Low power consumption,Low ESR Cap.Compatible TL5012 Series

General Description

TL5012 series are highly precise,low power consumption, high voltage, positive voltage regulators manufactured using CMOS and laser trimming technologies .The series provides large currents with a significantly small dropout voltage. The series is compatible with low ESR ceramic capacitors .The current limiter's foldback circuit also operates as a short protect for the output current limiter and the output pin.

Features

- Highly Accurate：±2%
- Output voltage range：1.5V~5.0V (selectable in 0.1V steps)
- Low power consumption：8uA(TYP.)
- Large output current：300mA (V_{IN}＝4.3V,V_{OUT}＝3.3V)
- Input voltage: up to 6 V
- Dropout voltage： 0.2V at 100mA and 0.40V at 200mA
- Excellent Input Stability
- Be available to regulator and reference voltage
- Packages:SOT23-3，SOT89-3，SOT23，TO-92

Selection Guide

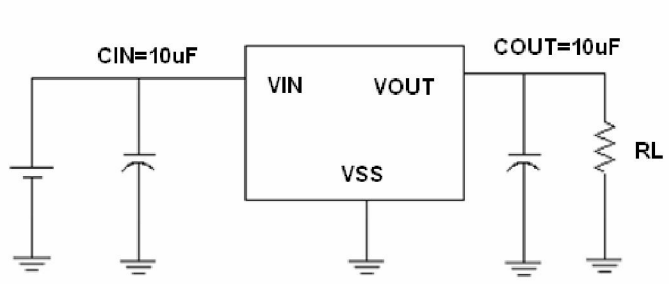
TL 50 12 X XX X X

- Environment mark
  e.g.:G-Lead free
- Package：
  e.g.： P-SOT89-3
  X-SOT23
  M3-SOT23-3
  T-TO-92
- Output Voltage
  e.g.： 18-1.8V
  28-2.8V
  30-3.0V
  33-3.3V
  .....
- Function
- Product Type
- Product Series

Typical Application

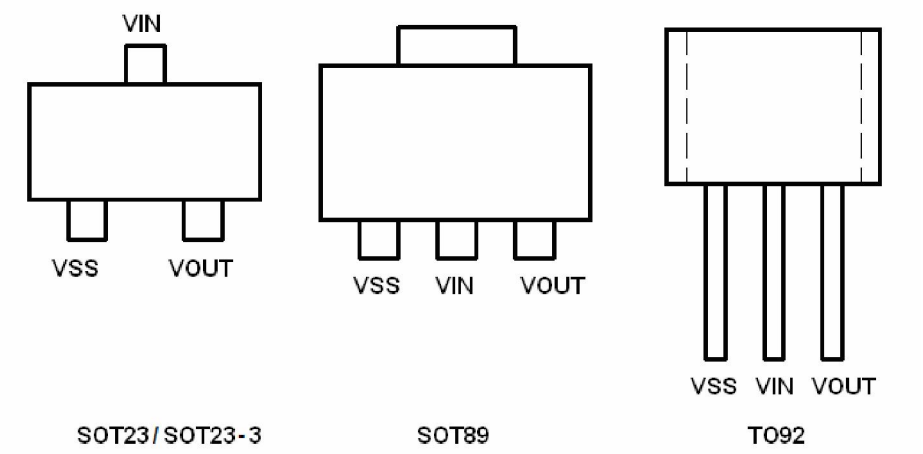
- Battery powered equipment
- Communication tools
- Mobile phones
- Portable games
- Portable AV systems
- Cameras, Video systems
- Reference voltage sources

Typical Application Circuit



Product	Supply Current
TL5012A	8 uA
TL5012K	180 uA

Pin Configuration



Pin Assignment

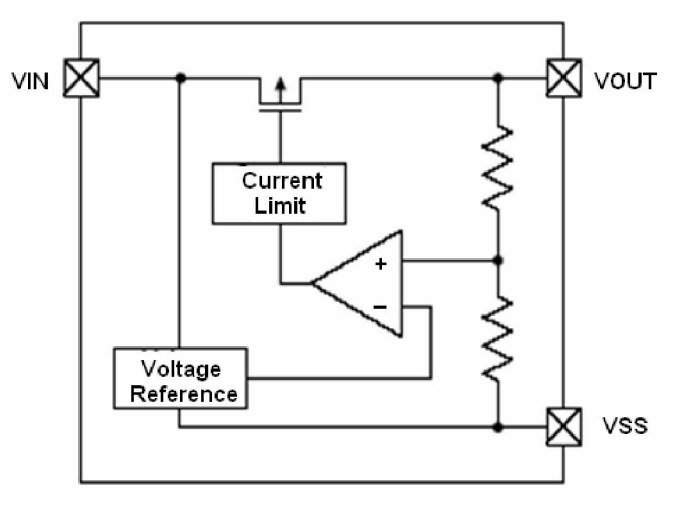
TL5012Axx/TL5012Kxx

Pin					Name	Function
M3	P	P1	X	T		
SOT23-3	SOT89-3	SOT89-3	SOT23	TO-92		
1	1	2	1	1	Vss	Ground
2	3	1	2	3	Vout	Output
3	2	3	3	2	Vin	input

