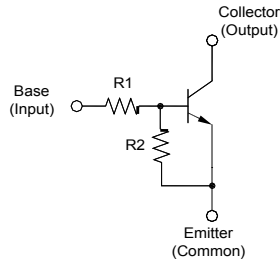


## MMDTC143ZCA

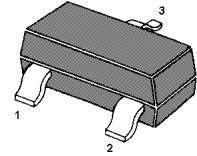
### NPN Silicon Epitaxial Planar Digital Transistor

#### Features

- With built-in bias resistors
- Simplify circuit design



#### SOT-23



1. BASE
2. EMITTER
3. COLLECTOR

**MARKING:** Z23

#### Absolute Maximum Ratings ( $T_a = 25\text{ }^\circ\text{C}$ )

| Parameter                 | Symbol    | Value         | Unit             |
|---------------------------|-----------|---------------|------------------|
| Collector Emitter Voltage | $V_{CEO}$ | 50            | V                |
| Input Voltage             | $V_I$     | - 5 to + 30   | V                |
| Collector Current         | $I_C$     | 100           | mA               |
| Power Dissipation         | $P_{tot}$ | 200           | mW               |
| Junction Temperature      | $T_j$     | 150           | $^\circ\text{C}$ |
| Storage Temperature Range | $T_{stg}$ | - 55 to + 150 | $^\circ\text{C}$ |

#### Characteristics at $T_a = 25\text{ }^\circ\text{C}$

| Parameter   | Symbol        | Min. | Typ. | Max. | Unit          |
|---|---------------|------|------|------|---------------|
| DC Current Gain<br>at $V_{CE} = 5\text{ V}$ , $I_C = 10\text{ mA}$                              | $h_{FE}$      | 80   | -    | -    | -             |
| Collector Base Cutoff Current<br>at $V_{CB} = 50\text{ V}$                                      | $I_{CBO}$     | -    | -    | 0.5  | $\mu\text{A}$ |
| Emitter Base Cutoff Current<br>at $V_{EB} = 5\text{ V}$   | $I_{EBO}$     | -    | -    | 1.8  | mA            |
| Collector Emitter Saturation Voltage<br>at $I_C = 5\text{ mA}$ , $I_B = 0.25\text{ mA}$         | $V_{CE(sat)}$ | -    | -    | 0.3  | V             |
| Input on Voltage<br>at $V_{CE} = 0.3\text{ V}$ , $I_C = 5\text{ mA}$                            | $V_{I(on)}$   | -    | -    | 1.3  | V             |
| Input off Voltage<br>at $V_{CE} = 5\text{ V}$ , $I_C = 100\text{ }\mu\text{A}$                  | $V_{I(off)}$  | 0.5  | -    | -    | V             |
| Transition frequency<br>at $V_{CE} = 10\text{ V}$ , $-I_E = 5\text{ mA}$ , $f = 100\text{ MHz}$ | $f_T$         | -    | 250  | -    | MHz           |
| Input Resistance  | $R_1$         | 3.29 |      | 6.11 | K $\Omega$    |
| Resistance Ratio  | $R_2 / R_1$   | 8    | 10   | 12   | -             |

## Typical Characteristics

Fig.1 Input voltage vs. output current (ON characteristics)

