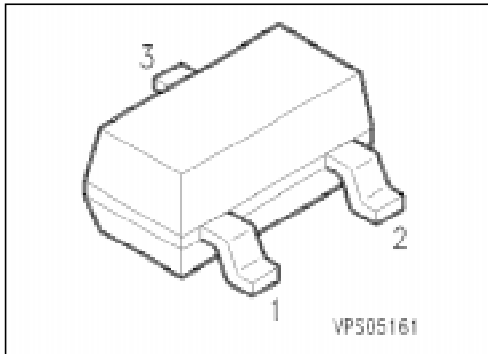


## PNP Silicon Darlington Transistors

**SMBTA 63**  
**SMBTA 64**

- High collector current
- High DC current gain



| Type     | Marking | Ordering Code<br>(tape and reel) | Pin Configuration |   |   | Package <sup>1)</sup> |
|----------|---------|----------------------------------|-------------------|---|---|-----------------------|
|          |         |                                  | 1                 | 2 | 3 |                       |
| SMBTA 63 | s2U     | Q68000-A2625                     | B                 | E | C | SOT-23                |
| SMBTA 64 | s2V     | Q68000-A2485                     |                   |   |   |                       |

### Maximum Ratings

| Parameter                                     | Symbol    | Values         |          | Unit |
|-----------------------------------------------|-----------|----------------|----------|------|
|                                               |           | SMBTA 63       | SMBTA 64 |      |
| Collector-emitter voltage                     | $V_{CE0}$ | 30             | 30       | V    |
| Collector-base voltage                        | $V_{CB0}$ | 30             | 30       |      |
| Emitter-base voltage                          | $V_{EB0}$ | 10             | 10       |      |
| Collector current                             | $I_C$     | 500            |          | mA   |
| Peak collector current                        | $I_{CM}$  | 800            |          |      |
| Base current                                  | $I_B$     | 100            |          |      |
| Peak base current                             | $I_{BM}$  | 200            |          |      |
| Total power dissipation, $T_S = 81\text{ °C}$ | $P_{tot}$ | 360            |          | mW   |
| Junction temperature                          | $T_j$     | 150            |          | °C   |
| Storage temperature range                     | $T_{stg}$ | − 65 ... + 150 |          |      |

### Thermal Resistance

|                                  |              |            |     |
|----------------------------------|--------------|------------|-----|
| Junction - ambient <sup>2)</sup> | $R_{th\ JA}$ | $\leq 280$ | K/W |
| Junction - soldering point       | $R_{th\ JS}$ | $\leq 210$ |     |

<sup>1)</sup> For detailed information see chapter Package Outlines.

<sup>2)</sup> Package mounted on epoxy pcb 40 mm × 40 mm × 1.5 mm/6 cm<sup>2</sup> Cu.

## Electrical Characteristics

at  $T_A = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified.

| Parameter | Symbol | Values |      |      | Unit |
|-----------|--------|--------|------|------|------|
|           |        | min.   | typ. | max. |      |

## DC characteristics

|                                                                                                                                                                                |               |                                 |                  |                  |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------------------------|------------------|------------------|----|
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$                                                                                                           | $V_{(BR)CE0}$ | 30                              | —                | —                | V  |
| Collector-base breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$                                                                                                              | $V_{(BR)CB0}$ | 30                              | —                | —                |    |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}$                                                                                                                | $V_{(BR)EB0}$ | 10                              | —                | —                |    |
| Collector-base cutoff current<br>$V_{CB} = 30\text{ V}$                                                                                                                        | $I_{CB0}$     | —                               | —                | 100              | nA |
| Emitter cutoff current<br>$V_{EB} = 10\text{ V}$                                                                                                                               | $I_{EB0}$     | —                               | —                | 100              |    |
| DC current gain <sup>1)</sup><br>$I_C = 10\text{ mA}$ , $V_{CE} = 5\text{ V}$<br>SMBTA 63<br>SMBTA 64<br>$I_C = 100\text{ mA}$ , $V_{CE} = 5\text{ V}$<br>SMBTA 63<br>SMBTA 64 | $h_{FE}$      | 5000<br>10000<br>10000<br>20000 | —<br>—<br>—<br>— | —<br>—<br>—<br>— | —  |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 100\text{ mA}$ , $I_B = 0.1\text{ mA}$                                                                            | $V_{CEsat}$   | —                               | —                | 1.5              | V  |
| Base-emitter saturation voltage <sup>1)</sup><br>$I_C = 100\text{ mA}$ , $I_B = 0.1\text{ mA}$                                                                                 | $V_{BEsat}$   | —                               | —                | 2                |    |

