

### General Description

The XC6221A is a low-dropout (LDO) voltage regulator with enable function that operates from a 1.2V to 5.5V supply. It provides up to 300mA of output current in miniaturized packaging.

The feature of 2μA low quiescent current and 0.5μA shutdown current are ideal for the battery application with long service life. The other features include current limit function, over temperature protection and output discharge function.

### Features

- 2μA Ground Current at no Load
- ±2% Output Accuracy
- 300mA Output Current
- 10nA Disable Current (by option)
- Wide Operating Input Voltage Range: 1.2V to 5.5V
- Dropout Voltage: 0.18V at 300mA ( $V_{OUT}=3.3V$ )
- Support Fixed Output Voltage 1.2V, 1.5V, 1.6V, 1.8V, 2.5V, 2.8V, 3.0V, 3.3V, 3.6V
- Stable with Ceramic or Tantalum Capacitor
- Current Limit Protection
- Over-Temperature Protection
- SOT23-5, Packages

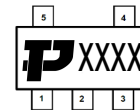
### Applications

- Portable, Battery Powered Equipment
- Low Power Microcontrollers
- Laptop, Palmtops and PDAs
- Wireless Communication Equipment
- Audio/Video Equipment

### Ordering Information

**XC6221A332MR**

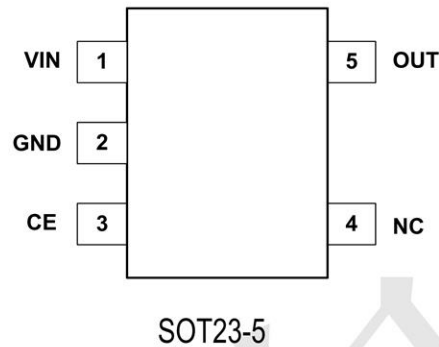
### Marking Information



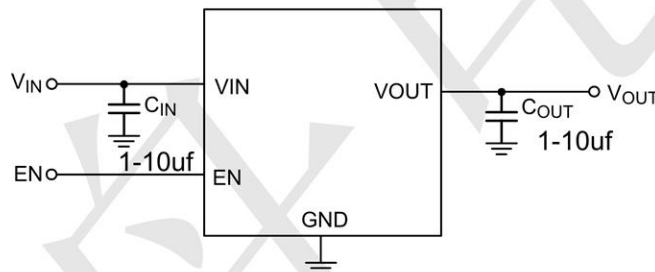
**P**: Logo  
XXXX: Marking ID

Output voltage: 12=1.2V  
15=1.5V  
18=1.8V  
30=3.0V  
33=3.3V  
36=3.6V

### PIN CONFIGURATION



### Typical Application Circuit



### ABSOLUTE MAXIMUM RATINGS

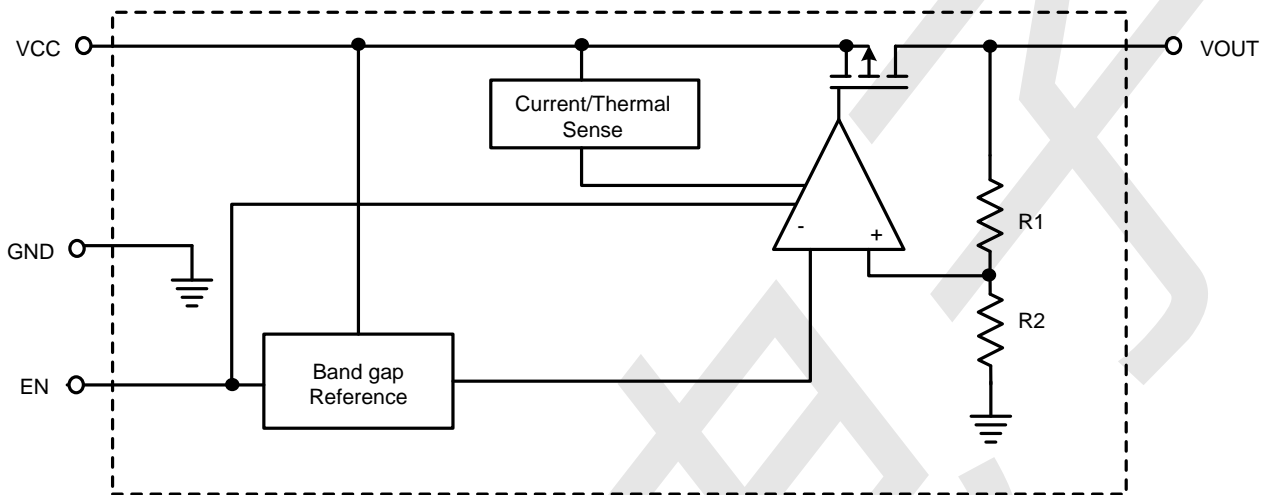
Parameter		Value	Unit
Supply Voltage		-0.3~+6.5	V
Power Dissipation	SOT-23-5	400	mW
	SOT-89	600	mW
Thermal Resistance, Junction-to-Ambient	SOT-23-5	380	°C/W
	SOT-89	180	°C/W
Operating Junction Temperature		-40 ~ +125	°C
Storage Temperature Range		-65 ~ +150	°C
Lead Temperature (Soldering, 10 sec)		300	°C

