

isc Silicon NPN Power Transistor

2SC3691

DESCRIPTION

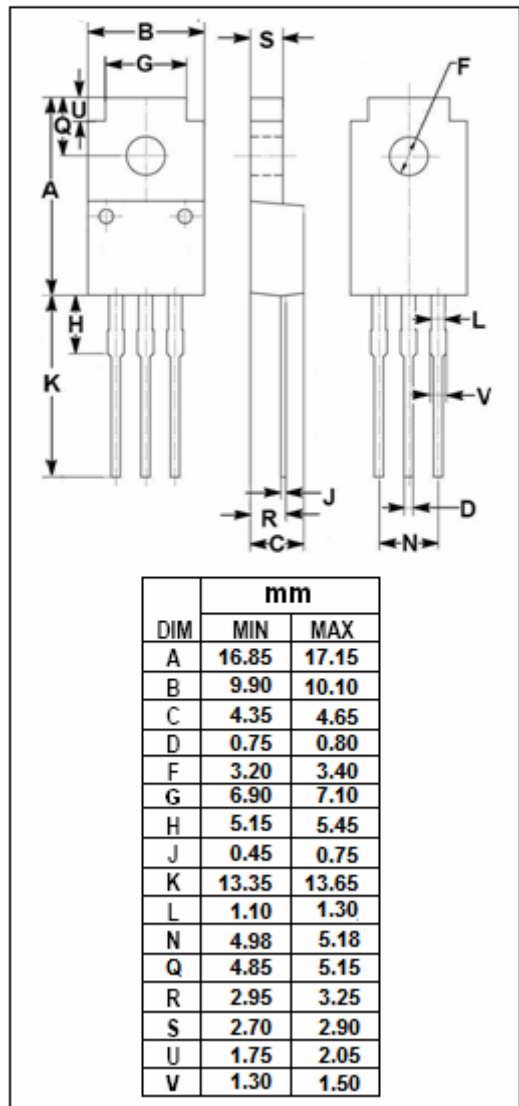
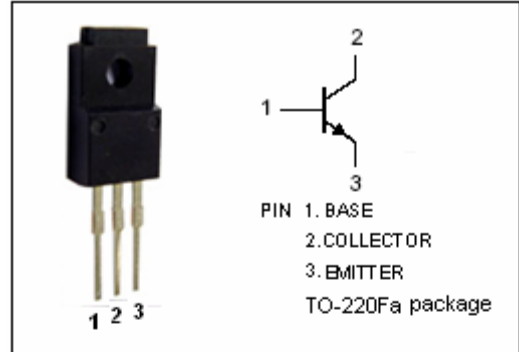
- Low Collector Saturation Voltage
: $V_{CE(sat)} = 0.5V(\text{Max}) @ I_C = 4A$
- Collector-Emitter Sustaining Voltage-
: $V_{CEO(SUS)} = 60V (\text{Min})$
- High Switching Speed

APPLICATIONS

- Designed for high speed and power switching applications

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

| SYMBOL | PARAMETER | VALUE | UNIT |
|-----------|---|---------|------------------|
| V_{CBO} | Collector-Base Voltage | 100 | V |
| V_{CEO} | Collector-Emitter Voltage | 60 | V |
| V_{EBO} | Emitter-Base Voltage | 7 | V |
| I_C | Collector Current-Continuous | 5 | A |
| I_{CM} | Collector Current-Peak | 10 | A |
| I_B | Base Current-Continuous | 2.5 | A |
| P_C | Collector Power Dissipation @ $T_C=25^\circ\text{C}$ | 25 | W |
| | Collector Power Dissipation @ $T_a=25^\circ\text{C}$ | 2 | |
| T_J | Junction Temperature | 150 | $^\circ\text{C}$ |
| T_{stg} | Storage Temperature Range | -55~150 | $^\circ\text{C}$ |



