数据手册
DATASHEET

TP2603

(Over Voltage and Over Current Protection IC)

TP2603 Over Voltage and Over Current Protection IC

General Description /概述

The TP2603 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 TP2603 is available in SOT23/SOT23-6 package. Standard products are Pb-free and Halogen-free。

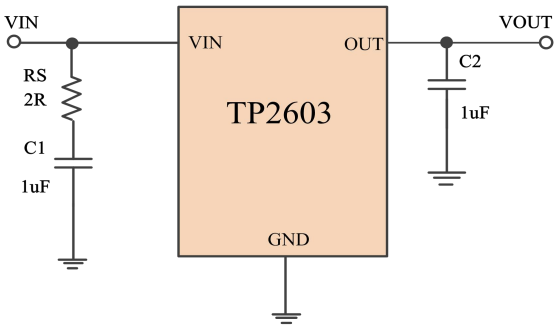
Features/特点

- Absolute maximum input voltage: 32V；
- Maximum load current: 2A ；
- Low power path resistance: 160mΩ (Typ.) ；
- OVP Threshold(default): 6.1V ；
- OVP response time: 100nS ；
- SCP and OTP
- Thermal shutdown protection & Auto recovery；
- Output short-circuit protection；
- RoHS Compliant and 100% Lead (Pb)-Free ；
- SOT23/SOT23-6 Package。

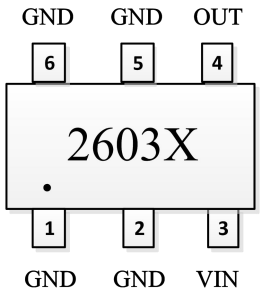
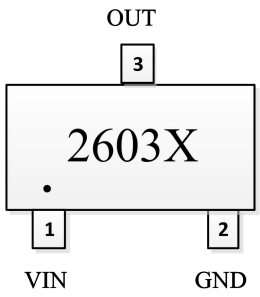
Application/应用领域

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

Typical Application Circuit/典型应用图:



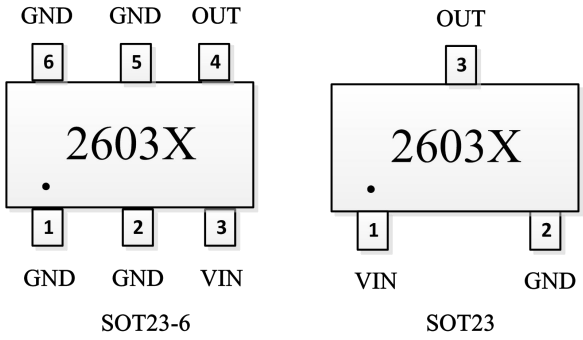
Ordering Information /订购信息：

 SOT23-6 封装	订单型号
	TP2603-SOT236
	Marking Information： 2603X:
 SOT23 封装	订单型号
	TP2603-SOT23
	Marking Information： 2603X:

ABSOLUTE MAXIMUM RATINGS/绝对最大额定值

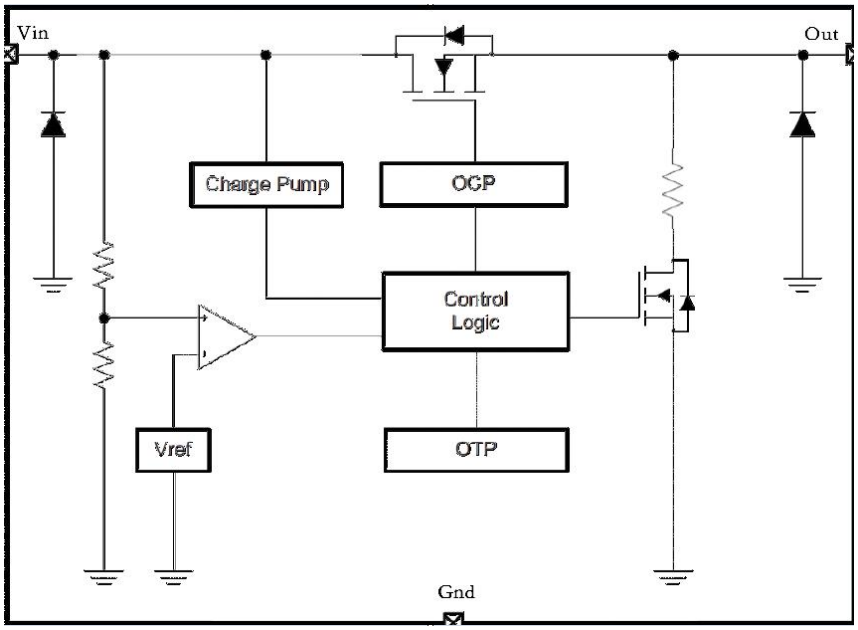
SYMBOL	ITEMS		VALUE	UNIT
V_{IN}	Input Voltage		-0.3~32	V
Output	Output voltage (OUT pin)		-0.3~32	V
I_{OMAX}	Maximum Output Continues Load Current		2.2	A
P_{DMAX}	Power Dissipation	SOT23-6	0.6	W
		SOT23	0.45	W
$R_{\theta JA}$	Thermal Resistance	SOT23-6	120	℃/W
		SOT23	180	℃/W
T_J	Junction Temperature		-40~125	℃
Tstg	Storage Temperature		-40~85	℃
Tsolder	Package Lead Soldering Temperature (10s)		260	℃
HBM	ESD Susceptibility, Human Body Model		2.0	KV

Pin Description /引脚描述



PIN			引脚名称	引脚功能描述
SOT23-6	SOT23			
1			GND	Power ground pin.
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			GND	Power ground pin.

