

TS78XX

3-Terminal 1.5A Positive Voltage Regulator

DRAWING

Features

- ◆ Output Current up to 1.5A
- ◆ Output Voltages of 5,6,8,9,10,12,15,18,24V
- ◆ Thermal Overload protection
- ◆ Short Circuit protection
- ◆ Output Transistor Safe Operating Area Protection
- ◆ Package :TO-220AB



IN GND OUT

General Description

The TS78XX series of three-terminal positive regulator are Available in the TO-220AB/220T/263-2L, ITO-220AB Package and with several fixed output voltage ,marking Them useful in a wide range of applications. Each type Employs internal current limiting, thermal shut down and Safe operating area protection, marking it provided, They Can deliver over 1.5A output current.

Absolute Maximum Ratings

Parameter	Symbol	Value		Units
		Min	Max	
Output Voltage	V _I		35①	V
			40②	V
Power	P _D		15③	W
Operating temperature	T _{amb}	-20	80	°C
Storage Temperature Range	T _{stg}	-55	150	°C

Note: ① For 7805,7806,7809,7812,7815,7818,7824

② When the temperature exceeds 150°C, the output automatically protected.

Electrical Characteristics

7805

Parameter	Symbol	Conditions	Specification values			Unit
			Min	Typ	Max	
Output Voltage	VO	V _I =8~20V, I _O =5mA~1.5A, P _D ≤15W	4.75	5	5.25	V
Line Regulation	REGV	V _I =8~25V, I _O =500mA			100	mV
Load Regulation	REGL	V _I =10V, I _O =5mA~1.5A			100	mV
Input Voltage	V _I		7.5		35	V
Ripple Rejection	Srip	V _I =12V, I _O =100mA, V _{IPP} =4V, f=100Hz	62			dB
Maximum output current	I _{OM}			2.2		A
Output Voltage Drift	△V/T	I _O =5mA, T _J =0~125°C		-0.3		mV/°C
Output Noise Voltage	VNO	f=10Hz~100kHz		40		μV

7806

Parameter	Symbol	Conditions	Specification values			Unit
			Min	Typ	Max	
Output Voltage	VO	VI=9~21V,IO=5mA~1.5A,P _D ≤15W	5.7	6	6.3	V
Line Regulation	REGV	VI=8.5~23V,I _o =100mA			120	mV
Load Regulation	REGL	VI=15V,IO=5mA~1.5A			120	mV
Input Voltage	VI		8.5		35	V
Ripple Rejection	Srip	VI=13V,I _o =100mA,V _{IPP} =4V,f=100Hz	59			dB
Maximum output current	I _{OM}			1.5		A
Output Voltage Drift	△V/T	I _o =5mA,T _j =0~125℃		-0.4		mV/℃
Output Noise Voltage	VNO	f=10Hz~100kHz		40		uV

7808

Parameter	Symbol	Conditions	Specification values			Unit
			Min	Typ	Max	
Output Voltage	VO	VI=12~24V,IO=5mA~1.5A,P _D ≤15W	7.6	8	8.4	V
Line Regulation	REGV	VI=11.5~26V,I _o =100mA			180	mV
Load Regulation	REGL	VI=18V,IO=5mA~1.5A			180	mV
Input Voltage	VI		11.5		35	V
Ripple Rejection	Srip	VI=18V,I _o =100mA,V _{IPP} =4V,f=100Hz	56			dB
Maximum output current	I _{OM}			1.5		A
Output Voltage Drift	△V/T	I _o =5mA,T _j =0~125℃		-0.5		mV/℃
Output Noise Voltage	VNO	f=10Hz~100kHz		55		uV

7809

Parameter	Symbol	Conditions	Specification values			Unit
			Min	Typ	Max	
Output Voltage	VO	VI=12~24V,IO=5mA~1.5A,P _D ≤15W	8.55	9	9.45	V
Line Regulation	REGV	VI=11.5~26V,I _o =100mA			180	mV
Load Regulation	REGL	VI=18V,IO=5mA~1.5A			180	mV
Input Voltage	VI		11.5		35	V
Ripple Rejection	Srip	VI=18V,I _o =100mA,V _{IPP} =4V,f=100Hz	56			dB
Maximum output current	I _{OM}			1.5		A
Output Voltage Drift	△V/T	I _o =5mA,T _j =0~125℃		-0.5		mV/℃
Output Noise Voltage	VNO	f=10Hz~100kHz		57		uV

