

TOSHIBA INTEGRATED IGBT MODULE SILICON N CHANNEL IGBT

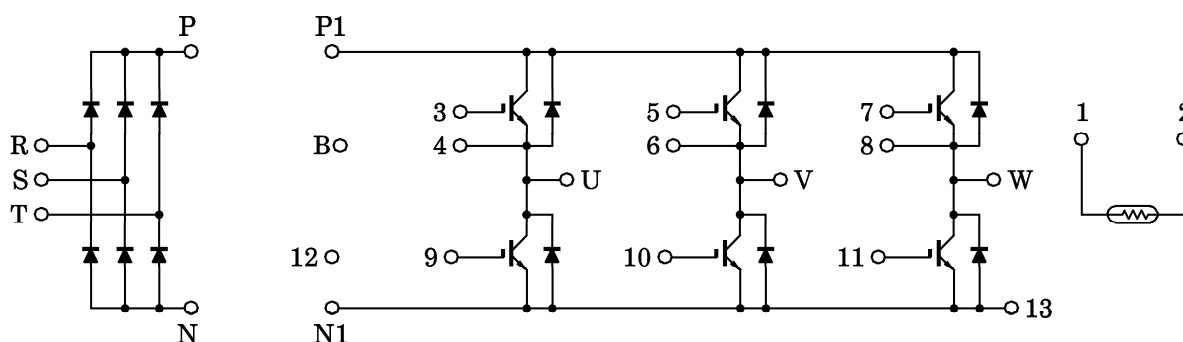
MIG25Q806H, MIG25Q806HA

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

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

EQUIVALENT CIRCUIT

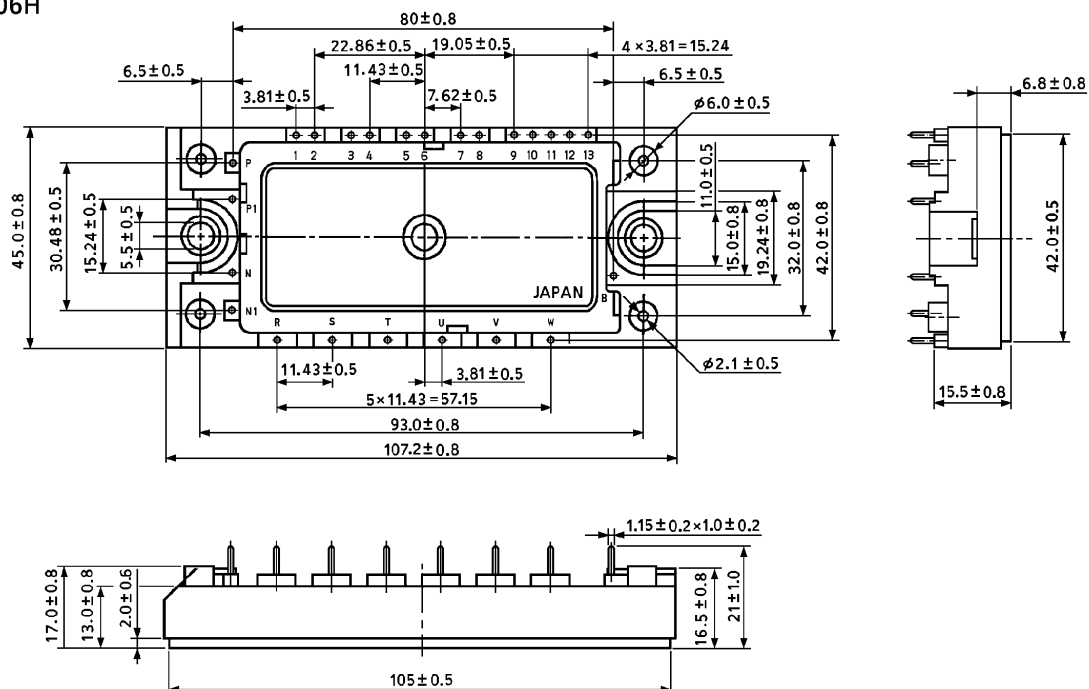


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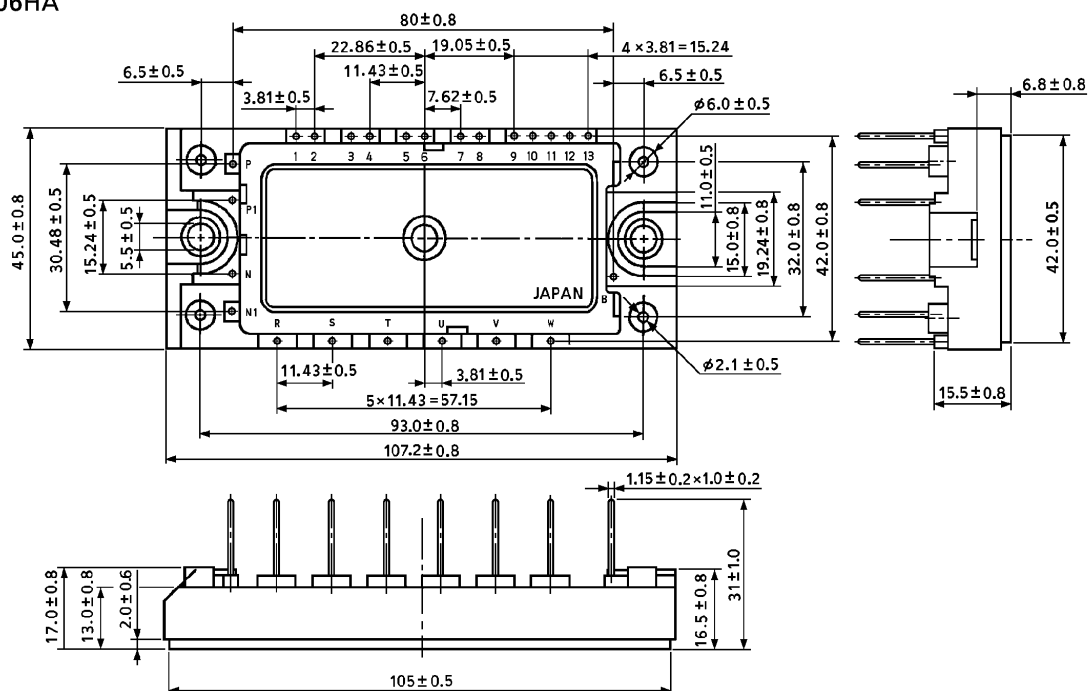
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Unit : mm

2-108E5A



2-108E6A



MAXIMUM RATINGS (Ta = 25°C)

STAGE	CHARACTERISTIC		SYMBOL	RATING	UNIT
Inverter	Collector-Emitter Voltage		V _{CES}	1200	V
	Gate-Emitter Voltage		V _{GES}	±20	V
	Collector Current	DC	I _C	35 / 25	A
		1 ms	I _{CP}	70 / 50	A
	Forward Current	DC	I _F	25	A
		1 ms	I _{FM}	50	A
Collector Power Dissipation (T _c = 25°C)			P _C	200	W
Converter	Repetitive Peak Reverse Voltage		V _{RRM}	1600	V
	Average Output Rectified Current		I _O	20	A
	Peak One Cycle Surge Forward Current (50 Hz, Non-Repetitive)		I _{FSM}	400	A
Module	Junction Temperature		T _j	150	°C
