

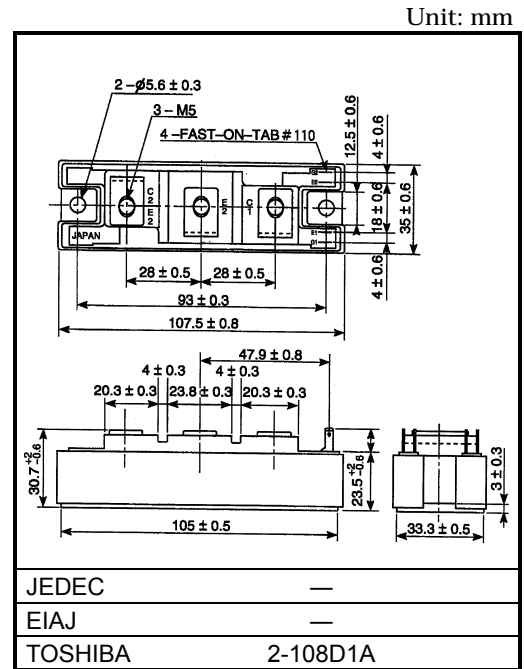
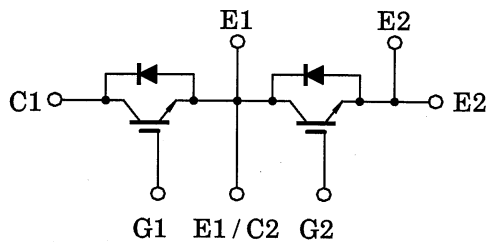
TOSHIBA GTR Module Silicon N Channel IGBT

# MG75Q2YS51

High Power Switching Applications  
 Motor Control Applications

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

### Equivalent Circuit



Weight: 240g

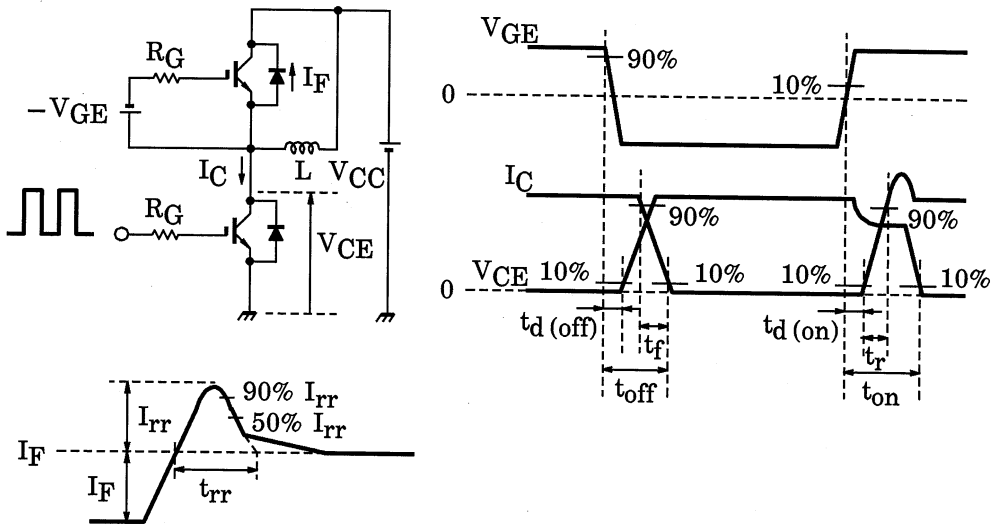
### Maximum Ratings (Ta = 25°C)

