

2SH12

Silicon N-Channel IGBT

HITACHI

1st. Edition
Feb. 1995

Application

High speed power switching

Features

- High speed switching
- Low on saturation voltage

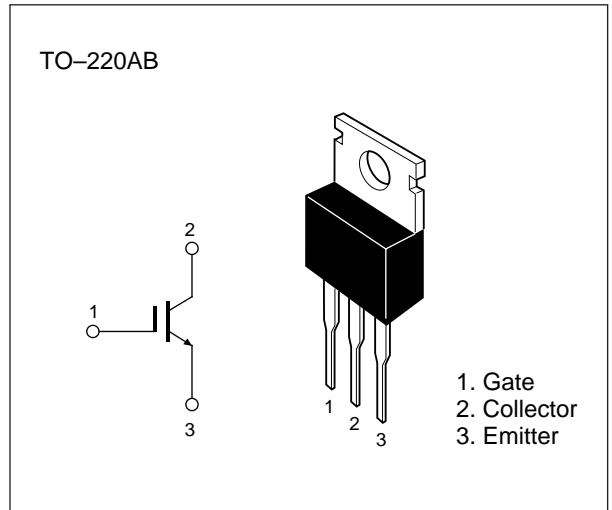


Table 1 Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Item	Symbol	Ratings	Unit
Collector to emitter voltage	V_{CES}	600	V
Gate to emitter voltage	V_{GES}	± 20	V
Collector current	I_C	15	A
Collector peak current	$i_{c(\text{peak})}$	30	A
Collector dissipation	P_C^*	60	W
Channel temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

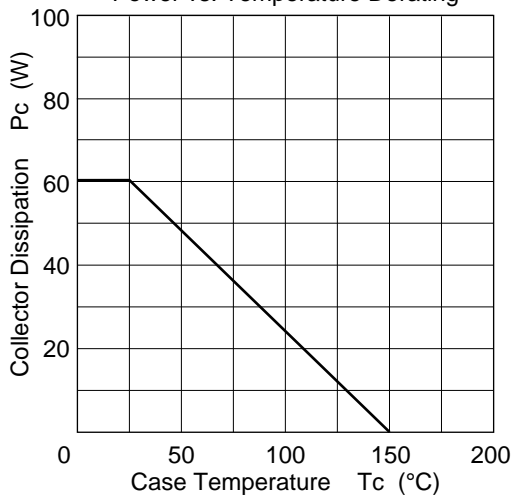
* Value at $T_c = 25^\circ\text{C}$

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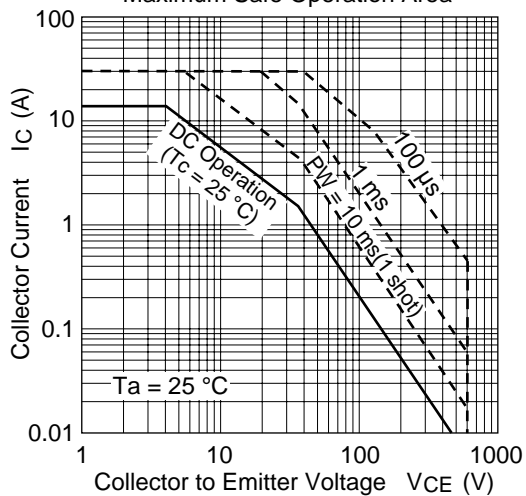
Table 2 Electrical Characteristics ($T_a = 25^\circ\text{C}$)

