

## Dual, Low noise, 150mA LDO regulator

### Features:

- Two low dropout voltage regulators
- 150mA output current for each LDO
- 25uA operating supply current per LDO
- Low 27uVRMS output noise
- Standby Mode: 0.1uA
- Low 200mV dropout at 100mA load
- 65dB PSRR at 1kHz
- Excellent Line regulation: 0.05%/V
- Independent Shutdown controls
- 1.2V to 5.0V Factory-Preset Output
- Output Current Limit
- Highly Accurate:  $\pm 2\%$  ( $\pm 1\%$  customized)

### Applications:

- Cellular phones
- Cordless phones and radio communication equipment
- Battery Powered equipment
- Notebook and hand-hold equipment
- Wireless LAN
- GPS receivers

### General Description:

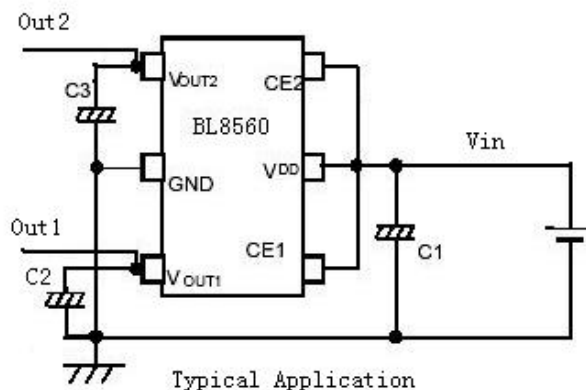
The BL8560 dual, low-noise, low-dropout regulator delivers at least 150mA of continuous output current. The output voltage for each regulator is set independently by trimming. Voltages are selectable in 100mV steps within a range of 1.2V to 5.0V. Typical output noise is 27uVrms, and PSRR is 65dB at 1KHz. The BL8560 includes two independent logic-controlled shutdown inputs and allows the output of each regulator to be turned off independently.

The BL8560 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

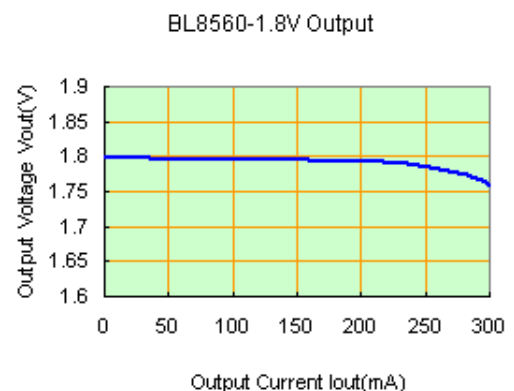
The BL8560 has excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within  $\pm 2\%$ .

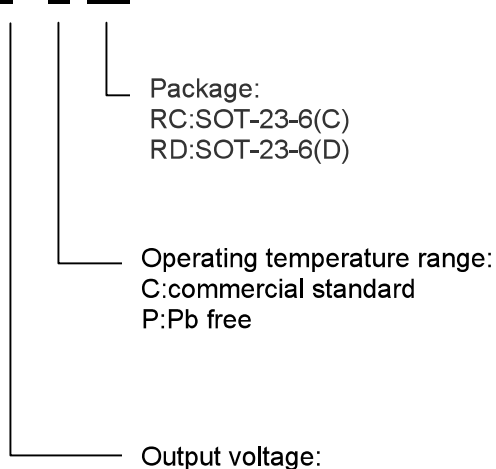
The BL8560 is available in SOT-23-6 package which is lead (Pb)- free

