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TP552 Series

50V,200mA,2uA, Higt PSRR Voltage Reaulators

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Features

- 2μA Ground Current at no Load
- ±2% Output Accuracy
- 200mA Output Current
- Wide Operating Input Voltage Range: 2V to 50V
- Dropout Voltage: 0.65V at 100mA (V_{OUT}=5V)
- Support Fixed Output Voltage 1.8V, 3.3V, 5V, 9V, 12V
- Stable with Ceramic or Tantalum Capacitor
- Current Limit Protection
- Over-Temperature Protection
- SOT-23-5 Package Available

Applications

- Portable, Battery Powered Equipment
- Low Power Microcontrollers
- Laptop, Palmtops and PDAs
- Wireless Communication Equipment
- Audio/Video Equipment
- Car Navigation Systems
- Industrial Controls
- Weighting Scales
- Meters
- Home Automation

General Descrition

The TP552C is a low-dropout (LDO) voltage regulators with enable function offering the benefits of high input voltage, low-dropout voltage, low-power consumption, and miniaturized packaging.

The features of low quiescent current as low as 2μA and zero disable current is ideal for powering the battery equipment to a longer service life. The TP552C is stable with the ceramic output capacitor over its wide input range from 2V to 50V and the entire range of output load current.

Ordering Information

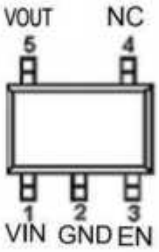
TP552C50S5

- S5:SOT23-5 Package
  D4:DFN1X1-4 Package
- Output voltage: 12=1.2V
  15=1.5V
  18=1.8V
  30=3.0V
  33=3.3V
  50=5.0V
  A9=9V
  B2=12V

Marking

TP552C12S5 Marking: ₱J12
TP552C15S5 Marking: ₱J15
TP552C18S5 Marking: ₱J18
TP552C30S5 Marking: ₱J30
TP552C33S5 Marking: ₱J33
TP552C50S5 Marking: ₱J50
TP552CA9S5 Marking: ₱JA9
TP552CB2S5 Marking: ₱JB2

PIN CONFIGURATION



SOT23-5

Pin No	Pin Name	Pin Function
1	VIN	Input of Supply Voltage.
2	GND	Ground
3	EN	Enable Control Input.
4	NC	No Internal Connection.
5	VOUT	Output of the Regulator

