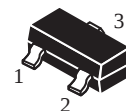
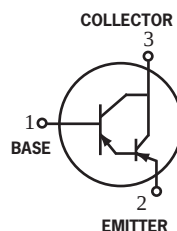


### Darlington Transistor PNP Silicon

 Lead(Pb)-Free



SOT-23

### MAXIMUM RATINGS (Ta=25 °C)

| Rating                       | Symbol           | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Emitter Voltage    | V <sub>CES</sub> | -30   | Vdc  |
| Collector-Base Voltage       | V <sub>CBO</sub> | -30   | Vdc  |
| Emitter-Base Voltage         | V <sub>EBO</sub> | -10   | Vdc  |
| Collector Current-Continuous | I <sub>C</sub>   | -500  | mAdc |

### THERMAL CHARACTERISTICS

| Characteristics                                                                                   | Symbol                            | Value       | Unit        |
|---------------------------------------------------------------------------------------------------|-----------------------------------|-------------|-------------|
| Total Device Dissipation FR-5 Board <sup>(1)</sup><br>T <sub>A</sub> =25 °C<br>Derate above 25 °C | P <sub>D</sub>                    | 225<br>1.8  | mW<br>mW/°C |
| Thermal Resistance, Junction Ambient                                                              | R <sub>θJA</sub>                  | 556         | °C/W        |
| Junction and Storage, Temperature                                                                 | T <sub>J</sub> , T <sub>stg</sub> | -55 to +150 | °C          |

### Device Marking

MMBTA63=2U , MMBTA64=2V

### ELECTRICAL CHARACTERISTICS

| Characteristics                                                                   | Symbol               | Min | Max  | Unit |
|-----------------------------------------------------------------------------------|----------------------|-----|------|------|
| Collector-Emitter Breakdown Voltage(I <sub>C</sub> =-100 uAdc, I <sub>B</sub> =0) | V <sub>(BR)CEO</sub> | -30 | -    | Vdc  |
| Collector Cutoff Current(V <sub>CB</sub> =-30Vdc, I <sub>E</sub> =0)              | I <sub>CBO</sub>     | -   | -0.1 | uAdc |
| Emitter Cutoff Current(V <sub>EB</sub> =-10Vdc, I <sub>C</sub> =0)                | I <sub>EBO</sub>     | -   | -0.1 | uAdc |

1. FR-5=1.0×0.75×0.062 in

2. Pulse Test: Pulse Width≤ 300us, Duty Cycle ≤ 2.0%

**ELECTRICAL CHARACTERISTICS** ( $T_a=25\text{ }^{\circ}\text{C}$  unless otherwise noted) (Continued)

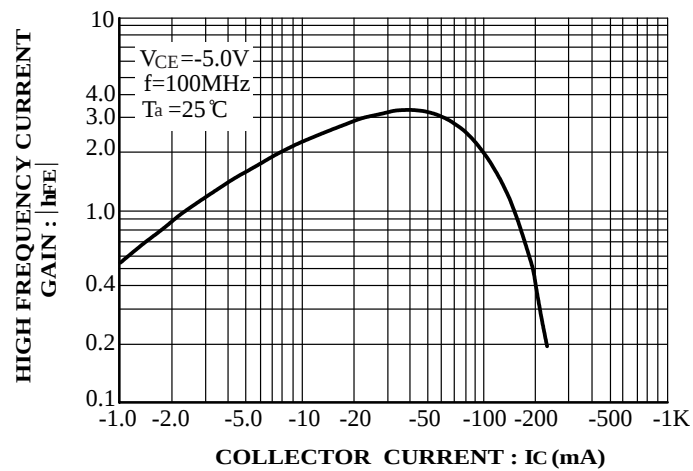
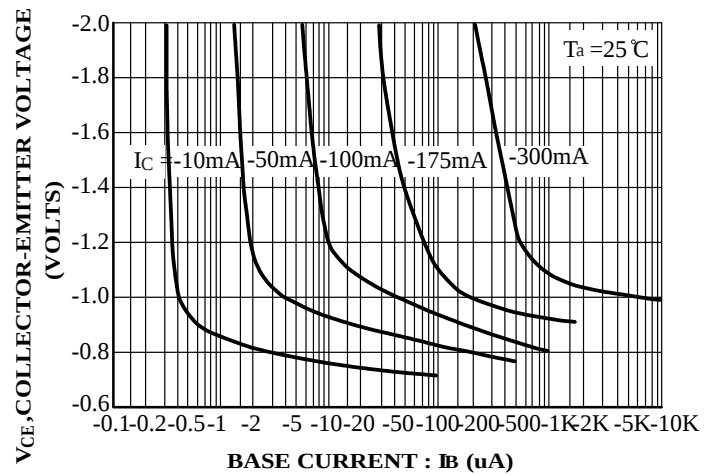
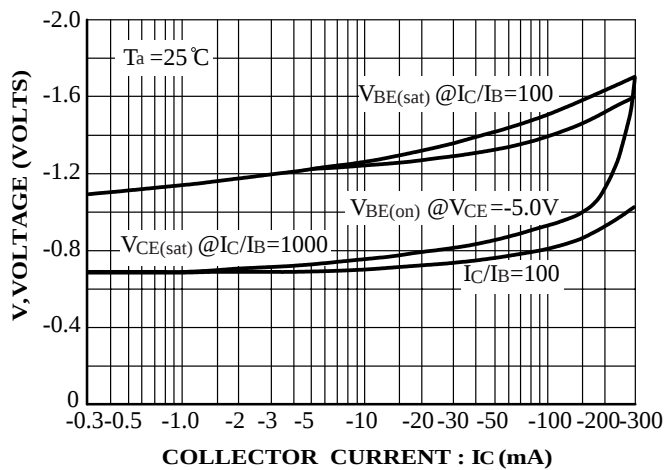
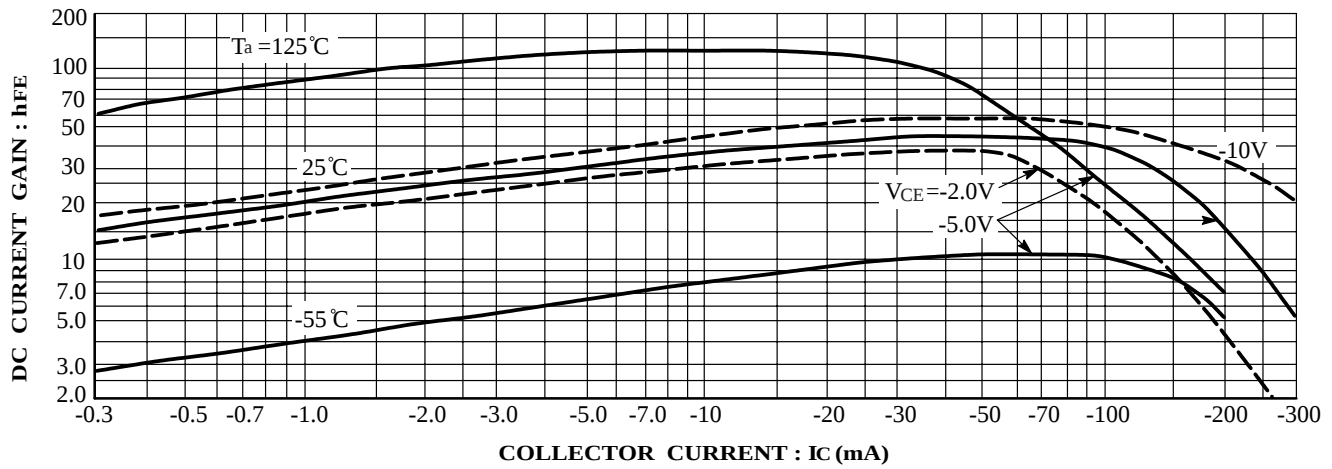
| Characteristics | Symbol | Min | Max | Unit |
|-----------------|--------|-----|-----|------|
|-----------------|--------|-----|-----|------|

