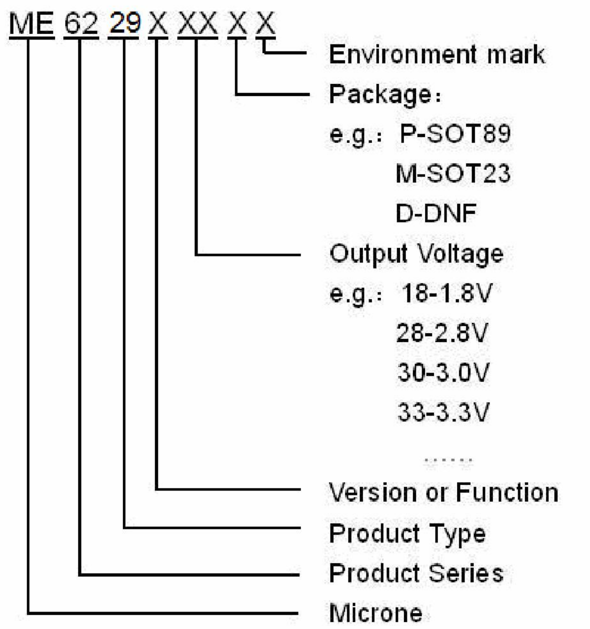
High Speed LDO Regulators,High PSRR,Low noise,ME6229 Series

General Description

The ME6229 series are highly accurate, low noise, CMOS LDO Voltage Regulators. Offering low output noise, high ripple rejection ratio, low dropout and very fast turn-on times, the ME6229 series is ideal for today's cutting edge mobile phone. Internally the ME6229 includes a reference voltage source, error amplifiers, driver transistors, current limiters and phase compensators. The ME6229's current limiters' foldback circuit also operates as a short protect for the output current limiter and. the output pin. The ME6229 series is also fully compatible with low ESR ceramic capacitors, reducing cost and improving output stability. This high level of output stability is maintained even during frequent load fluctuations, due to the excellent transient response performance and high PSRR achieved across a broad range of frequencies.The CE function allows the output of regulator to be turned off, resulting in greatly reduced power consumption.

Selection Guide



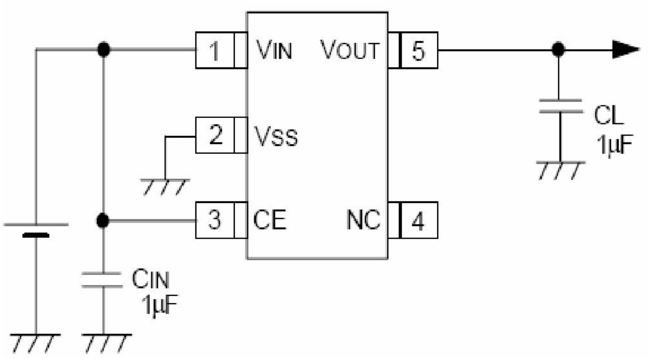
Features

- Maximum Output Current: 500Ma （V_{IN}＝5V,V_{OUT}＝3.3V）
- Dropout Voltage: 100mV@ I_{OUT} =100mA
- Operating Voltage Range: 2V～6.0V
- Highly Accuracy: ±2%
- Low Power Consumption: 50uA （TYP.）
- Standby Current: 0.1uA （TPY.）
- High Ripple Rejection: 70dB@1KHz （ME6229C33）
- Low output noise: 50uVrms
- Line Regulation: 0.05% （TYP.）
- Ultra Small Packages: SOT-89-3， SOT-23-3， SOT-23-5, DFN6L, SOT-353

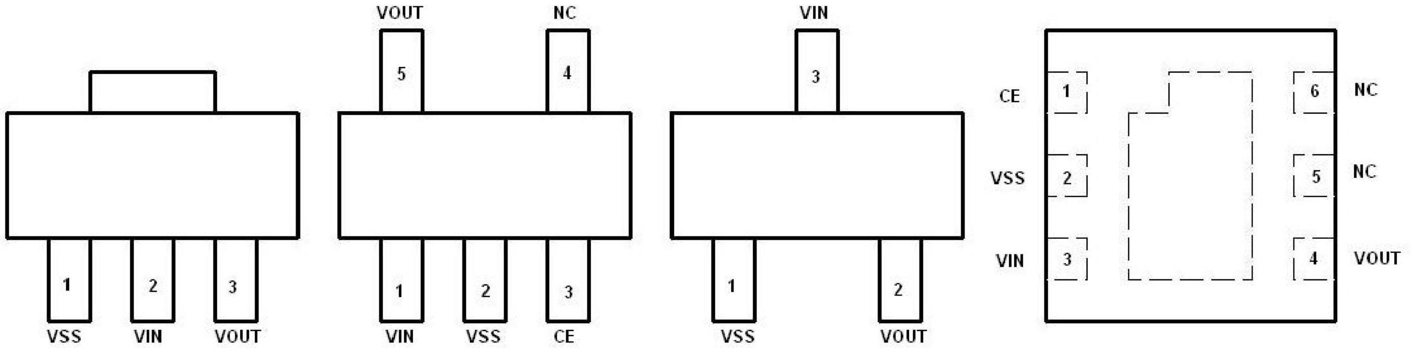
Typical Application

- Mobile phones
- Cordless phones, radio communication equipment
- Portable games
- Cameras, Video cameras
- Reference voltage sources
- Battery powered equipment

