



Low power consumption, Low ESR Cap. Compatible

General Description

ME6216 series are highly precise, low power consumption, positive voltage regulators manufactured using CMOS technologies. The series provides large currents with a significantly small dropout voltage.

The series is compatible with low ESR ceramic capacitors. The current limiter's foldback circuit also operates as a short protect for the output current limiter and the output pin.

Features

- Output voltage range: 1.0V~5.0V
- Input voltage: up to 6 V
- Dropout Voltage: 110mV@ $I_{OUT}=100mA$
240mV@ $I_{OUT}=200mA$
- Highly Accuracy: $\pm 1\%$
- Low power consumption: 6 μA (TYP.)
- Large output current: 300mA ($V_{IN}=4.3V, V_{OUT}=3.3V$)
- Excellent Input Stability
- Be available to regulator and reference voltage

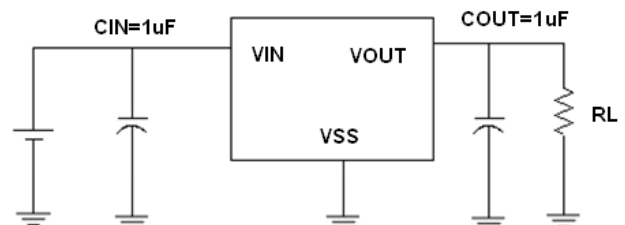
Typical Application

- Communication tools
- Mobile phones
- Portable games
- Portable AV systems
- Cameras, Video systems
- Reference voltage sources

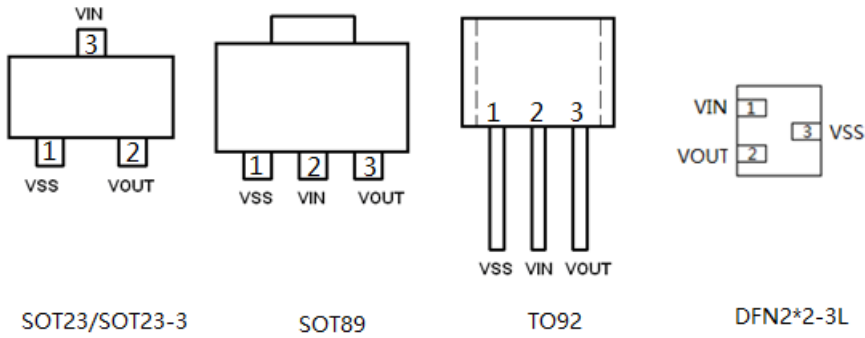
Package

- 3-pin SOT89-3, SOT23-3, SOT23, TO92, DFN2*2-3L

Typical Application Circuit



Pin Configuration

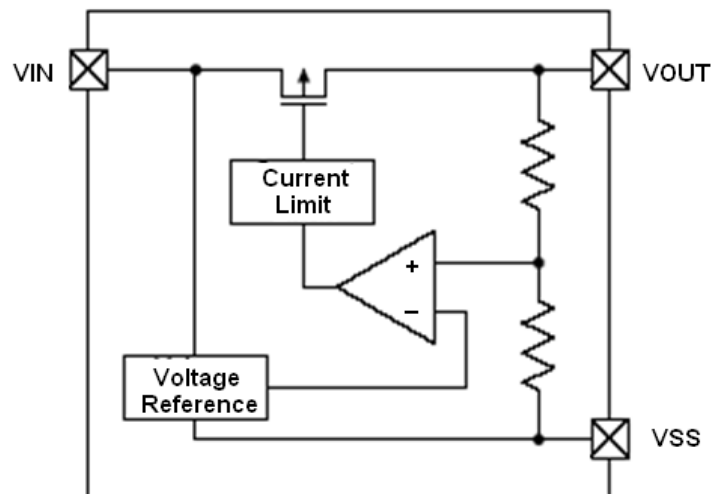


Pin Assignment

ME6216Axx

Pin					Name	Function
M3	P	X	T	N3		
SOT23-3	SOT89-3	SOT23	TO-92	DFN3L		
1	1	1	1	3	VSS	Ground
2	3	2	3	2	VOUT	Output
3	2	3	2	1	VIN	Input

Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Description	Units	
Input Voltage	V_{IN}	6.5	V	
Output Current	I_{OUT}	390	mA	
Output Voltage	V_{OUT}	$V_{SS}-0.3 \sim V_{out}+0.3$	V	
Power Dissipation	SOT23-3	P_d	300	mW
	SOT89-3	P_d	500	mW
	SOT23	P_d	300	mW
	TO-92	P_d	500	mW
	DFN3L	P_d	500	mW
Operating Ambient Temperature	T_{Opr}	-25 ~ +125	°C	
Storage Temperature	T_{stg}	-40 ~ +125	°C	

Electrical Characteristics

ME6216 ($V_{out}=1.2V$)

($V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1\mu F, T_a=25^{\circ}C$ Unless otherwise stated)

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage ($V_{out}=1.0\sim 1.3V$)	$V_{OUT(E)}$ (Note 2)	$I_{OUT}=10mA,$ $V_{IN}=V_{OUT}+1V$	$V_{OUT(T)}$ -0.015	$V_{OUT(T)}$ (Note 1)	$V_{OUT(T)}$ +0.015	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	$I_{OUT (max)}$	$V_{IN}= V_{OUT} +1V$		250		mA
Load Regulation	ΔV_{OUT}	$V_{IN}= V_{OUT} +1V$ $1mA \leq I_{OUT} \leq 100mA$		8	12	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{OUT} =100mA$		320	350	mV
	V_{dif2}	$I_{OUT} =200mA$		570	600	mV
Supply Current	I_{SS}	$V_{IN}= V_{OUT} +1V$		6	8	μA
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT} =10mA$ $V_{out}+1V \leq V_{IN} \leq 6V$		0.05	0.2	%/V
Power Supply Ripple Rejection Ratio	PSRR	$V_{in}= [V_{OUT} +1]V$ +1Vp-pAC $I_{OUT} =10mA, f=1kHz$		65		dB
Short Circuit Current	I_{short}	$V_{in}= V_{OUT} (T)+1V$ $V_{OUT} =V_{SS}$		50	70	mA
Over Current Protection	I_{limit}	$V_{IN}= V_{OUT} +1V$		310	340	mA

ME6216 (Vout=1.4V)

($V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1\mu F, T_a=25^{\circ}C$ Unless otherwise stated)

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	$V_{OUT(E)}$ (Note 2)	$I_{OUT}=10mA,$ $V_{IN}=V_{OUT}+1V$	X 0.99	$V_{OUT(T)}$ (Note 1)	X 1.01	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	$I_{OUT} (max)$	$V_{IN}= V_{OUT} +1V$		250		mA
Load Regulation	ΔV_{OUT}	$V_{IN}= V_{OUT} +1V$ $1mA \leq I_{OUT} \leq 100mA$		8	12	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{OUT} =100mA$		280	300	mV
	V_{dif2}	$I_{OUT} =200mA$		510	530	mV
Supply Current	I_{SS}	$V_{IN}= V_{OUT} +1V$		6	8	μA
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT} =10mA$ $V_{out}+1V \leq V_{IN} \leq 6V$		0.05	0.2	%/V
Power Supply Ripple Rejection Ratio	PSRR	$V_{in}= [V_{OUT} +1]V$ $+1V_{p-pAC}$ $I_{OUT} =10mA, f=1kHz$		65		dB
Short Circuit Current	I_{short}	$V_{in}= V_{OUT} (T)+1V$ $V_{OUT} =V_{SS}$		50	70	mA
Over Current Protection	I_{limit}	$V_{IN}= V_{OUT} +1V$		380	420	mA

ME6216 (Vout=1.8V)

($V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1\mu F, T_a=25^{\circ}C$ Unless otherwise stated)

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	$V_{OUT(E)}$ (Note 2)	$I_{OUT}=10mA,$ $V_{IN}=V_{OUT}+1V$	X 0.99	$V_{OUT(T)}$ (Note 1)	X 1.01	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	$I_{OUT} (max)$	$V_{IN}= V_{OUT} +1V$		300		mA
Load Regulation	ΔV_{OUT}	$V_{IN}= V_{OUT} +1V$ $1mA \leq I_{OUT} \leq 100mA$		8	12	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{OUT} =100mA$		190	210	mV
	V_{dif2}	$I_{OUT} =200mA$		380	400	mV
Supply Current	I_{SS}	$V_{IN}= V_{OUT} +1V$		6	8	μA
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT} =10mA$ $V_{out}+1V \leq V_{IN} \leq 6V$		0.05	0.2	%/V

