

Ordering number : ENN7219A



SANYO Semiconductors

## DATA SHEET

# CPH3121 / CPH3221 — PNP / NPN Epitaxial Planar Silicon Transistors

## DC / DC Converter Applications

### Applications

- Relay drivers, lamp drivers, motor drivers, flash.

### Features

- Adoption of MBIT processes.
- High current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.
- Ultrasmall package facilitates miniaturization in end products (mounting height : 0.9mm).
- High allowable power dissipation.

### Specifications ( ) : CPH3121

#### Absolute Maximum Ratings at Ta=25°C

| Parameter                    | Symbol           | Conditions                                             | Ratings     | Unit |
|------------------------------|------------------|--------------------------------------------------------|-------------|------|
| Collector-to-Base Voltage    | V <sub>CB0</sub> |                                                        | (-)15       | V    |
| Collector-to-Emitter Voltage | V <sub>CEO</sub> |                                                        | (-12)15     | V    |
| Emitter-to-Base Voltage      | V <sub>EB0</sub> |                                                        | (-)5        | V    |
| Collector Current            | I <sub>C</sub>   |                                                        | (-)3        | A    |
| Collector Current (Pulse)    | I <sub>CP</sub>  |                                                        | (-)5        | A    |
| Base Current                 | I <sub>B</sub>   |                                                        | (-)600      | mA   |
| Collector Dissipation        | P <sub>C</sub>   | Mounted on a ceramic board (600mm <sup>2</sup> ×0.8mm) | 0.9         | W    |
| Junction Temperature         | T <sub>J</sub>   |                                                        | 150         | °C   |
| Storage Temperature          | T <sub>stg</sub> |                                                        | -55 to +150 | °C   |

#### Electrical Characteristics at Ta=25°C

| Parameter                | Symbol           | Conditions                                       | Ratings |          |        | Unit |
|--------------------------|------------------|--------------------------------------------------|---------|----------|--------|------|
|                          |                  |                                                  | min     | typ      | max    |      |
| Collector Cutoff Current | I <sub>CBO</sub> | V <sub>CB</sub> =(-)12V, I <sub>E</sub> =0       |         |          | (-)0.1 | μA   |
| Emitter Cutoff Current   | I <sub>EB0</sub> | V <sub>EB</sub> =(-)4V, I <sub>C</sub> =0        |         |          | (-)0.1 | μA   |
| DC Current Gain          | h <sub>FE</sub>  | V <sub>CE</sub> =(-)2V, I <sub>C</sub> =(-)500mA | 200     |          | 560    |      |
| Gain-Bandwidth Product   | f <sub>T</sub>   | V <sub>CE</sub> =(-)2V, I <sub>C</sub> =(-)500mA |         | (380)350 |        | MHz  |
| Output Capacitance       | C <sub>ob</sub>  | V <sub>CB</sub> =(-)10V, f=1MHz                  |         | (40)23   |        | pF   |

Marking : CPH3121 : AS, CPH3221 : CS

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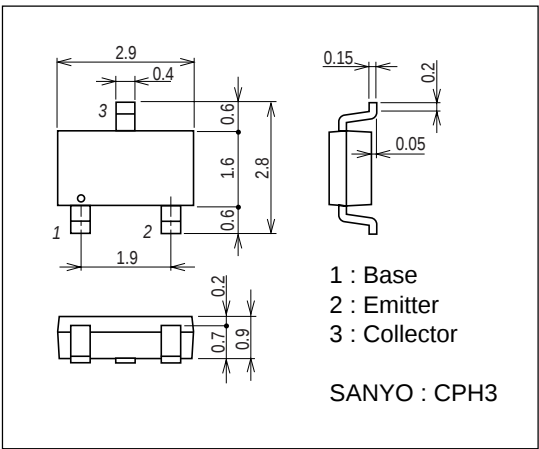
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| Parameter                               | Symbol        | Conditions                  | Ratings |           |           | Unit |
|-----------------------------------------|---------------|-----------------------------|---------|-----------|-----------|------|
|                                         |               |                             | min     | typ       | max       |      |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=(-)1.5A, I_B=(-)30mA$  |         | (-110)115 | (-165)175 | mV   |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=(-)1.5A, I_B=(-)30mA$  |         | (-)0.85   | (-)1.2    | V    |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=(-)10\mu A, I_E=0$     | (-)15   |           |           | V    |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=(-)1mA, R_{BE}=\infty$ | (-12)15 |           |           | V    |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E=(-)10\mu A, I_C=0$     | (-)5    |           |           | V    |
| Turn-ON Time                            | $t_{on}$      | See specified Test Circuit. |         | (30)30    |           | ns   |
| Storage Time                            | $t_{stg}$     | See specified Test Circuit. |         | (90)210   |           | ns   |
| Fall Time                               | $t_f$         | See specified Test Circuit. |         | (14)11    |           | ns   |

