WL2003E

300mA, Low noise, High PSRR，RF LDO

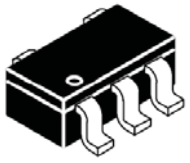
Http://www.willsemi.com

Descriptions

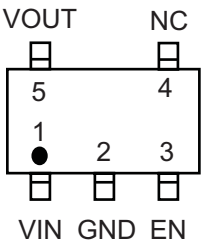
The WL2003E series are 300mA low dropout linear regulators and optimized to provide a high performance solution for battery power system to deliver low quiescent current. The WL2003E series are designed for portable RF and wireless applications to deliver ultra low output noise and high PSRR. The devices offer a new level of cost effective performance in cellular phones, laptop and notebook computers, and other portable devices.

The WL2003E series are designed to make use of low cost ceramic capacitors which ensure the stability of the output current, and enhance the efficiency in order to prolong the battery life of those portable devices.

The WL2003E regulators are available in standard SOT-23-5L package. Standard products are Pb-free and Halogen-free



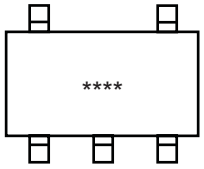
SOT-23-5L



Pin Configuration (Top View)

Features

- Input voltage : 2.5V ~ 5.5V
- Output voltage : 1.2V ~ 3.3V
- Output current : 300mA
- PSRR : 70dB @ 1KHz
- Output noise : 100uV
- Quiescent current : 120μA
- Shut-down current : < 0.1μA
- Dropout voltage : 120mV
- Recommend capacitor : 1uF
- Operating Temperature : -40 ~ +85 °C
- Over current/over temperature protection



For detail marking information, please see page 7.

Marking

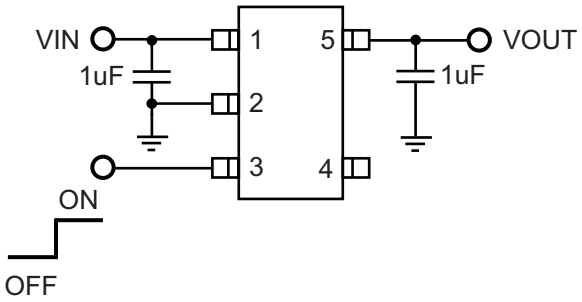
Applications

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

Order Informations

For detail order information, please see page 7.

