

Low noise, fast response 300mA LDO regulator

Features

- Low Power Consumption: 15uA (Typ.)
- Low Output Noise (47uVRMS)
- Standby Mode: 0.1uA
- Low Dropout Voltage 0.16V@300mA (Typ.)
- High Ripple Rejection: 73dB@100Hz (Typ.)
- Low Temperature Coefficient: $\pm 100\text{ppm}/^\circ\text{C}$
- 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: $\pm 2\%$ ($\pm 1\%$ 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.

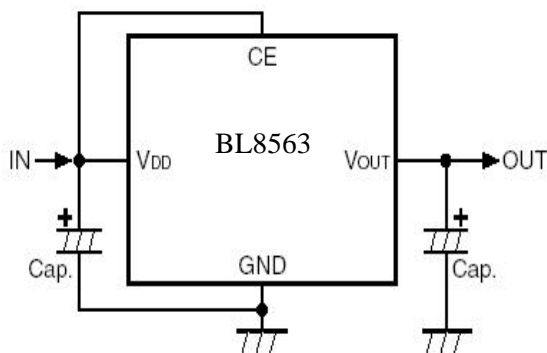
BL8563 can provide output value in the range of 1.5V~4.5V every 0.1V step. It also can be customized on command.

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

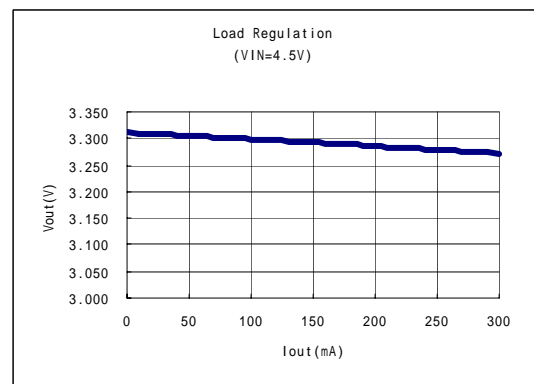
BL8563 has excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within $\pm 2\%$.

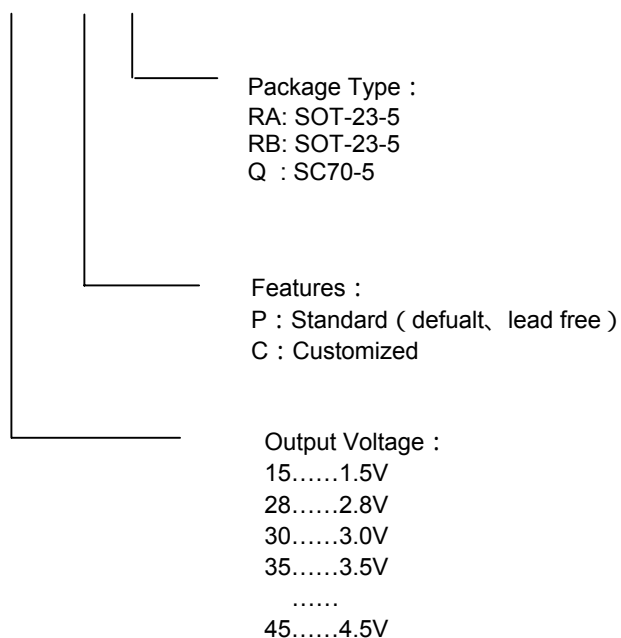
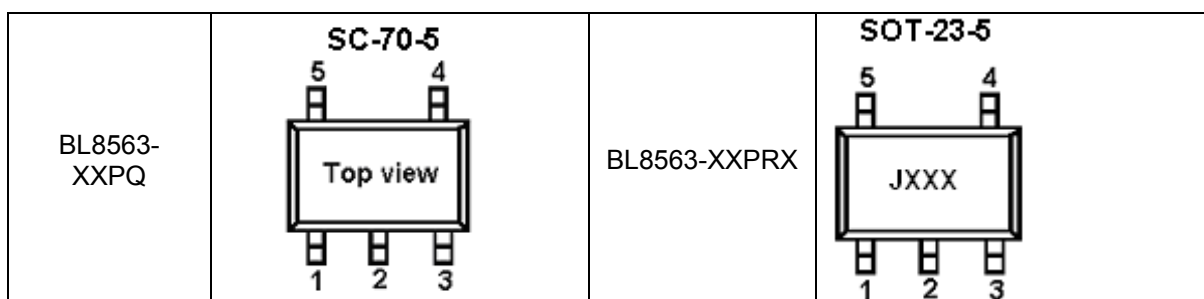
BL8563 is available in SOT-23-5, SC-70-5 packages which is lead free. It also can available in these packages with lead.

