2SH31

Silicon N Channel IGBT
High Speed Power Switching

HITACHI

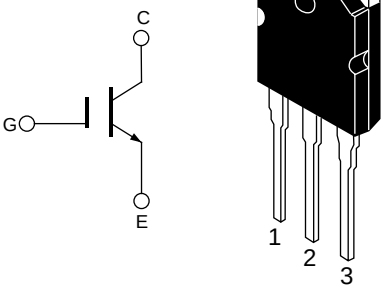
ADE-208-793(Z)
1st. Edition
May 1999

Features

- High speed switching
- Low on-voltage

Outline

TO–3P



1. Gate
2. Collector (Flange)
3. Emitter

Hitachi semiconductor

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to Emitter voltage	V_{CES}	600	V
Gate to Emitter voltage	V_{GES}	±20	V
Collector current	I_C	75	A
Collector peak current	ic(peak)	150	A
Collector dissipation	P_C Note1	150	W
Channel temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

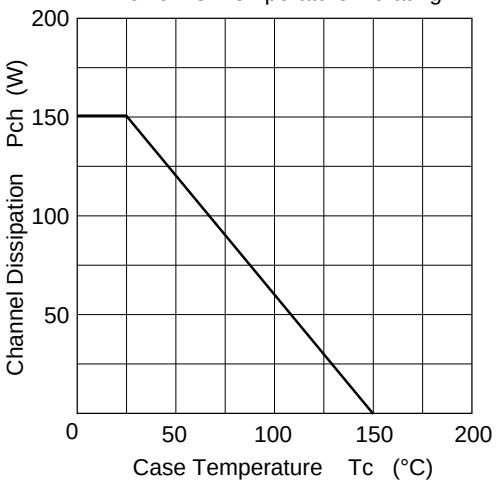
Note: 1. Value at Tc = 25°C

Electrical Characteristics (Ta = 25°C)

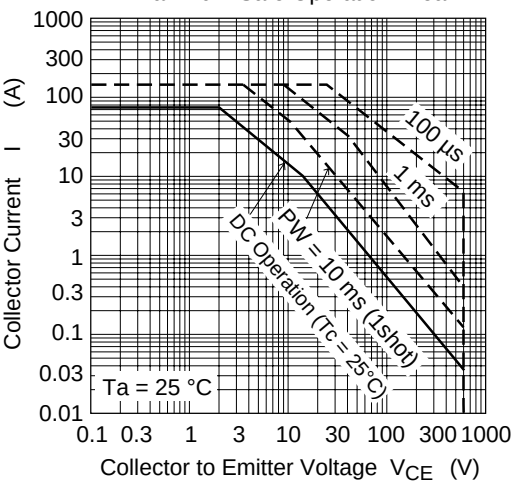
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	I_{CES}	—	—	100	µA	V_{CE} = 600V, V_{GE} = 0
Gate to emitter leak current	I_{GES}	—	—	±1	µA	V_{GE} = ± 20 V, V_{CE} = 0
Gate to emitter cutoff voltage	$V_{GE(off)}$	6.0	—	8.0	V	I_C = 75mA, V_{CE} = 10V
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	2.1	2.6	V	I_C = 75A, V_{GE} = 15V
Input capacitance	Cies	—	4100	—	pF	V_{CE} = 10V, V_{GE} = 0 f = 1MHz
Switching time	t_r	—	400	—	ns	I_C = 75A
	t_{on}	—	600	—	ns	R_L = 4 Ω
	t_f	—	300	600	ns	V_{GS} = ±15V
	t_{off}	—	800	1600	ns	Rg = 50 Ω

