

WL2836E

Low noise, High PSRR, High speed, CMOS LDO

Descriptions

The WL2836E 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 WL2836E 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 WL2836E regulators are available in standard SOT-23-5L Package. Standard products are Pb-free and Halogen-free.

Features

- Input Voltage Range : 1.4V~5.5V
- Output Voltage Range : 0.8V~3.3V
- Output current : 300mA
- Quiescent current : 50μA Typ.
- Shut-down current : < 1μA
- Dropout voltage : 140mV @ $I_{OUT}=0.3A$
- PSRR : 78dB @ 1kHz, $V_{OUT}=1.8V$
- Low Output Voltage Noise : 20μV_{RMS} Typ.
- Output Voltage Tolerance : ±2% @ $V_{OUT}>2V$
- Recommend capacitor : 1μF
- Thermal-Overload and Short-Circuit Protection

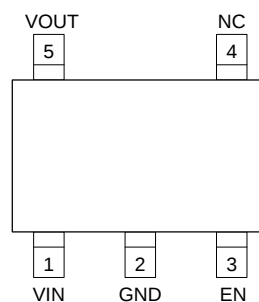
Applications

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

<https://www.omnivision-group.com/>

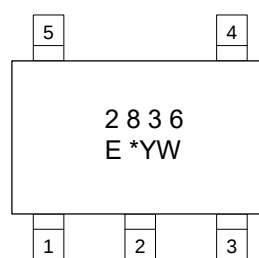


SOT-23-5L



SOT-23-5L

Pin Configuration (Top View)



SOT-23-5L

2836 : Device Code

E : Package Code

*** : Voltage Code**

Y : Year code

W: Week code

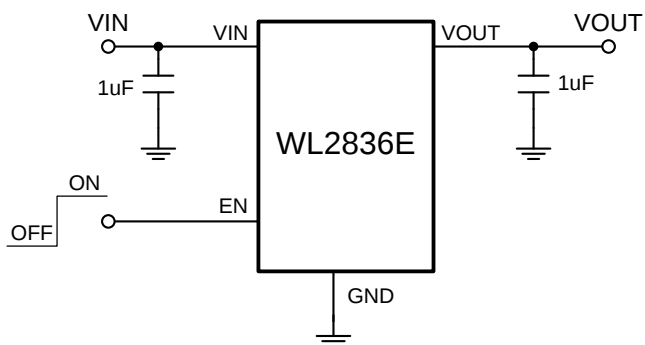
For detail marking information, please see page 15.

Marking

Order information

For detail order information, please see page 15.

Typical Application

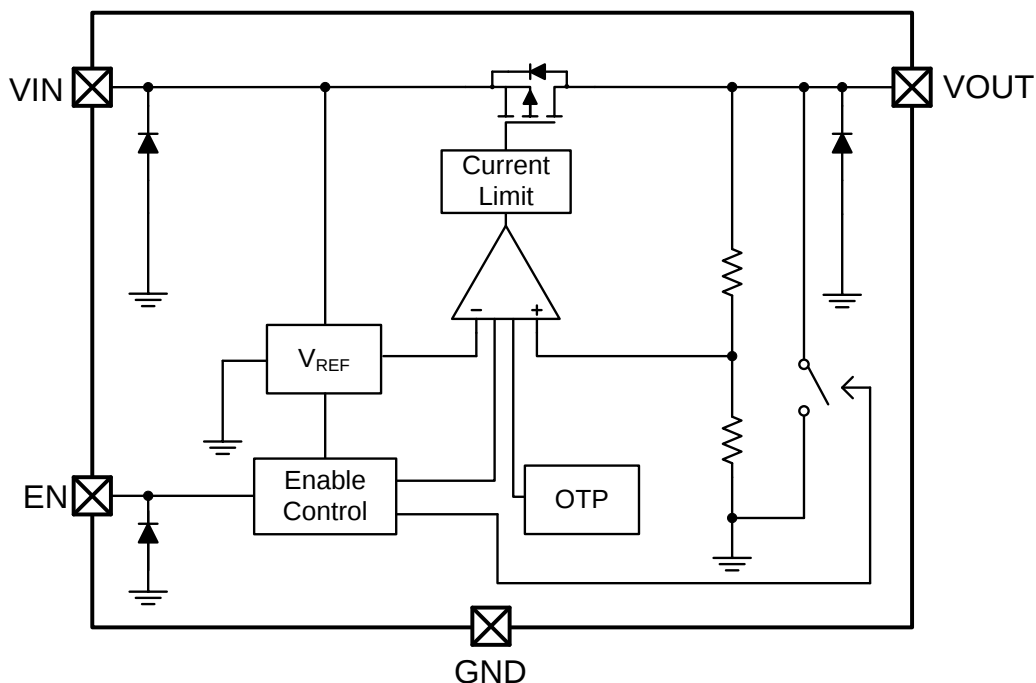


Pin Description

SOT-23-5L

PIN	Symbo l	Description
1	V_{IN}	Input
2	GND	Ground
3	EN	Enable (Active high)
4	NC	No connection
5	V_{OUT}	Output

Block Diagram



Absolute Maximum Ratings

Parameter		Value	Unit
Power Dissipation, $P_D@T_A=25^{\circ}\text{C}$		400	mW
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}		400	mA
Lead Temperature Range		260	$^{\circ}\text{C}$
Storage Temperature Range		-55 ~ 150	$^{\circ}\text{C}$
Operating Junction Temperature Range		150	$^{\circ}\text{C}$
MSL		Level-3	
ESD Ratings	HBM	7500	V
	MM	300	V

Recommend Operating Ratings

Parameter	Value	Unit
Operating Supply voltage	1.4~5.5	V
Operating Temperature Range	-40~85	$^{\circ}\text{C}$
Junction-to-ambient Thermal Resistance ^{[1][2][3]} , $R_{\theta JA}$	127	$^{\circ}\text{C/W}$
Junction-to-Board Thermal Resistance ^{[1][2][3]} , $R_{\theta JB}$	78	$^{\circ}\text{C/W}$
Junction-to-case _(Bottom) Thermal Resistance ^{[1][2][3]} , $R_{\theta JC(Top)}$	56	$^{\circ}\text{C/W}$

[1] Thermal resistance data is highly dependent on application and board layout. In applications where high maximum power dissipation exists, special care must be paid to thermal dissipation issues in board design.

[2] Single component mounted on 2oz, 1.5*1.5 inch² FR4 PCB with 1.0*1.0 inch² Cu area.

[3] The test results are for reference only, if you need to compare with other company's products, it is recommended to do the comparison test under the same conditions to have the reference significance.

