

2SH21

Silicon N-Channel IGBT

HITACHI

1st. Edition
Feb. 1995

Application

High speed power switching

Features

- High speed switching
- Low on saturation voltage

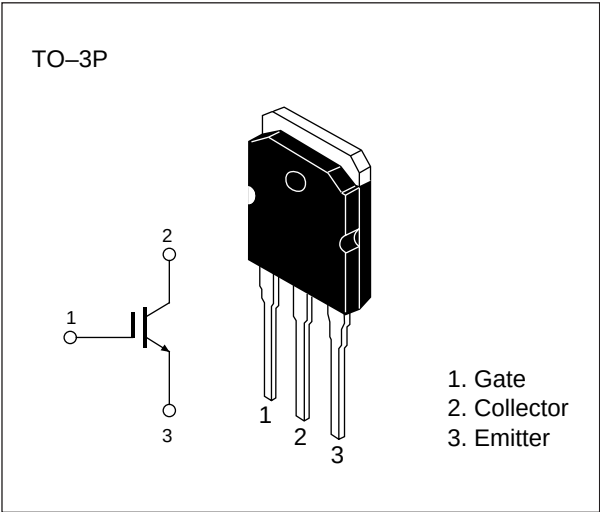


Table 1 Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to emitter voltage	V _{CES}	600	V
Gate to emitter voltage	V _{GES}	±20	V
Collector current	I _C	50	A
Collector peak current	ic(peak)	100	A
Collector dissipation	P _C *	150	W
Channel temperature	T _J	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

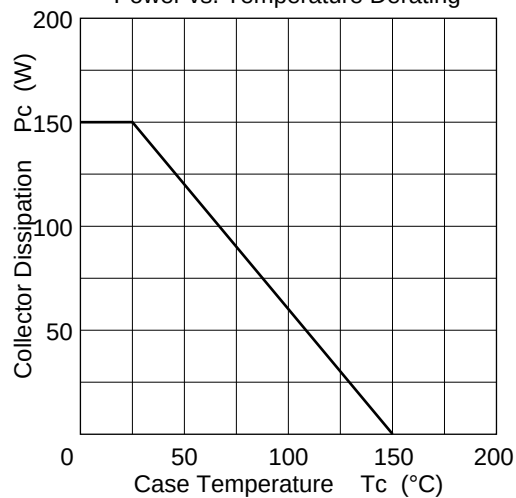
* Value at Tc = 25°C

Table 2 Electrical Characteristics (Ta = 25°C)

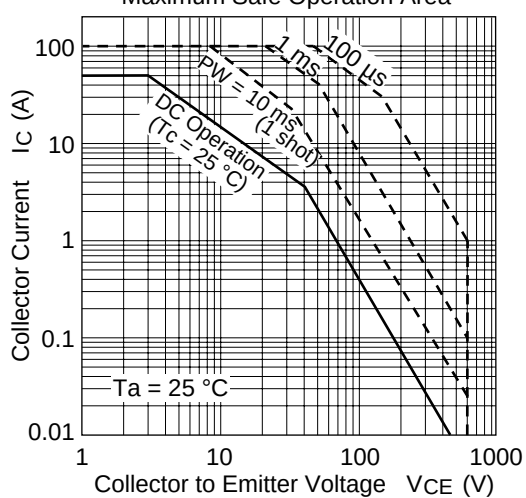
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to emitter breakdown voltage	$V_{(BR)CES}$	600	—	—	V	$I_C = 100\text{ }\mu\text{A}$, $V_{GE} = 0$
Zero gate voltage collector current	I_{CES}	—	—	0.5	mA	$V_{CE} = 600\text{ V}$, $V_{GE} = 0$
Gate to emitter leak current	I_{GES}	—	—	± 1	μA	$V_{GE} = \pm 20\text{ V}$, $V_{CE} = 0$
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	$I_C = 25\text{ A}$, $V_{GE} = 15\text{ V}$
Collector to emitter saturation voltage	$V_{CE(sat)2}$	—	2.0	2.6**	V	$I_C = 50\text{ A}$, $V_{GE} = 15\text{ V}$
Input capacitance	C_{ies}	—	4200	—	pF	$V_{CE} = 10\text{ V}$, $V_{GE} = 0$, $f = 1\text{ MHz}$
Switching time	t_r	—	350	—	ns	$I_C = 50\text{ A}$,
	t_{on}	—	500	—		$R_L = 6\text{ }\Omega$,
	t_f	—	2000	—		$V_{GE} = \pm 15\text{ V}$
	t_{off}	—	2700	—		$R_g = 50\text{ }\Omega$

