WL2811EA

Low noise, High PSRR, High speed, CMOS LDO

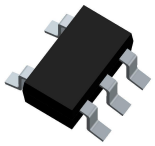
Http://www.sh-willsemi.com

Descriptions

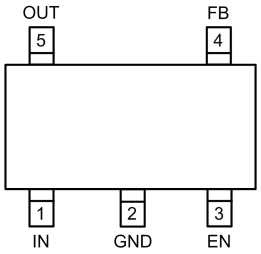
The WL2811EA series is a high accuracy, low noise, high speed, high PSRR, low dropout CMOS Linear regulator with high ripple rejection. The devices offer a new level of cost effective performance in cellular phones, laptop and notebook computers, and other portable devices.

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.

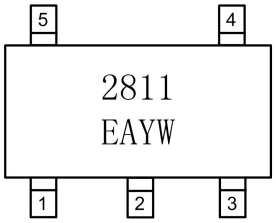
The WL2811EA regulators are available in standard SOT-23-5L Package. Standard products are Pb-free and Halogen-free.



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

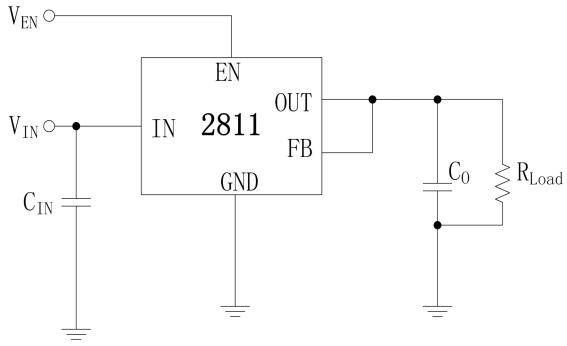
Applications

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

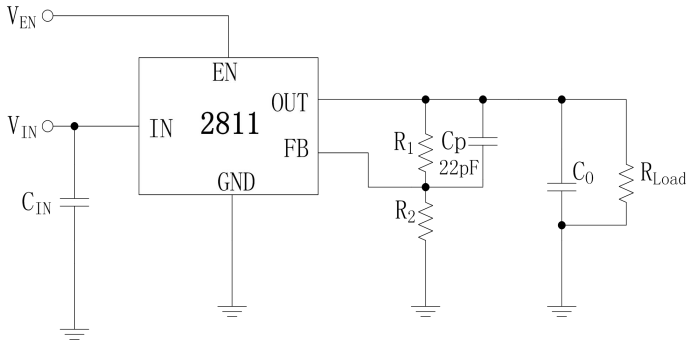
Order Information

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

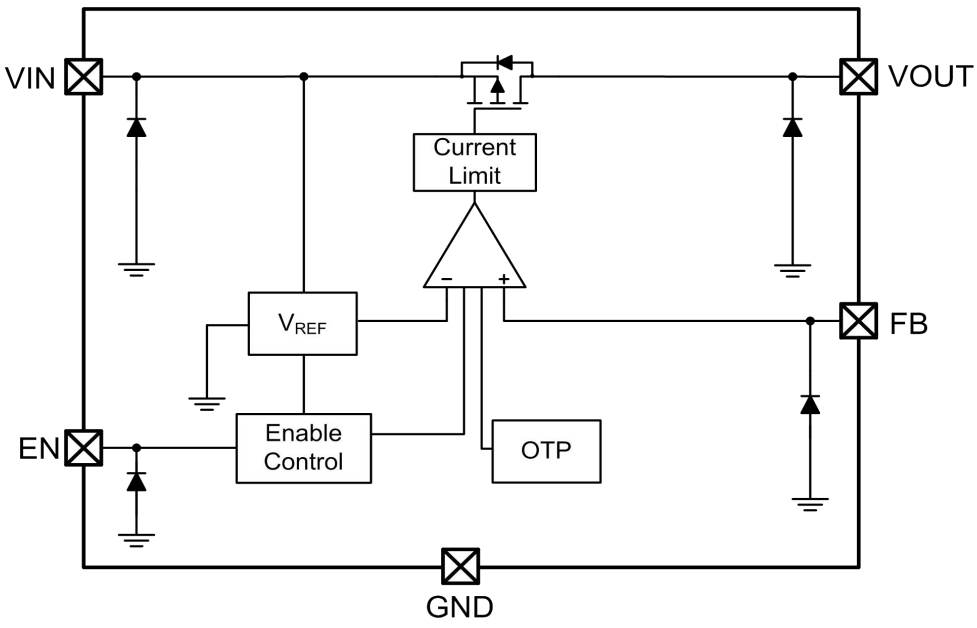
SOT-23-5L

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	°C
Storage Temperature Range		-55 ~ 150	°C
Operating Junction Temperature Range		150	°C
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	°C
Operating Temperature Range	-40～85	°C
Thermal Resistance, $R_{\theta JA}$ (SOT-23-5L), Note1	125	°C/W
Thermal Resistance, $R_{\theta JC}$ (SOT-23-5L)	73	°C/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

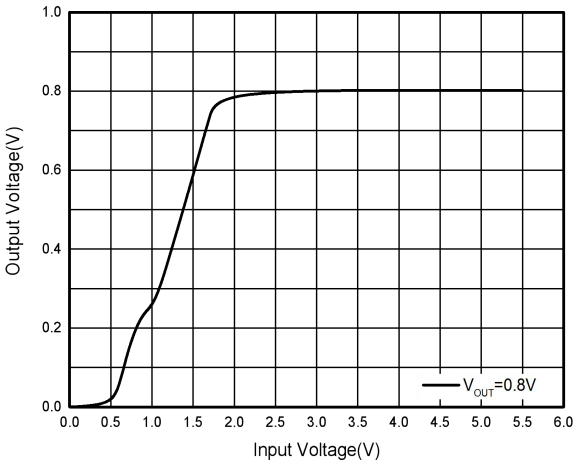
(Ta=25°C, V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1μF, CP=22pF, I_{OUT}=1mA, unless otherwise noted)

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≦V_{OUT} < 2.1V			0.2	0.3	V
		2.1V≦V_{OUT} < 2.5V			0.17	0.26	
		2.5V≦V_{OUT} < 2.8V			0.15	0.23	
		2.8V≦V_{OUT}			0.14	0.21	
Line Regulation	△V_{LINE}	V_{IN}=V_{OUT}+1V~5.5V			1	5.1	mV
Load Regulation	△V_{Load}	I_{OUT}=1~300mA			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 1Ω			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=100KΩ	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}=1μF, Iout=10mA, Vout=0.8V			12		μV_{RMS}
Thermal shutdown threshold	T_{SD}				166		℃
Thermal shutdown hysteresis	△ T_{SD}				35		℃