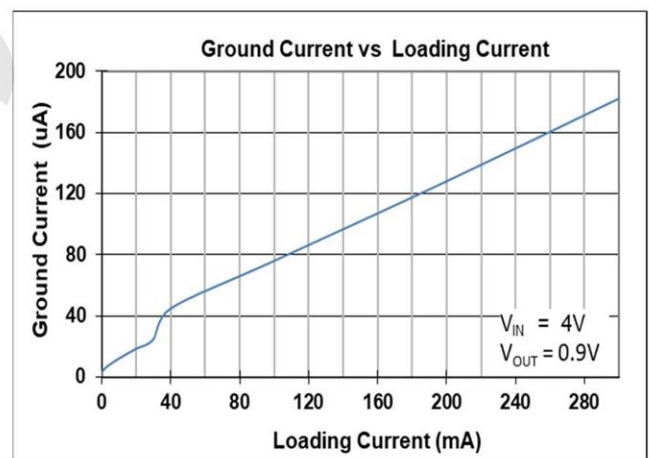
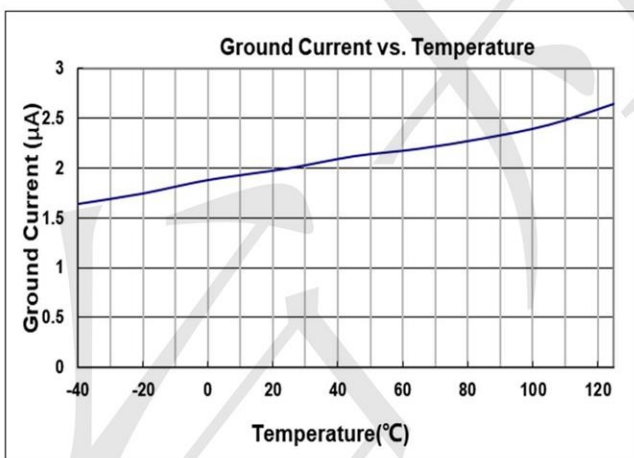
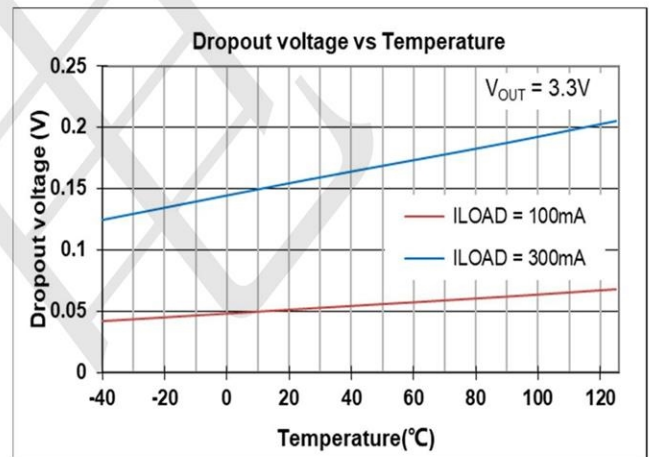
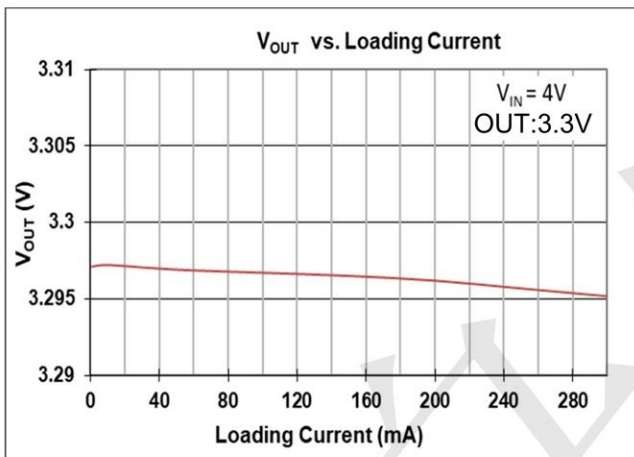
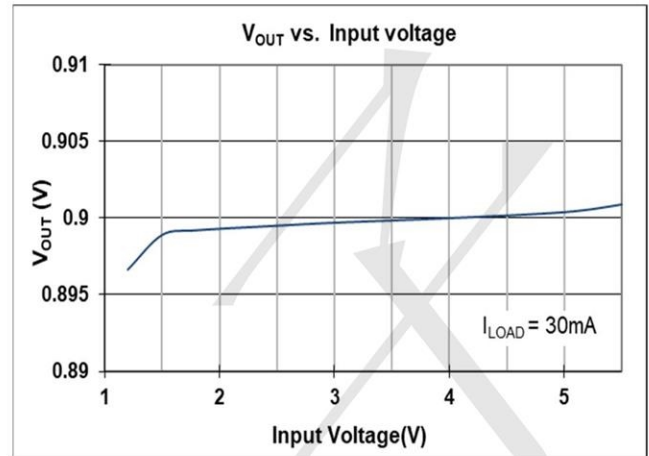
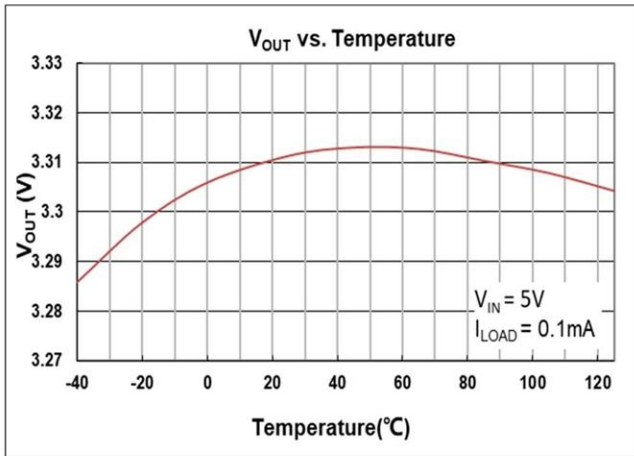
### Electrical Characteristics (T =25°C unless otherwise noted)

