

Features

- Maximum Output Current: 600mA
- Low Quiescent Current: 50uA(Typ.)
- Very low dropout voltage :
300mV@600mA(Vout=3.3V)
- Highly Accurate: $\pm 2\%$ (Fixed Output)
 $\pm 1\%$ (Adjustable Output)
- 0.02%/V Line Regulation
- Auto discharge function
- 75dB PSRR @ 1KHz
- $-40^{\circ}\text{C} \sim 125^{\circ}\text{C}$ Wide Operating Temperature
- 2000V HBM ESD
- 150°C Thermal Protection

Applications

- Battery powered portable devices
- Smart phone, tablet
- Hi resolution camera sensor power
- Wireless modules
- RF, PLL, VCO clock power

General Description

The TP9650C Series is a low dropout, positive linear regulator with very low quiescent current. It can supply 600mA output current with a input range from 1.7V to 7V, which makes it suitable for all kinds of applications.

TP9650C Series use advanced CMOS technology to achieve very low dropout voltage (300mV @600mA). Fast structural design achieves 75dB PSRR at 1kHz while still maintaining a small 50uA quiescent current.

Trimming technique is used to guarantee output voltage accuracy within $\pm 2\%$ (Fixed Output); $\pm 1\%$ (Adjustable Output). TP9650C Series provides full fault protection including current limit, short circuit protection and thermal shutdown protection.

