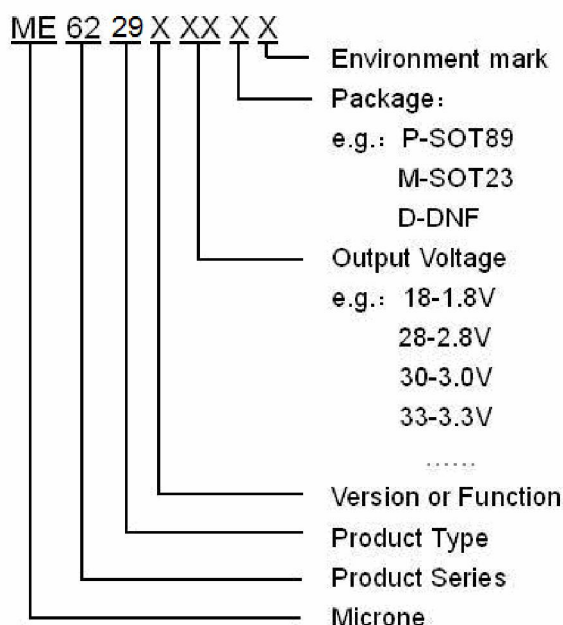


High Speed LDO Regulators, High PSRR, Low noise, ME6229 Series

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



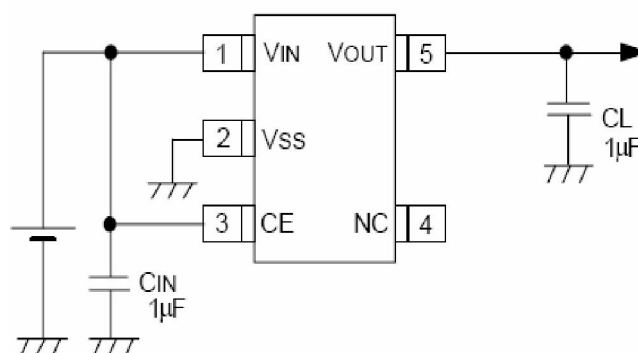
Features

- | 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: $\pm 2\%$
- | 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

