

TOSHIBA GTR Module Silicon N Channel IGBT

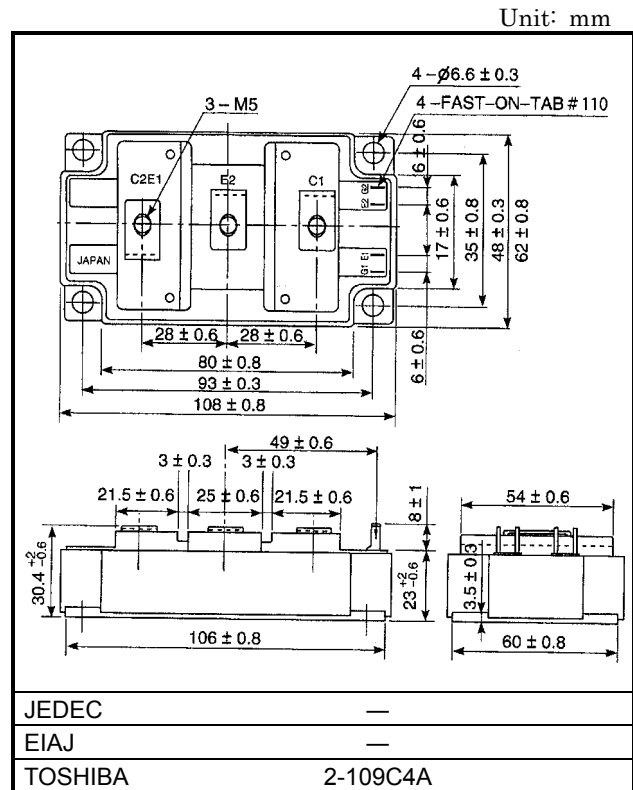
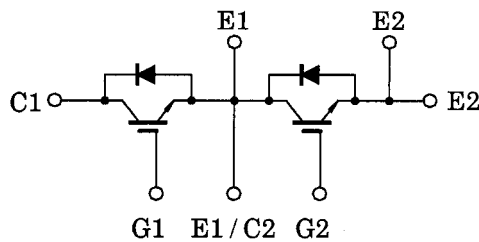
## MG200Q2YS50

High Power Switching Applications

Motor Control Applications

- High input impedance
- High speed :  $t_f = 0.3\mu s$  (Max.)  
@Inductive Load
- Low saturation voltage  
:  $V_{CE(sat)} = 3.6V$  (Max.)
- Enhancement-mode
- Includes a complete half bridge in one package.
- The electrodes are isolated from case.

### Equivalent Circuit



Weight: 430g

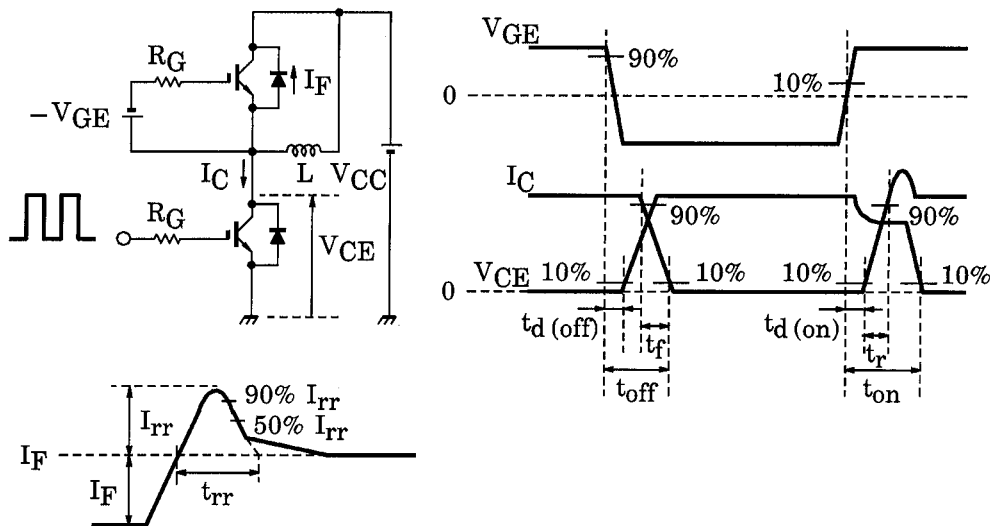
### Maximum Ratings (Ta = 25°C)

