FC6206S Series Low ESR Cap. Compatible Positive Voltage Regulator

❖ Application

- Battery Powered Equipment
- Palmtops
- Portable Cameras and Video Recorders
- Reference Voltage Sources

❖ Features

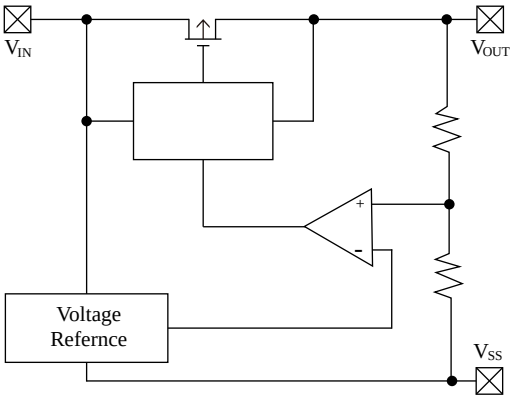
- CMOS Low Power Consumption :
  Typical 1.0uA at Vout=3.0V
- Output Voltage Range : 1.5V to 5.0V in 0.1V increments
- Highly Accurate:
  Output Voltage + 3% for 1.5V to 1.9V
  Output Voltage + 2% for 2.0V to 5.0V
- Maximum Output Current: 250mA
  (within the maximum power dissipation, Vout=5.0V)
  Small Input-Output Voltage Differential:
  0.16V at 100mA and 0.4V at 200mA
- Input stability: Typ. 0.2%/V
- Package Available:
  SOT- 23 (250mW) , SOT-25 (350mW)
  SOT- 89 (500mW) , TO - 92 (300mW)
- Reverse Battery Protection

❖ General Description

The FC6206S series are highly precise, low power consumption, high voltage, positive voltage output, three-pin regulator. It provides high output current even when the input/output voltage differential is small.

The FC6206S consists of a high-precision voltage reference, an error correction circuit and reverse battery protection.

❖ Block Diagram

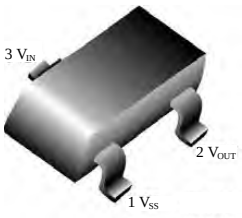


Absolute Maximum Ratings

Parameter		Symbol	Ratings	Units
Input Voltage		V_{IN}	6	V
Output Current		I_{OUT}	500	mA
Output Voltage		V_{OUT}	V_{SS}-0.3 ~V_{IN}+0.3	V
Continuous Total Power Dissipation	SOT-23/25	P_d	250/350	mW
	SOT-89		500	
	TO-92		300	
Operating Ambient Temperature		T_{opr}	-40 ~ +85	°C
Storage Temperature		T_{stg}	-55 ~ +125	°C

❖ Pin Configuration

SOT-23



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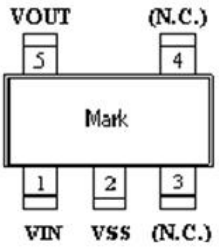
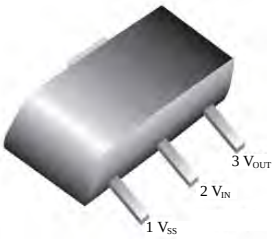
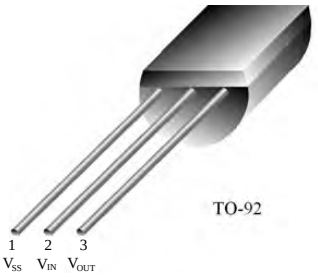


SOT-89



TO-92



Package Pin Number			Pin Name	Function
SOT-23	SOT-89	TO-92		
1	1	1	V_{SS}	Ground
3	2	2	V_{IN}	Power Input
2	3	3	V_{OUT}	Output

❖ Standard Circuit

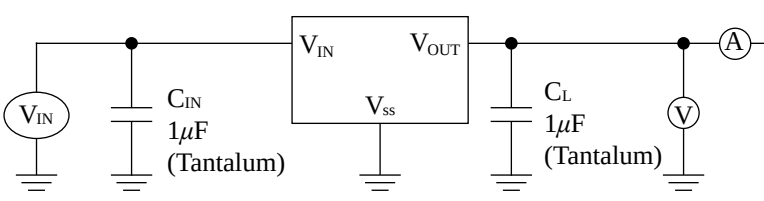
Note on Use

1. Oscillation may occur as a result of the impedance present between the power supply and the IC's input. Please use a capacitor (CIN) of at least 1uF, when the impedance is 10 ohm or more.
   With a large output current, Voltage output can be stabilised by increasing capacitor (CIN) size. If CIN is small and capacitor (CL) size is increased, oscillation may occur. In such cases, Voltage output can be stabilised by either increasing the size of CIN or decreasing the size of CL.

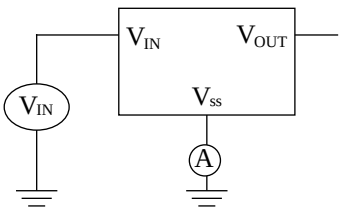
2. Please ensure that output current (IOUT) is less than Pd / (VIN-VOUT) and does not exceed the stipulated Continuous Total Power Dissipation value (Pd).

❖ Test Circuit

Test Circuit 1



Test Circuit 2



❖ Electrical Characteristic

FC6206S302 V OUT(T)=3.0V(Note 1)

Parameter	Symbol	Conditions	Min	Typ	Max	Units	Circuit
Output Voltage	VOUT(E) (Note 2)	IOUT=40mA VIN=4.0V	2.940	3.000	3.060	V	1
Maximum Output Current	IOUT max	VIN=4.0V, VOUT(E)≤2.7V	350			mA	1
Load Stability	⊿VOUT	VIN=4.0V, 1mA≤IOUT≤ 100mA		25		mV	1
Input –Output	Vdif1	IOUT=80mA		80		mV	1
Voltage Differential (Note 3)	Vdif2	IOUT=150mA		250		mV	1
Supply Current	Iss	VIN=4.0V		1.0		uA	2
Input Stability	$\frac{\Delta VOUT}{\Delta VIN * VOUT}$	IOUT=40mA VOUT(T)+1.0V≤VIN ≤6V		0.01	0.30	%V	1
Input Voltage	VIN		1.8		6	V	-
Current Limiter	Ishort	VIN = VOUT+1 5V, VOUT=VSS		100		mA	1

Note : 1. VOUT(T) = Specified Output Voltage.

