

# 2SH29

Silicon N Channel IGBT  
High Speed Power Switching

# HITACHI

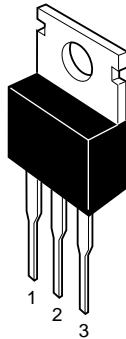
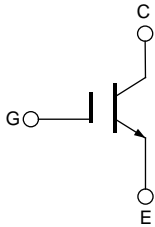
ADE-208-791A(Z)  
2nd. Edition  
May 1999

## Features

- High speed switching
- Low on-voltage

## Outline

TO-220AB



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

**Absolute Maximum Ratings** (Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to Emitter voltage	V <sub>CES</sub>	600	V
Gate to Emitter voltage	V <sub>GES</sub>	±20	V
Collector current	I <sub>C</sub>	30	A
Collector peak current	ic(peak)	60	A
Collector dissipation	P <sub>C</sub> <sup>Note1</sup>	75	W
Channel temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

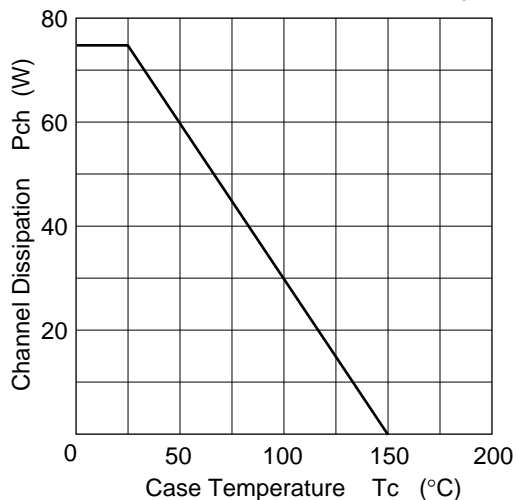
Note: 1. Value at Tc = 25°C

**Electrical Characteristics** (Ta = 25°C)

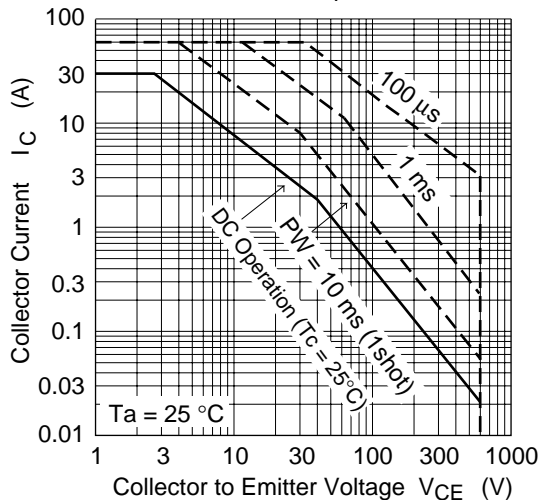
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	I <sub>CES</sub>	—	—	100	μA	V <sub>CE</sub> = 600V, V <sub>GE</sub> = 0
Gate to emitter leak current	I <sub>GES</sub>	—	—	±1	μA	V <sub>GE</sub> = ± 20 V, V <sub>CE</sub> = 0
Gate to emitter cutoff voltage	V <sub>GE(off)</sub>	6.0	—	8.0	V	I <sub>C</sub> = 30 mA, V <sub>CE</sub> = 10V
Collector to emitter saturation voltage	V <sub>CE(sat)</sub>	—	2.1	2.6	V	I <sub>C</sub> = 30 A, V <sub>GE</sub> = 15V
Input capacitance	C <sub>ies</sub>	—	1850	—	pF	V <sub>CE</sub> = 10V, V <sub>GE</sub> = 0 f = 1MHz
Switching time	t <sub>r</sub>	—	200	—	ns	I <sub>C</sub> = 30 A
	t <sub>on</sub>	—	310	—	ns	R <sub>L</sub> = 10 Ω
	t <sub>f</sub>	—	300	600	ns	V <sub>GS</sub> = ±15V
	t <sub>off</sub>	—	520	1040	ns	R <sub>g</sub> = 50 Ω

