

TENTATIVE TOSHIBA INTEGRATED IGBT MODULE SILICON N CHANNEL IGBT

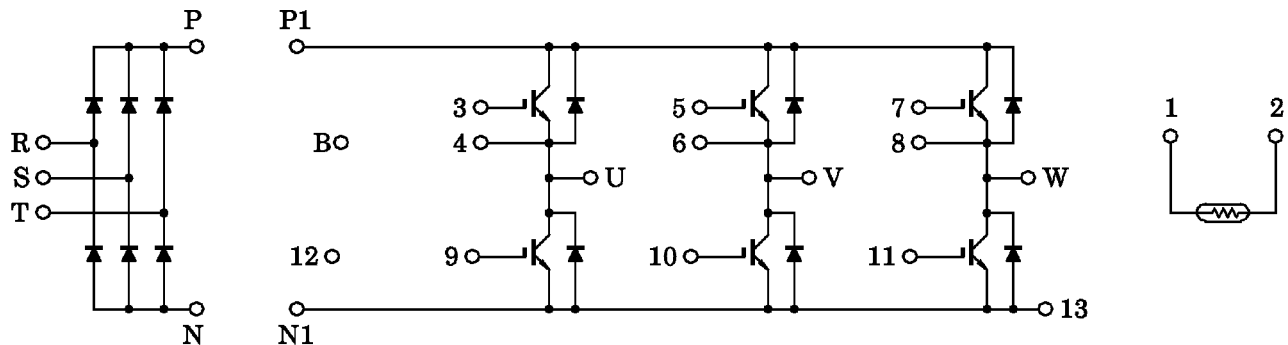
# MIG20J806H, MIG20J806HA

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

- Integrates Inverter, Converter Power Circuits and Thermistor in One Package.
- Output (Inverter Stage)  
: 3φ 20A / 600V IGBT
- Input (Converter Stage)  
: 3φ 30A / 800V Silicon Rectifier
- The Electrodes are Isolated from Case.
- Outline  
MIG20J806H : 2-108E5A  
MIG20J806HA : 2-108E6A
- Weight : 190g