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

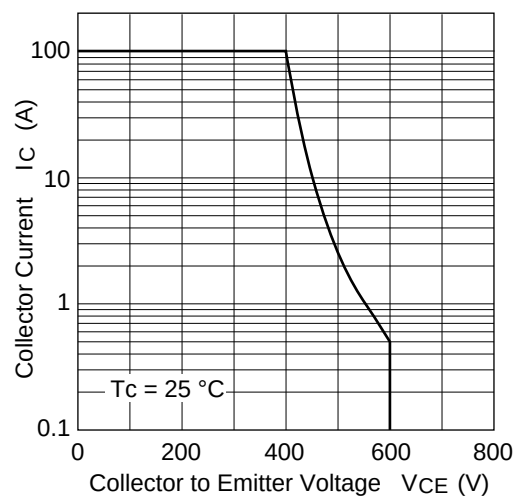
Power vs. Temperature Derating



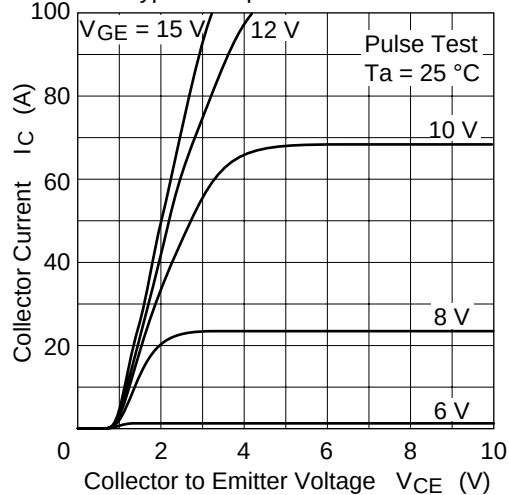