	Storage Temperature Range		T _{stg}	−40~125	°C
	Isolation Voltage		V _{Isol}	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 _{GES}	V _{GE} = ±20 V, V _{CE} = 0	—	—	±500	nA	
Collector Cut-Off Current		I _{CES}	V _{CE} = 1200 V, V _{GE} = 0	—	—	0.5	mA	
Gate-Emitter Cut-Off Voltage		V _{GE (off)}	I _C = 25 mA, V _{CE} = 5 V	—	6.0	—	V	
Collector-Emitter Saturation Voltage		V _{CE (sat)}	I _C = 25 A	T _j = 25°C	—	2.8	3.2	V
			V _{GE} = 15 V	T _j = 125°C	—	3.1	3.7	
Input Capacitance		C _{ies}	V _{CE} = 10 V, V _{GE} = 0, f = 1 MHz	—	2600	—	pF	
Switching Time	Rise Time	t _r	V _{CC} = 600 V	—	0.07	0.15	μs	
	Turn-On Time	t _{on}	I _C = 25 A	—	0.15	0.30		
	Fall Time	t _f	V _{GE} = ±15 V	—	0.07	0.10		
	Turn-Off Time	t _{off}	R _G = 51 Ω T _j = 125°C (Note 1)	—	0.60	0.90		
Forward Voltage		V _F	I _F = 25 A, V _{GE} = 0	—	2.0	2.8	V	
Reverse Recovery Time		t _{rr}	I _F = 25 A, V _{GE} = −10 V di / dt = 400 A / μs	—	0.10	0.25	μs	
Thermal Resistance		R _{th (j-c)}	Transistor	—	—	0.6	°C / W	
			Diode	—	—	1.0		