Electronics Characteristics

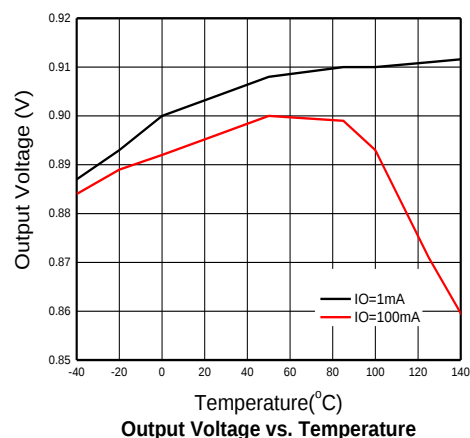
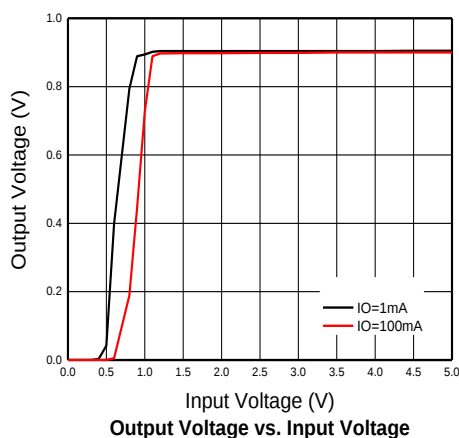
 (Ta=25°C, V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1 μF, I_{OUT}=1mA, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Output Voltage	V _{OUT}	V _{OUT} ≤ 2V	-30	V _{OUT}	+30	mV
		V _{OUT} > 2V	0.98× V _{OUT}	V _{OUT}	1.02× V _{OUT}	V
Input Voltage	V _{IN}		1.4		5.5	V
Current Limit	I _{LIM}	V _{EN} =V _{IN}	300			mA
Dropout Voltage	V _{DROP}	V _{OUT} =3.3V, I _{OUT} =300mA		118	185	mV
		V _{OUT} =3V, I _{OUT} =300mA		122	192	
		V _{OUT} =2.8V, I _{OUT} =300mA		130	204	
		V _{OUT} =2.5V, I _{OUT} =300mA		140	220	
		V _{OUT} =1.6V, I _{OUT} =300mA		205	320	
		V _{OUT} =1V, I _{OUT} =300mA		370	555	
Line Regulation	ΔV _{LINE}	V _{IN} =V _{OUT} +0.5V~5.5V		1	5	mV
Load Regulation	ΔV _{Load}	V _{OUT} =2.8V, I _{OUT} =1~300mA		22	40	mV
Quiescent Current	I _Q	V _{OUT} =2.8V, I _{OUT} =0		50	90	μA
Short Current	I _{SHORT}	V _{EN} =V _{IN} , V _{OUT} Short to GND with 1 Ω		120		mA
Shut-down Current	I _{SHDN}	V _{EN} =0V			1.0	μA
Power Supply Rejection Rate	PSRR	V _{IN} =(V _{OUT} +1V) _{DC} + 0.5V _{P-P} I _{OUT} =10mA, V _{OSET} =1.8V	f=100Hz	80		dB
			f=1kHz	78		dB
			f=10kHz	65		dB
			f=100kHz	56		dB
			f=1MHz	43		dB
EN logic high voltage	V _{ENH}	V _{IN} =5.5V, I _{OUT} =1mA	1			V
EN logic low voltage	V _{ENL}	V _{IN} =5.5V, V _{OUT} =0V			0.4	V
EN Input Current	I _{EN}	V _{EN} = 0 to 5.5V		120		nA
Output Noise Voltage	e _{NO}	10Hz to 100KHz, C _{OUT} =1μF		13× V _{OUT}		μV _{RMS}
Thermal shutdown threshold	T _{SD}			160		°C
Thermal shutdown hysteresis	Δ T _{SD}			30		°C
Auto-discharge Nch Tr, ON Resistance	R _{LOW}	V _{IN} =4V, V _{CE} =0V, V _{OUT} =2.8V		120		Ω

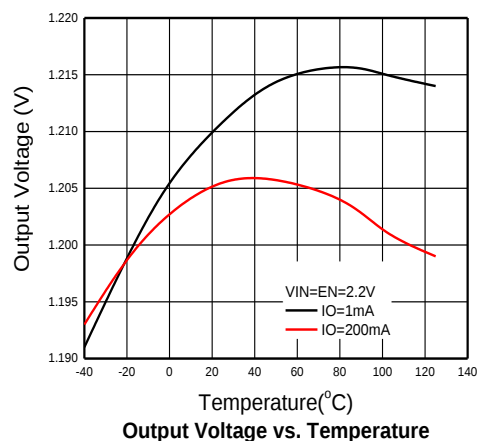
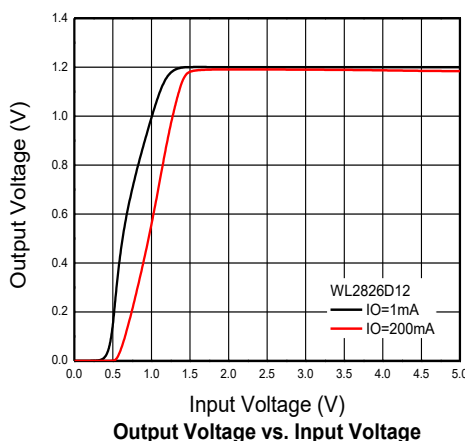
Typical characteristics ($T_a=25^{\circ}\text{C}$, $V_{\text{IN}}=V_{\text{OUT}}+1\text{V}$, $I_{\text{OUT}}=1\text{mA}$, $C_{\text{IN}}=C_{\text{OUT}}=1\ \mu\text{F}$, unless otherwise noted)

(1) EN is driven by square pulse, the duty cycle is less than 20%

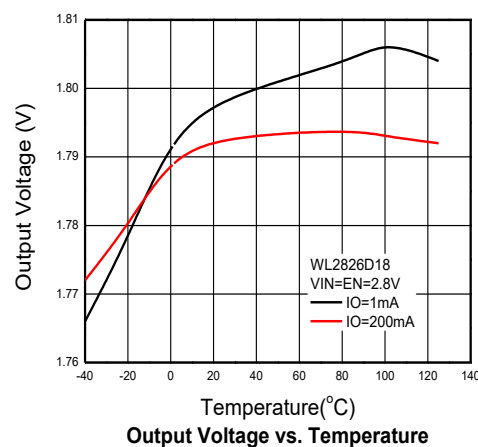
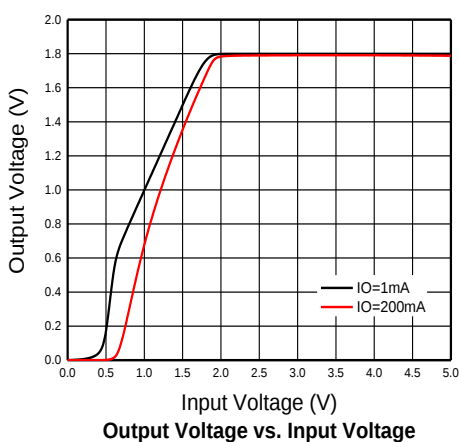
$V_{\text{OUT}}=0.9\text{V}$