Maximum Safe Operation Area

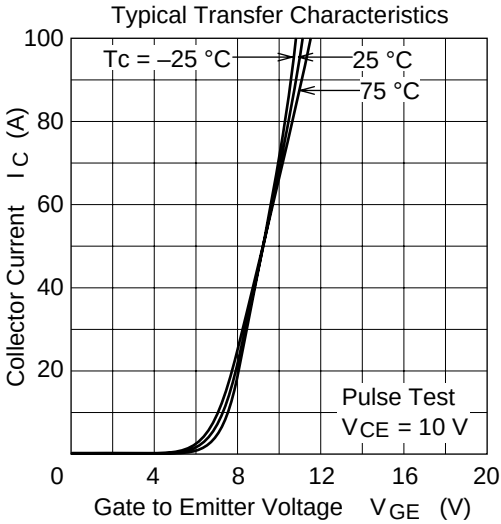
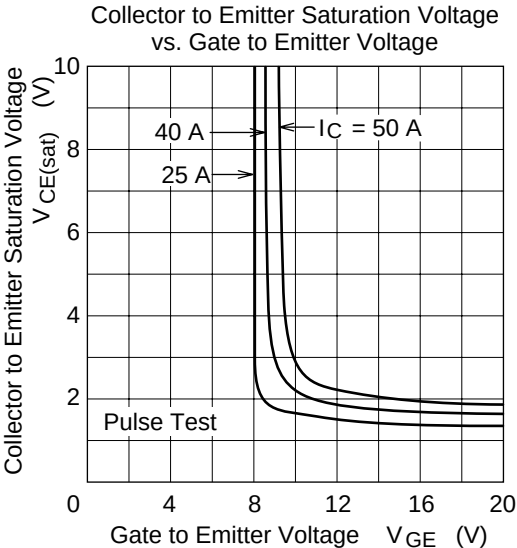
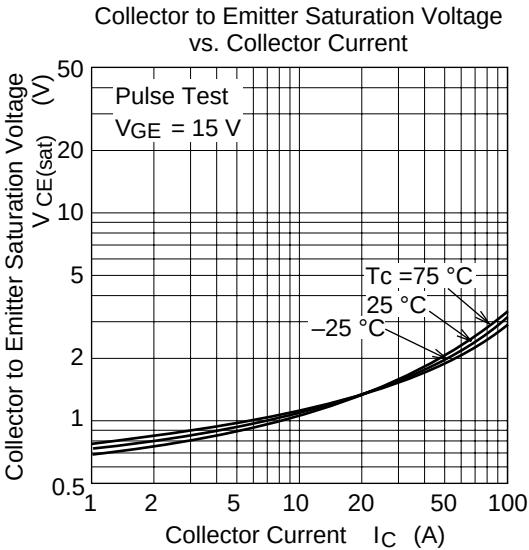
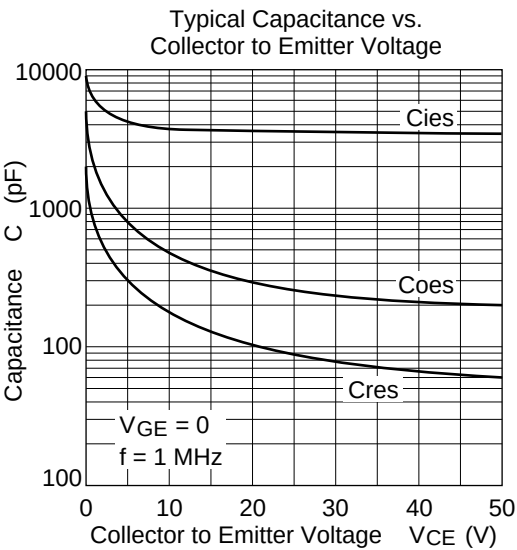


