

WL2004

300mA, Low noise, High PSRR, LDO

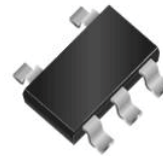
[Http://www.willsemi.com](http://www.willsemi.com)

Descriptions

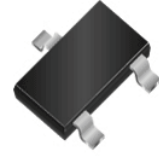
The WL2004 series are 300mA low dropout linear regulators and optimized to provide a high performance solution for battery power system to deliver low quiescent current. The WL2004 series are designed for portable RF and wireless applications to deliver ultra low output noise and high PSRR. The devices offer a new level of cost effective performance in cellular phones, laptop and notebook computers, and other portable devices.

The WL2004 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.

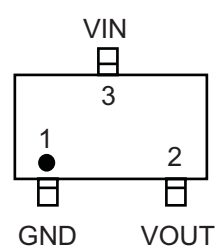
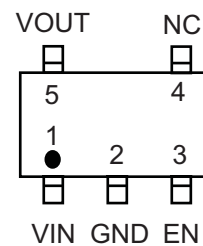
The WL2004 regulators are available in SOT-23-5L packages and SOT-23-3L package. WL2004 series are Pb-free and Halogen free products.



SOT-23-5L



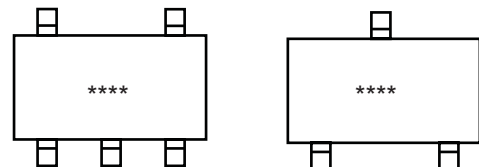
SOT-23-3L



Pin Configuration (Top View)

Features

- Input voltage : 2.2V ~ 5.5V
- Output voltage : 1.2V ~ 3.3V
- Output current : 300mA
- PSRR : 70dB @ 1KHz
- Output noise : 100uV
- Quiescent current : 120µA Typ.
- Shut-down current : < 0.1µA
- Dropout voltage : 190mV @ 300mA
- Recommend capacitor : 1uF
- Operating Temperature : -40 ~ +85 °C
- Over current/over temperature protection



For detail marking information please see page 8, 9.

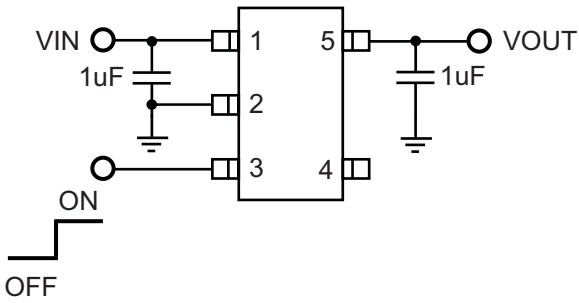
Marking

Applications

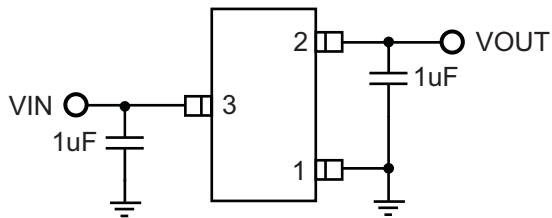
- MP3/MP4 Players
- Cellphones, radiophone, digital cameras
- Bluetooth, wireless handsets
- Others electronics devices