EQUIVALENT CIRCUIT



961001EAA2

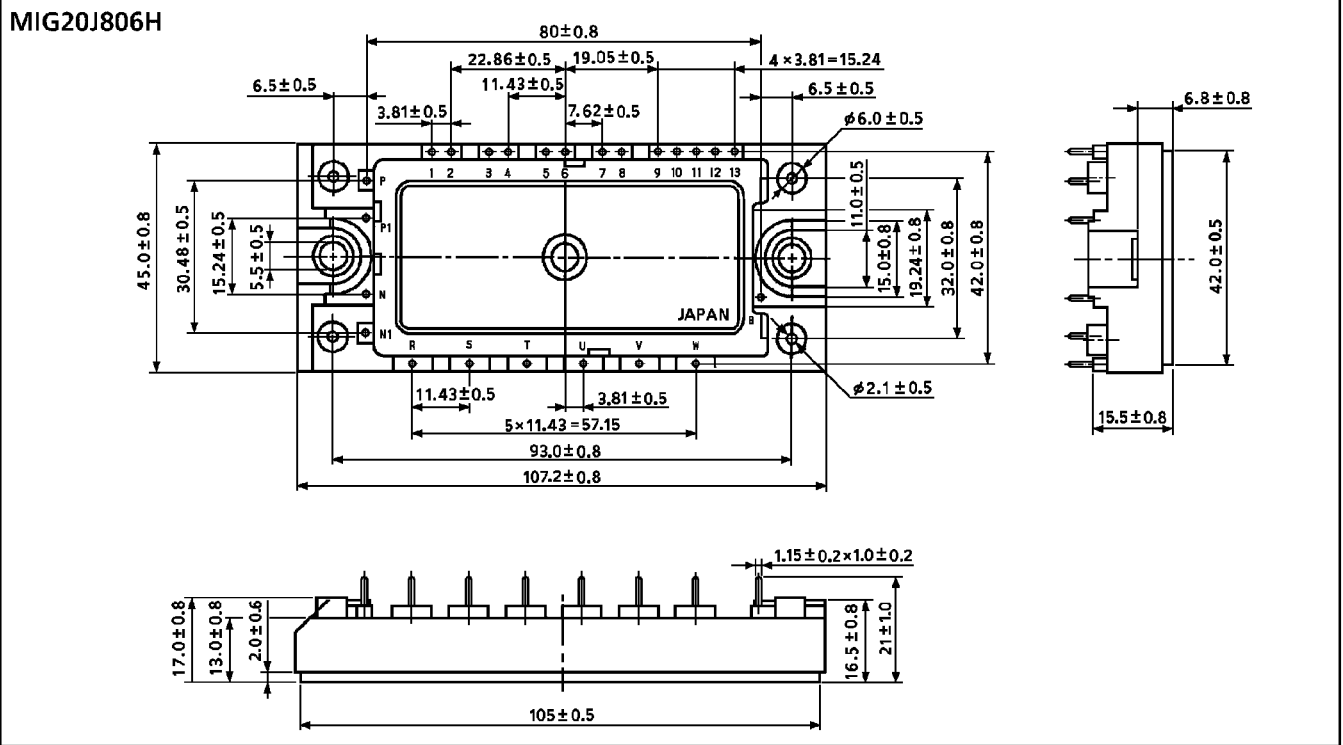
