LR8563

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

LR8563 series is a group of positive voltage output, low power consumption, low dropout voltage regulator.

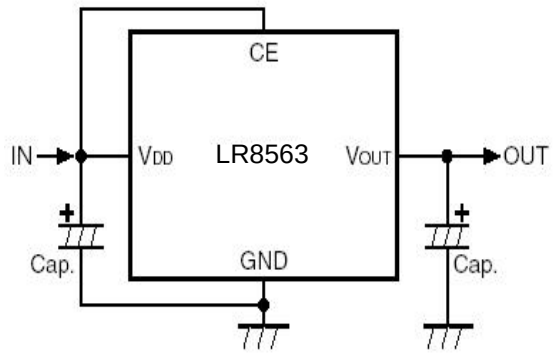
LR8563 can provide output value in the range of 1.5V~4.5V every 0.1V step. It also can be customized on command.

LR8563 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module with discharge capability.

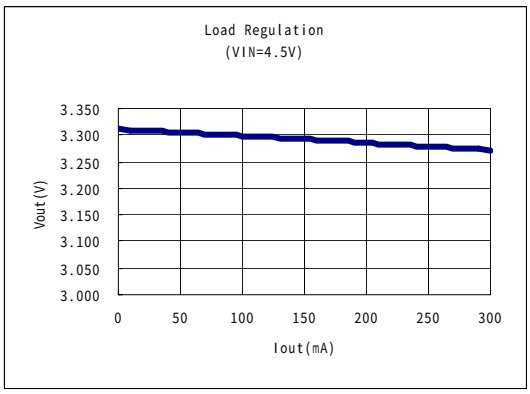
LR8563 has excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within±2%.

LR8563 is available in SOT-23-5, SC-70-5 packages which is lead free. It also can available in these packages with lead.

LR8563 Typical Application Circuit



LR8563 Typical Performance Characteristics



Selection Guide

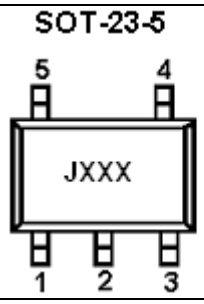
LR8563-*XX X X*

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

LR8563-XXPQ		LR8563-XXPRX	

Pin Description

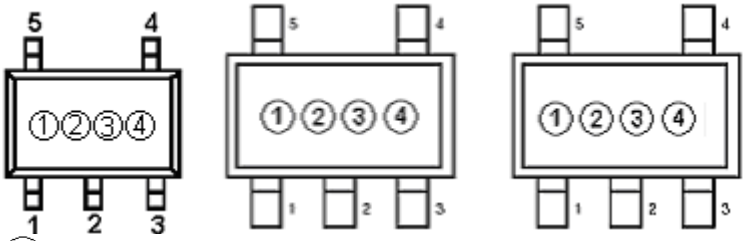
Pin Number			Symbol	Function
SC-70-5	SOT-23-5A	SOT-23-5B		
5	5	1	VOUT	Output pin
1	1	3	VDD	Input Pin
2	2	2	GND	Ground Pin
3	3	4	CE	Chip Enable Pin
4	4	5	NC	No Connection

Product Classification

Output Voltage	Package Type	Product Name	Package Type	Product Name	Package Type	Product Name
1.5V	SOT-23-5A	LR8563-15PRA	SOT-23-5B	LR8563-15PRB	SC70-5	LR8563-15PQ
1.8V	SOT-23-5A	LR8563-18PRA	SOT-23-5B	LR8563-18PRB	SC70-5	LR8563-18PQ
2.1V	SOT-23-5A	LR8563-21PRA	SOT-23-5B	LR8563-21PRB	SC70-5	LR8563-21PQ
2.5V	SOT-23-5A	LR8563-25PRA	SOT-23-5B	LR8563-25PRB	SC70-5	LR8563-25PQ
2.8V	SOT-23-5A	LR8563-28PRA	SOT-23-5B	LR8563-28PRB	SC70-5	LR8563-28PQ
3.0V	SOT-23-5A	LR8563-30PRA	SOT-23-5B	LR8563-30PRB	SC70-5	LR8563-30PQ
3.2V	SOT-23-5A	LR8563-32PRA	SOT-23-5B	LR8563-32PRB	SC70-5	LR8563-32PQ
3.3V	SOT-23-5A	LR8563-33PRA	SOT-23-5B	LR8563-33PRB	SC70-5	LR8563-33PQ
3.5V	SOT-23-5A	LR8563-35PRA	SOT-23-5B	LR8563-35PRB	SC70-5	LR8563-35PQ
⋮	⋮	⋮	⋮	⋮	⋮	⋮
4.5V	SOT-23-5A	LR8563-45PRA	SOT-23-5B	LR8563-45PRB	SC70-5	LR8563-45PQ