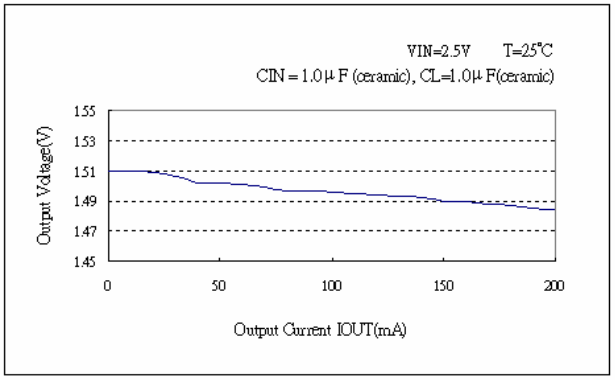
2. VOUT(E) = Effective Output Voltage (i.e. the output voltage when (VOUT(T)+1.0V) is provided at the VIN pin while maintaining a certain IOUT value).

3. Vdif = VIN1(Note 4) – VOUT(E)
4. VIN1 = The input voltage at the time 98% of VOUT (E) is output (input voltage has been gradually reduced).

❖ Typical Performance Characteristics

1) Output Voltage vs. Output Current

FC6206S153



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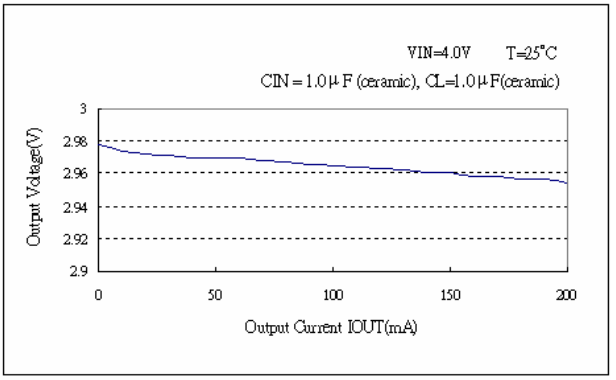

2) Current Limit

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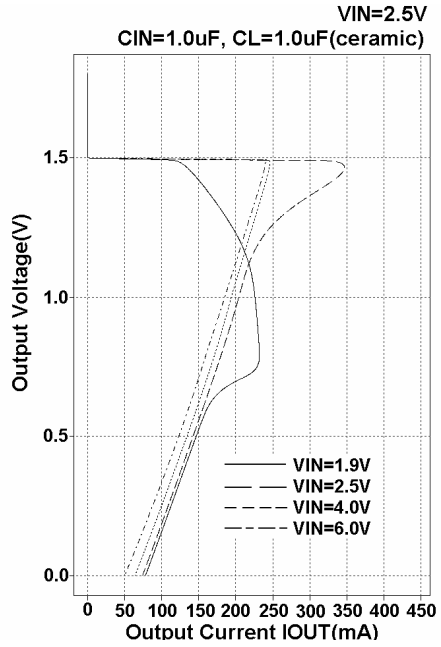

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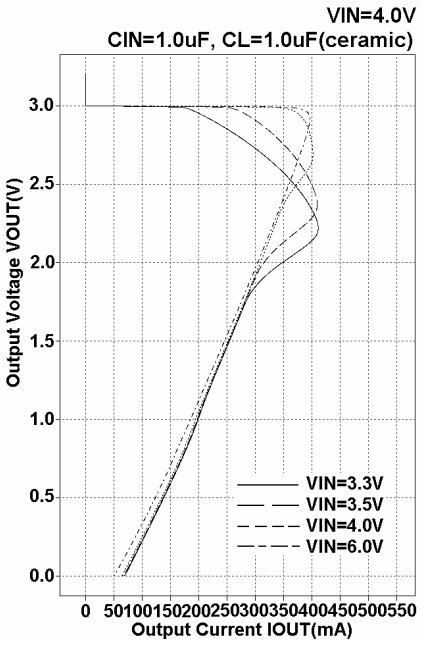
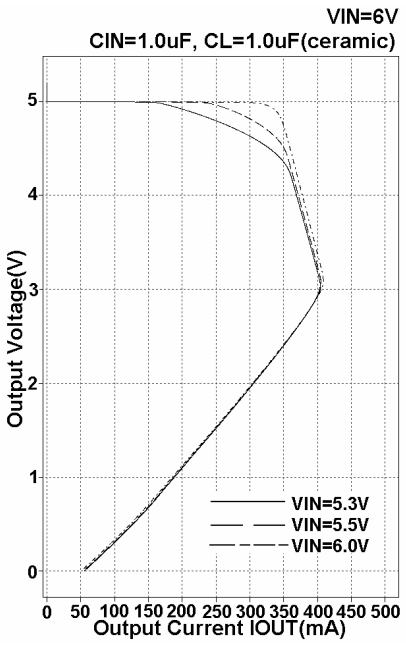


FC6206S502



3) Output Voltage vs. Input Voltage

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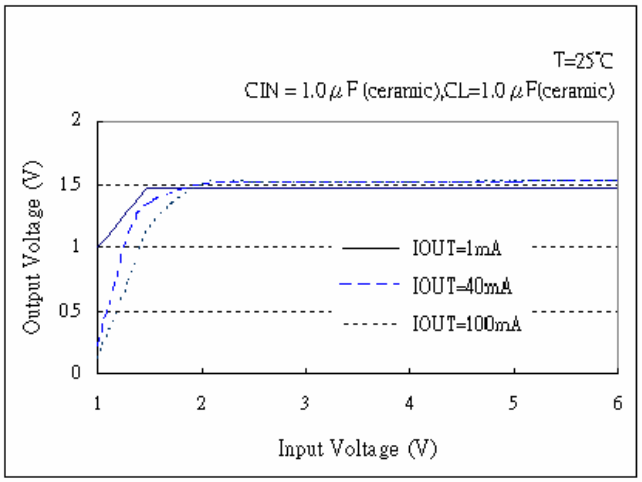