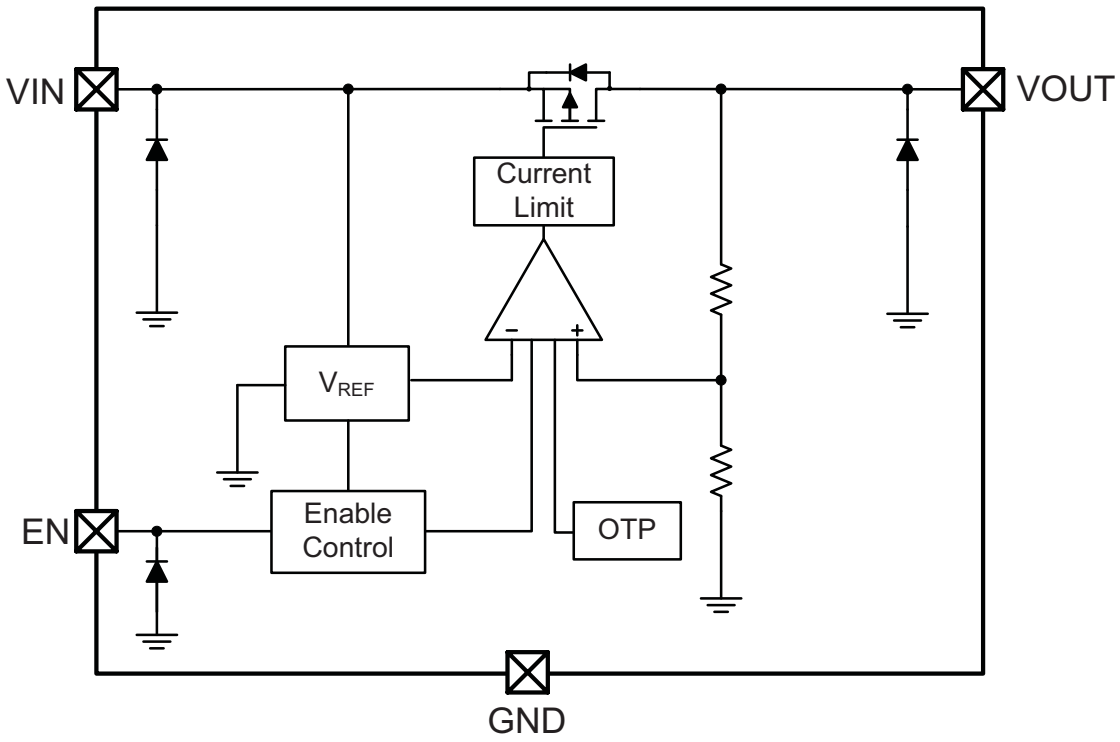
Typical Applications



Pin Descriptions

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

Block Diagram



Absolute Maximum Ratings

Parameter	Value	Unit
Power Dissipation	500	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	°C
Storage Temperature Range	-55 ~ 150	°C
Operating Junction Temperature Range	150	°C
ESD Rating (HBM)	±8000	V
ESD Rating (MM)	±1000	V
ESD Rating (CDM)	±4000	V

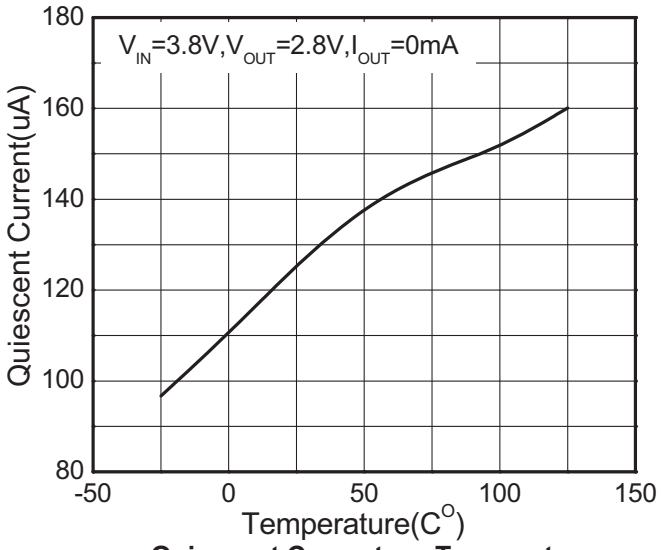
Recommend Operating Ratings

Parameter	Value	Unit
Thermal Resistance, $R_{\theta JA}$	250	°C/W
Operating Temperature Range	-40～85	°C

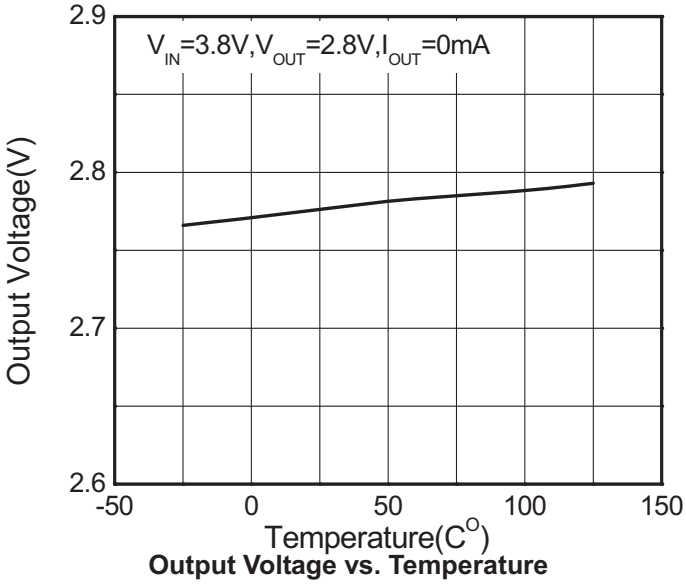
Electronics Characteristics (T_A=25°C, V_{IN} =V_{OUT}+1V, C_{IN}=C_{OUT}=1uF, Unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	V_{OUT}	V_{OUT} < =1.5V		±30		mV
		V_{OUT} > 1.5V		±2		%
Current Limit	I_{LIM}	V_{IN} = Vout+1V	400			mA
Dropout Voltage	V_{DROP}	I_{OUT}=200mA, Vout=2.8V		120	200	mV
		I_{OUT}=300mA, Vout=2.8V		190	300	
Line Regulation	$\triangle V_{LINE}$	V_{IN}=2.5~5.5V, I_{OUT}=1mA		0.03	0.15	%/V
Load Regulation	$\triangle V_{Load}$	V_{IN}=3.8V, I_{OUT} = 1~ 300mA		22	30	mV
Quiescent Current	I_Q	V_{EN}>1.2V, $_{OUT}$=0		120	150	uA
Shut-down Current	I_{SHDN}	V_{IN}=3.3V,EN=0V		0.1	1.0	uA
Power Supply Rejection Rate	PSRR	F=100Hz ,I_{OUT}=10 mA,0.5Vpp		70		dB
		F=10KHz, I_{OUT}=10mA,0.5Vpp		67		
EN logic high voltage	V_{ENH}	V_{IN}=V_{OUT}+1V, Start-up	1.2			V
EN logic low voltage	V_{ENL}	V_{IN}=V_{OUT}+1V, Shutdown			0.4	V
EN Input Current	I_{EN}	VEN= 0 to 5V			1.0	uA
Output Noise Voltage	e_{NO}	10Hz to 100KHz, I_{OUT}=200mA, C_{OUT}=1uF		100		uV_{p-p}
Thermal Shutdown Temperature	T_{SD}			165		°C
Thermal Shutdown Hysteresis	ΔT_{SD}			30		°C