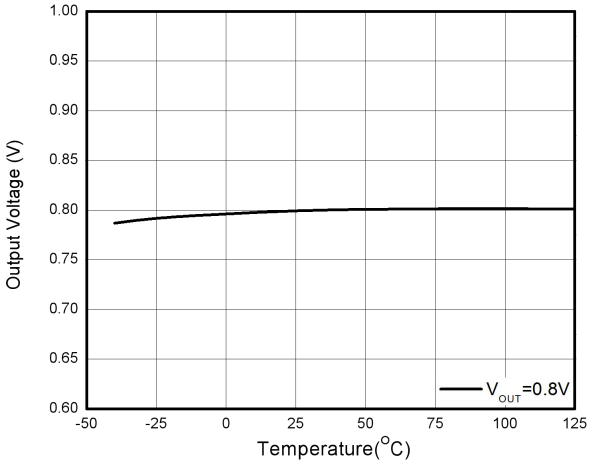
note: When V_{OUT} < 1.8V, V_{DD} should be greater than 2V.

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

V_{OUT}=0.8V

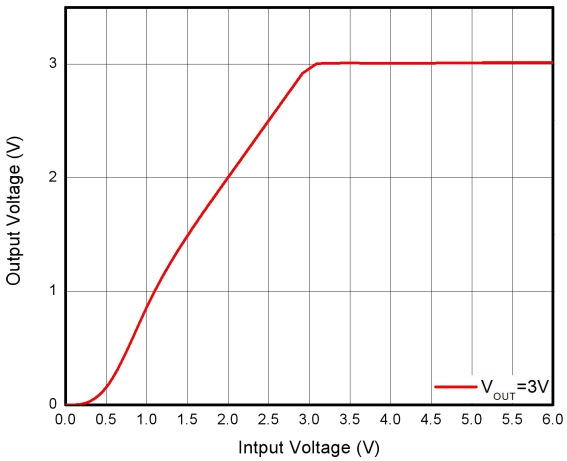


Output Voltage VS Input Voltage

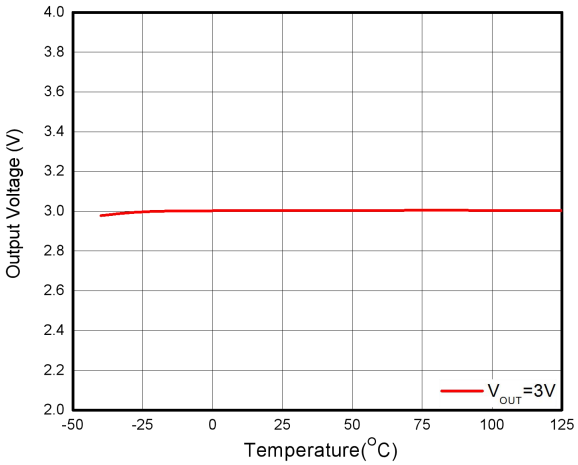


Output Voltage VS Temperature

V_{OUT}=3V

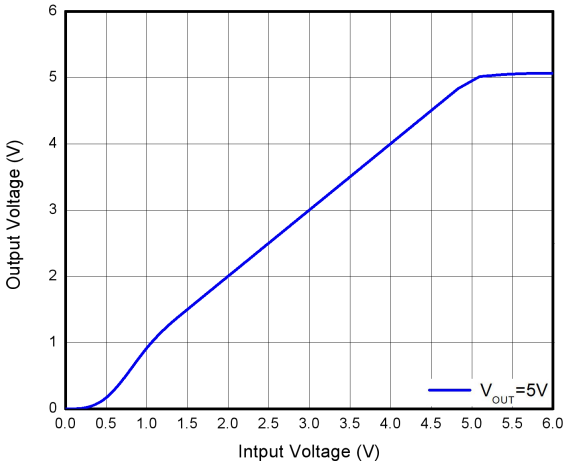


Output Voltage VS Input Voltage

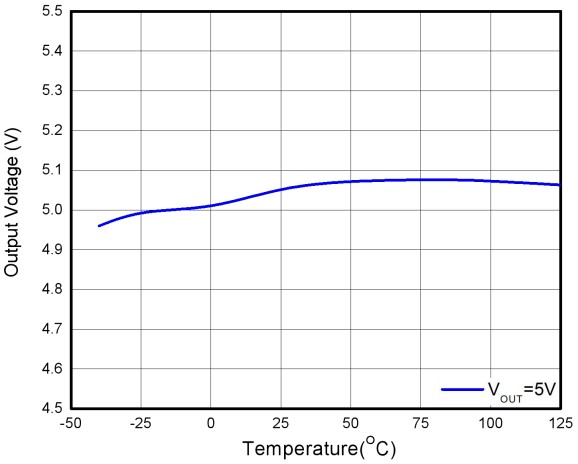


Output Voltage VS Temperature

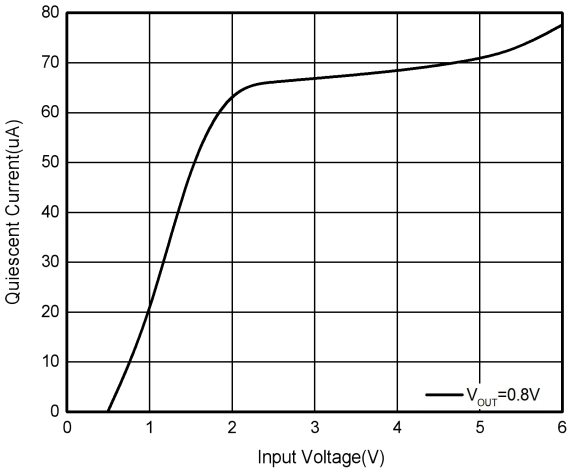
V_{OUT}=5V



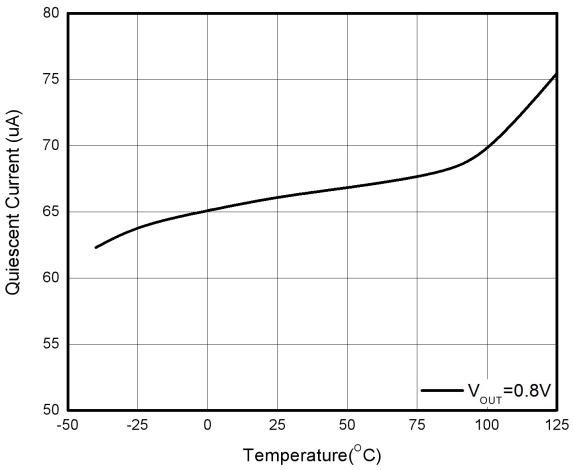
Output Voltage VS Input Voltage