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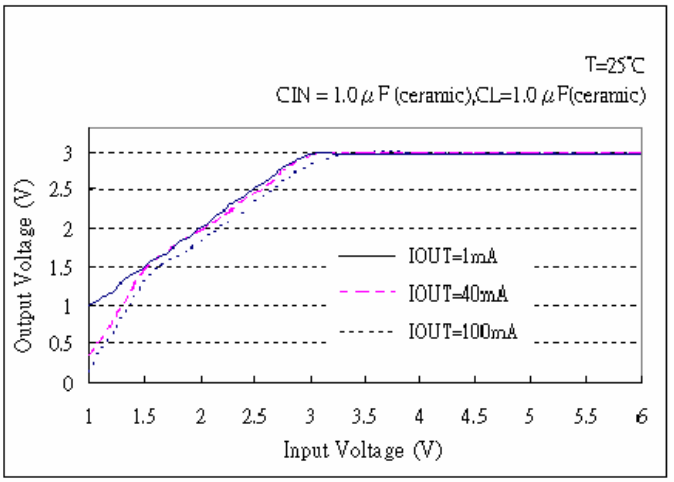
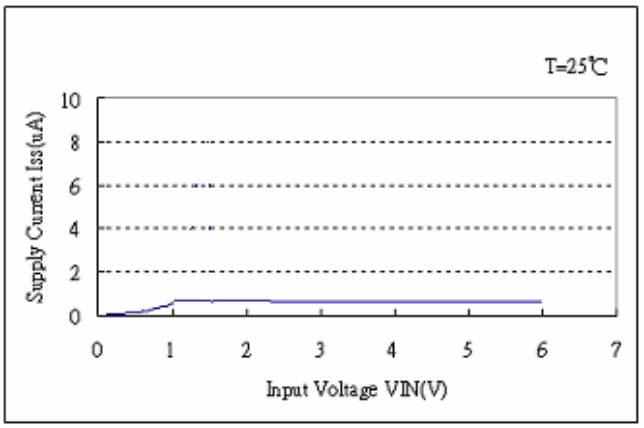


4) Supply Current vs. Input Voltage

FC6206S153



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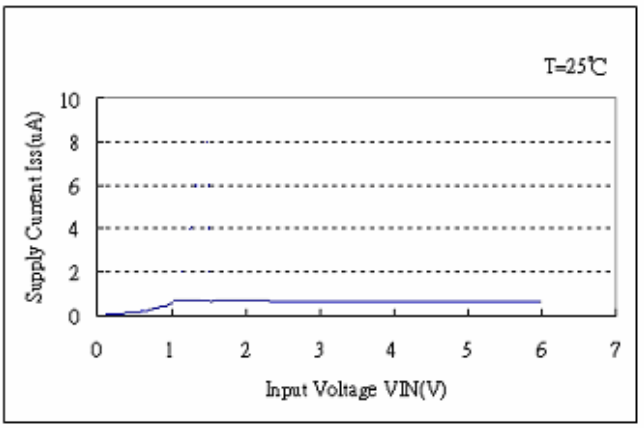
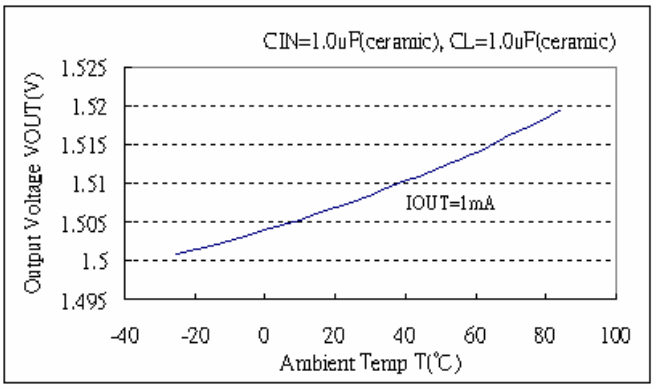


5) Output Voltage vs. Ambient Temperature

FC6206S153



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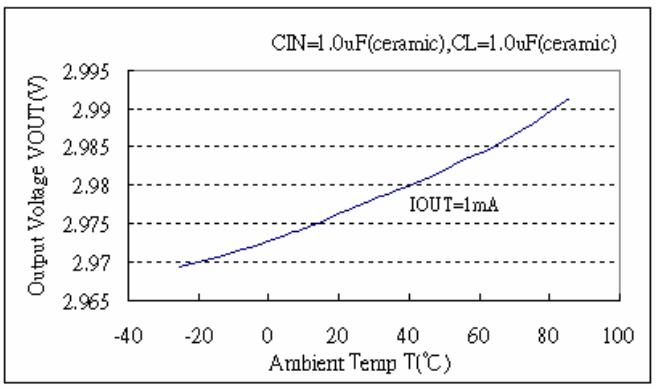
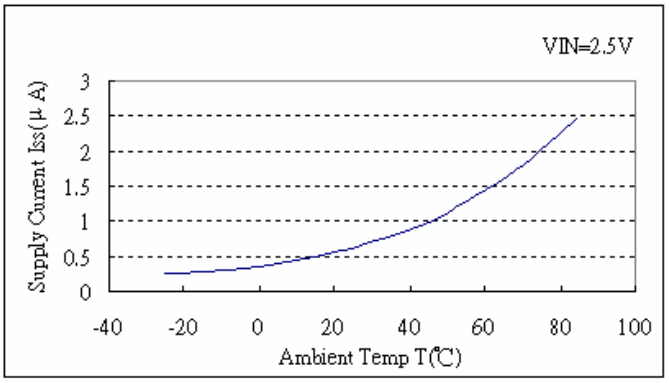