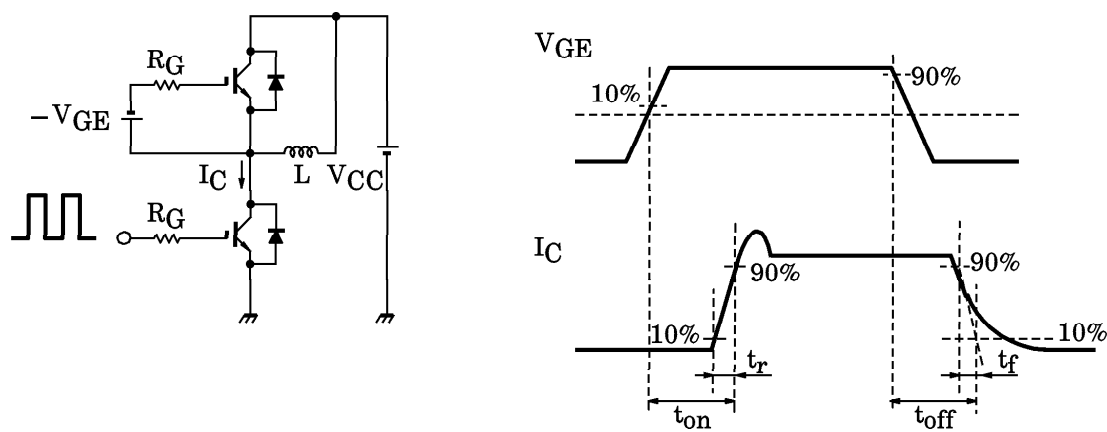
b. Converter stage

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Repetitive Peak Reverse Current	I_{RRM}	$V_{RRM} = 1600\text{ V}$	—	—	50	μA
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	$^{\circ}\text{C/W}$

