1A Adjustable Voltage High Speed LDO Regulators ME6118 Series

General Description

The ME6118 series are highly accurate, low noise, LDO Voltage Regulators that are capable of providing an output current that is in excess of 1A with a maximum dropout voltage of 1.3V at 1A （ME6118A33）.This series contains four fixed output voltages of 1.2V, 1.8V, 2.5V and 3.3V that have no minimum load requirement to maintain regulation. On chip trimming adjusts the reference/output voltage to within ±2% accuracy. Internal protection features consist of output current limiting, safe operating area compensation, and thermal shutdown. The ME6118series can operate with up to 18V input.

Features

- Output Current in Excess of 1A
- Dropout Voltage:80mV@ I_{OUT} =100mA （ME6118A33）
- Operating Voltage Range: 2.5V～18V
- Highly Accuracy: ±2％
- Adjustable Output Voltage Option
- Standby Current: 52uA（TYP.）
- High Ripple Rejection: 70dB@1KHz（ME6118A33）
- Line Regulation:　2mV（TYP.）
- Temperature Stability≤0.5%
- Thermal Shutdown Protection：160℃

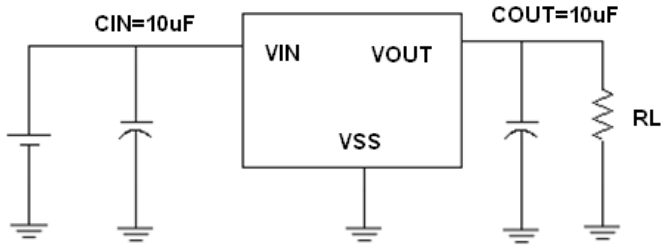
Typical Application

- Consumer and Industrial Equipment Point of Regulation
- Switching Power Supply Post Regulation
- Hard Drive Controllers
- Battery Chargers

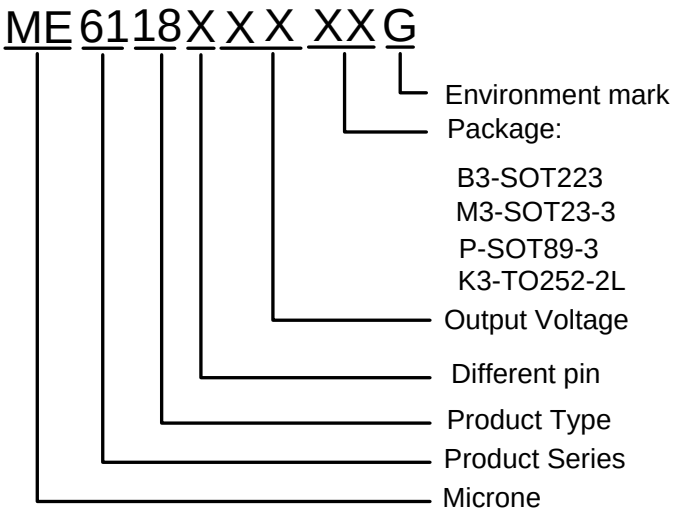
Package

- 3-pin　SOT223 ，SOT23-3，SOT89-3，TO252-2L

Typical Application Circuit



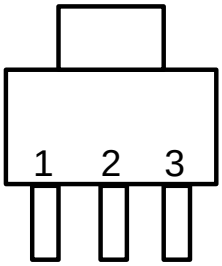
Selection Guide



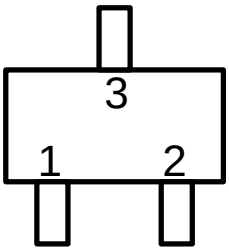
product series	product description
ME6118A12B3G	V_{OUT} =1.2V； Package：SOT223
ME6118A18B3G	V_{OUT} =1.8V； Package：SOT223
ME6118A25B3G	V_{OUT} =2.5V； Package：SOT223
ME6118A33B3G	V_{OUT} =3.3V； Package： SOT223
ME6118A50B3G	V_{OUT} =5.0V； Package：SOT223
ME6118E25B3G	V_{OUT} =2.5V； Package：SOT223； Different pin
ME6118E33B3G	V_{OUT} =3.3V； Package：SOT223； Different pin
ME6118A33M3G	V_{OUT} =3.3V； Package：SOT23-3
ME6118H33M3G	V_{OUT} =3.3V； Package：SOT23-3； Different pin
ME6118A33PG	V_{OUT} =3.3V； Package：SOT89-3
ME6118L50K3G	V_{OUT} =5.0V； Package：TO252-2L； Different pin

NOTE: At present ,there are five kinds of voltage value：1.2V、1.8V、2.5V、3.3V、5.0V。
If you need other voltage and package, please contact our sales staff。

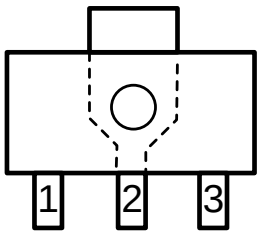
Pin Configuration



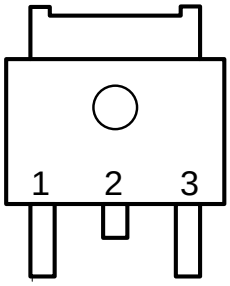
SOT223



SOT23-3



SOT89-3



TO252-2L

Pin Assignment

ME6118AXX

Pin Number				Pin Name	Functions
SOT223	SOT89-3	TO252-2L	SOT23-3		
1	1	1	1	GND	Ground
2	3	2	2	V_{OUT}	Output
3	2	3	3	V_{IN}	Power Input

ME6118EXX

Pin Number		Pin Name	Functions
SOT223	TO252-2L		
1	1	GND	Ground
2	2	V_{IN}	Power Input
3	3	V_{OUT}	Output

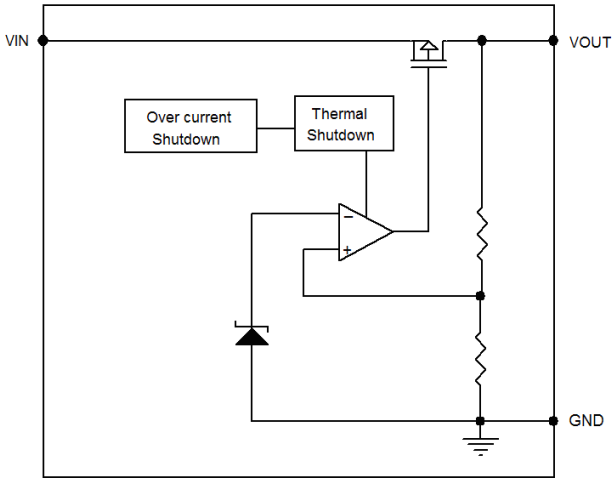
ME6118HXX

Pin Number		Pin Name	Functions
SOT223	TO252-2L		
1	1	V_{OUT}	Output
2	2	GND	Ground
3	3	V_{IN}	Power Input