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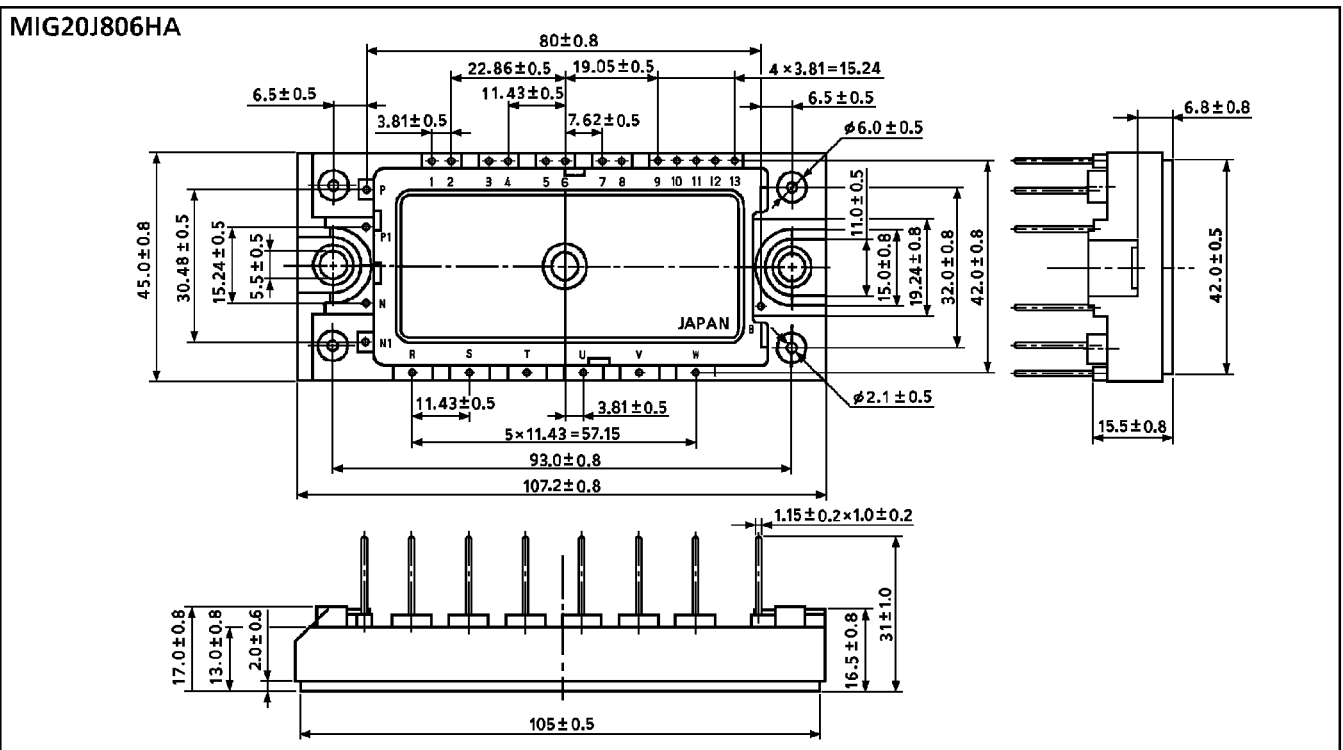
**Package Dimension**

