WL2801E

Low noise, High PSRR, High speed, CMOS LDO

Http://www.willsemi.com

Descriptions

The WL2801E series is a high accuracy, low noise, high speed, 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 current limiter's fold-back circuit also operates as a short circuit protection and an output current limiter at the output pin.
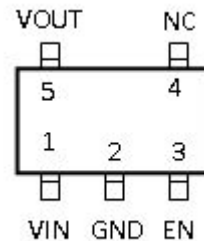
The WL2801E regulators are available in standard SOT-23-5L packages. Standard products are Pb-free and Halogen-free.

SOT-23-5L

Features

- Input voltage   : 2.7V~5.5V
- Output range   : 1.2V~3.3V
- Output current   : 200mA (@Vout<2V)(Typ.)
-                        300mA (@Vout>2V)(Typ.)
- PSRR   : 75dB @ 217Hz
- Dropout voltage   : 170mV @ I_{OUT}=200mA
- Quiescent current : 70μA Typ.
- Shut-down current : < 0.1μA
- Recommend capacitor : 1uF

Pin Configuration (Top View)

Applications

- MP3/MP4 Players
- Cellphones, radiophone, digital cameras
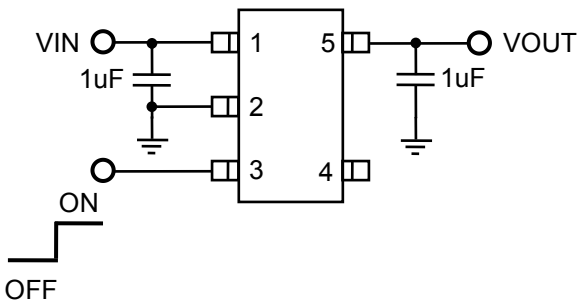- Bluetooth, wireless handsets
- Others portable electronics device
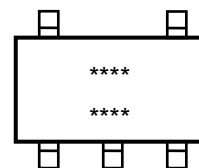
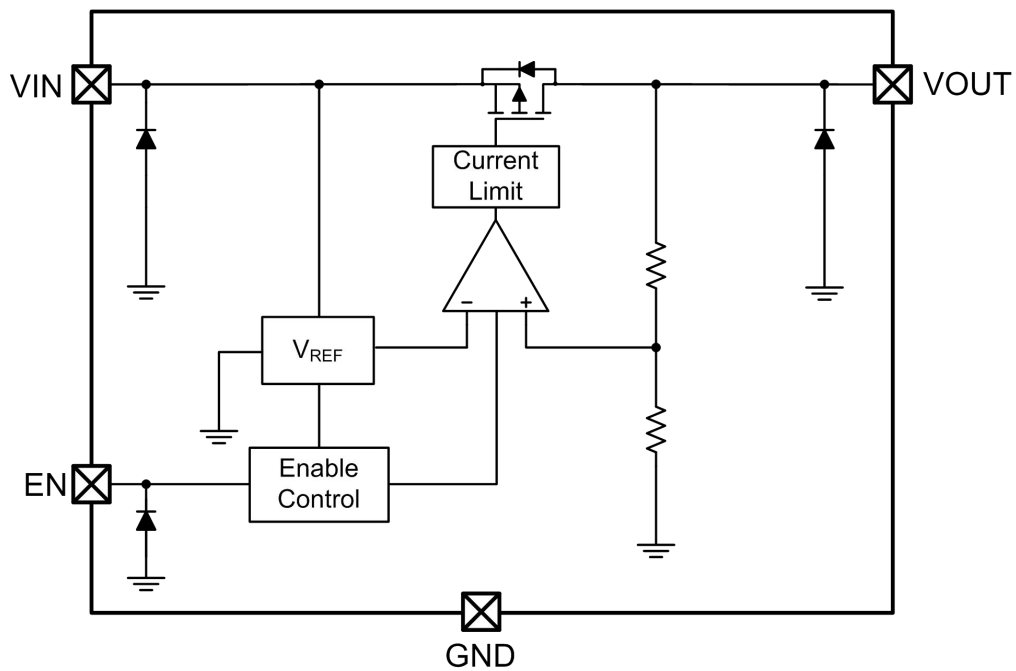For detail marking information, please see page 9.

Marking

Order Information

For detail order information, please see page 9.

