

WL2863E

Ultra-Low Noise, High PSRR LDO, 250mA Linear Regulator for RF and Analog Circuits

[Http://www.ovt.com](http://www.ovt.com)

Descriptions

The WL2863E is a linear regulator capable of supplying 250-mA output current. Designed to meet the requirements of RF and analog circuits, the WL2863E device provides low noise, high PSRR, low quiescent current and very good load /line transients.

The device is designed to work with a 1 μ F input and 1 μ F output ceramic capacitor (no separate noise Operation bypass capacitor is required).

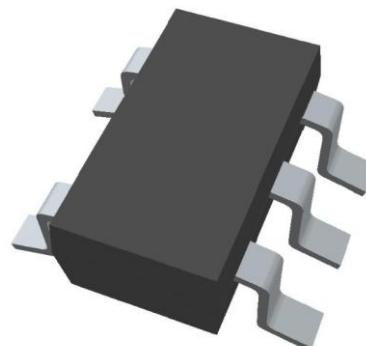
The WL2863E regulators are available in standard SOT-23-5L Package. Standard products are Pb-free and Halogen-free.

Features

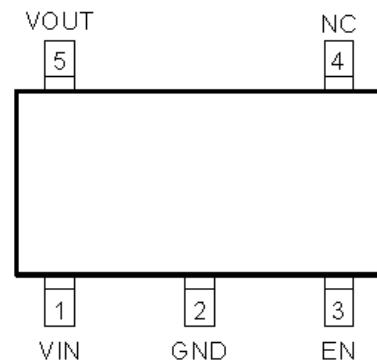
- Input Voltage Range :2.2V~5.5V
- Output Voltage Range :1.2V~4.3V
- Output current :250mA
- PSRR :Typ.100dB at 10mA , f =1KHz
:Typ. 45dB at 10mA , f =1MHz
- Low Dropout :Typ. 115mV at 250mA
- Quiescent current :Typ. 21 μ A
- Low Output Voltage Noise:Typ. 7 μ VRMS
- Output Voltage Tolerance : \pm 2%
- Shutdown Current :Typ. 0.01 μ A
- UVLO Threshold(V) :Typ. 1.90V
- Recommend capacitor :1uF
- Stable with 1 μ F Ceramic Input and Output capacitor
- No Noise Bypass Capacitor Required
- Thermal-Overload Protection

Applications

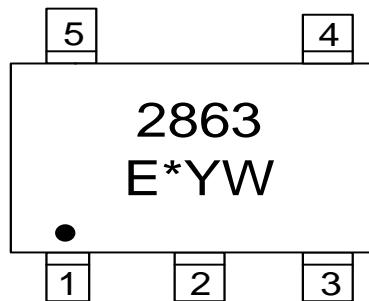
- Cell phones , radiophone, digital cameras
- Bluetooth, wireless handsets
- HiFi products
- Others portable electronics device



SOT-23-5L



Pin Configuration (Top View)



Marking

2863 : Device Code

E : Special Code

*** : Voltage Code**

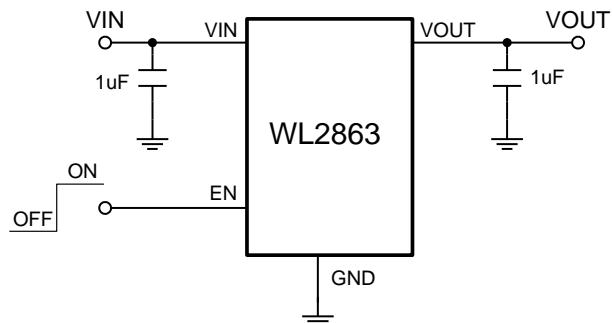
Y : Year Code

W : Week Code

Order Information

For detail order information, please see page 11

Typical Application

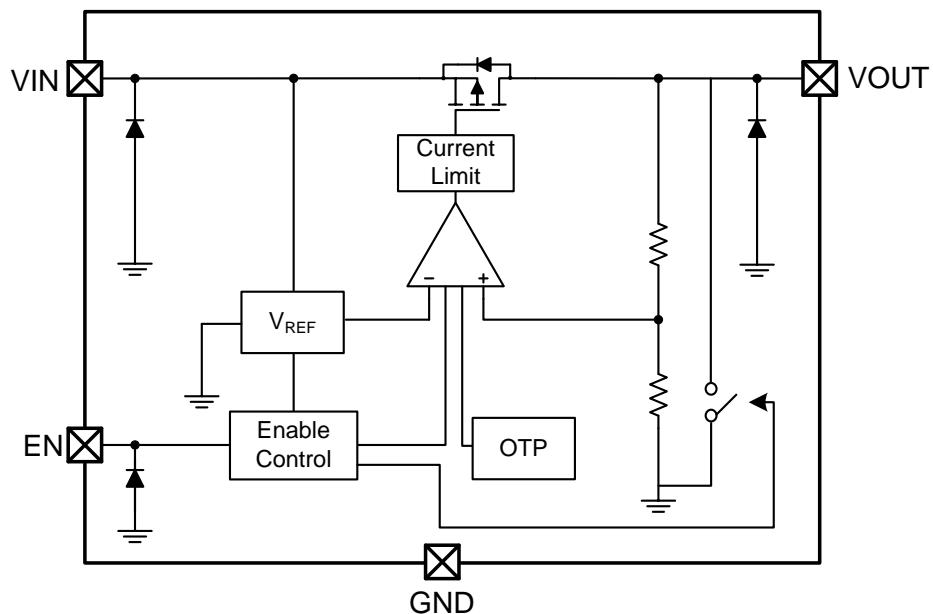


Note : The input and output capacitor must be located a distance of not more than 1 cm