Unit : mm



2-108E5A

Unit : mm



2-108E6A

MAXIMUM RATINGS (Ta = 25°C)

STAGE	CHARACTERISTIC	SYMBOL	RATING	UNIT	
Inverter	Collector-Emitter Voltage	V <sub>CES</sub>	600	V	
	Gate-Emitter Voltage	V <sub>GES</sub>	±20	V	
	Collector Current	DC	I <sub>C</sub>	25 / 20	A
		1ms	I <sub>CP</sub>	50 / 40	A
	Forward Current	DC	I <sub>F</sub>	20	A
		1ms	I <sub>FM</sub>	40	A
Collector Power Dissipation (T <sub>c</sub> = 25°C)		P <sub>C</sub>	90	W	
Converter	Repetitive Peak Reverse Voltage	V <sub>RRM</sub>	800	V	
	Average Output Rectified Current	I <sub>O</sub>	30	A	
	Peak One Cycle Surge Forward Current (50Hz, Non-Repetitive)	I <sub>FSM</sub>	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 / 40°C)  
(25°C / 40°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> = ±20V, V <sub>CE</sub> = 0	—	—	±500	nA
Collector Cut-Off Current	I <sub>CES</sub>	V <sub>CE</sub> = 600V, V <sub>GE</sub> = 0	—	—	1.0	mA
Gate-Emitter Cut-Off Voltage	V <sub>GE (off)</sub>	I <sub>C</sub> = 2mA, V <sub>CE</sub> = 5V	5.0	—	8.0	V
Collector-Emitter Saturation Voltage	V <sub>CE (sat)</sub>	I <sub>C</sub> = 20A	—	2.1	2.7	V
		V <sub>GE</sub> = 15V	—	2.2	2.8	
Input Capacitance	C <sub>ies</sub>	V <sub>CE</sub> = 10V, V <sub>GE</sub> = 0, f = 1MHz	—	1850	—	pF
Switching Time	Rise Time	t <sub>r</sub>	V <sub>CC</sub> = 300V			μs
	Turn-On Time	t <sub>on</sub>	I <sub>C</sub> = 20A			
	Fall Time	t <sub>f</sub>	V <sub>GE</sub> = ±15V			
	Turn-Off Time	t <sub>off</sub>	R <sub>G</sub> = 62Ω (Note 1)			
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 20A, V <sub>GE</sub> = 0	—	2.0	2.8	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 20A, V <sub>GE</sub> = -10V di/dt = 100A/μs	—	0.08	0.15	μs
Thermal Resistance	R <sub>th (j-c)</sub>	Transistor	—	—	1.39	°C/W
		Diode	—	—	2.6	

