



## 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 $\mu A$ (TYP.)
- Large output current: 300mA ( $V_{IN} = 4.3V, V_{OUT} = 3.3V$ )
- Excellent Input Stability
- Be available to regulator and reference voltage

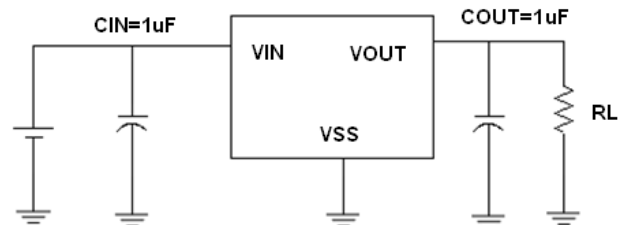
### Typical Application

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

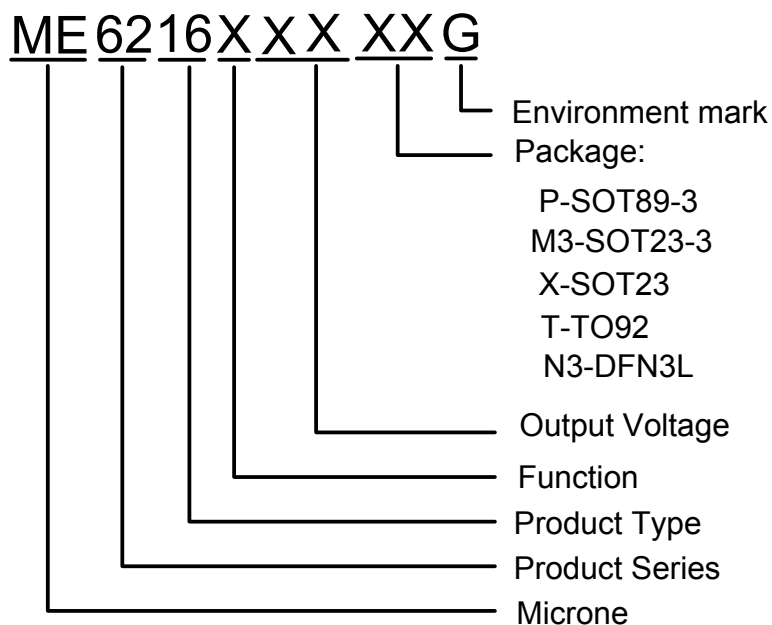
### Package

- 3-pin SOT89-3, SOT23-3, SOT23, TO92, DFN3L

### Typical Application Circuit



## Selection Guide

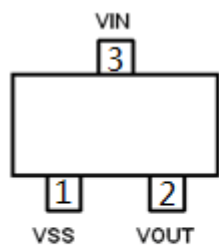


| product series | product description                                       |
|----------------|---|
| ME6216A10PG    | V <sub>OUT</sub> =1.0V; Package: SOT89-3                  |
| ME6216A28M3G   | V <sub>OUT</sub> =2.8V; Package: SOT23-3                  |
| ME6216A30XG    | V <sub>OUT</sub> =3.0V; Package: SOT23                    |
| ME6216A18TG    | V <sub>OUT</sub> =1.8V; Package: TO92                     |
| ME6216A18N3AG  | V <sub>OUT</sub> =1.8V; Package: DFN3L(2.0*2.0*0.55-1.30) |

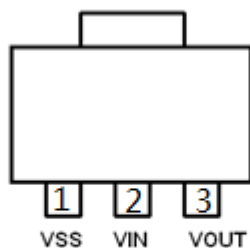
### NOTE:

1. At present ,there are five kinds of voltage value: 1.0V、 1.2V、 1.3V、 1.5V、 1.8V、 2.0V、 2.5V、 2.7V、 2.8V、 3.0V、 3.3V、 3.6V、 5.0V。
2. If you need other voltage and package, please contact our sales staff.

