



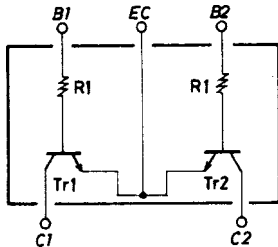
# FC138

## NPN Epitaxial Planar Silicon Composite Transistor Switching Applications (with Bias Resistance)

### Features

- On-chip bias resistance ( $R1=4.7k\Omega$ ).
- Composite type with 2 transistors contained in the CP package currently in use, improving the mounting efficiency greatly.
- The FC138 is formed with two chips, being equivalent to the 2SC3900, placed in one package.
- Excellent in thermal equilibrium and pair capability.

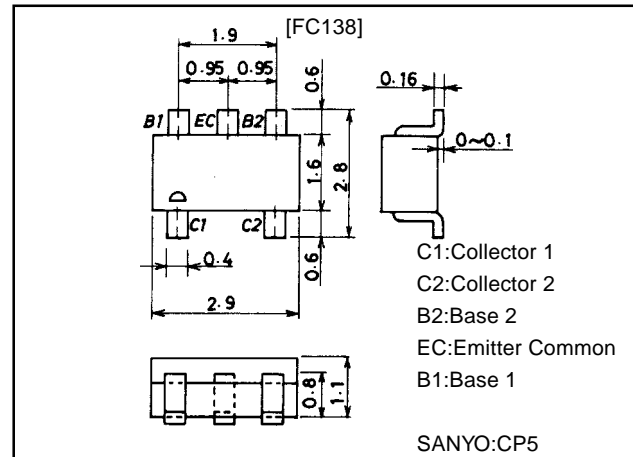
### Electrical Connection



### Package Dimensions

unit:mm

2066



### Specifications

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

| Parameter                    | Symbol    | Conditions | Ratings     | Unit             |
|------------------------------|-----------|------------|-------------|------------------|
| Collector-to-Base Voltage    | $V_{CBO}$ |            | 50          | V                |
| Collector-to-Emitter Voltage | $V_{CEO}$ |            | 50          | V                |
| Emitter-to-Base Voltage      | $V_{EBO}$ |            | 5           | V                |
| Collector Current            | $I_C$     |            | 100         | mA               |
| Peak Collector Current       | $I_{CP}$  |            | 200         | mA               |
| Collector Dissipation        | $P_C$     | 1 unit     | 200         | mW               |
| Total Power Dissipation      | $P_T$     |            | 300         | 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 | $I_{CBO}$     | $V_{CB}=40\text{V}, I_E=0$             |         |      | 0.1 | $\mu\text{A}$ |
| Emitter Cutoff Current   | $I_{EBO}$     | $V_{EB}=5\text{V}, I_C=0$              |         |      | 0.1 | $\mu\text{A}$ |
| DC Current Gain          | $h_{FE}$      | $V_{CE}=5\text{V}, I_C=10\text{mA}$    | 100     |      |     |               |
| Gain-Bandwidth Product   | $f_T$         | $V_{CE}=10\text{V}, I_C=5\text{mA}$    |         | 250  |     | MHz           |
| Output Capacitance       | $C_{ob}$      | $V_{CB}=10\text{V}, f=1\text{MHz}$     |         | 3.3  |     | pF            |
| C-E Saturation Voltage   | $V_{CE(sat)}$ | $I_C=10\text{mA}, I_B=0.5\text{mA}$    |         | 0.1  | 0.3 | V             |
| C-B Breakdown Voltage    | $V_{(BR)CBO}$ | $I_C=10\mu\text{A}, I_E=0$             | 50      |      |     | V             |
| C-E Breakdown Voltage    | $V_{(BR)CEO}$ | $I_C=100\mu\text{A}, R_{BE}=\infty$    | 50      |      |     | V             |
| Input OFF-State Voltage  | $V_{I(off)}$  | $V_{CE}=5\text{V}, I_C=100\mu\text{A}$ | 0.4     | 0.55 | 0.8 | V             |
| Input ON-State Voltage   | $V_{I(on)}$   | $V_{CE}=0.2\text{V}, I_C=10\text{mA}$  | 0.6     | 1.0  | 2.0 | V             |
| Input Resistance         | R1            |  | 3.3     | 4.7  | 6.1 | k $\Omega$    |

