WL2861K

High Input Voltage, Low Quiescent Current LDO

Http://www.sh-willsemi.com

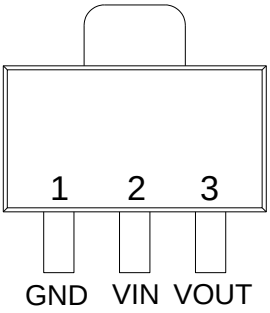
Descriptions

The WL2861K series is a high accuracy, high input voltage low quiescent current, high speed, and low dropout Liner regulator with high ripple rejection. The device is manufactured with Bi-CMOS process.

The WL2861K offers over-current limit and over temperature protection to ensure the device working in well conditions.

The WL2861K regulators are available in standard SOT-89-3L packages. Standard products are Pb-free and Halogen-free.

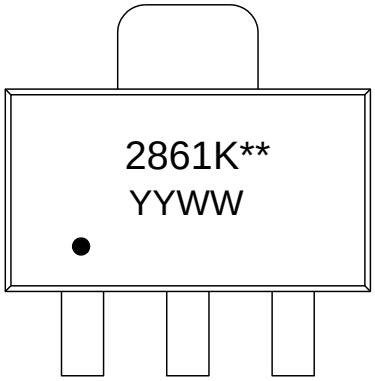
SOT-89



Pin Configuration (Top View)

Features

- Supply Voltage : 4.75V~40V
- Output Range : 1.8V~5.7V
- Output Current : 100mA (for detail please see page6.)
- PSRR : 60dB @ 100Hz
- Dropout Voltage : 800mV @ I_{OUT}=100mA
- Quiescent Current : 10μA@V_{IN}=7V(Typ.)
- Recommend Capacitor : 10uF



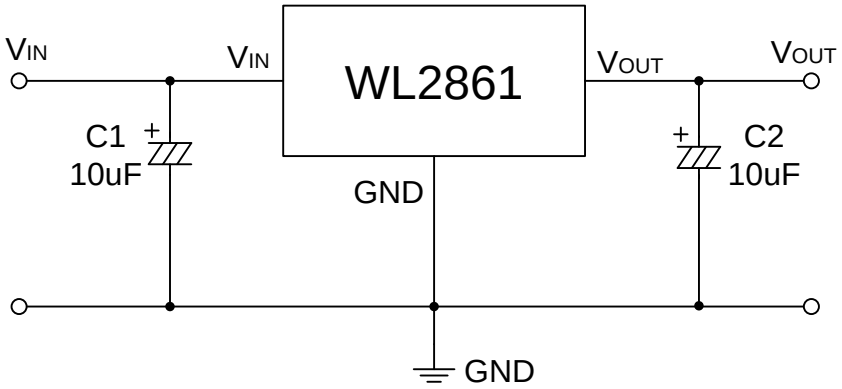
For detail marking information, please see page 9.

Marking

Order Information

For detail order information, please see page 9.