Absolute Maximum Ratings

Parameter		Symbol	Description	Units
Input Voltage		V_{IN}	6.5	V
Output Current		I_{out}	500	mA
Output Voltage		V_{out}	Vss-0.3 ~ Vout+0.3	V
Power Dissipation	SOT23-3	Pd	300	mW
	SOT89-3	Pd	500	mW
	SOT23	Pd	300	mW
	TO-92	Pd	500	mW
Operating Ambient Temperature		T_{Opr}	-25 ~ +85	℃
Storage Temperature		T_{stg}	-40 ~ +125	℃

Block Diagram



TL5012A15

(VIN=Vout+1V,Cin=Cout=1u,Ta=25℃ Unless otherwise stated)

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA, V_{IN}=Vout+1V	X 0.98	V_{OUT}(T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	I_{OUT} (max)	V_{IN}=Vout+1V		100		mA
Load Regulation	ΔV_{OUT}	V_{IN}=Vout+1V, 1mA≤I_{OUT}≤80mA		10		mV
Dropout Voltage (Note 3)	V_{dif1}	I_{OUT} =20mA		180		mV
	V_{dif2}	I_{OUT} =50mA		360		mV
Supply Current	I_{SS}	V_{IN}=Vout+1V		7		μA
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =10mA Vout+1V ≤V_{IN}≤5V		0.1		%/V
Power Supply Ripple Rejection Ratio	PSRR	Vin= [Vout+1]V +1Vp-pAC I_{OUT} =10mA,f=1kHz		45		dB
Short Circuit Current	I_{short}	Vin=Vout(T)+1.5V Vout=Vss		20		mA
Over Current Protection	I_{limit}			300		mA

TL5012A18

(VIN=Vout+1V,Cin=Cout=1u,Ta=25^{O}C Unless otherwise stated)

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA, V_{IN}=Vout+1V	X 0.98	V_{OUT}(T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	I_{OUT} (max)	V_{IN}=Vout+1V		120		mA
Load Regulation	ΔV_{OUT}	V_{IN}=Vout+1V, 1mA≤I_{OUT}≤80mA		12		mV
Dropout Voltage (Note 3)	V_{dif1}	I_{OUT} =20mA		180		mV
	V_{dif2}	I_{OUT} =50mA		360		mV
Supply Current	I_{SS}	V_{IN}=Vout+1V		7		μA
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =10mA Vout+1V ≤V_{IN}≤5V		0.1		%/V
Power Supply Ripple Rejection Ratio	PSRR	Vin= [Vout+1]V +1Vp-pAC I_{OUT} =10mA,f=1kHz		45		dB
Short Circuit Current	I_{short}	Vin=Vout(T)+1.5V Vout=Vss		25		mA
Over Current Protection	I_{limit}			400		mA

TL5012A28

(VIN=Vout+1V,Cin=Cout=1u,Ta=25^{O}C Unless otherwise stated)

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA, V_{IN}=Vout+1V	X 0.98	V_{OUT}(T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	I_{OUT} (max)	V_{IN}=Vout+1V		300		mA
Load Regulation	ΔV_{OUT}	V_{IN}=Vout+1V 1mA≤I_{OUT}≤100mA		14		mV
Dropout Voltage (Note 3)	V_{dif1}	I_{OUT} =80mA		180		mV
	V_{dif2}	I_{OUT} =200mA		380		mV
Supply Current	I_{SS}	V_{IN}=Vout+1V		8		μA
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA Vout+1V ≤V_{IN}≤6V		0.03		%/V
Power Supply Ripple Rejection Ratio	PSRR	Vin= [Vout+1]V +1Vp-pAC I_{OUT} =10mA,f=1kHz		50		dB
Short Circuit Current	I_{short}	Vin=Vout(T)+1.5V Vout=Vss		30		mA
Over Current Protection	I_{limit}			500		mA

TL5012A30

(VIN=Vout+1V,Cin=Cout=1u,Ta=25℃ Unless otherwise stated)