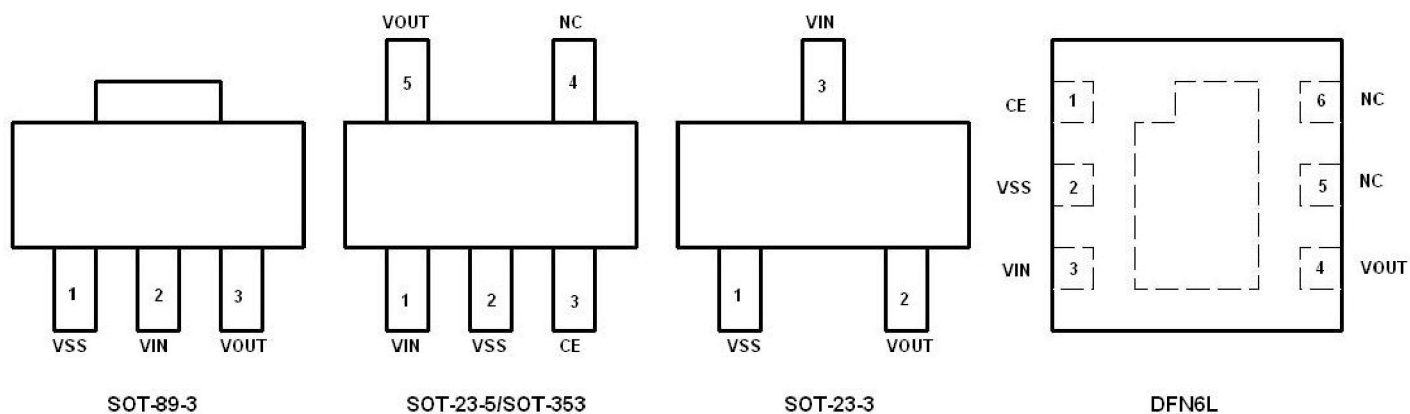
Typical Application

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

Typical Application Circuit



Pin Configuration



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

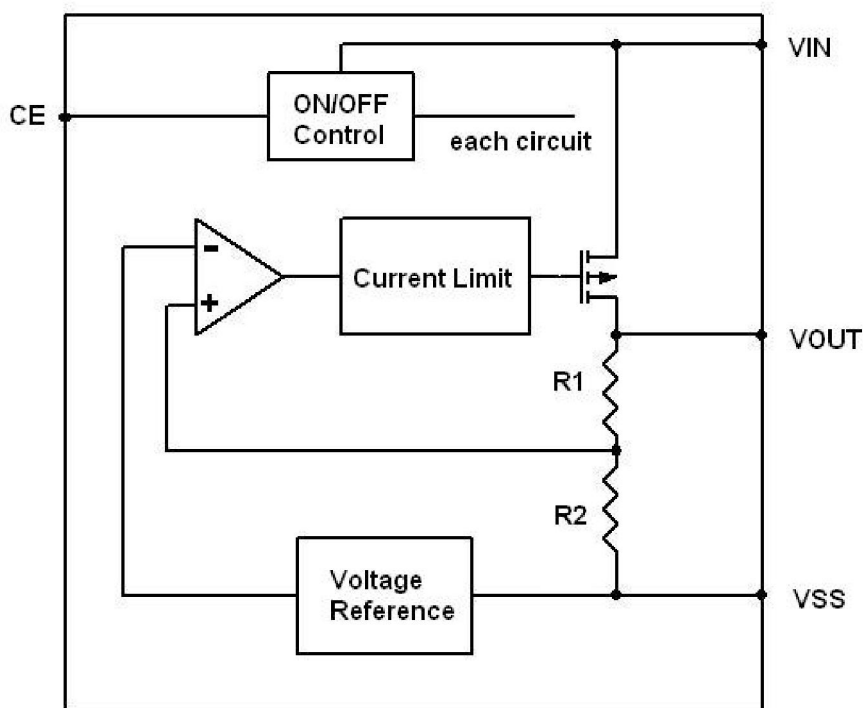
ME6229CXX

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}	$V_{SS}-0.3 \sim V_{IN} +0.3$	V	
CE Pin Voltage	V_{CE}	$V_{SS}-0.3 \sim V_{IN} +0.3$	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
 $(V_{IN} = V_{OUT} + 1V, V_{CE} = V_{IN}, C_{IN} = C_L = 1\mu F, T_a = 25^\circ C, \text{ unless otherwise noted})$

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	V_{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	$\frac{V_{OUT}}{V_{IN} \cdot V_{OUT}}$	$I_{OUT} = 40mA$ $V_{OUT} + 1V V_{IN} 6.5V$		0.03		%/V
CE "High" Voltage	VCEH	Start up	1.0			V
CE "Low" Voltage	VCEL	Shut down			0.7	V
Output noise	EN	$I_{OUT} = 40mA, 300Hz \sim 50kHz$		50		μV_{rms}
Ripple Rejection Rate	PSRR	$V_{IN} = [V_{OUT} + 1]V$ $+1V_{p-pAC}$	$I_{OUT} = 10mA, 1kHz$	70		dB
			$I_{OUT} = 100mA, 10kHz$	62		

ME6229C18
 $(V_{IN} = V_{OUT} + 1V, V_{CE} = V_{IN}, C_{IN} = C_L = 1\mu F, T_a = 25^\circ C, \text{ unless otherwise noted})$

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	V_{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	$\frac{V_{OUT}}{V_{IN} \cdot V_{OUT}}$	$I_{OUT} = 40mA$ $V_{OUT} + 1V V_{IN} 6.5V$		0.05		%/V
CE "High" Voltage	VCEH	Start up	1.0			V
CE "Low" Voltage	VCEL	Shut down			0.7	V
Output noise	EN	$I_{OUT} = 40mA, 300Hz \sim 50kHz$		50		μV_{rms}

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

($V_{IN} = V_{OUT} + 1V$, $V_{CE} = V_{IN}$, $C_{IN} = C_L = 1\mu F$, $T_a = 25^\circ C$, 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	V_{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	$\frac{V_{OUT}}{V_{IN} \cdot V_{OUT}}$	$I_{OUT} = 40mA$ $V_{OUT} + 1V$ 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		μV_{rms}
Ripple Rejection Rate	PSRR	$V_{IN} = [V_{OUT} + 1]V + 1V$ V_p -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