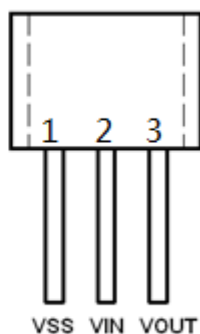
## Pin Configuration



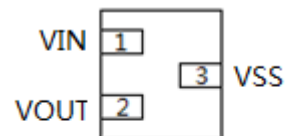
SOT23/SOT23-3



SOT89



TO92



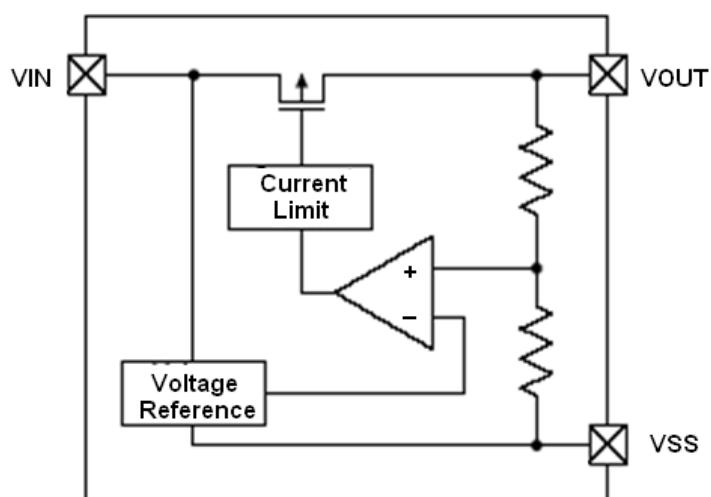
DFN3L

## 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<br>( $V_{out}=1.0\sim 1.3V$ ) | $V_{OUT(E)}$<br>(Note 2)                             | $I_{OUT}=10mA,$<br>$V_{IN}=V_{OUT}+1V$                      | $V_{OUT(T)}$<br>-0.015 | $V_{OUT(T)}$<br>(Note 1) | $V_{OUT(T)}$<br>+0.015 | V       |
| Input Voltage                                | $V_{IN}$   |   |                        |                          | 6                      | V       |
| Maximum Output Current                       | $I_{OUT(max)}$                                       | $V_{IN}=V_{OUT}+1V$   |                        | 250                      | 280                    | mA      |
| Load Regulation                              | $\Delta V_{OUT}$                                     | $V_{IN}=V_{OUT}+1V$<br>$1mA \leq I_{OUT} \leq 100mA$        |                        | 8                        | 12                     | mV      |
| Dropout Voltage<br>(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                      | $\mu A$ |
| Line Regulations                             | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$ | $I_{OUT}=10mA$<br>$V_{out}+1V \leq V_{IN} \leq 6V$          |                        | 0.05                     | 0.2                    | %/V     |
| Power Supply Ripple Rejection Ratio          | PSRR   | $V_{in}=[V_{OUT}+1]V$<br>+1Vp-pAC<br>$I_{OUT}=10mA, f=1kHz$ |                        | 65                       |                        | dB      |
| Short Circuit Current                        | $I_{short}$  | $V_{in}=V_{OUT(T)}+1V$<br>$V_{OUT}=V_{SS}$                  |                        | 50                       | 70                     | mA      |
| Over Current Protection                      | $I_{limit}$  | $V_{IN}=V_{OUT}+1V$   |                        | 310                      | 340                    | 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                         | $V_{OUT(E)}$<br>(Note 2)                             | $I_{OUT}=10mA$ ,<br>$V_{IN}=V_{OUT}+1V$                          | X 0.99 | $V_{OUT(T)}$<br>(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                        | $\Delta V_{OUT}$                                     | $V_{IN}= V_{OUT} +1V$<br>$1mA \leq I_{OUT} \leq 100mA$           |        | 8                        | 12     | mV      |
| Dropout Voltage<br>(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      | $\mu A$ |
| Line Regulations                       | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$ | $I_{OUT} =10mA$<br>$V_{out}+1V \leq V_{IN} \leq 6V$              |        | 0.05                     | 0.2    | %/V     |
| Power Supply Ripple<br>Rejection Ratio | PSRR   | $V_{in}= [V_{OUT} +1]V$<br>$+1Vp-pAC$<br>$I_{OUT} =10mA, f=1kHz$ |        | 65                       |        | dB      |