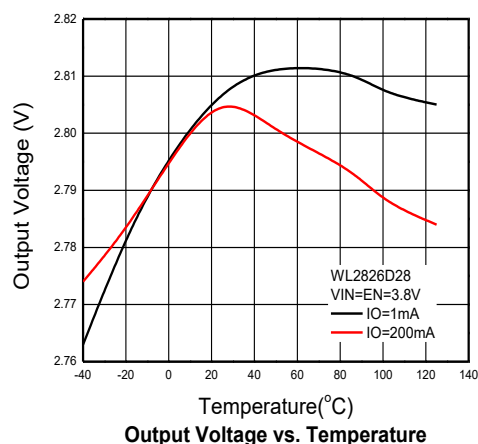
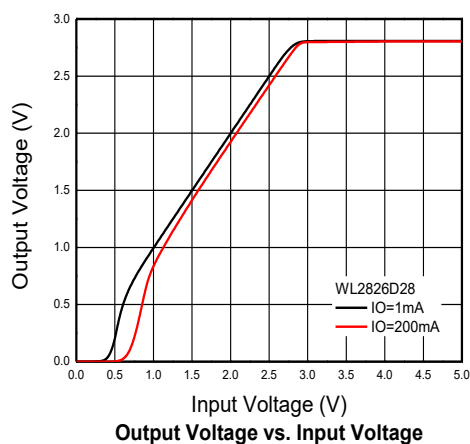
$V_{\text{OUT}}=1.2\text{V}$



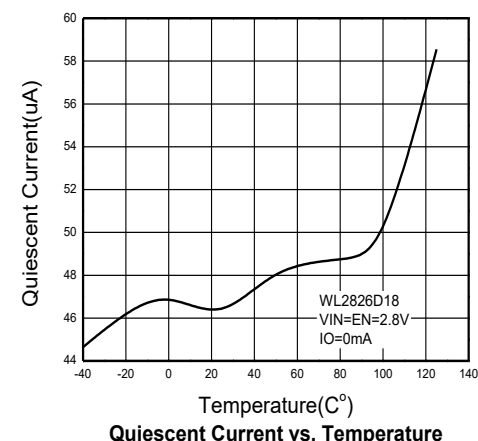
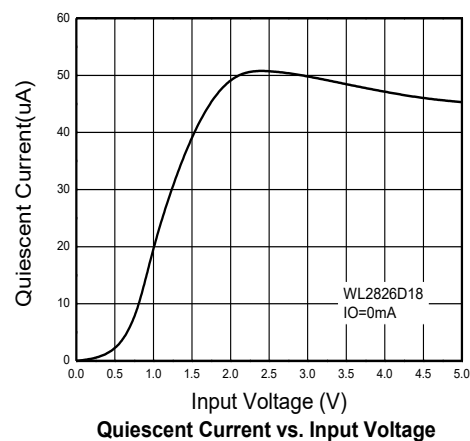
$V_{\text{OUT}}=1.8\text{V}$