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ELECTRICAL CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP. | MAX | UNIT |
|-----------------|--------------------------------------|---|-----|------|-----------|---------------|
| $V_{CEO(SUS)}$ | Collector-Emitter Sustaining Voltage | $I_C=3A; I_B=0.3A, L=1mH$ | 60 | | | V |
| $V_{CE(sat)-1}$ | Collector-Emitter Saturation Voltage | $I_C=3A; I_B=0.15A$ | | | 0.3 | V |
| $V_{CE(sat)-2}$ | Collector-Emitter Saturation Voltage | $I_C=4A; I_B=0.2A$ | | | 0.5 | V |
| $V_{BE(sat)-1}$ | Base-Emitter Saturation Voltage | $I_C=3A; I_B=0.15A$ | | | 1.2 | V |
| $V_{BE(sat)-2}$ | Base-Emitter Saturation Voltage | $I_C=4A; I_B=0.2A$ | | | 1.5 | V |
| I_{CBO} | Collector Cutoff Current | $V_{CB}=60V; I_E=0$ | | | 10 | μA |
| I_{CEX} | Collector Cutoff Current | $V_{CE}=60V; V_{BE}=-1.5V$ $T_a=125^{\circ}\text{C}$ | | | 10 1.0 | μA mA |
| I_{EBO} | Emitter Cutoff Current | $V_{EB}=5V; I_C=0$ | | | 10 | μA |
| h_{FE-1} | DC Current Gain | $I_C=0.5A; V_{CE}=2V$ | 100 | | | |
| h_{FE-2} | DC Current Gain | $I_C=1A; V_{CE}=2V$ | 100 | 200 | 400 | |
| h_{FE-3} | DC Current Gain | $I_C=3A; V_{CE}=2V$ | 60 | | | |
| f_T | Current-Gain—Bandwidth Product | $I_C=0.5A; V_{CE}=10V$ | | 150 | | MHz |
| C_{OB} | Output Capacitance | $I_E=0; V_{CB}=10V; f_{test}=1.0MHz$ | | 70 | | pF |

Switching times

| | | | | | | |
|-----------|--------------|---|--|--|-----|---------|
| t_{on} | Turn-on Time | $I_C=3A; I_{B1}=-I_{B2}=0.15A$ $R_L=17\Omega; V_{CC}\approx 50V$ | | | 0.3 | μs |
| t_{stg} | Storage Time | | | | 1.5 | μs |
| t_f | Fall Time | | | | 0.3 | μs |

