

TOSHIBA INTEGRATED IGBT MODULE SILICON N CHANNEL IGBT

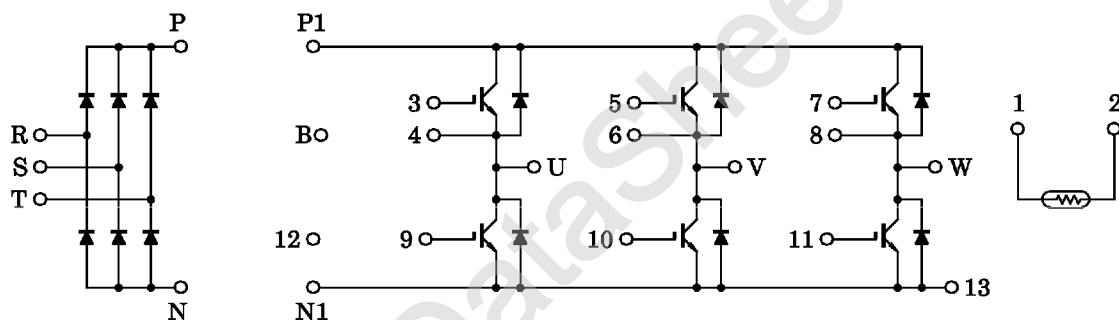
# MIG25Q806H, MIG25Q806HA

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

- Integrates Inverter, Converter Power Circuits and Thermistor in One Package.
- Output (Inverter Stage) : 3 $\phi$  25 A / 1200 V IGBT
- Input (Converter Stage) : 3 $\phi$  20 A / 1600 V Silicon Rectifier
- The Electrodes are Isolated from Case.
- Outline  
 MIG25Q806H : 2-108E5A  
 MIG25Q806HA : 2-108E6A
- Weight : 190 g

EQUIVALENT CIRCUIT



961001EAA2

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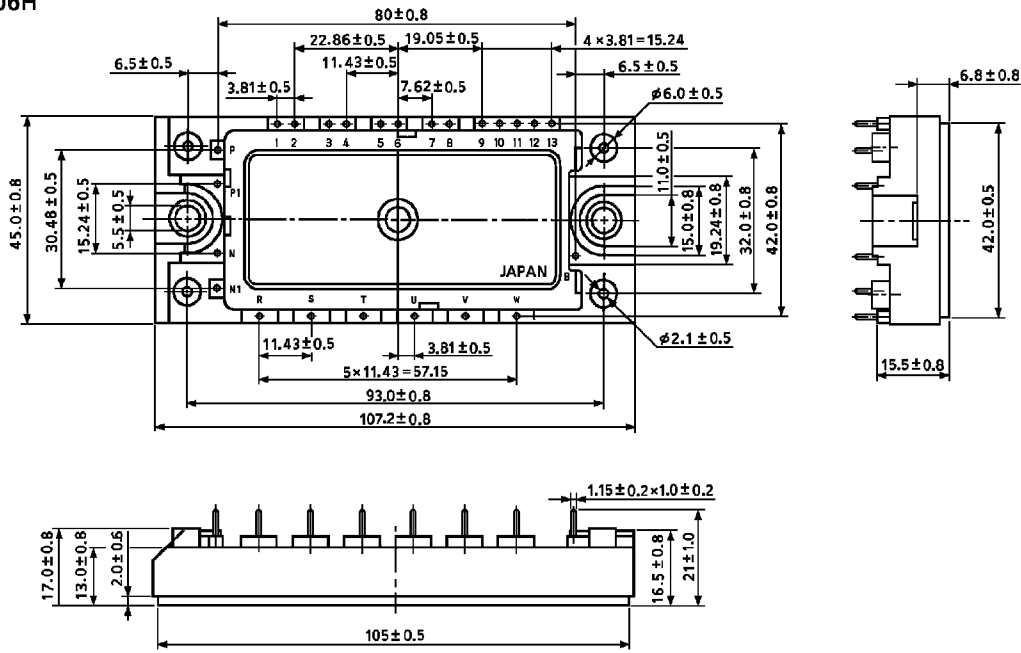
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Package Dimension

