

Low power consumption, Low ESR Cap. Compatible ME6216 Series

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.

Selection Guide

ME 62 16 X XX X X

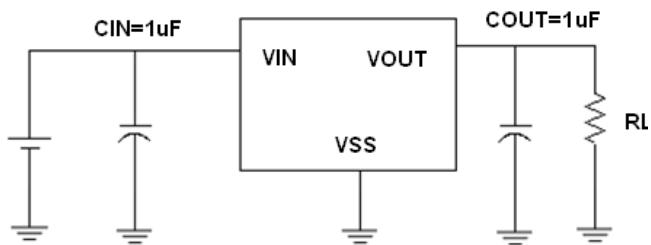
Environment mark
 e.g.: G-Lead free
Package:
 e.g.: P-SOT89-3
 M3-SOT23-3
 X-SOT23
 T-TO92
Output Voltage
 e.g.: 10-1.0V
 12-1.2V
 13-1.3V
 15-1.5V
 18-1.8V
 25-2.5V
 28-2.8V
 30-3.0V
 33-3.3V
 36-3.6V
 50-5.0V
Version or Function
 e.g.: A- no "CE"
 C- have "CE"
Product Type
Product Series
Microne

Features

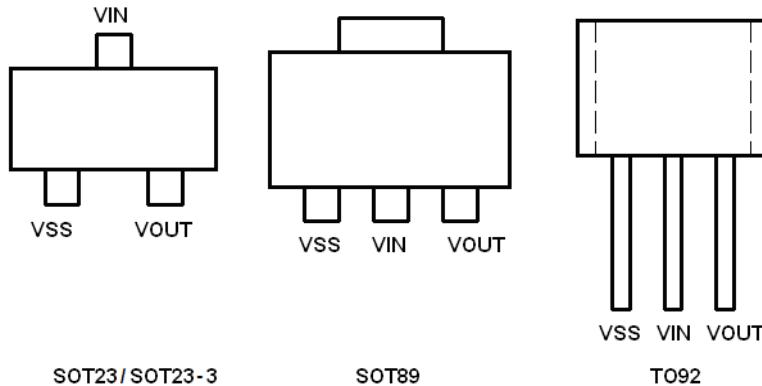
- Highly Accurate: $\pm 1\%$
- Output voltage range: 1.0V~5.0V
- Low power consumption: 5uA(TYP.)
- Large output current: 300mA ($V_{IN}=4.3V, V_{OUT}=3.3V$)
- Input voltage: up to 6 V
- Dropout voltage:
0.11V at 100mA and 0.22V at 200mA
($V_{IN}=4.3V, V_{OUT}=3.3V$)
- Excellent Input Stability
- Be available to regulator and reference voltage
- Packages:SOT23-3, SOT89-3, SOT23, TO-92

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

Typical Application Circuit



Pin Configuration



Pin Assignment

ME6216Axx

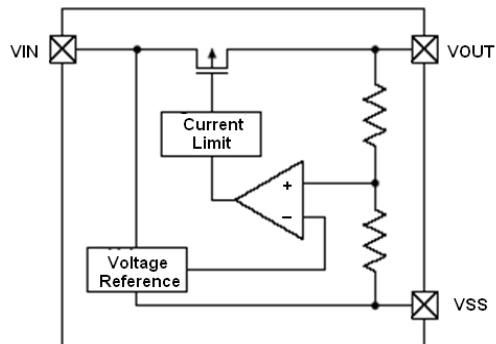
Pin				Name	Function
M3	P	X	T		
SOT23-3	SOT89-3	SOT23	TO-92		
1	1	1	1	VSS	Ground
2	3	2	3	VOUT	Output
3	2	3	2	VIN	Input

