

120V 100mA Ultralow-Quiescent-Current LDO120

General Description

The MX5712T ultra-low quiescent current regulator features low dropout voltage and low current in the standby mode. With less than 2.4 μ A quiescent current at no load, the MX5712T is ideally suited for standby micro-control-unit systems, especially for always-on applications like E-meters, fire alarms, smoke detectors and other battery operated systems. The MX5712T retains all of the features that are common to low dropout regulators including a low dropout PMOS pass device, short circuit protection, and thermal shutdown.

The MX5712T has a 130V maximum operating voltage limit, a -40°C to 125°C operating temperature range, and $\pm 2\%$ output voltage tolerance over the entire output current, input voltage range. The MX5712T is available in a SOT893 package.

Features

- VIN Range 7 to 120V
- Output Voltage Tolerances of $\pm 2\%$
- Output Current of 100 mA
- Ultra Low Quiescent Current ($I_Q=2.4\mu A$)
- Dropout Voltage Typically 4V at $I_{OUT}=50mA$
- Internal Thermal Overload Protection
- Internal Short-Circuit Current Limit
- Ceramic Capacitor Stable

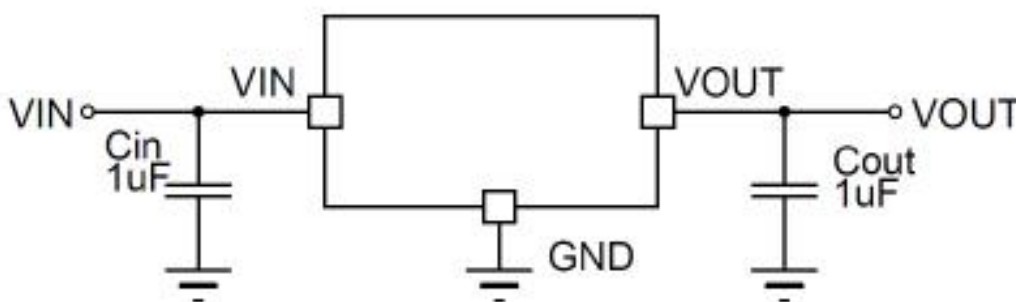
Applications

- E-meters, Water Meters and Gas Meters
- Fire Alarm, Smoke Detector
- Appliances and White Goods

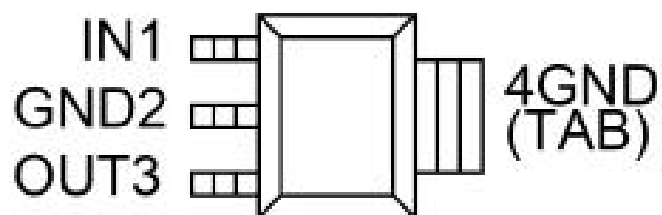
Ordering Information

Part Number	Package	Output Voltage	Marking Information
MX5712T	SOT89-3L	5.0V	JY5712-5.0