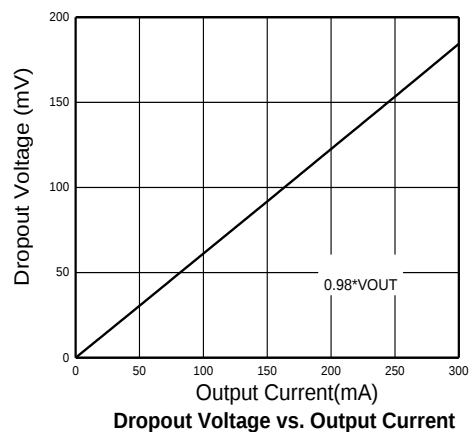
$V_{OUT}=2.8V$



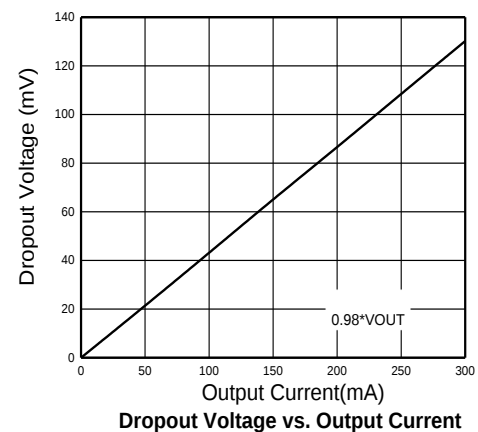
$V_{OUT}=1.8V$



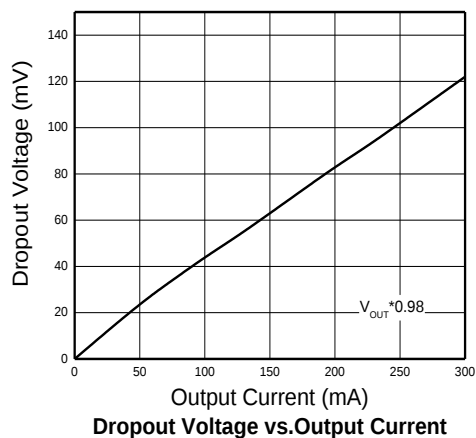
$V_{OUT}=1.8V$



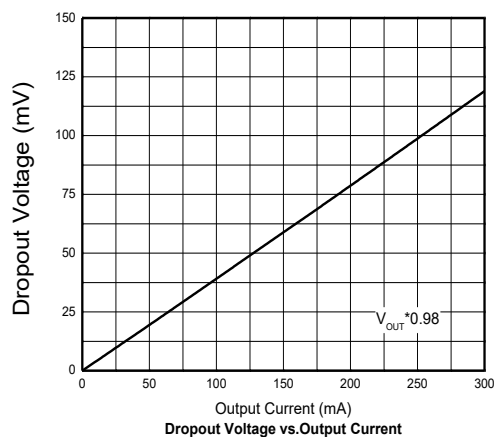
$V_{OUT}=2.8V$



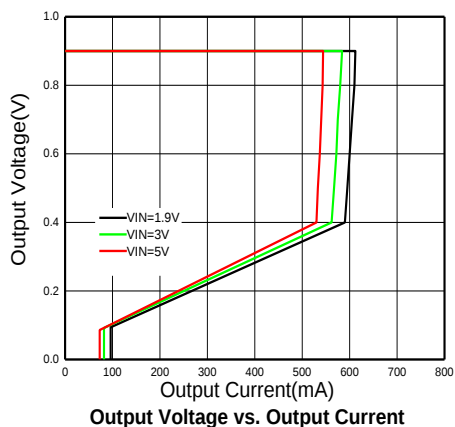
V_{OUT}=3.0V



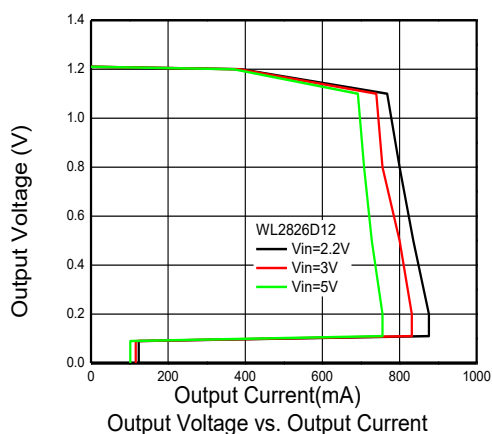
V_{OUT}=3.3V



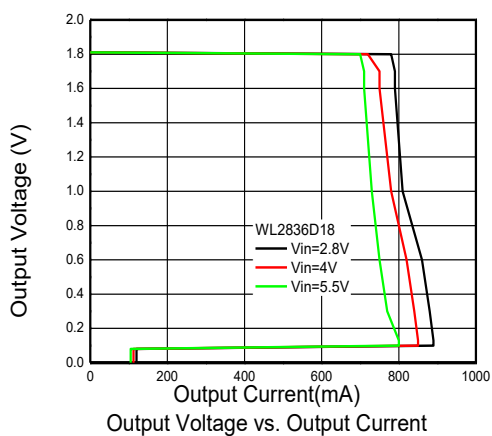
V_{out}=0.9V⁽¹⁾



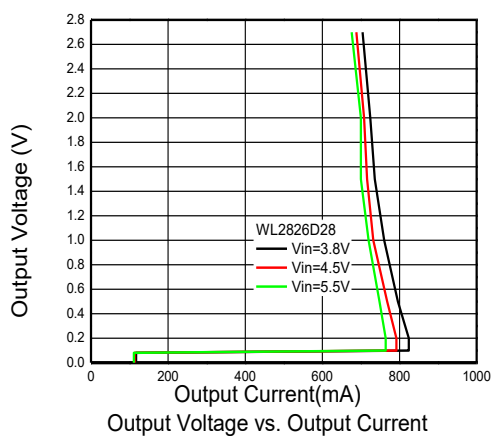
V_{out}=1.2V⁽¹⁾



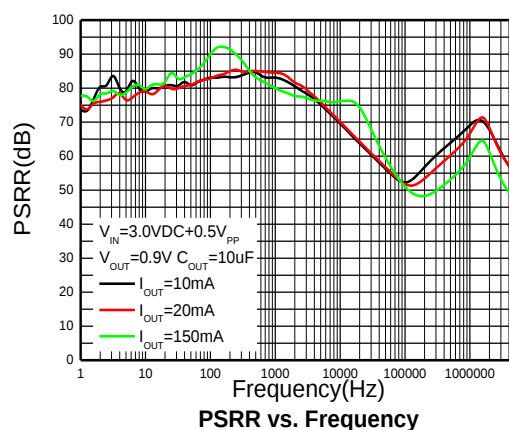
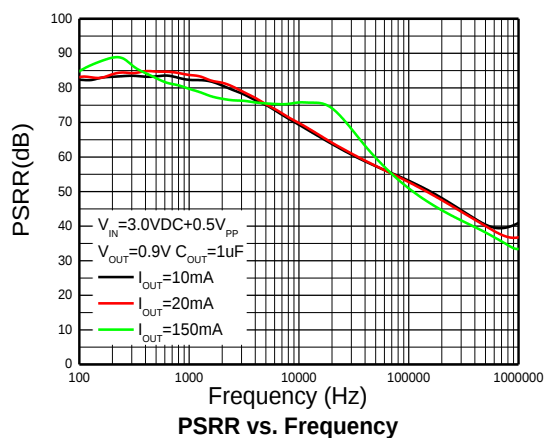
V_{out}=1.8V⁽¹⁾



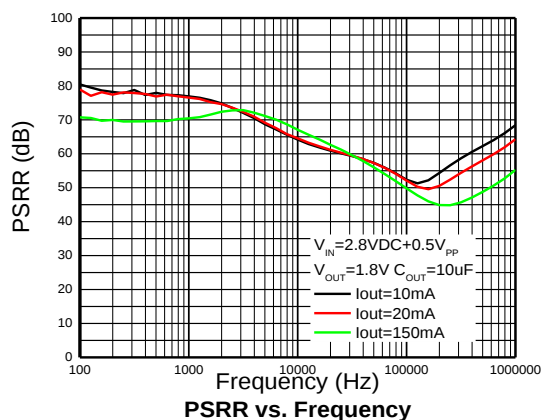
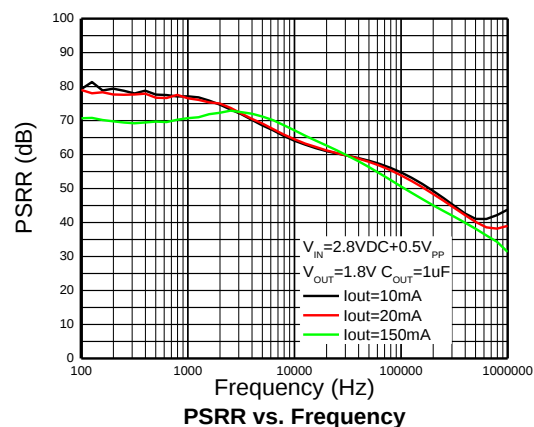
V_{out}=2.8V⁽¹⁾



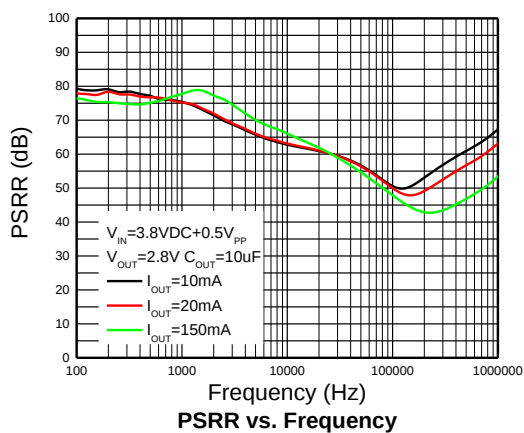
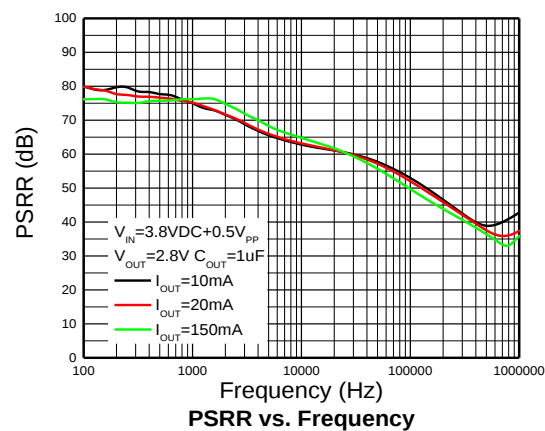
$V_{OUT}=0.9V$