6) Supply Current vs. Ambient Temperature

FC6206S153



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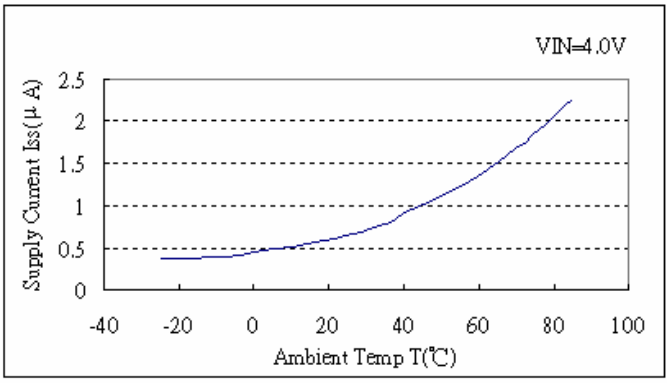
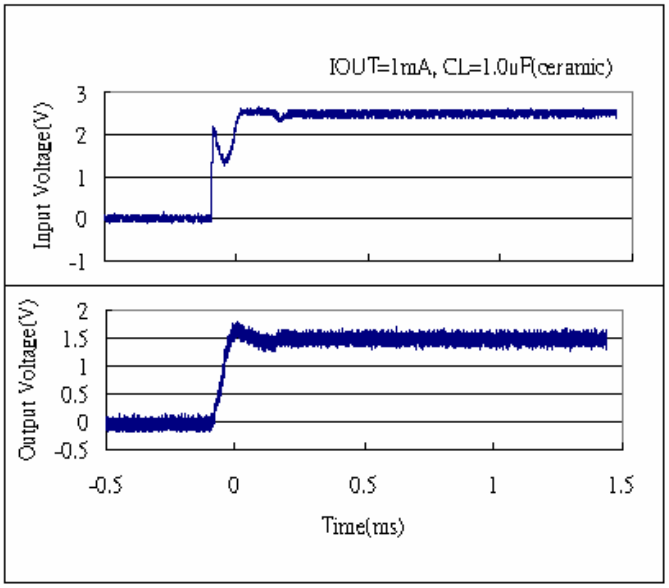
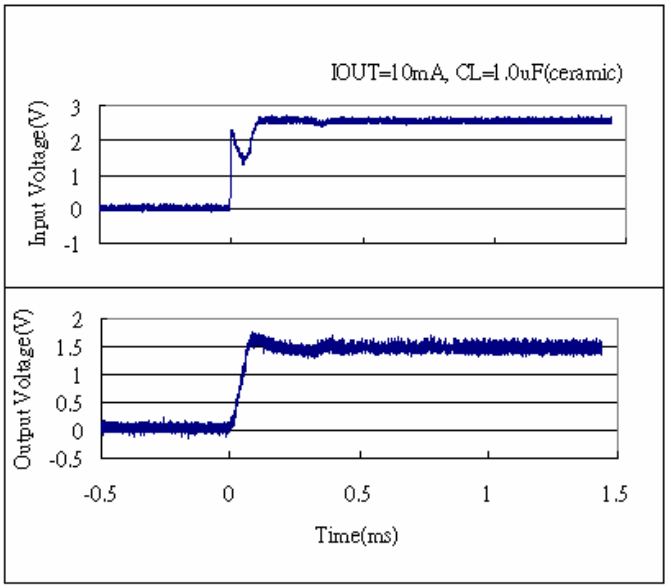


7) Input Transient Response 1

FC6206S153





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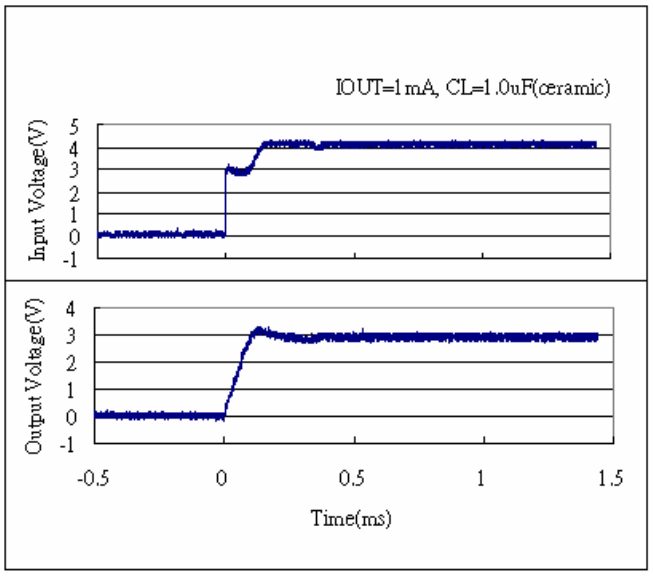
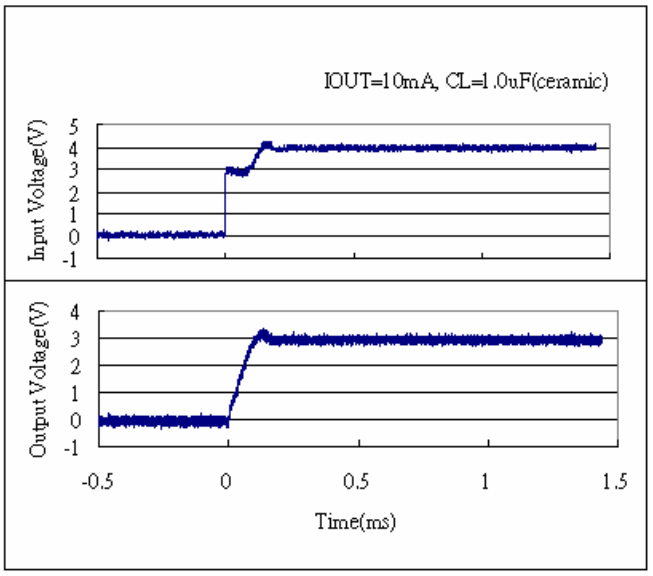
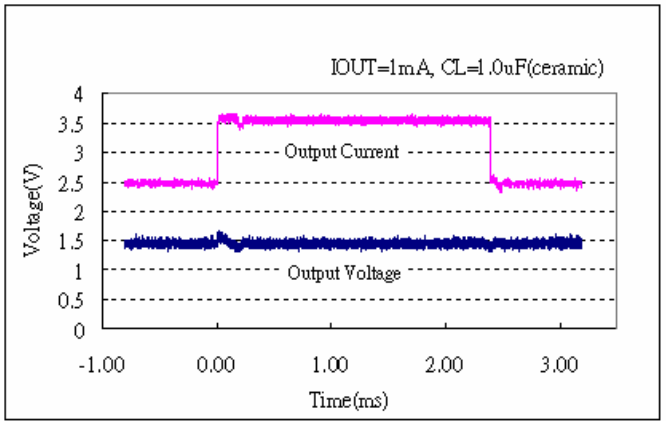
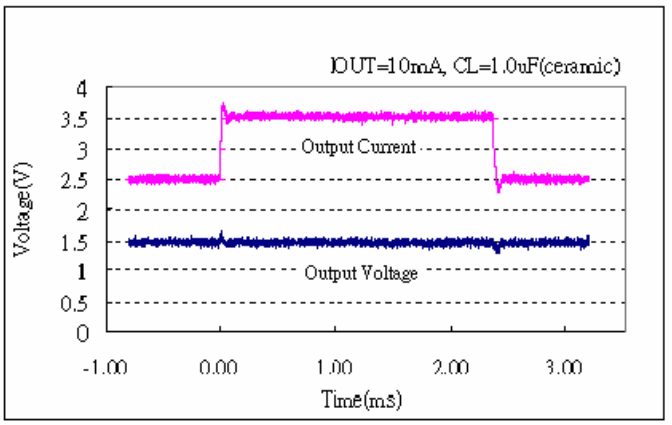