PIN Functions

PIN	Symbol	Description
1	VIN	Input voltage supply pin , 1 μ F capacitor should be connected at this input
2	GND	Common ground connection
3	EN	Chip enable: Applying VEN < 0.4 V disables the regulator, Pulling VEN > 1.2 V enables the LDO.
4	NC	No internal electrical connection
5	VOUT	Regulated output voltage. 1 μ F capacitor should be connected at this input

Block Diagram



Absolute Maximum Ratings

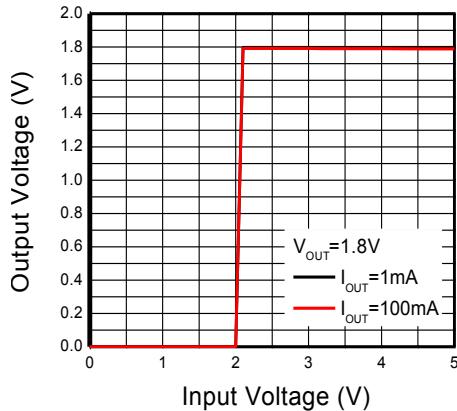
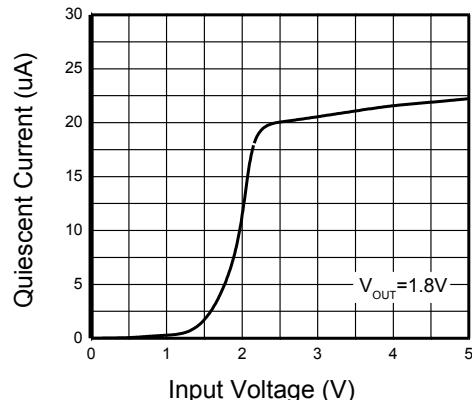
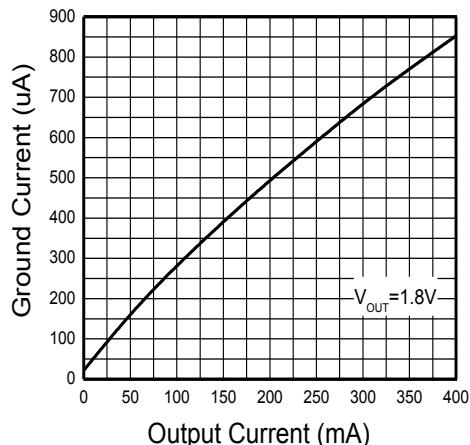
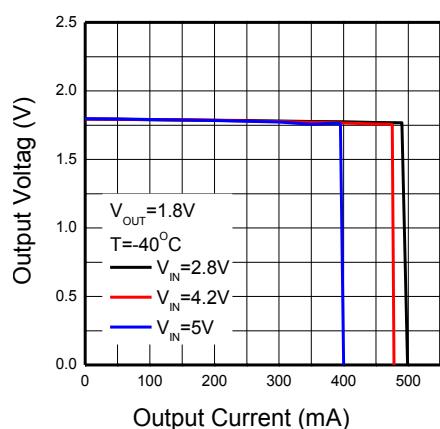
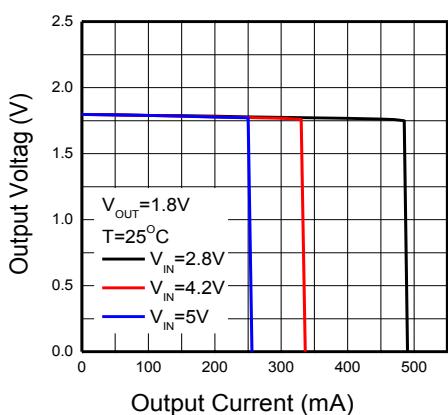
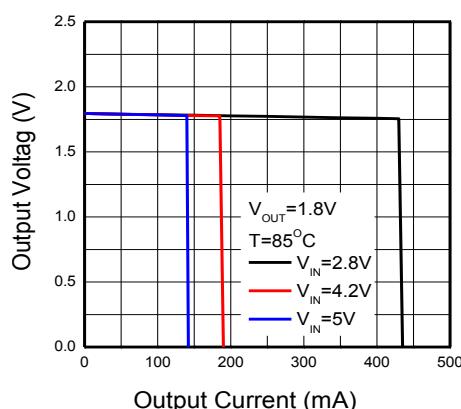
Parameter	Value	Unit
Power Dissipation, $P_D @ T_A = 25^\circ C$	Internally Limited	mW
V_{IN} Range	-0.3 ~ 6.0	V
V_{EN} Range	-0.3 to $V_{IN} + 0.3$	V
V_{OUT} Range	-0.3 to $V_{IN} + 0.3$	V
I_{OUT}	300	mA
Lead Temperature Range	260	$^\circ C$
Storage Temperature Range	-55 ~ 150	$^\circ C$
Operating Junction Temperature Range	150	$^\circ C$
ESD Ratings	HBM	2000
	MM	200