ME6118LXX

Pin Number		Pin Name	Functions
SOT223	TO252-2L		
1	1	V_{IN}	Power Input
2	2	GND	Ground
3	3	V_{OUT}	Output

Block Diagram



Absolute Maximum Ratings

Parameter		Symbol	Ratings	Units
Input Voltage		V_{IN}	18	V
Output Current		I_{OUT}	1.1	A
Output Voltage		V_{OUT}	Vss-0.3～V_{IN} +0.3	V
ThetaJa	SOT223	θja	70	℃/W
	SOT89-3		100	
	TO252-2L		56	
	SOT23-3		230	
Operating Temperature Range		T_{OPR}	－40～＋125	℃
Storage Temperature Range		T_{STG}	－40～＋150	℃
Lead Temperature			260℃，4sec	

Electrical Characteristics

ME6118A12/E12/H12/L12 (Packages:SOT223 ， SOT89-3,TO252-2L**)**

(V_{IN}= V_{OUT}+1.3V，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, V_{IN}= V_{OUT}+1.3V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	V_{IN}= V_{OUT}+1.3V		800		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT}+1.3V , 1mA≤I_{OUT}≤800mA		3		mV
Dropout Voltage (Note 3)	V_{DIF1}	I_{OUT} =100mA		195		mV
	V_{DIF2}	I_{OUT} =400mA		665		mV
	V_{DIF3}	I_{OUT} =800mA		1250		mV
	V_{DIF4}	I_{OUT} =1000mA		1600		mV
Quiescent Current	I_{ss}	V_{IN}= V_{OUT}+1.3V		53		uA
Line Regulation	ΔV_{OUT}	I_{OUT} =0mA		2		mV

		V_{OUT}+1.3V ≤V_{IN}≤18V				
Thermal Shutdown Protection	T_{sd}	I_{OUT}=10mA, V_{IN}= V_{OUT}+1.3V		155		℃
Over Current Protection	I_{limit}	V_{IN}=3V		1.1		A

ME6118A18/E18/H18/L18 (Packages:SOT223 ， SOT89-3,TO252-2L**)**

(V_{IN}= V_{OUT}+1.2V，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 V_{IN}= V_{OUT}+1.2V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	V_{IN}= V_{OUT}+1.2V		800		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT}+1.2V , 1mA≤I_{OUT}≤800mA		5		mV
Dropout Voltage (Note 3)	V_{DIF1}	I_{OUT} =100mA		115		mV
	V_{DIF2}	I_{OUT} =400mA		450		mV
	V_{DIF3}	I_{OUT} =800mA		940		mV
	V_{DIF4}	I_{OUT} =1000mA		1600		mV
Quiescent Current	I_{ss}	V_{IN}= V_{OUT}+1.2V		52		uA
Line Regulation	ΔV_{OUT}	I_{OUT} =0mA V_{OUT}+1.2V ≤V_{IN}≤18V		2		mV
Thermal Shutdown Protection	T_{sd}	I_{OUT}=10mA V_{IN}= V_{OUT}+1.2V		160		℃
Over Current Protection	I_{limit}	V_{IN}=3.5V		1.1		A

ME6118A25/E25/H25/L25 (Packages:SOT223 ， SOT89-3,TO252-2L**)**

(V_{IN}= V_{OUT}+1.2V，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, V_{IN}= V_{OUT}+1.2V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	V_{IN}= V_{OUT}+1.2V		800		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT}+1.2V , 1mA≤I_{OUT}≤800mA		5		mV
Dropout Voltage (Note 3)	V_{DIF1}	I_{OUT} =100mA		90		mV
	V_{DIF2}	I_{OUT} =500mA		450		mV
	V_{DIF3}	I_{OUT} =800mA		790		mV
	V_{DIF4}	I_{OUT} =1000mA		1300		mV
Quiescent Current	I_{ss}	V_{IN}= V_{OUT}+1.2V		53		uA
Line Regulation	ΔV_{OUT}	I_{OUT} =0mA V_{OUT}+1.2V ≤V_{IN}≤18V		2		mV
Thermal Shutdown	T_{sd}	I_{OUT}=10mA,		160		℃

Protection		V_{IN}= V_{OUT}+1.2V				
Over Current Protection	I_{limit}	V_{IN}=4.0V		1.1		A

ME6118A33/E33/H33/L33 (Packages:SOT223 ， SOT89-3,TO252-2L**)**

(V_{IN}= V_{OUT}+1.2V，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, V_{IN}= V_{OUT}+1.2V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	V_{IN}= V_{OUT}+1.2V		800		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT}+1.2V , 1mA≤I_{OUT}≤800mA		7		mV
Dropout Voltage (Note 3)	V_{DIF1}	I_{OUT} =100mA		80		mV
	V_{DIF2}	I_{OUT} =500mA		400		mV
	V_{DIF3}	I_{OUT} =800mA		680		mV
	V_{DIF4}	I_{OUT} =1000mA		1300		mV
Quiescent Current	I_{ss}	V_{IN}= V_{OUT}+1.2V		53		uA
Line Regulation	ΔV_{OUT}	I_{OUT} =0mA V_{OUT}+1.2V ≤V_{IN}≤18V		2		mV
Thermal Shutdown Protection	T_{sd}	I_{OUT}=10mA, V_{IN}= V_{OUT}+1.2V		160		℃
Over Current Protection	I_{limit}	V_{IN}=5.0V		1.1		A

ME6118A33 (Package: SOT23-3 **)**

(V_{IN}= V_{OUT}+1.2V，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, V_{IN}= V_{OUT}+1.2V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	V_{IN}= V_{OUT}+1.2V		500		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT}+1.2V , 1mA≤I_{OUT}≤500mA		10		mV
Dropout Voltage (Note 3)	V_{DIF1}	I_{OUT} =100mA		70		mV
	V_{DIF2}	I_{OUT} =300mA		220		mV
	V_{DIF3}	I_{OUT} =500mA		385		mV
Quiescent Current	I_{ss}	V_{IN}= V_{OUT}+1.2V		53		uA
Line Regulation	ΔV_{OUT}	I_{OUT} =0mA V_{OUT}+1.2V ≤V_{IN}≤18V		2		mV
Thermal Shutdown Protection	T_{sd}	I_{OUT}=10mA, V_{IN}= V_{OUT}+1.2V		160		℃
Over Current Protection	I_{limit}	V_{IN}=5.0V		1.1		A

