

# 2SA2040 / 2SC5707



## High Current Switching Applications

### Applications

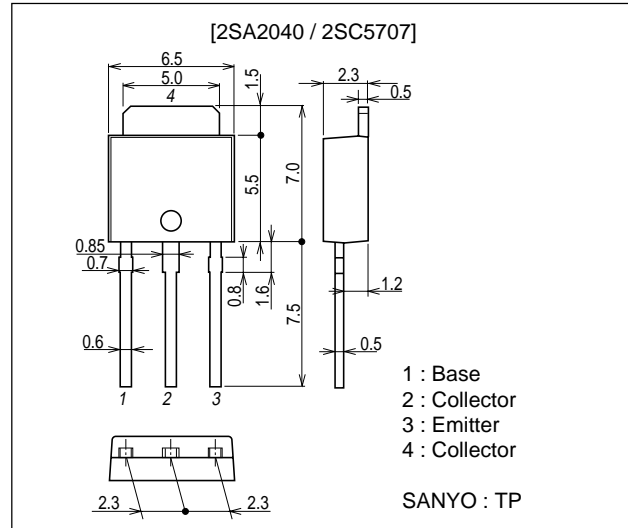
- DC-DC converter, relay drivers, lamp drivers, motor drivers, strobos.

### Features

- Adoption of FBET, MBIT process.
- Large current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.
- High allowable power dissipation.

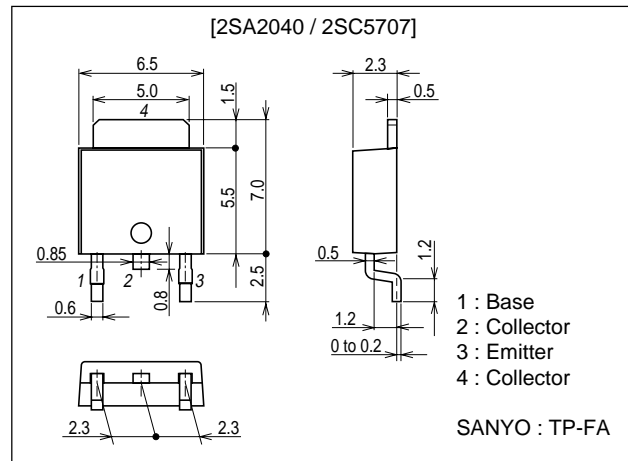
### Package Dimensions

unit : mm  
2045B



### Package Dimensions

unit : mm  
2044B



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### Specifications

Note\*( ) : 2SA2040

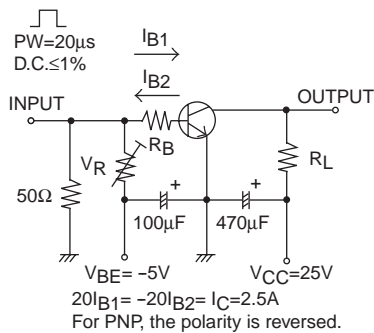
#### Absolute Maximum Ratings at Ta=25°C

| Parameter                    | Symbol           | Conditions           | Ratings     | Unit |
|------------------------------|------------------|----------------------|-------------|------|
| Collector-to-Base Voltage    | V <sub>CB0</sub> |                      | (-50)80     | V    |
| Collector-to-Emitter Voltage | V <sub>CES</sub> |                      | (-50)80     | V    |
| Collector-to-Emitter Voltage | V <sub>CEO</sub> |                      | (-)50       | V    |
| Emitter-to-Base Voltage      | V <sub>EBO</sub> |                      | (-)6        | V    |
| Collector Current            | I <sub>C</sub>   |                      | (-)8        | A    |
| Collector Current (Pulse)    | I <sub>CP</sub>  |                      | (-)11       | A    |
| Base Current                 | I <sub>B</sub>   |                      | (-)2        | A    |
| Collector Dissipation        | P <sub>C</sub>   |                      | 1.0         | W    |
|                              |                  | T <sub>c</sub> =25°C | 15          | W    |
| Junction Temperature         | T <sub>J</sub>   |                      | 150         | °C   |
| Storage Temperature          | T <sub>stg</sub> |                      | -55 to +150 | °C   |