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA, V_{IN}=Vout+1V	X 0.98	V_{OUT}(T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	I_{OUT} (max)	V_{IN}=Vout+1V		300		mA
Load Regulation	ΔV_{OUT}	V_{IN}=Vout+1V 1mA≤I_{OUT}≤100mA		14		mV
Dropout Voltage (Note 3)	V_{dif1}	I_{OUT} =80mA		180		mV
	V_{dif2}	I_{OUT} =200mA		380		mV
Supply Current	I_{SS}	V_{IN}=Vout+1V		8		μA
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA Vout+1V ≤V_{IN}≤6V		0.03		%/V
Power Supply Ripple Rejection Ratio	PSRR	Vin= [Vout+1]V +1Vp-pAC I_{OUT} =10mA,f=1kHz		50		dB
Short Circuit Current	I_{short}	Vin=Vout(T)+1.5V Vout=Vss		30		mA
Over Current Protection	I_{limit}			500		mA

TL5012A33

(VIN=Vout+1V,Cin=Cout=1u,Ta=25^{O}C Unless otherwise stated)

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA, V_{IN}=Vout+1V	X 0.98	V_{OUT}(T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	I_{OUT} (max)	V_{IN}=Vout+1V		300		mA
Load Regulation	ΔV_{OUT}	V_{IN}=Vout+1V 1mA≤I_{OUT}≤100mA		14		mV
Dropout Voltage (Note 3)	V_{dif1}	I_{OUT} =80mA		180		mV
	V_{dif2}	I_{OUT} =200mA		380		mV
Supply Current	I_{SS}	V_{IN}=Vout+1V		9		μA
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA Vout+1V ≤V_{IN}≤6V		0.03		%/V
Power Supply Ripple Rejection Ratio	PSRR	Vin= [Vout+1]V +1Vp-pAC I_{OUT} =10mA,f=1kHz		50		dB
Short Circuit Current	I_{short}	Vin=Vout(T)+1.5V Vout=Vss		30		mA
Over Current Protection	I_{limit}			500		mA

TL5012K33

(VIN=Vout+1V,Cin=Cout=1u,Ta=25^{O}C Unless otherwise stated)

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA, V_{IN}=Vout+1V	X 0.98	V_{OUT}(T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	I_{OUT} (max)	V_{IN}=Vout+1V		300		mA
Load Regulation	ΔV_{OUT}	V_{IN}=Vout+1V 1mA≤I_{OUT}≤100mA		14		mV
Dropout Voltage (Note 3)	V_{dif1}	I_{OUT} =80mA		180		mV
	V_{dif2}	I_{OUT} =200mA		380		mV
Supply Current	I_{SS}	V_{IN}=Vout+1V		180		μA
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA Vout+1V ≤V_{IN}≤6V		0.03		%/V
Power Supply Ripple Rejection Ratio	PSRR	Vin= [Vout+1]V +1Vp-pAC I_{OUT} =10mA,f=1kHz		50		dB
Short Circuit Current	I_{short}	Vin=Vout(T)+1.5V Vout=Vss		30		mA
Over Current Protection	I_{limit}			500		mA

Note :

1. V_{OUT} (T) ：Specified Output Voltage
2. V_{OUT} (E) ：Effective Output Voltage (Ie. The output voltage when "V_{OUT} (T)+1.0V"is provided at the Vin pin while maintaining a certain Iout value.)
3. V_{dif} ：V_{IN1} –V_{OUT} (E)'

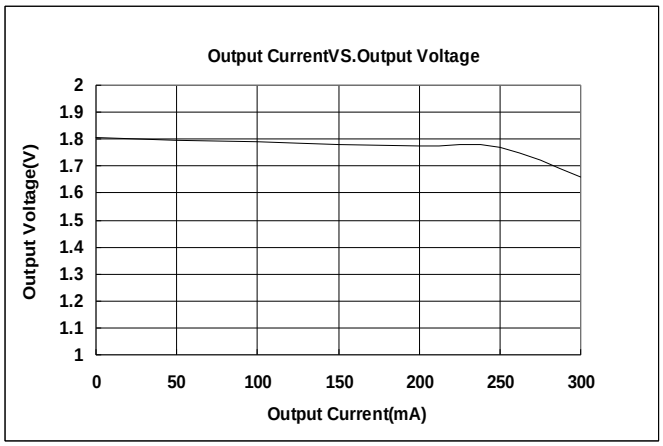
   V_{IN1} ：The input voltage when V_{OUT}(E)' appears as input voltage is gradually decreased.

   V_{OUT} (E)'=A voltage equal to 98% of the output voltage whenever an amply stabilized Iout {V_{OUT} (T)+1.0V} is input.