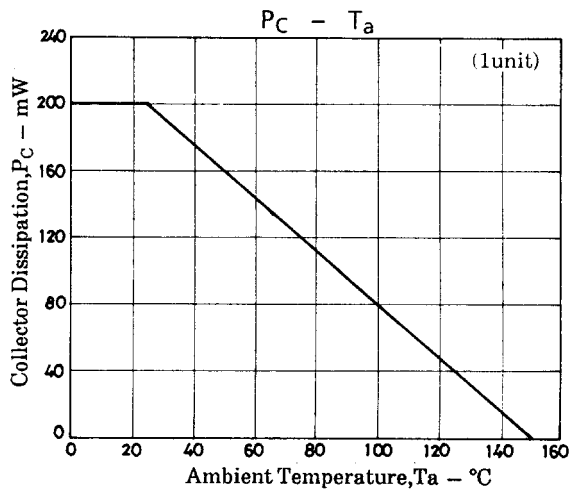
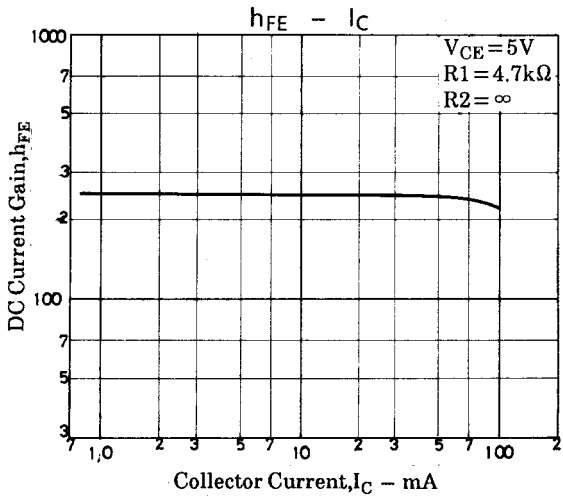
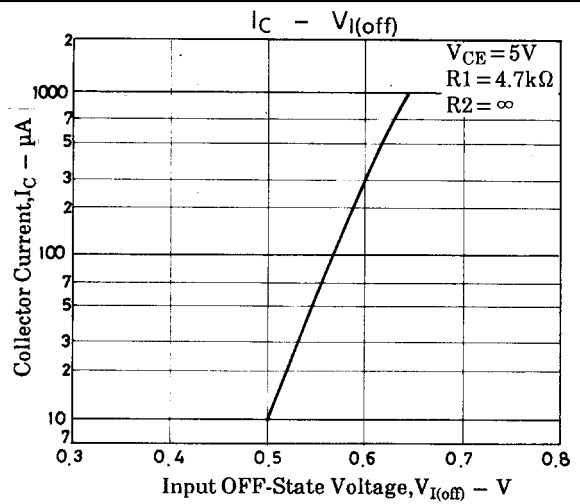
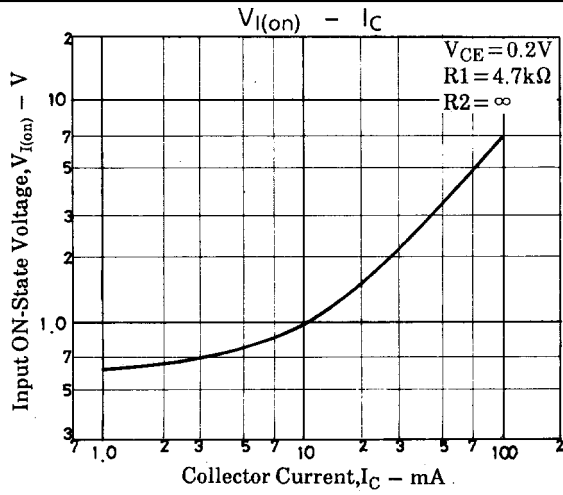
Note:The specifications shown above are for each individual transistor.

Marking:138

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# FC138



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