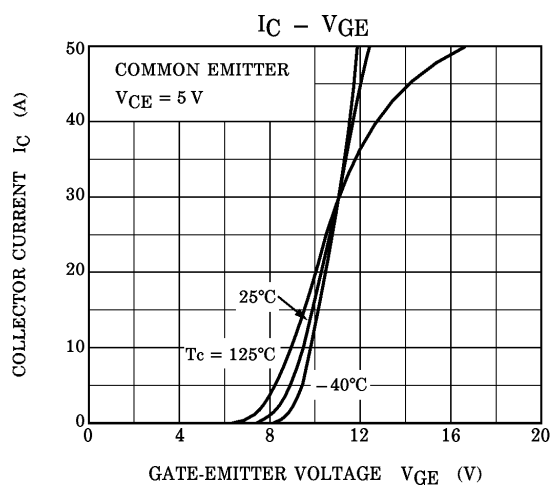
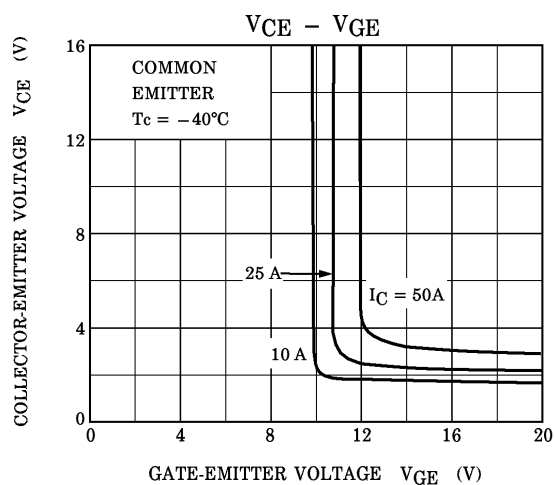
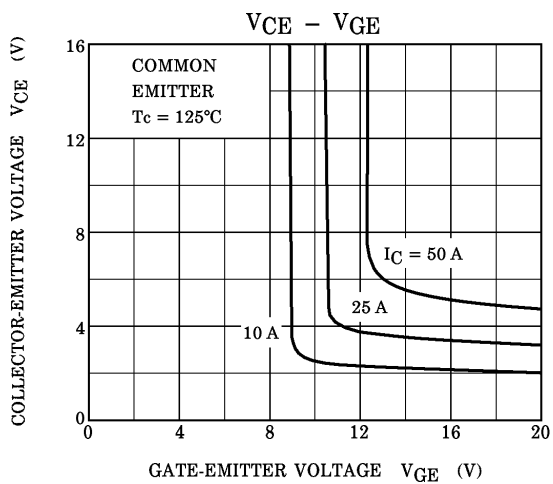
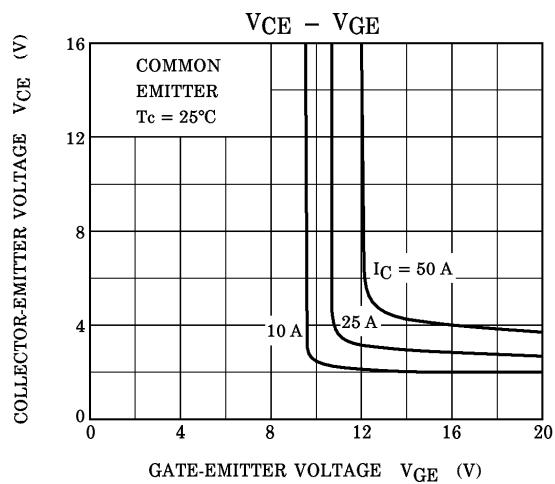
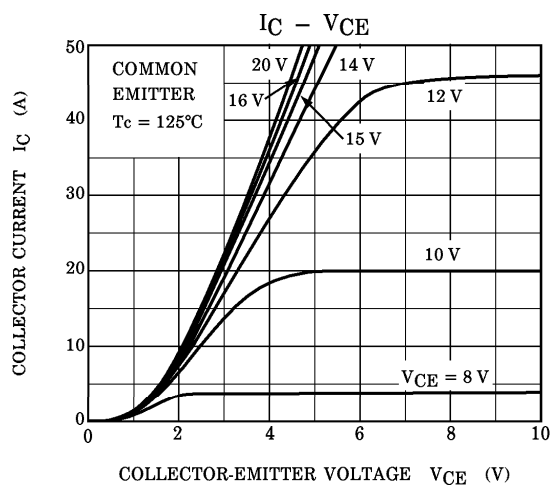
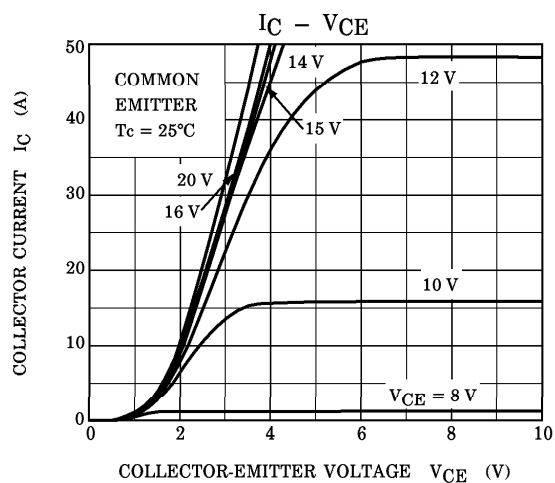
c. Thermistor

