



## Digital Transistors (Built-in Resistors)

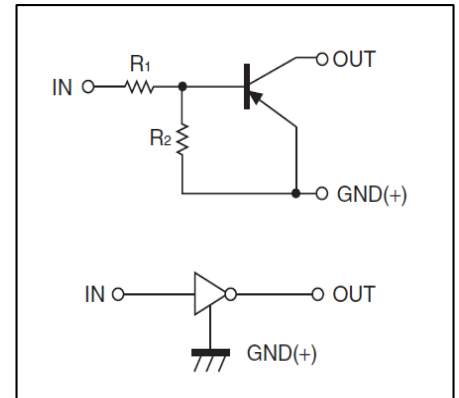
### DTA144EE/DTA144EUA DTA144EKA /DTA144ECA

DIGITAL TRANSISTOR (PNP)

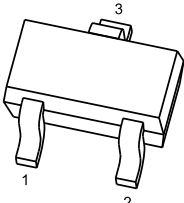
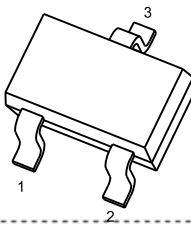
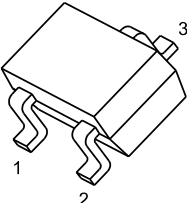
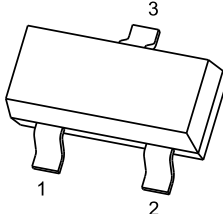
#### FEATURES

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors(see equivalent circuit)
- The bias resistors consist of thin-film resistors with complete isolation to allow positive biasing of the input.They also have the advantage of almost completely eliminating parasitic effects
- Only the on/off conditions need to be set for operation, making device design easy

#### • Equivalent Circuit



#### PIN CONNENCTIONS and MARKING

|                                                                                                                              |                                            |                                                                                                                                |                                          |
|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| <b>DTA144EE</b><br><br><b>MARKING:16</b>  | <b>SOT-523</b><br>1.IN<br>2.GND<br>3.OUT   | <b>DTA144EUA</b><br><br><b>MARKING:16</b> | <b>SOT-323</b><br>1.IN<br>2.GND<br>3.OUT |
| <b>DTA144EKA</b><br><br><b>MARKING:16</b> | <b>SOT-23-3L</b><br>1.IN<br>2.GND<br>3.OUT | <b>DTA144ECA</b><br><br><b>MARKING:16</b> | <b>SOT-23</b><br>1.IN<br>2.GND<br>3.OUT  |