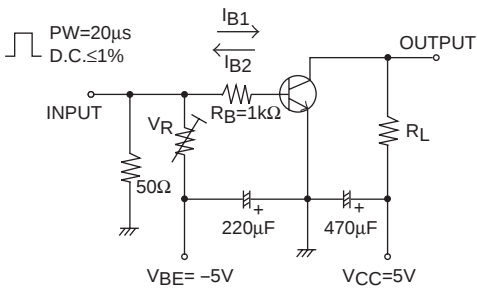
## Package Dimensions

unit : mm

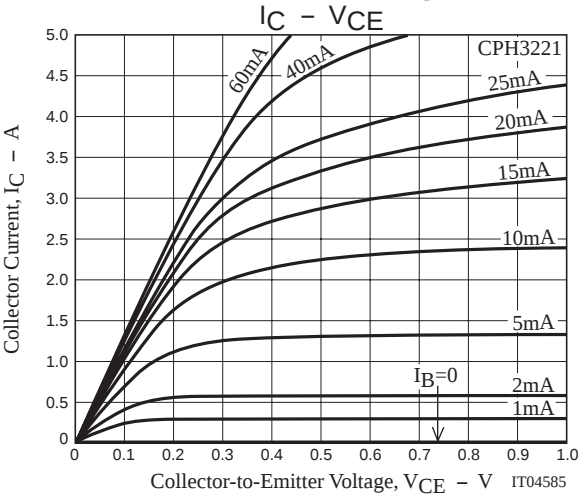
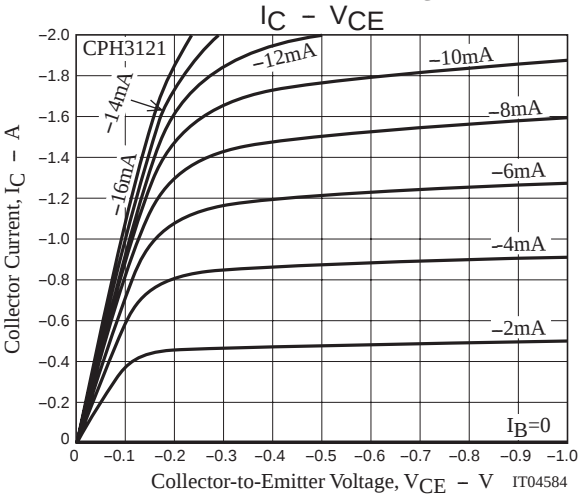
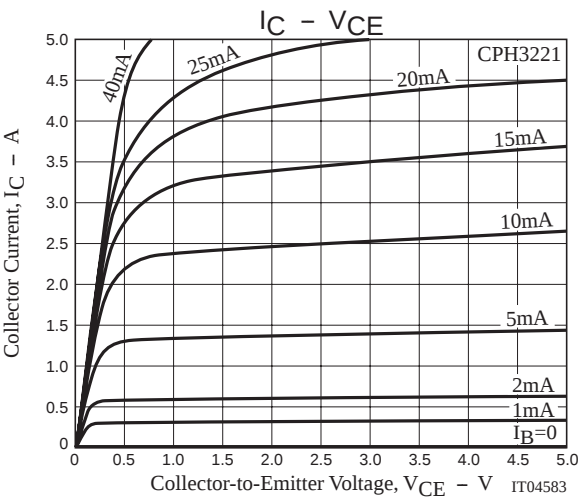
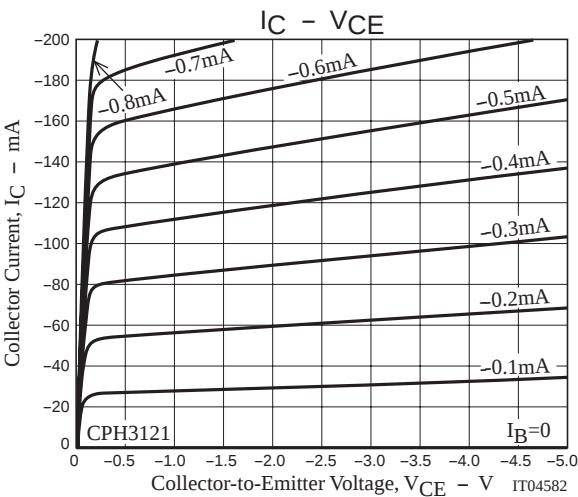
2150A



