ\text{C}$		5	45	
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
		$I_O = 5mA \text{ to } 350mA$, $T_J = 25\text{ }^\circ\text{C}$			0.5	

Electrical Characteristics (LM78M06)

($V_I=11V$, $I_O=350mA$, $0\text{ }^\circ\text{C} \leq T_J \leq 125\text{ }^\circ\text{C}$, 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	110	mV
		$V_I = 9V \text{ to } 25V$ $T_J = 25\text{ }^\circ\text{C}$		1.5	55	
Load Regulation	ΔV_O	$I_O = 5mA \text{ to } 500mA$, $25\text{ }^\circ\text{C}$		14	110	mV
		$I_O = 100mA \text{ to } 350mA$, $25\text{ }^\circ\text{C}$		4	55	
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
		$I_O = 5mA \text{ to } 350mA$, $T_J = 25\text{ }^\circ\text{C}$			0.5	

Electrical Characteristics (LM78M08)

($V_I=14V$, $I_O=350mA$, $0\text{ }^\circ\text{C} \leq T_J \leq 125\text{ }^\circ\text{C}$, 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	150	mV
		$V_I = 11V \text{ to } 17V$ $T_J = 25\text{ }^\circ\text{C}$		2	75	
Load Regulation	ΔV_O	$I_O = 5mA \text{ to } 500mA$, $25\text{ }^\circ\text{C}$		12	150	mV
		$I_O = 100mA \text{ to } 350mA$, $25\text{ }^\circ\text{C}$		4	75	
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
		$I_O = 5mA \text{ to } 350mA$, $T_J = 25\text{ }^\circ\text{C}$			0.5	

Electrical Characteristics (LM78M09)

($V_I=16V$, $I_O=350mA$, $0\text{ }^{\circ}C \leq T_J \leq 125\text{ }^{\circ}C$, 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	170	mV
		$V_I = 13V$ to $19V$ $T_J = 25\text{ }^{\circ}C$		2	85	
Load Regulation	ΔV_O	$I_O = 5mA$ to $500mA$, $25\text{ }^{\circ}C$		12	170	mV
		$I_O = 100mA$ to $350mA$, $25\text{ }^{\circ}C$		4	85	
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 $500mA$, $T_J = 25\text{ }^{\circ}C$			0.5	

Electrical Characteristics (LM78M12)

($V_I=19V$, $I_O=350mA$, $0\text{ }^{\circ}C \leq T_J \leq 125\text{ }^{\circ}C$, 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	230	mV
		$V_I = 16V$ to $22V$ $T_J = 25\text{ }^{\circ}C$		3.0	110	
Load Regulation	ΔV_O	$I_O = 5mA$ to $500mA$, $25\text{ }^{\circ}C$		12	230	mV
		$I_O = 100mA$ to $350mA$, $25\text{ }^{\circ}C$		4	110	
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 $350mA$, $T_J = 25\text{ }^{\circ}C$			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>

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