ME6216Bxx

Pin	Name	Function
P		
SOT89-3		
2	VSS	Ground
1	VOUT	Output
3	VIN	Input

Absolute Maximum Ratings

Parameter	Symbol	Description	Units
Input Voltage	V_{IN}	6.5	V
Output Current	I_{OUT}	500	mA
Output Voltage	V_{OUT}	$V_{SS}-0.3 \sim V_{OUT}+0.3$	V
Power Dissipation	SOT23-3	P_d	mW
	SOT89-3	P_d	mW
	SOT23	P_d	mW
	TO-92	P_d	mW
Operating Ambient Temperature	T_{Opr}	-25 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +125	°C

Block Diagram

Electrical Characteristics
ME6216-1.0V
 $(V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1\mu F, Ta=25^{\circ}C \text{ Unless otherwise stated})$

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	$V_{OUT}(E)$ (Note 2)	$I_{OUT}=10mA,$ $V_{IN}=V_{OUT}+1V$	$V_{OUT}(T)$ -0.015	$V_{OUT}(T)$ (Note 1)	$V_{OUT}(T)$ +0.015	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	$I_{OUT} (\text{max})$	$V_{IN}=V_{OUT}+1V$		200	250	mA
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+1V$ $1mA \leq I_{OUT} \leq 100mA$		6	10	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{OUT}=50mA$		280	300	mV
	V_{dif2}	$I_{OUT}=80mA$		390	410	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	$V_{IN} = [V_{OUT} + 1]V$ +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	80	mA
Over Current Protection	I_{limit}	$V_{IN}=V_{OUT}+1V$		310		mA

ME6216-1.2V
 $(V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1\mu F, Ta=25^{\circ}C \text{ Unless otherwise stated})$

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	$V_{OUT}(E)$ (Note 2)	$I_{OUT}=10mA,$ $V_{IN}=V_{OUT}+1V$	$V_{OUT}(T)$ -0.015	$V_{OUT}(T)$ (Note 1)	$V_{OUT}(T)$ +0.015	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	$I_{OUT} (\text{max})$	$V_{IN}=V_{OUT}+1V$		250	300	mA
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+1V$		6	10	mV

		$1\text{mA} \leq I_{\text{OUT}} \leq 100\text{mA}$				
Dropout Voltage (Note 3)	V_{dif1}	$I_{\text{OUT}} = 50\text{mA}$		150	170	mV
	V_{dif2}	$I_{\text{OUT}} = 80\text{mA}$		220	240	mV
Supply Current	I_{ss}	$V_{\text{IN}} = V_{\text{OUT}} + 1\text{V}$		5	8	μA
Line Regulations	$\frac{\Delta V_{\text{OUT}}}{\Delta V_{\text{IN}} \cdot V_{\text{OUT}}}$	$I_{\text{OUT}} = 10\text{mA}$ $V_{\text{OUT}} + 1\text{V} \leq V_{\text{IN}} \leq 6\text{V}$		0.05	0.2	%/V
Power Supply Ripple Rejection Ratio	PSRR	$V_{\text{IN}} = [V_{\text{OUT}} + 1]\text{V}$ +1Vp-pAC $I_{\text{OUT}} = 10\text{mA}, f = 1\text{kHz}$		65		dB
Short Circuit Current	I_{short}	$V_{\text{IN}} = V_{\text{OUT}}(T) + 1\text{V}$ $V_{\text{OUT}} = V_{\text{SS}}$		50	80	mA
Over Current Protection	I_{limit}	$V_{\text{IN}} = V_{\text{OUT}} + 1\text{V}$		310		mA