ME6118A50/E50/H50/L50 (Packages:SOT223 ， SOT89-3,TO252-2L**)**

(V_{IN}= V_{OUT}+1.2V，$C_{IN=}C_L$=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, V_{IN}= V_{OUT}+1.2V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Maximum Output Current	I_{OUTMAX}	V_{IN}= V_{OUT}+1.2V		800		mA
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT}+1.2V , 1mA≤I_{OUT}≤800mA		8		mV
Dropout Voltage (Note 3)	V_{DIF1}	I_{OUT} =100mA		60		mV
	V_{DIF2}	I_{OUT} =500mA		300		mV
	V_{DIF3}	I_{OUT} =800mA		500		mV
	V_{DIF4}	I_{OUT} =1000mA		900		mV
Quiescent Current	I_{ss}	V_{IN}= V_{OUT}+1.2V		53		uA
Line Regulation	ΔV_{OUT}	I_{OUT} =0mA V_{OUT}+1.2V ≤V_{IN}≤18V		2		mV
Thermal Shutdown Protection	T_{sd}	I_{OUT}=10mA, V_{IN}= V_{OUT}+1.2V		160		℃
Over Current Protection	I_{limit}	V_{IN}=6.5V		1.1		A

Note ：

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

2.V_{OUT} (E) ： Effective Output Voltage (ie. The output voltage when “V_{OUT} (T)+1.2V”is provided at the Vin pin while maintaining a certain Iout value.)

3.V_{DIF}： V_{IN1} –V_{OUT} (E)’

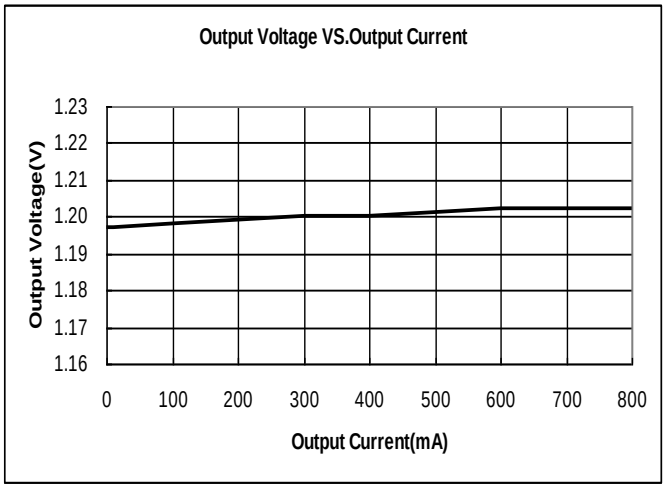
V_{IN1} ： The input voltage when V_{OUT}(E)’ appears as input voltage is gradually decreased.

V_{OUT} (E)’=A voltage equal to 98% of the output voltage whenever an amply stabilized Iout and {V_{OUT} (T)+1.2V} is input.