Power Supply Ripple Rejection Ratio	PSRR	$V_{in} = [V_{OUT} + 1]V$ $+1V_{p-pAC}$ $I_{OUT} = 10mA, f = 1kHz$		65		dB
Short Circuit Current	I_{short}	$V_{in} = V_{OUT}(T) + 1V$ $V_{OUT} = VSS$		50	70	mA
Over Current Protection	I_{limit}	$V_{IN} = V_{OUT} + 1V$		380	420	mA

ME6216(Vout=2.8V)

($V_{IN} = V_{OUT} + 1V, C_{IN} = C_{OUT} = 1\mu F, T_a = 25^\circ C$ Unless otherwise stated)

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	$V_{OUT}(E)$ (Note 2)	$I_{OUT} = 10mA,$ $V_{IN} = V_{OUT} + 1V$	X 0.99	$V_{OUT}(T)$ (Note 1)	X 1.01	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	$I_{OUT} (max)$	$V_{IN} = V_{OUT} + 1V$		300		mA
Load Regulation	ΔV_{OUT}	$V_{IN} = V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 100mA$		8	14	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{OUT} = 100mA$		120	140	mV
	V_{dif2}	$I_{OUT} = 200mA$		230	250	mV
Supply Current	I_{SS}	$V_{IN} = V_{OUT} + 1V$		5	8	μA
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT} = 10mA$ $V_{out} + 1V \leq V_{IN} \leq 6V$		0.05	0.2	%/V
Power Supply Ripple Rejection Ratio	PSRR	$V_{in} = [V_{OUT} + 1]V$ $+1V_{p-pAC}$ $I_{OUT} = 10mA, f = 1kHz$		65		dB
Short Circuit Current	I_{short}	$V_{in} = V_{OUT}(T) + 1V$ $V_{OUT} = VSS$		50	70	mA
Over Current Protection	I_{limit}	$V_{IN} = V_{OUT} + 1V$		380	420	mA

ME6216(Vout=3.3V)

($V_{IN} = V_{OUT} + 1V, C_{IN} = C_{OUT} = 1\mu F, T_a = 25^\circ C$ Unless otherwise stated)

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	$V_{OUT}(E)$ (Note 2)	$I_{OUT} = 10mA,$ $V_{IN} = V_{OUT} + 1V$	X 0.99	$V_{OUT}(T)$ (Note 1)	X 1.01	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	$I_{OUT} (max)$	$V_{IN} = V_{OUT} + 1V$		300		mA
Load Regulation	ΔV_{OUT}	$V_{IN} = V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 100mA$		14	18	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{OUT} = 100mA$		100	120	mV
	V_{dif2}	$I_{OUT} = 200mA$		210	260	mV

Supply Current	I_{SS}	$V_{IN} = V_{OUT} + 1V$		4	8	μA
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT} = 10mA$ $V_{OUT} + 1V \leq V_{IN} \leq 6V$		0.07	0.2	%/V
Power Supply Ripple Rejection Ratio	PSRR	$V_{IN} = [V_{OUT} + 1]V$ $+1V_{p-pAC}$ $I_{OUT} = 10mA, f = 1kHz$		65		dB
Short Circuit Current	I_{short}	$V_{IN} = V_{OUT}(T) + 1V$ $V_{OUT} = V_{SS}$		50	70	mA
Over Current Protection	I_{limit}	$V_{IN} = V_{OUT} + 1V$		380	420	mA

ME6216(V_{out}=5.0V)

($V_{IN} = V_{OUT} + 1V, C_{IN} = C_{OUT} = 1\mu F, T_a = 25^{\circ}C$ Unless otherwise stated)

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	$V_{OUT}(E)$ (Note 2)	$I_{OUT} = 10mA,$ $V_{IN} = V_{OUT} + 1V$	X 0.99	$V_{OUT}(T)$ (Note 1)	X 1.01	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	$I_{OUT} (max)$	$V_{IN} = V_{OUT} + 1V$		500		mA
Load Regulation	ΔV_{OUT}	$V_{IN} = V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 100mA$		8	14	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{OUT} = 100mA$		90	110	mV
	V_{dif2}	$I_{OUT} = 200mA$		170	200	mV
Supply Current	I_{SS}	$V_{IN} = V_{OUT} + 1V$		7	8	μA
Power Supply Ripple Rejection Ratio	PSRR	$V_{IN} = [V_{OUT} + 1]V$ $+1V_{p-pAC}$ $I_{OUT} = 10mA, f = 1kHz$		65		dB
Short Circuit Current	I_{short}	$V_{IN} = V_{OUT}(T) + 1V$ $V_{OUT} = V_{SS}$		50	70	mA
Over Current Protection	I_{limit}	$V_{IN} = V_{OUT} + 1V$		550	600	mA

