

2SH20

Silicon N-Channel IGBT

HITACHI

1st. Edition
Feb. 1995

Application

High speed power switching

Features

- High speed switching
- Low on saturation voltage

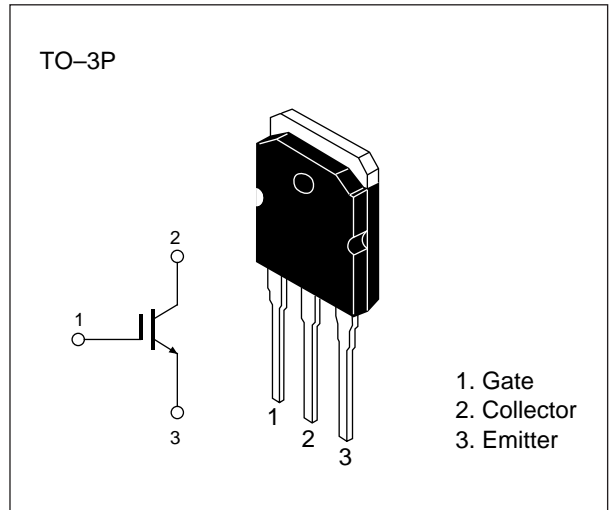


Table 1 Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

| Item | Symbol | Rated | Unit |
|------------------------------|----------------------|-------------|------------------|
| Collector to emitter voltage | V_{CES} | 600 | V |
| Gate to emitter voltage | V_{GES} | ± 20 | V |
| Collector current | I_C | 36 | A |
| Collector peak current | $i_{c(\text{peak})}$ | 60 | A |
| Collector dissipation | P_C^* | 100 | W |
| Channel temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

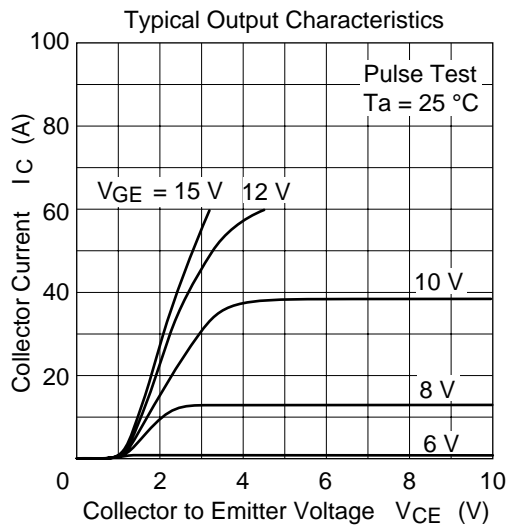
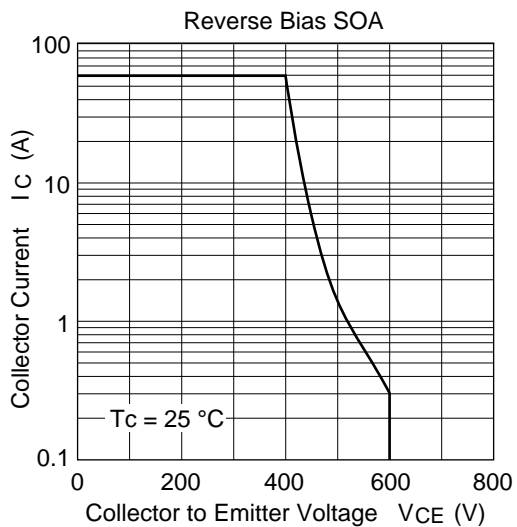
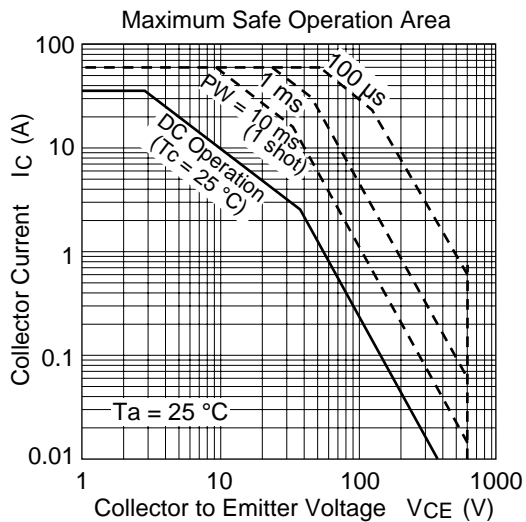
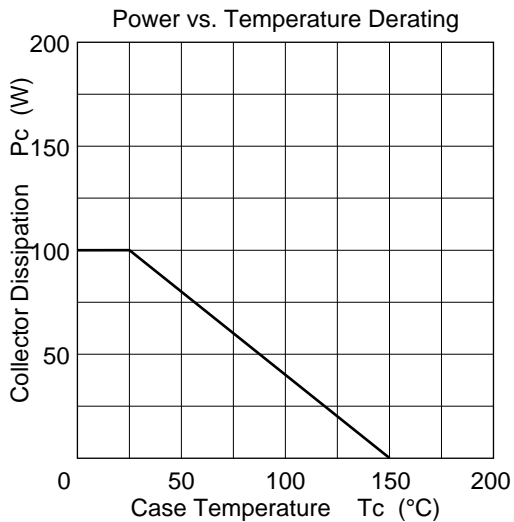
* Value at $T_c = 25^\circ\text{C}$