7812

Parameter	Symbol	Conditions	Specification values			Unit
			Min	Typ	Max	
Output Voltage	VO	VI=15~27V, IO=5mA~1.5A, PD≤15W	11.5	12	12.5	V
Line Regulation	REGV	VI=15~23V, IO=100mA		60	110	mV
Load Regulation	REGL	VI=19V, IO=5mA~1.5A		60	240	mV
Input Voltage	VI		14.6		35	V
Ripple Rejection	Srip	VI=22V, IO=100mA, V _{IPP} =4V, f=100Hz	55			dB
Maximum output current	I _{OM}			1.5		A
Output Voltage Drift	△V/T	I _o =5mA, T _j =0~125°C		-1.5		mV/°C
Output Noise Voltage	VNO	f=10Hz~100kHz		75		uV

7815

Parameter	Symbol	Conditions	Specification values			Unit
			Min	Typ	Max	
Output Voltage	VO	VI=18~30V, IO=5mA~1.5A, P _D ≤15W	14.25	15	15.75	V
Line Regulation	REGV	VI=18~30V, IO=100mA			300	mV
Load Regulation	REGL	VI=23V, IO=5mA~1.5A			300	mV
Input Voltage	VI		17.7		35	V
Ripple Rejection	Srip	VI=26V, IO=100mA, V _{IPP} =4V, f=100Hz	54			dB
Maximum output current	I _{OM}			1.5		A
Output Voltage Drift	△V/T	I _o =5mA, T _j =0~125°C		-1		mV/°C
Output Noise Voltage	VNO	f=10Hz~100kHz		90		uV

7818

Parameter	Symbol	Conditions	Specification values			Unit
			Min	Typ	Max	
Output Voltage	VO	VI=21~33, IO=5mA~1.5A, P _D ≤15W	17.1	18	18.9	V
Line Regulation	REGV	VI=21~33V, IO=100mA			360	mV
Load Regulation	REGL	VI=27V, IO=5mA~1.5A			360	mV
Input Voltage	VI		20.8		35	V
Ripple Rejection	Srip	VI=30V, IO=100mA, V _{IPP} =4V, f=100Hz	53			dB
Maximum output current	I _{OM}			1.5		A
Output Voltage Drift	△V/T	I _o =5mA, T _j =0~125°C		-1.1		mV/°C
Output Noise Voltage	VNO	f=10Hz~100kHz		110		uV

7824

Parameter	Symbol	Conditions	Specification values			Unit
			Min	Typ	Max	
Output Voltage	VO	VI=27~38, IO=5mA~1.5A, PO≤15W	23	24	25	V
Line Regulation	REGV	VI=27~38V, IO=100mA			400	mV
Load Regulation	REGL	VI=33V, IO=5mA~1.5A			480	mV
Input Voltage	VI		27		40	V
Ripple Rejection	Srip	VI=36V, IO=100mA, V _{IPP} =4V, f=100Hz	50			dB
Maximum output current	I _{OM}			1.5		A
Output Voltage Drift	ΔV/T	IO=5mA, T _J =0~125°C		-3		mV/°C
Output Noise Voltage	VNO	f=10Hz~100kHz		170		μV