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	—	5.0	V	$I_C = 1 \text{ mA}$, $V_{CE} = 10 \text{ V}$
Collector to emitter saturation voltage	$V_{CE(sat)1}$	—	2.0	—	V	$I_C = 7.5 \text{ A}$, $V_{GE} = 15 \text{ V}$
Collector to emitter saturation voltage	$V_{CE(sat)2}$	—	2.6	3.3	V	$I_C = 15 \text{ A}$, $V_{GE} = 15 \text{ V}$
Input capacitance	C_{ies}	—	1400	—	pF	$V_{CE} = 10 \text{ V}$, $V_{GE} = 0$, $f = 1 \text{ MHz}$
Switching time	t_r	—	120	—	ns	$I_C = 15 \text{ A}$, $R_L = 20 \Omega$, $V_{GE} = \pm 15 \text{ V}$ $R_g = 50 \Omega$
	t_{on}	—	200	—		
	t_f	—	300	600		
	t_{off}	—	500	1000		

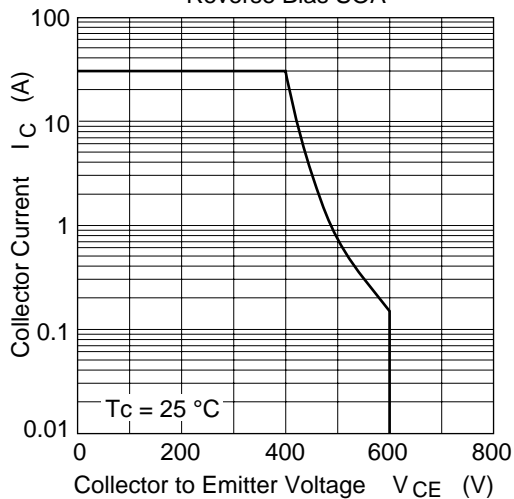
Power vs. Temperature Derating



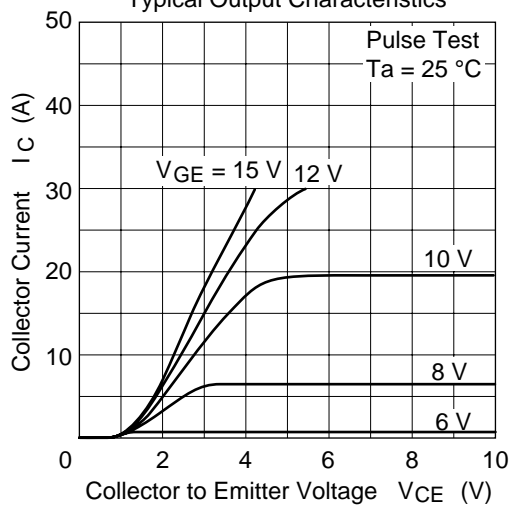
Maximum Safe Operation Area

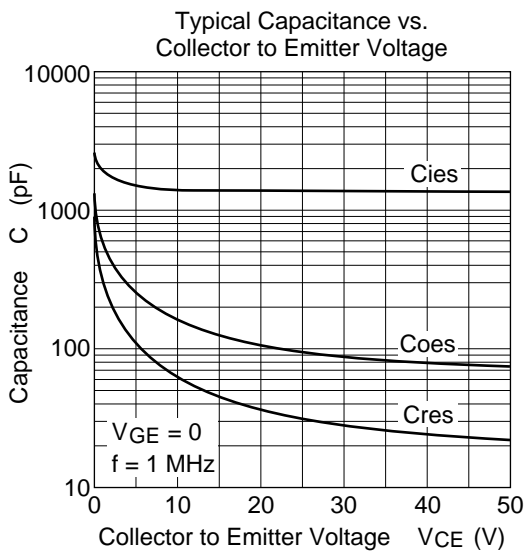
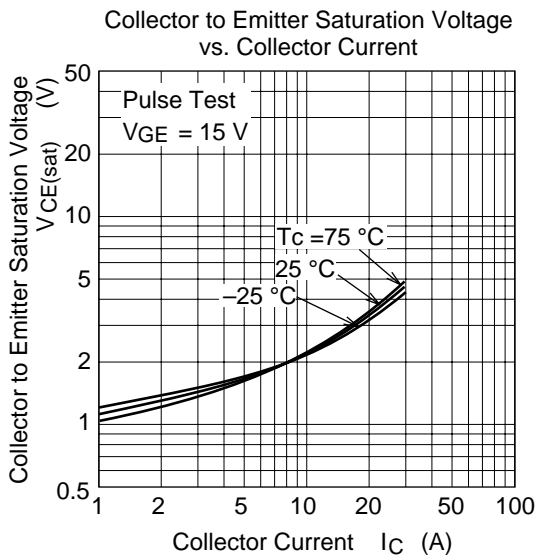
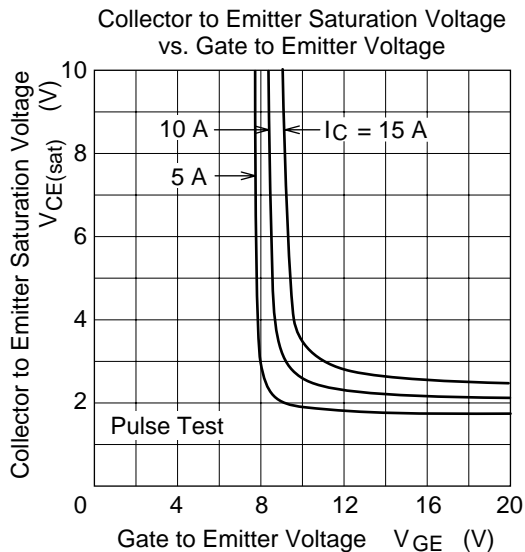
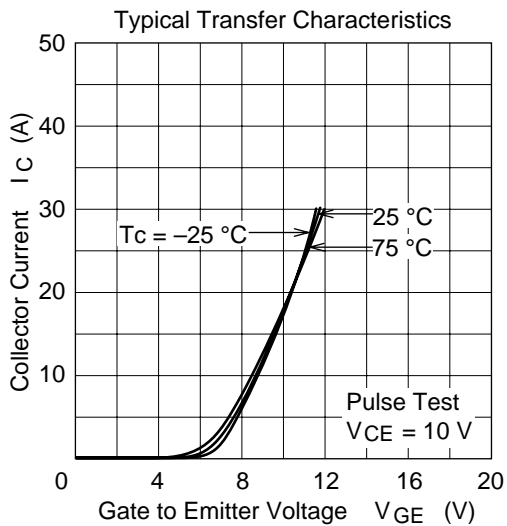