($V_{IN} = V_{OUT} + 1V$, $V_{CE} = V_{IN}$, $C_{IN} = C_L = 1\mu F$, $T_a = 25^\circ C$, 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	V_{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	$\frac{V_{OUT}}{V_{IN} \cdot V_{OUT}}$	$I_{OUT} = 40mA$ $V_{OUT} + 1V$ 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	$I_{OUT} = 40\text{mA}$, 300Hz~50kHz		50		uVrms
Ripple Rejection Rate	PSRR	$V_{IN} = [V_{OUT} + 1]\text{V}$ $+1\text{Vp-pAC}$	$I_{OUT} = 10\text{mA}, 1\text{kHz}$		70	dB
			$I_{OUT} = 100\text{mA}, 10\text{kHz}$		62	
			$I_{OUT} = 200\text{mA}, 10\text{kHz}$		62	
Short-circuit Current	I_{SHORT}	$V_{IN} = V_{OUT} + 1\text{V}$, $V_{CE} = V_{IN}$, $V_{OUT} = 0\text{V}$		120		mA

ME6229C33

($V_{IN} = V_{OUT} + 1\text{V}$, $V_{CE} = V_{IN}$, $C_{IN} = C_L = 1\mu\text{F}$, $T_a = 25^\circ\text{C}$, unless otherwise noted)

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

ME6229A33

($V_{IN} = V_{OUT} + 1\text{V}$, $C_{IN} = C_L = 1\mu\text{F}$, $T_a = 25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	$V_{OUT(E)}$ (Note 2)	$I_{OUT} = 30\text{mA}$, $V_{IN} = V_{OUT} + 1\text{V}$	X 0.98	$V_{OUT(T)}$ (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	$V_{IN} = V_{OUT} + 1\text{V}$		500		mA
Load Regulation	V_{OUT}	$V_{IN} = V_{OUT} + 1\text{V}$, $1\text{mA } I_{OUT} \ 100\text{mA}$		9		mV
Dropout	V_{DIF1}	$I_{OUT} = 100\text{mA}$		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	$\frac{V_{OUT}}{V_{IN} \cdot V_{OUT}}$	$I_{OUT} = 40mA$ $V_{OUT} + 1V$ $V_{IN} 6.5V$		0.05		%/V
Output noise	EN	$I_{OUT} = 40mA$, 300Hz~50kHz		50		μV_{rms}
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

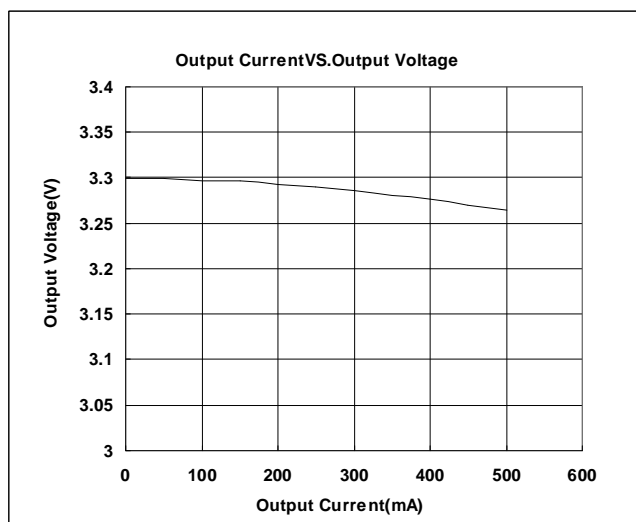
Note :

- $V_{OUT} (T)$: Specified Output Voltage
- $V_{OUT} (E)$: Effective Output Voltage (i.e. The output voltage when “ $V_{OUT} (T) + 1.0V$ ” is provided at the Vin pin while maintaining a certain Iout value.)
- 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.

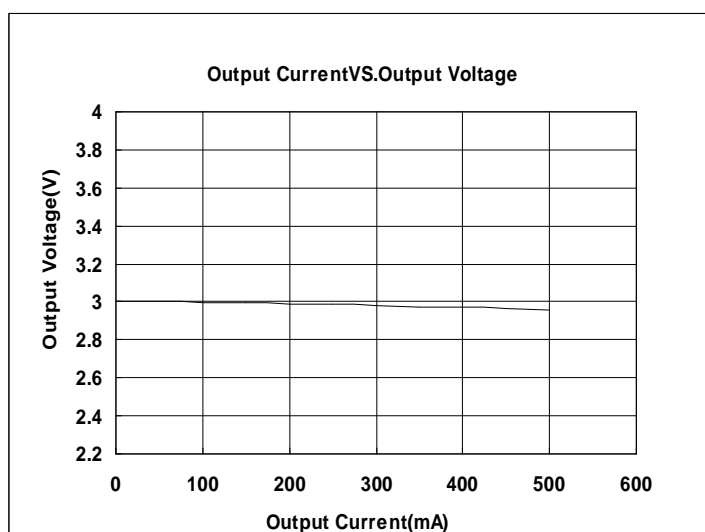
Type Characteristics

(1) Output Current VS. Output Voltage ($V_{IN} = V_{out} + 1$, $T_a = 25^\circ C$)