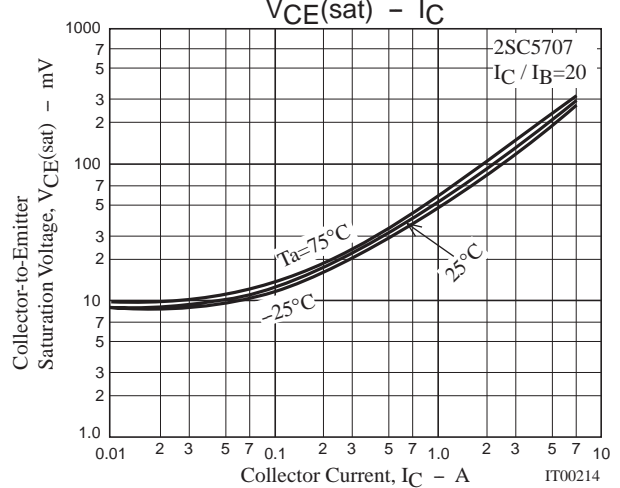
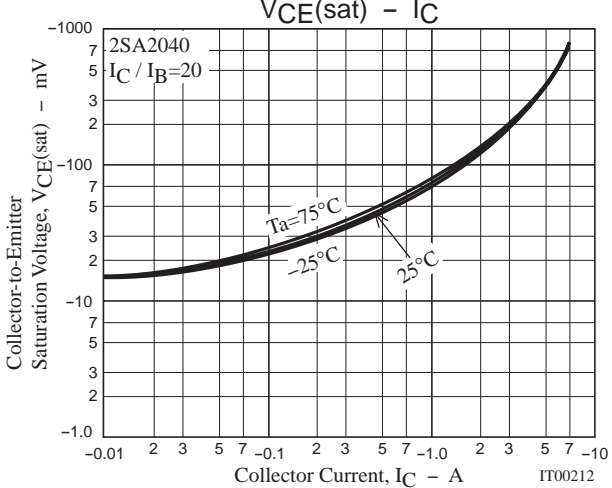
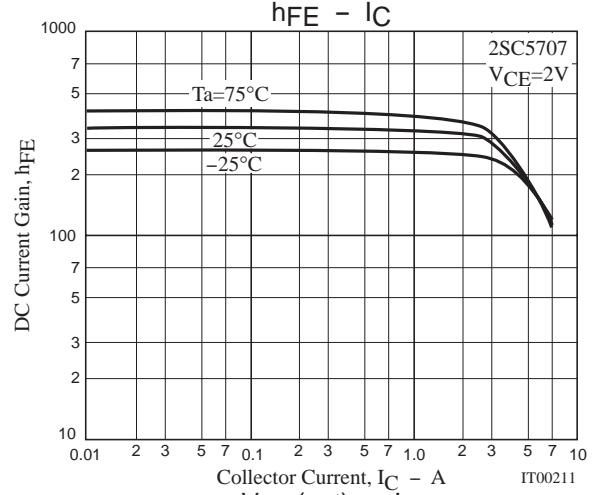
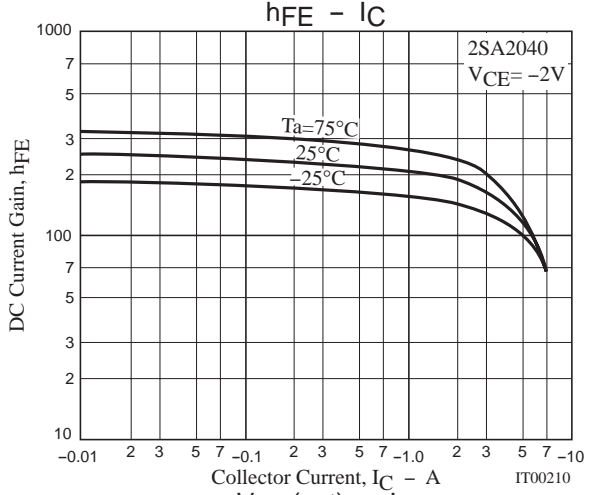
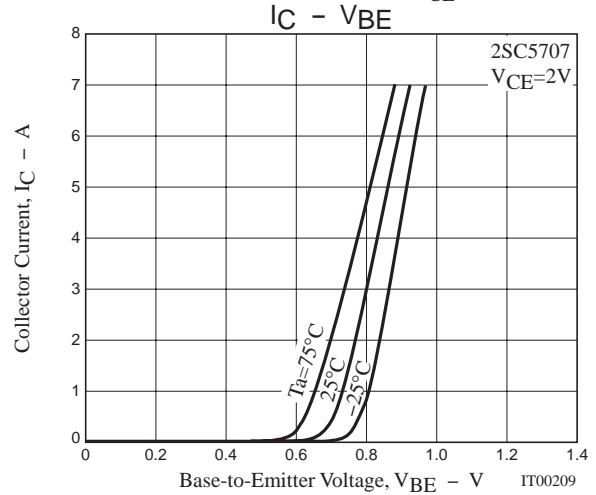
