



**THE DATASHEET OF
DTC143TE-TP**



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 Negative 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
- Halogen Free. "Green" Device (Note 1)
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

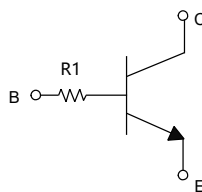
Maximum Ratings @ 25°C Unless Otherwise Specified

| Parameter | Symbol | Value | Unit |
|------------------------------|-----------|-------------|------|
| Collector-Emitter Voltage | V_{CEO} | 50 | V |
| Collector-Base Voltage | V_{CBO} | 50 | V |
| Emitter-Base Voltage | V_{EBO} | 5 | V |
| Collector Current-Continuous | I_C | 100 | mA |
| Collector Dissipation | P_C | 150 | mW |
| Junction Temperature | T_J | 150 | °C |
| Storage Temperature Range | T_{STG} | -55 to +150 | °C |

Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

Device Marking: 03

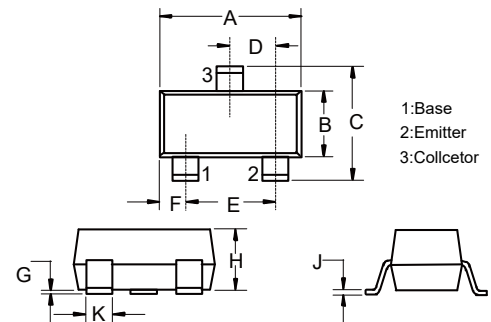
Internal Structure



B:Base
C:Collector
E:Emitter

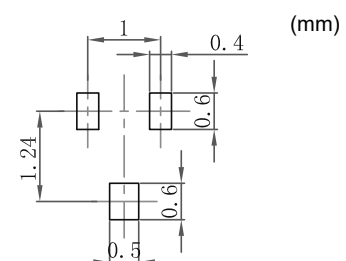
NPN Digital Transistor

SOT-523



| DIM | INCHES | | MM | | NOTE |
|-----|--------|-------|------|------|------|
| | MIN | MAX | MIN | MAX | |
| A | 0.059 | 0.067 | 1.50 | 1.70 | |
| B | 0.030 | 0.033 | 0.75 | 0.85 | |
| C | 0.057 | 0.069 | 1.45 | 1.75 | |
| D | 0.020 | | 0.50 | | TYP. |
| E | 0.035 | 0.043 | 0.90 | 1.10 | |
| G | 0.000 | 0.004 | 0.00 | 0.10 | |
| H | 0.024 | 0.031 | 0.60 | 0.80 | |
| J | 0.004 | 0.008 | 0.10 | 0.20 | |
| K | 0.006 | 0.014 | 0.15 | 0.35 | |

Suggested Solder Pad Layout



Electrical Characteristics @ 25°C Unless Otherwise Specified

| Parameter | Symbol | Min | Typ | Max | Units | Conditions |
|--------------------------------------|---------------|------|-----|------|------------|------------------------------------|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | 50 | --- | --- | V | $I_C=50\mu A, I_E=0$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | 50 | --- | --- | V | $I_C=1mA, I_B=0$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 5 | --- | --- | V | $I_E=50\mu A, I_C=0$ |
| Collector Cut-off Current | I_{CBO} | --- | --- | 0.5 | μA | $V_{CB}=50V, I_E=0$ |
| Emitter Cut-off Current | I_{EBO} | --- | --- | 0.5 | μA | $V_{EB}=4V, I_C=0$ |
| DC Current Gain | h_{FE} | 100 | 300 | 600 | --- | $I_C=1mA, V_{CE}=5V$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | --- | --- | 0.3 | V | $I_C=5mA, I_B=0.25mA$ |
| Input Resistance | R_1 | 3.29 | 4.7 | 6.11 | K Ω | |
| Transition Frequency | f_T | --- | 250 | --- | MHz | $V_{CE}=10.0V, I_E=-5mA, f=100MHz$ |

