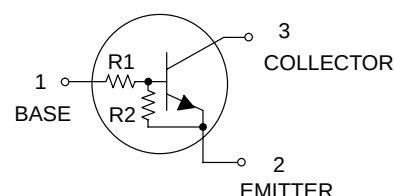
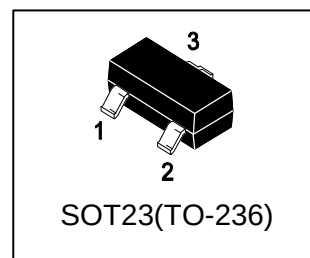


# S-LDTD143ELT1G

Bias Resistor Transistors  
NPN Silicon Surface Mount Transistors  
with Monolithic Bias Resistor Network

## 1. FEATURES

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors.
- 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 the device design easy.
- We declare that the material of product complies with RoHS requirements and Halogen Free.
- S- prefix for automotive and other applications requiring unique site and control change requirements; AEC-Q101 qualified and PPAP capable.



## 2. Applications

- Inverter, Interface, Driver.

## 3. DEVICE MARKING AND ORDERING INFORMATION

| Device         | Marking | R1(K) | R2(K) | Vin(V)  | Shipping        |
|----------------|---------|-------|-------|---------|-----------------|
| S-LDTD143ELT1G | E6      | 4.7   | 4.7   | -10~+30 | 3000/Tape&Reel  |
| S-LDTD143ELT3G | E6      | 4.7   | 4.7   | -10~+30 | 13000/Tape&Reel |

## 4. MAXIMUM RATINGS(Ta = 25°C)

| Parameter                 | Symbol | Limits | Unit |
|---------------------------|--------|--------|------|
| Collector-Emitter Voltage | VCEO   | 50     | V    |
| Collector-Base Voltage    | VCBO   | 50     | V    |
| Collector Current         | IC     | 500    | mA   |

## 5. THERMAL CHARACTERISTICS

| Parameter                                                                         | Symbol  | Limits     | Unit        |
|-----------------------------------------------------------------------------------|---------|------------|-------------|
| Total Device Dissipation,<br>FR-5 Board (Note 1) @ TA = 25°C<br>Derate above 25°C | PD      | 225<br>1.8 | mW<br>mW/°C |
| Thermal Resistance,<br>Junction-to-Ambient(Note 1)                                | RθJA    | 556        | °C/W        |
| Junction and Storage temperature                                                  | TJ,Tstg | -55~+150   | °C          |

1. FR-5 = 1.0×0.75×0.062 in.

## 6. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

### OFF CHARACTERISTICS

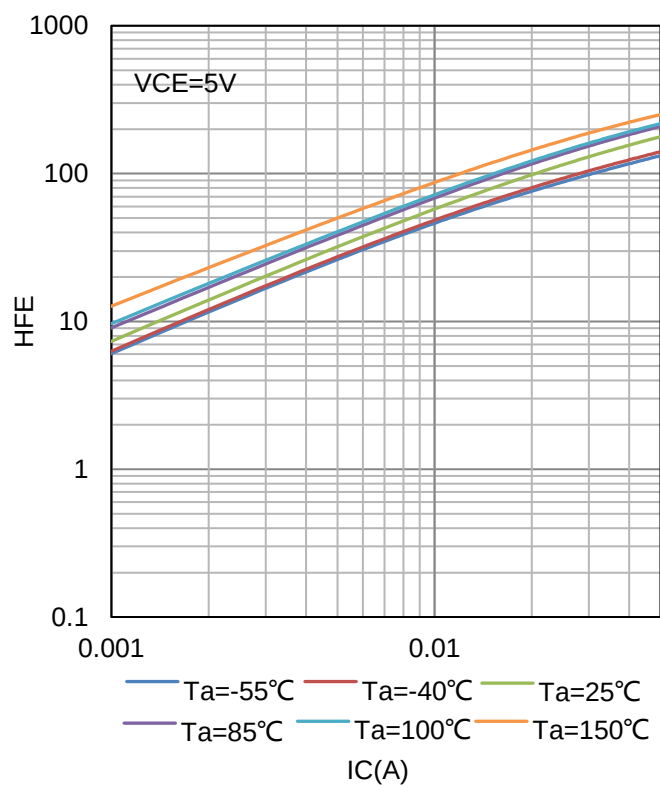
| Characteristic                                                | Symbol   | Min. | Typ. | Max. | Unit    |
|---------------------------------------------------------------|----------|------|------|------|---------|
| Collector–Emitter Breakdown Voltage<br>(IC = 2.0 mA, IB = 0)  | VBR(CEO) | 50   | -    | -    | V       |
| Collector–Base Breakdown Voltage<br>(IC = 10 $\mu$ A, IE = 0) | VBR(CBO) | 50   | -    | -    | V       |
| Collector-Base Cutoff Current<br>(VCB = 50 V, IE = 0)         | ICBO     | -    | -    | 100  | nA      |
| Collector-Emitter Cutoff Current<br>(VCE = 50 V, IB = 0)      | ICEO     | -    | -    | 1    | $\mu$ A |
| Emitter-Base Cutoff Current<br>(VEB = 5.0 V, IC = 0)          | IEBO     | -    | -    | 1.8  | mA      |

