80V High Input Voltage LDO Linear Regulators

GENERAL DESCRIPTION

PW8600 series is designed for power sensitive applications. It includes a precision and high voltage input stage, an ultracurrent branch, and results in a ultra and low-dropout linear regulator. The PW8600 operates from an input volta of VOUT+1V to 65V, consumes only 1.8uA quiescent current, and offers 1% initial accuracy and low dropout voltage, 70mV typical at 10mA.

PW8600 is a fixed output LDO with available has available voltages at 3V to 5.0V. Other features include short-circuit protection and thermal shutdown.

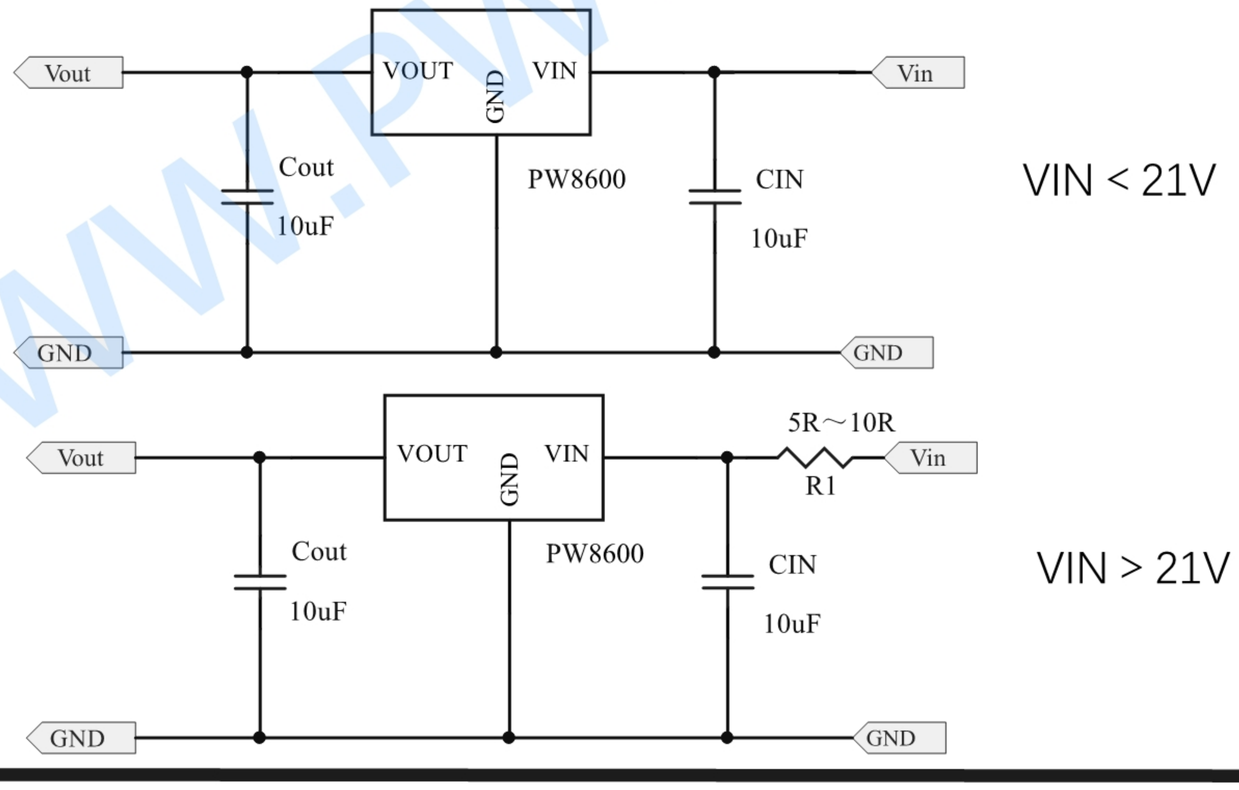
FEATURES

- Wide Operating Voltage: VOUT+1V to 65V (max Vin can be up to 80V)
- Ultra Low Quiescent Current : 1.8uA(Typ.)
- Output accuracy: ±2%
- High output current: ⩾200mA (VIN=7V, VOUT=5V)
- Low Dropout Voltages: 70mV@10mA, 700mV@100mA
- System startup with no overshoot
- Short circuit protection is designed with no overshoot
- Excellent power / load transient response
- Low temperature coefficient :100ppm/℃
- Packages: SOT23-3

APPLICATIONS

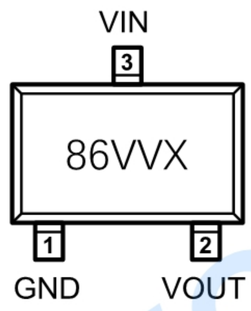
- Battery-powered equipment
- Smoke detector and sensor
- Microcontroller Applications
- Smart electric meter

TYPICAL APPLICATION CIRCUIT



PIN ASSIGNMENT/DESCRIPTION

(TOP VIEW)



Product Series	Package	Pin Number	Pin Name	Functions
PW8600AXXHV	SOT23-3	1	GND	Ground
		2	VOUT	Output
		3	VIN	Input
Marking：Device code: 86 ， Output voltage： VV {3.3V=33， 5.0V=50}， lot number code: X .				