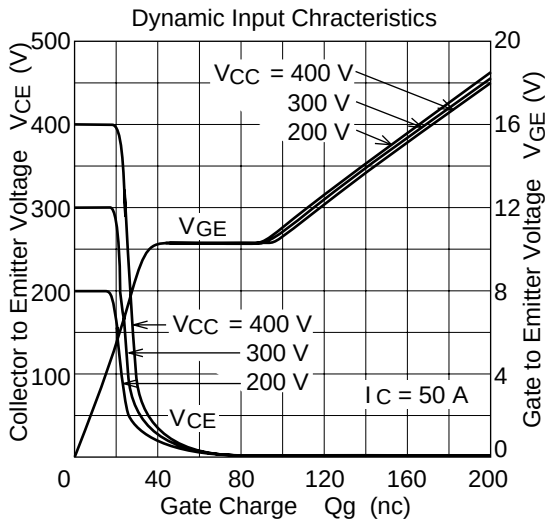
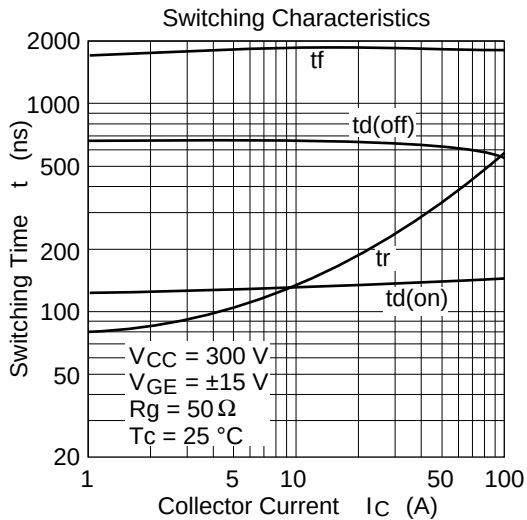
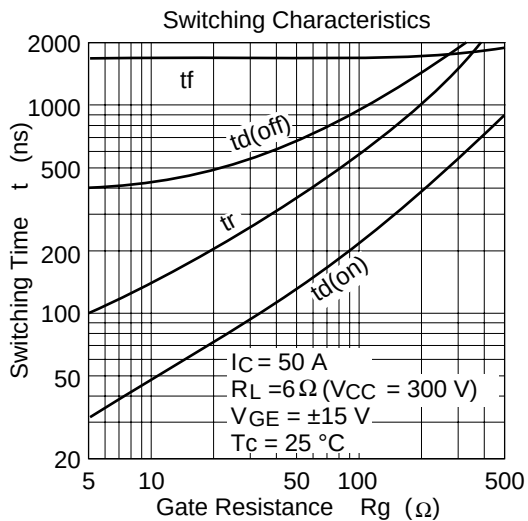
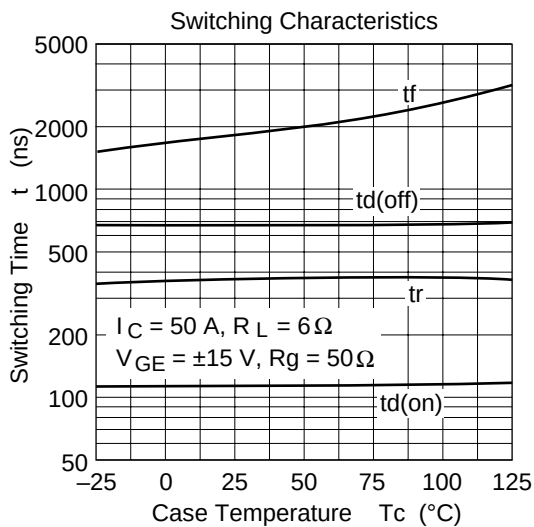
Reverse Bias SOA

