TP362 Series

36V,200mA,2uA, Higt PSRR Voltage Reaulators

www.sot23.com.tw

Features

- 2μA Ground Current at no Load
- ±2% Output Accuracy
- 200mA Output Current
- Wide Operating Input Voltage Range: 2V to 36V
- 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 Microcontro lers
- Laptop, Palmtops and PDAs
- Wireless Communication Equipment
- Audio/Video Equipment
- Car Navigation Systems
- Industrial Controls
- Weighting Scales
- Meters
- Home Automation

General Descrition

The TP362C 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 TP362C is stable with the ceramic output capacitor over its wide input range from 2V to 36V and the entire range of output load current.

Ordering Information

TP362C50S5

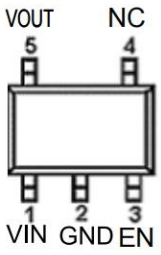
- S5:SOT23-5 Package
- Output voltage: 12=1.2V, 15=1.5V, 18=1.8V, 30=3.0V, 33=3.3V, 50=5.0V, A9=9V, B2=12V

Marking

TP362C12S5 Marking: ₱H12
TP362C15S5 Marking: ₱H15
TP362C18S5 Marking: ₱H18
TP362C30S5 Marking: ₱H30
TP362C33S5 Marking: ₱H33
TP362C50S5 Marking: ₱H50

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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

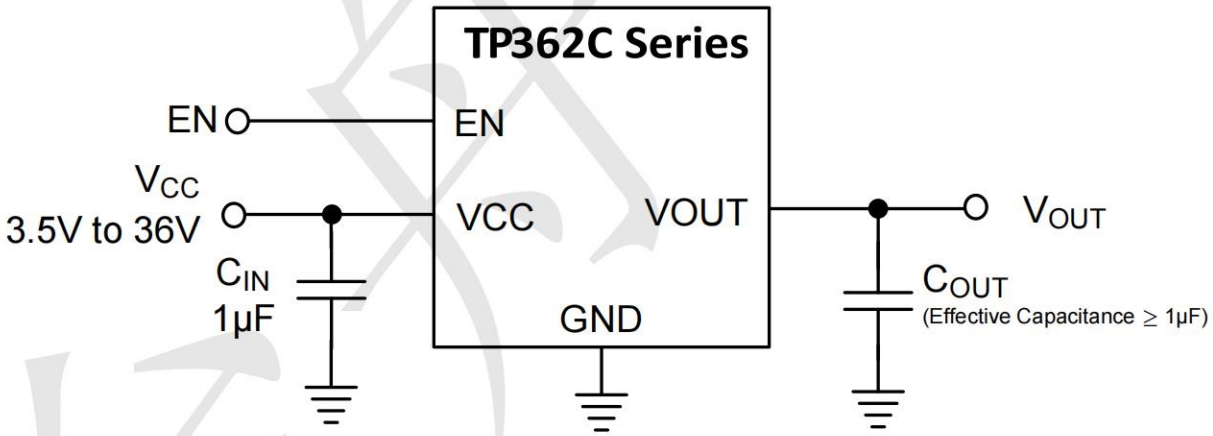
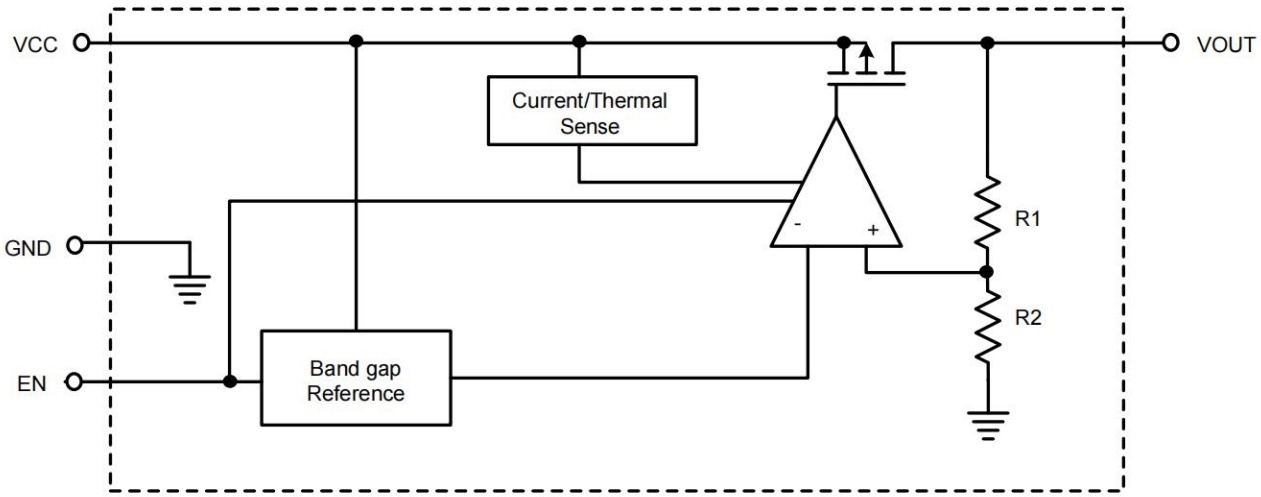