ME6216-1.3V

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

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	$V_{\text{OUT}}(E)$ (Note 2)	$I_{\text{OUT}} = 10\text{mA}$, $V_{\text{IN}} = V_{\text{OUT}} + 1\text{V}$	$V_{\text{OUT}}(T)$ -0.015	$V_{\text{OUT}}(T)$ (Note 1)	$V_{\text{OUT}}(T)$ +0.015	V
Input Voltage	V_{IN}				6	V
Maximum Output Current	$I_{\text{OUT}}(\text{max})$	$V_{\text{IN}} = V_{\text{OUT}} + 1\text{V}$		250	300	mA
Load Regulation	ΔV_{OUT}	$V_{\text{IN}} = V_{\text{OUT}} + 1\text{V}$ $1\text{mA} \leq I_{\text{OUT}} \leq 100\text{mA}$		6	10	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{\text{OUT}} = 50\text{mA}$		160	180	mV
	V_{dif2}	$I_{\text{OUT}} = 80\text{mA}$		250	270	mV
Supply Current	I_{ss}	$V_{\text{IN}} = V_{\text{OUT}} + 1\text{V}$		5	8	μA
Line Regulations	$\frac{\Delta V_{\text{OUT}}}{\Delta V_{\text{IN}} \cdot V_{\text{OUT}}}$	$I_{\text{OUT}} = 10\text{mA}$ $V_{\text{OUT}} + 1\text{V} \leq V_{\text{IN}} \leq 6\text{V}$		0.05	0.2	%/V
Power Supply Ripple Rejection Ratio	PSRR	$V_{\text{IN}} = [V_{\text{OUT}} + 1]\text{V}$ +1Vp-pAC $I_{\text{OUT}} = 10\text{mA}, f = 1\text{kHz}$		65		dB
Short Circuit Current	I_{short}	$V_{\text{IN}} = V_{\text{OUT}}(T) + 1\text{V}$ $V_{\text{OUT}} = V_{\text{SS}}$		50	80	mA
Over Current Protection	I_{limit}	$V_{\text{IN}} = V_{\text{OUT}} + 1\text{V}$		340		mA

ME6216-1.5V

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

PARAMETER	SYMBOL	CONDITION	MIX	TYP	MAX	UNIT
Output Voltage	$V_{\text{OUT}}(E)$ (Note 2)	$I_{\text{OUT}} = 10\text{mA}$, $V_{\text{IN}} = V_{\text{OUT}} + 1\text{V}$	X 0.99	$V_{\text{OUT}}(T)$ (Note 1)	X 1.01	V

Input Voltage	V_{IN}				6	V
Maximum Output Current	I_{OUT} (max)	$V_{IN} = V_{OUT} + 1V$		300	350	mA
Load Regulation	ΔV_{OUT}	$V_{IN} = V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 100mA$		5	10	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{OUT} = 50mA$		120	140	mV
	V_{dif2}	$I_{OUT} = 80mA$		190	210	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	$V_{IN} = [V_{OUT} + 1]V$ +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	80	mA
Over Current Protection	I_{limit}	$V_{IN} = V_{OUT} + 1V$		400		mA

ME6216-1.8V

($V_{IN} = V_{OUT} + 1V, C_{IN} = C_{OUT} = 1\mu F, T_a = 25^{\circ}C$ 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	350	mA
Load Regulation	ΔV_{OUT}	$V_{IN} = V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 100mA$		5	10	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{OUT} = 50mA$		100	120	mV
	V_{dif2}	$I_{OUT} = 80mA$		150	170	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	$V_{IN} = [V_{OUT} + 1]V$ +1Vp-pAC $I_{OUT} = 10mA, f = 1kHz$		65		dB
Short Circuit Current	I_{short}	$V_{IN} = V_{OUT} (T) + 1V$ $V_{OUT} = V_{SS}$		40	80	mA
Over Current Protection	I_{limit}	$V_{IN} = V_{OUT} + 1V$		420		mA

ME6216-2.5V
 $(V_{IN}=V_{OUT}+1V, CIN=COUT=1\mu F, Ta=25^{\circ}C \text{ Unless otherwise stated})$

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	$I_{OUT} (\text{max})$	$V_{IN}=V_{OUT}+1V$		260	300	mA
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+1V$ $1mA \leq I_{OUT} \leq 100mA$		9	18	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{OUT}=80mA$		100	120	mV
	V_{dif2}	$I_{OUT}=200mA$		260	280	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	$V_{IN}=[V_{OUT}+1]V$ +1Vp-pAC $I_{OUT}=10mA, f=1kHz$		65		dB
Short Circuit Current	I_{short}	$V_{IN}=V_{OUT}(T)+1V$ $V_{OUT}=V_{SS}$		40	80	mA
Over Current Protection	I_{limit}	$V_{IN}=V_{OUT}+1V$		420		mA