Type Characteristics

(1) Output CurrentVS.Output Voltage (VIN=Vout+1, **Ta = 25 °C**)

TL5012A18PG



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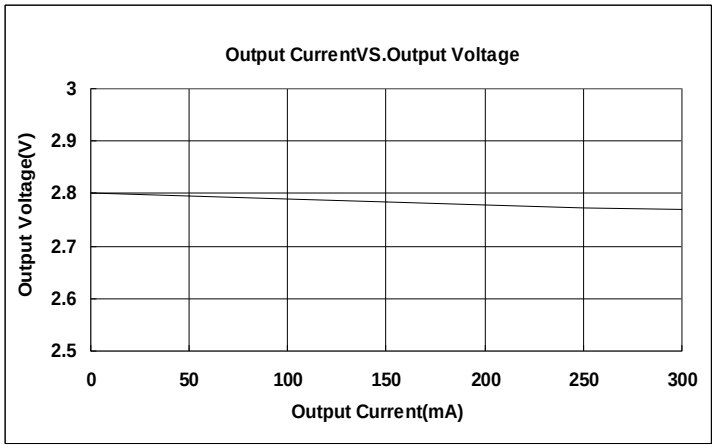

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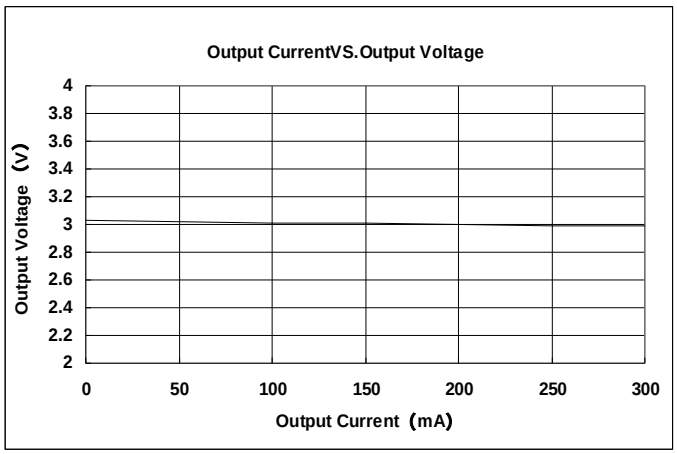

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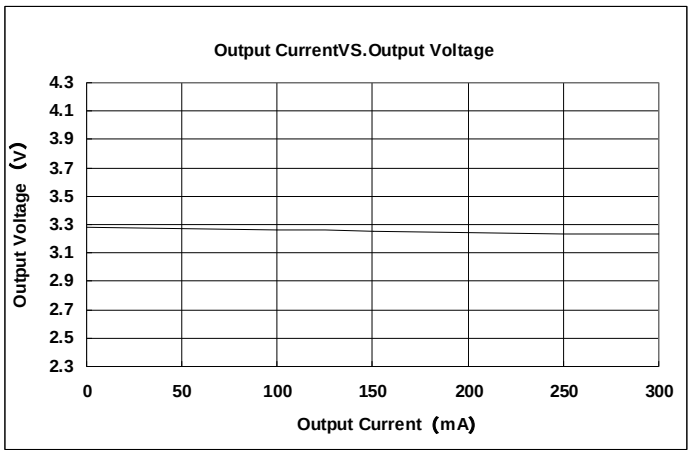

(2) Input VoltageVS.Output Voltage (**Ta = 25 °C**)

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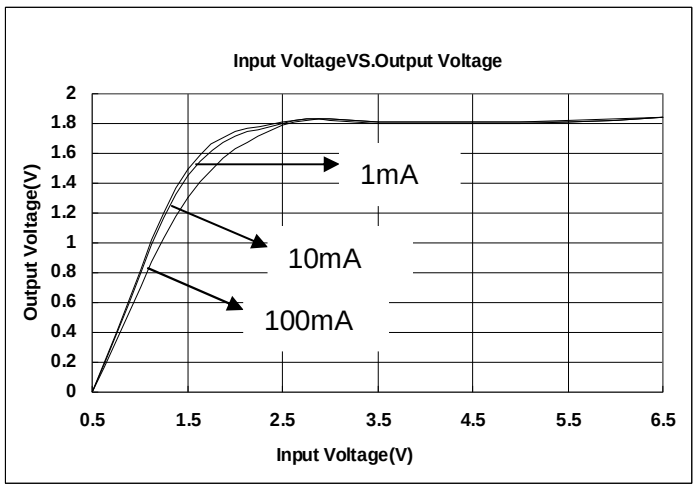

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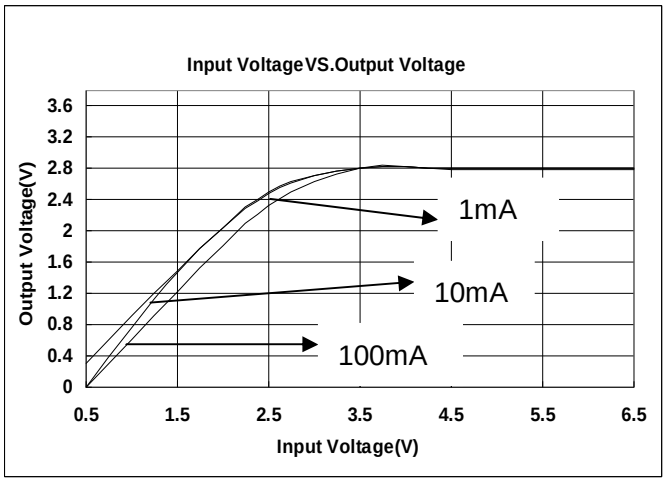