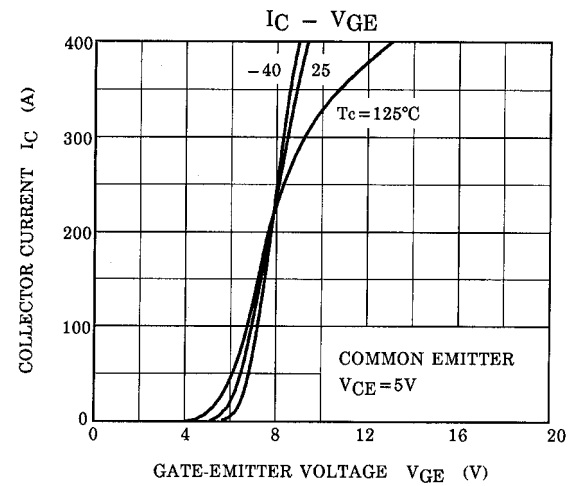
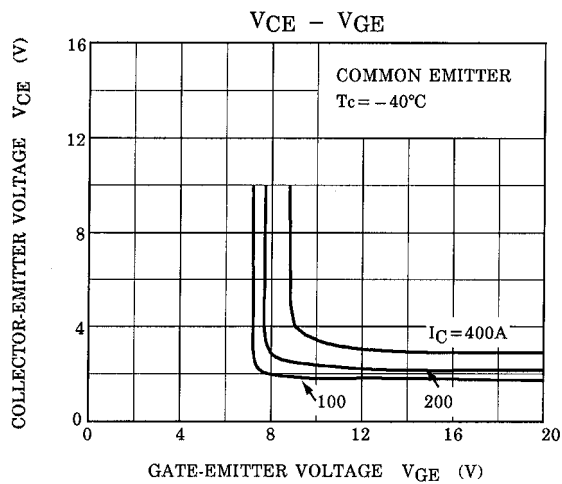
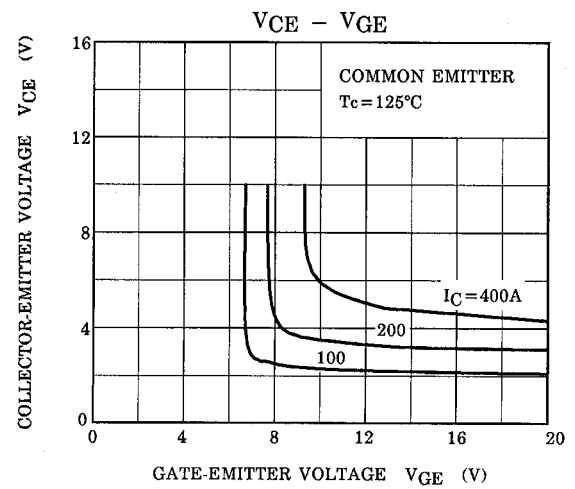
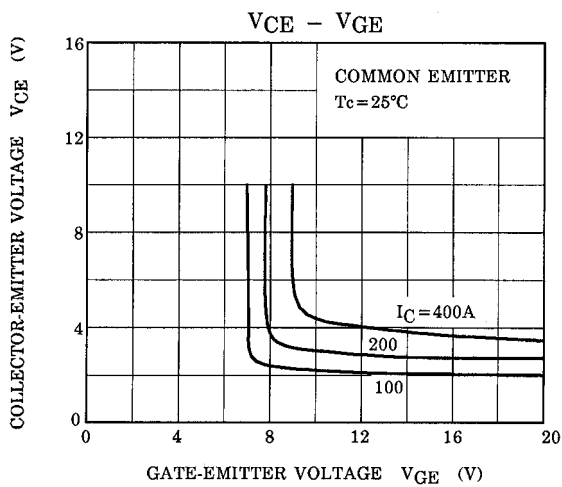
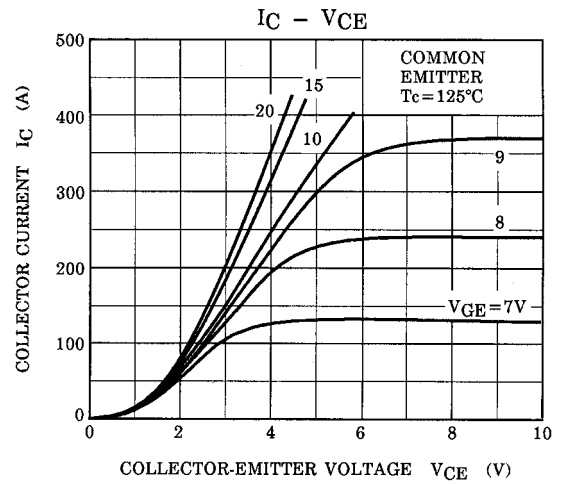
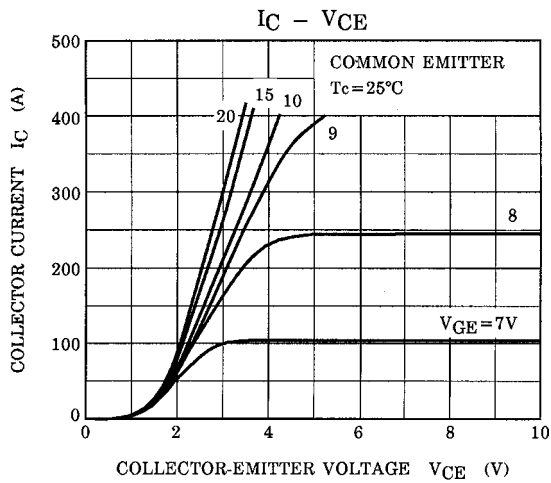
Characteristic		Symbol	Rating	Unit
Collector-emitter voltage		$V_{CES}$	1200	V
Gate-emitter voltage		$V_{GES}$	±20	V
Collector current	DC	$I_C$ (25°C / 80°C)	300/200	A
	1ms	$I_{CP}$ (25°C / 80°C)	600/400	
Forward current	DC	$I_F$	200	A
	1ms	$I_{FM}$	400	
Collector power dissipation (Tc = 25°C)		$P_C$	1400	W
Junction temperature		$T_j$	150	°C
Storage temperature range		$T_{stg}$	-40 ~ 125	°C
Isolation voltage		$V_{Isol}$	2500 (AC 1 min.)	V
Screw torque (Terminal / mounting)		—	3 / 3	N·m