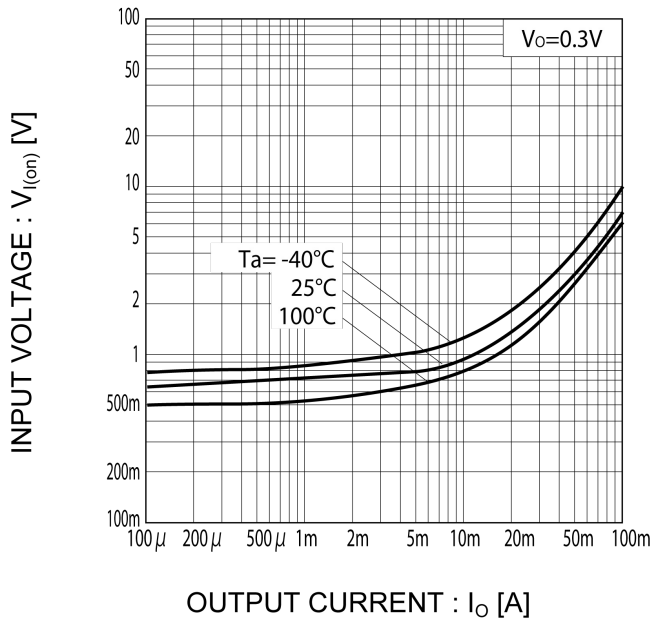


Fig.2 Output current vs. input voltage (OFF characteristics)

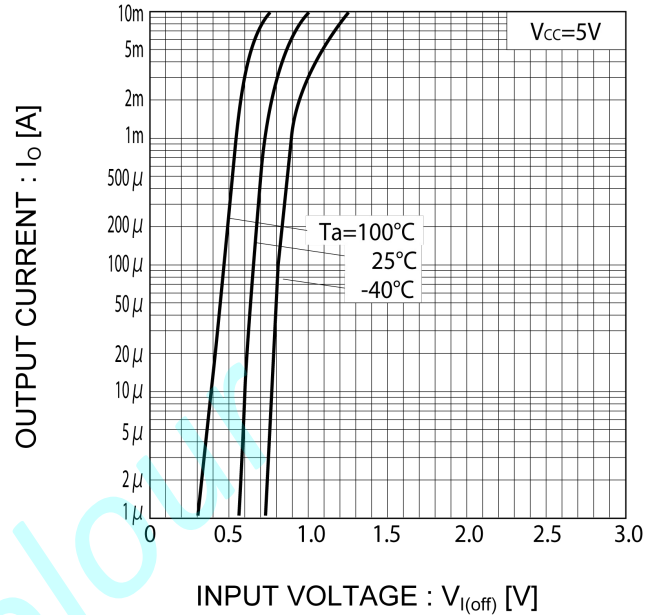


Fig.3 Output current vs. output voltage

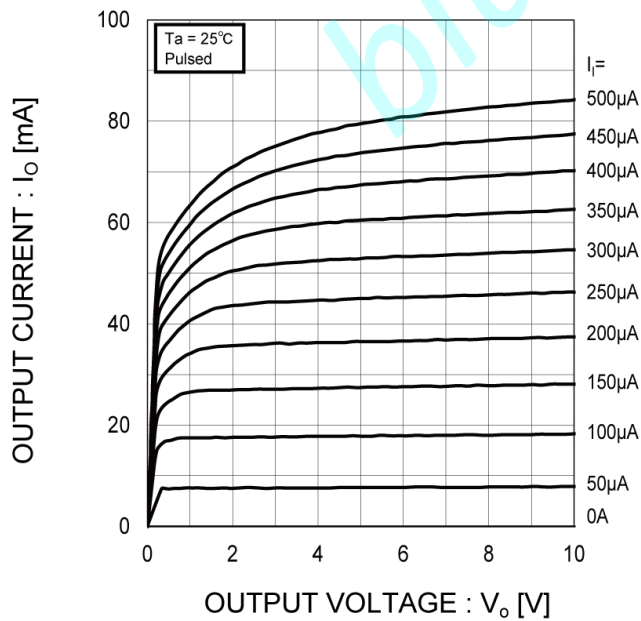
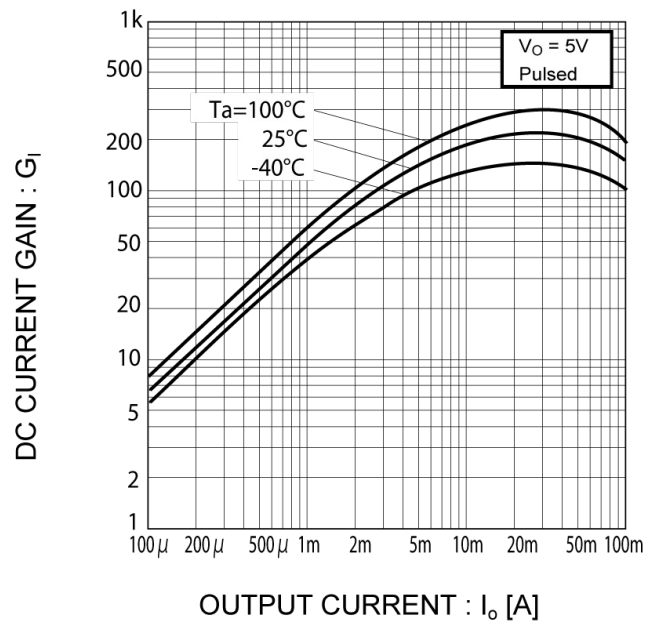