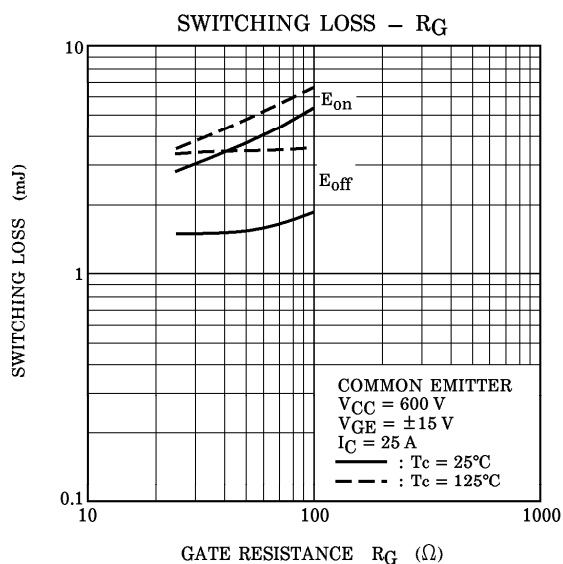
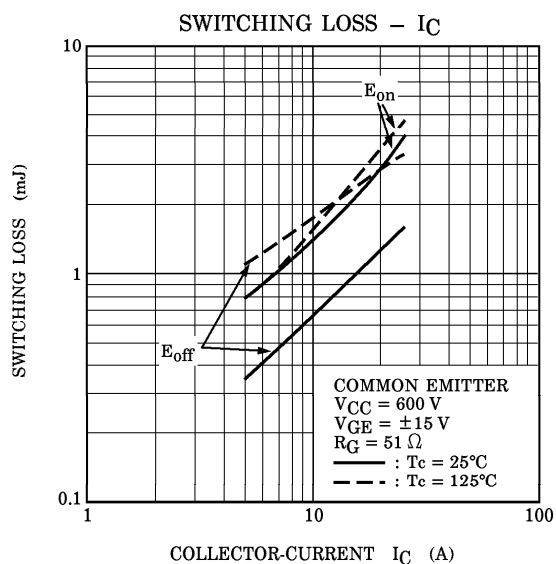
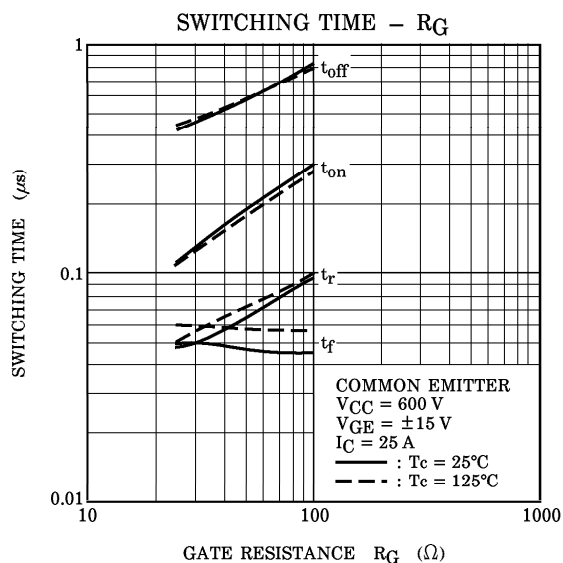
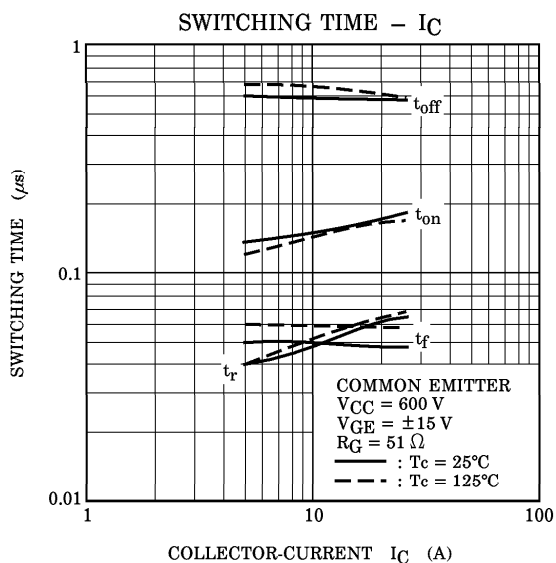
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Zero-power Resistance	R_{25}	$I_{TM} = 0.2\text{ mA}$, $T_c = 25^{\circ}\text{C}$	17.31	20	23.14	$\text{k}\Omega$
B Value	$B_{25/85}$	$T_c = 25^{\circ}\text{C} / T_c = 85^{\circ}\text{C}$	—	3760	—	K