Unit : mm

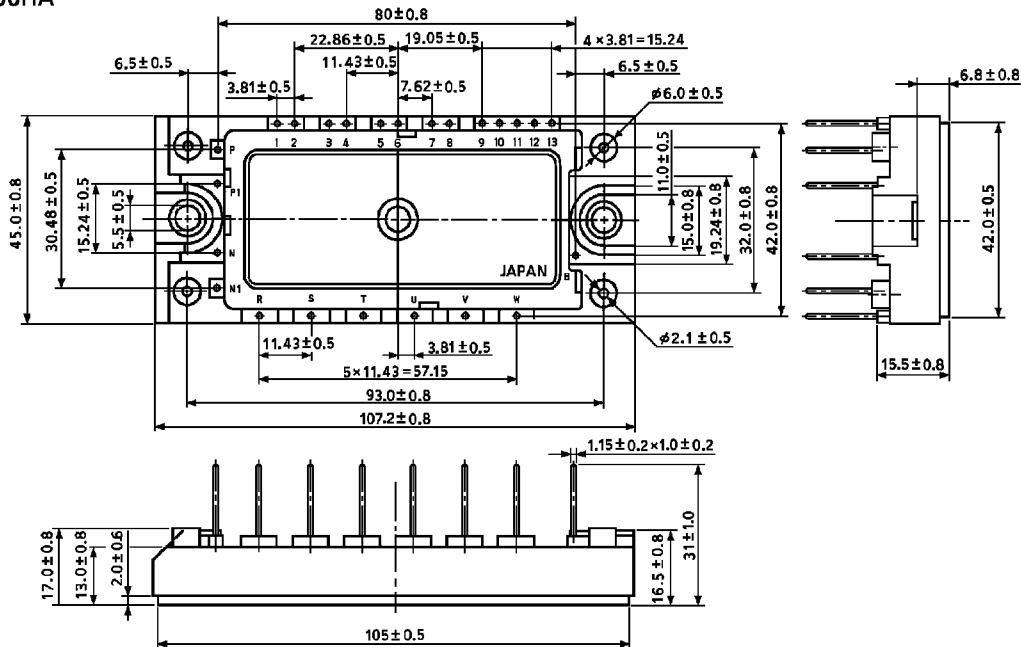
MIG25Q806H



2-108E5A

Unit : mm

MIG25Q806HA



2-108E6A

MAXIMUM RATINGS (Ta = 25°C)

STAGE	CHARACTERISTIC	SYMBOL	RATING	UNIT	
Inverter	Collector-Emitter Voltage	V <sub>CES</sub>	1200	V	
	Gate-Emitter Voltage	V <sub>GES</sub>	±20	V	
	Collector Current	DC	I <sub>C</sub>	35 / 25	A
		1 ms	I <sub>CP</sub>	70 / 50	A
	Forward Current	DC	I <sub>F</sub>	25	A
		1 ms	I <sub>FM</sub>	50	A
Collector Power Dissipation (T <sub>c</sub> = 25°C)		P <sub>C</sub>	200	W	
Converter	Repetitive Peak Reverse Voltage	V <sub>R</sub> RM	1600	V	
	Average Output Rectified Current	I <sub>O</sub>	20	A	
	Peak One Cycle Surge Forward Current (50 Hz, Non-Repetitive)	I <sub>F</sub> SM	400	A	
Module	Junction Temperature	T <sub>j</sub>	150	°C	
	Storage Temperature Range	T <sub>stg</sub>	-40~125	°C	
	Isolation Voltage	V <sub>Isol</sub>	2500 (AC 1 minute)	V	
	Screw Torque	—	6	N·m	

(25°C / 80°C)  
(25°C / 80°C)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

a. Inverter stage

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I <sub>GES</sub>	V <sub>GE</sub> = ±20 V, V <sub>CE</sub> = 0	—	—	±500	nA	
Collector Cut-Off Current	I <sub>CES</sub>	V <sub>CE</sub> = 1200 V, V <sub>GE</sub> = 0	—	—	0.5	mA	
Gate-Emitter Cut-Off Voltage	V <sub>GE</sub> (off)	I <sub>C</sub> = 25 mA, V <sub>CE</sub> = 5 V	—	6.0	—	V	
Collector-Emitter Saturation Voltage	V <sub>CE</sub> (sat)	I <sub>C</sub> = 25 A, T <sub>j</sub> = 25°C	—	2.8	3.2	V	
		V <sub>GE</sub> = 15 V, T <sub>j</sub> = 125°C	—	3.1	3.7		
Input Capacitance	C <sub>ies</sub>	V <sub>CE</sub> = 10 V, V <sub>GE</sub> = 0, f = 1 MHz	—	2600	—	pF	
Switching Time	Rise Time	t <sub>r</sub>	V <sub>CC</sub> = 600 V	—	0.07	0.15	μs
	Turn-On Time	t <sub>on</sub>	I <sub>C</sub> = 25 A	—	0.15	0.30	
	Fall Time	t <sub>f</sub>	V <sub>GE</sub> = ±15 V, R <sub>G</sub> = 51 Ω	—	0.07	0.10	
	Turn-Off Time	t <sub>off</sub>	T <sub>j</sub> = 125°C (Note 1)	—	0.60	0.90	
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 25 A, V <sub>GE</sub> = 0	—	2.0	2.8	V	
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 25 A, V <sub>GE</sub> = -10 V, di / dt = 400 A / μs	—	0.10	0.25	μs	
Thermal Resistance	R <sub>th</sub> (j-c)	Transistor	—	—	0.6	°C / W	
		Diode	—	—	1.0		