Main Characteristics

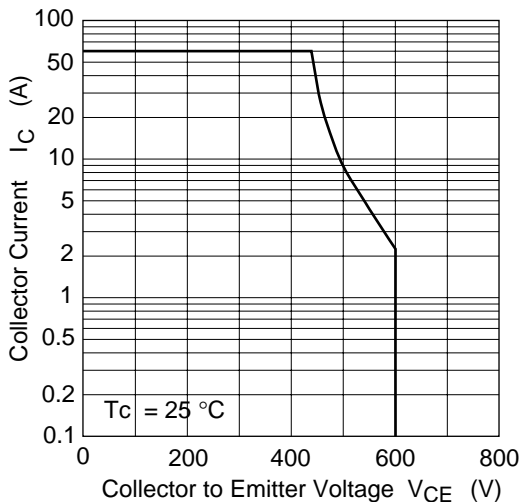
Power vs. Temperature Derating



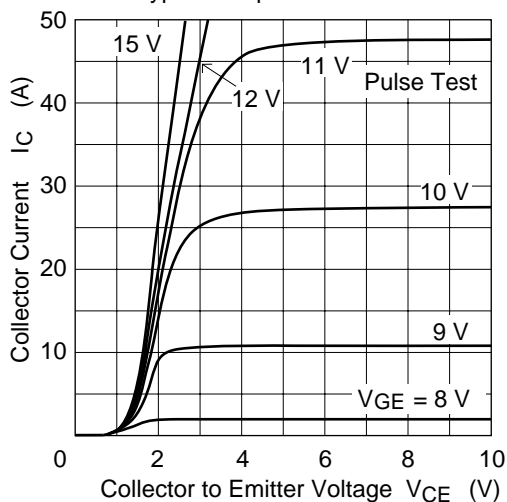
Maximum Safe Operation Area

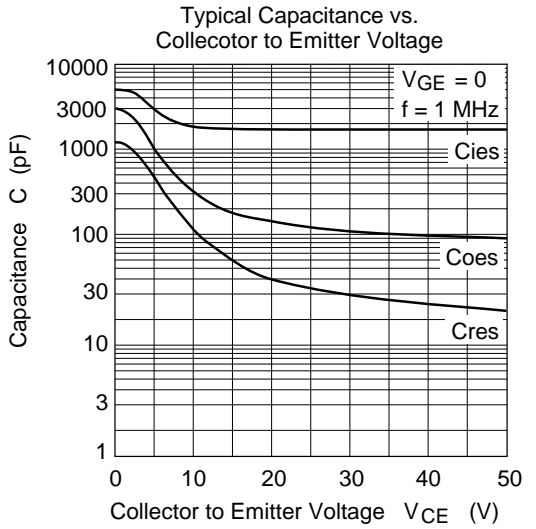
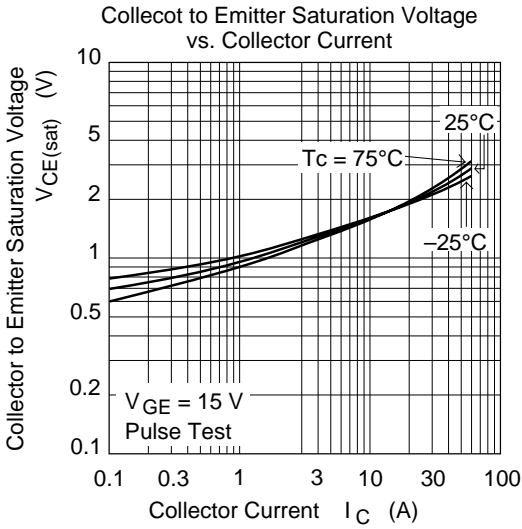
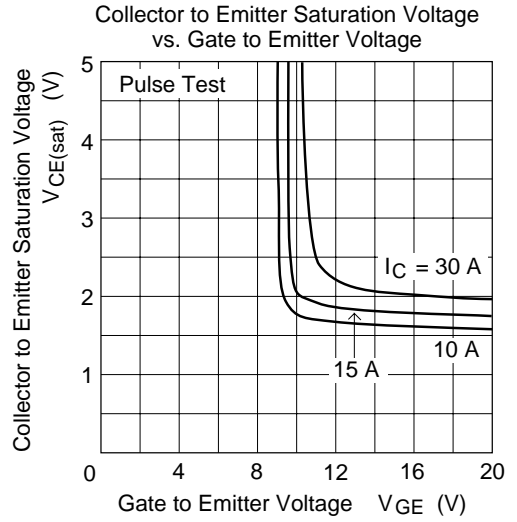
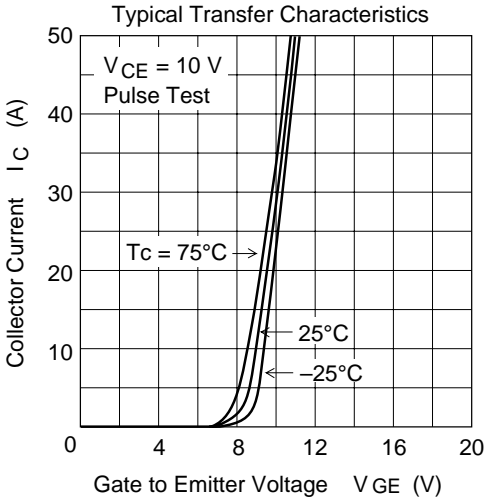