Figure 1: Application circuit of Fixed V_{OUT} LDO with enable and sense functions

BLOCK DIAGRAM



Absolute Maximum Ratings

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

VOUT Pin to GND Pin Voltage TP362CA1, B2 ,S5 ..... -0.3V to 14V

TP362C18 ,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 36V

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

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

Electrical Characteristics

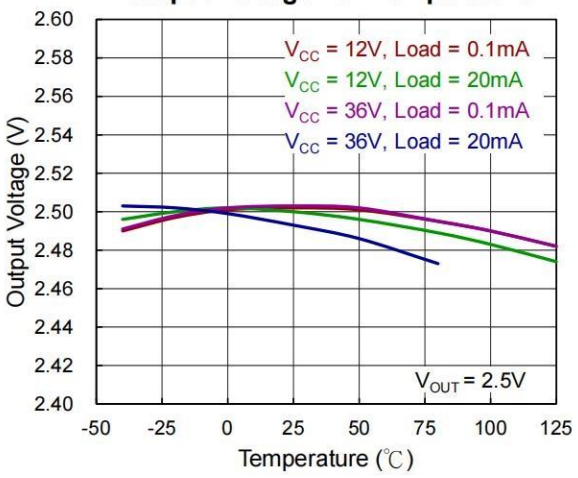
(V_{IN}=15V, V_{EN}=5V, T_A=25°C, unless otherwise specified) (Note 1)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage	V_{IN}		2	--	36	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		μA
	I_{QH}	5V < V_{OUT} ≤ 12V		4.5		
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	100	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

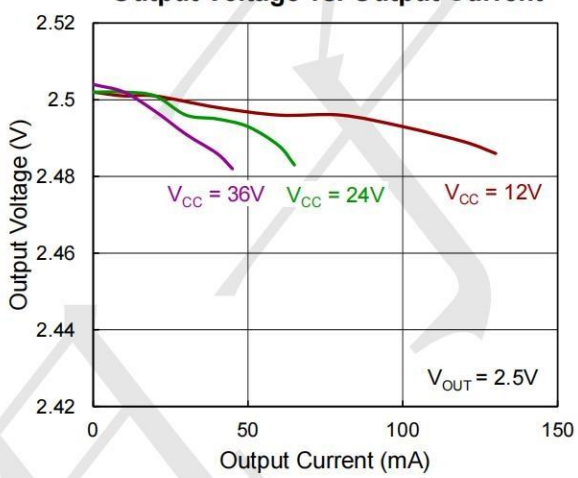
Note 1. Specifications are production tested at T_A=25°C. Specifications over the -40°C to 85°C operating temperature range are assured by design, characterization and correlation with Statistical Quality Controls (SQC).

