



LC1208

200mA Low Consumption Linear Regulator

DESCRIPTION

LC1208 series is a group of positive voltage output, low power consumption, low dropout voltage, three terminal regulator. It can provide 200mA output current when input / output voltage differential drops to 430mV ($V_{out} = 2.8V$), The very low power consumption of LC1208 ($I_q = 1.0\mu A$) can greatly improve natural life of batteries.

LC1208 can provide output value in the range of 1.1V~5.5V in 0.1V steps. It also can be customized on command.

LC1208 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

LC1208 has well load transient response and good temperature characteristic, And it uses trimming technique to guarantee output voltage accuracy within $\pm 2\%$.

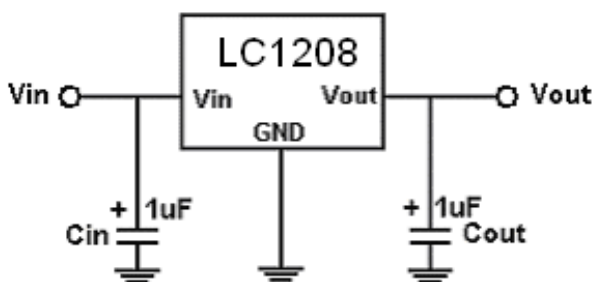
FEATURES

- Low power consumption: $1.0\mu A$ (Typ.)
- Maximum output current: 200mA
- Small dropout voltage
 - 210mV@100mA ($V_{out} = 2.8V$)
 - 430mV@200mA ($V_{out} = 2.8V$)
- Input voltage range: 1.5V~6V
- Output voltage range: 1.1V~5.5V (customized on command in 0.1V steps)
- Highly accurate: $\pm 2\%$ ($\pm 1\%$ customized)
- Output current limit

APPLICATIONS

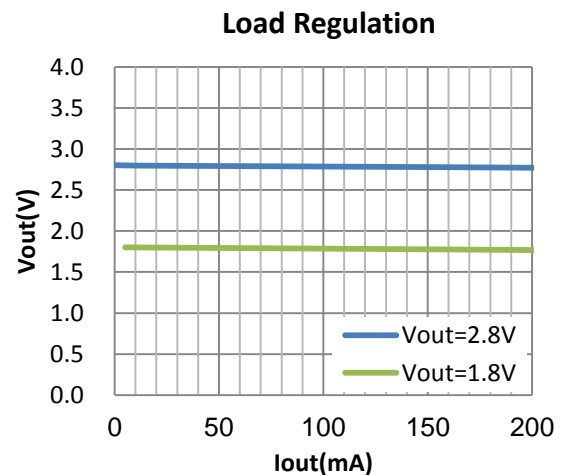
- Battery powered equipment
- Power management of MP3、PDA、DSC、mouse、PS2 games
- Reference voltage source regulation after switching power

TYPICAL APPLICATION



Note: Input capacitor ($C_{in} = 1\mu F$) and output capacitor ($C_{out} = 1\mu F$) are recommended in all application circuit. Ceramic capacitor is recommended.

ELECTRICAL CHARACTERISTICS



ORDERING INFORMATION

LC1208 [1](#) [2](#) [3](#) [4](#) [5](#)

Code	Description
1	Temperature&Rohs: C:-40~85°C ,Pb Free Rohs Std.
2	Package type: B3:SOT-23-3 B3A:TSOT-23 B5:SOT-23-5 C3:SOT-89-3 H:TO-92
3	Packing type: TR:Tape&Reel (Standard) BG:Bag (TO-92)
4	Output voltage: e.g. 11=1.1V 15=1.5V 55=5.5V
5	Voltage accuracy: 1=±1% Blank(default)=±2%

MARKING DESCRIPTON

Output Voltage Code

VOUT	Code	VOUT	Code	VOUT	Code
1.2V	2	2.9V	9	4.3V	3
1.3V	3	3.0V	0	4.4V	4
1.4V	4	3.1V	1	4.5V	5
1.5V	5	3.2V	2	4.6V	6
1.8V	8	3.3V	3	4.7V	7
2.0V	0	3.4V	4	4.8V	8
2.1V	1	3.5V	5	4.9V	9
2.2V	2	3.6V	6	5.0V	0
2.3V	3	3.7V	7	5.1V	1
2.4V	4	3.8V	8	5.2V	2
2.5V	5	3.9V	9	5.3V	3
2.6V	6	4.0V	0	5.4V	4
2.7V	7	4.1V	1	5.5V	5
2.8V	8	4.2V	2		

Y: The Year of manufacturing, "1" stands for year 2011, "2" stands for year 2012, and "8" stands for year 2018.
W: The week of manufacturing. "A" stands for week 1, "Z" stands for week 26, "A" stands for week 27, "Z" stands for week 52.