(V<sub>IN</sub>=5V, V<sub>EN</sub>=5V, T<sub>A</sub>=25°C, unless otherwise specified) (Note 1)

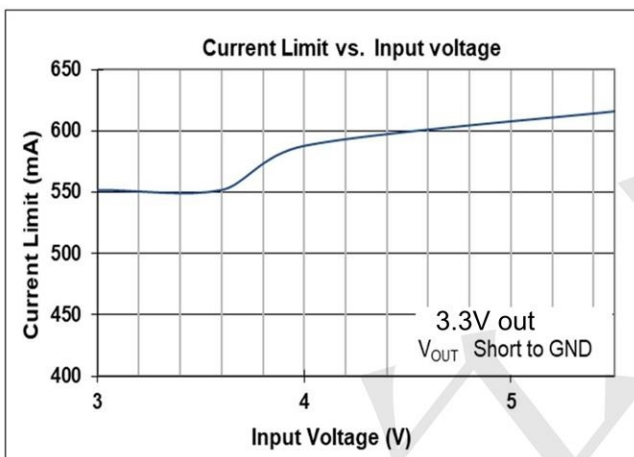
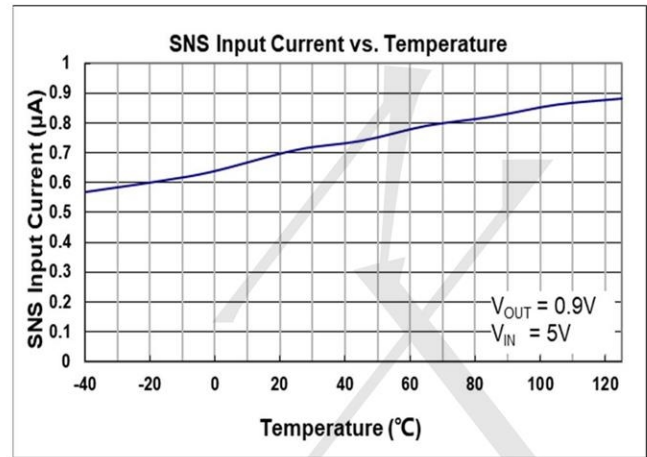
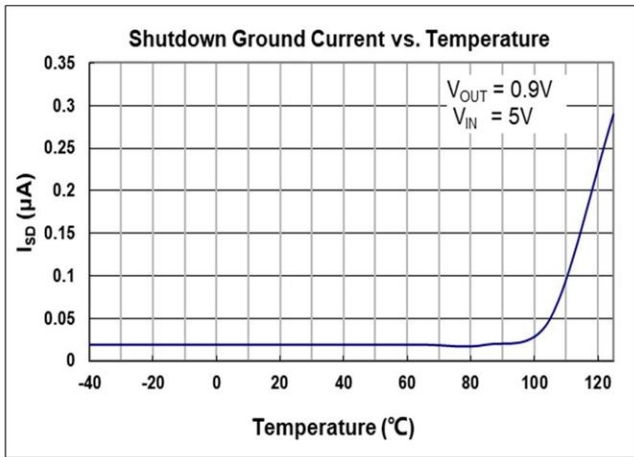
PARAMETER	TEST CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage		V <sub>IN</sub>	1.2		5.5	V
DC Output Voltage Accuracy	I <sub>LOAD</sub> =0.1mA		-2		2	%
SNS Input Current	SNS=V <sub>OUT</sub>	I <sub>SNS</sub>		0.5		μA
Dropout Voltage (Note 2)	I <sub>LOAD</sub> =300mA, V <sub>OUT</sub> ≥3V	V <sub>DROP_3V</sub>		0.18		V
	I <sub>LOAD</sub> =300mA, V <sub>OUT</sub> =2.8V	V <sub>DROP_2.8V</sub>		0.23		
	I <sub>LOAD</sub> =300mA, V <sub>OUT</sub> =2.5V	V <sub>DROP_2.5V</sub>		0.23		
	I <sub>LOAD</sub> =300mA, V <sub>OUT</sub> =1.8V	V <sub>DROP_1.8V</sub>		0.28		
	I <sub>LOAD</sub> =300mA, V <sub>OUT</sub> =1.5V	V <sub>DROP_1.5V</sub>		0.36		
	I <sub>LOAD</sub> =300mA, V <sub>OUT</sub> =1.2V	V <sub>DROP_1.2V</sub>		0.45		
GND Current	I <sub>LOAD</sub> =0mA	I <sub>Q</sub>		2		μA
Shutdown GND Current	V <sub>EN</sub> =0V, V <sub>OUT</sub> =0V	I <sub>SD</sub>		0.1	0.5	μA
V <sub>OUT</sub> Shutdown Leakage Current	V <sub>EN</sub> =0V, V <sub>OUT</sub> =0V	I <sub>LEAK</sub>		0.1	0.5	μA