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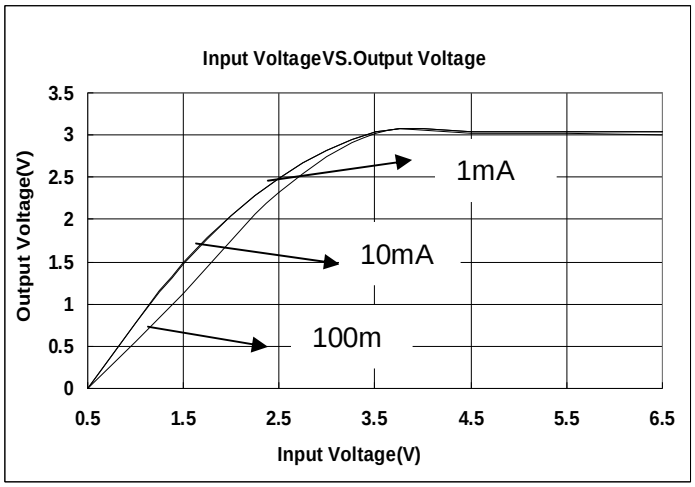

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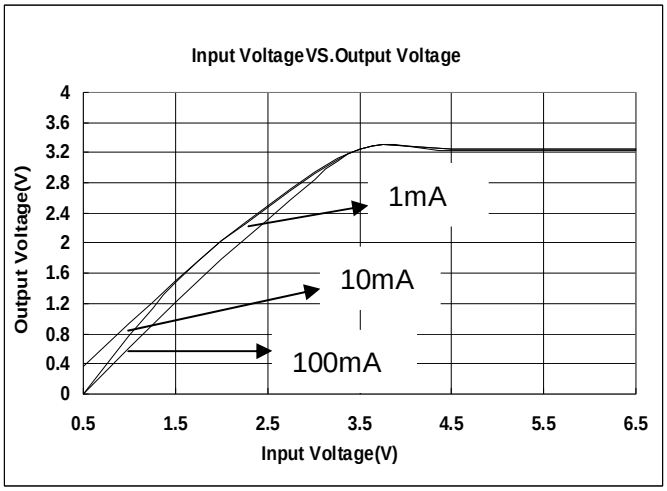

（3）Output Current VS.Droput Voltage（VIN=Vout+1V,**Ta = 25 °C**）

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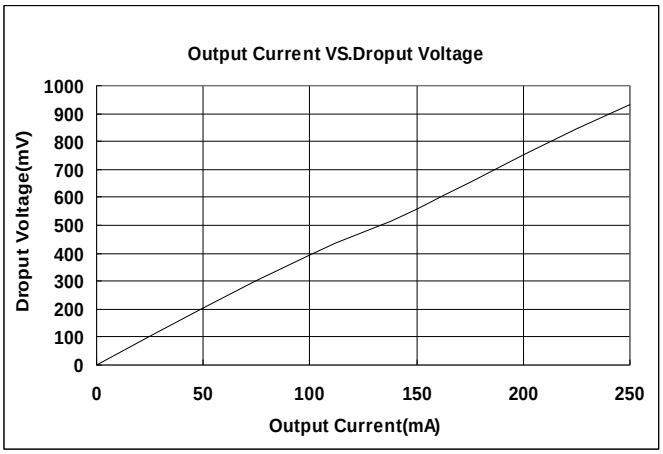

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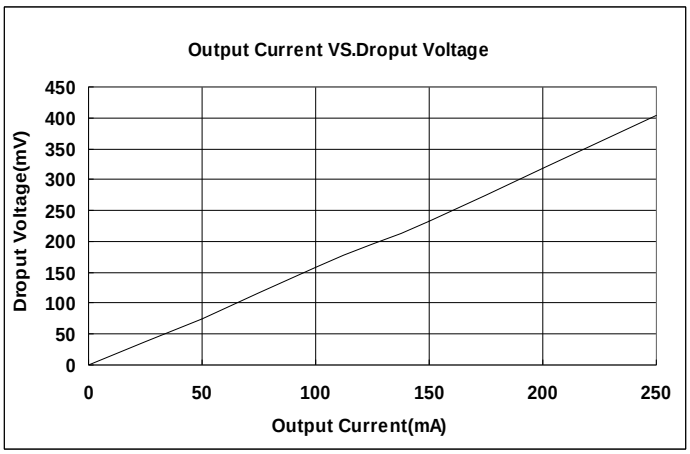