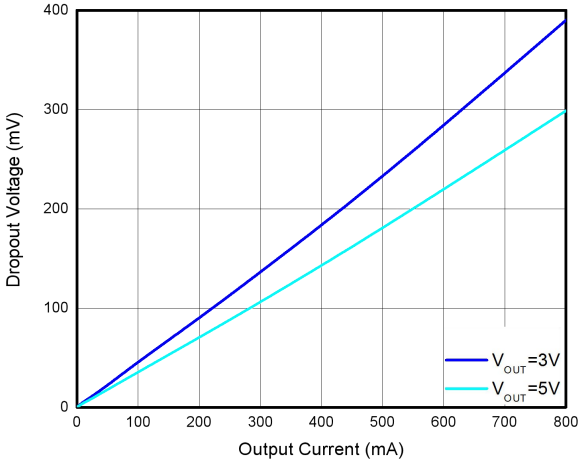
Output Voltage VS Temperature



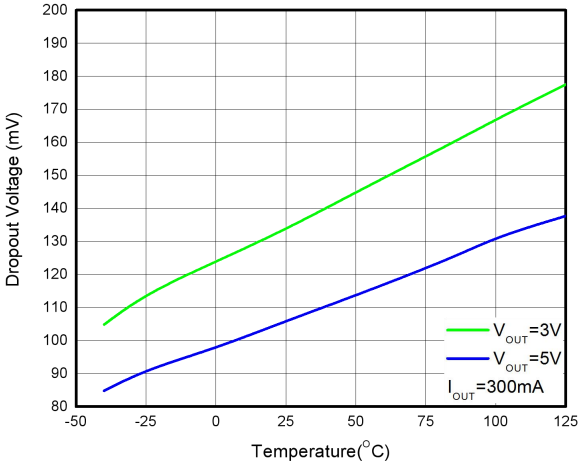
Quiescent Current VS Input Voltage



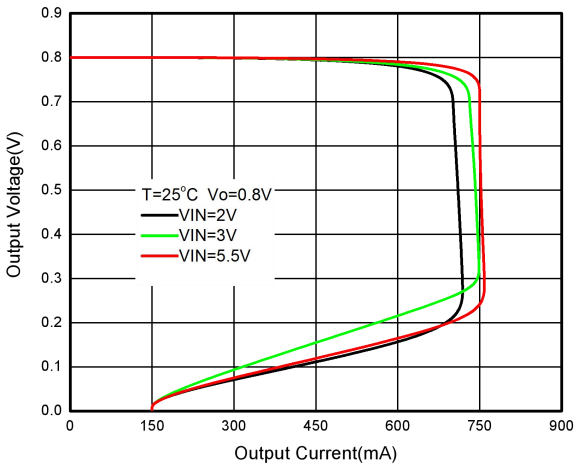
Quiescent Current VS Temperature



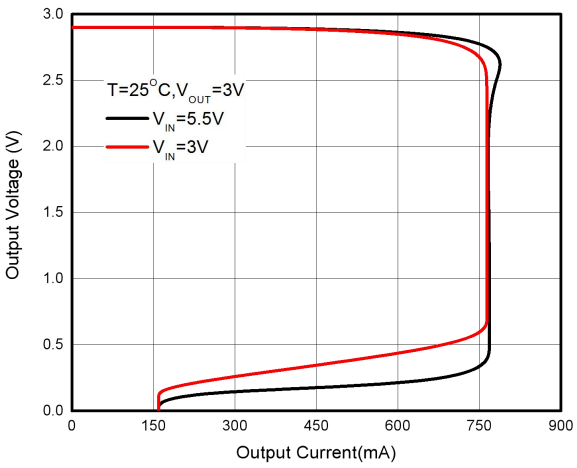
Dropout Voltage VS Output Current



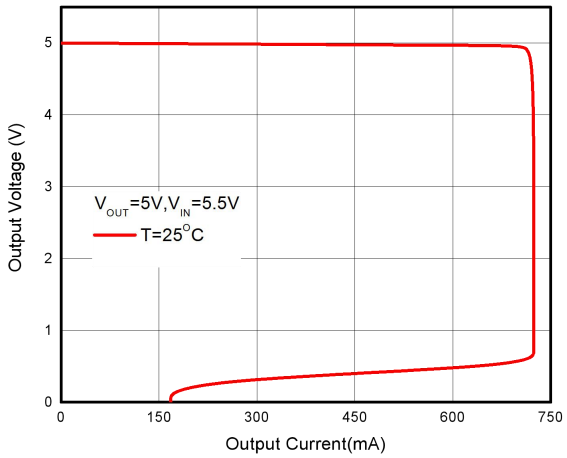
Dropout Voltage VS Temperature



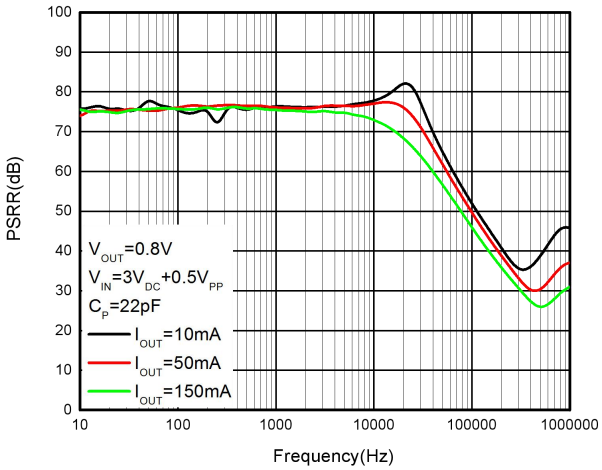
Output Voltage VS Output Current



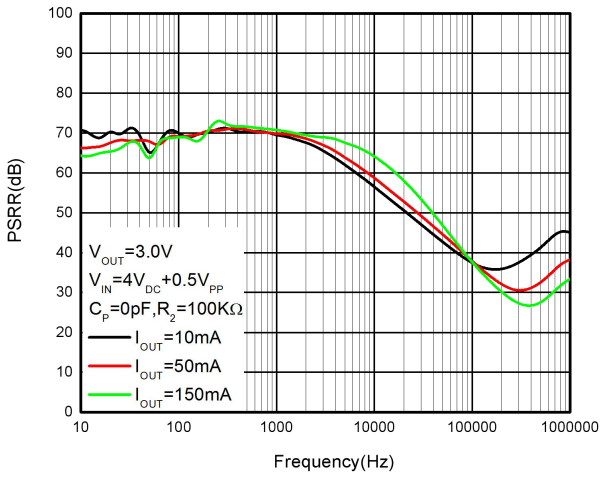
Output Voltage VS Output Current



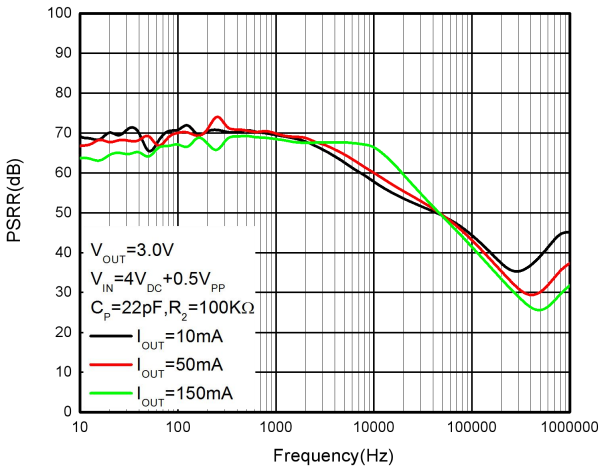
Output Voltage VS Output Current