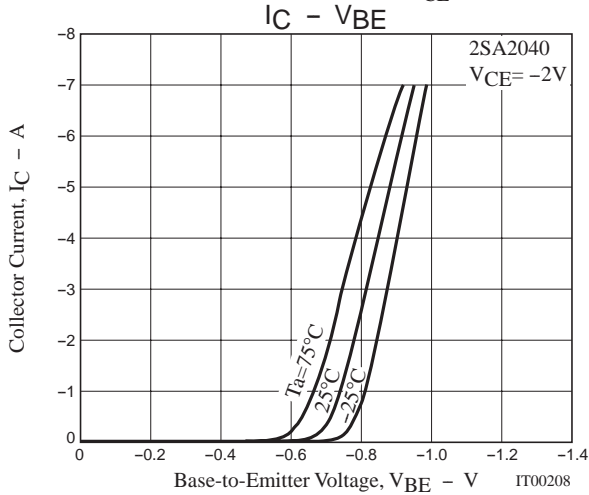
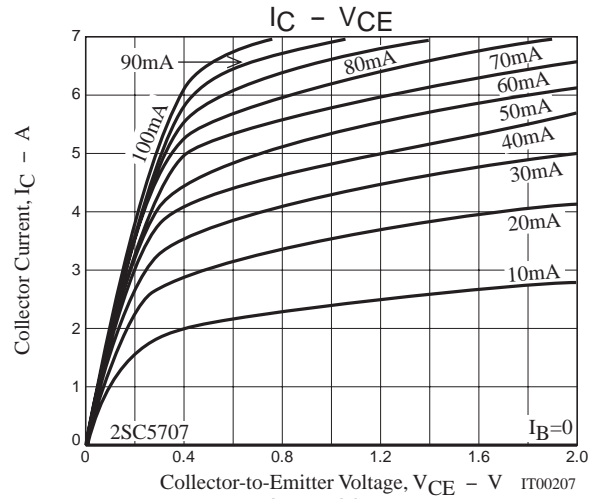
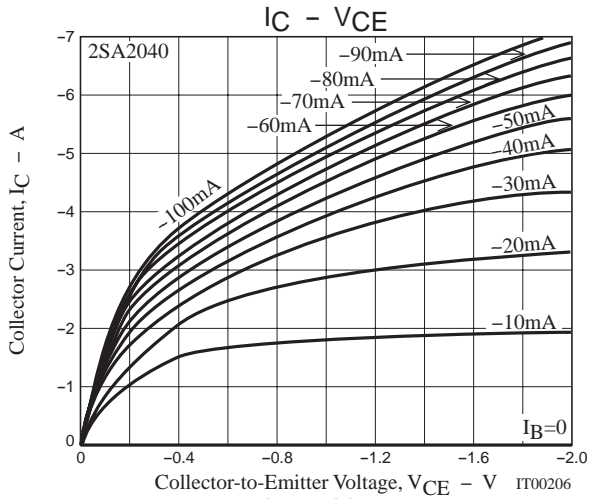
#### Electrical Characteristics at Ta=25°C