Typical Application Circuit

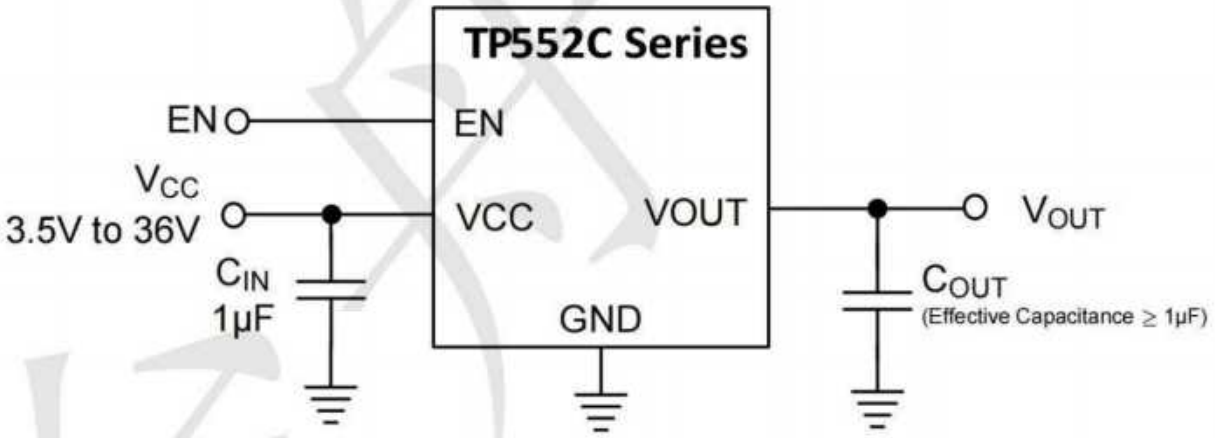
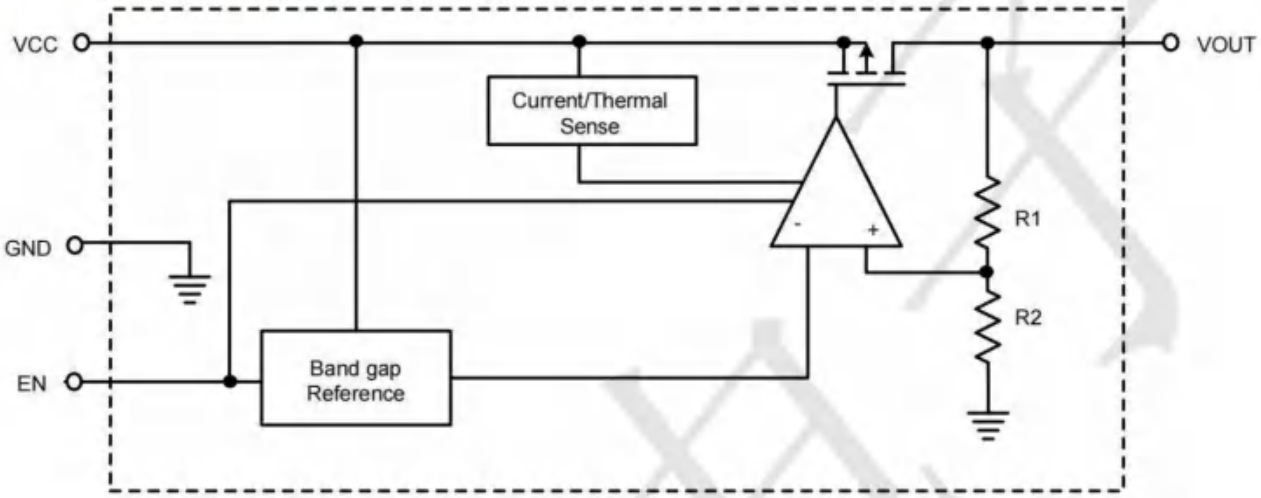


Figure 1: Application circuit of Fixed V_{OUT} LDO with enable and sense functions

BLOCK DIAGRAM



Absolute Maximum Ratings

VIN Pin to GND Pin Voltage ..... -0.3V to 60V

VOUT Pin to GND Pin Voltage TP552CA1, B2 ,S5 ..... -0.3V to 14V

TP552C18 ,33,50 S5 ..... -0.3V to 6.0V

VOUT Pin to VIN Pin Voltage ..... -40V to 0.3V

Storage Temperature Range ..... -60ºC~150ºC

Lead Temperature (Soldering, 10 sec) 260ºC

Junction Temperature 150ºC

Operating Ambient Temperature Range T_A ..... -40ºC~85ºC

SOT-23-5, θ_{JA} ---------- 218.1°C/W

SOT-23-5, θ_{JC} ---------- 28.5°C/W

(Assume no Ambient Airflow, no Heatsink)

Recommended Operating Conditions

Supply Input Voltage ----------3.5V to 50V

Junction Temperature Range ---------- –40°C to 125°C

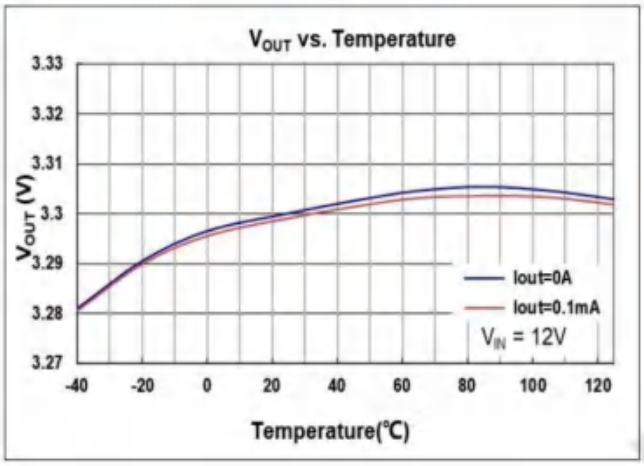
Ambient Temperature Range---------- –40°C to 85°C