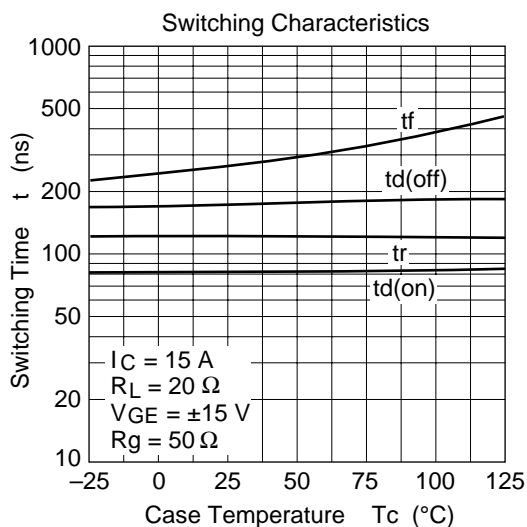
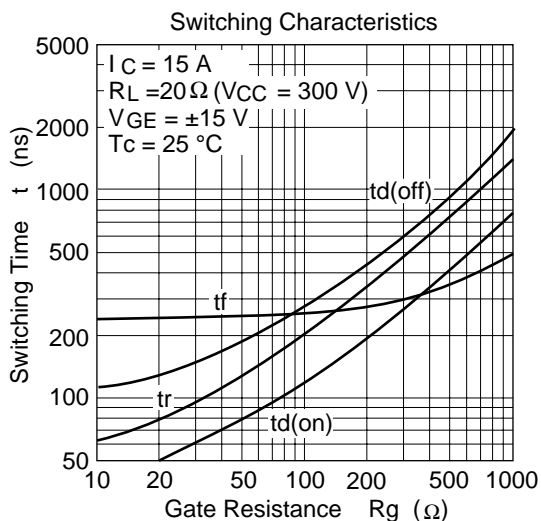
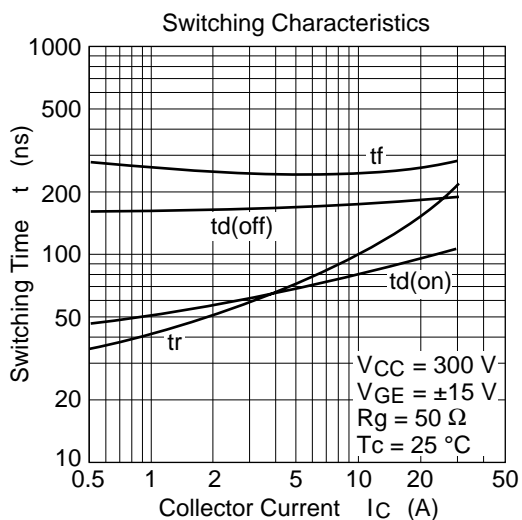
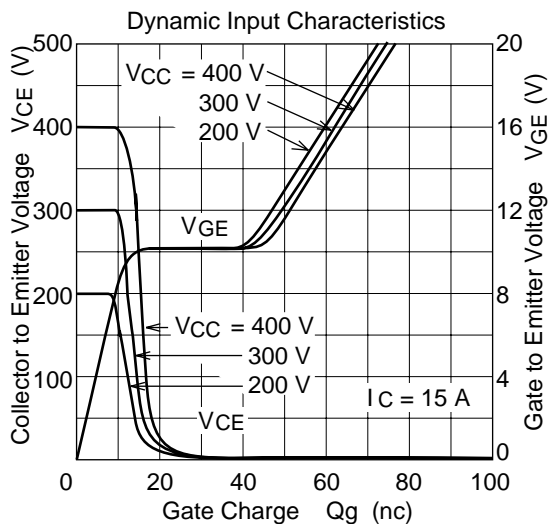
Reverse Bias SOA