| Short Circuit Current                  | $I_{short}$  | $V_{in}= V_{OUT} (T)+1V$<br>$V_{OUT} =VSS$                       |        | 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                         | $V_{OUT(E)}$<br>(Note 2)                             | $I_{OUT}=10mA$ ,<br>$V_{IN}=V_{OUT}+1V$                          | X 0.99 | $V_{OUT(T)}$<br>(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                        | $\Delta V_{OUT}$                                     | $V_{IN}= V_{OUT} +1V$<br>$1mA \leq I_{OUT} \leq 100mA$           |        | 8                        | 14     | mV      |
| Dropout Voltage<br>(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      | $\mu A$ |
| Line Regulations                       | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$ | $I_{OUT} =10mA$<br>$V_{out}+1V \leq V_{IN} \leq 6V$              |        | 0.05                     | 0.2    | %/V     |
| Power Supply Ripple<br>Rejection Ratio | PSRR   | $V_{in}= [V_{OUT} +1]V$<br>$+1Vp-pAC$<br>$I_{OUT} =10mA, f=1kHz$ |        | 65                       |        | dB      |
| Short Circuit Current                  | $I_{short}$  | $V_{in}= V_{OUT} (T)+1V$<br>$V_{OUT} =VSS$                       |        | 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                      | $V_{OUT(E)}$<br>(Note 2)                             | $I_{OUT}=10mA$ ,<br>$V_{IN}=V_{OUT}+1V$                          | X 0.99 | $V_{OUT(T)}$<br>(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                     | $\Delta V_{OUT}$                                     | $V_{IN}=V_{OUT}+1V$<br>$1mA \leq I_{OUT} \leq 100mA$             |        | 14                       | 18     | mV      |
| Dropout Voltage<br>(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      | $\mu A$ |
| Line Regulations                    | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$ | $I_{OUT}=10mA$<br>$V_{out}+1V \leq V_{IN} \leq 6V$               |        | 0.07                     | 0.2    | %/V     |
| Power Supply Ripple Rejection Ratio | PSRR   | $V_{in}=[V_{OUT}+1]V$<br>$+1V_{p-pAC}$<br>$I_{OUT}=10mA, f=1kHz$ |        | 65                       |        | dB      |
| Short Circuit Current               | $I_{short}$  | $V_{in}=V_{OUT}(T)+1V$<br>$V_{OUT}=V_{SS}$                       |        | 50                       | 70     | mA      |
| Over Current Protection             | $I_{limit}$  | $V_{IN}=V_{OUT}+1V$  |        | 380                      | 420    | mA      |

## ME6216(Vout=5.0V)

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

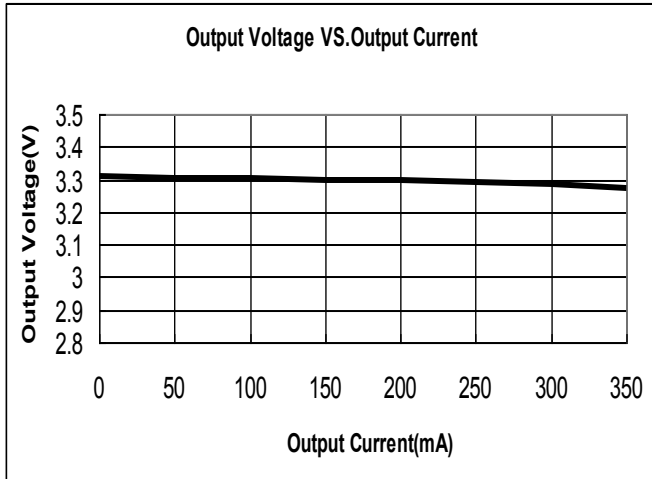
| PARAMETER                           | SYMBOL                   | CONDITION  | MIX    | TYP                      | MAX    | UNIT    |
|-------------------------------------|--------------------------|--|--------|--------------------------|--------|---------|
| Output Voltage                      | $V_{OUT(E)}$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