| Parameter                               | Symbol               | Conditions  | Ratings |           |           | Unit |
|---|----------------------|---|---------|-----------|-----------|------|
|   |                      |   | min     | typ       | max       |      |
| Collector Cutoff Current                | I <sub>CBO</sub>     | V <sub>CB</sub> =(-)40V, I <sub>E</sub> =0        |         |           | (-)0.1    | μA   |
| Emitter Cutoff Current                  | I <sub>EBO</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> =(-)10V, I <sub>C</sub> =(-)500mA |         | (290)330  |           | MHz  |
| Output Capacitance                      | C <sub>ob</sub>      | V <sub>CB</sub> =(-)10V, f=1MHz                   |         | (50)28    |           | pF   |
| Collector-to-Emitter Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>C</sub> =(-)3.5A, I <sub>B</sub> =(-)175mA |         | (-230)160 | (-390)240 | mV   |
|   |                      | I <sub>C</sub> =(-)2A, I <sub>B</sub> =(-)40mA    |         | (-240)110 | (-400)170 | mV   |
| Base-to-Emitter Saturation Voltage      | V <sub>BE(sat)</sub> | I <sub>C</sub> =(-)2A, I <sub>B</sub> =(-)40mA    |         | (-)0.83   | (-)1.2    | V    |
| Collector-to-Base Breakdown Voltage     | V <sub>(BR)CBO</sub> | I <sub>C</sub> =(-)10μA, I <sub>E</sub> =0        | (-50)80 |           |           | V    |
| Collector-to-Emitter Breakdown Voltage  | V <sub>(BR)CES</sub> | I <sub>C</sub> =(-)100μA, R <sub>BE</sub> =∞      | 80      |           |           | V    |
| Collector-to-Emitter Breakdown Voltage  | V <sub>(BR)CEO</sub> | I <sub>C</sub> =(-)1mA, R <sub>BE</sub> =∞        | (-)50   |           |           | V    |
| Emitter-to-Base Breakdown Voltage       | V <sub>(BR)EBO</sub> | I <sub>E</sub> =(-)10μA, I <sub>C</sub> =0        | (-)6    |           |           | V    |
| Turn-On Time                            | t <sub>on</sub>      | See specified test circuit.                       |         | (40)30    |           | ns   |
| Storage Time                            | t <sub>stg</sub>     | See specified test circuit.                       |         | (225)420  |           | ns   |
| Fall Time                               | t <sub>f</sub>       | See specified test circuit.                       |         | 25        |           | ns   |