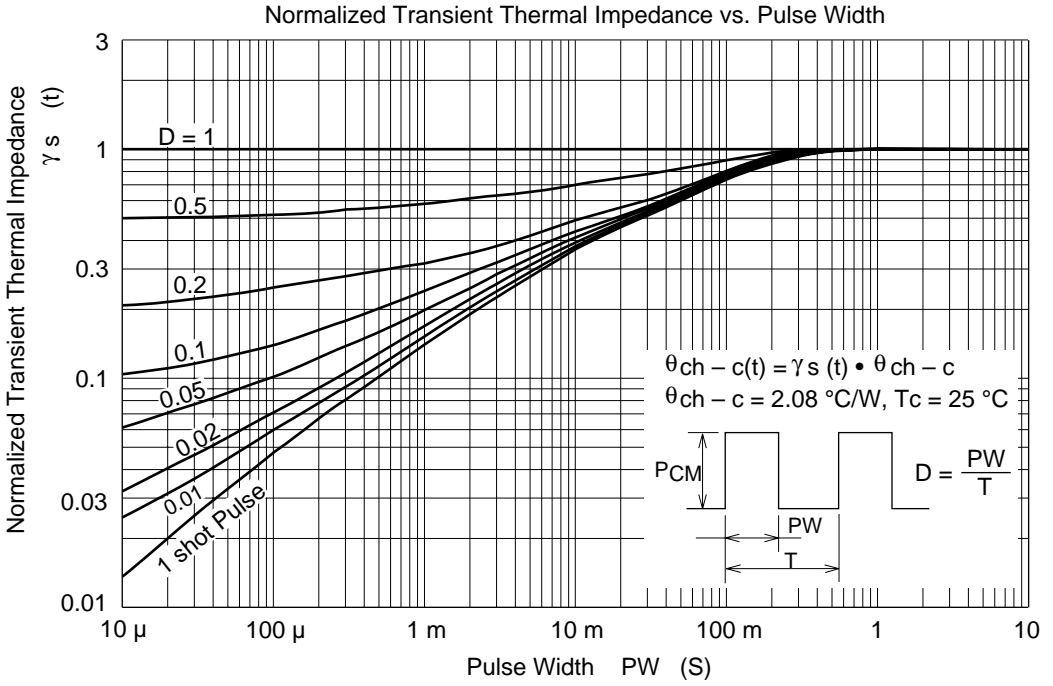


Typical Output Characteristics

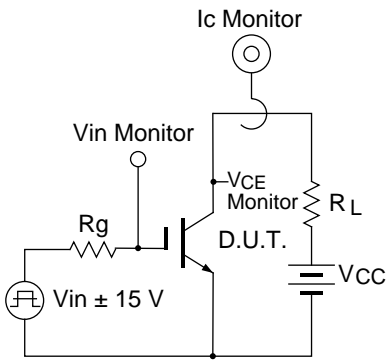




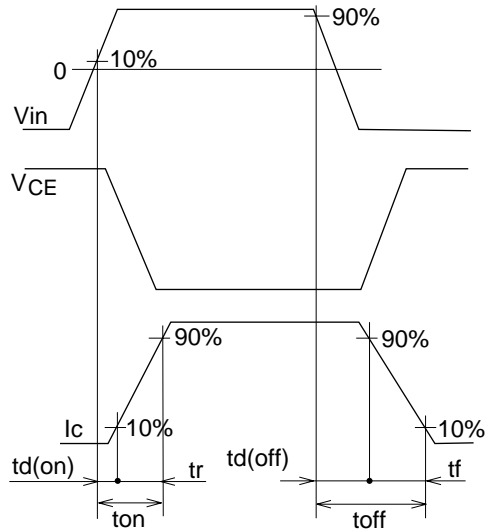




Switching Time Test Circuit



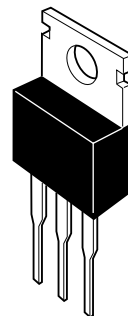
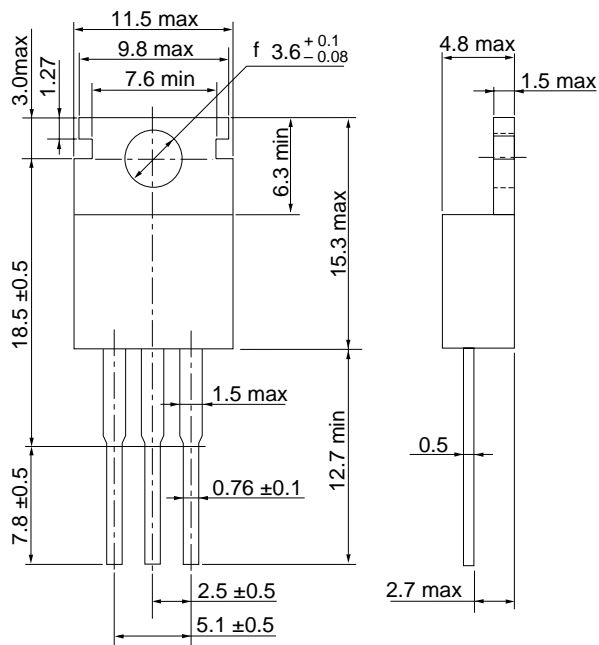
Waveforms



Package Dimensions

Unit : mm

• TO-220AB



Hitachi Code	TO-220AB
EIAJ	SC-46
JEDEC	—

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