$V_{OUT}=1.8V$



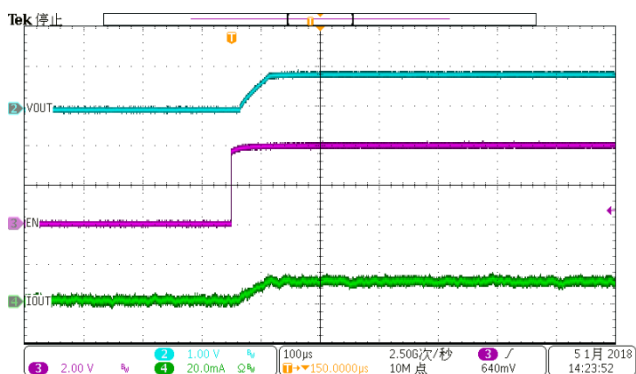
$V_{OUT}=2.8V$



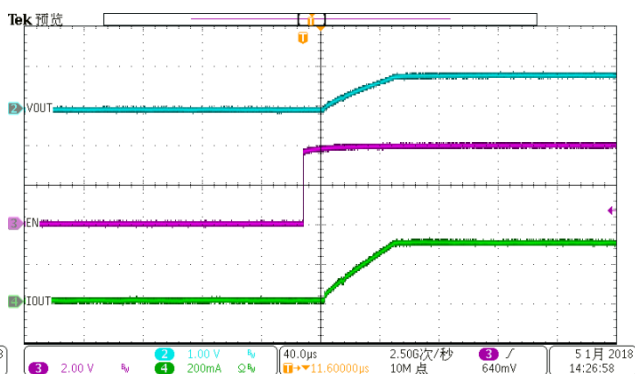
1.Start up (Soft Start from EN)