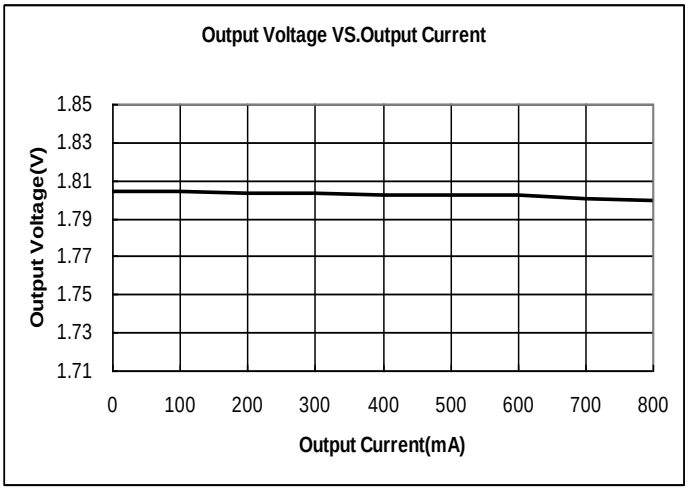
Type Characteristics

（1） Output Voltage VS. Output Current

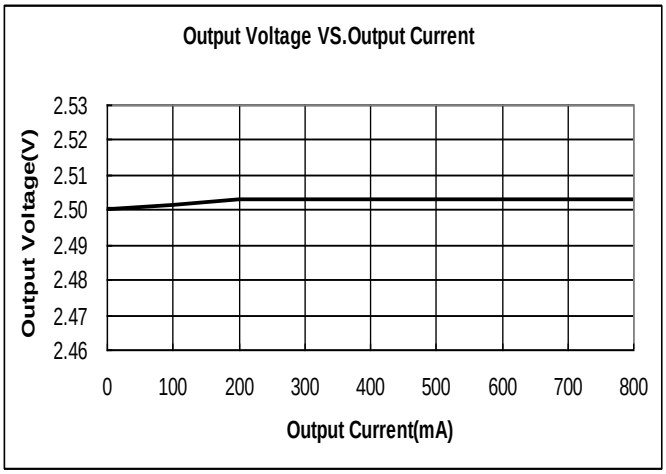
ME6118A12B3G（VIN=V_{OUT}+1.3V）



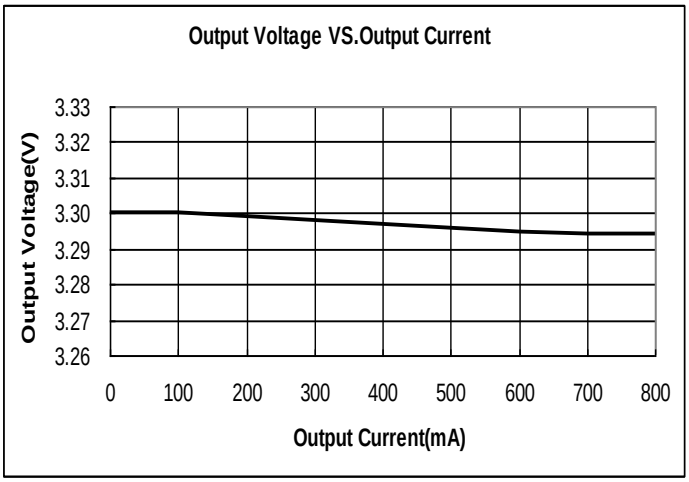
ME6118A18B3G（VIN=V_{OUT}+1.2V）



ME6118A25B3G（VIN=V_{OUT}+1.2V）

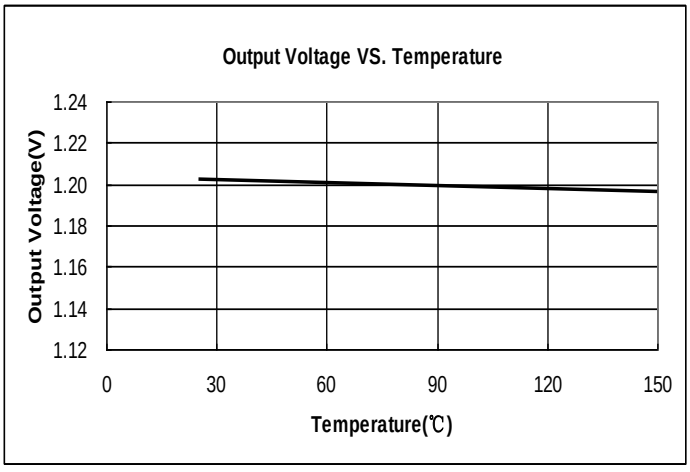


ME6118A33B3G（VIN=V_{OUT}+1.2V）



（2） Output Voltage VS. Temperature

ME6118A12B3G（VIN=V_{OUT}+1.3V , I_{OUT}=10mA）



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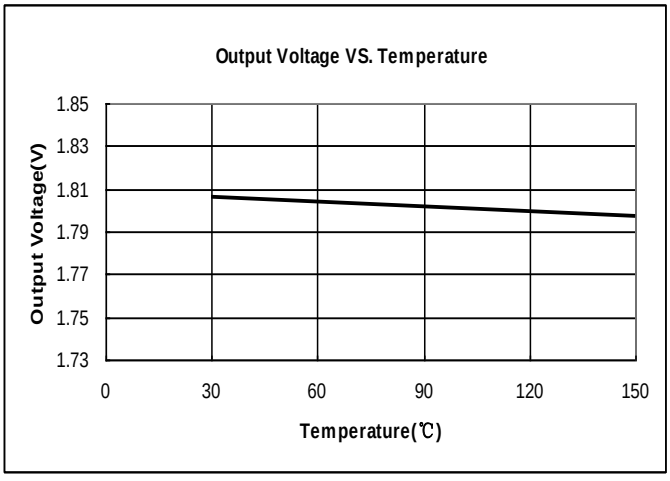
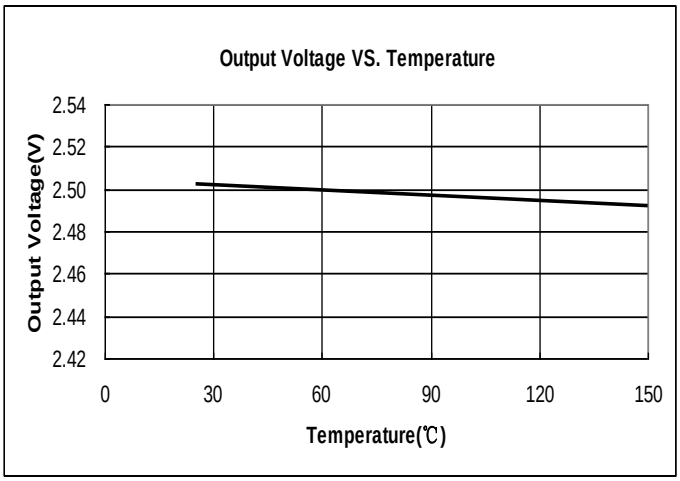
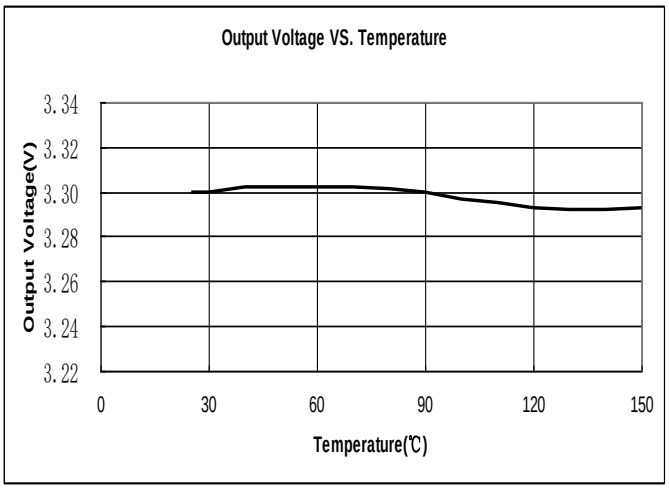


ME6118A25B3G（VIN=V_{OUT}+1.2V , I_{OUT}=10mA）

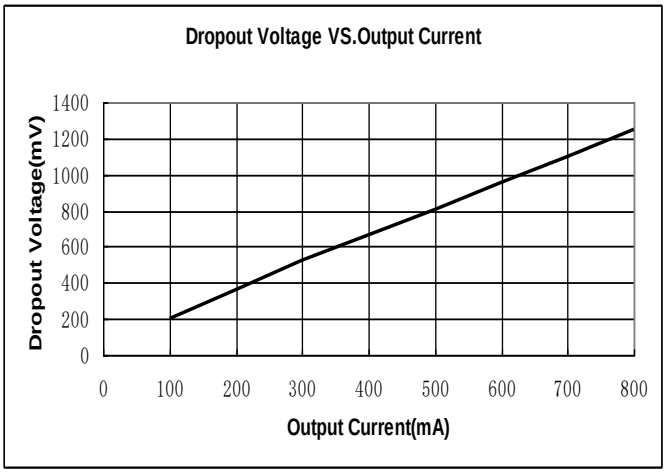


ME6118A33B3G（VIN=V_{OUT}+1.2V , I_{OUT}=10mA）



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

ME6118A12B3G



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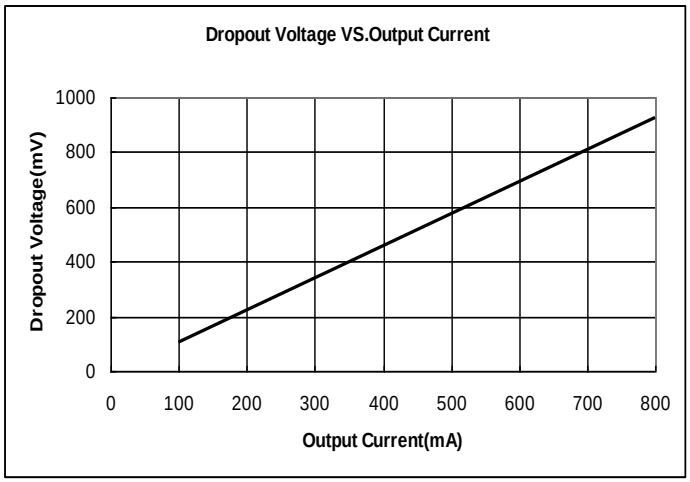

