

Features

- 8.0V output voltage with tolerances of $\pm 5\%$ over the temperature range
- Output current in excess of 100mA
- Internal thermal overload protection
- Output transistor safe area protection
- Internal short circuit current limiting
- No external components
- Available in plastic TO92-3L and plastic SOP-8L low profile packages
- Lead-free Package: TO92-3L (Note 1)
- SOP-8L: Available in "Green" Molding Compound (No Br, Sb) (Note 2)
- Lead Free Finish / RoHS Compliant (Note 3)

General Description

The AP78L08 of three terminal positive regulators is available with fixed output voltages making them useful in a wide range of applications. These regulators can provide local on card regulation, eliminating the distribution problems associated with single point regulation. The voltages available allow the AP78L08 to be used in logic system, instrumentation, HiFi, and other solid state electronic equipment.

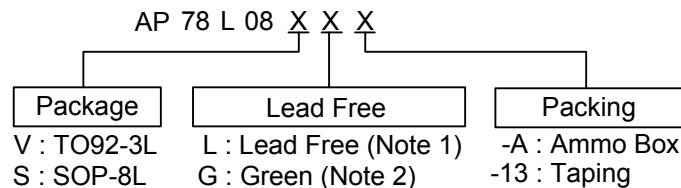
The AP78L08 is available in the plastic TO92-3L package, the plastic SOP-8L package using industrial standard package technology. With adequate heat sinking the regulator can deliver 100mA output current. Current limiting is included to limit the peak output current to a safe value. Safe area protection for the output transistors is provided to limit internal power dissipation. If internal power dissipation becomes too high for the heat sinking provided, the thermal shutdown circuit takes over preventing the IC from overheating.

Applications

Well suited for a wide range of applications, such as:

- Lighting Ballast
- STB
- Power supply
- Audio Equipment

Ordering Information



- Note: 1. TO92-3L is available in "Lead Free" only.
 2. SOP-8L is available in "Green" only.
 3. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.

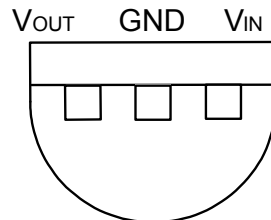
Device	Package Code	Packaging (Note 4)	Ammo Box / Tube		13" Tape and Reel	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix
AP78L08V	V	TO92-3L	2000/Box	-A	NA	NA
AP78L08S	S	SOP-8L	NA	NA	2500/Tape & Reel	-13

- Note: 4. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

Pin Assignments

(1) TO92-3L

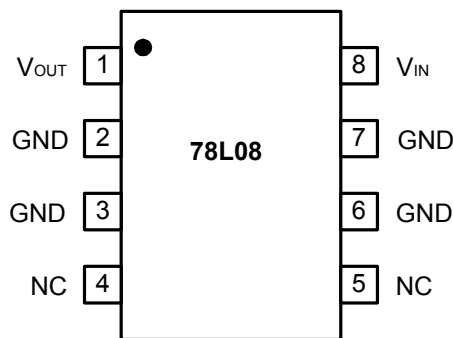
(Bottom View)



TO92-3L

(2) SOP-8L

(Top View)



SOP-8L

Pin Descriptions

Name	Description
V _{IN}	Operating Voltage Input
V _{OUT}	Voltage Output Pin
GND	Ground
NC	No Connection

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V _{CC}	Supply Voltage	+30	V
V _{OUT}	Output Voltage to Ground	8	V
T _{ST}	Storage Temperature	-65 to +150	°C
T _{OP}	Operating Junction temperature	-20 to 125	°C
T _{MJ}	Maximum Junction Temperature	150	°C