PIN CONFIGURATION

Product classification		LC1208CB3TR□□
Marking		SOT-23-3
NXYW	N:Product code	
	X:Output voltage	
	YW: Date code	
Product classification		LC1208CB3ATR□□
Marking		TSOT-23
NXYW	N:Product code	
	X:Output voltage	
	YW: Date code	
Product classification		LC1208CB5TR□□
Marking		SOT-23-5
NXYW	N:Product code	
	X:Output voltage	
	YW: Date code	
Product classification		LC1208CC3TR□□
Marking		SOT-89-3
NXX LLBYW	N:Product code	
	XX:Output voltage	
	LL:LOT NO.	
	B:FAB code	
	YW:Date code	
Product classification		LC1208CHBG□□
Marking		TO-92
NXX LLBYW	N:Product code	
	XX:Output voltage	
	LL:LOT NO.	
	B:FAB code	
	YW:Date code	
GND	Ground pin	
Vin	Supply voltage input	
Vout	Output voltage	
EN	Chip enable	
NC	No connection	

ABSOLUTE MAXIMUM RATING

Parameter		Value
Max input voltage		8V
Operating junction temperature(T _J)		125°C
Ambient temperature(T _A)		-40°C -85°C
Power dissipation	SOT-23-3	250mW
	TSOT-23	250mW
	SOT-23-5	250mW
	SOT-89-3	500mW
	TO-92	500mW
Storage temperature(T _S)		-40°C -150°C
Lead temperature & time		260°C,10S

Note:

Exceed these limits to damage to the device.

Exposure to absolute maximum rating conditions may affect device reliability.

RECOMMENDED WORK CONDITIONS

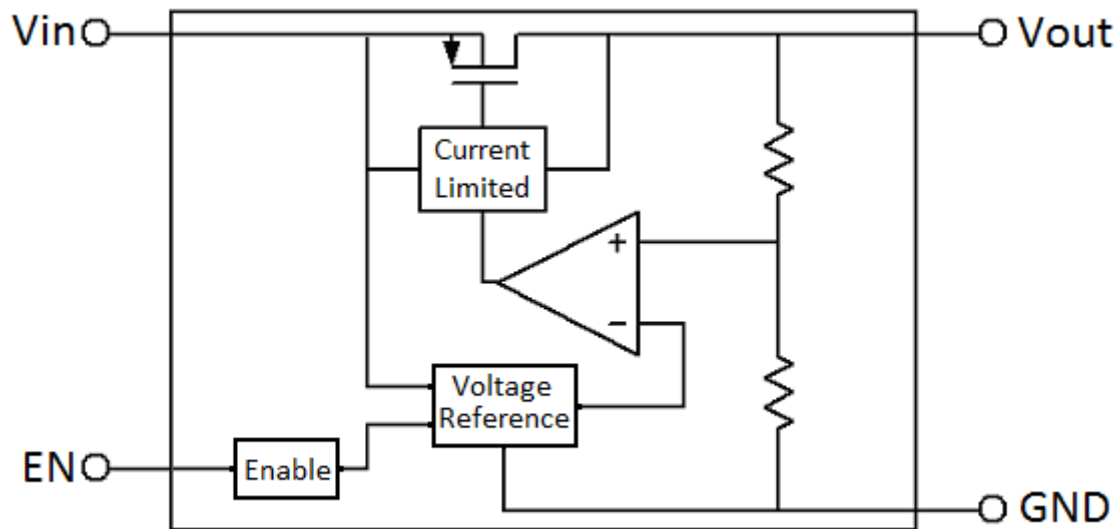
Item	Min	Recommended	Max.	Unit
Input voltage range			6	V
Ambient temperature	-40		85	°C

