

2SH20

Silicon N-Channel IGBT

HITACHI

1st. Edition
Feb. 1995

Application

High speed power switching

Features

- High speed switching
- Low on saturation voltage

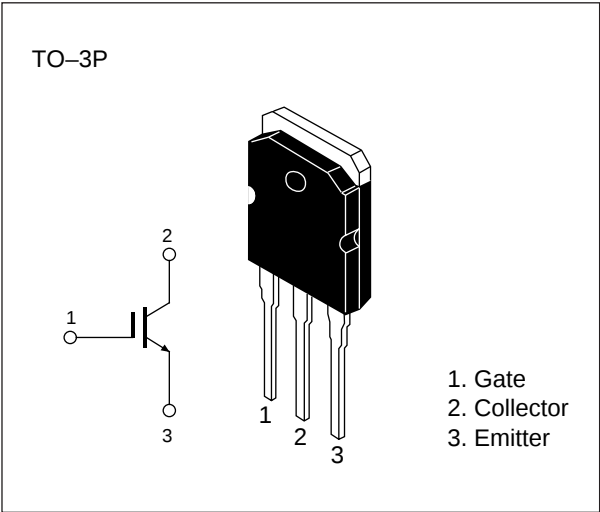


Table 1 Absolute Maximum Ratings (Ta = 25°C)

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

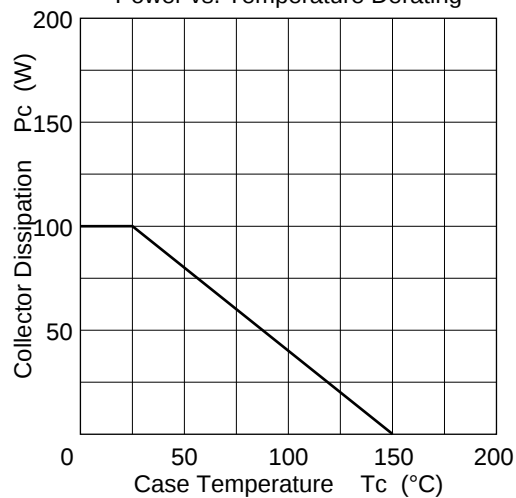
* Value at $T_c = 25^\circ\text{C}$

Table 2 Electrical Characteristics (Ta = 25°C)

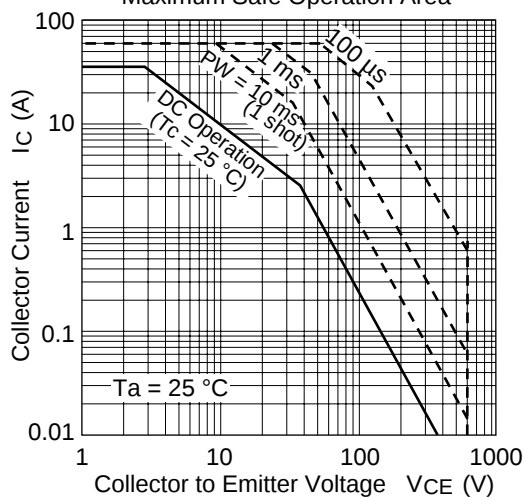
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to emitter breakdown voltage	$V_{(BR)CES}$	600	—	—	V	$I_C = 100\text{ }\mu\text{A}$, $V_{GE} = 0$
Zero gate voltage collector current	I_{CES}	—	—	0.5	mA	$V_{CE} = 600\text{ V}$, $V_{GE} = 0$
Gate to emitter leak current	I_{GES}	—	—	± 1	μA	$V_{GE} = \pm 20\text{ V}$, $V_{CE} = 0$
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	$I_C = 15\text{ A}$, $V_{GE} = 15\text{ V}$
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	$I_C = 30\text{ A}$,
	t_{on}	—	300	—		$R_L = 10\text{ }\Omega$,
	t_f	—	2000	—		$V_{GE} = \pm 15\text{ V}$
	t_{off}	—	2500	—		$R_g = 50\text{ }\Omega$