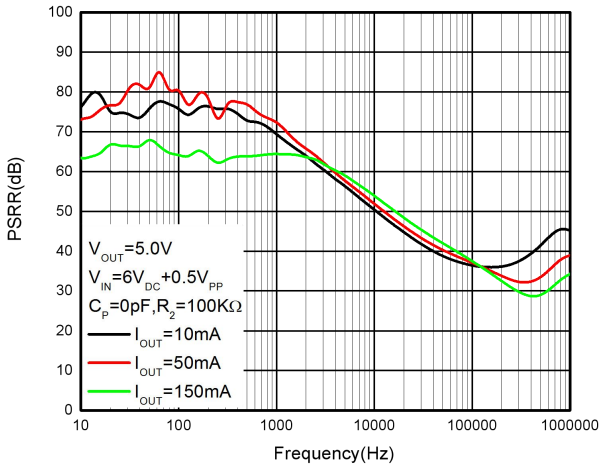
PSRR VS Frequency



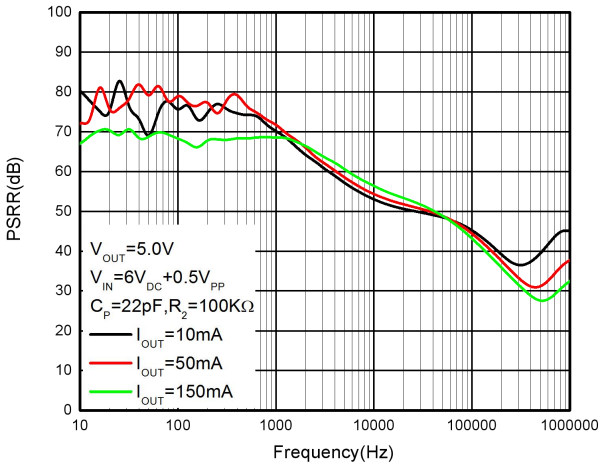
PSRR VS Frequency



PSRR VS Frequency



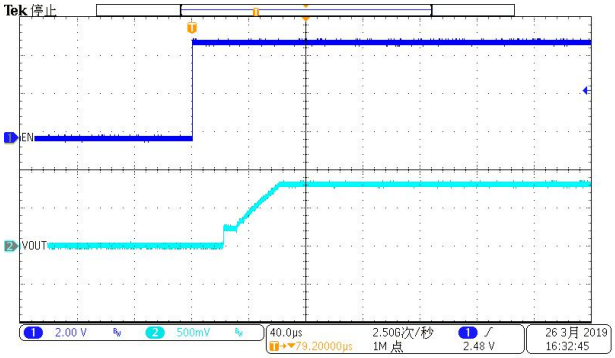
PSRR VS Frequency



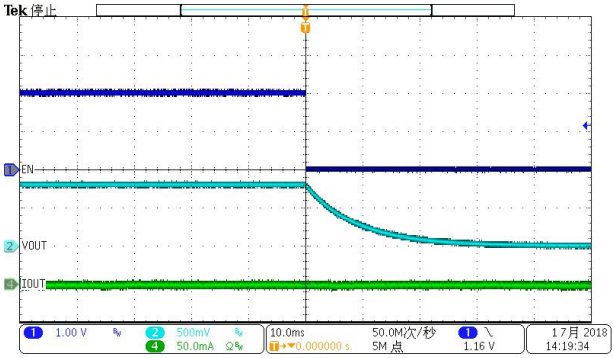
PSRR VS Frequency

1. Start up & Shutdown(I_{OUT}=1mA)

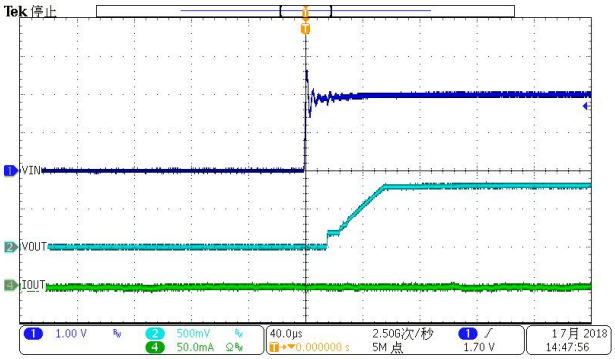
V_{OUT}=0.8V,EN ON



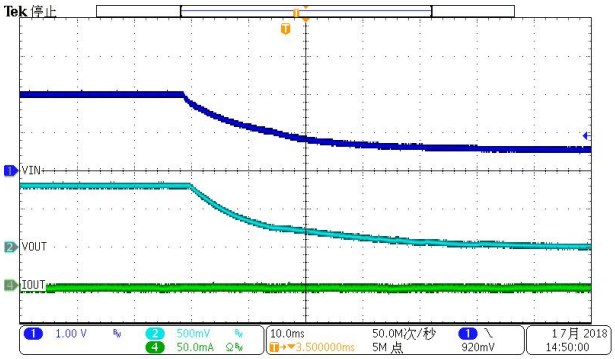
V_{OUT}=0.8V,EN OFF



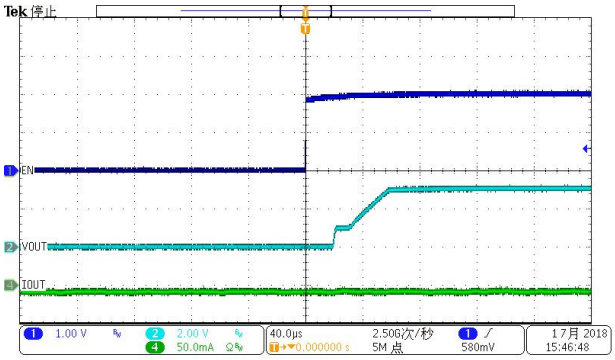
V_{OUT}=0.8V,Power ON



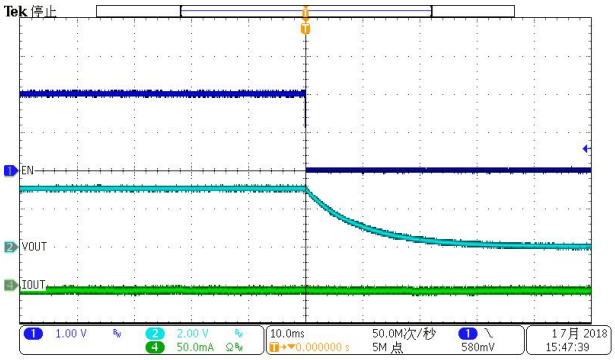
V_{OUT}=0.8V,Power OFF



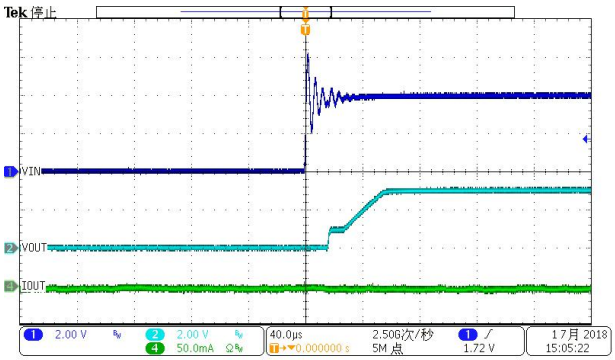