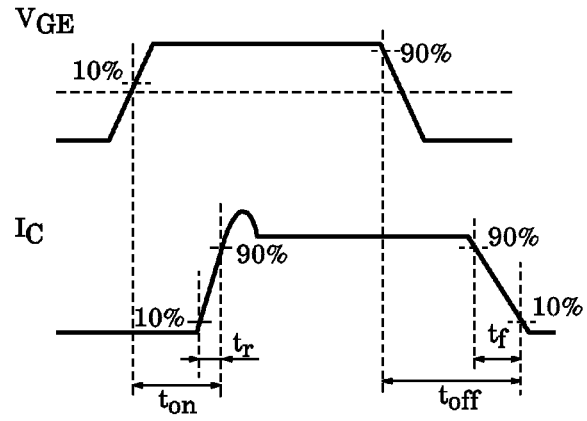
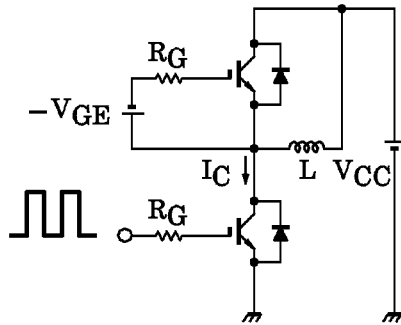
## b. Converter stage

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Repetitive Peak Reverse Current	I <sub>RRM</sub>	V <sub>RRM</sub> = 800V	—	—	50	μA
Peak Forward Voltage	V <sub>FM</sub>	I <sub>FM</sub> = 30A	—	1.05	1.20	V
Peak One Cycle Surge Forward Current	I <sub>FSM</sub>	50Hz sine-half-wave	400	—	—	A
Thermal Resistance	R <sub>th (j-c)</sub>	—	—	—	1.56	°C/W

