500mA，Low Quiescent, Low Dropout LDO Linear Regulators

ME6210 Series

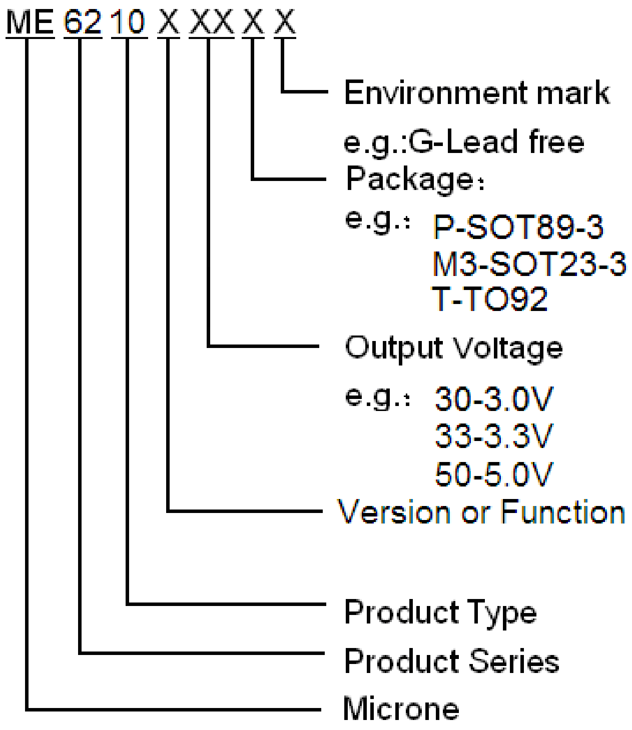
General Description

ME6210 series are low quiescent, low-dropout linear voltage regulators.ME6210 series are based on the CMOS process and allow high voltage input .The allow operation voltage as high as 18V. ME6210 series have short circuit protection function.

Features

- High output accuracy：± 2%
- Input voltage：2V to 18 V
- Output voltage：1.5V ~ 5.0V
- Ultra-low quiescent current (Typ. = 1.5 μ A)
- Output Current：Iout = 500mA （When Vin = 4V and Vout =3V）
  Low dropout voltage: 11mV@ Iout =10mA (Typ. Vout = 3.0V)
- Input good stability：Typ. 0.03% / V
- Short-circuit Current:：Typ. 50mA
- Ceramic capacitor can be used
- Package：SOT89-3, SOT23-3, TO-92.

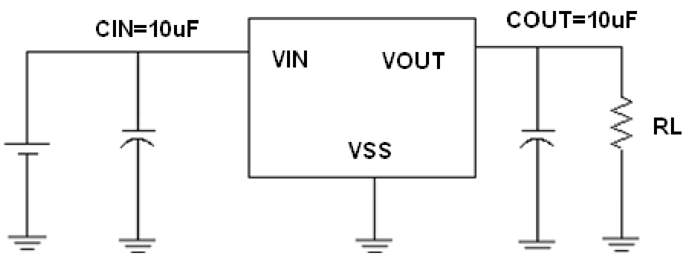
Selection Guide



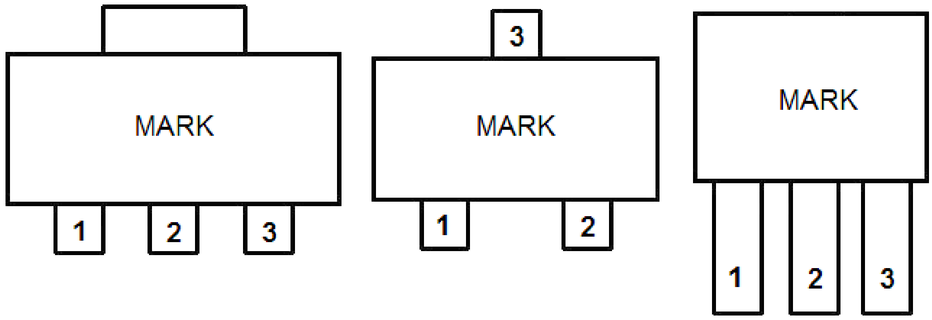
Typical Application

- Power source for home electric/electronic appliances
- Power source for battery-powered devices
- Power source for personal communication devices

