

isc Silicon NPN Power Transistor

2SC3969

DESCRIPTION

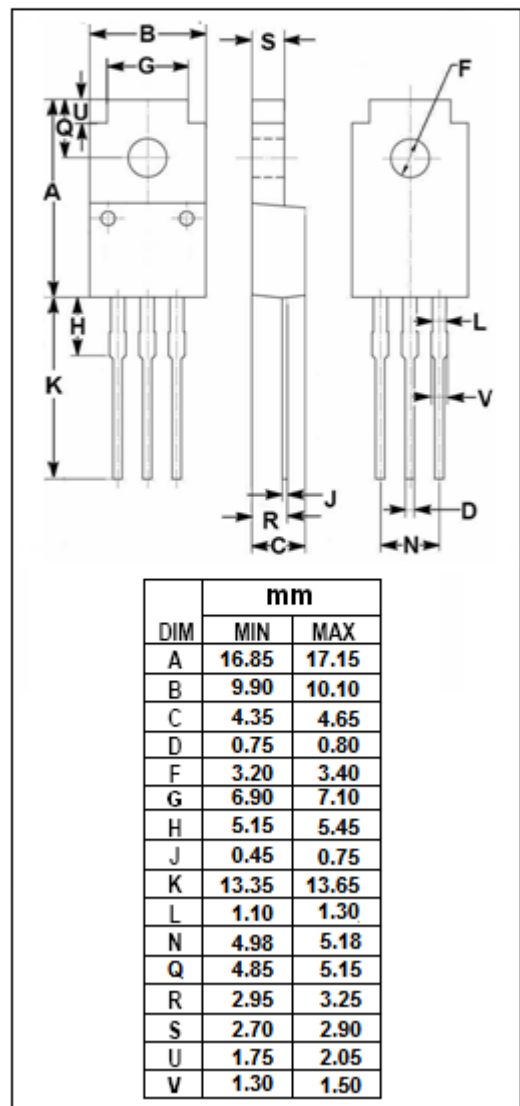
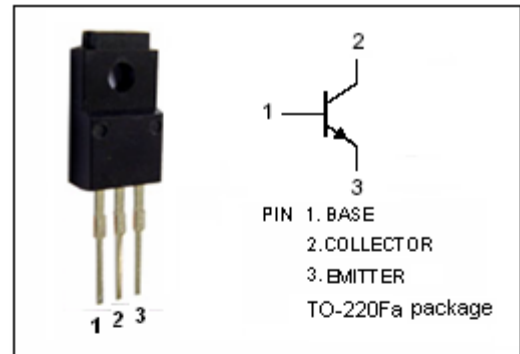
- Low Collector Saturation Voltage
- High Collector-Emitter Breakdown Voltage-  
:  $V_{(BR)CEO} = 400V$  (Min)
- High Switching Speed

APPLICATIONS

- Designed for switching regulator applications

ABSOLUTE MAXIMUM RATINGS( $T_a=25^\circ C$ )

| SYMBOL    | PARAMETER   | VALUE   | UNIT       |
|-----------|---|---------|------------|
| $V_{CBO}$ | Collector-Base Voltage                            | 400     | V          |
| $V_{CEO}$ | Collector-Emitter Voltage                         | 400     | V          |
| $V_{EBO}$ | Emitter-Base Voltage                              | 7       | V          |
| $I_C$     | Collector Current-Continuous                      | 2       | A          |
| $I_{CM}$  | Collector Current-Peak                            | 4       | A          |
| $P_C$     | Collector Power Dissipation<br>@ $T_c=25^\circ C$ | 20      | W          |
|           | Collector Power Dissipation<br>@ $T_a=25^\circ C$ | 2       |            |
| $T_J$     | Junction Temperature                              | 150     | $^\circ C$ |
| $T_{stg}$ | Storage Temperature Range                         | -55~150 | $^\circ C$ |



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## ELECTRICAL CHARACTERISTICS

 $T_C=25^{\circ}\text{C}$  unless otherwise specified

| SYMBOL        | PARAMETER                            | CONDITIONS  | MIN | TYP. | MAX | UNIT          |
|---------------|--------------------------------------|---|-----|------|-----|---------------|
| $V_{CE(SUS)}$ | Collector-Emitter Sustaining Voltage | $I_C=1.0\text{A}$ ; $I_{B1}=0.1\text{A}$ , $L=1\text{mH}$ | 400 |      |     | V             |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage     | $I_C=50\mu\text{A}$ ; $I_E=0$                             | 400 |      |     | V             |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage  | $I_C=1\text{mA}$ ; $I_B=0$                                | 400 |      |     | V             |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage       | $I_E=50\mu\text{A}$ ; $I_C=0$                             | 7   |      |     | V             |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C=1\text{A}$ ; $I_B=0.2\text{A}$                       |     |      | 1.0 | V             |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage      | $I_C=1\text{A}$ ; $I_B=0.2\text{A}$                       |     |      | 1.5 | V             |
| $I_{CBO}$     | Collector Cutoff Current             | $V_{CB}=400\text{V}$ ; $I_E=0$                            |     |      | 10  | $\mu\text{A}$ |
| $I_{EBO}$     | Emitter Cutoff Current               | $V_{EB}=7\text{V}$ ; $I_C=0$                              |     |      | 10  | $\mu\text{A}$ |
| $h_{FE}$      | DC Current Gain                      | $I_C=0.1\text{A}$ ; $V_{CE}=5\text{V}$                    | 25  |      | 50  |               |
| $f_T$         | Current-Gain—Bandwidth Product       | $I_E=-0.1\text{A}$ ; $V_{CE}=10\text{V}$                  |     | 10   |     | MHz           |
| $C_{OB}$      | Output Capacitance                   | $I_E=0$ ; $V_{CB}=10\text{V}$ ; $f=1.0\text{MHz}$         |     | 30   |     | pF            |

## Switching times

|           |              |  |  |  |     |               |
|-----------|--------------|--|--|--|-----|---------------|
| $t_{on}$  | Turn-on Time | $I_C=0.8\text{A}$ ; $I_{B1}=-I_{B2}=0.08\text{A}$ ;<br>$R_L=250\Omega$ ; $V_{CC}\approx 200\text{V}$ |  |  | 1.0 | $\mu\text{s}$ |
| $t_{stg}$ | Storage Time |  |  |  | 2.5 | $\mu\text{s}$ |
| $t_f$     | Fall Time    |  |  |  | 1.0 | $\mu\text{s}$ |