Order Information

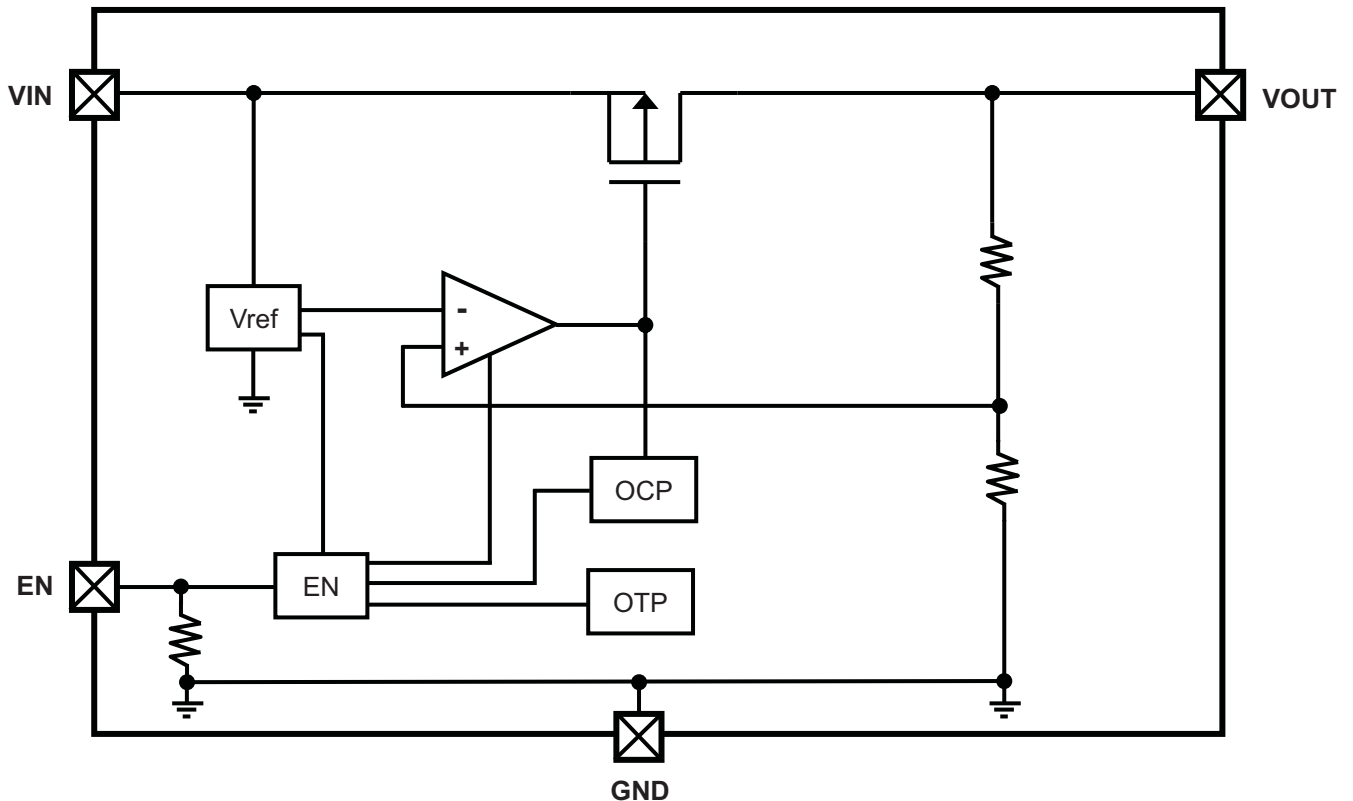
For detail order information please see page 8, 9.

Typical Application

Pin Description

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



PIN	Symbol	Description
1	GND	Ground
2	VOUT	Output
3	VIN	Input

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	-65 ~ 150	°C
Operating Junction Temperature Range	150	°C

