

Bipolar Transistors Silicon PNP Epitaxial Type

TDTA143E

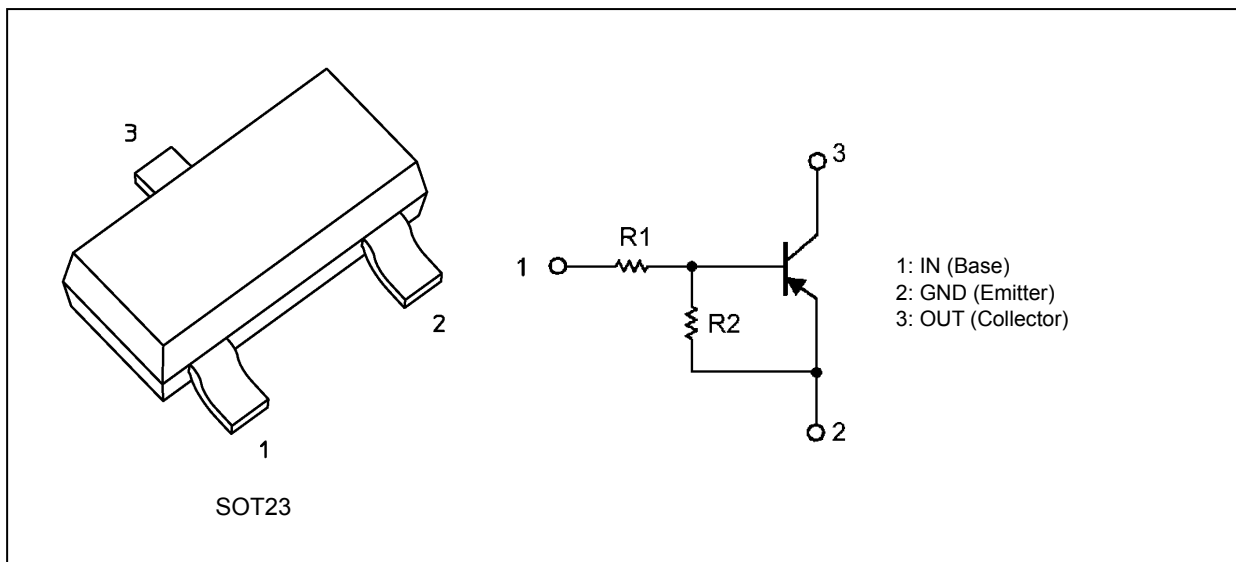
1. Applications

- Switching
- Inverter Circuits
- Driver Circuits

2. Features

- (1) The integrated bias resistor reduces the number of external parts required, making it possible to reduce system size and assembly time.
- (2) Toshiba offers transistors with a wide range of resistance to accommodate various circuit designs.
- (3) Complementary to TDTC143E

3. Packaging and Internal Circuit



4. Absolute Maximum Ratings (Note) (Unless otherwise specified, $T_a = 25\text{ }^\circ\text{C}$)

| Characteristics | Symbol | Rating | Unit |
|----------------------|-----------|------------|------------------|
| Supply voltage | V_{CC} | -50 | V |
| Output current | I_o | -100 | mA |
| Power dissipation | P_D | 320 | mW |
| Junction temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -55 to 150 | $^\circ\text{C}$ |

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

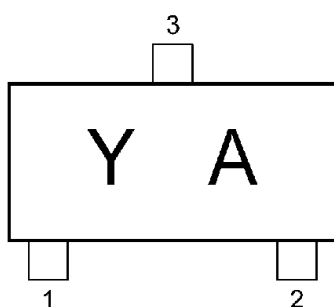
Start of commercial production

2016-03

5. Electrical Characteristics (Unless otherwise specified, $T_a = 25\text{ }^\circ\text{C}$)

| Characteristics | Symbol | Note | Test Condition | Min | Typ. | Max | Unit |
|----------------------|--------------|------|---|------|------|------|------------|
| Input voltage (off) | $V_{I(off)}$ | | $V_{CC} = -5\text{ V}$, $I_O = -0.1\text{ mA}$ | — | — | -1.0 | V |
| Input voltage (on) | $V_{I(on)}$ | | $V_O = -0.3\text{ V}$, $I_O = -20\text{ mA}$ | -4.2 | — | — | V |
| Output voltage | $V_{O(on)}$ | | $I_O = -10\text{ mA}$, $I_I = -0.5\text{ mA}$ | — | -0.1 | -0.3 | V |
| Input bias current | I_I | | $V_I = -5\text{ V}$ | — | — | -1.8 | mA |
| Output current | $I_{O(off)}$ | | $V_{CC} = -50\text{ V}$, $V_I = 0\text{ V}$ | — | — | -500 | nA |
| DC current gain | G_I | | $V_O = -5\text{ V}$, $I_O = -10\text{ mA}$ | 30 | — | — | — |
| Input resistance | R_I | | — | 3.29 | 4.7 | 6.11 | k Ω |
| Resistance ratio | R_2/R_1 | | — | 0.8 | 1.0 | 1.2 | — |
| Transition frequency | f_T | | $V_{CE} = -10\text{ V}$, $I_E = 5\text{ mA}$, $f = 100\text{ MHz}$ | — | 250 | — | MHz |