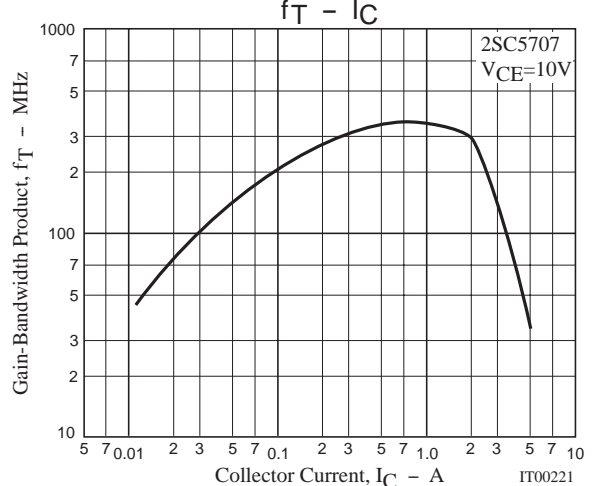
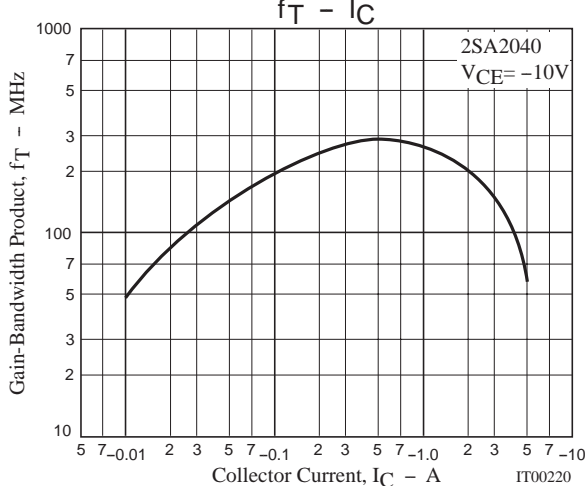
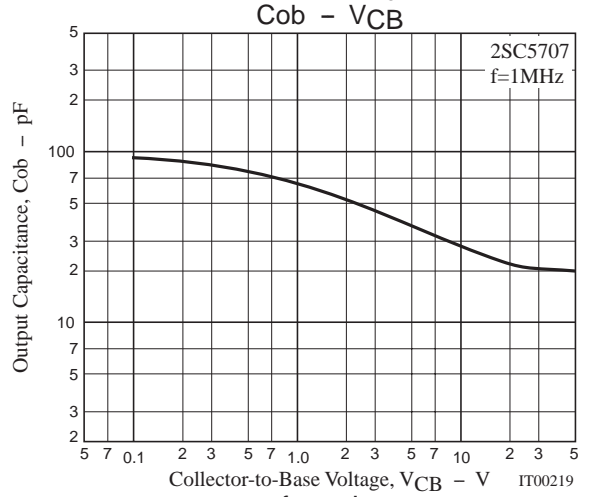
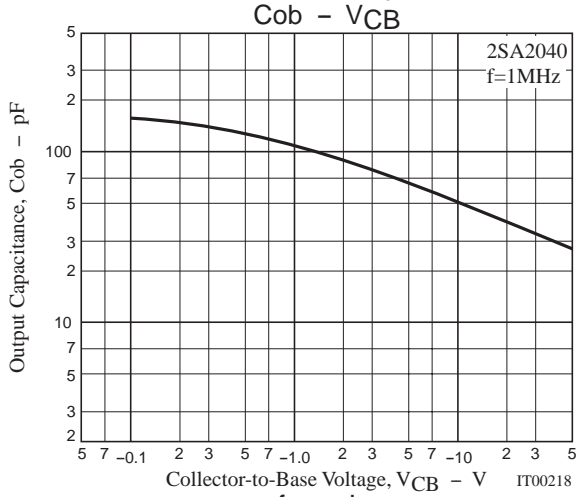
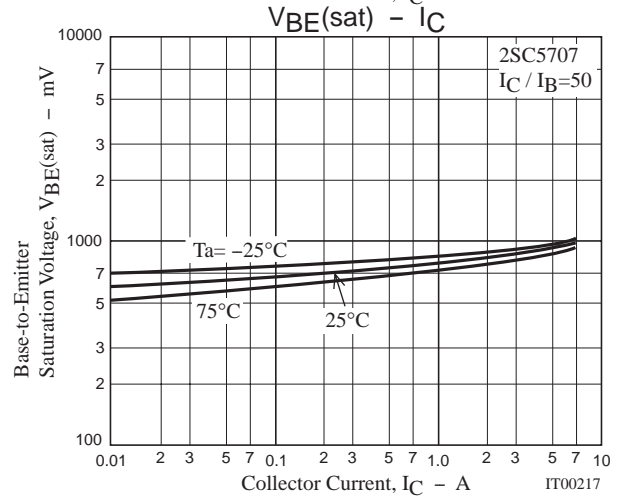
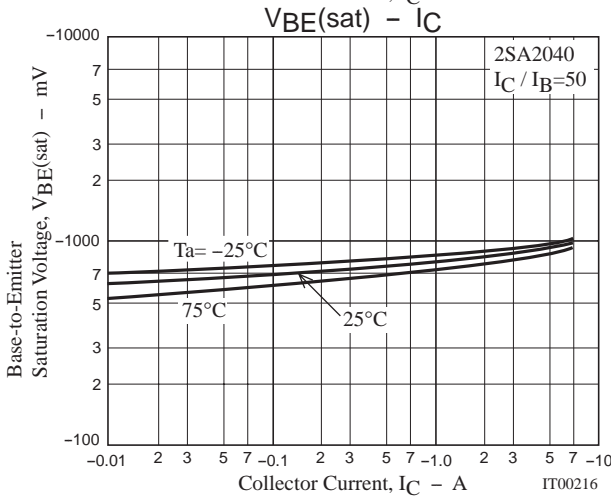
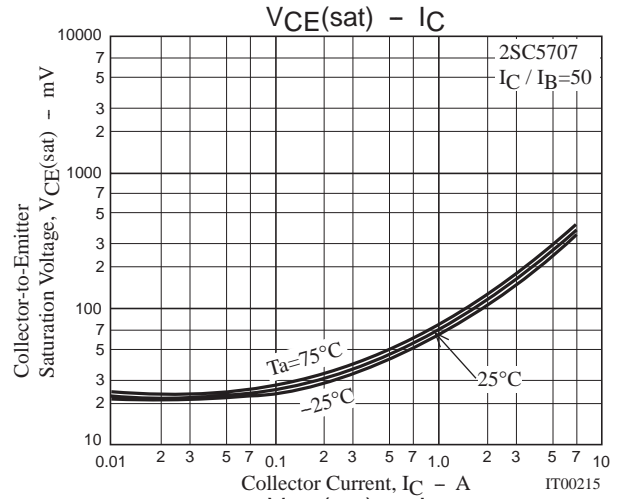
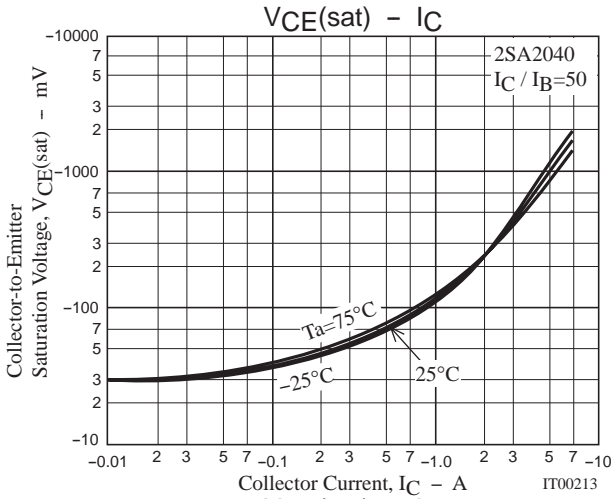
#### Swicthing Time Test Circuit