### ON CHARACTERISTICS (Note 2.)

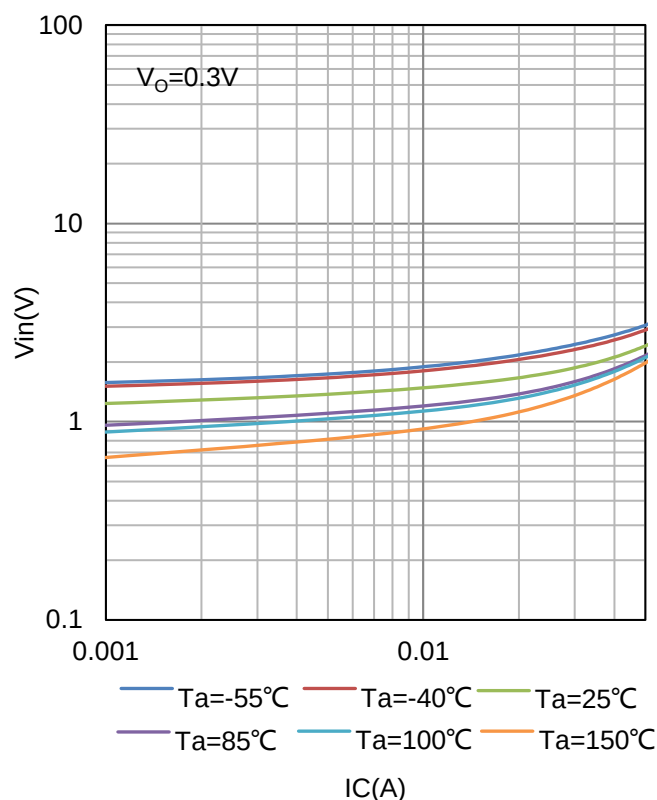
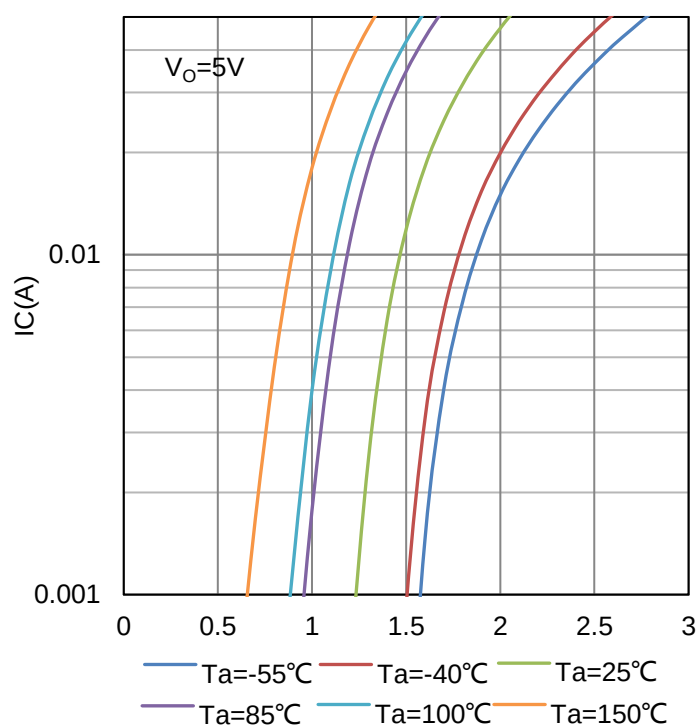
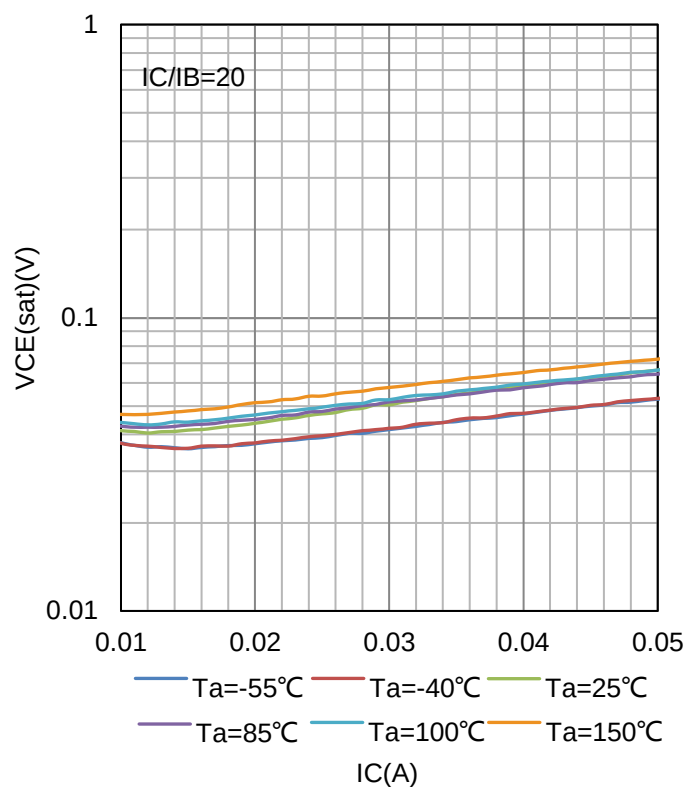
|                                                                      |          |      |     |      |            |
|----------------------------------------------------------------------|----------|------|-----|------|------------|
| DC Current Gain<br>(IC = 50 mA, VCE = 5 V)                           | HFE      | 47   | -   | -    |            |
| Collector–Emitter Saturation Voltage<br>(IC = 50 mA, IB = 2.5 mA)    | VCE(sat) | -    | -   | 0.3  | V          |
| Input Voltage (off)<br>(VCE = 5.0 V, IC = 100 $\mu$ A)               | Vi(off)  | -    | -   | 0.5  | V          |
| Input Voltage (on)<br>(VCE = 0.3 V, IC = 20 mA)                      | Vi(on)   | 3    | -   | -    | V          |
| Output Voltage (on)<br>(VCC = 5.0 V, VB = 3 V, RL =1.0K $\Omega$ )   | VOL      | -    | -   | 0.3  | V          |
| Output Voltage (on)<br>(VCC = 5.0 V, VB = 0.5 V, RL =1.0K $\Omega$ ) | VOH      | 4.9  | -   | -    | V          |
| Input Resistor                                                       | R1       | 3.29 | 4.7 | 6.11 | K $\Omega$ |
| Resistor Ratio                                                       | R1/R2    | 0.8  | 1   | 1.2  |            |