Enable Threshold Voltage	EN Rising	V <sub>IH</sub>	1.0			V
	EN Falling	V <sub>IL</sub>			0.4	
EN Input Current	V <sub>EN</sub> =5V	I <sub>EN</sub>		10	100	nA
Line Regulation	I <sub>LOAD</sub> =30mA, 1.5V≤V <sub>IN</sub> ≤5.5V or (V <sub>OUT</sub> +0.2V)≤V <sub>IN</sub> ≤5.5V	ΔLINE		0.2		%
Load Regulation	10mA≤I <sub>LOAD</sub> ≤300mA	ΔLOAD		0.2		%
Output Current Limit	V <sub>OUT</sub> =0V	I <sub>LIM</sub>	300	500		mA
Power Supply Rejection Ratio	V <sub>OUT</sub> =1.2V, I <sub>LOAD</sub> =5mA, V <sub>IN</sub> =2V, f=100Hz	PSRR		80		dB
	V <sub>OUT</sub> =1.2V, I <sub>LOAD</sub> =5mA, V <sub>IN</sub> =2V, f=1kHz			75		
Output Voltage Noise	V <sub>IN</sub> =3.5V, I <sub>LOAD</sub> =0.1A, BW=10Hz to 100kHz, C <sub>OUT</sub> =1μF, V <sub>OUT</sub> =1.2V			80		μV <sub>RMS</sub>
	V <sub>IN</sub> =3.5V, I <sub>LOAD</sub> =0.1A, BW=10Hz to 100kHz, C <sub>OUT</sub> =1μF, V <sub>OUT</sub> =2.8V			120		
Thermal Shutdown Temperature	I <sub>LOAD</sub> =10mA	T <sub>SD</sub>		155		°C
Thermal Shutdown Hysteresis	I <sub>LOAD</sub> =10mA	ΔT <sub>SD</sub>		15		°C
Discharge Resistance	V <sub>EN</sub> =0V, V <sub>OUT</sub> =0.1V			100		Ω