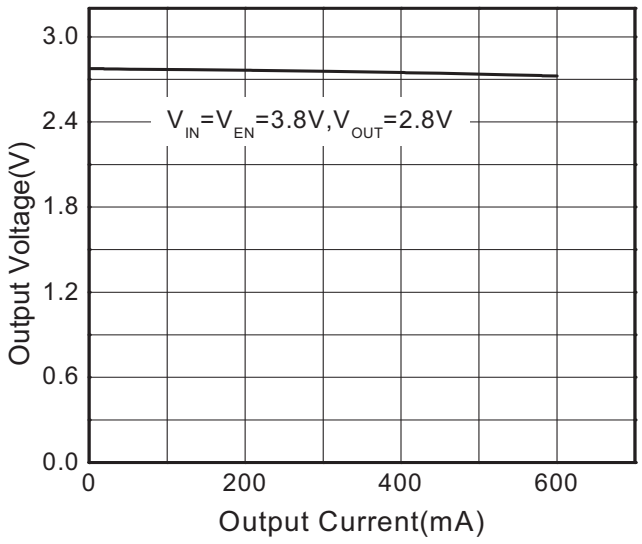
Typical Characteristics



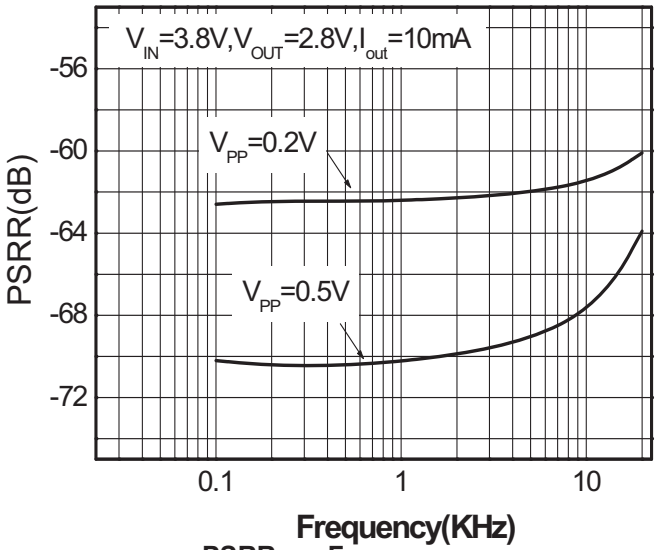
Quiescent Current vs. Temperature



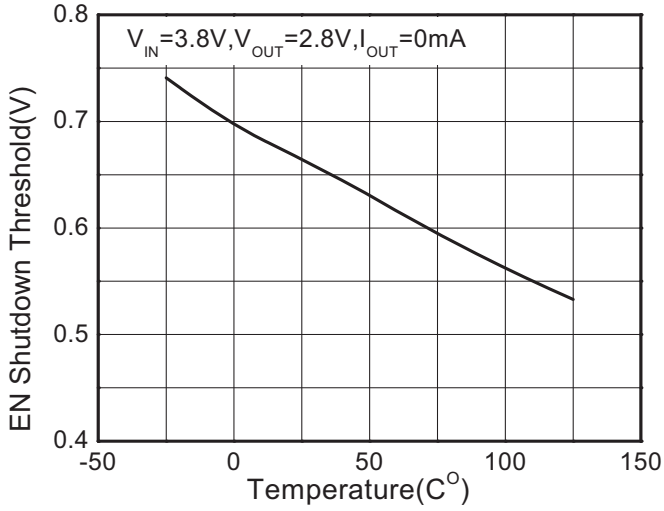
Output Voltage vs. Temperature



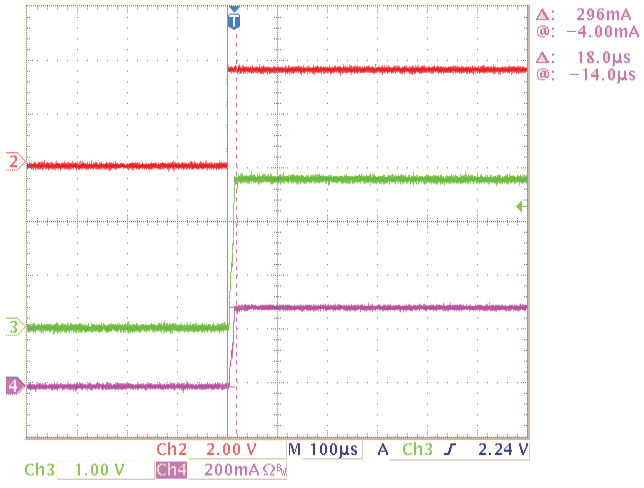
Output Voltage vs. Output Current



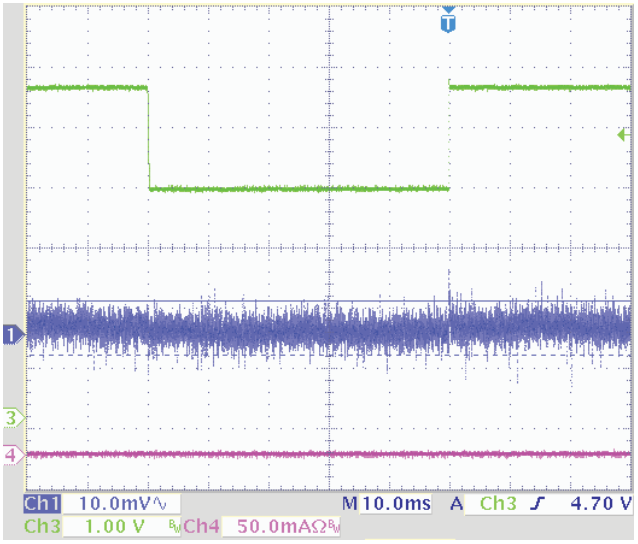
PSRR vs. Frequency



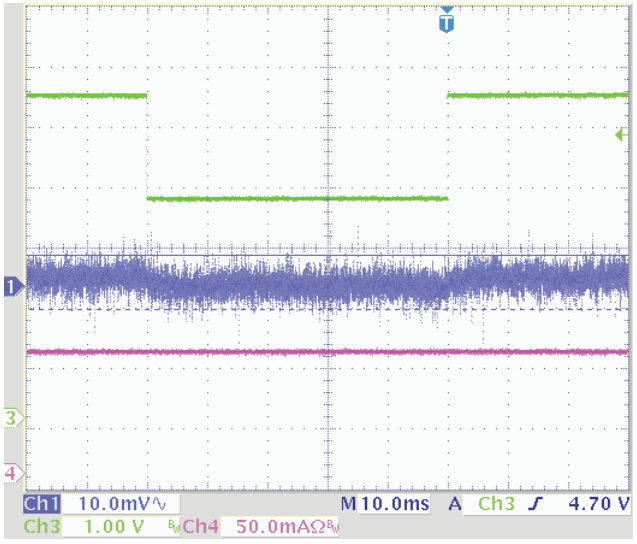