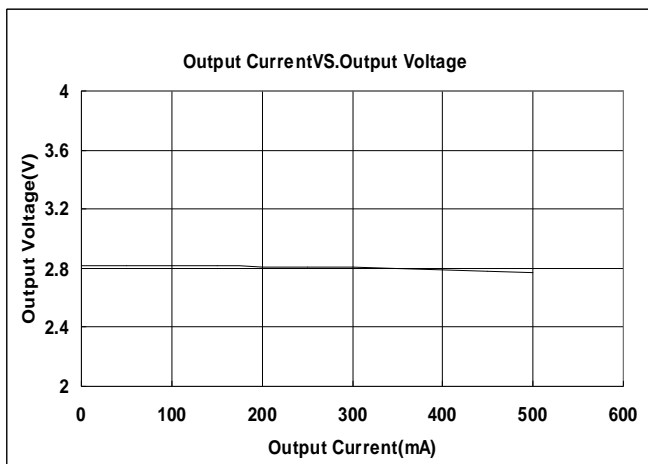
ME6229C33M5G



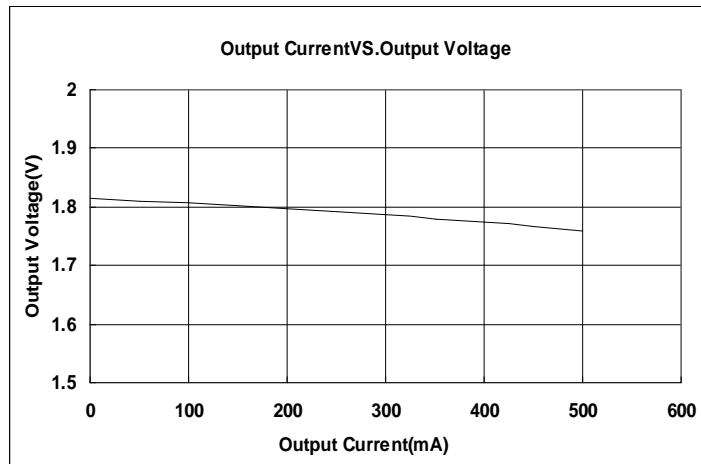
ME6229C30M5G



ME6229C28M5G

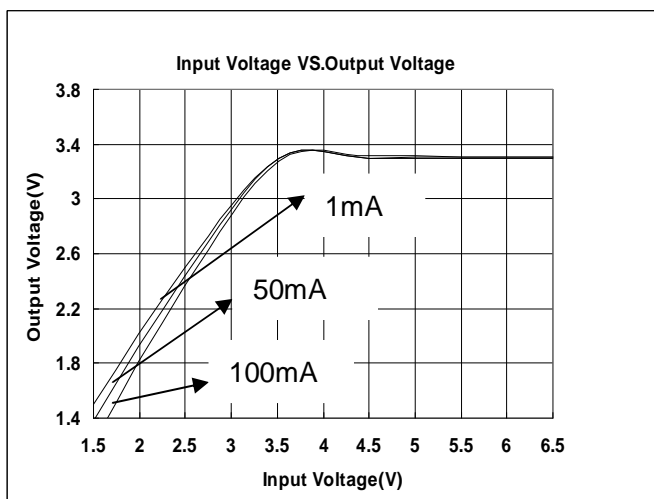


ME6229C18M5G

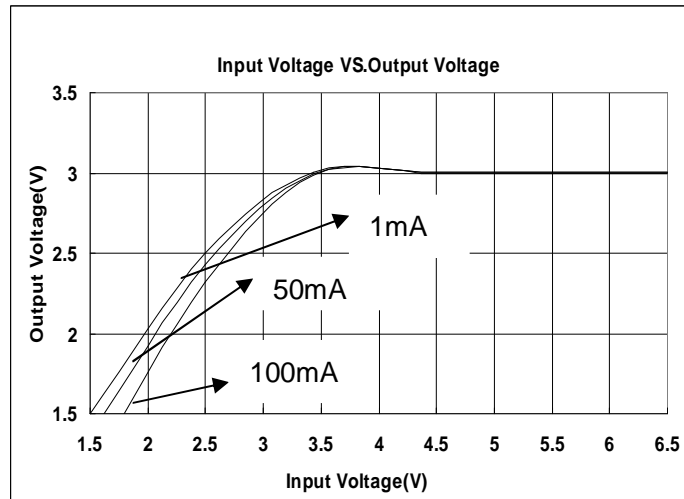


(2) Input Voltage VS. Output Voltage (Ta = 25 °C)