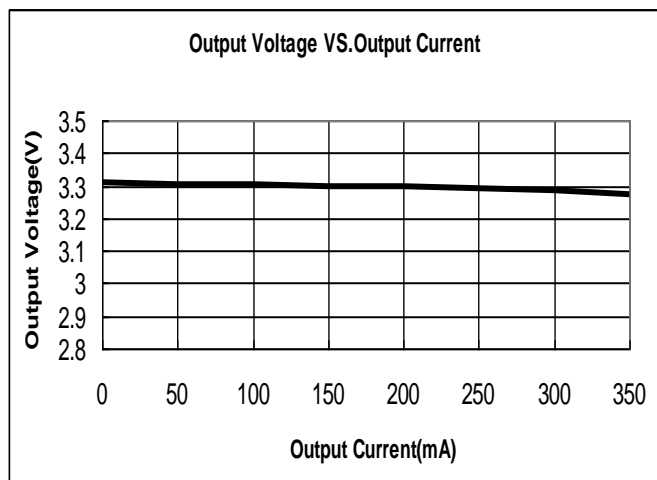
Note :

- $V_{OUT}(T)$: Specified Output Voltage
- $V_{OUT}(E)$: Effective Output Voltage (i.e. The output voltage when " $V_{OUT}(T) + 1.0V$ " is provided at the V_{IN} pin while maintaining a certain I_{OUT} 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 $I_{OUT} \{V_{OUT}(T) + 1.0V\}$ is input.

Type Characteristics (ME6216A33)

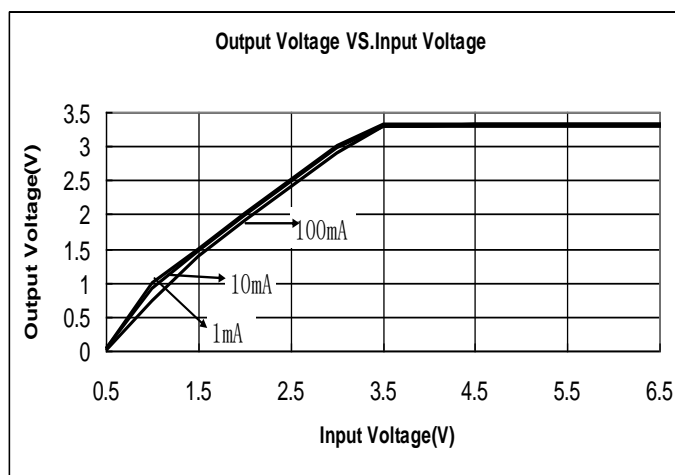
(1) Output Voltage VS. Output Current

($V_{IN}=V_{OUT}+1$, $T_a = 25\text{ }^\circ\text{C}$)



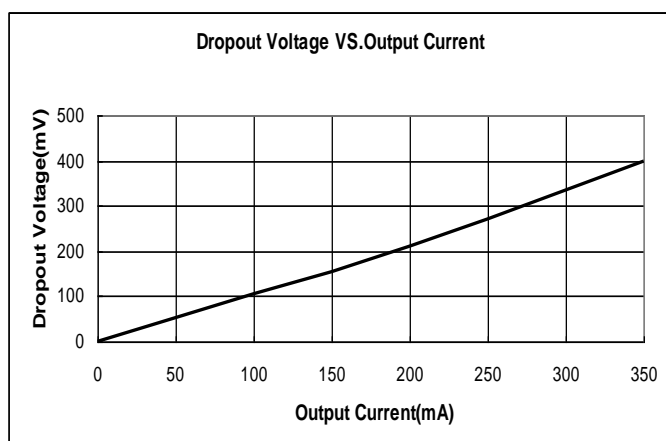
(2) Output Voltage VS. Input Voltage

($T_a = 25\text{ }^\circ\text{C}$)