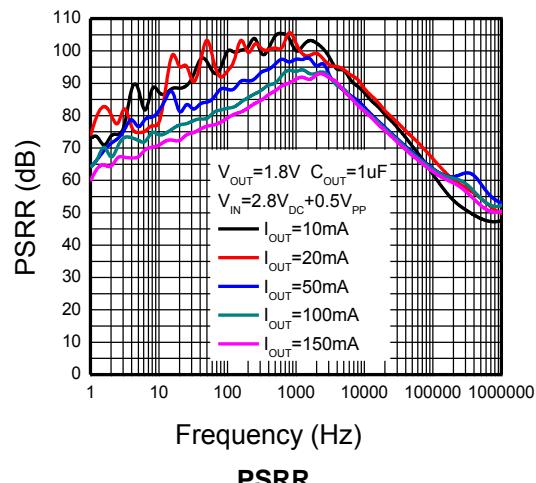
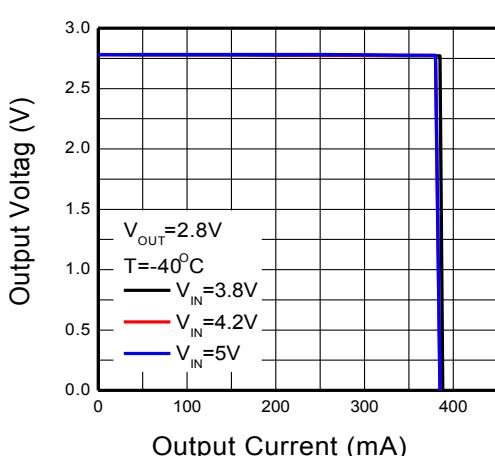
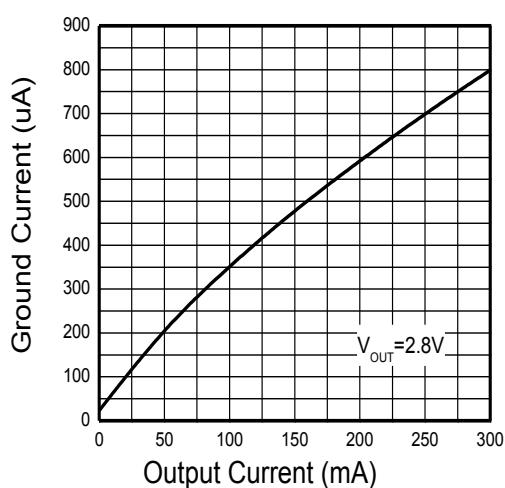
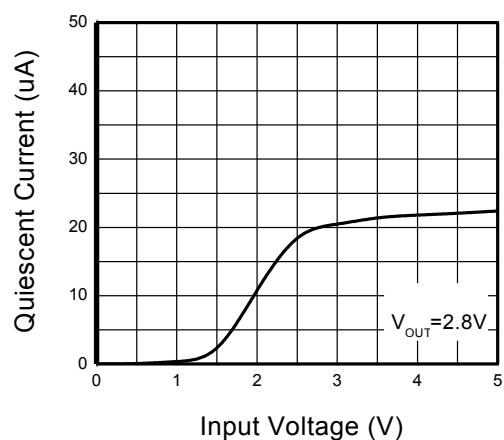
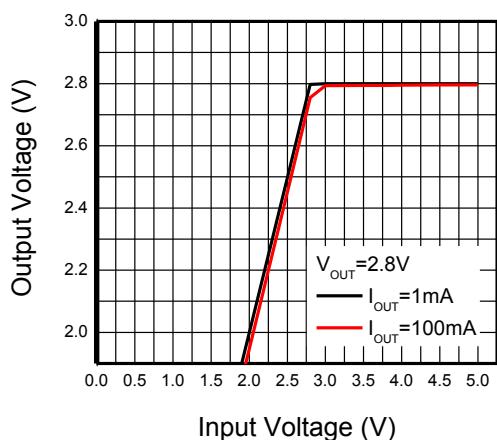
Recommend Operating Ratings

