BL8563

Low noise, fast response 300mA LDO regulator

Features

- Low Power Consumption: 15uA   Typ.

- Low Output Noise (47uVRMS)

- Standby Mode: 0.1uA

- Low Dropout Voltage0.16V@300mA (Typ.)

- High Ripple Rejection: 73dB@100Hz (Typ.)

- Low Temperature Coefficient: ± 100ppm/°C

- Excellent Line Regulation: 0.05%/V

- Build-in Chip Enable And Discharge Circuit

- Output Voltage Range: 1.5V~4.5V (customized on command every 0.1V step)

- Highly Accurate: ± 2% (± 1% customized)

- Output Current Limit

Applications

- Power source for cellular phones and various kind of PCSs

- Battery Powered equipment

- Power Management of MP3, PDA, DSC,

General Description

BL8563 series is a group of positive voltage output, low power consumption, low dropout voltage regulator.
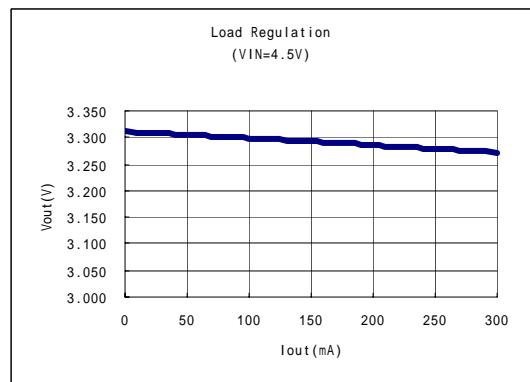
BL8563 can provide output value in the range of 1.5V~4.5V every 0.1V step. It also can be customized on command.

BL8563 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module with discharge capability.

BL8563 has excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within± 2%.
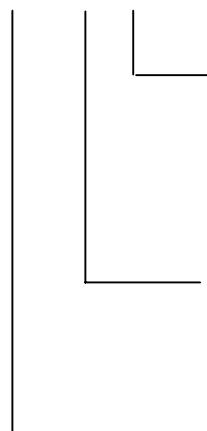
BL8563 is available in SOT-23-5, SC-70-5 packages which is lead free. It also can available in these packages with lead.

BL8563 Typical Application Circuit


BL8563 Typical Performance Characteristics

Selection Guide

BL8563-*XX* *X* *X*
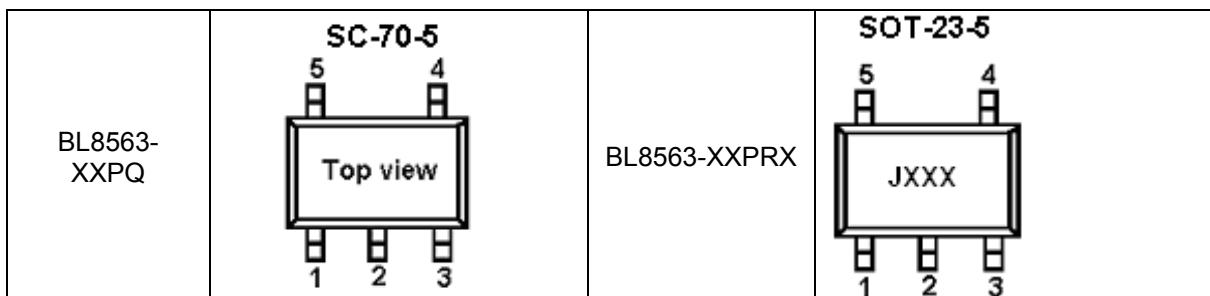
Package Type
RA: SOT-23-5
RB: SOT-23-5
Q : SC70-5

Features
P Standard defualt lead free
C Customized

Output Voltage
15……1.5V
28……2.8V
30……3.0V
35……3.5V
……
45……4.5V

Pin Assignment

	SC-70-5		SOT-23-5
BL8563-XXPQ	5 4 Top view 1 2 3	BL8563-XXPRX	5 4 JXXX 1 2 3
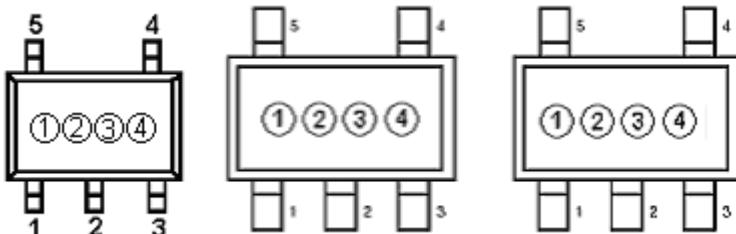
Pin Description

