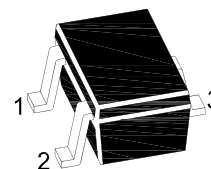
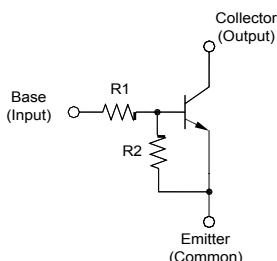


## NPN Silicon Epitaxial Planar Digital Transistor

### Features

- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process



1.Base 2.Emllter 3.Collector  
SOT-523 Plastic Package

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

| Parameter                 | Symbol    | Value         | Unit             |
|---------------------------|-----------|---------------|------------------|
| Collector Emitter Voltage | $V_{CEO}$ | 50            | V                |
| Input Voltage             | $V_I$     | - 10 to + 30  | V                |
| Collector Current         | $I_C$     | 100           | mA               |
| Power Dissipation         | $P_{tot}$ | 150           | 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 $V_{CE} = 5\text{ V}$ , $I_C = 10\text{ mA}$                              | $h_{FE}$      | 30   | -    | -    | -             |
| 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 $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$         | $V_{CE(sat)}$ | -    | -    | 0.3  | V             |
| Input on Voltage<br>at $V_{CE} = 0.3\text{ V}$ , $I_C = 20\text{ mA}$                           | $V_{I(on)}$   | -    | -    | 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 | 4.7  | 6.11 | K $\Omega$    |
| Resistance Ratio                                                                                | $R_2 / R_1$   | 0.8  | 1    | 1.2  | -             |

## MMDTC143EE

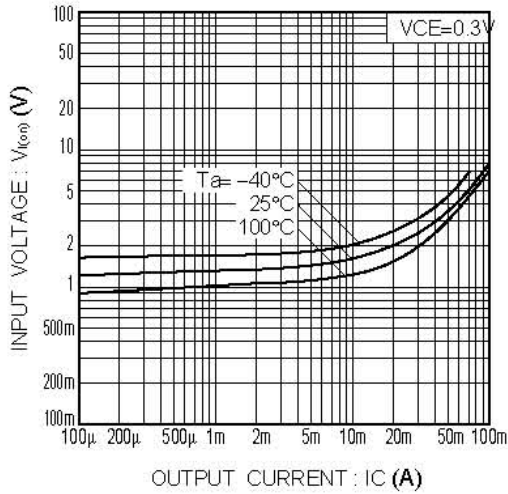


Fig.1 Input voltage vs. output current (ON characteristics)

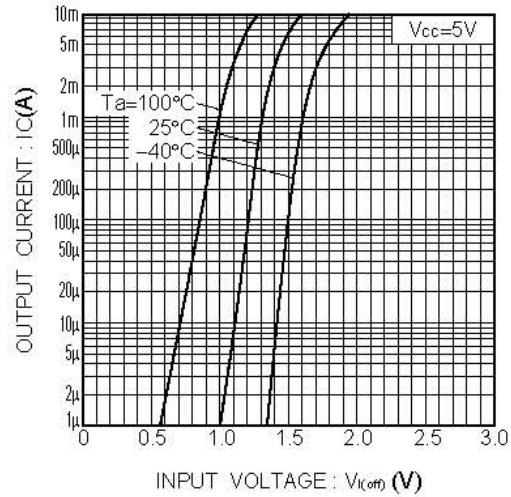


Fig.2 Output current vs. input voltage (OFF characteristics)