$V_{OUT}=0.9V$

$V_{IN}=1.9V, C_{OUT}=1\mu F, I_{OUT}=10mA$

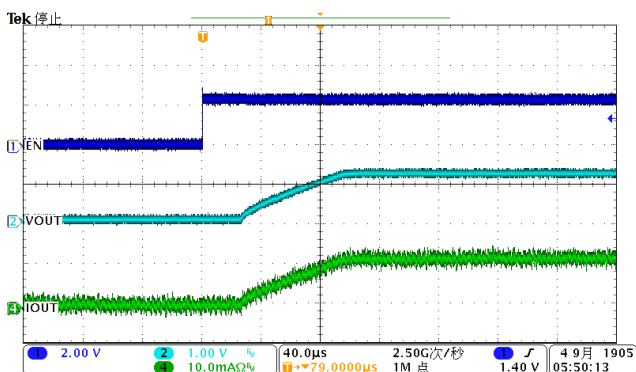


$V_{IN}=1.9V, C_{OUT}=1\mu F, I_{OUT}=300mA$

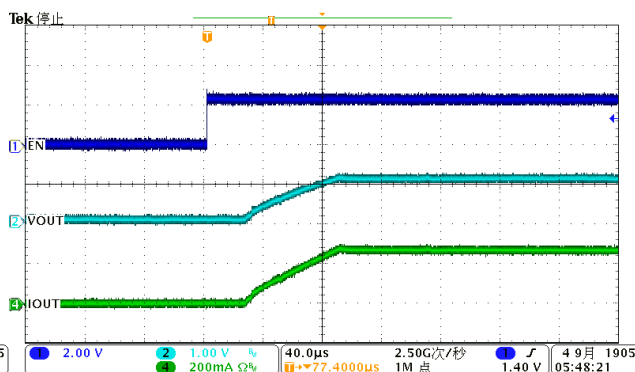


$V_{OUT}=1.2V$

$V_{IN}=2.2V, C_{OUT}=1\mu F, I_{OUT}=10mA$

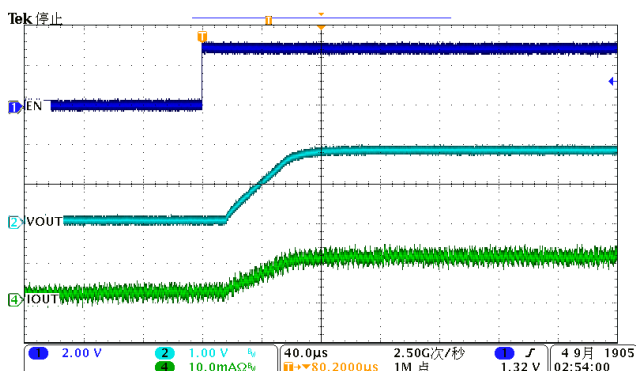


$V_{IN}=2.2V, C_{OUT}=1\mu F, I_{OUT}=300mA$

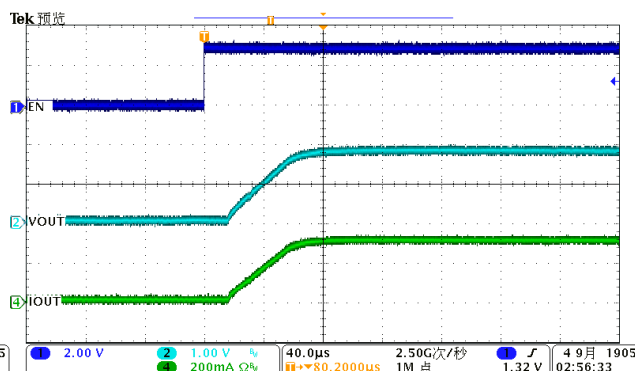


$V_{OUT}=1.8V$

$V_{IN}=2.8V, C_{OUT}=1\mu F, I_{OUT}=10mA$

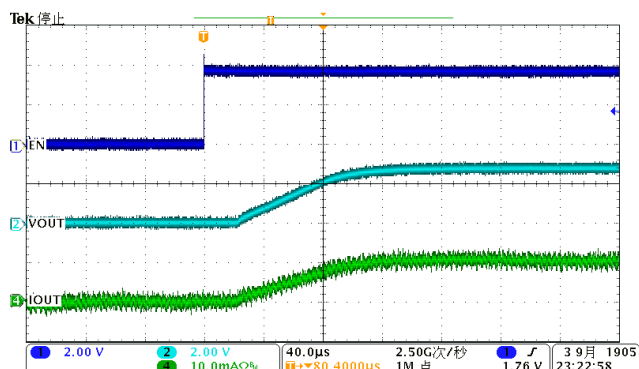


$V_{IN}=2.8V, C_{OUT}=1\mu F, I_{OUT}=300mA$

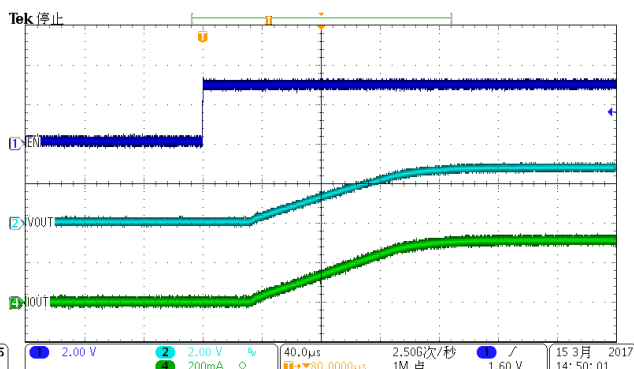


V_{OUT}=2.8V

V_{IN}=3.8V, C_{OUT}=1μF, I_{OUT}=10mA



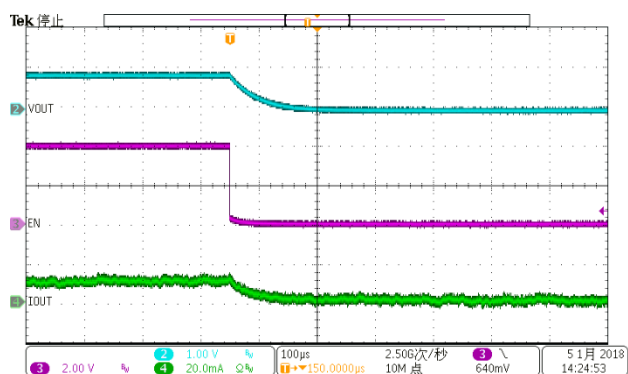
V_{IN}=3.8V, C_{OUT}=1μF, I_{OUT}=300mA



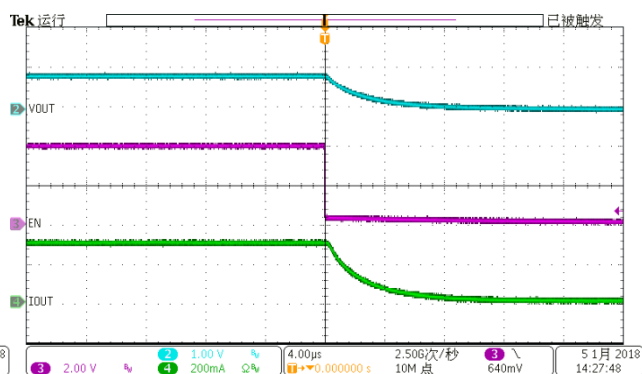
2.Shutdown (Shutdown from EN)