**ON CHARACTERISTICS**

|                                                                                                           |               |                |        |     |
|-----------------------------------------------------------------------------------------------------------|---------------|----------------|--------|-----|
| $I_C = -10\text{ mA}$ , $V_{CE} = -5.0\text{ Vdc}$<br>$I_C = -100\text{ mA}$ , $V_{CE} = -5.0\text{ Vdc}$ | $h_{FE}$      | 10000<br>20000 | -<br>- |     |
| Collector-Emitter Saturation Voltage<br>( $I_C = -100\text{ mA}$ , $I_B = -0.1\text{ mA}$ )               | $V_{CE(sat)}$ | -              | -1.5   | Vdc |
| Base-Emitter On Voltage<br>( $I_C = -100\text{ mA}$ , $V_{CE} = -5.0\text{ Vdc}$ )                        | $V_{BE(on)}$  | -              | -2.0   | Vdc |

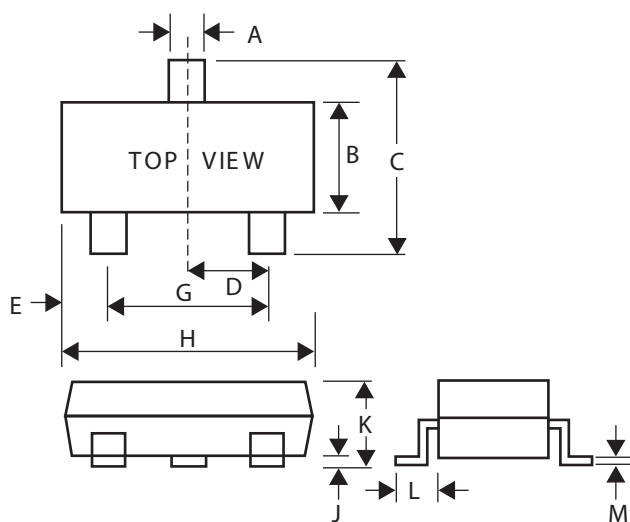
**SMALL-SIGNAL CHARACTERISTICS**

|                                                                                                                 |       |     |   |     |
|-----------------------------------------------------------------------------------------------------------------|-------|-----|---|-----|
| Current-Gain-Bandwidth Product<br>( $I_C = -10\text{ mA}$ , $V_{CE} = -5.0\text{ Vdc}$ , $f = 100\text{ MHz}$ ) | $f_T$ | 125 | - | MHz |
|-----------------------------------------------------------------------------------------------------------------|-------|-----|---|-----|



**SOT-23 Package Outline Dimensions**

Unit:mm



| Dim | Min   | Max  |
|-----|-------|------|
| A   | 0.35  | 0.51 |
| B   | 1.19  | 1.40 |
| C   | 2.10  | 3.00 |
| D   | 0.85  | 1.05 |
| E   | 0.46  | 1.00 |
| G   | 1.70  | 2.10 |
| H   | 2.70  | 3.10 |
| J   | 0.01  | 0.13 |
| K   | 0.89  | 1.10 |
| L   | 0.30  | 0.61 |
| M   | 0.076 | 0.25 |