

Bipolar Transistors Silicon PNP Epitaxial Type

## TDTA143E

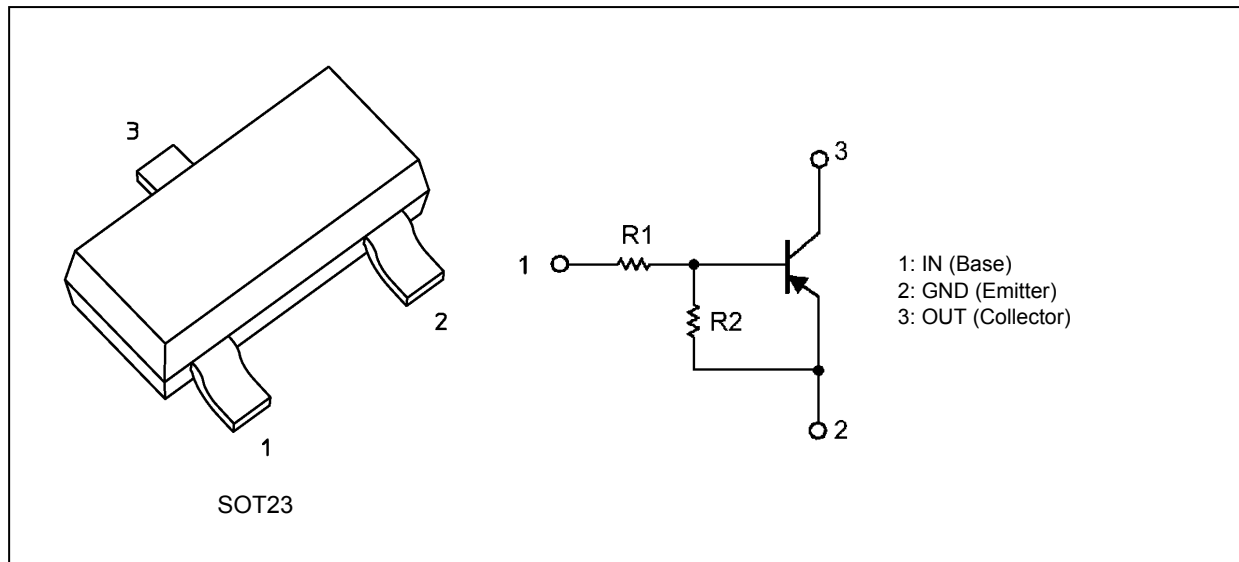
### 1. Applications

- 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.

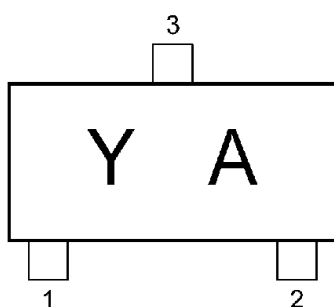
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Start of commercial production  
2016-03

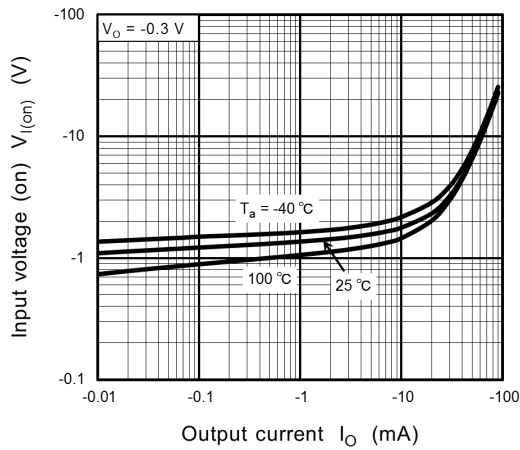
## 5. Electrical Characteristics (Unless otherwise specified, $T_a = 25\text{ }^\circ\text{C}$ )

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	$I_I$		$V_I = -5\text{ V}$	—	—	-0.74	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	$R_1$		—	3.29	4.7	6.11	k $\Omega$
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

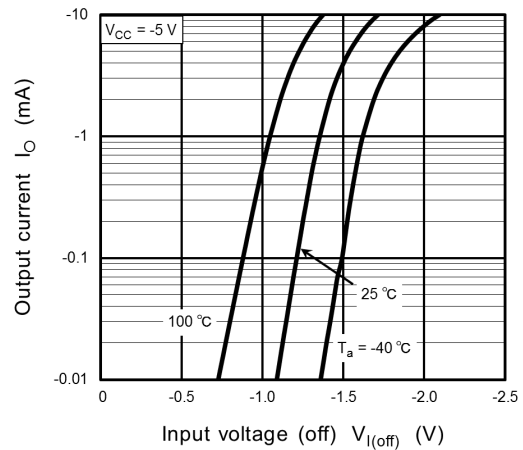
## 6. Marking



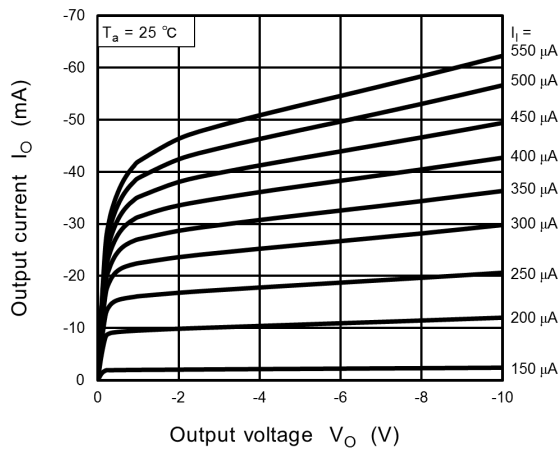
## 7. Characteristics Curves (Note)



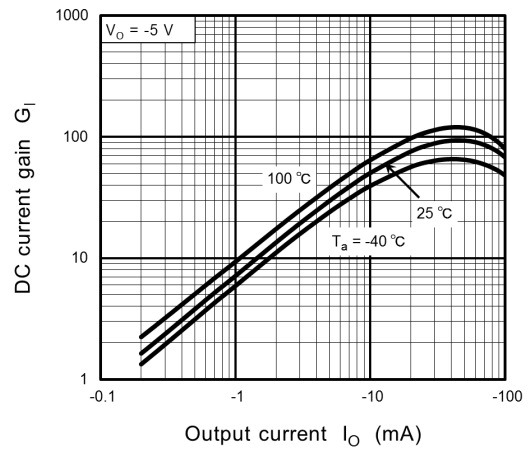
**Fig. 7.1**  $V_{I(on)} - I_O$



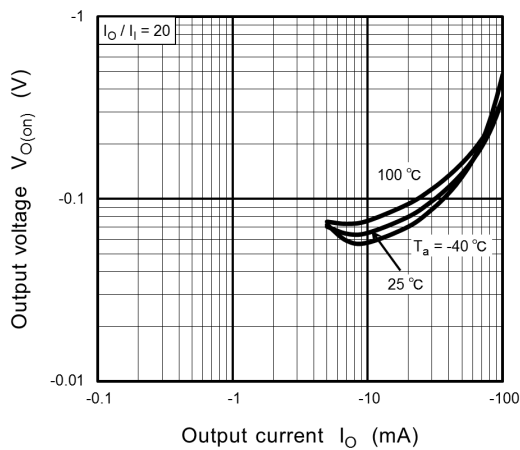
**Fig. 7.2**  $I_O - V_{I(off)}$



**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.



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