V_{OUT}=0.9V

V_{IN}=1.9V, C_{OUT}=1μF, I_{OUT}=10mA

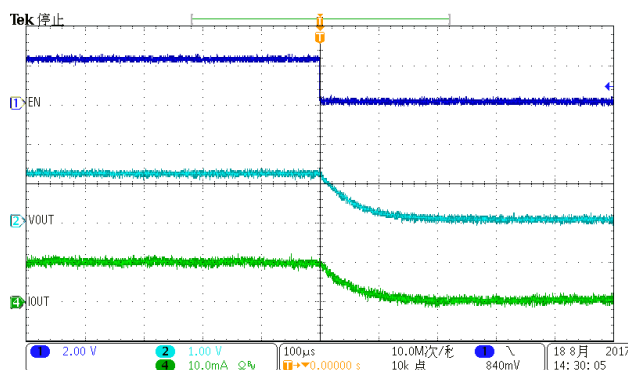


V_{IN}=1.9V, C_{OUT}=1μF, I_{OUT}=300mA

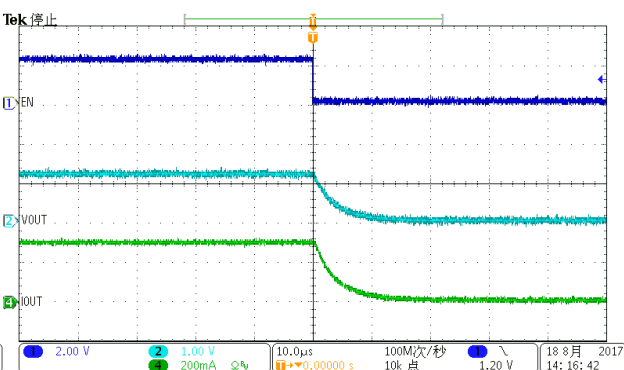


V_{OUT}=1.2V

V_{IN}=2.2V, C_{OUT}=1μF, I_{OUT}=10mA

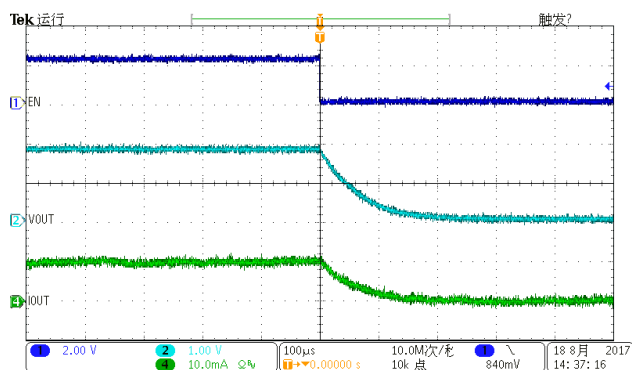


V_{IN}=2.2V, C_{OUT}=1μF, I_{OUT}=300mA

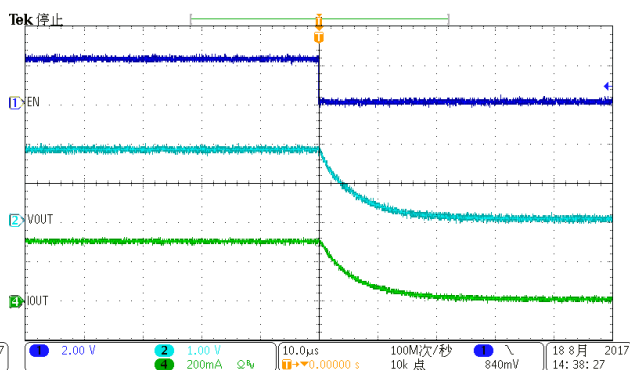


$V_{OUT}=1.8V$

$V_{IN}=2.8V, C_{OUT}=1\mu F, I_{OUT}=10mA$

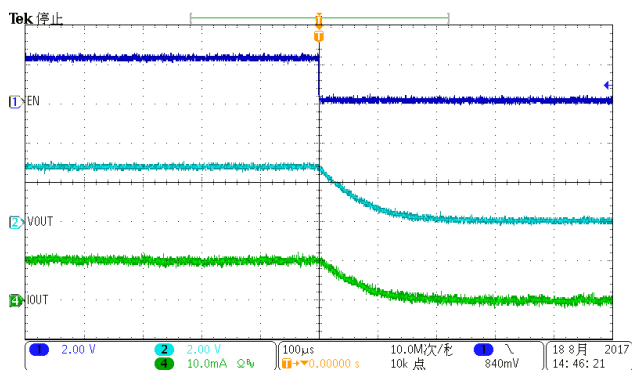


$V_{IN}=2.8V, C_{OUT}=1\mu F, I_{OUT}=300mA$

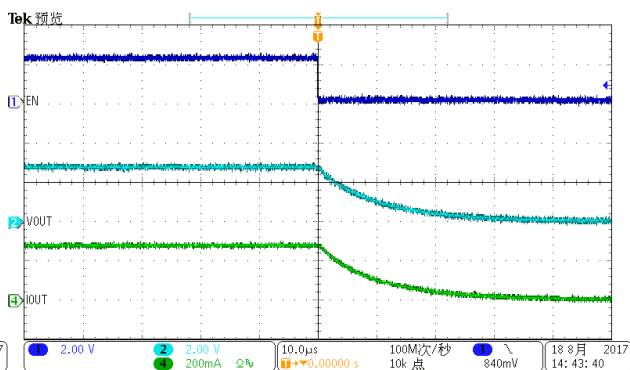


$V_{OUT}=2.8V$

$V_{IN}=3.8V, C_{OUT}=1\mu F, I_{OUT}=10mA$



$V_{IN}=3.8V, C_{OUT}=1\mu F, I_{OUT}=300mA$

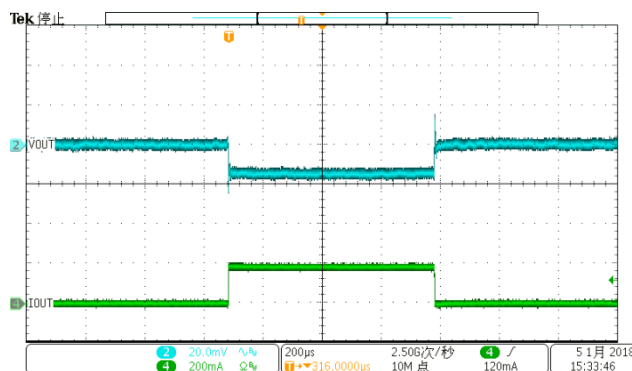


3. Load & Line Transient

Load step

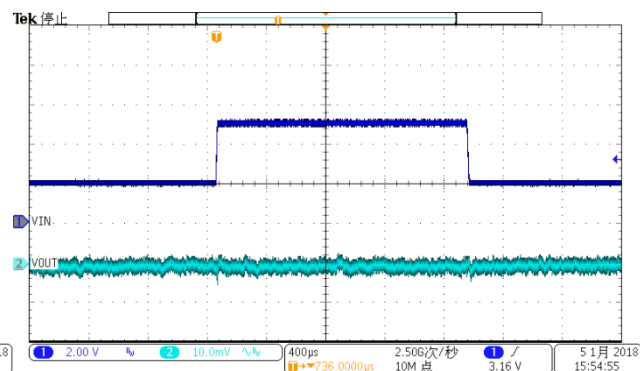
$V_{OUT}=0.9V$

$V_{IN}=1.9V, C_{OUT}=1\mu F, I_{OUT}=1mA-200mA$ in $1\mu s$



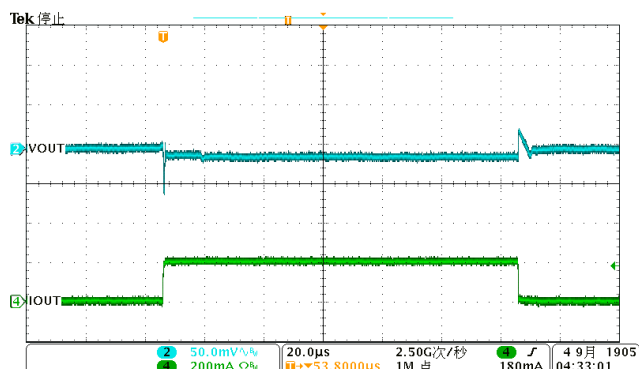
Line Step

$V_{IN}=2.2V-3.2V$ in $20\mu s, C_{OUT}=1\mu F, I_{OUT}=1mA$

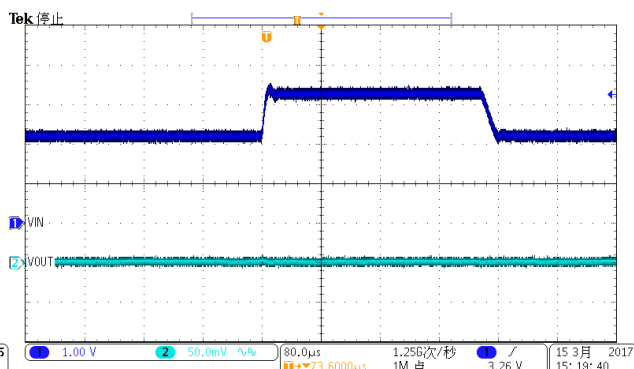


$V_{OUT}=1.2V$

$V_{IN}=2.2V, C_{OUT}=1\mu F, I_{OUT}=1mA-200mA$ in $1\mu s$

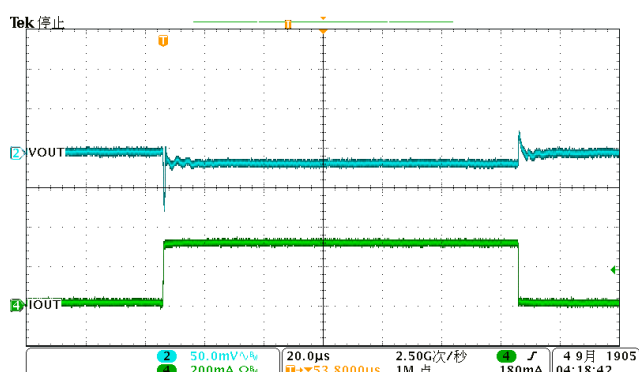


$V_{IN}=2.2V-3.2V$ in $20\mu s, C_{OUT}=1\mu F, I_{OUT}=1mA$

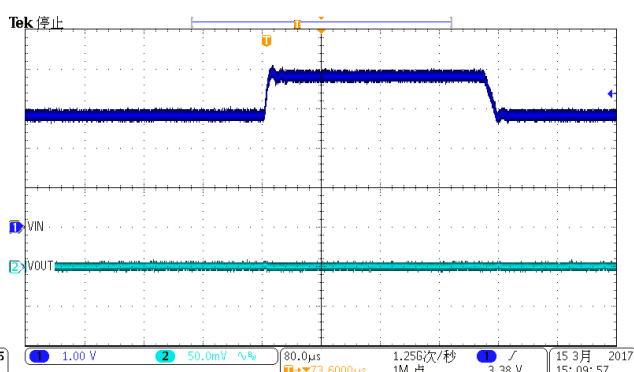


$V_{OUT}=1.8V$

$V_{IN}=2.8V, C_{OUT}=1\mu F, I_{OUT}=1mA-300mA$ in $1\mu s$

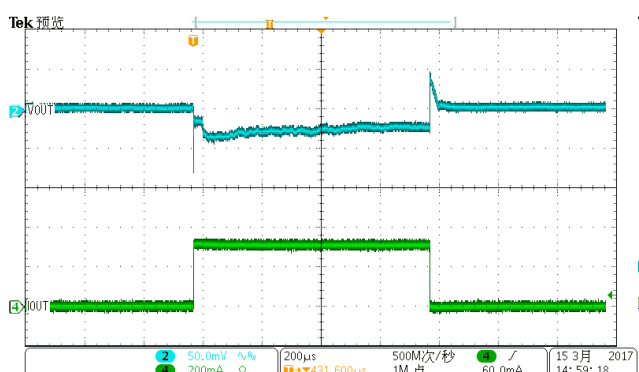


$V_{IN}=2.8V-3.8V$ in $20\mu s, C_{OUT}=1\mu F, I_{OUT}=1mA$

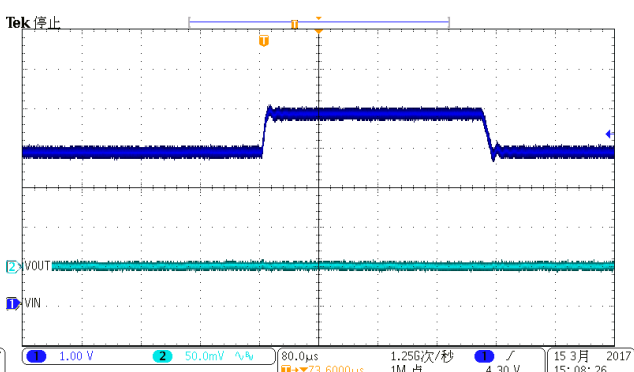


$V_{OUT}=2.8V$

$V_{IN}=3.8V, C_{OUT}=1\mu F, I_{OUT}=1mA-300mA$ in $1\mu s$

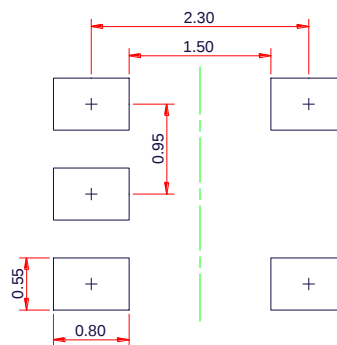
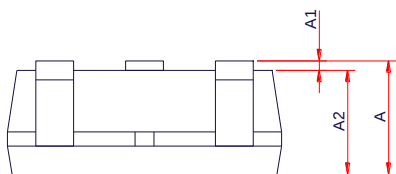
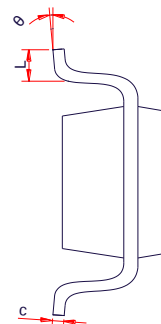
