

POSITIVE VOLTAGE REGULATOR

Description

The HT78XX is integrated linear positive regulator with three terminals. The HT78XX offer several fixed output voltages making them useful in wide range of applications. When used as a zener diode/resistor combination replacement, the HT78XX usually results in an effective output impedance improvement of two orders of magnitude, lower quiescent current.

The HT78XX is available in the TO-252, TO-220 & TO-263 packages,

Features

- **Output Current of 1.5A**
- **Output Voltage Tolerance of 5%**
- **Internal thermal overload protection**
- **Internal Short-Circuit Limited**
- **No External Component**
- **Output Voltage 5.0V, 6V, 8V, 9V, 10V, 12V, 15V, 18V, 24V**
- **Offer in plastic TO-252, TO-220 & TO-263**
- **Direct Replacement for HT78XX**

Applications

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

Packaging Information



Top View

1. Input
2. GND
3. Output

Ordering Information

Device	Operating Voltage	Temp.
HT7805	7 to 20	0 to 125 °C
HT7806	8 to 20	0 to 125 °C
HT7808	10.5 to 23	0 to 125 °C
HT7809	11.5 to 24	0 to 125 °C
HT7810	12.5 to 25	0 to 125 °C
HT7812	14.5 to 27	0 to 125 °C
HT7815	17.5 to 30	0 to 125 °C
HT7818	20.5 to 33	0 to 125 °C
HT7824	26.5 to 39	0 to 125 °C

TO-220 (T)
 TO-263 (S)
 TO-252 (D)

Absolute Maximum Rating

Parameter	HT78--	Unit
Input Voltage	HT7824, HT7827 All Others	40 35 V
Operating Free-Air, Case, Virtual Junction Temp.	0 to 150	°C
Storage Temperature Range	-65 to 150	
Lead temperature 1.6 mm from case for sec.	260	

Electrical Characteristics (HT7805)

($V_I=10V$, $I_O=500mA$, $0^\circ C \leq T_J \leq 125^\circ C$, unless otherwise specified. (Note 1))

Parameter	Symbol	Conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_O	$T_J = 25^\circ C$	4.8	5.0	5.2	V
Line Regulation	ΔV_O	$V_I = 7V$ to $25V$ $T_J = 25^\circ C$		3	100	mV
		$V_I = 8V$ to $12V$ $T_J = 25^\circ C$		1	50	
Load Regulation	ΔV_O	$I_O = 5mA$ to $1.5A$, $25^\circ C$		15	100	mV
		$I_O = 250mA$ to $750mA$, $25^\circ C$		5	50	
Ripple Rejection	RR	$V_I = 8V$ to $18V$, $f=120Hz$	62	78		dB
Output Noise Voltage	V_N	$F=10Hz$ to $100Hz$ $T_J = 25^\circ C$		40		μV
Dropout Voltage	V_D	$T_J = 25^\circ C$		2.0		V
Quiescent Current		$T_J = 25^\circ C$		4.2	8	mA
Quiescent Current Change	ΔI_Q	$V_I = 7V$ to $25V$, $T_J = 25^\circ C$			1.3	mA
		$I_O = 5mA$ to $1A$, $T_J = 25^\circ C$			0.5	

Electrical Characteristics (HT7806)

($V_I=11V$, $I_O=500mA$, $0^\circ C \leq T_J \leq 125^\circ C$, unless otherwise specified. (Note 1))

Parameter	Symbol	Conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_O	$T_J = 25^\circ C$	5.75	6.0	6.25	V
Line Regulation	ΔV_O	$V_I = 8V$ to $25V$ $T_J = 25^\circ C$		5	120	mV
		$V_I = 9V$ to $25V$ $T_J = 25^\circ C$		1.5	60	
Load Regulation	ΔV_O	$I_O = 5mA$ to $1.5A$, $25^\circ C$		14	120	mV
		$I_O = 250mA$ to $750mA$, $25^\circ C$		4	60	
Ripple Rejection	RR	$V_I = 9V$ to $19V$, $f=120Hz$	59	75		dB
Output Noise Voltage	V_N	$F=10Hz$ to $100Hz$ $T_J = 25^\circ C$		45		μV
Dropout Voltage	V_D	$T_J = 25^\circ C$		2.0		V
Quiescent Current		$T_J = 25^\circ C$		4.3	8.0	mA
Quiescent Current Change	ΔI_Q	$V_I = 8V$ to $25V$, $T_J = 25^\circ C$			1.3	mA
		$I_O = 5mA$ to $1A$, $T_J = 25^\circ C$			0.5	