Typical Application Circuit



Pin Configuration



SOT-89-3 SOT-23-5/SOT-353 SOT-23-3 DFN6L

Pin Assignment

ME6229AXX

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

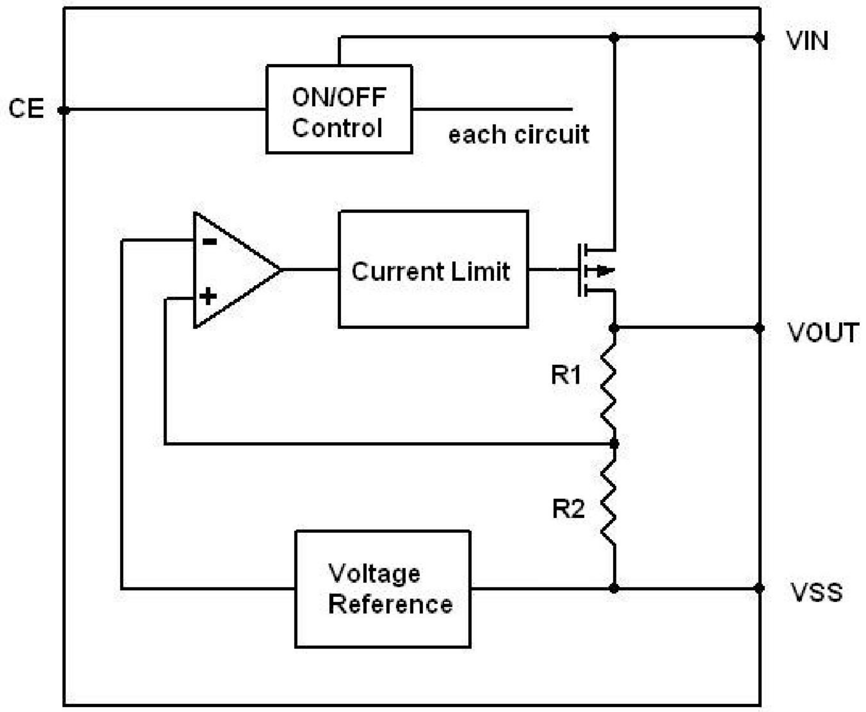
ME6229CXX

Pin Number		Pin Name	Functions
SOT-23-5/SOT-353	DFN6L		
1	3	V_{IN}	Power Input
2	2	V_{SS}	Ground
3	1	CE	ON / OFF Control
4	5,6	NC	NC
5	4	V_{OUT}	Output

Absolute Maximum Ratings

Parameter		Symbol	Ratings	Units
Input Voltage		V_{IN}	6.5	V
Output Current		I_{OUT}	600	mA
Output Voltage		V_{OUT}	Vss-0.3～V_{IN} +0.3	V
CE Pin Voltage		V_{CE}	Vss-0.3～V_{IN} +0.3	V
Power Dissipation	SOT-23	P_D	250	mW
	SOT-353		250	
	DFN		300	
	SOT-89		500	
Operating Temperature Range		T_{OPR}	－25～＋85	℃
Storage Temperature Range		T_{STG}	－40～＋125	℃

Block Diagram



Electrical Characteristics

ME6229C12

(V_{IN}= V_{OUT}+1V，V_{CE} = V_{IN}，$C_{IN=}C_L$=1uF，Ta=25^{O}C ,unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=30mA, V_{IN}= V_{OUT}+1V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	V_{IN}= V_{OUT}+1V		300		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT}+1V , 1mA≤I_{OUT}≤100mA		8		mV
Dropout Voltage (Note 1)	V_{DIF1}	I_{OUT} =100mA		280		mV
	V_{DIF2}	I_{OUT} =200mA		500		mV
Supply Current	I_{SS}	V_{IN}= V_{OUT}+1V		40		μA
Stand-by Current	I_{CEL}	V_{CE}＝0V		0.1		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA V_{OUT}+1V ≤V_{IN}≤6.5V		0.03		%/V
CE "High" Voltage	VCEH	Start up	1.0			V
CE "Low" Voltage	VCEL	Shut down			0.7	V
Output noise	EN	I_{OUT} =40mA，300Hz~50kHz		50		uVrms
Ripple Rejection Rate	PSRR	V_{IN} = [V_{OUT} +1]V +1Vp-pAC; I_{OUT}=10mA,1kHZ		70		dB
		V_{IN} = [V_{OUT} +1]V +1Vp-pAC; I_{OUT}=100mA,10kHZ		62		dB

