



## 2SC3039

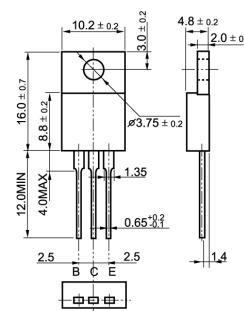
## Silicon Epitaxial Planar Transistor

### GENERAL DESCRIPTION

Silicon NPN high frequency, high power transistors in a plastic envelope, primarily for use in audio and general purpose



TO-220



### QUICK REFERENCE DATA

| SYMBOL      | PARAMETER                             | CONDITIONS                                        | TYP | MAX | UNIT    |
|-------------|---------------------------------------|---------------------------------------------------|-----|-----|---------|
| $V_{CESM}$  | Collector-emitter voltage peak value  | $V_{BE} = 0V$                                     | -   | 500 | V       |
| $V_{CEO}$   | Collector-emitter voltage (open base) |                                                   | -   | 300 | V       |
| $I_C$       | Collector current (DC)                |                                                   | -   | 7   | A       |
| $I_{CM}$    | Collector current peak value          |                                                   | -   |     | A       |
| $P_{tot}$   | Total power dissipation               | $T_{mb} \leq 25^\circ C$                          | -   | 50  | W       |
| $V_{CEsat}$ | Collector-emitter saturation voltage  | $I_C = 3.0A; I_B = 0.3A$                          | -   | 2   | V       |
| $V_F$       | Diode forward voltage                 | $I_F = 3.0A$                                      | 1.5 | 2.0 | V       |
| $t_f$       | Fall time                             | $I_C = 3A, I_{B1} = -I_{B2} = 0.3A, V_{CC} = 60V$ | 0.4 | 1.0 | $\mu s$ |

### LIMITING VALUES

| SYMBOL     | PARAMETER                             | CONDITIONS               | MIN | MAX | UNIT       |
|------------|---------------------------------------|--------------------------|-----|-----|------------|
| $V_{CESM}$ | Collector-emitter voltage peak value  | $V_{BE} = 0V$            | -   | 500 | V          |
| $V_{CEO}$  | Collector-emitter voltage (open base) |                          | -   | 300 | V          |
| $V_{EBO}$  | Emitter-base voltage (open collector) |                          |     | 5   | V          |
| $I_C$      | Collector current (DC)                |                          | -   | 7   | A          |
| $I_B$      | Base current (DC)                     |                          | -   | 2   | A          |
| $P_{tot}$  | Total power dissipation               | $T_{mb} \leq 25^\circ C$ | -   | 50  | W          |
| $T_{sta}$  | Storage temperature                   |                          | -55 | 150 | $^\circ C$ |
| $T_j$      | Junction temperature                  |                          | -   | 150 | $^\circ C$ |

### ELECTRICAL CHARACTERISTICS

| SYMBOL        | PARAMETER                             | CONDITIONS                                        | TYP | MAX | UNIT    |
|---------------|---------------------------------------|---------------------------------------------------|-----|-----|---------|
| $I_{CBO}$     | Collector-base cut-off current        | $V_{CB} = 400V$                                   | -   | 0.2 | mA      |
| $I_{EBO}$     | Emitter-base cut-off current          | $V_{EB} = 5V$                                     | -   | 0.2 | mA      |
| $V_{(BR)CEO}$ | Collector-emitter breakdown voltage   | $I_C = 1mA$                                       | 300 |     | V       |
| $V_{CEsat}$   | Collector-emitter saturation voltages | $I_C = 2.0A; I_B = 0.5A$                          | -   | 2   | V       |
| $h_{FE}$      | DC current gain                       | $I_C = 0.8A; V_{CE} = 5V$                         | 15  | 100 |         |
| $f_T$         | Transition frequency at $f = 5MHz$    | $I_C = 1A; V_{CE} = 12V$                          | 25  | -   | MHz     |
| $C_c$         | Collector capacitance at $f = 1MHz$   | $V_{CB} = 10V$                                    | 120 | -   | pF      |
| $t_{on}$      | On times                              | $I_C = 3A, I_{B1} = -I_{B2} = 0.3A, V_{CC} = 60V$ |     | 1.0 | $\mu s$ |
| $t_s$         | Turn-off storage time                 | $I_C = 3A, I_{B1} = -I_{B2} = 0.3A, V_{CC} = 60V$ |     | 2.5 | $\mu s$ |
| $t_f$         | Fall time                             | $I_C = 3A, I_{B1} = -I_{B2} = 0.3A, V_{CC} = 60V$ | 0.4 | 1.0 | $\mu s$ |