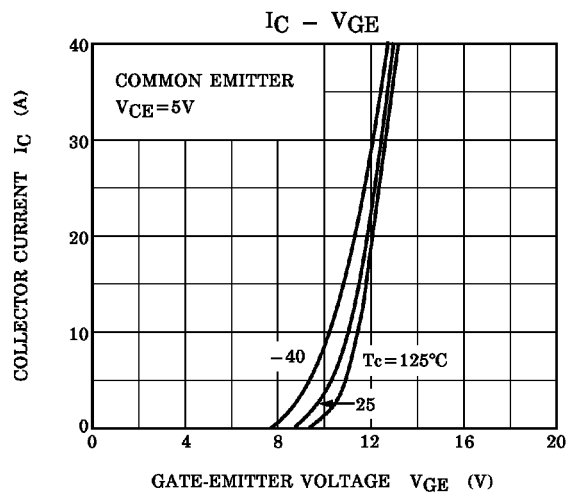
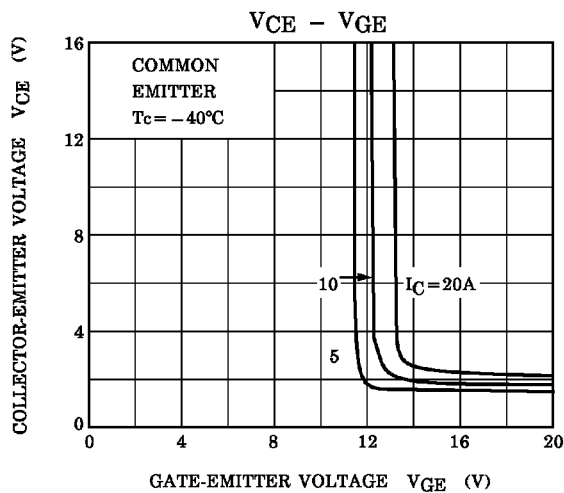
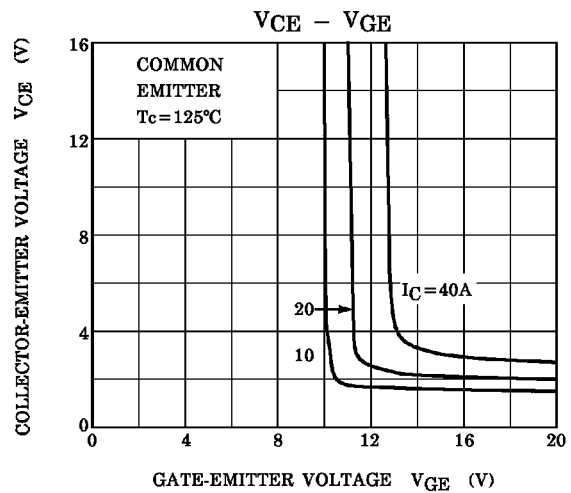
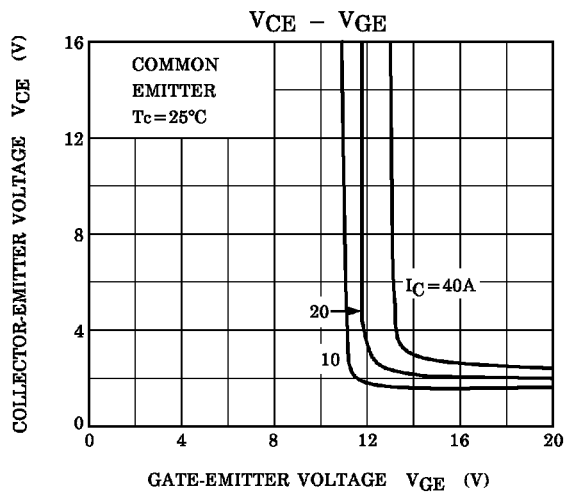
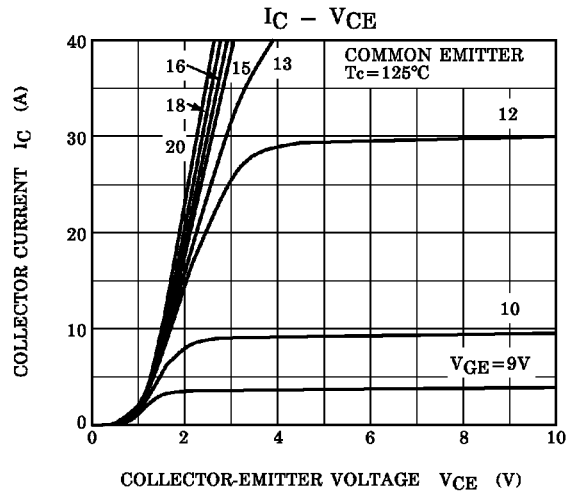
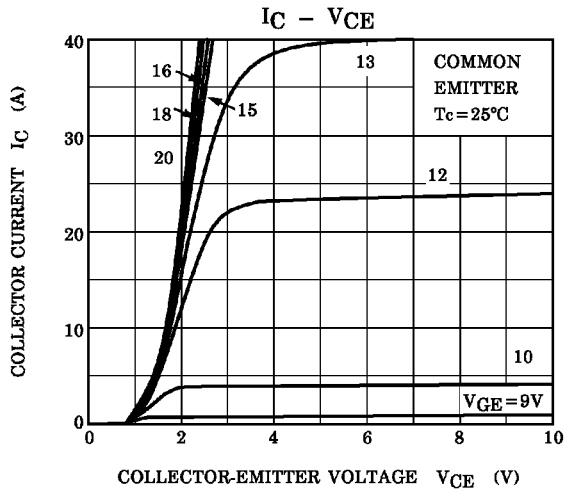
## c. Thermistor