ELECTRICAL CHARACTERISTICS

(Test conditions: C_{in}=1uF,C_{out}=1uF,T_A=25°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Type	Max	Units
V _{in}	Input voltage				6	V
V _{out}	Output voltage		V _{out} x0.98		V _{out} X1.02	V
I _{out} (Max.)	Maximum output current	V _{in} -V _{out} =1V	200			mA
Dropout voltage	Input-output voltage differential	I _{out} =100mA	V _{out} ≤ 1.8V	600	1000	mV
			V _{out} ≥ 1.8V	300	600	
$\frac{\Delta V_{out}}{\Delta V_{in} \cdot V_{out}}$	Line regulation	I _{out} =10mA 1.5V ≤ V _{in} ≤ 8V		0.2	0.3	%/V
ΔV_{out}	Load regulation	V _{in} =Set V _{out} +1V 1mA ≤ I _{out} ≤ 100mA		20	40	mV
I _q	Quiescent current	V _{in} =Set V _{out} +1V		1.0	5.0	uA
$\frac{\Delta V_{out}}{\Delta T \cdot V_{out}}$	Output voltage temperature coefficient	I _{out} =10mA		100		ppm/°C
V _{ENH}	EN input voltage "H"		1.5		V _{in}	V
V _{ENL}	EN input voltage "L"		0		0.2	V

BLOCK DIAGRAM



EXPLANATION

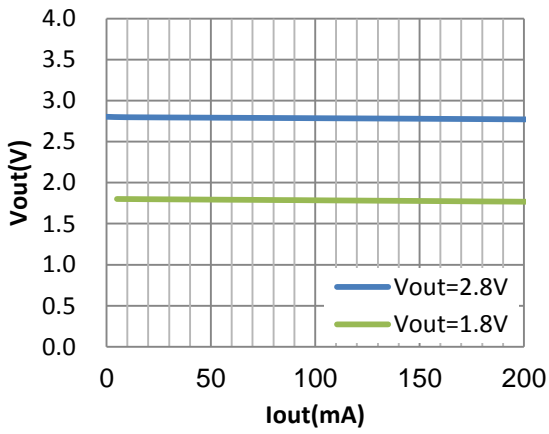
LC1208 is a series of low dropout voltage and low power consumption three pins regulator. Its application circuit is very simple, which only needs two outside capacitors. It is composed of these modules: high accuracy voltage reference, current limit circuit, error amplifier, output driver and power transistor.

Current Limit module can keep chip and power system away from danger when load current is more than 200mA.

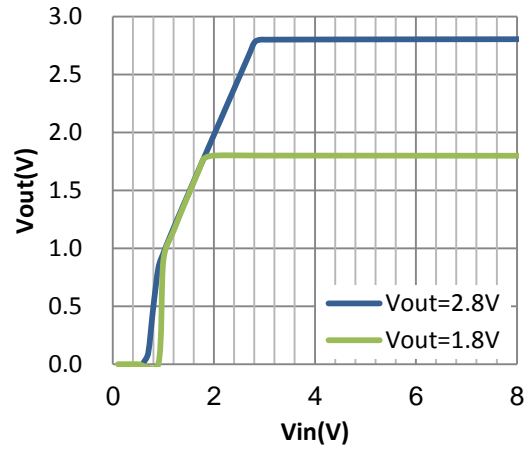
LC1208 uses trimming technique to assure the accuracy of output value within $\pm 2\%$, at the same time, temperature compensation is elaborately considered in this chip, which makes LC1208's temperature coefficient within 100ppm/ $^{\circ}\text{C}$.

