WL2811EA

Low noise, High PSRR, High speed, CMOS LDO

Descriptions
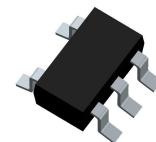
The WL2811EA series is a high accuracy, low noise, high speed, high PSRR, low dropout CMOS Linear regulator with high ripple rejection. The devices offer a new level of cost effective performance in cellular phones, laptop and notebook computers, and other portable devices.

The WL2811EA has the fold-back maximum output current which depends on the output voltage. So the current limit functions both as a short circuit protection and as an output current limiter.
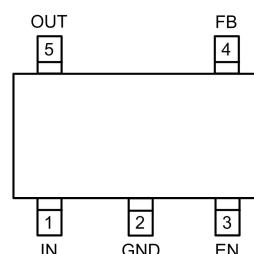
The WL2811EA regulators are available in standard SOT-23-5L Package. Standard products are Pb-free and Halogen-free.

SOT-23-5L

Pin Configuration (Top View)

2811: Device Code

EA : Special Code

Y : Year Code

**W: Week Code**

Marking

Features
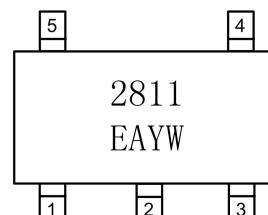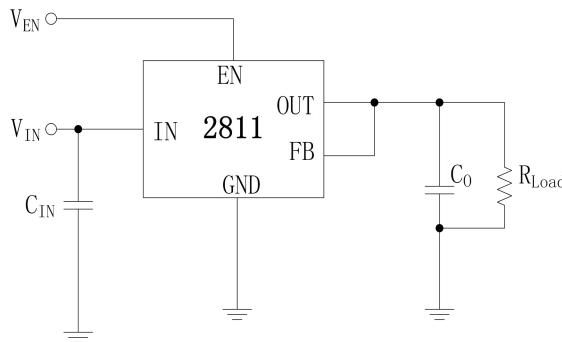
- Input Voltage Range   :2V~5.5V
- Output Voltage Range   : 0.8V~5V
- Output current   : 300mA
- Quiescent current   : 75µA Typ.
- Shut-down current   : < 1µA
- Dropout voltage   : 141mV @ I_{OUT}=0.3A
- PSRR   : 70dB @ 1kHz, V_{OUT}=3V
- Low Output Voltage Noise   : 12µV_{RMS} Typ.
- Output Voltage Tolerance   : ±2%
- Recommend capacitor   : 1µF
- Thermal-Overload and Short-Circuit Protection

Applications
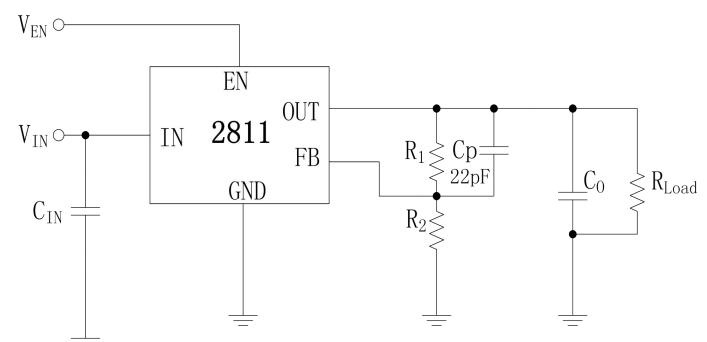
- MP3/MP4 Players
- Cellphones, radiophone, digital cameras
- Bluetooth, wireless handsets
- Others portable electronics device

Order Information

Device	Package	Shipping
WL2811EA-5/TR	**SOT-23-5L**	**3000/Reel&Tape**

Typical Application

For V_{OUT}=0.8V Application

For V_{OUT} >0.8V Application

$$R_1 = R_2 \times \left(\frac{V_{OUT}}{0.8V} - 1 \right)$$
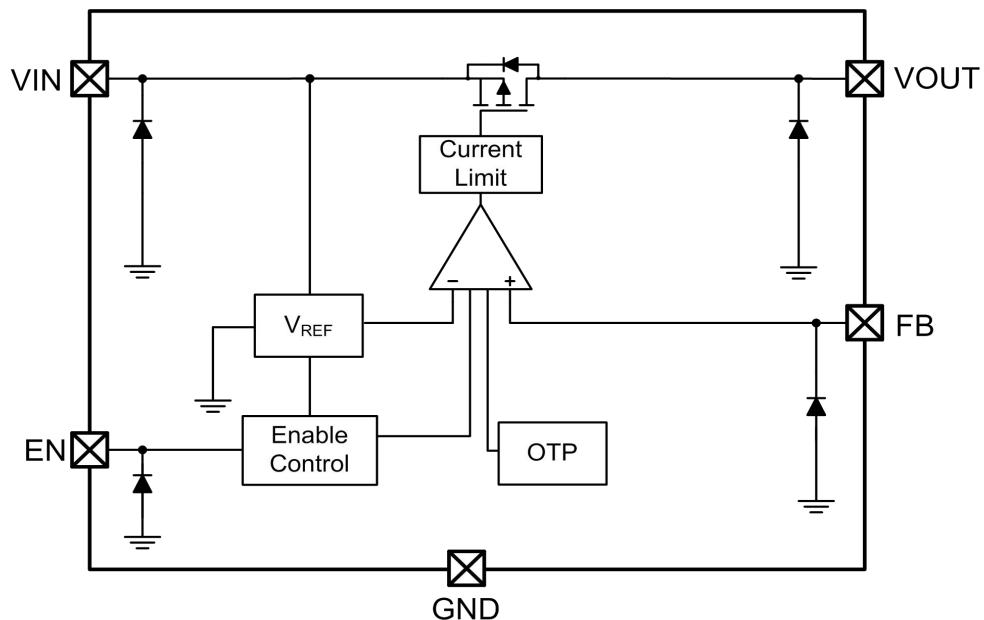
Pin Description

SOT-23-5L

PIN	Symbol	Description
1	IN	Regulator Input .
2	GND	Ground .
3	EN	Enable (Active high).
4	FB	Feedback Pin.This is used to set the output voltage of the device.
5	OUT	Regulator Output .

V_{OUT}(V)	R_1(kΩ)	R_2(kΩ)
1.0	10.5	40.2
1.8	51.1	40.2
2.85	97.6	37.4
3.0	97.6	35.7

Standard 1% Resistor Values for Common Output Voltages of Adjustable Voltage Version

Block Diagram

Absolute Maximum Ratings

Parameter		Value	Unit
V_{IN} Range		-0.3～6.5	V
V_{EN} Range		-0.3～V_{IN}	V
V_{OUT} Range		-0.3～V_{IN}	V
I_{OUT}		300	mA
Lead Temperature Range		260	ºC
Storage Temperature Range		-55 ~ 150	ºC
Operating Junction Temperature Range		150	ºC
MSL		Level-3	
ESD Ratings	HBM	8000	V
	MM	400	V

Recommend Operating Ratings

Parameter	Value	Unit
Operating Supply voltage	2～5.5	V
Operating Junction Temperature Range,Tj	-40～125	ºC
Operating Temperature Range	-40～85	ºC
Thermal Resistance, $R_{\theta JA}$ (SOT-23-5L), Note1	125	ºC/W
Thermal Resistance, $R_{\theta JC}$ (SOT-23-5L)	73	ºC/W

Note1. Surface mounted on FR-4 Board using 2 oz, 1 square inch Cu area, PCB board size 1.5*1.5 square inches.