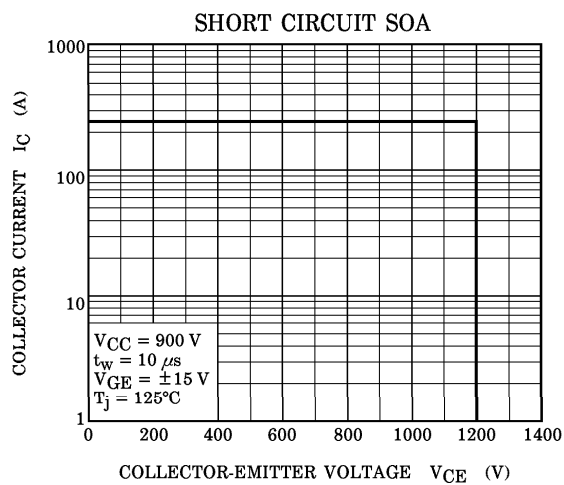
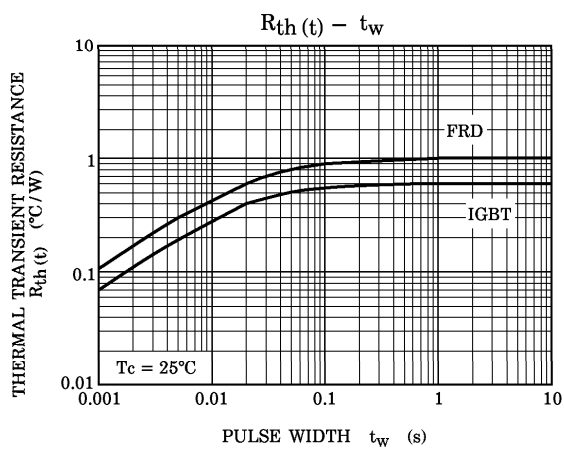
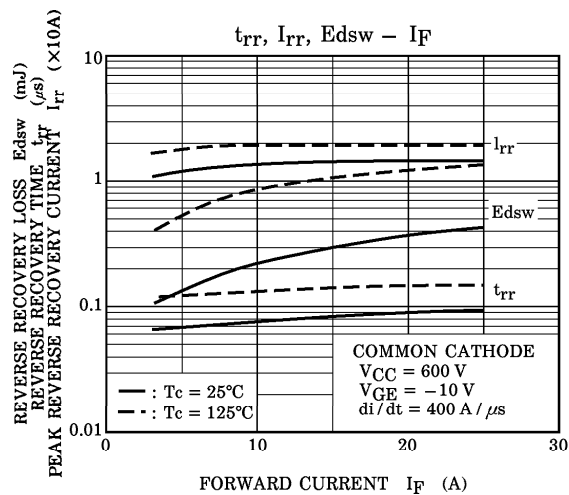
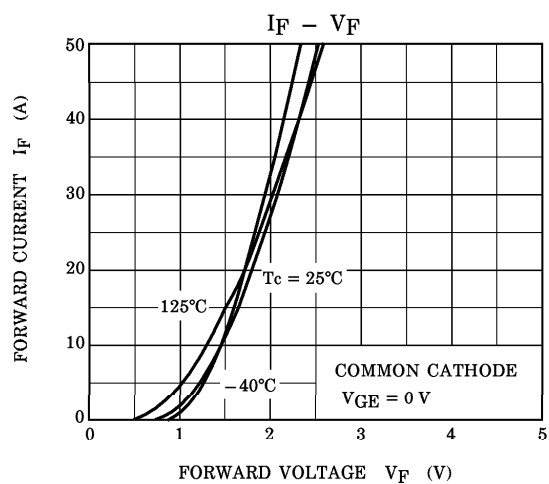
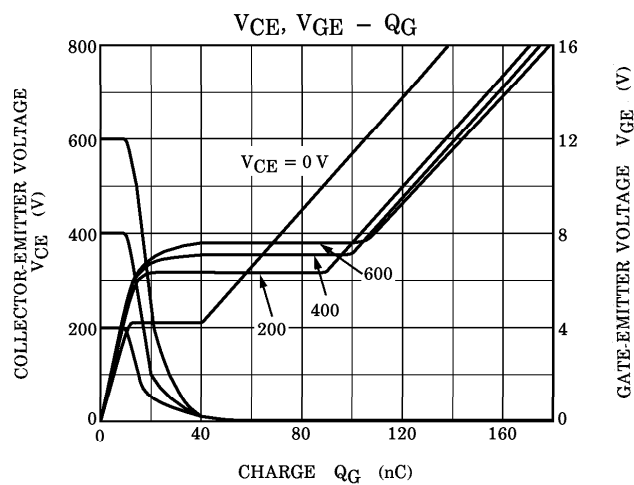