Main Characteristics

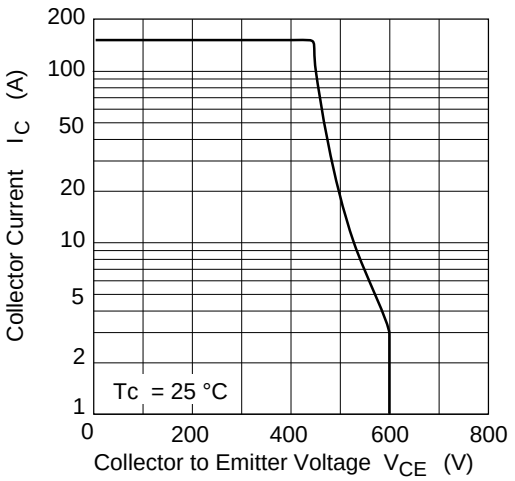
Power vs. Temperature Derating



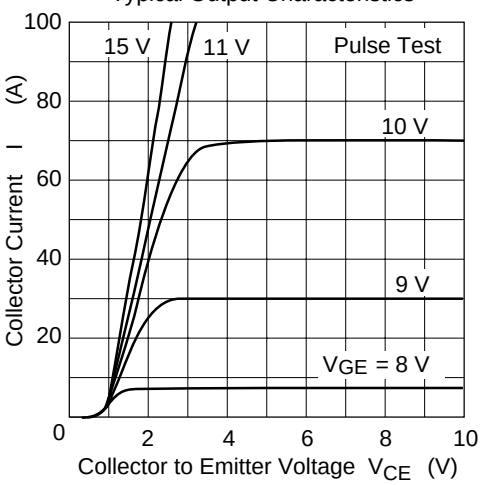
Maximum Safe Operation Area



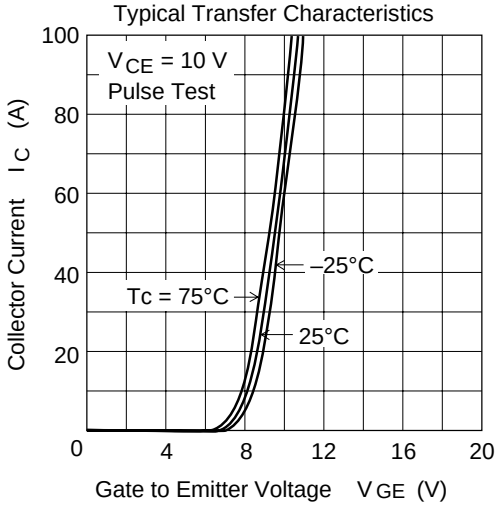
Reverse Bias SOA



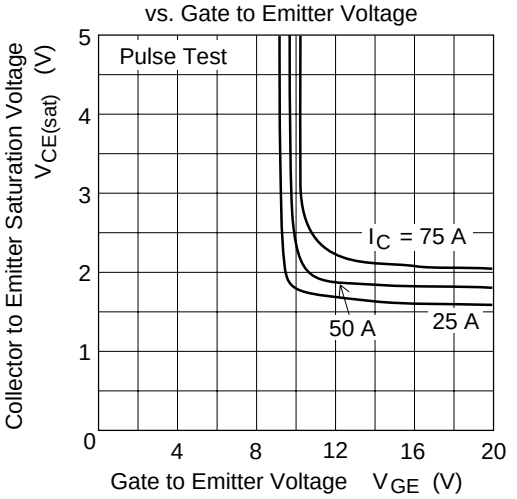
Typical Output Characteristics



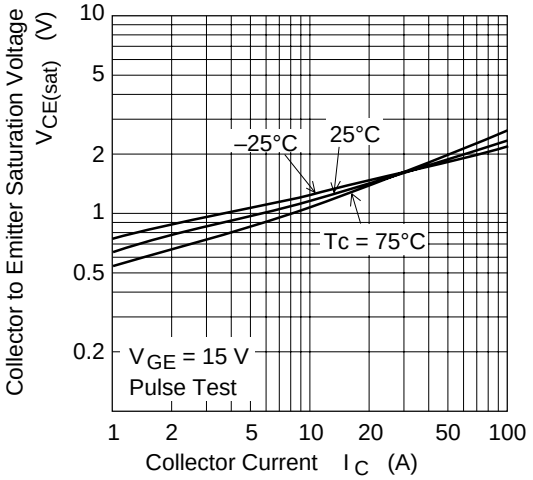
Typical Transfer Characteristics



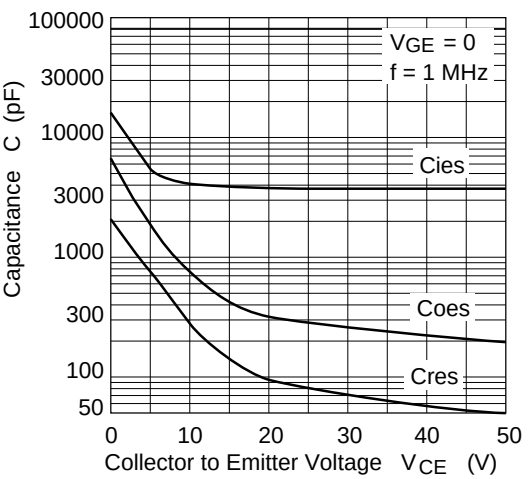
Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage



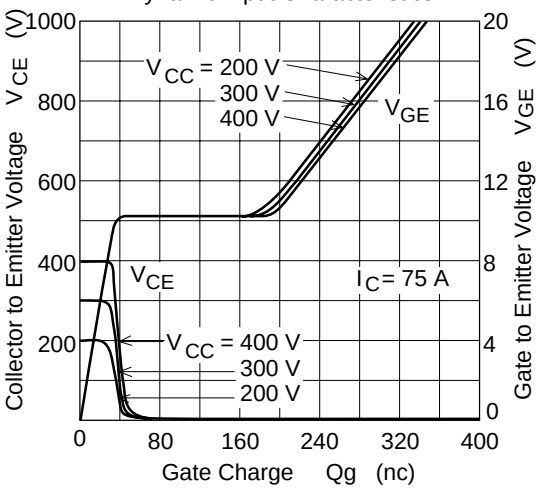
Collecot to Emitter Saturation Voltage vs. Collector Current



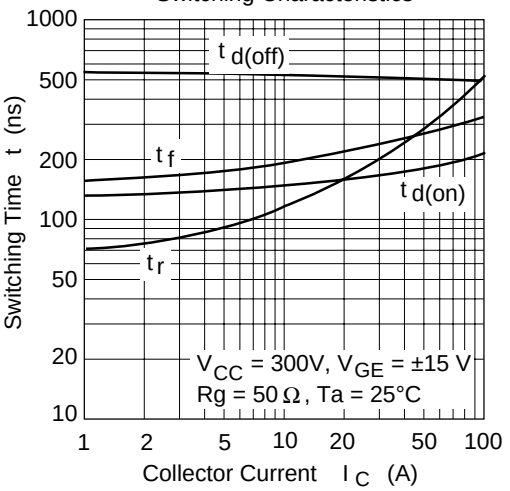
Typical Capacitance vs. Collecotor to Emitter Voltage