ME6216-3.0V
 $(V_{IN}=V_{OUT}+1V, CIN=COUT=1\mu F, Ta=25^{\circ}C \text{ Unless otherwise stated})$

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	$I_{OUT} (\text{max})$	$V_{IN}=V_{OUT}+1V$		300	350	mA
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+1V$ $1mA \leq I_{OUT} \leq 100mA$		10	18	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{OUT}=80mA$		90	110	mV
	V_{dif2}	$I_{OUT}=200mA$		220	240	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	$V_{IN}=[V_{OUT}+1]V$ +1Vp-pAC $I_{OUT}=10mA, f=1kHz$		65		dB

Short Circuit Current	I_{short}	$V_{IN} = V_{OUT}(T) + 1V$ $V_{OUT} = VSS$		40	80	mA
Over Current Protection	I_{limit}	$V_{IN} = V_{OUT} + 1V$		450		mA

ME6216-3.3V

($V_{IN} = V_{OUT} + 1V$, $CIN = COUT = 1\mu F$, $Ta = 25^{\circ}C$ 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	350	mA
Load Regulation	ΔV_{OUT}	$V_{IN} = V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 100mA$		10	18	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{OUT} = 80mA$		80	100	mV
	V_{dif2}	$I_{OUT} = 200mA$		220	240	mV
Supply Current	I_{ss}	$V_{IN} = V_{OUT} + 1V$		6	8	μA
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT} = 10mA$ $V_{OUT} + 1V \leq V_{IN} \leq 6V$		0.07	0.2	%/V
Power Supply Ripple Rejection Ratio	PSRR	$V_{IN} = [V_{OUT} + 1]V$ +1Vpp-pAC $I_{OUT} = 10mA, f = 1kHz$		65		dB
Short Circuit Current	I_{short}	$V_{IN} = V_{OUT}(T) + 1V$ $V_{OUT} = VSS$		40	80	mA
Over Current Protection	I_{limit}	$V_{IN} = V_{OUT} + 1V$		450		mA

ME6216-5.0V

($V_{IN} = V_{OUT} + 1V$, $CIN = COUT = 1\mu F$, $Ta = 25^{\circ}C$ 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	400	mA
Load Regulation	ΔV_{OUT}	$V_{IN} = V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 100mA$		10	18	mV
Dropout Voltage (Note 3)	V_{dif1}	$I_{OUT} = 80mA$		65	80	mV
	V_{dif2}	$I_{OUT} = 200mA$		160	180	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}	$V_{IN} = V_{OUT}(T) + 1V$ $V_{OUT} = VSS$		40	80	mA
Over Current Protection	I_{limit}	$V_{IN} = V_{OUT} + 1V$		550		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 I_{OUT} value.)
3. V_{dif} : $V_{IN1} - V_{OUT}(E)'$

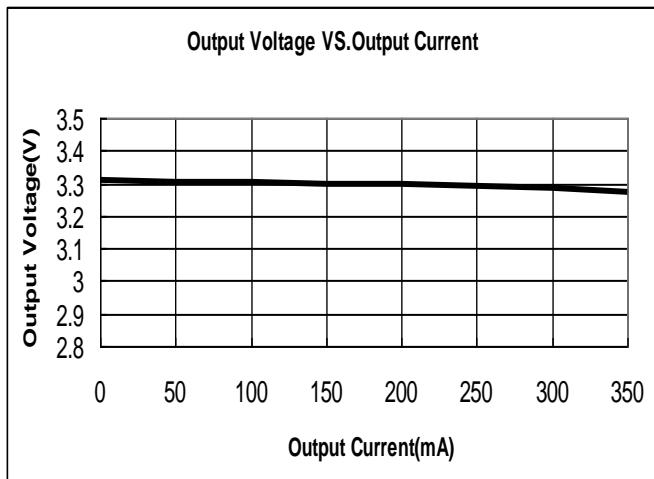
V_{IN1} : The input voltage when $V_{OUT}(E)'$ appears as input voltage is gradually decreased.