Typical Application

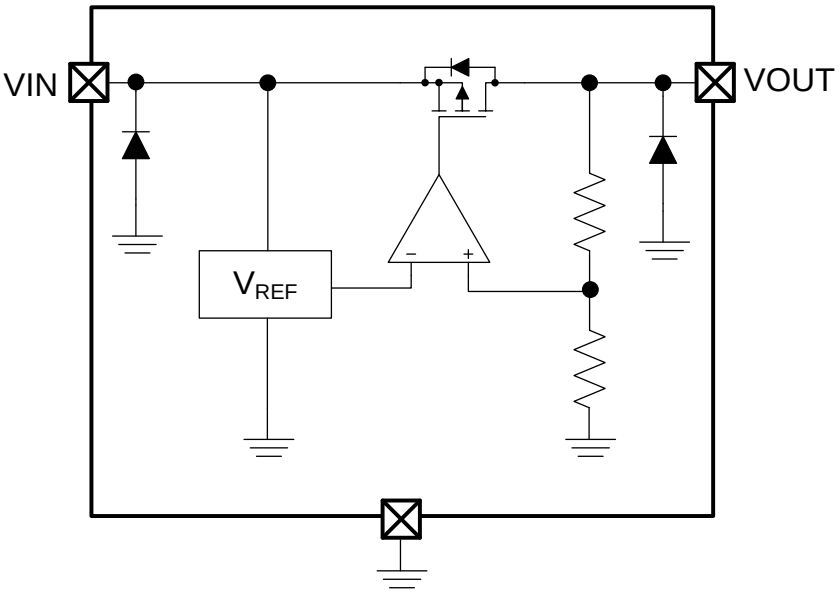


（Locate Cin and Cout as close to the Vin pin and Vout pin as possible.）

Pin Description

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

Block Diagram



Absolute Maximum Ratings

Parameter	Value	Unit
Power Dissipation	Internal limited	mW
V_{IN} Range	-0.3～45	V
V_{OUT} Range	-0.3～6.5	V
Lead Temperature Range	260	°C
Storage Temperature Range	-55 ~ 150	°C
Operating Junction Temperature Range	150	°C
ESD MM	400	V
ESD HBM	4K	V

Recommend Operating Ratings

Parameter	Value	Unit
Operating Supply voltage	4.75～40	V
Operating Temperature Range	-40～85	°C
Thermal Resistance (On PCB) , $R_{\theta JA}$	77	°C/W
Power Dissipation	1000	mW

Electronics Characteristics (V_{OUT}=5V, Ta=25°C V_{IN}=12V, C_{IN}=C_{OUT}=10uF, unless otherwise noted)

Symbol	Parameter	Test Condition		WL2861K SPEC			Unit
				Min.	Typ.	Max.	
V_{IN}	Input Range	I_{OUT}=10mA		4.75		40	V
V_{OUT}	Output Range	I_{OUT}=10mA		4.9	5.0	5.1	V
		7V≤V_{IN}≤30V 1mA≤I_{OUT}≤100mA, P_D≤0.75W①		4.75		5.25	V
I_Q	Quiescent Current	V_{IN}=7V, No load			10	15	μA
		V_{IN}=24V, No load			11	16	
		V_{IN}=40V, No load			13	20	
V_{DROP}	Dropout Voltage	I_{OUT}=1mA			8	12	mV
		I_{OUT}=100mA			800	1200	
Δ V_{Line}	Line Regulation	V_{IN}=7--24V I_{OUT}=1mA			0.02		%/V
		V_{IN}=7--45V I_{OUT}=1mA			0.1		
Δ V_{Load}	Load Regulation	I_{OUT}=1--100mA			0.6		%
e_{NO}	Output Noise	I_{OUT}=10mA			250		μV
PSRR	Ripple Rejection	V_{IN}=10V	f=100Hz		60		dB
		V_{PP}=0.5V	f=1KHz		45		
		I_{OUT}=1mA	f=10KHz		35		
T_{SD}	Thermal Protection	I_{OUT}=1mA②			165		℃
ΔVo/ΔT	Temperature Cofficient	I_{OUT}=1mA③			±0.5		mv/℃

Electronics Characteristics (V_{OUT}=3.3V, Ta=25°C V_{IN}=12V, C_{IN}=C_{OUT}=10uF, unless otherwise noted)

Symbol	Parameter	Test Condition		WL2861K SPEC			Unit
				Min.	Typ.	Max.	
V_{IN}	Input Range	I_{OUT}=10mA		4.75		40	V
V_{OUT}	Output Range	I_{OUT}=10mA		3.234	3.3	3.366	V
		7V≤V_{IN}≤30V 1mA≤I_{OUT}≤100mA， P_D≤0.75W①		3.135		3.465	V
I_Q	Quiescent Current	V_{IN}=7V, No load			10	15	μA
		V_{IN}=24V, No load			11	16	
		V_{IN}=40V, No load			13	20	
Δ V_{Line}	Line Regulation	V_{IN}=7--24V I_{OUT}=1mA			0.02		%/V
		V_{IN}=7--45V I_{OUT}=1mA			0.1		
Δ V_{Load}	Load Regulation	I_{OUT}=1--100mA			0.6		%
e_{NO}	Output Noise	I_{OUT}=10mA			250		μV
PSRR	Ripple Rejection	V_{IN}=10V	f=100Hz		60		dB
		V_{PP}=0.5V	f=1KHz		45		
		I_{OUT}=1mA	f=10KHz		35		
T_{SD}	Thermal Protection	I_{OUT}=1mA②			165		℃
ΔVo/ΔT	Temperature Cofficient	I_{OUT}=1mA③			±0.5		mv/℃