Typical Application



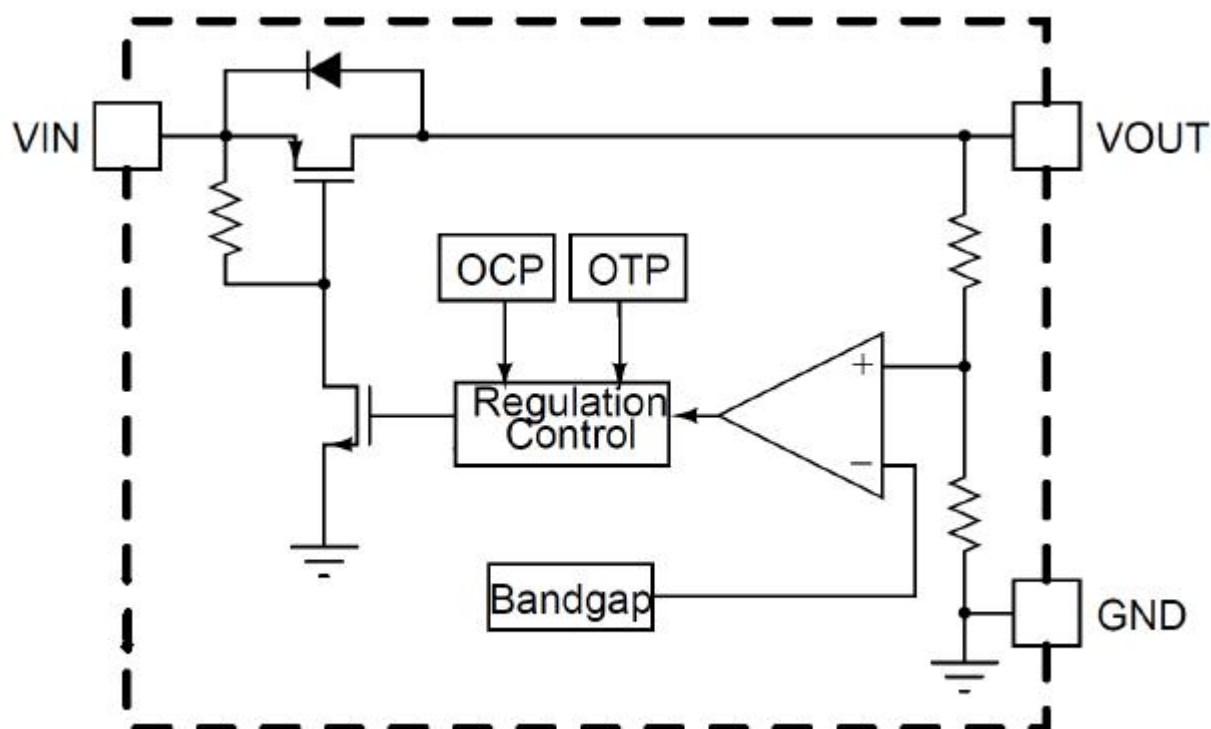
Pin Configuration



Pin Assignment

Pin Name	SOT893 Pin No	Pin Function
OUT	3	Output Voltage Pin.
GND	2,4	Ground.
IN	1	Input Voltage pin.

Function Block Diagram



Absolute Maximum Ratings

Parameter	Value
V _{IN}	-0.3V to +130V
V _{OUT}	-0.3V to +26V
Junction Temperature	125°C
Lead Temperature (soldering, 10sec)	300°C
Storage Temperature	-65 to 150°C

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.

Recommended Operating Conditions

Input Voltage, V _{IN}	+3.3V to +120V
Junction Temperature	-40 to 125°C

Electrical Characteristics

V_{IN}=V_{OUT} + 4.5V or V_{IN}=5V (whichever is greater), I_{OUT}=100uA, C_{IN}=1uF, C_{OUT}=1uF, T_J=25°C, unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Input Voltage	V _{IN}		3.3		120	V
Output Voltage	V _{OUT}		-2%		2%	V
Line Regulation	ΔV _{LINE}	V _{IN} =V _{OUT} +1V to 120V		5	20	mV
Load Regulation	ΔV _{LOAD}	I _{OUT} =1mA to 50mA		25	50	mV
		I _{OUT} =1mA to 100mA		40	100	mV
Dropout Voltage	ΔV _{DROP}	I _{OUT} =50mA		4		V
Quiescent Current	I _Q	T _J =25°C		2.4	4.0	uA
Shutdown Current	I _{SD}	V _{EN} = 0V			0.1	uA
Current Limit	I _{CL}		110	160		mA
Thermal Shutdown	TSD	Shutdown, temperature rise		160		°C
		Reset, temperature fall		140		°C

Typical Characteristics

$V_{IN}=V_{OUT} + 4.5V$ or $V_{IN}=5V$ (whichever is greater), $I_{OUT}=100\mu A$, $C_{IN}=1\mu F$, $C_{OUT}=1\mu F$, $T_J=25^{\circ}C$, unless otherwise specified

