

2SH20

Silicon N-Channel IGBT

HITACHI

1st. Edition
Feb. 1995

Application

High speed power switching

Features

- High speed switching
- Low on saturation voltage

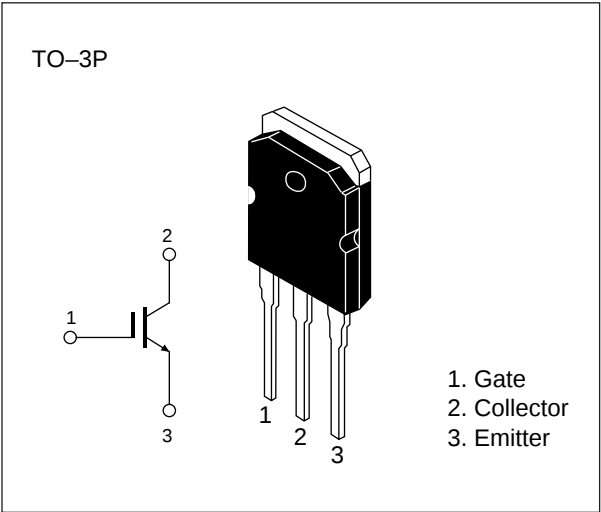


Table 1 Absolute Maximum Ratings (Ta = 25°C)

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 $T_c = 25^\circ\text{C}$

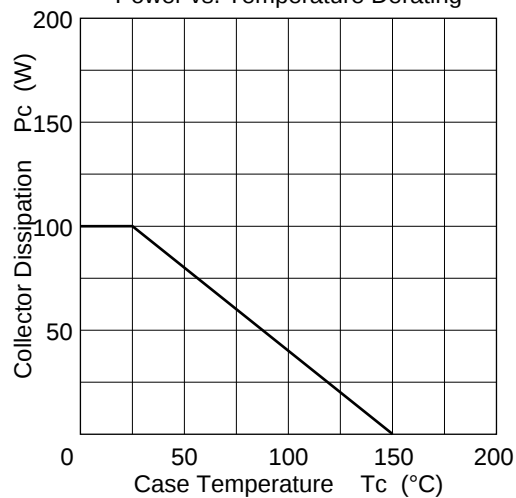
2SH20

Table 2 Electrical Characteristics (Ta = 25°C)

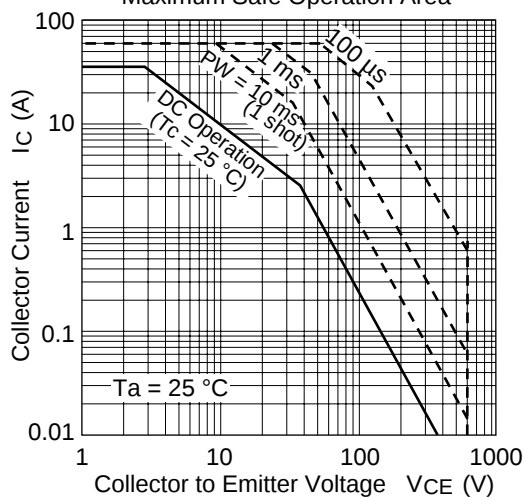
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to emitter breakdown voltage	$V_{(BR)CES}$	600	—	—	V	$I_C = 100\text{ }\mu\text{A}$, $V_{GE} = 0$
Zero gate voltage collector current	I_{CES}	—	—	0.5	mA	$V_{CE} = 600\text{ V}$, $V_{GE} = 0$
Gate to emitter leak current	I_{GES}	—	—	± 1	μA	$V_{GE} = \pm 20\text{ V}$, $V_{CE} = 0$
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 ($I_C=20\text{A}$)

