100 mA, High Input Voltage LDO Linear Regulators ME6203 Series

General Description

ME6203 series are low-dropout linear voltage regulators with a built-in voltage reference module, error correction module and phase compensation module. ME6203 series are based on the CMOS process and allow high voltage input with low quiescent current. This series can deliver 100mA output current and allow an input voltage as high as 40V.This series has the function of internal feedback resistor setting from 2.1V to 12V. The output accuracy is ± 2%.

Features

- High output accuracy：± 2%
- Input voltage：up to 40 V
- Output voltage：2.1V ~ 12V
- Ultra-low quiescent current (Typ.= 3 μ A)
- Output Current：I_{OUT} = 100mA
  （When V_{IN} = 5.5V and V_{OUT} =3.3V）
- Short-circuit Current：(Typ.= 20mA)
- Low temperature coefficient
- Ceramic capacitor can be used

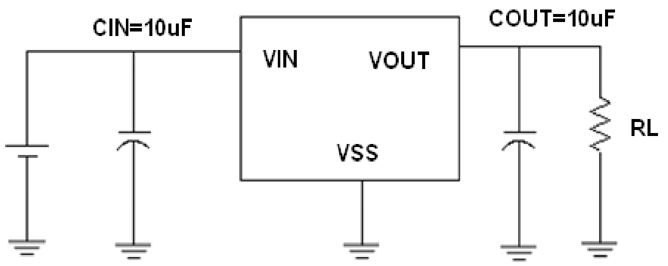
Typical Application

- Electronic weighbridge
- SCM
- Phones, cordless phones
- Security Products
- Water meters, power meters

Package

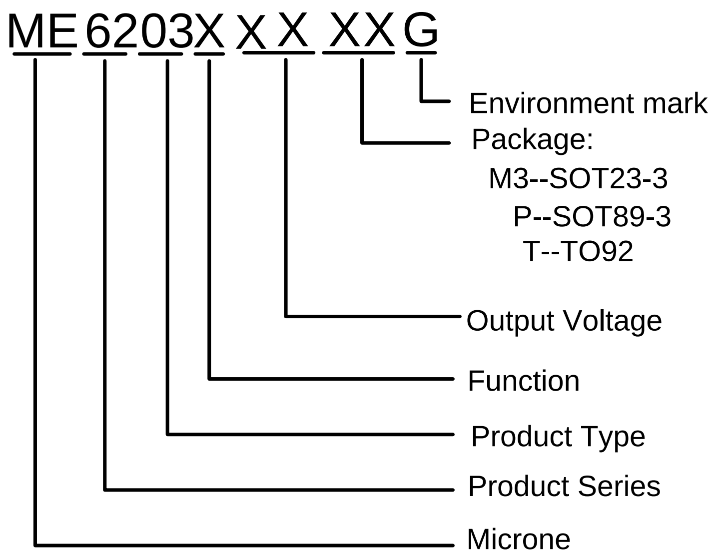
- 3-pin SOT89-3 、SOT23-3 、TO92

Typical Application



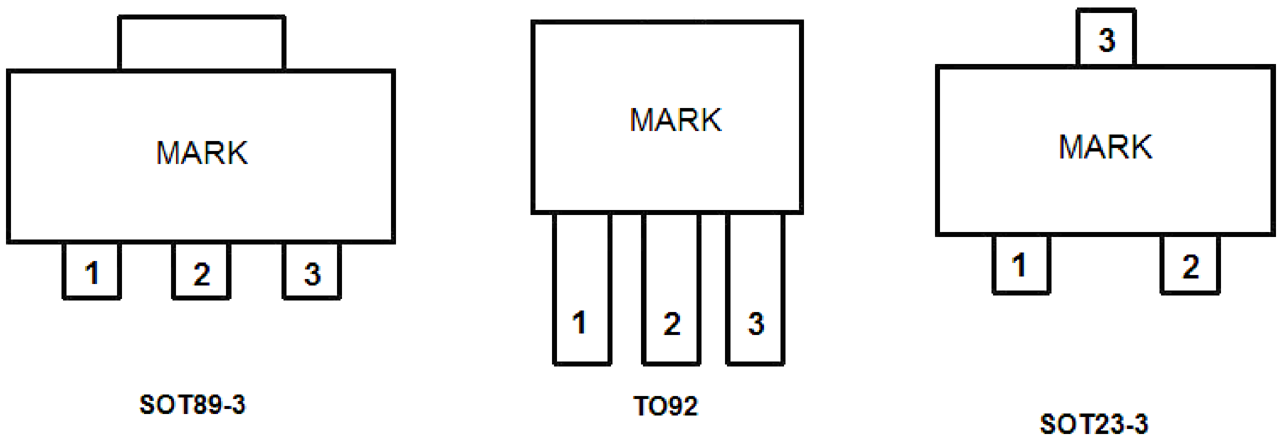
Suggesting : The circuit uses the electrolytic capacitors or tantalum capacitors in the best ,when it is applied in the high input voltage.

Selection Guide



product series	product description
ME6203A18M3G	V_{OUT} =1.8V； Package：M3,P,T
ME6203A25M3G	V_{OUT} =2.5V； Package：M3,P,T
ME6203A30M3G	V_{OUT} =3.0V； Package：M3,P,T
ME6203A33M3G	V_{OUT} =3.3V； Package:：M3,P,T
ME6203A36M3G	V_{OUT} =3.6V； Package：M3,P,T
ME6203A44M3G	V_{OUT} =4.4V； Package：M3,P,T
ME6203A50M3G	V_{OUT} =5.0V； Package：M3,P,T

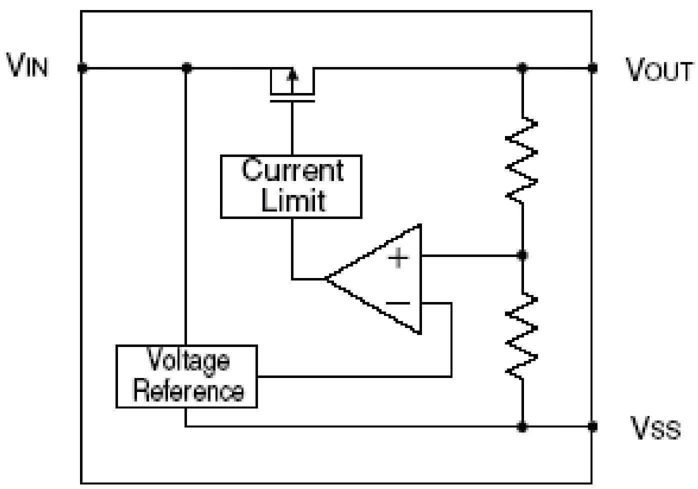
Pin Configuration



Pin Assignment

Pin Number		Pin Name	Functions
SOT89-3 / TO92	SOT23-3		
1	1	V_{SS}	Ground
2	3	V_{IN}	Power Input
3	2	V_{OUT}	Output

Block Diagram



Absolute Maximum Ratings

Parameter		Symbol	Ratings	Units
Input Voltage		V_{IN}	40	V
Output Current		I_{OUT}	150	mA
Output Voltage		V_{OUT}	Vss-0.3～V_{IN} +0.3	V
Power Dissipation	SOT89-3	P_D	500	mW
	TO92		500	
	SOT23-3		300	
Operating Junction Temperature Range		T_J	－45～＋150	℃
Storage Temperature Range		T_{STG}	－55～＋150	℃
Lead Temperature			260℃，10sec	

Electrical Characteristics

ME6203A18

(V_{IN}= V_{OUT}+2.0V，C_{IN}=C_L=10uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}		3.0		40	V
Maximum Output Current	I_{OUT} _max	V_{IN}= V_{OUT}+3.7V		100		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT} +3.7V, 1mA≤I_{OUT}≤100mA		30	60	mV
Dropout Voltage (Note 3)	V_{DIF}	I_{OUT} =100mA		3.7		V
Supply Current	I_{SS}	V_{IN}= V_{OUT} +2V		2.0	4	μ A
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT} =1mA V_{OUT} +1V ≤V_{IN}≤40V		0.03	0.1	%/V
Short-circuit Current	I_{SHORT}	V_{OUT}=0V		20	40	mA
Temperature Coefficient	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	I_{OUT} =10mA -40℃≤Ta≤85℃		80		ppm/℃

ME6203A25

(V_{IN}= V_{OUT}+2.0V，C_{IN}=C_L=10uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}		3.0		40	V
Maximum Output Current	I_{OUT} _max	V_{IN}= V_{OUT}+3.0V		100		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT} +3.0V, 1mA≤I_{OUT}≤100mA		32	60	mV
Dropout Voltage (Note 3)	V_{DIF}	I_{OUT} =100mA		2.91		V
Supply Current	I_{SS}	V_{IN}= V_{OUT} +2V		2.5	4	μ A
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT} =1mA V_{OUT} +1V ≤V_{IN}≤40V		0.02	0.1	%/V
Short-circuit Current	I_{SHORT}	V_{OUT}=0V		20	40	mA
Temperature Coefficient	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	I_{OUT} =10mA -40℃≤Ta≤85℃		80		ppm/℃

ME6203A30

(V_{IN}= V_{OUT}+2.0V，C_{IN}=C_L=10uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}		3.0		40	V
Maximum Output Current	I_{OUT} _max	V_{IN}= V_{OUT}+2.5V		100	120	mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT} +2.5V, 1mA≤I_{OUT}≤100mA		30	60	mV
Dropout Voltage (Note 3)	V_{DIF}	I_{OUT} =10mA		0.25		V
		I_{OUT} =50mA		1.2		V
Supply Current	I_{SS}	V_{IN}= V_{OUT} +2V		3	4	μ A
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT} =1mA V_{OUT} +1V ≤V_{IN}≤40V		0.02	0.1	%/V
Short-circuit Current	I_{SHORT}	V_{OUT}=0V		20	40	mA
Temperature Coefficient	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	I_{OUT} =10mA -40℃≤Ta≤85℃		80		ppm/℃

ME6203A33

(V_{IN}= V_{OUT}+2.0V，C_{IN}=C_L=10uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}		3.3		40	V
Maximum Output Current	I_{OUT} _max	V_{IN}= V_{OUT}+2.2V		100	120	mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT} +2.2V, 1mA≤I_{OUT}≤100mA		30	60	mV
Dropout Voltage (Note 3)	V_{DIF}	I_{OUT} =10mA		0.22		V
		I_{OUT} =50mA		1.1		V
Supply Current	I_{SS}	V_{IN}= V_{OUT} +2V		3	4	μ A
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT} =1mA V_{OUT} +1V ≤V_{IN}≤40V		0.04	0.1	%/V
Short-circuit Current	I_{SHORT}	V_{OUT}=0V		20	40	mA
Temperature Coefficient	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	I_{OUT} =10mA -40℃≤Ta≤85℃		80		ppm/℃

ME6203A36

(V_{IN}= V_{OUT}+2.0V，C_{IN}=C_L=10uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}		3.6		40	V
Maximum Output Current	I_{OUT} _max	V_{IN}= V_{OUT}+2.2V		100	120	mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT} +2.2V, 1mA≤I_{OUT}≤100mA		30	60	mV
Dropout Voltage (Note 3)	V_{DIF}	I_{OUT} =10mA		0.20		V
		I_{OUT} =50mA		1.0		V
Supply Current	I_{SS}	V_{IN}= V_{OUT} +2V		3	4	μ A
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT} =1mA V_{OUT} +1V ≤V_{IN}≤40V		0.02	0.1	%/V
Short-circuit Current	I_{SHORT}	V_{OUT}=0V		20	40	mA
Temperature Coefficient	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	I_{OUT} =10mA -40℃≤Ta≤85℃		80		ppm/℃

ME6203A44

(V_{IN}= V_{OUT}+2.0V，$C_{IN=}C_L$=10uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}		3.0		40	V
Maximum Output Current	I_{OUT} _max	V_{IN}= V_{OUT}+2.0V		100		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT} +2.0V, 1mA≤I_{OUT}≤100mA		31	60	mV
Dropout Voltage (Note 3)	V_{DIF}	I_{OUT} =10mA		0.17		V
		I_{OUT} =50mA		0.82		V
Supply Current	I_{SS}	V_{IN}= V_{OUT} +2V		3	4	μ A
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT} =1mA V_{OUT} +1V ≤V_{IN}≤40V		0.02	0.1	%/V
Short-circuit Current	I_{SHORT}	V_{OUT}=0V		20	40	mA
Temperature Coefficient	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	I_{OUT} =10mA -40℃≤Ta≤85℃		80		ppm/℃

ME6203A50

(V_{IN}= V_{OUT}+2.0V，$C_{IN=}C_L$=10uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}		5.0		40	V
Maximum Output Current	I_{OUT} _max	V_{IN}= V_{OUT}+2.0V		150	180	mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT} +2.0V, 1mA≤I_{OUT}≤100mA		33	60	mV
Dropout Voltage (Note 3)	V_{DIF}	I_{OUT} =10mA		0.13		V
		I_{OUT} =50mA		0.68		V
Supply Current	I_{SS}	V_{IN}= V_{OUT} +2V		3.3	4.5	μ A
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT} =1mA V_{OUT} +1V ≤V_{IN}≤40V		0.03	0.1	%/V
Short-circuit Current	I_{SHORT}	V_{OUT}=0V		25	40	mA
Temperature Coefficient	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	I_{OUT} =10mA -40℃≤Ta≤85℃		80		ppm/℃

Note ：

1. V_{OUT} (T) ： Specified Output Voltage

2.V_{OUT} (E) ： Effective Output Voltage (ie. The output voltage when “V_{OUT} (T)+ 2.0V”is provided at the V_{IN} pin while maintaining a certain I_{OUT} value.)

3.V_{DIF}： V_{IN1} –V_{OUT} (E)’

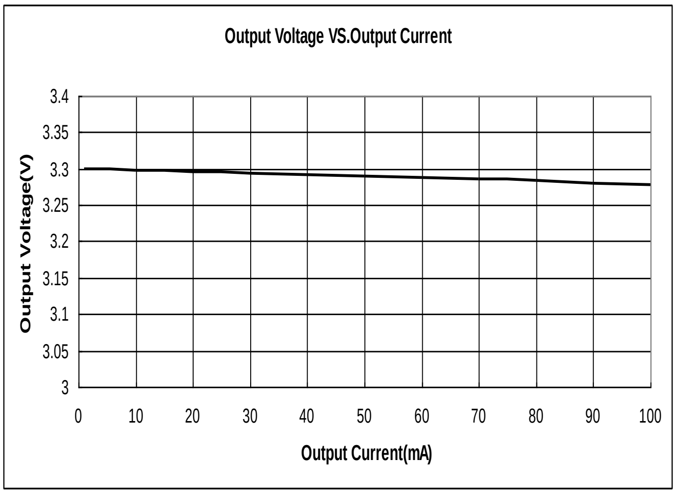
V_{IN1} ： The input voltage when V_{OUT}(E)’ appears as input voltage is gradually decreased.

V_{OUT} (E)’=A voltage equal to 98% of the output voltage whenever an amply stabilized I_{OUT} and {V_{OUT} (T)+2.2V} is input.

Type Characteristics

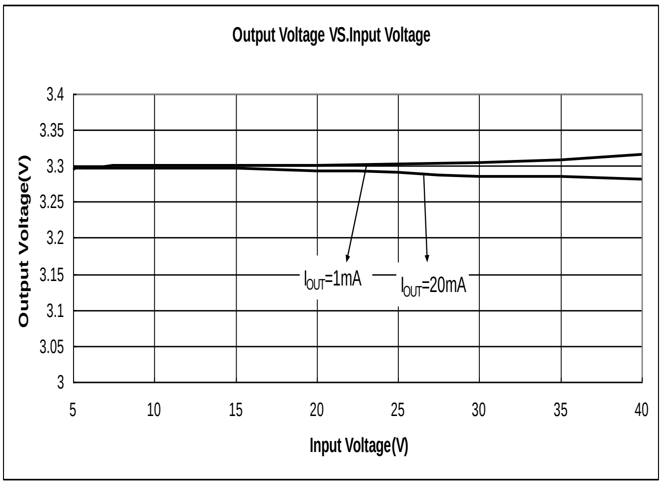
（1）Output Voltage VS. Output Current （ **Ta = 25 °C**）

ME6203A33（V_{IN}=V_{OUT}+2.2V）



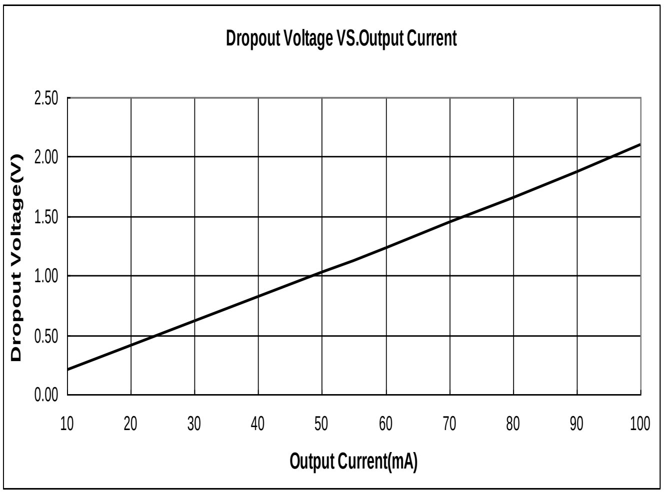
（2）Output Voltage VS. Input Voltage （ **Ta = 25 °C**）

ME6203A33



（3）Dropout Voltage VS. Output Current（ **Ta = 25 °C**）

ME6203A33



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

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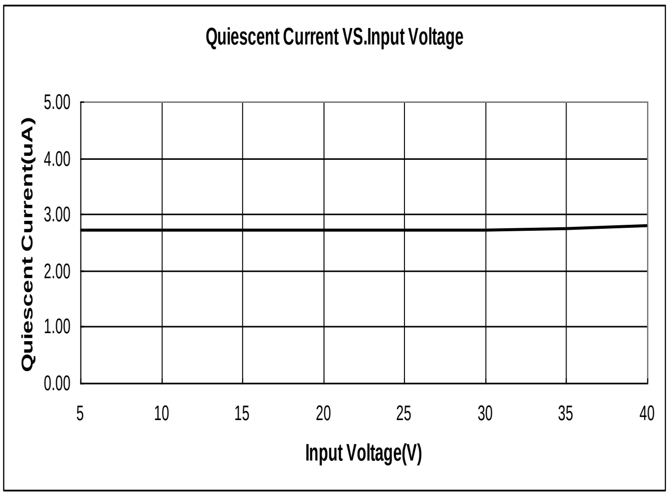
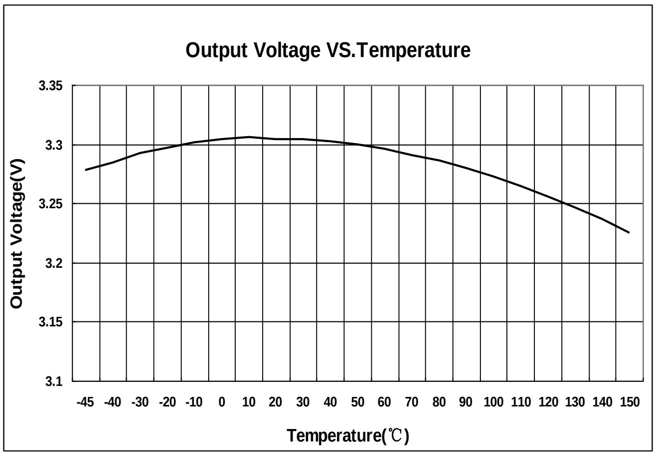