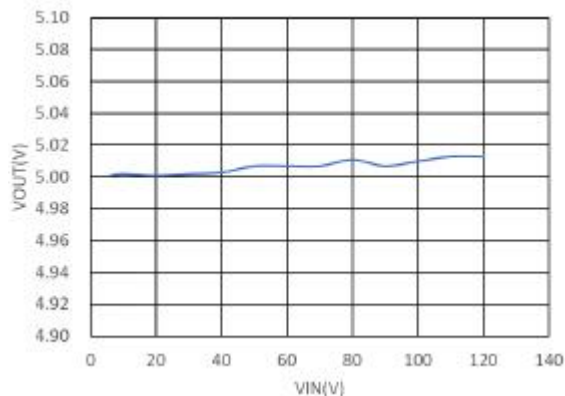


Fig1 Vout vs Vin

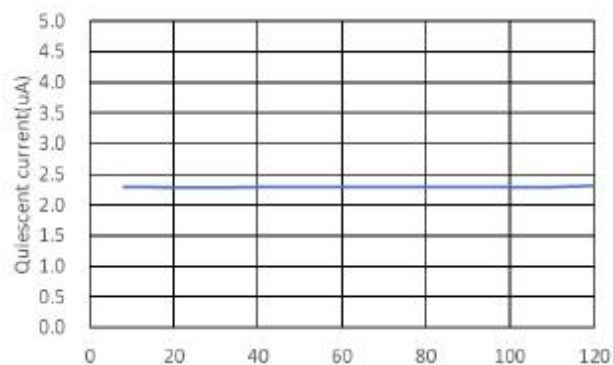


Fig2 Iq vs Vin

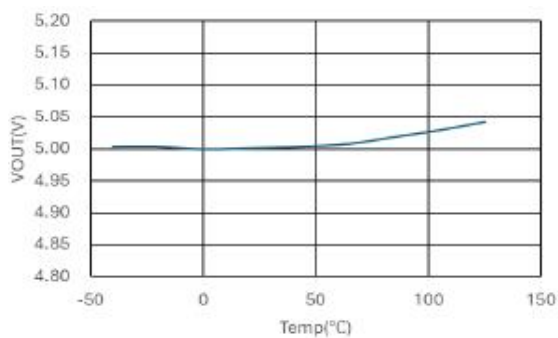


Fig3 Vout vs Temperature

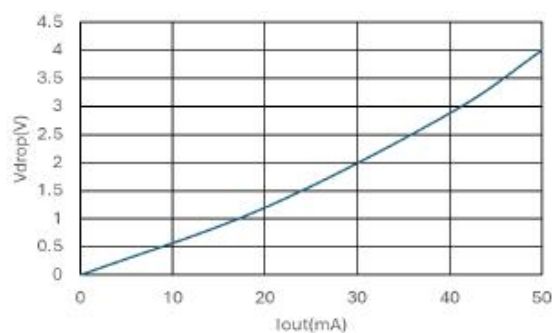


Fig4 Enable ON/OFF



Fig5 Vout Load Transient(1 to 50mA)