Typical Application

VIN

1uF

ON

OFF

| 1 | 5 | VOUT |

| 2 | | 1uF |

| 3 | 4 | |

Pin Description

PIN	Symbol	Description
1	VIN	Input
2	GND	Ground
3	EN	Enable (Active high)
4	NC	Not connected
5	VOUT	Output

Block Diagram

VIN

VOUT

Current Limit

V_{REF}

EN

Enable Control

GND

Absolute Maximum Ratings

Parameter	Value	Unit
Power Dissipation	Internal limited	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
Lead Temperature Range	260	ºC
Storage Temperature Range	-55 ~ 150	ºC
Operating Junction Temperature Range	150	ºC

Recommend Operating Ratings

| Parameter	Value	Unit
Operating Supply voltage	2.7~5.5	V
Operating Temperature Range	-40~85	ºC
Thermal Resistance, $R_{\theta JA}$	250	ºC/W

Electronics Characteristics (Ta=25ºC, V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1uF, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	V_{OUT} <2V, V_{IN}=2.7V, I_{OUT}=1mA	0.97 V_{OUT}	V_{OUT}	1.03 V_{OUT}	V
		$V_{OUT} \geqq$ 2V, I_{OUT}=1mA	0.98 V_{OUT}	V_{OUT}	1.02 V_{OUT}	
Current Limit	I_{LIM}	V_{EN}=V_{IN}	Ref. to Output Voltage vs. Output Current Chart			mA
Dropout Voltage	V_{DROP}	V_{OUT}=2.8V, I_{OUT}=200mA		170	200	mV
		V_{OUT}=2.8V, I_{OUT}=300mA		250	300	
Line Regulation	$\triangle V_{LINE}$	V_{IN}=2.7~5.5V, I_{OUT}=1mA		0.01	0.15	%/V
Load Regulation	$\triangle V_{Load}$	V_{OUT}=2.8V , I_{OUT}=1~300mA		20	30	mV
Quiescent Current	I_Q	V_{OUT}=2.8V, I_{OUT}=0		70	100	µA
Short Current	I_{SHORT}	V_{EN}=V_{IN}, V_{OUT} Short to GND with 1Ω		170		mA
Shut-down Current	I_{SHDN}	V_{EN}=0V		0.1	1.0	µA
Power Supply Rejection Rate	PSRR	V_{IN}=(V_{OUT}+1V)$_{DC}$+0.5V_{P-P} F=217Hz ,Iout=10mA		75		dB
		V_{IN}=(V_{OUT}+1V)$_{DC}$+0.5V_{P-P} F=10KHz, Iout=10mA		65		
EN logic high voltage	V_{ENH}	V_{IN}=5.5V, I_{OUT}=1mA	1.2			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			1.0	µA
Output Noise Voltage	e_{NO}	10Hz to 100KHz, C_{OUT}=1µF		100		µV_{RMS}

Typical characteristics (Ta=25°C, V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1uF, unless otherwise noted)
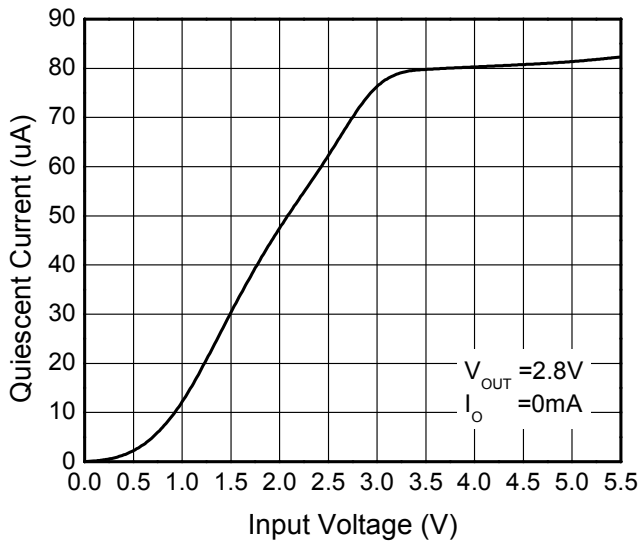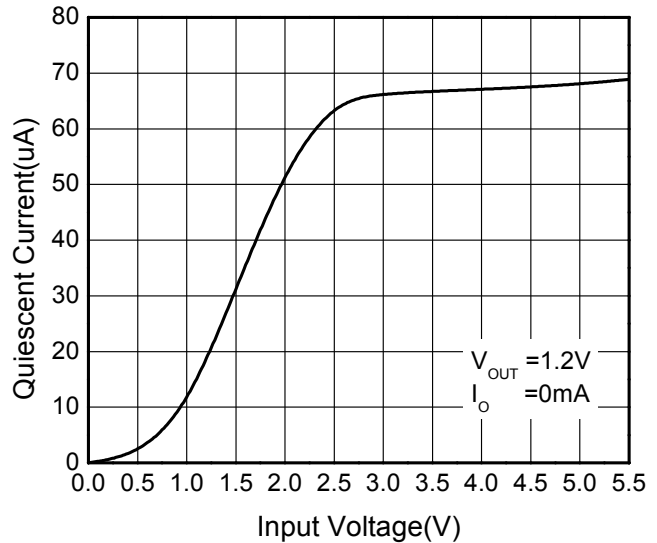
V_{OUT} =2.8V
I_o =0mA