Electrical Characteristics (HT7808)

 ($V_I=14V$, $I_O=500mA$, $0^\circ C \leq T_J \leq 125^\circ C$, unless otherwise specified. (Note 1))

Parameter	Symbol	Conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_O	$T_J = 25^\circ C$	7.7	8.0	8.3	V
Line Regulation	ΔV_O	$V_I = 10.5V$ to $25V$ $T_J = 25^\circ C$		6	160	mV
		$V_I = 11V$ to $17V$ $T_J = 25^\circ C$		2	80	
Load Regulation	ΔV_O	$I_O = 5mA$ to $1.5A$, $25^\circ C$		12	160	mV
		$I_O = 250mA$ to $750mA$, $25^\circ C$		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 $100Hz$ $T_J = 25^\circ C$		52		μV
Dropout Voltage	V_D	$T_J = 25^\circ C$		2.0		V
Quiescent Current		$T_J = 25^\circ C$		4.3	8	mA
Quiescent Current Change	ΔI_Q	$V_I = 10.5V$ to $25V$, $T_J = 25^\circ C$			1	mA
		$I_O = 5mA$ to $1A$, $T_J = 25^\circ C$			0.5	

Electrical Characteristics (HT7809)

 ($V_I=16V$, $I_O=500mA$, $0^\circ C \leq T_J \leq 125^\circ C$, unless otherwise specified. (Note 1))

Parameter	Symbol	Conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_O	$T_J = 25^\circ C$	8.6	9.0	9.40	V
Line Regulation	ΔV_O	$V_I = 11.5V$ to $27V$ $T_J = 25^\circ C$		7	180	mV
		$V_I = 13V$ to $19V$ $T_J = 25^\circ C$		2	90	
Load Regulation	ΔV_O	$I_O = 5mA$ to $1.5A$, $25^\circ C$		12	180	mV
		$I_O = 250mA$ to $750mA$, $25^\circ C$		4	90	
Ripple Rejection	RR	$V_I = 12V$ to $19V$, $f=120Hz$	55	70		dB
Output Noise Voltage	V_N	$F=10Hz$ to $100Hz$ $T_J = 25^\circ C$		60		μV
Dropout Voltage	V_D	$T_J = 25^\circ C$		2.0		V
Quiescent Current		$T_J = 25^\circ C$		4.3	8	mA
Quiescent Current Change	ΔI_Q	$V_I = 11.5V$ to $27V$, $T_J = 25^\circ C$			1.0	mA
		$I_O = 5mA$ to $1A$, $T_J = 25^\circ C$			0.5	

Electrical Characteristics (HT7810)

 (V_I=17V, I_O=500mA, 0°C ≤ T_J ≤ 125 °C, , unless otherwise specified. (Note 1)

Parameter	Symbol	Conditions	MIN	TYP	MAX	UNIT
Output Voltage	V _O	T _J = 25 °C	9.6	10	10.4	V
Line Regulation	ΔV _O	V _I = 12.5V to 28V T _J = 25 °C		7	200	mV
		V _I = 14V to 20V T _J = 25 °C		2	100	
Load Regulation	ΔV _O	I _O = 5mA to 1.5A, 25 °C		12	200	mV
		I _O = 250mA to 750mA, 25 °C		4	100	
Ripple Rejection	RR	V _I = 13V to 23V, f=120Hz	55	71		dB
Output Noise Voltage	V _N	F= 10Hz to 100Hz T _J = 25 °C		70		μV
Dropout Voltage	V _D	T _J = 25 °C		2.0		V
Quiescent Current		T _J = 25 °C		4.3	8	mA
Quiescent Current Change	ΔI _Q	V _I = 12.5V to 28V, T _J = 25 °C			1.0	mA
		I _O = 5mA to 1A, T _J = 25 °C			0.5	

Electrical Characteristics (HT7812)

 (V_I=19V, I_O=500mA, 0°C ≤ T_J ≤ 125 °C, unless otherwise specified. (Note 1)

Parameter	Symbol	Conditions	MIN	TYP	MAX	UNIT
Output Voltage	V _O	T _J = 25 °C	11.50	12	12.5	V
Line Regulation	ΔV _O	V _I = 14.5V to 30V T _J = 25 °C		10	240	mV
		V _I = 16V to 22V T _J = 25 °C		3.0	120	
Load Regulation	ΔV _O	I _O = 5mA to 1.5A, 25 °C		12	240	mV
		I _O = 250mA to 750mA, 25 °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 °C		75		μV
Dropout Voltage	V _D	T _J = 25 °C		2.0		V
Quiescent Current		T _J = 25 °C		4.3	8.0	mA
Quiescent Current Change	ΔI _Q	V _I = 14.5V to 30V, T _J = 25 °C			1.0	mA
		I _O = 5mA to 1A, T _J = 25 °C			0.5	