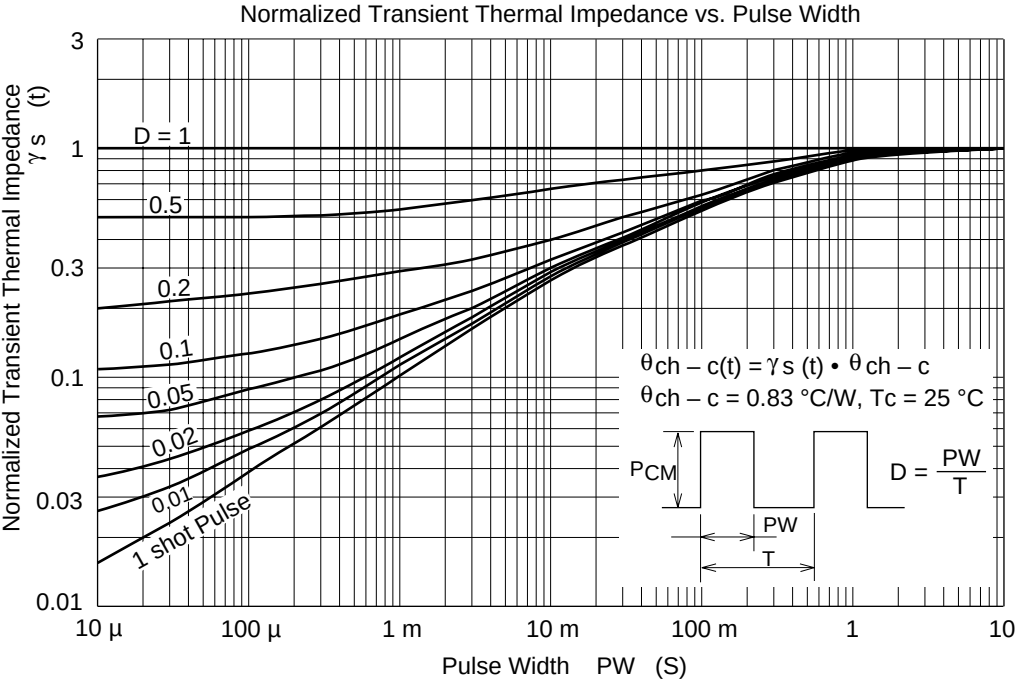


Typical Output Characteristics

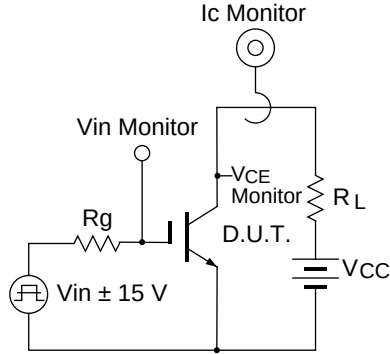




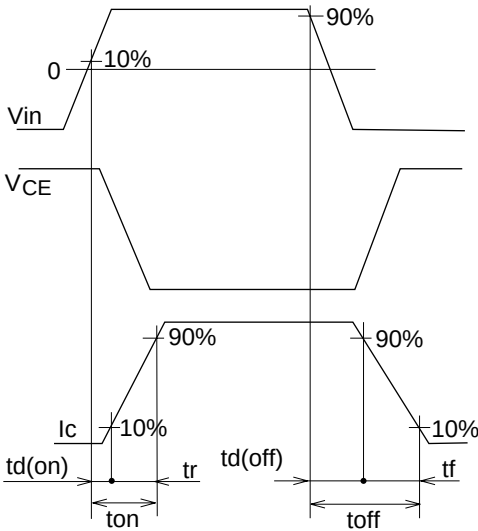




Switching Time Test Circuit



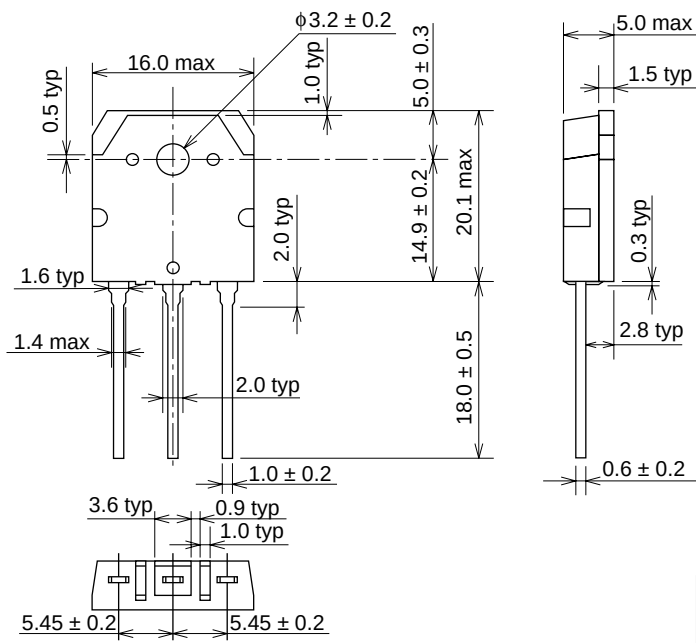
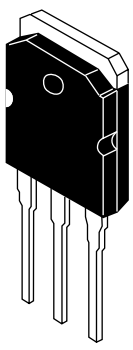
Waveforms



Package Dimensions

Unit : mm

• TO-3P



Hitachi Code	TO-3P
EIAJ	SC-65
JEDEC	—

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