Quiescent current vs. Supply voltage

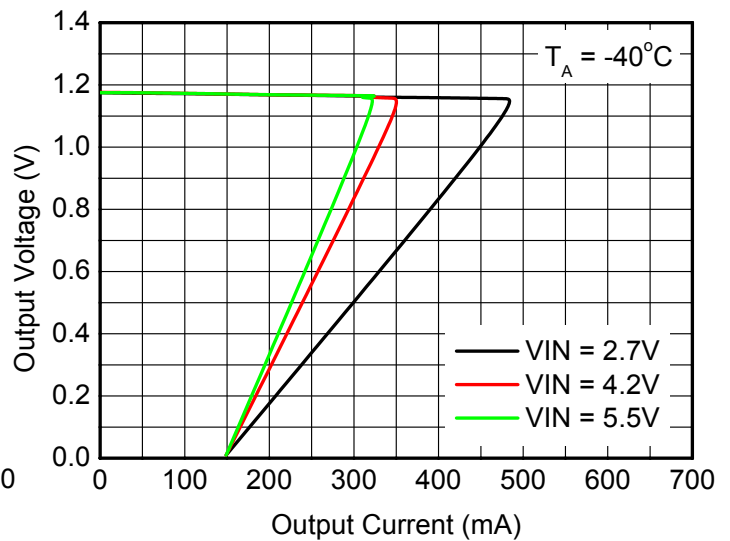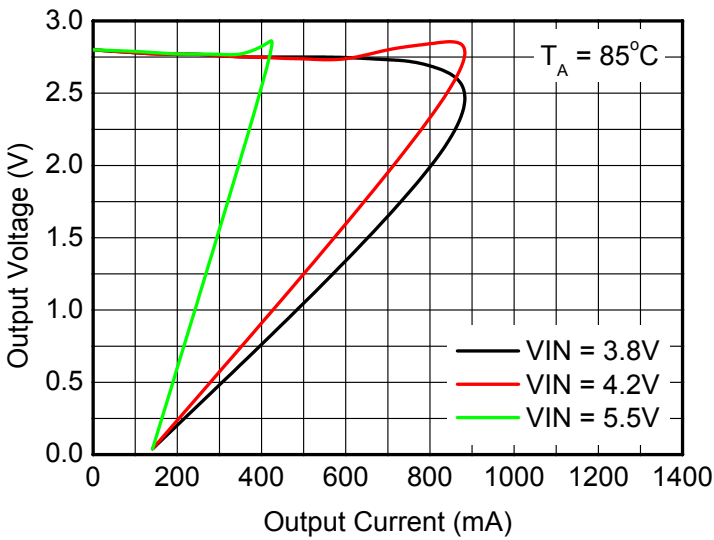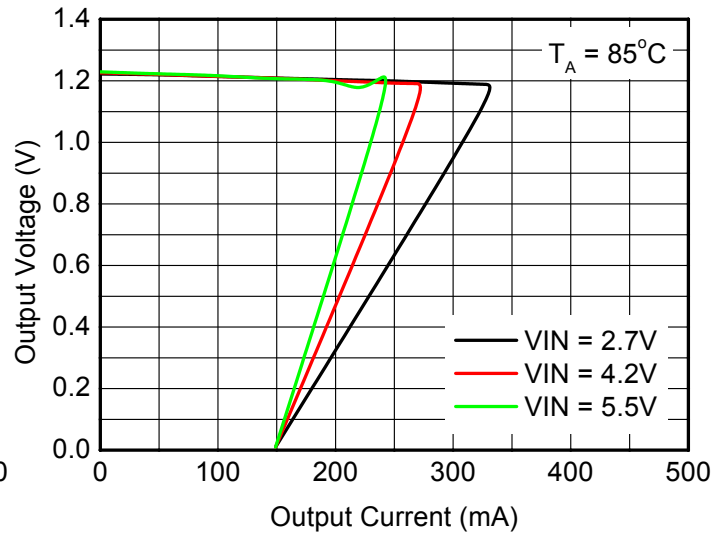V_{OUT} =1.2V
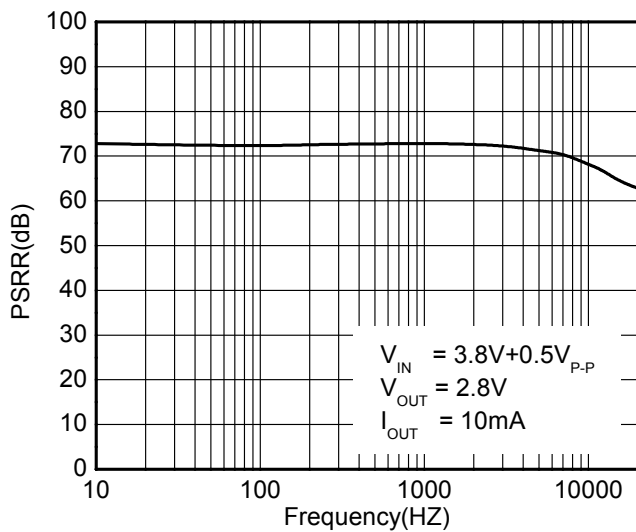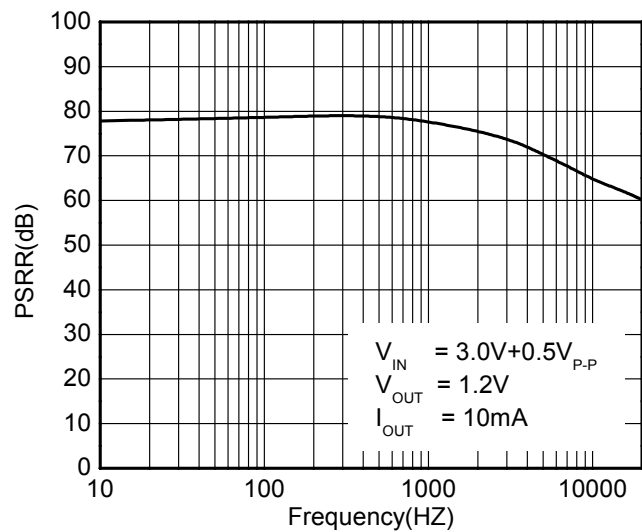I_o =0mA