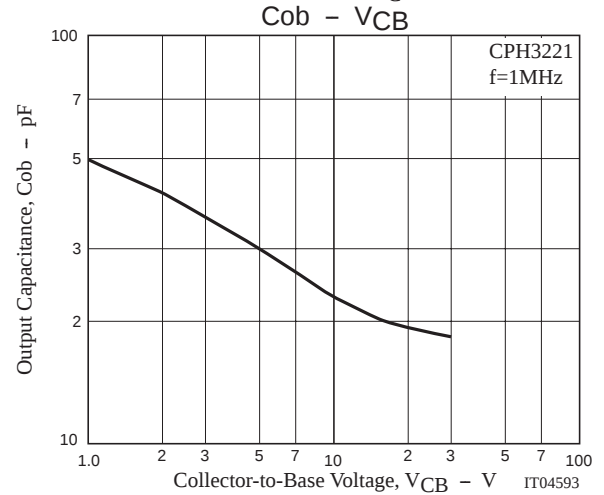
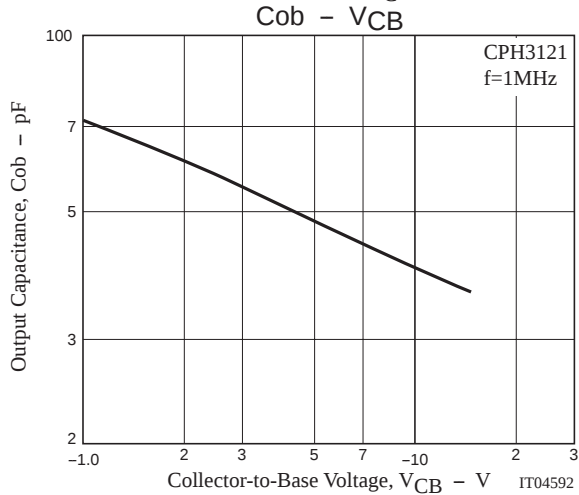
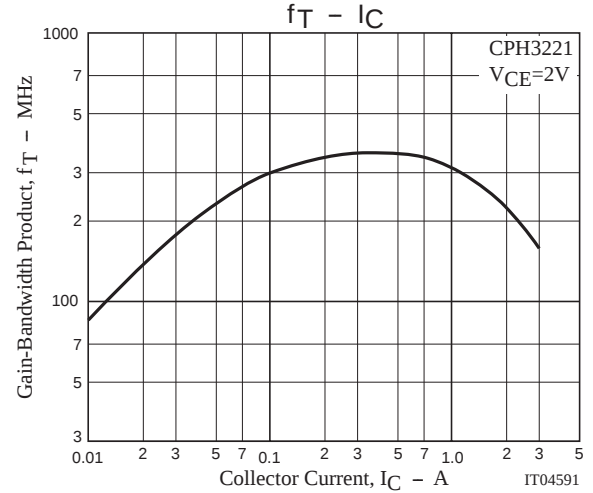
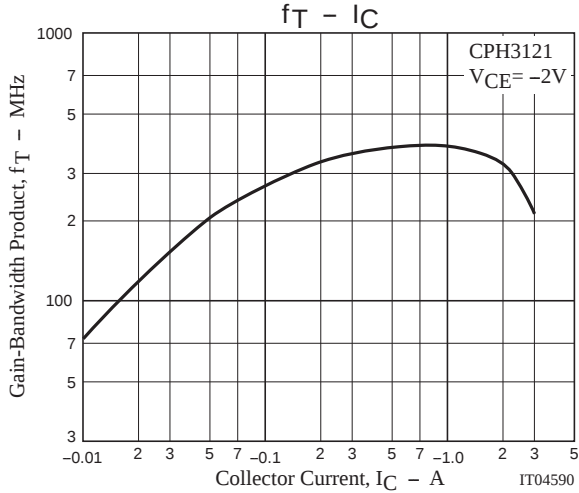