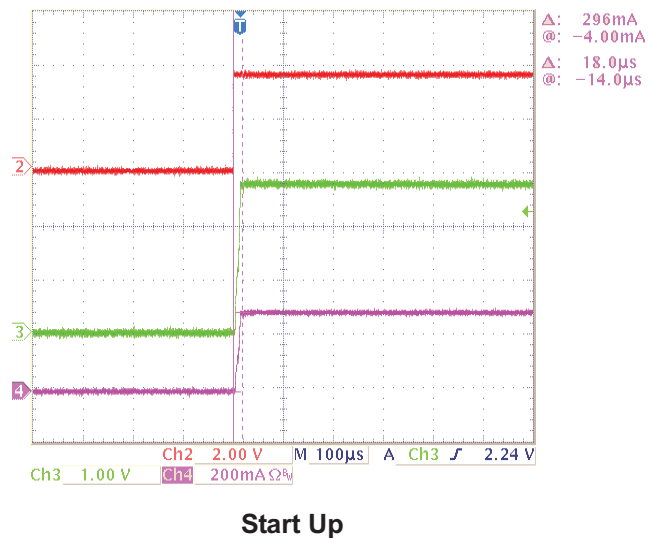
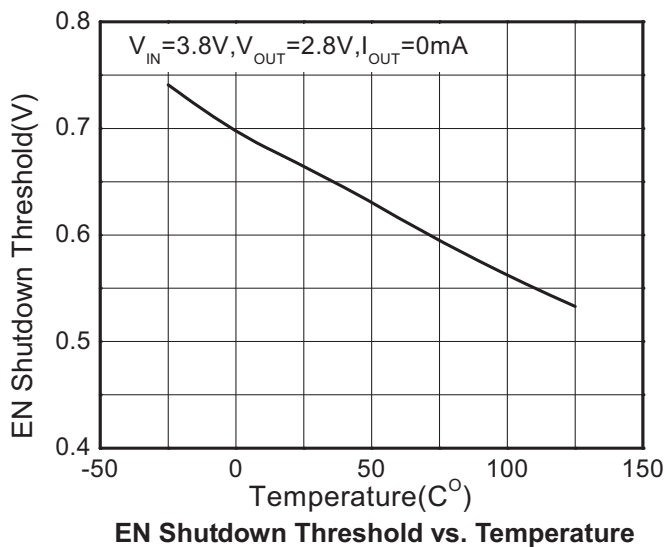
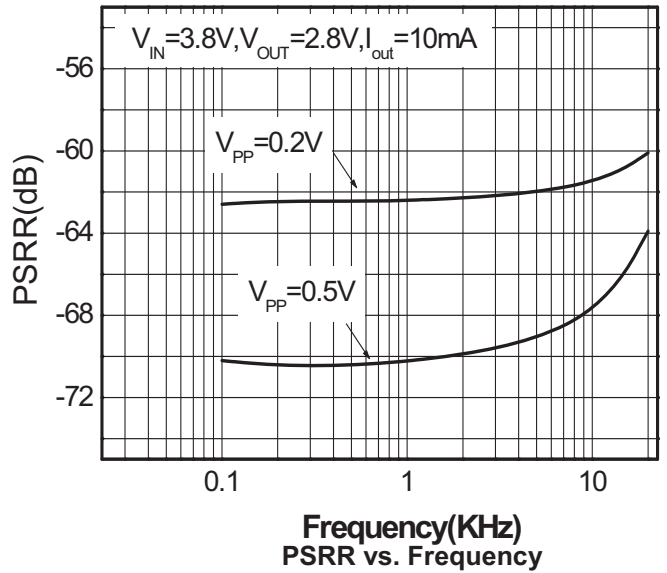