Electronics Characteristics
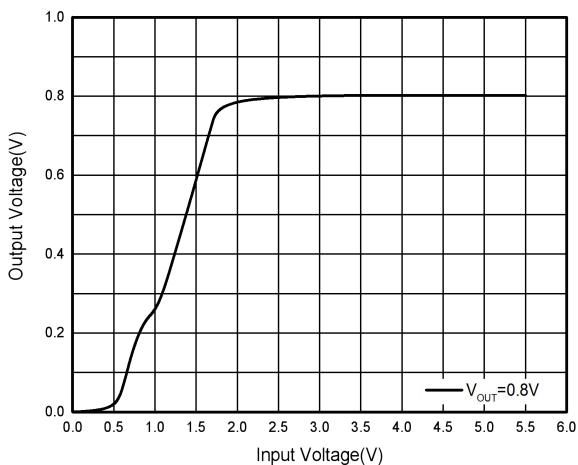
(Ta=25ºC, $V_{IN}=V_{OUT}+1V$, $C_{IN}=C_{OUT}=1\mu F$, CP=22pF, $I_{OUT}=1mA$, unless otherwise noted)

Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
Feedback Voltage	Vfb	Iout=1mA		0.8*0.98	0.8	0.8*1.02	V
Input Voltage	V_{IN}			2		5.5	V
Current Limit	I_{LIM}	$V_{EN}=V_{IN}$		300			mA
Dropout Voltage (I_{OUT} = 300mA) (note)	V_{DROP}	$1.8V \leqq V_{OUT} < 2.1V$			0.2	0.3	V
		$2.1V \leqq V_{OUT} < 2.5V$			0.17	0.26	
		$2.5V \leqq V_{OUT} < 2.8V$			0.15	0.23	
		$2.8V \leqq V_{OUT}$			0.14	0.21	
Line Regulation	$\triangle V_{LINE}$	$V_{IN}=V_{OUT}+1V\sim5.5V$			1	5.1	mV
Load Regulation	$\triangle V_{Load}$	$I_{OUT}=1\sim300mA$			1	5.1	mV
Quiescent Current	I_Q	$I_{out}=0$			75	100	µA
Short Current	I_{SHORT}	$V_{EN}=V_{IN}$, V_{OUT} Short to GND with 1 Ω			157	280	mA
Shut-down Current	I_{SHDN}	$V_{EN}=0V$			0.12	<1	µA
Power Supply Rejection Rate	PSRR	$V_{IN}=(V_{OUT}+1V)_{DC}+0.5V_{P-P}$,$I_{OUT}=10mA$, $V_{OSET}=3V$,Cp=22pF, R2=100K Ω	f=100Hz		70		dB
			f=1kHz		70		dB
			f=10kHz		58		dB
			f=100kHz		45		dB
EN logic high voltage	V_{ENH}	$V_{IN}=5.5V$		1			V
EN logic low voltage	V_{ENL}	$V_{IN}=5.5V$				0.4	V
EN Input Current	I_{EN}	$V_{EN}=5.5V$			0.14		µA
Output Noise Voltage	e_{NO}	10Hz to 100KHz, $C_{OUT}=1\mu F$, Iout=10mA, Vout=0.8V			12		μV_{RMS}
Thermal shutdown threshold	T_{SD}				166		℃
Thermal shutdown hysteresis	$\triangle T_{SD}$				35		℃
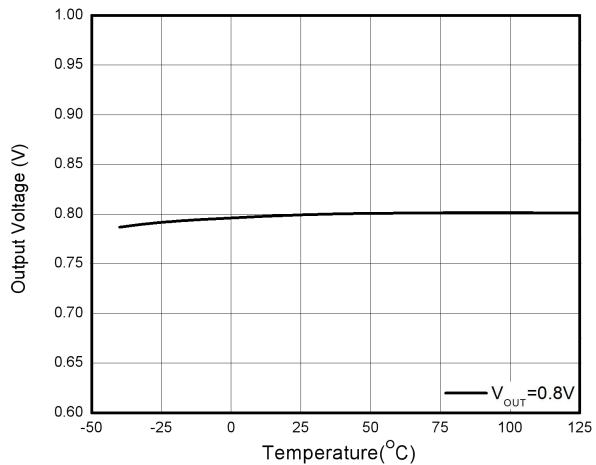
note: When V_{OUT} < 1.8V, V_{DD} should be greater than 2V.

Typical characteristics (Ta=25ºC,V_{IN}=V_{OUT}+1V,I_{OUT}=1mA,C_{IN}=C_{OUT}=1 μF,CP=22pF,unless otherwise noted)

V_{OUT}=0.8V
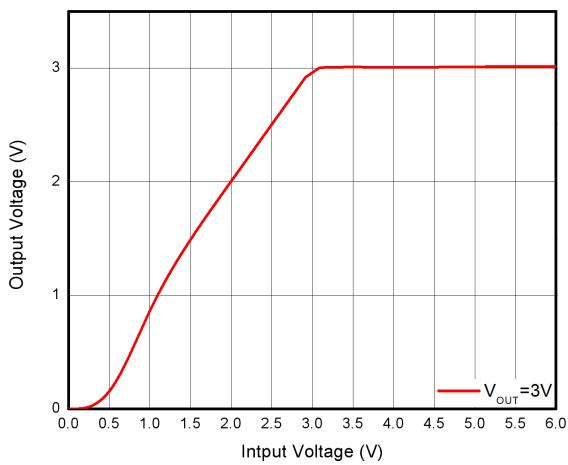
**Output Voltage VS Input Voltage**
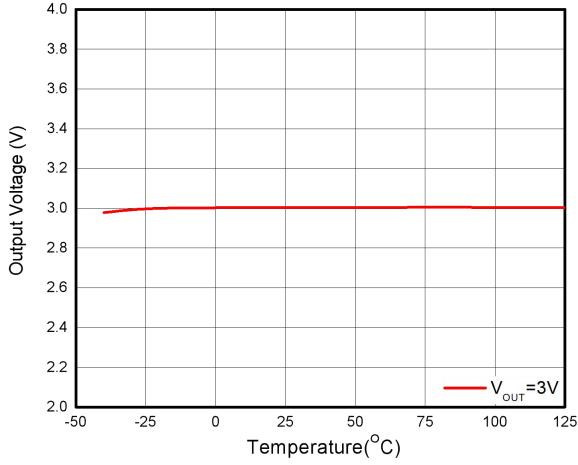
Output Voltage VS Temperature