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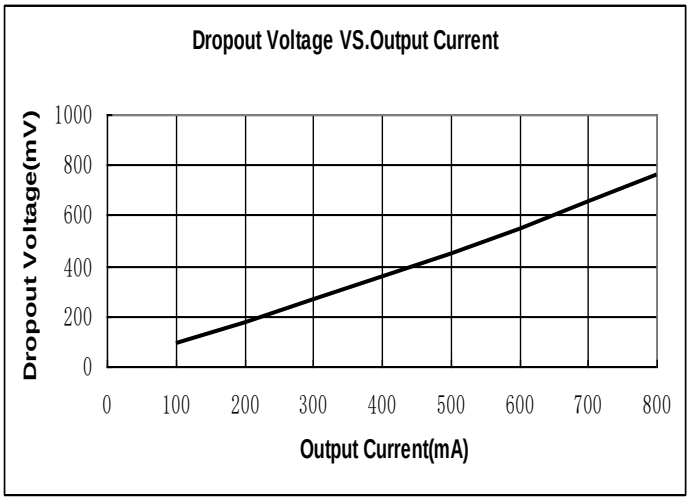

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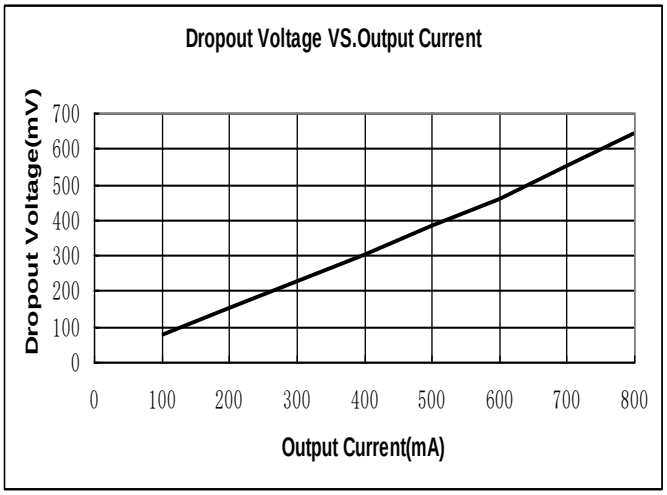
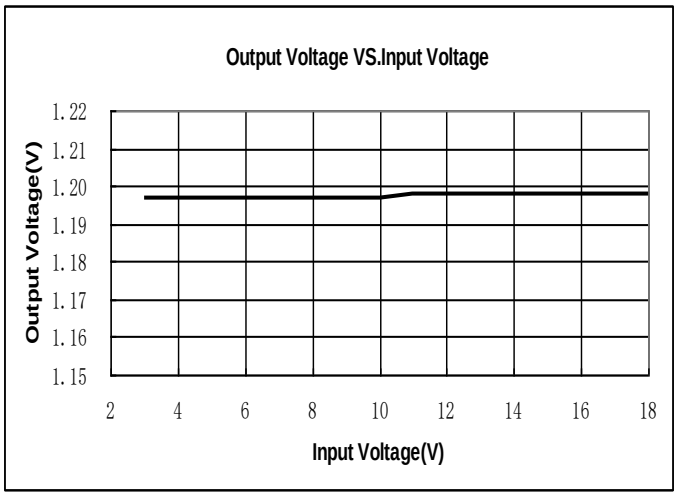
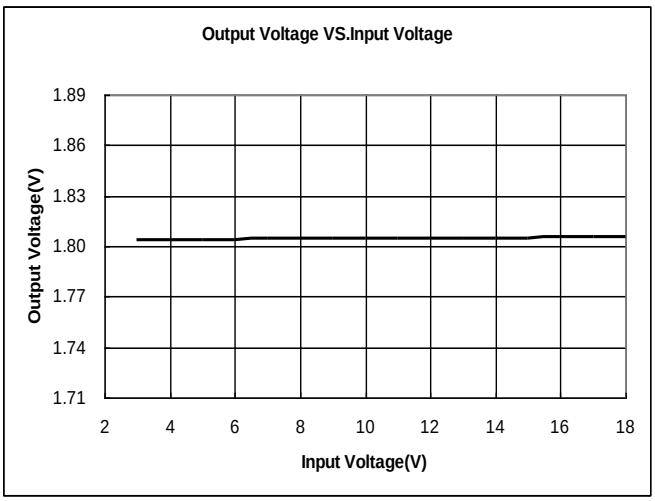


（4）Output Voltage VS. Input Voltage（Ta = 25 °C）

ME6118A12B3G



ME6118A18B3G



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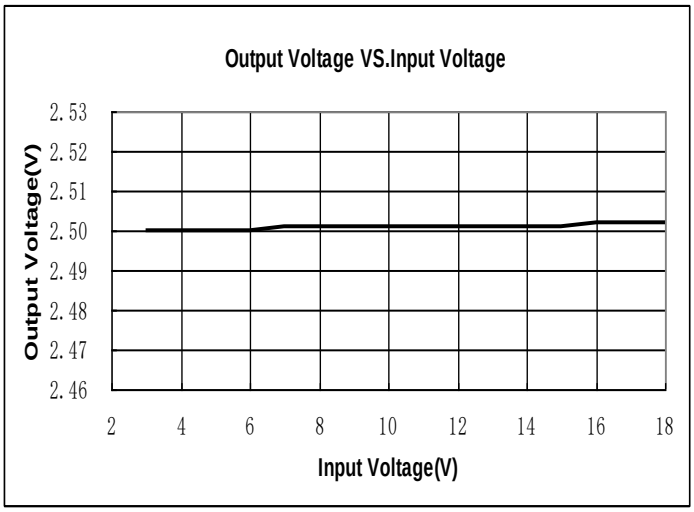
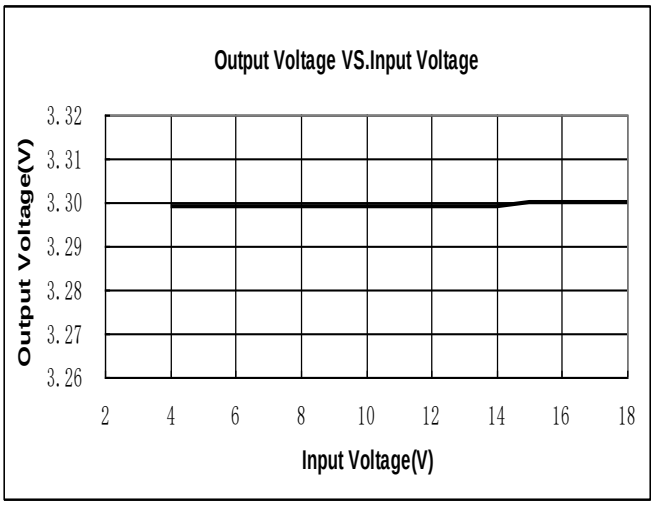
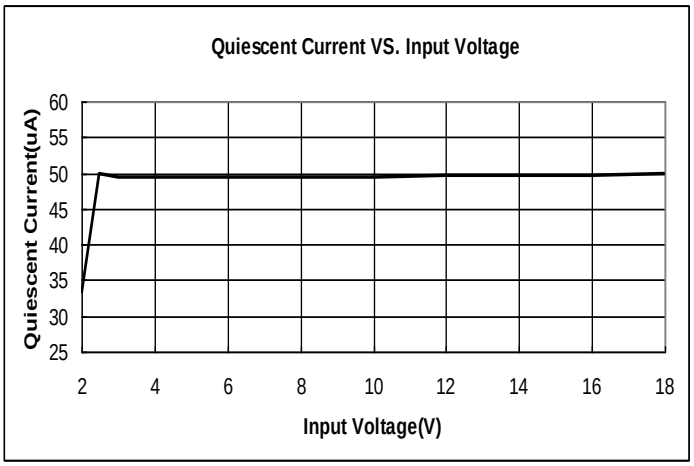