Quiescent current vs. Supply voltage

I_O=1mA

I_O=200mA

Output voltage vs. Supply voltage

I_O=1mA

I_O=200mA

Output voltage vs. Supply voltage

T_A = -40°C

VIN = 3.8V
VIN = 4.2V
VIN = 5.5V

Output voltage vs. Output current

T_A = -40°C

VIN = 2.7V
VIN = 4.2V
VIN = 5.5V

Output voltage vs. Output current

Output voltage vs. Output current

Output voltage vs. Output current

Output voltage vs. Output current

Output voltage vs. Output current

$V_{IN} = 3.8V+0.5V_{P-P}$
$V_{OUT} = 2.8V$
$I_{OUT} = 10mA$

PSRR

$V_{IN} = 3.0V+0.5V_{P-P}$
$V_{OUT} = 1.2V$
$I_{OUT} = 10mA$
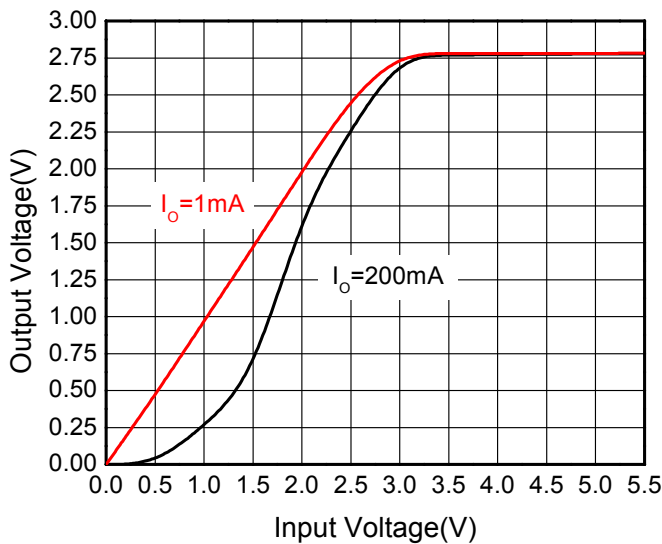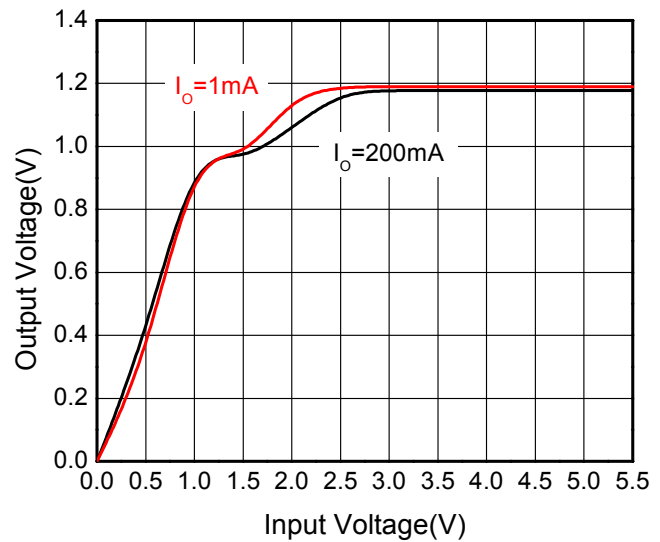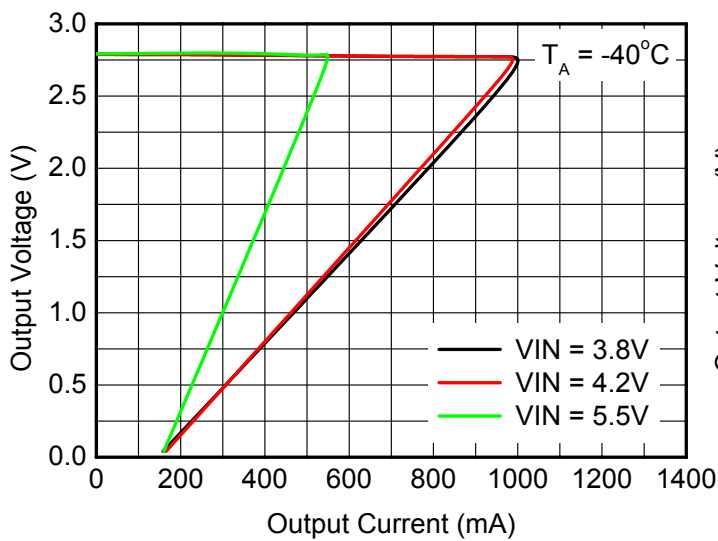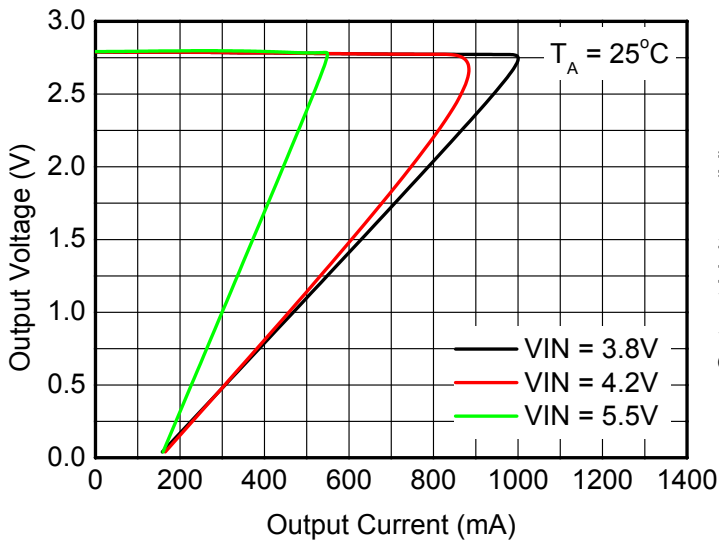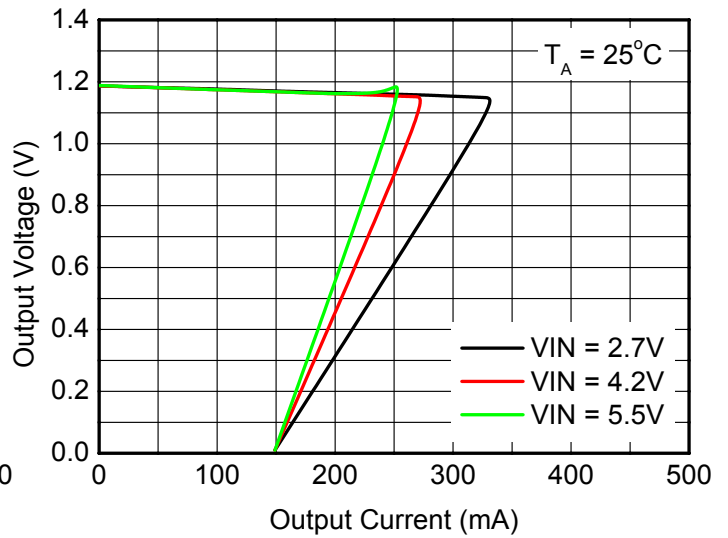