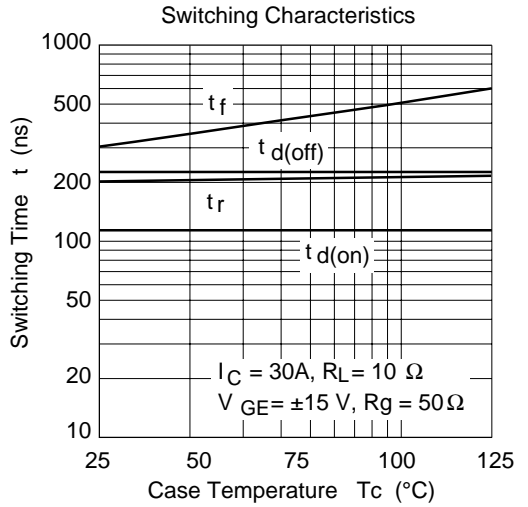
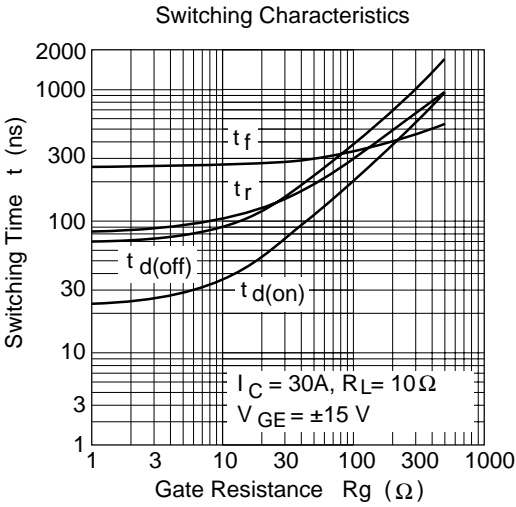
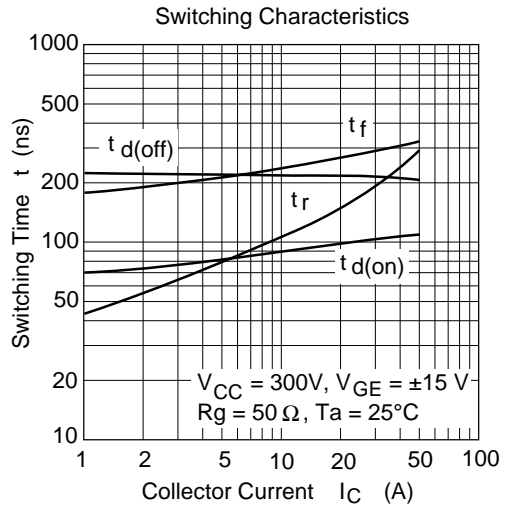
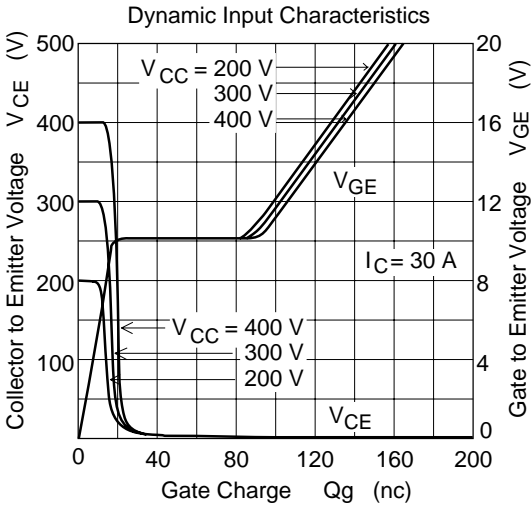
Reverse Bias SOA