BL8563 Typical Application Circuit



BL8563 Typical Performance Characteristics

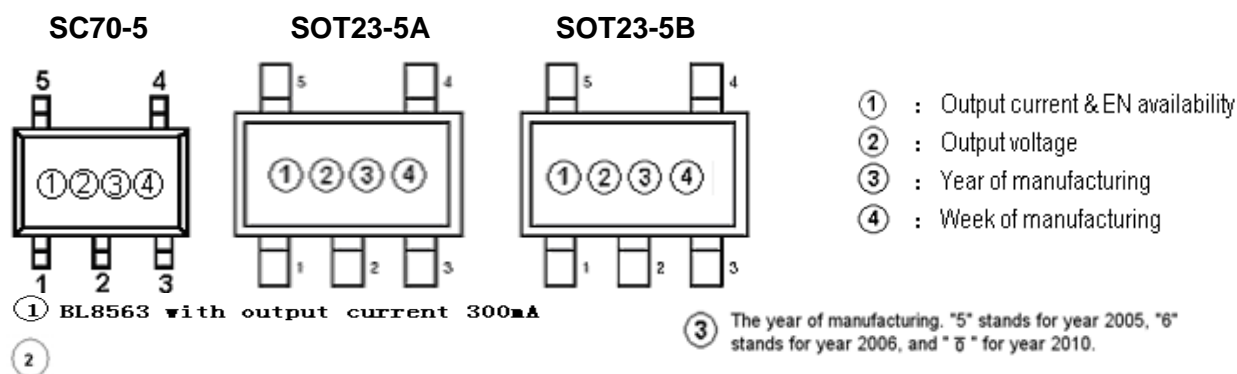


Selection Guide
BL8563-XX X X

Pin Assignment

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

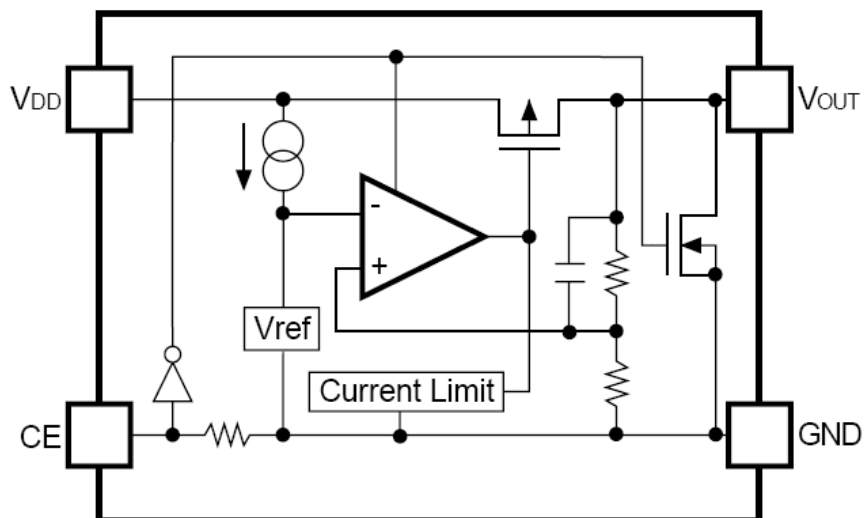
Output Voltage	Package Type	Product Name	Package Type	Product Name	Package Type	Product Name
1.5V	SOT-23-5A	BL8563-15PRA	SOT-23-5B	BL8563-15PRB	SC70-5	BL8563-15PQ
1.8V	SOT-23-5A	BL8563-18PRA	SOT-23-5B	BL8563-18PRB	SC70-5	BL8563-18PQ
2.1V	SOT-23-5A	BL8563-21PRA	SOT-23-5B	BL8563-21PRB	SC70-5	BL8563-21PQ
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