Absolute Maximum Ratings (note)

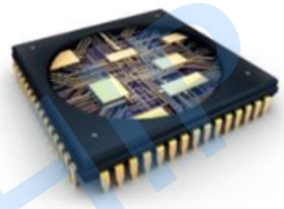
SYMBOL	ITEMS	VALUE	UNIT
V_{IN}	Input Supply Voltage	80	V
V_{OUT}-GND	Output Voltage TO GND	6	V
V_{out} - V_{IN}	Output Voltage TO V_{IN}	-75	V
T_A	Operating Temperature	-40~105	℃
T_J	Maximum Junction Temperature	150	℃
T_{stg}	Storage Temperature	-40 to 150	℃
T_{solder}	Package Lead Soldering Temperature (10s)	260	℃
θ_{JA}	Thermal Resistance,Junction to Ambient	280	℃/W
P_D	Power Consumption	446	m/W

Note: Stresses exceeding the range specified under "Absolute Maximum Ratings" may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

Products

Reel /outer anti-static packaging	Product
 NO：1, QR code content: WWW.PWCHIP.COM; 2. Product: PWCHIP product model name; 3. Lot No: wafer batch code/internal system production code (customers can send this code to support@pwchip.com to verify product information and confirm); 4. D/C: packaging cycle; 5. QTY: packaging quantity (box/disc); 6. Data: packaging time.	PW8600AXXHV XX：Output voltage （3.3V=33，5.0V=50）; PW8600A33HV，PW8600A50HV.
	Brand / **Package**: 平芯微/PWCHIP / SOT23-3L
	Specification / **Qty per reel**: Taping & Reel / 3000 PCS
	Marking 86VVX Device code: 86； Output voltage：VV （3.3V=33，5.0V=50）; Lot number code: X.

Product Center



MOSFET　OVP/OCP Protection　Li-ion Charger　Li-ion Protector　Li-ion charge-discharge　LDO

Voltage　Detector　DC-DC Boost　DC-DC Buck　DC-DC Boost-Buck　USB Fast charging　LED driver

Product Title	MODE	Vin Range	Vout Range	Iout MAX	FOSC	Iq typ	Package	Link
PW2052B	Synchronous	2.3V～6V	0.6V～5V	2A	1.5MHZ	150uA	SOT23-6L	Detail
PW2335	Synchronous	4.5V~30V	ADJ	3A	500KHZ	600uA	SOP8-EP	Detail
PW2312A	Synchronous	4.5V～55V	ADJ	0.6A	1.2MHZ	250uA	SOT23-6L	Detail
PW2458	Synchronous	3.8V～36V	0.8V～35V	5A	0.1-1.1MHZ	25uA	SOP8-EP	Detail
PW2153	Asynchronous	8V~150V	5V~30V	10A	140KHZ	1mA	SOP8	Detail
PW2902	Asynchronous	8V~90V	5V~30V	2A	140KHZ	1mA	SOP8-EP	Detail
PW2906	Asynchronous	12V～90V	1.3V～20V	0.6A	150KHZ	2.5mA	SOP8-EP	Detail
PW2815	Asynchronous	4.5V～80V	ADJ	1.5A	480KHZ	0.73mA	SOP8-EP	Detail

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RECOMMANDED OPERATING Conditions