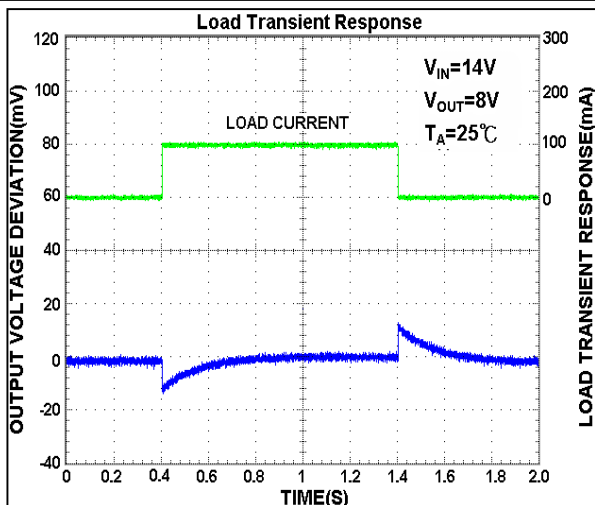
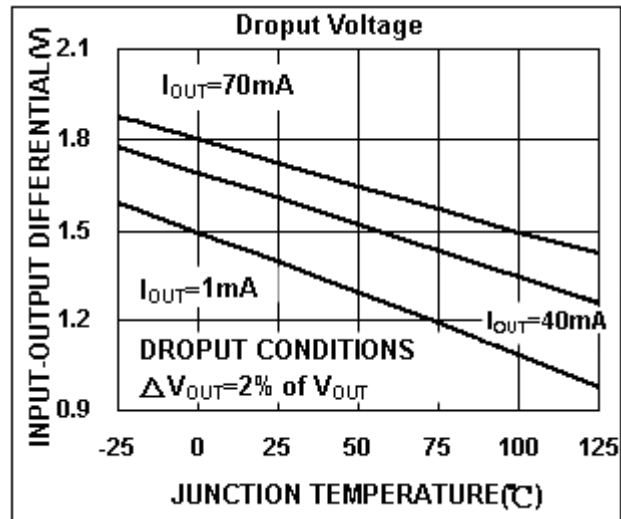
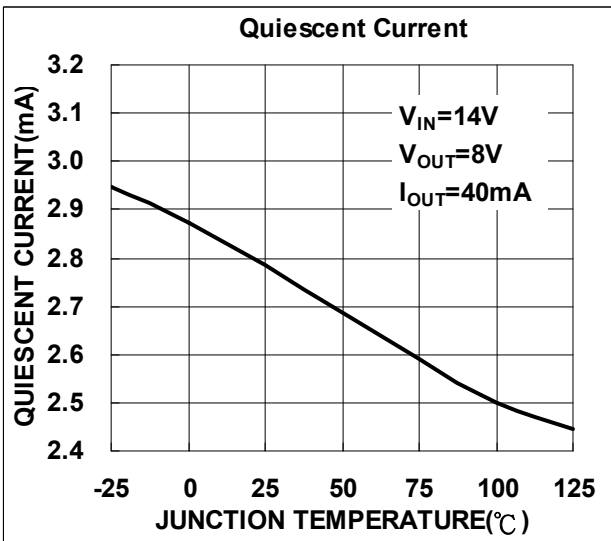
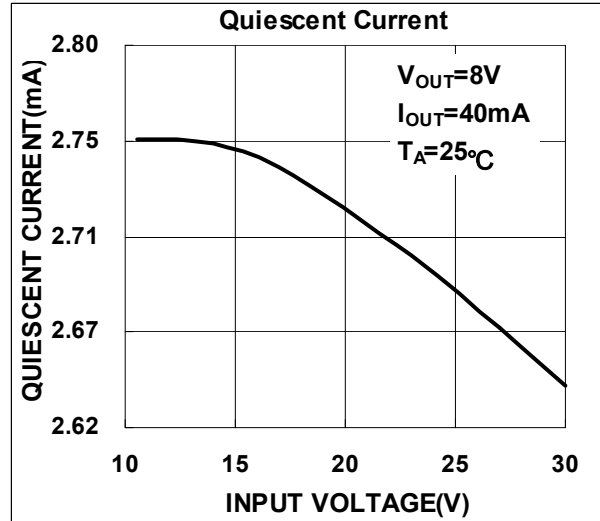
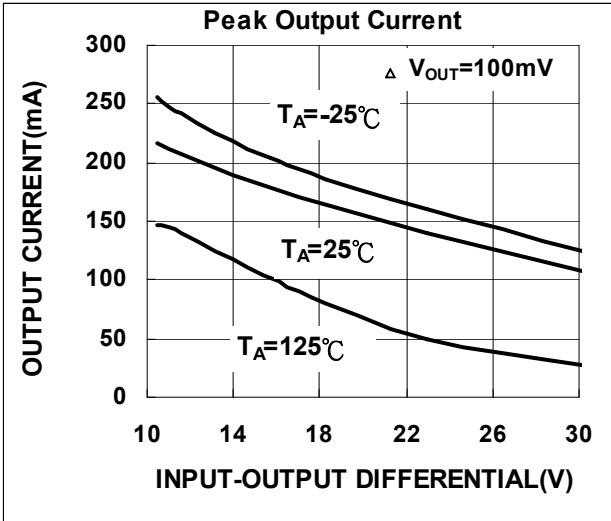
Electrical Characteristics (All Output Voltage Versions)