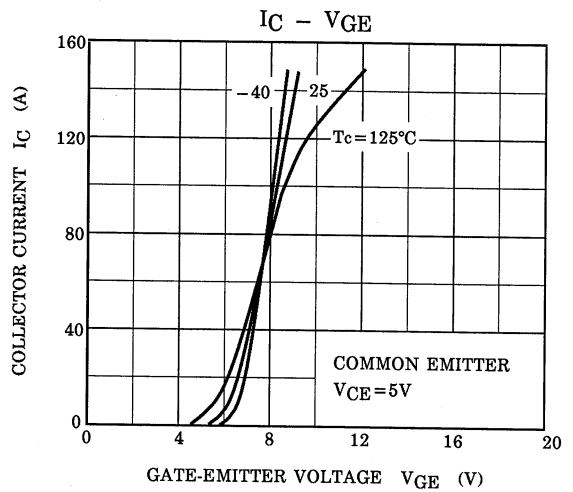
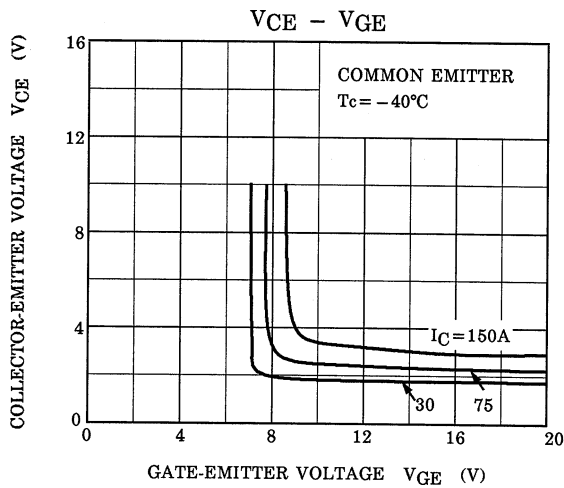
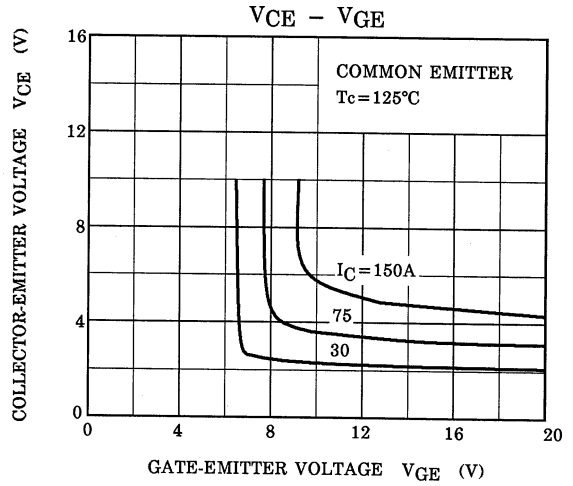
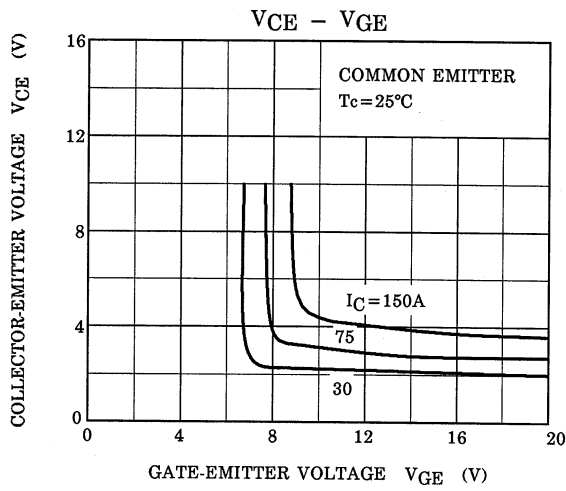
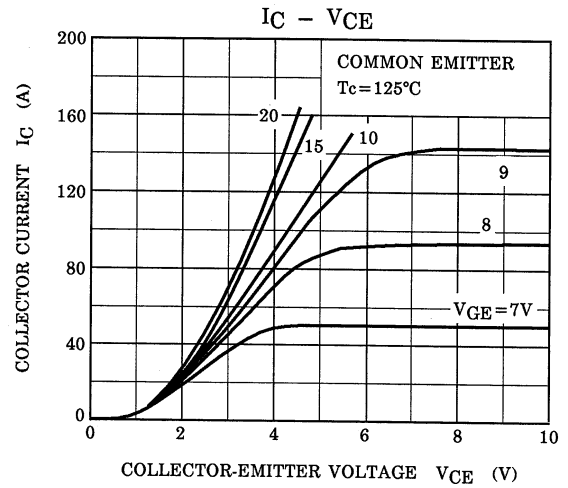
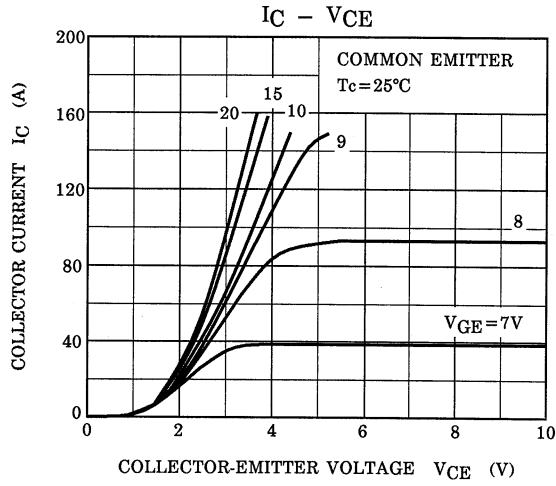
Characteristic	Symbol	Rating	Unit	
Collector-emitter voltage	$V_{CES}$	1200	V	
Gate-emitter voltage	$V_{GES}$	$\pm 20$	V	
Collector current	DC	$I_C$ (25°C / 80°C)	100 / 75	A
	1ms	$I_{CP}$ (25°C / 80°C)	200 / 150	
Forward current	DC	$I_F$	75	A
	1ms	$I_{FM}$	150	
Collector power dissipation (Tc = 25°C)	$P_C$	600	W	
Junction temperature	$T_j$	150	°C	
Storage temperature range	$T_{stg}$	-40 ~ 125	°C	
Isolation voltage	$V_{Isol}$	2500 (AC 1minute)	V	
Screw torque (Terminal / mounting)	—	3 / 3	N·m	