Code	Vout	Code	Vout	Code	Vout
5	1.5V	6	2.6V	7	3.7V
6	1.6V	7	2.7V	8	3.8V
7	1.7V	8	2.8V	9	3.9V
8	1.8V	9	2.9V	0	4.0V
9	1.9V	0	3.0V	1	4.1V
0	2.0V	1	3.1V	2	4.2V
1	2.1V	2	3.2V	3	4.3V
2	2.2V	3	3.3V	4	4.4V
3	2.3V	4	3.4V	5	4.5V
4	2.4V	5	3.5V		
5	2.5V	6	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	H	34	S	45
B	2	M	13	X	24	T	35	F	46
C	3	N	14	Y	25	J	36	U	47
D	4	O	15	Z	26	K	37	V	48
E	5	P	16	A	27	L	38	W	49
F	6	Q	17	B	28	M	39	X	50
G	7	R	18	C	29	N	40	Y	51
H	8	S	19	D	30	O	41	Z	52
I	9	T	20	E	31	P	42		
J	10	U	21	F	32	Q	43		
K	11	V	22	G	33	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 (T _s)	-----	-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: $C_{in}=1\mu F, C_{out}=3.4\mu F, T_A=25^\circ C$, unless otherwise specified.)

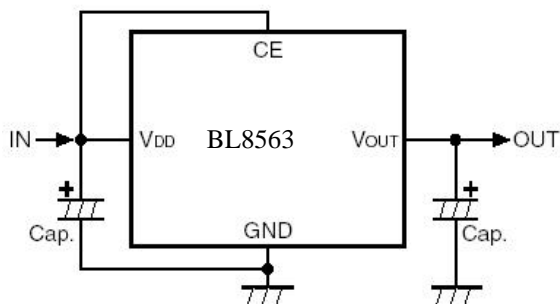
BL8563 for arbitrary output voltage

Symbol	Parameter	Conditions	Min	Typ	Max	Units
V_{in}	Input Voltage				6	V
V_{out}	Output Voltage	$V_{in}=\text{Set } V_{out}+1V$ $1mA \leq I_{out} \leq 30mA$	$V_{out} \times 0.98$	V_{out1}	$V_{out} \times 1.02$	V
$I_{out}(\text{Max.})$	Maximun Output Current	$V_{in}-V_{out}=1V$	300			mA
V_{drop}^1	Dropout Voltage, $V_{out} \geq 2.8V$	$I_{out}=100mA$		50	80	mV
		$I_{out}=300mA$		160	220	mV
$\frac{\Delta V_{out}}{\Delta V_{in} \cdot V_{out}}$	Line Regulation	$I_{out}=40mA$ $2.8V \leq V_{in} \leq 6V$		0.05	0.2	%/V
$\frac{\Delta V_{out}}{\Delta I_{out}}$	Load Regulation	$V_{in}=\text{Set } V_{out}+1V$ $1mA \leq I_{out} \leq 300mA$		30	50	mV
I_{ss}	Supply Current	$V_{in}=\text{Set } V_{out}+1V$		15	25	μA
$I_{standby}$	Supply Current (Srandby)	$V_{in}=\text{Set } V_{out}+1V$ $V_{ce}=\text{GND}$		0.1	1.0	μA
$\frac{\Delta V_{out}}{\Delta T \cdot V_{out}}$	Output Voltage Temperature Coefficiency	$I_{out}=30mA$		± 100		ppm/ $^\circ C$
PSRR	Ripple Rejection	$F=100Hz,$ Ripple=0.5Vp-p $V_{in}=\text{Set } V_{out}+1V$		70		dB
I_{lim}	Short Current Limit	$V_{out}=0V$		500		mA
R_{pd}	CE Pull down Resistance		2.0	5.0	10.0	$M\Omega$
V_{ceh}	CE Input Voltage "H"		1.5		V_{in}	V
V_{cel}	CE Input Voltage "L"		0		0.25	V
E_n	Output Noise	$BW=10Hz \sim 100kHz$		47		μV_{rms}

1) $V_{drop} = V_{in1} - (V_{out2} \times 0.98)$ V_{out2} is the output voltage when $V_{in} = V_{out1} + 1.0V$ and $I_{out} = 300Ma$

V_{in1} is the input voltage at which the output voltage becomes 98% of V_{out1} after gradually decreasing the input voltage.