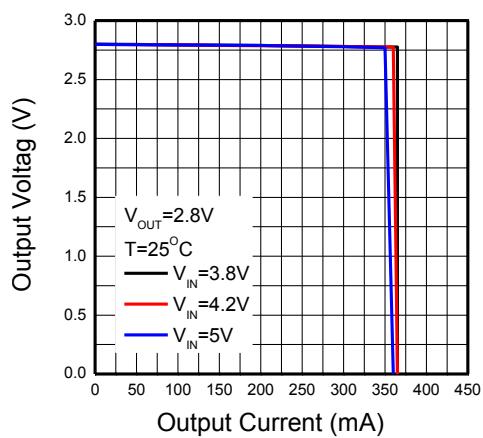
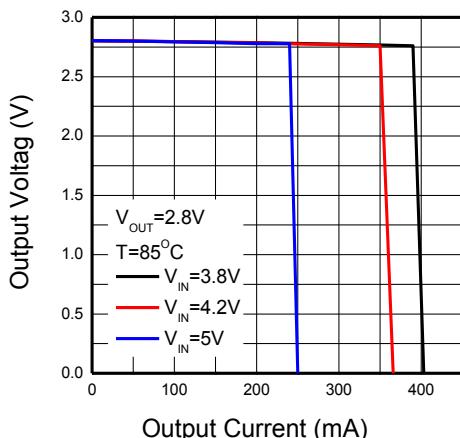
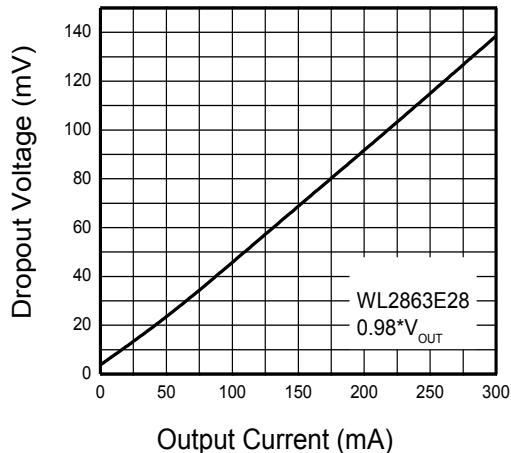
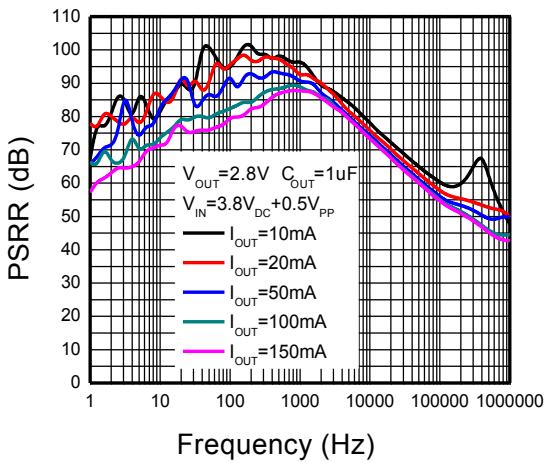
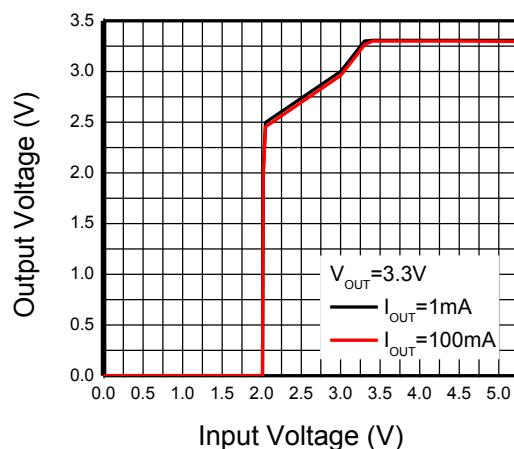
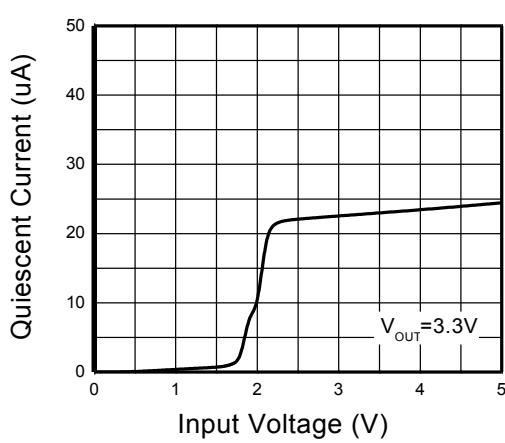
Parameter	Value	Unit
Operating Supply voltage	2.2 ~ 5.5	V
Operating Temperature Range	-40 ~ 85	$^\circ C$
Thermal Resistance, $R_{\theta JA}$	250	$^\circ C/W$