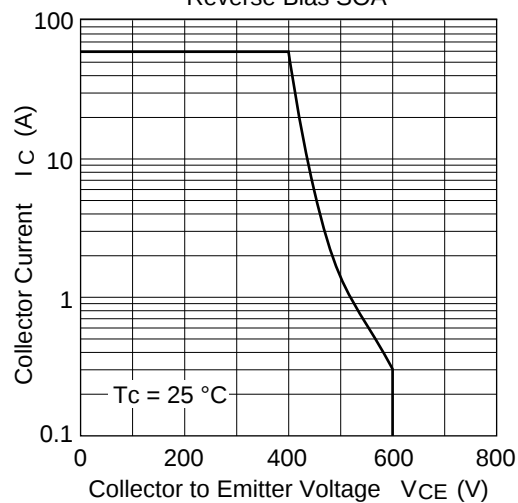
Power vs. Temperature Derating



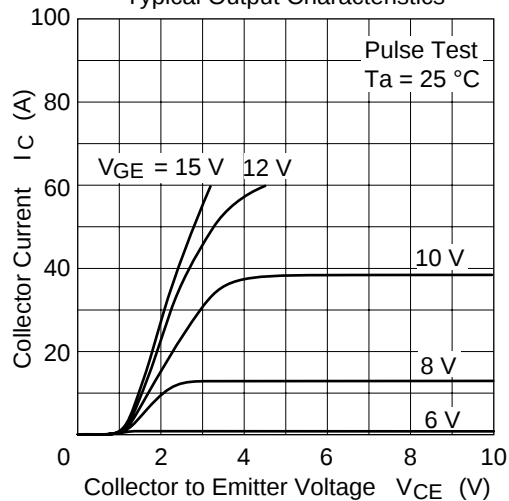
Maximum Safe Operation Area



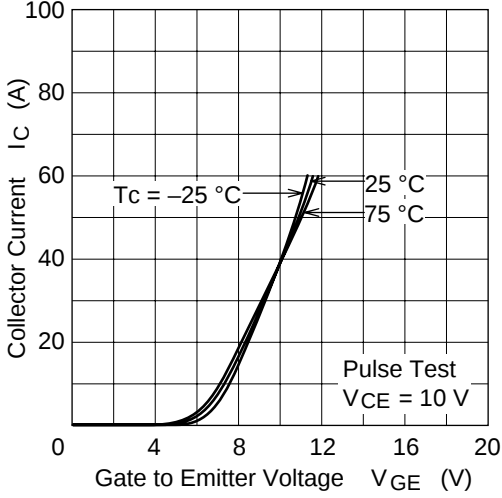
Reverse Bias SOA



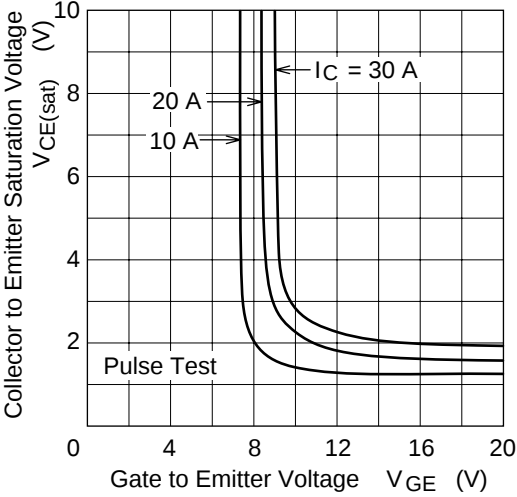
Typical Output Characteristics



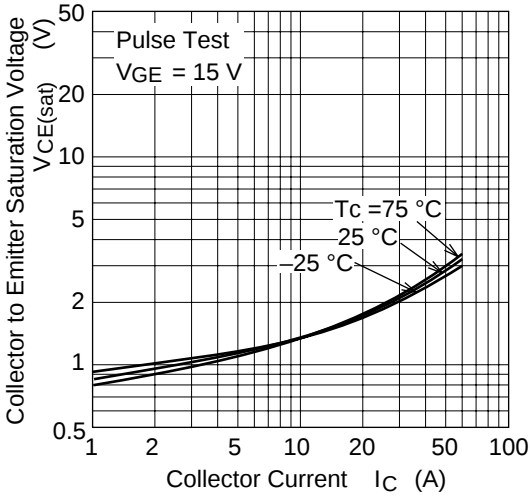