6. Marking



7. Characteristics Curves (Note)

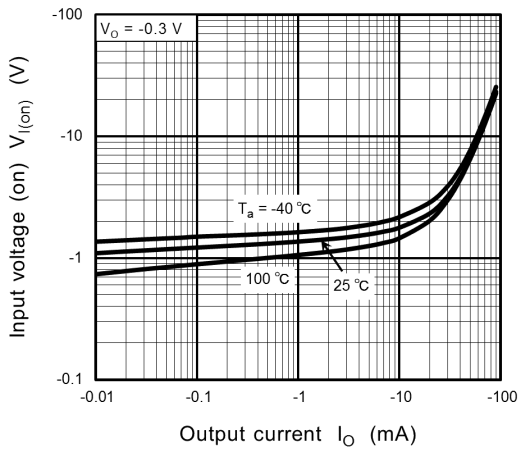


Fig. 7.1 $V_{I(on)} - I_O$

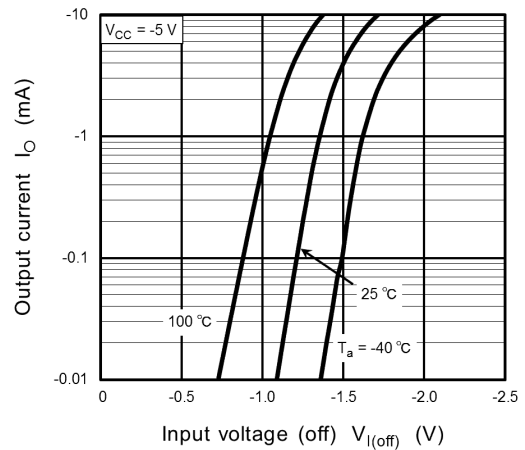


Fig. 7.2 $I_O - V_{I(off)}$

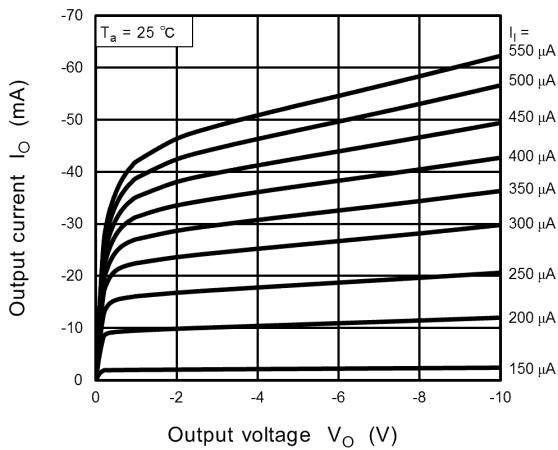


Fig. 7.3 $I_O - V_O$

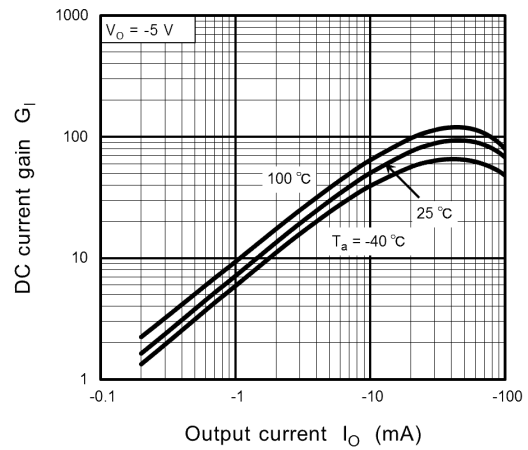


Fig. 7.4 $G_I - I_O$