Typical Characteristics

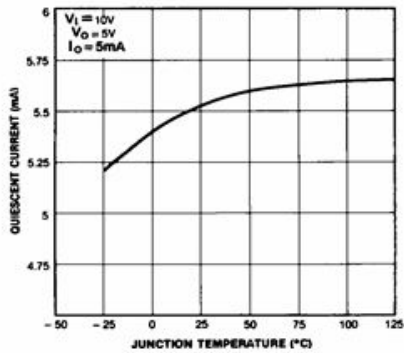


Figure 1. Quiescent Current

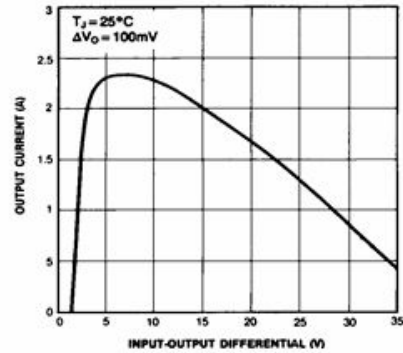


Figure 2. Peak Output Current

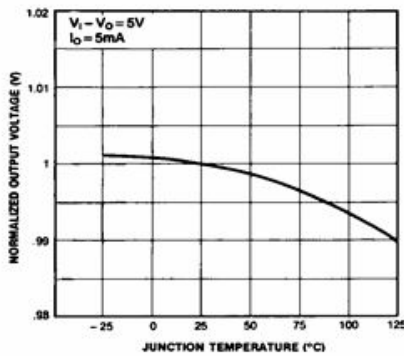


Figure 3. Output Voltage

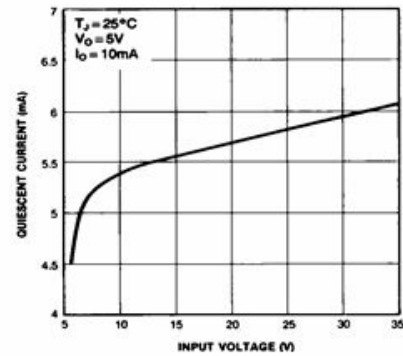
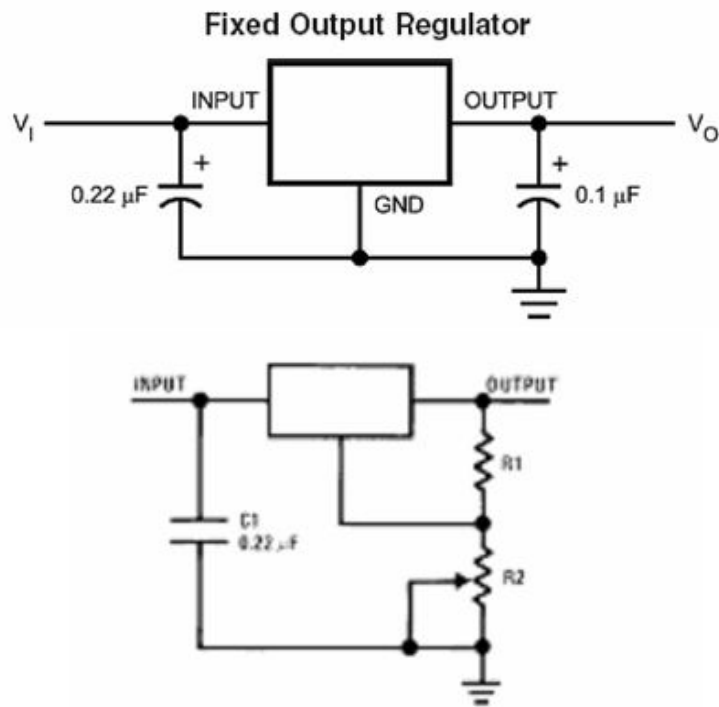
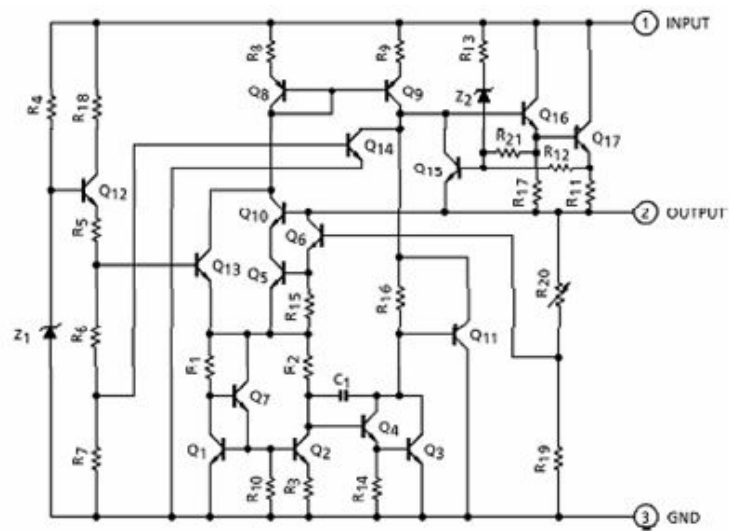


