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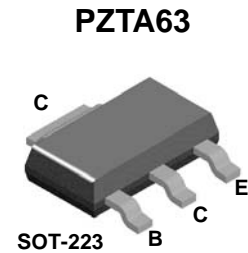
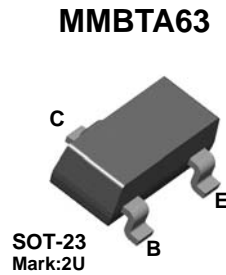
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# MPSA63 / MMBTA63 / PZTA63

## PNP Darlington Transistor

### Features

- This device is designed for applications requiring extremely high current gain at currents to 800 mA.
- Sourced from Process 61.



### 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 | $^\circ\text{C}$ |

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

#### NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

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

| Symbol          | Parameter                               | Max.   |          |          | Units                     |
|-----------------|---|--------|----------|----------|---------------------------|
|                 |   | MPSA63 | *MMBTA63 | **PZTA63 |                           |
| $P_D$           | Total Device Dissipation                | 625    | 350      | 1,000    | mW                        |
|                 | Derate above $25^\circ\text{C}$         | 5.0    | 2.8      | 8.0      | mW/ $^\circ\text{C}$      |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case    | 83.3   |          |          | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 200    | 357      | 125      | $^\circ\text{C}/\text{W}$ |

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

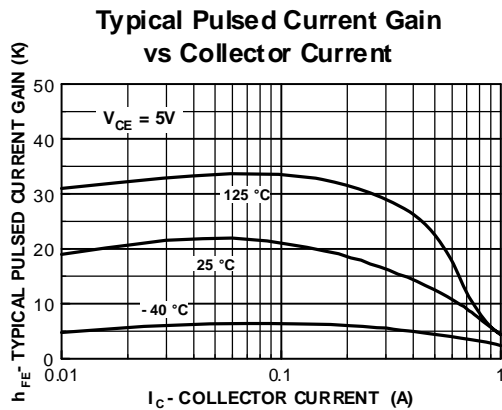
\*\* Device mounted on FR-4 PCB  $36\text{mm} \times 18\text{mm} \times 1.5\text{mm}$ ; mounting pad for the collector lead min.  $6\text{cm}^2$ .

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

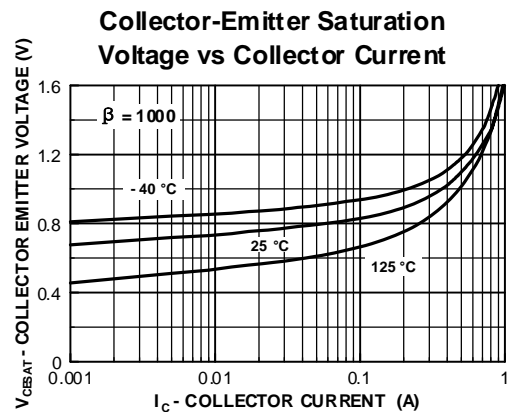
| Symbol                              | Parameter                            | Test Condition  | Min.            | Max. | Units |
|-------------------------------------|--------------------------------------|---|-----------------|------|-------|
| <b>Off Characteristics</b>          |                                      |   |                 |      |       |
| $BV_{(BR)CES}$                      | 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                      | $I_C = -10\text{mA}, V_{CE} = -5.0\text{V}$<br>$I_C = -100\text{mA}, V_{CE} = -5.0\text{V}$ | 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     | $I_C = -10\text{mA}, V_{CE} = -5.0\text{V},$<br>$f = 100\text{MHz}$                         | 125             |      | MHz   |

\* Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

**Typical Performance Characteristics**

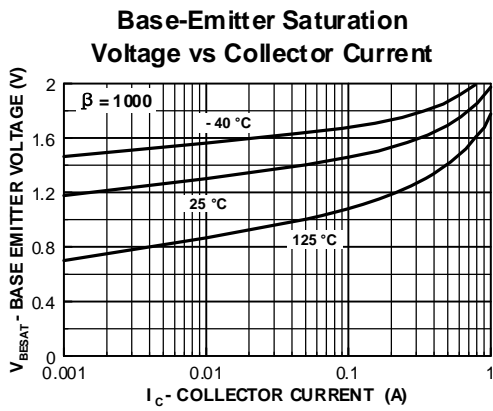


**Figure 1. Typical Pulsed Current Gain vs Collector Current**

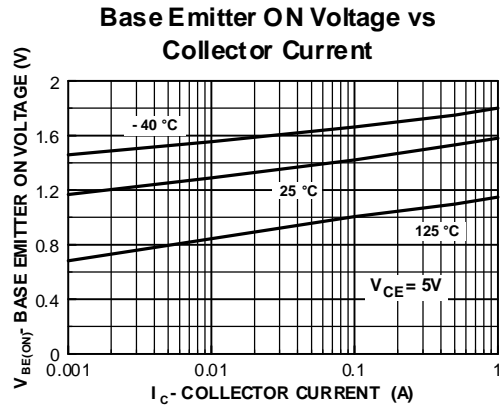


**Figure 2. Collector-Emitter Saturation Voltage vs Collector Current**

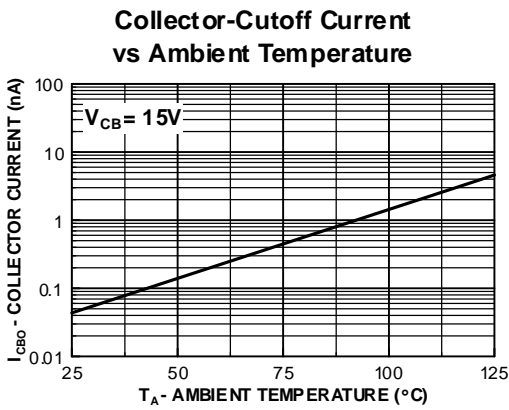
**Typical Performance Characteristics** (continued)



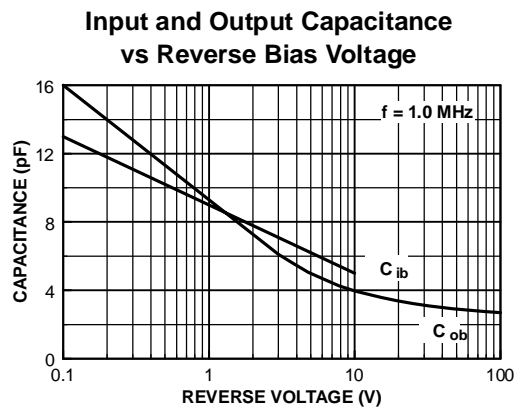
**Figure 3. Base-Emitter Saturation Voltage vs Collector Current**



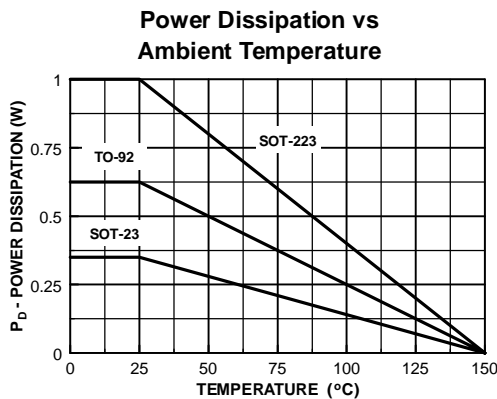
**Figure 4. Base-Emitter ON Voltage vs Collector Current**



**Figure 5. Collector Cutoff Current vs Ambient Temperature**



**Figure 6. Input and Output Capacitance vs Reverse Bias Voltage**



**Figure 7. Power Dissipation vs Ambient Temperature**



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