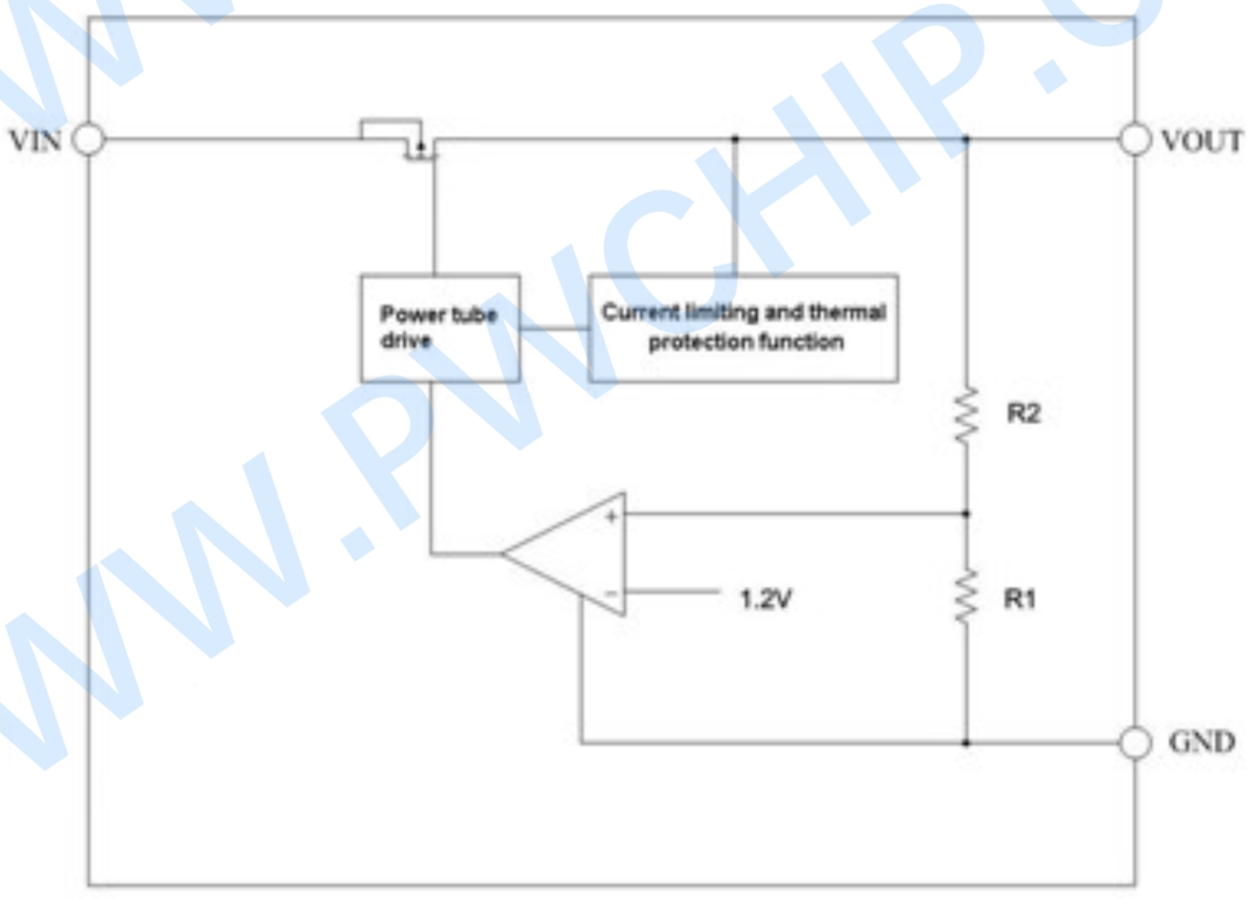
SYMBOL	ITEMS	VALUE	UNIT
VIN	VIN Supply Voltage	60	V
TLEAD	Lead Temperature (Soldering) 10 seconds	230	℃
TA	Operating Temperature	-20 to +85	℃

ELECTRICAL CHARACTERISTICS

(TA=25°C, CIN=1uF, VIN=VOUT+1.0V, COUT=10μF, unless otherwise noted)