**Note :**

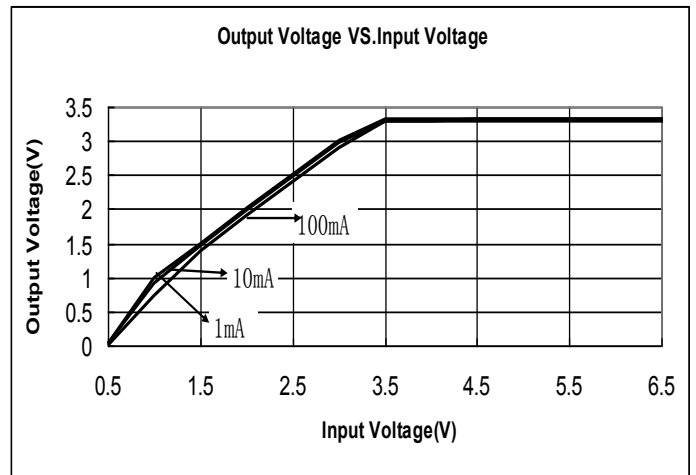
1.  $V_{OUT}(T)$  : Specified Output Voltage
2.  $V_{OUT}(E)$  : Effective Output Voltage ( i.e. The output voltage when " $V_{OUT}(T)+1.0V$ " is provided at the Vin pin while maintaining a certain  $I_{OUT}$  value.)
3.  $V_{dif}$  :  $V_{IN1} - V_{OUT}(E)'$   
 $V_{IN1}$  : The input voltage when  $V_{OUT}(E)'$  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 )

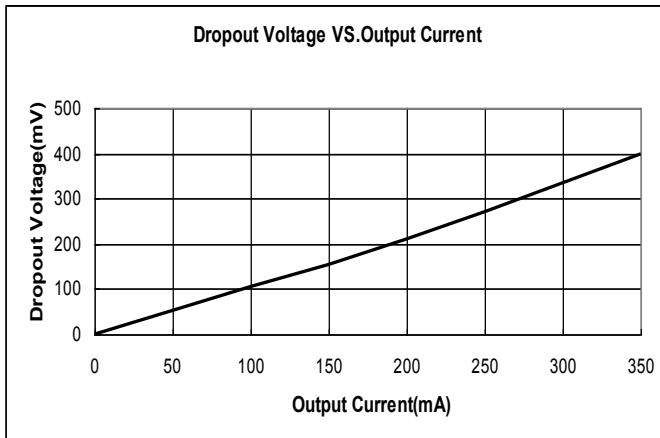
(1) Output Voltage VS. Output Current  
( $V_{IN}=V_{OUT}+1, T_a = 25\text{ }^\circ\text{C}$ )



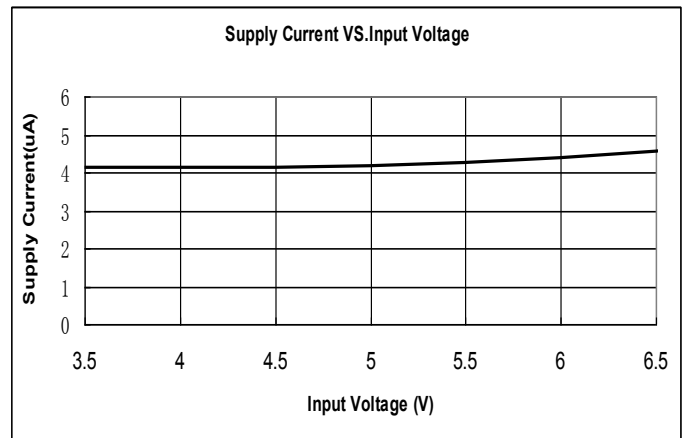
(2) Output Voltage VS. Input Voltage  
( $T_a = 25\text{ }^\circ\text{C}$ )