Typical Application Circuit



Application hints

NOTE1: Input capacitor ($C_{in}=1\mu F$) is recommended in all application circuit.

NOTE2: Output capacitor ($C_{out}=3.3\mu F/4.7\mu F$) 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.

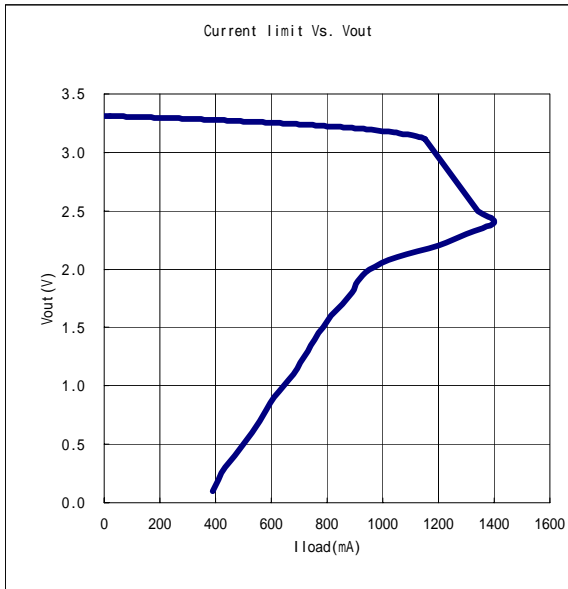
BL8563 can provide output value in the range of 1.5V~4.5V every 0.1V step. It also can be customized on command.

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

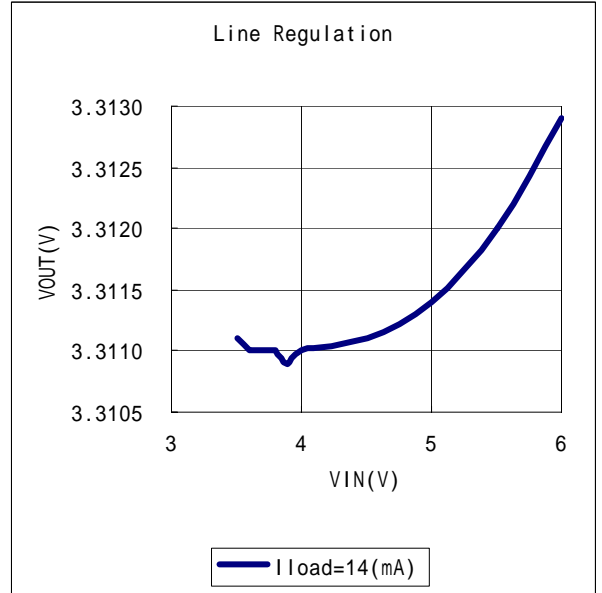
BL8563 has excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within $\pm 2\%$.

Typical Performance Characteristics

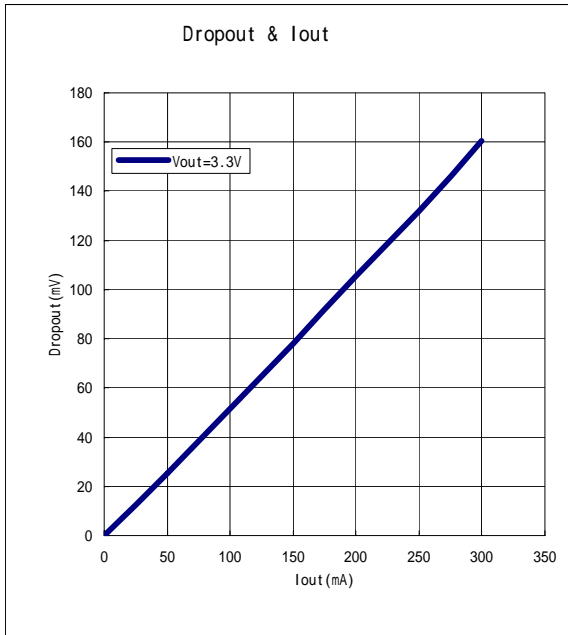
1) Output Voltage vs. Output Current (with output short protection)