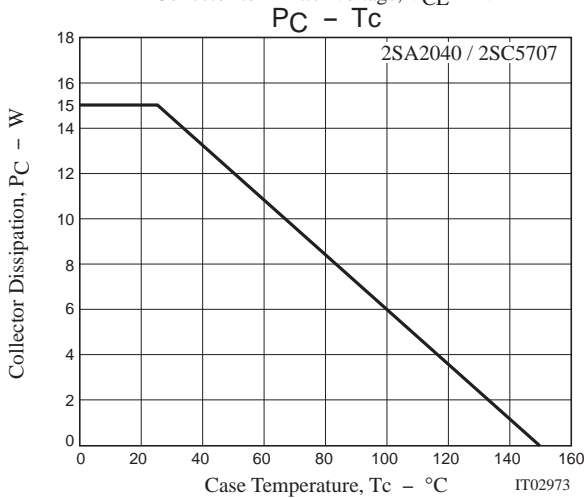
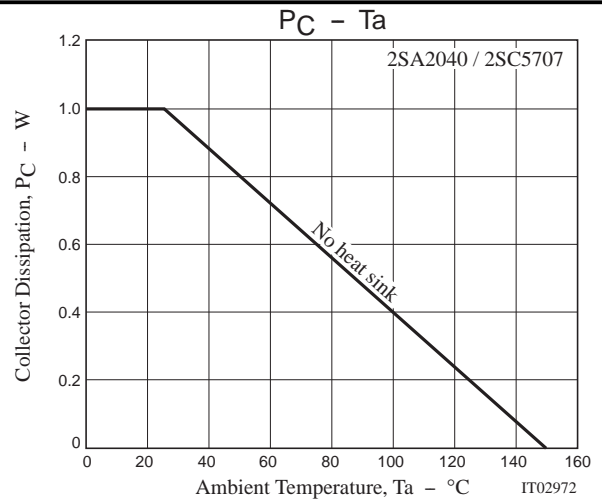
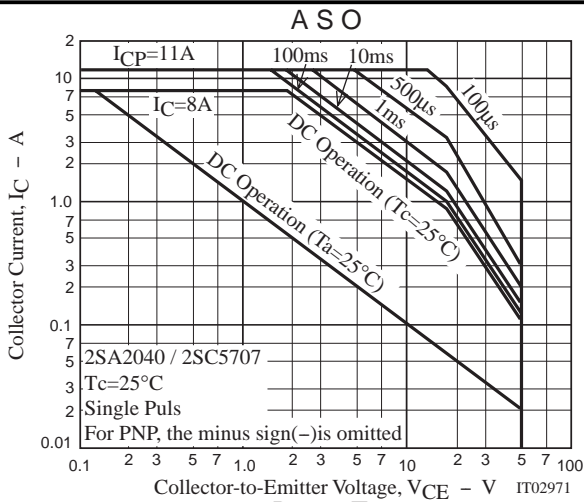
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