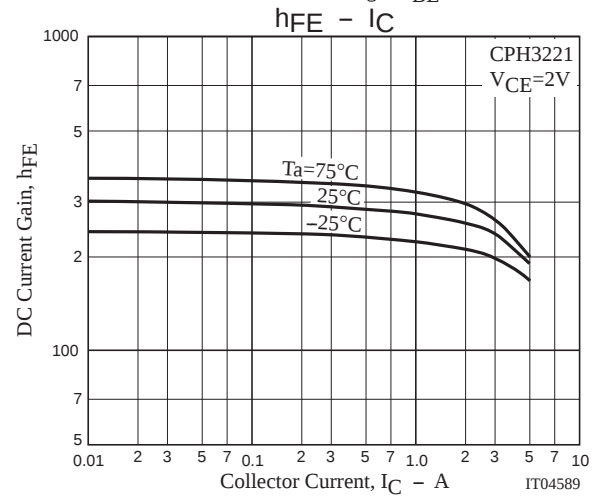
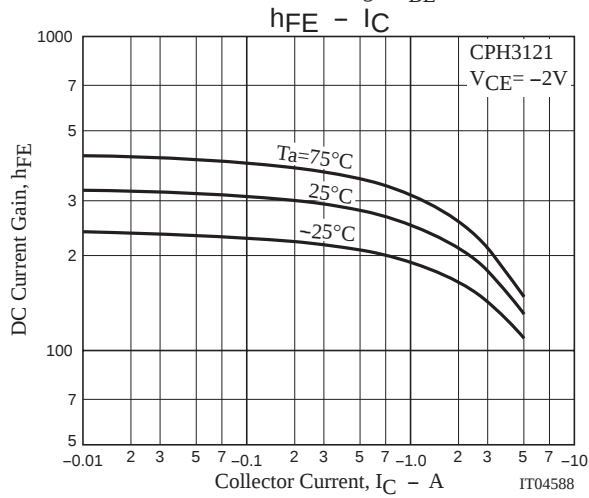
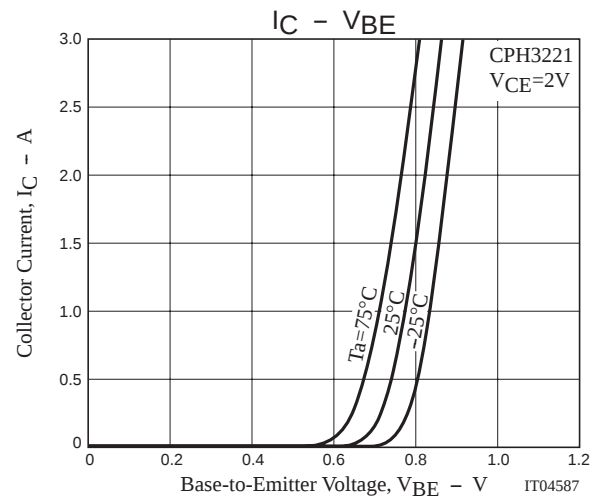
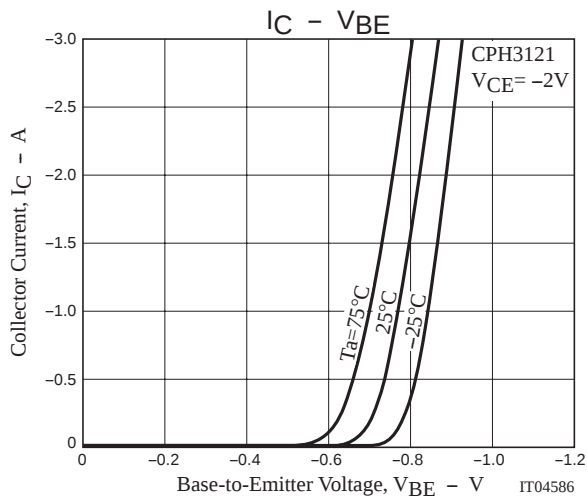
## Switching Time Test Circuit