ME6118A33B3G

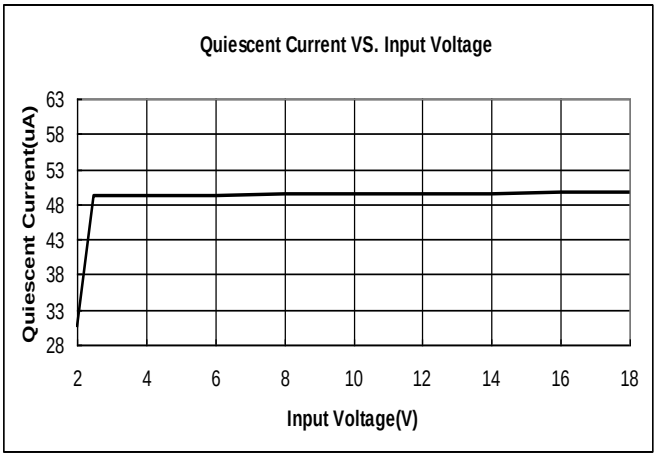


（5）Quiescent Current VS. Input Voltage

ME6118A12B3G



ME6118A18B3G



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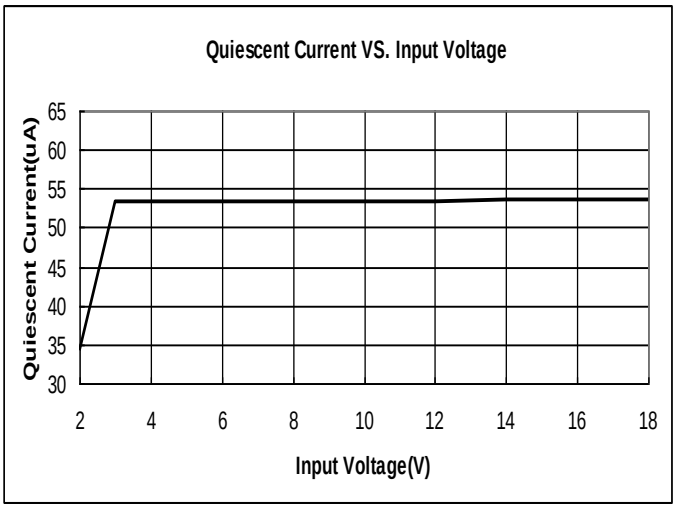
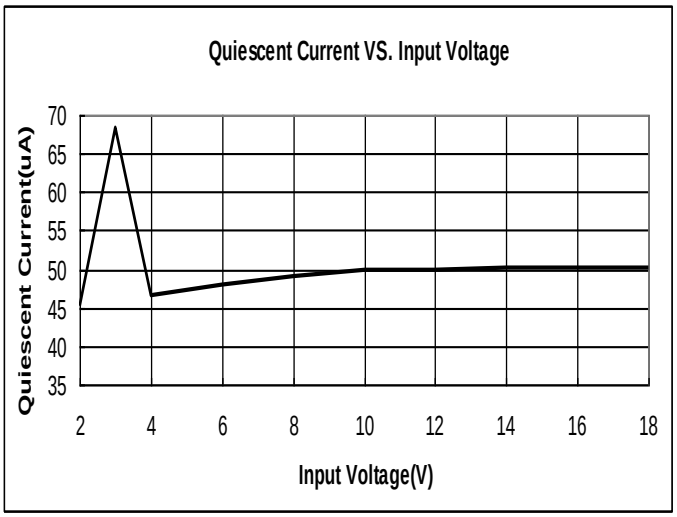


ME6118A33B3G



Applications Information

1. Input Bypass Capacitor

An input capacitor is recommended. A 10uF tantalum on the input is a suitable input bypassing for almost all applications.

2. Output Capacitor

The output capacitor is critical in maintaining regulator stability, and must meet the required conditions for both minimum amount of capacitance and ESR (Equivalent Series Resistance).The minimum output capacitance required by the ME6118 is 10μF,if a tantalum capacitor is used. Any increase of the output capacitance will merely improve the loop stability and transient response. The ESR of the output capacitor should be less than 0.5Ω .

3. Load Regulation

The ME6118 regulates the voltage that appears between its output and ground pins, or between its output and adjust pins. In some cases, line resistances can introduce errors to the voltage across the load. To obtain the best load regulation, a few precautions are needed. Figure1, shows a typical application using a fixed output regulator. The Rt1 and Rt2 are the line resistances. It is obvious that the V_{LOAD} is less than the V_{OUT} by the sum of the voltage drops along the line resistances. In this case, the load regulation seen at the R_{LOAD} would be degraded from the datasheet specification. To improve this , the load should be tied directly to the output terminal on the positive side and directly tied to the ground terminal on the negative side.

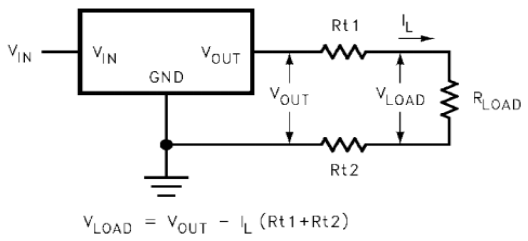
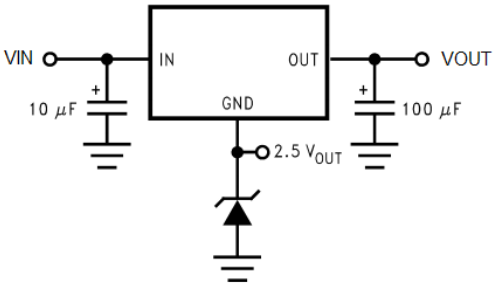