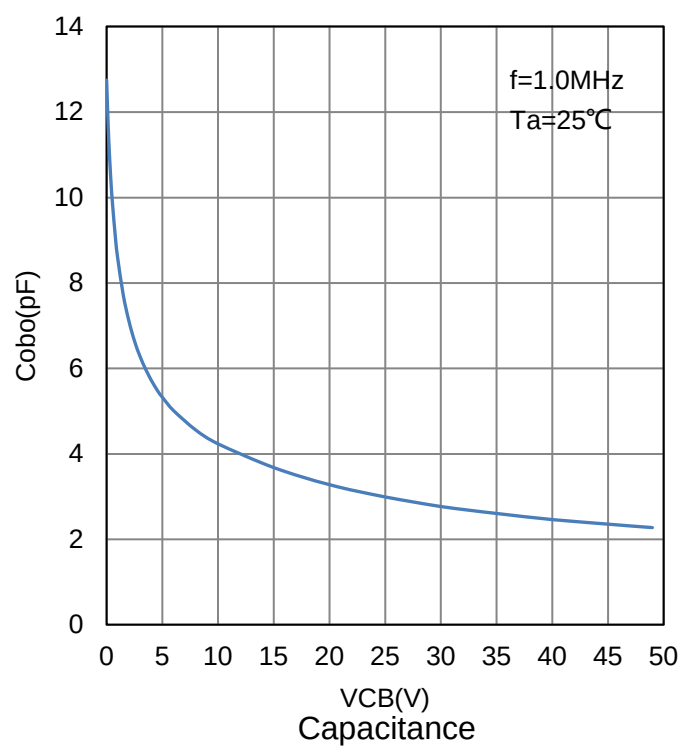
2. Pulse Test: Pulse Width < 300  $\mu$ s, Duty Cycle < 2.0%