Figure 4. Quiescent Current

Test Circuit

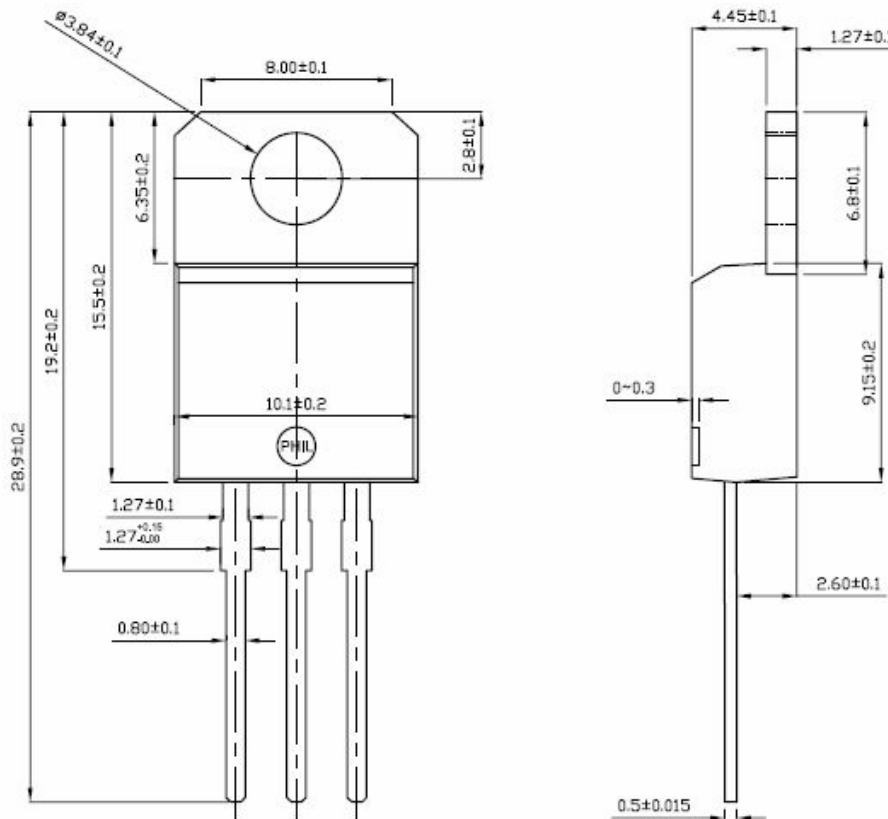


Schematic Diagram

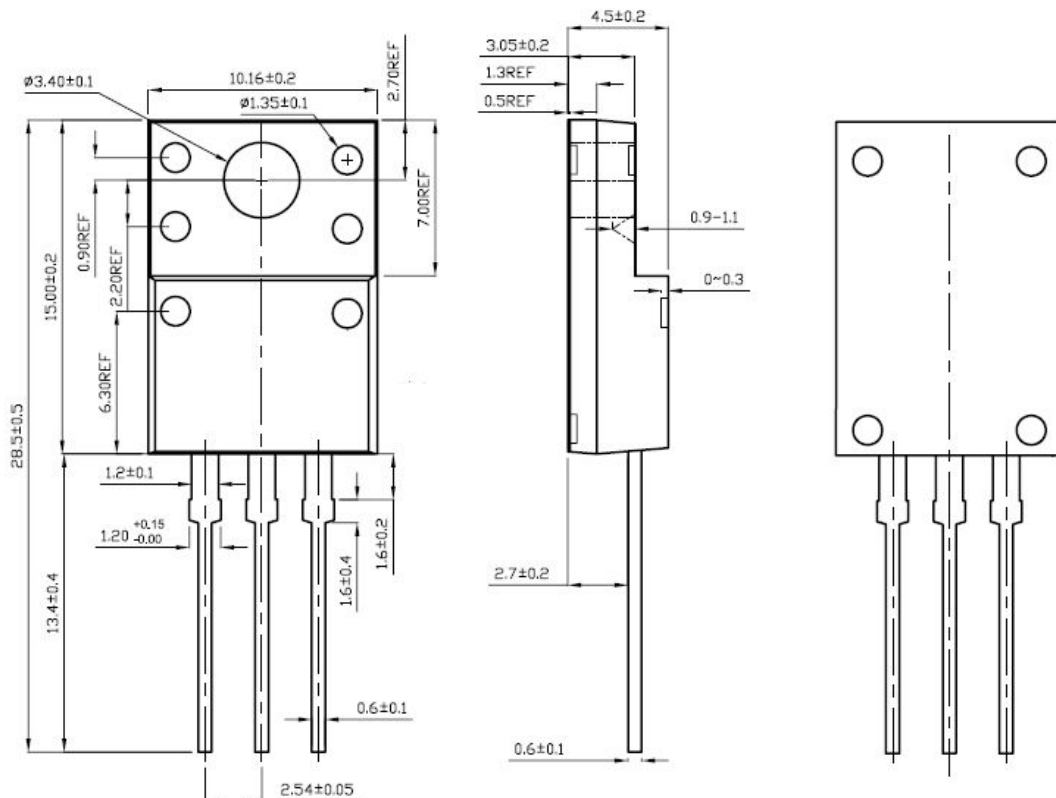


