■ General Description

The TCS2187 series are highly precise, low noise, positive voltage LDO regulators manufactured using CMOS processes. The series achieves high ripple rejection and low dropout and consists of a standard voltage source, an error correction, current limiter and a phase compensation circuit plus a driver transistor. The series is also compatible with low ESR ceramic capacitors which give added output stability. This stability can be maintained even during load fluctuations due to the excellent transient response of the series.

The current limiter's feedback circuit also operates as a short protect for the output current limiter and the output pin The CE function enables the output to be turned off, resulting in greatly reduced power consumption.

■ Package

- SOT23-5L

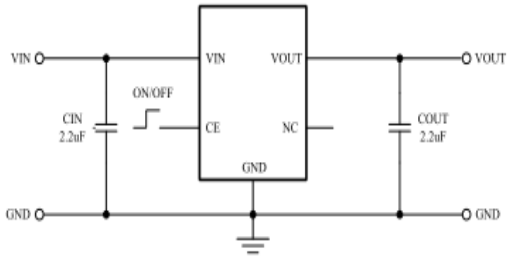
■ Features

- Output Voltage Range: 1.2V to 5.0V (selectable in 100mV steps)
- Highly Accurate: ± 1%
- Dropout Voltage: 200mV @ 100mA (3.0V type)
- Low Power Consumption: 0.8μA (TYP.)
- Maximum Output Current : 250mA
- Standby Current : less than 0.1μA
- Internal protector: current limiter
- Internal discharge MOS

■ Applications

- Wearable electronic products
- Security
- Three table
- Real-time clock

■ Typical Application Circuit



注意：输入电容器(C1)：1μF以上；输出电容器(C2)：1 μF以上

Caution: 1. The above connection diagram and constant will not guarantee successful operation. Perform thorough evaluation using the actual application to set the constant.

2. Input capacitor (CIN): 1.0μF or more, Output capacitor (COUT): 1.0μF or more (tantalum capacitor)

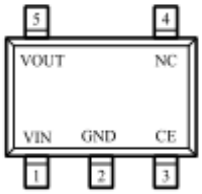
3. A general series regulator may oscillate, depending on the external components selected. Check that no oscillation occurs with the application using the above capacitor.

■ Ordering Information

PACKAGE	TEMPERATURE RANGE	ORDERING PART NUMBER	TRANSPORT MEDIA	MARKING
SOT23-5L	-40°C to 85°C	TCS2187_EXX	Tape and Reel 3000 units	

XX said voltage, voltage is; 1.5V；1.8V；2.5V； 2.8V；3.0V； 3.3V

■ Pin Configuration

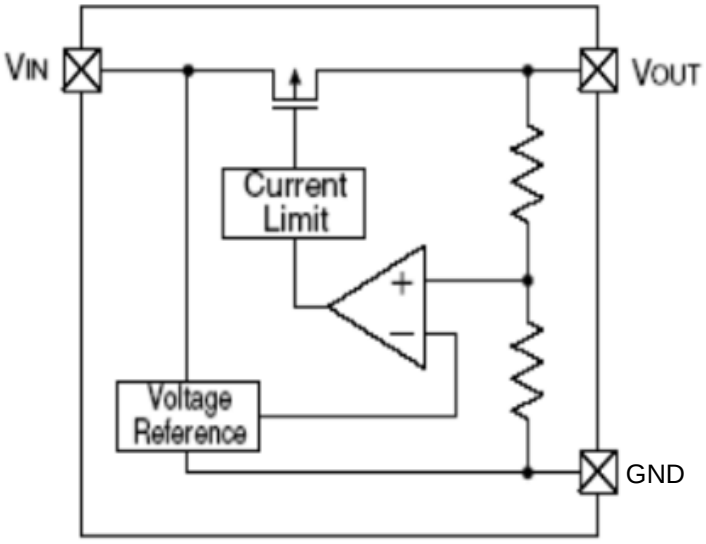


SOT23-5L
(TOP VIEW)