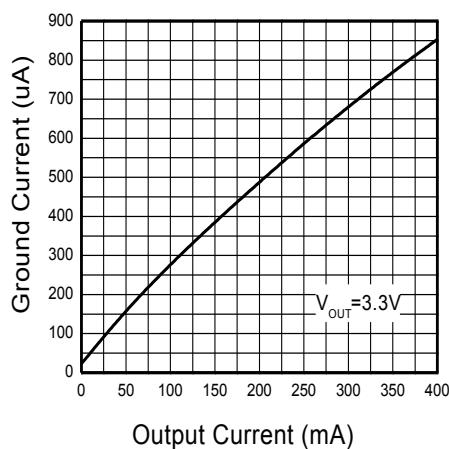
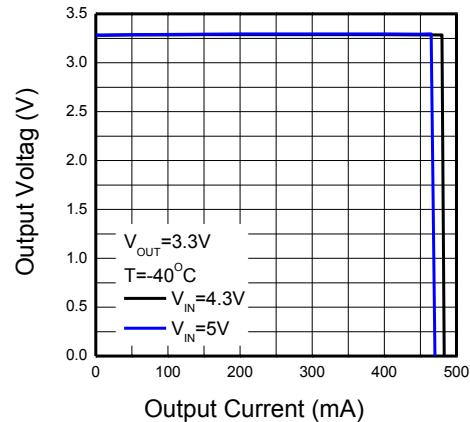
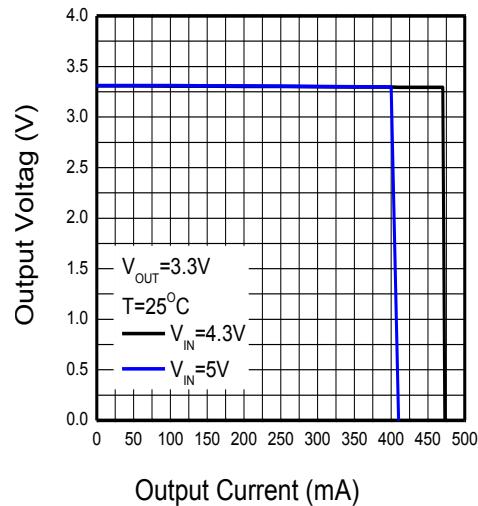
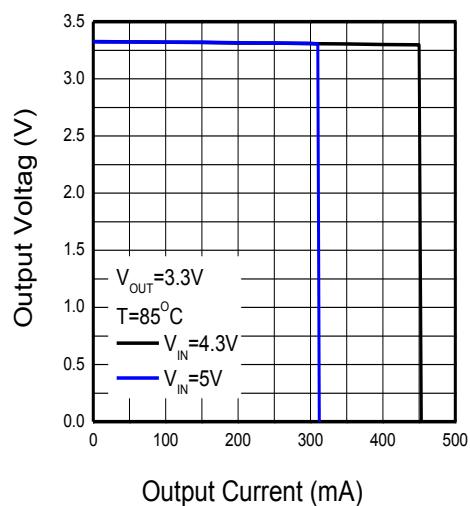
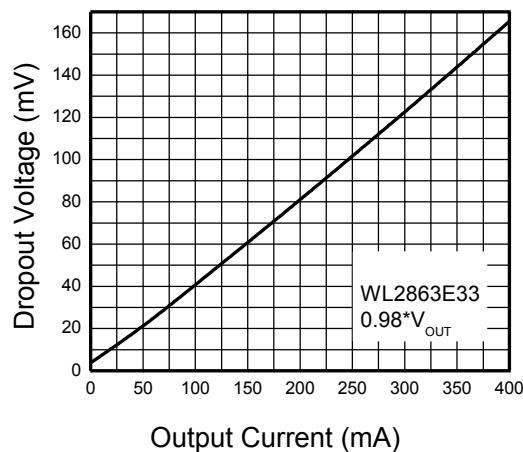
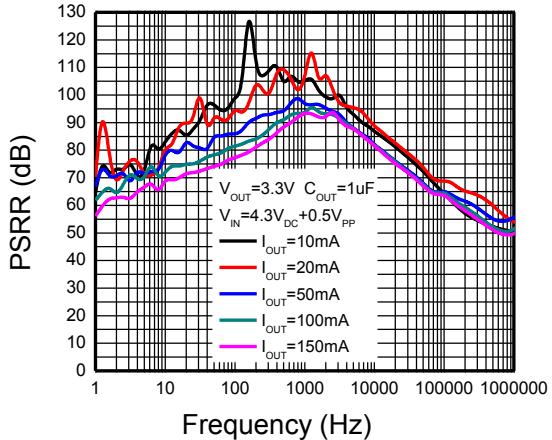
Electronics Characteristics ($V_{IN} = V_{OUT(NOM)} + 1V$, $C_{IN} = C_{OUT} = 1\mu F$, $V_{EN} = 1.2$ V. Typical values are at $T_a = +25^\circ C$, unless otherwise noted)