EN Shutdown Threshold vs. Temperature



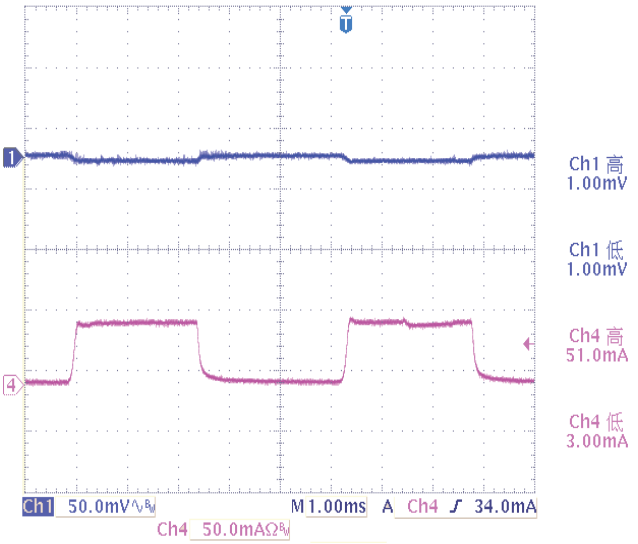
Start Up



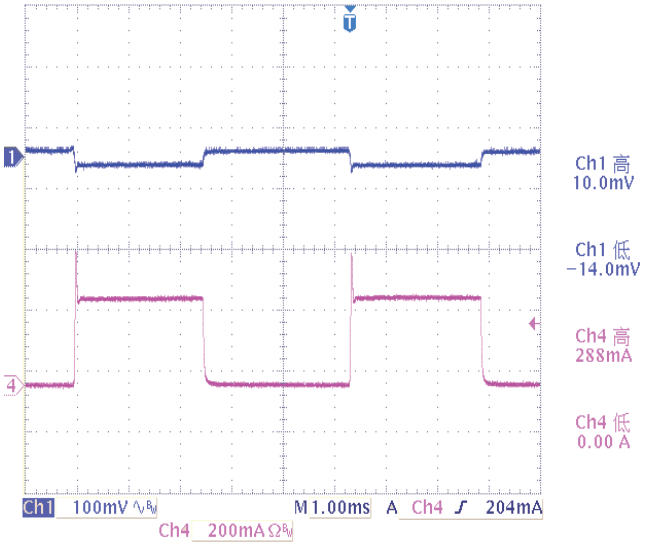
Line Regulation



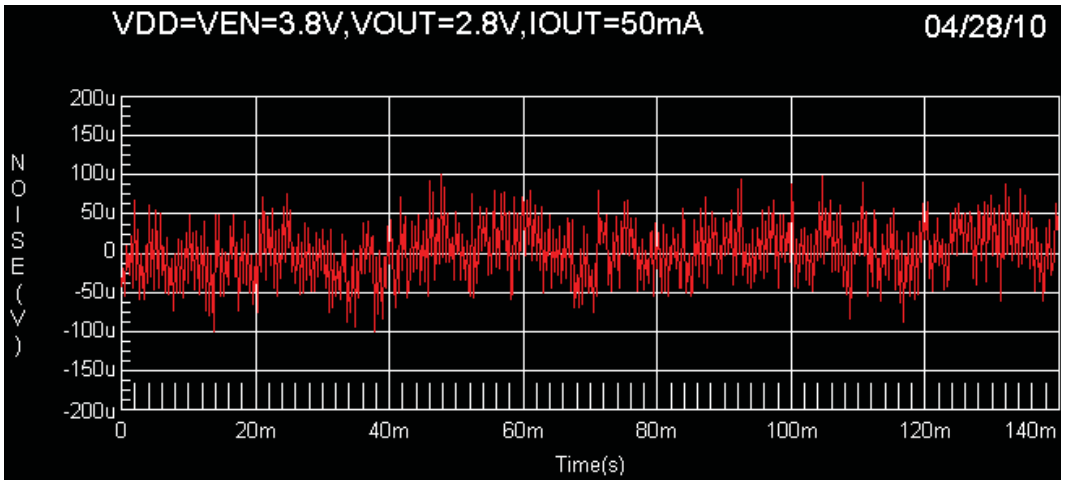
Line Regulation



Load Regulation



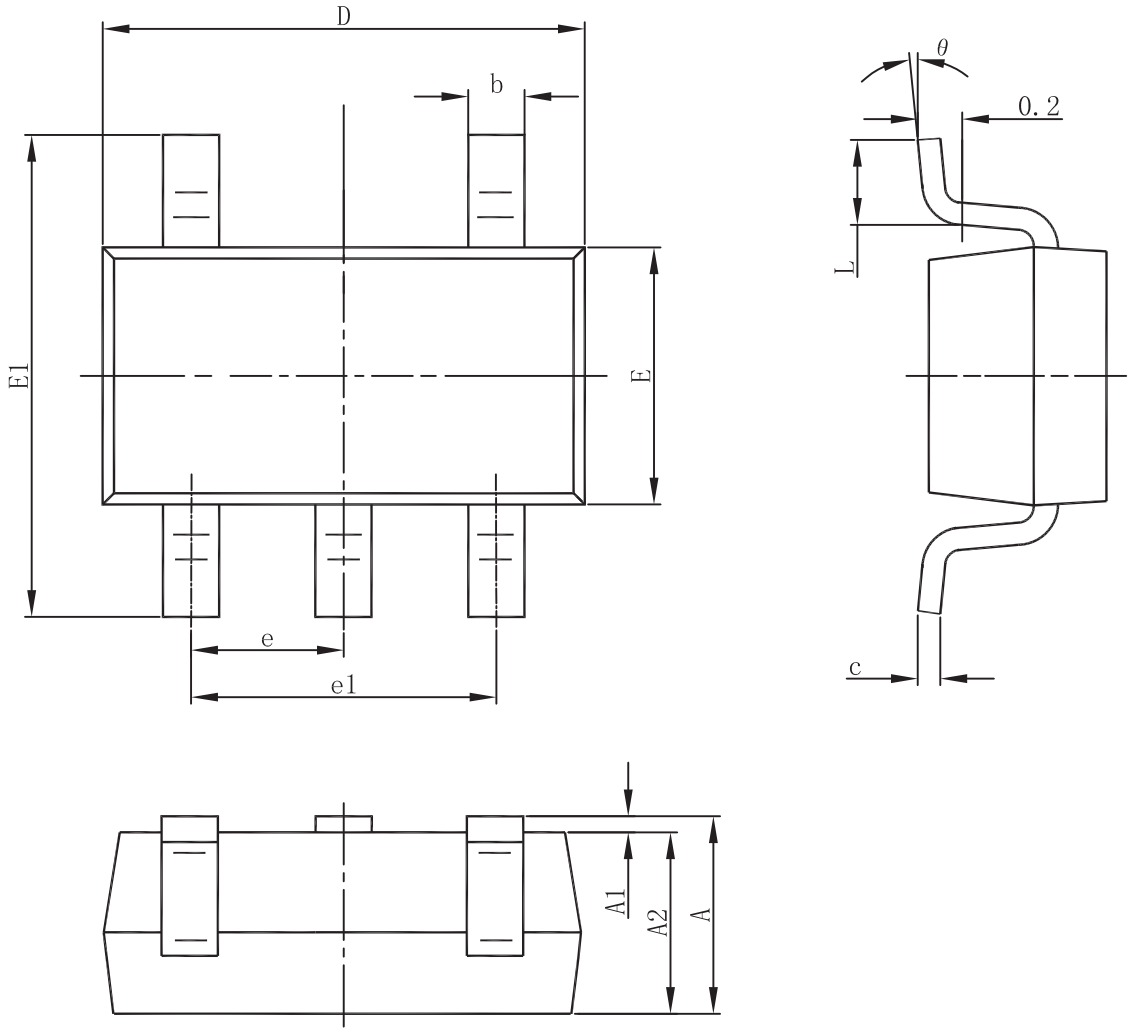
Load Regulation



Output Noise (VDD by Battery)

Package outline dimensions

SOT-23-5L



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950(Basic)	