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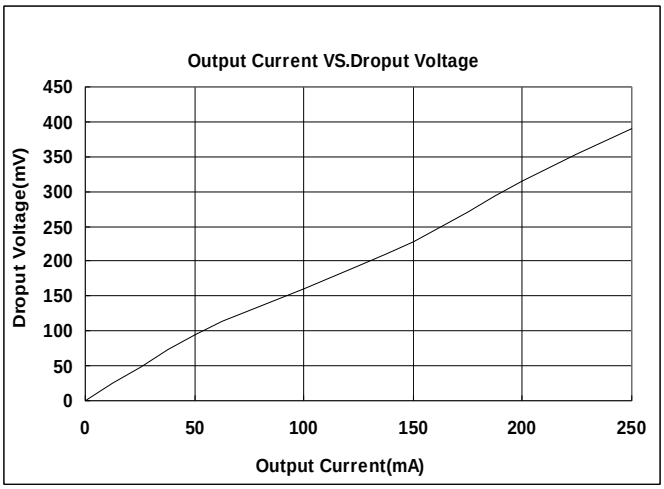

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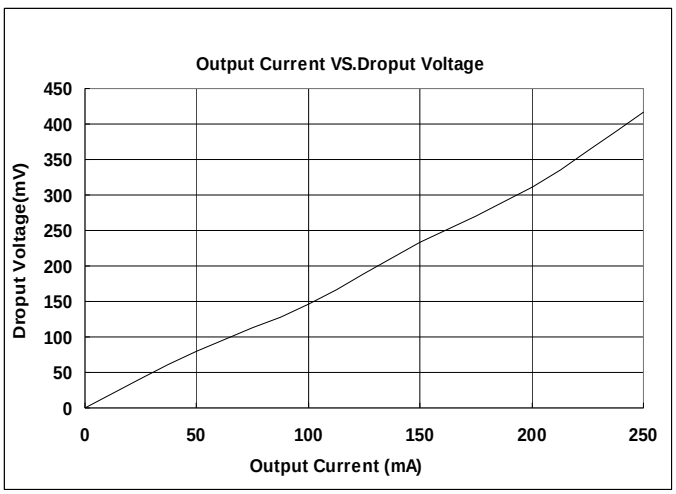

（4）Input Voltage VS. Supply Current（**Ta = 25 °C**）

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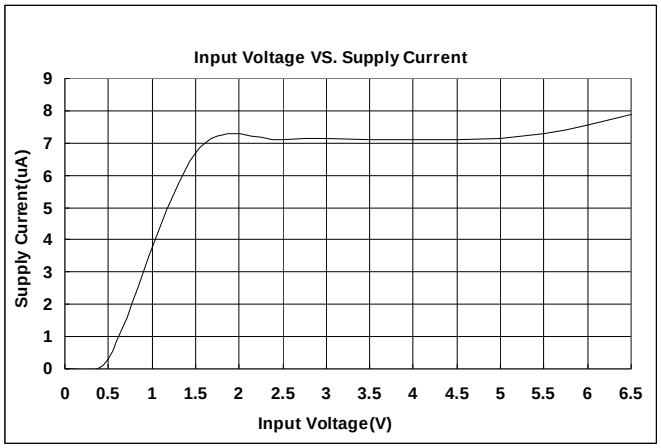

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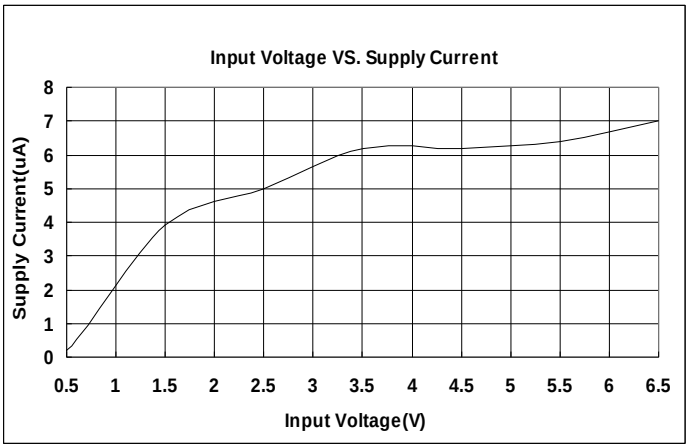