V_{OUT}=3V
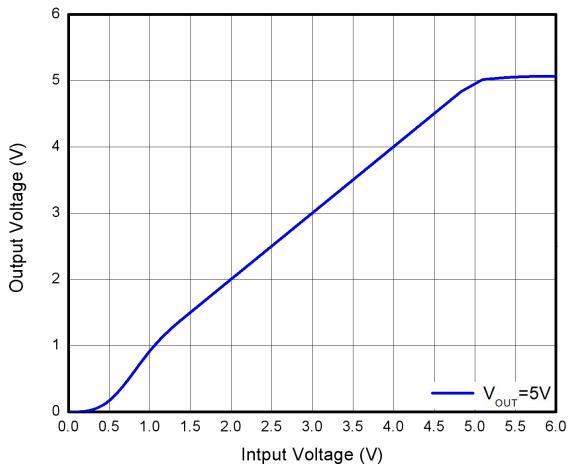
Output Voltage VS Input Voltage
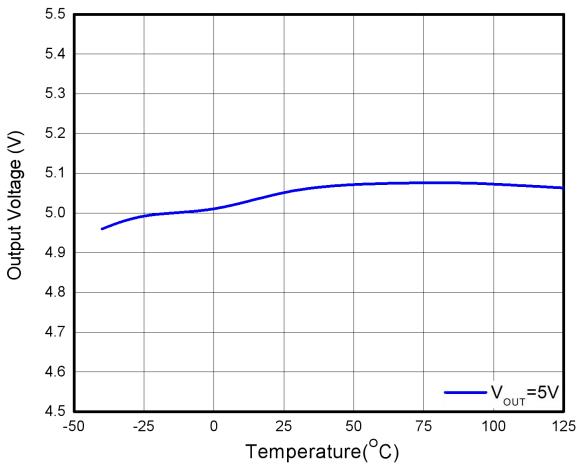
Output Voltage VS Temperature