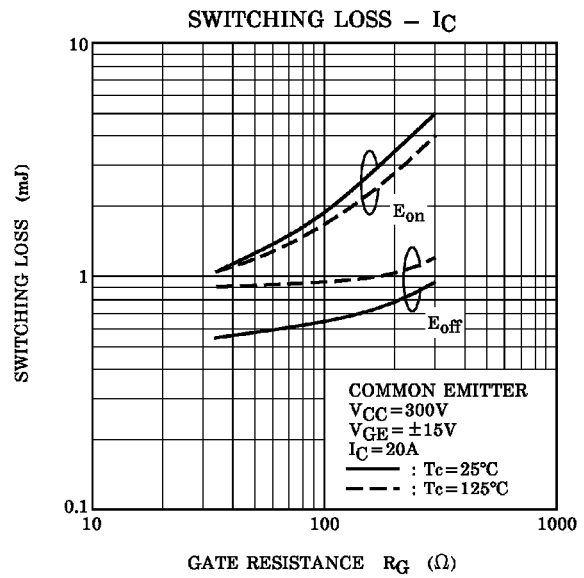
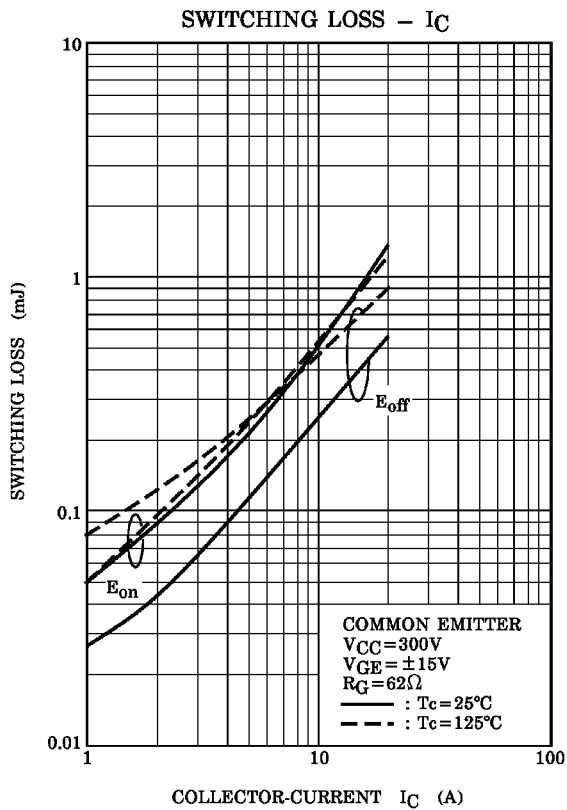
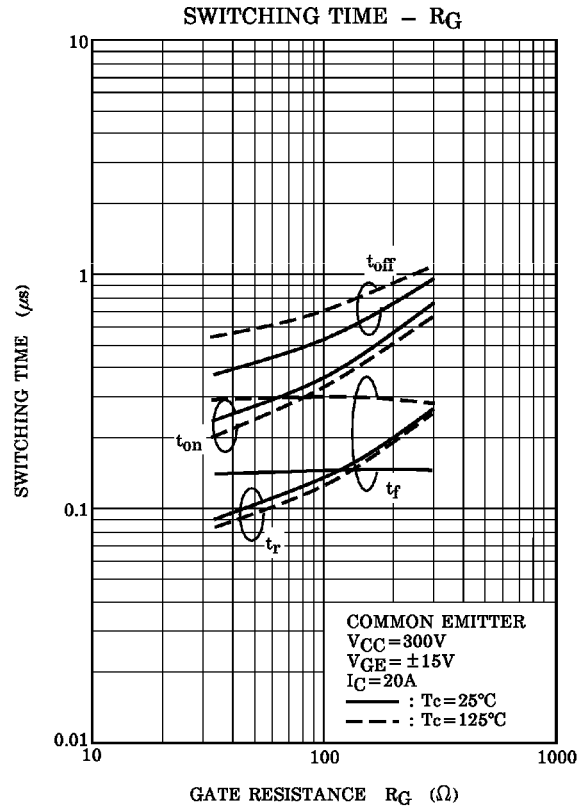
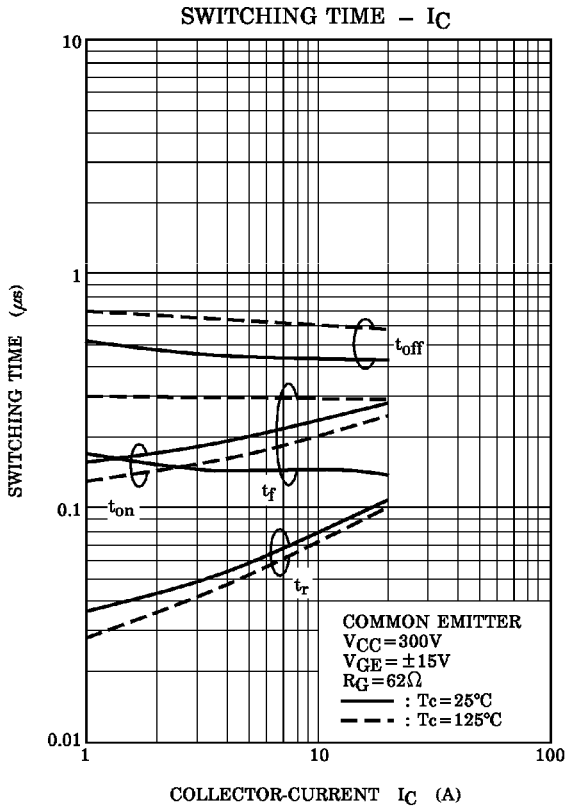
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Zero-power Resistance	R <sub>25</sub>	I <sub>TM</sub> = 0.2mA, T <sub>c</sub> = 25°C	17.31	20	23.14	kΩ
B Value	B <sub>25 / 85</sub>	T <sub>c</sub> = 25°C / T <sub>c</sub> = 85°C	—	3760	—	K