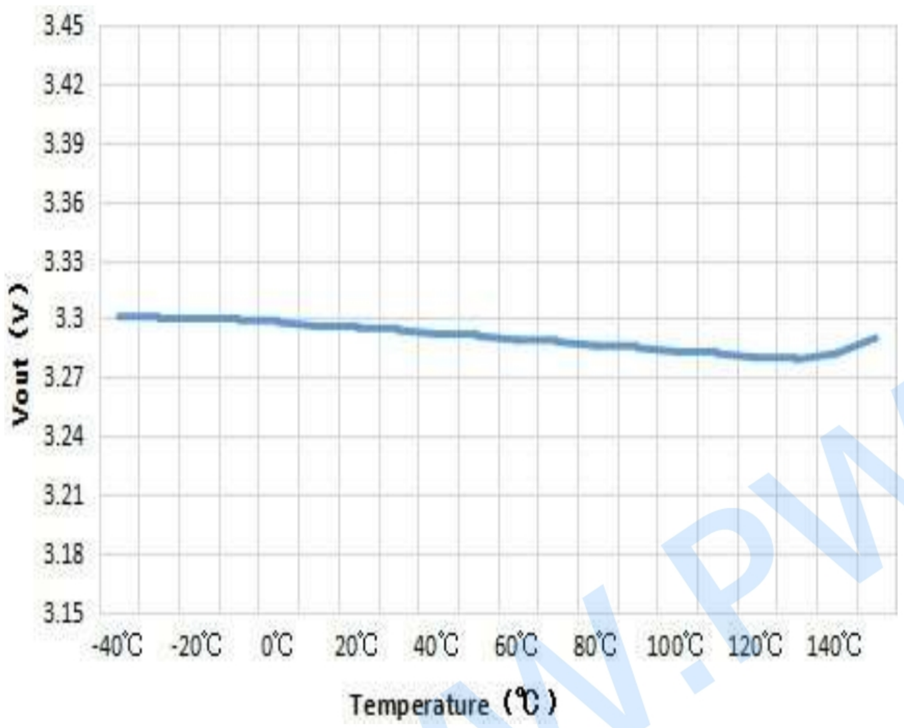
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input Voltage Range	V_{IN}		2.8		60	V
Output Voltage Accuracy	V_{OUT}	I_{OUT}=10mA	-2%		2%	
Quiescent Current	I_Q	V_{IN}=6V~60V		1.8	4	μA
Output Current	I_{OUT}			200		mA
Dropout Voltage	V_{DROP}	I_{OUT}=10mA ΔV_{OUT}= - V_{OUT} *2%		70		mV
		I_{OUT}=100mA ΔV_{OUT}= - V_{OUT} *2%		700		mV
Load Regulation	V_{LR}	1mA ≤ I_{OUT} ≤ 100mA		20		mV
Line Regulation	V_{SR}	I_{OUT}=1mA,V_{IN}=(V_{OUT} +1V) to 30V		0.2		%/V
Power Supply Rejection Ratio	PSRR	Vin=12V ,Iout=10mA F=1Khz,Vout=3.3V		70		dB
Current Limit	I_{LIMIT}	VIN=(VOUT +1V) to 60V		400		mA
Thermal Protection	T_{SHDN}			125		℃
Output Voltage Temperature Coefficient	T_{CVOUT}	IOUT=10mA -40℃≤T_{AMB}≤100℃		-17		ppm/℃