■ Pin Assignment

引脚号 SOT23-5L	引脚名	功能
1	VIN	输入端
2	GND	接地端
3	CE	使能端
4	NC	空
5	VOUT	输出端

■ Function Block Diagram



■ Absolute Maximum Ratings

Parameter	Symbol	Maximum Rating		Unit
Input Voltage	V_{IN}	V_{SS}-0.3～V_{SS}+5.5		V
	$V_{ON/OFF}$	V_{SS}-0.3～V_{IN}+0.3		
Output Current	V_{OUT}	V_{SS}-0.3～V_{IN}+0.3		
Power Dissipation	P_D	SOT-23-5L	400	mW
Operating Ambient Temperature	Topr	-40～+85		°C
Storage Temperature	Tstg	-40～+125		

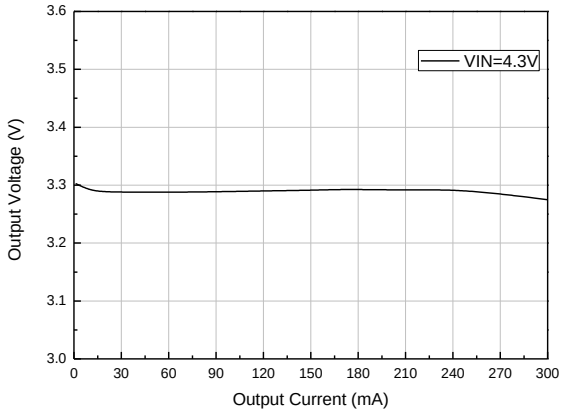
■ Electrical Characteristics

(TA=25℃ unless otherwise noted)

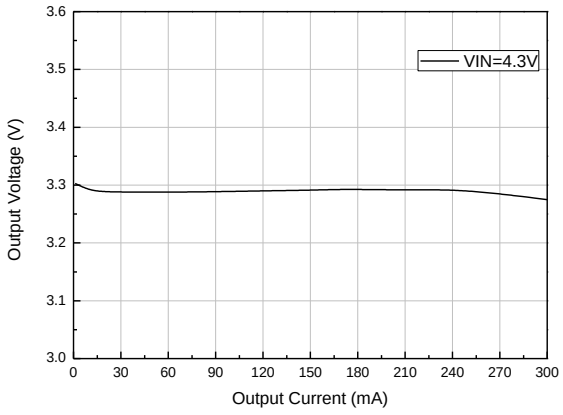
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Output Voltage	$V_{OUT(E)}$	V_{IN} =$V_{OUT(S)}$+1.0 V, I_{OUT}=30 mA	$V_{OUT(S)}$ ×0.99	$V_{OUT(S)}$	$V_{OUT(S)}$ ×1.01	V
Output Current	I_{OUT}	V_{IN}≥$V_{OUT(S)}$+1.0 V	250	-	-	mA
Dropout Voltage	V_{drop}	I_{OUT}=50 mA	-	0.1	0.12	V
		I_{OUT}=100 mA	-	0.2	0.24	
Line Regulations	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	$V_{OUT(S)}$+0.5 V ≤V_{IN}≤5.5 V I_{OUT}=30 mA	-	0.10	0.20	%/V
Load Regulation	ΔV_{OUT2}	V_{IN}=$V_{OUT(S)}$+1.0 V 1.0 mA ≤I_{OUT} ≤100 mA	-	10	20	mV
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}$	V_{IN}=$V_{OUT(S)}$+1.0 V, I_{OUT}=10 mA -40°C ≤Ta≤85°C	-	±100	-	ppm/℃
Supply Current	I_{SS1}	V_{IN}=$V_{OUT(S)}$+1.0 V	-	0.8	1.3	μA
Standby Current	Istby	V_{IN}=$V_{OUT(S)}$+1.0 V,Vce=0	-0.1	-	0.1	uA
Input Voltage	V_{IN}	-	2.0	-	5.5	V
Ripple-Rejection	|PSRR|	V_{IN}=$V_{OUT(S)}$+1.0 V，f=1 kHz Vrip=0.5 Vrms, I_{OUT}=50 mA	-	35	-	dB
		V_{IN}=$V_{OUT(S)}$+1.0 V，f=10 kHz Vrip=0.5 Vrms, I_{OUT}=50 mA	-	30	-	dB
CE “High” Voltage	V_{CEH}	-	1.6	-	-	V
CE “Low” Voltage	V_{CEL}	-	-	-	0.5	V
CE “High”Current （no resistor built in）	I_{CEH}	V_{IN}=V_{CE}=$V_{OUT(T)}$+1V	-0.1	-	0.1	μA
CE “Low” Current （no resistor built in）	I_{CEl}	V_{IN}= $V_{OUT(T)}$+1V ， V_{CE}=V_{SS}	-0.1	-	0.1	μA
Inrush Current	I_{RUSH}	V_{IN}= $V_{OUT(T)}$+1V,CL=47uF, VCE=0→$V_{OUT(T)}$+1V	-	450	-	mA