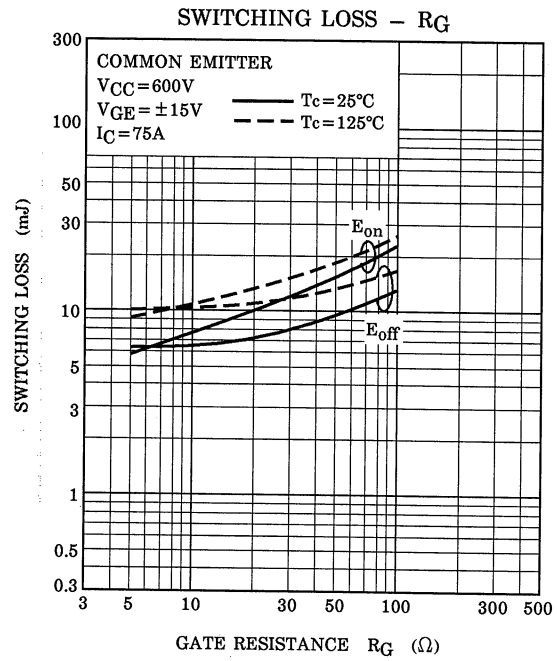
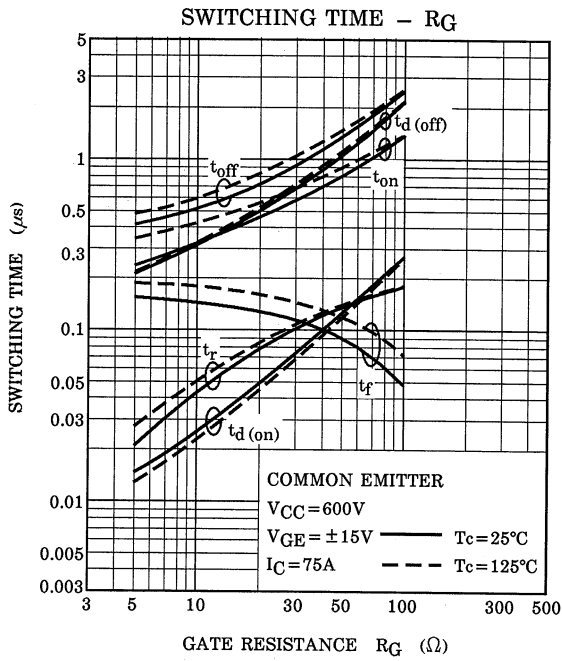
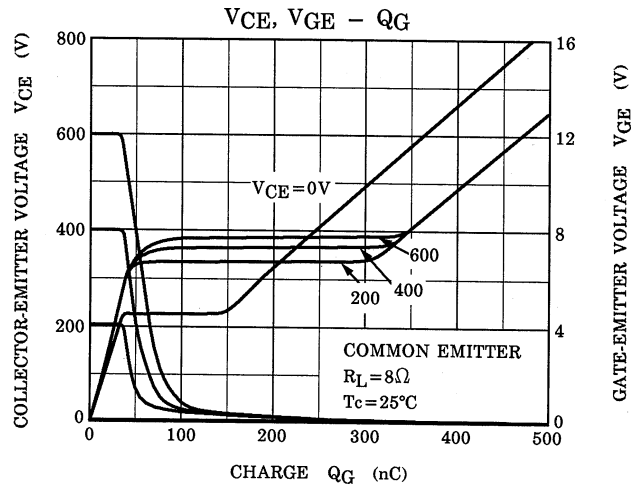
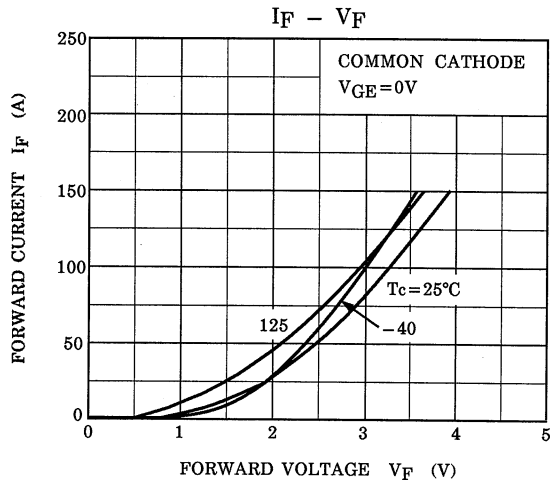
## Electrical Characteristics (Ta = 25°C)