Note①：The specification with temperature coefficient is guaranteed by design.

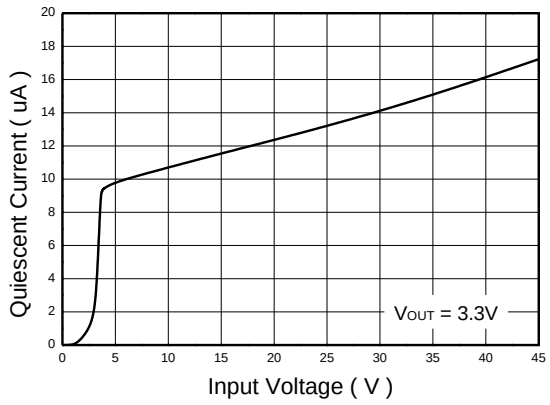
If the junction temperature is higher than T_{SD}, the chip will work in thermal protection and V_{OUT} will be pull down.

Note②：Setting V_{IN}=12V，I_{OUT}=1mA，and rising in temperature of thermostat-box, The temperature when V_{OUT} changes from V_{normal} to less than 90% of V_{normal} is the thermal protection threshold temperature.

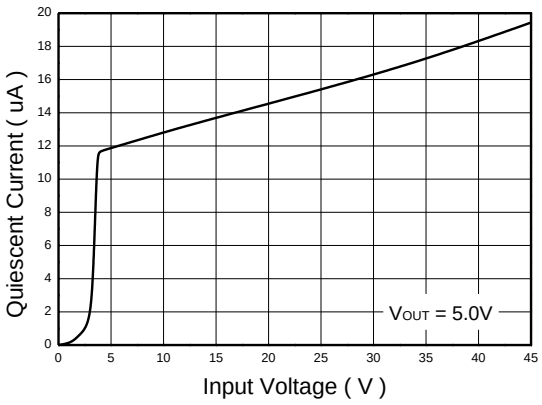
Note③：Record V_{OUT} value @ I_{OUT}=1mA by changing the temperature of thermostat-box. Please refer to the figures of Output Voltage VS Temperature on page 5.

Note④：V_{IN}<4.75V, V_{DROP} is not accurate for V_{OUT}=3.3V.

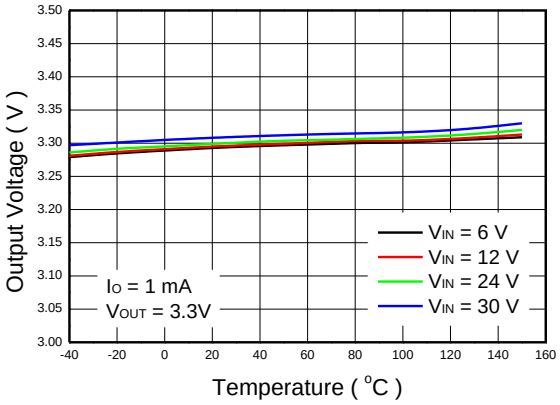
Typical characteristics (Ta=25℃, C_{IN}=C_{OUT}=10uF, unless otherwise noted)