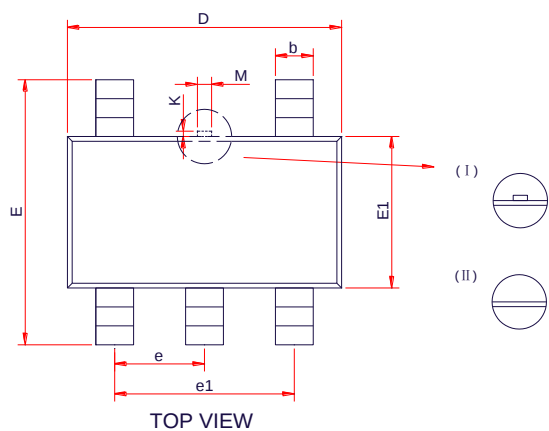


$V_{IN}=3.8V-4.8V$ in $20\mu s, C_{OUT}=1\mu F, I_{OUT}=1mA$



PACKAGE OUTLINE DIMENSIONS

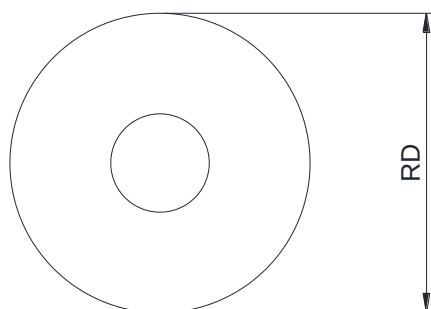
SOT-23-5L



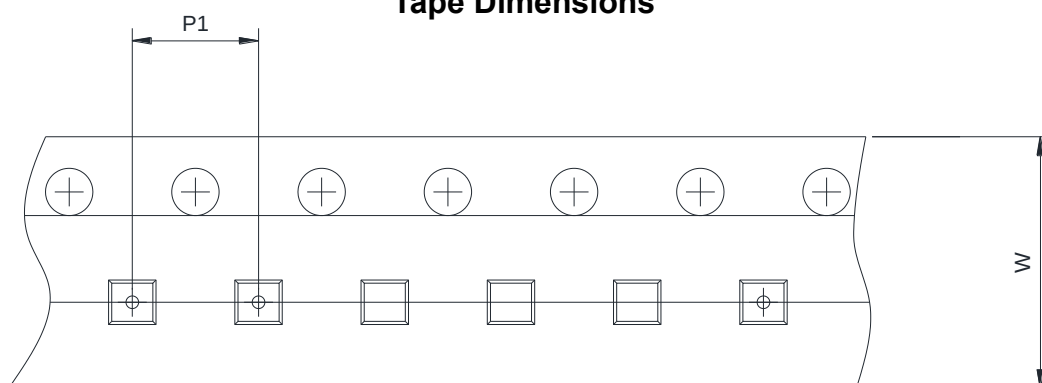
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	-	-	1.25
A1	0.00	-	0.15
A2	1.00	1.10	1.20
b	0.30	0.40	0.50
c	0.10	-	0.21
D	2.72	2.92	3.12
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	0.45	0.60
M	0.10	0.15	0.25
K	0.00	-	0.25
θ	0°	-	8°

TAPE AND REEL INFORMATION

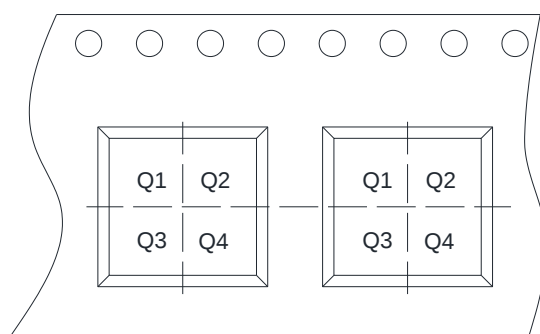
Reel Dimensions



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

ORDER INFORMATION

Ordering No.	Vout (V)	Package	Operating Temperature	Marking	Shipping
WL2836E08-5/TR	0.8	SOT-23-5L	-40~+85°C	2836 EhYW	Tape and Reel, 3000
WL2836E09-5/TR	0.9	SOT-23-5L	-40~+85°C	2836 EAYW	Tape and Reel, 3000
WL2836E10-5/TR	1.0	SOT-23-5L	-40~+85°C	2836 EBYW	Tape and Reel, 3000
WL2836E11-5/TR	1.1	SOT-23-5L	-40~+85°C	2836 EDYW	Tape and Reel, 3000
WL2836E12-5/TR	1.2	SOT-23-5L	-40~+85°C	2836 EEYW	Tape and Reel, 3000
WL2836E13-5/TR	1.3	SOT-23-5L	-40~+85°C	2836 EFYW	Tape and Reel, 3000
WL2836E15-5/TR	1.5	SOT-23-5L	-40~+85°C	2836 EGYW	Tape and Reel, 3000
WL2836E18-5/TR	1.8	SOT-23-5L	-40~+85°C	2836 EHYW	Tape and Reel, 3000
WL2836E25-5/TR	2.5	SOT-23-5L	-40~+85°C	2836 EKYW	Tape and Reel, 3000
WL2836E27-5/TR	2.7	SOT-23-5L	-40~+85°C	2836 EYYW	Tape and Reel, 3000
WL2836E28-5/TR	2.8	SOT-23-5L	-40~+85°C	2836 ELYW	Tape and Reel, 3000
WL2836E29-5/TR	2.9	SOT-23-5L	-40~+85°C	2836 EgYW	Tape and Reel, 3000
WL2836E30-5/TR	3.0	SOT-23-5L	-40~+85°C	2836 EMYW	Tape and Reel, 3000
WL2836E33-5/TR	3.3	SOT-23-5L	-40~+85°C	2836 ENYW	Tape and Reel, 3000