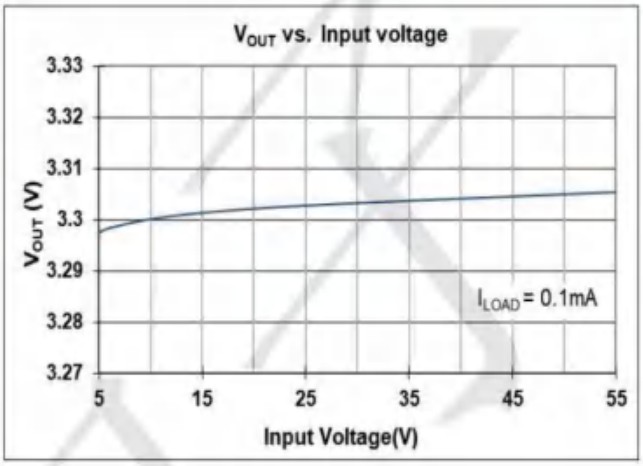
Electrical Characteristics

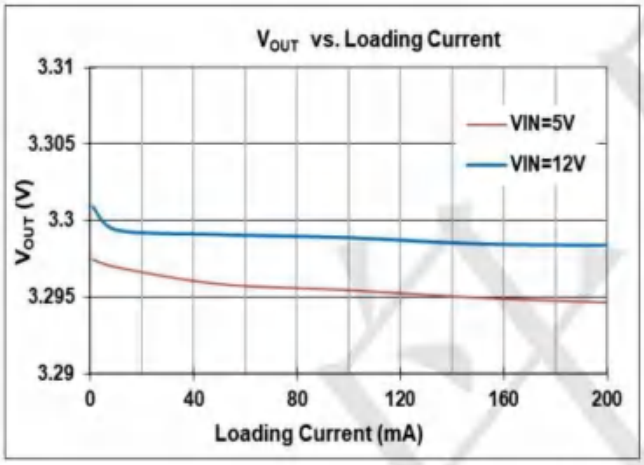
(V_{IN}=15V, V_{EN}=5V, T_A=25°C, unless otherwise specified) (Note 1)

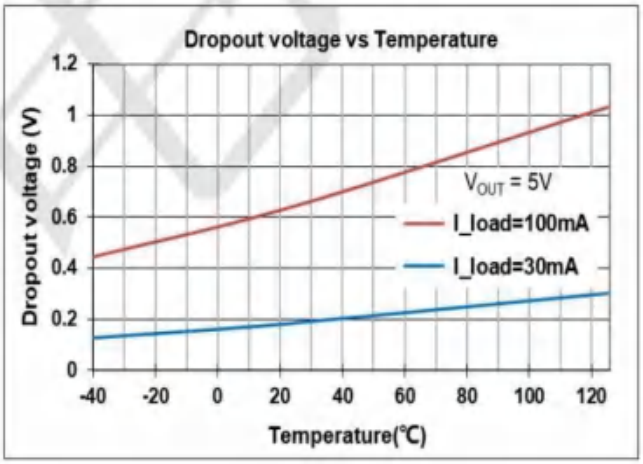
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage	V_{IN}		2	--	50	V
DC Output Voltage Accuracy		I_{LOAD} =0.1mA	-2		2	%
Dropout Voltage (I_{LOAD} =100mA)	V_{DROP}	V_{OUT} ≥ 5V	--	0.66		V
	$V_{DROP_3.3V}$	V_{OUT} = 3.3V		0.75		
	$V_{DROP_1.8V}$	V_{OUT} = 1.8V		1		
Ground Current (I_{LOAD} = 0mA)	I_Q	V_{OUT} ≤ 5V		2	3.5	μA
	I_{QH}	5V < V_{OUT} ≤ 12V		5	8	
Shutdown Ground Current	I_{SD}	V_{EN} = 0V, V_{OUT} = 0V		0.01	0.5	μA
V_{OUT} Shutdown Leakage Current	I_{LEAK}			0.01	0.5	μA
Enable Threshold Voltage	V_{IH}	EN Rising			2	V
	V_{IL}	EN Falling	0.6			
EN Input Current	I_{EN}	V_{EN} = 36V		10		nA
Line Regulation	ΔLINE	I_{LOAD} =1mA, 5 ≤ V_{IN} ≤ 36V	--	0.3		%
Load Regulation	ΔLOAD	1mA≤ I_{LOAD} ≤ 0.2A		0.1		%
Output Current Limit	I_{LIM}	V_{OUT} =0	200	300		mA
Power Supply Rejection Ratio	PSRR	V_{OUT} =5V, I_{LOAD} =1mA, V_{IN} = 12V, f = 100Hz		70		dB
Thermal Shutdown Temperature	T_{SD}	I_{LOAD} =10mA	--	160	--	°C
Thermal Shutdown Hysteresis	ΔT_{SD}			15		°C