Electrical Characteristics (HT7815)

 ($V_I=23V$, $I_O=500mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, unless otherwise specified. (Note 1))

Parameter	Symbol	Conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_O	$T_J = 25^{\circ}C$	14.40	15	15.60	V
Line Regulation	ΔV_O	$V_I = 17.5V$ to $30V$ $T_J = 25^{\circ}C$		12	300	mV
		$V_I = 20V$ to $26V$ $T_J = 25^{\circ}C$		3	150	
Load Regulation	ΔV_O	$I_O = 5mA$ to $1.5A$, $25^{\circ}C$		12	300	mV
		$I_O = 250mA$ to $750mA$, $25^{\circ}C$		4	150	
Ripple Rejection	RR	$V_I = 18.5V$ to $28.5V$, $f=120Hz$	54	70		dB
Output Noise Voltage	V_N	$F=10Hz$ to $100Hz$ $T_J = 25^{\circ}C$		90		μV
Dropout Voltage	V_D	$T_J = 25^{\circ}C$		2.0		V
Quiescent Current		$T_J = 25^{\circ}C$		4.3	8.0	mA
Quiescent Current Change	ΔI_Q	$V_I = 17.5V$ to $30V$, $T_J = 25^{\circ}C$			1.0	mA
		$I_O = 5mA$ to $1A$, $T_J = 25^{\circ}C$			0.5	

Electrical Characteristics (HT7818)

 ($V_I=27V$, $I_O=500mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, unless otherwise specified. (Note 1))

Parameter	Symbol	Conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_O	$T_J = 25^{\circ}C$	17.30	18	18.7	V
Line Regulation	ΔV_O	$V_I = 21V$ to $33V$ $T_J = 25^{\circ}C$		15	360	mV
		$V_I = 24V$ to $33V$ $T_J = 25^{\circ}C$		5	180	
Load Regulation	ΔV_O	$I_O = 5mA$ to $1.5A$, $25^{\circ}C$		12	360	mV
		$I_O = 250mA$ to $750mA$, $25^{\circ}C$		4	180	
Ripple Rejection	RR	$V_I = 22V$ to $32V$, $f=120Hz$	53	69		dB
Output Noise Voltage	V_N	$F=10Hz$ to $100Hz$ $T_J = 25^{\circ}C$		110		μV
Dropout Voltage	V_D	$T_J = 25^{\circ}C$		2.0		V
Quiescent Current		$T_J = 25^{\circ}C$		4.5	8.0	mA
Quiescent Current Change	ΔI_Q	$V_I = 21V$ to $33V$, $T_J = 25^{\circ}C$			1.0	mA
		$I_O = 5mA$ to $1A$, $T_J = 25^{\circ}C$			0.5	

Electrical Characteristics (HT7824)

($V_I=33V$, $I_O=500mA$, $0^{\circ}C \leq T_J \leq 125^{\circ}C$, unless otherwise specified. (Note 1))

Parameter	Symbol	Conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_O	$T_J = 25^{\circ}C$	23	24	25	V
Line Regulation	ΔV_O	$V_I = 27V$ to $38V$, $T_J = 25^{\circ}C$		18	480	mV
		$V_I = 30V$ to $36V$, $T_J = 25^{\circ}C$		6	240	
Load Regulation	ΔV_O	$I_O = 5mA$ to $1.5A$, $25^{\circ}C$		12	480	mV
		$I_O = 250mA$ to $750mA$, $25^{\circ}C$		4	240	
Ripple Rejection	RR	$V_I = 28V$ to $38V$, $f=120Hz$	50	66		dB
Output Noise Voltage	V_N	$F= 10Hz$ to $100Hz$, $T_J = 25^{\circ}C$		170		μV
Dropout Voltage	V_D	$T_J = 25^{\circ}C$		2.0		V
Quiescent Current		$T_J = 25^{\circ}C$		4.6	8.0	mA
Quiescent Current Change	ΔI_Q	$V_I = 27V$ to $38V$, $T_J = 25^{\circ}C$			1.0	mA
		$I_O = 5mA$ to $1.0A$, $T_J = 25^{\circ}C$			0.5	

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