Pin Number			Symbol	Function
SC-70-5	SOT-23-5A	SOT-23-5B		
5	5	1	VOUT	Output pin
1	1	3	VDD	Input Pin
2	2	2	GND	Ground Pin
3	3	4	CE	Chip Enable Pin
4	4	5	NC	No Connection

Product Classification

Output Voltage	Package Type	Product Name	Package Type	Product Name	Package Type	Product Name
1.5V	SOT-23-5A	BL8563-15PRA	SOT-23-5B	BL8563-15PRB	SC70-5	BL8563-15PQ
1.8V	SOT-23-5A	BL8563-18PRA	SOT-23-5B	BL8563-18PRB	SC70-5	BL8563-18PQ
2.1V	SOT-23-5A	BL8563-21PRA	SOT-23-5B	BL8563-21PRB	SC70-5	BL8563-21PQ
2.5V	SOT-23-5A	BL8563-25PRA	SOT-23-5B	BL8563-25PRB	SC70-5	BL8563-25PQ
2.8V	SOT-23-5A	BL8563-28PRA	SOT-23-5B	BL8563-28PRB	SC70-5	BL8563-28PQ
3.0V	SOT-23-5A	BL8563-30PRA	SOT-23-5B	BL8563-30PRB	SC70-5	BL8563-30PQ
3.2V	SOT-23-5A	BL8563-32PRA	SOT-23-5B	BL8563-32PRB	SC70-5	BL8563-32PQ
3.3V	SOT-23-5A	BL8563-33PRA	SOT-23-5B	BL8563-33PRB	SC70-5	BL8563-33PQ
3.5V	SOT-23-5A	BL8563-35PRA	SOT-23-5B	BL8563-35PRB	SC70-5	BL8563-35PQ
⋮	⋮	⋮	⋮	⋮	⋮	⋮
4.5V	SOT-23-5A	BL8563-45PRA	SOT-23-5B	BL8563-45PRB	SC70-5	BL8563-45PQ

Product Marking information

SC70-5   **SOT23-5A**   **SOT23-5B**

① : Output current & EN availability
② : Output voltage
③ : Year of manufacturing
④ : Week of manufacturing

① BL8563 with output current 300mA

③ The year of manufacturing, "5" stands for year 2005, "6" stands for year 2006, and " ō " for year 2010.

②

Code	Vout	Code	Vout	Code	Vout
5	1.5V	6̄	2.6V	7̄	3.7V
6	1.6V	7̄	2.7V	8̄	3.8V
7	1.7V	8̄	2.8V	9̄	3.9V
8	1.8V	9̄	2.9V	0̄	4.0V
9	1.9V	0̄	3.0V	1̄	4.1V
0̄	2.0V	1̄	3.1V	2̄	4.2V
1̄	2.1V	2̄	3.2V	3̄	4.3V
2̄	2.2V	3̄	3.3V	4̄	4.4V
3̄	2.3V	4̄	3.4V	5̄	4.5V
4̄	2.4V	5̄	3.5V		
5̄	2.5V	6̄	3.6V		

④

Code	Week of Mfg	Code	Week of Mfg	Code	Week of Mfg	Code	Week of Mfg	Code	Week of Mfg
A	1	L	12	W	23	H̄	34	S̄	45
B	2	M	13	X	24	Ī	35	T̄	46
C	3	N	14	Y	25	J̄	36	Ū	47
D	4	O	15	Z	26	K̄	37	V̄	48
E	5	P	16	Ā	27	L̄	38	W̄	49
F	6	Q	17	B̄	28	M̄	39	X̄	50
G	7	R	18	C̄	29	N̄	40	Ȳ	51
H	8	S	19	D̄	30	ō	41	Z̄	52
I	9	T	20	Ē	31	P̄	42		
J	10	U	21	F̄	32	Q̄	43		
K	11	V	22	Ḡ	33	R̄	44		

Block Diagram

Absolute Maximum Ratings

Max input voltage --8V
Junction Temperature (T_J) --- 125°C
Output Current --- 300mA
Power Dissipation
SOT-23-5--250mW
Storage Temperature (Ts) ---45°C   150°C