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 LR8563 with output current 300mA

②

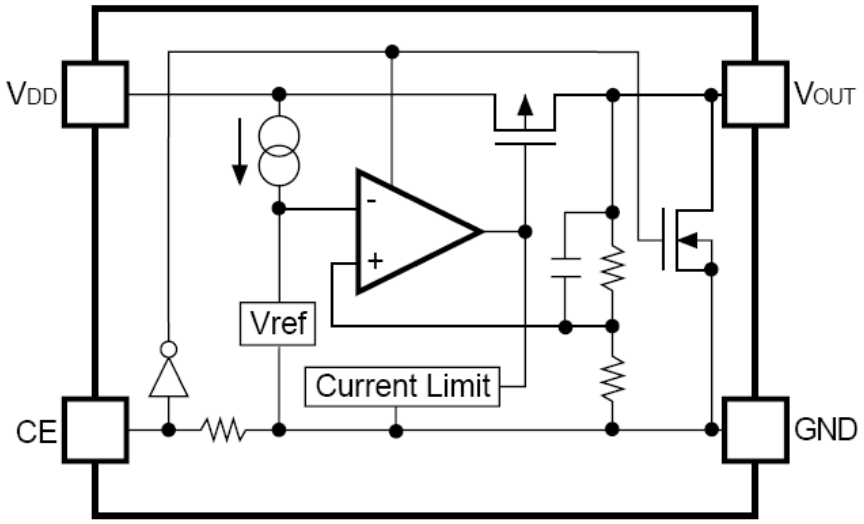
Code	Vout	Code	Vout	Code	Vout
5	1.5V	$\overline{6}$	2.6V	$\underline{7}$	3.7V
6	1.6V	$\overline{7}$	2.7V	$\underline{8}$	3.8V
7	1.7V	$\overline{8}$	2.8V	$\underline{9}$	3.9V
8	1.8V	$\overline{9}$	2.9V	$\underline{0}$	4.0V
9	1.9V	$\underline{0}$	3.0V	$\underline{1}$	4.1V
$\overline{0}$	2.0V	$\underline{1}$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

③ The year of manufacturing. "5" stands for year 2005, "6" stands for year 2006, and " $\overline{0}$ " for year 2010.

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	$\overline{H}$	34	$\overline{S}$	45
B	2	M	13	X	24	$\overline{I}$	35	$\overline{T}$	46
C	3	N	14	Y	25	$\overline{J}$	36	$\overline{U}$	47
D	4	O	15	Z	26	$\overline{K}$	37	$\overline{V}$	48
E	5	P	16	$\overline{A}$	27	$\overline{L}$	38	$\overline{W}$	49
F	6	Q	17	$\overline{B}$	28	$\overline{M}$	39	$\overline{X}$	50
G	7	R	18	$\overline{C}$	29	$\overline{N}$	40	$\overline{Y}$	51
H	8	S	19	$\overline{D}$	30	$\overline{O}$	41	$\overline{Z}$	52
I	9	T	20	$\overline{E}$	31	$\overline{P}$	42		
J	10	U	21	$\overline{F}$	32	$\overline{Q}$	43		
K	11	V	22	$\overline{G}$	33	$\overline{R}$	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

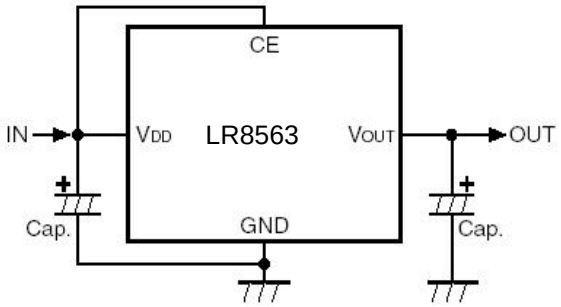
(Test Conditions: Cin=1uF,Cout=3.4uF,TA=25°C, unless otherwise specified.)