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

Type Characteristics (ME6216A33)

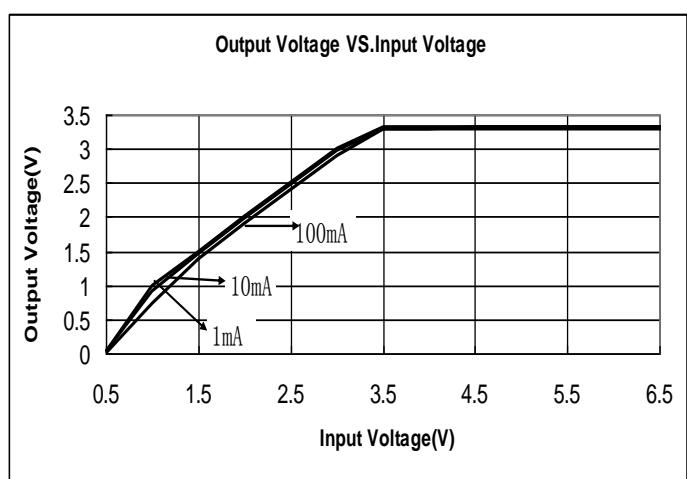
(1) Output Voltage VS. Output Current

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



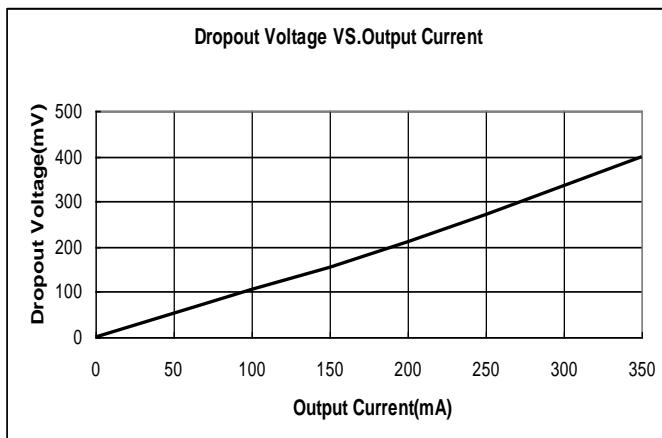
(2) Output Voltage VS. Input Voltage

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



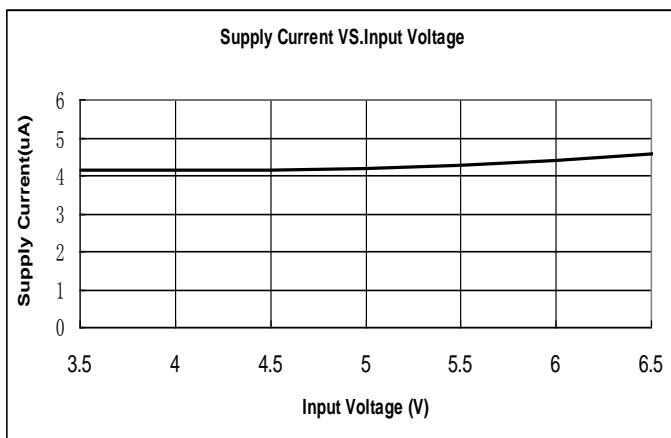