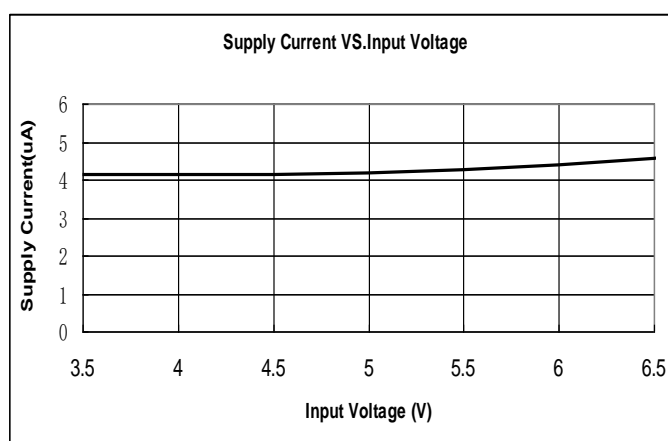
(3) Dropout Voltage VS. Output Current

($V_{IN}=V_{OUT}+1V$, $T_a = 25\text{ }^\circ\text{C}$)

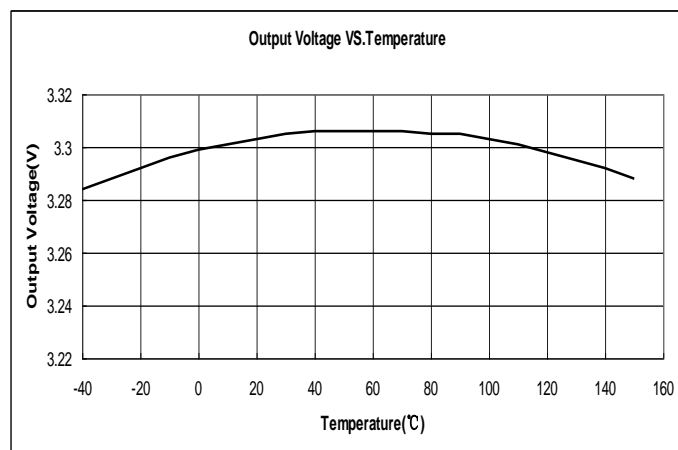


(4) Supply Current VS. Input Voltage

($T_a = 25\text{ }^\circ\text{C}$)

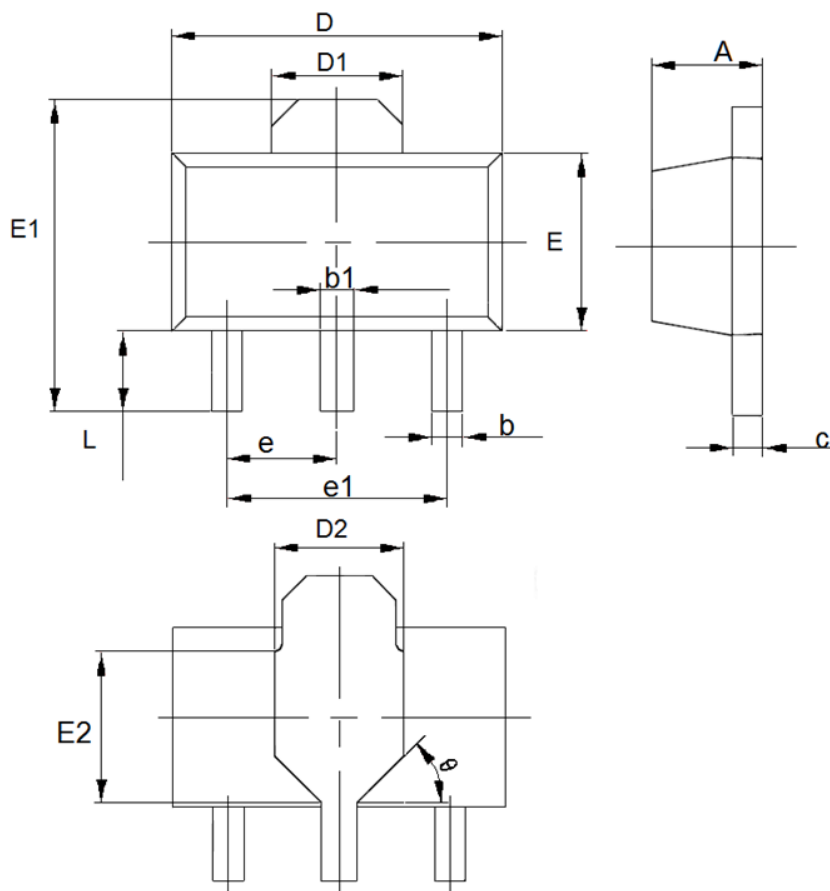


(5) Output Voltage VS. Temperature ($V_{IN}=V_{OUT}+1V$, $I_{OUT} = 10\text{mA}$)