Typical Application Circuit



Pin Configuration



SOT89-3 SOT23-3 TO92

Pin Assignment

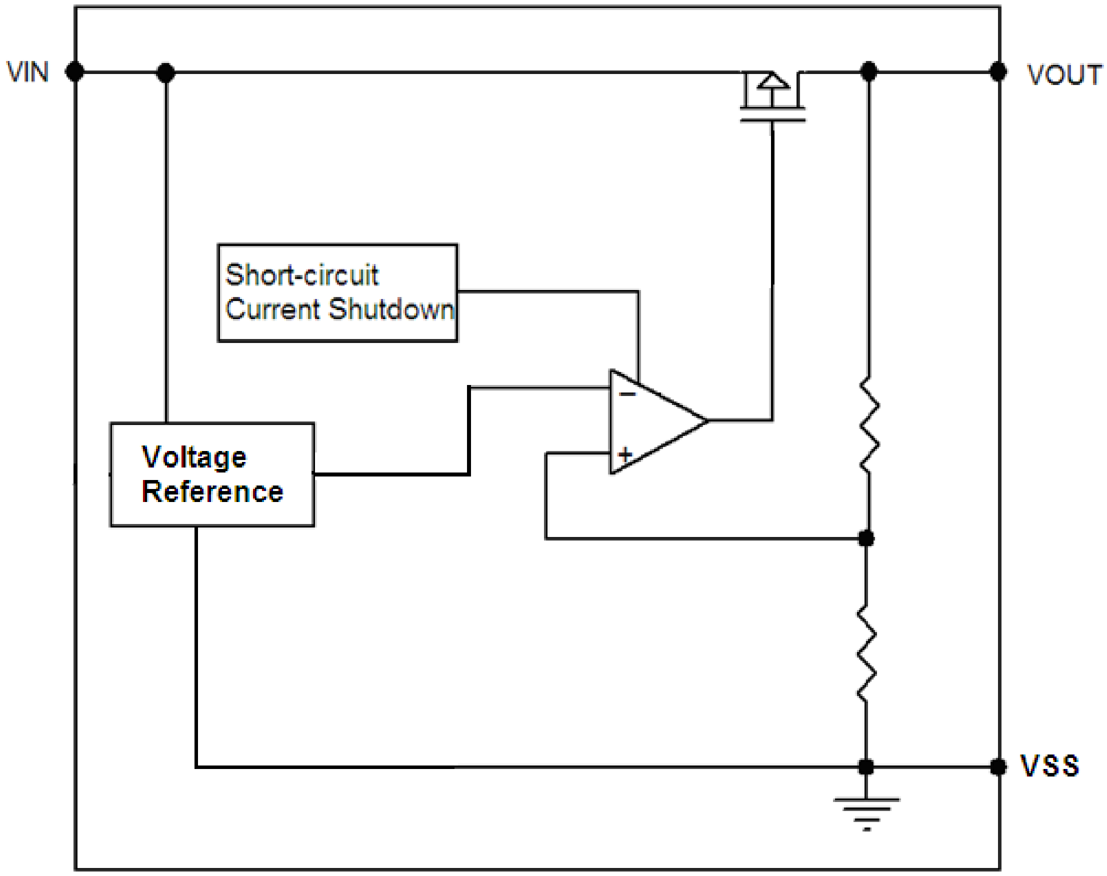
ME6210AXX

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

Absolute Maximum Ratings

Parameter		Symbol	Ratings	Units
Input Voltage		V_{IN}	18	V
Output Current		I_{OUT}	700	mA
Output Voltage		V_{OUT}	Vss-0.3～V_{IN} +0.3	V
Power Dissipation	SOT89-3	P_D	500	mW
	TO92		500	mW
	SOT23-3		300	mW
Operating Temperature Range		T_{OPR}	－25～＋85	℃
Storage Temperature Range		T_{STG}	－40～＋125	℃
Lead Temperature			260℃，10sec	

