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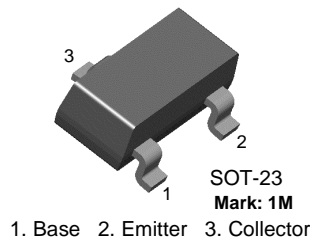
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# MMBTA13

## NPN Darlington Transistor

- This device is designed for applications requiring extremely high Current gain at collector Currents to 1.0A.
- Sourced from process 05.
- See MPSA14 for characteristics.



### Absolute Maximum Ratings $T_a = 25^\circ\text{C}$ unless otherwise noted

| Symbol         | Parameter  | Value       | Units            |
|----------------|--|-------------|------------------|
| $V_{CES}$      | Collector-Emitter Voltage                        | 30          | V                |
| $V_{CBO}$      | Collector-Base Voltage                           | 30          | V                |
| $V_{EBO}$      | Emitter-Base Voltage                             | 10          | V                |
| $I_C$          | Collector Current - Continuous                   | 1.2         | A                |
| $T_J, T_{STG}$ | Operating and Storage Junction Temperature Range | -55 to +150 | $^\circ\text{C}$ |

### Electrical Characteristics $T_a = 25^\circ\text{C}$ unless otherwise noted

| Symbol                              | Parameter                            | Test Condition  | Min.            | Max. | Units |
|-------------------------------------|--------------------------------------|---|-----------------|------|-------|
| <b>Off Characteristics</b>          |                                      |   |                 |      |       |
| $V_{(BR)CES}$                       | Collector-Emitter Breakdown Voltage  | $I_C = 100\mu\text{A}, I_B = 0$   | 30              |      | V     |
| $I_{CBO}$                           | Collector-Cutoff Current             | $V_{CB} = 30\text{V}, I_E = 0$  |                 | 100  | nA    |
| $I_{EBO}$                           | Emitter-Cutoff Current               | $V_{EB} = 10\text{V}, I_C = 0$  |                 | 100  | nA    |
| <b>On Characteristics *</b>         |                                      |   |                 |      |       |
| $h_{FE}$                            | DC Current Gain                      | $V_{CE} = 5.0\text{V}, I_C = 10\text{mA}$<br>$V_{CE} = 5.0, I_C = 100\text{mA}$ | 5,000<br>10,000 |      |       |
| $V_{CE(sat)}$                       | Collector-Emitter Saturation Voltage | $I_C = 100\text{mA}, I_B = 0.1\text{mA}$  |                 | 1.5  | V     |
| $V_{BE(on)}$                        | Base-Emitter On Voltage              | $I_C = 100\text{mA}, V_{CE} = 5.0\text{V}$                                      |                 | 2.0  | V     |
| <b>Small Signal Characteristics</b> |                                      |   |                 |      |       |
| $f_T$                               | Current Gain Bandwidth Product       | $I_C = 10\text{mA}, V_{CE} = 10\text{V}, f = 100\text{MHz}$                     | 125             |      | pF    |

\* Pulse Test: Pulse Widths  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

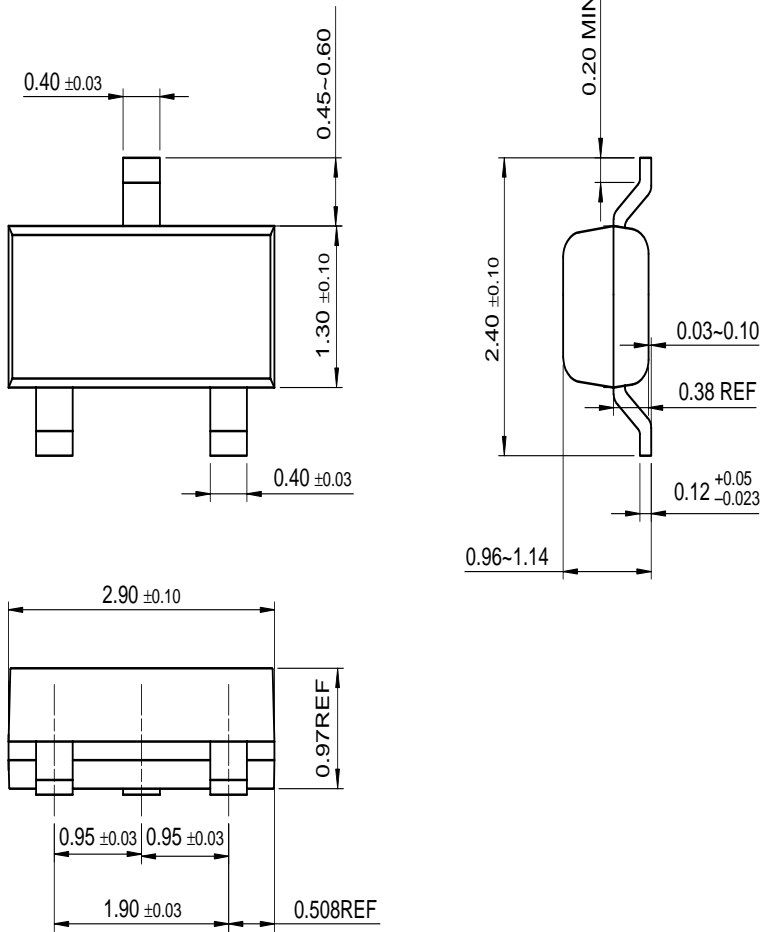
**Thermal Characteristics**  $T_a=25^\circ\text{C}$  unless otherwise noted

| Symbol                | Parameter   | Max.       | Units                            |
|-----------------------|---|------------|----------------------------------|
| $P_D$                 | Total Device Dissipation<br>Derate above $25^\circ\text{C}$ | 350<br>2.8 | mW<br>$\text{mW}/^\circ\text{C}$ |
| $R_{\theta\text{JC}}$ | Thermal Resistance, Junction to Case                        |            | $^\circ\text{C}/\text{W}$        |
| $R_{\theta\text{JA}}$ | Thermal Resistance, Junction to Ambient                     | 357        | $^\circ\text{C}/\text{W}$        |

\* Device mounted on FR-4PCB  $1.6'' \times 1.6'' \times 0.06''$ .

Mechanical Dimensions

SOT-23



Dimensions in Millimeters

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