



# 2SA1973/2SC5310

## DC/DC Converter Applications

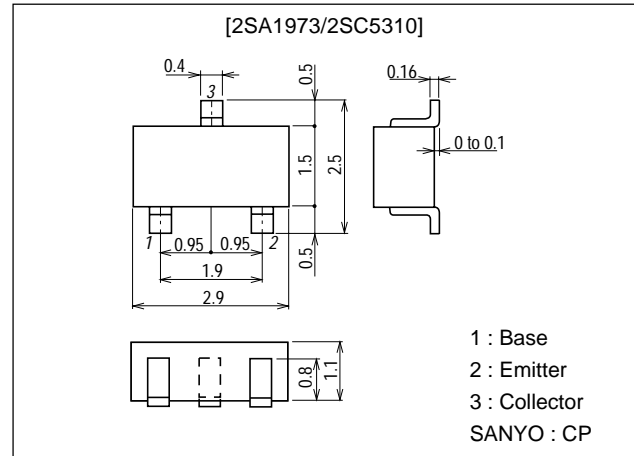
### Features

- Adoption of FBET, MBIT processes.
- Large current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.
- Ultrasmall package facilitates miniaturization in end products.

### Package Dimensions

unit:mm

2018B



### Specifications

() : 2SA1973

Absolute Maximum Ratings at  $T_a = 25^\circ\text{C}$ 

| Parameter                    | Symbol    | Conditions                                   | Ratings     | Unit             |
|------------------------------|-----------|--|-------------|------------------|
| Collector-to-Base Voltage    | $V_{CB0}$ |  | (-)30       | V                |
| Collector-to-Emitter Voltage | $V_{CEO}$ |  | (-)25       | V                |
| Emitter-to-Base Voltage      | $V_{EBO}$ |  | (-)6        | V                |
| Collector Current            | $I_C$     |  | (-)1        | A                |
| Collector Current (Pulse)    | $I_{CP}$  |  | (-)3        | A                |
| Base Current                 | $I_B$     |  | (-)200      | mA               |
| Collector Dissipation        | $P_C$     | Mounted on a glass-epoxy board (20×30×1.6mm) | 250         | mW               |
| Junction Temperature         | $T_J$     |  | 150         | $^\circ\text{C}$ |
| Storage Temperature          | $T_{stg}$ |  | -55 to +150 | $^\circ\text{C}$ |

Electrical Characteristics at  $T_a = 25^\circ\text{C}$ 

| Parameter                | Symbol    | Conditions                                 | Ratings |     |        | Unit          |
|--------------------------|-----------|--|---------|-----|--------|---------------|
|                          |           |  | min     | typ | max    |               |
| Collector Cutoff Current | $I_{CBO}$ | $V_{CB}=(-)20\text{V}, I_E=0$              |         |     | (-)0.1 | $\mu\text{A}$ |
| Emitter Cutoff Current   | $I_{EBO}$ | $V_{EB}=(-)3\text{V}, I_C=0$               |         |     | (-)0.1 | $\mu\text{A}$ |
| DC Current Gain          | $h_{FE}$  | $V_{CE}=(-)2\text{V}, I_C=(-)100\text{mA}$ | 135*    |     | 400*   |               |

\* : The 2SA1973/2SC5310 are classified by 100mA  $h_{FE}$  as follows :

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| Rank     | 5          | 6          |
|----------|------------|------------|
| $h_{FE}$ | 135 to 270 | 200 to 400 |