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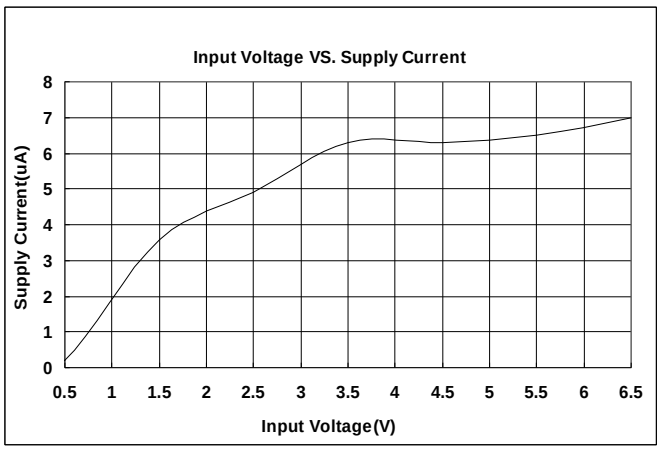

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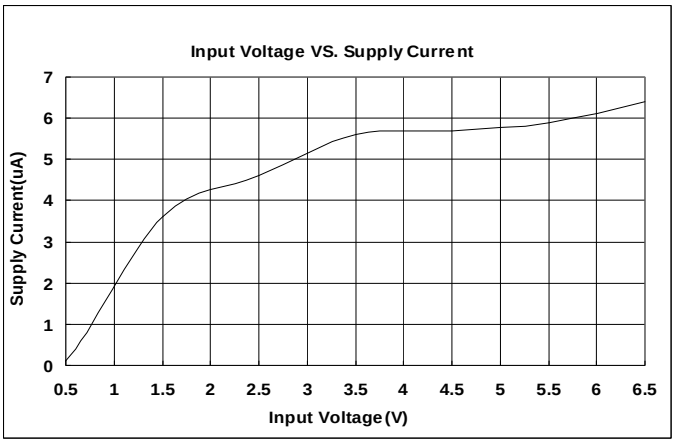
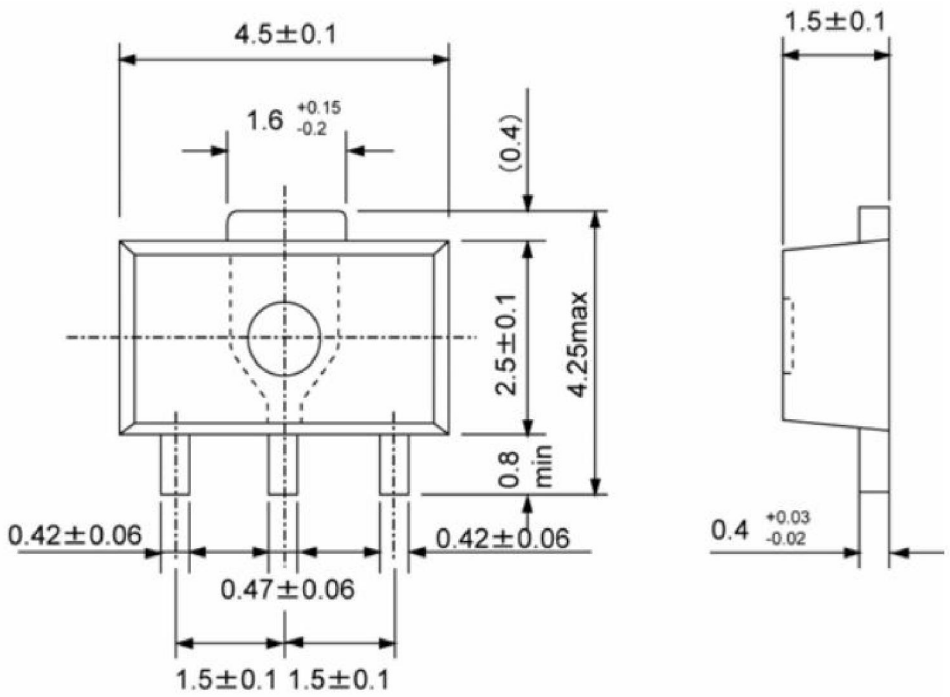
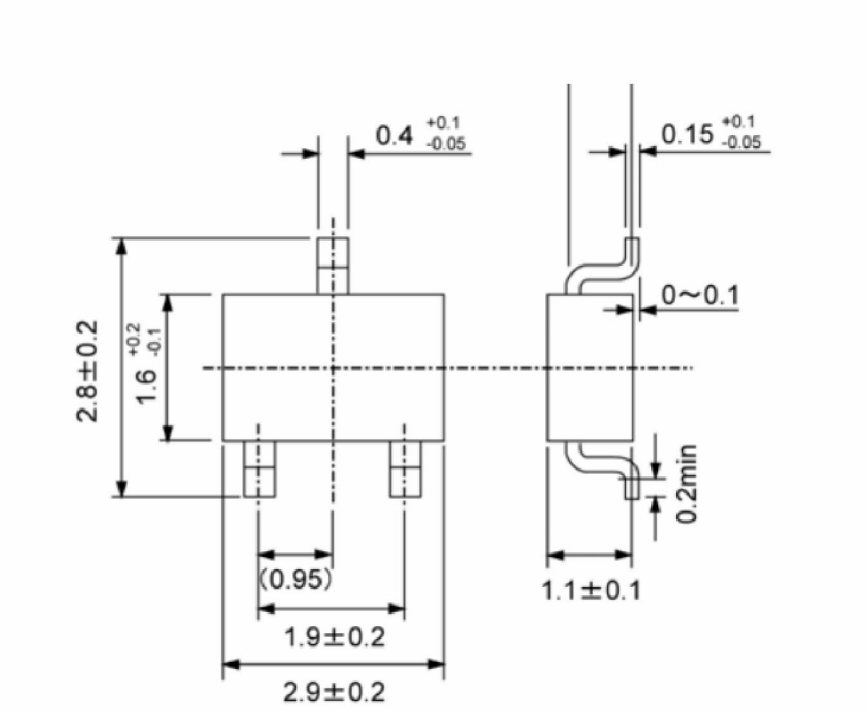