Recommended Work Conditions

Item	Min	Recommended	Max	unit
Input Voltage Range			6	V
Ambient Temperature	-40		85	°C

Electrical Characteristics
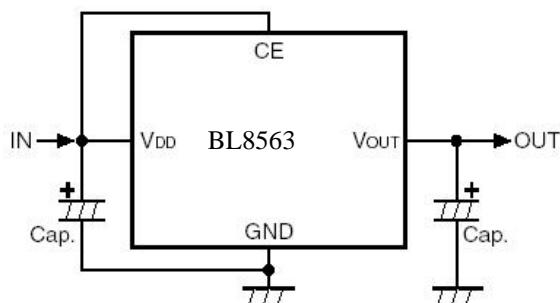
Test Conditions: Cin=1uF,Cout=3.4uF,TA=25°C, unless otherwise specified.

BL8563 for arbitrary output voltage

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Vin	Input Voltage				6	V
Vout	Output Voltage	Vin=Set Vout+1V 1mA≤Iout≤30mA	Vout x0.98	Vout1	Vout X1.02	V
Iout (Max.)	Maximun Output Current	Vin-Vout=1V	300			mA
Vdrop[1]	Dropout Voltage,Vout≥2.8V	Iout=100mA		50	80	mV
		Iout=300mA		160	220	mV
$\dfrac{\Delta Vout}{\Delta Vin \cdot Vout}$	Line Regulation	Iout=40mA 2.8V≤Vin≤6V		0.05	0.2	%/V
$\dfrac{\Delta Vout}{\Delta Iout}$	Load Regulation	Vin=Set Vout+1V 1mA≤Iout≤300mA		30	50	mV
Iss	Supply Current	Vin=Set Vout+1V		15	25	uA
Istandby	Supply Current (Srandby)	Vin=Set Vout+1V Vce=GND		0.1	1.0	uA
$\dfrac{\Delta Vout}{\Delta T \cdot Vout}$	Output Voltage Temperature Coefficiency	Iout=30mA		± 100		ppm/°C
PSRR	Ripple Rejection	F=100Hz, Ripple=0.5Vp-p Vin=Set Vout+1V		70		dB
Ilim	Short Current Limit	Vout=0V		500		mA
Rpd	CE Pull down Resistance		2.0	5.0	10.0	MΩ
Vceh	CE Input Voltage "H"		1.5		Vin	V
Vcel	CE Input Voltage "L"		0		0.25	V
En	Output Noise	BW=10Hz~100kHz		47		uVrms

1) Vdrop=Vin1-(Vout2*0.98) Vout2 is the output voltage when Vin=Vout1+1.0V and Iout=300Ma
Vin1 is the input voltage at which the output voltage becomes 98% of Vout1 after gradually decreasing the input voltage.

Typical Application Circuit

Application hints

NOTE1: Input capacitor (Cin=1uF) is recommended in all application circuit.

NOTE2: Output capacitor (Cout=3.3uF/4.7uF) is recommended in all application to assure the stability of circuit.

Explanation

BL8563 series is a group of positive voltage output, low noise, low power consumption, low dropout voltage regulator.
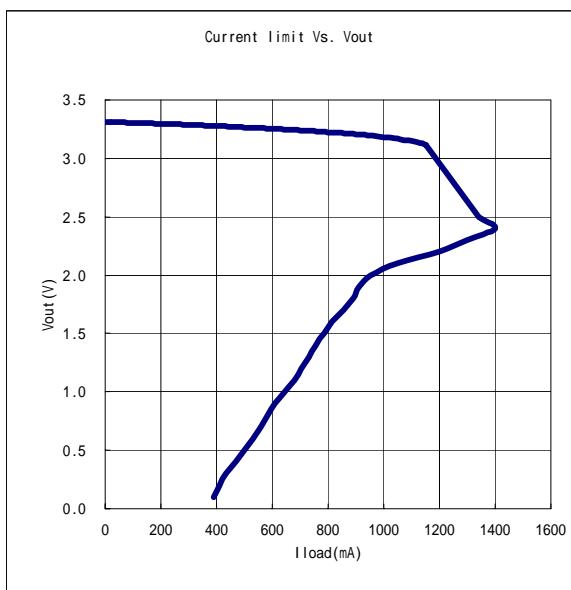
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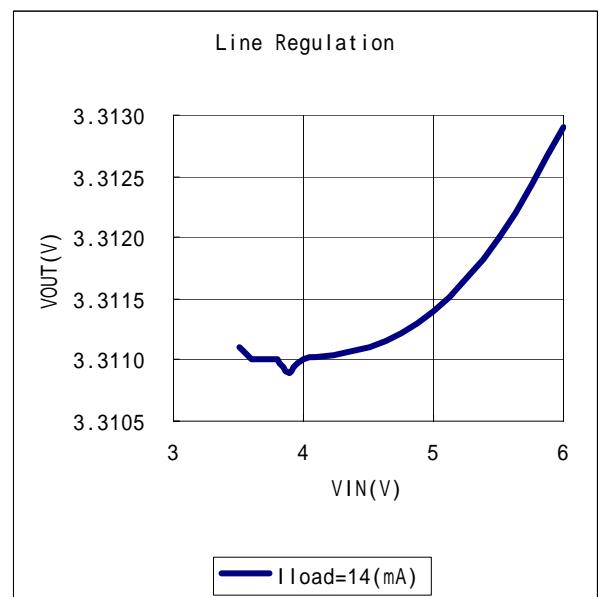
BL8563 has excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within$\pm$ 2%.