## 7.ELECTRICAL CHARACTERISTICS CURVES

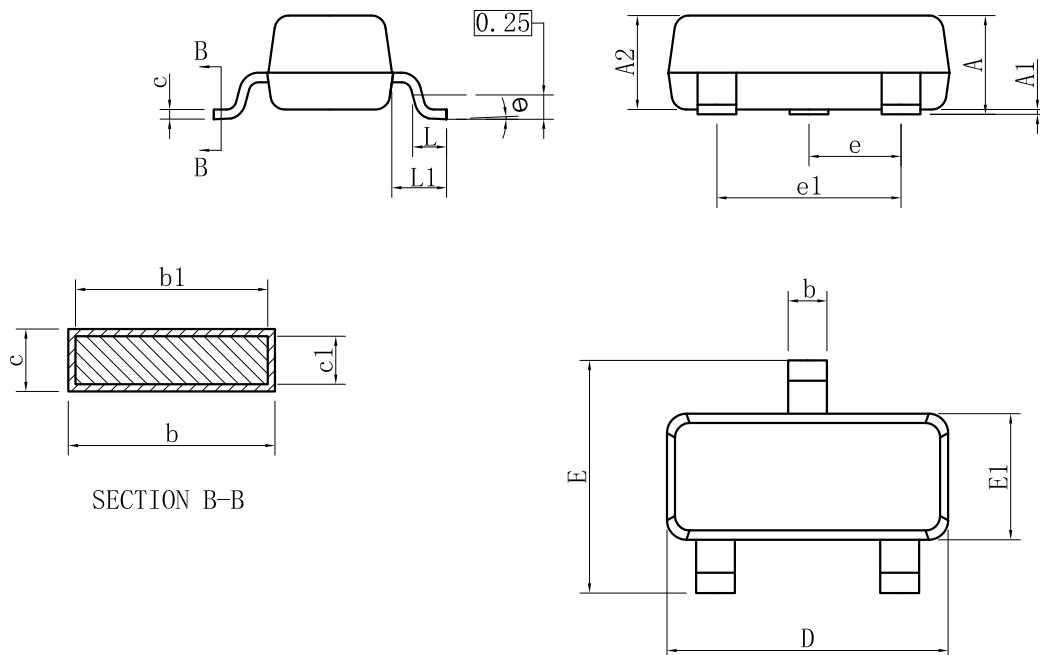


HFE vs. IC


 $V_{in}$  vs. IC

IC vs.  $V_{in}$ 

 $V_{CE(sat)}$  vs. IC

**7.ELECTRICAL CHARACTERISTICS CURVES(Con.)**

## 8.OUTLINE AND DIMENSIONS

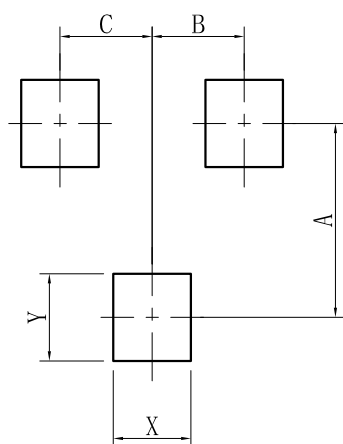


| SOT23                |         |      |      |
|----------------------|---------|------|------|
| DIM                  | MIN     | NOR  | MAX  |
| A                    | 0.89    | —    | 1.12 |
| A1                   | 0.01    | —    | 0.10 |
| A2                   | 0.88    | 0.95 | 1.02 |
| b                    | 0.30    | —    | 0.50 |
| b1                   | 0.30    | 0.40 | 0.45 |
| c                    | 0.08    | —    | 0.20 |
| c1                   | 0.08    | 0.10 | 0.16 |
| D                    | 2.80    | 2.90 | 3.04 |
| E                    | 2.10    | —    | 2.64 |
| E1                   | 1.20    | 1.30 | 1.40 |
| e                    | 0.95BSC |      |      |
| e1                   | 1.90BSC |      |      |
| L                    | 0.40    | 0.46 | 0.60 |
| L1                   | 0.54REF |      |      |
| θ                    | 0°      | —    | 8°   |
| All Dimensions in mm |         |      |      |

### GENERAL NOTES

- 1.Top package surface finish Ra0.4±0.2um
- 2.Bottom package surface finish Ra0.7±0.2um
- 3.Side package surface finish Ra0.4±0.2um

## 9.SOLDERING FOOTPRINT



| SOT-23 |      |
|--------|------|
| DIM    | (mm) |
| X      | 0.80 |
| Y      | 0.90 |
| A      | 2.00 |
| B      | 0.95 |
| C      | 0.95 |

## **DISCLAIMER**

- Curve guarantee in the specification. The curve of test items with electric parameter is used as quality guarantee. The curve of test items without electric parameter is used as reference only.
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