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

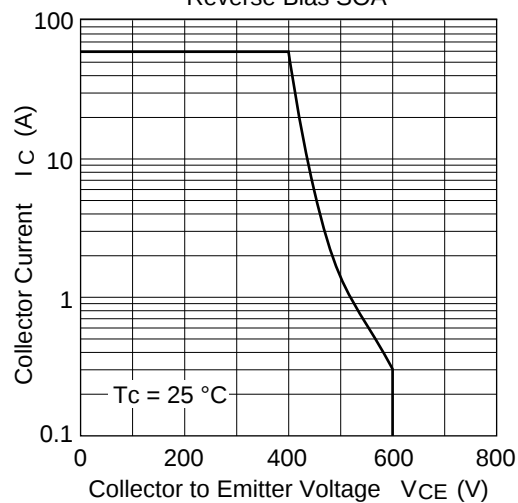
Power vs. Temperature Derating



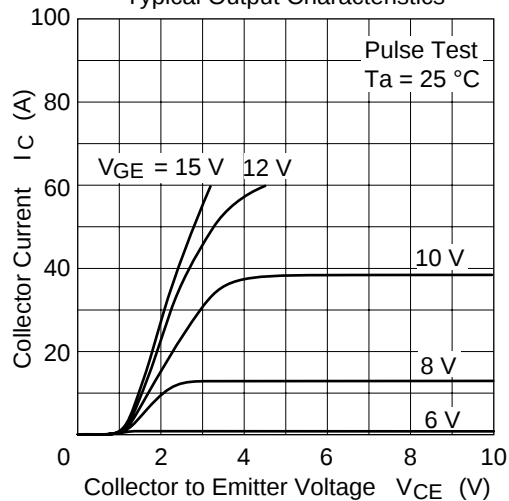
Maximum Safe Operation Area



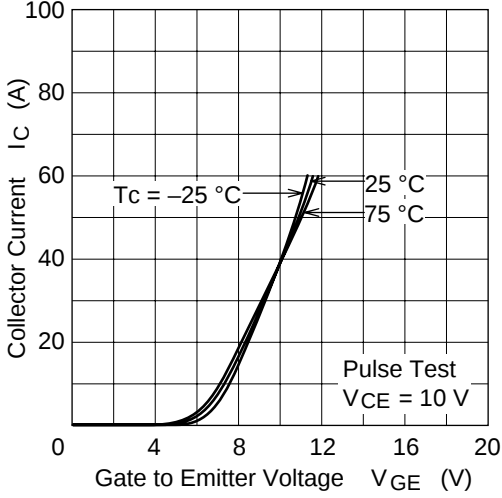
Reverse Bias SOA



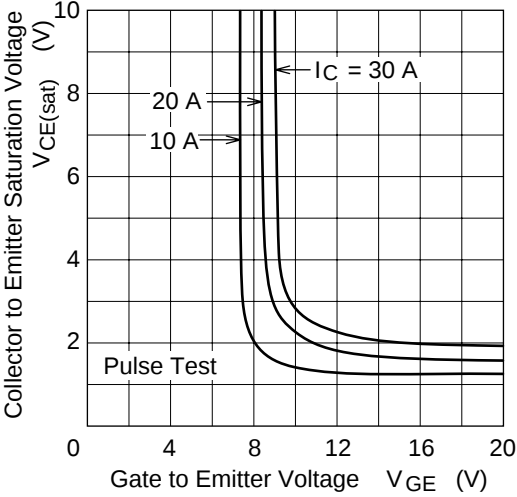
Typical Output Characteristics



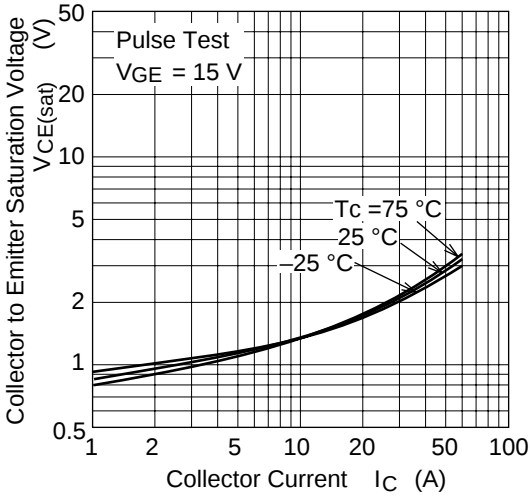
Typical Transfer Characteristics



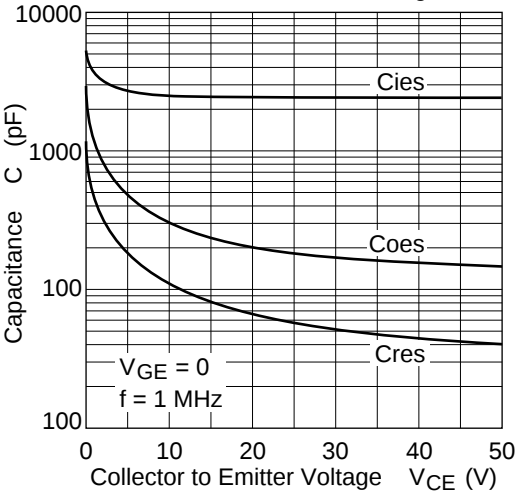
Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage

