50V 200mA Ultra Low Current Consumption CMOS Voltage Regulator

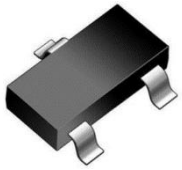
SSP7955

General Description

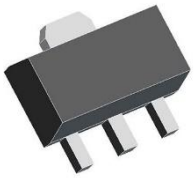
The SSP7955 is ultra-low quiescent current regulator features low dropout voltage and low current in the standby mode. With less than 2.4μA quiescent current at no load, the SSP7955 is ideally suited for standby micro-control-unit systems, especially for always-on applications like E-meters, fire alarms, smoke detectors and other battery-operated systems. The SSP7955 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 SSP7955 has 50V maximum operating voltage limit, and -40°C to 85°C operating temperature range, and ±2% output voltage tolerance over the entire output current, input voltage, and temperature range.

The SSP7955 regulators are available in standard SOT23-3, SOT89 and SOT223 packages.



SOT23-3



SOT89



SOT223

Features

- Vin Range up to 50V
- Output Range: 1.5V～5.0V
- Maximum Output Current: 200mA
- Dropout Voltage: 700mV@IOUT=100mA
- Ultra low quiescent current: 2.4μA @ 8V
- Output voltage tolerances of ±2% Over the temperature range
- Internal Thermal Overload Protection
- Built-in Current Limiter

Applications

- E-meters, Water Meters and Gas Meters
- Cellphones, Radiophone, Digital Cameras
- Fire Alarm, Smoke Detector
- Appliances and White Goods

Selection Table

Part No	Output Voltage	Package	Marking
SSP7955P25PR	2.5V	SOT89-3	7525-H#
SSP7955P30PR	3.0V		7530-H#
SSP7955P33PR	3.3V		7533-H#
SSP7955P36PR	3.6V		7536-H#
SSP7955P40PR	4.0V		7540-H#
SSP7955P44PR	4.4V		7544-H#
SSP7955P50PR	5.0V		7550-H#

Part No	Output Voltage	Package	Marking
SSP7955P25MR	2.5V	SOT23-3	HT25
SSP7955P30MR	3.0V		HT30
SSP7955P33MR	3.3V		HT33
SSP7955P36MR	3.6V		HT36
SSP7955P40PR	4.0V		HT40

Order Information

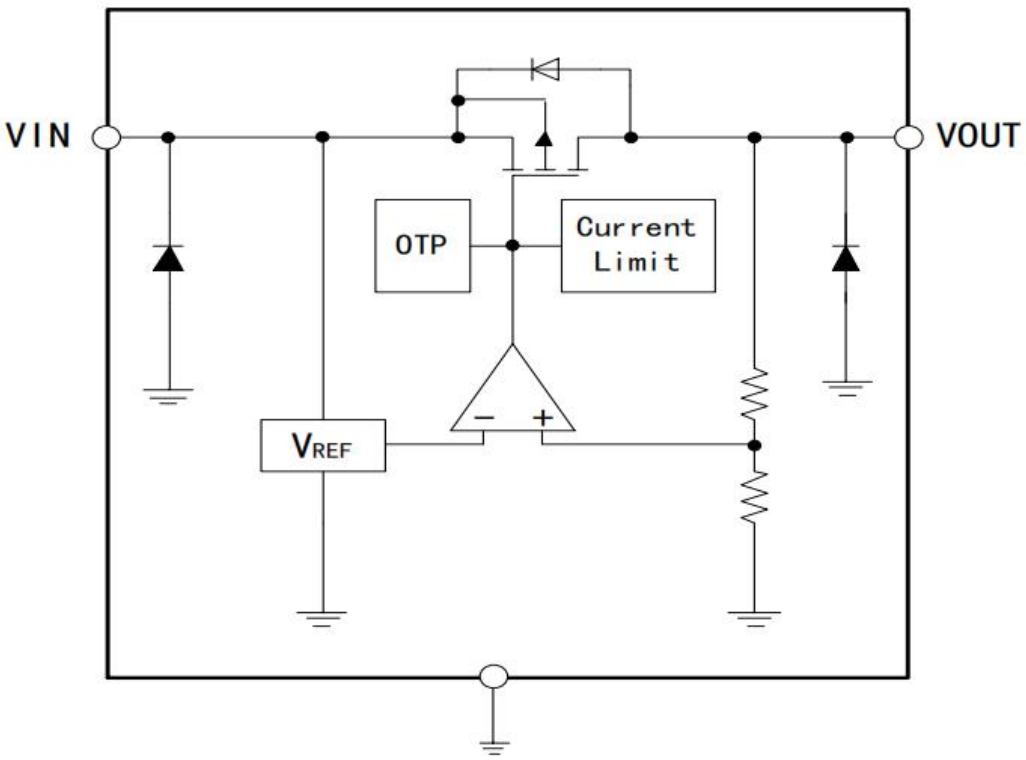
Product Model	Package	Manner of packing	Minimum Packing Quantity
SSP7955PXXMX	SOT23-3	Reel	3000
SSP7955PXXPX	SOT89-3		1000
SSP7955PXXGX	SOT223		2500