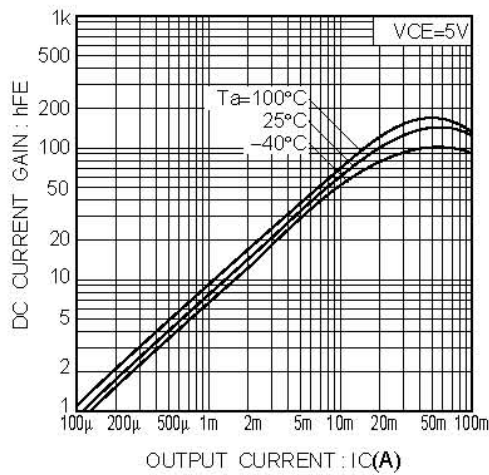


Fig.3 DC current gain vs. output current

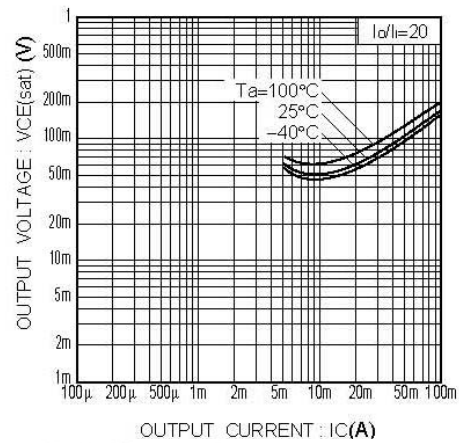


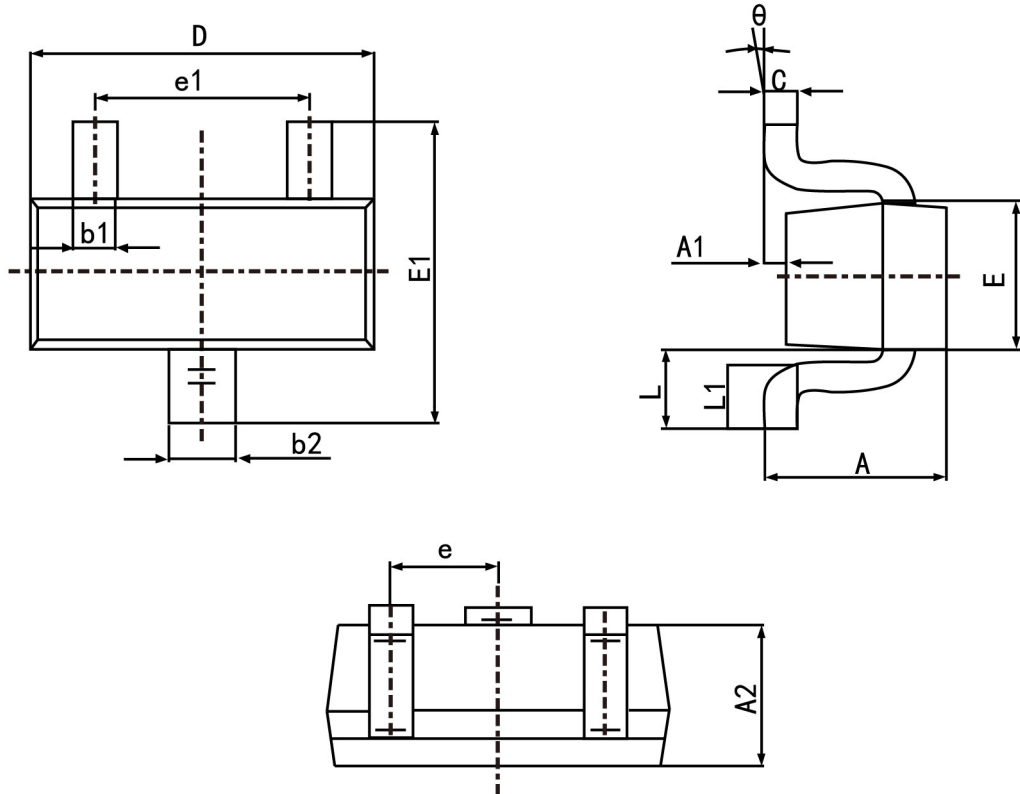
Fig.4 Output voltage vs. output current



## PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-523



| Symbol | Dimension in Millimeters |       |
|--------|--------------------------|-------|
|        | Min                      | Max   |
| A      | 0.700                    | 0.900 |
| A1     | 0.000                    | 0.100 |
| A2     | 0.700                    | 0.800 |
| b1     | 0.150                    | 0.250 |
| b2     | 0.250                    | 0.350 |
| c      | 0.100                    | 0.200 |
| D      | 1.500                    | 1.700 |
| E      | 0.700                    | 0.900 |
| E1     | 1.450                    | 1.750 |
| e      | 0.500                    | TYP.  |
| e1     | 0.900                    | 1.100 |
| L      | 0.400 REF.               |       |
| L1     | 0.260                    | 0.460 |
| θ      | 0°                       | 8°    |