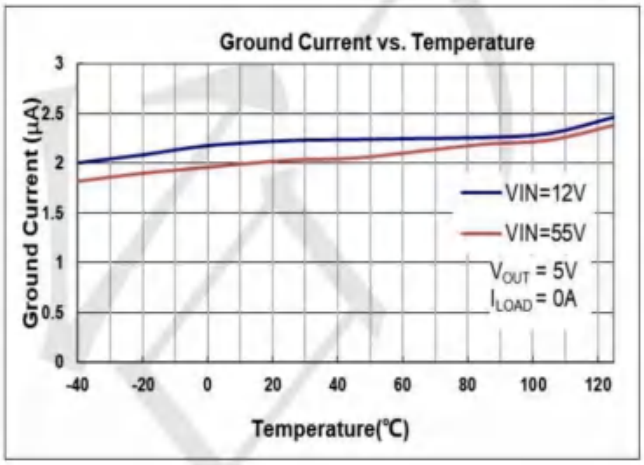
Typical Operating Characteristics

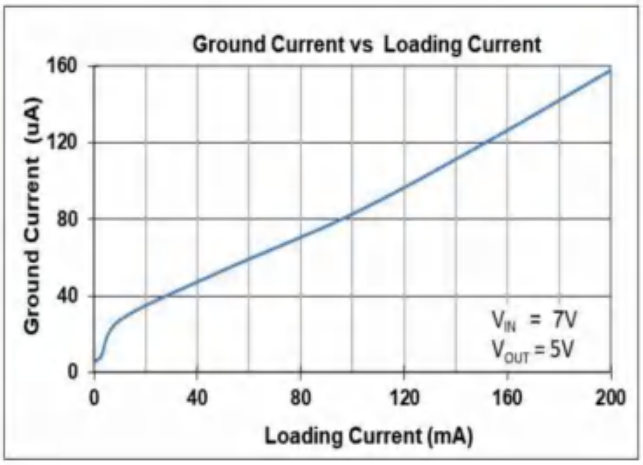




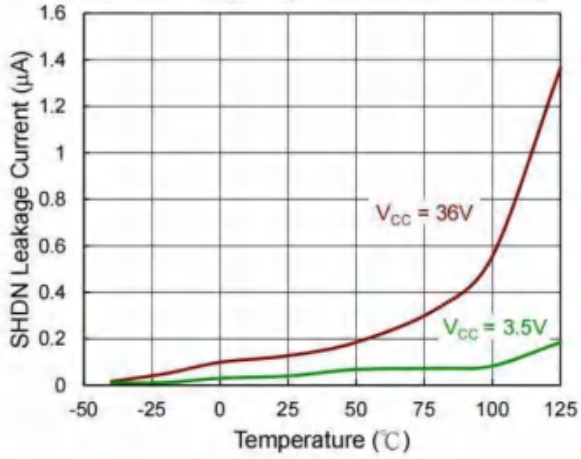




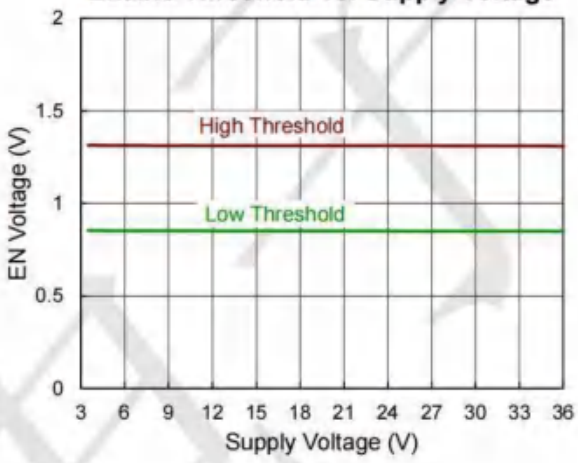




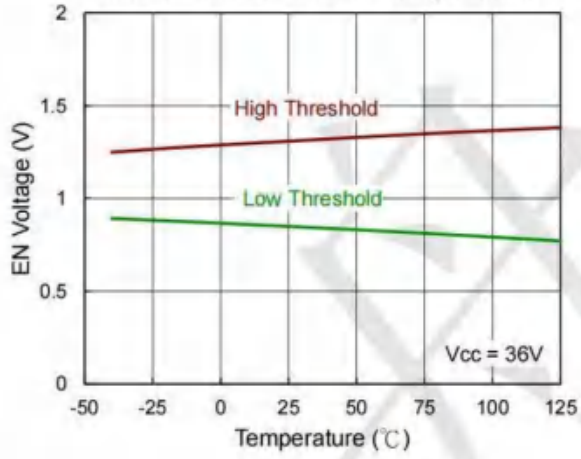
SHDN Leakage Input Current vs. Temp.