### BL8560 Typical Application Circuit




### BL8560 Typical Performance Characteristics:



**Selection Guide:**
**BL8560- X X XX**


- A:1.5V(Output1),2.5V(Output2)
- B:1.5V(Output1),2.8V(Output2)
- C:1.5V(Output1),3.0V(Output2)
- D:1.5V(Output1),3.3V(Output2)
- E:1.5V(Output1),4.0V(Output2)
- F:1.8V(Output1),1.8V(Output2)
- G:1.8V(Output1),2.5V(Output2)
- H:1.8V(Output1),2.8V(Output2)
- I:1.8V(Output1),3.0V(Output2)
- J:1.8V(Output1),3.3V(Output2)
- K:2.5V(Output1),1.8V(Output2)
- L:2.5V(Output1),2.5V(Output2)
- M:2.8V(Output1),1.8V(Output2)
- N:2.8V(Output1),2.5V(Output2)
- O:2.8V(Output1),2.8V(Output2)
- P:2.8V(Output1),3.0V(Output2)
- Q:3.0V(Output1),2.5V(Output2)
- R:3.0V(Output1),3.0V(Output2)
- S:3.0V(Output1),3.3V(Output2)
- T:3.3V(Output1),1.8V(Output2)
- U:3.3V(Output1),2.5V(Output2)
- V:3.3V(Output1),2.8V(Output2)
- W:5.0V(Output1),3.3V(Output2)
- X:2.8V(Output1),1.5V(Output2)

**Pin Assignment:**

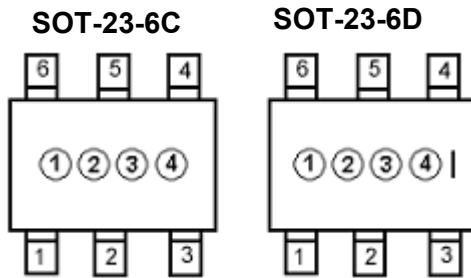
Product Classification	Assembly type & Pin Configuration
BL8560-□□RC BL8560-□□RD	

**Pin Description:**

Pin Number		Symbol	Function
SOT-23-6C	SOT-23-6D		
1	6	Vout1	Output1 pin
2	2	Vdd	Input Pin
3	4	Vout2	Output2 pin
4	3	CE2	Chip Enable Pin2
5	5	GND	Ground Pin
6	1	CE1	Chip Enable Pin1

**Product Classification:**

Output Voltage	Package Type	Product Name	Package Type	Product Name
1.5V/2.5V	SOT-23-6C	BL8560-APRC	SOT-23-6D	BL8560-APRD
1.5V/2.8V	SOT-23-6C	BL8560-BPRC	SOT-23-6D	BL8560-BPRD
1.5V/3.0V	SOT-23-6C	BL8560-CPRC	SOT-23-6D	BL8560-CPRD
1.5V/3.3V	SOT-23-6C	BL8560-DPRC	SOT-23-6D	BL8560-DPRD
1.5V/4.0V	SOT-23-6C	BL8560-EPRC	SOT-23-6D	BL8560-EPRD
1.8V/1.8V	SOT-23-6C	BL8560-FPRC	SOT-23-6D	BL8560-FPRD
1.8V/2.5V	SOT-23-6C	BL8560-GPRC	SOT-23-6D	BL8560-GPRD
1.8V/2.8V	SOT-23-6C	BL8560-HPRC	SOT-23-6D	BL8560-HPRD
1.8V/3.0V	SOT-23-6C	BL8560-IPRC	SOT-23-6D	BL8560-IPRD
⋮	⋮	⋮	⋮	⋮
5.0V/3.3V	SOT-23-6C	BL8560-WPRC	SOT-23-6D	BL8560-WPRD