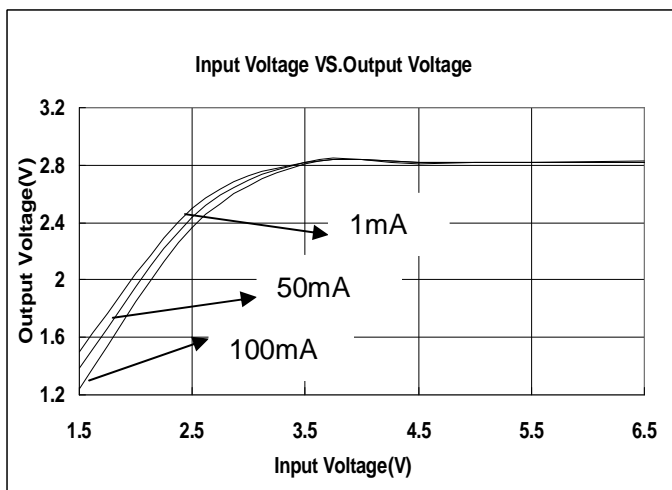
ME6229C33M5G



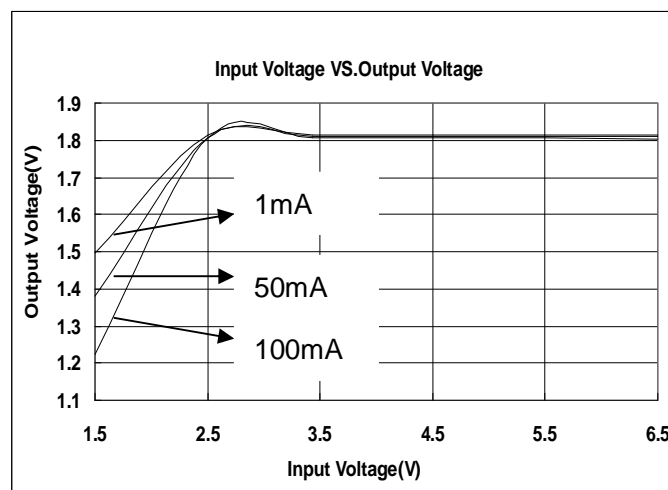
ME6229C30M5G



ME6229C28M5G

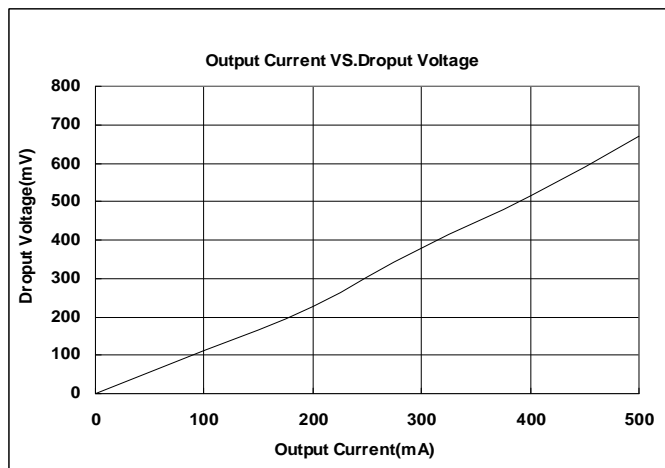


ME6229C18M5G

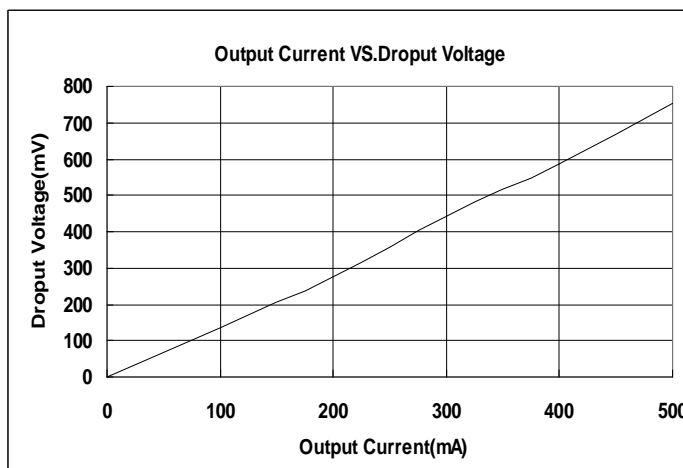


(3) Output Current VS. Dropout Voltage ($V_{IN}=V_{out}+1V, T_a = 25^\circ C$)