Block Diagram



Electrical Characteristics

ME6210A30

(V_{IN}= V_{OUT}+1.0V，$C_{IN=}C_{OUT}$=10uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=40mA, V_{IN}=Vout+1V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}				18	V
Maximum Output Current	I_{OUT} _max	V_{IN}=Vout+1V	500	500		mA
Load Regulation	ΔV_{OUT}	V_{IN}=Vout+1V, 1mA≤I_{OUT}≤200mA		12	30	mV
Dropout Voltage (Note 3)	V_{DIF1}	I_{OUT} =10mA		11	14	mV
	V_{DIF2}	I_{OUT} =100mA		110	140	mV
	V_{DIF3}	I_{OUT} =200mA		220	280	mV

Supply Current	I_{SS}	V_{IN}=Vout+1V		1.5	2.5	μ A
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT} =10mA Vout+1V ≤V_{IN}≤18V		0.03	0.1	%/V
Temperature coefficient	$\frac{\Delta V_{OUT}}{\Delta Ta \times V_{OUT}}$	V_{IN}=Vout+1V ,I_{OUT} =10mA -40℃≤Ta≤125℃		±60	±100	Ppm/℃
Short-circuit Current	Ishort	V_{IN}=Vout+1V		50	70	mA

ME6210A33

(V_{IN}= V_{OUT}+1.0V，C_{IN}=C_{OUT}=10uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=40mA, V_{IN}=Vout+1V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}				18	V
Maximum Output Current	I_{OUT} _max	V_{IN}=Vout+1V	500	500		mA
Load Regulation	ΔV_{OUT}	V_{IN}=Vout+1V, 1mA≤I_{OUT}≤200mA		12	30	mV
Dropout Voltage (Note 3)	V_{DIF1}	I_{OUT} =10mA		10	13	mV
	V_{DIF2}	I_{OUT} =100mA		100	130	mV
	V_{DIF3}	I_{OUT} =200mA		200	260	mV
Supply Current	I_{SS}	V_{IN}=Vout+1V		1.6	2.5	μ A
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT} =10mA Vout+1V ≤V_{IN}≤18V		0.03	0.1	%/V
Temperature coefficient	$\frac{\Delta V_{OUT}}{\Delta Ta \times V_{OUT}}$	V_{IN}=Vout+1V ,I_{OUT} =10mA -40℃≤Ta≤125℃		±60	±100	Ppm/℃
Short-circuit Current	Ishort	V_{IN}=Vout+1V		50	70	mA

ME6210A50

(V_{IN}= V_{OUT}+1.0V，C_{IN}=C_{OUT}=10uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=40mA, V_{IN}=Vout+1V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}				18	V
Maximum Output Current	I_{OUT} _max	V_{IN}=Vout+1V	500	500		mA
Load Regulation	ΔV_{OUT}	V_{IN}=Vout+1V, 1mA≤I_{OUT}≤200mA		10	30	mV

Dropout Voltage (Note 3)	V_{DIF1}	I_{OUT} =10mA		8	11	mV
	V_{DIF2}	I_{OUT} =100mA		80	110	mV
	V_{DIF3}	I_{OUT} =200mA		160	220	mV
Supply Current	I_{SS}	V_{IN}=Vout+1V		1.7	2.5	μ A
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT} =10mA Vout+1V ≤V_{IN}≤18V		0.03	0.1	%/V
Temperature coefficient	$\frac{\Delta V_{OUT}}{\Delta Ta \times V_{OUT}}$	V_{IN}=Vout+1V ,I_{OUT} =10mA -40℃≤Ta≤125℃		±60	±100	Ppm/℃
Short-circuit Current	Ishort	V_{IN}=Vout+1V		50	70	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.