**Product Marking information:**


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

①

Code	Iout	EN
K	dual 150mAChannel	Yes

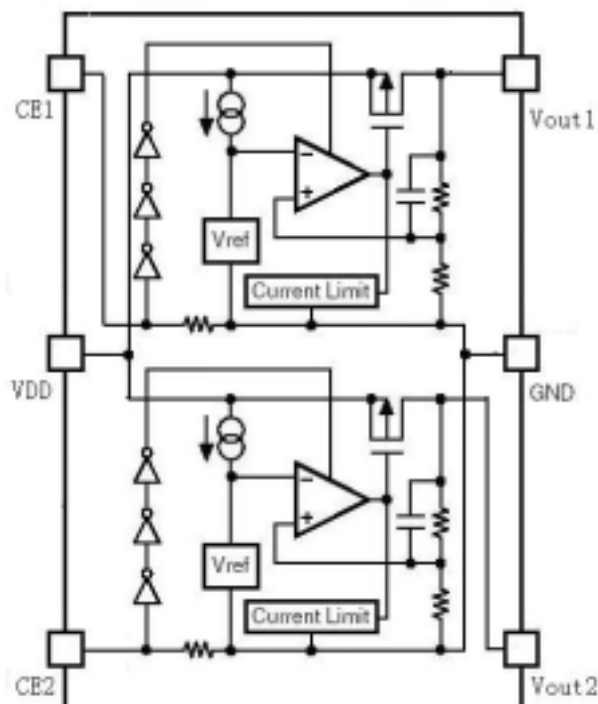
②

Code	Vout1	Vout2	Code	Vout1	Vout2
A	1.5V	2.5V	N	2.8V	2.5V
B	1.5V	2.8V	O	2.8V	2.8V
C	1.5V	3.0V	P	2.8V	3.0V
D	1.5V	3.3V	Q	3.0V	2.5V
E	1.5V	4.0V	R	3.0V	3.0V
F	1.8V	1.8V	S	3.0V	3.3V
G	1.8V	2.5V	T	3.3V	1.8V
H	1.8V	2.8V	U	3.3V	2.5V
I	1.8V	3.0V	V	3.3V	2.8V
J	1.8V	3.3V	W	5.0V	3.3V
K	2.5V	1.8V	X	2.8V	1.5V
L	2.5V	2.5V	Y		
M	2.8V	1.8V	Z		

③ : The year of manufacturing, "5" stands for year 2005, "6" stands for year 2006, and "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	H	34	S	45
B	2	M	13	X	24	T	35	T	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	-----	10V
Junction Temperature (T <sub>J</sub> )	-----	125°C
Output Current	-----	200mA
Power Dissipation		
SOT-23-6	-----	200mW
Storage Temperature(T <sub>S</sub> )	-----	-45°C~150°C
Lead Temperature and Time	-----	260°C, 10S

**Recommended Work Conditions:**

Item	Min	Recommended	Max	unit
Input Voltage Range			8	V
Ambient Temperature	-40		85	°C

**Electrical Characteristics:**

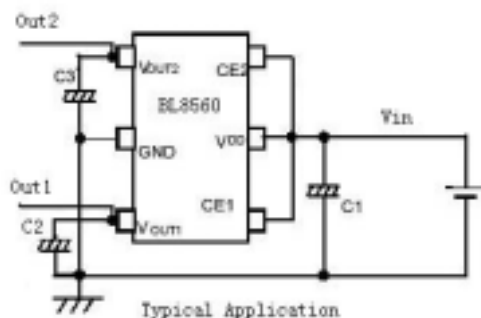
(Test Conditions: C1=1uF,C2=C3=2.2uF,TA=25°C, unless otherwise specified. )

**BL8560, for arbitrary output voltage**

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Vin	Input Voltage		1.5		8	V
Vout	Output Voltage	Vin=Set Vout+1V 1mA≤Iout≤30mA	Vout x0.98		Vout X1.02	V
Iout (Max.)	Maximun Output Current	Vin-Vout=1V	150			mA
Dropout Voltage	Input-Output Voltage Differentia	Refer to the ELECTRICAL CHARACTERISTICS by OUTPUT VOLTAGE				
$\frac{\Delta V_{out}}{\Delta V_{in} \cdot V_{out}}$	Line Regulation	Iout=40mA 1.6V≤Vin≤8V		0.05	0.2	%/V
$\Delta V_{out} / \Delta I_{out}$	Load Regulation	Vin=Set Vout+1V 1mA≤Iout≤80mA		12	40	mV
I <sub>ss</sub>	Supply Current	Vin=Set Vout+1V		25	50	uA
I <sub>standby</sub>	Supply Current (Srandby)	Vin=Set Vout+1V Vce=Gnd		0.1	1.0	uA
$\frac{\Delta V_{out}}{\Delta T \cdot V_{out}}$	Output Voltage Temperature Coefficiency	Iout=30mA		±100		ppm/°C
PSRR	Ripple Rejection	F=1kHz, Ripple=0.5Vp-p Vin=Set Vout+1V		65		dB
I <sub>lim</sub>	Short Current Limit	Vout=0V		20		mA
R <sub>pd</sub>	CE Pull down Resistance		2.0	5.0	10.0	MΩ
V <sub>ceh</sub>	CE Input Voltage "H"		1.5		Vin	V
V <sub>cel</sub>	CE Input Voltage "L"		0		0.25	V
en	Output Noise	BW=10Hz~100kHz		27		uVrms