Packaging Information

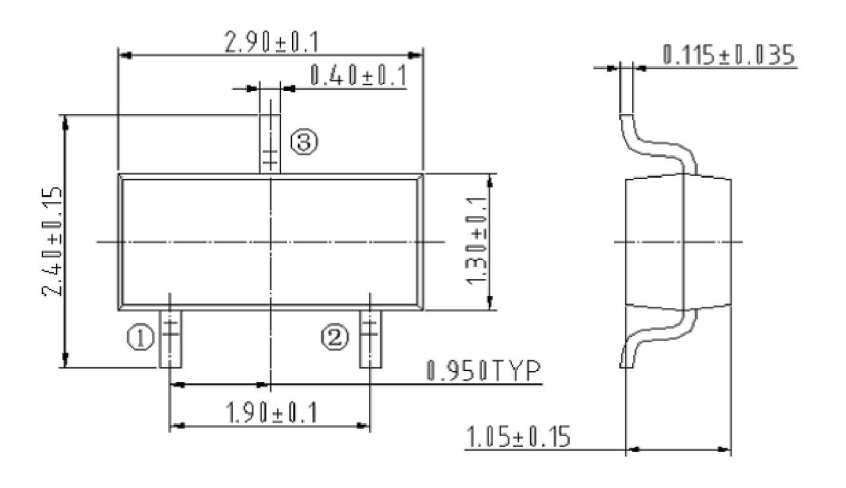
● SOT89-3



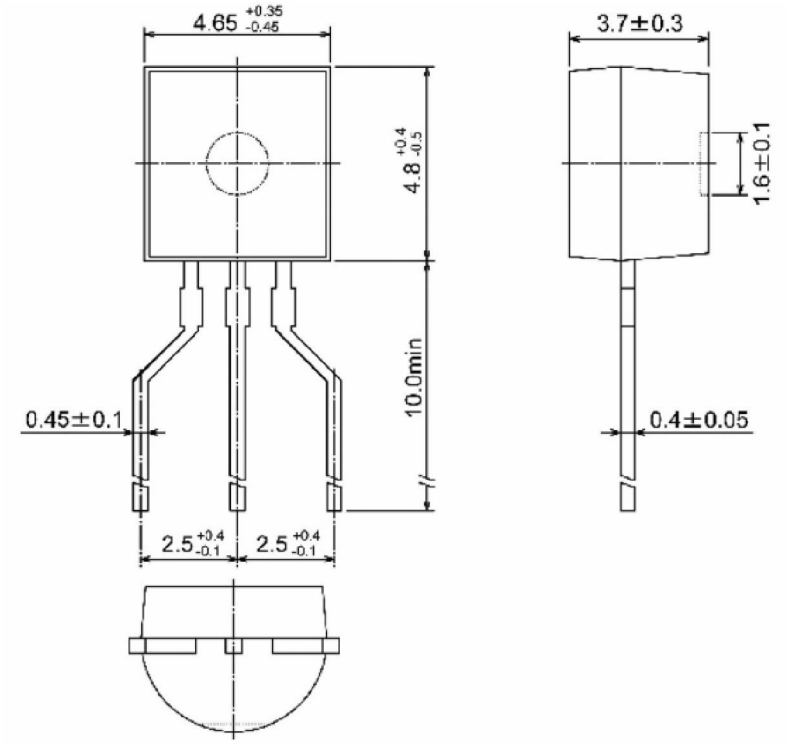
● SOT23-3



● SOT23


2.90±0.1
0.40±0.1
0.115±0.035
③
2.40±0.15
1.30±0.1
①
②
0.95TYP
1.90±0.1
1.05±0.15

● TO-92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3.7±0.3
4.8 +0.4 -0.5
1.6±0.1
10.0min
0.45±0.1
0.4±0.05
2.5 +0.4 -0.1
2.5 +0.4 -0.1