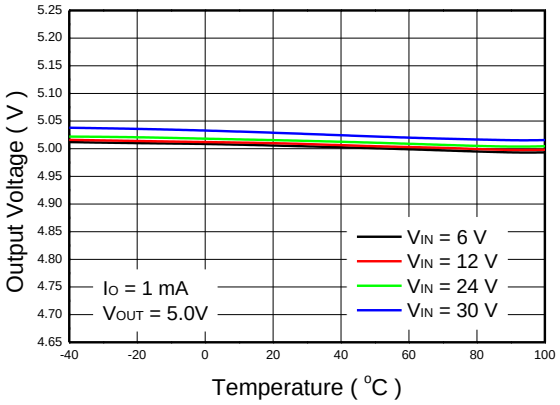
Quiescent Current vs. Input Voltage



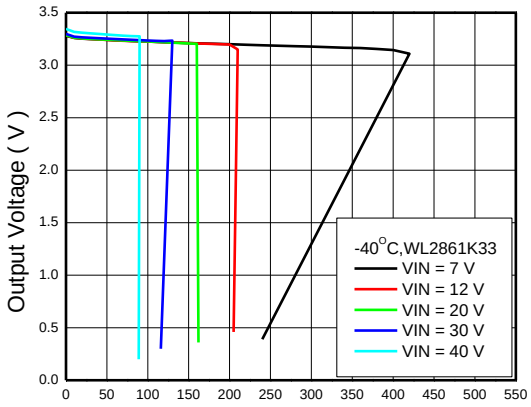
Quiescent Current vs. Input Voltage



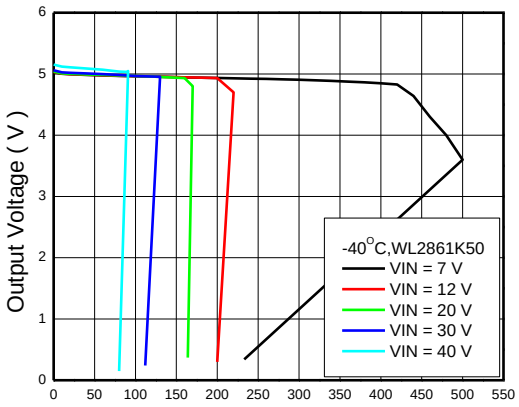
Output Voltage vs. Temperature



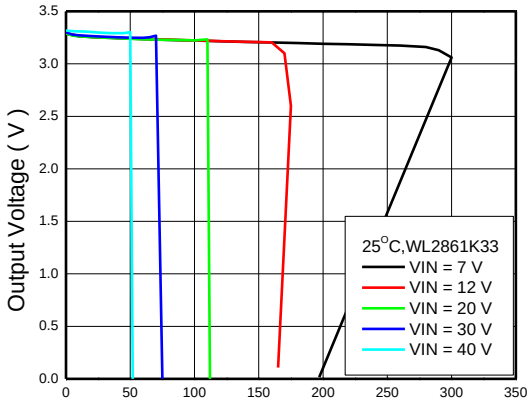
Output Voltage vs. Temperature



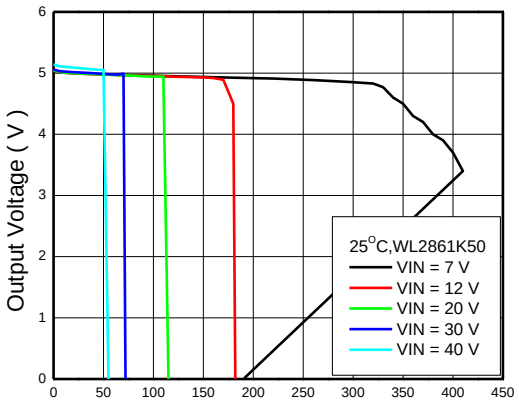
Output Voltage vs. Output Current



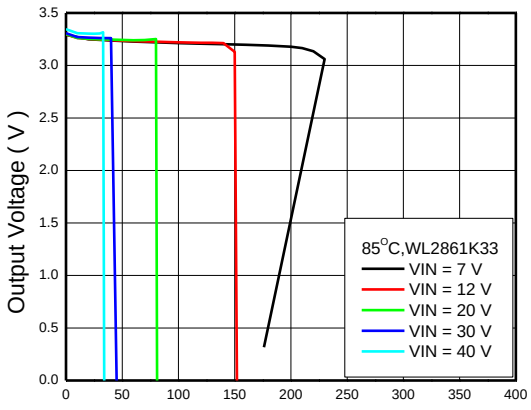