Marking : 2SA1973 : NS  
2SC5310 : NN

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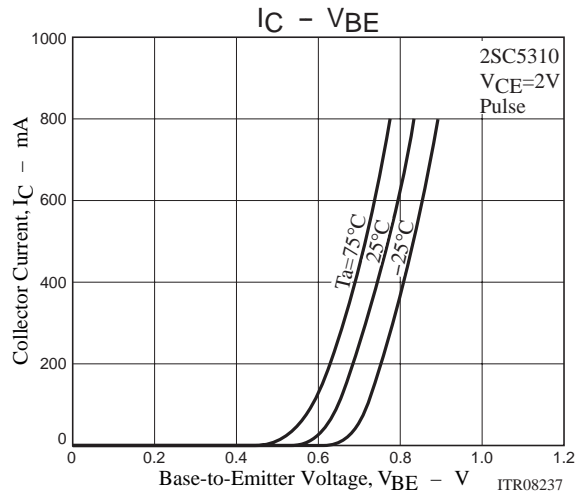
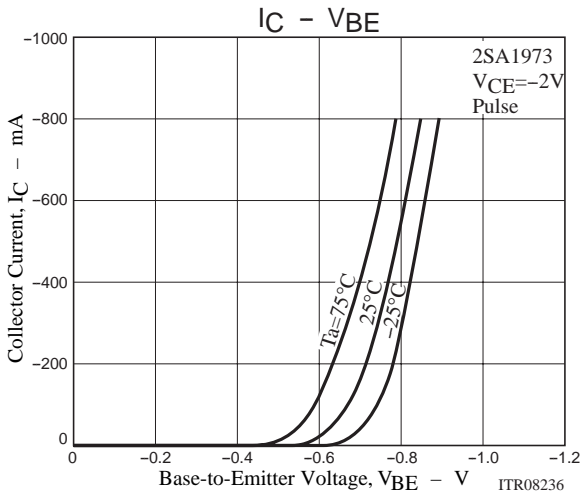
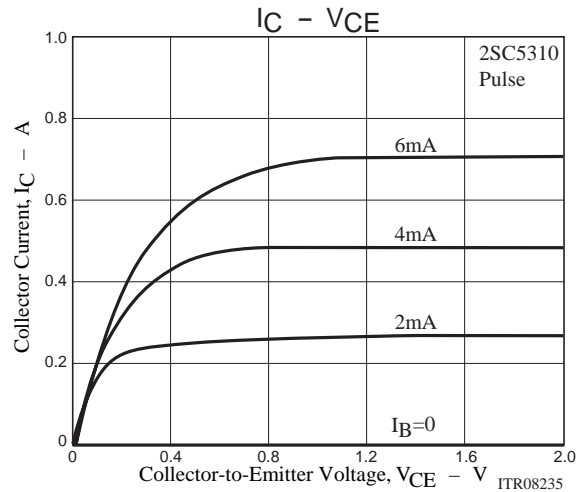
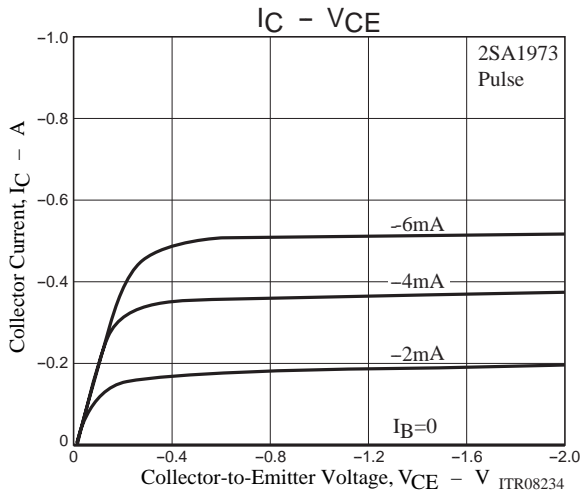
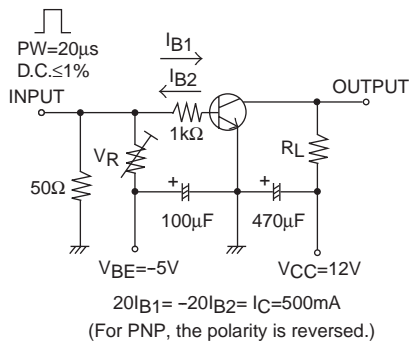
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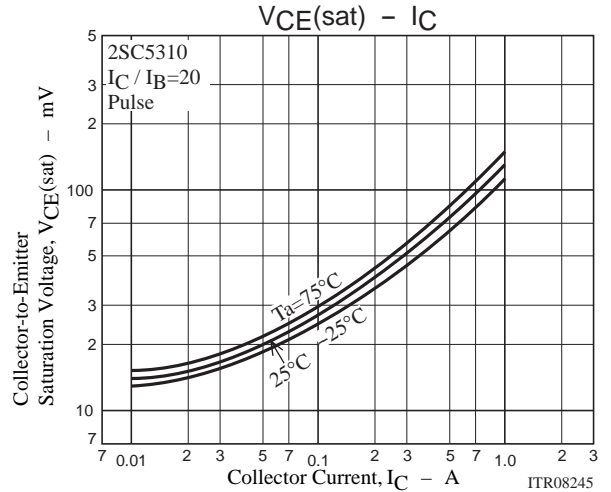
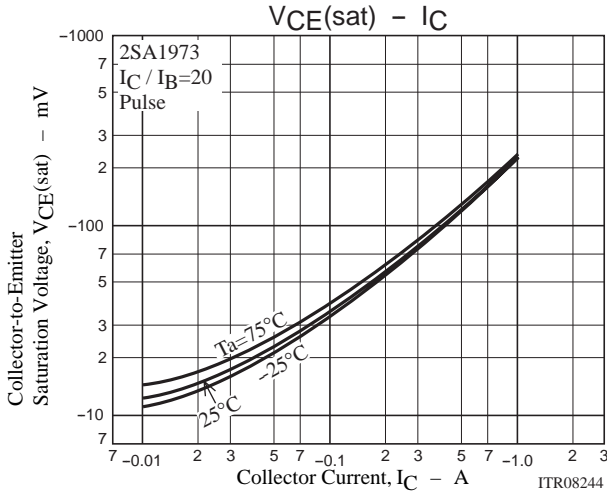
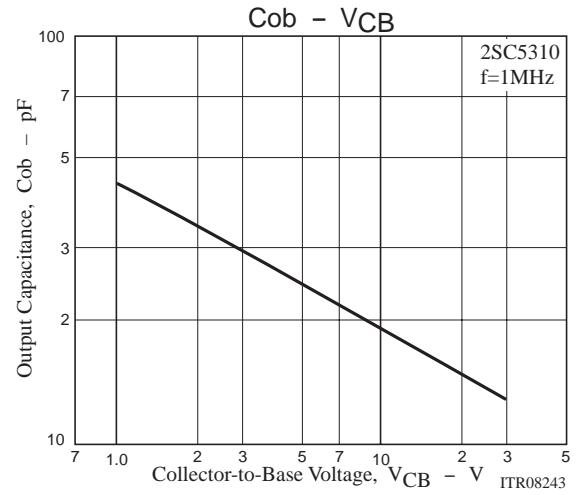
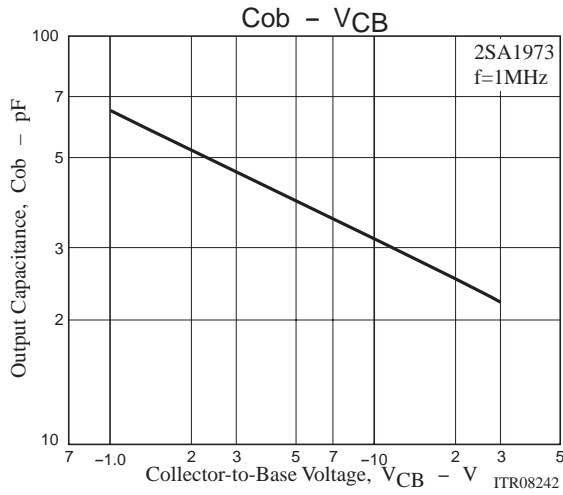
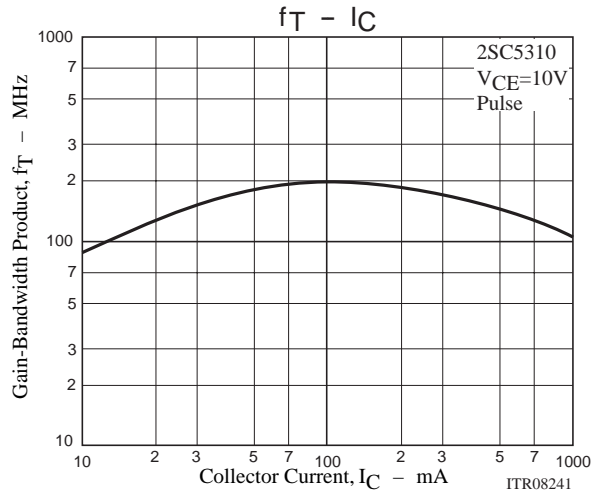
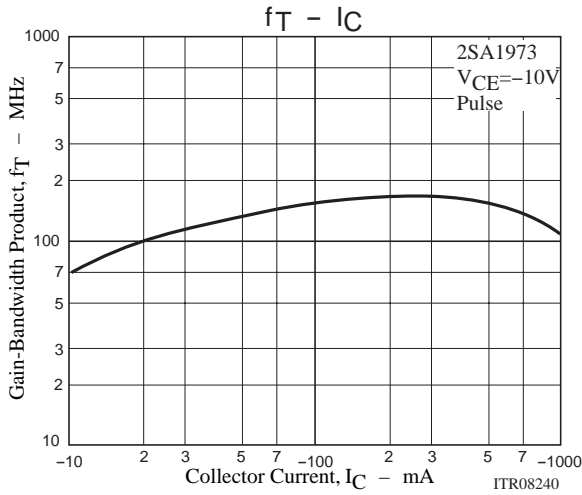
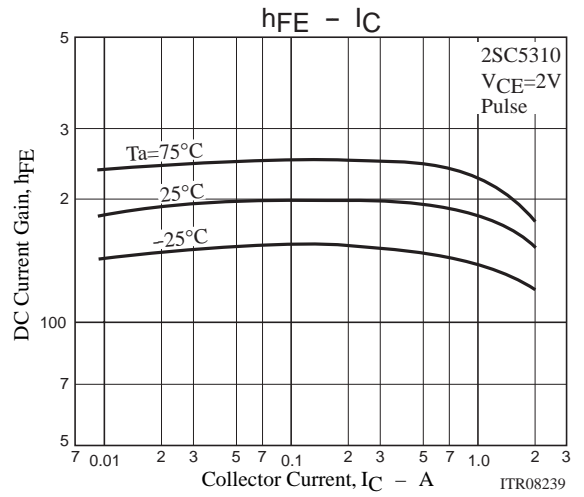
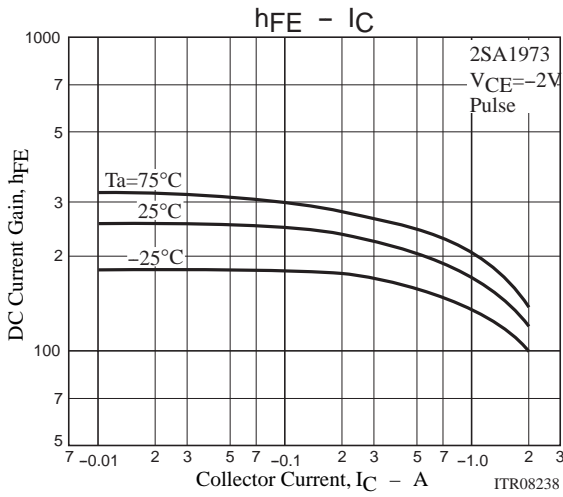
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| Parameter                               | Symbol        | Conditions                   | Ratings |        |        | Unit |
|---|---------------|------------------------------|---------|--------|--------|------|
|   |               |                              | min     | typ    | max    |      |
| Gain-Bandwidth Product                  | $f_T$         | $V_{CE}=(-)10V, I_C=(-)50mA$ |         | 150    |        | MHz  |
| Output Capacitance                      | $C_{ob}$      | $V_{CB}=(-)10V, f=1MHz$      |         | (32)19 |        | pF   |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=(-)500mA, I_B=(-)25mA$  |         | (-150) | (-300) | mV   |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=(-)500mA, I_B=(-)25mA$  |         | 100    | 200    | mV   |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=(-)10\mu A, I_E=0$      | (-30)   |        |        | V    |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=(-)1mA, R_{BE}=\infty$  | (-25)   |        |        | V    |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E=(-)10\mu A, I_C=0$      | (-6)    |        |        | V    |
| Turn-ON Time                            | $t_{on}$      | See specified Test Circuit   |         | (60)60 |        | ns   |
| Storage Time                            | $t_{stg}$     | See specified Test Circuit   |         | (350)  |        | ns   |
| Fall Time                               | $t_f$         | See specified Test Circuit   |         | 500    |        | ns   |
|   |               |                              |         | (25)25 |        | ns   |