**Electrical Characteristics by Output Voltage**

Output Voltage Vout (V)	Dropout Voltage, V <sub>DIF</sub> (V)		
	Condition	Typ.	Max.
Vout =1.5V	Iout = 120mA	0.38	0.70
Vout = 1.6V		0.36	0.65
Vout = 1.7V		0.34	0.60
1.8 ≤ Vout ≤ 2.0		0.32	0.55
2.1 ≤ Vout ≤ 2.7		0.28	0.50
2.8 ≤ Vout ≤ 4.0		0.22	0.35

**Typical Application Circuit:**

**Application hints:**

**NOTE1:** Input capacitor ( $C1=1\mu\text{F}$ ) is recommended in all application circuit.

**NOTE2:** Output capacitor ( $C2=C3=1\mu\text{F}/2.2\mu\text{F}$ ) is recommended in all application to assure the stability of circuit.

**Explanation:**

The BL8560 series are highly accurate, Dual, low noise, CMOS low dropout voltage regulators.

The output voltage for each regulator is set independently by trimming. Voltages are selectable in 100mV steps within a range of 1.2V to 5.0V. It also can be customized on command.

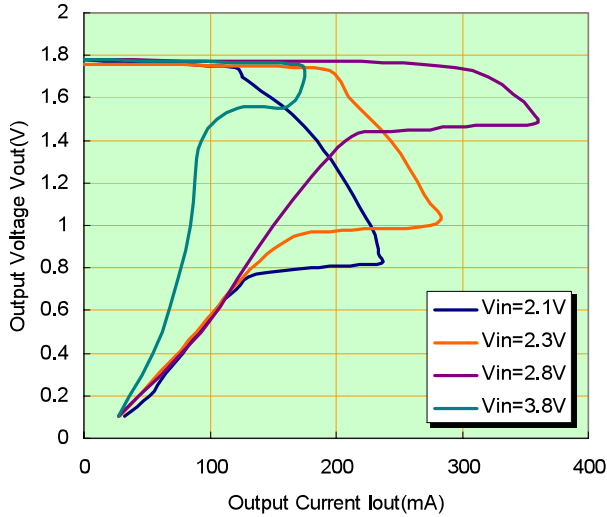
The BL8560 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

The BL8560 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:

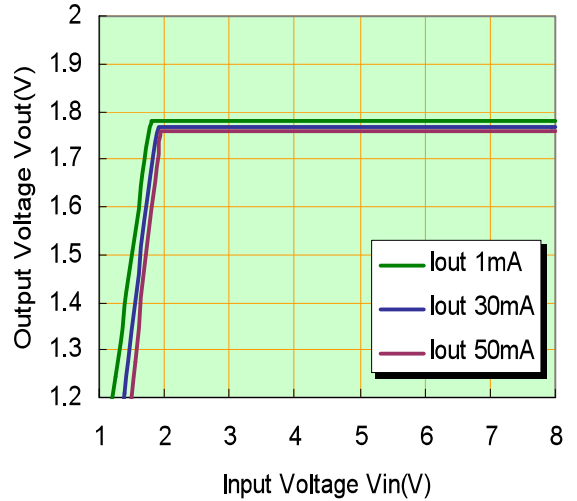
### 1) Output Voltage vs. Output Current (with output short protection)