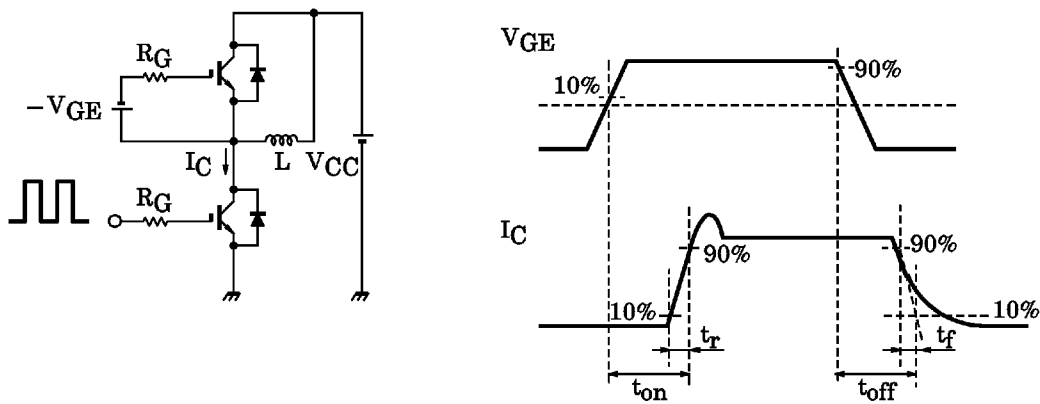
b. Converter stage

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Repetitive Peak Reverse Current	$I_{RRM}$	$V_{RRM} = 1600\text{ V}$	—	—	50	$\mu\text{A}$
Peak Forward Voltage	$V_{FM}$	$I_{FM} = 20\text{ A}$	—	1.05	1.20	V
Peak One Cycle Surge Forward Current	$I_{FSM}$	50 Hz sine-half-wave	400	—	—	A
Thermal Resistance	$R_{th(j-c)}$	—	—	—	1.56	$^{\circ}\text{C/W}$