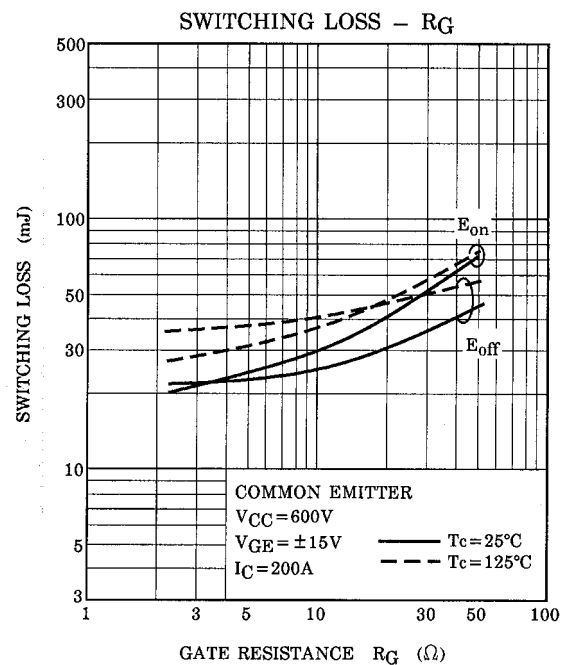
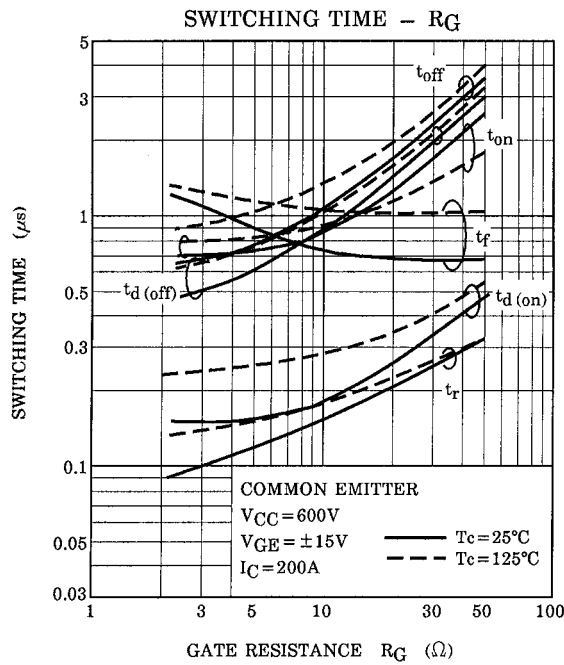
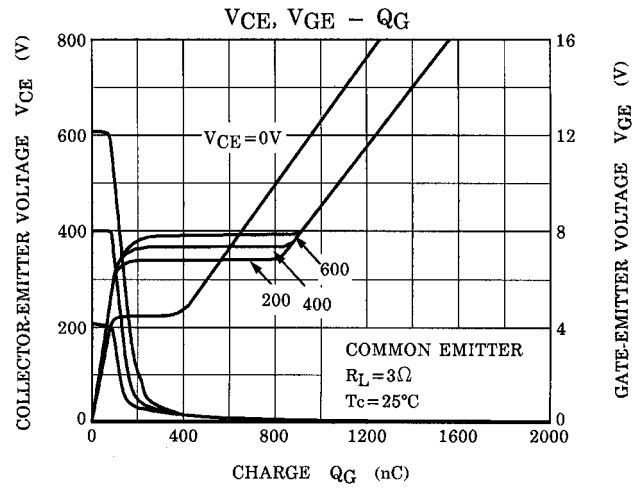
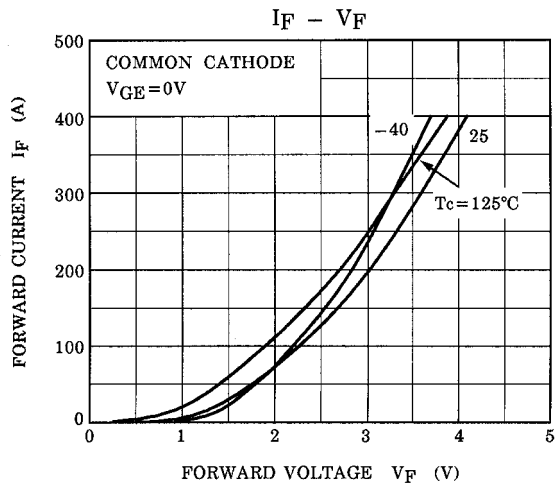
## Electrical Characteristics (Ta = 25°C)