Output Voltage vs. Output Current



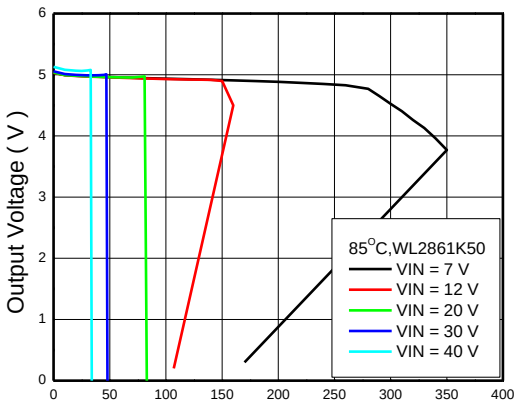
Output Voltage vs. Output Current



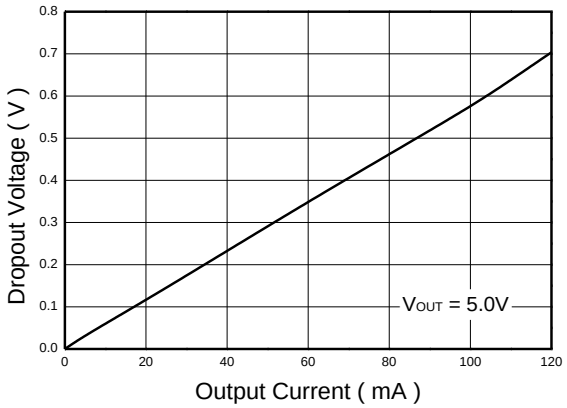
Output Voltage vs. Output Current



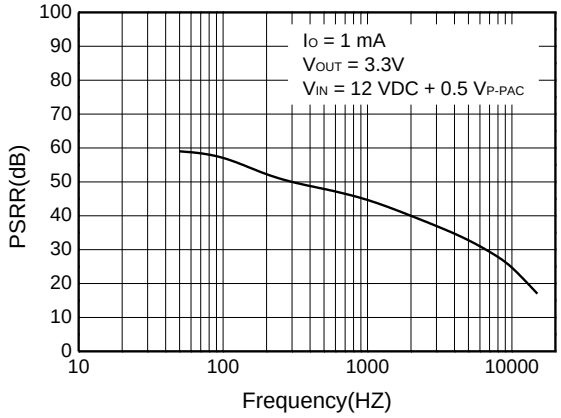
Output Voltage vs. Output Current



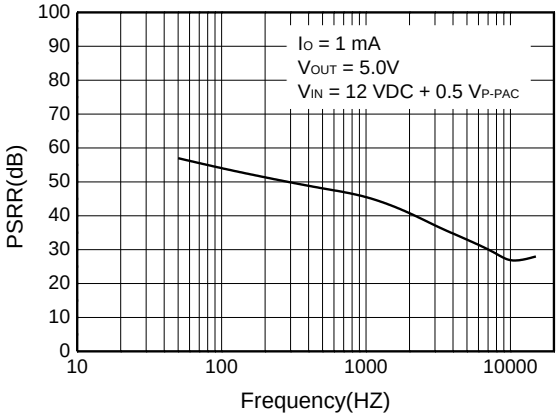
Output Voltage vs. Output Current



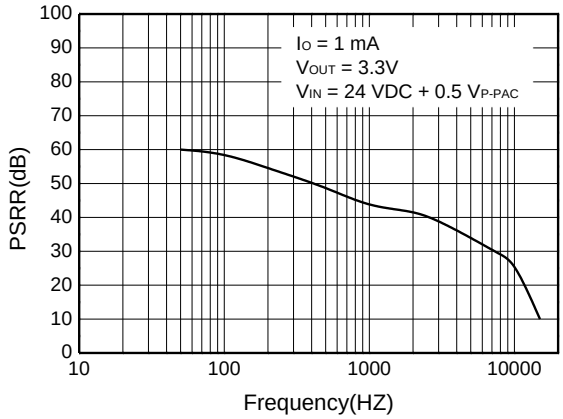
Dropout Voltage vs. Output Current