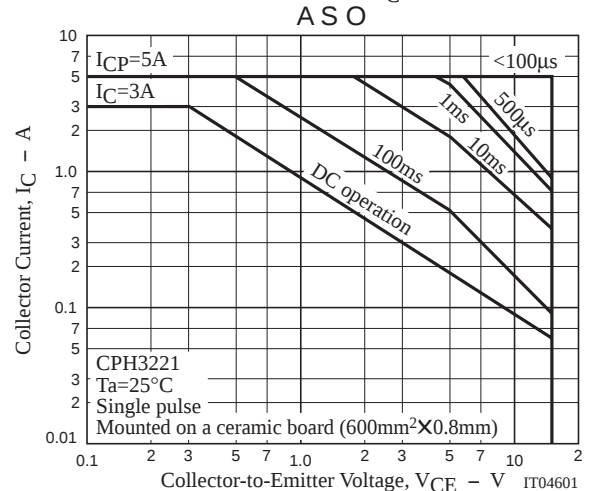
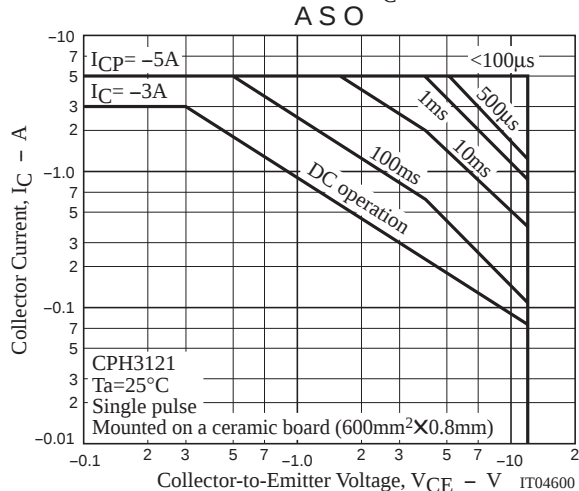
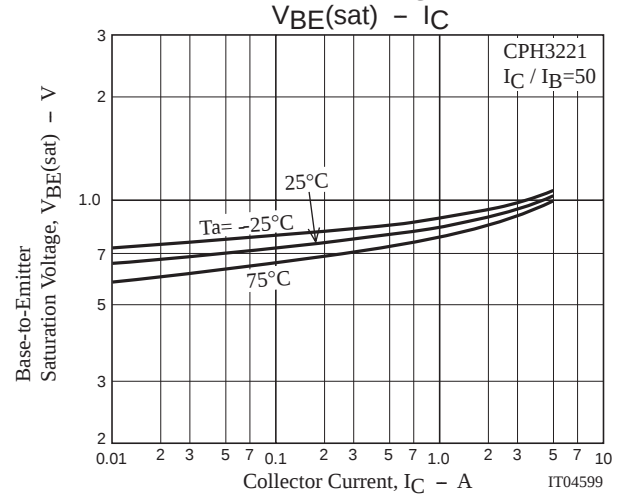
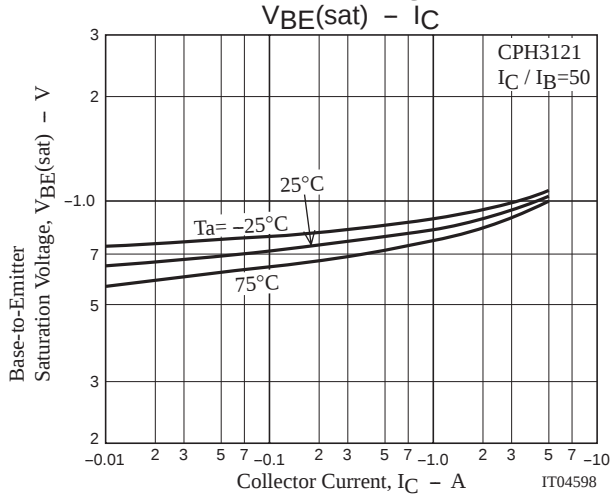
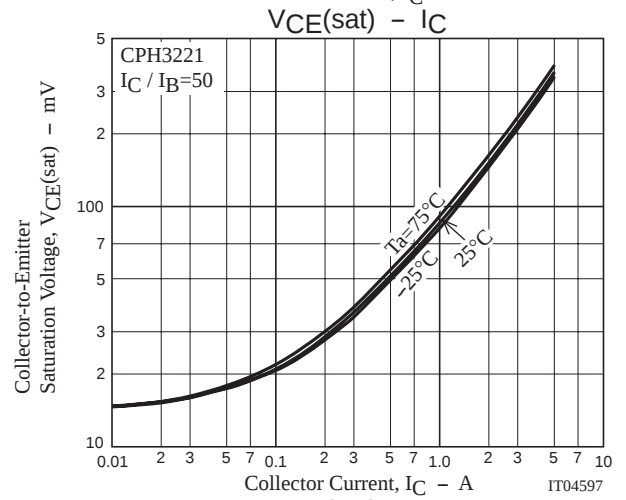
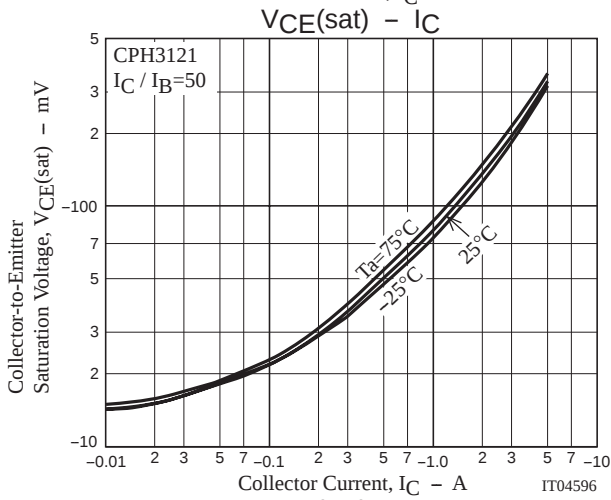