LR8563 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
$\frac{\Delta Vout}{\Delta Vin \cdot Vou}$	Line Regulation	Iout=40mA 2.8V≤Vin≤6V		0.05	0.2	%/V
$\Delta Vout / \Delta Iout$	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
$\frac{\Delta Vout}{\Delta T \cdot Vout}$	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.

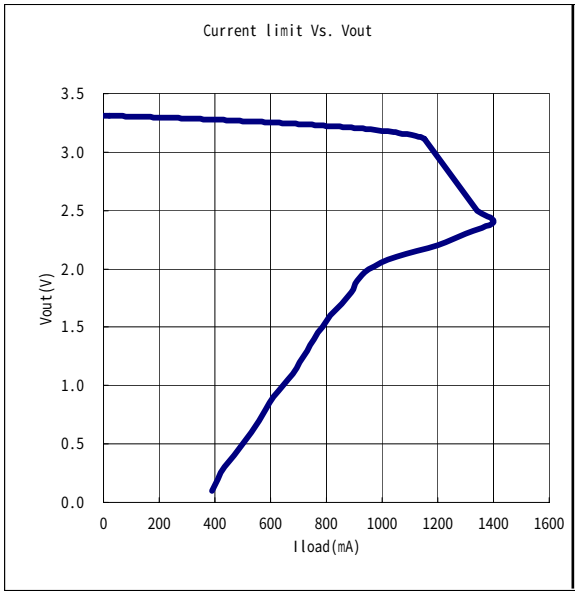
NOTE2: Output capacitor (Cout=3.3uF/4.7uF) is recommended in all application to assure the stability of circuit.

Explanation

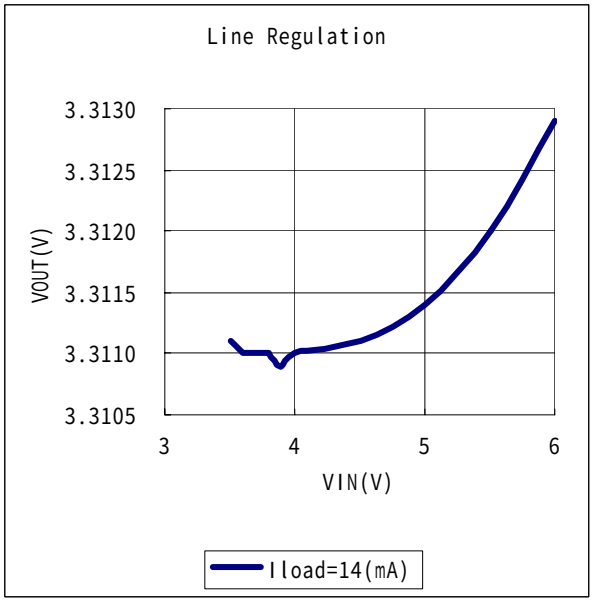
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Typical Performance Characteristics

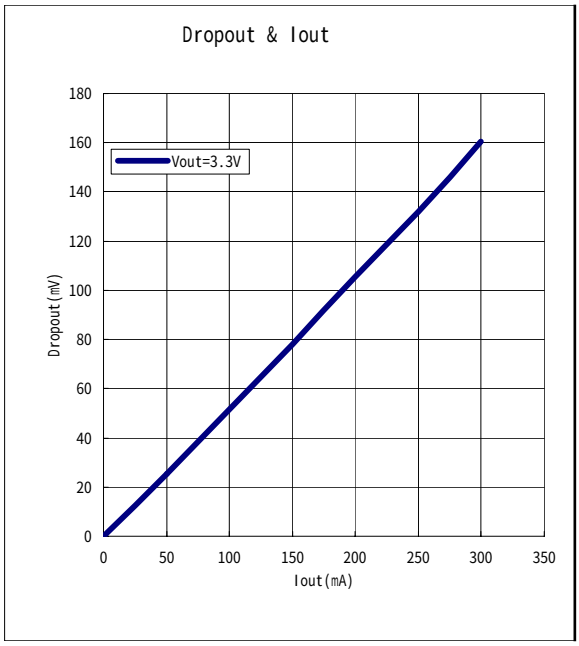
1) Output Voltage vs. Output Current (with output short protection)



