

数据手册 DATASHEET

TP2601 (Over Voltage and Over Current Protection IC)

TP2601 Over Voltage and Over Current Protection IC

General Description / 概述

The TP2601 is an Over-Voltage-Protection (OVP) and Over-Current-Protection (OCP) device. The device will switch off internal MOSFET to disconnect VIN to VOUT to protect load when any of input voltage, input current over the threshold. The Over temperature protection (OTP) function monitors chip temperature to protect the device.

The TP2601 is available in SOT23-3L/SOT23-6L package. Standard products are Pb-free and Halogen-free.

Features/特点

- Absolute maximum input voltage: 32V;
- Maximum load current: 2A ;
- Low power path resistance: SOT23-6: 150mΩ (Typ.) ;
- OVP Threshold(default): 6.1V ;
- Protection Voltage Programmable by VFB=1.2V
- OVP response time: 100nS ;
- SCP and OTP
- Thermal shutdown protection & Auto recovery;
- Output short-circuit protection;
- RoHS Compliant and 100% Lead (Pb)-Free ;
- SOT23-3L/SOT23-6L Package。

Application/应用领域

- GPS ,TWS;
- PAD ;
- Battery Supplied System;
- Driving record instrument;
- Car Camera;
- E-Cigarette;

Typical Application Circuit/典型应用图:

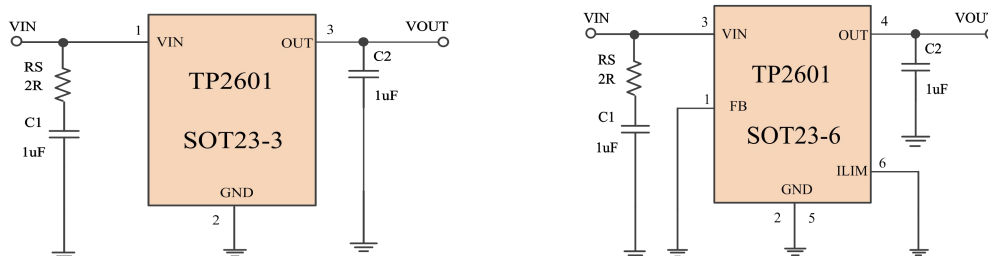


Figure 1: Typical Application Schematic(default)

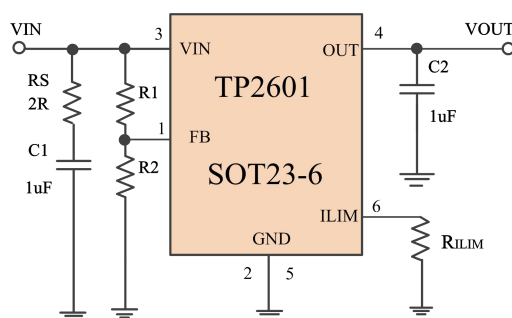
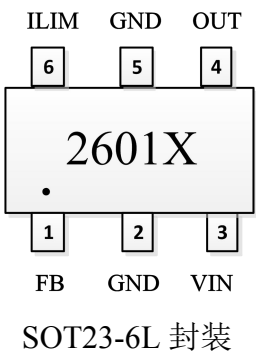
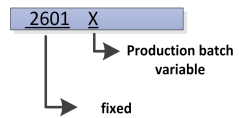
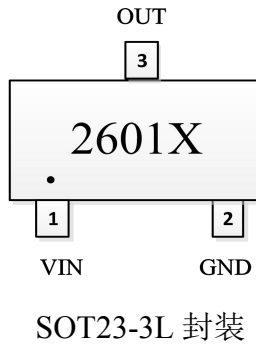
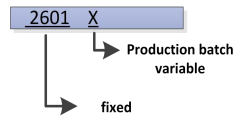


Figure 2: Typical Application Schematic(OVP/OCP is adjustable)