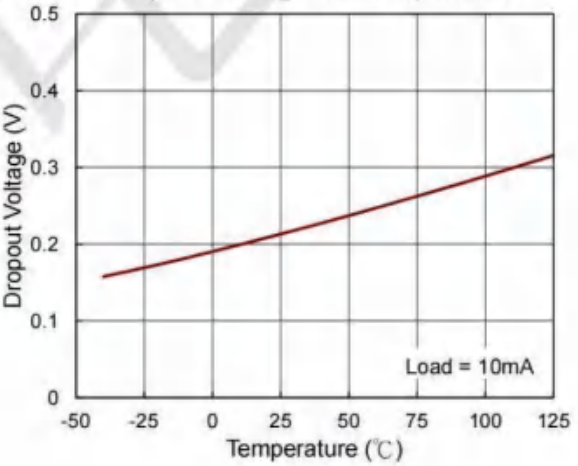
Enable Threshold vs. Supply Voltage



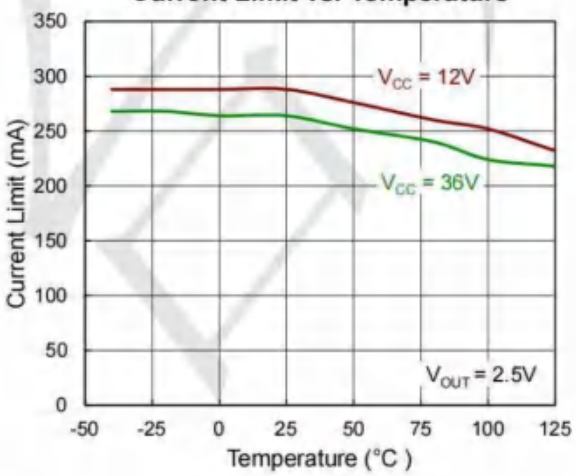
Enable Threshold vs. Temperature



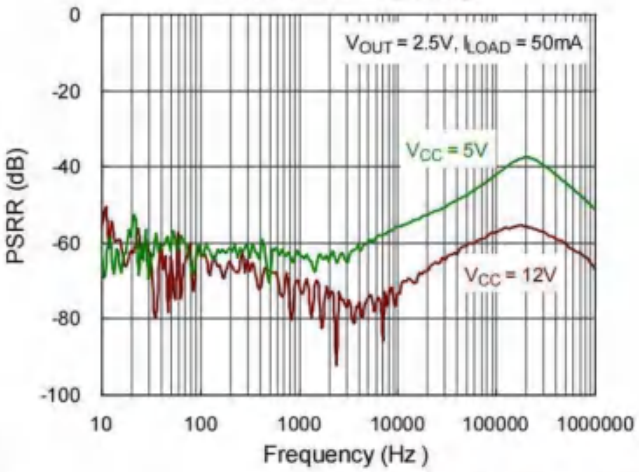
Dropout Voltage vs. Temperature