Typical Transfer Characteristics



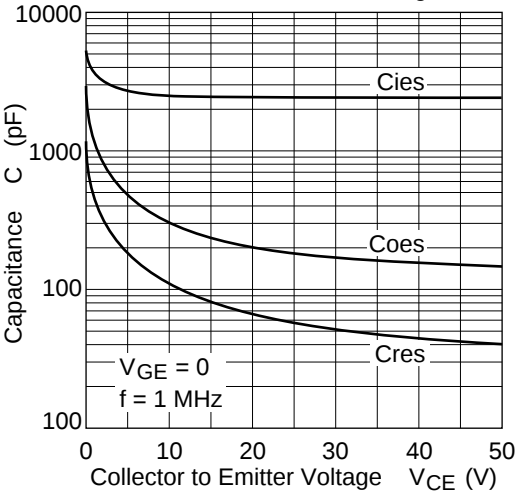
Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage

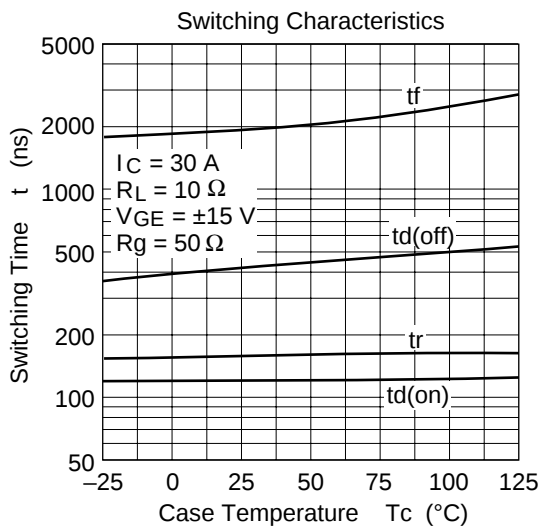
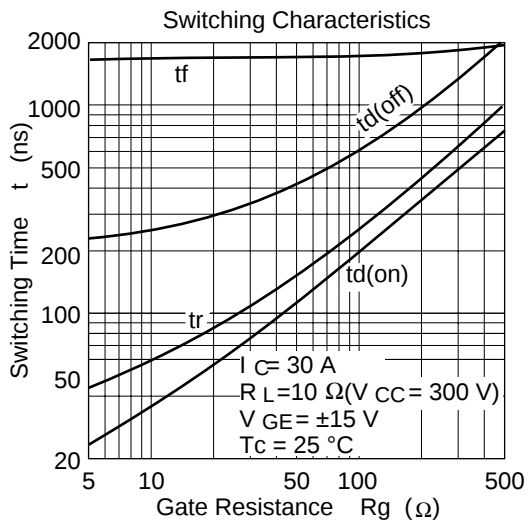
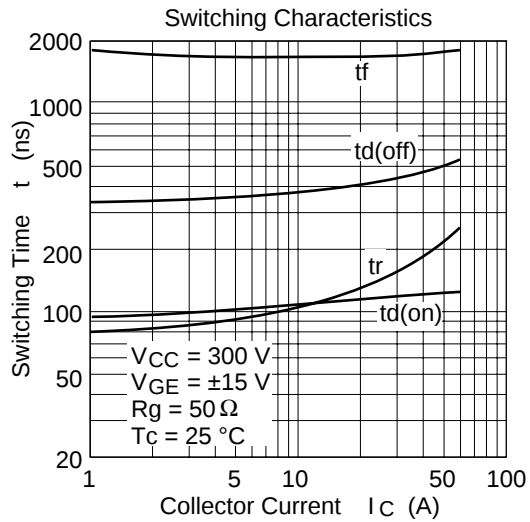
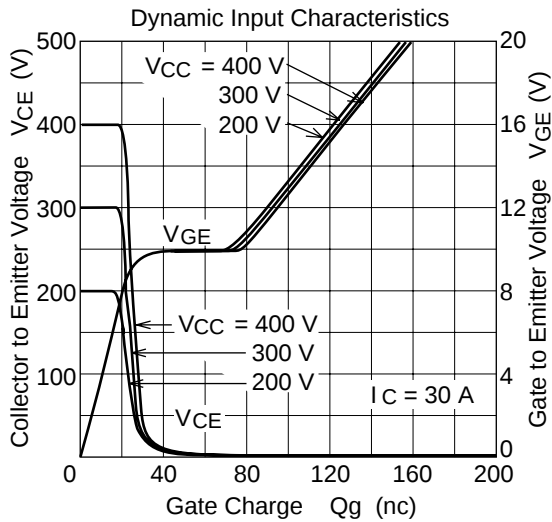