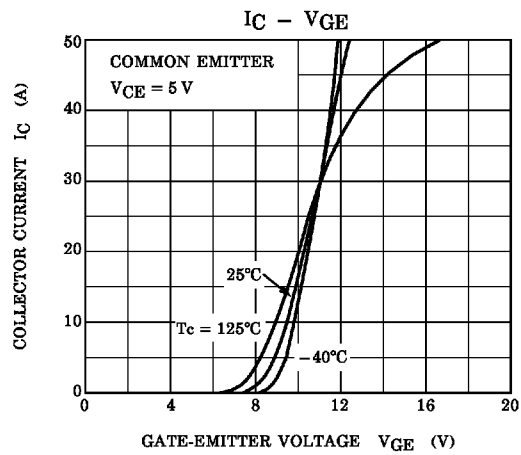
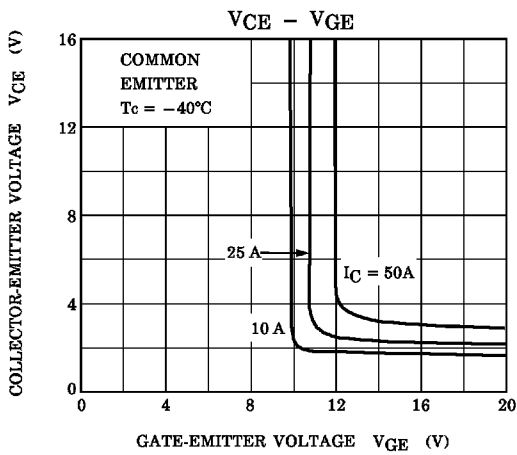
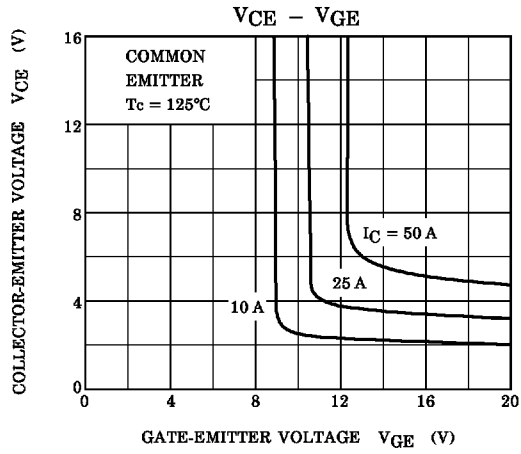
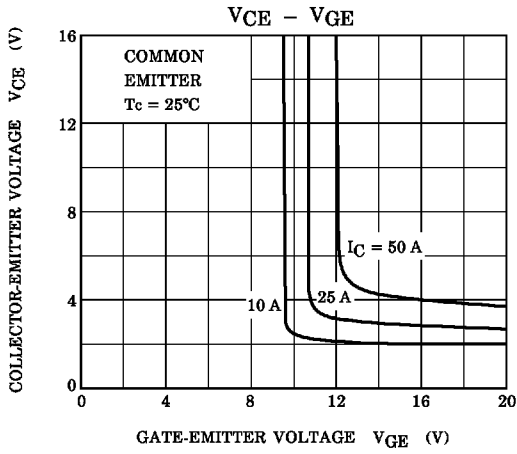
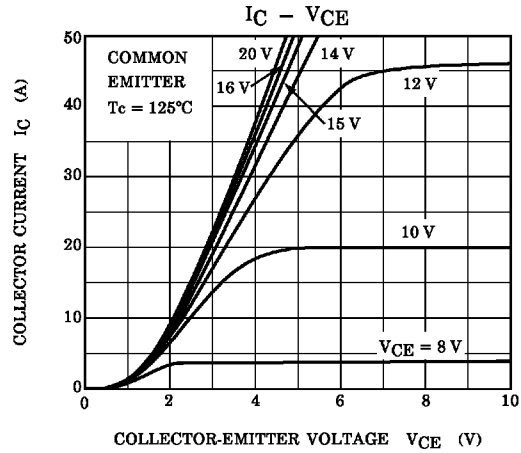
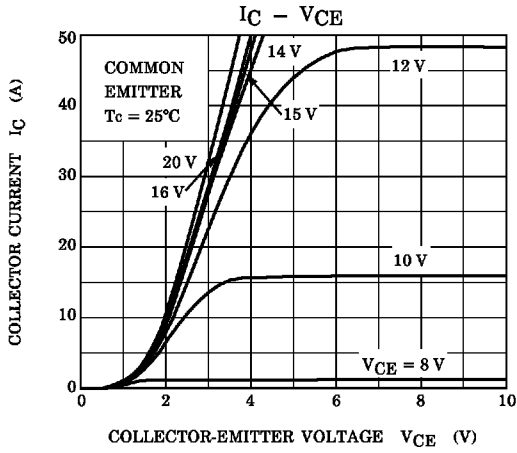
c. Thermistor