V_{OUT}=3V,R_2=100kΩ,C_P=0,EN ON



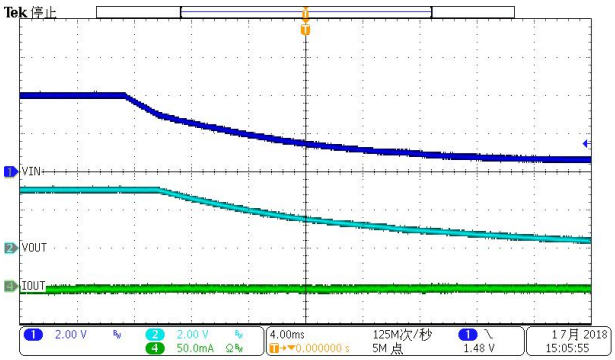
V_{OUT}=3V,R_2=100kΩ,C_P=0,EN OFF



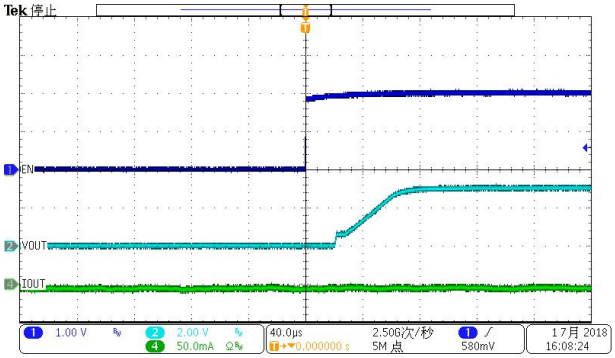
V_{OUT}=3V,R_2=100kΩ,C_P=0,Power ON



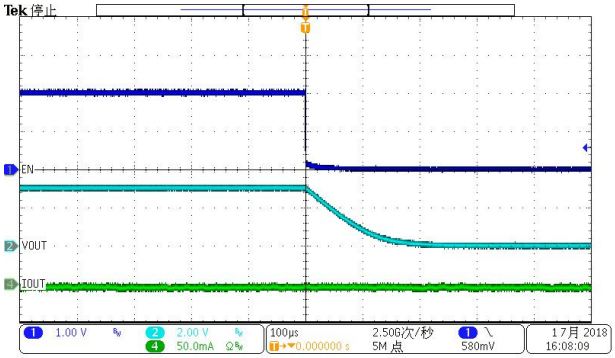
V_{OUT}=3V,R_2=100kΩ,C_P=0,Power OFF



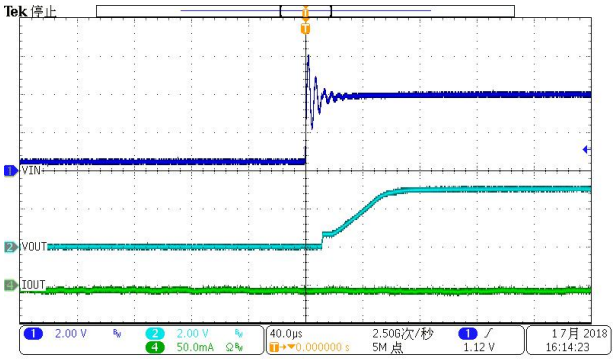
V_{OUT}=3V,R_2=100kΩ,C_P=22pF,EN ON



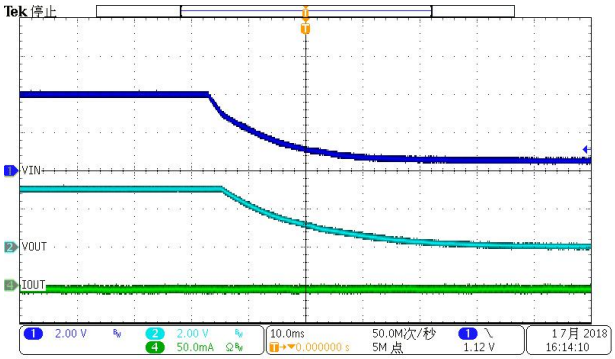
V_{OUT}=3V,R_2=100kΩ,C_P=22pF,EN OFF



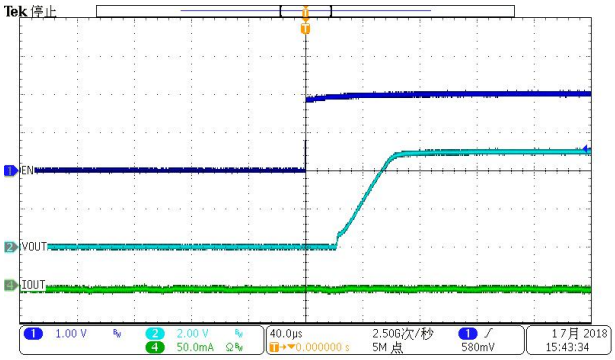
V_{OUT}=3V,R_2=100kΩ,C_P=22pF,Power ON



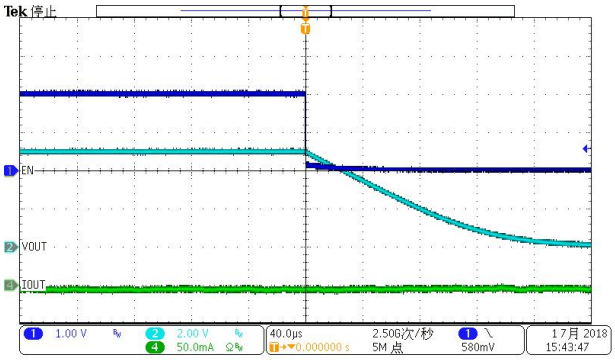
V_{OUT}=3V,R_2=100kΩ,C_P=22pF,Power OFF



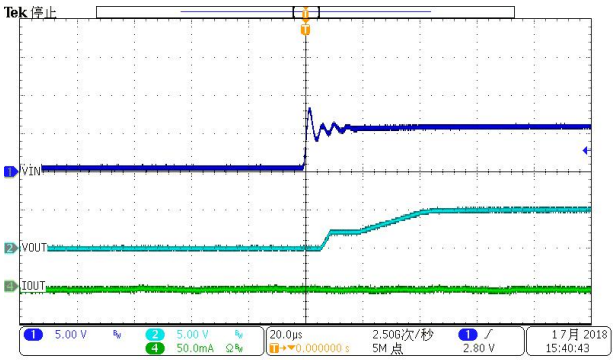