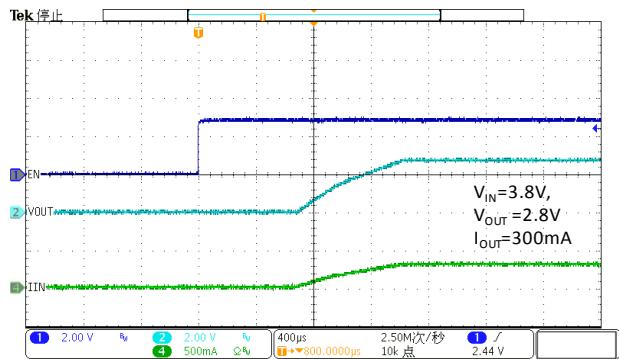
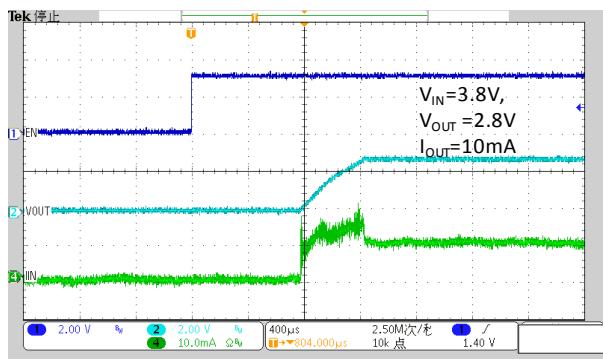
Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
Operating Input Voltage	V_{IN}			2.2		5.5	V
Output Voltage Accuracy	V_{OUT}	$V_{IN} = V_{OUT(NOM)} + 1V$ $I_{OUT}=1mA$		-2		+2	%
Output Current Limit	I_{LIM}	$V_{OUT} = 90\% V_{OUT(NOM)}$		250			mA
Dropout Voltage		$V_{OUT}=2.8V_{(NOM)}$, $I_{OUT}=250mA$			115	170	mV
		$V_{OUT}=3.0V_{(NOM)}$, $I_{OUT}=250mA$			108	162	
		$V_{OUT}=3.3V_{(NOM)}$, $I_{OUT}=250mA$			102	150	
Line Regulation	ΔV_{LINE}	$V_{IN}=2.2V \sim 5V$, $I_{OUT}=1mA$		0.1			mV
Load Regulation	ΔV_{Load}	$I_{OUT}=1 \sim 200mA$		15			mV
Quiescent Current	I_Q	$I_{OUT}=0mA$		21	25		μA
Short Current	I_{SHORT}	$V_{OUT}=0V$		390			mA
Shut-down Current	I_{SHDN}	$V_{EN} \square 0.4$ V, $V_{IN} = 4.8$ V		0.01	1.0		μA
Power Supply Rejection Rate	$PSRR$	$I_{OUT} = 10mA$	$f=100Hz$ $f=1KHz$ $f=100KHz$ $f=1MHz$	95 100 60 45			dB
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	μA
Turn-On Time		$C_{OUT} = 1\mu F$, From assertion of V_{EN} to $V_{OUT} = 95\% V_{OUT}$ (NOM)			1.5		mS
Output Voltage Noise	e_{NO}	$10Hz$ to $100KHz$,	$I_{OUT} = 1mA$ $I_{OUT} = 200mA$	7 5			$\mu VRMS$
Thermal shutdown threshold	T_{SDH}	Temperature rising			150		$^\circ C$
	T_{SDL}	Temperature falling			120		$^\circ C$
Under voltage lock out threshold	V_{UVLO}				1.9		V
Active Output Discharge Resistance	R_{LOW}	$V_{EN}<0.4V$		300			Ω
Line Transient	$Tran_{LINE}$	$V_{IN} = (V_{OUT(NOM)} + 2 V)$ to $(V_{OUT(NOM)} + 1 V)$ in 30 us, $I_{OUT} = 1 mA$		-1			mV
		$V_{IN} = (V_{OUT(NOM)} + 1 V)$ to $(V_{OUT(NOM)} + 2 V)$ in 30 us, $I_{OUT} = 1 mA$				+1	
Load Transient	$Tran_{LOAD}$	$I_{OUT} = 1$ mA to 200 mA in 10 us		-10			mV
		$I_{OUT} = 200$ mA to 1 mA in 10 us				+10	

Typical characteristics ($T_a=25^\circ C$, $V_{IN}=V_{OUT}+1 V$, $C_{IN}=C_{OUT}=1\mu F$, unless otherwise noted)
 $V_{OUT}=1.8V$

Output voltage vs. Supply voltage

Quiescent current vs. Supply voltage

Ground Current vs. Output Current

Output voltage vs. Output current

Output voltage vs. Output current

Output voltage vs. Output current


 $V_{OUT}=2.8V$


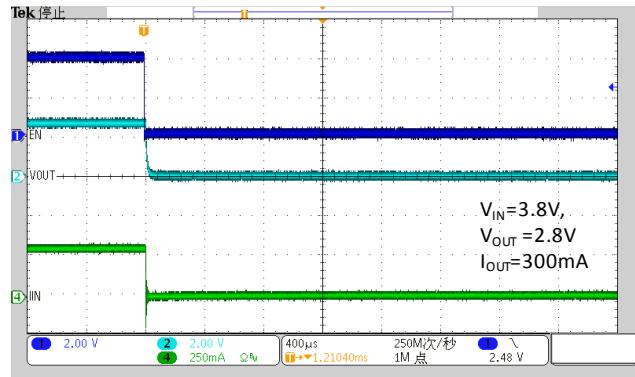
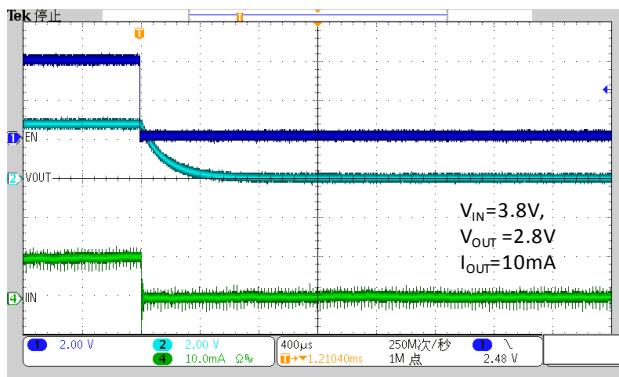

