



# FX509

PNP Epitaxial Planar Silicon Transistor

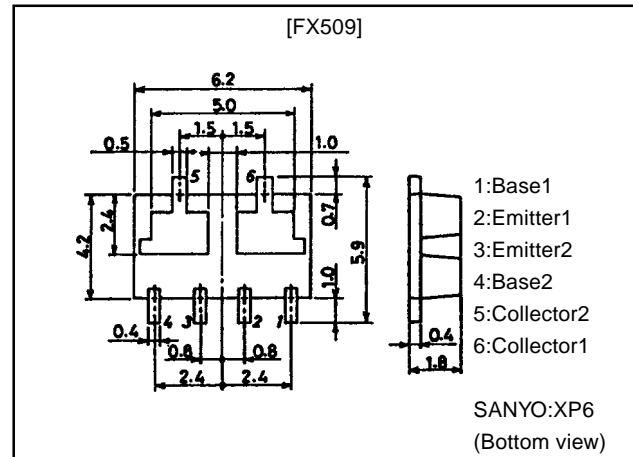
## High-Current Switching Applications

### Features

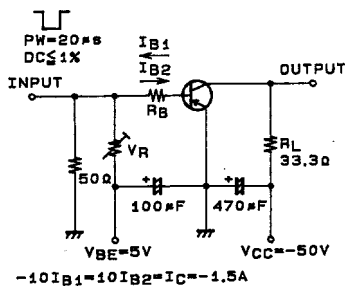
- Composite type with 2PNP transistors contained in one package, facilitating high-density mounting.
- The FX509 houses two chips, each being equivalent to the 2SB1215, in one package.
- Matched pair characteristics.

### Package Dimensions

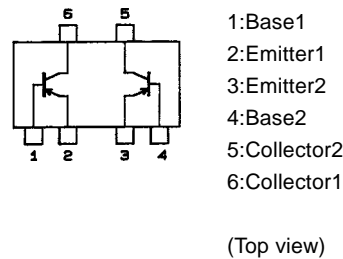
unit:mm  
2118



### Switching Time Test Circuit



### Electrical Connection



### Specifications

#### Absolute Maximum Ratings at $T_a = 25^\circ C$

| Parameter                    | Symbol    | Conditions   | Ratings     | Unit |
|------------------------------|-----------|--|-------------|------|
| Collector-to-Base Voltage    | $V_{CB0}$ |  | -120        | V    |
| Collector-to-Emitter Voltage | $V_{CE0}$ |  | -100        | V    |
| Emitter-to-Base Voltage      | $V_{EB0}$ |  | -6          | V    |
| Collector Current            | $I_C$     |  | -3          | A    |
| Collector Current (Pulse)    | $I_{CP}$  |  | -6          | A    |
| Base Current                 | $I_B$     |  | -0.6        | A    |
| Collector Dissipation        | $P_C$     | Mounted on ceramic board (750mm <sup>2</sup> ×0.8mm) 1unit | 1.5         | W    |
| Total Dissipation            | $P_T$     | Mounted on ceramic board (750mm <sup>2</sup> ×0.8mm)       | 2           | W    |
| Junction Temperature         | $T_J$     |  | 150         | °C   |
| Storage Temperature          | $T_{stg}$ |  | -55 to +150 | °C   |