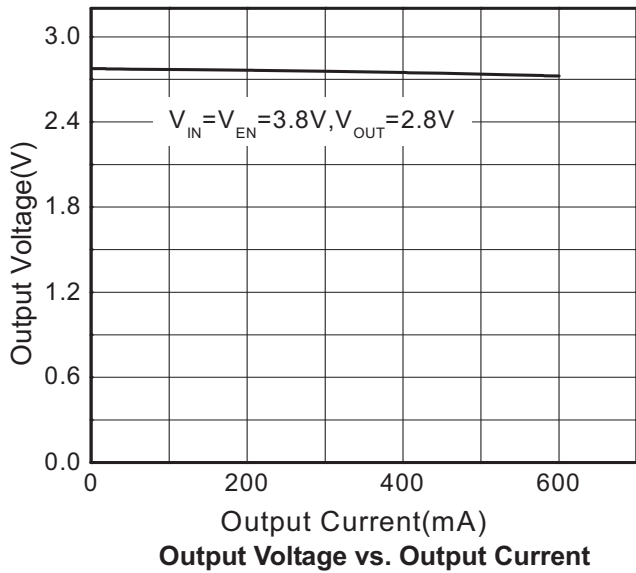
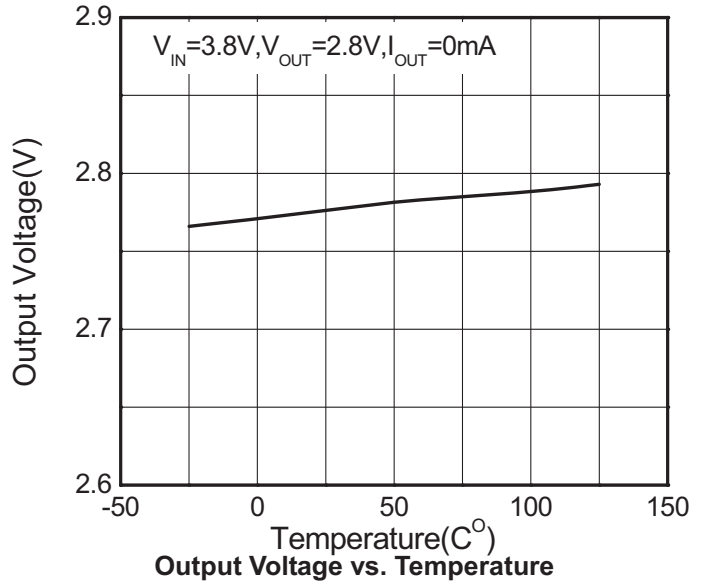
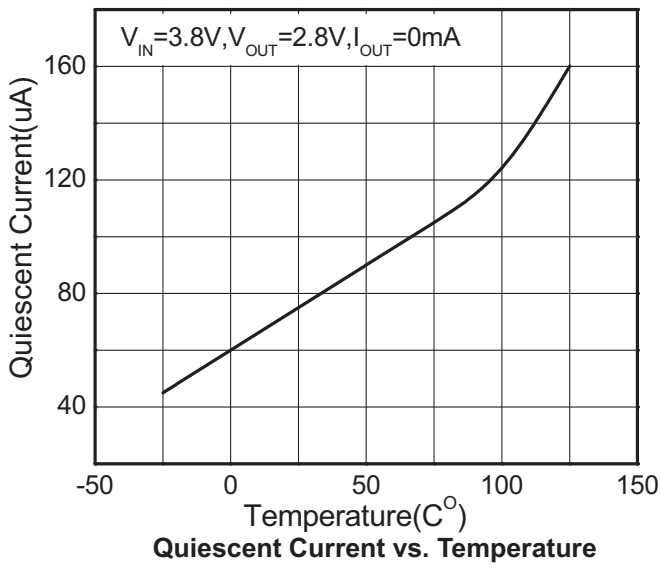
Operating Range

