

General Description

L78LxxABUTR is three-terminal positive regulators. One of these regulators can deliver up to 150mA of output current. The internal limiting and thermal-shutdown features of the tegulator make them essentially immune to overload. When used as a replacement for a zener diode-resistor Combination, an effective improvement in output impedance can be obtained, together with lower quiescent current.

Features

- Output Current of 150mA
- Thermal Overload Protection
- Short Circuit Protection
- Output transistor safe area protection
- No external components
- Package:SOT-89
- Output Voltage Accuracy: tolerance ±5%

Pin Configuration And Descriptions

SOT-89

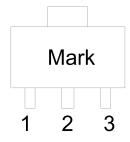


Table1:L78LxxABUTRseries(SOT-89PKG)

PIN NO.	PIN NAME	FUNCTION		
1	VOUT Output voltage pin			
2	GND GND pin			
3	VIN	Input voltage pin		

Order Information

Orderable Device	Package	Output Voltage	Packing Option
L78LxxABUTR	SOT-89	3.3V,5.0V,6.0V,8.0V,9.0V, 12V,15V,18V,24V,	1000/Reel

xx:33,05,06,08,09,12,15,18,24

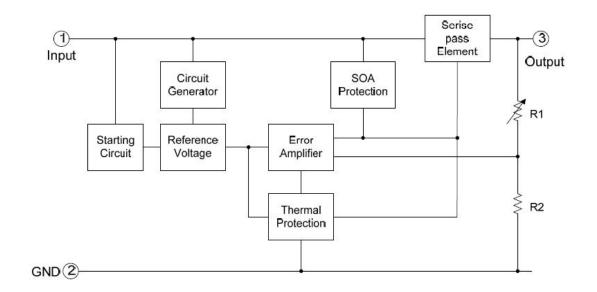


Absolute Maximum Ratings

Description	Symbol	Value Range	Unit
Input supply voltage	VIN MAX	30	V
MAX. Output current	Lоит	150	mA
MAX Power	P _{max}	0.5	W
Junction temperature	Tj	-55∼ + 150	°C
Operation temperature	Topr	-40∼+125	°C
Storage temperature	Tstr	-55∼ + 155	°C
Soldering temperature and time		+260	°C
ESD Rating, (HBM)	ESD	2	KV

Note: The absolute maximum ratings are rated values exceeding which the product could suffer physical damage. These values must therefore not be exceeded under any conditions.

Block Diagram





DC Characteristics (unless otherwise noted TA= 25°C)

Parameter	Symbol	Conditions	Min.	Тур.	Max.	Unit	
		Io=40mA, VIN=10V	0.964vout	vout	1.036vout		
Output Voltage	Vout	Io=1mA~40mA VIN=7V~18V	0.96vout	vout	1.04vout	V	
		Io=1mA~10mA VIN=10V	0.95vout	vout	1.05vout		
Line Description	LND	VIN=7V~18V, Io=20mA	-150	-	150	\/	
Line Regulation	LNR VIN=8V~18V, Io=20mA -	-100	-	100	mV		
		VIN=10V, Io=1mA~100mA	-100	-	100		
Load Regulation	LDR	VIN=10V, Io=1mA~40mA	-30 - 30	30	- mV		
Dropout Voltage	V_{DIF}	Ta=25℃,lo=100mA	-	2	-	V	
Output noise Voltage	V_N	F=10Hz to 100KHz	-	40	-	uV/Vo	
Ripple Rejection	PSRR	Ta=25℃,f=120Hz, lo=40mA, VIN=8V~20V	-	80	-	dB	
Quiescent Current	ΙQ	VIN=10V, IOUT=40mA	-	-	5.5	mA	
Quiescent Current	Current	VIN=8V~18V, I ₀ =20mA	-1.5	-	1.5		
Change	∆lq	VIN=10V, IOUT=1mA~40mA,	-0.1	-	0.1	mA	

LNR: Line Regulation. The change in output voltage for a change in the input voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that the average chip temperature is not significantly affected.

LDR: Load Regulation. The change in output voltage for a change in load current at constant chip temperature.



Application Circuit

Basic Circuits

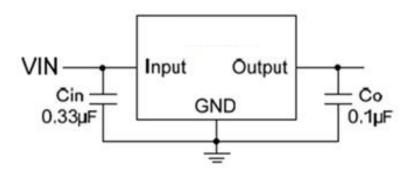


Fig.1 Typical Application

A common ground is required between the input and the output voltages. The input voltage must remain typically 2.0 V above the output voltage even during the low point on the input ripple voltage.