· Marking:509

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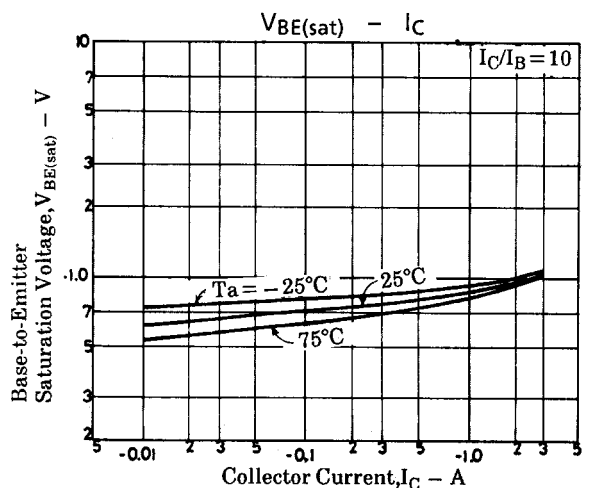
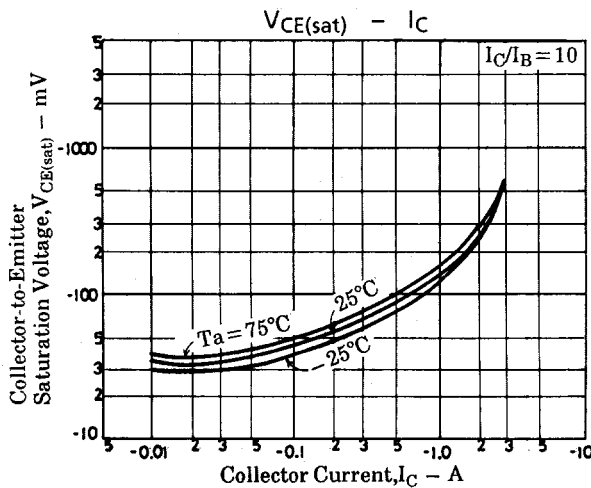
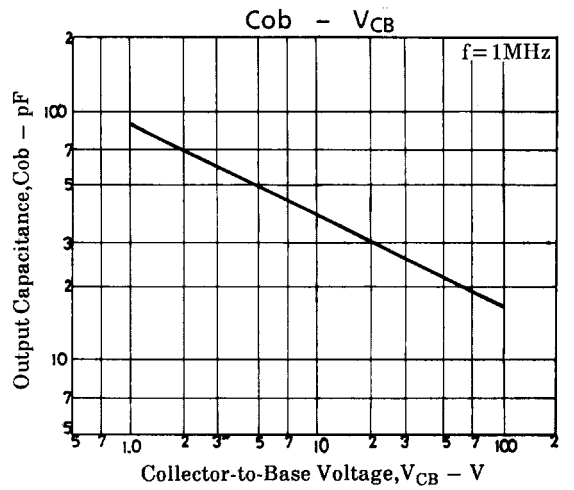
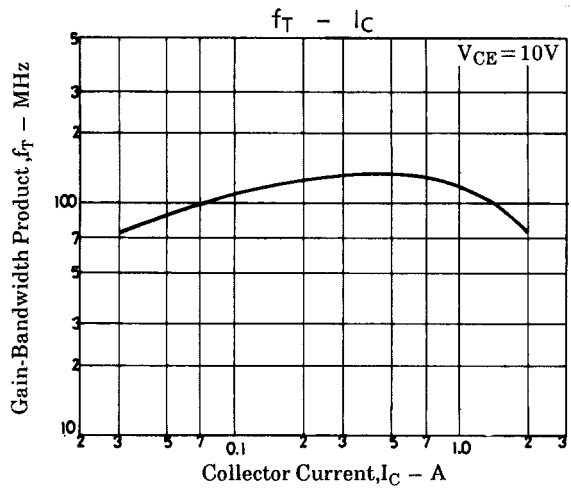
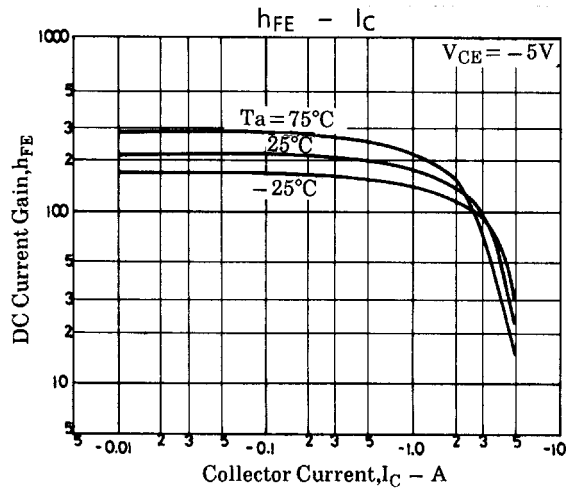
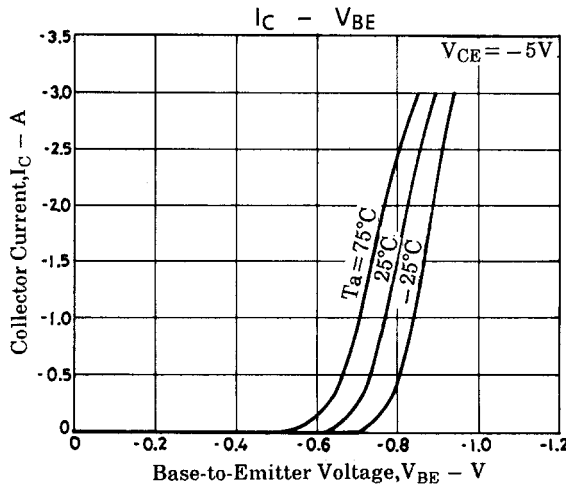
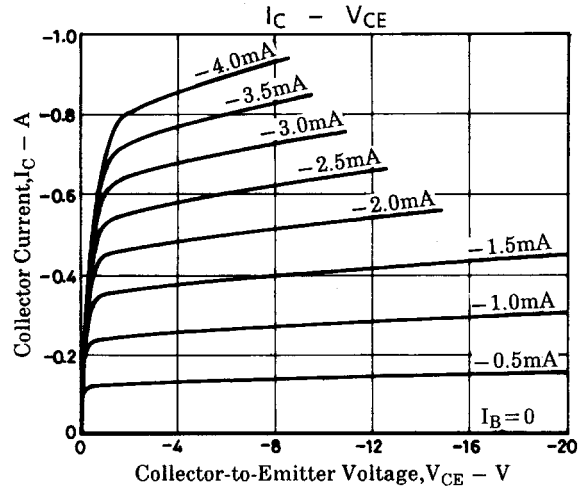
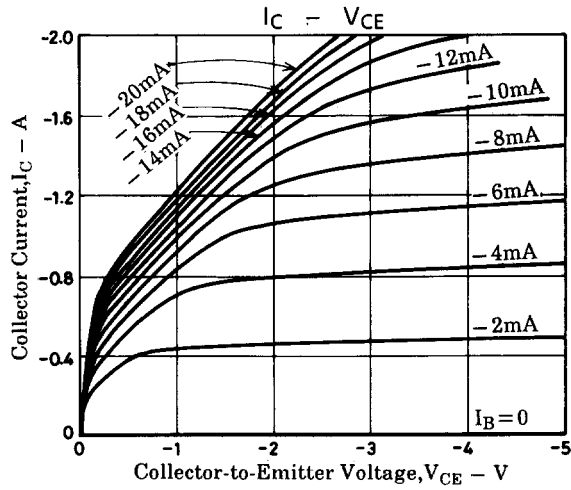
## FX509

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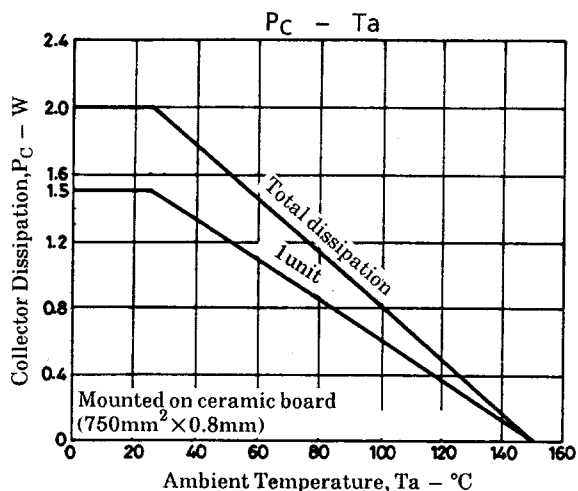
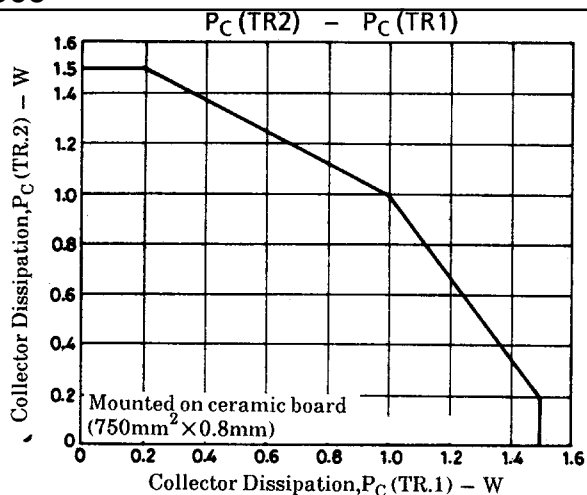
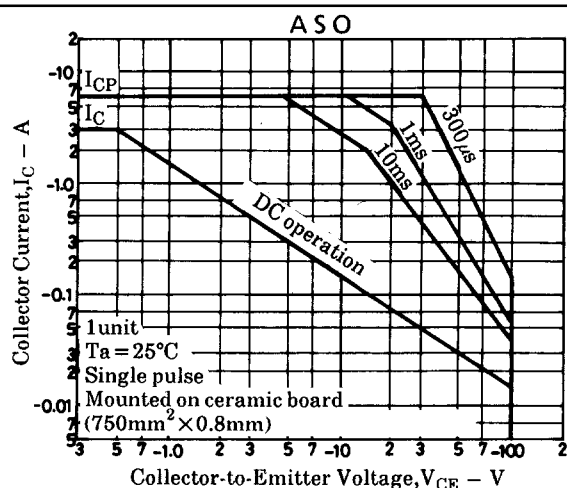
### Electrical Characteristics at $T_a = 25^\circ\text{C}$