(3) Dropout Voltage VS. Output Current

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

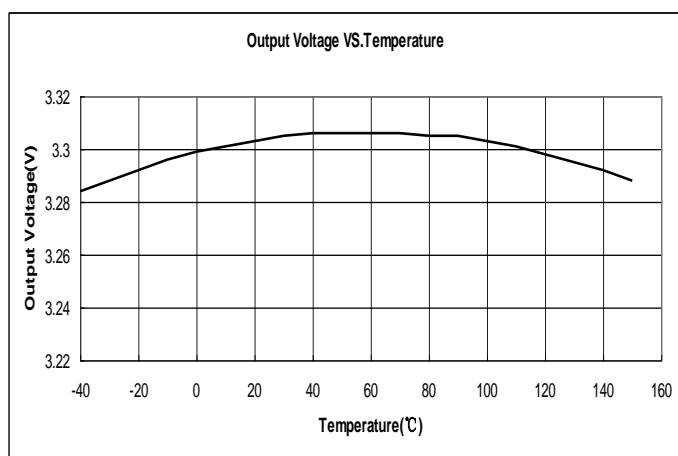


(4) Supply Current VS. Input Voltage

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

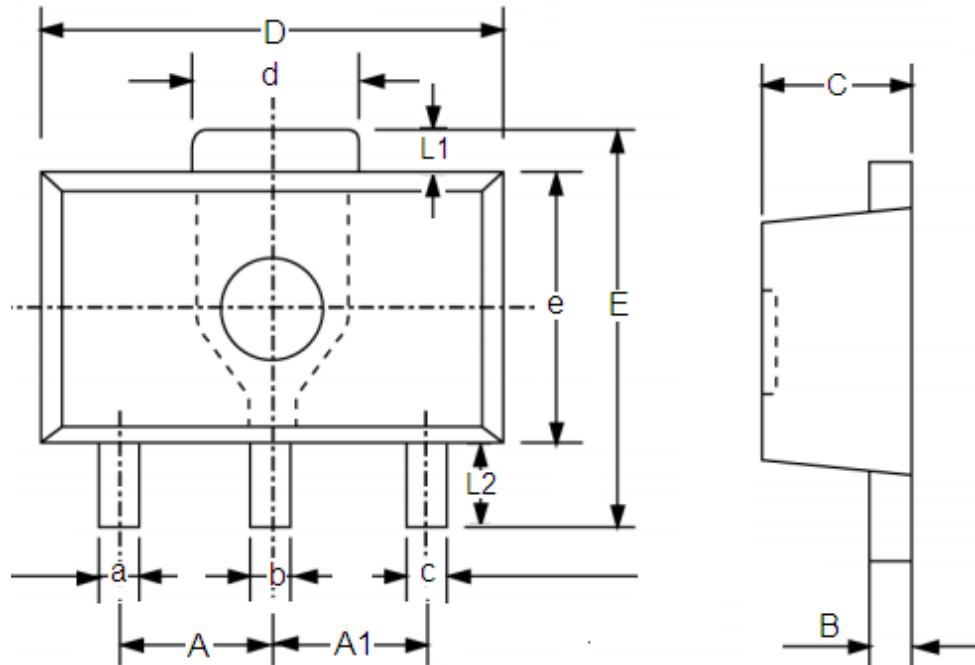


(5) Output Voltage VS. Temperature ($V_{IN}=V_{OUT}+1\text{V}$, $I_{OUT} = 10\text{mA}$)