Order Information

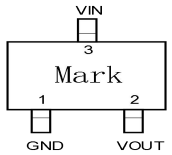
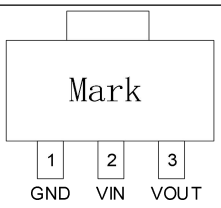
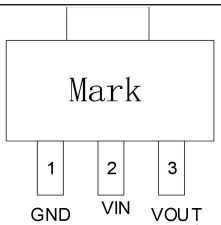
SSP7955P①②③④

Designator	Symbol	Description
①②	Integer	Output Voltage(1.5~5.0V)
③	M	Package: SOT23-3
	P	Package: SOT89
	G	Package: SOT223
④	R	RoHS / Pb Free
	G	Halogen Free

Block Diagram

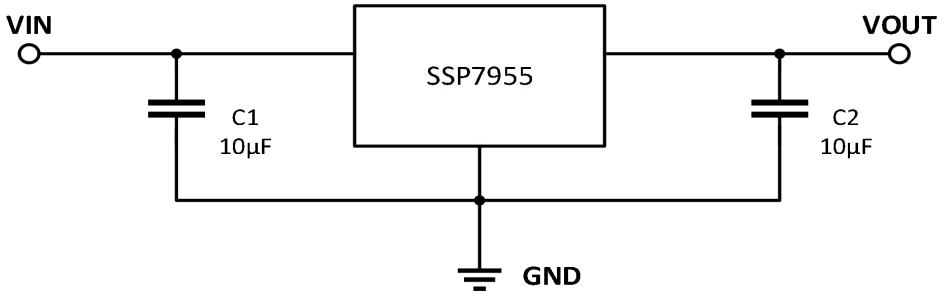


Pin Assignment

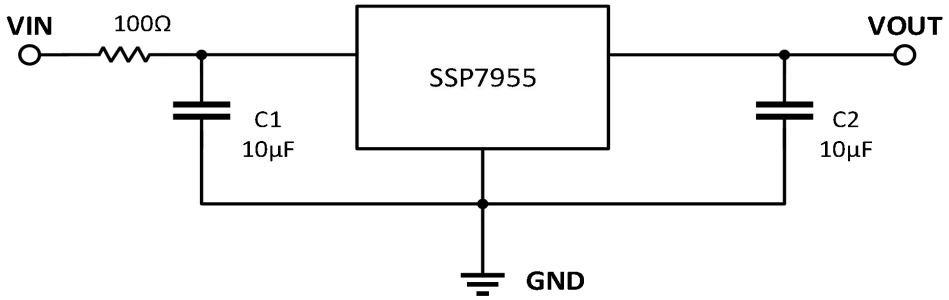
SSP7955PXXMX		
PIN NO	PIN NAME	 SOT23-3(Top View)
1	GND	
2	VOUT	
3	VIN	
SSP7955PXXPX		
PIN NO	PIN NAME	 SOT89（Top View）
1	GND	
2	VIN	
3	VOUT	
SSP7955PXXGX		
PIN NO	PIN NAME	 SOT223（Top View）
1	VIN	
2	GND	
3	VOUT	