V_{OUT}=5V

Output Voltage VS Input Voltage

Output Voltage VS Temperature

Quiescent Current VS Input Voltage

Quiescent Current VS Temperature

Dropout Voltage VS Output Current

Dropout Voltage VS Temperature

Output Voltage VS Output Current

Output Voltage VS Output Current

Output Voltage VS Output Current

PSRR VS Frequency

PSRR VS Frequency

PSRR VS Frequency

PSRR VS Frequency

PSRR VS Frequency
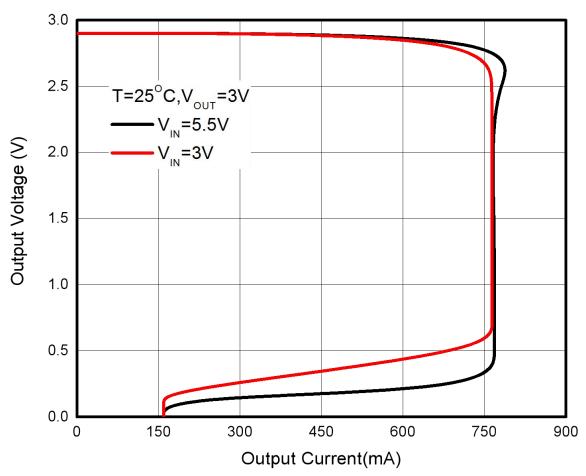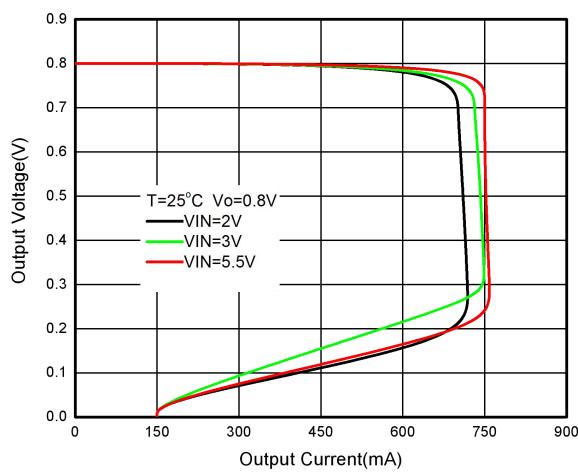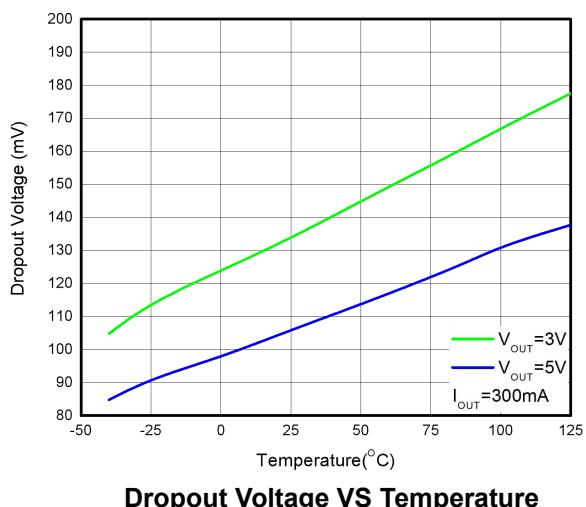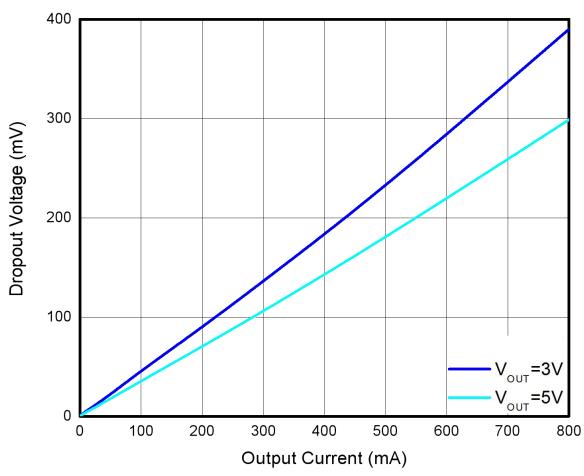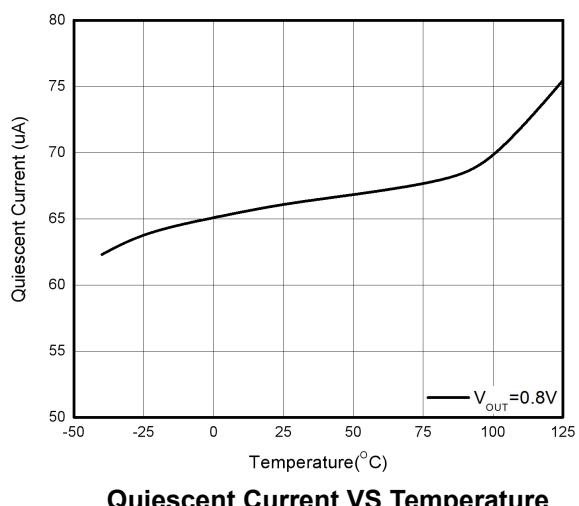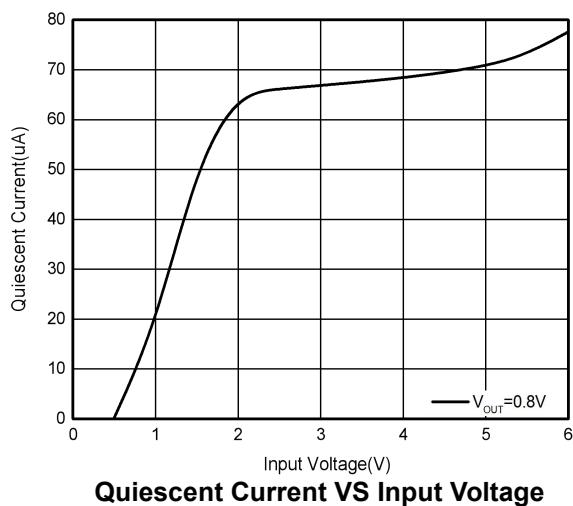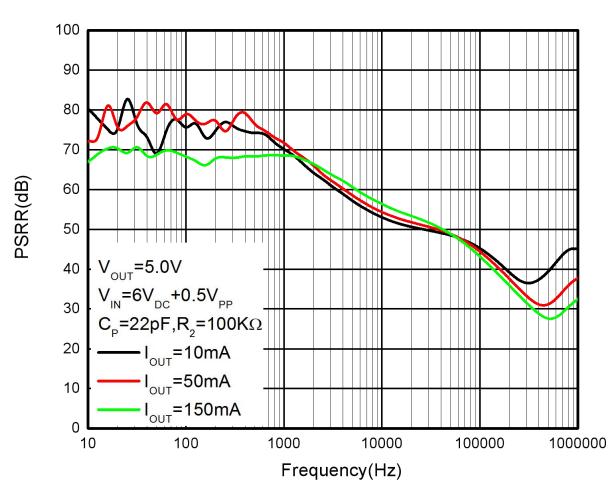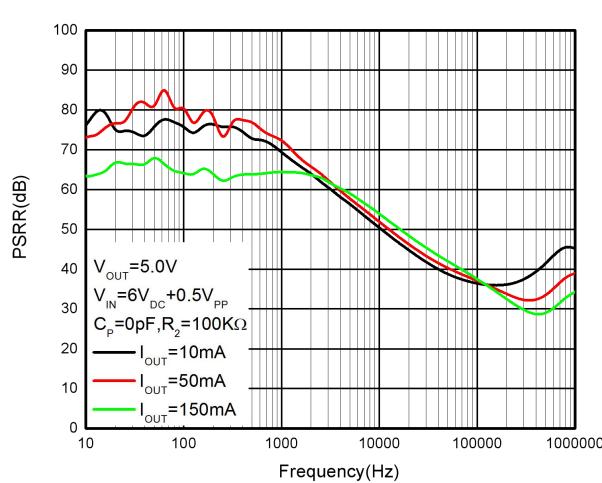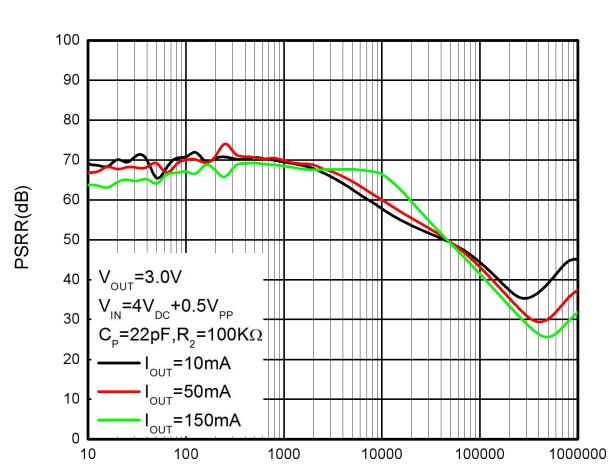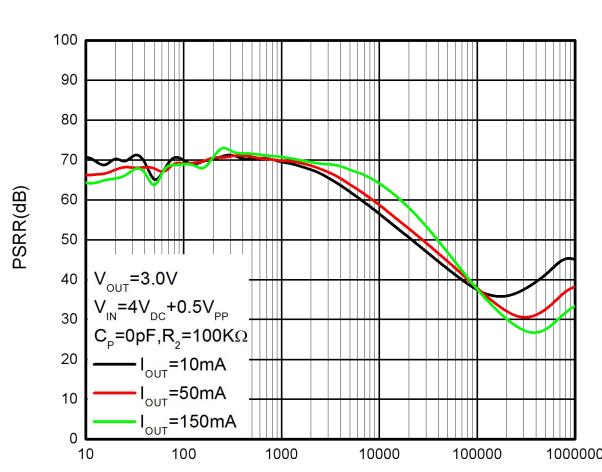