Output voltage vs. Output current

Output voltage vs. Output current

Dropout Voltage vs. Output Current

PSRR
 $V_{\text{OUT}} = 3.3\text{V}$

Output voltage vs. Supply voltage

Quiescent current vs. Supply voltage


Ground Current vs. Output Current

Output voltage vs. Output current

Output voltage vs. Output current

Output voltage vs. Output current

Dropout Voltage vs. Output Current

PSRR



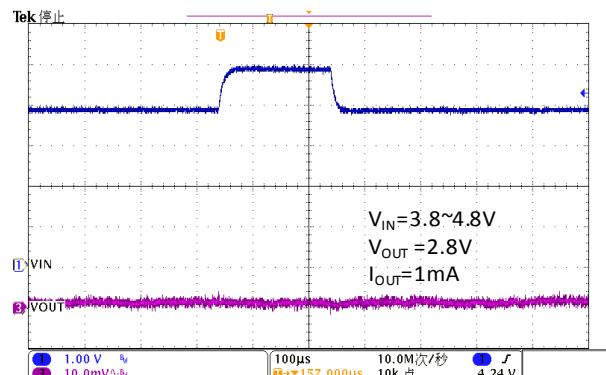
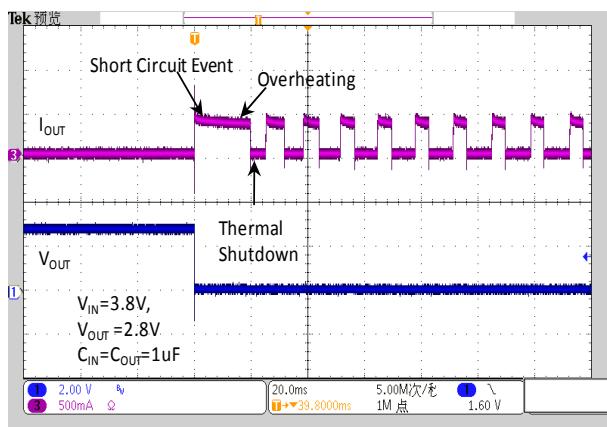
Soft-Start From EN

Soft-Start From EN



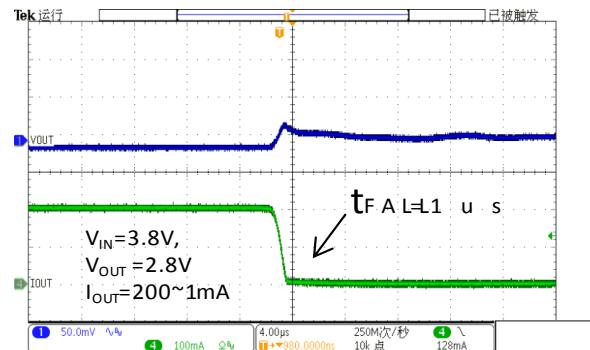
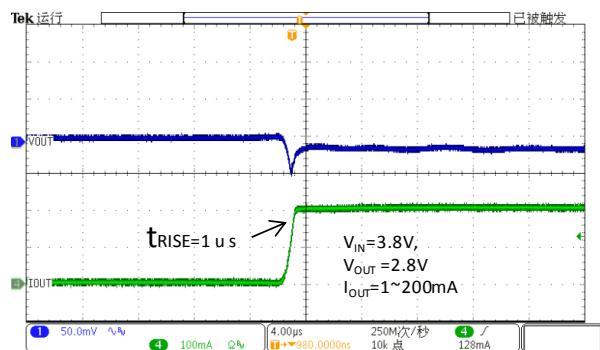
EN Shutdown

EN Shutdown



Short Circuit and Thermal Shutdown

Line Transient Response



ORDER INFORMATION

Ordering No.	Vout (V)	Package	Operating Temperature	Marking	Shipping
WL2863E12-5/TR	1.2	SOT-23-5L	-40~+85°C	2863 EEYW	Tape and Reel, 3000
WL2863E15-5/TR	1.5	SOT-23-5L	-40~+85°C	2863 EGYW	Tape and Reel, 3000
WL2863E18-5/TR	1.8	SOT-23-5L	-40~+85°C	2863 EHYW	Tape and Reel, 3000
WL2863E25-5/TR	2.5	SOT-23-5L	-40~+85°C	2863 EKYW	Tape and Reel, 3000
WL2863E28-5/TR	2.8	SOT-23-5L	-40~+85°C	2863 ELYW	Tape and Reel, 3000
WL2863E29-5/TR	2.9	SOT-23-5L	-40~+85°C	2863 EgYW	Tape and Reel, 3000
WL2863E30-5/TR	3.0	SOT-23-5L	-40~+85°C	2863 EMYW	Tape and Reel, 3000
WL2863E33-5/TR	3.3	SOT-23-5L	-40~+85°C	2863 ENYW	Tape and Reel, 3000