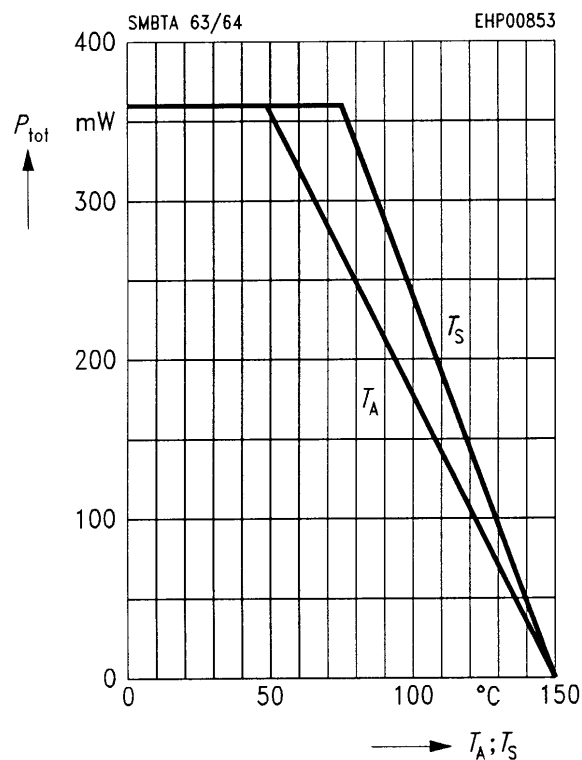
## AC characteristics

|                                                                                            |       |     |   |   |     |
|--------------------------------------------------------------------------------------------|-------|-----|---|---|-----|
| Transition frequency<br>$I_C = 50\text{ mA}$ , $V_{CE} = 5\text{ V}$ , $f = 20\text{ MHz}$ | $f_T$ | 125 | — | — | MHz |
|--------------------------------------------------------------------------------------------|-------|-----|---|---|-----|

<sup>1)</sup> Pulse test conditions:  $t \leq 300\text{ }\mu\text{s}$ ,  $D = 2\text{ }\%$ .