TYPICAL PERFORMANCE CHARACTERISTICS

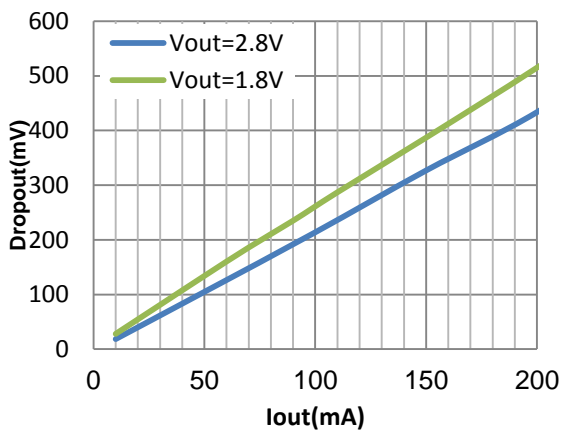
Load Regulation



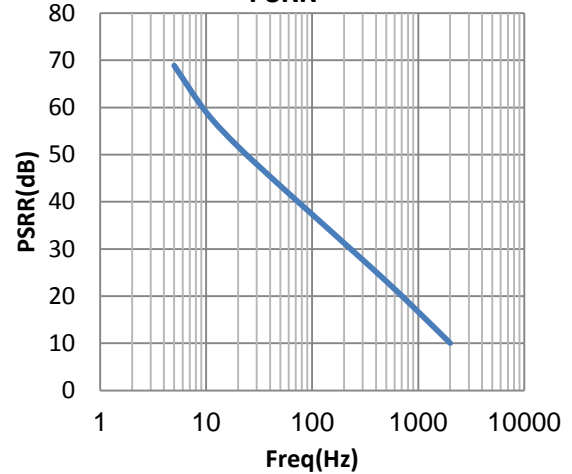
Line Regulation



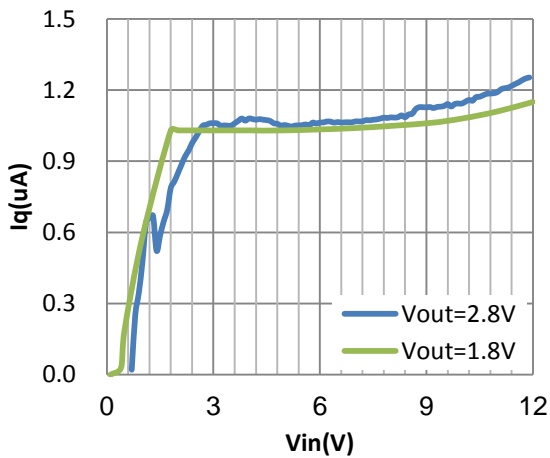
Dropout Voltage



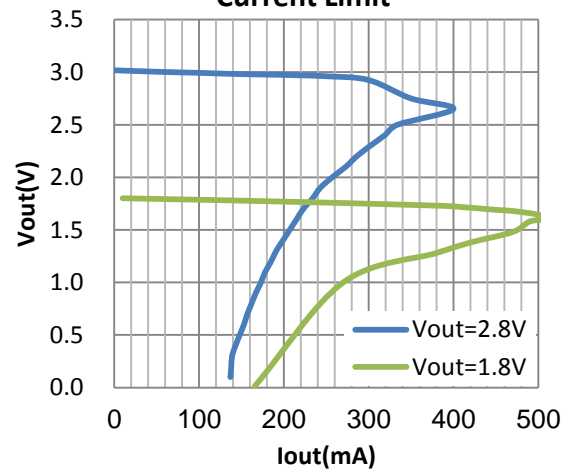
PSRR



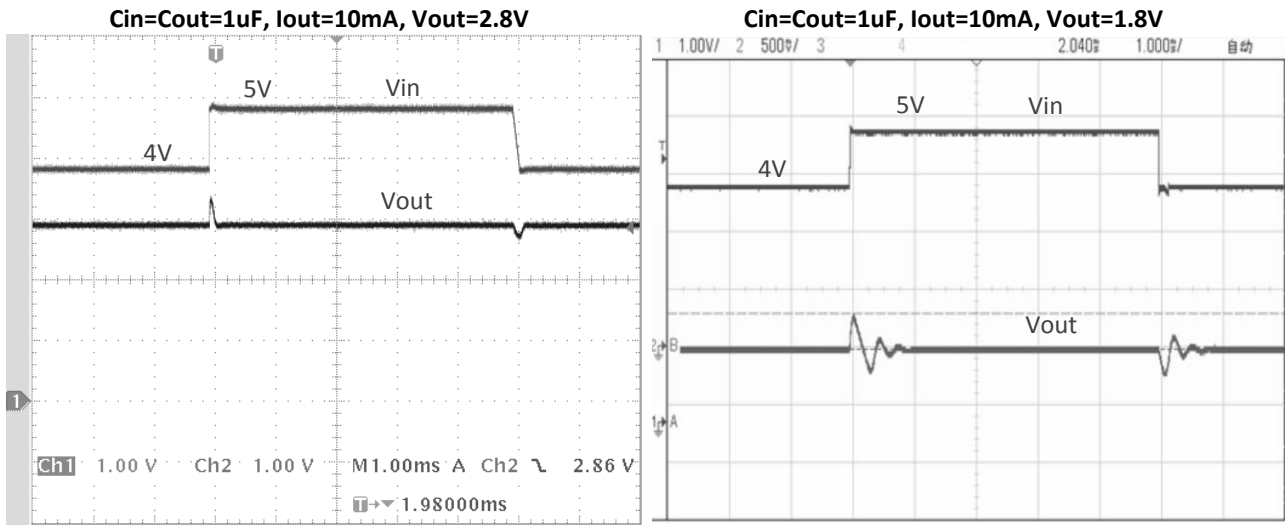