Functional Block Diagram

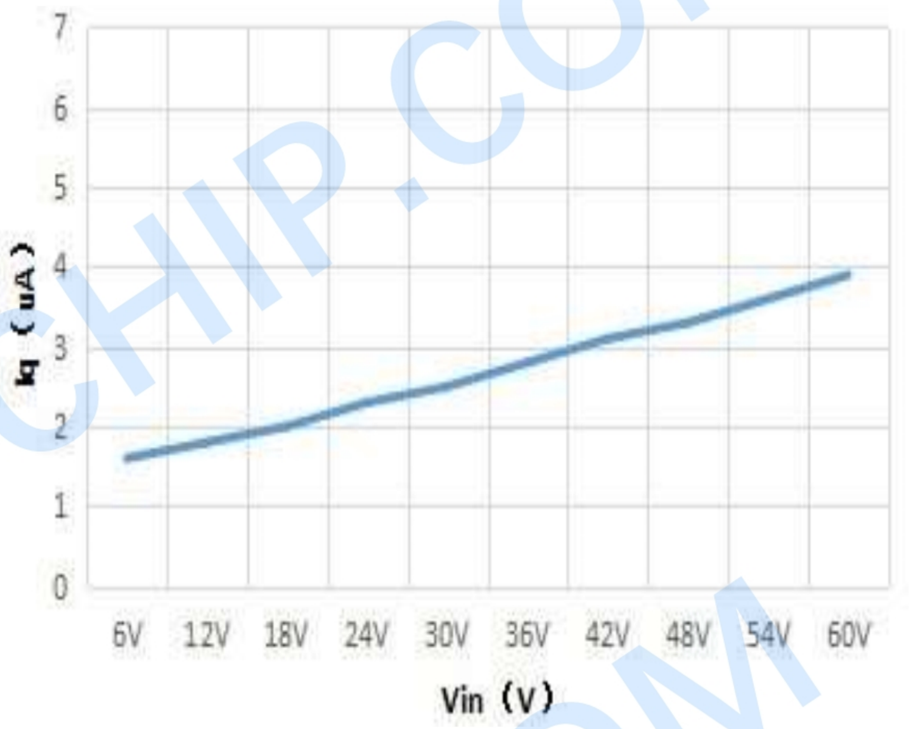


TYPICAL PERFORMANCE CHARACTERISTICS

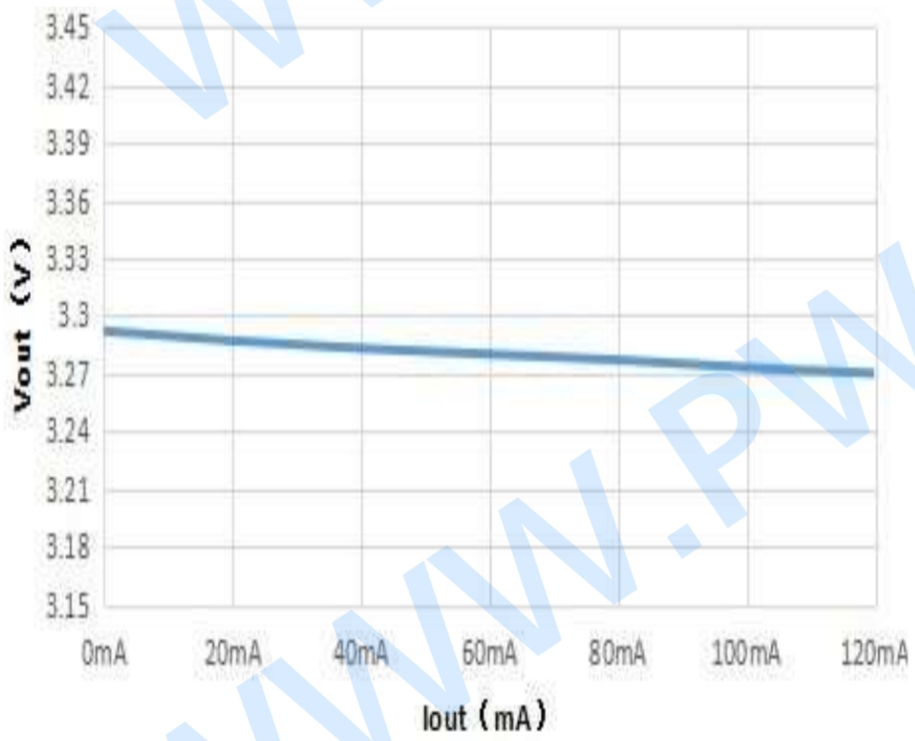
(TA=25°C, CIN=1uF, VIN=VOUT(3.3V)+1.0V, COUT=10μF, unless otherwise noted)