| Parameter                | Symbol                       | Conditions                       | Ratings |      |      | Unit          |
|--------------------------|------------------------------|----------------------------------|---------|------|------|---------------|
|                          |                              |                                  | min     | typ  | max  |               |
| Collector Cutoff Current | $I_{CBO}$                    | $V_{CB}=-100V, I_E=0$            |         |      | -1   | $\mu\text{A}$ |
| Emitter Cutoff Current   | $I_{EBO}$                    | $V_{EB}=-4V, I_C=0$              |         |      | -1   | $\mu\text{A}$ |
| DC Current Gain          | $h_{FE1}$                    | $V_{CE}=-5V, I_C=-500\text{mA}$  | 140     |      | 400  |               |
|                          | $h_{FE2}$                    | $V_{CE}=-5V, I_C=-2A$            | 40      |      |      |               |
| DC Current Gain Ratio    | $h_{FE}(\text{small/large})$ | $V_{CE}=-5V, I_C=-500\text{mA}$  | 0.8     |      |      |               |
| Gain-Bandwidth Product   | $f_T$                        | $V_{CE}=-5V, I_C=-500\text{mA}$  |         | 180  |      | MHz           |
| Output Capacitance       | Cob                          | $V_{CB}=-10V, f=1\text{MHz}$     |         | 40   |      | pF            |
| C-E Saturation Voltage   | $V_{CE}(\text{sat})$         | $I_C=-1.5A, I_B=-150\text{mA}$   |         | -200 | -500 | mV            |
| B-E Saturation Voltage   | $V_{BE}(\text{sat})$         | $I_C=-1.5A, I_B=-150\text{mA}$   |         | -0.9 | -1.2 | V             |
| C-B Breakdown Voltage    | $V_{(BR)CBO}$                | $I_C=-10\mu\text{A}, I_E=0$      | -120    |      |      | V             |
| C-E Breakdown Voltage    | $V_{(BR)CEO}$                | $I_C=-1\text{mA}, R_{BE}=\infty$ | -100    |      |      | V             |
| E-B Breakdown Voltage    | $V_{(BR)EBO}$                | $I_E=-10\mu\text{A}, I_C=0$      | -6      |      |      | V             |
| Turn-ON Time             | $t_{on}$                     | See sepcified Test Circuit       |         | 100  |      | ns            |
| Storage Time             | $t_{stg}$                    | See sepcified Test Circuit       |         | 800  |      | ns            |
| Fall Time                | $t_f$                        | See sepcified Test Circuit       |         | 50   |      | ns            |

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