ME6229C18

(V_{IN}= V_{OUT}+1V，V_{CE} = V_{IN}，$C_{IN=}C_L$=1uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=30mA, V_{IN}= V_{OUT}+1V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	V_{IN}= V_{OUT}+1V		300		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT}+1V , 1mA≤I_{OUT}≤100mA		9		mV
Dropout Voltage (Note 1)	V_{DIF1}	I_{OUT} =100mA		200		mV
	V_{DIF2}	I_{OUT} =200mA		400		mV
Supply Current	I_{SS}	V_{IN}= V_{OUT}+1V		45		μA
Stand-by Current	I_{CEL}	V_{CE}＝0V		0.1		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA V_{OUT}+1V ≤V_{IN}≤6.5V		0.05		%/V
CE "High" Voltage	VCEH	Start up	1.0			V
CE "Low" Voltage	VCEL	Shut down			0.7	V
Output noise	EN	I_{OUT} =40mA，300Hz~50kHz		50		uVrms

Ripple Rejection Rate	PSRR	V_{IN} = [V_{OUT}+1]V+1V p-pAC, I_{OUT}=10mA,1kHZ		70		dB
		I_{OUT}=100mA,10kHZ		62		

ME6229C28

(V_{IN}= V_{OUT}+1V，V_{CE} = V_{IN}，C_{IN}=C_L=1uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=30mA, V_{IN}= V_{OUT}+1V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	V_{IN}= V_{OUT}+1V		450		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT}+1V , 1mA≤I_{OUT}≤100mA		7		mV
Dropout Voltage (Note 1)	V_{DIF1}	I_{OUT} =100mA		110		mV
	V_{DIF2}	I_{OUT} =200mA		220		mV
Supply Current	I_{SS}	V_{IN}= V_{OUT}+1V		50		μA
Stand-by Current	I_{CEL}	V_{CE}＝0V		0		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA, V_{OUT}+1V ≤V_{IN}≤6.5V		0.04		%/V
CE"High"Voltage	VCEH	Start up	1.0			V
CE "Low" Voltage	VCEL	Shut down			0.7	V
Output noise	EN	I_{OUT} =40mA，300Hz~50kHz		50		uVrms
Ripple Rejection Rate	PSRR	V_{IN}=[V_{OUT}+1]V+1Vp-pAC, I_{OUT}=10mA,1kHZ		70		dB
		I_{OUT}=100mA,10kHZ		62		
		I_{OUT}=200mA,10kHZ		62		
Short-circuit Current	I_{SHORT}	V_{IN}= V_{OUT}+1V, V_{CE}＝V_{IN}, V_{OUT}＝0V		120		mA

ME6229C30

(V_{IN}= V_{OUT}+1V，V_{CE} = V_{IN}，C_{IN}=C_L=1uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=30mA, V_{IN}= V_{OUT}+1V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	V_{IN}= V_{OUT}+1V		500		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT}+1V , 1mA≤I_{OUT}≤100mA		8		mV
Dropout Voltage (Note 1)	V_{DIF1}	I_{OUT} =100mA		100		mV
	V_{DIF2}	I_{OUT} =200mA		210		mV
Supply Current	I_{SS}	V_{IN}= V_{OUT}+1V		50		μA
Stand-by Current	I_{CEL}	V_{CE}＝0V		0.1		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA, V_{OUT}+1V ≤V_{IN}≤6.5V		0.05		%/V
CE "High" Voltage	VCEH	Start up	1.0			V
CE "Low" Voltage	VCEL	Shut down			0.7	V

Output noise	EN	I_{OUT} =40mA，300Hz~50kHz			50		uVrms
Ripple Rejection Rate	PSRR	V_{IN} = [V_{OUT} +1]V +1Vp-pAC	I_{OUT}=10mA,1kHZ		70		dB
			I_{OUT}=100mA,10kHZ		62		
			I_{OUT}=200mA,10kHZ		62		
Short-circuit Current	I_{SHORT}	V_{IN}= V_{OUT}+1V, V_{CE}＝V_{IN}, V_{OUT}＝0V			120		mA

ME6229C33

(V_{IN}= V_{OUT}+1V，V_{CE} = V_{IN}，C_{IN}=C_L=1uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=30mA, V_{IN}= V_{OUT}+1V		X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	V_{IN}= V_{OUT}+1V			500		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT}+1V , 1mA≤I_{OUT}≤100mA			9		mV
Dropout Voltage (Note 1)	V_{DIF1}	I_{OUT} =100mA			120		mV
	V_{DIF2}	I_{OUT} =200mA			260		mV
Supply Current	I_{SS}	V_{IN}= V_{OUT}+1V			50		μA
Stand-byCurrent	I_{CEL}	V_{CE}＝0V			0.1		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA V_{OUT}+1V ≤V_{IN}≤6.5V			0.05		%/V
CE “High” Voltage	VCEH	Start up		1.0			V
CE “Low” Voltage	VCEL	Shut down				0.7	V
Output noise	EN	I_{OUT} =40mA，300Hz~50kHz			50		uVrms
Ripple Rejection Rate	PSRR	V_{IN} = [V_{OUT} +1]V +1Vp-pAC	I_{OUT}=10mA,1kHZ		70		dB
			I_{OUT}=100mA,10kHZ		62		
			I_{OUT}=200mA,10kHZ		62		
Short-circuit Current	I_{SHORT}	V_{IN}= V_{OUT}+1V, V_{CE}＝V_{IN}, V_{OUT}＝0V			150		mA