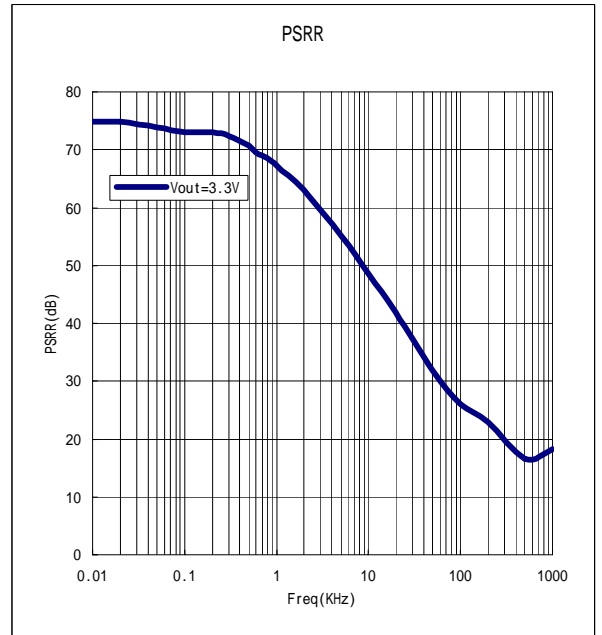
2) Output Voltage vs. Input Voltage



3) Dropout Voltage vs. Output Current

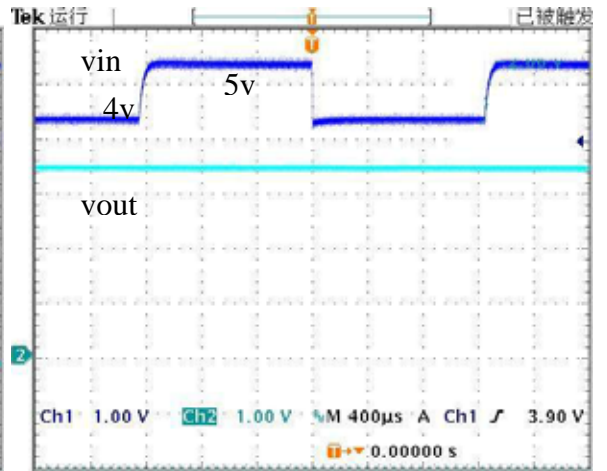
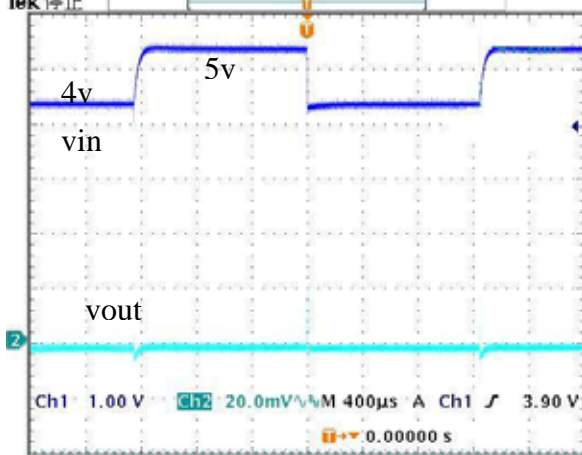