PSRR
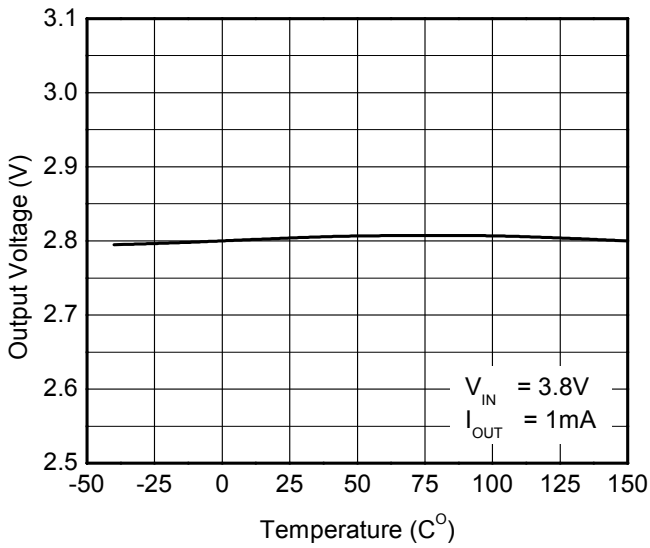
Output voltage vs. Temperature
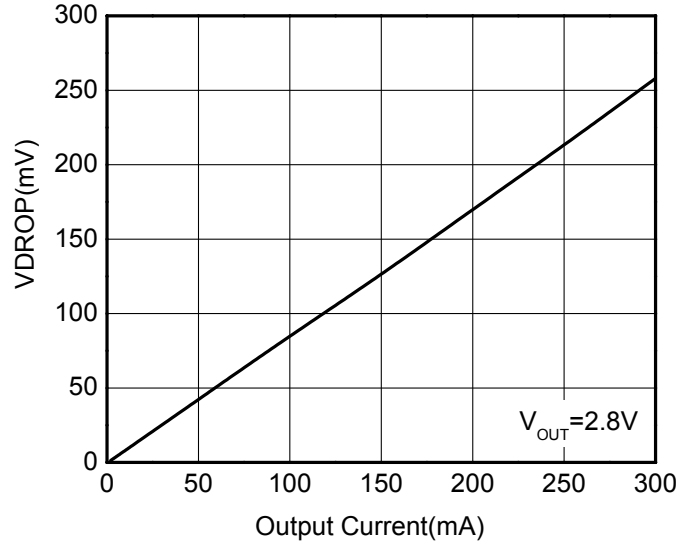
Output voltage vs. Temperature
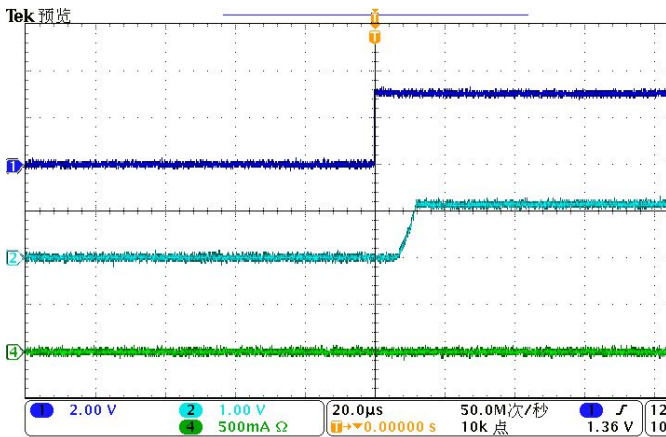
Start Up
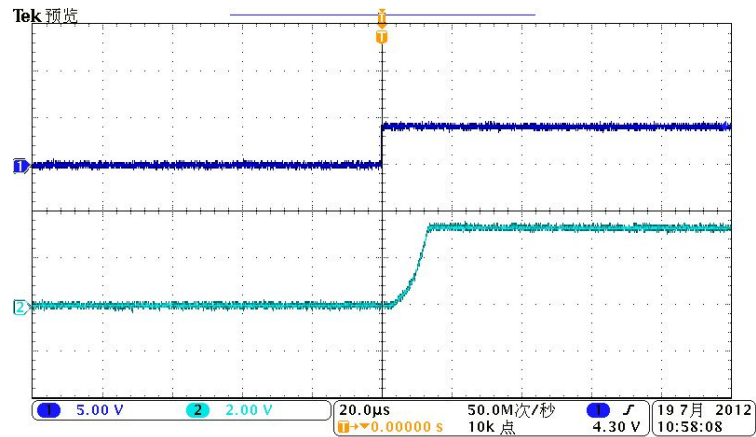
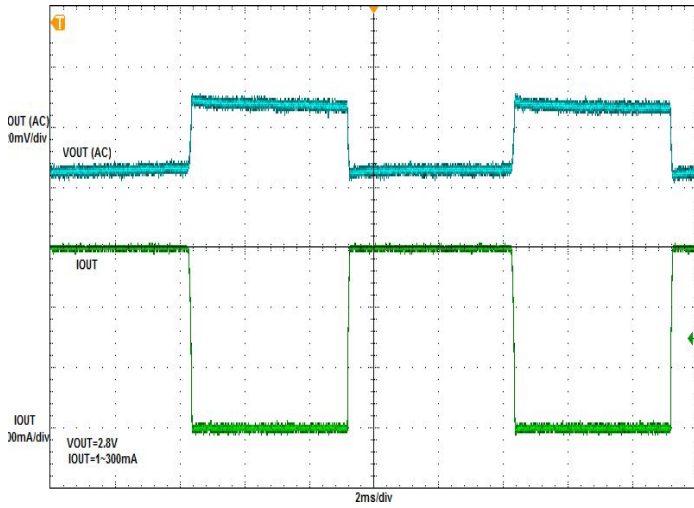
Start Up
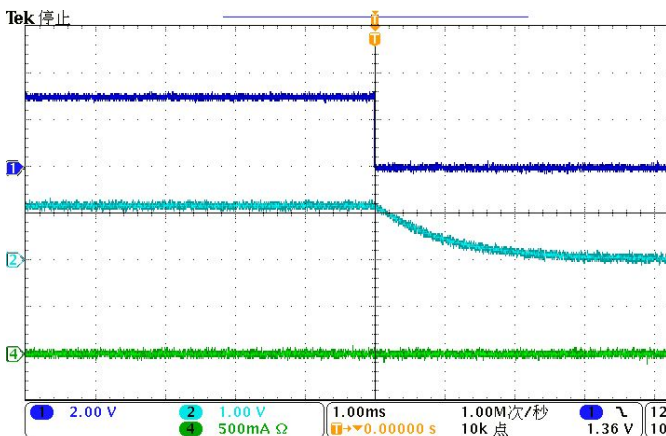
Shutdown
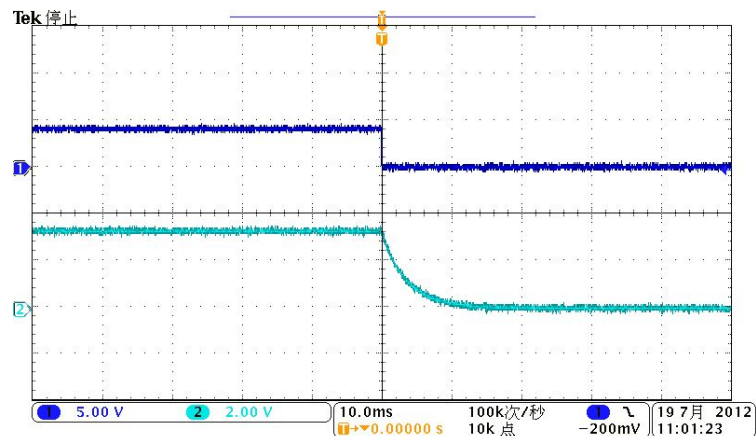
Shutdown