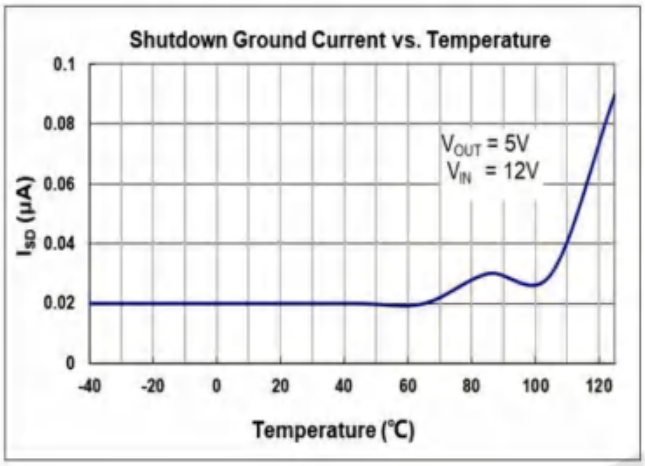


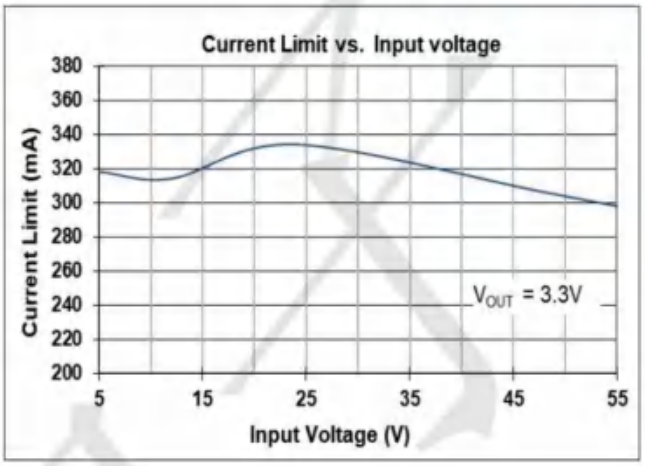
Current Limit vs. Temperature



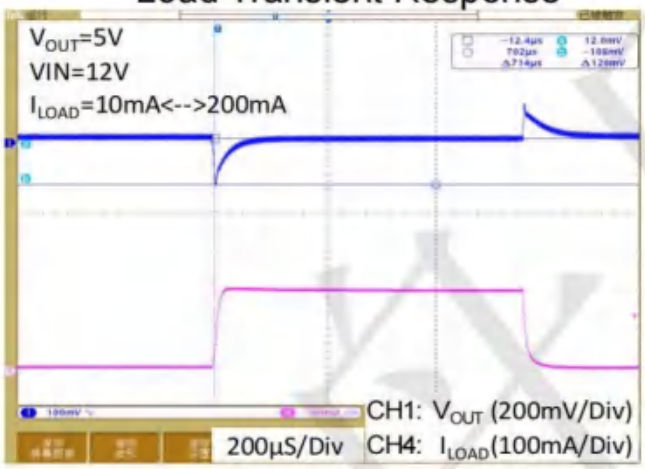
PSRR vs. Frequency



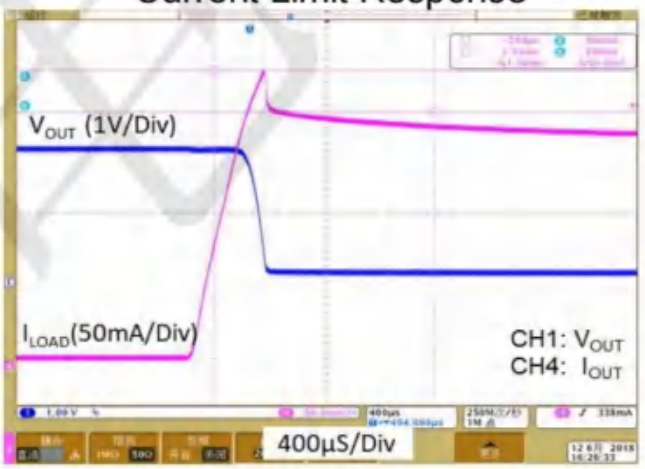