Limits in standard typeface are for T_A=25°C, **Bold typeface applies over T_J= -20°C to 125°C for TO92-3L and SOP-8L Packages.**
 Unless otherwise specified: V_{IN}=14V, I_O=40mA, C_I=0.33μF, C_O=0.1μF.

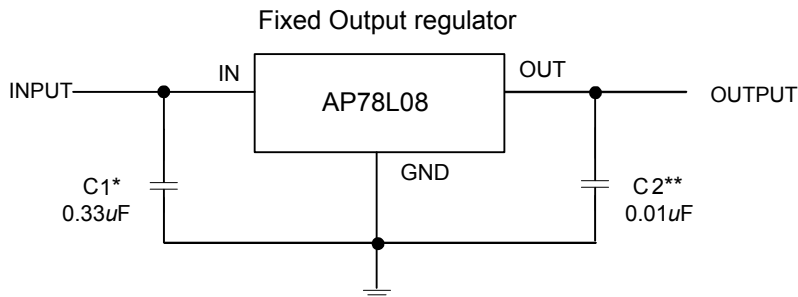
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _O	Output Voltage		7.7	8	8.3	V
		10.5V ≤ V _{IN} ≤ 23V 1mA ≤ I _O ≤ 40mA	7.6		8.4	
		1mA ≤ I _O ≤ 70mA	7.6		8.4	
ΔV _O	Line Regulation	10.5V ≤ V _{IN} ≤ 23V		42	175	mV
		11V ≤ V _{IN} ≤ 23V		36	125	
ΔV _O	Load Regulation	1mA ≤ I _O ≤ 100mA		18	80	mV
		1mA ≤ I _O ≤ 40mA		10	40	
I _Q	Quiescent Current			2	5.5	mA
ΔI _Q	Quiescent Current Change	11V ≤ V _{IN} ≤ 23V 1mA ≤ I _O ≤ 40mA			1.5 0.1	
V _n	Output Noise Voltage	f=10Hz to 100kHz (Note 5)	-	54		μV
ΔV _{IN} /ΔV _{OUT}	Ripple Rejection	f=120Hz 13V ≤ V _{IN} ≤ 23V	37	46		dB
I _{PK}	Peak Output Current			140		mA
ΔV _O /ΔT	Average Output Voltage Tempco	I _O =5mA		-0.8		mV/°C
V _{IN(Min)}	Minimum Value of Input Voltage Required to Maintain Line Regulation			9.7		V
θ _{JA}	Thermal Resistance Junction to Ambient	TO92-3L (Note 6)		176		°C/W
		SOP-8L (Note 7)		152		
θ _{JC}	Thermal Resistance Junction to case	TO92-3L (Note 6)		33		
		SOP-8L (Note 7)		7		

Note: 5. Recommend 0.01μF minimum load capacitance at output to suppress high frequency noise.
 6. Test conditions for TO92-3L: No heat sink, no air flow.
 7. Test conditions for SOP-8L, TO92-3L: Device mounted on 2 oz. copper, minimum recommended pad layout, FB-4 PCB.

Typical Performance Characteristics



Typical Application Circuit



- ★ : Required if the regulator is located more than 3" from the power supply filter.
- ★★ : See (Note 5) in the electrical characteristics table.