8) Input Transient Response 2

FC6206S153





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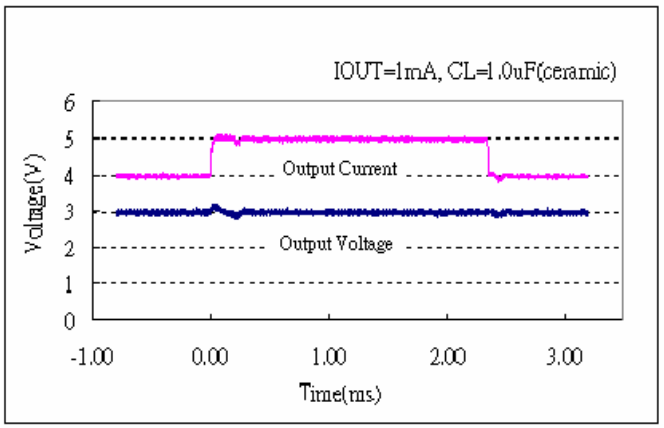
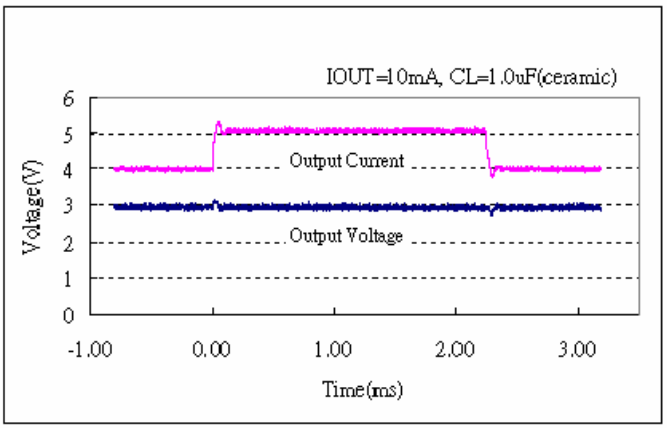
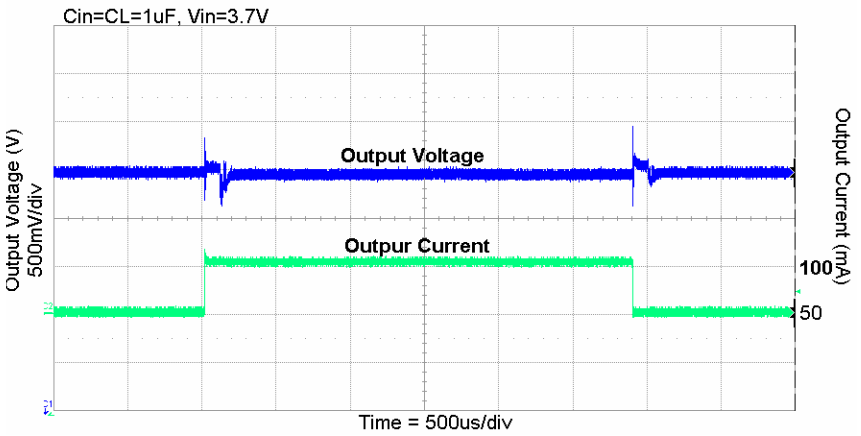