Curve Characteristics

Fig. 1 - Static Characteristics

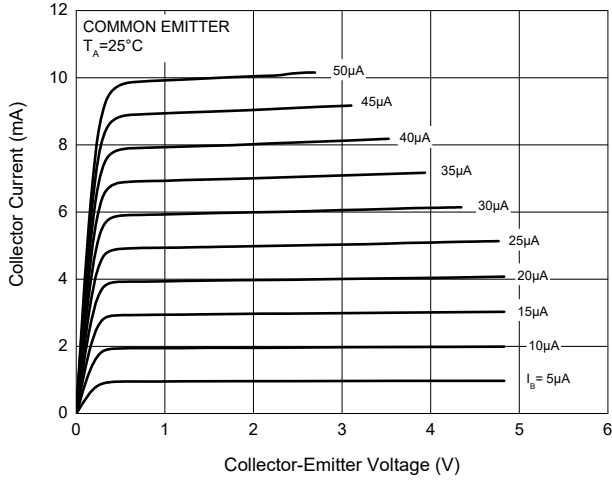


Fig. 2 - DC Current Gain Characteristics

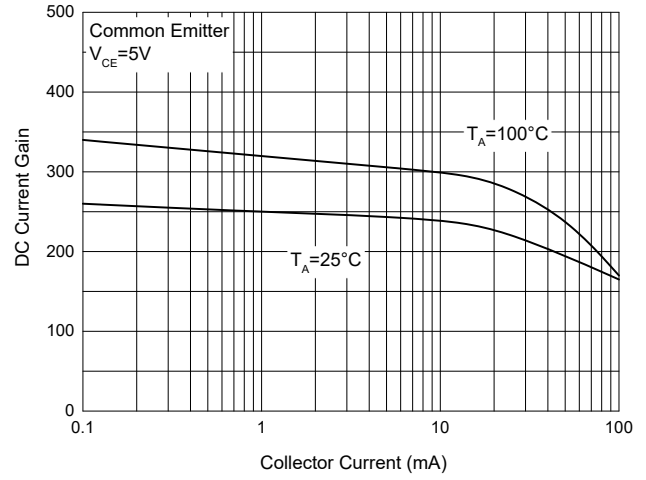


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

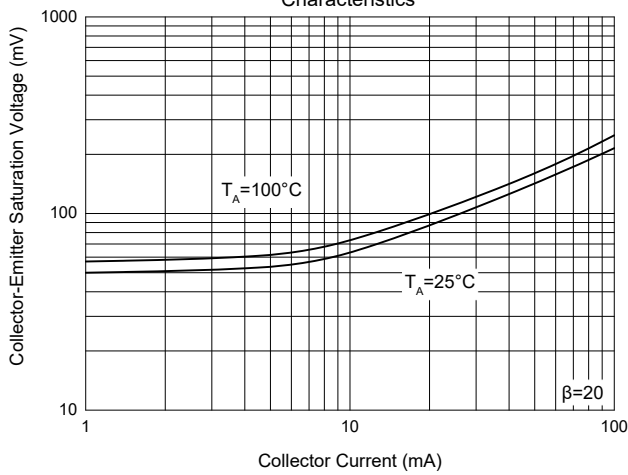
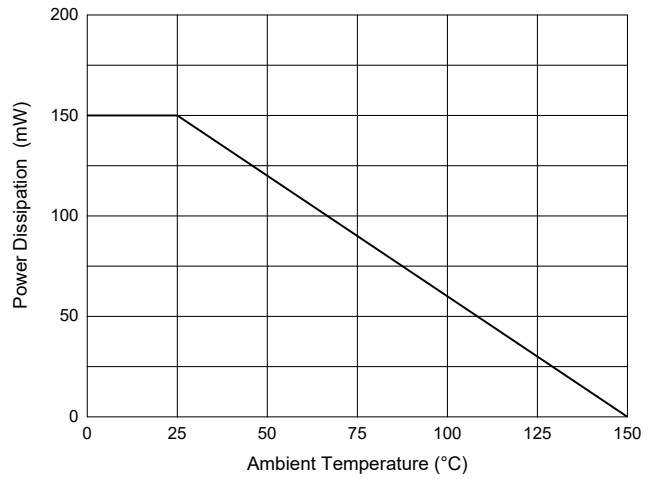


Fig. 5 - Power Derating Curve



Ordering Information

| Device | Packing |
|----------------|----------------------|
| Part Number-TP | Tape&Reel:3Kpcs/Reel |

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