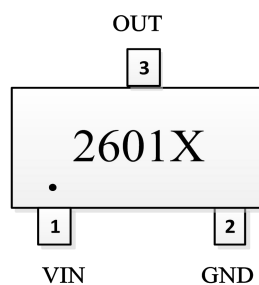
ABSOLUTE MAXIMUM RATINGS/绝对最大额定值

SYMBOL	ITEMS		VALUE	UNIT
V _{IN}	Input Voltage		-0.3~32	V
Output	Output voltage (OUT pin)		-0.3~32	V
V _{IN}	Input voltage (FB/ILIM PIN)		-0.3~9	V
I _{OMAX}	Maximum Output Continues Load Current		2.2	A
P _{DMAX}	Power Dissipation	SOT23-6	0.6	W
		SOT23-3	0.45	W
R _{θJA}	Thermal Resistance	SOT23-6	120	℃/W
		SOT23-3	180	℃/W
T _J	Junction Temperature		-40~125	℃
T _{stg}	Storage Temperature		-40~85	℃
T _{solder}	Package Lead Soldering Temperature (10s)		260	℃
HBM	ESD Susceptibility, Human Body Model		2.0	KV

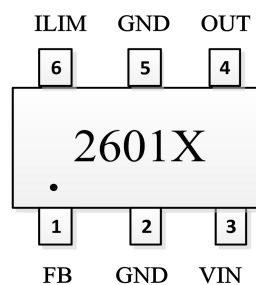
Ordering Information /订购信息

 SOT23-6L 封装	订单型号 TP2601-SOT236
	Marking Information: 2601X: 
 SOT23-3L 封装	TP2601-SOT233
	Marking Information: 2601X: 

Pin Description /引脚描述



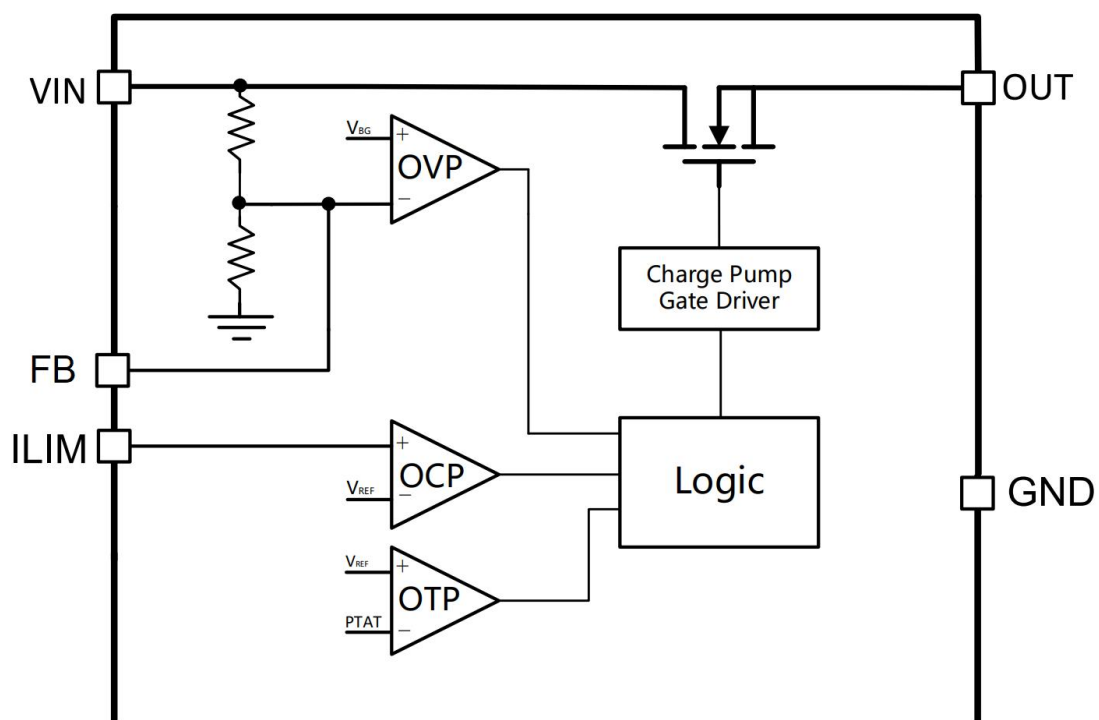
SOT23-3L



SOT23-6L

PIN		SYMBOL	PIN DESCRIPTION
SOT23-6	SOT23-3		
1		FB	OVP feedback input pin. A resistor divider from IN to AGND thru this pin. VFB=1.2V, When FB grounding , default OVP=6.1V.
2	2	GND	Power ground pin.
3	1	VIN	Power input pin. Decouple high frequency noise by connecting at least 1uF MLCC to ground.
4	3	OUT	Output voltage pin. Decouple high frequency noise by connecting at least 1uF MLCC to ground.
5		GND	Power ground pin.
6		ILIM	Regulating protection current, When ILIM grounding , default IOCP=2.7A.

