

#### **General Description**

The HSPX5205 series is a set of low voltage differential (LDO converters) with a wide voltage input range of 3.0V to 18V, low voltage differential, low power consumption, and miniaturized packaging. The output voltage range is 3.0-5.0V, and the HSPX5205 has low static current characteristics as low as 20uA. The circuit also has a CE enable control port, which can put the circuit into sleep mode. It is particularly suitable for battery powered and long-term standby system equipment applications, helping to reduce standby power consumption of system equipment, effectively extending standby time and battery life.

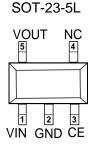
#### **Features**

- Low Power Consumption
- Low Voltage Drop
- 0.2uA Max IQ in Shutdown Mode
- Withstanding Voltage 18V
- Quiescent Current 20uA
- Output Voltage Accuracy: tolerance ±2%
- High output current: 200mA

#### **Application**

- Battery-powered Equipments
- Communication Equipments
- Audio/Video Equipments
- Smart Battery Packs
- Smoke Detectors
- CO2 DETECTORS

#### Pin Configuration And Descriptions



PIN No.	Name	Functions Description
SOT-23-5L		Functions Description
1	Vin	Input
2	GND	Ground
3	CE	ON/OFF Control
4	NC	No Connect
5	Vouт	Output

#### Order Information

Orderable Device	Package	Output Voltage	Packing Option
HSPX5205M5-L-3-0	SOT-23-5L	3.0V	3000/Reel
HSPX5205M5-L-3-3	SOT-23-5L	3.3V	3000/Reel
HSPX5205M5-L-5-0	SOT-23-5L	5.0V	3000/Reel



## **Absolute Maximum Ratings**

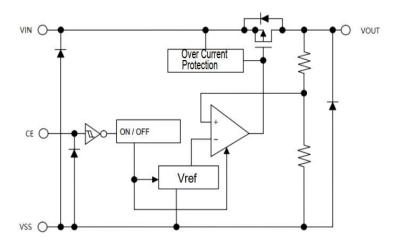
Description	Symbol	Value Range	Unit
Limit Power Voltage	Vin	-0.3∼ <b>+</b> 22	V
Storage Temperature Range	Тѕтс	-50∼+125	°C
Operating Free-air Temperature Range	TA	-40∼ <b>+</b> 85	°C

Note:Stresses greater than those listed under "Absolute Maximum Ratingsmay" cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditionsis" not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

### **Heat Dissipation**

Description	Symbol	Package	Value Range	Unit
Thermal resistance	JA	SOT-23-5L	500	°C/W
Power dissipation	Pw	SOT-23-5L	200	mW

## **Block Diagram**





### DC Characteristics (unless otherwise noted TA= 25°C)

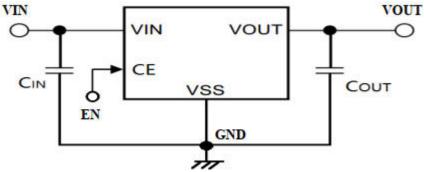
Parameter	Symbol	Test Condition	Min	Тур	Max	Unit
Input Voltage	Vin		3.0		18	V
Output Voltage	Vouт		3.0		5.0	V
Voltage Accuracy		louт=1mA	-2		+2	%
Output Current	Іоит	VIN=VOUT+2.0V		100		mA
Load Regulation	∆Vо∪т	V <sub>IN</sub> =V <sub>OUT</sub> +2.0V 1mA≪I <sub>OUT</sub> ≪150mA		20		mV
Line Regulation	△Vout/ Vout*△Vin	Vout+1.0V≤ViN≤18V Iout=10mA		0.015	0.2	%/V
Voltage Drop	V <sub>DIF</sub> <sup>1</sup>	Іоит=100mA,Vоит=3.3V		200		mV
Quiescent Current	Iss	Vce=Vin		20	50	μΑ
Standby Current	ISTANDBY	Vce=Vss			0.1	μΑ
	Vсен	VIN=VOUT+2.0V	1.7		18	V
	Vcel	VIN=VOUT+2.0V	0		0.3	V
short-circuit current	Ishort	VIN=VOUT+2.0V		300		mA
Temperature Coefficient	△Vουτ/ △Ta*Vουτ	Vin=Vout+2.0V lout=10mA -40°C≤Ta≤125°C		±100		ppm/°C
Discharge Resistor	R <sub>DIS</sub> <sup>2</sup>	VCE<0.5V		300		

**Note:** 1.When  $V_{IN}=V_{OUT}+2.0V$ , as the output voltage declined 2%, the  $V_{DIF}=V_{IN}-V_{OUT}$ .

2.Output active discharge resistor Rdis, As the input voltage increases, it decreases.

# **Application Circuit**

#### **Basic Circuits**



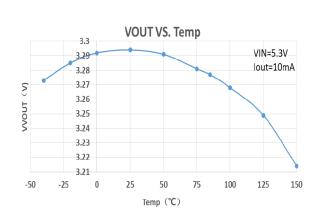
- 1. C<sub>IN</sub> is used to stabilize the input capacitor.
- 2. CIN eramic capacitors greater than or equal to 1pF can be used for COUT.

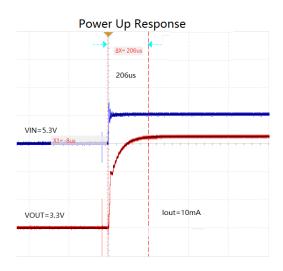


## **Function Description**

HSPX5205 series are linear voltage regulator ICs withstanding 20V voltage. The series IC consists of a voltage reference, an error amplifier, a current limiter and a phase compensation circuit plus a driver transistor. The output stabilization capacitor is also compatible with low ESR ceramic capacitors. The over current protection circuit and the over voltage protection circuit are built-in. The protection circuit will operate wheb the output current or input voltage reaches limit level.

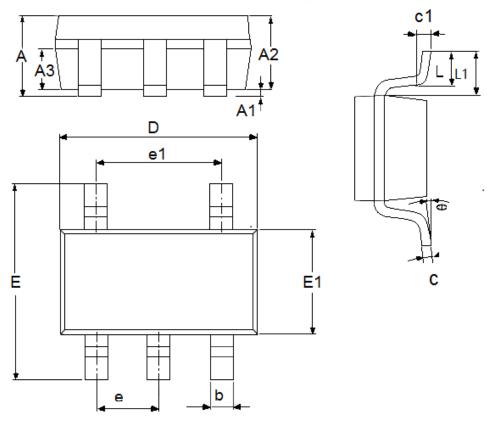
## **Typical Characteristics**







# Package Outline Dimensions SOT-23-5L



Ol	Dimensions in	Millimeters	Dimensions In Inches	
Symbol	Min	Max	Min	Max
Α	1.05	1.45	0.0413	0.0571
A1	0	0.15	0.0000	0.0059
A2	0.9	1.3	0.0354	0.0512
A3	0.6	0.7	0.0236	0.0276
b	0.25	0.5	0.0098	0.0197
С	0.1	0.23	0.0039	0.0091
D	2.82	3.05	0.1110	0.1201
e1	1.9(TYP)		0.0748	S(TYP)
Е	2.6	3.05	0.1024	0.1201
E1	1.5	1.75	0.0512	0.0689
е	0.95(TYP)		0.0374	·(TYP)
L	0.25	0.6	0.0098	0.0236
L1	0.59(TYP)		0.0232	(TYP)
θ	0	8°	0.0000	8°
c1	0.2(TYP)		0.0079	(TYP)



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