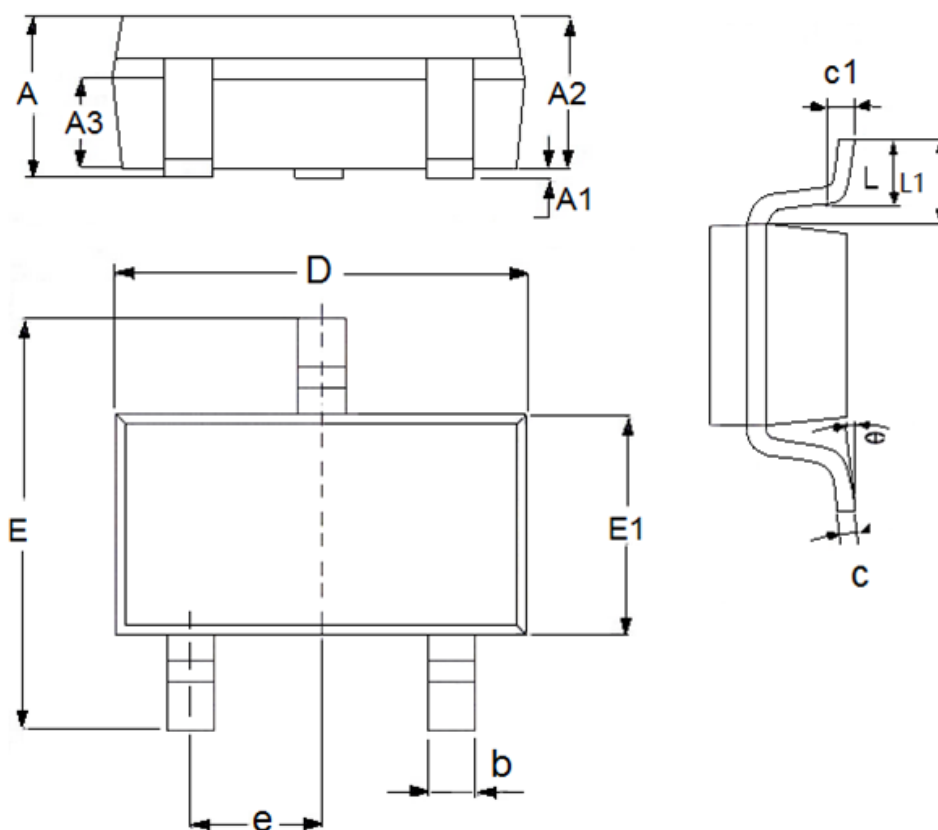
Packaging Information

● SOT89-3



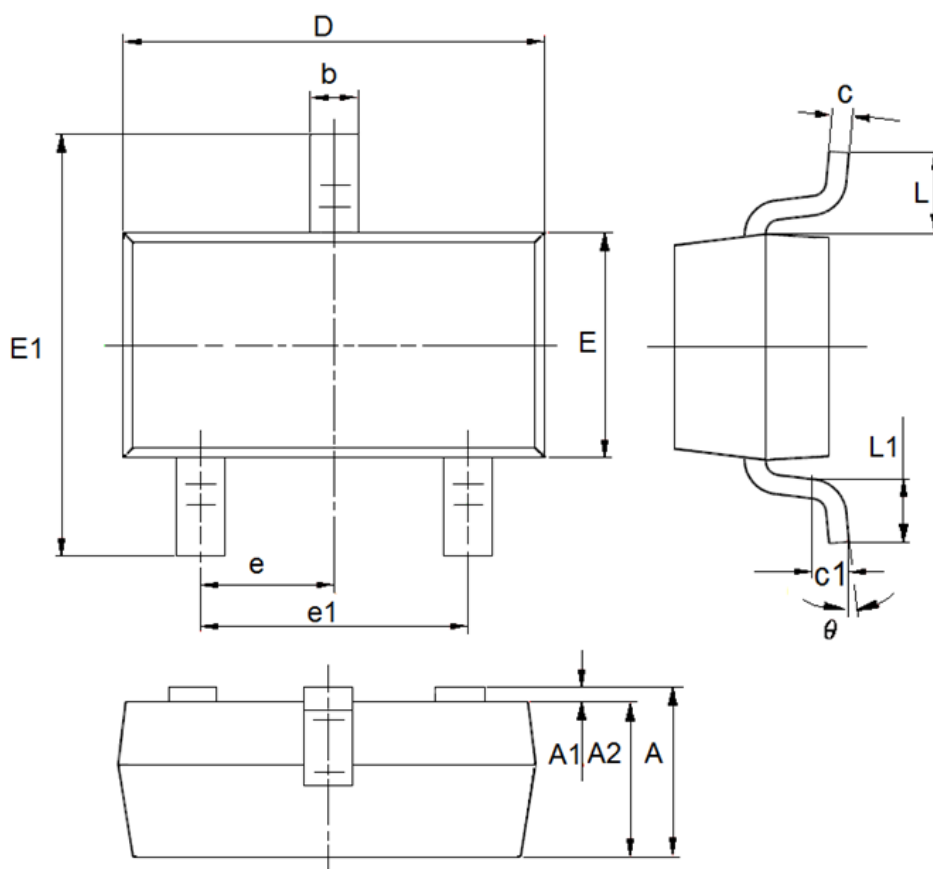
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.4	1.6	0.0551	0.063
b	0.32	0.52	0.0126	0.0205
b1	0.4	0.58	0.0157	0.0228
c	0.35	0.45	0.0138	0.01772
D	4.4	4.6	0.1732	0.1811
D1	1.55(TYP)		0.061(TYP)	
D2	1.75(TYP)		0.0689(TYP)	
e1	3(TYP)		0.1181(TYP)	
E	2.3	2.6	0.0906	0.1023
E1	3.94	4.4	0.1551	0.1732
E2	1.9(TYP)		0.0748(TYP)	
e	1.5(TYP)		0.0591(TYP)	