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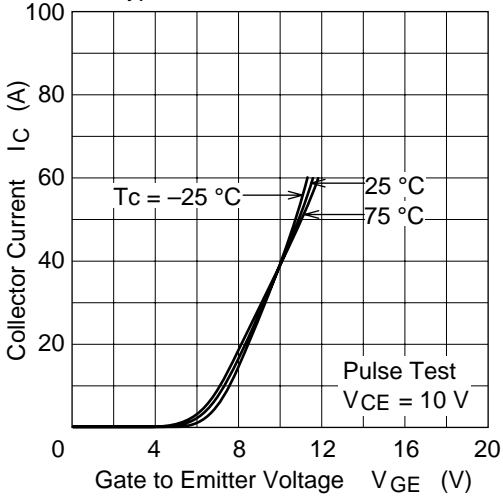
Table 2 Electrical Characteristics ($T_a = 25^\circ\text{C}$)

| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|---|----------------|-----|------|---------|---------------|---|
| Collector to emitter breakdown voltage | $V_{(BR)CES}$ | 600 | — | — | V | $I_C = 100\ \mu\text{A}$, $V_{GE} = 0$ |
| Zero gate voltage collector current | I_{CES} | — | — | 0.5 | mA | $V_{CE} = 600\ \text{V}$, $V_{GE} = 0$ |
| Gate to emitter leak current | I_{GES} | — | — | ± 1 | μA | $V_{GE} = \pm 20\ \text{V}$, $V_{CE} = 0$ |
| Gate to emitter cutoff current | $V_{GE(off)}$ | 3.0 | — | 6.0 | V | $I_C = 1\ \text{mA}$, $V_{CE} = 10\ \text{V}$ |
| Collector to emitter saturation voltage | $V_{CE(sat)1}$ | — | 1.5 | — | V | $I_C = 15\ \text{A}$, $V_{GE} = 15\ \text{V}$ |
| Collector to emitter saturation voltage | $V_{CE(sat)2}$ | — | 2.0 | 2.6** | V | $I_C = 30\ \text{A}$, $V_{GE} = 15\ \text{V}$ |
| Input capacitance | C_{ies} | — | 2600 | — | pF | $V_{CE} = 10\ \text{V}$, $V_{GE} = 0$, $f = 1\ \text{MHz}$ |
| Switching time | t_r | — | 160 | — | ns | $I_C = 30\ \text{A}$, $R_L = 10\ \Omega$, $V_{GE} = \pm 15\ \text{V}$ $R_g = 50\ \Omega$ |
| | t_{on} | — | 300 | — | | |
| | t_f | — | 2000 | — | | |
| | t_{off} | — | 2500 | — | | |