Cin is required if regulator is located an appreciable distance from power supply filter.

Co is not needed for stability; however, it does improve transient response.

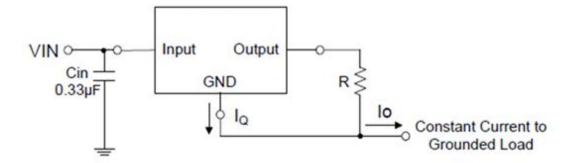


Fig.2 Constant Current Regulator

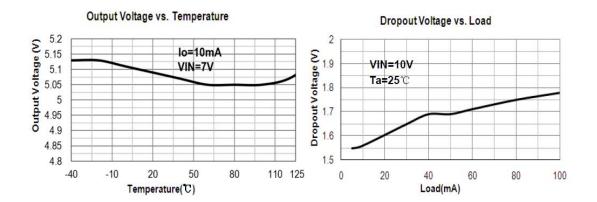


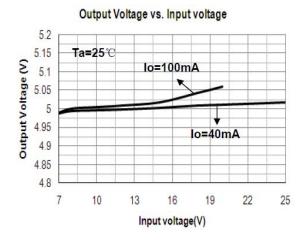
Function Description

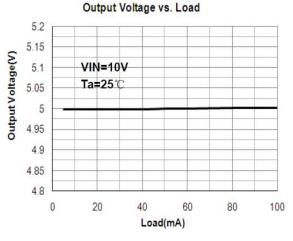
L78LxxABUTR is designed with Thermal Overload Protection that shuts down the circuit when subjected to an excessive power overload condition, and Output Transistor Safe-Area Compensation that reduces the output short circuit current as the voltage across the pass transistor is increased.

In many low current applications, compensation capacitors are not reguired. However, it is recommended that the regulator input be bypassed with a capacitor if the regulator is connected to the power supply filter with long wire lengths, or if the output load capacitance is large. An input bypass capacitor should be selected to provide good high frequency characteristics to insure stable operation under all load conditions. A 0.33 uFor larger tantalum, mylar, or other capacitor having low internal impedance at highfreguencies should be chosen. The bypass capacitor should be mounted with the shortest possible leadsdirectly acros s the regulator's input terminals. Normally good construction techniques should be used tominimize ground loops and lead resistance drops since the regulator has no external sense lead.

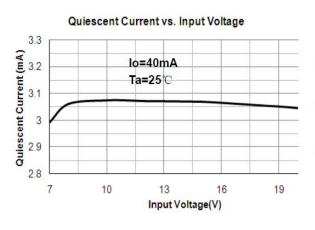
Typical Characteristics

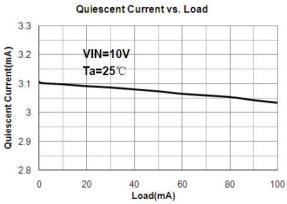




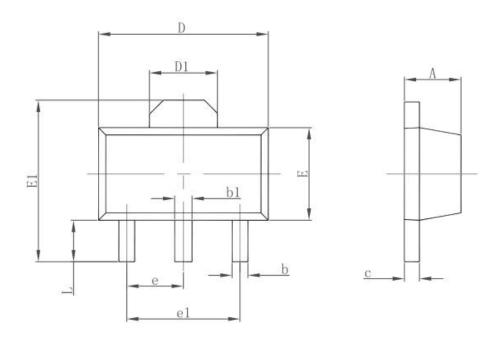




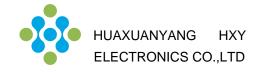




Package Outline Dimensions SOT-89



0	Dimensions	In Millimeters	Dimensions In Inches		
Symbol	Min.	Max.	Min.	Max.	
Α	1.400	1.600	0.055	0.063	
b	0.320	0.520	0.013	0.020	
b1	0.400	0.580	0.016	0.023	
С	0.350	0.440	0.014	0.017	
D	4.400	4.600	0.173	0.181	
D1	1.550 REF.		0.061 REF.		
E	2.300	2.600	0.091	0.102	
E1	3.940	4.250	0.155	0.167	
е	1.500 TYP.		0.060 TYP.		
e1	3.000 TYP.		0.118 TYP.		
L	0.900	1.200	0.035	0.047	



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