## Total power dissipation $P_{\text{tot}} = f(T_A^*; T_S)$

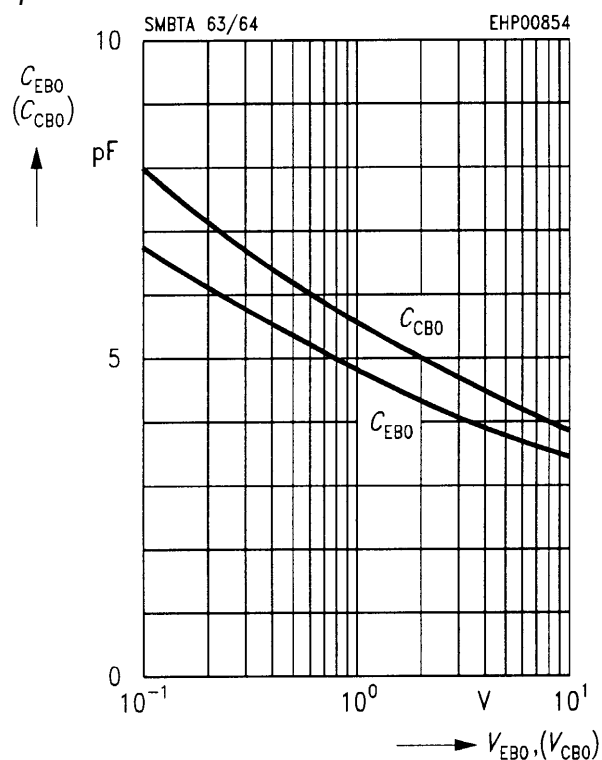
\* Package mounted on epoxy



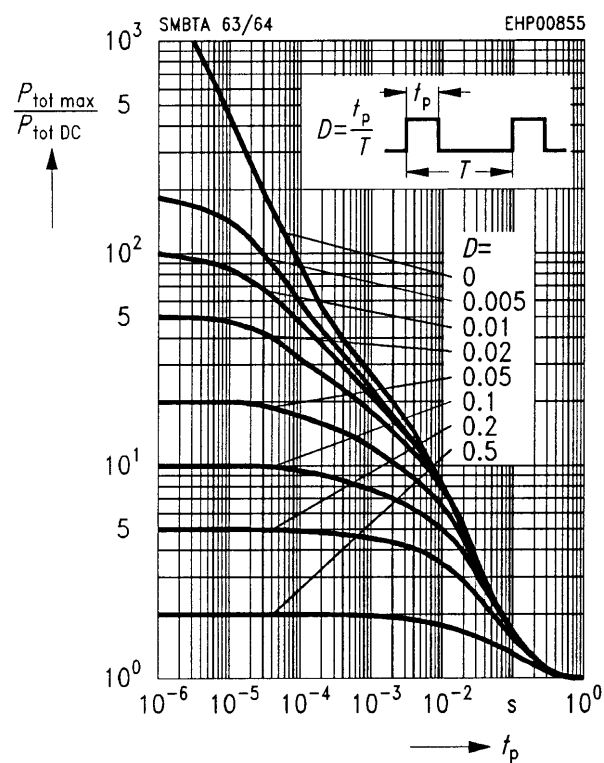
## Collector-base capacitance $C_{CB0} = f(V_{CB0})$