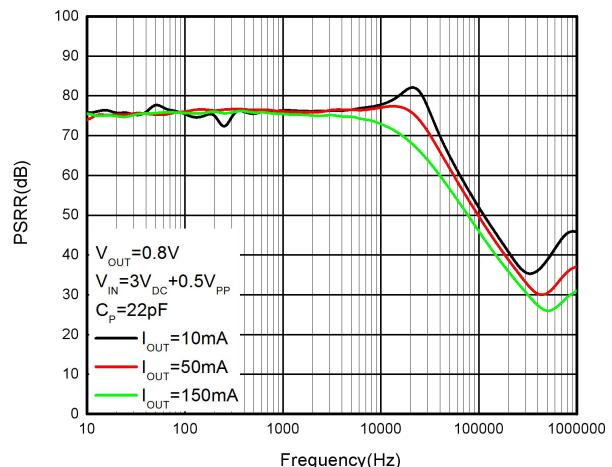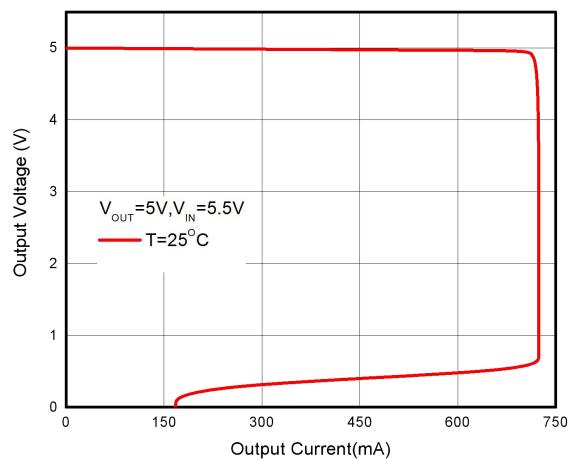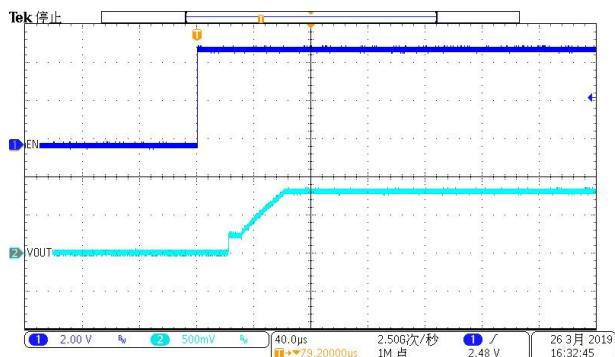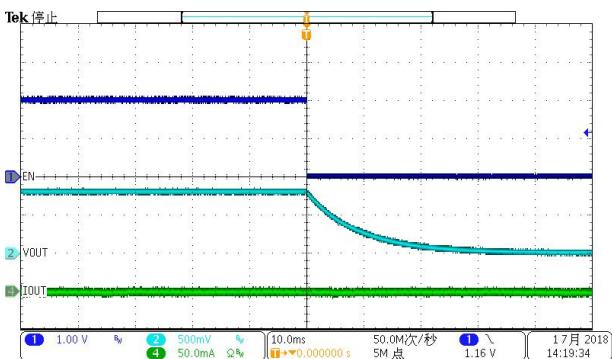
1. Start up & Shutdown(I_{OUT}=1mA)
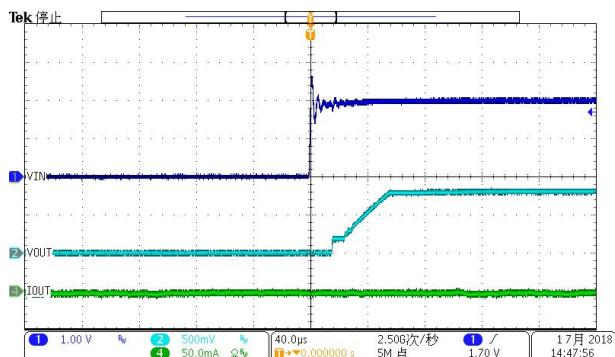
V_{OUT}=0.8V,EN ON
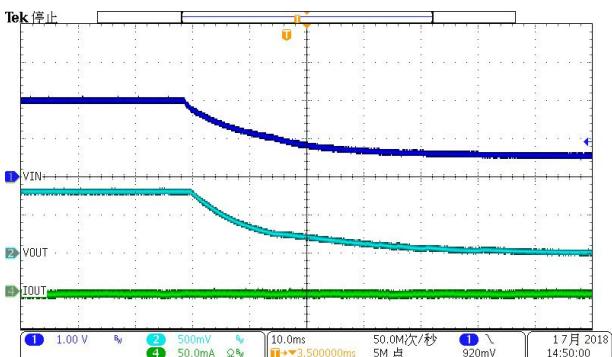
V_{OUT}=0.8V,EN OFF
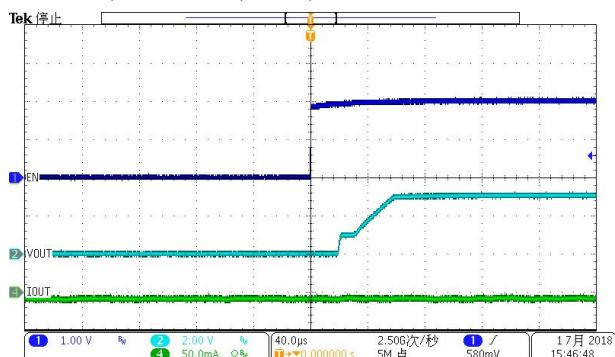
V_{OUT}=0.8V,Power ON
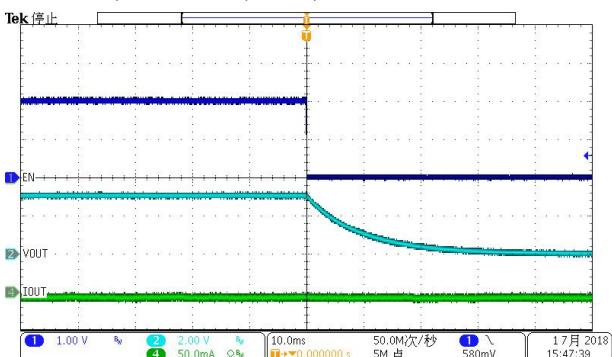
V_{OUT}=0.8V,Power OFF
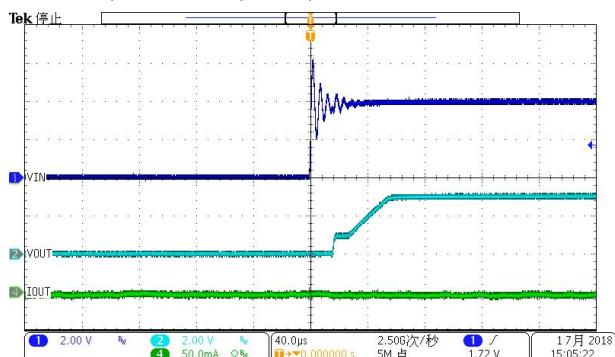
V_{OUT}=3V,R_2=100kΩ,C_P=0,EN ON
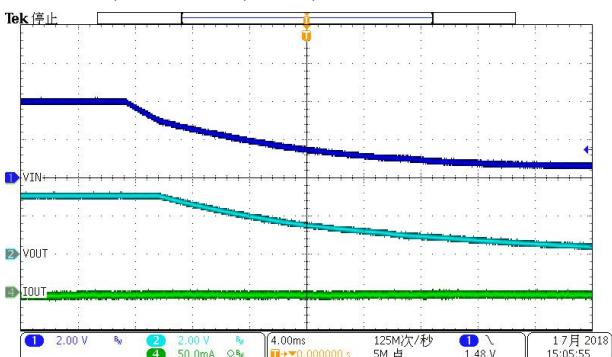
V_{OUT}=3V,R_2=100kΩ,C_P=0,EN OFF
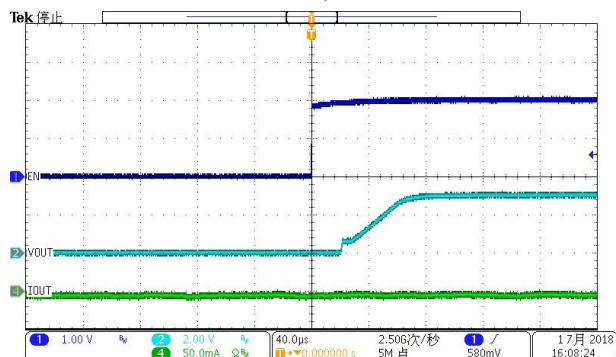
V_{OUT}=3V,R_2=100kΩ,C_P=0,Power ON
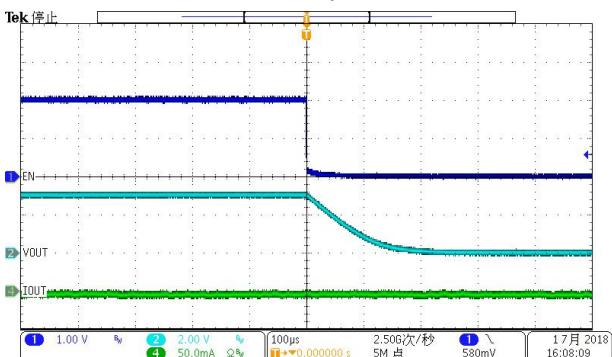
V_{OUT}=3V,R_2=100kΩ,C_P=0,Power OFF
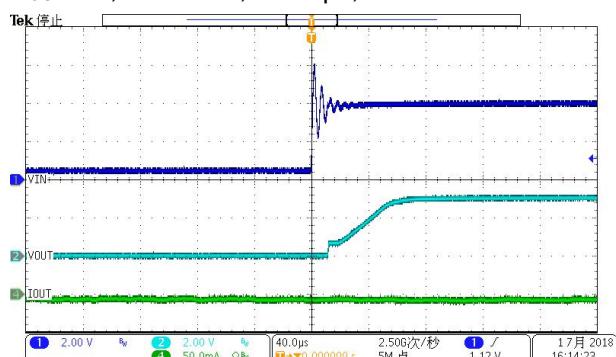