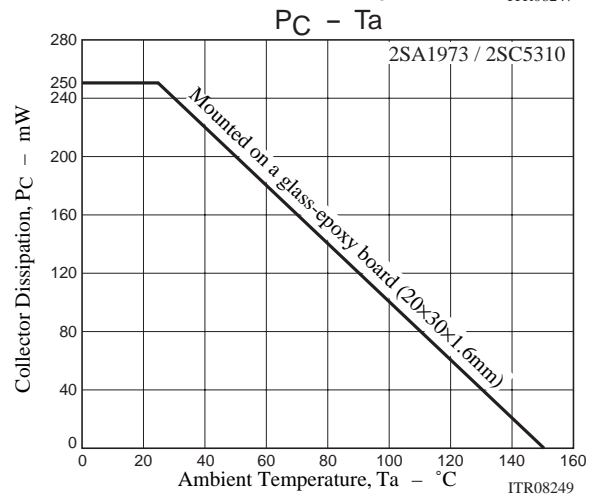
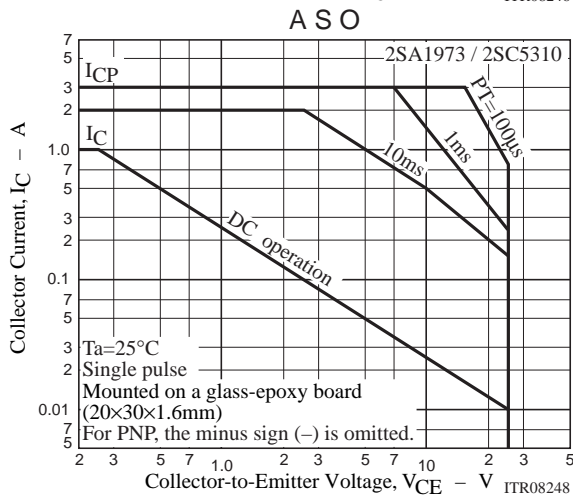
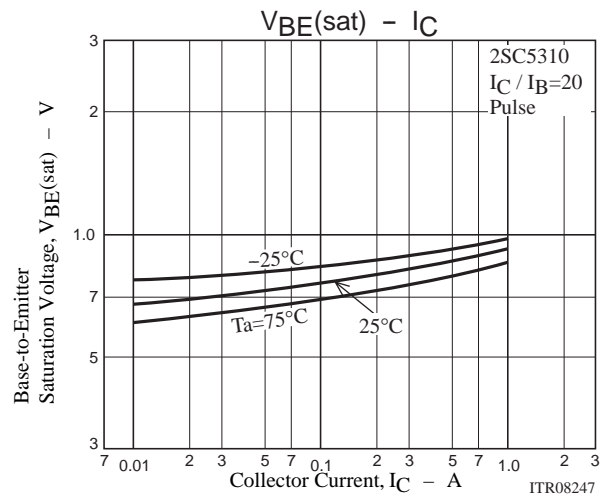
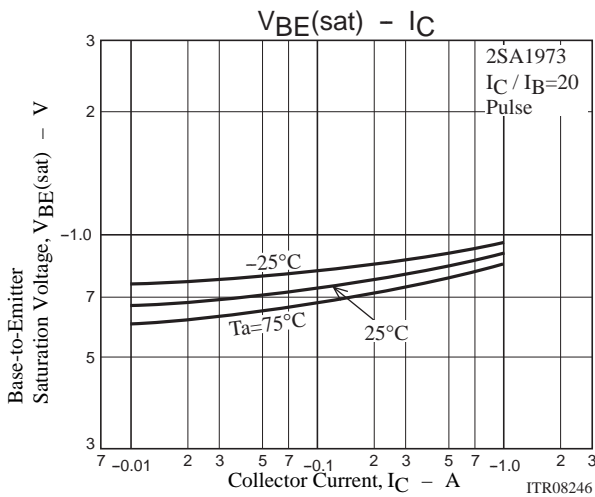
## Switching Time Test Circuit



# 2SA1973/2SC5310



## 2SA1973/2SC5310



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