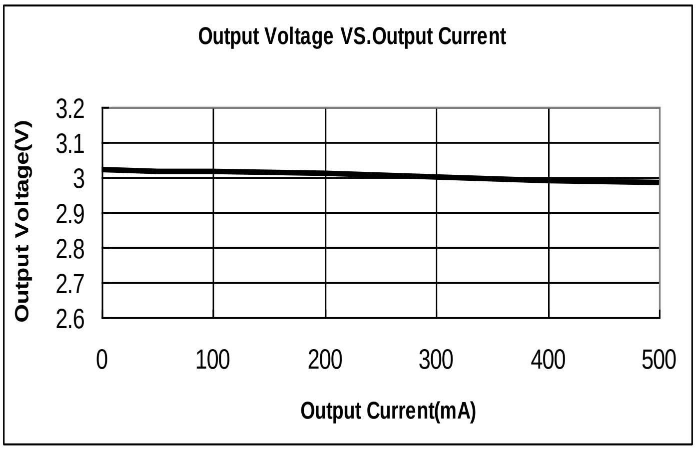
V_{OUT} (E)’=A voltage equal to 98% of the output voltage whenever an amply stabilized Iout and {V_{OUT} (T) +1.0V} is input.

Precautions

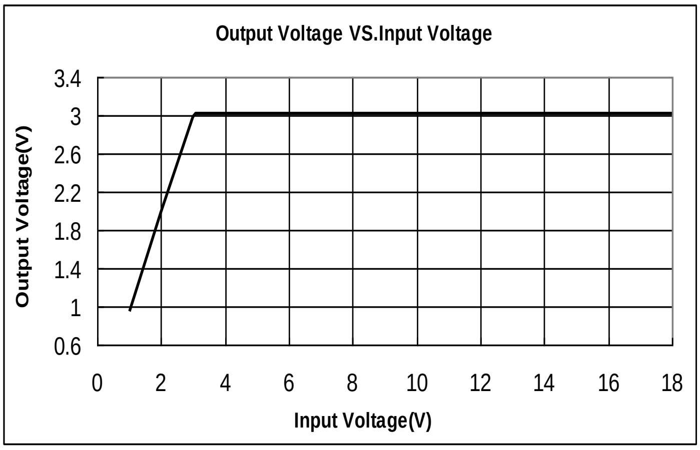
- During the test, if AC/DC power supply and the ceramic chip capacitors collocation is used, there may be serious voltage spike phenomenon instantaneously. When the power supply access to 15V, the voltage is rushed to about 30V instantaneously. Because of exceeding the limit voltage of chip, the chip is damaged. If you string a small resistance of 1 ohm in the input end during the test, the peak phenomenon can be avoided.
- In the test, there is serious burr phenomenon only when the AC/DC power is used with ceramic chip capacitors. But electrolytic capacitors and tantalum capacitance won't appear above phenomenon. Please be sure to pay attention to this point when you use AC/DC power.
- In normal use, when any type of capacitor is used with battery or the supply of fire power, the above phenomenon doesn’t occur.

Type Characteristics

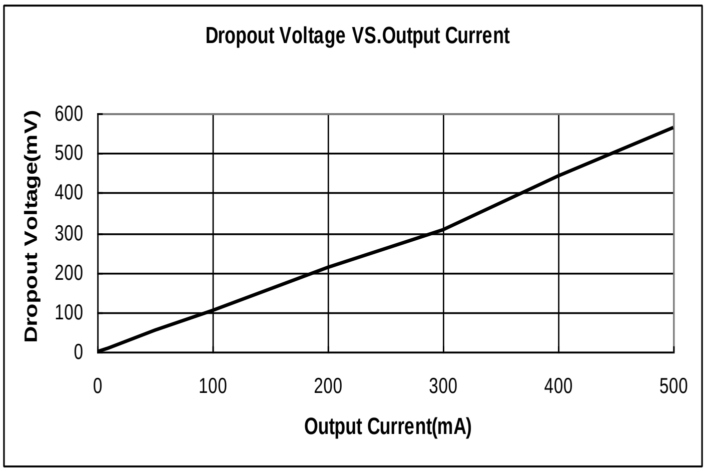
（1） Output Voltage VS. Output Current
（ Ta = 25 °C，VIN=4V） ME6210A30