Functional Block Diagram/内部结构框图



Electrical Characteristics/电气特性参数

VIN=5V, C1=C2=1uF, TA=25°C, unless otherwise noted.

Parameter	Test Conditions	Min	Typ	Max	Units
Power input/电源输入					
Input Voltage	FB=GND Iout=10mA	3.0	5.0	32.0	V
UVLO	FB=GND Iout=10mA		2.4		V
OVP	FB=GND Iout=10mA	5.8	6.1	6.4	V
Ron	VCC=5V, Iout=1A		150	200	mΩ
Iq	Standby current, IN and Vcc < OVP voltage				
	NO Load, VIN=5V		60		uA
	NO Load, VIN=30V		150		uA
OVP/OCP/ 过压过/流保护					
VFB	Iout=10mA	1.15	1.2	1.25	V
OVP Range		4.0		20.0	V
IOCP	ILIM=GND	2.20	2.70	3.20	A
	ILIM=2K	1.30	1.50	1.75	A
Internal time control/temperature protection point/内部时间控制/温度保护点					
TSTART	VIN=5V		25		ms
TON	VOUT = 10% VIN to VOUT = 90% VIN, Cout=1uF		6		us
TOVP			100		ns
TOCP			120		us
TSDD			25		ms
Thermal Shutdown			150		°C
TOTP_HYS			20		°C

Function Descriptions/功能说明

1. UVLOOver Current Protection (OCP)

If the load current rises to the OCP threshold, the device will cut off the output voltage. The OCP threshold is calculated by the equation:

$$I_{LIM}(A) = \frac{3000}{R_{LIM}} \pm 15\% \quad (\text{current in A, resistance in } \Omega)$$

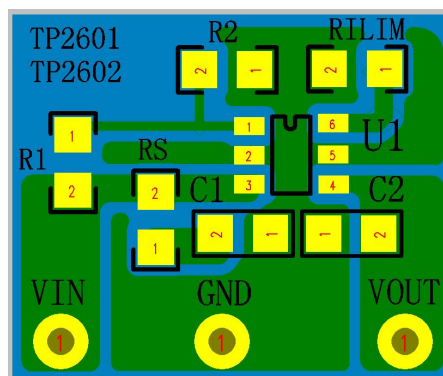
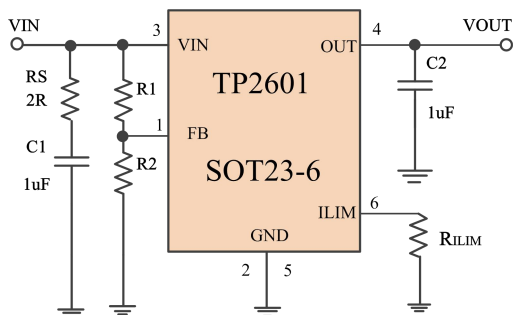
2. overvoltage protection (OVP)

OVP feedback input pin. A resistor divider from IN to AGND thru this pin. VFB=1.2V, When FB grounding , default OVP=6.1V. The OVP threshold is calculated by the equation:

$$OVP(V) = \frac{R1 + R2}{R2} \times 1.2$$

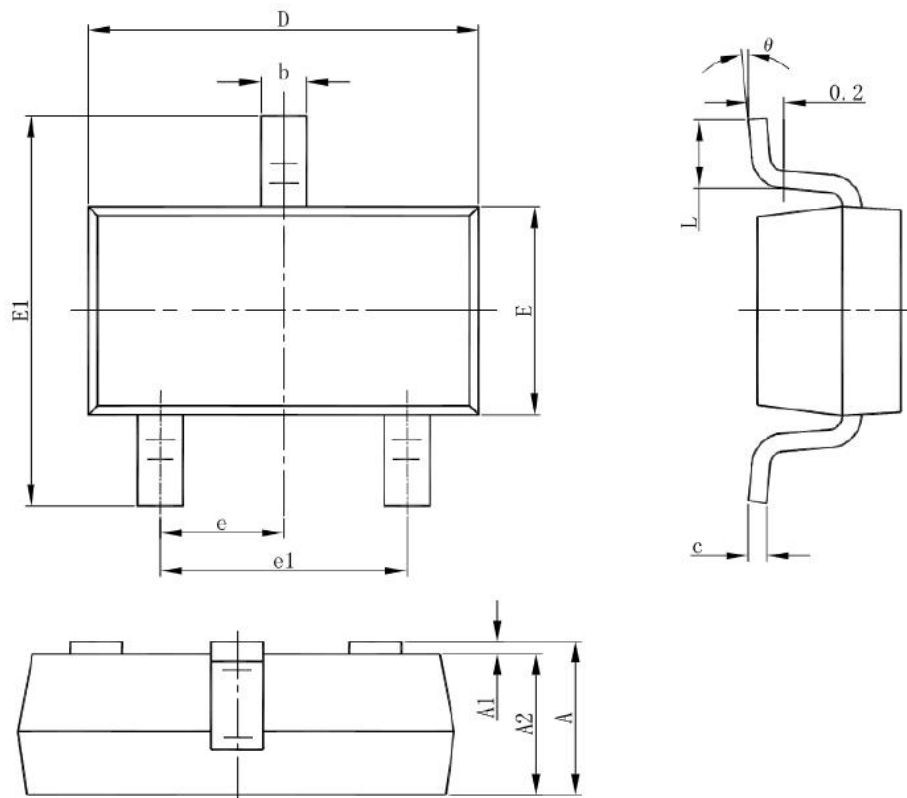
TP2601 LAYOUT:

Typical Application Schematic(OVP/OCP is adjustable)



Package Outline/外观尺寸

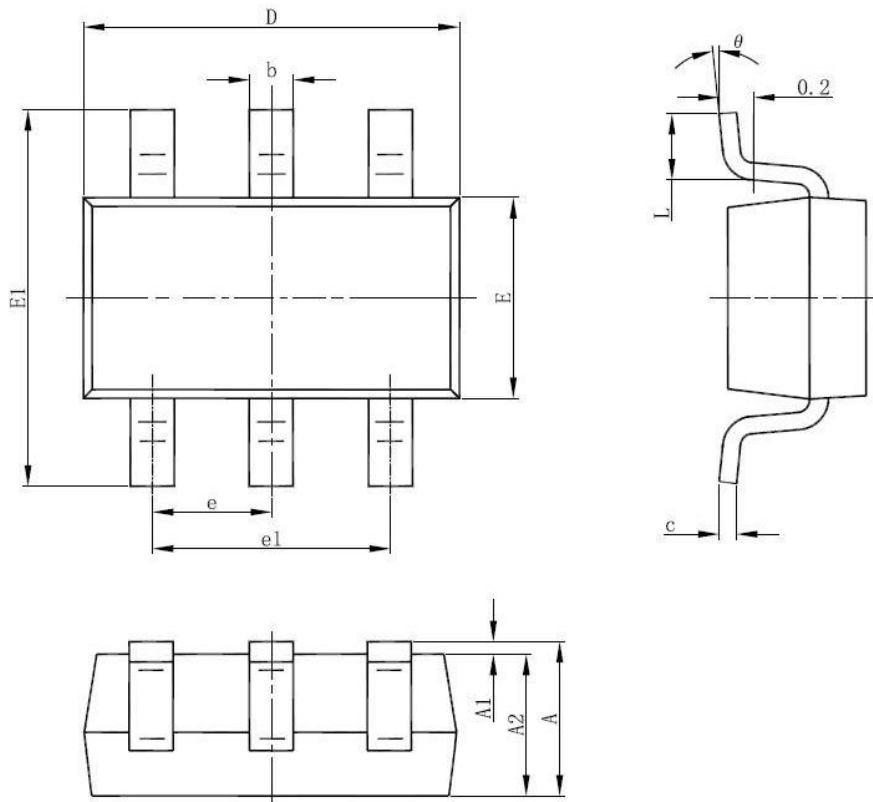
SOT-23-3L:



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	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

SOT-23-6L:

SOT-23-6L PACKAGE OUTLINE DIMENSIONS



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°