BL8560-1.8V

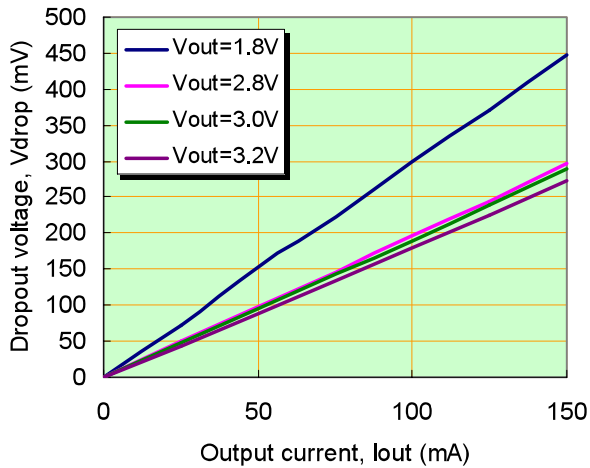


### 2) Output Voltage vs. Input Voltage

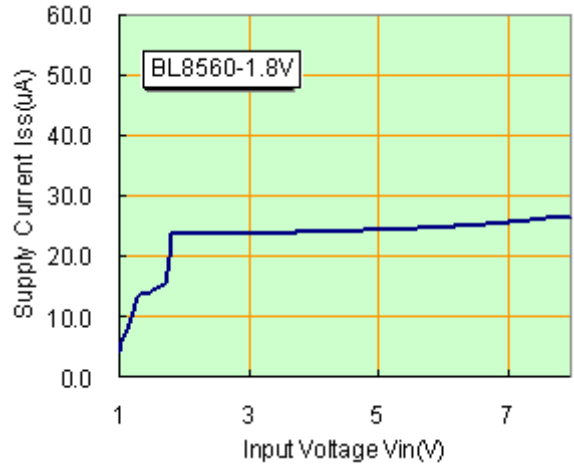
BL8560-1.8V



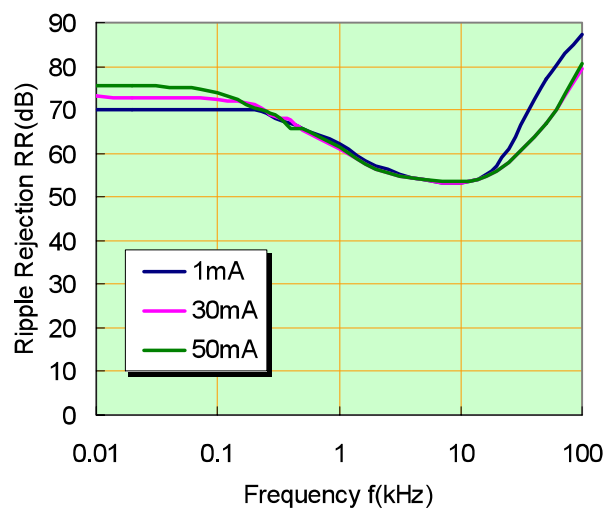
### 3) Dropout Voltage vs. Output Current