Typical Operating Characteristics

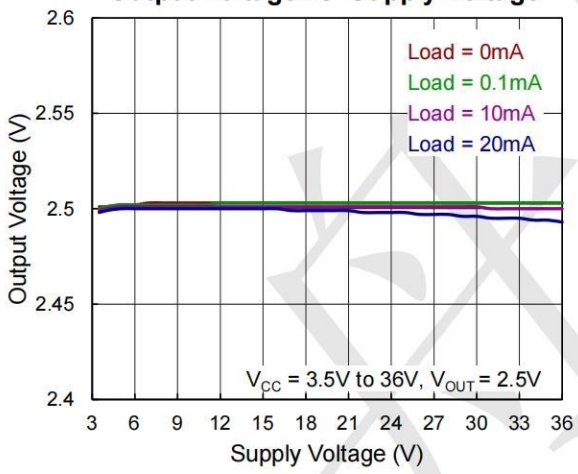
Output Voltage vs. Temperature



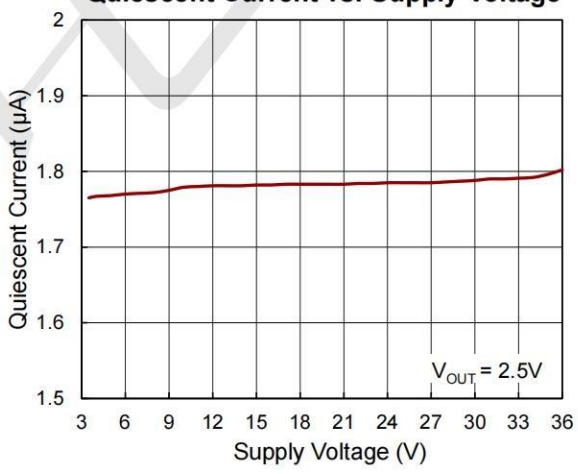
Output Voltage vs. Output Current



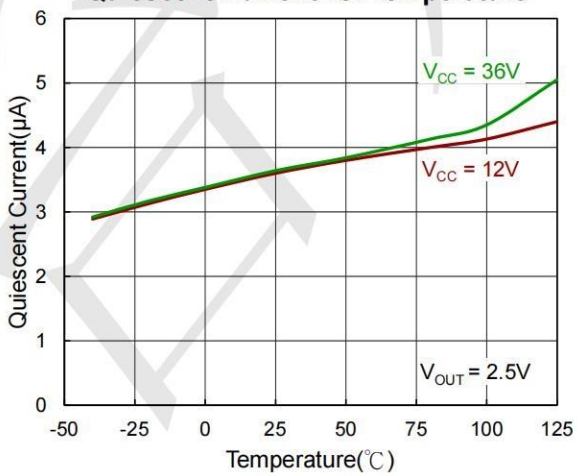
Output Voltage vs. Supply Voltage



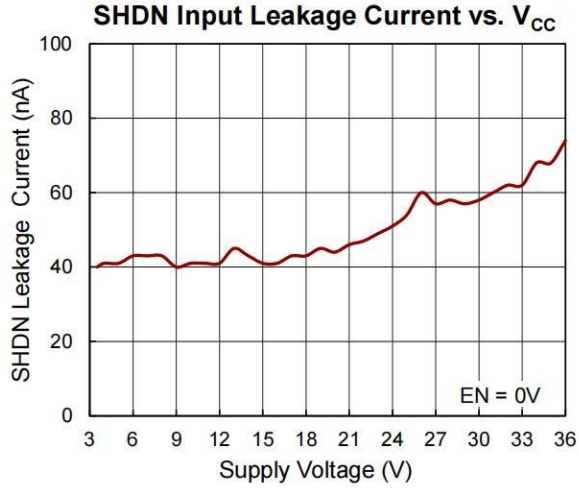
Quiescent Current vs. Supply Voltage



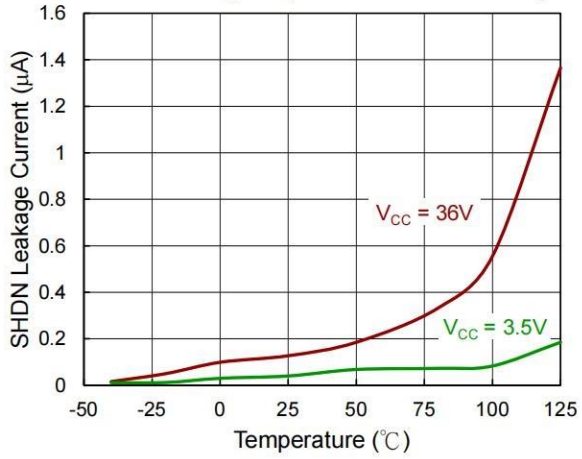
Quiescent Current vs. Temperature



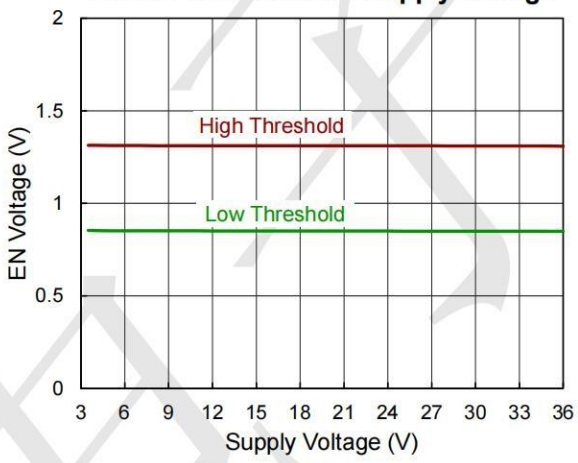
SHDN Input Leakage Current vs. V_{CC}



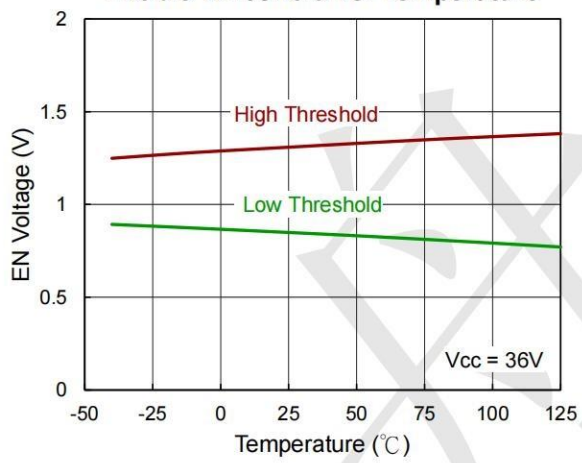
SHDN Leakage Input Current vs. Temp.



