

uP78L12CR
150mA Fixed Output Voltage Regulator



General Description:

The uP78L12CR are three terminal positive regulators designed for a wide variety of applications including local, on-card regulation.

This series of regulators are complete with internal current limiting, thermal shutdown protection, and safe-area compensation which make them virtually immune from output overload. If adequate heat sinking is provided, these regulators can deliver output currents up to 100mA.

The uP78L12CR output voltage is offered in voltage tolerance: $\pm 1.5\%$.

The uP78L12CR is available in SOT-89 packages.

The uP78L12CR are characterized for operation from -40°C to 125°C .

Features:

- Output Current up to 150mA
- Fixed Output Voltages of 12V
- Output Voltage Accuracy: $\pm 1.5\%$
- Internal Short Circuit Current Limiting
- Internal Thermal Overload Protection
- No External Components
- Output Transistor Safe-Area Protection
- OTP: 160°C

Applications:

- Industry Applications
- Microprocessor Power Supplies
- Mother Boards

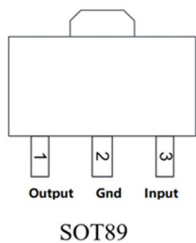


Figure 1. Package types of uP78L12CR

Ordering Information

Device Name	Package	Mark ID	Voltage Tolerance	Operating Free-Air Temperature (TA)
uP78L12CR	SOT89	G96	$\pm 1.5\%$	-40°C to 125°C

Typical Applications

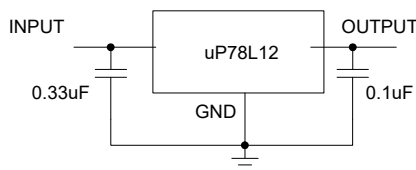


Figure 2. Typical Application Circuit

Functional Block Diagram:

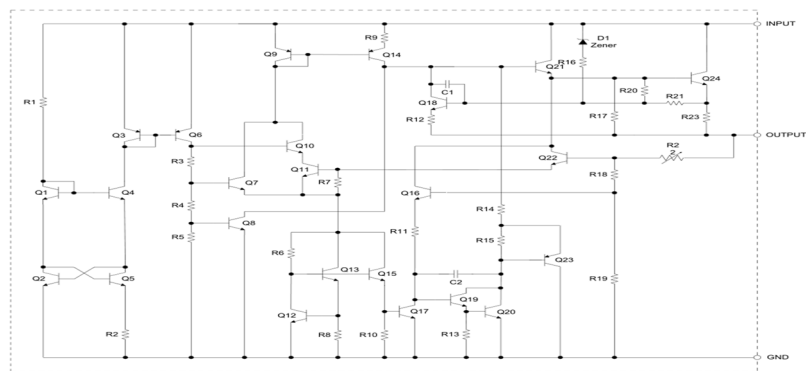


Figure 3. Functional Block Diagram of μ P78L12CR

Absolute Maximum Ratings(Note1)

(Operation temperature range applies unless otherwise specified.)

Parameter	Symbol	Range	Unit
Input Voltage	V_{IN}	36	V
Output Current	I_O	200	mA
Operating Junction Temperature	T_J	150	$^{\circ}\text{C}$
Lead Temperature (Soldering, 10sec)	T_{LEAD}	260	$^{\circ}\text{C}$
Power Dissipation	P_D	750	mW
Storage Temperature Range	T_{STG}	-65 to 150	$^{\circ}\text{C}$
Thermal resistance, SOT89	θ_{JA}	55	$^{\circ}\text{C/W}$
ESD rating, human body mode	HBM	2000	V
ESD rating, machine mode	MM	200	V

Note: 1. Absolute maximum ratings indicate stresses beyond which may cause permanent damage to the device.