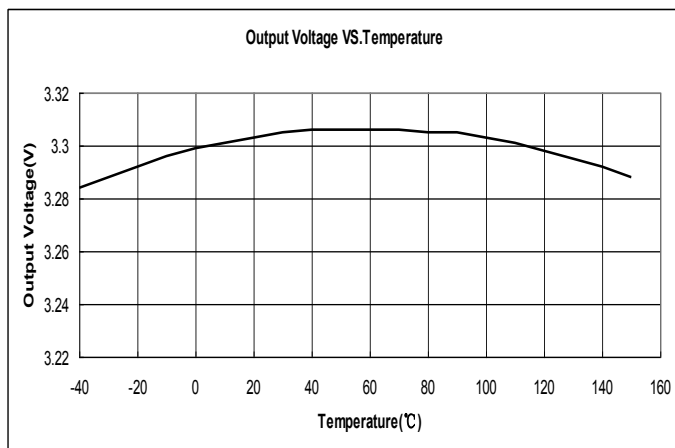
(3) Dropout Voltage VS. Output Current  
( $V_{IN}=V_{OUT}+1V, T_a = 25\text{ }^\circ\text{C}$ )



(4) Supply Current VS. Input Voltage  
( $T_a = 25\text{ }^\circ\text{C}$ )



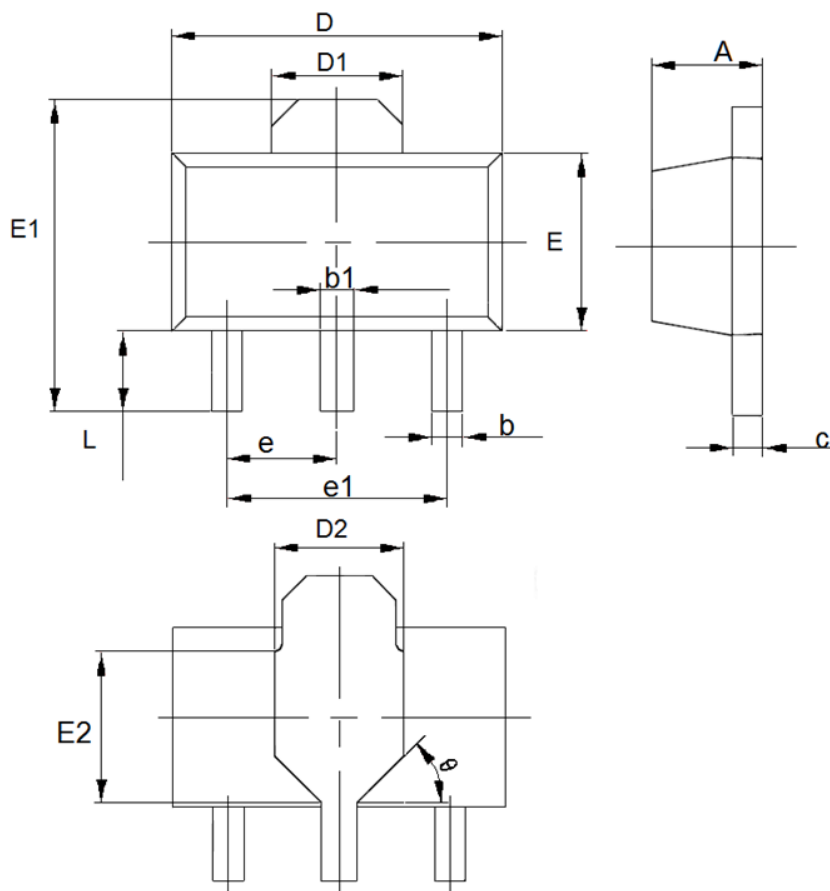
(5) Output Voltage VS. Temperature ( $V_{IN}=V_{OUT}+1V$ ,  $I_{OUT}=10mA$ )