V_{OUT}=3V,R_2=100kΩ,C_P=22pF,EN ON
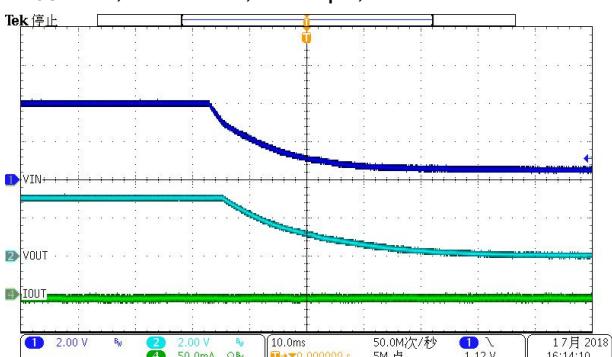
V_{OUT}=3V,R_2=100kΩ,C_P=22pF,EN OFF
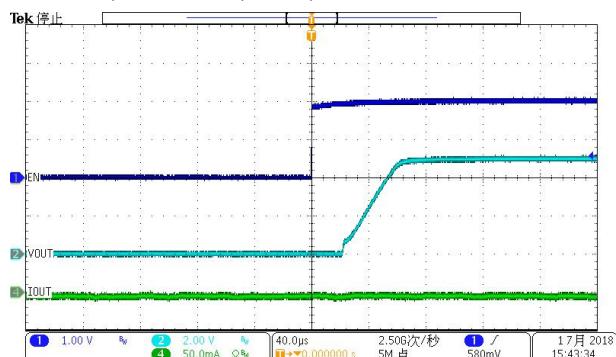
V_{OUT}=3V,R_2=100kΩ,C_P=22pF,Power ON
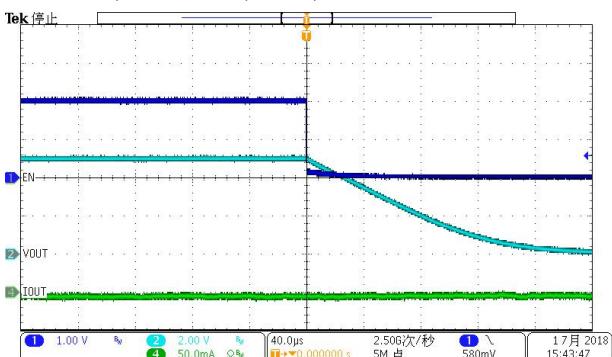
V_{OUT}=3V,R_2=100kΩ,C_P=22pF,Power OFF
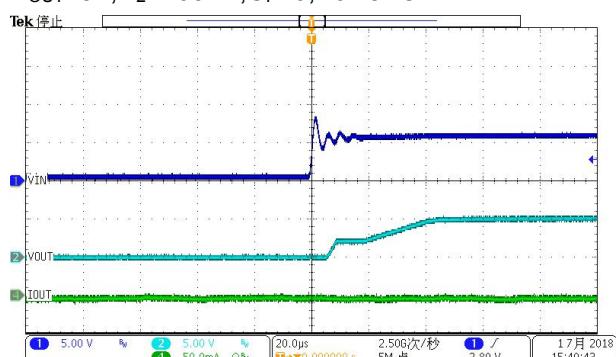
V_{OUT}=5V,R_2=100kΩ,C_P=0,EN ON
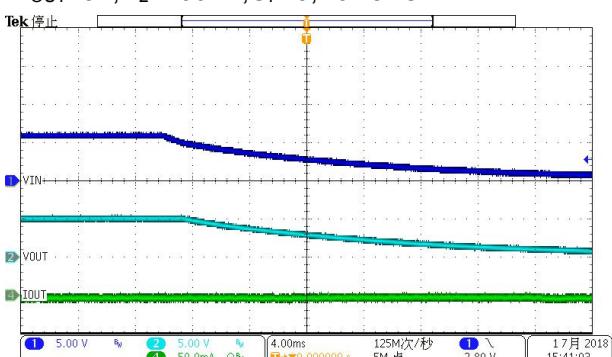
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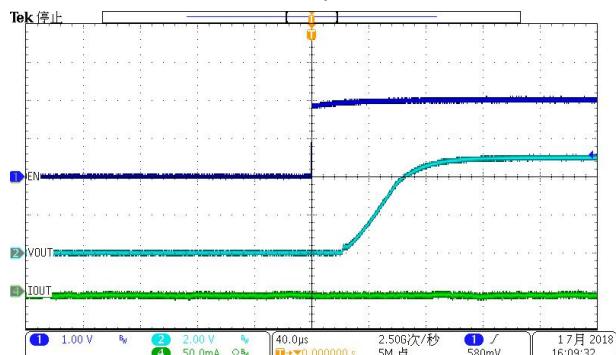
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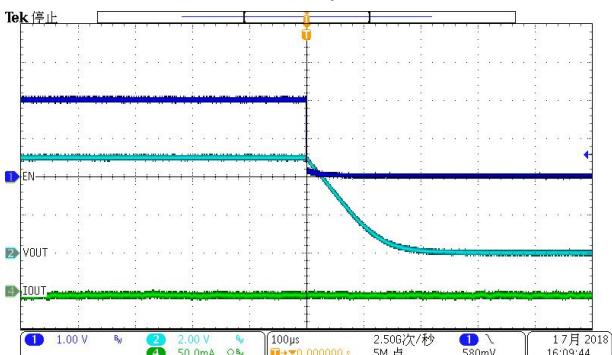
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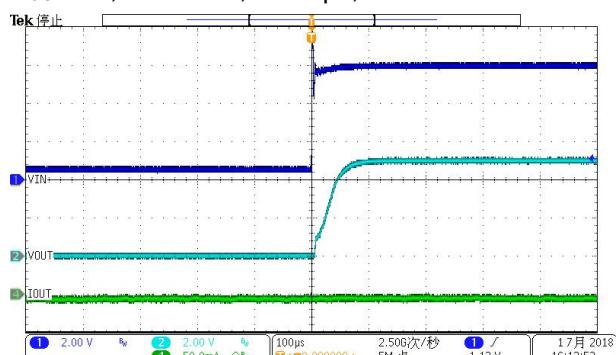
V_{OUT}=5V,R_2=100kΩ,C_P=22pF,EN ON
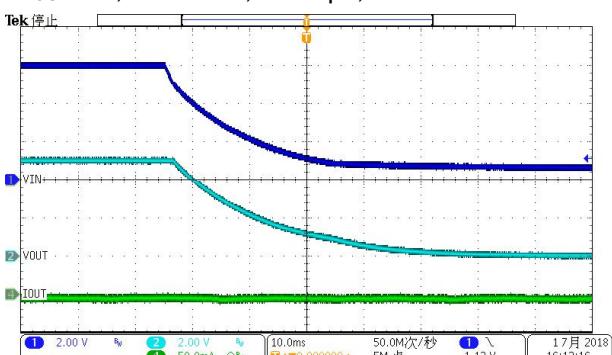
V_{OUT}=5V,R_2=100kΩ,C_P=22pF,EN OFF