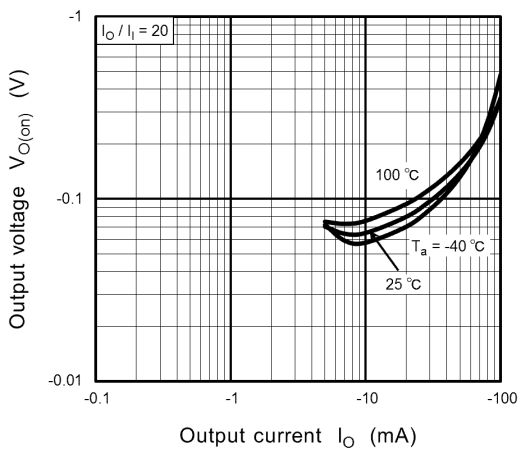
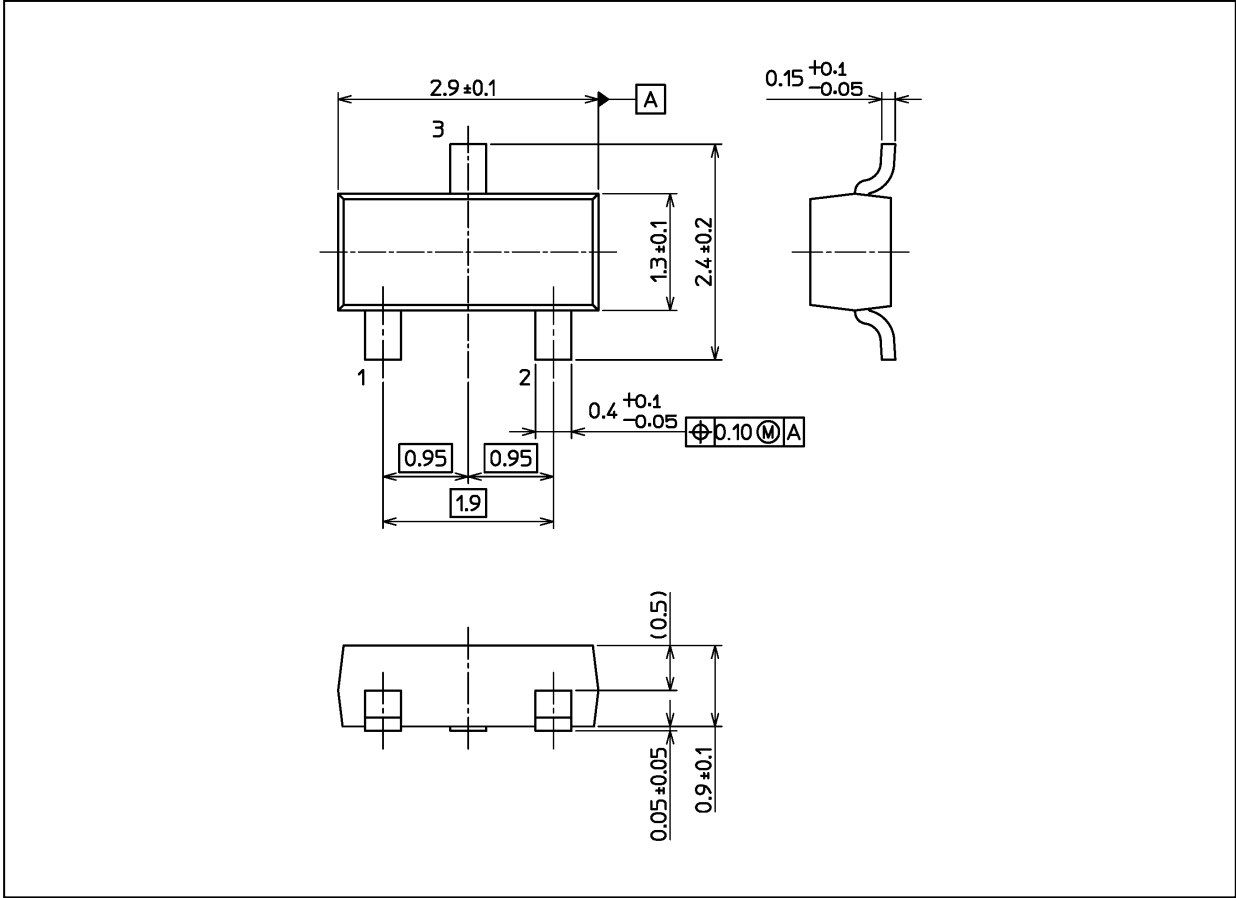


Fig. 7.5 $V_{O(on)} - I_O$

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Package Dimensions

Unit: mm



Weight: 9 mg (typ.)

| Package Name(s) |
|------------------|
| TOSHIBA: 2-3AB1A |
| Nickname: SOT23 |

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