■ Typical Performance Characteristics

1. Output Voltage VS Temperature



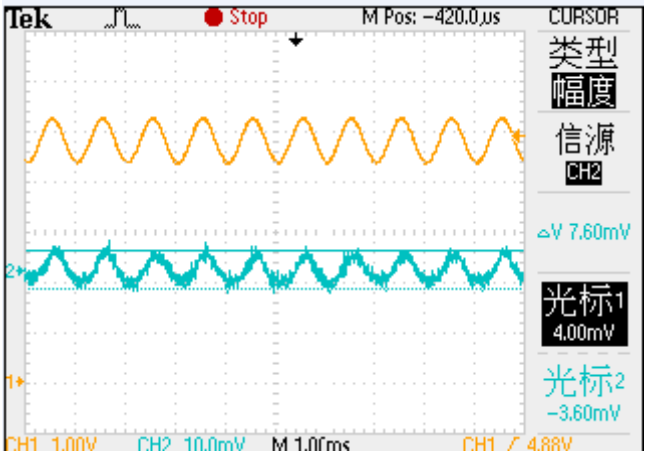
2. VOUT VS Output Current



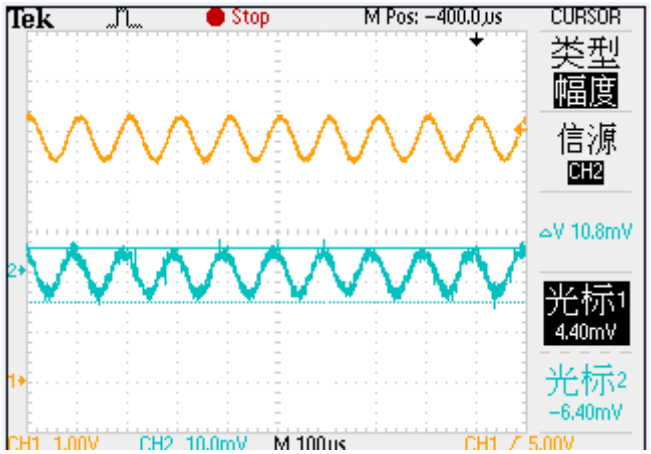
3. Load transient response (IL=0-261-0mA)

4. Load transient response (IL=10-264-10mA)

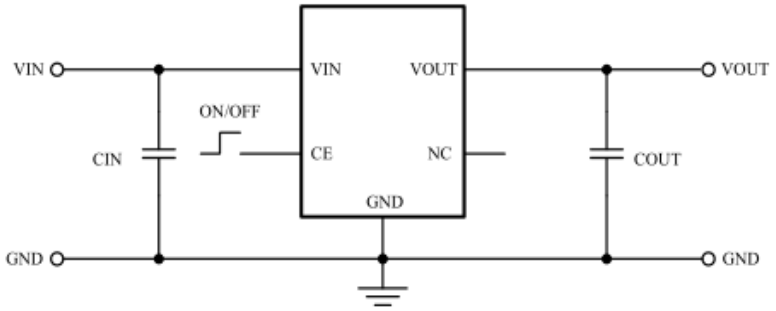
5. Ripple-Rejection (IL=50mA, Vpp=1V, F=1KHZ)