Functional Block Diagram/内部结构框图



Electrical Characteristics/电气特性参数

VIN =5V,C1=C2=1uF, TA=25℃, 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
Ron	VCC=5V, Iout=1A		160	200	mΩ
Iq	Standby current, IN and Vcc <OVP voltage NO Load，VIN=5V NO Load，VIN=30V		 60 150		 uA uA
OVP/OCP/ 过压过/流保护					
OVP	FB=GND Iout=10mA	5.8	6.1	6.4	V
IOCP		2.20	2.70	3.20	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		℃
TOTP_HYS			20		℃

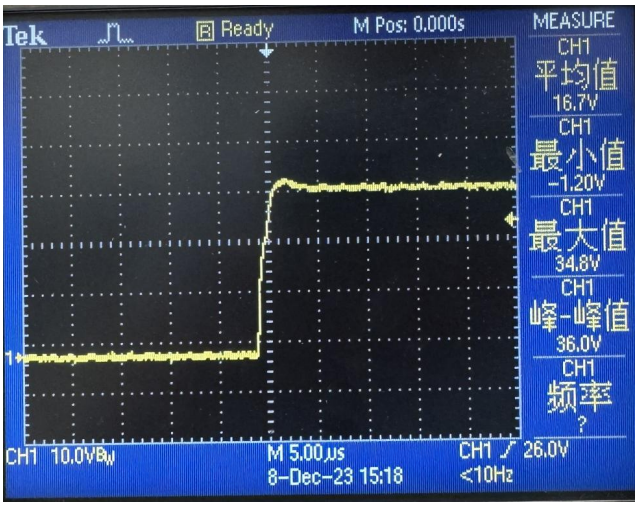
Function Descriptions/功能应用说明

1.TP2603 is an integrated 160mΩ(typical) low-on-resistance FET overvoltage and overcurrent protection chip to prevent voltage failure in the post-stage low-voltage system. The maximum voltage of TP2603 can reach 32VDC. If the input voltage (VIN) exceeds 6.1V, the internal FET will quickly shut down./TP2603 是一颗集成 160mΩ(典型)低导通阻值场效应管的过压与过流保护芯片，防止后级低压系统出现电压故障，TP2603 最高耐压可达 32VDC。如果输入电压(VIN)超过 6.1V，内部场效应管将迅速关闭。

2.About the input capacitor/关于输入电容

In order to limit the voltage drop caused by the instantaneous inrush current on the input power supply when the internal FFAT is switched on to the load capacitor at the output or the output is short-circuited, it is recommended to place a 1uF/50V MLCC capacitor or larger capacitor between the VIN and GND pins. To improve the hot-swap voltage withstand, connect another 2-ohm resistor to the input capacitor in series. For details, see the typical application diagram./当内部场效应管开通到输出端的负载电容或输出端短路时，为了限制瞬时涌流对输入电源造成的电压降，建议在 VIN 和 GND 引脚之间放置 1uF/50V MLCC 电容或更大电容。当需要提高热插拔耐压，建议在输入电容上再串联一个 2Ω电阻，具体应用参考典型应用图。

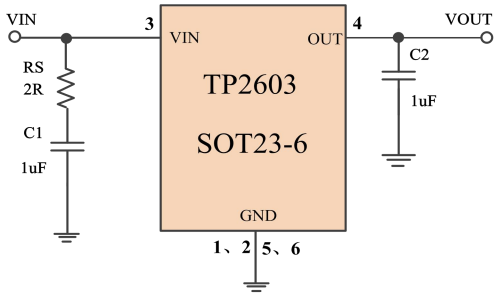
Measured input 32V power-on waveform diagram (circuit according to typical application) :/实测输入 32V 上电波形图（电路按典型应用）：

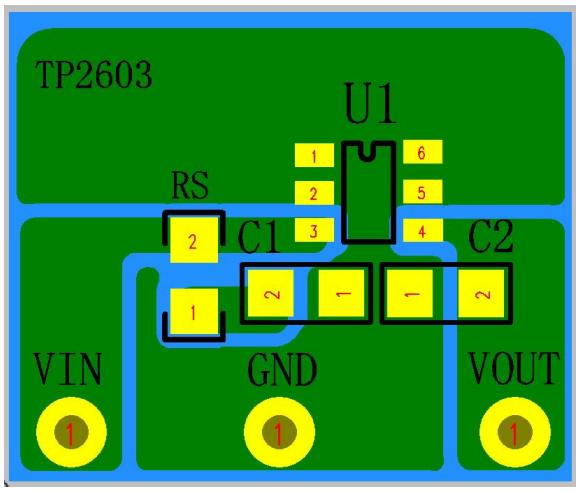


3.About output capacitance/关于输出电容

A capacitor of 1uF or larger should be placed between the OUT and GND pins./在 OUT 和 GND 引脚之间应该放置一个 1uF 或更大的电容。