Marking

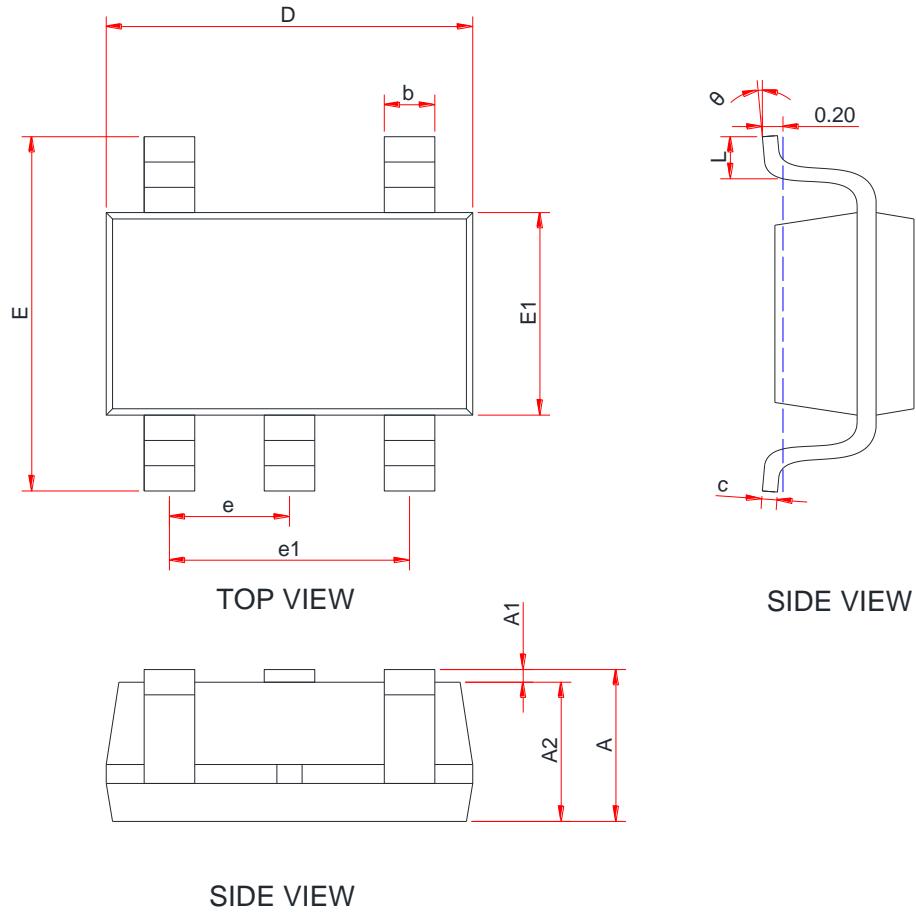
2863 : Device Code

E : Special Code

***** : Voltage Code

Y : Year Code

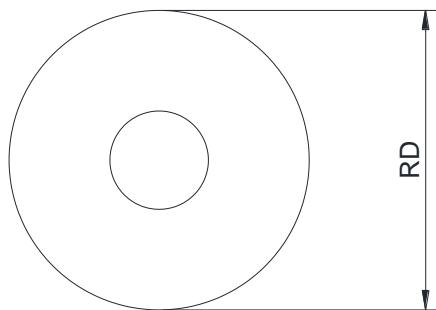
W : Week Code

PACKAGE OUTLINE DIMENSIONS
SOT-23-5L


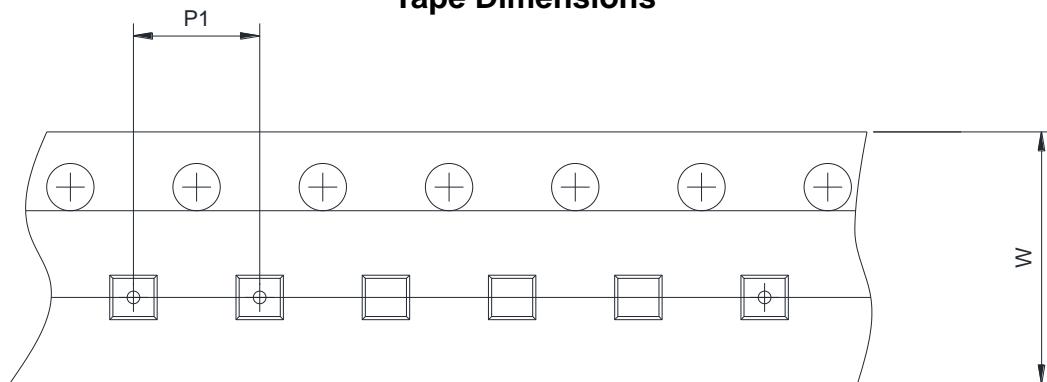
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	-	-	1.45
A1	0.00	-	0.15
A2	0.90	1.10	1.30
b	0.30	0.40	0.50
c	0.10	-	0.21
D	2.72	-	3.05
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95 BSC		
e1	1.95 BSC		
L	0.30	-	0.60
θ	8 ° Ref.		

TAPE AND REEL INFORMATION

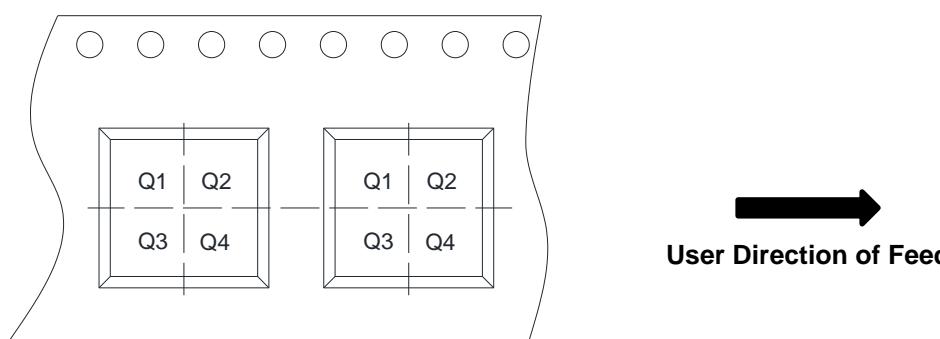
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



RD	Reel Dimension	<input checked="" type="checkbox"/> 7inch <input type="checkbox"/> 13inch
W	Overall width of the carrier tape	<input checked="" type="checkbox"/> 8mm <input type="checkbox"/> 12mm <input type="checkbox"/> 16mm
P1	Pitch between successive cavity centers	<input type="checkbox"/> 2mm <input checked="" type="checkbox"/> 4mm <input type="checkbox"/> 8mm
Pin1	Pin1 Quadrant	<input type="checkbox"/> Q1 <input type="checkbox"/> Q2 <input checked="" type="checkbox"/> Q3 <input type="checkbox"/> Q4