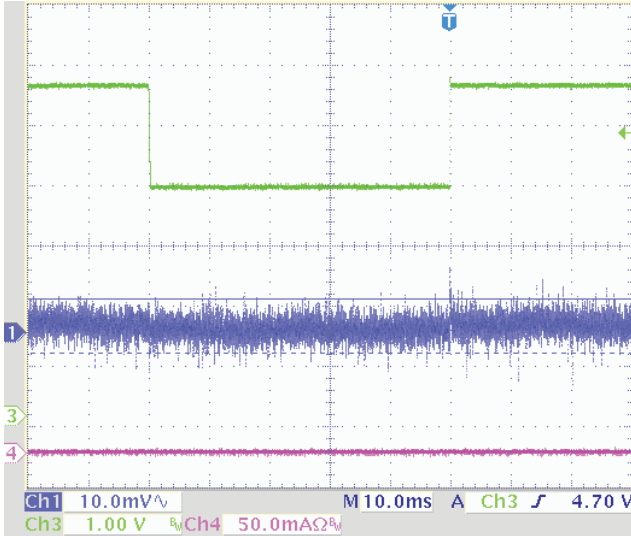
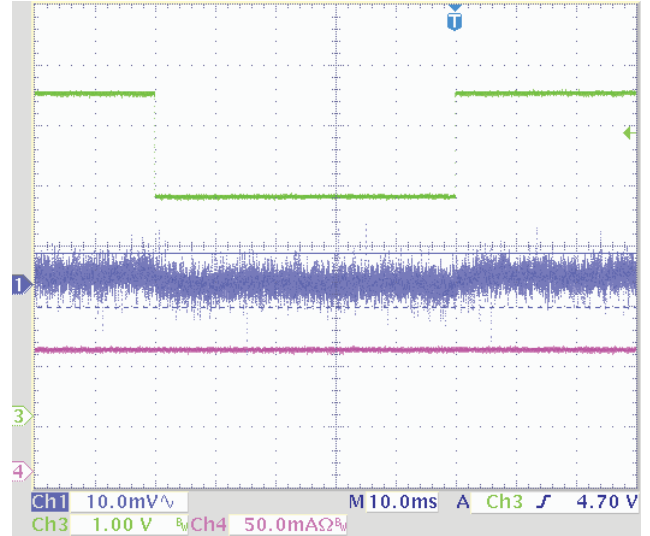
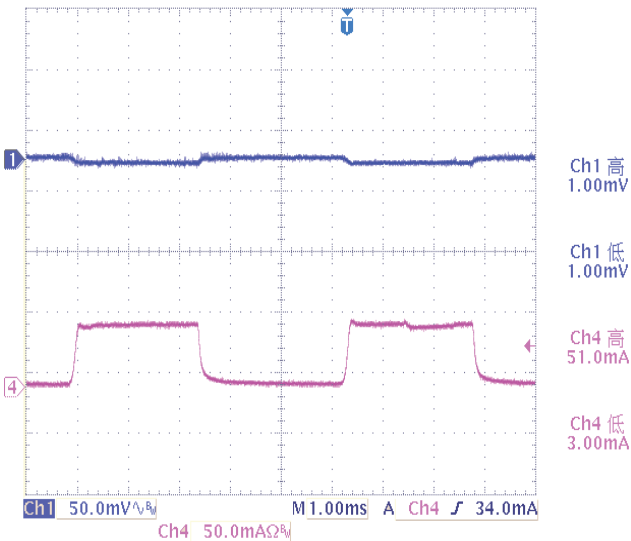
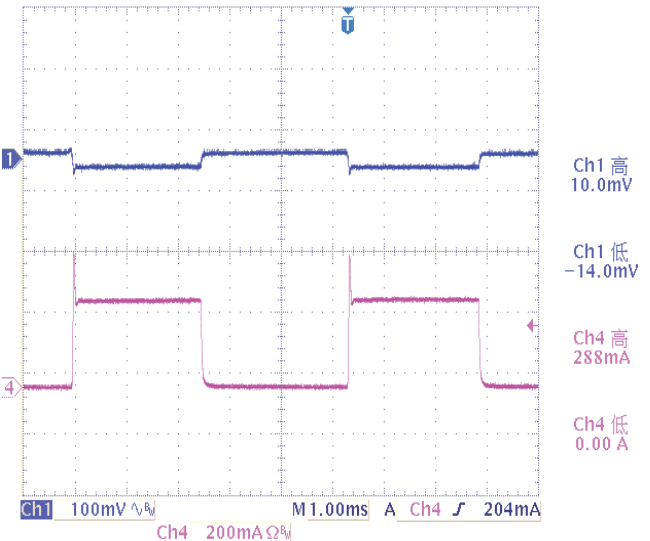
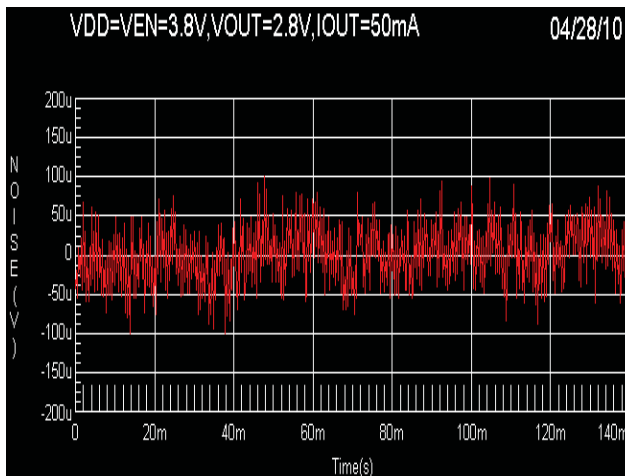
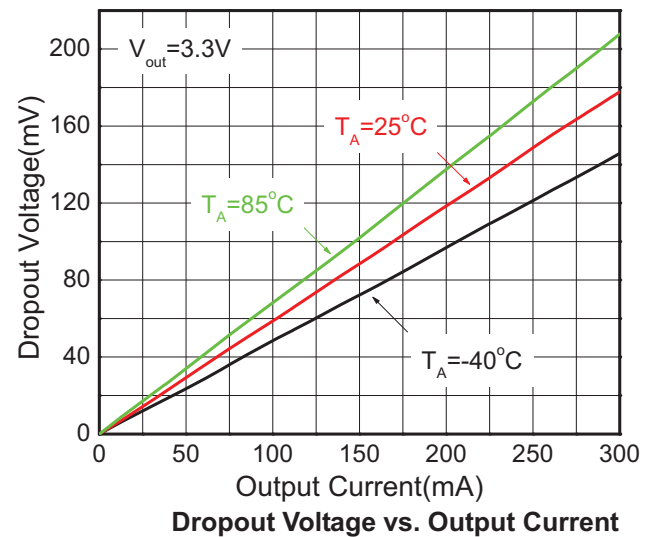
Parameter	Value	Unit
Thermal Resistance, R _{θJA}	250	°C/W
Operating Temperature Range	-40~85	°C