Typical Performance Characteristics
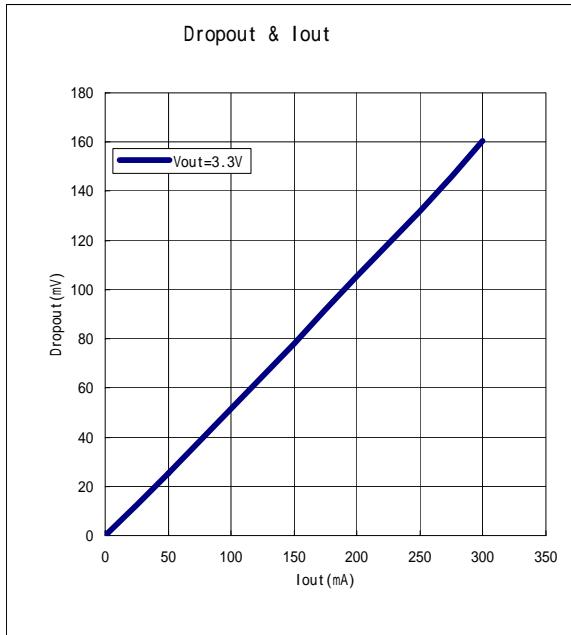
1) Output Voltage vs. Output Current (with output short protection)

Current limit Vs. Vout

(Chart: Vout(V) vs Iload(mA))
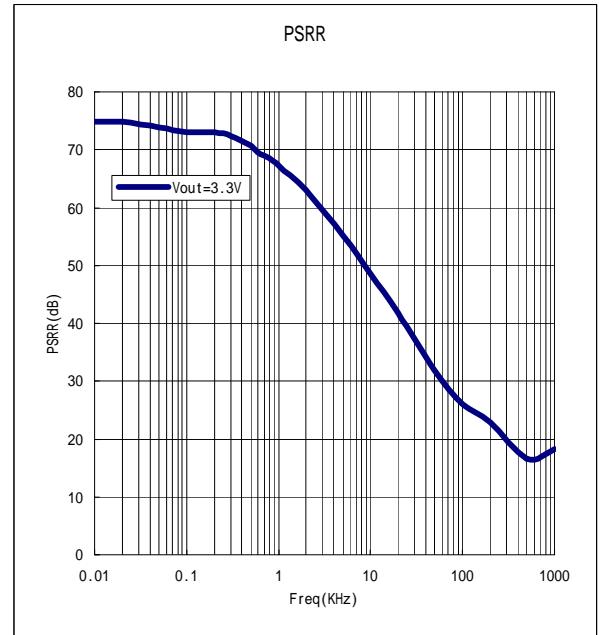
2) Output Voltage vs. Input Voltage

Line Regulation

(Chart: VOUT(V) vs VIN(V), Iload=14(mA))