Iq



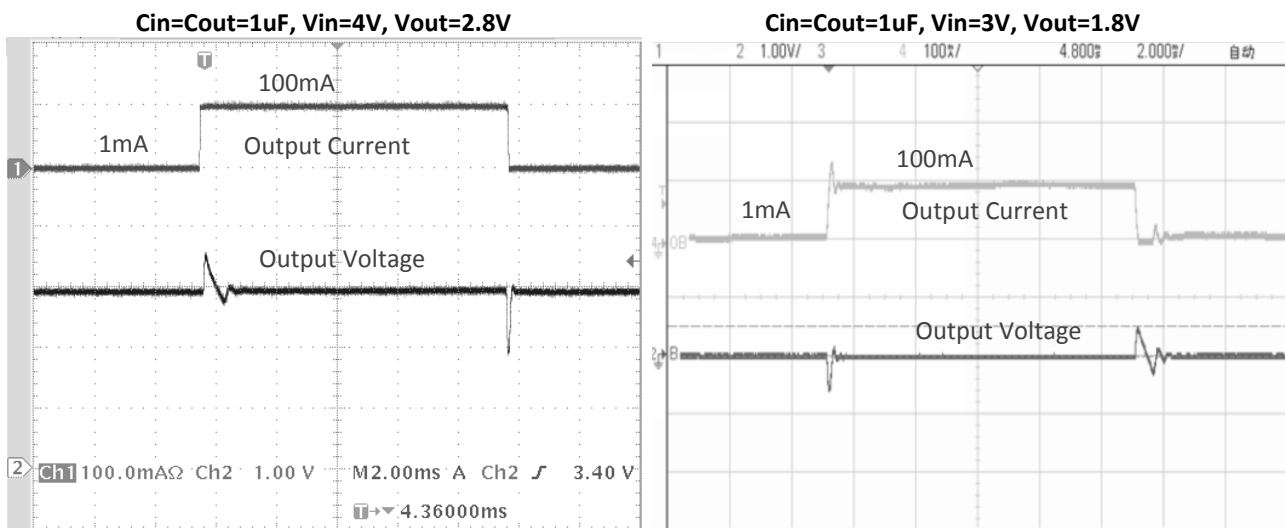
Current Limit



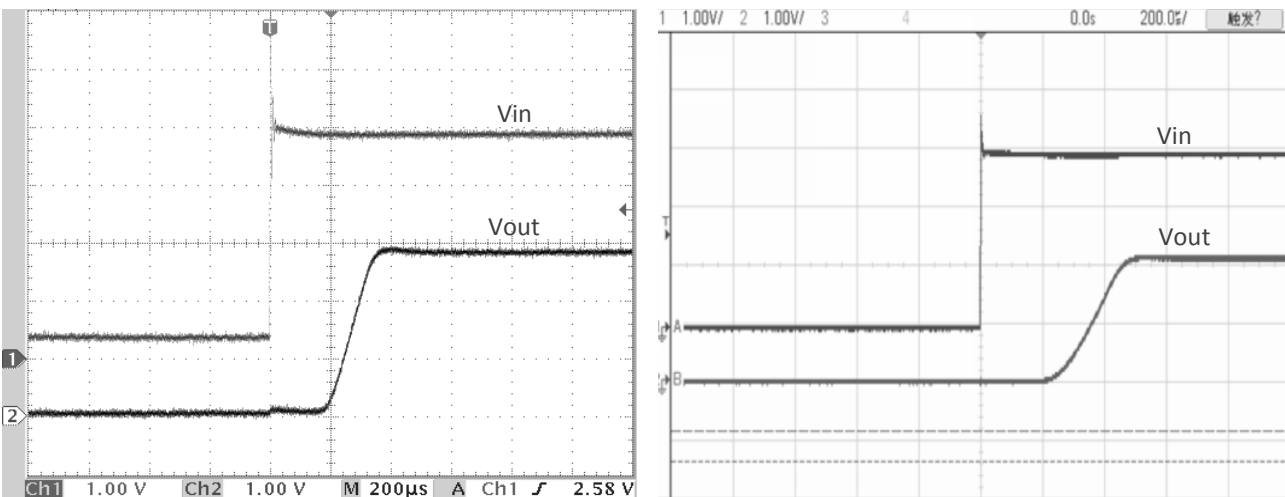
Line transient response



Load transient response



Start up



PACKAGE LINE

Package	TSOT-23	Devices per reel	3000Pcs						
Package dimension:									
	A	B	C	D	E	F	G	H	K