ME6229A33

(V_{IN}= V_{OUT}+1V，C_{IN}=C_L=1uF，Ta=25^{O}C,unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=30mA, V_{IN}= V_{OUT}+1V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	V_{IN}= V_{OUT}+1V		500		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT}+1V , 1mA≤I_{OUT}≤100mA		9		mV
Dropout	V_{DIF1}	I_{OUT} =100mA		120		mV

Voltage (Note 1)	V_{DIF2}	I_{OUT} =200mA		260		mV
Supply Current	I_{SS}	$V_{IN}= V_{OUT}+1V$		50		μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \bullet V_{OUT}}$	I_{OUT} =40mA $V_{OUT}+1V \le V_{IN} \le 6.5V$		0.05		%/V
Output noise	EN	I_{OUT} =40mA，300Hz~50kHz		50		uVrms
Ripple Rejection Rate	PSRR	V_{IN} = [V_{OUT} +1]V +1Vp-pAC	I_{OUT}=10mA,1kHZ	70		dB
			I_{OUT}=100mA,10kHZ	62		
			I_{OUT}=200mA,10kHZ	62		
Short-circuit Current	I_{SHORT}	$V_{IN}= V_{OUT}+1V,, V_{OUT}＝0V$		150		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**）

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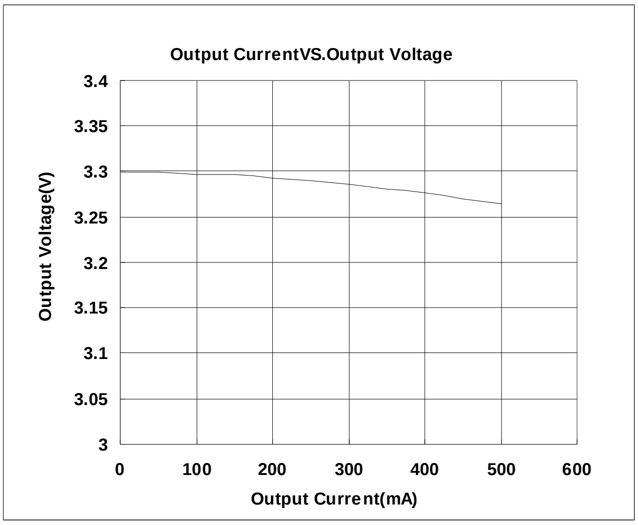

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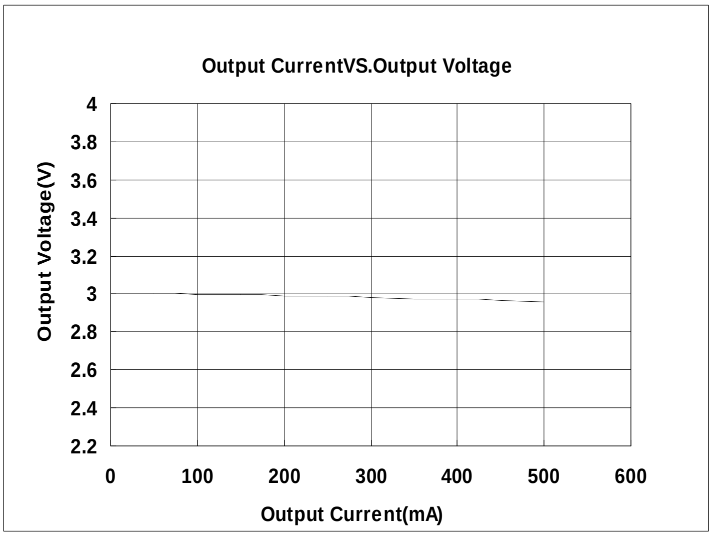

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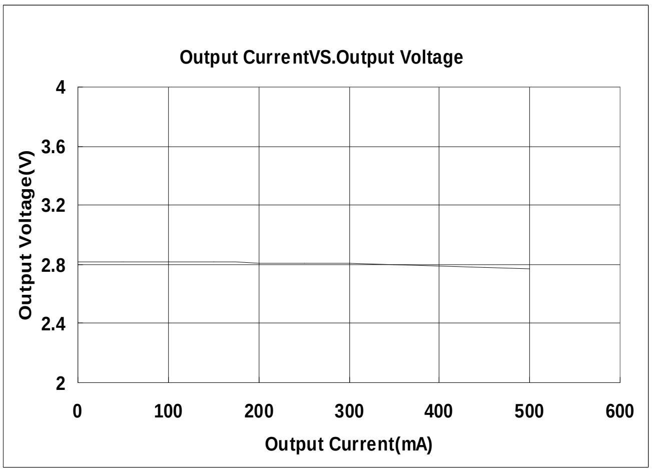