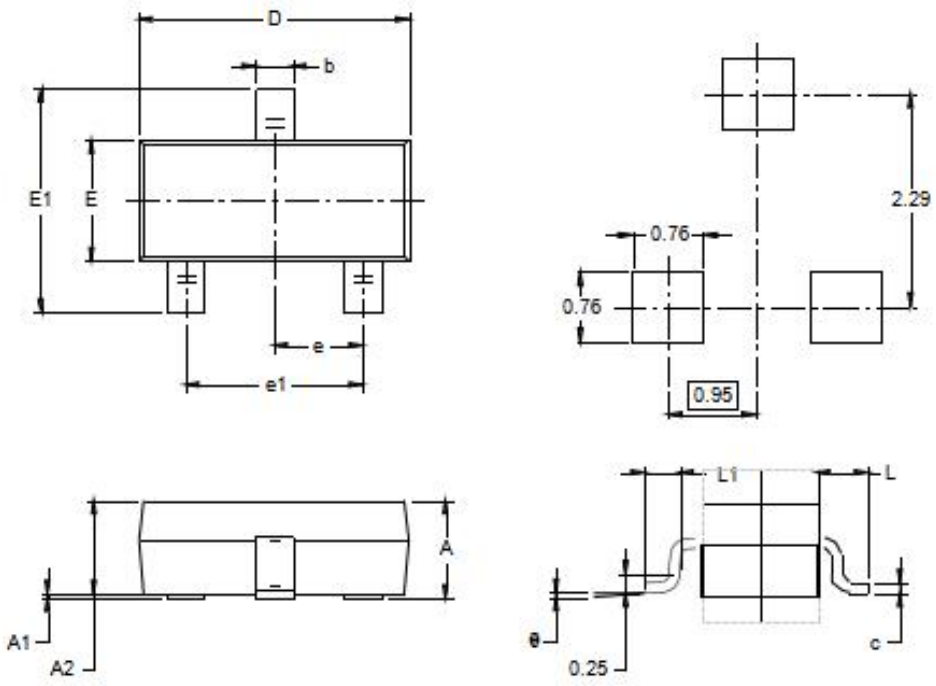
TP2603 LAYOUT:





Package Outline/外观尺寸

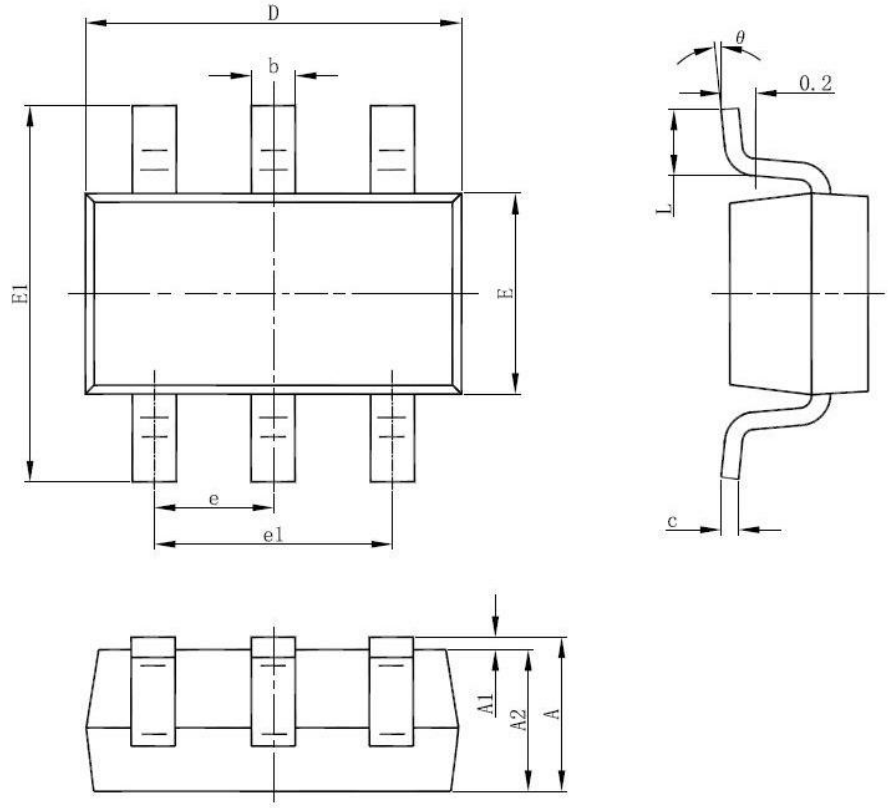
SOT23:



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT23-6L：

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°