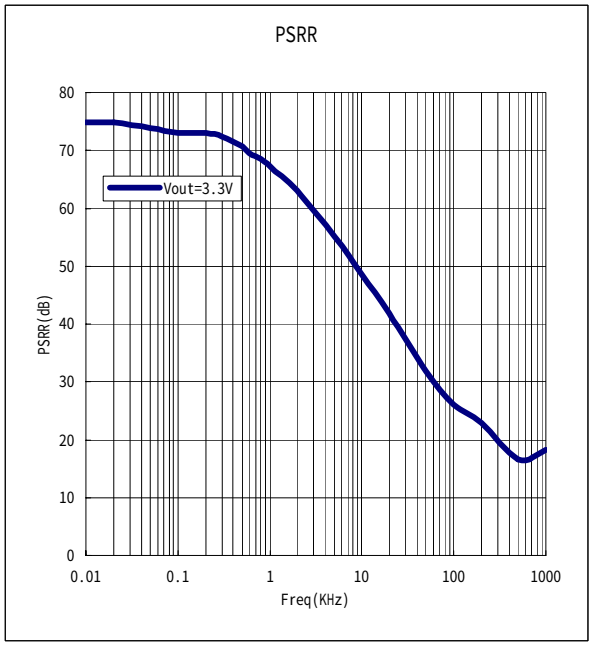
2) Output Voltage vs. Input Voltage



3) Dropout Voltage vs. Output Current

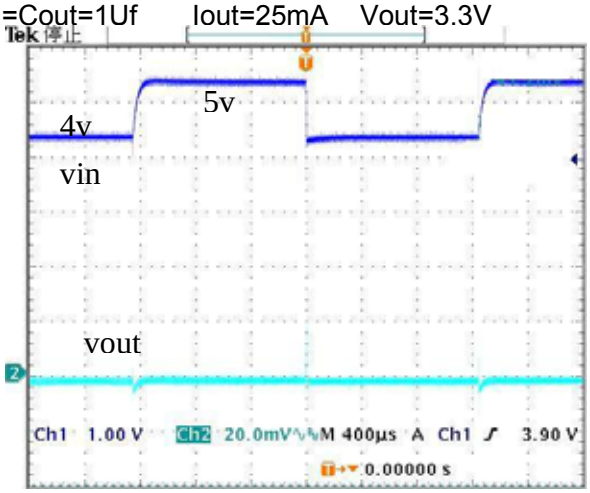


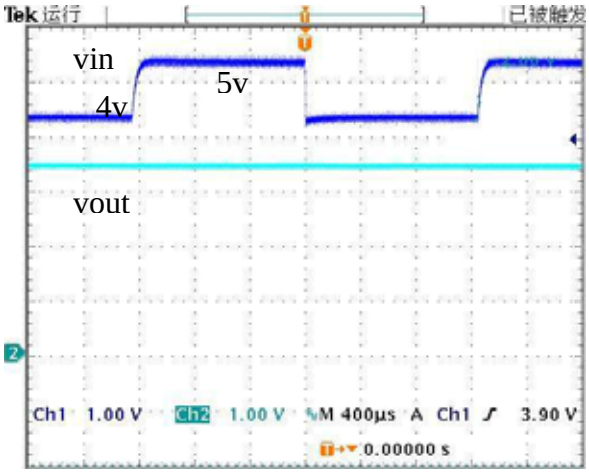
4) Ripple rejection vs. Frequency



5) Line transient response

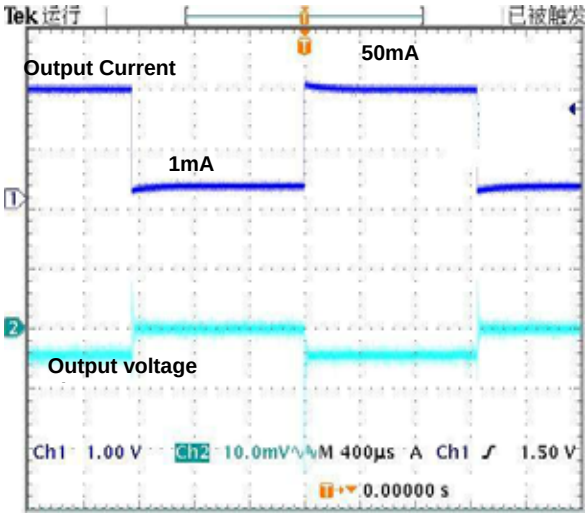
Cin=Cout=1Uf Iout=25mA Vout=3.3V