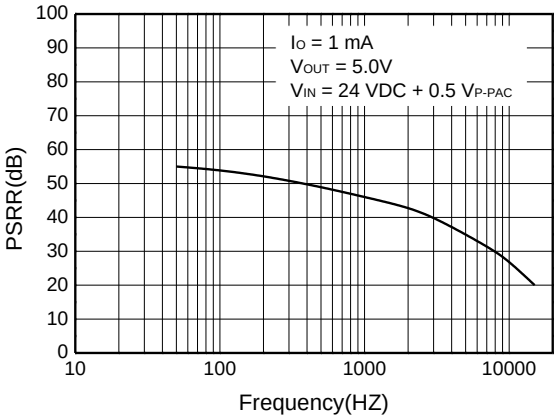
PSRR vs. Frequency



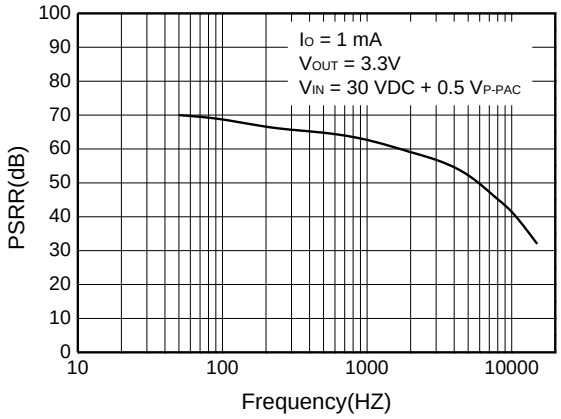
PSRR vs. Frequency



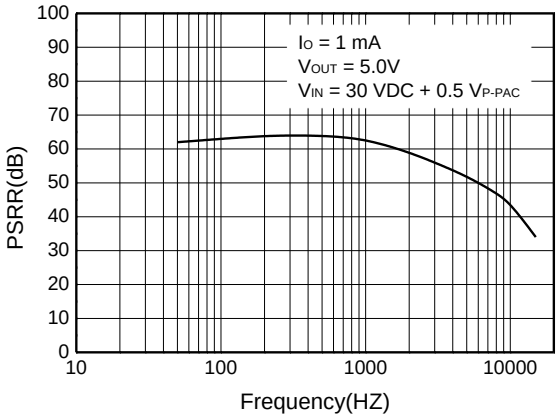
PSRR vs. Frequency



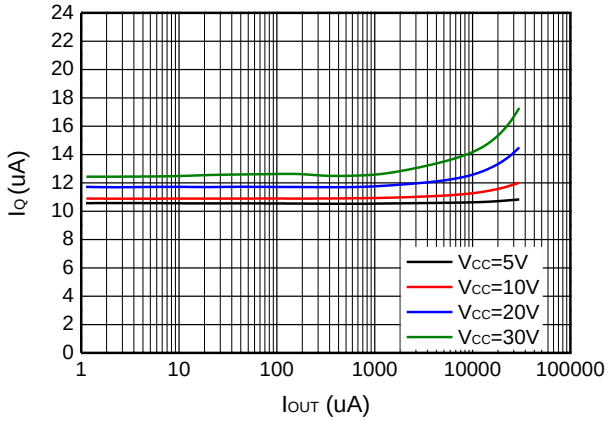
PSRR vs. Frequency



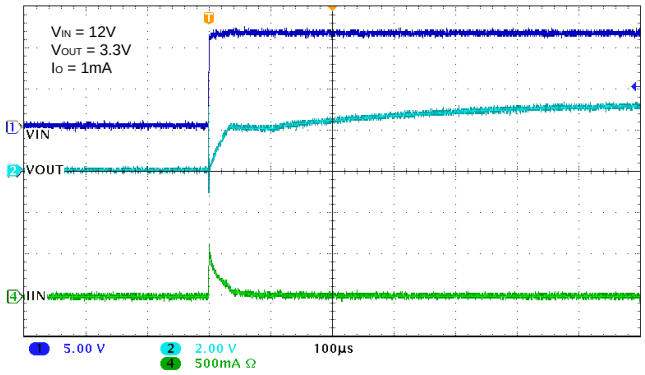
PSRR vs. Frequency



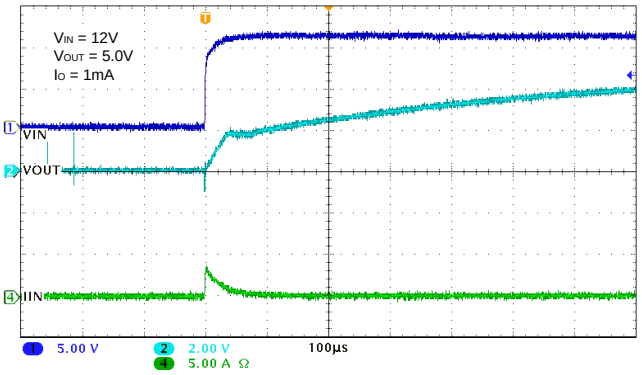
PSRR vs. Frequency



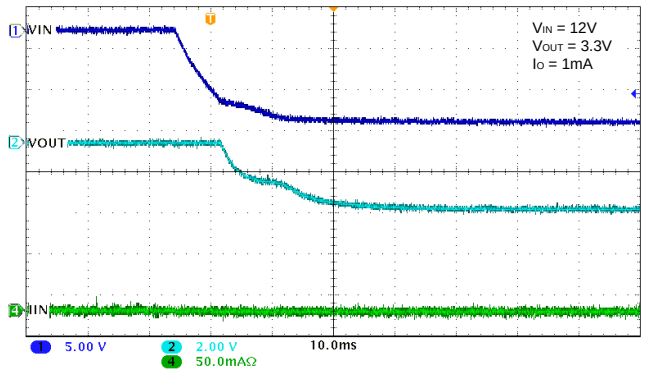
