

## Silicon NPN Power Transistors

## 2SC3086

## DESCRIPTION

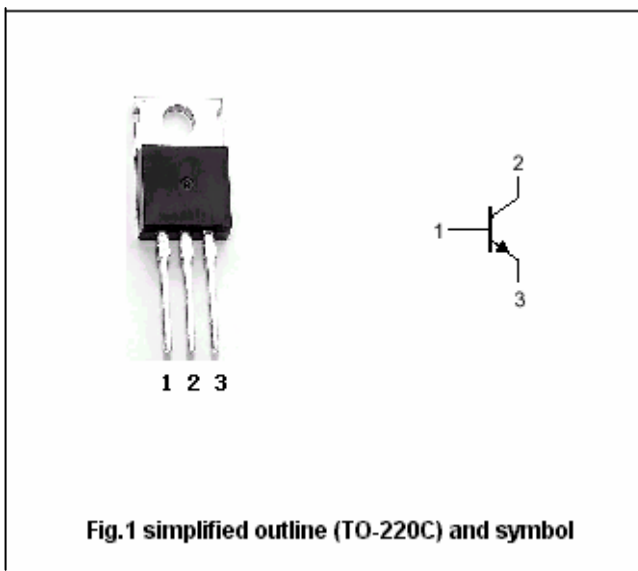
- With TO-220C package
- High breakdown voltage  
:  $V_{CBO}=800V(\text{Min})$
- Fast switching speed.
- Wide area of safe operation

## APPLICATIONS

- 500V/3A switching regulator applications

## PINNING

| PIN | DESCRIPTION                          |
|-----|--------------------------------------|
| 1   | Base                                 |
| 2   | Collector;connected to mounting base |
| 3   | Emitter                              |

Absolute maximum ratings( $T_a=25^\circ\text{C}$ )

| SYMBOL    | PARAMETER                 | CONDITIONS                                  | VALUE   | UNIT             |
|-----------|---------------------------|---------------------------------------------|---------|------------------|
| $V_{CBO}$ | Collector-base voltage    | Open emitter                                | 800     | V                |
| $V_{CEO}$ | Collector-emitter voltage | Open base                                   | 500     | V                |
| $V_{EBO}$ | Emitter-base voltage      | Open collector                              | 7       | V                |
| $I_C$     | Collector current         |                                             | 3       | A                |
| $I_{CP}$  | Collector current-peak    | $PW \leq 300\mu s$ , Duty Cycle $\leq 10\%$ | 6       | A                |
| $I_B$     | Base current              |                                             | 1       | A                |
| $P_C$     | Collector dissipation     | $T_C=25^\circ\text{C}$                      | 40      | W                |
|           |                           |                                             | 1.75    |                  |
| $T_j$     | Junction temperature      |                                             | 150     | $^\circ\text{C}$ |
| $T_{stg}$ | Storage temperature       |                                             | -55~150 | $^\circ\text{C}$ |

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## CHARACTERISTICS

Tj=25°C unless otherwise specified

| SYMBOL        | PARAMETER                            | CONDITIONS                  | MIN | TYP. | MAX | UNIT    |
|---------------|--------------------------------------|-----------------------------|-----|------|-----|---------|
| $V_{(BR)CEO}$ | Collector-emitter breakdown voltage  | $I_C=1mA$ ; $R_{BE}=\infty$ | 500 |      |     | V       |
| $V_{(BR)CBO}$ | Collector-base breakdown voltage     | $I_C=1mA$ ; $I_E=0$         | 800 |      |     | V       |
| $V_{(BR)EBO}$ | Emitter-base breakdown voltage       | $I_E=1mA$ ; $I_C=0$         | 7   |      |     | V       |
| $V_{CE(sat)}$ | Collector-emitter saturation voltage | $I_C=1.5A$ ; $I_B=0.3A$     |     |      | 1.0 | V       |
| $V_{BE(sat)}$ | Base-emitter saturation voltage      | $I_C=1.5A$ ; $I_B=0.3A$     |     |      | 1.5 | V       |
| $I_{CBO}$     | Collector cut-off current            | $V_{CB}=500V$ ; $I_E=0$     |     |      | 10  | $\mu A$ |
| $I_{EBO}$     | Emitter cut-off current              | $V_{EB}=5V$ ; $I_C=0$       |     |      | 10  | $\mu A$ |
| $h_{FE-1}$    | DC current gain                      | $I_C=0.3A$ ; $V_{CE}=5V$    | 15  |      | 50  |         |
| $h_{FE-2}$    | DC current gain                      | $I_C=1.5A$ ; $V_{CE}=5V$    | 8   |      |     |         |
| $f_T$         | Transition frequency                 | $I_C=0.3A$ ; $V_{CE}=10V$   |     | 18   |     | MHz     |
| $C_{OB}$      | Output capacitance                   | $f=10MHz$ ; $V_{CB}=10V$    |     | 40   |     | pF      |

## Switching times

|           |              |                                                                                 |  |  |     |         |
|-----------|--------------|---------------------------------------------------------------------------------|--|--|-----|---------|
| $t_{on}$  | Turn-on time | $V_{CC}=200V$ ; $I_C=2A$<br>$I_{B1}=0.4A$ ; $I_{B2}=-0.4A$ ;<br>$R_L=100\Omega$ |  |  | 1.0 | $\mu s$ |
| $t_{stg}$ | Storage time |                                                                                 |  |  | 3.0 | $\mu s$ |
| $t_f$     | Fall time    |                                                                                 |  |  | 1.0 | $\mu s$ |

◆  $h_{FE-1}$  classifications

| L     | M     | N     |
|-------|-------|-------|
| 15-30 | 20-40 | 30-50 |

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## PACKAGE OUTLINE

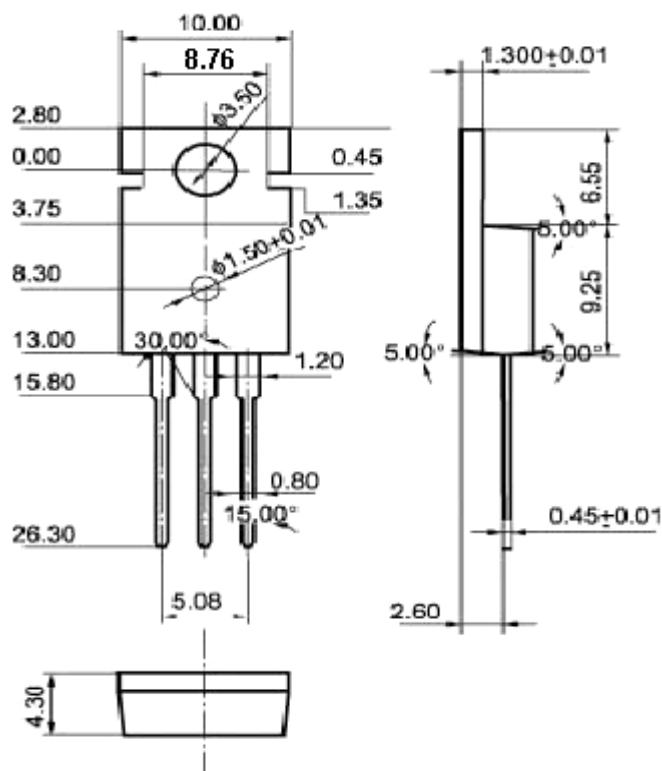


Fig.2 Outline dimensions (unindicated tolerance:±0.10 mm)