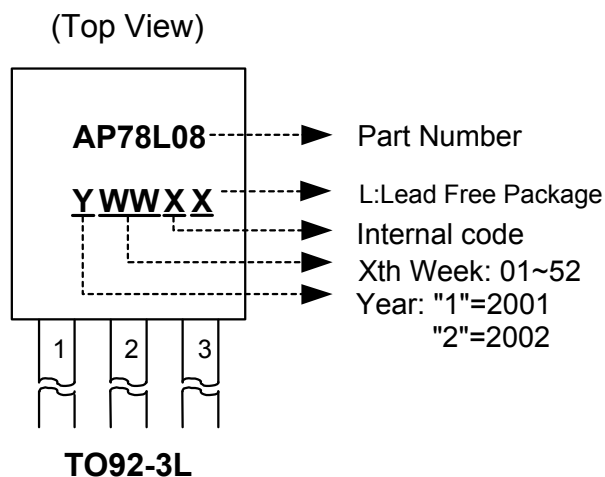
Function Description

Introduction

The AP78L08 fixed-mode 8V output voltage regulator is a three terminal device. The AP78L08 fixed voltage regulator series has built-in thermal overload protection which prevents the device from being damaged due to excessive junction temperature. The regulators also contain internal short-circuit protection which limits the maximum output current, and safe-area protection for the pass transistor which reduces the short-circuit current as the voltage across the pass transistor is increased.

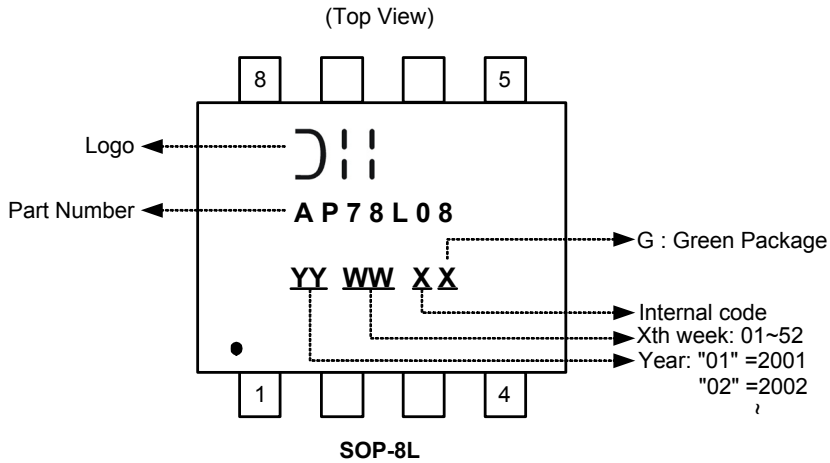
Marking Information

(1) TO92-3L



Marking Information (Continued)