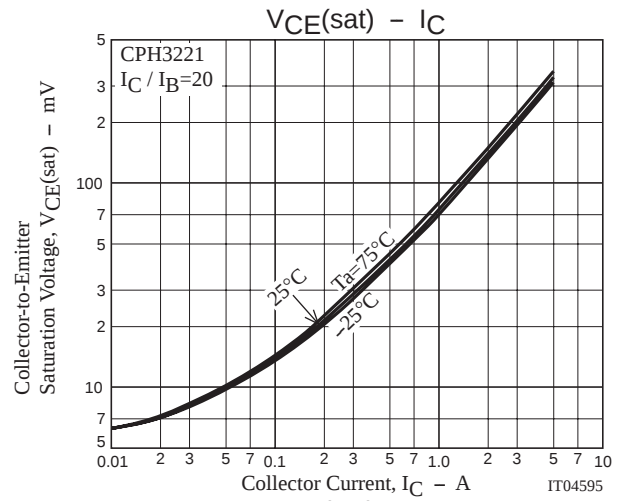
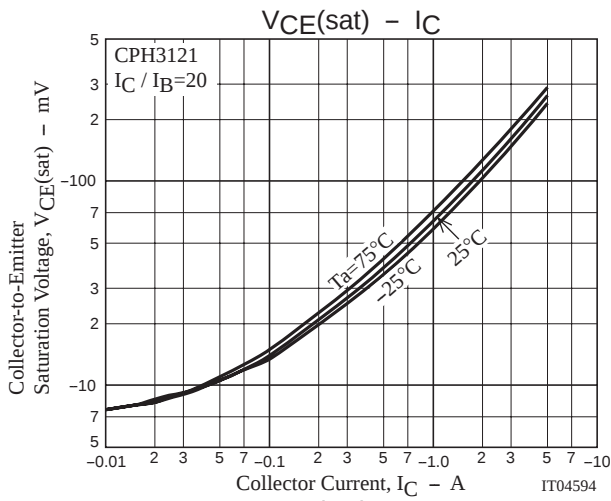
$I_C=20I_{B1}=-20I_{B2}=1.5A$   
For PNP, the polarity is reversed.



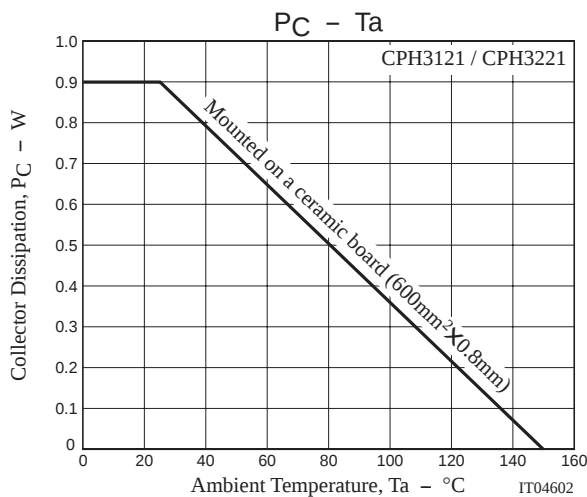
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