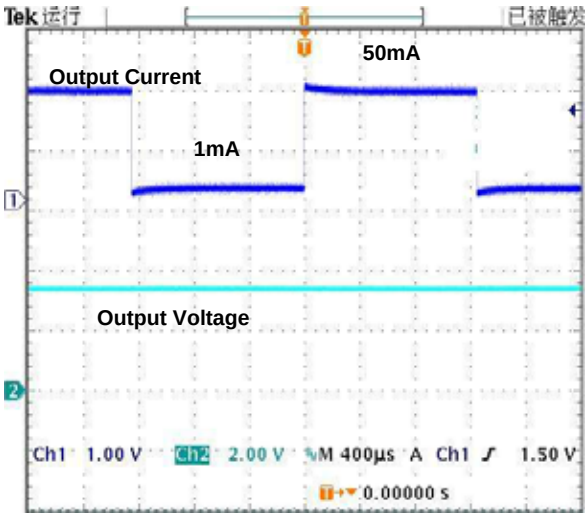




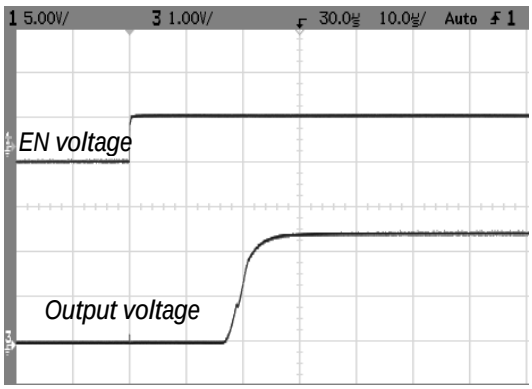
6) Load transient response

Cin=Cout=1uF Vin=4.5v Vout=3.3V

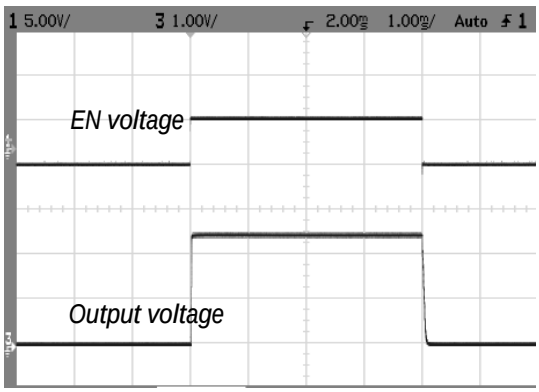




7) Startup response



8) Shutdown response

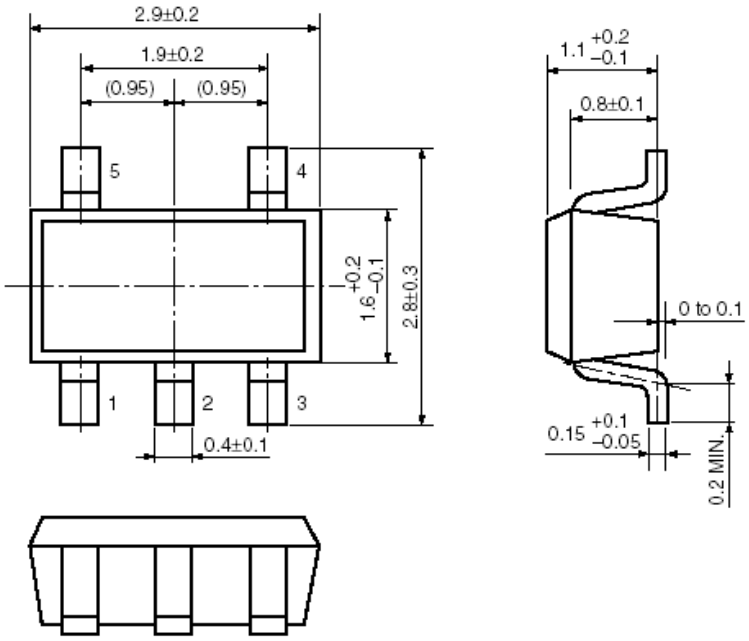


Package Information

SOT-23-5

Package specification

Unit: mm



SC70-5

Package specification

Unit: mm