3) Dropout Voltage vs. Output Current

Dropout & Iout

(Chart: Dropout(mV) vs Iout(mA), Vout=3.3V)
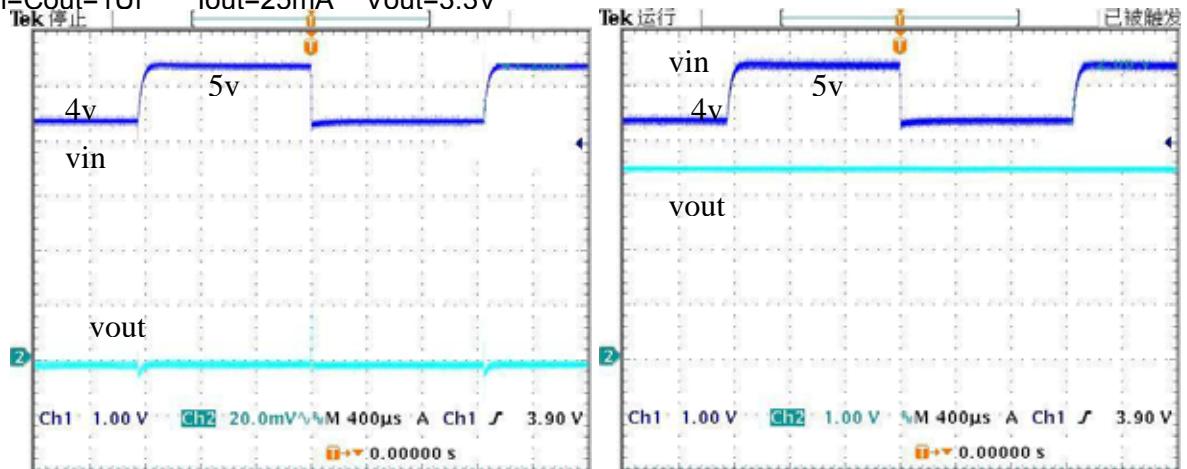
4) Ripple rejection vs. Frequency

PSRR

(Chart: PSRR(dB) vs Freq(KHz), Vout=3.3V)