Load Step
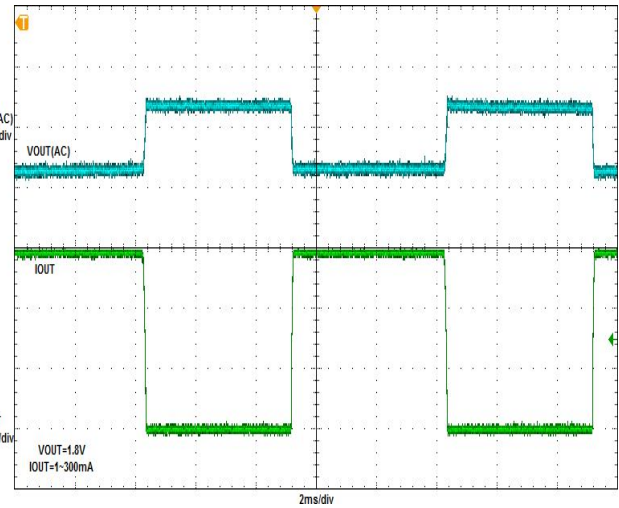
Load Step
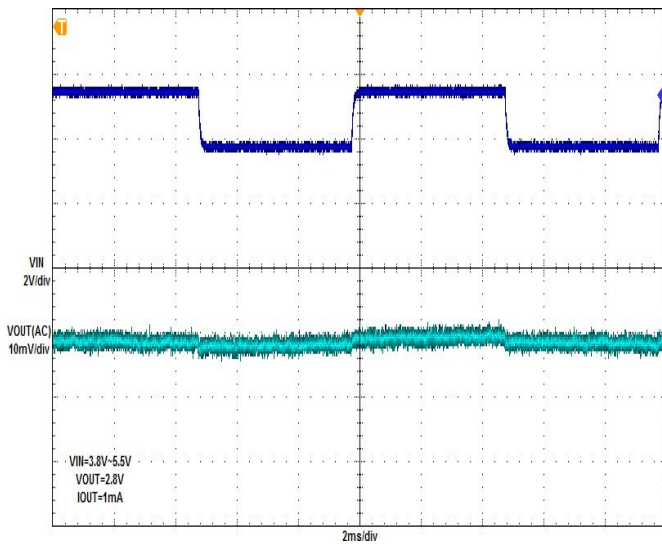
Line Step
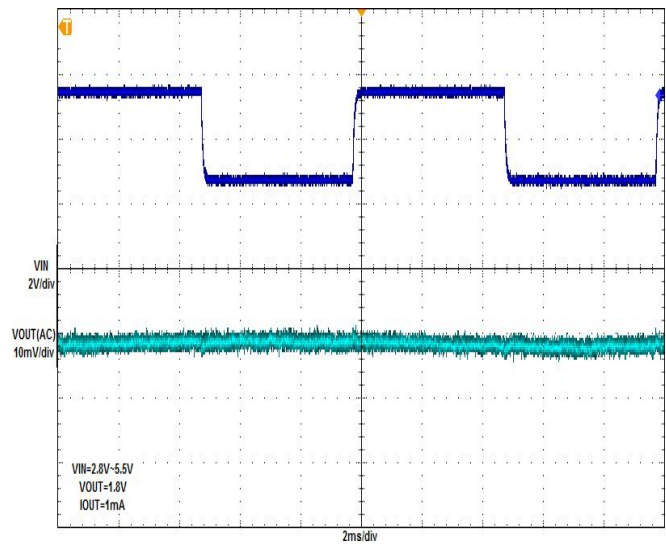
Line Step