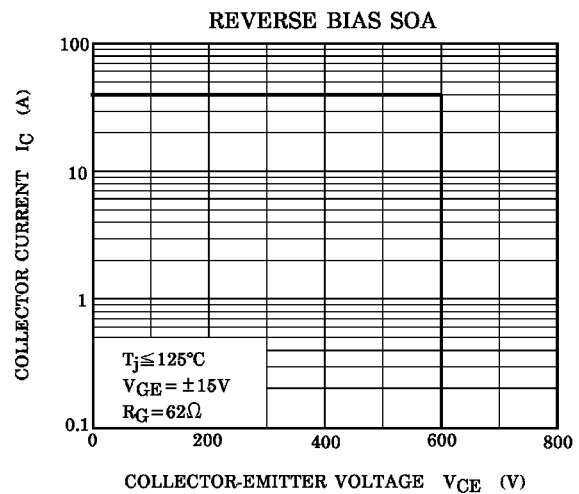
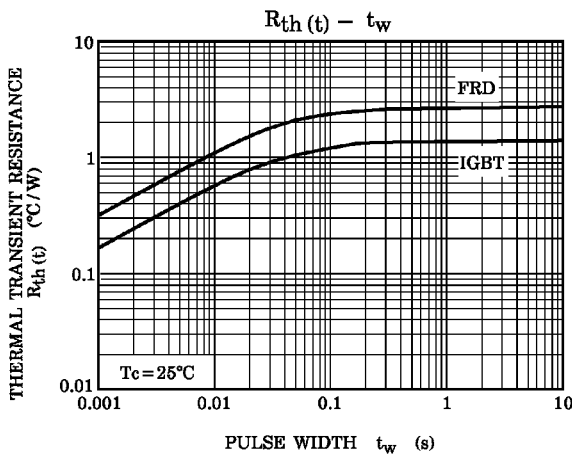
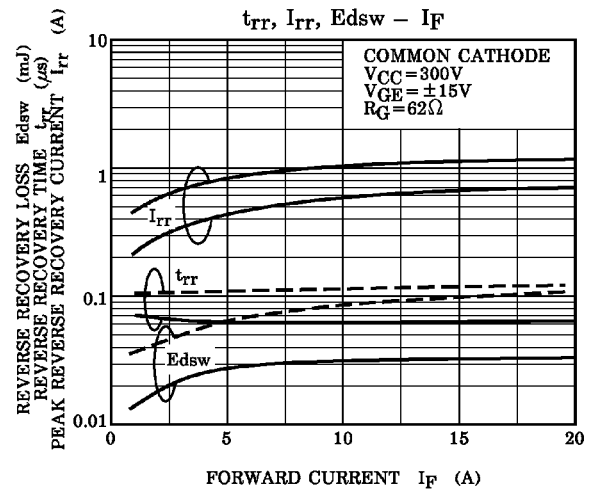
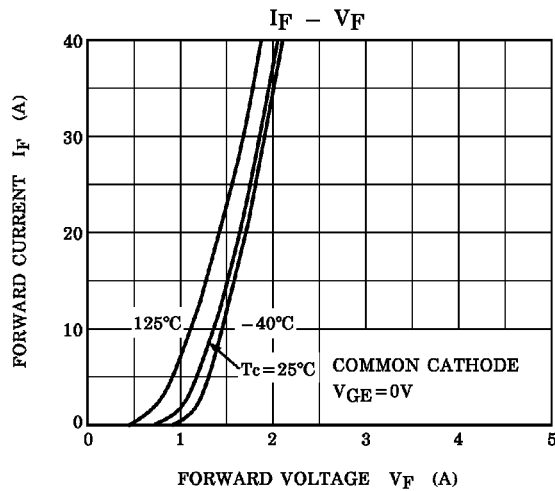
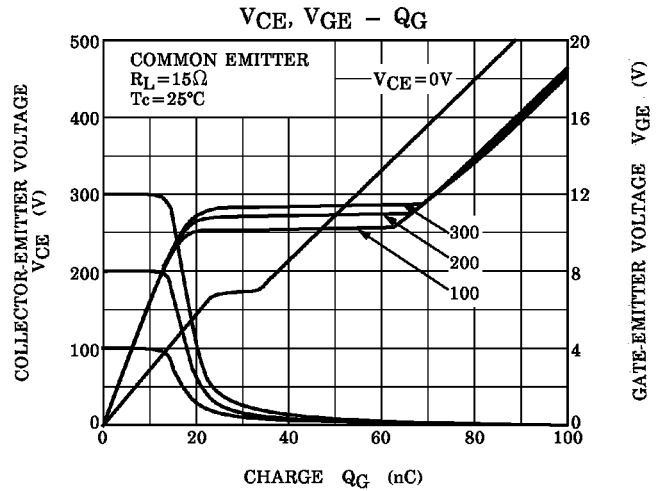
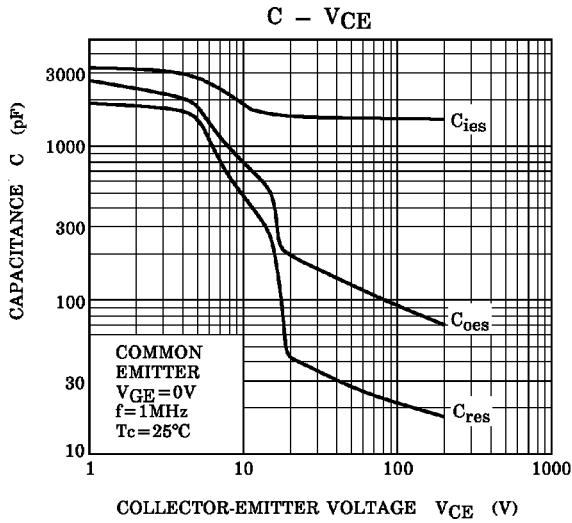
(Note 1) Switching Time Test Circuit & Timing Chart



a. Inverter stage









b. Converter stage