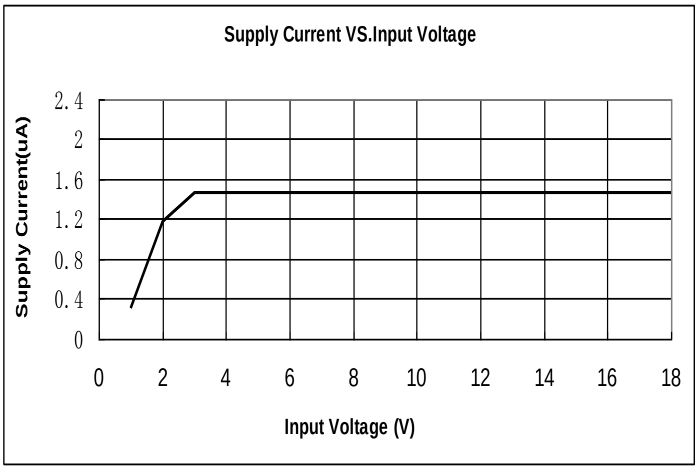
（2）Output Voltage VS. Input Voltage
（Ta = 25 °C，Iout=10mA） ME6210A30



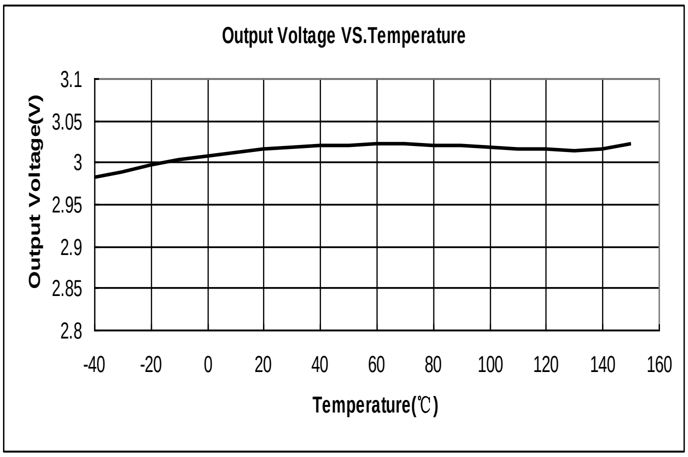
（3）Dropout Voltage VS. Output Current
（ Ta = 25 °C） ME6210A30