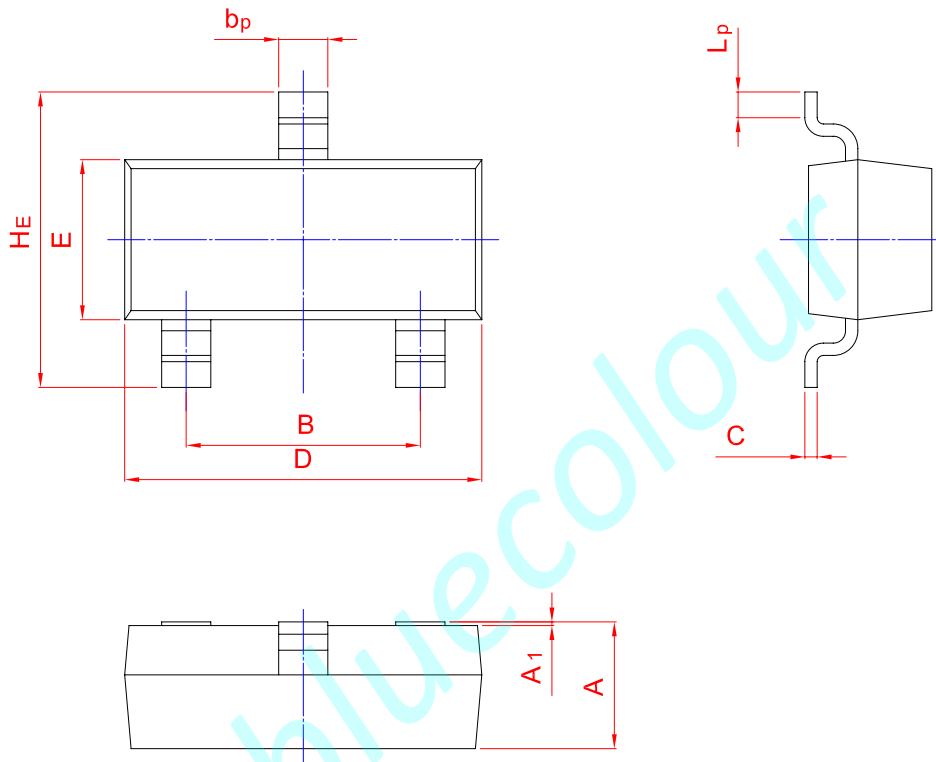
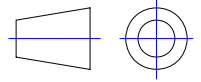
Fig.4 DC current gain vs. output current



## PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



| UNIT | A    | B    | bp   | C    | D    | E    | HE   | A1    | Lp   |
|------|------|------|------|------|------|------|------|-------|------|
| mm   | 1.40 | 2.04 | 0.50 | 0.19 | 3.10 | 1.65 | 3.00 | 0.100 | 0.50 |
|      | 0.95 | 1.78 | 0.35 | 0.08 | 2.70 | 1.20 | 2.20 | 0.013 | 0.20 |