## MAXIMUM RATINGS(Ta=25°C unless otherwise noted)

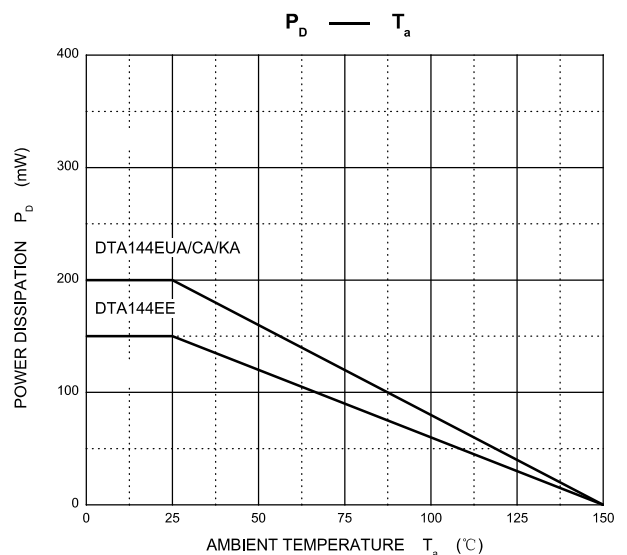
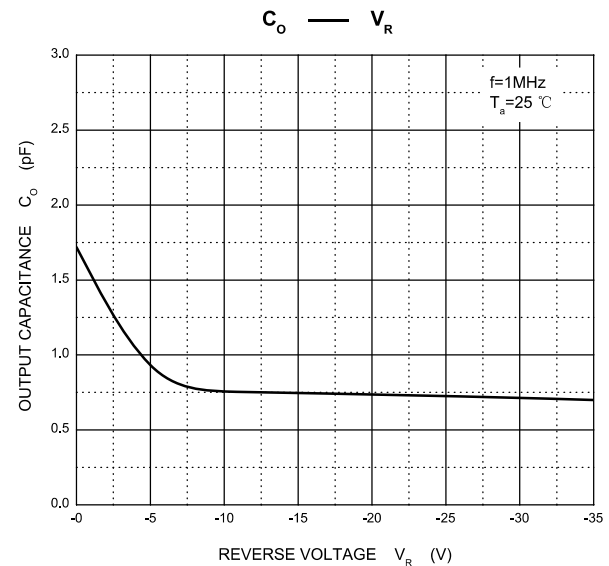
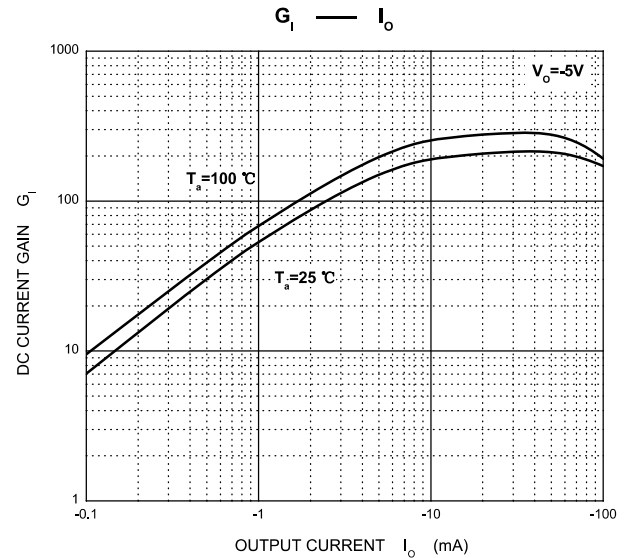
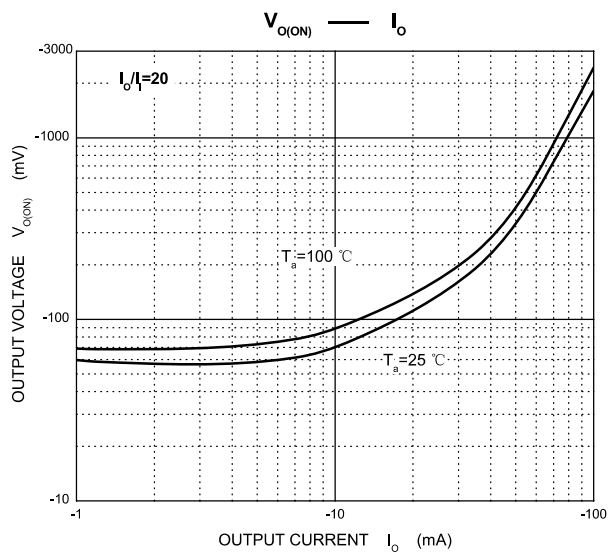
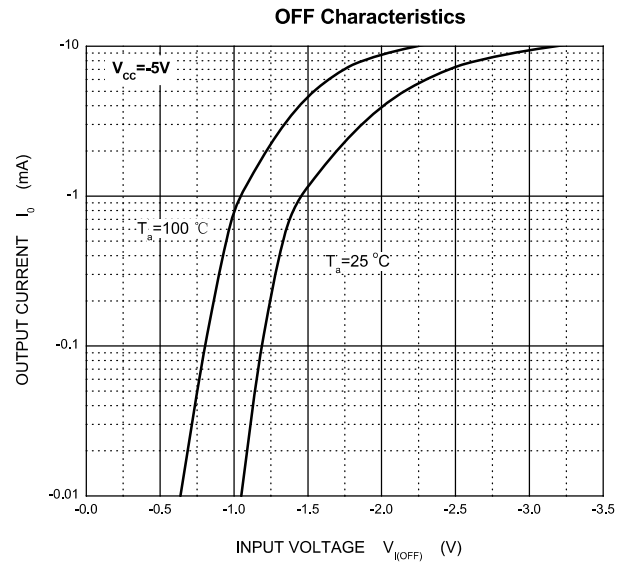
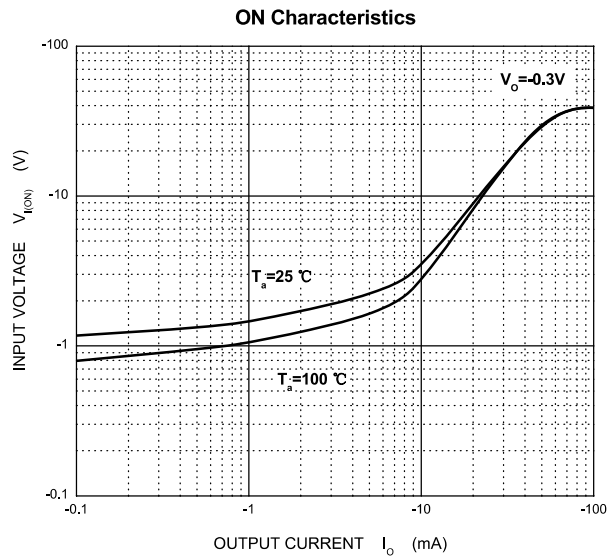
| Symbol           | Parameter              | Limits(DTA144E□) |     |     |     | Unit |
|------------------|------------------------|------------------|-----|-----|-----|------|
|                  |                        | E                | UA  | KA  | CA  |      |
| V <sub>CC</sub>  | Supply Voltage         | -50              |     |     |     | V    |
| V <sub>IN</sub>  | Input Voltage          | -40~+10          |     |     |     | V    |
| I <sub>O</sub>   | Output Current         | -30              |     |     |     | mA   |
| I <sub>CM</sub>  | Peak Collector Current | -100             |     |     |     | mA   |
| P <sub>D</sub>   | Power Dissipation      | 150              | 200 | 200 | 200 | mW   |
| T <sub>j</sub>   | Junction Temperature   | 150              |     |     |     | °C   |
| T <sub>stg</sub> | Storage Temperature    | -55~+150         |     |     |     | °C   |

## ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

| Parameter            | Symbol                         | Conditions                                           | Min  | Typ | Max   | Unit |
|----------------------|--------------------------------|------------------------------------------------------|------|-----|-------|------|
| Input voltage        | V <sub>I(off)</sub>            | V <sub>CC</sub> =-5V, I <sub>O</sub> =-100μA         | -0.5 |     |       | V    |
|                      | V <sub>I(on)</sub>             | V <sub>O</sub> =-0.3V, I <sub>O</sub> =-2 mA         |      |     | -3    | V    |
| Output voltage       | V <sub>O(on)</sub>             | I <sub>O</sub> /I <sub>I</sub> =-10mA/-0.5mA         |      |     | -0.3  | V    |
| Input current        | I <sub>I</sub>                 | V <sub>I</sub> =-5V                                  |      |     | -0.18 | mA   |
| Output current       | I <sub>O(off)</sub>            | V <sub>CC</sub> =-50V, V <sub>I</sub> =0             |      |     | -0.5  | μA   |
| DC current gain      | G <sub>I</sub>                 | V <sub>O</sub> =-5V, I <sub>O</sub> =-5mA            | 68   |     |       |      |
| Input resistance     | R <sub>1</sub>                 |                                                      | 32.9 | 47  | 61.1  | kΩ   |
| Resistance ratio     | R <sub>2</sub> /R <sub>1</sub> |                                                      | 0.8  | 1   | 1.2   |      |
| Transition frequency | f <sub>T</sub>                 | V <sub>O</sub> =-10V, I <sub>O</sub> =-5mA, f=100MHz |      | 250 |       | MHz  |