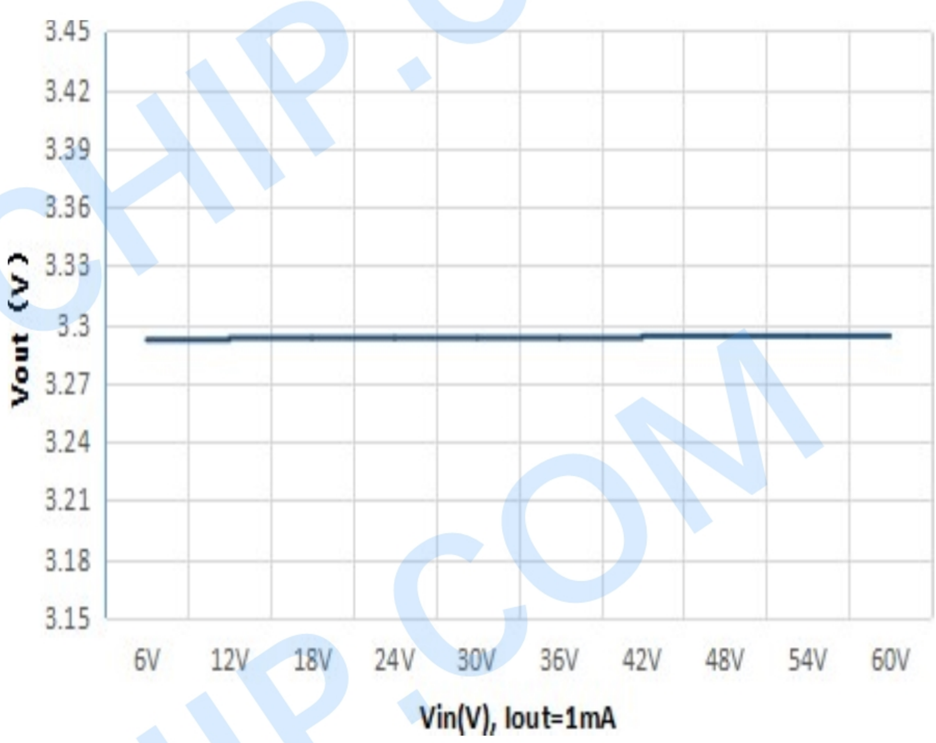
Output Voltage vs Temperature



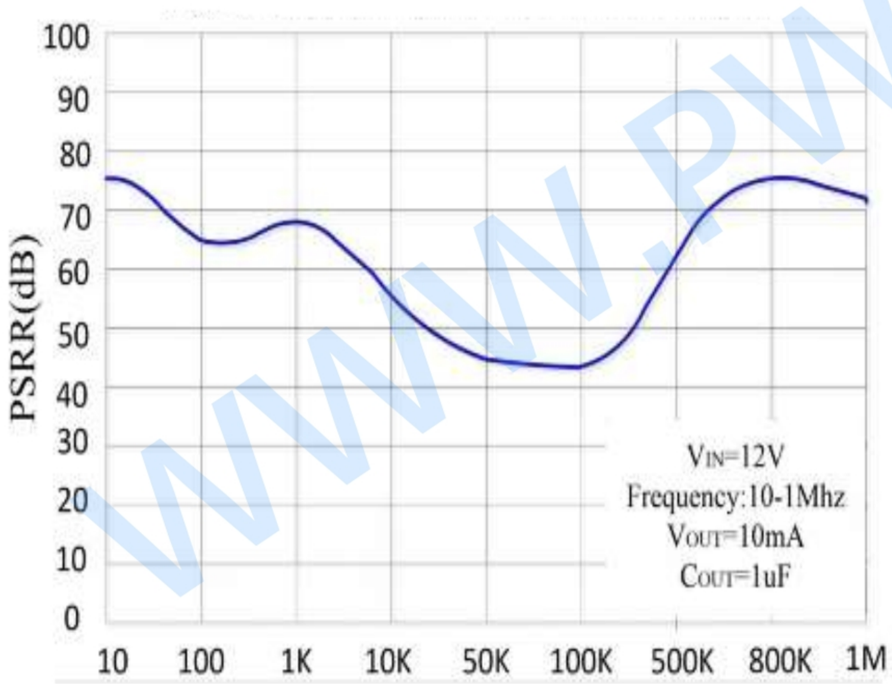
Quiescent current vs Input Voltage



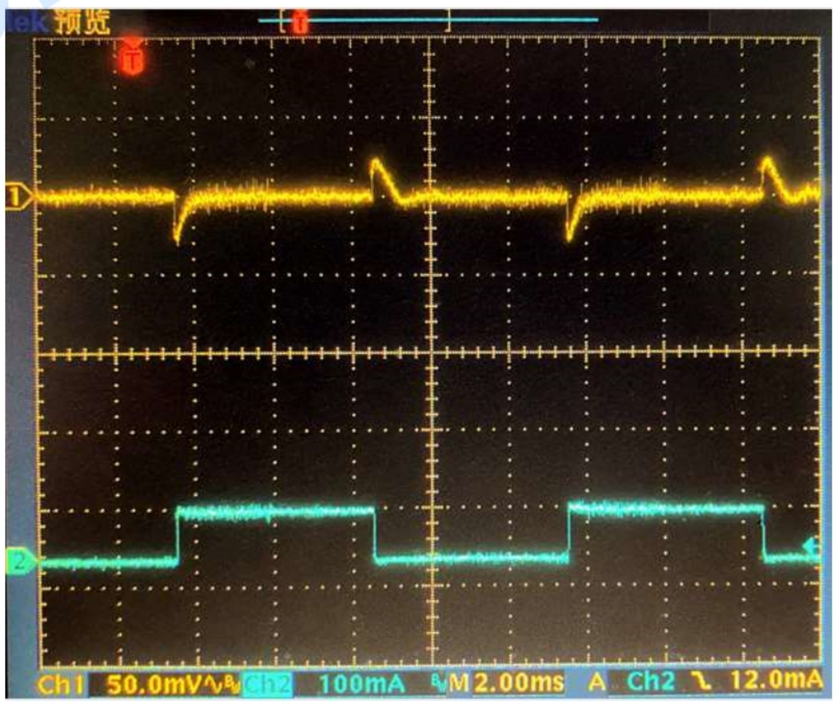
Load Regulation (Vin=30V)