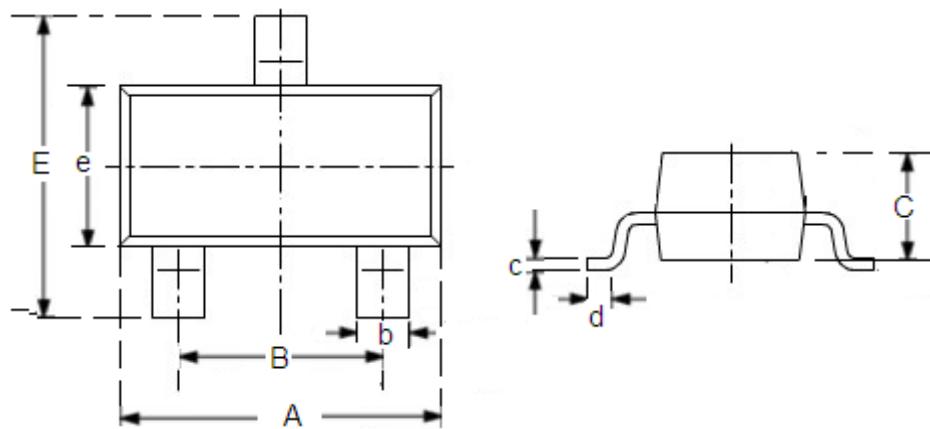
Packaging Information

- SOT89-3



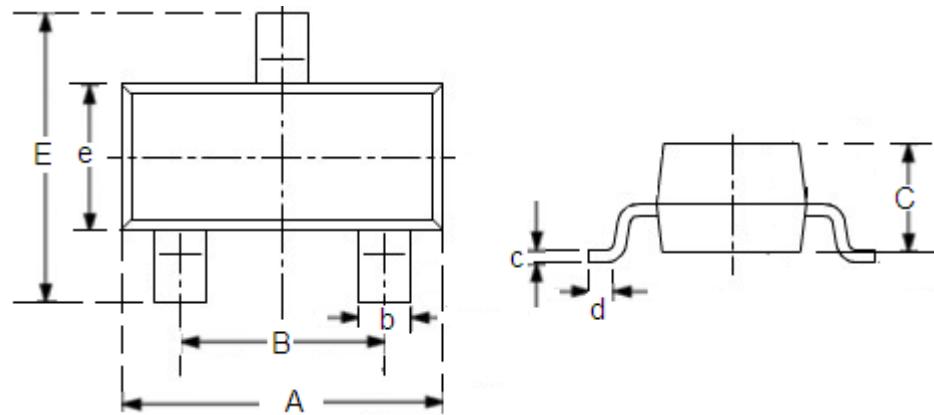
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.4	1.6	0.0551	0.0630
A1	1.4	1.6	0.0551	0.0630
a	0.36	0.48	0.0142	0.0189
b	0.41	0.53	0.0161	0.0209
c	0.36	0.48	0.0142	0.0189
d	1.4	1.75	0.0551	0.0689
B	0.38	0.43	0.015	0.0169
C	1.4	1.6	0.0551	0.0630
D	4.4	4.6	0.1732	0.181
E	-	4.25	-	0.1673
e	2.4	2.6	0.0945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

● SOT23-3



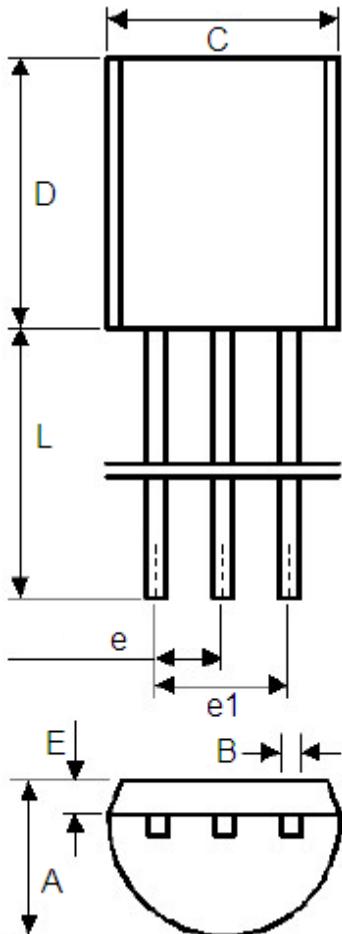
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.7	3.1	0.1063	0.122
B	1.7	2.1	0.0669	0.0827
b	0.35	0.5	0.0138	0.0197
C	1.0	1.2	0.0394	0.0472
c	0.1	0.25	0.0039	0.0098
d	0.2	-	0.0079	-
E	2.6	3.0	0.1023	0.1181
e	1.5	1.8	0.059	0.0708

● SOT23



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	2.1	2.64	0.0827	0.1039
e	1.2	1.4	0.0472	0.0551

● 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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