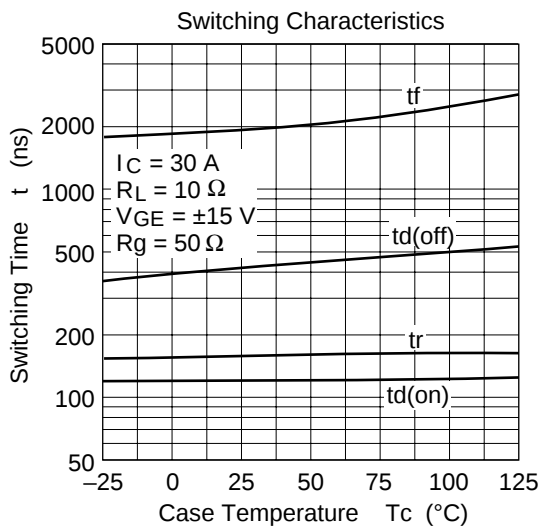
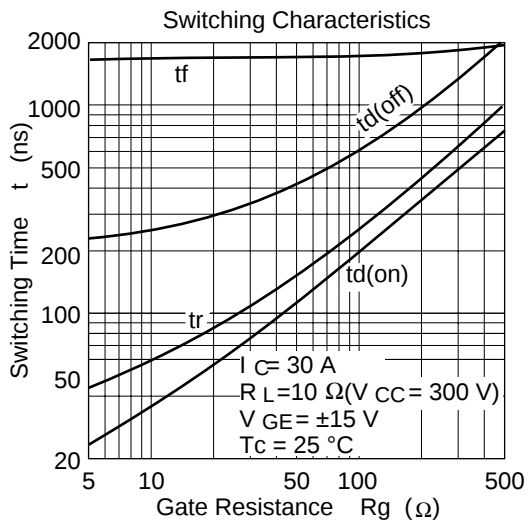
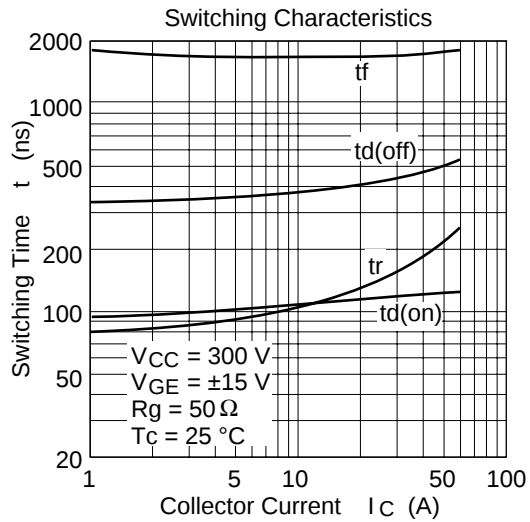
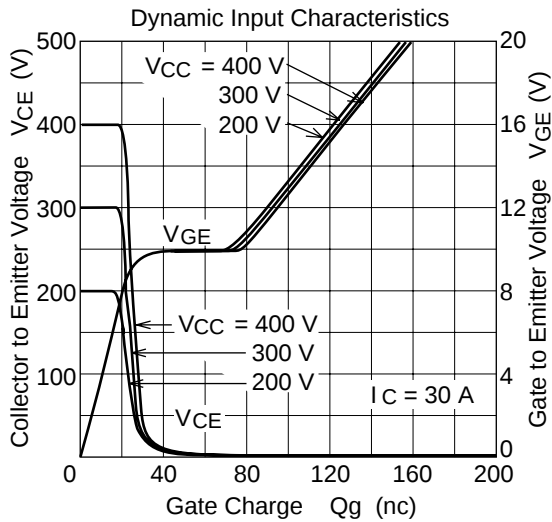


