

# Bias Resistor Transistor

## NPN Silicon Surface Mount Transistor with Monolithic Bias Resistor Network

**LDTC123TKT1G**

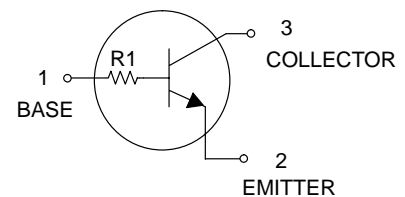
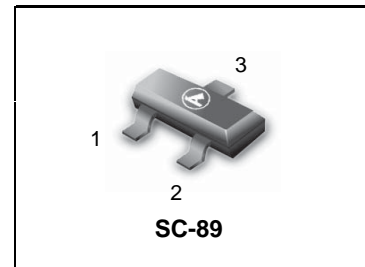
### ● Applications

Inverter, Interface, Driver

### ● Features

- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
- 2) 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.
- 3) Only the on/off conditions need to be set for operation, making the device design easy.

- We declare that the material of product compliance with RoHS requirements.



### ● Absolute maximum ratings (Ta=25°C)

| Parameter                   | Symbol           | Limits      | Unit |
|-----------------------------|------------------|-------------|------|
| Collector-base voltage      | V <sub>CB0</sub> | 50          | V    |
| Collector-emitter voltage   | V <sub>CEO</sub> | 50          | V    |
| Emitter-base voltage        | V <sub>EB0</sub> | 5           | V    |
| Collector current           | I <sub>c</sub>   | 100         | mA   |
| Collector Power dissipation | P <sub>c</sub>   | 200         | mW   |
| Junction temperature        | T <sub>j</sub>   | 150         | °C   |
| Storage temperature         | T <sub>stg</sub> | -55 to +150 | °C   |

### DEVICE MARKING AND RESISTOR VALUES

| Device       | Marking | R1 (K) | R2 (K) | Shipping          |
|--------------|---------|--------|--------|-------------------|
| LDTC123TKT1G | H1      | 2.2    | -      | 3000/Tape & Reel  |
| LDTC123TKT3G | H1      | 2.2    | -      | 10000/Tape & Reel |

### ● Electrical characteristics (Ta=25°C)

| Parameter                            | Symbol               | Min. | Typ. | Max. | Unit | Conditions   |
|--------------------------------------|----------------------|------|------|------|------|--|
| Collector-base breakdown voltage     | BV <sub>CB0</sub>    | 50   | -    | -    | V    | I <sub>c</sub> =50μA                                 |
| Collector-emitter breakdown voltage  | BV <sub>CEO</sub>    | 50   | -    | -    | V    | I <sub>c</sub> =1mA                                  |
| Emitter-base breakdown voltage       | BV <sub>EB0</sub>    | 5    | -    | -    | V    | I <sub>E</sub> =50μA                                 |
| Collector cutoff current             | I <sub>CB0</sub>     | -    | -    | 0.5  | μA   | V <sub>CB</sub> =50V                                 |
| Emitter cutoff current               | I <sub>EB0</sub>     | -    | -    | 0.5  | μA   | V <sub>EB</sub> =4V                                  |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> | -    | -    | 0.3  | V    | I <sub>c</sub> /I <sub>B</sub> =5mA/0.25mA           |
| DC current transfer ratio            | h <sub>FE</sub>      | 100  | 250  | 600  | -    | I <sub>c</sub> =1mA, V <sub>CE</sub> =5V             |
| Input resistance                     | R <sub>1</sub>       | 1.54 | 2.2  | 2.86 | kΩ   | -  |
| Transition frequency                 | f <sub>T</sub> *     | -    | 250  | -    | MHz  | V <sub>CB</sub> =10V, I <sub>E</sub> =-5mA, f=100MHz |

\* Characteristics of built-in transistor.