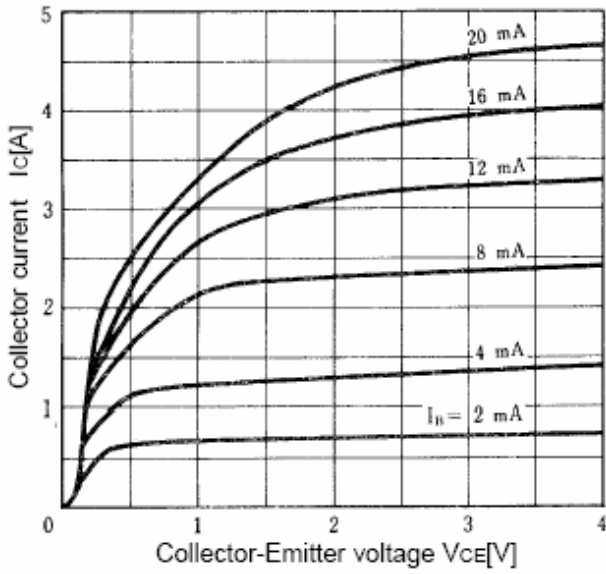
◆ h_{FE-2} classifications

| M | L | K |
|---------|---------|---------|
| 100-200 | 150-300 | 200-400 |

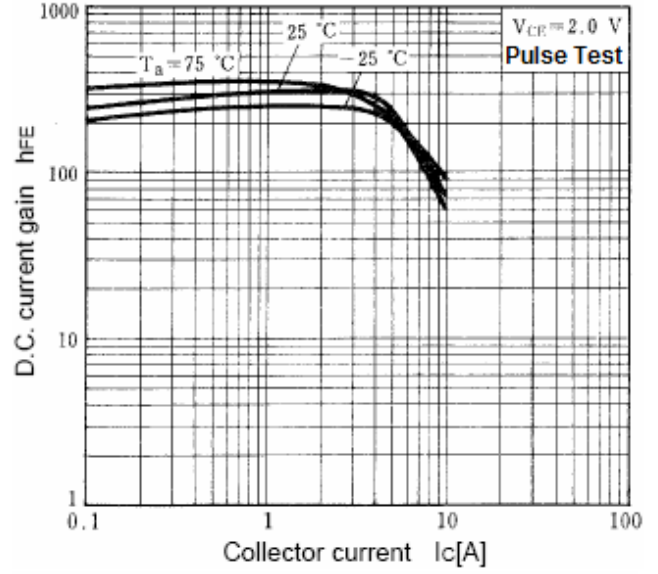
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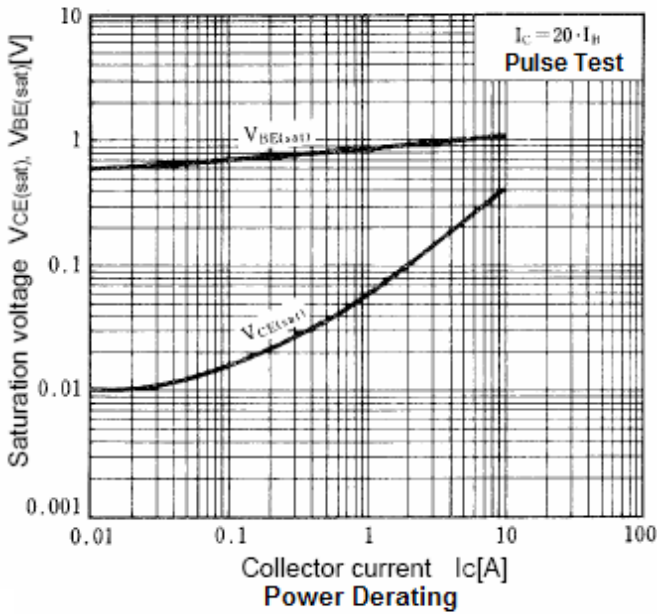
I_c - V_{CE} Characteristics



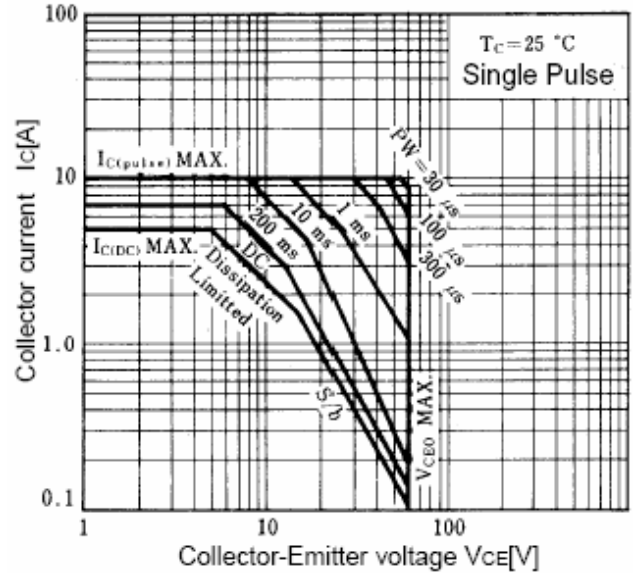
h_{FE} - I_c Characteristics



$V_{CE(sat)}$ - I_c & $V_{BE(sat)}$ - I_c Characteristics



Safe Operating Area



Power Derating