e1	1.800	2.000
L	0.300	0.600
θ	0°	8°

ORDER INFORMATION

Ordering No.	Vout (V)	Package	Operating Temperature	Marking	Shipping
WL2003E12G-5/TR	1.2	SOT-23-5L	-40~+85°C	WL12 YYWW	Tape and Reel, 3000
WL2003E13G-5/TR	1.3	SOT-23-5L	-40~+85°C	WL13 YYWW	Tape and Reel, 3000
WL2003E15G-5/TR	1.5	SOT-23-5L	-40~+85°C	WL15 YYWW	Tape and Reel, 3000
WL2003E18G-5/TR	1.8	SOT-23-5L	-40~+85°C	WL18 YYWW	Tape and Reel, 3000
WL2003E25G-5/TR	2.5	SOT-23-5L	-40~+85°C	WL25 YYWW	Tape and Reel, 3000
WL2003E28G-5/TR	2.8	SOT-23-5L	-40~+85°C	WL28 YYWW	Tape and Reel, 3000
WL2003E30G-5/TR	3.0	SOT-23-5L	-40~+85°C	WL30 YYWW	Tape and Reel, 3000
WL2003E33G-5/TR	3.3	SOT-23-5L	-40~+85°C	WL33 YYWW	Tape and Reel, 3000
WL2003E125G-5/TR	1.25	SOT-23-5L	-40~+85°C	W125 YYWW	Tape and Reel, 3000

Marking:

W* = Device Code**

YY = Year

WW = Week