Packaging Information

SOT-23-5L
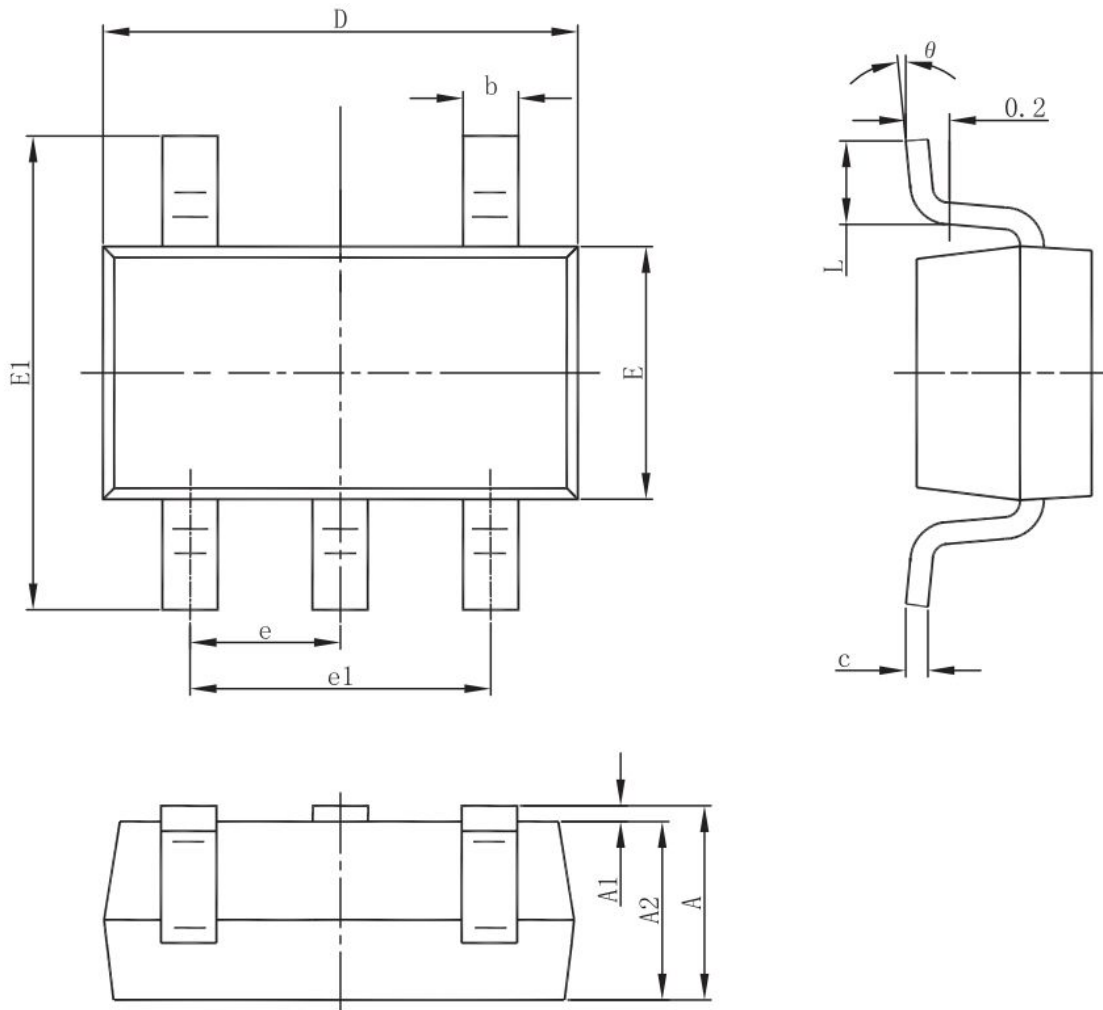
Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	1.050	-	1.250
A1	0.000	-	0.100
A2	1.050	-	1.150
b	0.300	0.4	0.500
c	0.100	-	0.200
D	2.820	2.9	3.020
E	1.500	1.6	1.700
E1	2.650	2.8	2.950
e	0.950 (Basic)		
e1	1.800	1.9	2.000
L	0.300	0.45	0.600
θ	0º	-	8º

ORDER INFORMATION

Ordering No.	Vout (V)	Package	Operating Temperature	Marking	Shipping
WL2801E12-5/TR	1.2	SOT-23-5L	-40~+85°C	WE12 YYWW	Tape and Reel, 3000
WL2801E13-5/TR	1.3	SOT-23-5L	-40~+85°C	WE13 YYWW	Tape and Reel, 3000
WL2801E15-5/TR	1.5	SOT-23-5L	-40~+85°C	WE15 YYWW	Tape and Reel, 3000
WL2801E18-5/TR	1.8	SOT-23-5L	-40~+85°C	WE18 YYWW	Tape and Reel, 3000
WL2801E25-5/TR	2.5	SOT-23-5L	-40~+85°C	WE25 YYWW	Tape and Reel, 3000
WL2801E28-5/TR	2.8	SOT-23-5L	-40~+85°C	WE28 YYWW	Tape and Reel, 3000
WL2801E30-5/TR	3.0	SOT-23-5L	-40~+85°C	WE30 YYWW	Tape and Reel, 3000
WL2801E33-5/TR	3.3	SOT-23-5L	-40~+85°C	WE33 YYWW	Tape and Reel, 3000

Marking:

WE** = Device Code

YY = Year

WW = Week

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