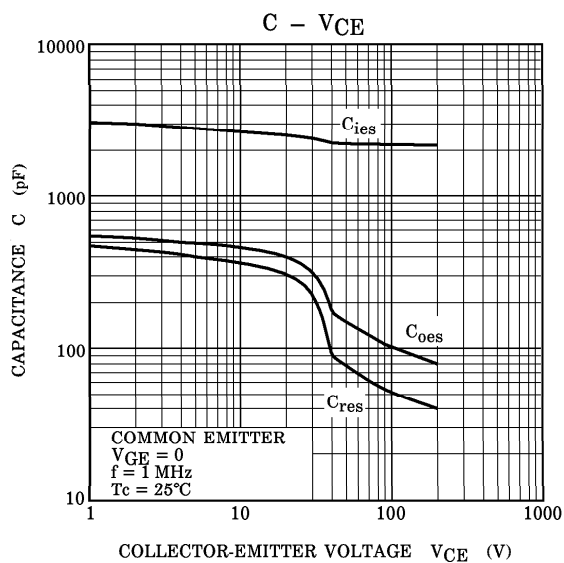
(Note 1) : Switching Time Test Circuit & Timing Chart

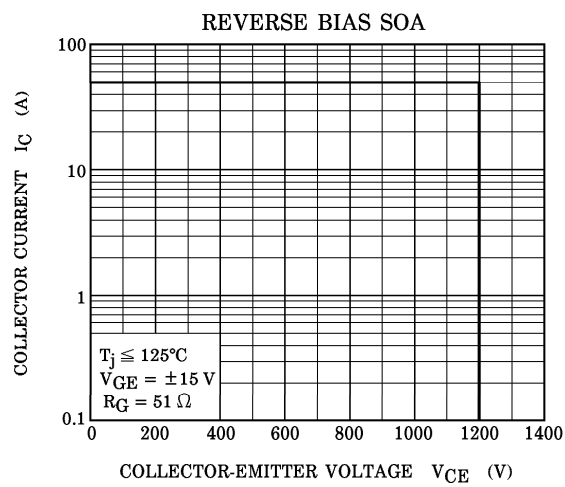


a. Inverter stage









b. Converter stage