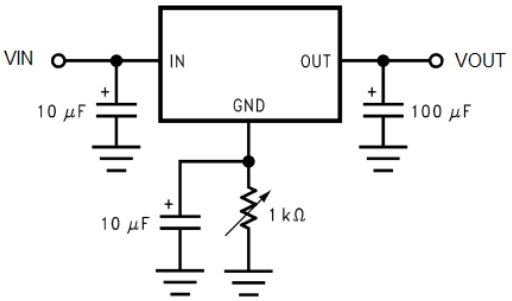
FIGURE 1. Typical Application using Fixed Output Regulator

Application Circuit

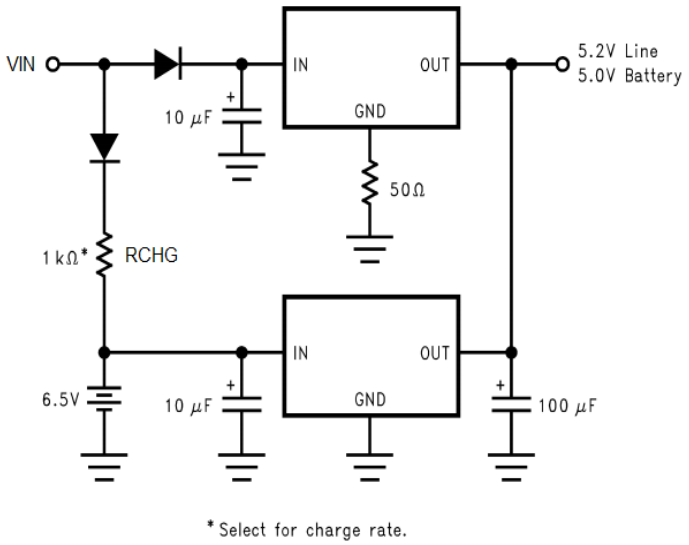
（1）Regulator with Reference



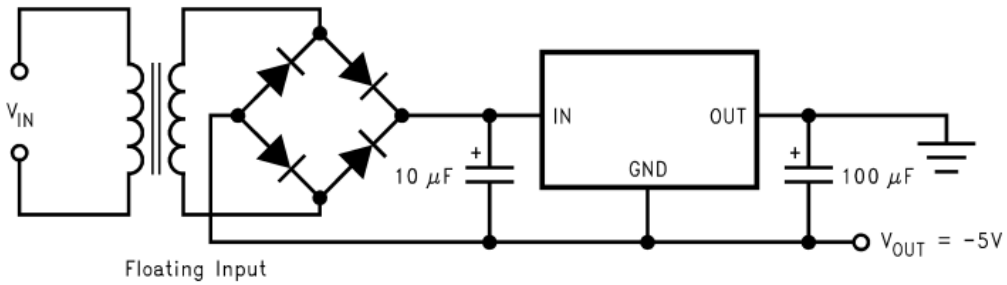
（2）Adjusting Output of Fixed Voltage Regulators