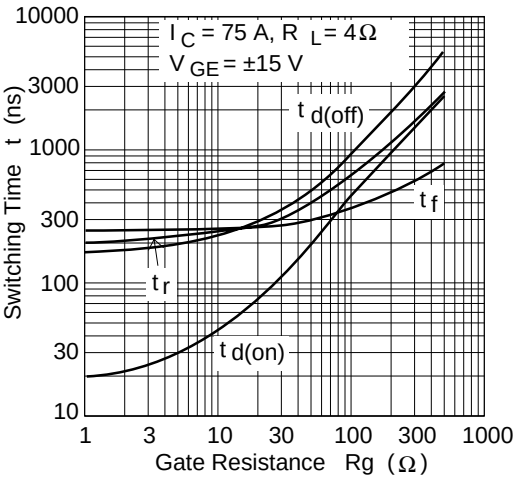
Dynamic Input Characteristics



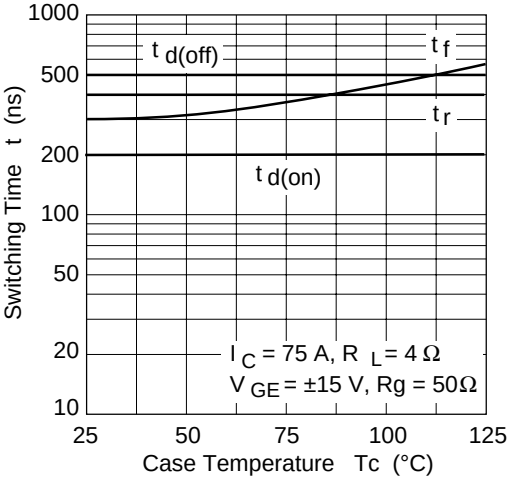
Switching Characteristics



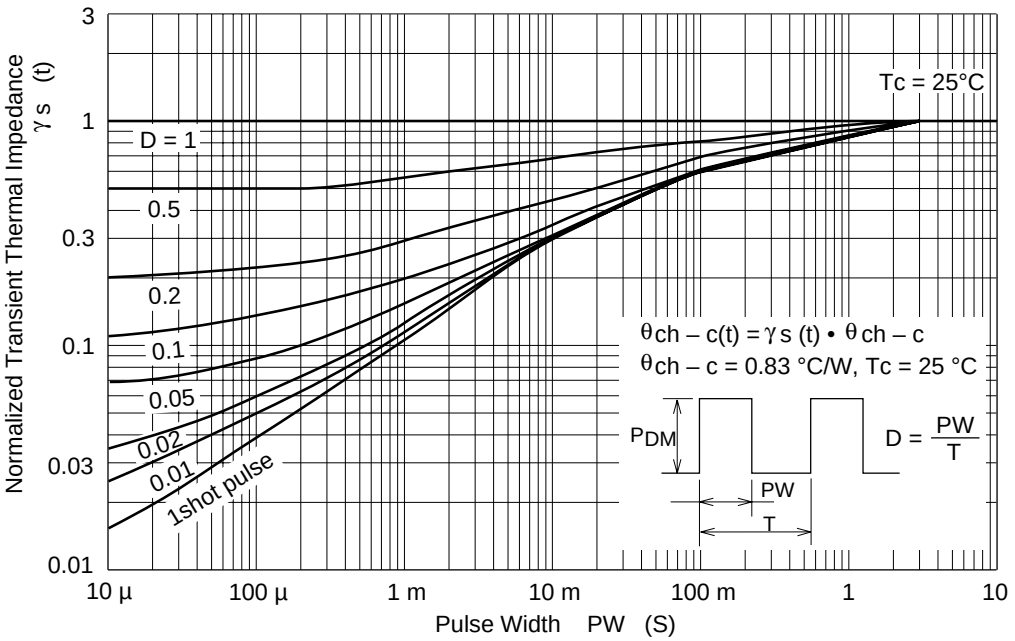
Switching Characteristics



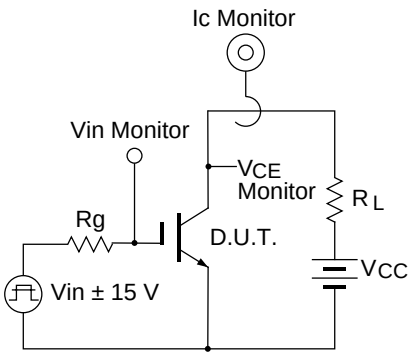
Switching Characteristics



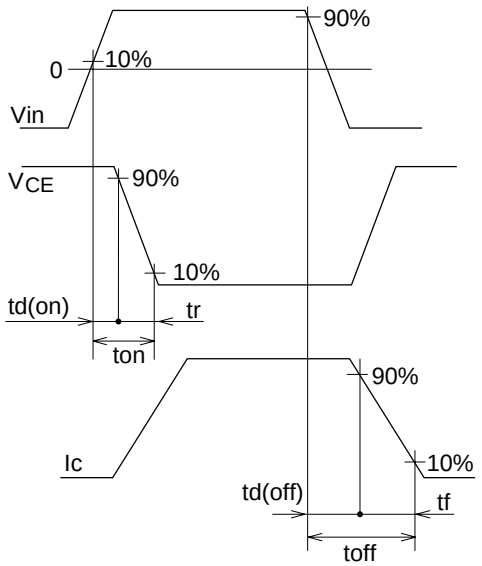
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit

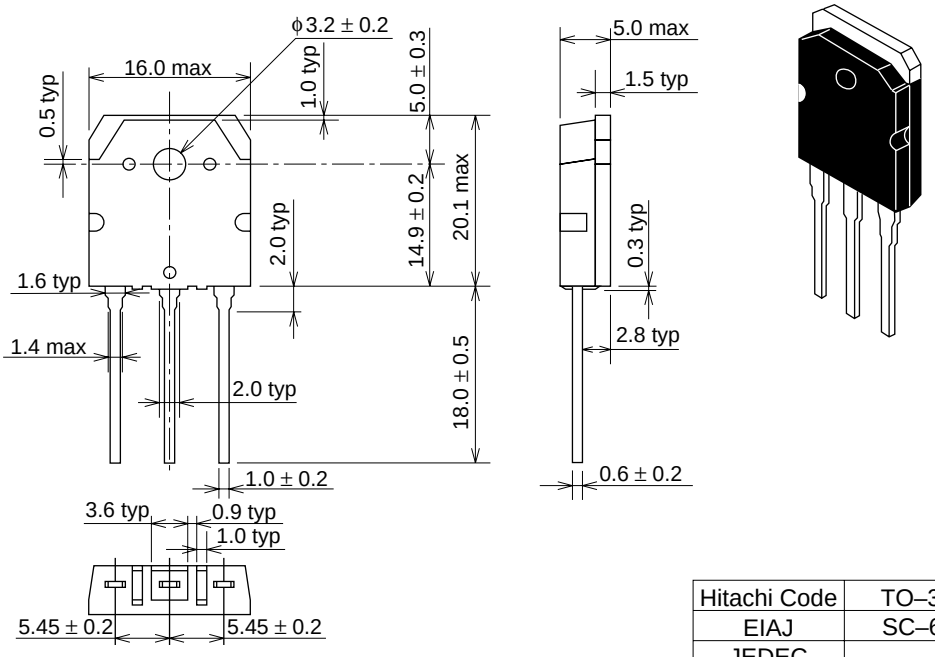


Waveform



Package Dimensions

Unit: mm



Hitachi Code	TO–3P
EIAJ	SC–65
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