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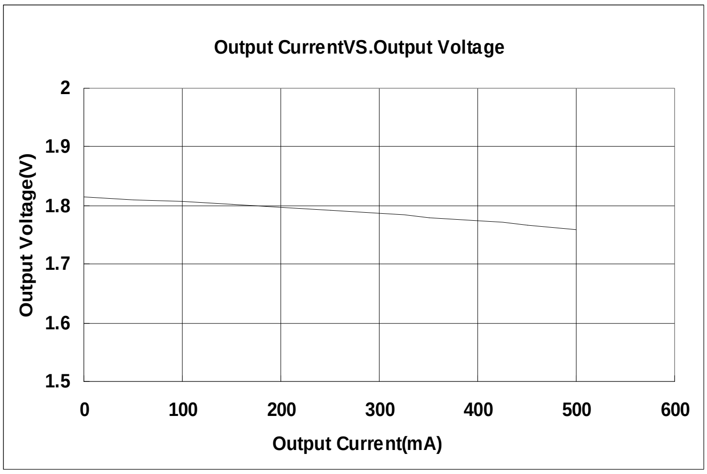

（2）Input VoltageVS.Output Voltage（**Ta = 25 °C**）

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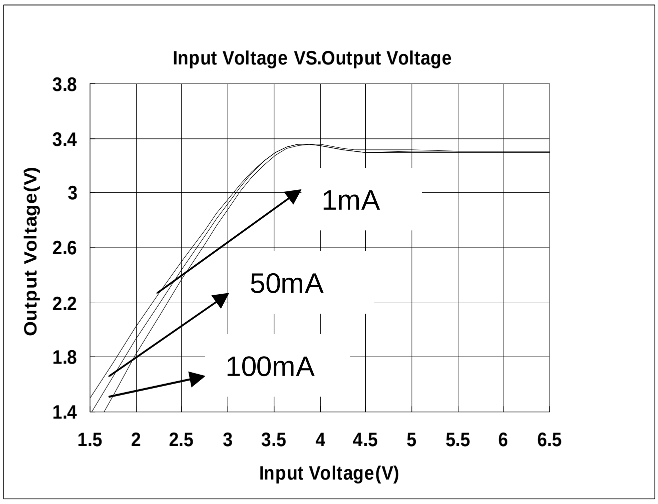

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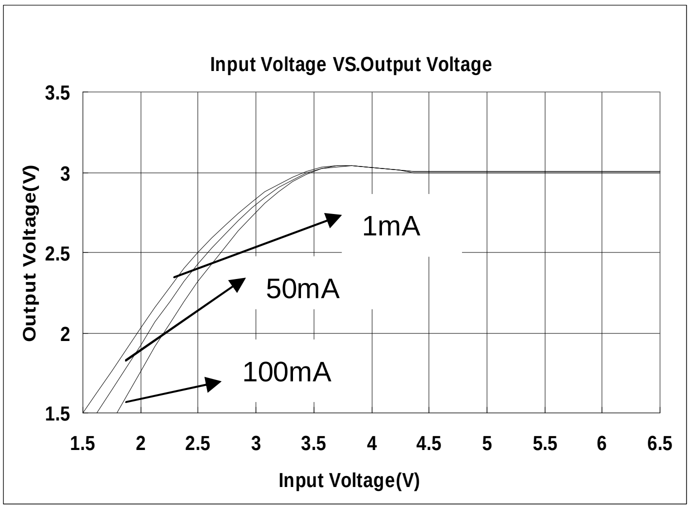

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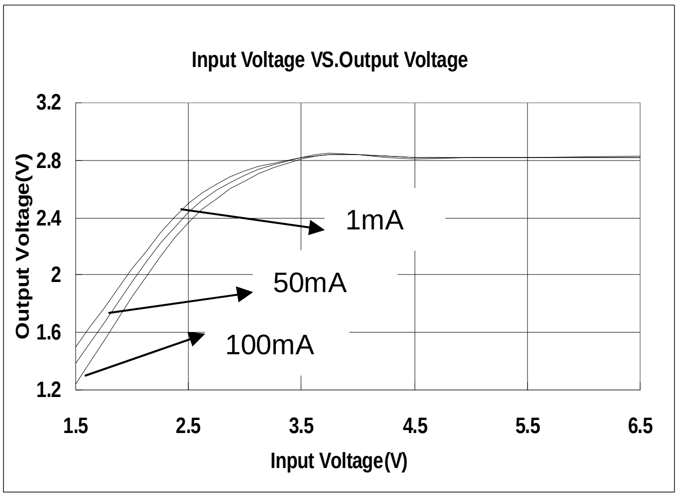