（3）Battery Backed-Up Power Supply

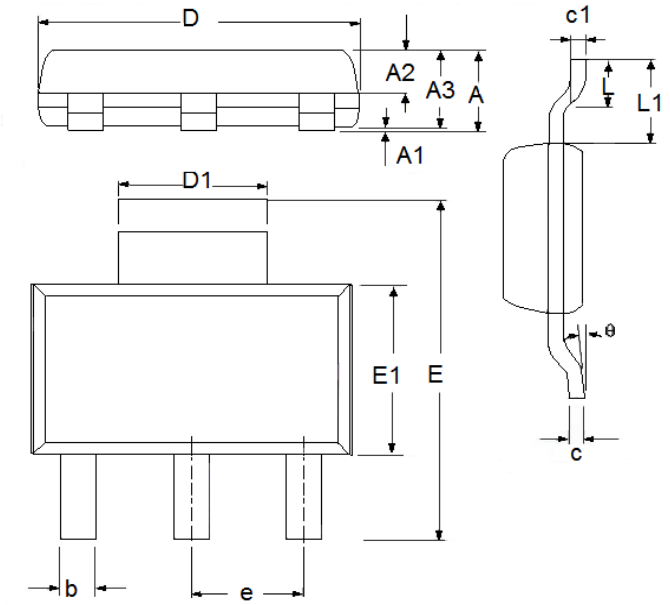


（4）Low Dropout Negative Supply



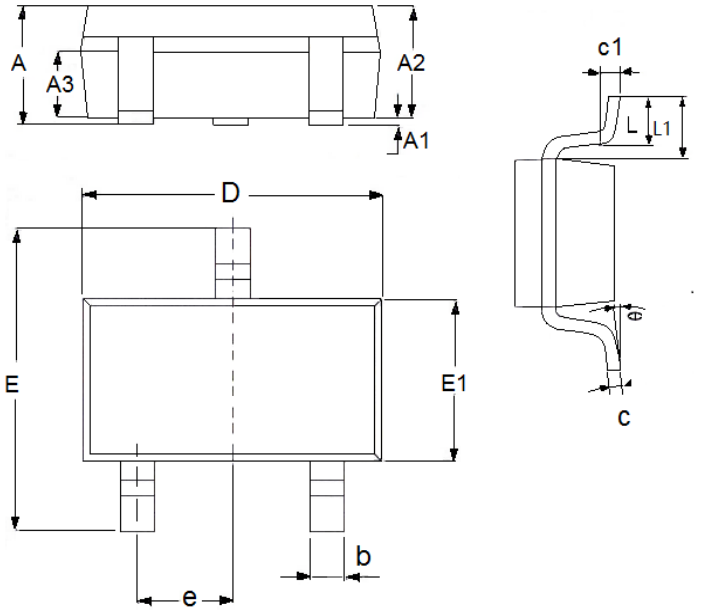
Packaging Information

● SOT223



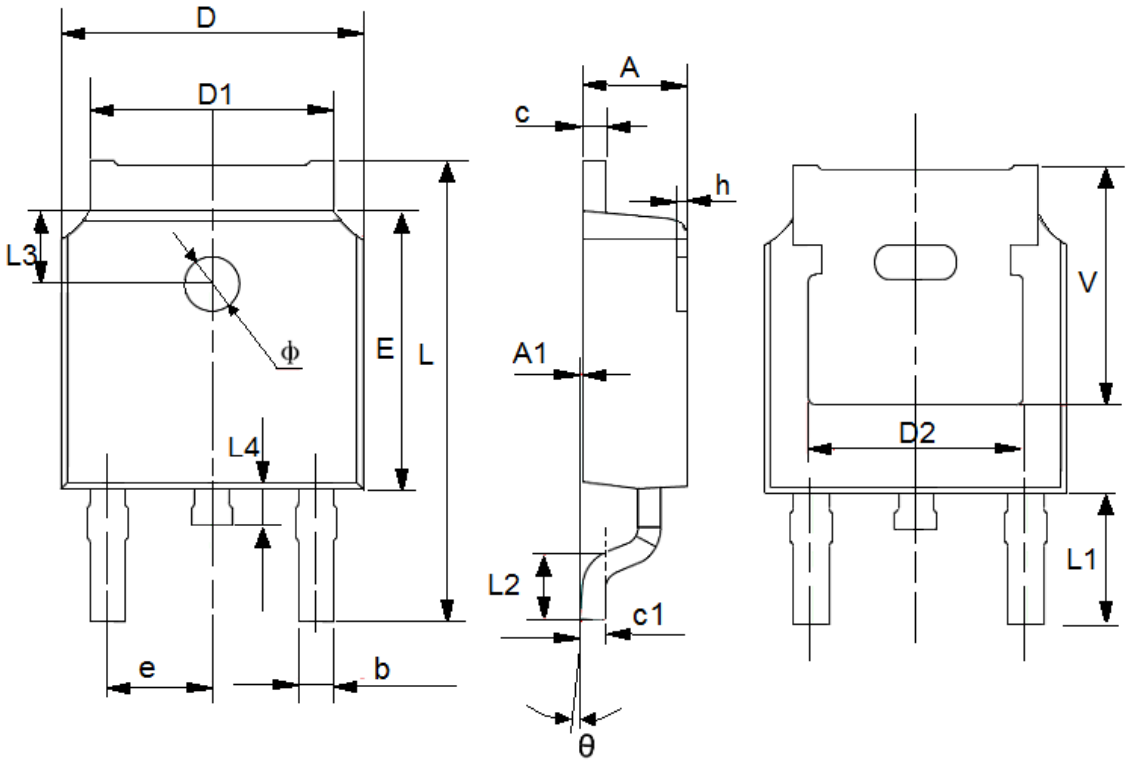
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.5	1.8	0.0591	0.0709
A1	0	0.12	0.0000	0.0047
A2	1.45	1.75	0.0571	0.0689
A3	0.85	0.95	0.0335	0.0374
b	0.6	0.82	0.0236	0.0323
c	0.24	0.35	0.0094	0.0138
D	6.2	6.6	0.2441	0.2598
D1	3.0(TYP)		0.1181(TYP)	
E	6.7	7.3	0.2638	0.2784
E1	3.3	3.7	0.1299	0.1457
e	2.3(TYP)		0.0906(TYP)	
L	0.9	1.15	0.0354	0.0453
L1	1.75(TYP)		0.0689(TYP)	
θ	0	10°	0.0000	10°
c1	0.25(TYP)		0.0098(TYP)	

● SOT23-3



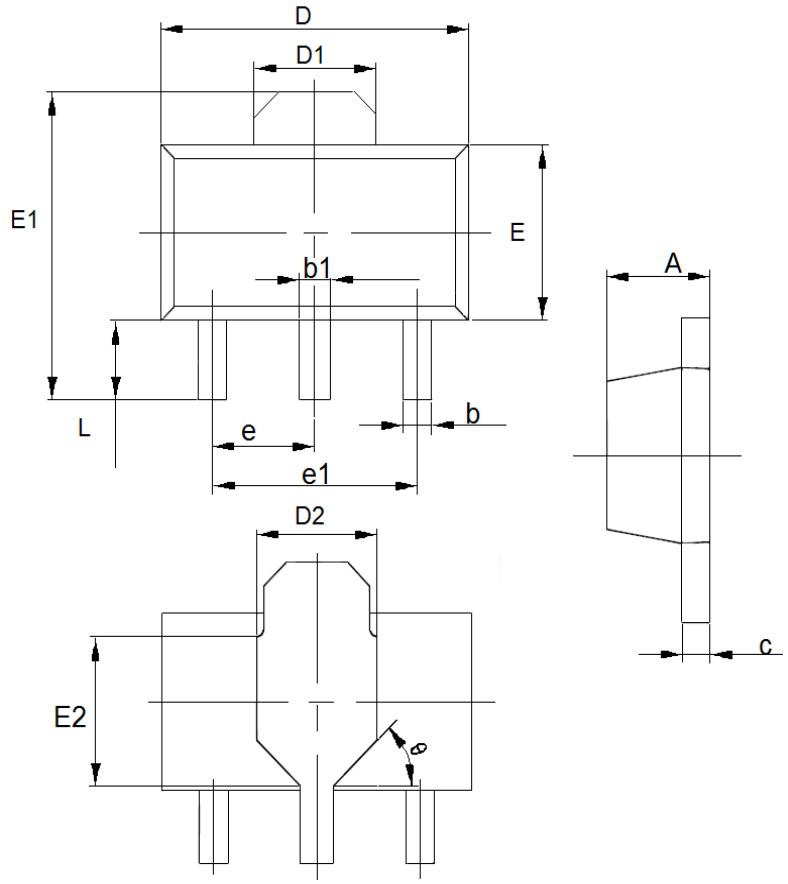
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.0	1.5	0.0394	0.0591
A1	0	0.15	0.0000	0.0059
A2	0.9	1.3	0.0354	0.0512
A3	0.6	0.7	0.0236	0.0276
b	0.25	0.5	0.0098	0.0197
c	0.1	0.25	0.0039	0.0098
D	2.8	3.1	0.1102	0.1220
E	2.6	3.1	0.1023	0.1220
E1	1.5	1.8	0.0591	0.0709
e	0.95(TYP)		0.0374(TYP)	
L	0.25	0.6	0.0098	0.0236
L1	0.59(TYP)		0.0232(TYP)	
θ	0	8°	0.0000	8°
c1	0.2(TYP)		0.0079(TYP)	
L1	0.59(TYP)		0.0232(TYP)	
θ	0	8°	0.0000	8°
c1	0.2(TYP)		0.0079(TYP)	

● TO252-2L



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.2	2.4	0.0866	0.0945
A1	0	0.127	0	0.005
b	0.66	0.86	0.026	0.0339
c	0.46	0.58	0.0181	0.0228
c1	0.498	0.6	0.0196	0.0236
D	6.5	6.7	0.2559	0.2638
D1	5.33(TYP)		0.2098(TYP)	
D2	4.83(TYP)		0.1902(TYP)	
E	6	6.2	0.2362	0.2441
e	2.286(TYP)		0.09(TYP)	
L	9.8	10.4	0.3858	0.4094
L1	2.9(TYP)		0.1142(TYP)	
L2	1.4	1.7	0.0551	0.0669
L3	1.8(TYP)		0.07(TYP)	
L4	0.6	1	0.0236	0.0394
h	0	0.3	0	0.0118
Φ	1.1	1.3	0.0433	0.0512
V	5.3(TYP)		0.2087(TYP)	
θ	0	8°	0	8°

● 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°	

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