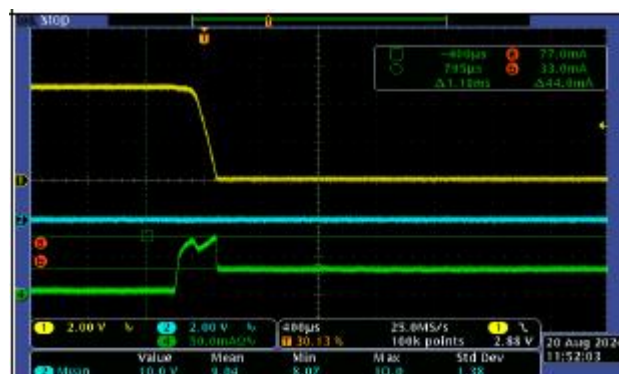


Fig6 Vout Short to GND

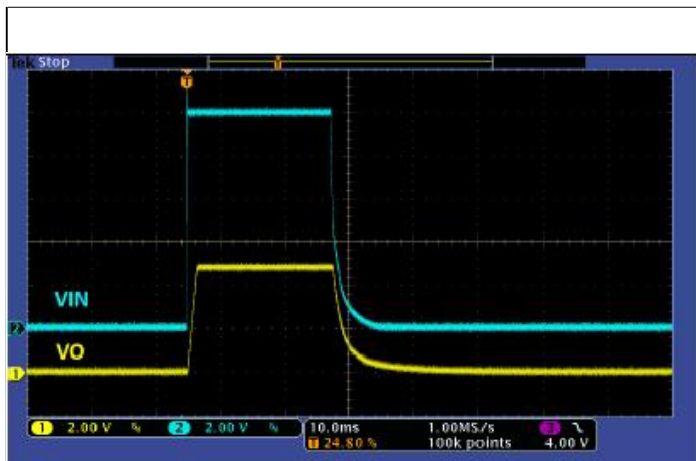


Fig7 Vin ON & OFF

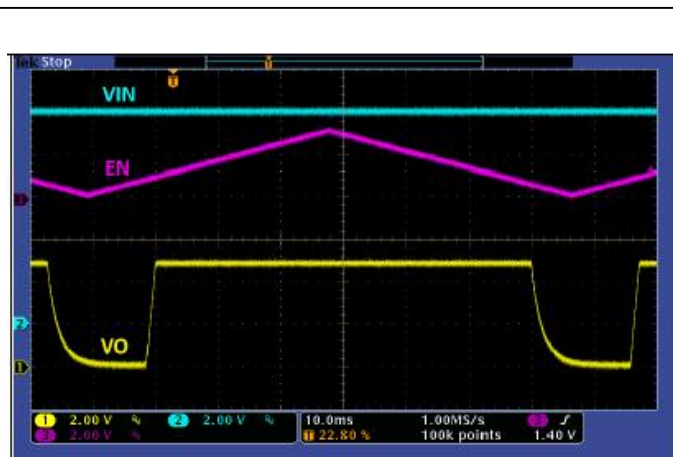
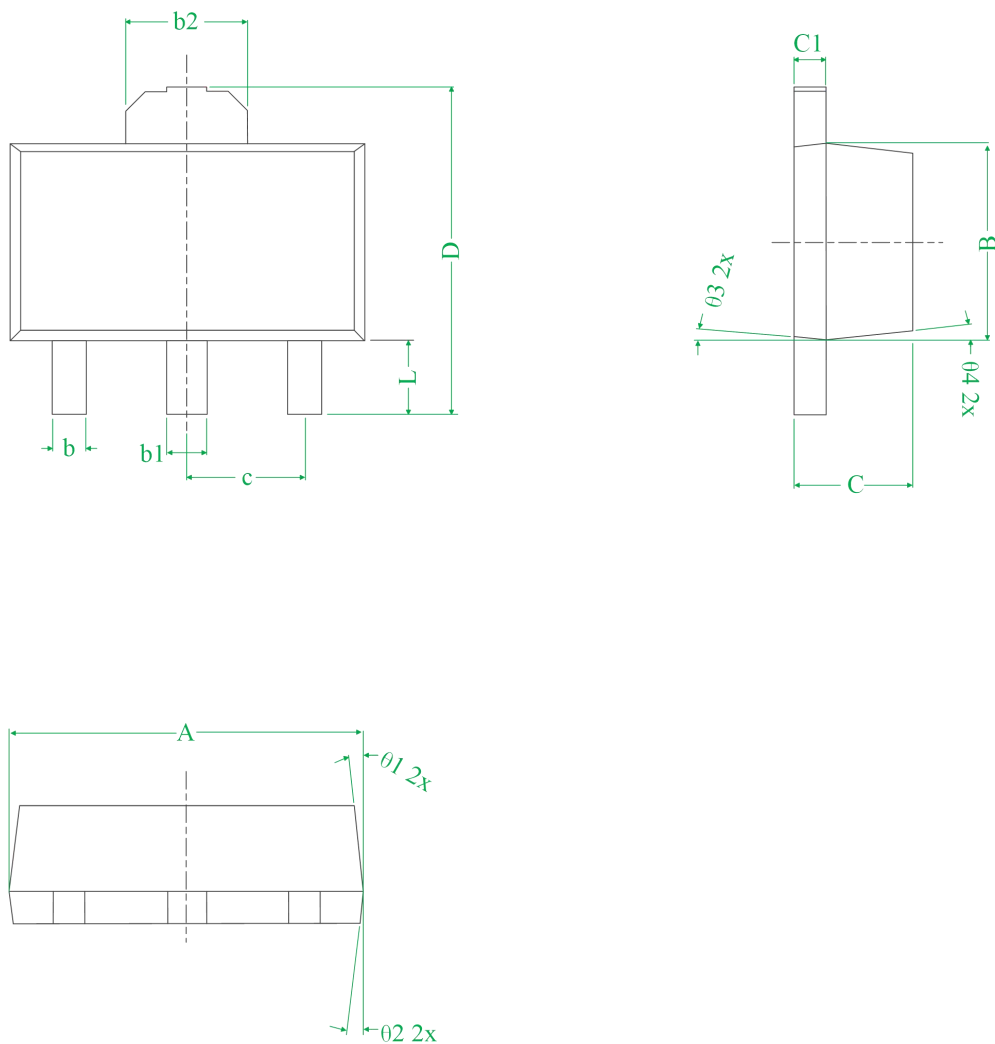


Fig8 EN ON & OFF

Package information



SOT89-3L for MX5712T

SYMBOL	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.45	4.5	4.75	0.1752	0.1791	0.1870
B	2.45	2.5	2.65	0.0965	0.1004	0.1043
C	1.40	1.50	1.60	0.0551	0.0591	0.0630
C1	0.40BSC			0.0157BSC		
D	4.10	4.20	4.30	0.1614	0.1654	0.1693
L	0.85	0.95	1.05	0.0335	0.0374	0.0413
b	0.35	0.40	0.45	0.0138	0.0157	0.0177
b1	0.43	0.48	0.53	0.0169	0.0189	0.0209
b2	1.5	1.55	1.60	0.0591	0.0610	0.0630
c	1.50BSC			0.0591BSC		
θ1	6°			6°		
θ2	5°			5°		
θ3	5°			5°		
θ4	6°			6°		

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- ◆ The information contained herein is subject to change without notice.

Version update record:

V10 The original version (preliminary)