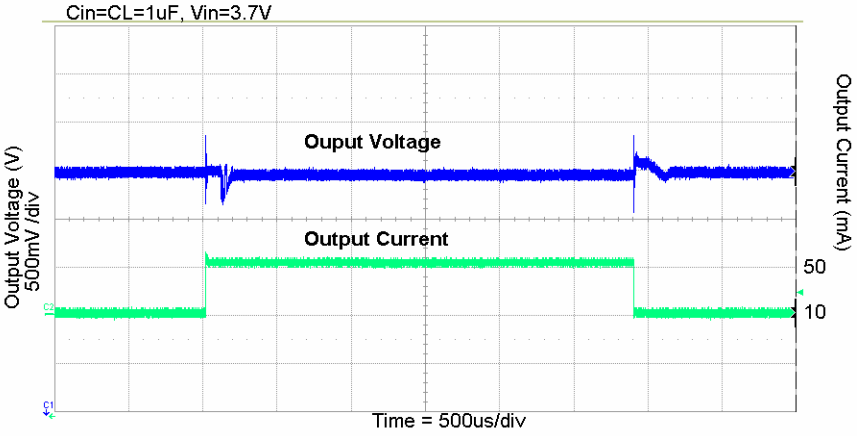


9) Load Transient Response

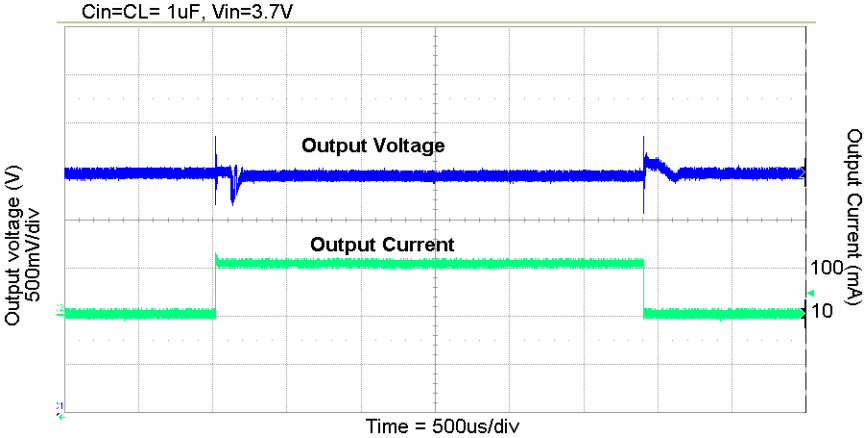
FC6206S272



Load Current 50mA to 100mA



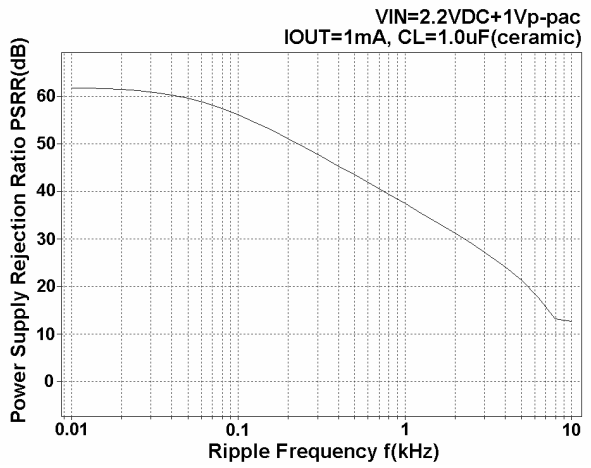
Load Current 10mA to 50mA



Load Current 10mA to 100mA

10) Power Supply Rejection Ratio

FC6206S153



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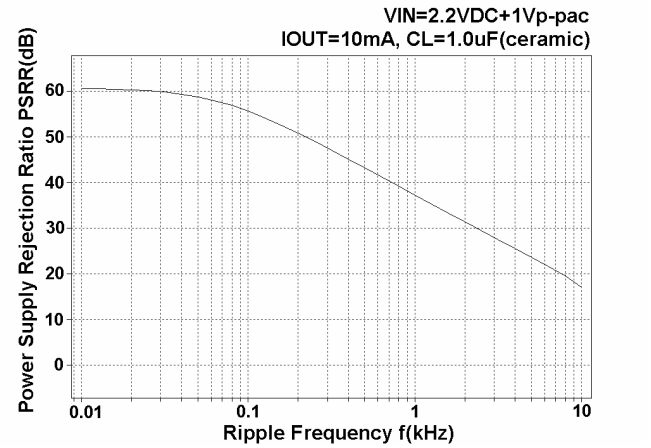

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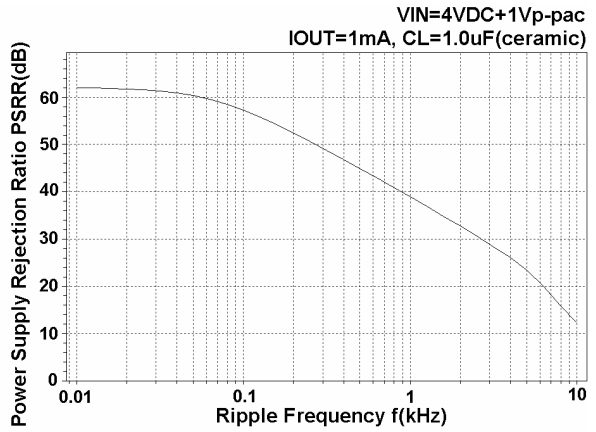

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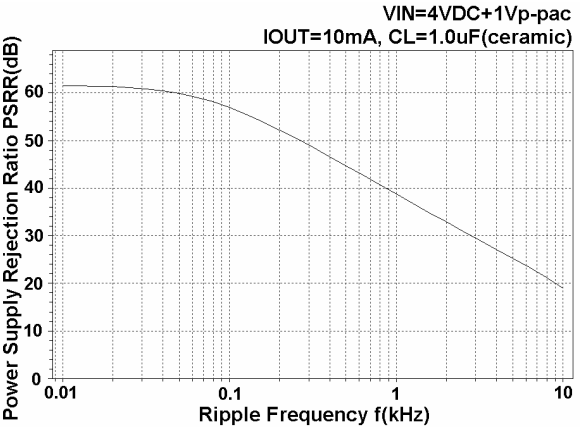


❖ Ordering Information

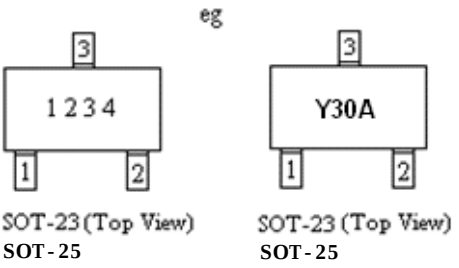
Designator	Description
①②	Output Voltage eg. 30=3.0V 50=5.0V
③	Output Voltage Accuracy 2 = ± 2.0% 3 = ± 3.0%
④	Package Type M = SOT-23 N=SOT-25 P = SOT-89 T = TO-92
⑤	Device Orientation R = Embossed Tape (Orientation of Device : Right) L = Embossed Tape (Orientation of Device : Left) B = Bag (TO-92) H = Paper Tape (TO-92)
⑥	G = Lead Free Part

FC6206S ①②③④⑤⑥

☐ *Marking*

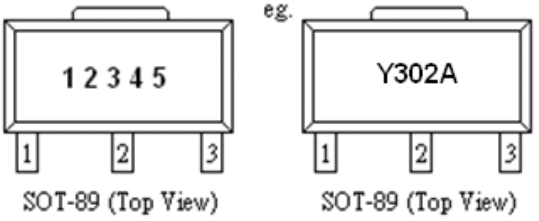
SOT-23/SOT-25 :

Designator	Description
1	**Type** Y = Positive Voltage Regulator
2,3	**Output Voltage** eg. 30 = 3.0V
4	**Internal Code**



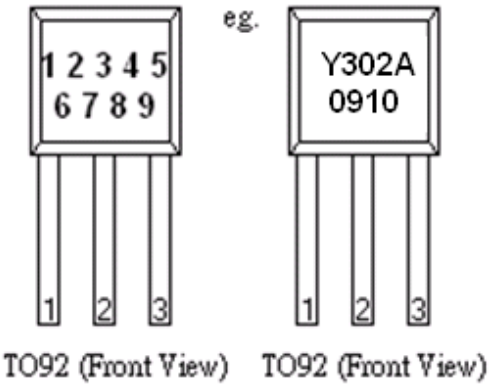
SOT-89 :

Designator	Description
1	**Type** Y = Positive Voltage Regulator
2,3	**Output Voltage** eg. 30 = 3.0V
4	**Output Voltage Accuracy** 2 = ±2.0% 3 = ±3.0%
5	**Internal Code**



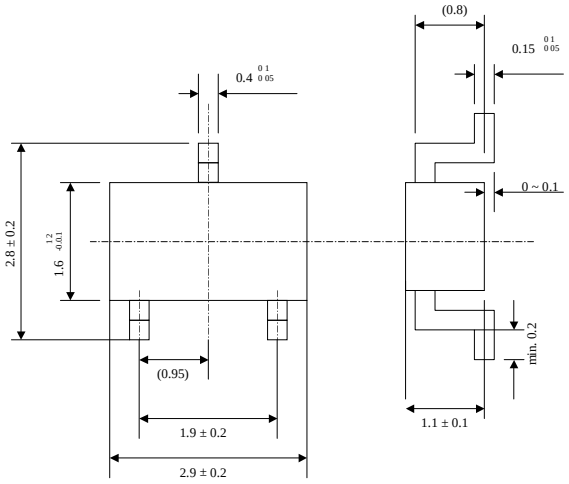
TO-92 :

Designator	Description
1	**Type** Y = Positive Voltage Regulator
2,3	**Output Voltage** eg. 30 = 3.0V
4	**Output Voltage Accuracy** 2 = ±2.0% 3 = ±3.0%
5	**Internal code**
6, 7	**Year Code** eg. 09 = Year 2009
8, 9	**Week Code** eg. 10 = Week 10