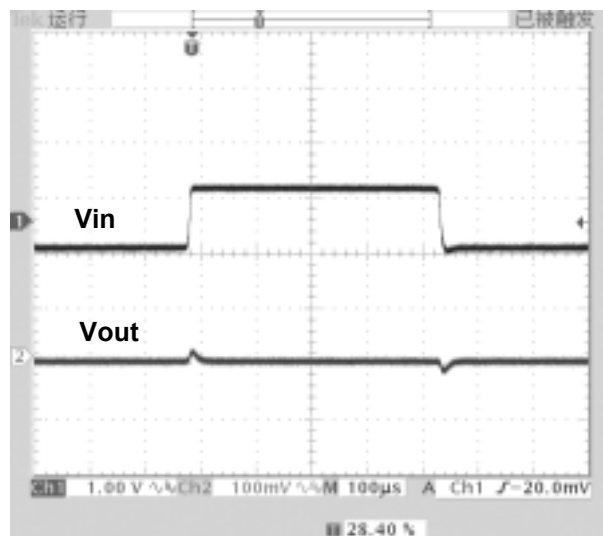
### 4) Supply Current vs. Input Voltage



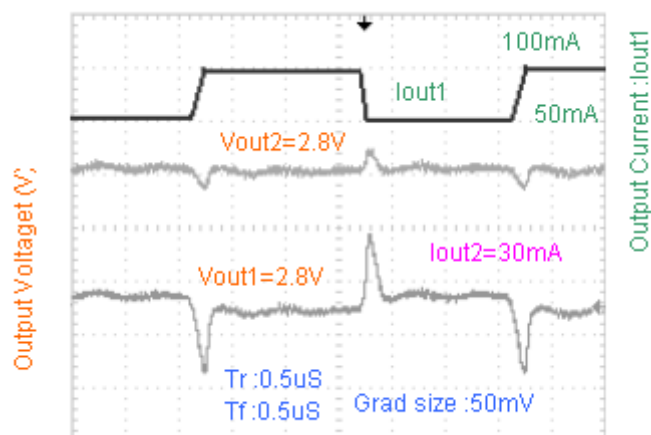
**5) Ripple rejection vs. Frequency**



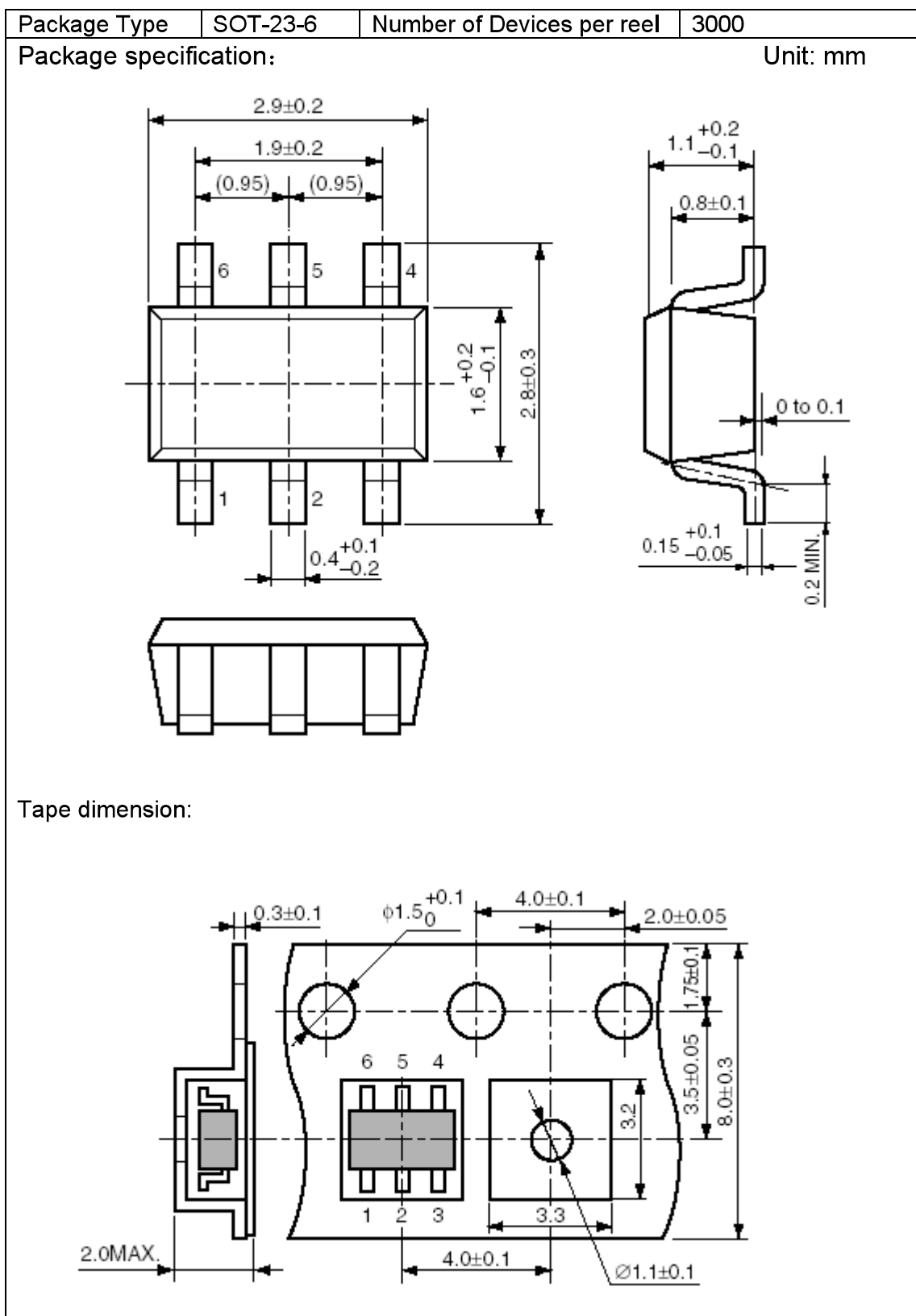
**6) Line transient response**



**7) Load transient response**





**Package Information:**


Reel dimension:

