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 1.8V to 12V. There are two output accuracy levels: ±1% (VOUT = 3.3V, 5.0V, 10.0V) and ±2% (other voltage values).

Features

- High output accuracy：
  ± 1%（VOUT =3.3V、5.0V、10V）
  ±2%（Others）
- Input voltage：up to 40 V
- Output voltage：1.8V ~ 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

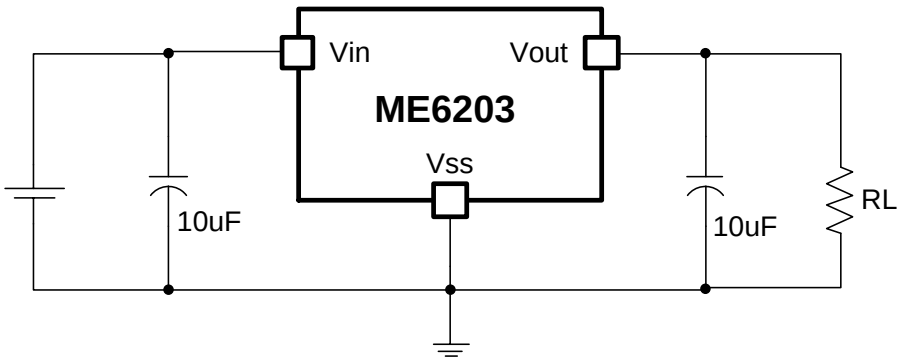
Typical Application

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

Package

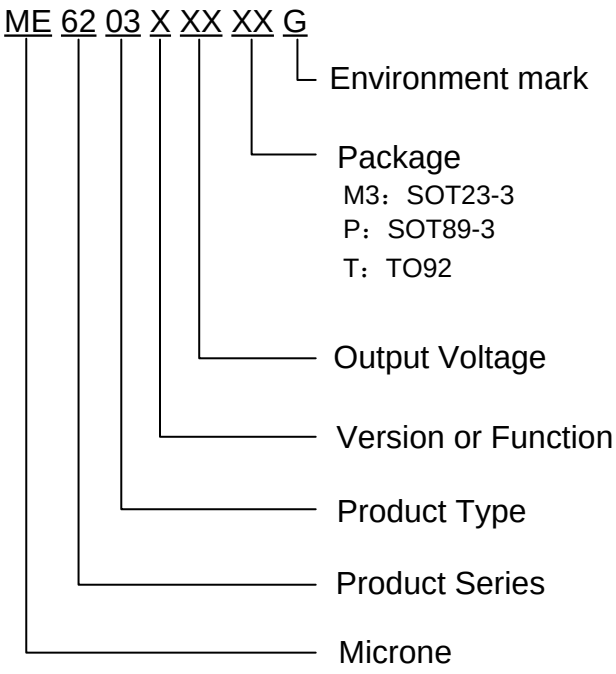
- 3-pin SOT89-3 、SOT23-3 、TO92

Typical Application



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

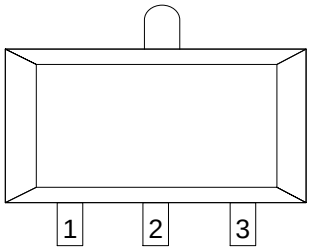
Selection Guide



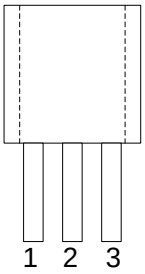
product series	product description
ME6203A18M3G	V_{OUT} =1.8V±2%；Package：SOT23-3
ME6203A18PG	V_{OUT} =1.8V±2%；Package：SOT89-3
ME6203A25M3G	V_{OUT} =2.5V±2%；Package：SOT23-3
ME6203A25PG	V_{OUT} =2.5V±2%；Package：SOT89-3
ME6203A30M3G	V_{OUT} =3.0V±2%；Package：SOT23-3
ME6203A30PG	V_{OUT} =3.0V±2%；Package：SOT89-3
ME6203A33M3G	V_{OUT} =3.3V±1%；Package：SOT23-3
ME6203A33PG	V_{OUT} =3.3V±1%；Package：SOT89-3
ME6203A33TG	V_{OUT} =3.3V±1%；Package：TO92
ME6203A36M3G	V_{OUT} =3.6V±2%；Package：OT23-3
ME6203A36PG	V_{OUT} =3.6V±2%；Package：OT89-3
ME6203A36TG	V_{OUT} =3.6V±2%；Package：TO92
ME6203A44M3G	V_{OUT} =4.4V±2%；Package：SOT23-3
ME6203A44PG	V_{OUT} =4.4V±2%；Package：SOT89-3
ME6203A50M3G	V_{OUT} =5.0V±1%；Package：SOT23-3
ME6203A50PG	V_{OUT} =5.0V±1%；Package：SOT89-3
ME6203A50TG	V_{OUT} =5.0V±1%；Package：TO92
ME6203A100M3G	V_{OUT} =10.0V±1%；Package：SOT23-3
ME6203A100PG	V_{OUT} =10.0V±1%；Package：SOT89-3

NOTE: If you need other voltage and package, please contact our sales staff。

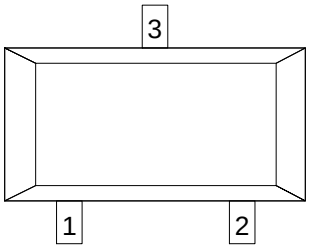
Pin Configuration



SOT-89-3



TO-92

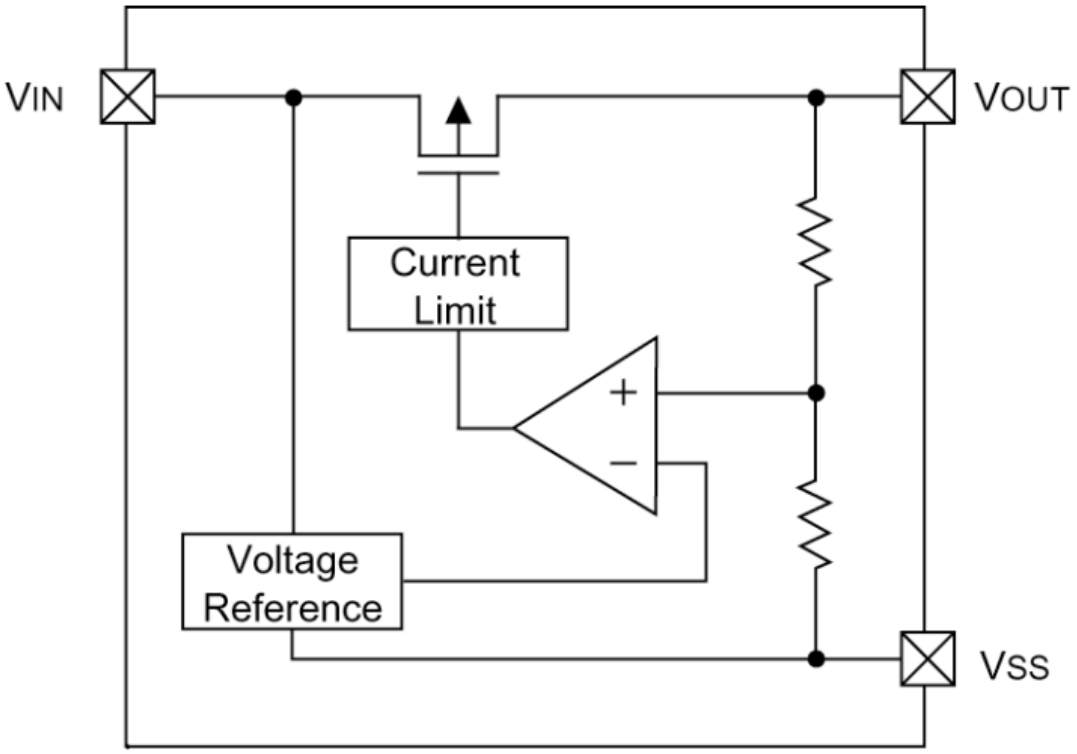


SOT23-3

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	SOT23-3	P_D	0.54	W
	SOT89-3		1.25	
	TO-92		0.83	
Thermal resistance	SOT23-3	θ_{JA}	230	ºC /W
	SOT89-3		100	
	TO-92		150	
Operating Ambient Temperature Range		T_{OPR}	-40 ~ +85	℃
Storage Temperature Range		T_{STG}	-55 ~ +150	℃
Maximum junction temperature		T_J	-40 ~ +150	ºC
Lead Temperature		T_{solder}	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}=V_{SS}		20	40	mA
Temperature Coefficient(Note 4)	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	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		3.0		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}=V_{SS}		20	40	mA
Temperature Coefficient(Note 4)	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	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		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}=V_{SS}		20	40	mA
Temperature Coefficient(Note 4)	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	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 0.99	V_{OUT} (T) (Note 1)	X 1.01	V
Input Voltage	V_{IN}		3.3		40	V
Maximum Output Current	I_{OUT} _max	V_{IN}= V_{OUT}+2.2V		100		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}=V_{SS}		20	40	mA
Temperature Coefficient(Note 4)	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	I_{OUT} =10mA -40℃≤Ta≤85℃		80		ppm/℃

ME6203A36 (V_{IN}= V_{OUT}+2.0V，C_{IN}=C_L=10uF，Ta=25°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		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}=V_{SS}		20	40	mA
Temperature Coefficient(Note 4)	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	I_{OUT} =10mA -40℃≤Ta≤85℃		80		ppm/℃

ME6203A44(V_{IN}= V_{OUT}+2.0V，C_{IN}=C_L=10uF，Ta=25°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}		4.4		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}=V_{SS}		20	40	mA
Temperature Coefficient(Note 4)	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	I_{OUT} =10mA -40℃≤Ta≤85℃		80		ppm/℃

ME6203A50(V_{IN}= V_{OUT}+2.0V，C_{IN}=C_L=10uF，Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA	X 0.99	V_{OUT} (T) (Note 1)	X 1.01	V
Input Voltage	V_{IN}		5.0		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		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}=V_{SS}		25	40	mA
Temperature Coefficient(Note 4)	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	I_{OUT} =10mA -40℃≤Ta≤85℃		80		ppm/℃

ME6203A100 (V_{IN}= V_{OUT}+1.5V，C_{IN}=C_L=10uF，Ta=25°C, unless otherwise noted))

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA	X 0.99	V_{OUT} (T) (Note 1)	X 1.01	V
Input Voltage	V_{IN}		10.0	-	40	V
Maximum Output Current	I_{OUT} _max	V_{IN}= V_{OUT}+1.5V	-	100	-	mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT} +1.5V, 1mA≤I_{OUT}≤100mA	-	20	60	mV
Dropout Voltage (Note 3)	V_{DIF}	I_{OUT} =10mA	-	0.09	-	V
		I_{OUT} =50mA	-	0.45	-	V
Supply Current	I_{SS}	V_{IN}= V_{OUT} +1.5V	-	5	7.5	μA
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}=V_{SS}	-	30	40	mA
Temperature Coefficient(Note 4)	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta Ta}$	I_{OUT} =10mA -40℃≤Ta≤85℃	-	80	-	ppm/℃

Note ：

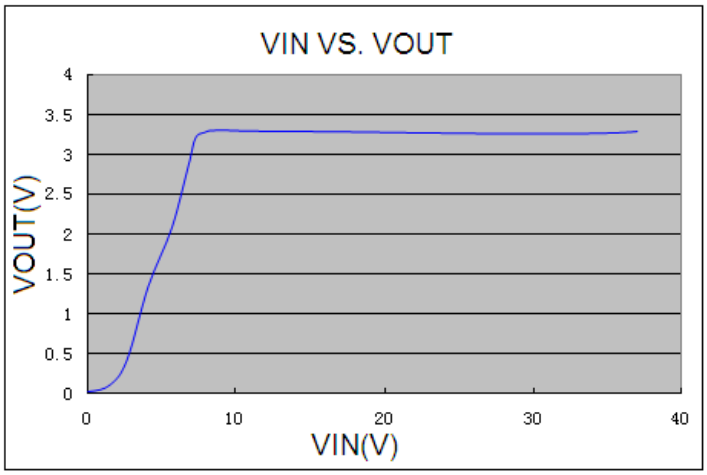
1. V_{OUT} (T) ： Specified Output Voltage
2. V_{OUT} (E) ： Effective Output Voltage (ie. The output voltage when "V_{OUT} (T)+ 2.0V"is provided at the V_{IN} pin while maintaining a certain I_{OUT} value.)
3. V_{DIF}： V_{IN1} –V_{OUT} (E)'

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

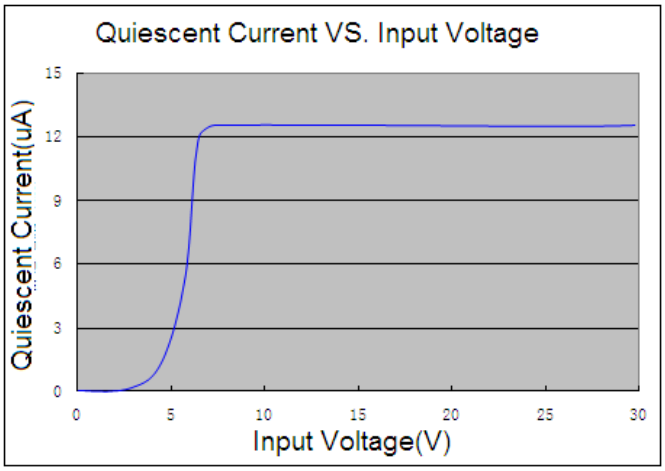
   V_{OUT} (E)'=A voltage equal to 98% of the output voltage whenever an amply stabilized I_{OUT} and {V_{OUT} (T)+2.2V} is input.
4. guaranteed by design.

Type Characteristics

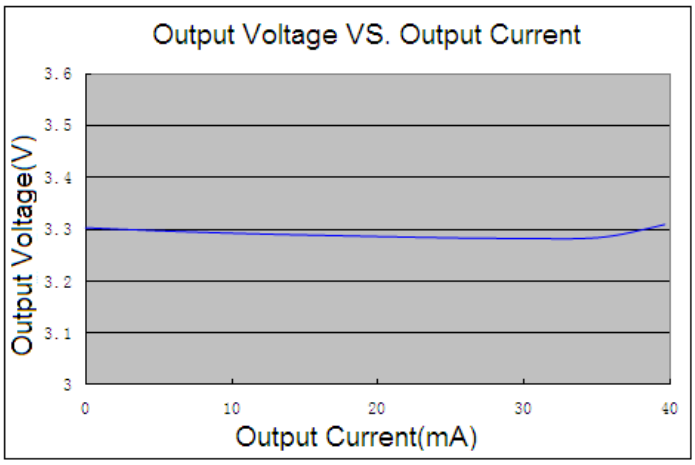
（1）Intput Voltage VS. Output Voltage（ **Ta = 25 °C**）



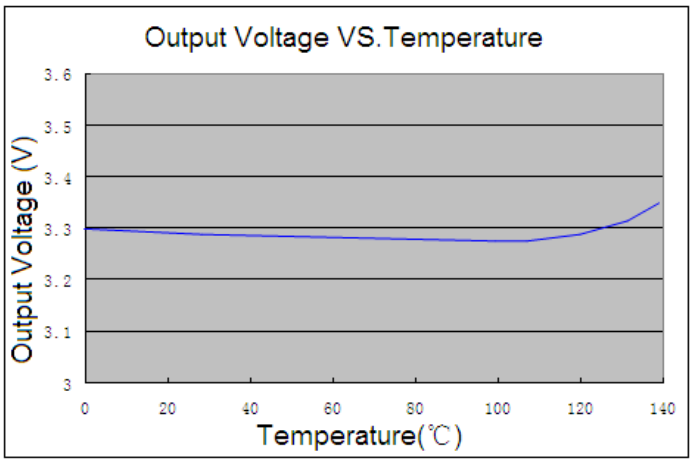
（2）Quiescent Current VS. Input Voltage（**Ta = 25 °C**）



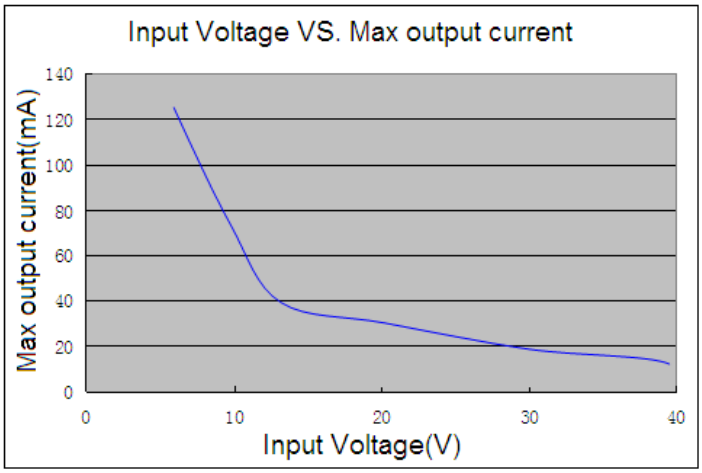
（3）Output Voltage VS. Output Current （ **Ta = 25 °C**）



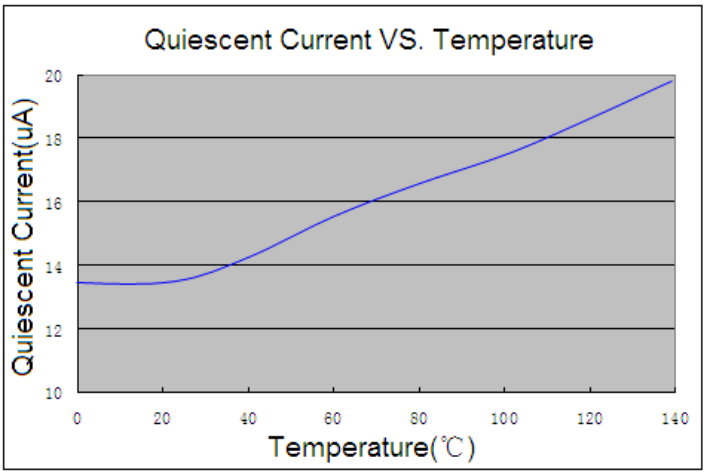
（4） Output Voltage VS.Temperature



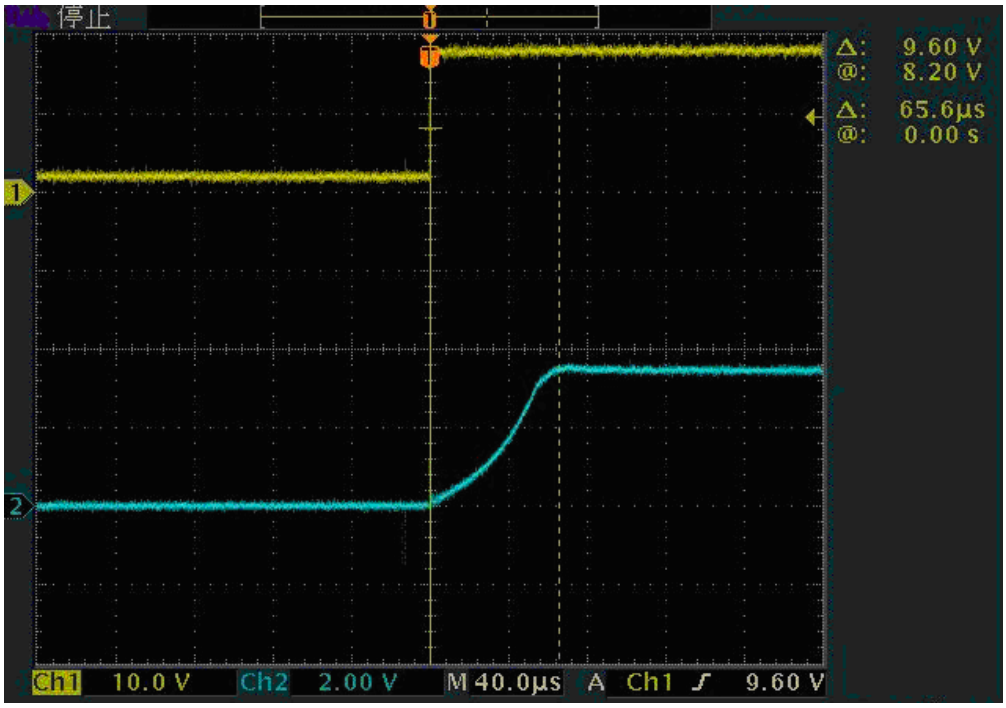
（5）Max output current VS. Input Voltage（ **Ta = 25 °C**）



（6）Quiescent Current VS. Temperature

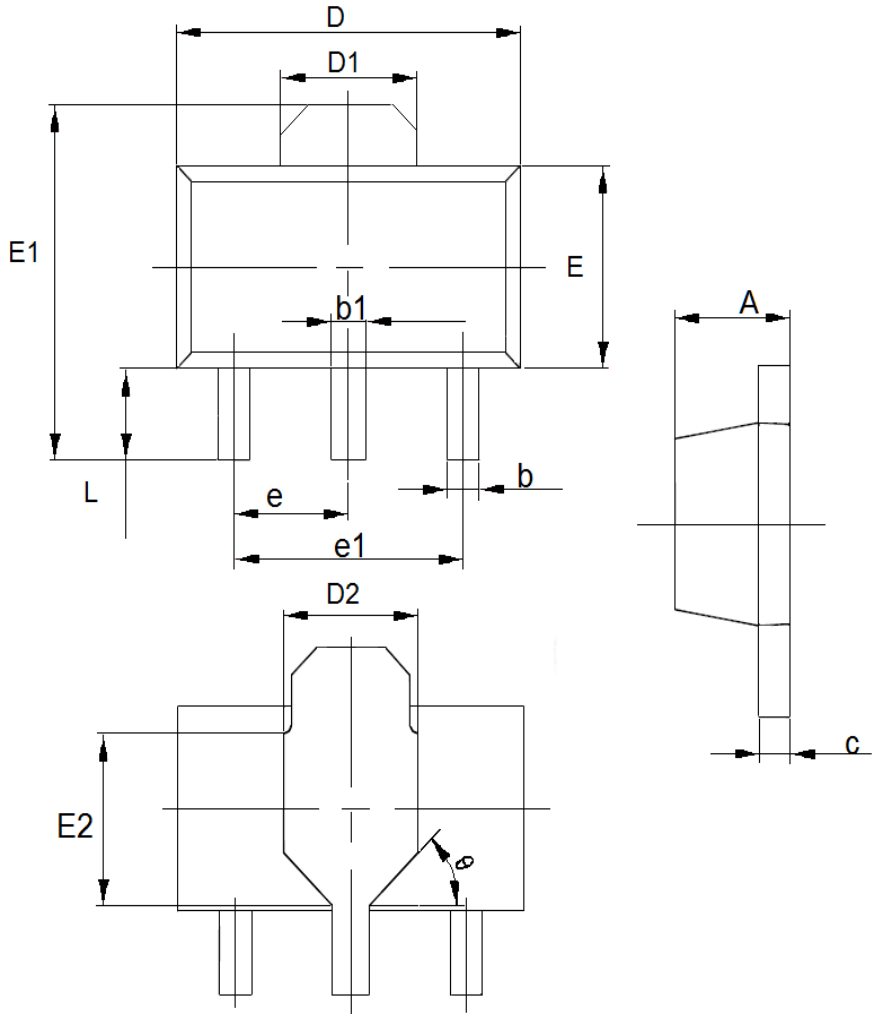


（7）Start Time(CH1：V_{IN}=18V，CH2:V_{OUT}=3.3V，T_A=25℃)



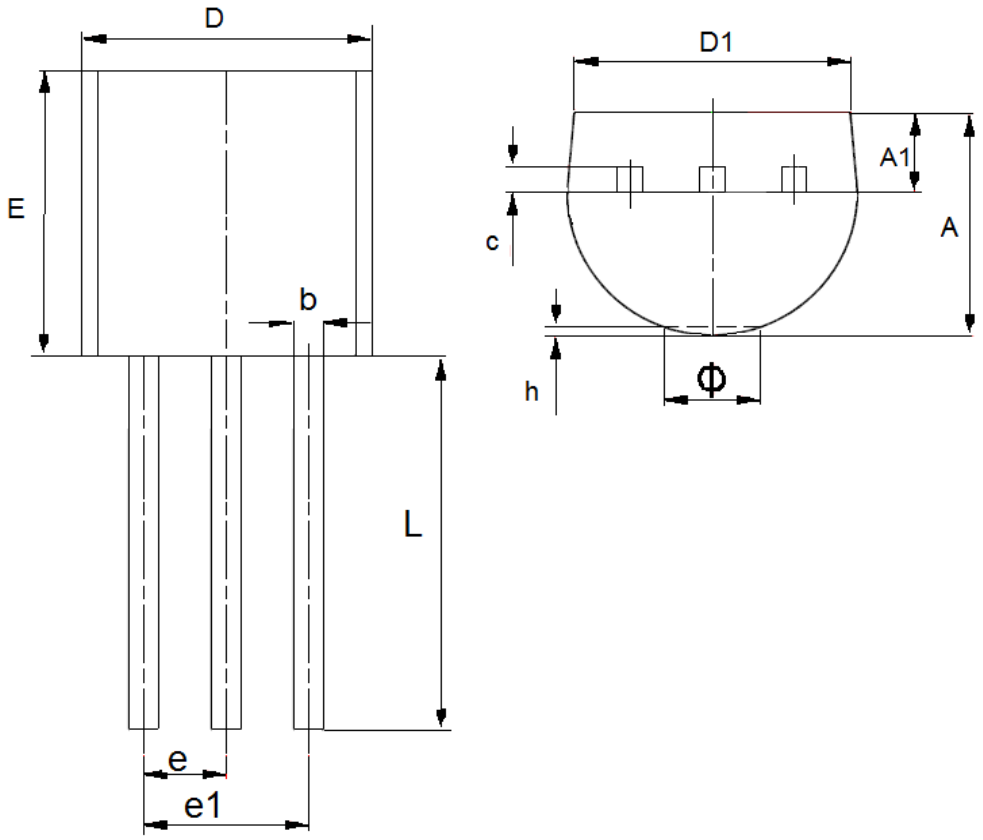
Packaging Information

- **Packaging Type: SOT89-3**



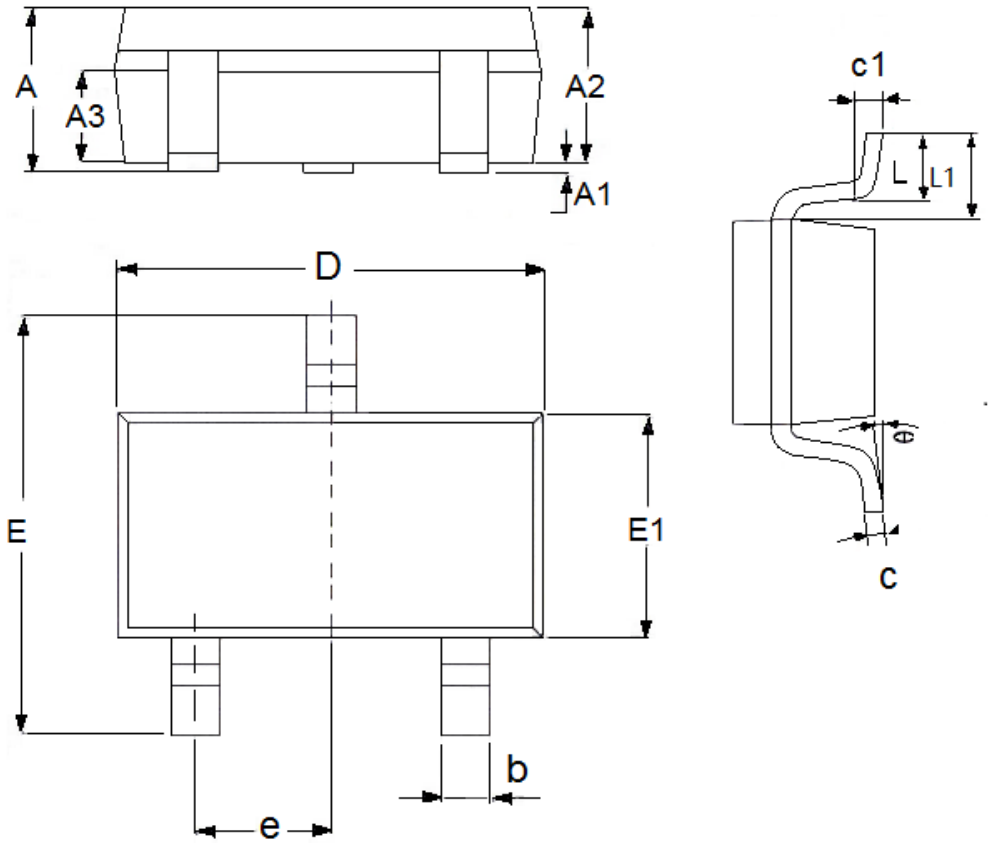
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.4	1.6	0.0551	0.0630
b	0.32	0.52	0.0126	0.0205
b1	0.4	0.58	0.0157	0.0228
c	0.35	0.45	0.0138	0.0177
D	4.4	4.6	0.1732	0.1811
D1	1.55(TYP)		0.061(TYP)	
D2	1.75(TYP)		0.0689(TYP)	
e1	3.0(TYP)		0.1181(TYP)	
E	2.3	2.6	0.0906	0.1023
E1	3.94	4.4	0.1551	0.1732
E2	1.9(TYP)		0.0748(TYP)	
e	1.5(TYP)		0.0591(TYP)	
L	0.8	1.2	0.0315	0.0472
θ	45°		45°	

- **Packaging Type: TO92**



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	3.3	3.7	0.1299	0.1457
A1	1.1	1.4	0.0433	0.0551
b	0.38	0.55	0.015	0.0217
c	0.36	0.51	0.0142	0.0201
D	4.3	4.7	0.1693	0.185
D1	3.43	—	0.135	—
E	4.3	4.7	0.1693	0.185
e	1.27TYP		0.05TYP	
e1	2.44	2.64	0.0961	0.1039
L	14.1	14.5	0.5551	0.5709
h	0	0.38	0	0.015
Φ	—	1.6	—	0.063

- **Packaging Type: SOT23-3**



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.05	1.45	0.0413	0.0571
A1	0	0.15	0.0000	0.0059
A2	0.9	1.3	0.0354	0.0512
A3	0.6	0.7	0.0236	0.0276
b	0.25	0.5	0.0098	0.0197
c	0.1	0.25	0.0039	0.0098
D	2.8	3.1	0.1102	0.1220
E	2.6	3.1	0.1023	0.1220
E1	1.5	1.8	0.0591	0.0709
e	0.95(TYP)		0.0374(TYP)	
L	0.25	0.6	0.0098	0.0236
L1	0.59(TYP)		0.0232(TYP)	
θ	0	8°	0.0000	8°
c1	0.2(TYP)		0.0079(TYP)	

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