L	0.8	1.2	0.0315	0.0472
θ	45°		45°	

● SOT23-3



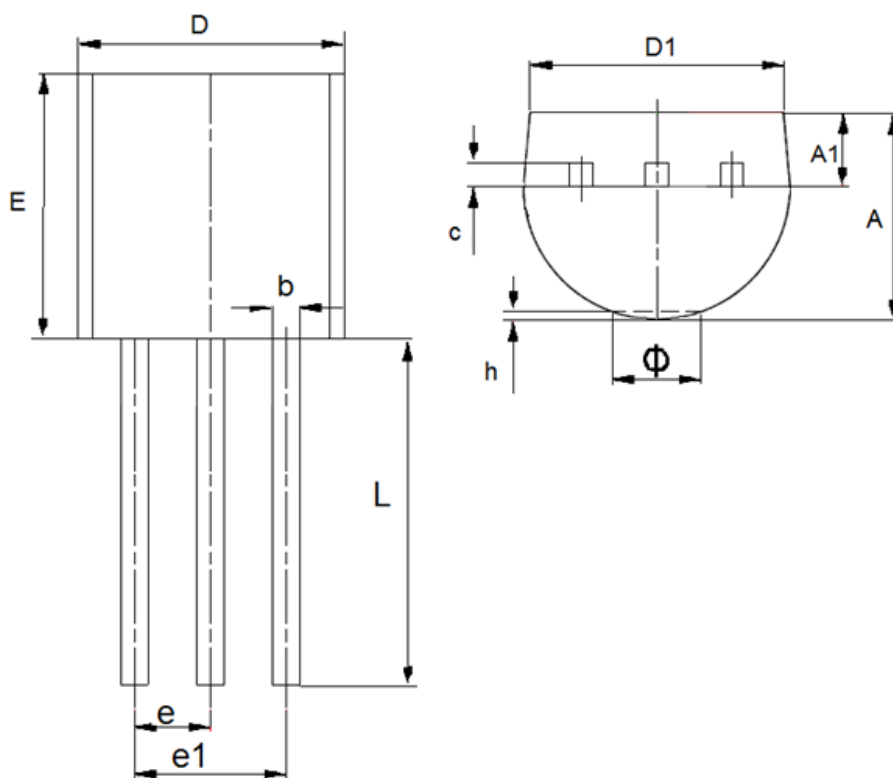
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1	1.5	0.0394	0.0591
A1	0	0.15	0	0.0059
A2	0.9	1.3	0.0354	0.0512
A3	0.6	0.7	0.0236	0.0276
b	0.25	0.5	0.0098	0.0197
c	0.1	0.25	0.0039	0.0098
D	2.8	3.1	0.1102	0.122
E	2.6	3.1	0.1023	0.122
E1	1.5	1.8	0.0591	0.0709
e	0.95(TYP)		0.0374(TYP)	
L	0.25	0.6	0.0098	0.0236
L1	0.59(TYP)		0.0232(TYP)	
θ	0	8°	0	8°
c1	0.2(TYP)		0.0079(TYP)	