V_{OUT}=5V,R_2=100kΩ,C_P=22pF,Power ON
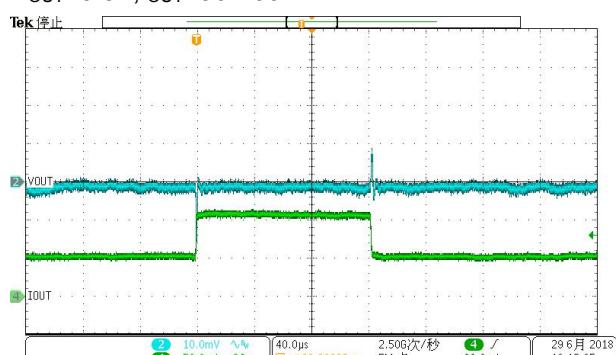
V_{OUT}=5V,R_2=100kΩ,C_P=22pF,Power OFF
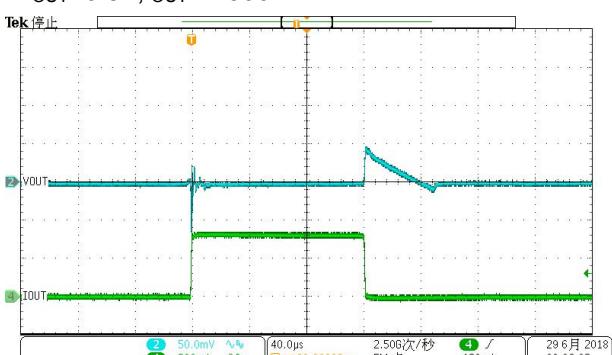
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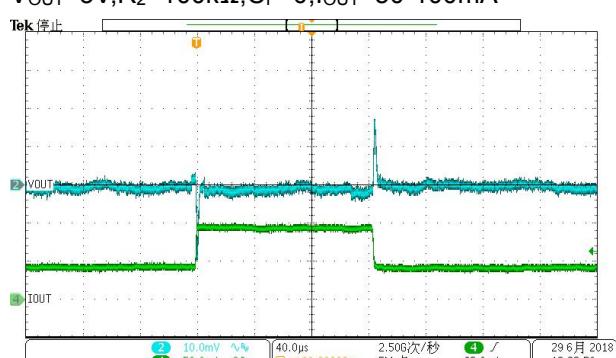
V_{OUT}=0.8V,I_{OUT}=50-100mA
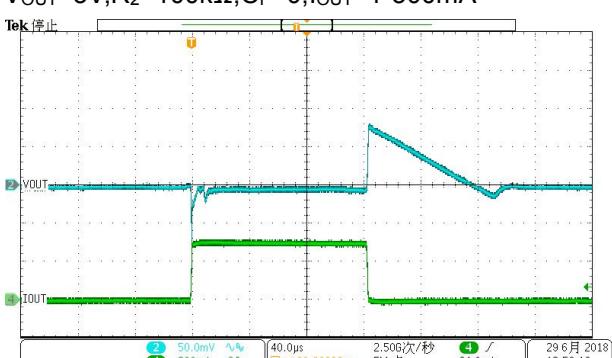
V_{OUT}=0.8V,I_{OUT}=1-300mA
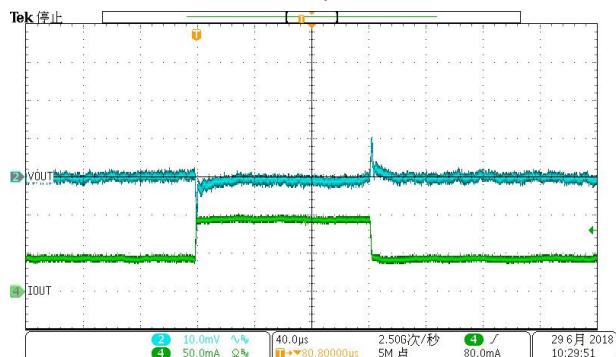
V_{OUT}=3V,R_2=100kΩ,C_P=0,I_{OUT}=50-100mA
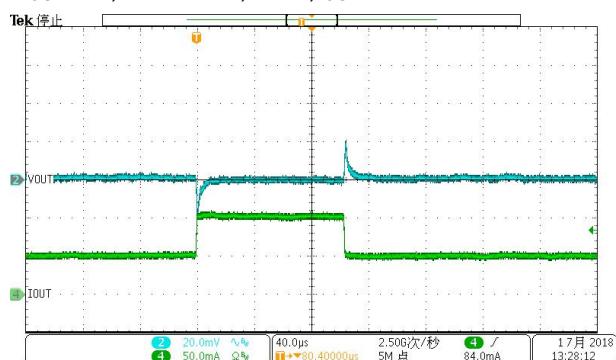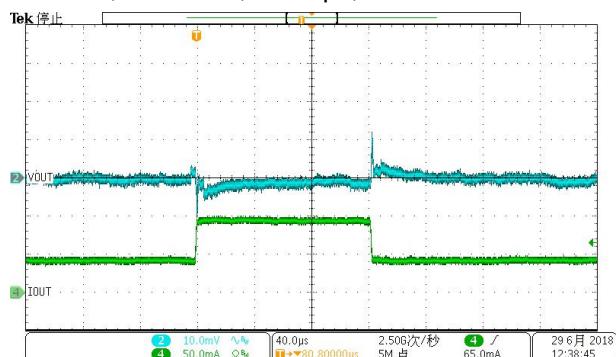
V_{OUT}=3V,R_2=100kΩ,C_P=0,I_{OUT}=1-300mA