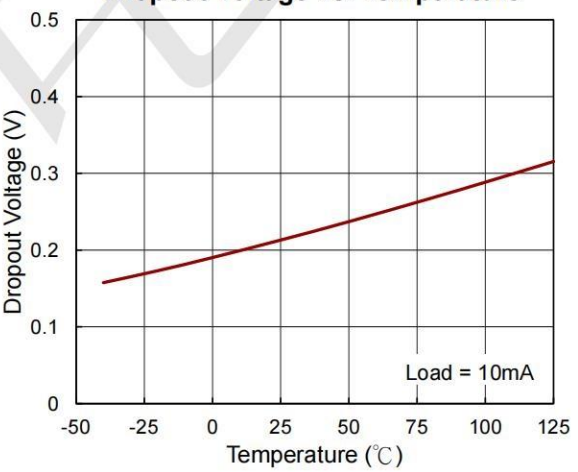
Enable Threshold vs. Supply Voltage



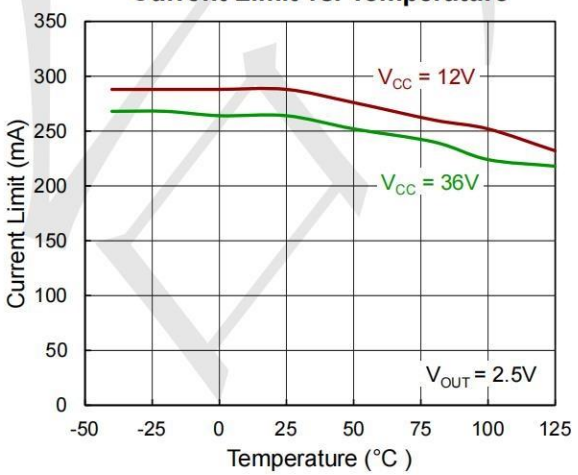
Enable Threshold vs. Temperature



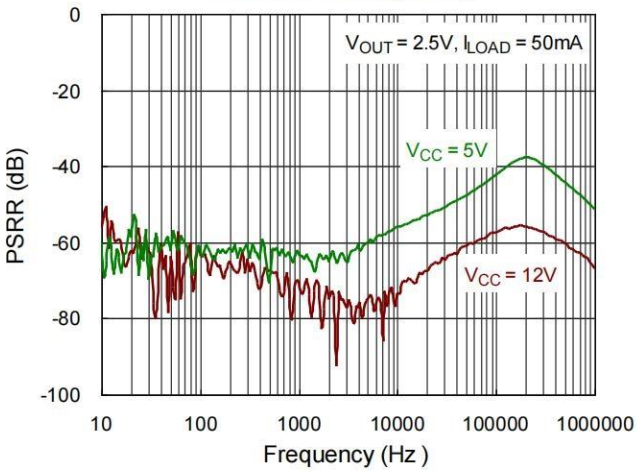
Dropout Voltage vs. Temperature



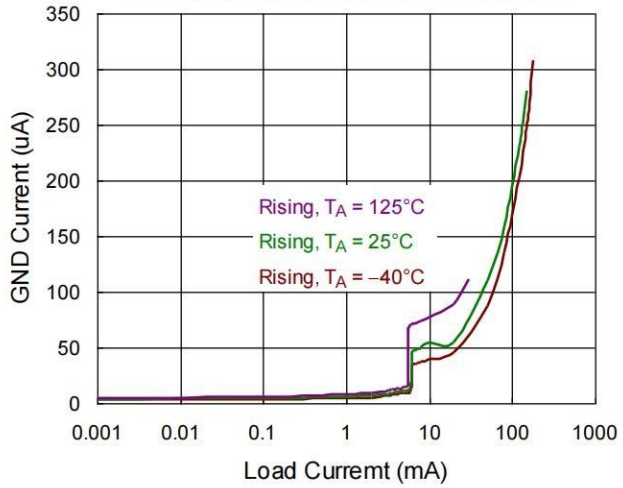
Current Limit vs. Temperature