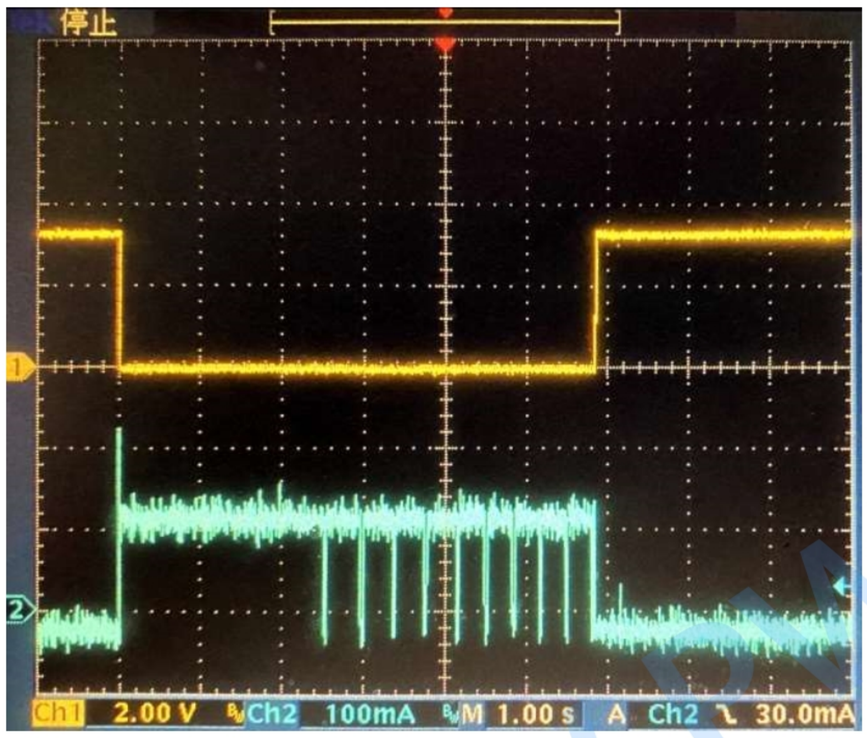
Line Regulation



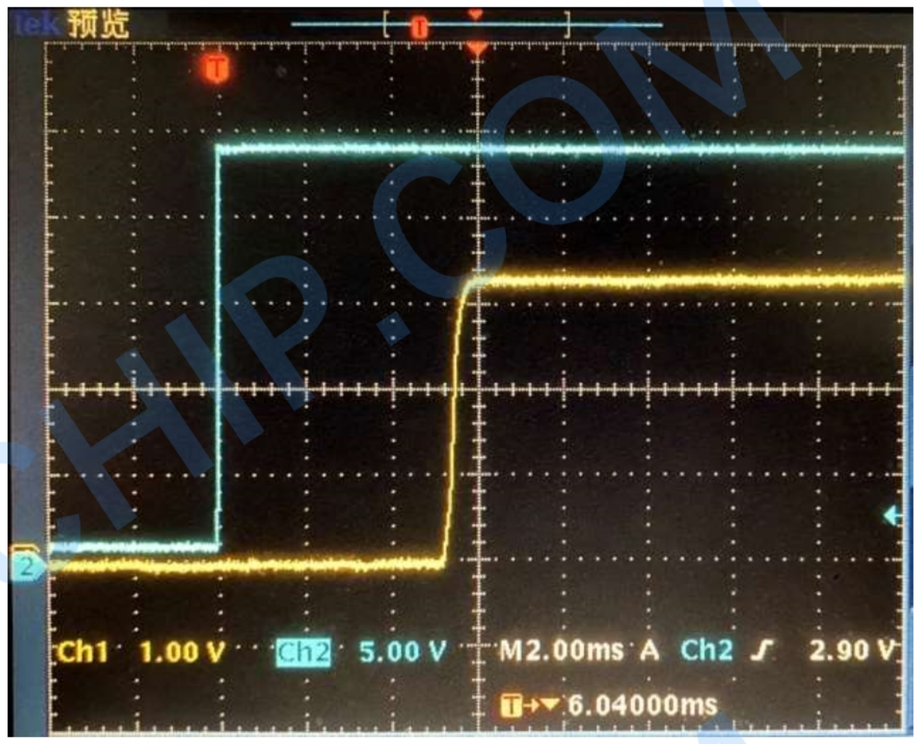
Power-Supply Rejection Ratio vs Frequency



Load Transient (Vin=12V) 10mA~100mA



Short-Circuit and OTP (Vin=24V)



VCC Power ON

APPLICATION INFORMATION

INPUT CAPACITOR

An input capacitor of 1μF is required between the VIN and GND pin. The capacitor shall be placed as close as possible to VIN pin, and the wide copper trace is also recommended.

OUTPUT CAPACITOR

The recommended is 10uF ceramic capacitor. The minimum capacitance for stable and correct operation is 1μF. The higher the value of this output capacitor, the lower the ripple during the operations. The output capacitor should be placed as close to the Output Pin as possible. The wide copper trace is recommended.

NO-LOAD STABILITY

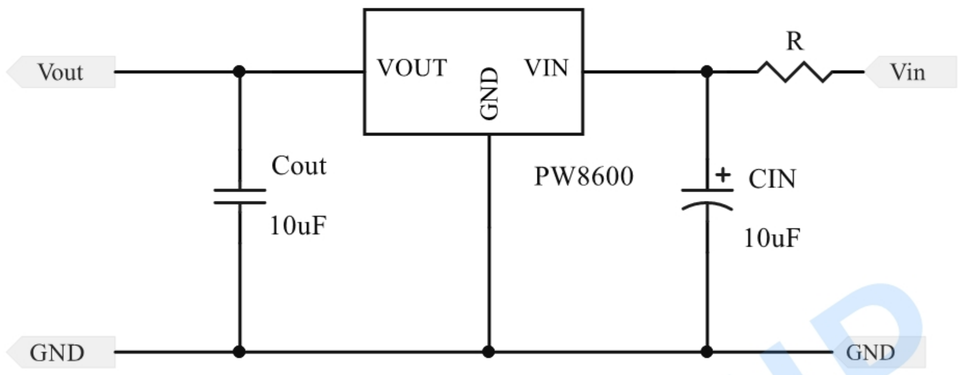
The PW8600 will remain stable and in regulation with no external load.