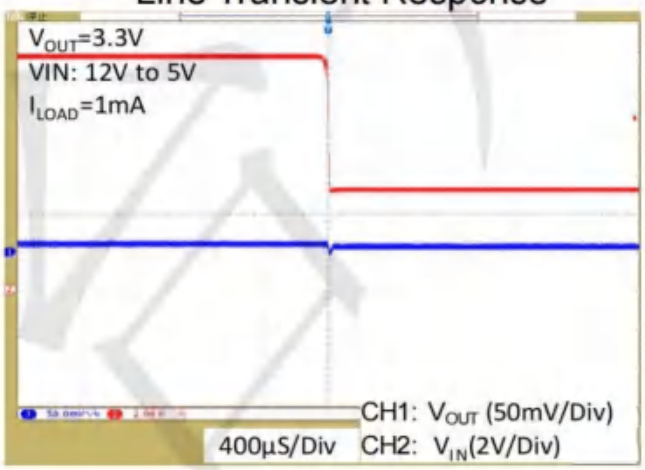
Load Transient Response



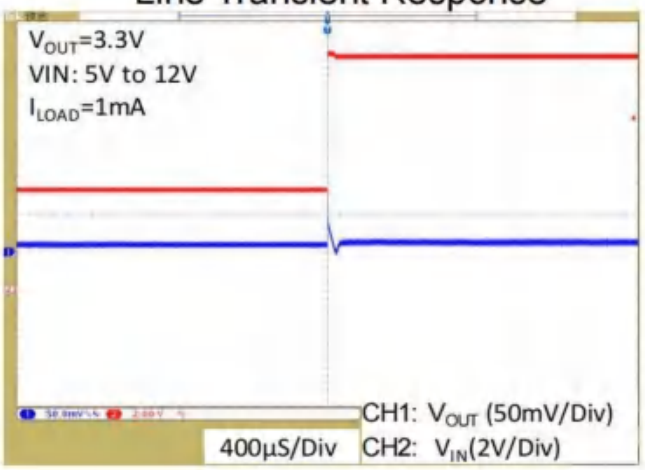
Current Limit Response



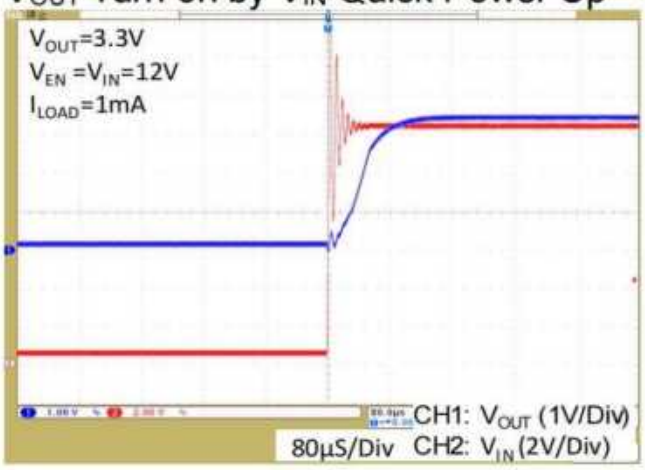
Line Transient Response



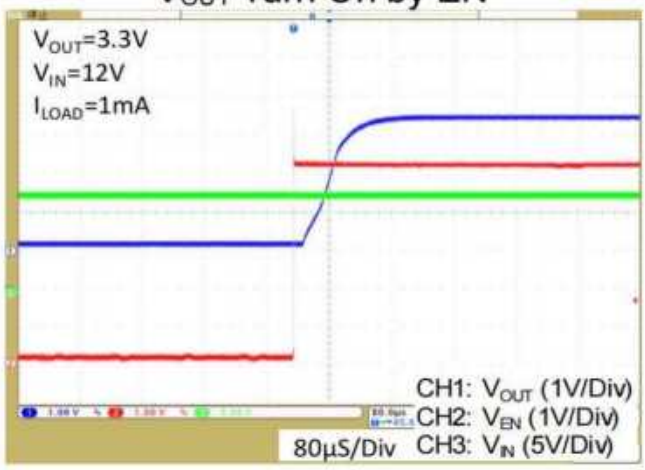