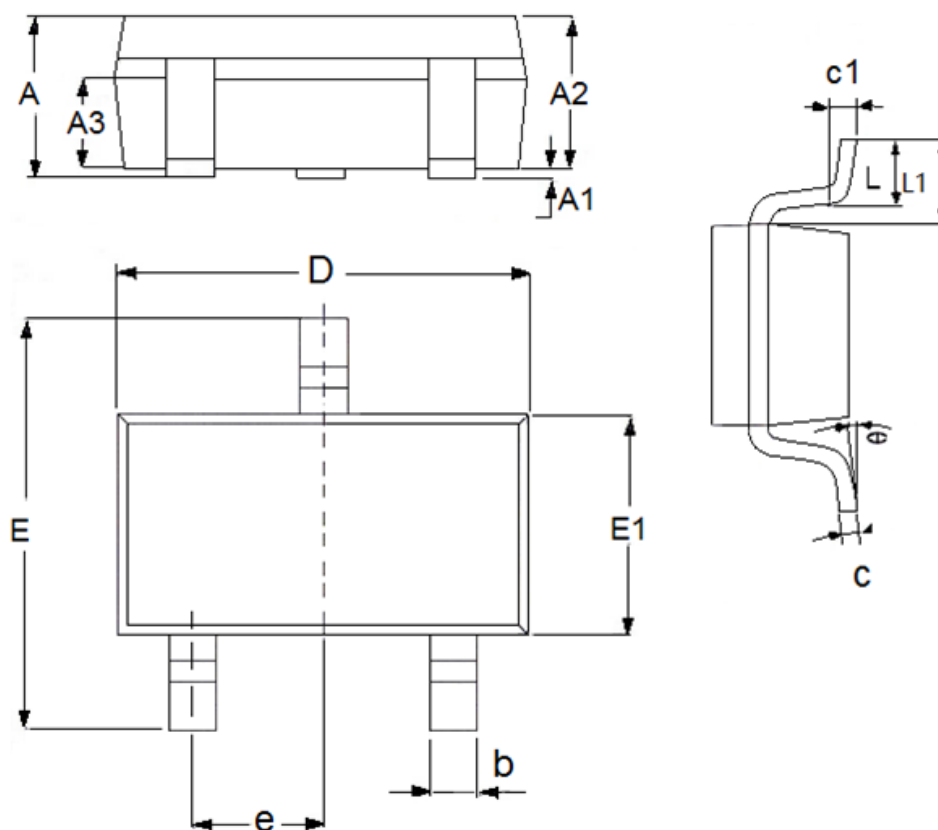
## Packaging Information

- SOT89-3



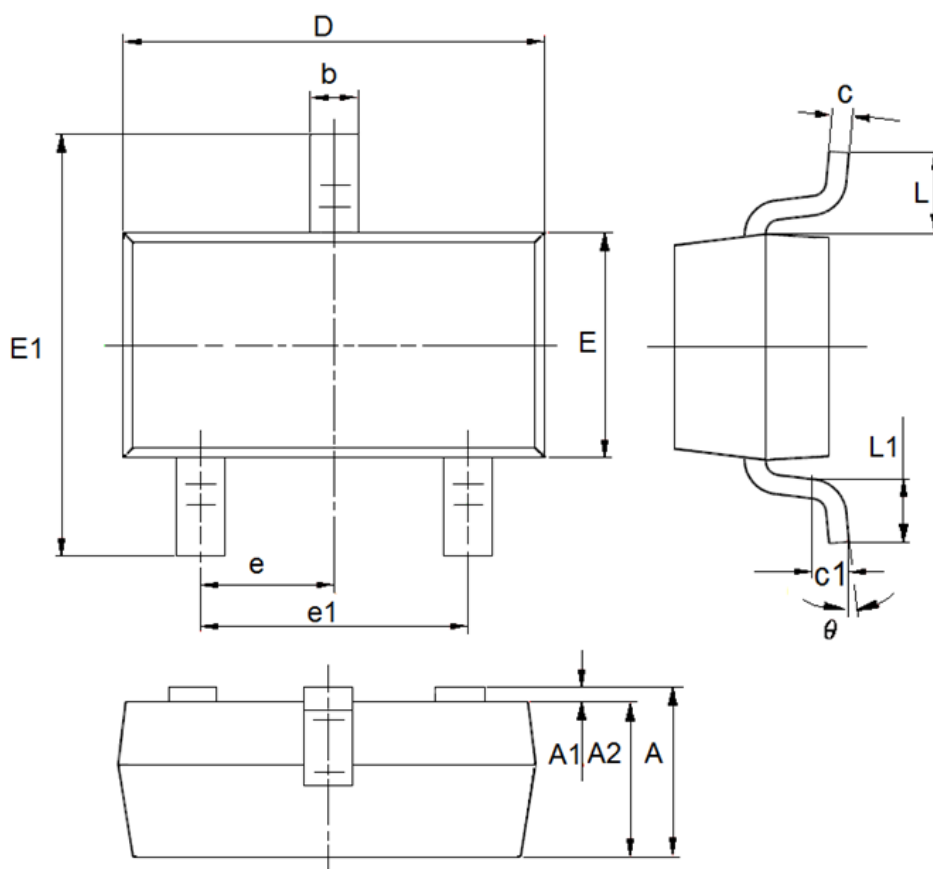
| DIM | Millimeters |      | Inches      |         |
|-----|-------------|------|-------------|---------|
|     | Min         | Max  | Min         | Max     |
| A   | 1.4         | 1.6  | 0.0551      | 0.063   |
| b   | 0.32        | 0.52 | 0.0126      | 0.0205  |
| b1  | 0.4         | 0.58 | 0.0157      | 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