Quiescent Current vs. Output Current



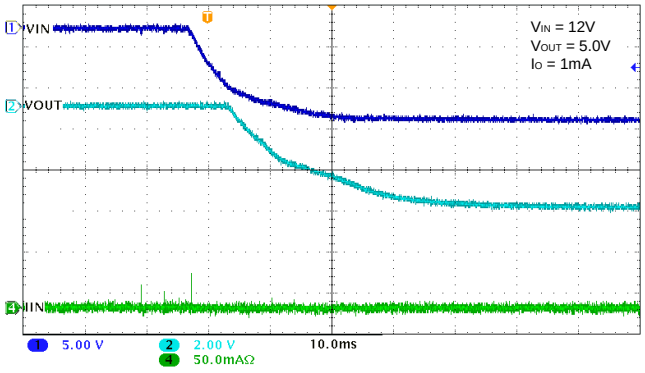
Startup from Power ON



Startup from Power ON



Shutdown from Power OFF



Shutdown from Power OFF

ORDER INFORMATION

Ordering No.	Vout (V)	Package	Operating Temperature	Marking	Shipping
WL2861K33-3/TR	3.3	SOT-89	-40~+85°C	2861K33 YYWW	Tape and Reel, 1000
WL2861K50-3/TR	5.0	SOT-89	-40~+85°C	2861K50 YYWW	Tape and Reel, 1000

Marking:

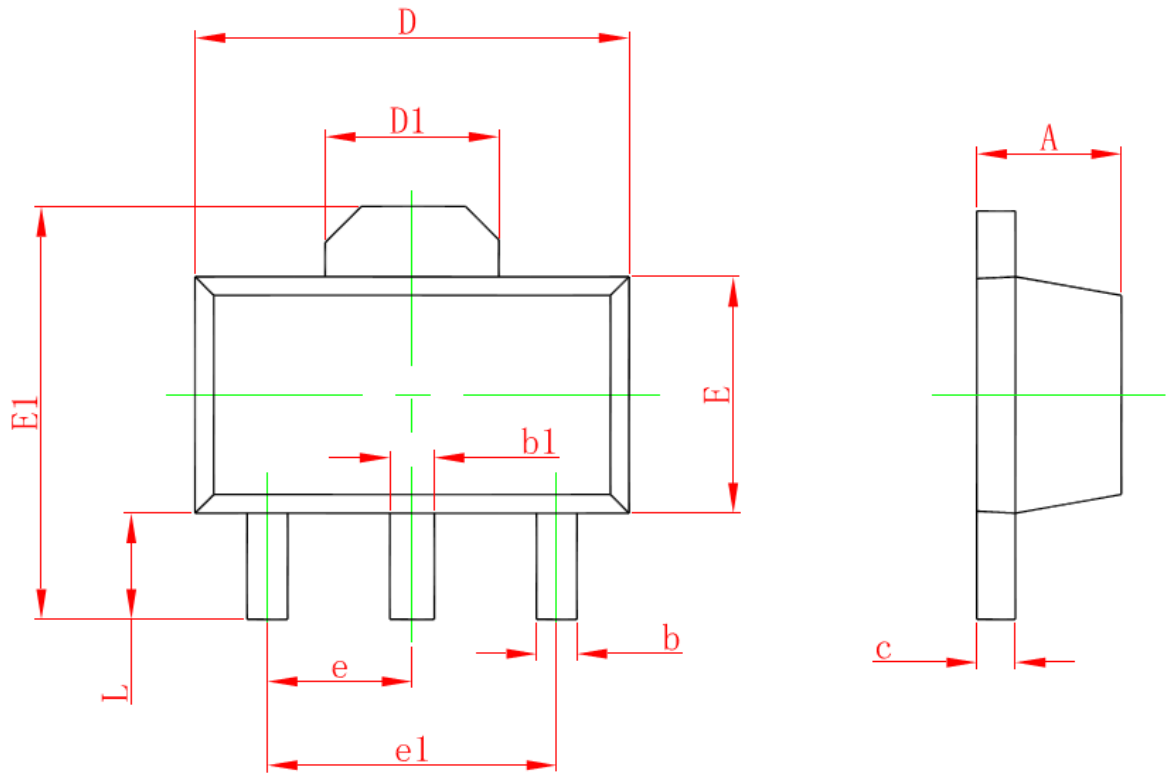
2861K = Device Code**

YY = Year

WW = Week

Package outline dimensions

SOT-89-3L



Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	1.40	1.50	1.60
b	0.38	0.42	0.47
b1	0.46	0.49	0.55
c	0.40	-	0.44
D	4.40	4.50	4.60
D1	1.60	1.70	1.80
E	2.40	2.50	2.60
E1	4.05	-	4.25
e	1.50 Typ.		
e1	3.00 Typ.		
L	0.89	-	1.20

制 修 订 记 录				
文件版本	制修日期	修订页次	修订人	变更内容
Rev.1.0	2015/05/22		江帆	文档制作
Rev.1.1	2016/04/15		金杰	为方便客户布板便利， 增加输入端电容的位置说明
Rev.1.2	2016/05/13		金杰	为方便客户测试最大限流值 增加过流保护直流测试条件的说明
Rev.1.3	2016/05/17		江帆	修正噪声值为 250uV。
Rev.1.4	2016/05/25		江帆	增加 100mA 以内直流输出电压精度范围 删去最大电流限制项说明 增加各项温度相关测试方法的说明