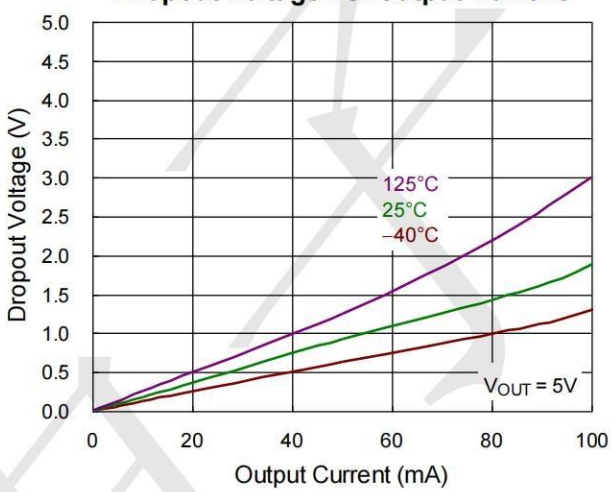
PSRR vs. Frequency



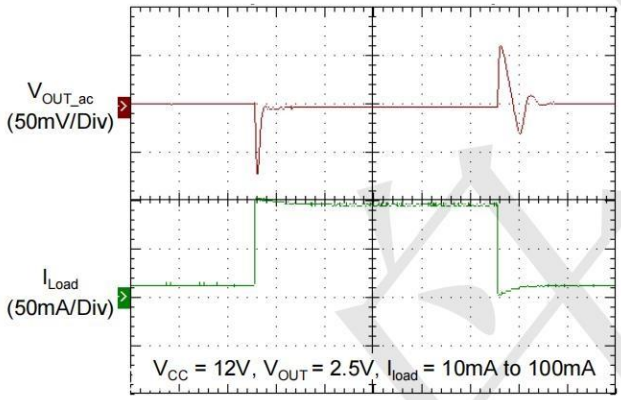
Ground Current vs. Load Current



Dropout Voltage vs. Output Current

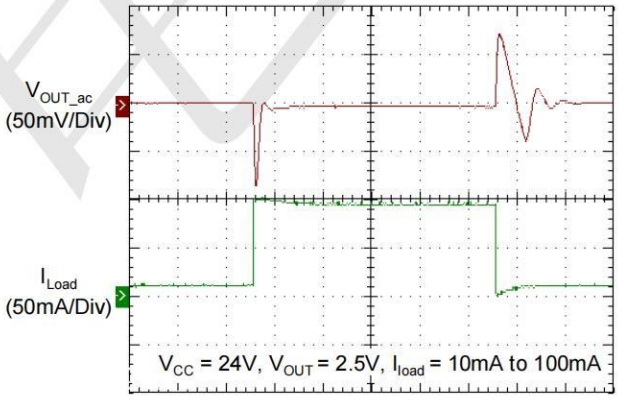


Load Transient Response



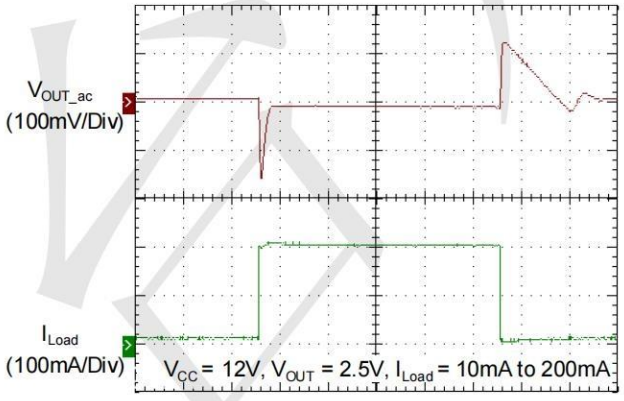
Time (250μs/Div)