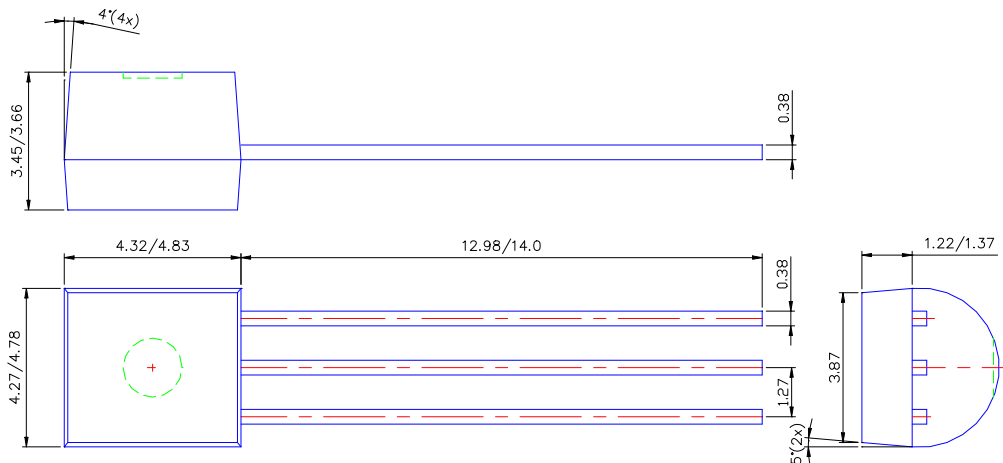
(2) SOP-8L



Device	Package	Identification Code
AP78L08S	SOP-8L	AP78L08

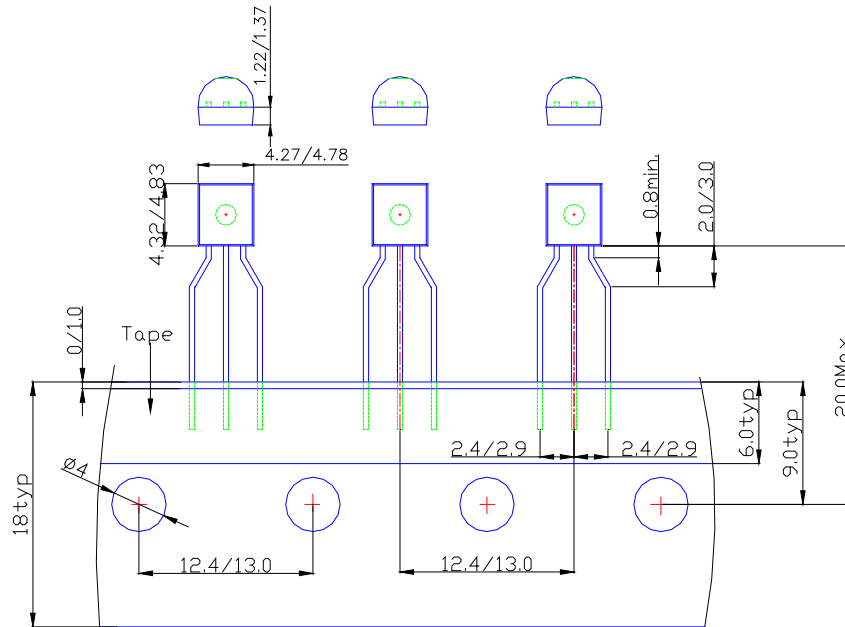
Package Information (unit: mm)

(1) Package Type: TO92-3L

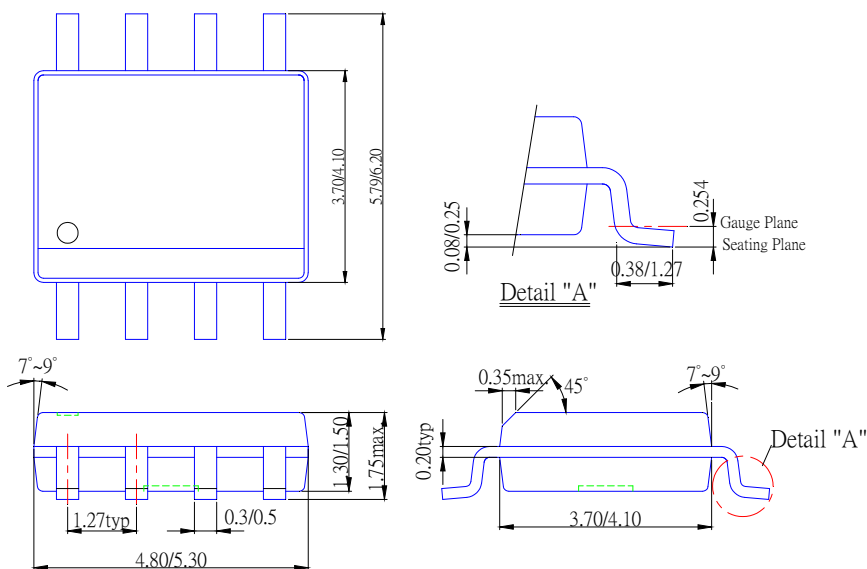


Package Information (Continued)

T092-3L for Ammo pack



(2) Package Type: SOP-8L



IMPORTANT NOTICE

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. Diodes Incorporated does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

LIFE SUPPORT

Diodes Incorporated products are not authorized for use as critical components in life support devices or systems without the expressed written approval of the President of Diodes Incorporated.