**BLOCK DIAGRAM**

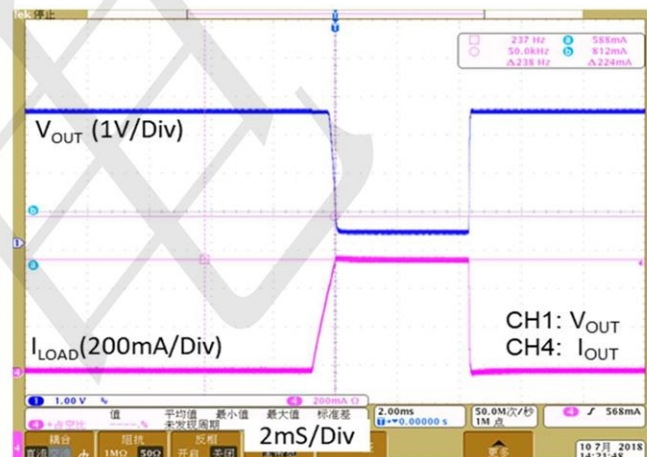




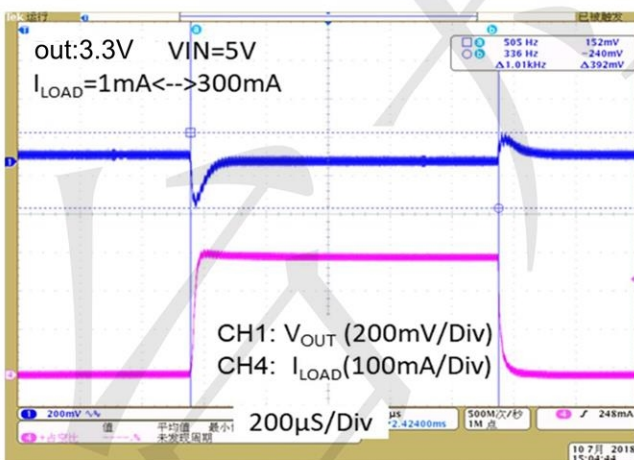




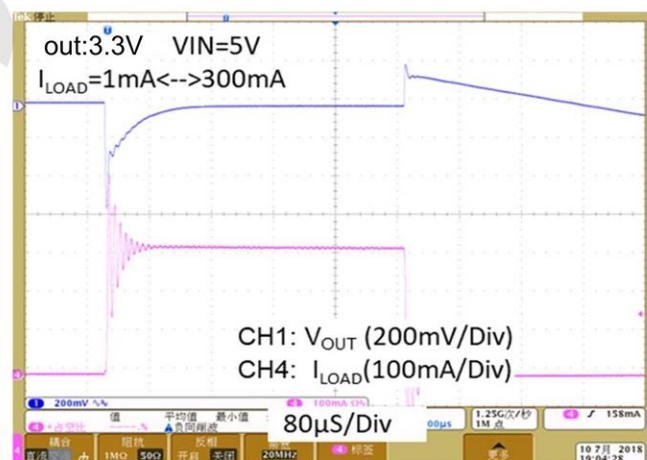
### Current Limit Response



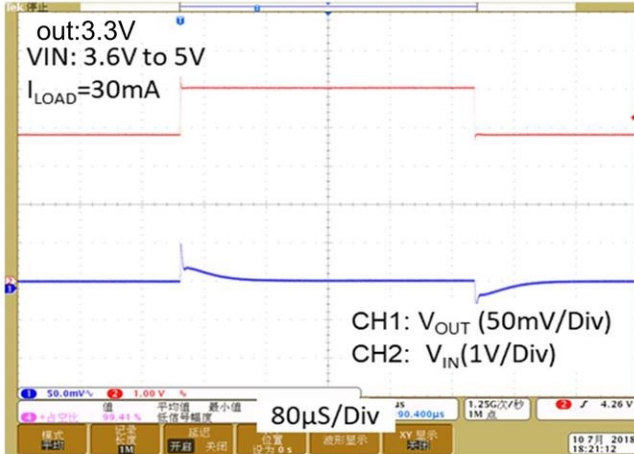
### Load Transient Response I



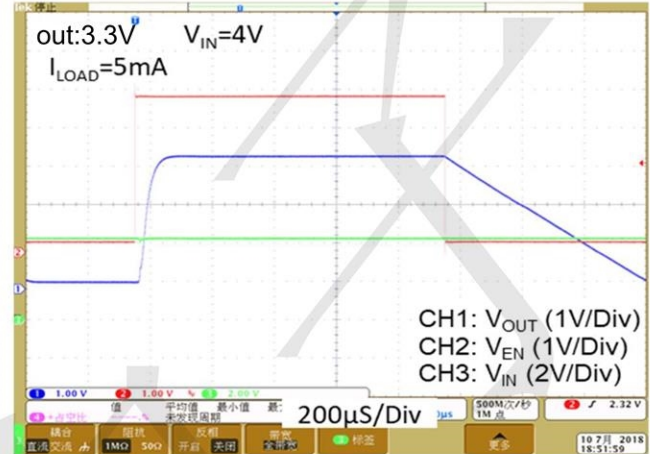