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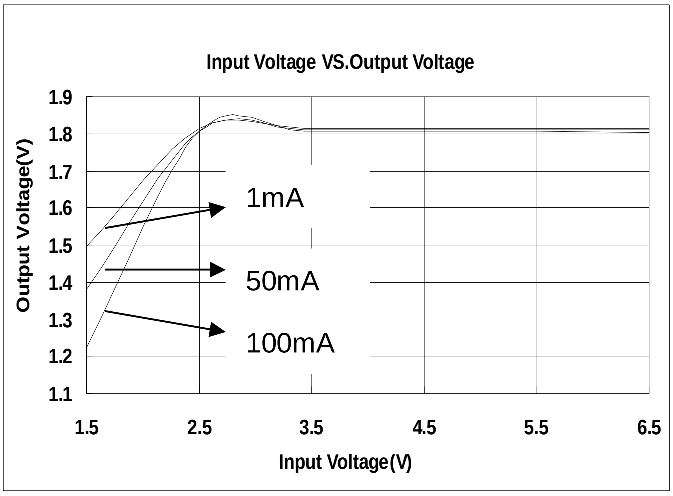

(3) Output Current VS.Droput Voltage (VIN=Vout+1V,**Ta = 25 °C**)

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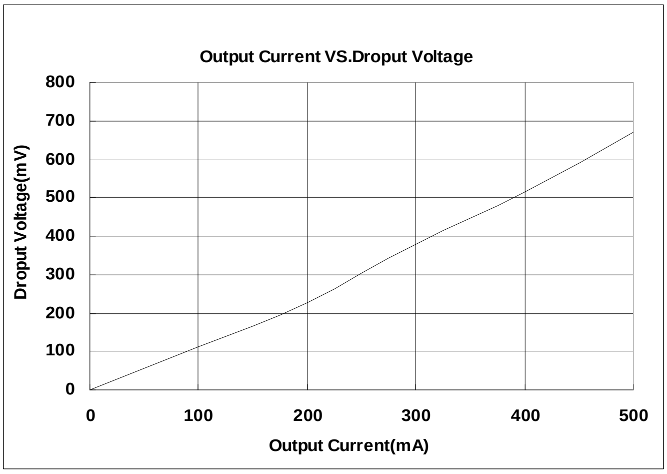

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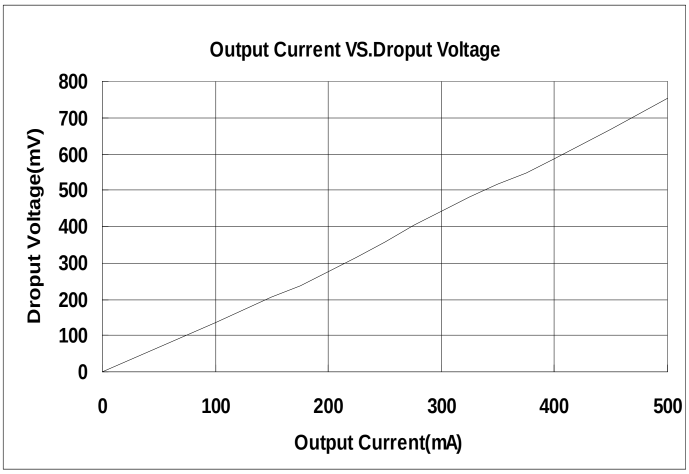

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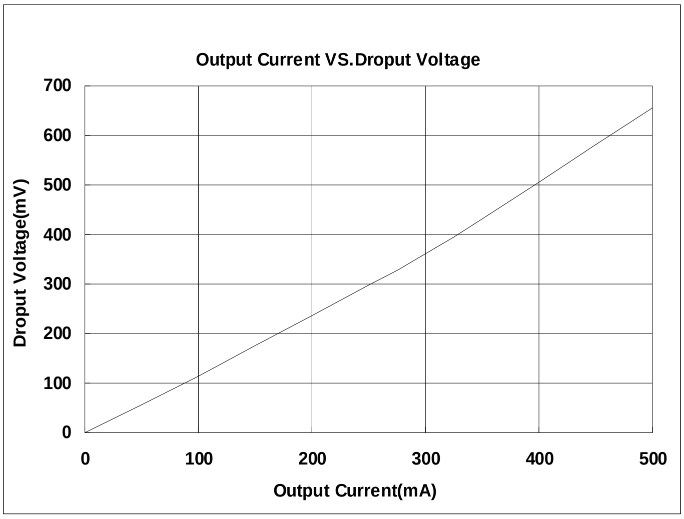

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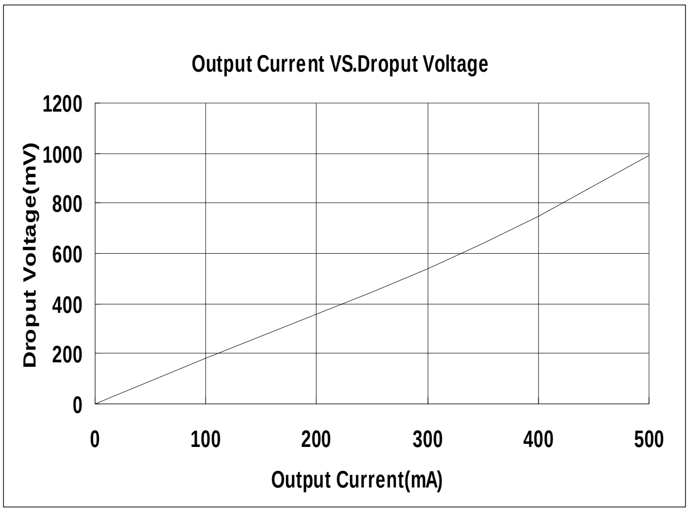