V_{OUT}=5V,R_2=100kΩ,C_P=0,EN ON



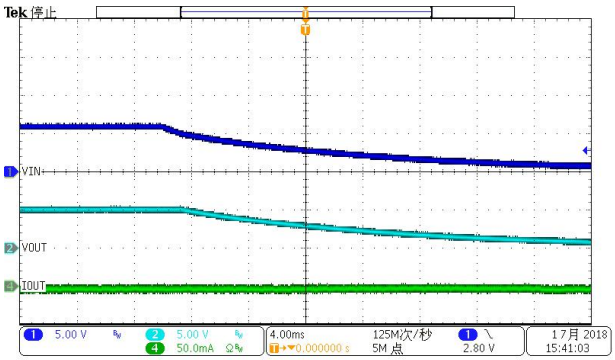
V_{OUT}=5V,R_2=100kΩ,C_P=0,EN OFF



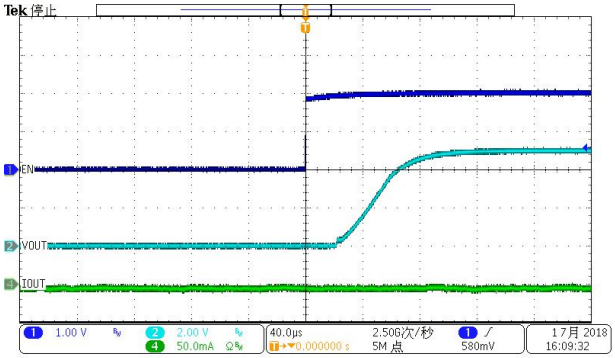
V_{OUT}=5V,R_2=100kΩ,C_P=0,Power ON



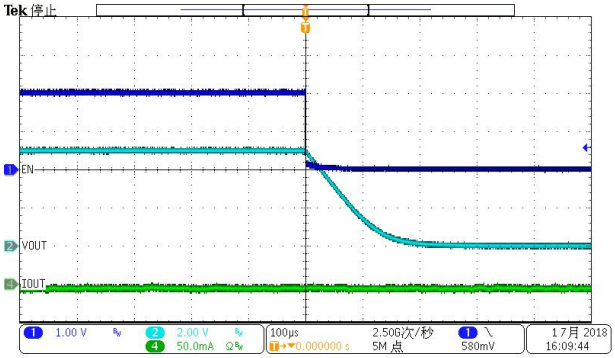
V_{OUT}=5V,R_2=100kΩ,C_P=0,Power OFF



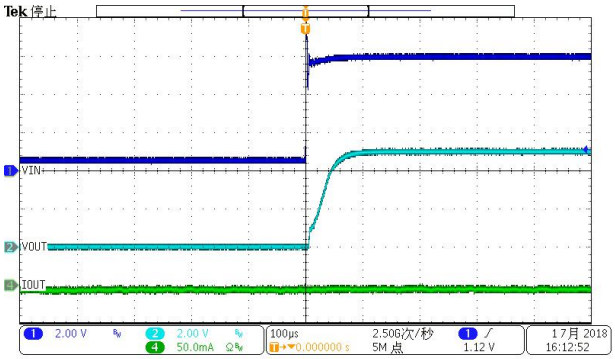
V_{OUT}=5V,R_2=100kΩ,C_P=22pF,EN ON



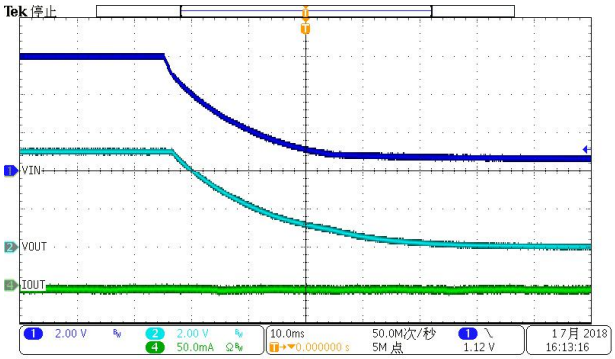
V_{OUT}=5V,R_2=100kΩ,C_P=22pF,EN OFF



V_{OUT}=5V,R_2=100kΩ,C_P=22pF,Power ON

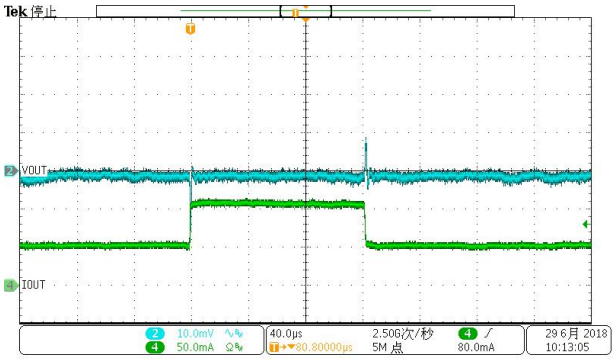


V_{OUT}=5V,R_2=100kΩ,C_P=22pF,Power OFF

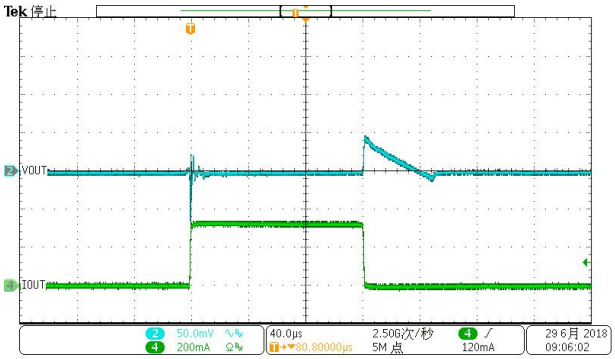