出厂标准	2.4±0.15	0.95±0.05	2.9±0.1	1.3±0.1	0.40±0.1	0.15±0.08	0.4±0.1	0.07±0.07	1.00±0.05

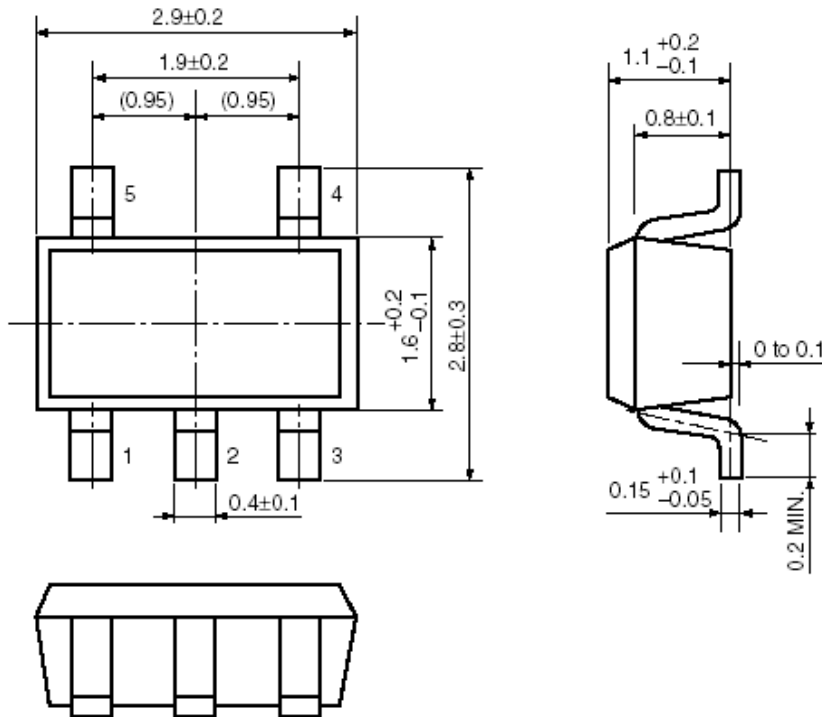
Unit: mm

Package	SOT-23-3	Devices per reel	3000Pcs						
Package dimension:									
	2.80±0.15	1.60	1.90	0.40±0.1	2.92	0.15±0.05	0.45±0.15	0.07±0.07	1.15