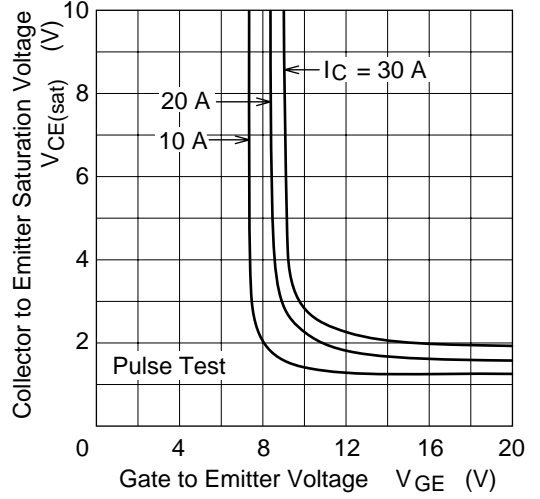
** $V_{CE(sat)2}$ is specified at the correlated test condition ($I_C=20\text{A}$)



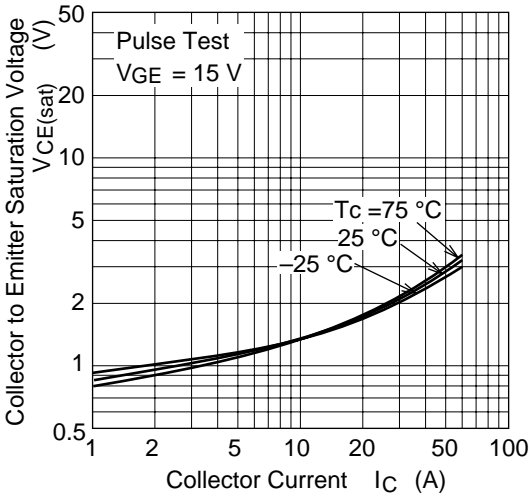
Typical Transfer Characteristics



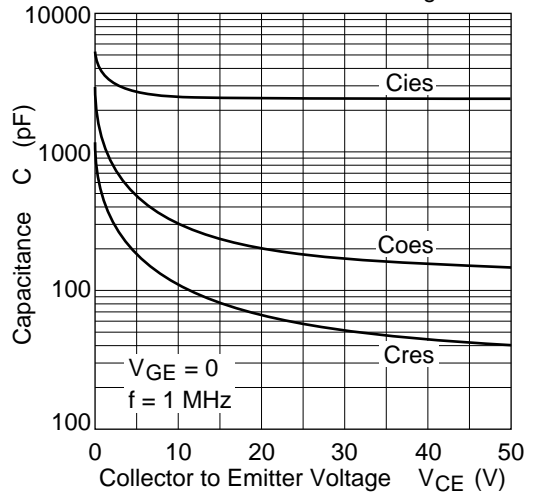
Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage

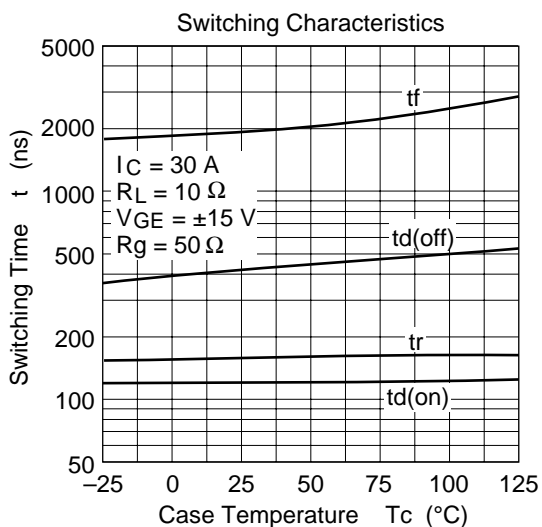
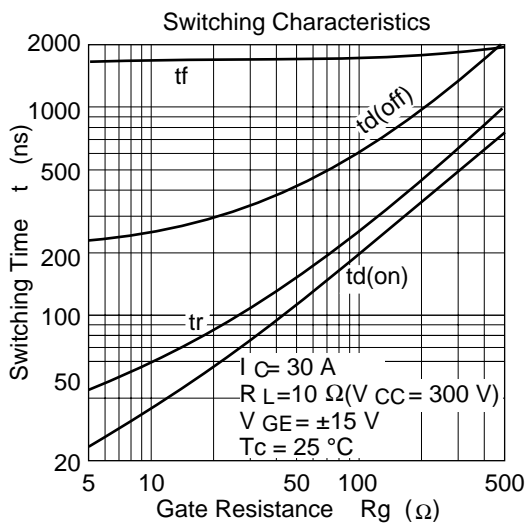
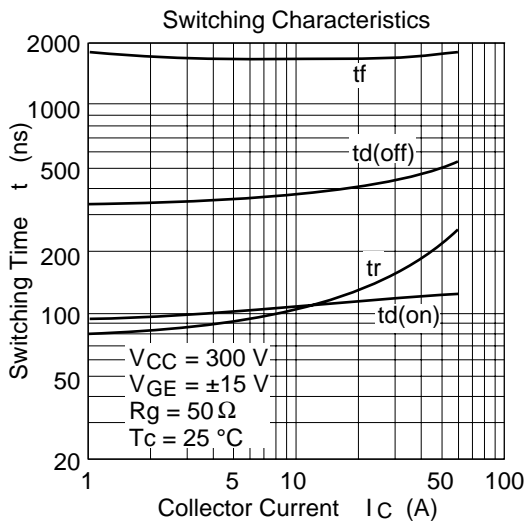
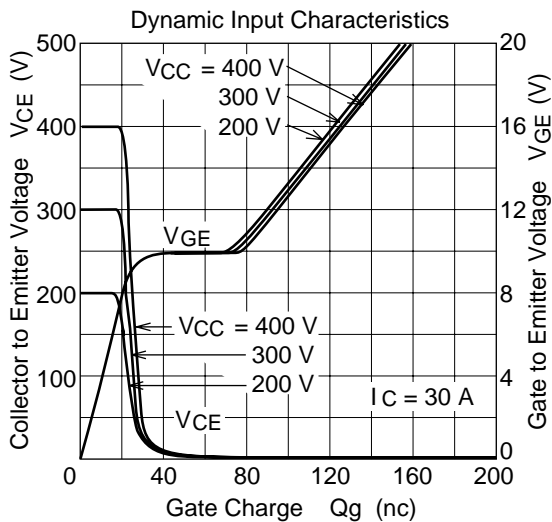