Application Circuits

Application Circuit One



Application Circuit Two



When the input voltage exceeds 24V, the initial power-on surge can surge to over twice the nominal input level. Under these demanding conditions, it's advisable to employ an input capacitor—either an electrolytic type or tantalum—rated above 10μF. Furthermore, integrate a small resistor at the VIN pin's front end (adjust its value based on the actual load current) to create an effective RC absorption circuit. This configuration will absorb and dissipate the voltage spike, significantly weakening its peak intensity.

Absolute Maximum Ratings

Parameter Specification	Symbol	Min	Max	Unit
Input Voltage	V_{IN}	-0.3	55	V
Output Voltage	V_{OUT}	-0.3	7	
Storage Temperature	T_{stg}	-55	150	℃
Lead Temperature(Soldering,10 sec.)			300	
Junction Temperature		-40	125	
Operating Temperature		-40	85	
Power Dissipation	P_D (1)		SOT23-3 220 SOT89 650 SOT223 1200	mW

Note: These are stress ratings only. Stresses exceeding the range specified under “Absolute Maximum Ratings” may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

(1)Increasing the welding area of package is beneficial to increase power consumption

Electrical Characteristics

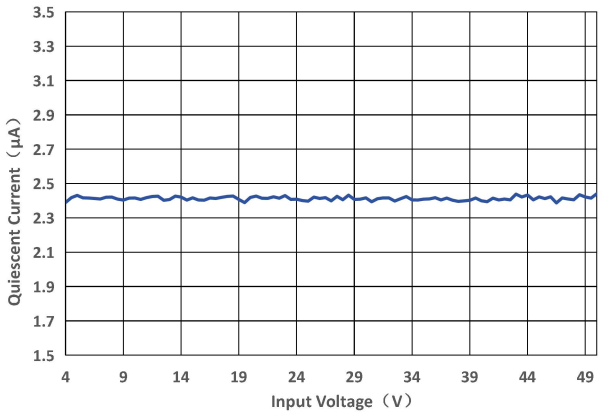
The following specifications apply for V_{IN}=12V, I_{OUT}=1mA, C_{IN}=C_{OUT}=10μF, T_J=25℃, unless specified otherwise.

SYMBOL	ITEMS	CONDITIONS	MIN	TYP	MAX	UNIT
V_{IN}	Input Voltage		2.7		50	V
V_{OUT}	Output Range		1.5		5.5	V
$\triangle V_{OUT}$	Output Voltage Accuracy		-2	V_{OUT}	2	%
I_Q	Quiescent Current	TJ=25℃	--	2.4	--	μA
I_{LIMIT}	Current Limit			260		mA
V_{DROP}	Dropout Voltage	I_{OUT}=100mA	--	700	--	mV
$\triangle V_{LINE}$	Line Regulation	V_{IN} = V_{OUT} + 1V to 40V, or V_{IN} = 5V to 40V, if V_{OUT} < 4V	--	2	--	mV
$\triangle V_{LOAD}$	Load Regulation	I_{OUT} = 1mA to 100mA	--	10	--	mV
		I_{OUT} = 1mA to 250mA	--	20	--	
PSRR	Power Supply Rejection Rate	Freq.=1kHz	--	60	--	dB
T_{SD}	Thermal Shutdown		--	160	--	℃
T_{HY}	Thermal Shutdown Hysteresis		--	20	--	℃