6. Ripple-Rejection (IL=50mA, Vpp=1V, F=10KHZ)



■ Application information



- **Setting the Input Capacitor and the Output Capacitor**

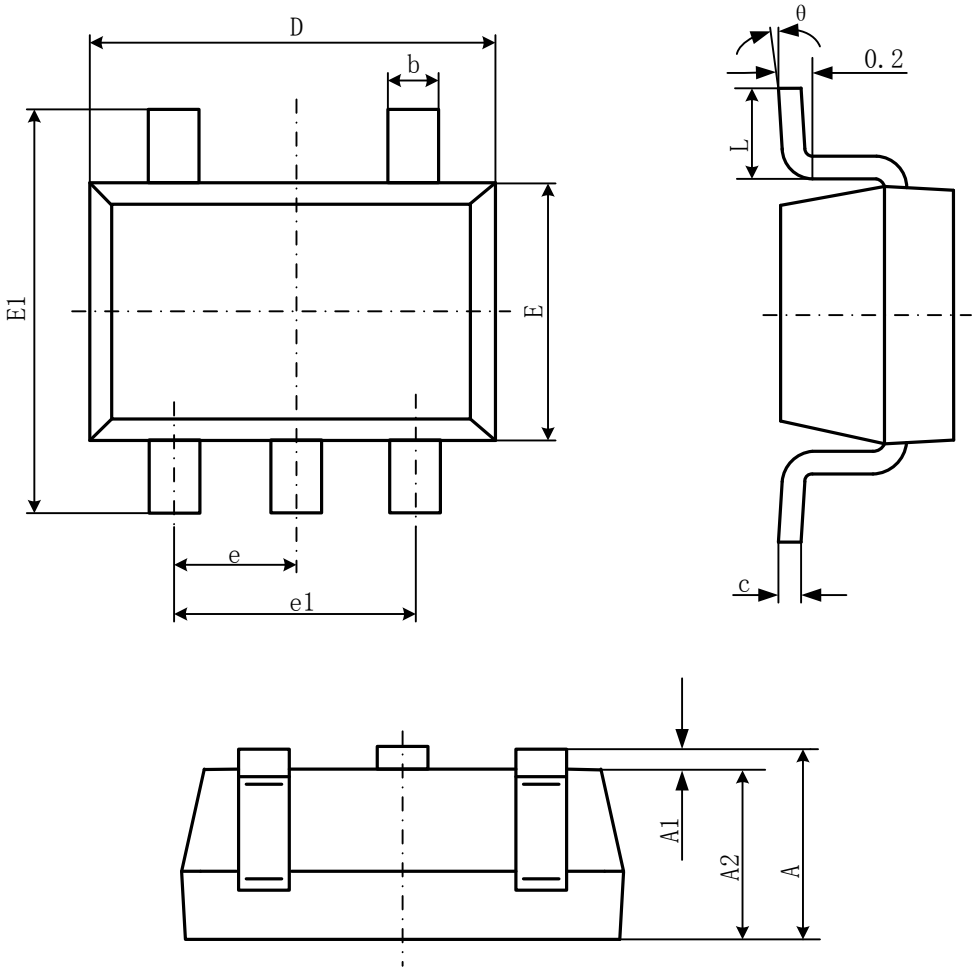
  Input capacitors（C1）and output capacitors(C2) are recommended to use more than 1uF, which can ensure the stability of the system

- **PCB Layout**

  In order to get better use effect, the main points for attention of PCB layout are as follows:

- The input and output capacitors are as close as possible to the chip pins.

- **SOT23-5L**



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°