Electronics Characteristics

V_{IN} = V_{EN}=3.8V, C_{IN}=1uF, T_A=25°C

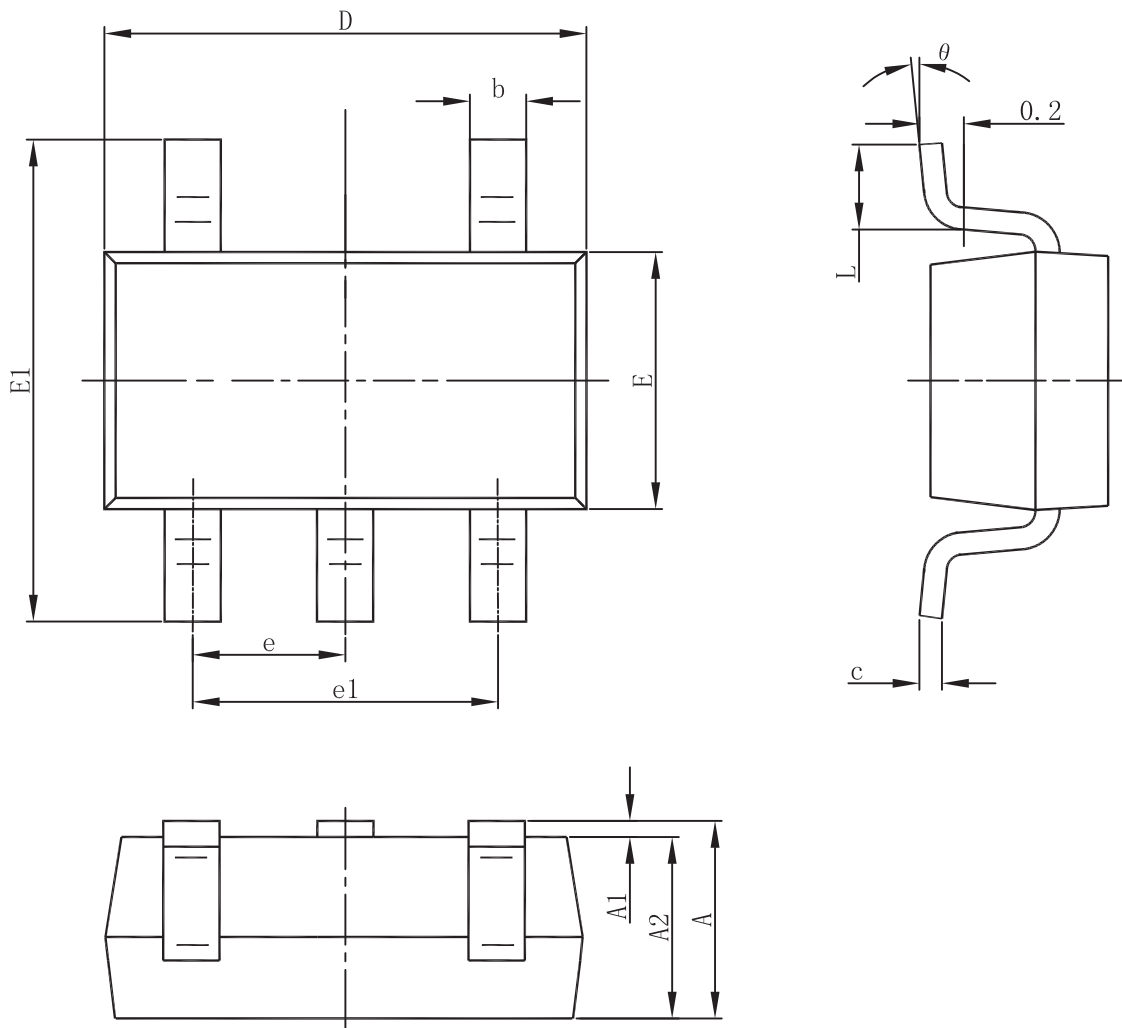
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Output Voltage	V _{out}	V _{in} =V _{out} +1V, I _{out} =270mA	1.170	1.200	1.230	V
			1.270	1.300	1.330	
			1.470	1.500	1.530	
			1.764	1.800	1.836	
			2.450	2.500	2.550	
			2.744	2.800	2.856	
			2.940	3.000	3.060	
			3.234	3.300	3.366	
Current Limit	I _{LIM}	V _{in} = V _{out} +1V	400	500		mA
Dropout Voltage	V _{DROP}	I _{out} =200mA, V _{out} =2.8V		120	200	mV
		I _{out} =300mA, V _{out} =2.8V		190	300	
Line Regulation	ΔV _{Line}	3.3≤V _{in} ≤6V, I _{out} =1mA		0.03	0.15	%/V
Load Regulation	ΔV _{Load}	V _{in} =3.8V, I _{out} = 1~ 300mA			0.8	%
Quiescent Current	I _q	V _{EN} >1.2V, I _{out} =0		120	150	μA
Shut-down Current	I _{SHDN}	V _{in} =3.3V, EN=0V		0.1	1.0	μA
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}	V _{EN} = 0 to 6V			0.1	μA
Output Noise Voltage	e _{NO}	10Hz to 100KHz, I _{out} =200mA, C _{out} =1μF		100		μV _{RMS}
Thermal Shutdown Temperature	T _{SD}			165		°C
Thermal Shutdown Hysteresis	Δ T _{SD}			30		°C