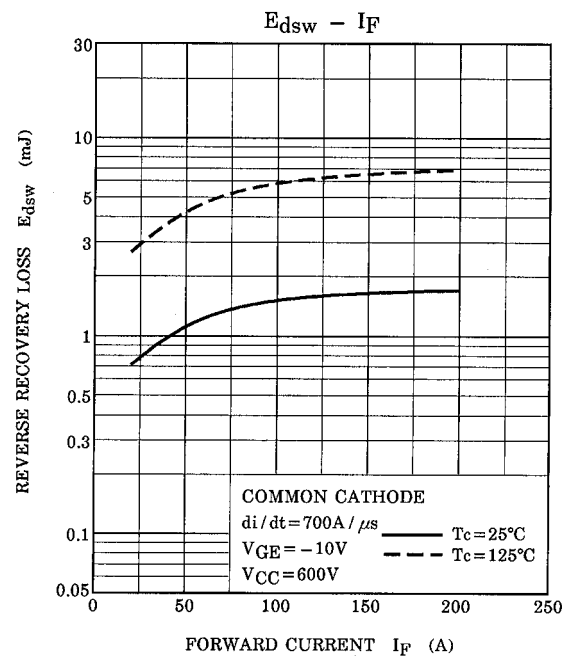
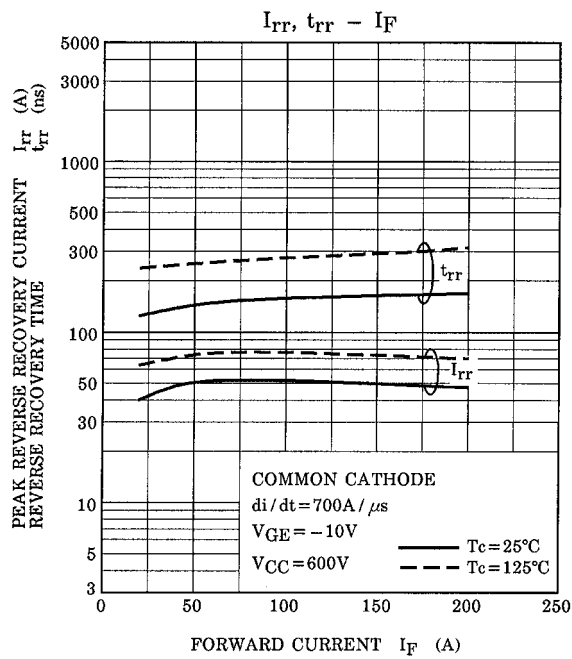
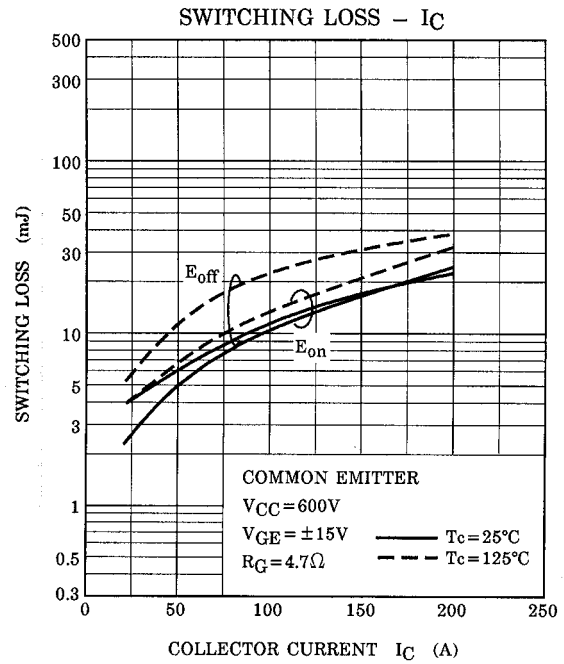
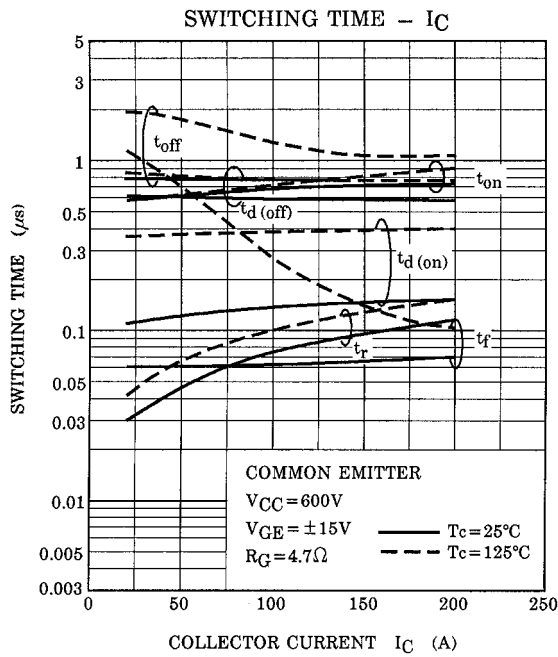
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		$I_{GES}$	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	$\pm 500$	nA
Collector cut-off current		$I_{CES}$	$V_{CE} = 1200V, V_{GE} = 0$	—	—	2.0	mA
Gate-emitter cut-off voltage		$V_{GE(off)}$	$I_C = 200mA, V_{CE} = 5V$	3.0	—	6.0	V
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 200A$ $V_{GE} = 15V$	—	2.8	3.6	V
			$T_J = 25^\circ C$ $T_J = 125^\circ C$	—	3.1	4.0	
Input capacitance		$C_{ies}$	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	21.0	—	nF
Switching time	Turn-on delay time	$t_{d(on)}$	Inductive load $V_{CC} = 600V$ $I_C = 200A$ $V_{GE} = \pm 15V$ $R_G = 4.7\Omega$ (Note 1)	—	0.05	—	$\mu s$
	Rise time	$t_r$		—	0.05	—	
	Turn-on time	$t_{on}$		—	0.2	—	
	Turn-off delay time	$t_{d(off)}$		—	0.5	—	
	Fall time	$t_f$		—	0.1	0.3	
	Turn-off time	$t_{off}$		—	0.6	—	
Forward voltage		$V_F$	$I_F = 200A, V_{GE} = 0$	—	2.4	3.5	V
Reverse recovery time		$t_{rr}$	$I_F = 200A, V_{GE} = -10V$ $di/dt = 700A/\mu s$ (Note 1)	—	0.1	0.25	$\mu s$
Thermal resistance		$R_{th(j-c)}$	Transistor stage	—	—	0.085	$^\circ C/W$
			Diode stage	—	—	0.24	