BL8563
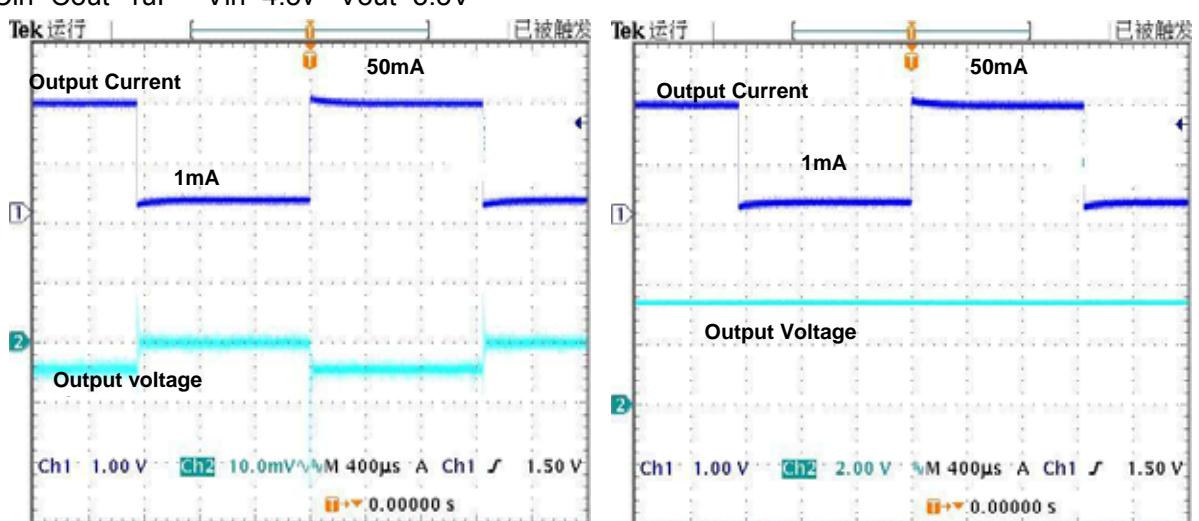
5) Line transient response
Cin=Cout=1Uf   Iout=25mA   Vout=3.3V
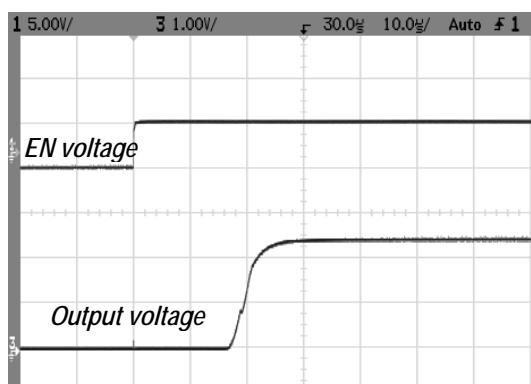
## 6) Load transient response
Cin=Cout=1uF   Vin=4.5v   Vout=3.3V
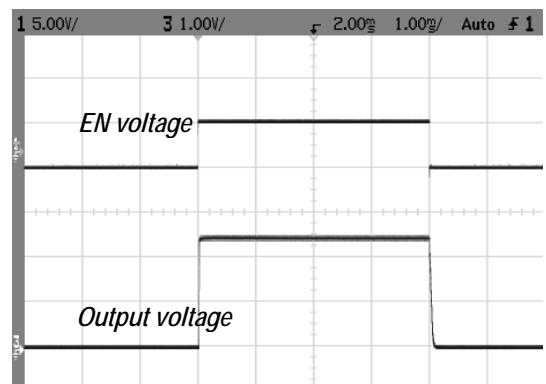
7) Startup response
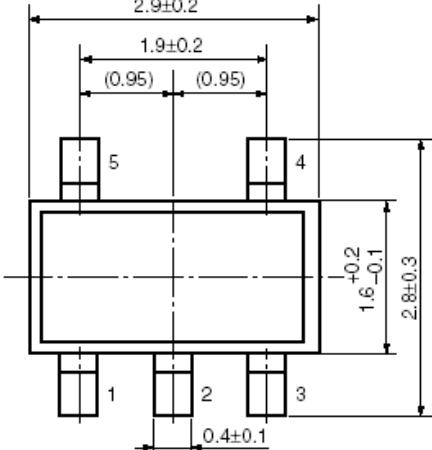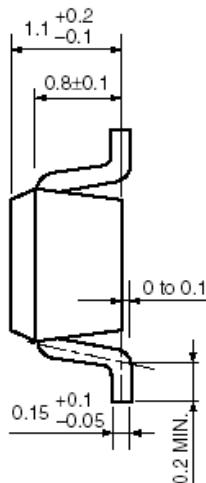
8) Shutdown response
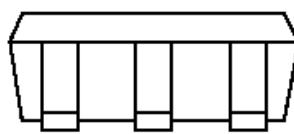
Package Information
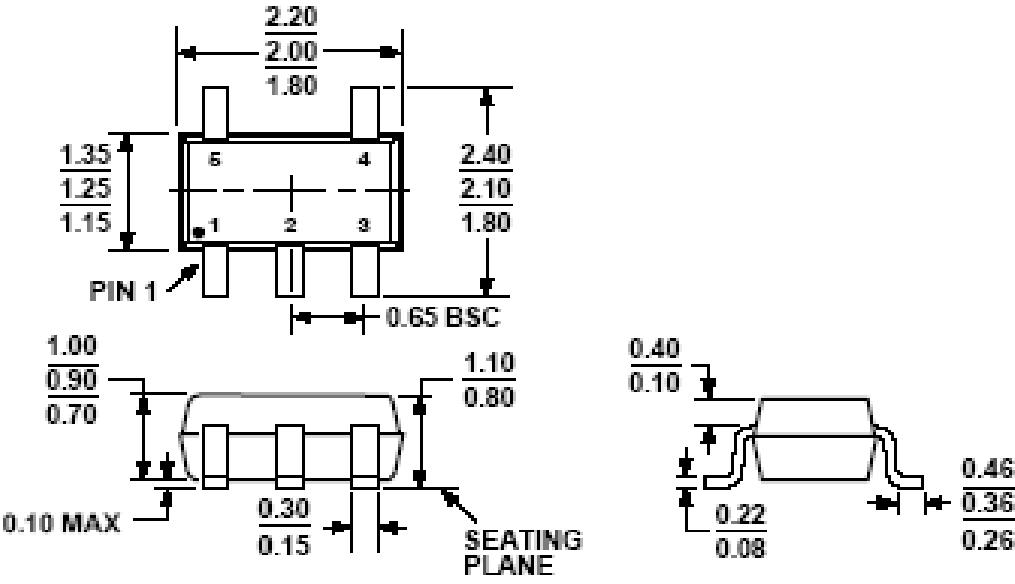
SOT-23-5

Package	SOT-23-5	Devices per reel	3000	Unit	mm
Package specification				Unit: mm	

SC70-5

Package	SC70-5	Devices per reel	1000	Unit	mm
Package Dimension					