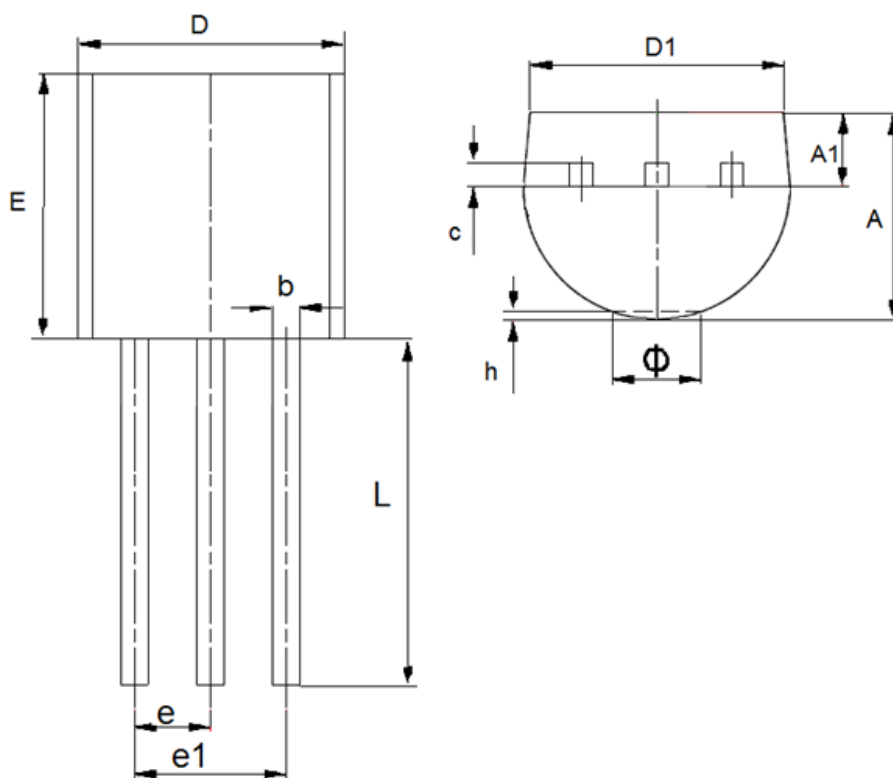
| DIM | Millimeters |      | Inches      |        |
|-----|-------------|------|-------------|--------|
|     | Min         | Max  | Min         | Max    |
| A   | 1           | 1.5  | 0.0394      | 0.0591 |
| A1  | 0           | 0.15 | 0           | 0.0059 |
| A2  | 0.9         | 1.3  | 0.0354      | 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