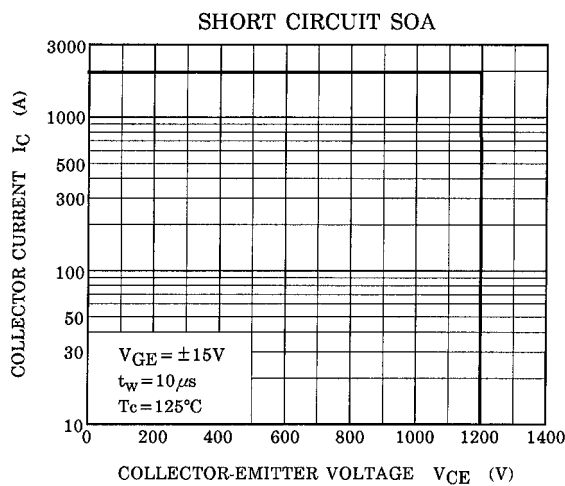
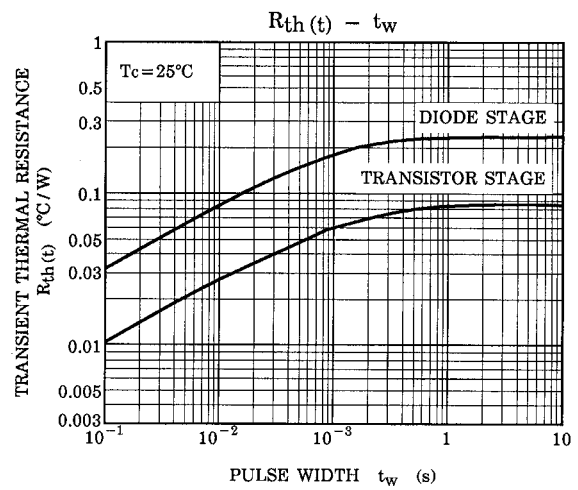
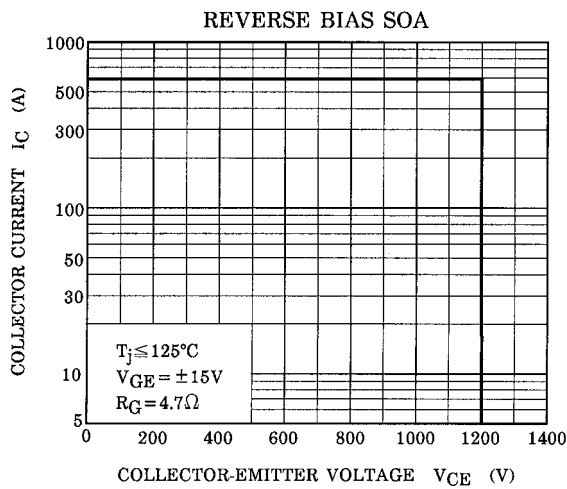
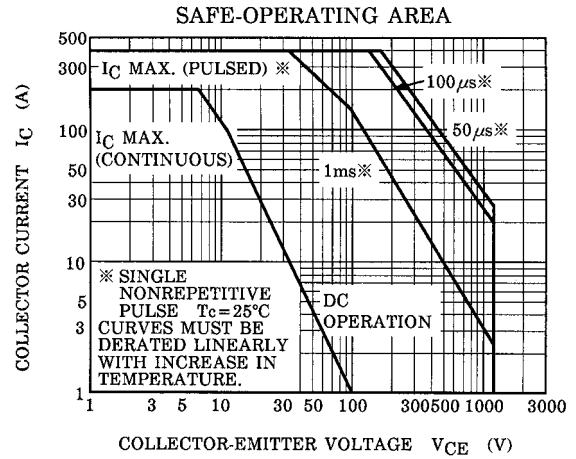
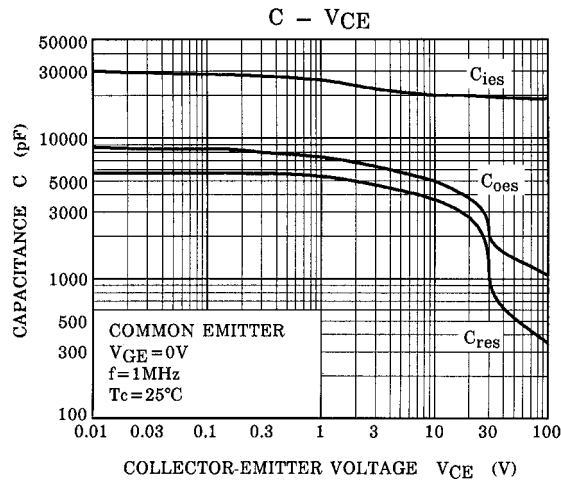
Note 1: Switching time and reverse recovery time test circuit & timing chart











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