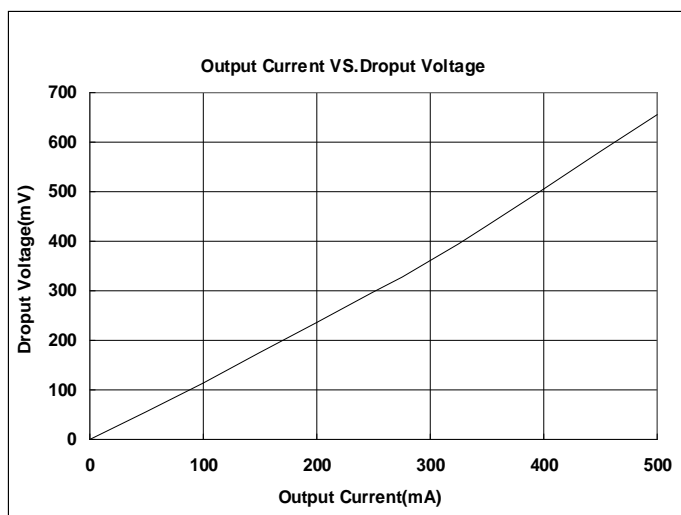
ME6229C33M5G



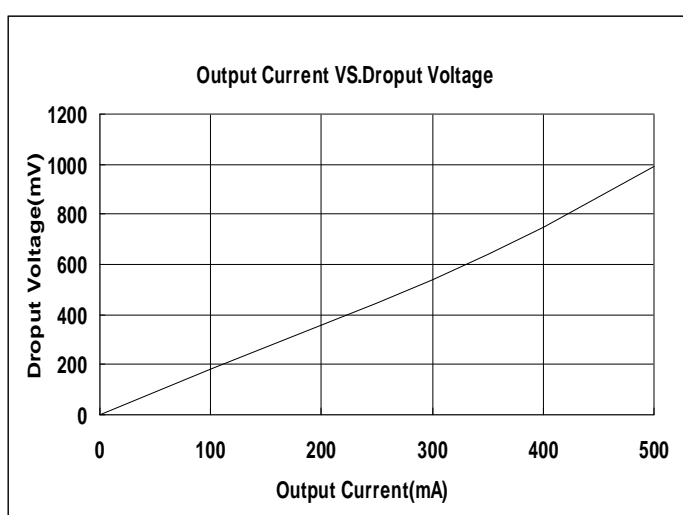
ME6229C30M5G



ME6229C28M5G

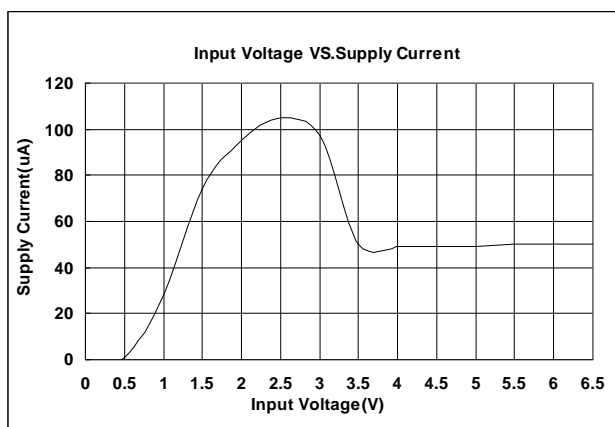


ME6229C18M5G

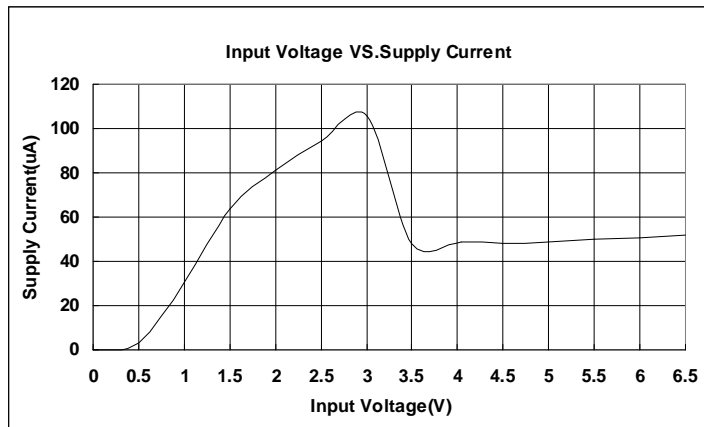


(4) Input Voltage VS. Supply Current ($T_a = 25^\circ C$)