Load Transient Response



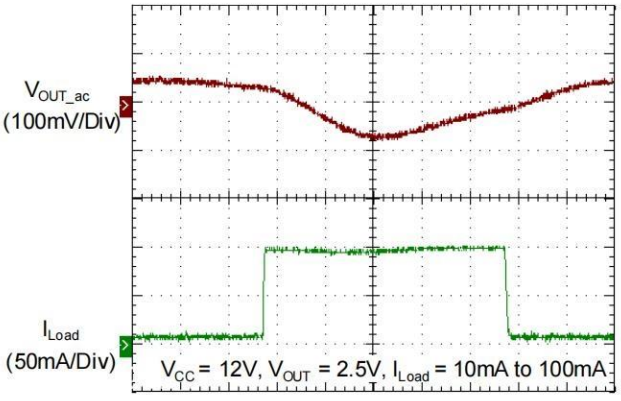
Time (250μs/Div)

Load Transient Response



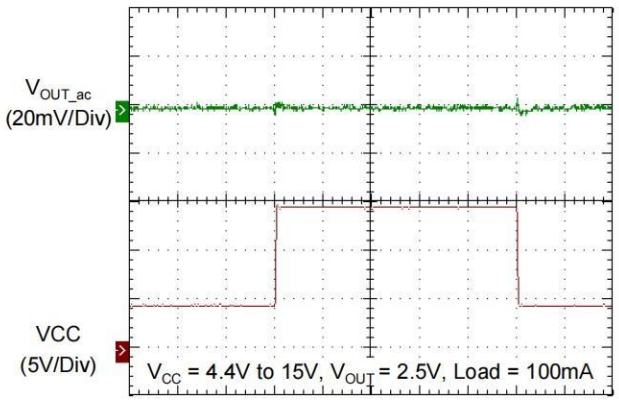
Time (250μs/Div)

Load Transient Response

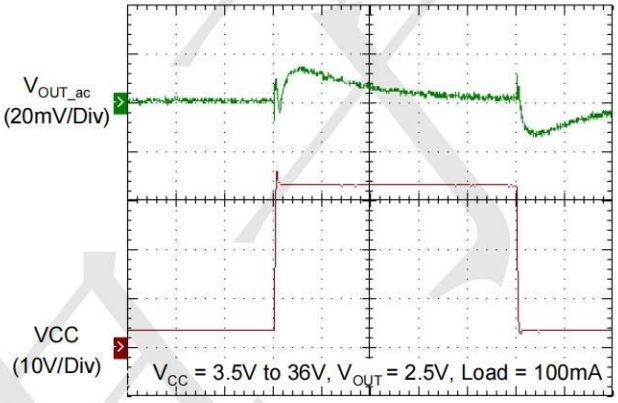


Time (10μs/Div)