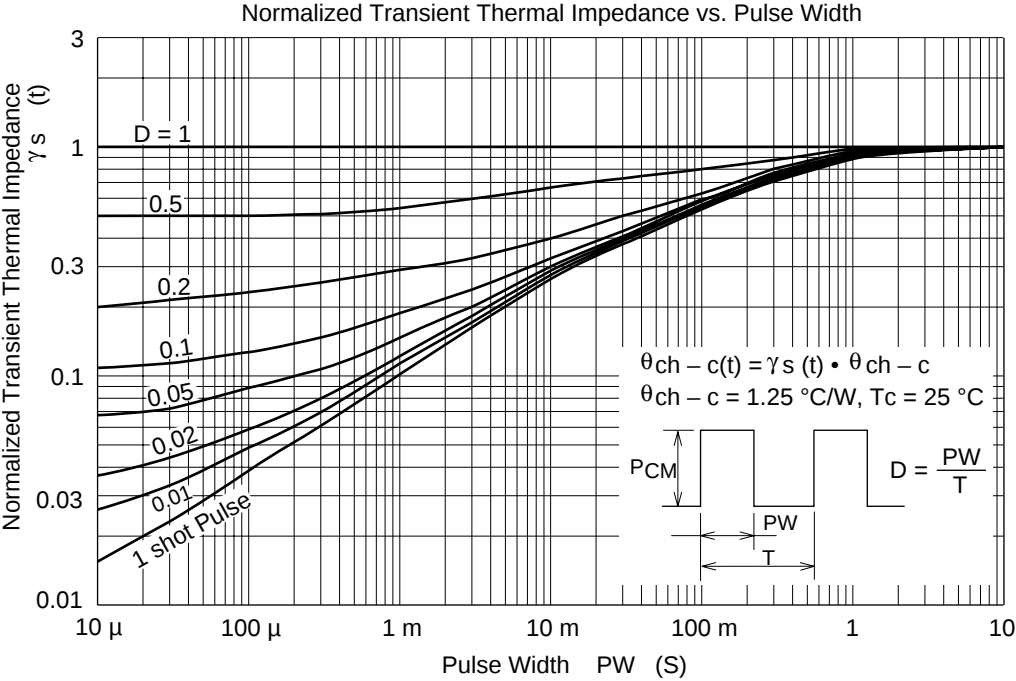
Collector to Emitter Saturation Voltage vs. Collector Current



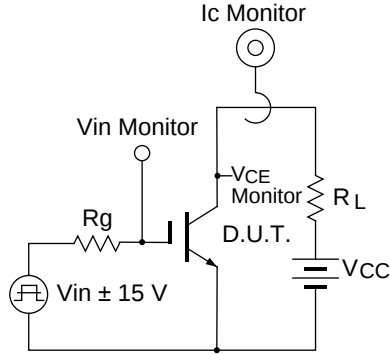
Typical Capacitance vs. Collector to Emitter Voltage



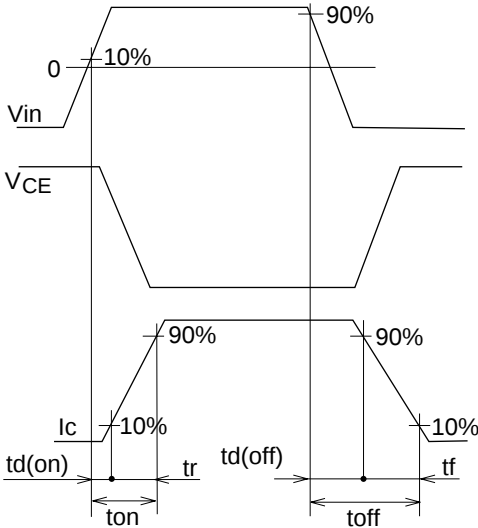




Switching Time Test Circuit



Waveforms



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HITACHI

Hitachi, Ltd.

Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

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For further information write to:

Hitachi Semiconductor (America) Inc. 179 East Tasman Drive, San Jose, CA 95134 Tel: <1> (408) 433-1990 Fax: <1> (408) 433-0223	Hitachi Europe GmbH Electronic components Group Dornacher Straße 3 D-85622 Feldkirchen, Munich Germany Tel: <49> (89) 9 9180-0 Fax: <49> (89) 9 29 30 00 Hitachi Europe Ltd. Electronic Components Group. Whitebrook Park Lower Cookham Road Maidenhead Berkshire SL6 8YA, United Kingdom Tel: <44> (1628) 585000 Fax: <44> (1628) 778322
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Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia Ltd.
Taipei Branch Office
3F, Hung Kuo Building, No.167,
Tun-Hwa North Road, Taipei (105)
Tel: <886> (2) 2718-3666
Fax: <886> (2) 2718-8180

Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower, World Finance Centre,
Harbour City, Canton Road, Tsim Sha Tsui,
Kowloon, Hong Kong
Tel: <852> (2) 735 9218
Fax: <852> (2) 730 0281
Telex: 40815 HITEC HX

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