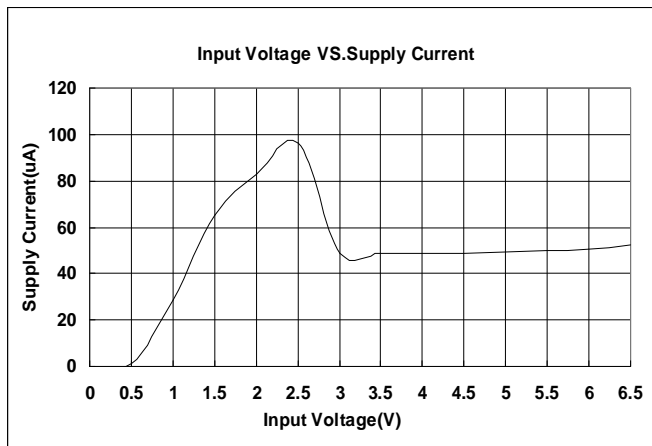
ME6229C33M5G



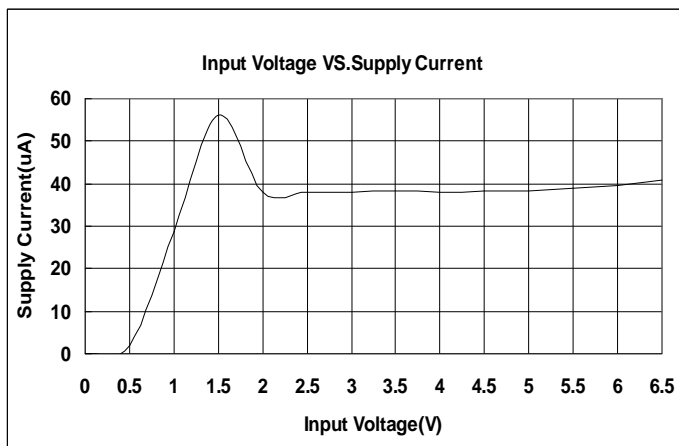
ME6229C30M5G



ME6229C28M5G

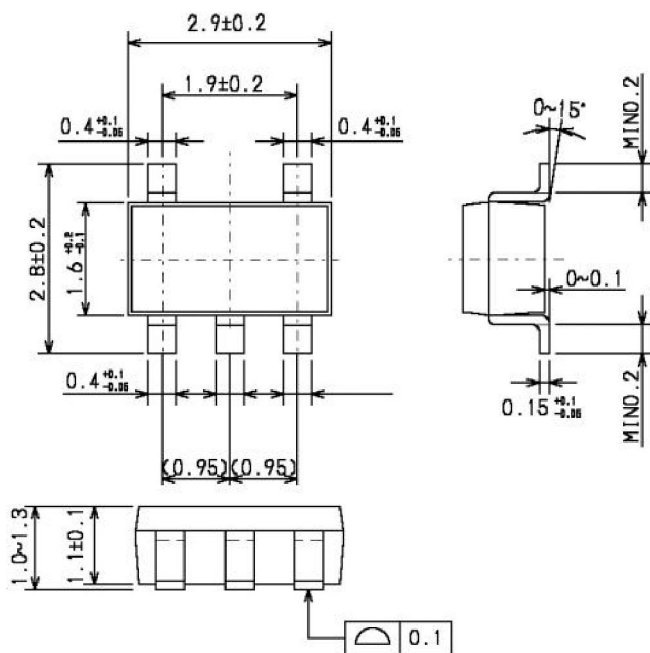


ME6229C18M5G

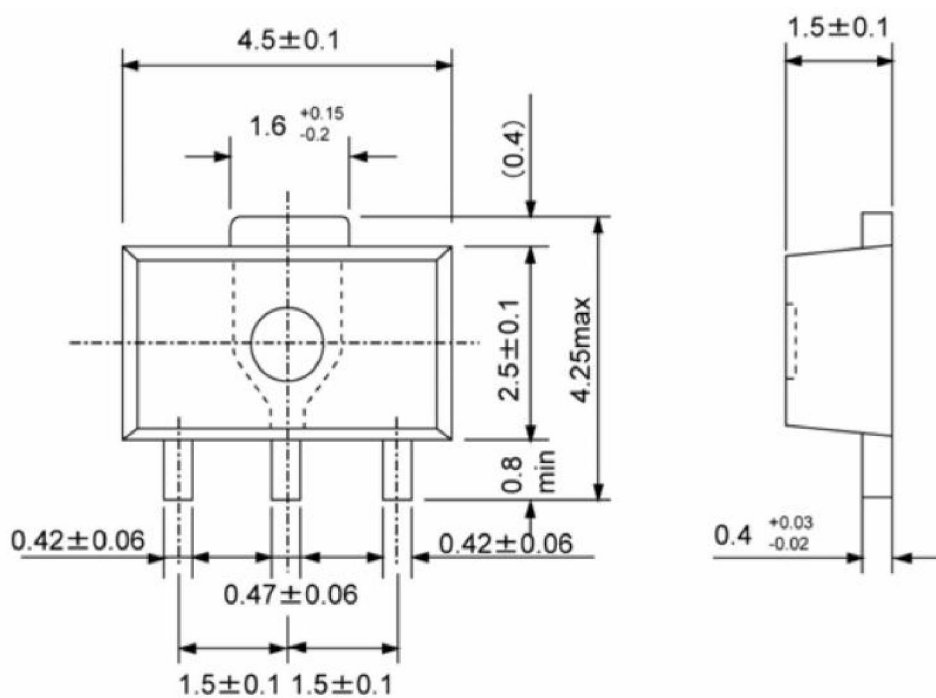


Packaging Information:

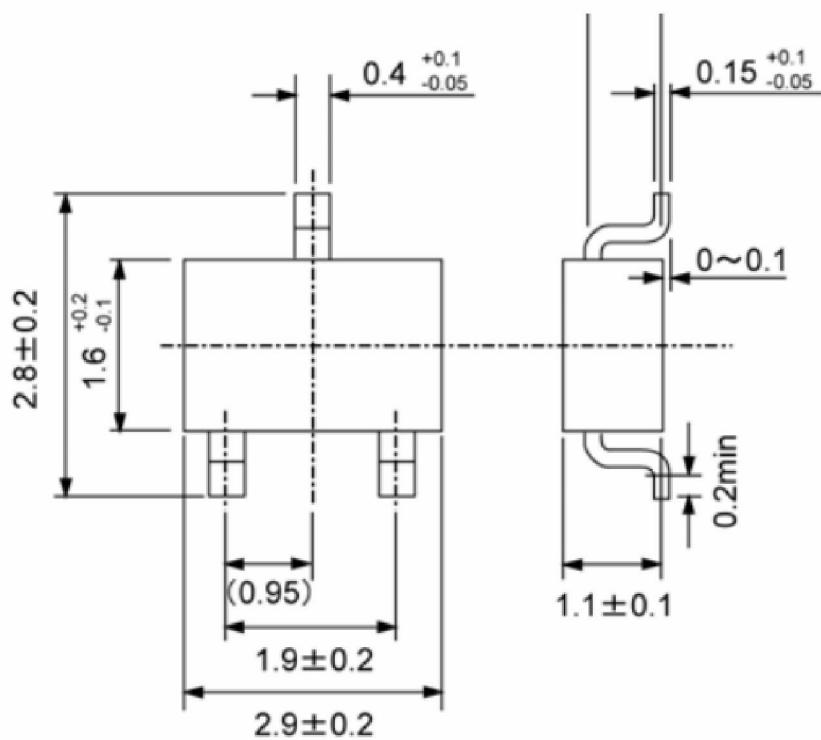
SOT23-5



SOT89-3



SOT23-3



- | The information described herein is subject to change without notice.
- | Nanjing Micro One Electronics Inc is not responsible for any problems caused by circuits or diagrams described herein whose related industrial properties, patents, or other rights belong to third parties. The application circuit examples explain typical applications of the products, and do not guarantee the success of any specific mass-production design.
- | Use of the information described herein for other purposes and/or reproduction or copying without the express permission of Nanjing Micro One Electronics Inc is strictly prohibited.
- | The products described herein cannot be used as part of any device or equipment affecting the human body, such as exercise equipment, medical equipment, security systems, gas equipment, or any apparatus installed in airplanes and other vehicles, without prior written permission of Nanjing Micro One Electronics Inc.
- | Although Nanjing Micro One Electronics Inc exerts the greatest possible effort to ensure high quality and reliability, the failure or malfunction of semiconductor products may occur. The user of these products should therefore give thorough consideration to safety design, including redundancy, fire-prevention measures, and malfunction prevention, to prevent any accidents, fires, or community damage that may ensue.