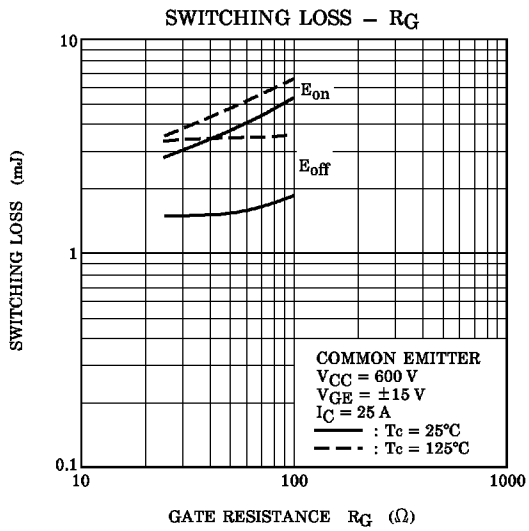
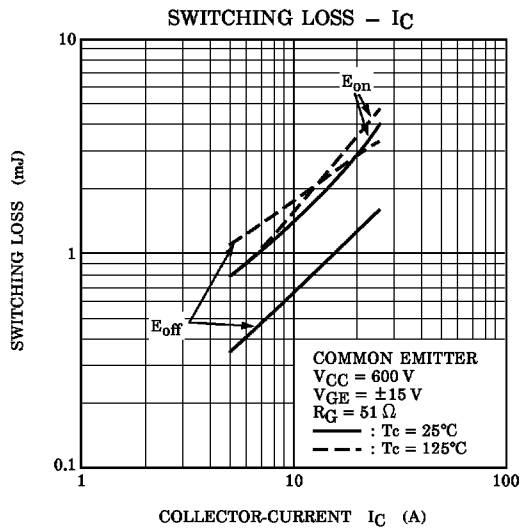
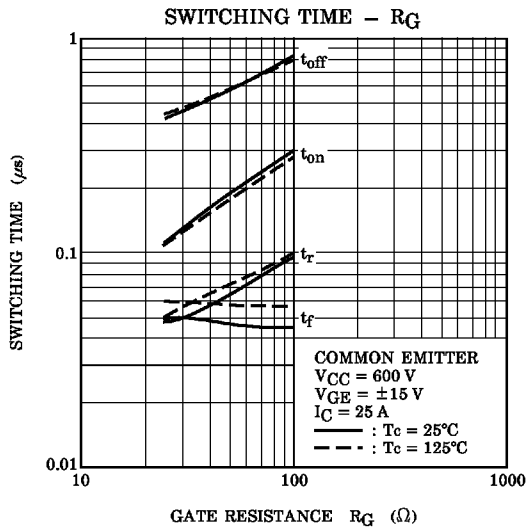
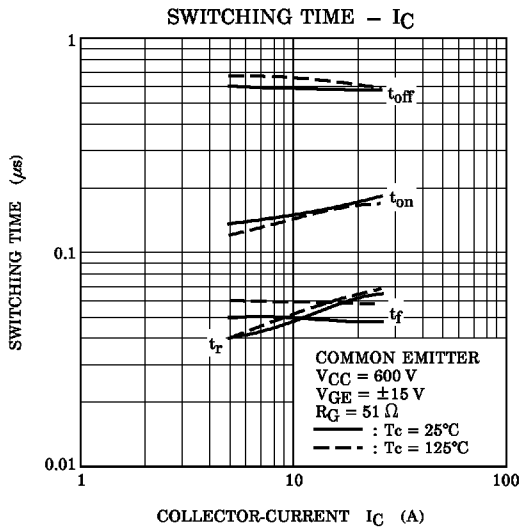
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Zero-power Resistance	$R_{25}$	$I_{TM} = 0.2\text{ mA}$ , $T_c = 25^{\circ}\text{C}$	17.31	20	23.14	$\text{k}\Omega$
B Value	$B_{25/85}$	$T_c = 25^{\circ}\text{C} / T_c = 85^{\circ}\text{C}$	—	3760	—	K