Typical Performance Graph


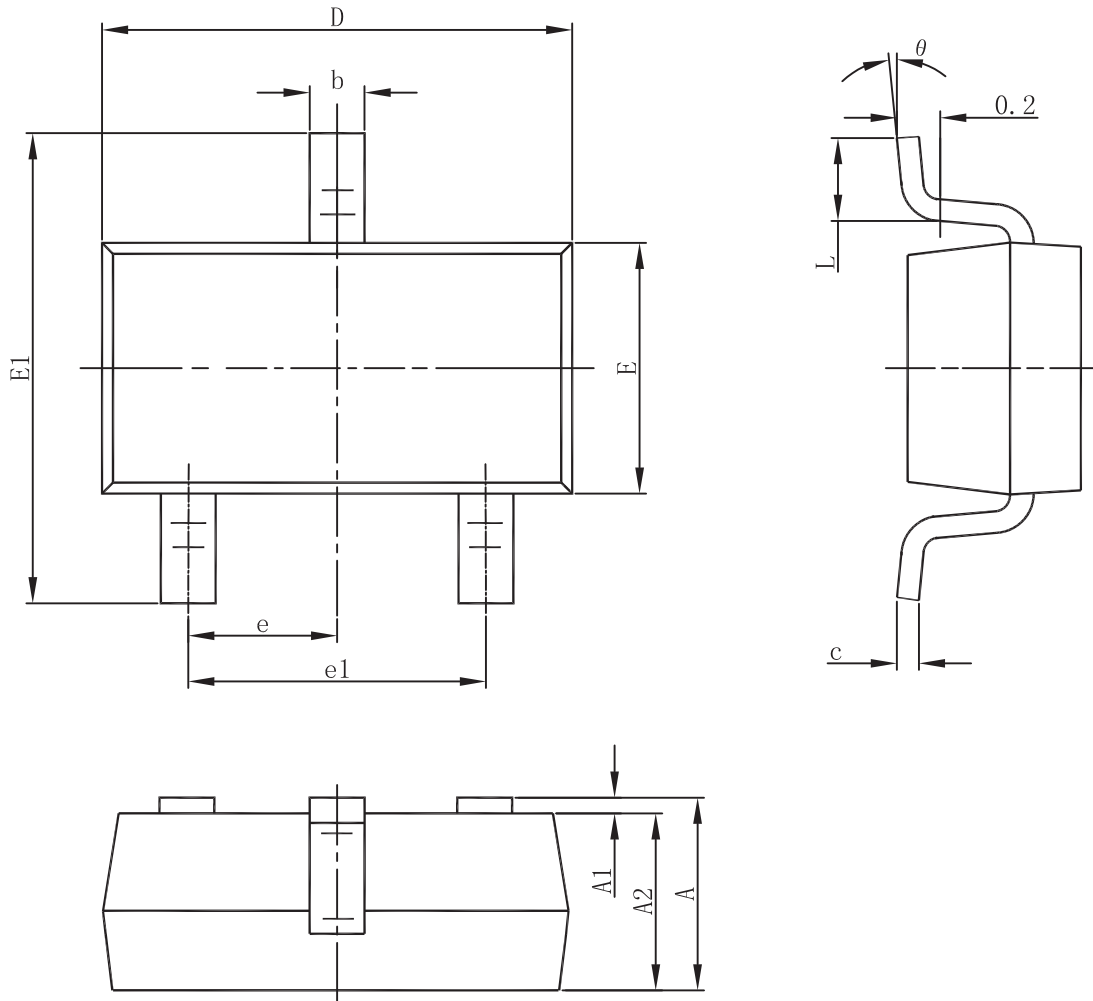

Line Regulation

Line Regulation

Load Regulation

Load Regulation

Output Noise (VDD by Battery)