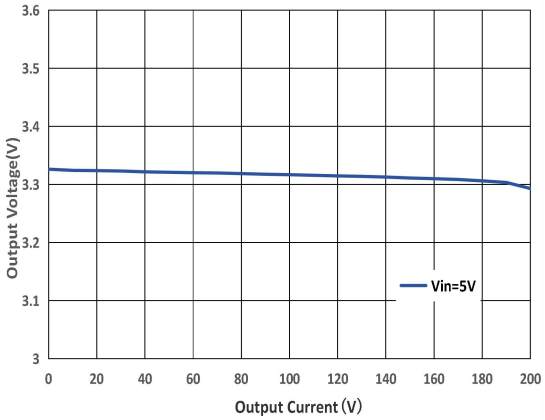
Typical Performance Characteristics

C_{IN}=10μF, C_{OUT}=10μF, V_{IN}=12V, V_{OUT}=3.3V T_J=25℃, unless specified otherwise

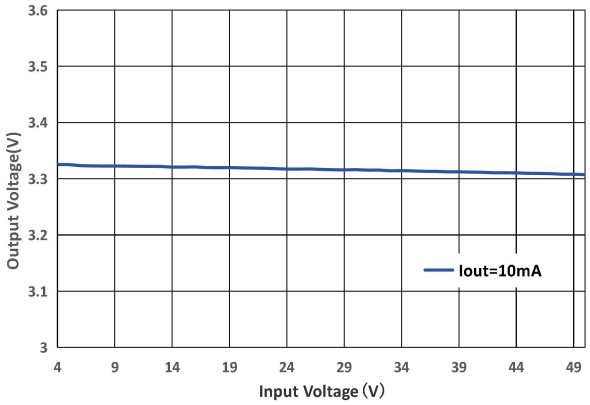
(1) Quiescent Current vs Input Voltage



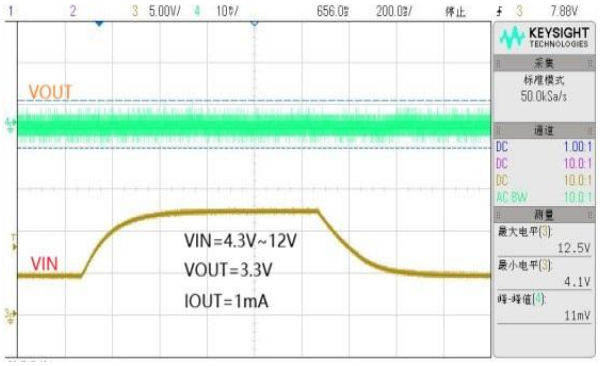
(2) Output Voltage vs Output Current

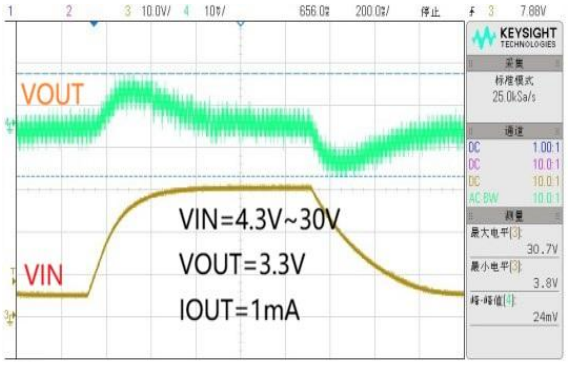


(3) Output Voltage vs Input Voltage

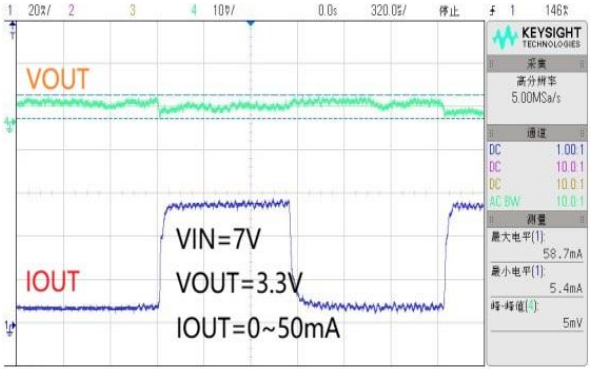


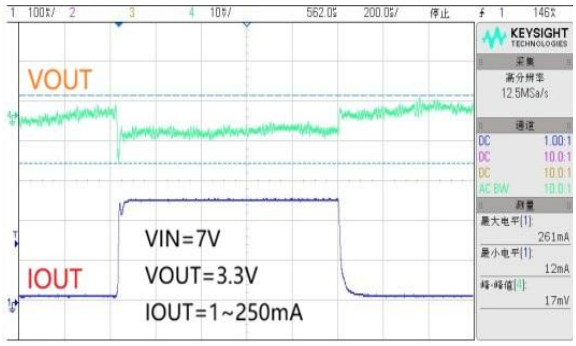
(4) Input Transient Response





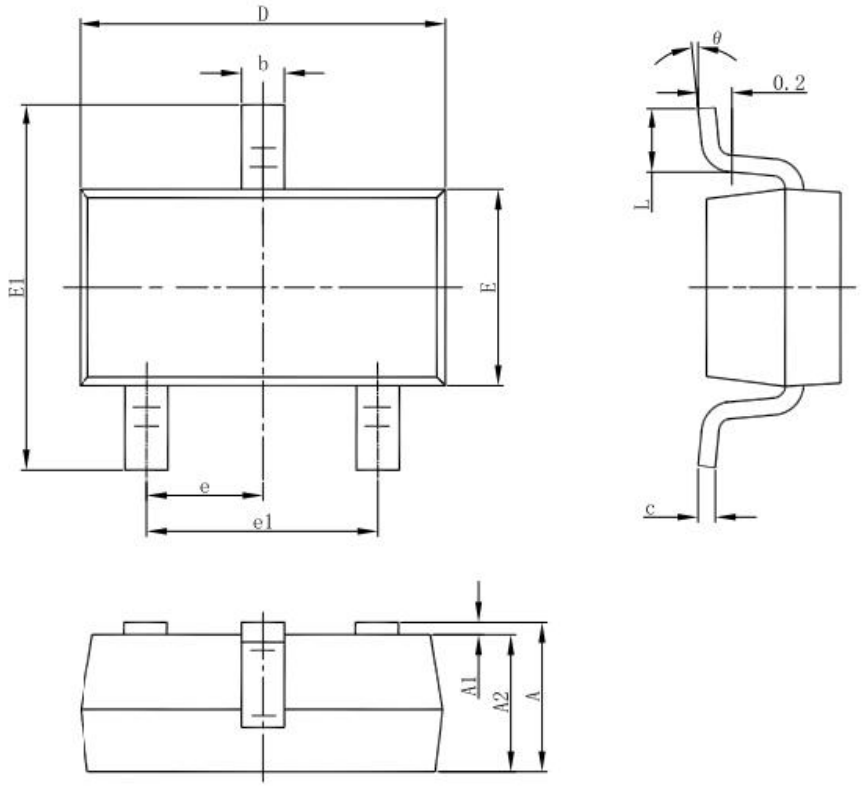
(5) Load Transient Response





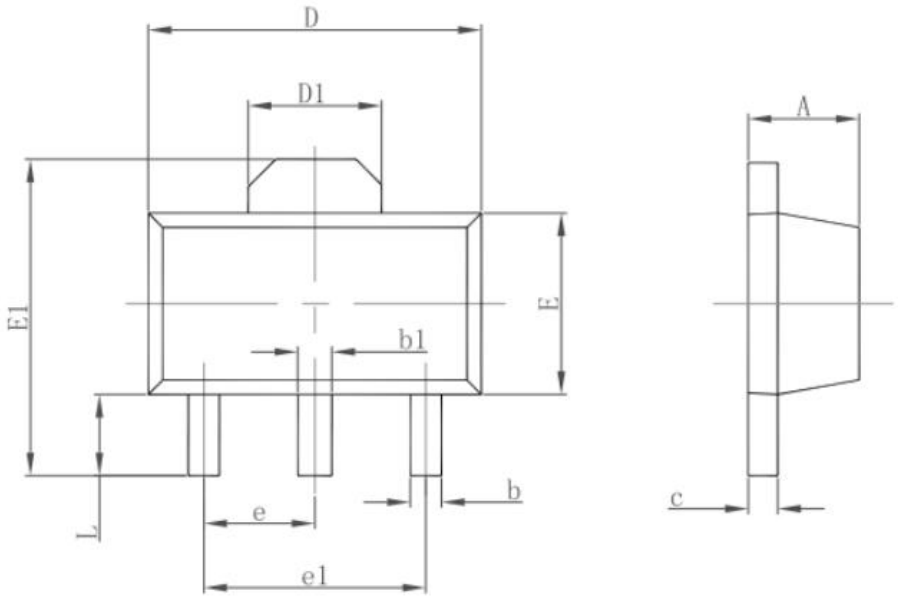
Package Information

3-pin SOT23-3 Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

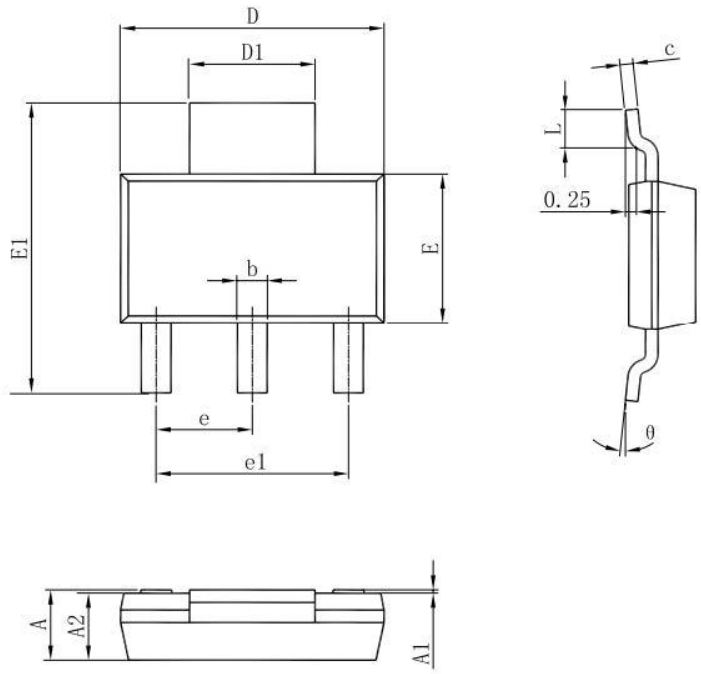
SOT89-3 Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	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
c	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
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

SOT223 Outline Dimensions

SOT-223 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300(BSC)		0.091(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°

Special Version

The company reserves the right of final interpretation of this specification.

Version Change Description

Versions：V1.0 Writer：XinCHun Li Time：2026.04.03

Modify the record：

Statement

The information in the usage specification is correct at the time of publication, Shanghai Siproin Microelectronics Co.,Ltd has the right to change and interpret the specification, and reserves the right to modify the product without prior notice. Users can obtain the latest version information from our official website or other effective channels before confirmation, and verify whether the relevant information is complete and up to date.

With any semiconductor product, there is a certain possibility of failure or failure under certain conditions. The buyer is responsible for complying with safety standards and taking safety measures when using the product for system design and complete machine manufacturing. The product is not authorized to be used as a critical component in life-saving or life-sustaining products or systems, in order to avoid potential failure risks that may cause personal injury or property loss.