Ordering Information

TP9650C33T3

PACKAGE TYPE

T3 : SOT-89-3

T5 : SOT-89-5

OUTPUT VOLTAGE

12: 1.2V

15: 1.5V

18: 1.8V

25: 2.5V

28: 2.8V

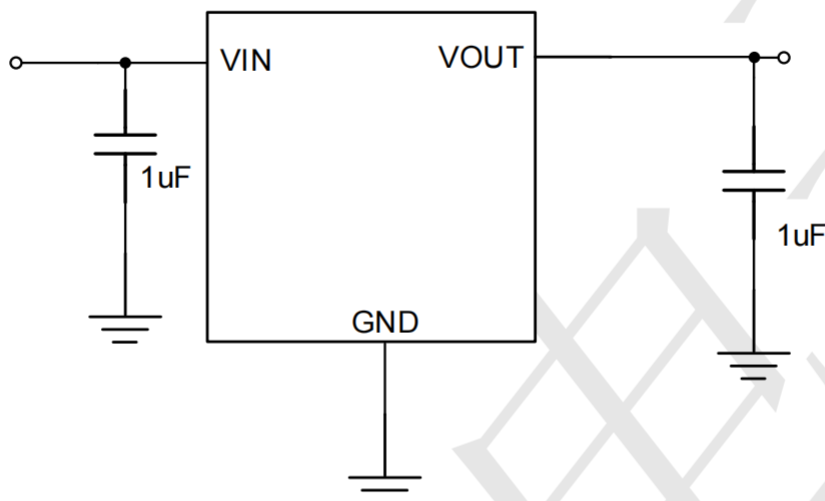
30: 3.0V

33: 3.3V

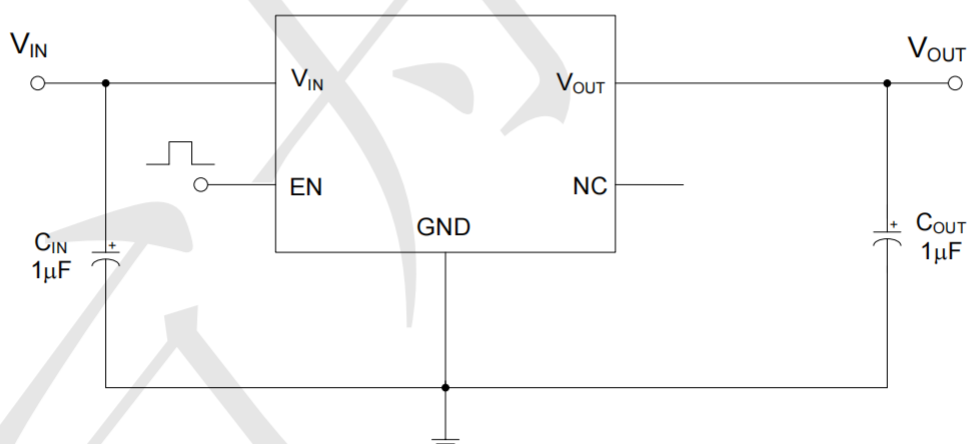
50: 5.0V

Typical Application Circuit

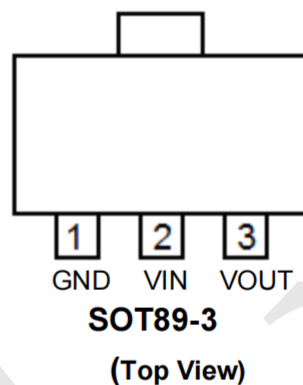
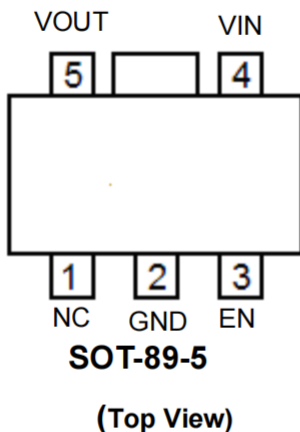
Package in SOT89



Package in SOT89-5



Applicable Packages



Functional Pin Description

Pin Name	Pin Function
VIN	Power Input Voltage
GND	Ground
EN	Chip Enable (Active High). Note that this pin is high impedance
NC	NO Connected
FB	Feedback Pin (adjustable voltage version only). Connect this pin to the midpoint of an external resistor divider to adjust the output voltage
VOUT	Output Voltage

Absolute Maximum Rating ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter		Value	Unit
Max Input Voltage		8.5	V
Output Current		300	mA
Power Dissipation		590	mW
Thermal Resistance, Junction-to-Ambient		170	$^{\circ}\text{C}/\text{W}$
Junction Temperature		150	$^{\circ}\text{C}$
Operating Ambient Temperature		$-40 \sim +125$	$^{\circ}\text{C}$
Storage Temperature Range		$-40 \sim +150$	$^{\circ}\text{C}$
Lead Temperature&Time		$260^{\circ}\text{C}, 10\text{S}$	--

Note1: Exceed these limits to damage to the device. Exposure to absolute maximum rating conditions may affect.

Recommended Operating Conditions

Parameter	Value	Unit
Supply Voltage	1.7~7	V
Maximum Output Current	600	mA
Operating Ambient Temperature	$-40 \sim +125$	$^{\circ}\text{C}$

Electrical Characteristics (T = 25°C unless otherwise noted)

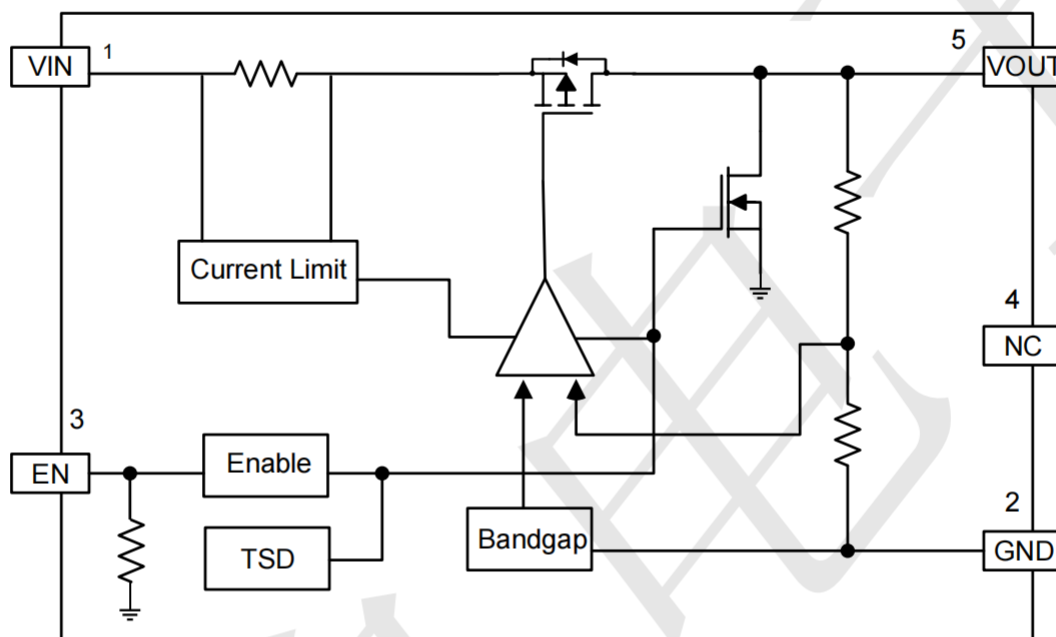
C_{IN}=1μF, C_{OUT}=1μF, T_A=25°C, unless otherwise noted.)