2. Load Transient

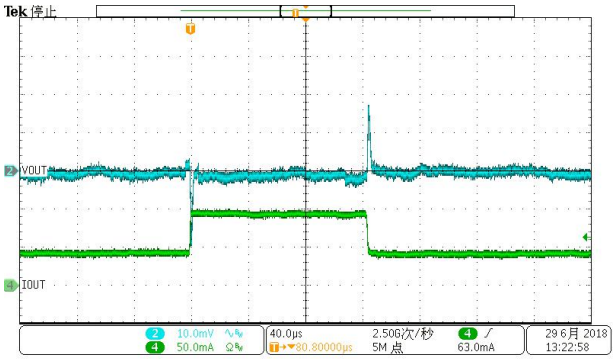
V_{OUT}=0.8V,I_{OUT}=50-100mA



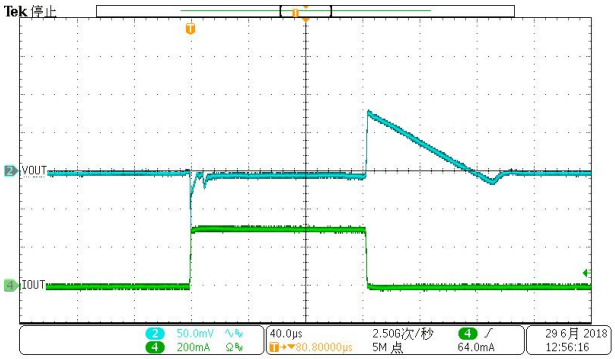
V_{OUT}=0.8V,I_{OUT}=1-300mA



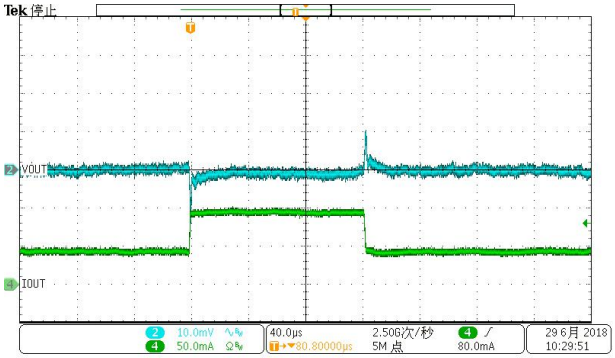
V_{OUT}=3V,R_2=100kΩ,C_P=0,I_{OUT}=50-100mA



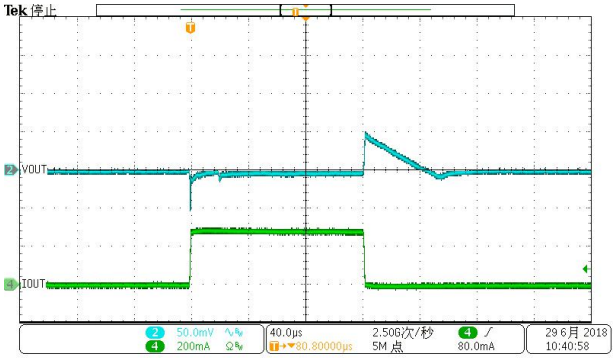
V_{OUT}=3V,R_2=100kΩ,C_P=0,I_{OUT}=1-300mA



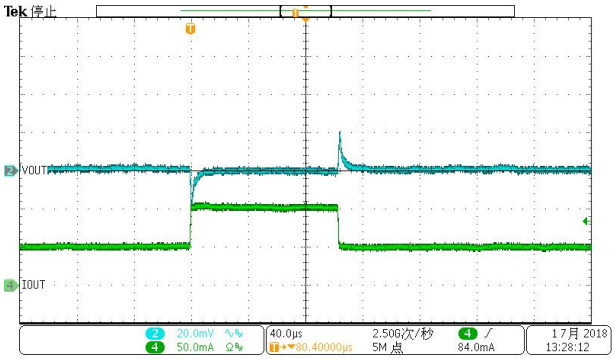
V_{OUT}=3V,R_2=100kΩ,C_P=22pF,I_{OUT}=50-100mA



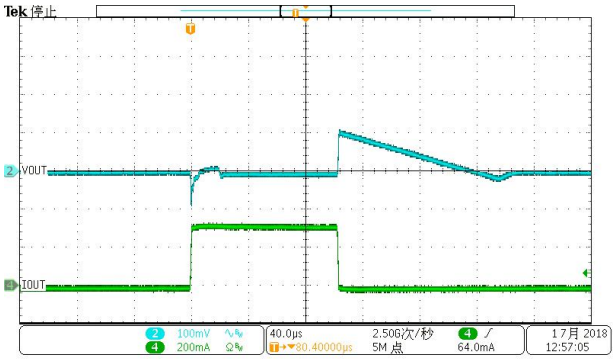
V_{OUT}=3V,R_2=100kΩ,C_P=22pF,I_{OUT}=1-300mA



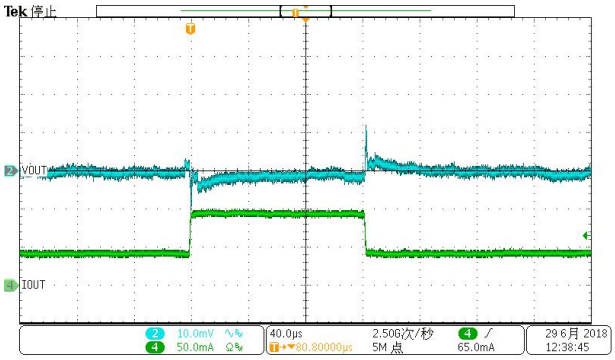
V_{OUT}=5V,R_2=100kΩ,C_P=0,I_{OUT}=50-100mA