V_{OUT}=3V,R_2=100kΩ,C_P=22pF,I_{OUT}=50-100mA

V_{OUT}=3V,R_2=100kΩ,C_P=22pF,I_{OUT}=1-300mA

V_{OUT}=5V,R_2=100kΩ,C_P=0,I_{OUT}=50-100mA

V_{OUT}=5V,R_2=100kΩ,C_P=0,I_{OUT}=1-300mA

V_{OUT}=5V,R_2=100kΩ,C_P=22pF,I_{OUT}=50-100mA
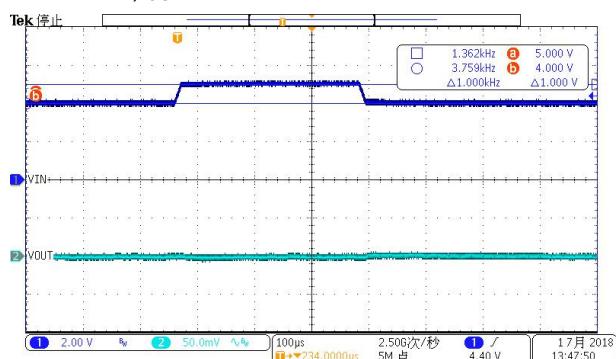
V_{OUT}=5V,R_2=100kΩ,C_P=22pF,I_{OUT}=1-300mA
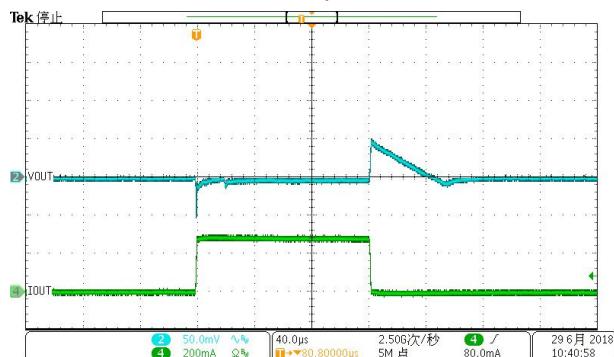
3. Line Transient
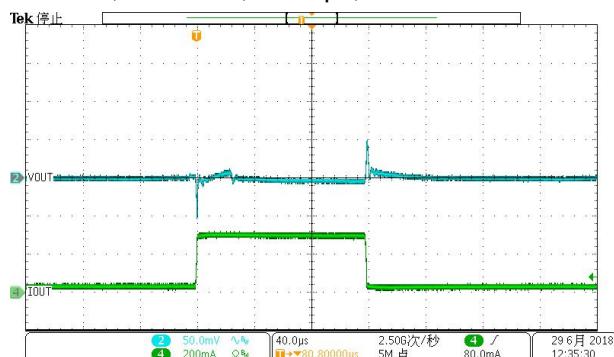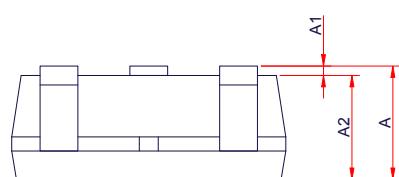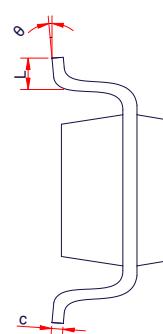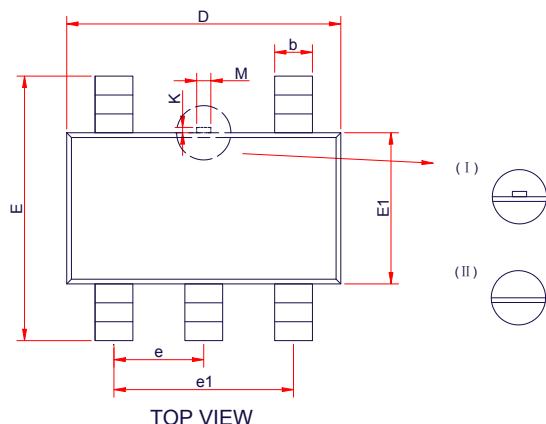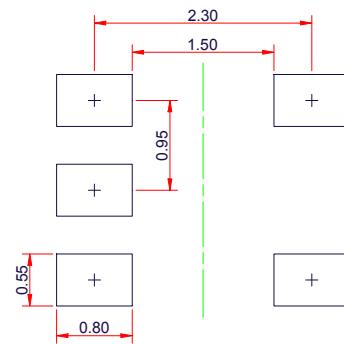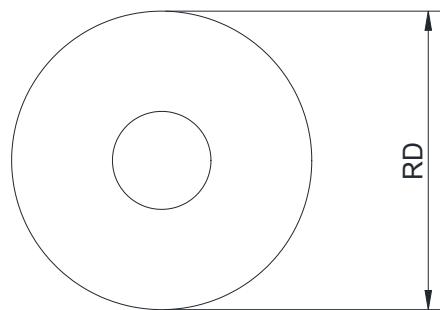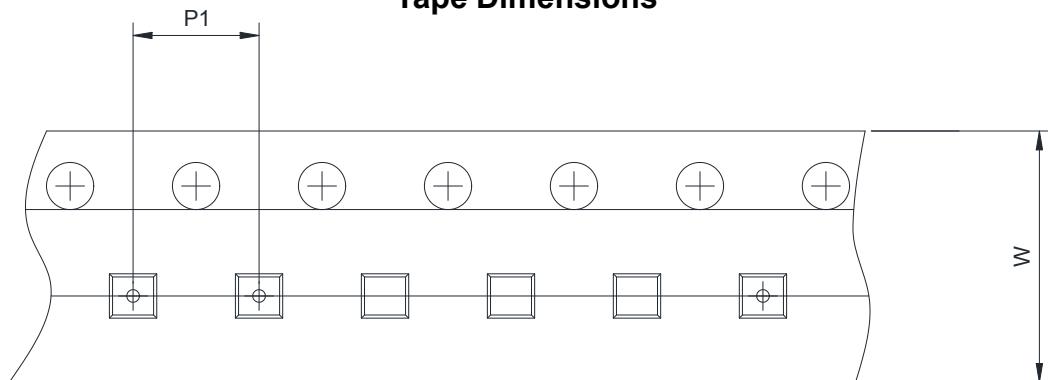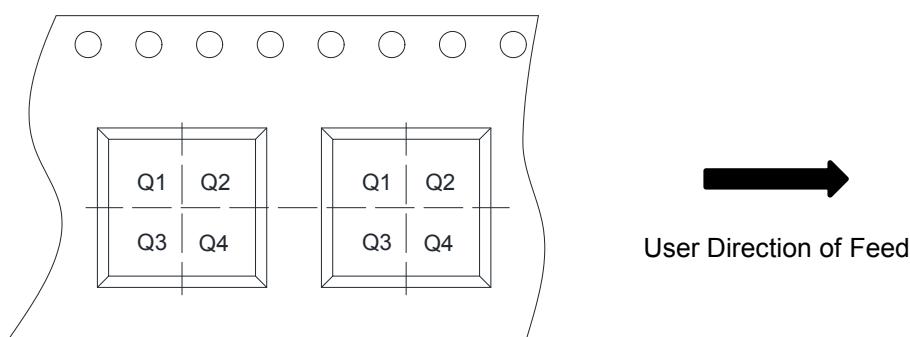
V_{IN}=4V-5V,I_{OUT}=1mA

PACKAGE OUTLINE DIMENSIONS

SOT-23-5L

TOP VIEW

SIDE VIEW

SIDE VIEW

RECOMMENDED LAND PATTERN (unit: mm)

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	-	-	1.45
A1	0.00	-	0.15
A2	0.90	1.10	1.30
b	0.30	0.40	0.50
c	0.10	-	0.21
D	2.72	2.92	3.12
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	0.45	0.60
M	0.10	0.15	0.25
K	0.00	-	0.25
θ	0°	-	8°

TAPE AND REEL INFORMATION

Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape

User Direction of Feed

RD	Reel Dimension	☑ 7inch	☐ 13inch		
W	Overall width of the carrier tape	☑ 8mm	☐ 12mm	☐ 16mm	
P1	Pitch between successive cavity centers	☐ 2mm	☑ 4mm	☐ 8mm	
Pin1	Pin1 Quadrant	☐ Q1	☐ Q2	☑ Q3	☐ Q4