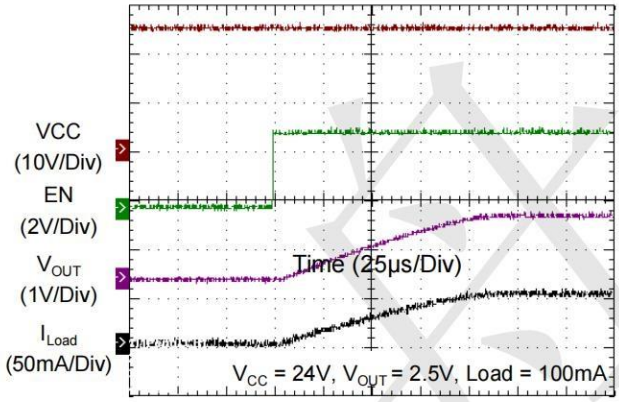
Line Transient Response



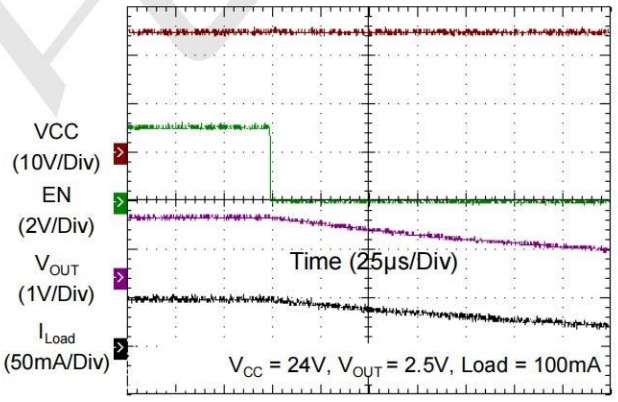
Line Transient Response



Power On from EN

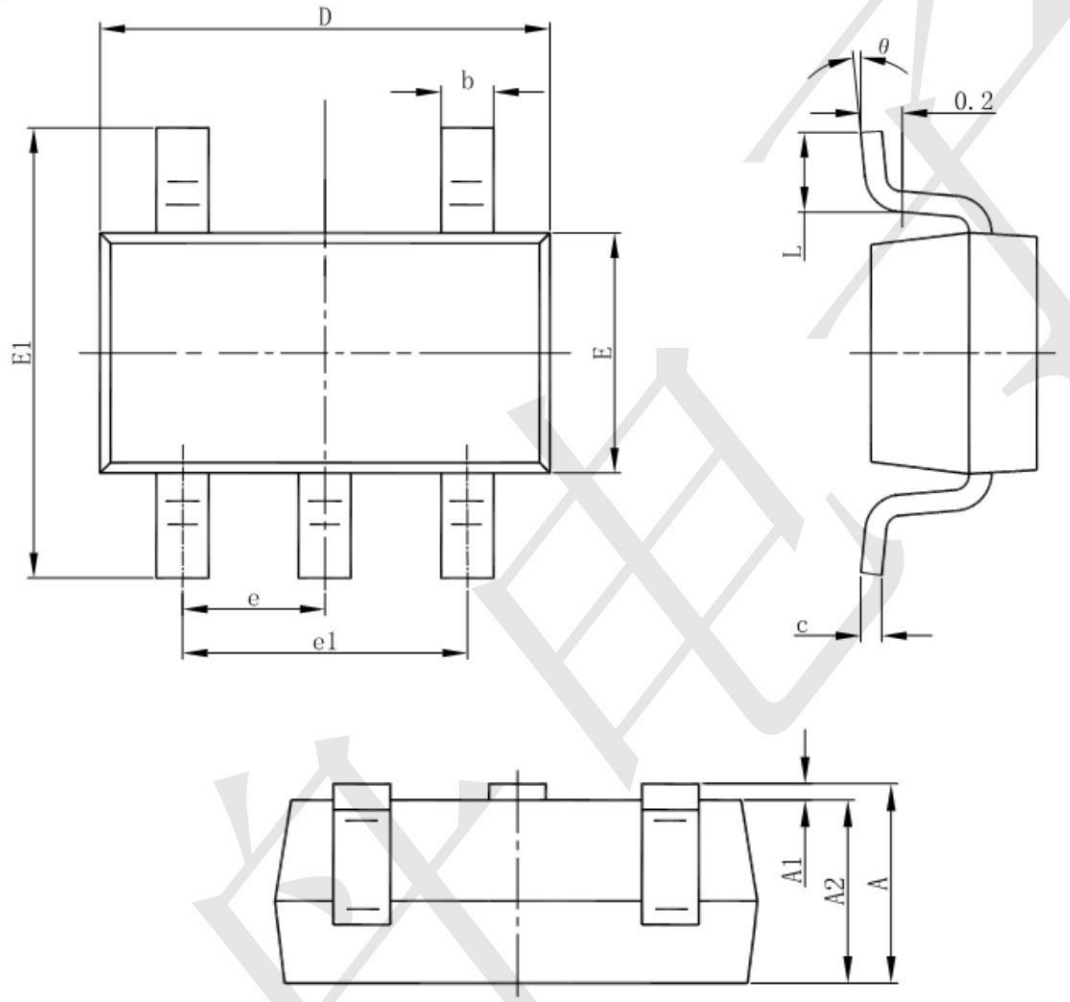


Power Off from EN



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°