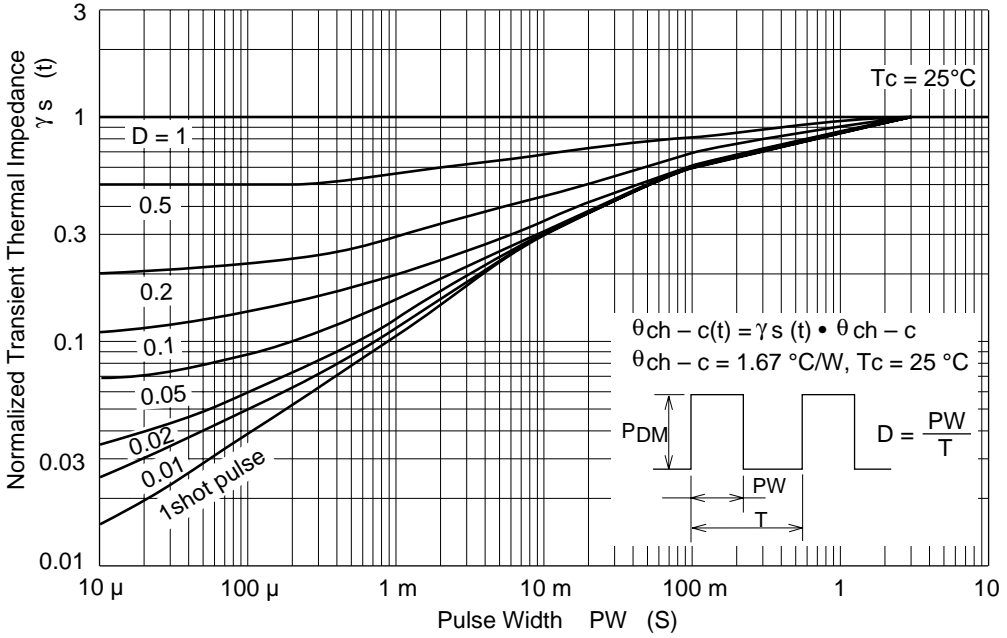
Typical Output Characteristics



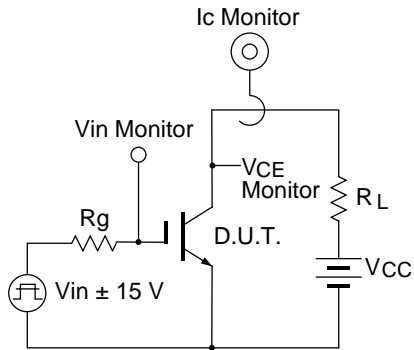




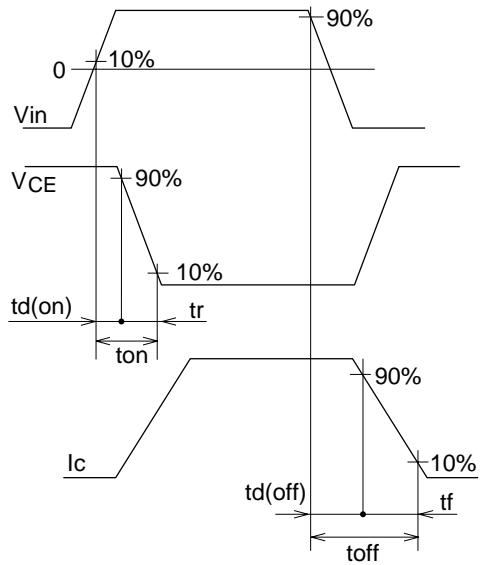
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit

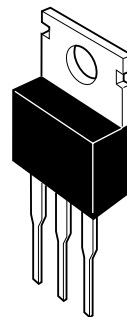
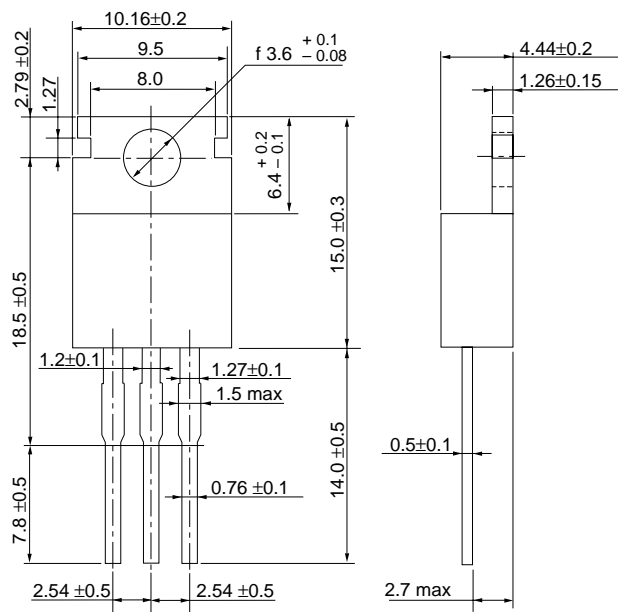


Waveform



## Package Dimensions

Unit: mm



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

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