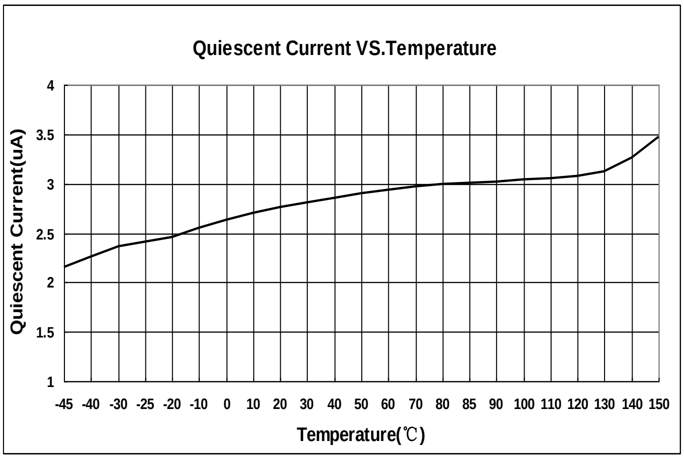
（5） Output Voltage VS.Temperature

ME6203A33 (I_{OUT}=10mA)



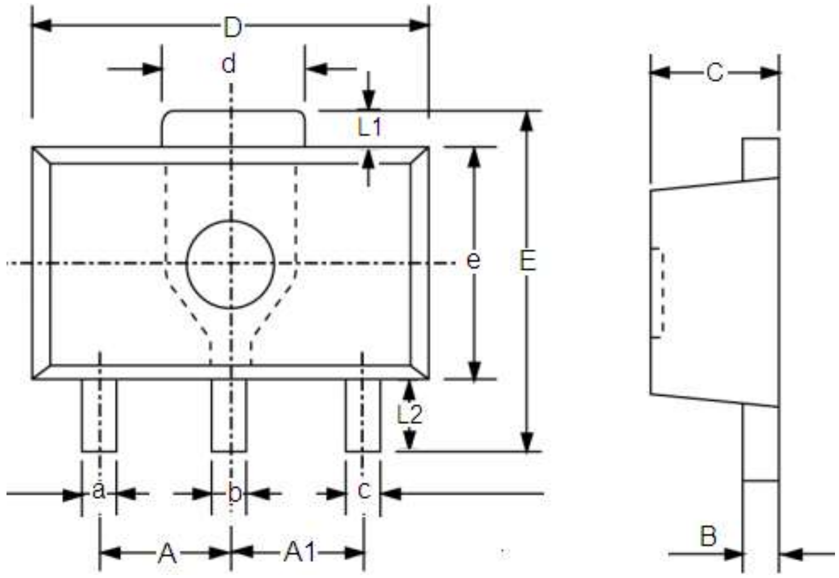
（6）Quiescent Current VS. Temperature

ME6203A33 （V_{IN}=V_{OUT}+2.2V）



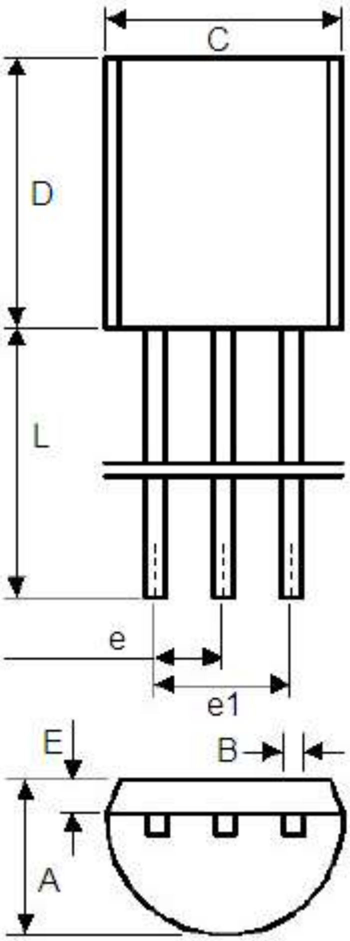
Packaging Information

- **Packaging Type: SOT89-3**



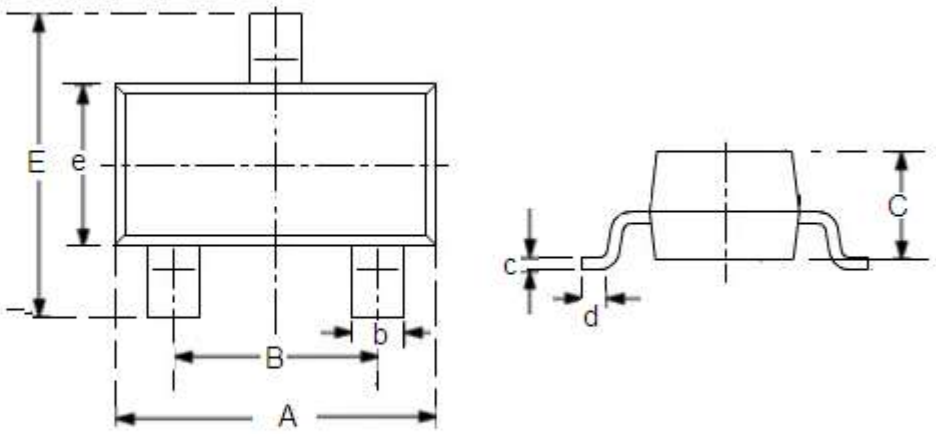
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.4	1.6	0.0551	0.0630
A1	1.4	1.6	0.0551	0.0630
a	0.36	0.48	0.0142	0.0189
b	0.41	0.53	0.0161	0.0209
c	0.36	0.48	0.0142	0.0189
d	1.4	1.75	0.0551	0.0689
B	0.38	0.43	0.015	0.0169
C	1.4	1.6	0.0551	0.0630
D	4.4	4.6	0.1732	0.181
E	-	4.25	-	0.1673
e	2.4	2.6	0.0945	0.1023
L1	0.4	-	0.0157	-
L2	0.8	-	0.0315	-

- **Packaging Type: TO92**



	Min	Max	Min	Max
A	3.4	3.8	0.13386	0.1496
B	0.3	0.5	0.0118	0.0197
C	4.4	4.8	0.1732	0.189
D	4.4	4.8	0.1732	0.189
E	0.9	1.5	0.0354	0.059
e	1.17	1.37	0.046	0.0539
e1	2.39	2.69	0.094	0.1059
L	12	16	0.4724	0.6299

- **Packaging Type: SOT23-3**



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.7	3.1	0.1063	0.122
B	1.7	2.1	0.0669	0.0827
b	0.35	0.5	0.0138	0.0197
C	1.0	1.2	0.0394	0.0472
c	0.1	0.25	0.0039	0.0098
d	0.2	-	0.0079	-
E	2.6	3.0	0.1023	0.1181
e	1.5	1.8	0.059	0.0708

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