(4) Input Voltage VS. Supply Current (**Ta = 25 °C**)

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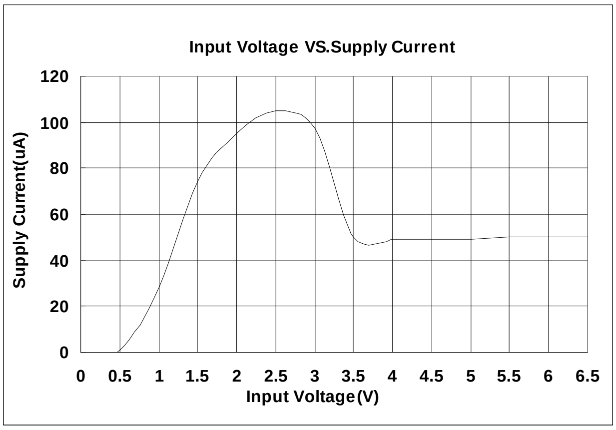

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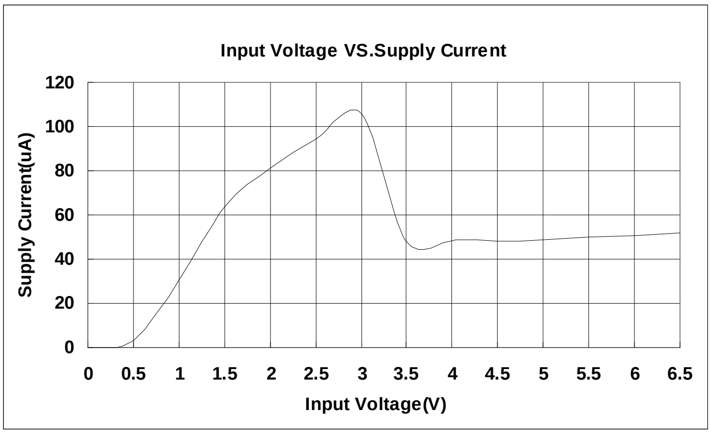

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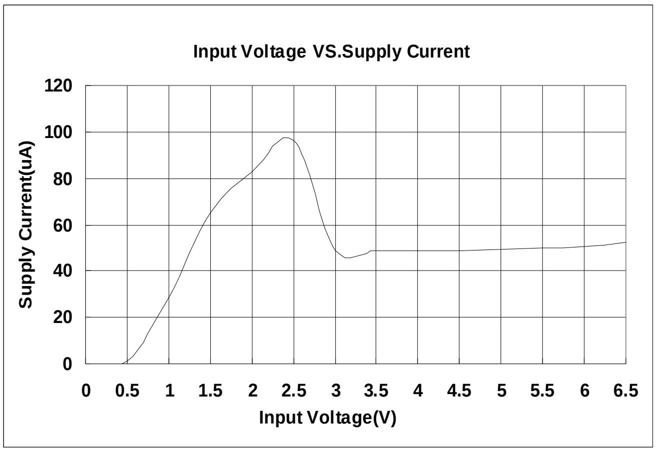