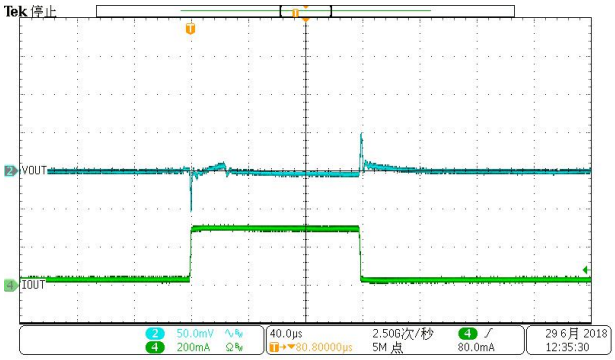
V_{OUT}=5V,R_2=100kΩ,C_P=0,I_{OUT}=1-300mA



V_{OUT}=5V,R_2=100kΩ,C_P=22pF,I_{OUT}=50-100mA

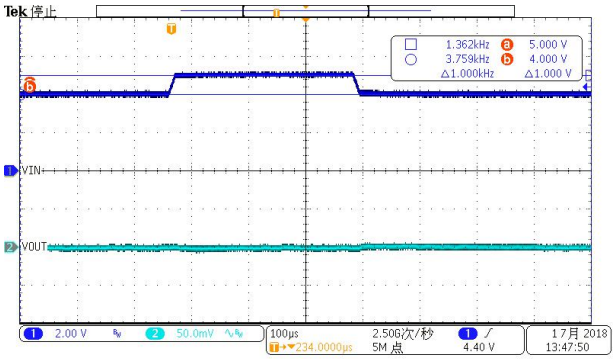


V_{OUT}=5V,R_2=100kΩ,C_P=22pF,I_{OUT}=1-300mA



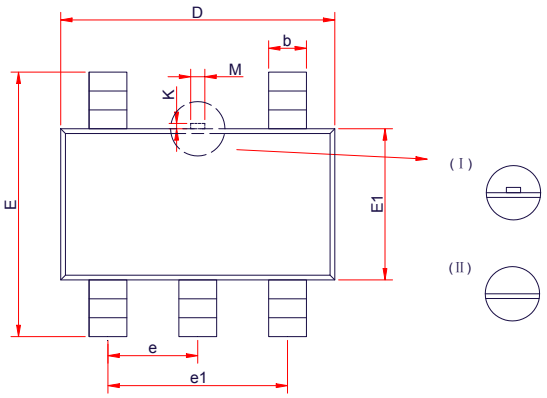
3. Line Transient

V_{IN}=4V-5V,I_{OUT}=1mA

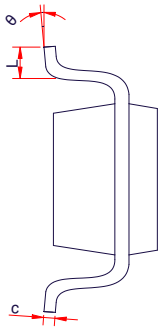


PACKAGE OUTLINE DIMENSIONS

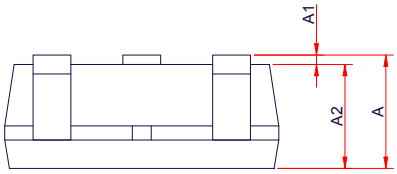
SOT-23-5L



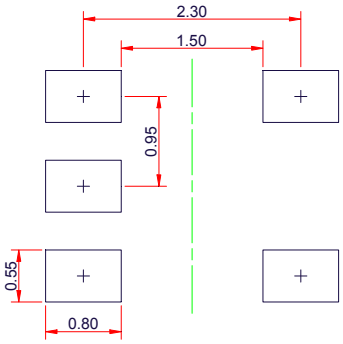
TOP VIEW



SIDE VIEW



SIDE VIEW

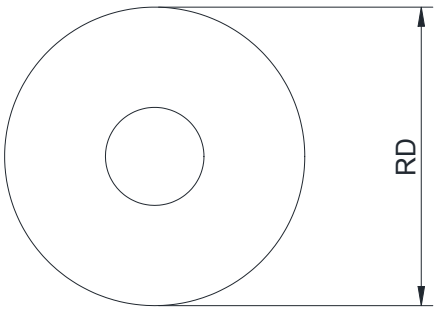


RECOMMENDED LAND PATTERN (unit: mm)

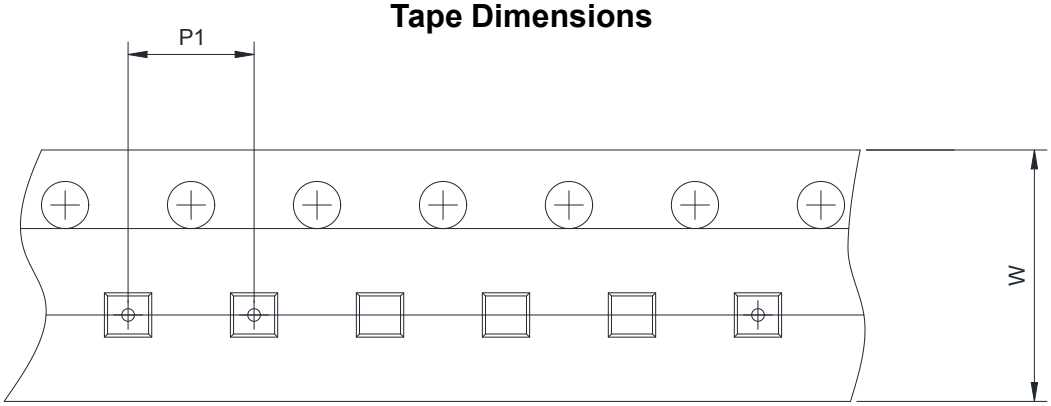
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	-	-	1.45
A1	0.00	-	0.15
A2	0.90	1.10	1.30
b	0.30	0.40	0.50
c	0.10	-	0.21
D	2.72	2.92	3.12
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	0.45	0.60
M	0.10	0.15	0.25
K	0.00	-	0.25
θ	0°	-	8°

TAPE AND REEL INFORMATION

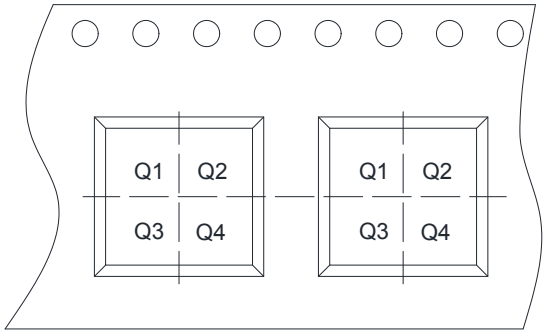
Reel Dimensions



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

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