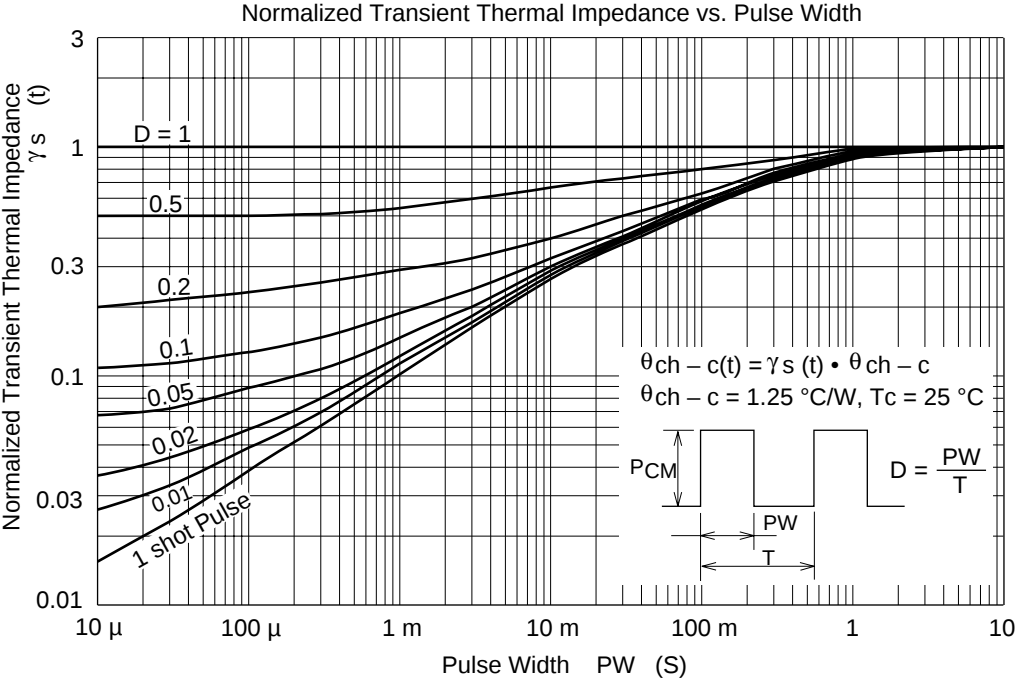
Collector to Emitter Saturation Voltage vs. Collector Current



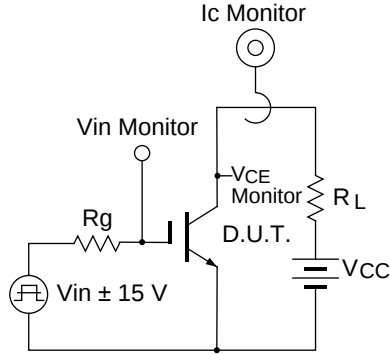
Typical Capacitance vs. Collector to Emitter Voltage



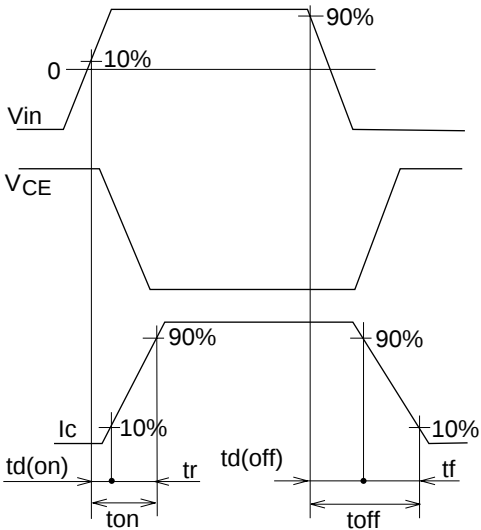




Switching Time Test Circuit



Waveforms



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