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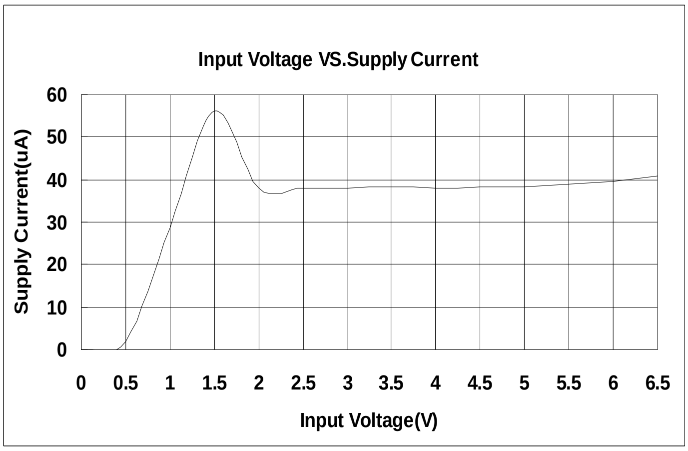
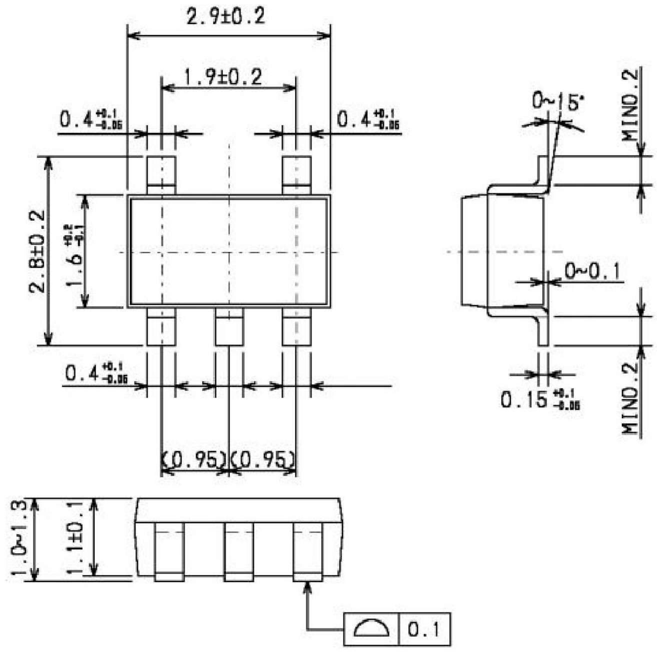
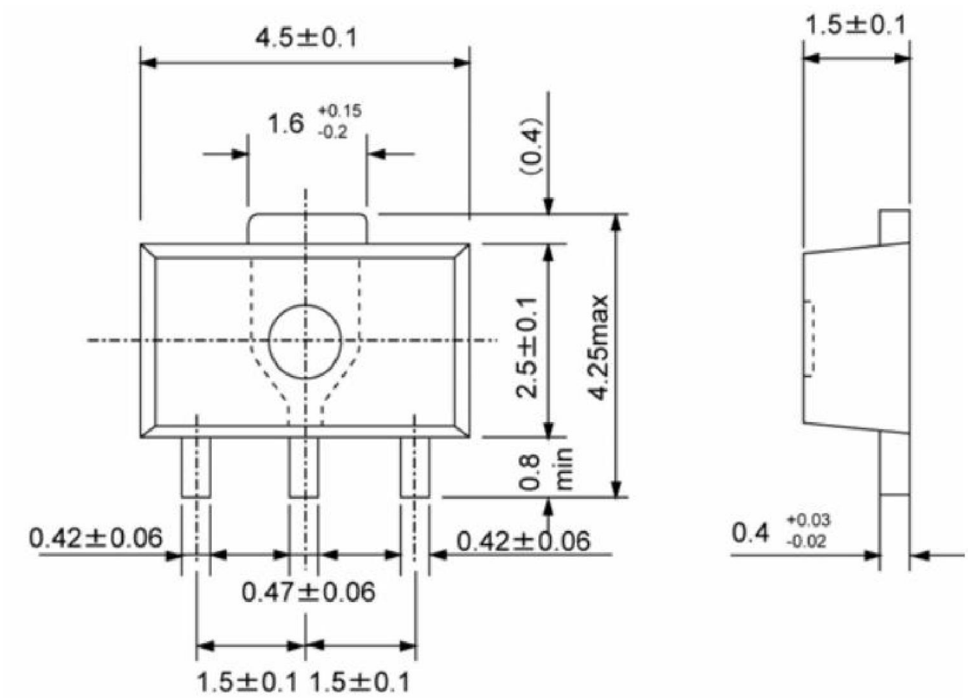


Packaging Information:

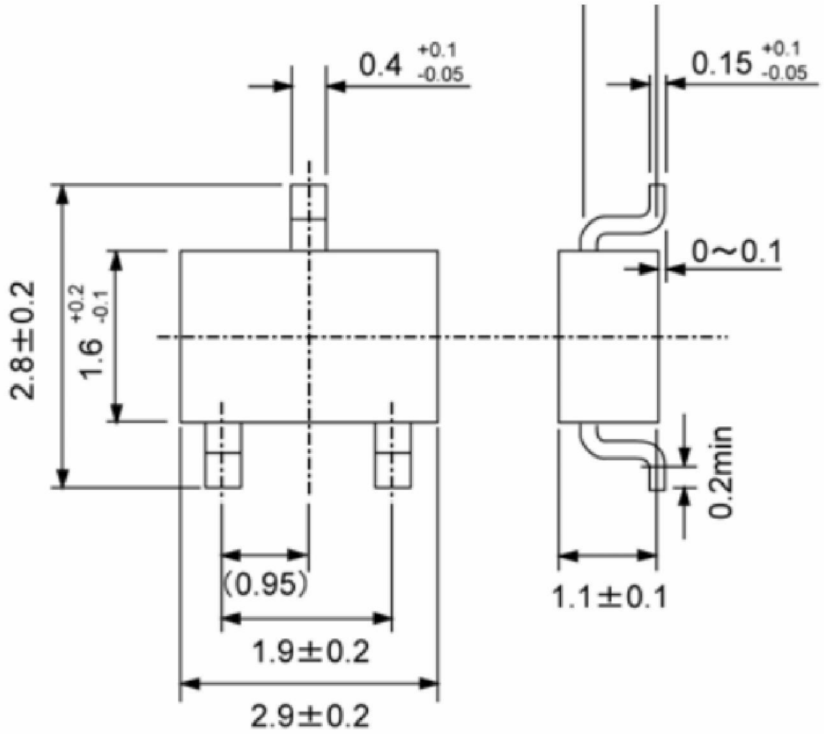
SOT23-5



SOT89-3



SOT23-3



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