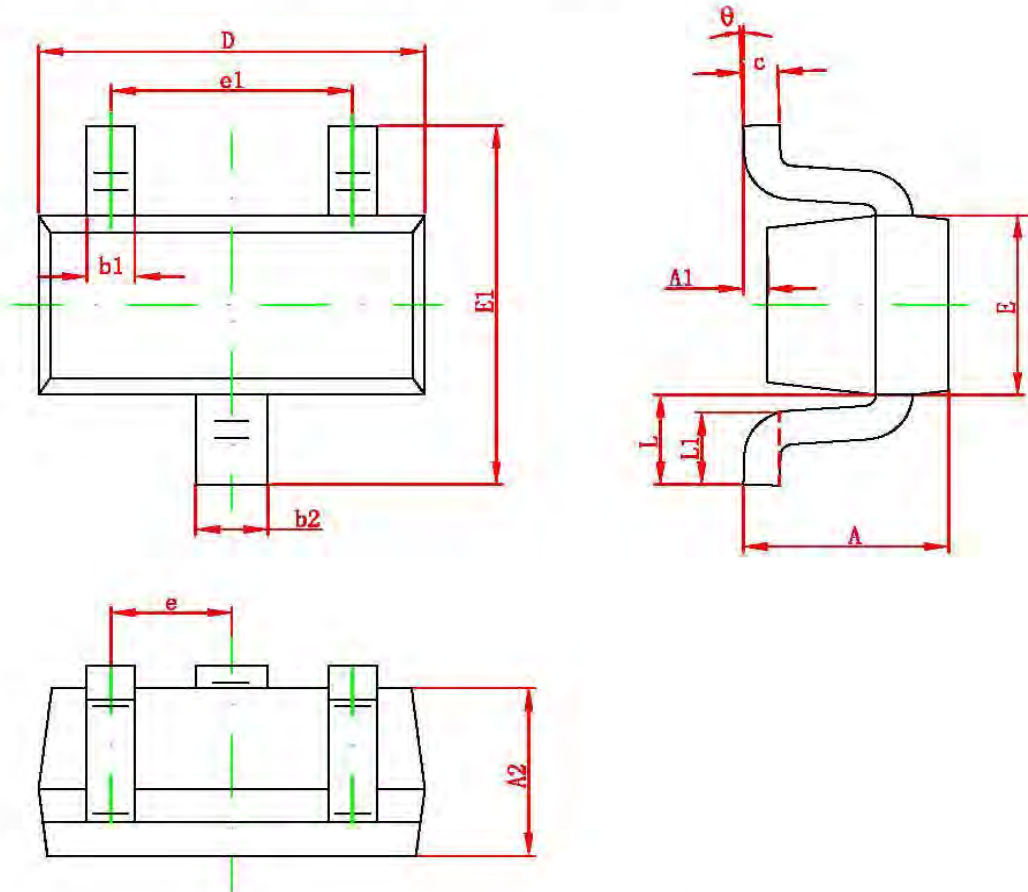


## Typical Characteristics





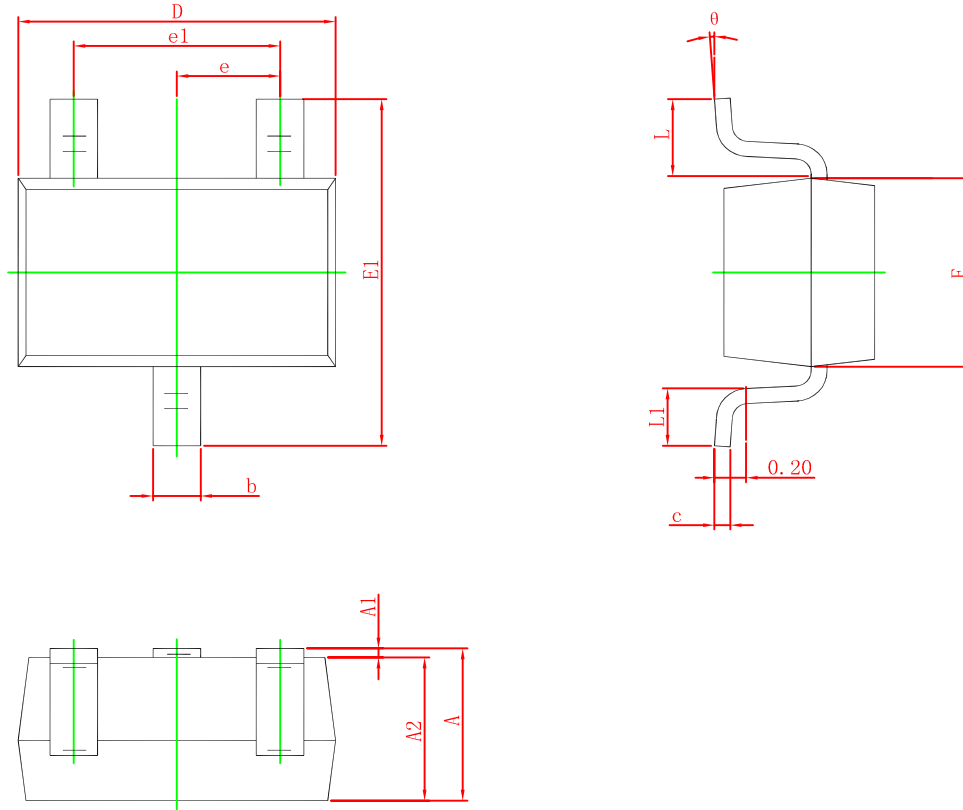
### SOT-523 PACKAGE OUTLINE DIMENSIONS



| Symbol   | Dimensions In Millimeters |       | Dimensions In Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min.                      | Max.  | Min.                 | Max.  |
| A        | 0.700                     | 0.900 | 0.028                | 0.035 |
| A1       | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2       | 0.700                     | 0.800 | 0.028                | 0.031 |
| b1       | 0.150                     | 0.250 | 0.006                | 0.010 |
| b2       | 0.250                     | 0.350 | 0.010                | 0.014 |
| c        | 0.100                     | 0.200 | 0.004                | 0.008 |
| D        | 1.500                     | 1.700 | 0.059                | 0.067 |
| E        | 0.700                     | 0.900 | 0.028                | 0.035 |
| E1       | 1.450                     | 1.750 | 0.057                | 0.069 |
| e        | 0.500 TYP.                |       | 0.020 TYP.           |       |
| e1       | 0.900                     | 1.100 | 0.035                | 0.043 |
| L        | 0.400 REF.                |       | 0.016 REF.           |       |