Collector to Emitter Saturation Voltage vs. Collector Current

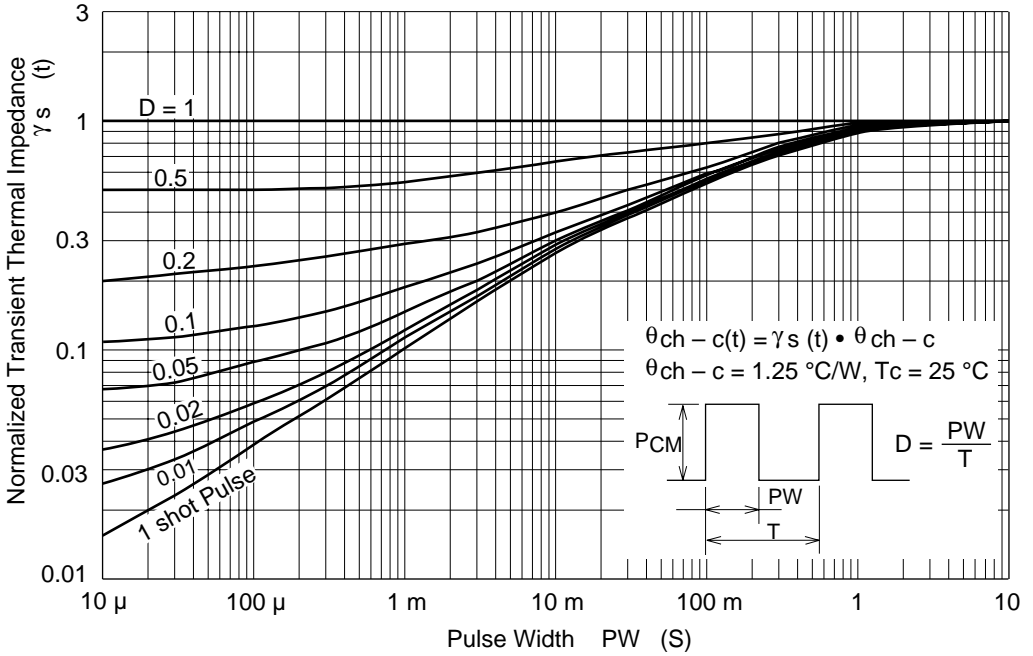


Typical Capacitance vs. Collector to Emitter Voltage

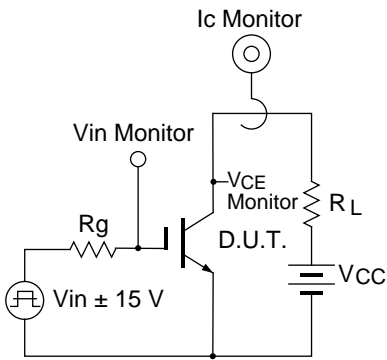




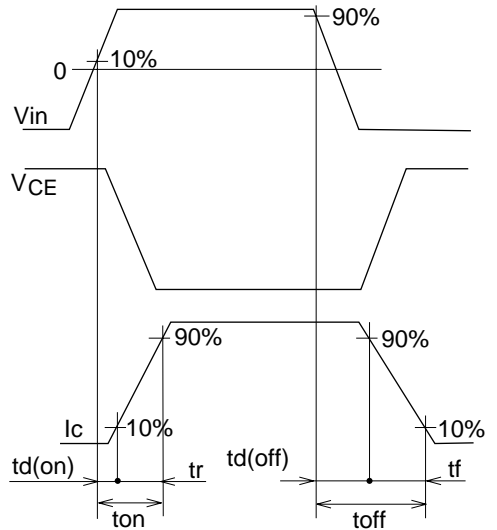
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



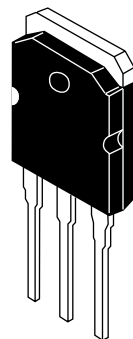
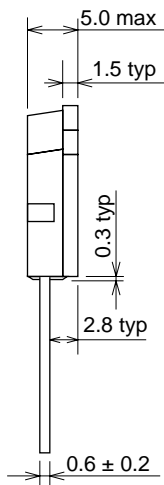
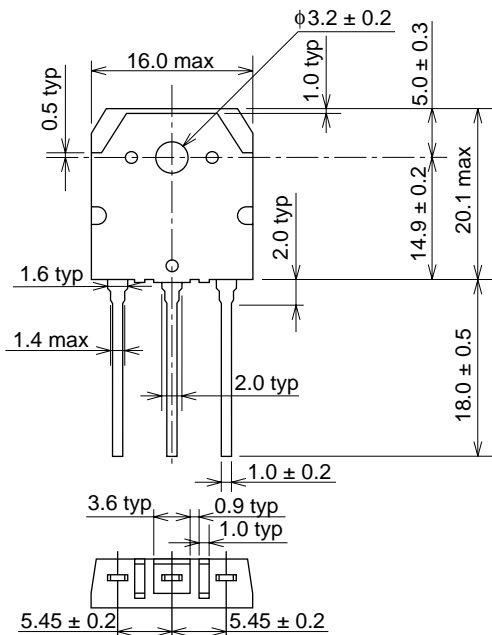
Waveforms



Package Dimensions

Unit : mm

• TO-3P



| | |
|--------------|-------|
| Hitachi Code | TO-3P |
| EIAJ | SC-65 |
| JEDEC | — |

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