Recommended Operation Ratings:

Parameter	Symbol	Min.	Max.	Unit
Input voltage	V_{IN}		36	V
Operating junction Temperature	T_J	-40	125	$^{\circ}\text{C}$



Electrical Characteristics:

(Test conditions: $V_{IN} = 19V$, $I_O = 40mA$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1\mu F$, $T_J = 25^{\circ}C$ unless otherwise noted.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O		11.82	12	12.18	V
Line Regulation	V_{RLINE}	$14.5V \leq 27V$		20	200	mV
Load Regulation	V_{RLOAD}	$1mA \leq 100mA$		80	180	mV
Quiescent Current	I_Q			2.8	4.2	mA
Quiescent Current Change	ΔI_Q	$14.5V \leq 27V$		0.2	1.5	mA
		$1mA \leq 40mA$		0.05	0.1	mA
Ripple Rejection	PSRR	$f = 120Hz, 8V \leq 18V$	47	62		dB
Dropout Voltage	V_{DROP}	$= 40mA$		1.7		V
		$= 100mA$		1.8		V
Output Noise Voltage	N_o	$10Hz \leq f \leq 100kHz$ (Note 2)		80		μV
Output Voltage Temperature Coefficient	$\Delta V_O / \Delta T$	$= 5mA$		0.42		$mV/^{\circ}C$
Over temperature Protection	OTP	$V_{IN} = 15V$	155	170		$^{\circ}C$
Thermal Resistance	θ_{JC}	SOT89		28.3		$^{\circ}C/W$

Note 2, 0.01 μF minimum load capacitance is recommended to limit high frequency noise.