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input Voltage		V _{IN}		1.7	--	7	V
Output Voltage Range		V _{OUT}	V _{IN} =V _{OUT} +1V 1mA<I _{OUT} <30mA	V _{OUT} ×0.98	--	V _{OUT} ×1.02	V
Feedback Voltage		V _{FB}	Adjustable Output Version	--	0.6	--	V
Output Voltage Accuracy		ΔV _{OUT}	Fixed Output Version	-2	--	+2	%
			Adjustable Output Version	-1	--	+1	%
Quiescent Current		I _Q	I _{OUT} =0mA	--	50	75	μA
Max. Output Current		I _{OUT} (Max.)	V _{IN} -V _{OUT} =1V	600	--	--	mA
Dropout Voltage		V _{DROP}	V _{OUT} =3.3V, I _{OUT} =600mA	--	300	500	mV
Line Regulation		ΔV _{LINE}	I _{OUT} =1mA	--	0.02	0.1	%/V
Load Regulation		ΔV _{LOAD}	0mA≤I _{OUT} ≤600mA	--	15	30	mV
Short Circuit Current		I _{SHORT}		--	250	--	mA
Current Limit		I _{LIM}	V _{IN} -V _{OUT} =1V	0.7	0.75	--	A
Standby Current			EN=0	--	--	1	μA
EN Input Threshold	Logic Low	V _{CEL}	EN Low Voltage	--	--	0.4	V
	Logic High	V _{CEH}	EN High Voltage	1	--	--	V
Power Supply Rejection Rate		PSRR	V _{IN} =V _{OUT} +0.5V, f=1KHz, I _{OUT} =10mA	--	75	--	dB
Startup Time		t _{start}		--	80	--	μS
Output Voltage Temperature Coefficient		TC _{VOUT}		-100	--	100	ppm/°C
OTP				130	150	170	°C
OTP Hysteresis				--	40	--	°C

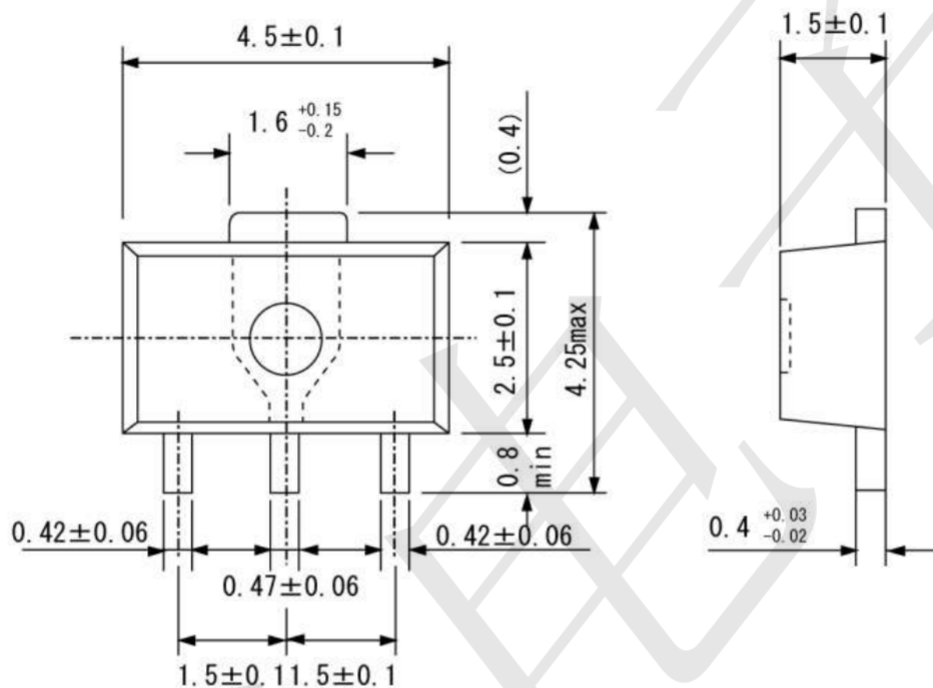
Note: All test are conducted under ambient temperature 25°C and within a short period of time 20ms.

Function Block Diagram

Fixed Output Voltage



SOT89 3



Package Information:

SOT89-5