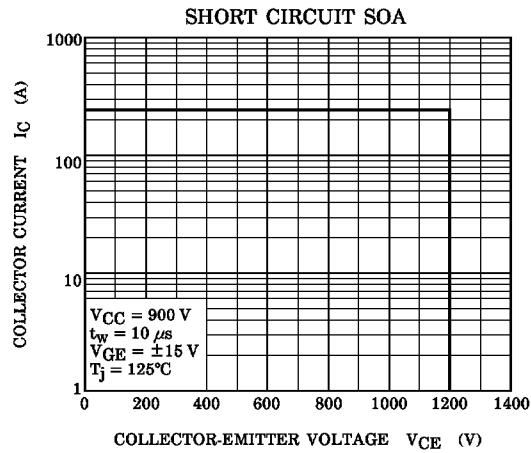
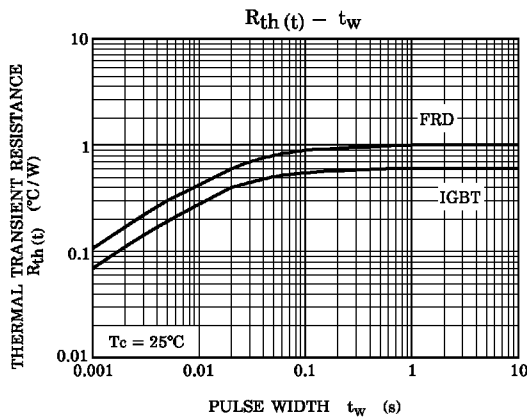
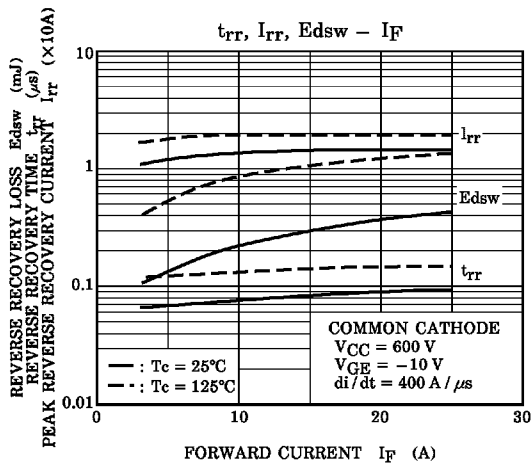
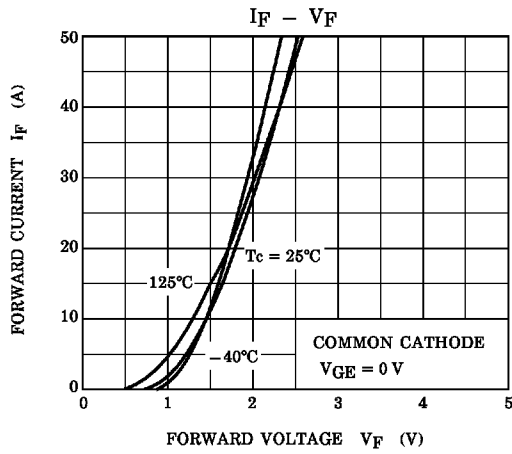
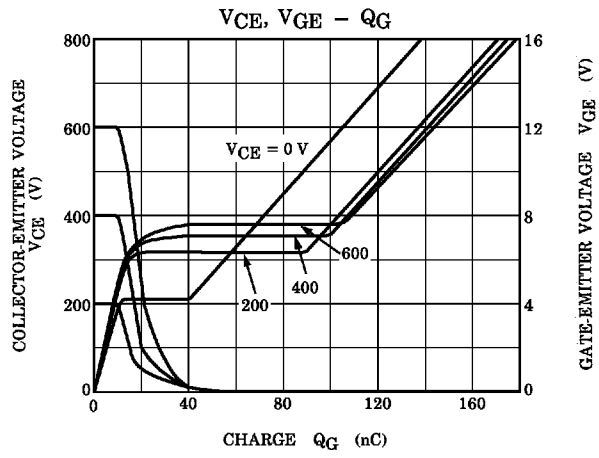
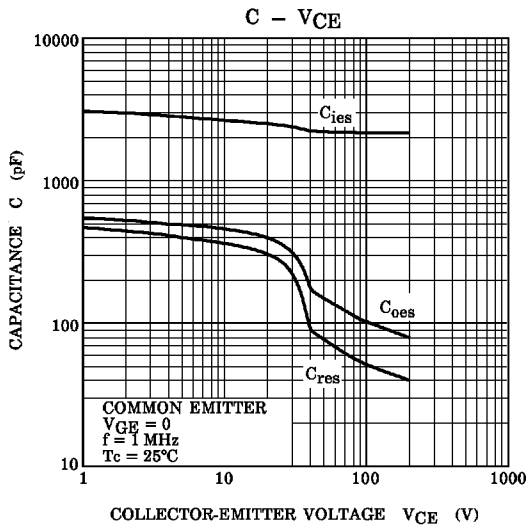
(Note 1) : Switching Time Test Circuit & Timing Chart

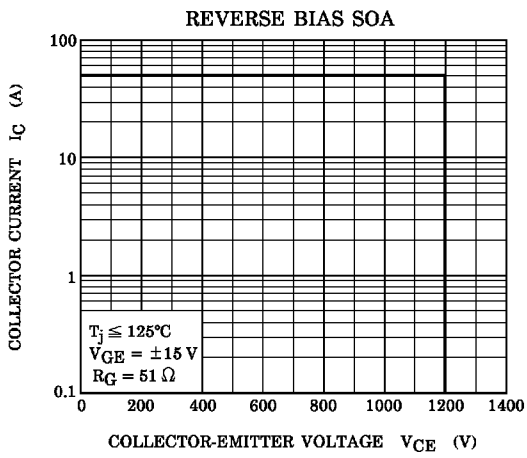


a. Inverter stage









**b. Converter stage**