Unit: mm

Package	SOT-23-5	Devices per reel	3000Pcs
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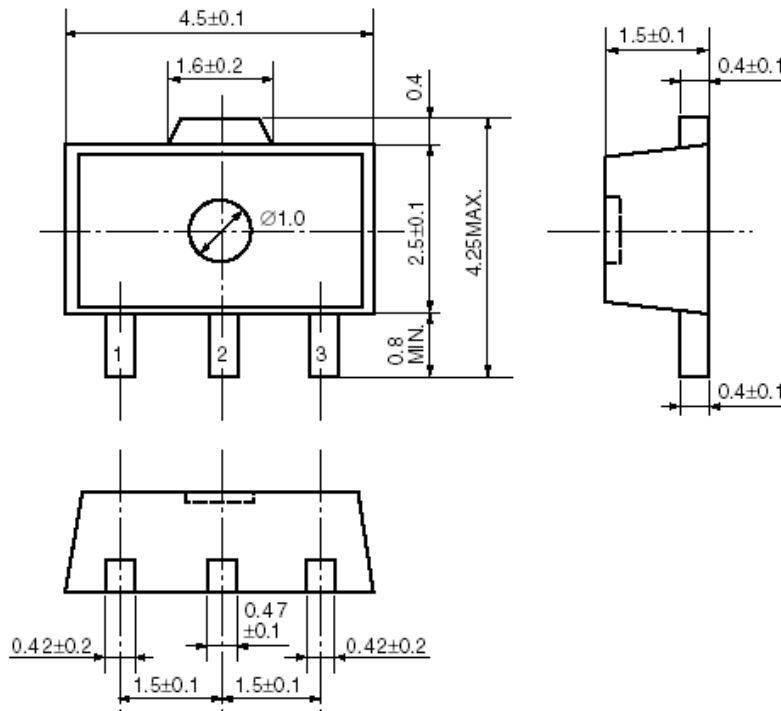
Package Dimension:



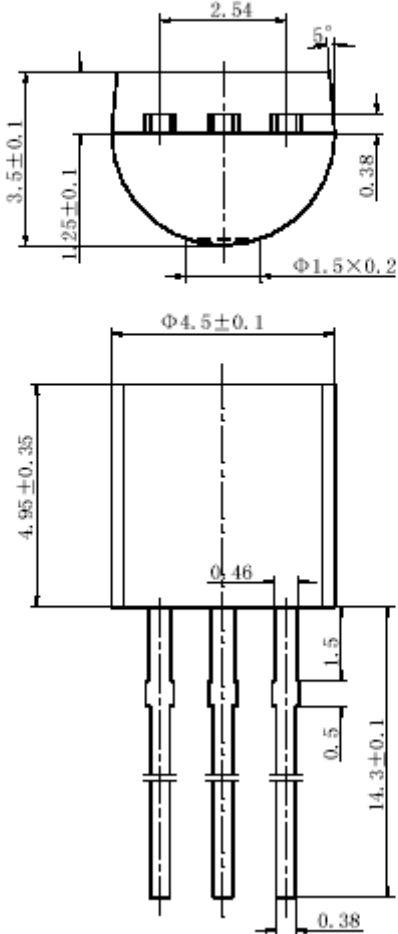
Unit: mm

Package	SOT-89-3	Devices per reel	1000Pcs
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Package Dimension:



Unit: mm

Package	TO-92	Devices per Bag	1000Pcs
<p data-bbox="164 338 384 367">Package Dimension:</p> <p data-bbox="778 349 868 378" style="text-align: center;">TO-92</p>  <p>The technical drawing shows two views of a TO-92 package. The top view is a semi-circle with a diameter of $\Phi 1.5 \pm 0.2$ mm. The total width of the package is 3.5 ± 0.1 mm, and the width of the flat top section is 2.54 mm. The height of the package is 1.25 ± 0.1 mm. The top surface is flat, and the bottom surface is semi-circular. The side view shows a cylindrical body with a diameter of $\Phi 4.5 \pm 0.1$ mm and a height of 4.95 ± 0.35 mm. The package has three leads extending from the bottom. The distance between the center of the package and the center of the leads is 0.46 mm. The length of the leads is 14.3 ± 0.1 mm. The diameter of the leads is 0.38 mm. The distance between the center of the package and the center of the leads is 1.5 mm. The distance between the center of the package and the center of the leads is 0.5 mm.</p> <p data-bbox="164 1442 268 1471">Unit: mm</p>			