LDTC123TKT1G

●Electrical characteristic curves

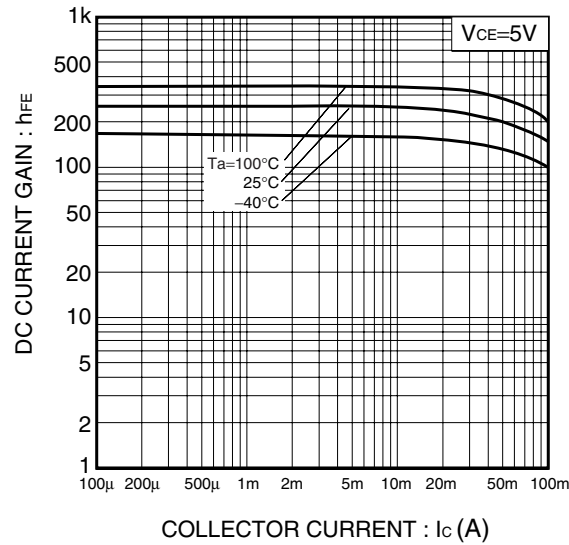


Fig.1 DC Current gain vs. Collector Current

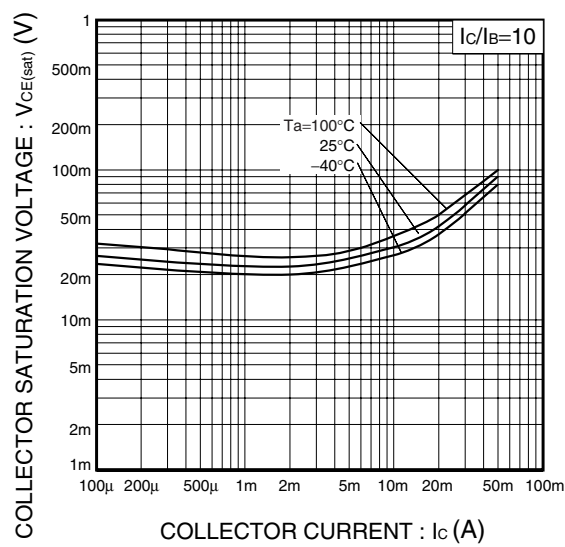
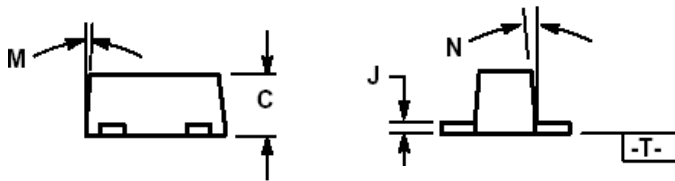


Fig.2 Collector-emitter saturation voltage vs. Collector Current

**LDTCT123TKT1G**
**SC-89**


## NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 463C-01 OBSOLETE, NEW STANDARD 463C-02.



| DIM | MILLIMETERS |      |      | INCHES    |       |       |
|-----|-------------|------|------|-----------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN       | NOM   | MAX   |
| A   | 1.50        | 1.60 | 1.70 | 0.059     | 0.063 | 0.067 |
| B   | 0.75        | 0.85 | 0.95 | 0.030     | 0.034 | 0.040 |
| C   | 0.60        | 0.70 | 0.80 | 0.024     | 0.028 | 0.031 |
| D   | 0.23        | 0.28 | 0.33 | 0.009     | 0.011 | 0.013 |
| G   | 0.50 BSC    |      |      | 0.020 BSC |       |       |
| H   | 0.53 REF    |      |      | 0.021 REF |       |       |
| J   | 0.10        | 0.15 | 0.20 | 0.004     | 0.006 | 0.008 |
| K   | 0.30        | 0.40 | 0.50 | 0.012     | 0.016 | 0.020 |
| L   | 1.10 REF    |      |      | 0.043 REF |       |       |
| M   | ---         | ---  | 10 ° | ---       | ---   | 10 °  |
| N   | ---         | ---  | 10 ° | ---       | ---   | 10 °  |
| S   | 1.50        | 1.60 | 1.70 | 0.059     | 0.063 | 0.067 |