4) Ripple rejection vs. Frequency



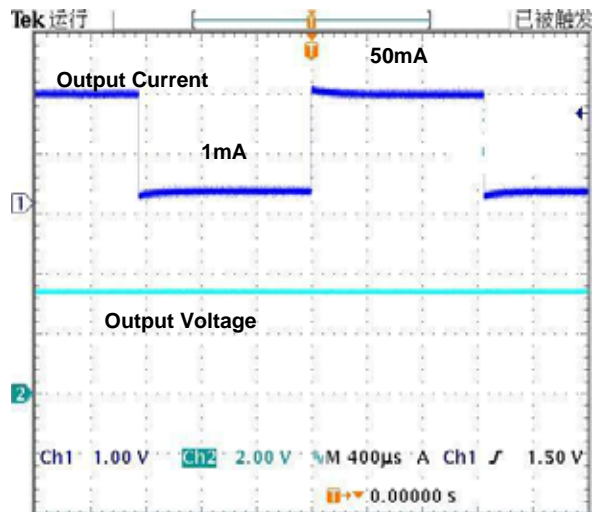
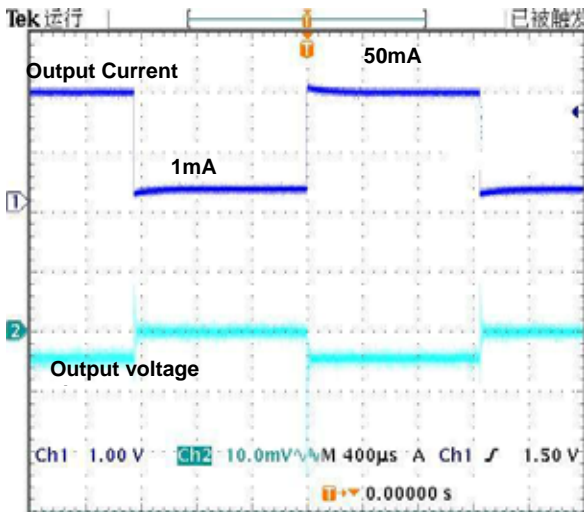
5) Line transient response

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

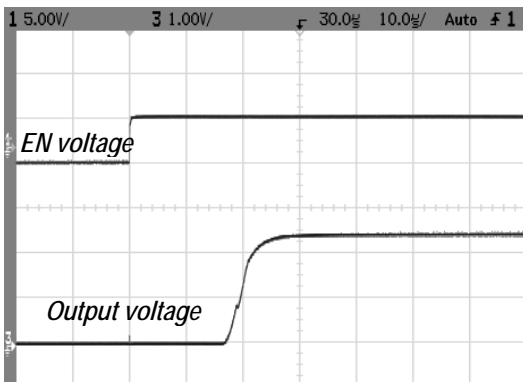


6) Load transient response

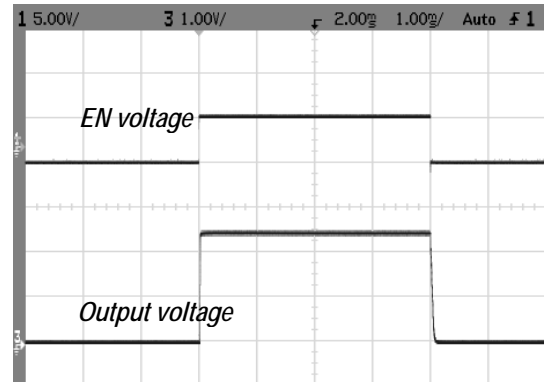
Cin=Cout=1uF Vin=4.5V Vout=3.3V



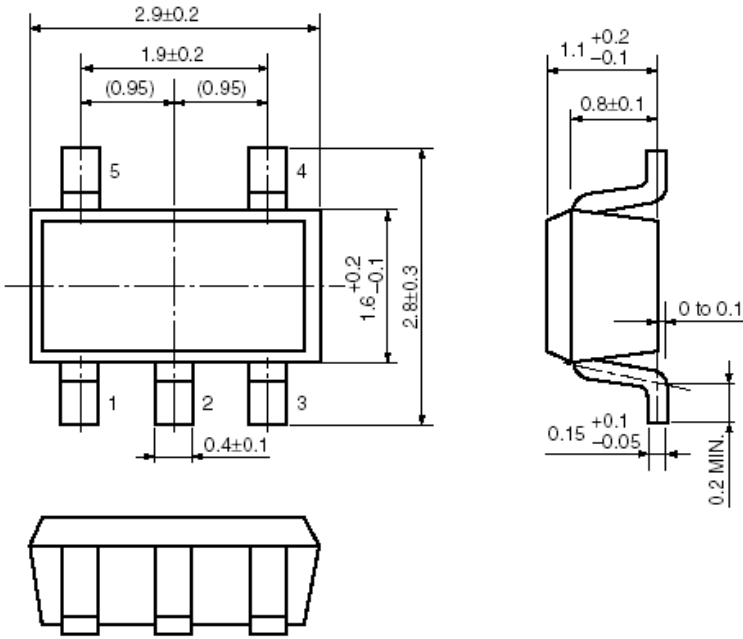
7) Startup response



8) Shutdown response



Package Information
SOT-23-5

Package	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					