Dropout Voltage vs. Output Current

Packaging Information

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°

SOT-23-3L


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
WL2004E12-5/TR	1.2	SOT-23-5L	-40~+85°C	WL12 YYWW	Tape and Reel, 3000
WL2004E13-5/TR	1.3	SOT-23-5L	-40~+85°C	WL13 YYWW	Tape and Reel, 3000
WL2004E15-5/TR	1.5	SOT-23-5L	-40~+85°C	WL15 YYWW	Tape and Reel, 3000
WL2004E18-5/TR	1.8	SOT-23-5L	-40~+85°C	WL18 YYWW	Tape and Reel, 3000
WL2004E25-5/TR	2.5	SOT-23-5L	-40~+85°C	WL25 YYWW	Tape and Reel, 3000
WL2004E28-5/TR	2.8	SOT-23-5L	-40~+85°C	WL28 YYWW	Tape and Reel, 3000
WL2004E30-5/TR	3.0	SOT-23-5L	-40~+85°C	WL30 YYWW	Tape and Reel, 3000
WL2004E33-5/TR	3.3	SOT-23-5L	-40~+85°C	WL33 YYWW	Tape and Reel, 3000
WL2004E12G-5/TR	1.2	SOT-23-5L	-40~+85°C	WL12 YYWW	Tape and Reel, 3000
WL2004E13G-5/TR	1.3	SOT-23-5L	-40~+85°C	WL13 YYWW	Tape and Reel, 3000
WL2004E15G-5/TR	1.5	SOT-23-5L	-40~+85°C	WL15 YYWW	Tape and Reel, 3000
WL2004E18G-5/TR	1.8	SOT-23-5L	-40~+85°C	WL18 YYWW	Tape and Reel, 3000
WL2004E25G-5/TR	2.5	SOT-23-5L	-40~+85°C	WL25 YYWW	Tape and Reel, 3000
WL2004E28G-5/TR	2.8	SOT-23-5L	-40~+85°C	WL28 YYWW	Tape and Reel, 3000
WL2004E30G-5/TR	3.0	SOT-23-5L	-40~+85°C	WL30 YYWW	Tape and Reel, 3000
WL2004E33G-5/TR	3.3	SOT-23-5L	-40~+85°C	WL33 YYWW	Tape and Reel, 3000

Remark:

1. WL2004ExxG is halogen free product.
2. Marking:
 - WL** = Device Code
 - YY = Year
 - WW = Week

Ordering No.	Vout (V)	Package	Operating Temperature	Marking	Shipping
WL2004N12-3/TR	1.2	SOT-23-3L	-40~+85°C	W12*	Tape and Reel, 3000
WL2004N13-3/TR	1.3	SOT-23-3L	-40~+85°C	W13*	Tape and Reel, 3000
WL2004N15-3/TR	1.5	SOT-23-3L	-40~+85°C	W15*	Tape and Reel, 3000
WL2004N18-3/TR	1.8	SOT-23-3L	-40~+85°C	W18*	Tape and Reel, 3000
WL2004N25-3/TR	2.5	SOT-23-3L	-40~+85°C	W25*	Tape and Reel, 3000
WL2004N28-3/TR	2.8	SOT-23-3L	-40~+85°C	W28*	Tape and Reel, 3000
WL2004N30-3/TR	3.0	SOT-23-3L	-40~+85°C	W30*	Tape and Reel, 3000
WL2004N33-3/TR	3.3	SOT-23-3L	-40~+85°C	W33*	Tape and Reel, 3000
WL2004N12G-3/TR	1.2	SOT-23-3L	-40~+85°C	W12*	Tape and Reel, 3000
WL2004N13G-3/TR	1.3	SOT-23-3L	-40~+85°C	W13*	Tape and Reel, 3000
WL2004N15G-3/TR	1.5	SOT-23-3L	-40~+85°C	W15*	Tape and Reel, 3000
WL2004N18G-3/TR	1.8	SOT-23-3L	-40~+85°C	W18*	Tape and Reel, 3000
WL2004N25G-3/TR	2.5	SOT-23-3L	-40~+85°C	W25*	Tape and Reel, 3000
WL2004N28G-3/TR	2.8	SOT-23-3L	-40~+85°C	W28*	Tape and Reel, 3000
WL2004N30G-3/TR	3.0	SOT-23-3L	-40~+85°C	W30*	Tape and Reel, 3000
WL2004N33G-3/TR	3.3	SOT-23-3L	-40~+85°C	W33*	Tape and Reel, 3000

Remark:

3. WL2004NxxG is halogen free product.
4. Marking:
 - W = Device Code
 - 12 = Voltage Code
 - * = Month code (A~Z)

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