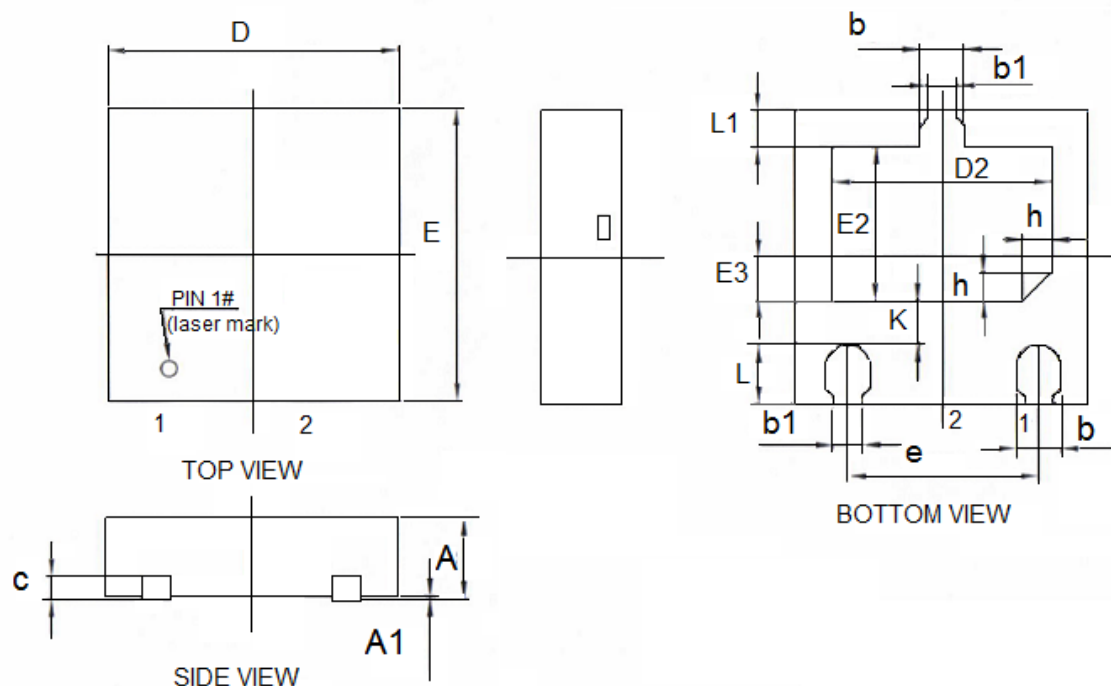
| DIM | Millimeters |      | Inches      |        |
|-----|-------------|------|-------------|--------|
|     | Min         | Max  | Min         | Max    |
| A   | 0.9         | 1.15 | 0.0354      | 0.0453 |
| A1  | 0           | 0.14 | 0           | 0.0055 |
| A2  | 0.9         | 1.05 | 0.0354      | 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  |
| $\Phi$ | —           | 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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