Emitter-base capacitance  $C_{EB0} = f(V_{EB0})$

$f = 1 \text{ MHz}$

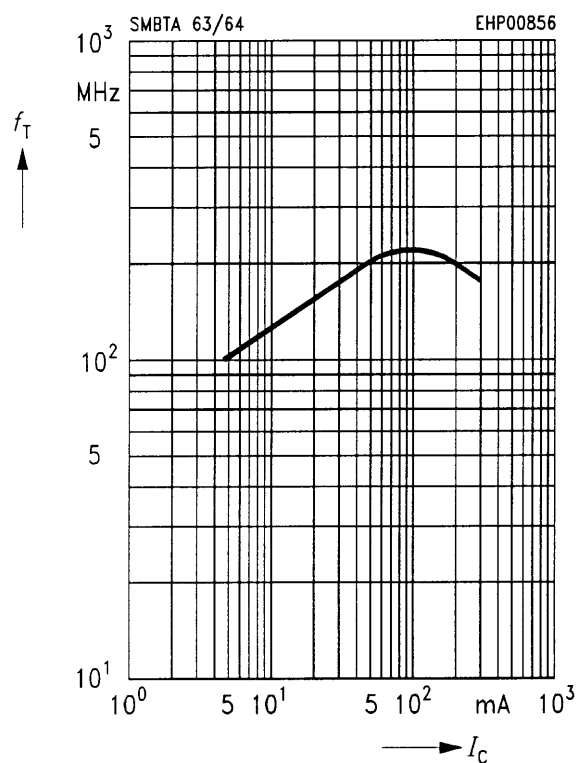


## Permissible pulse load $P_{\text{tot max}}/P_{\text{tot DC}} = f(t_p)$



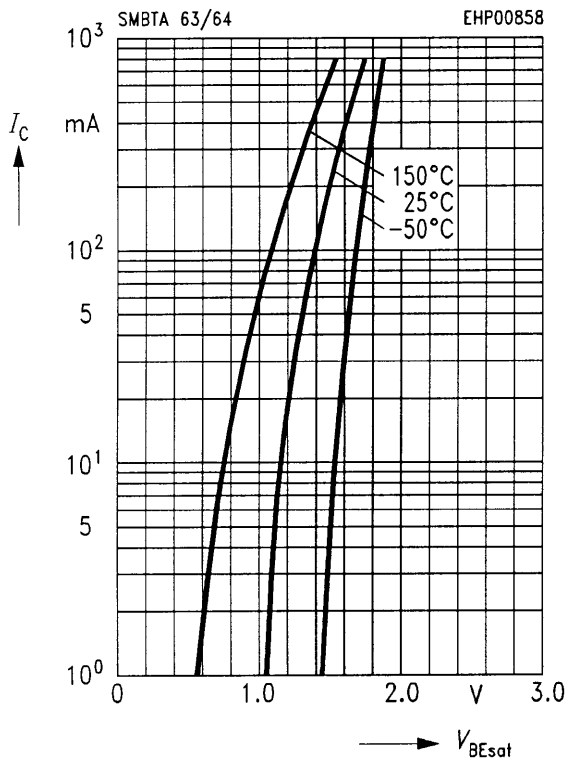
## Transition frequency $f_T = f(I_C)$

$V_{CE} = 5 \text{ V}$



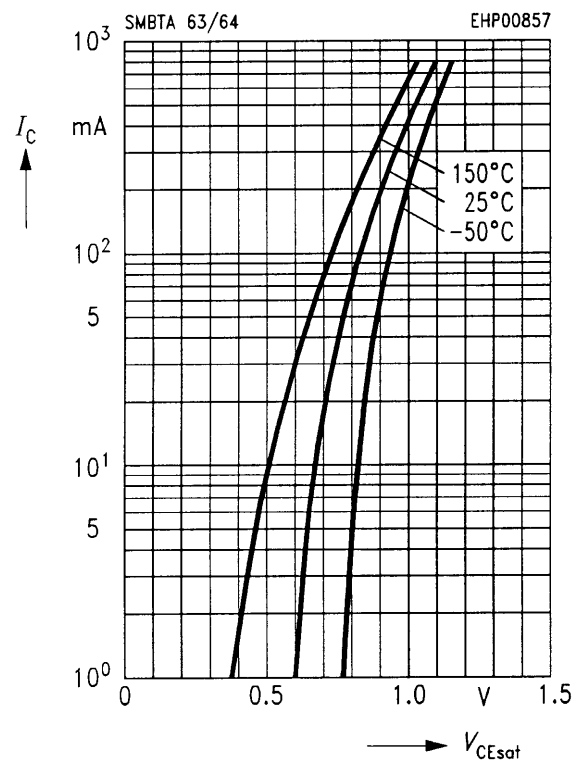
## Base-emitter saturation voltage

$$I_C = f(V_{BE \text{ sat}}), h_{FE} = 1000$$



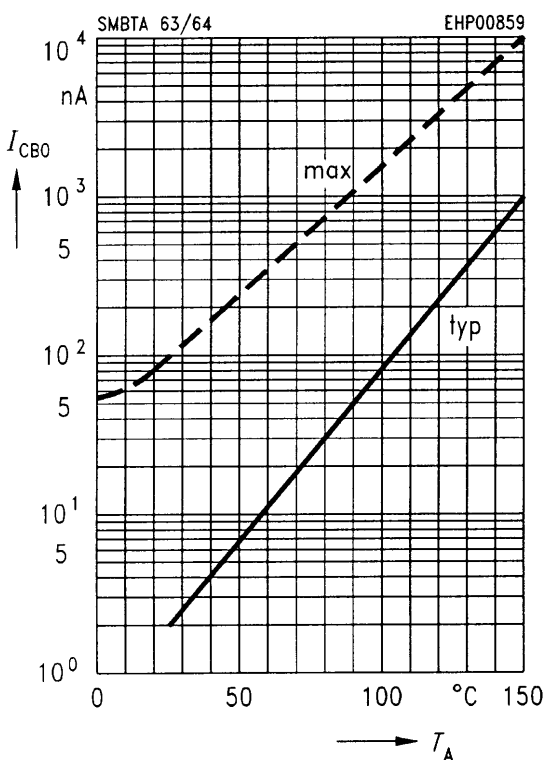
## Collector-emitter saturation voltage

$$I_C = f(V_{CE \text{ sat}}), h_{FE} = 1000$$



## Collector cutoff current $I_{CB0} = f(T_A)$

$$V_{CB} = V_{CE \text{ max}}$$



## DC current gain $h_{FE} = f(I_C)$

$$V_{CE} = 5 \text{ V}$$