（4）Supply Current VS. Input Voltage
（ Ta = 25 °C） ME6210A30

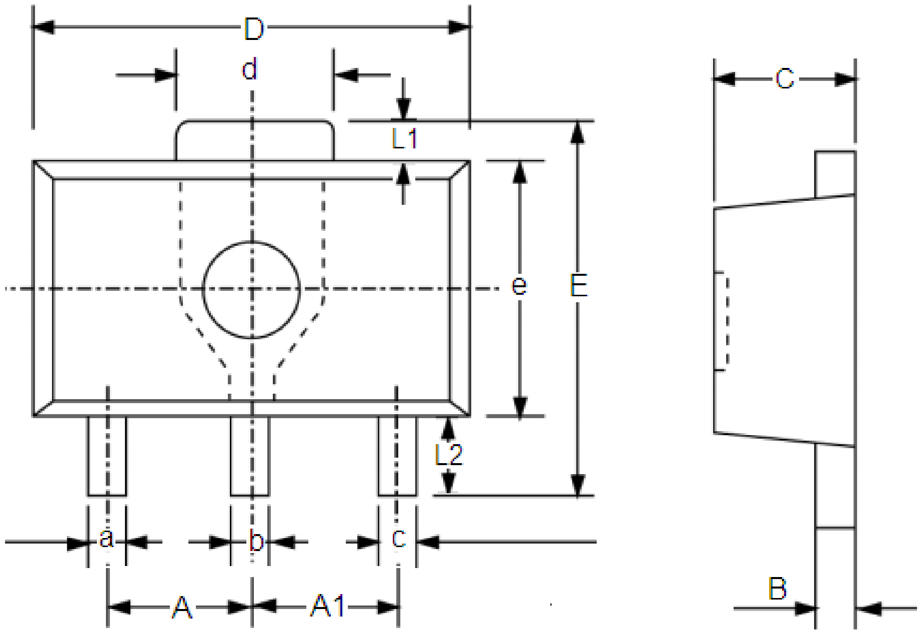


（5）Output Voltage VS. Temperature（VIN=4V ,Iout=10mA） ME6210A30



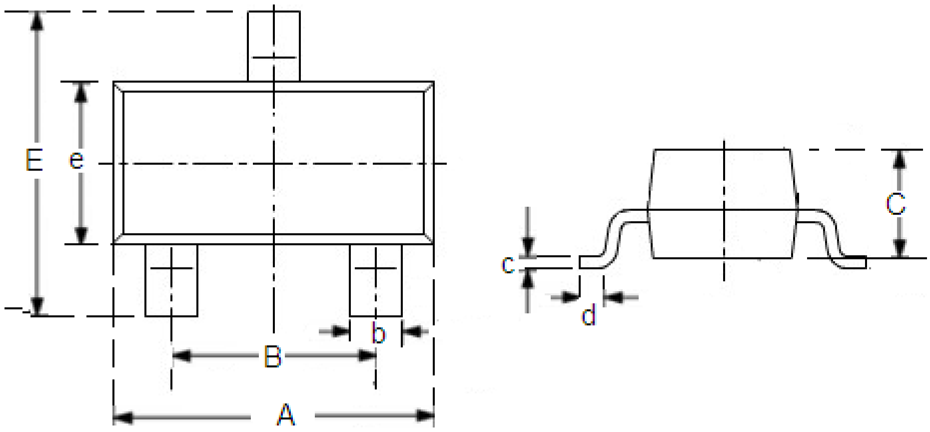
Packaging Information

- SOT89-3



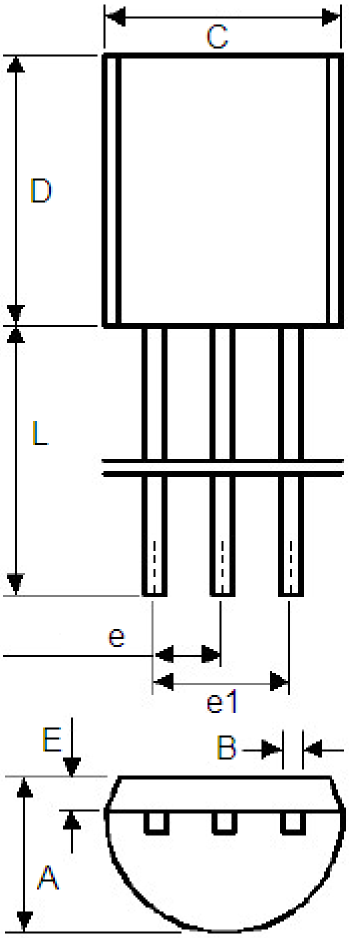
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.4	1.6	0.0551	0.0630
A1	1.4	1.6	0.0551	0.0630
a	0.36	0.48	0.0142	0.0189
b	0.41	0.53	0.0161	0.0209
c	0.36	0.48	0.0142	0.0189
d	1.4	1.75	0.0551	0.0689
B	0.38	0.43	0.015	0.0169
C	1.4	1.6	0.0551	0.0630
D	4.4	4.6	0.1732	0.181
E	-	4.25	-	0.1673
e	2.4	2.6	0.0945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

- 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

- TO-92



	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

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