● SOT23



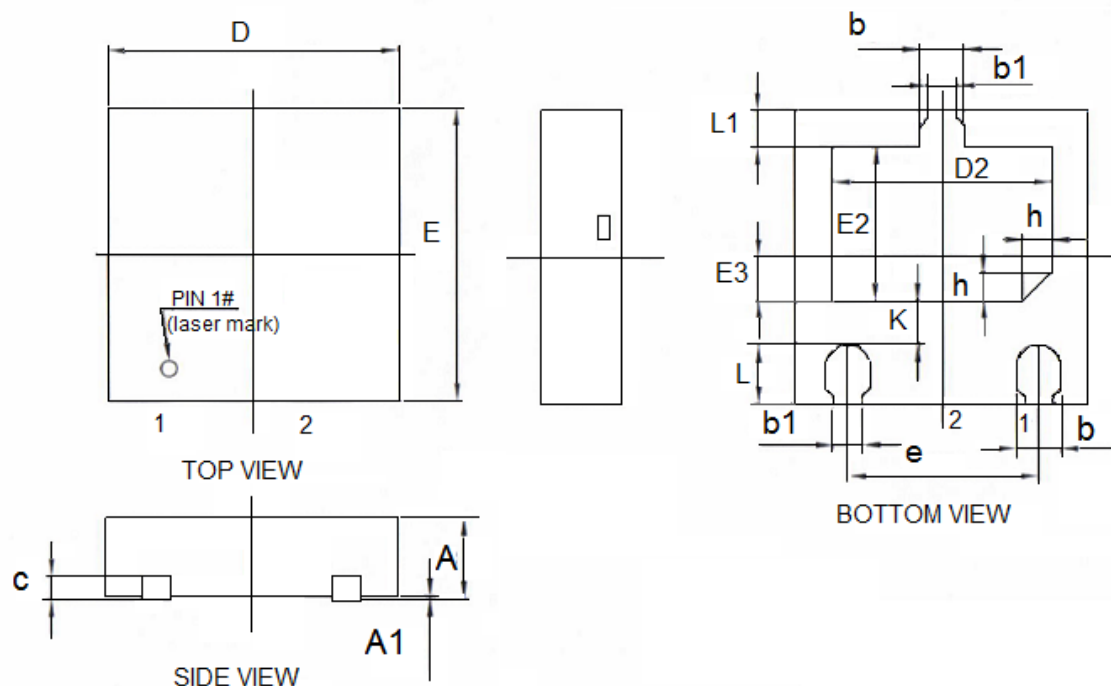
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	0.9	1.15	0.0354	0.0453
A1	0	0.14	0	0.0055
A2	0.9	1.05	0.0354	0.0413
b	0.28	0.52	0.011	0.0205
c	0.07	0.23	0.0028	0.0091
D	2.8	3	0.1102	0.1181
e1	1.8	2	0.0709	0.0787
E	1.2	1.4	0.0472	0.0551
E1	2.25	2.55	0.0886	0.1004
e	0.95(TYP)		0.0374(TYP)	
L	0.55(TYP)		0.0217(TYP)	
L1	0.25	0.55	0.0098	0.0217
θ	0	8°	0	8°
c1	0.25(TYP)		0.0098(TYP)	

● TO-92



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	1.27		0.05	
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

● DFN3L(2.0*2.0*0.55-1.30)



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	0.5	0.6	0.0197	0.0236
A1	0	0.05	0	0.002
c	0.152REF		0.006REF	
b	0.25	0.35	0.0098	0.0138
D	1.9	2.1	0.0748	0.0827
b1	0.2REF		0.0079REF	
E	1.9	2.1	0.0748	0.0827
E2	0.95	1.15	0.0374	0.0453
E3	0.2	0.4	0.0079	0.0157
e	1.3BSC		0.0512BSC	
L	0.35	0.45	0.0138	0.0177
L1	0.2	0.3	0.00787402	0.01181103
h	0.2REF		0.0079REF	
D2	1.4	1.6	0.0551	0.063
K	0.2	0.4	0.0079	0.01579

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