| L1       | 0.260                     | 0.460 | 0.010                | 0.018 |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |



## SOT-323 Package Outline Dimensions

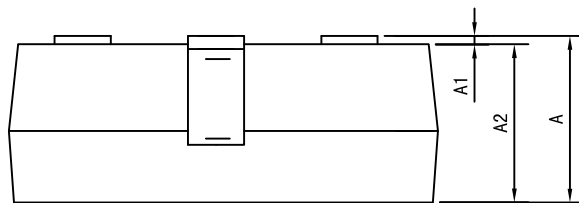
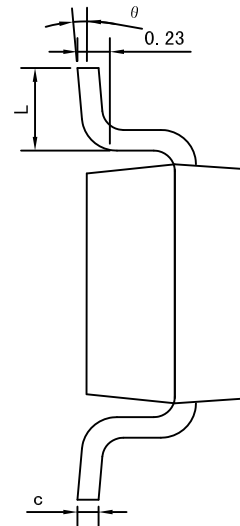
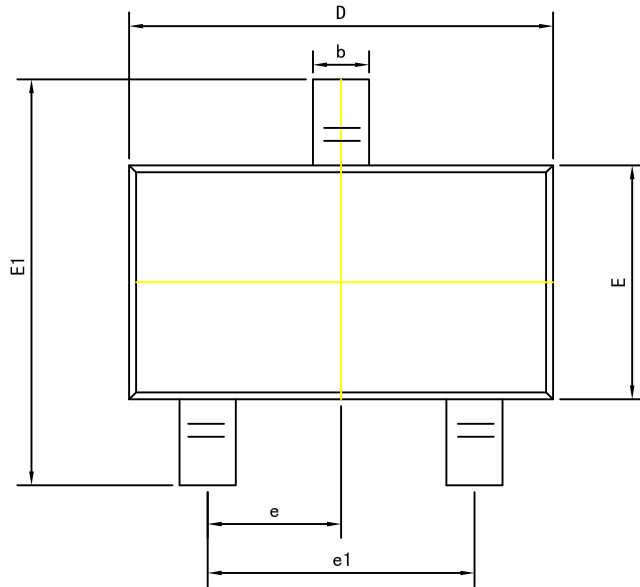


| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.900                     | 1.100 | 0.035                | 0.043 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.000 | 0.035                | 0.039 |
| b      | 0.200                     | 0.400 | 0.008                | 0.016 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.000                     | 2.200 | 0.079                | 0.087 |
| E      | 1.150                     | 1.350 | 0.045                | 0.053 |
| E1     | 2.150                     | 2.450 | 0.085                | 0.096 |
| e      | 0.650 TYP.                |       | 0.026 TYP.           |       |
| e1     | 1.200                     | 1.400 | 0.047                | 0.055 |
| L      | 0.525 REF.                |       | 0.021 REF.           |       |
| L1     | 0.260                     | 0.460 | 0.010                | 0.018 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |



## Package outline dimensions

### SOT23-3L



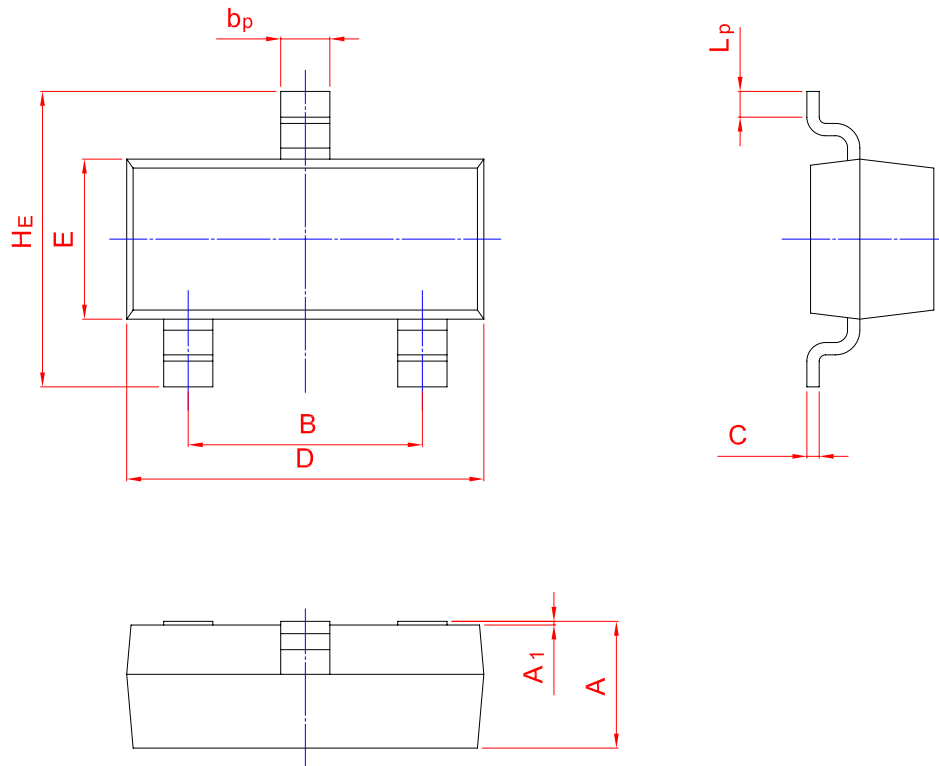
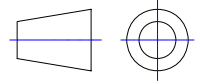
| Symbol   | Dimension in Millimeters |       |       |
|----------|--------------------------|-------|-------|
|          | Min                      | Typ   | Max   |
| A        | 1.050                    | 1.150 | 1.250 |
| A1       | 0.000                    | 0.050 | 0.100 |
| A2       | 1.050                    | 1.100 | 1.150 |
| b        | 0.300                    | 0.400 | 0.500 |
| c        | 0.100                    | 0.150 | 0.200 |
| D        | 2.820                    | 2.920 | 3.020 |
| E        | 1.500                    | 1.600 | 1.700 |
| E1       | 2.650                    | 2.800 | 2.950 |
| e        | 0.950 (Basic)            |       |       |
| e1       | 1.800                    | 1.900 | 2.000 |
| L        | 0.300                    | -     | 0.600 |
| $\theta$ | 0°                       | -     | 8°    |



## PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



| UNIT | A            | B            | bp           | C            | D            | E            | HE           | A1             | Lp           |
|------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|--------------|
| mm   | 1.40<br>0.95 | 2.04<br>1.78 | 0.50<br>0.35 | 0.19<br>0.08 | 3.10<br>2.70 | 1.65<br>1.20 | 3.00<br>2.20 | 0.100<br>0.013 | 0.50<br>0.20 |