### Load Transient Response II



Line Transient Response

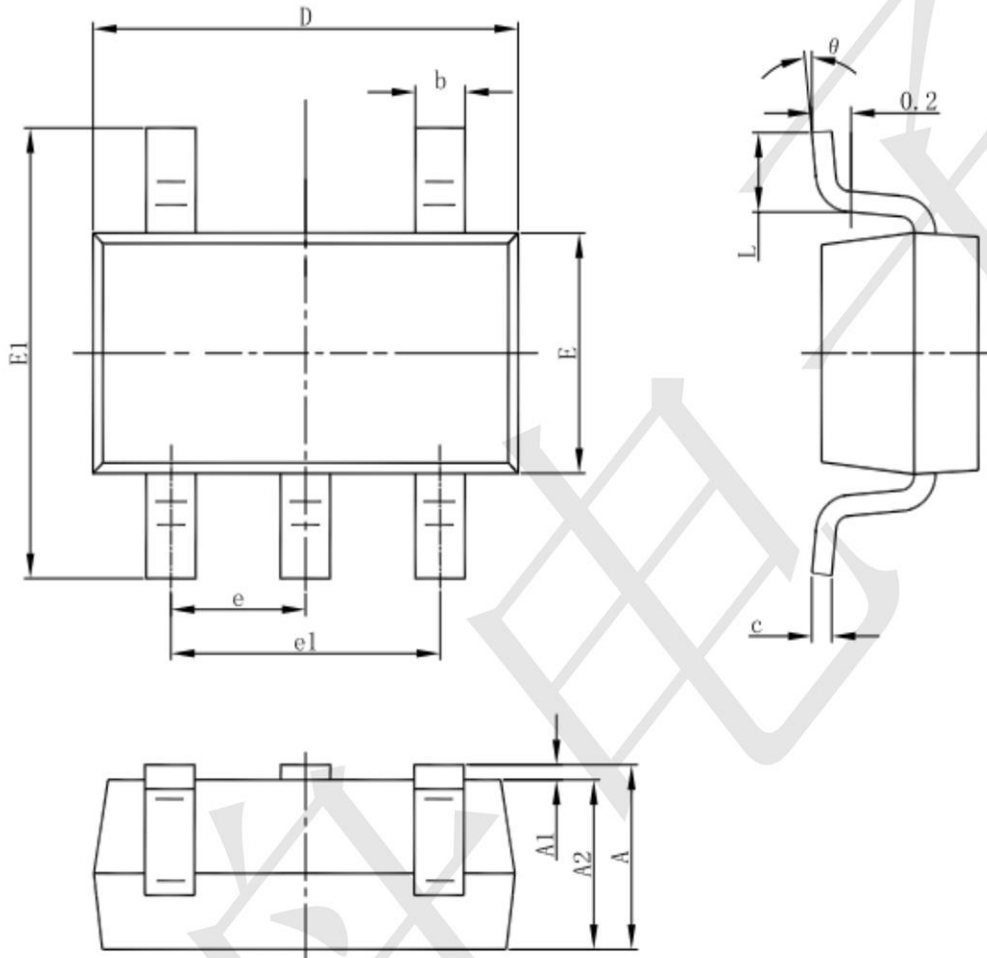


$V_{OUT}$  Turn On/Off by EN



### Package informantion

#### 3-pin SOT23-5 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
theta	0°	8°	0°	8°