Mechanical Dimensions

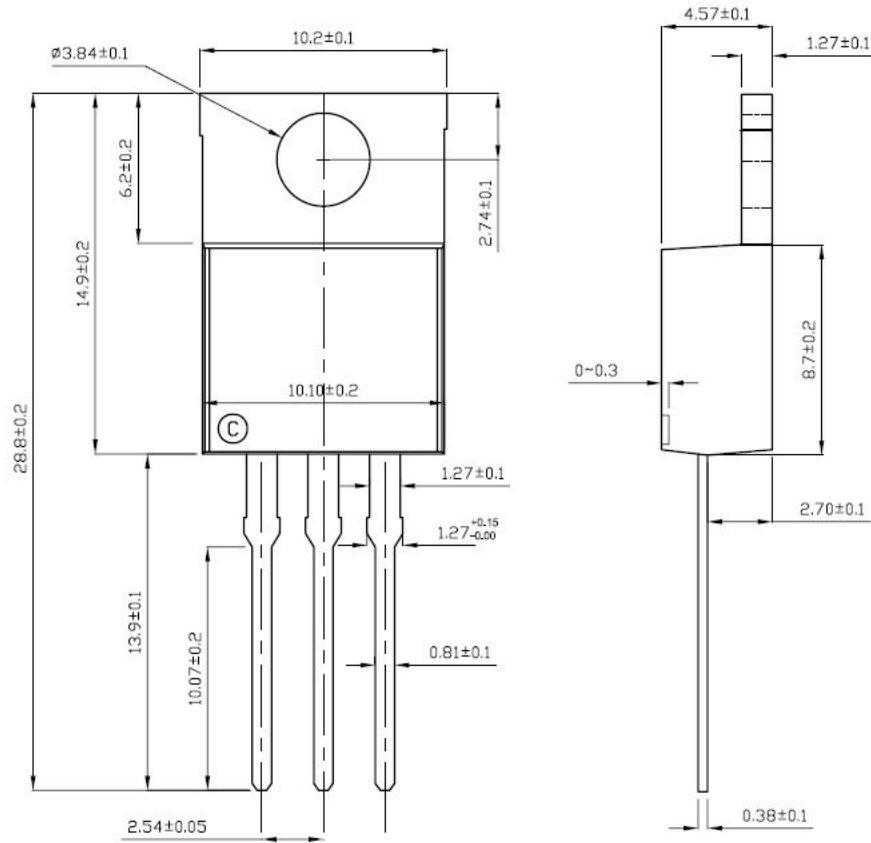
TO-220T



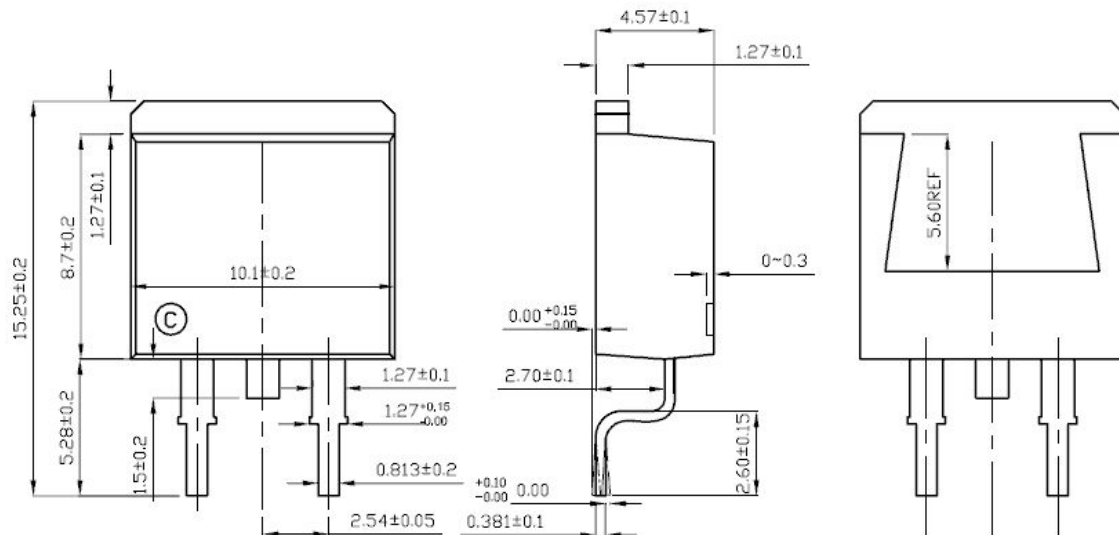
ITO-220AB



TO-220AB



TO-263-2L



TO-252