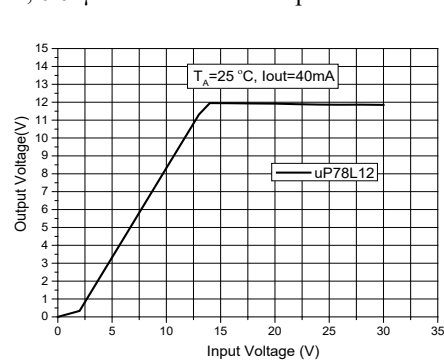


Figure 4. Output Voltage vs Input Voltage

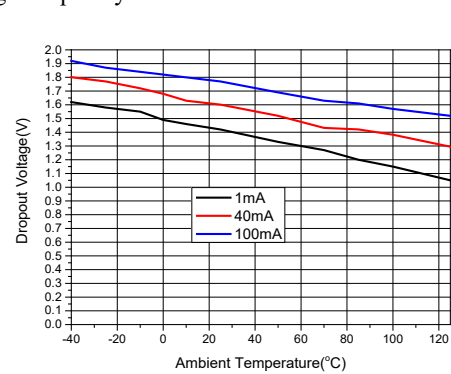


Figure 5. Dropout Voltage vs Ambient Temperature

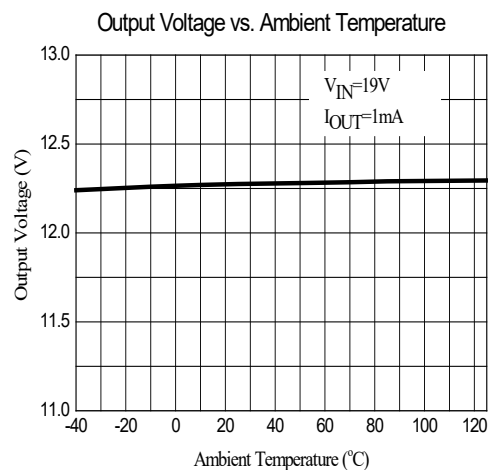


Figure 6. Output Voltage vs Ambient

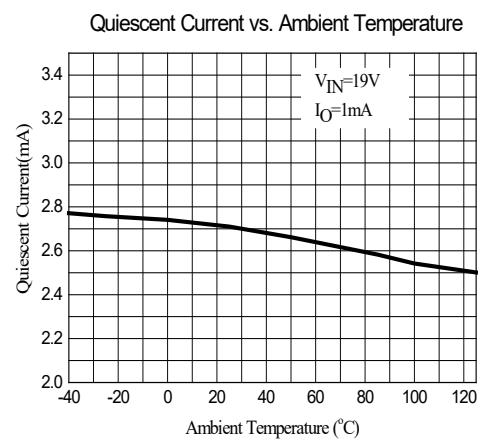
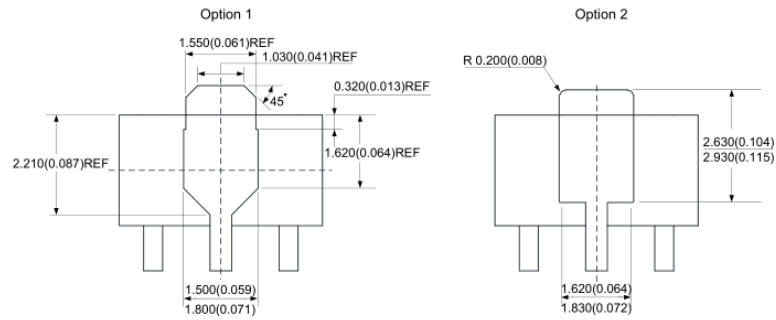
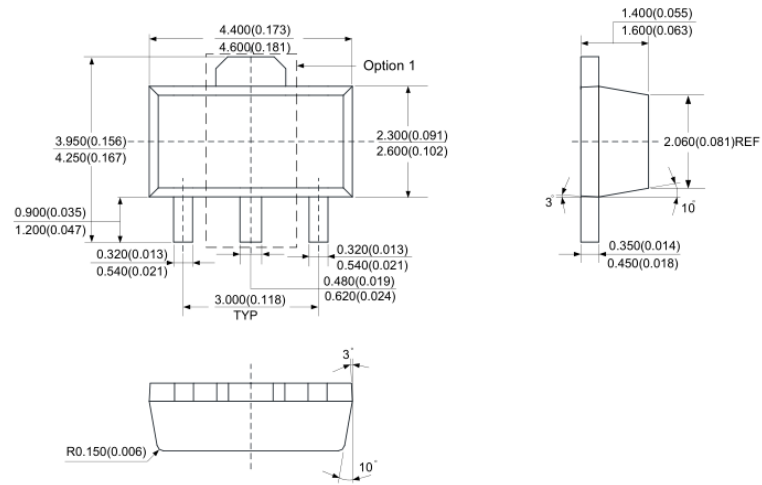
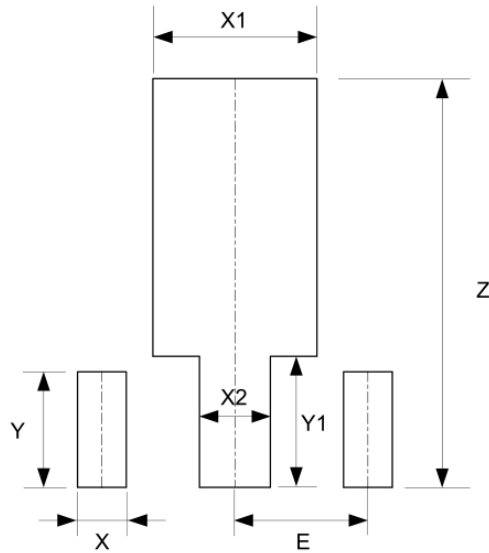


Figure 7. Quiescent Current vs Ambient Temperature

SOT-89



SOT-89



Dimensions	Z (mm)/(inch)	X (mm)/(inch)	X1 (mm)/(inch)	X2 (mm)/(inch)	Y (mm)/(inch)	Y1 (mm)/(inch)	E (mm)/(inch)
Value	4.600/0.181	0.550/0.022	1.850/0.073	0.800/0.031	1.300/0.051	1.475/0.058	1.500/0.059