❖ Packaging Information

SOT-23 :



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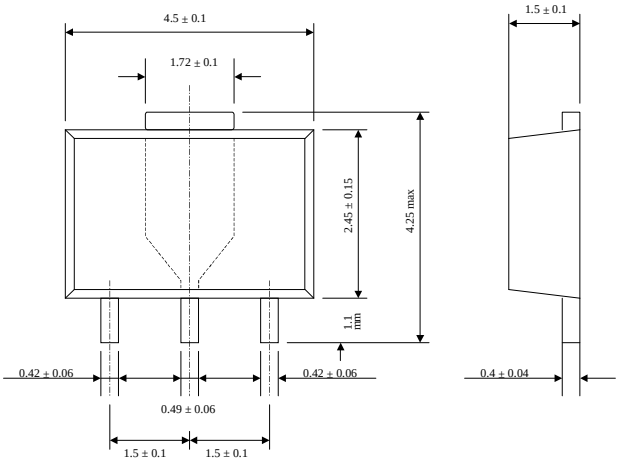

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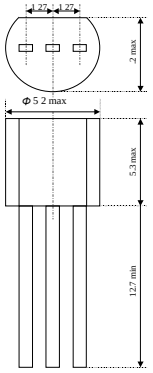
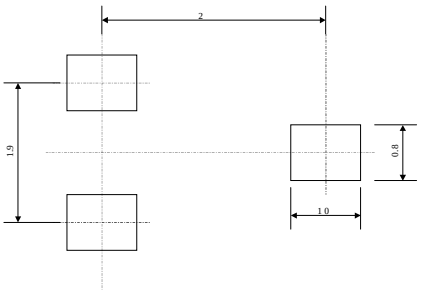


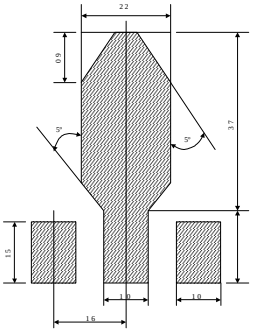
Units : mm

❖ Recommended Pattern Layout

SOT-23 :

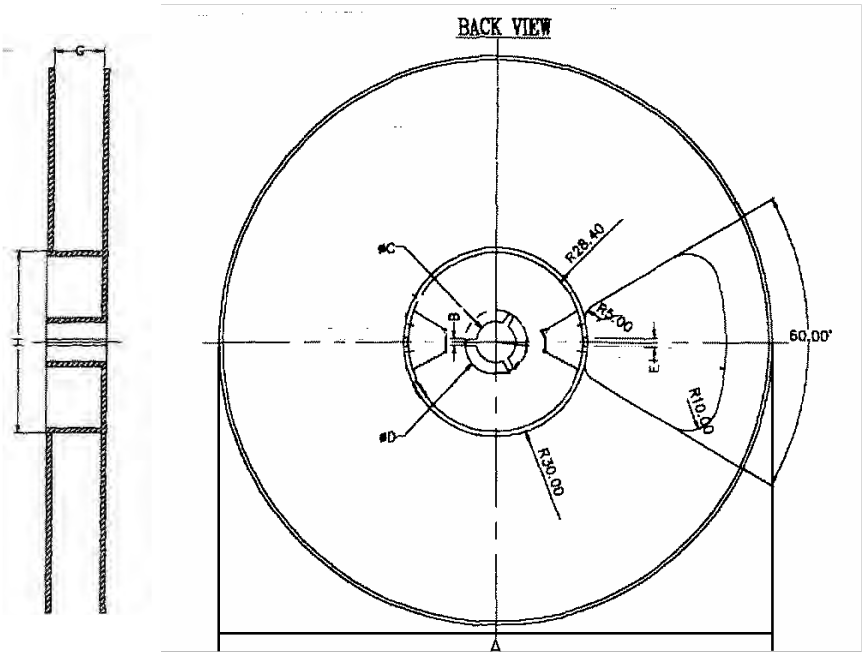


SOT-89



❖ Tape and Reel Information

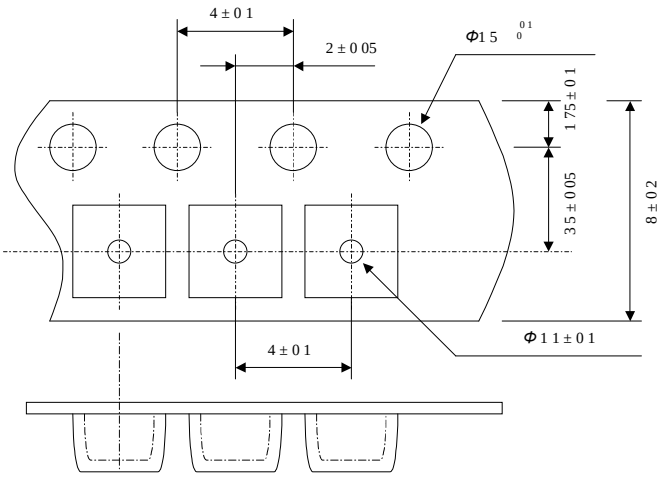
SOT-23/SOT-25 :

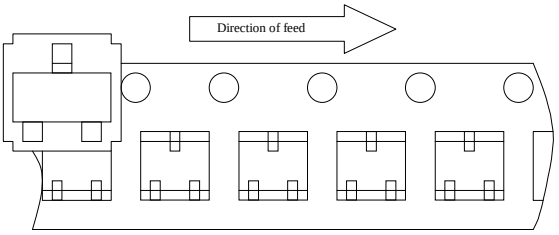


	SIZE (mm)
A	Φ178 ± 0.8
B	2 ± 0.2
C	Φ13 ± 0.2
D	Φ21 ± 0.8
G	8 ± 0.5
H	Φ60

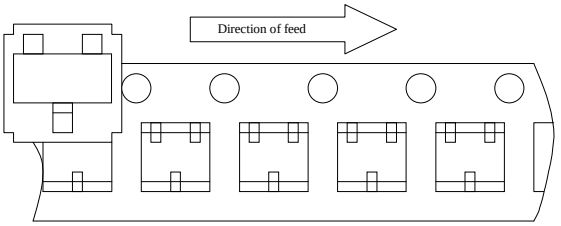
3,000 pcs / reel

SOT-23 Taping Specifications :