Line Transient Response



V_{OUT} Turn on by V_{IN} Quick Power Up

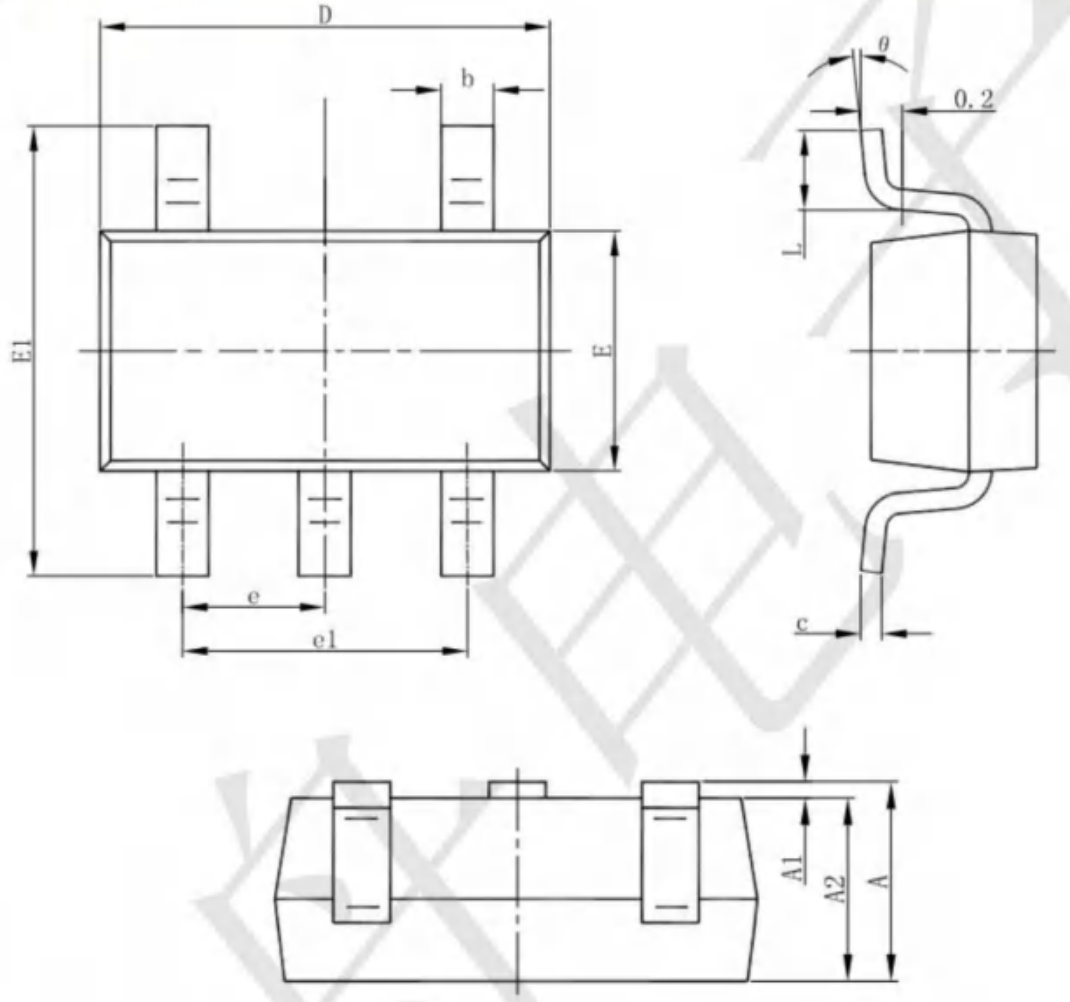


V_{OUT} Turn On by EN



Package informantion

SOT23-5



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°