FOLD-BACK SHORT-CIRCUIT PROTECTION

When short-circuit occurs, PW8600 will fold back the short-circuit currents to a pre-determined lower level, This will reduce excessive heat in otherwise large current conditions. This feature provides another level of protection to IC itself and also the whole system.

IN-RUSH CURRENT AND VOLTAGE

The following figure shows a typical application circuit for the PW8600 devices. Please keep in mind that in- rush current can push up the Vin overshoot by as much as 50%. For example, when Vin=50V, the in-rush caused spike voltage can be as high as 75V . Therefore the voltage rating of Cin needs to be higher than 50% of the application.

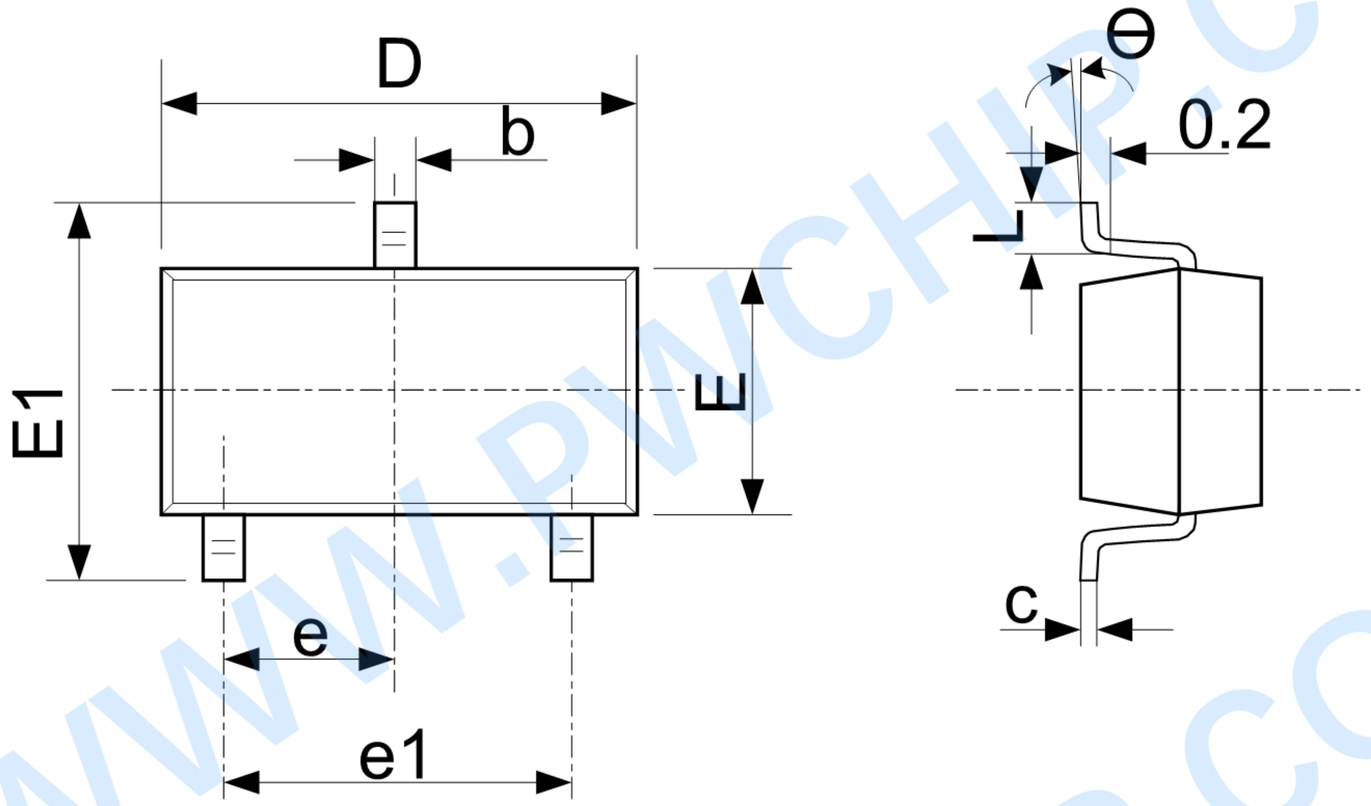


In live insertion application, it is suggested that R, CIN are selected as following

1. CIN=10μF ~ 100μF ceramic or electrolytic capacitor with maximum voltage greater than 80V, R=0;
2. CIN=1μF ~ 10μF ceramic or electrolytic with maximum voltage greater than 80V and R=2Ω in the type of 1206.

PACKAGE DESCRIPTION

SOT23-3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0℃	8℃	0℃	8℃

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