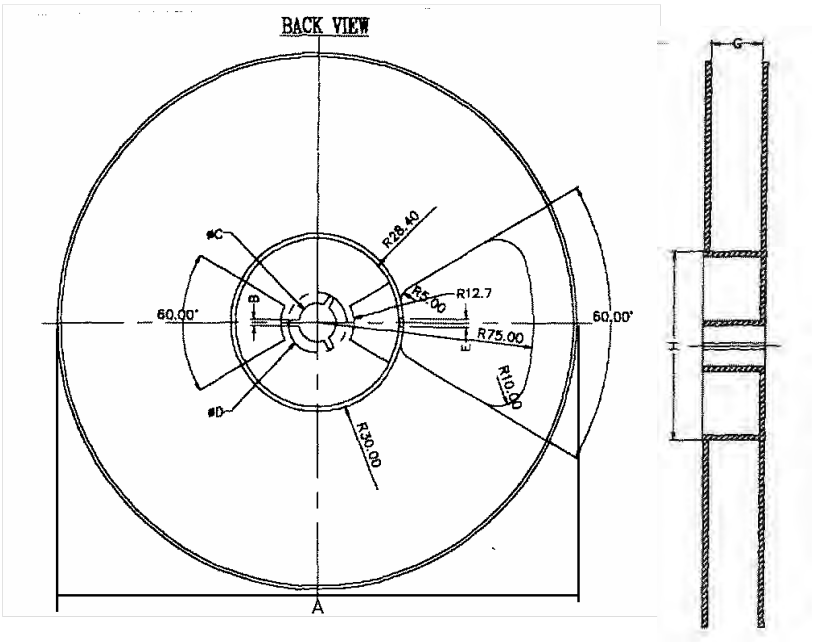


"R" type [Orientation of Device: Right]
Standard Type



"L" type [Orientation of Device: Left]
Reverse Type

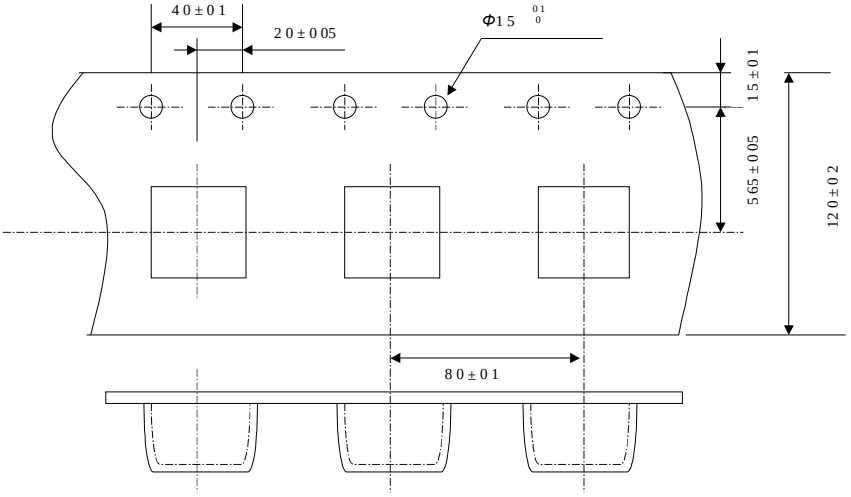
SOT-89 :

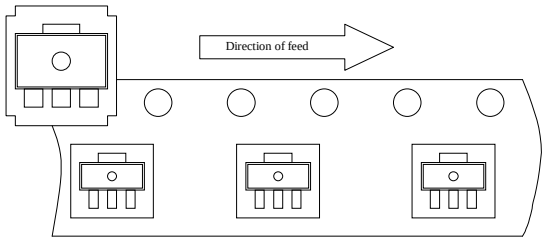


	SIZE (mm)
A	Φ 178 ± 0.8
B	2 ± 0.2
C	Φ 13 ± 0.2
D	Φ 21 ± 0.8
G	12 ± 0.5
H	Φ 60

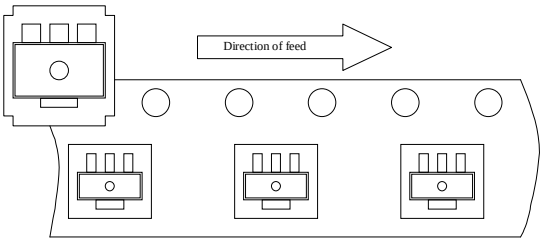
1,000 pcs / reel

SOT-89 Taping Specifications :



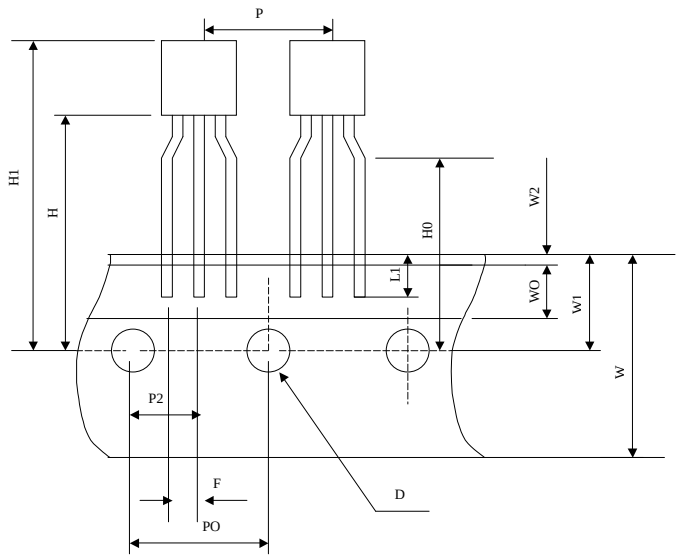


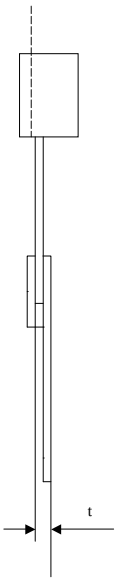
"R" type [Orientation of Device Right]
Standard Type



"L" type [Orientation of Device Left]
Reverse Type

TO-92 Taping Specifications :





	SIZE (mm)
P	12.7 ± 1.0
PO	12.7 ± 0.3
P2	6.35 ± 0.4
F	$2.5^{+0.45}_{-0.15}$
W	18.0 ± 1.0
WO	6.0 ± 0.3
W1	9.0 ± 0.5
W2	0.5 MAX
H	19.0 ± 0.5
H0	16.0 ± 0.5
H1	32.25 MAX
D	Φ4.0 ± 0.2
t	0.6 ± 0.2
L1	3.5 MIN

2,000 pcs / box