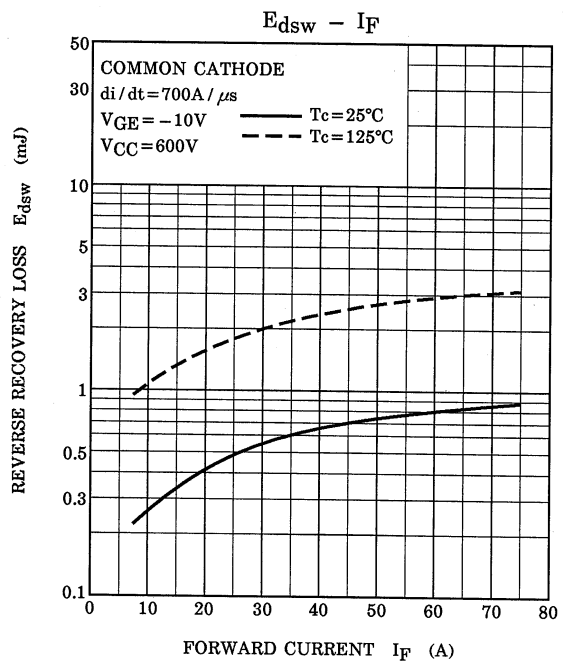
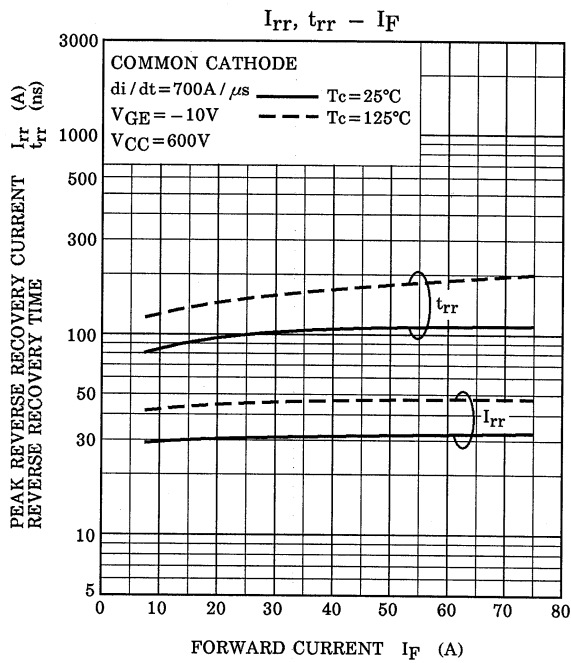
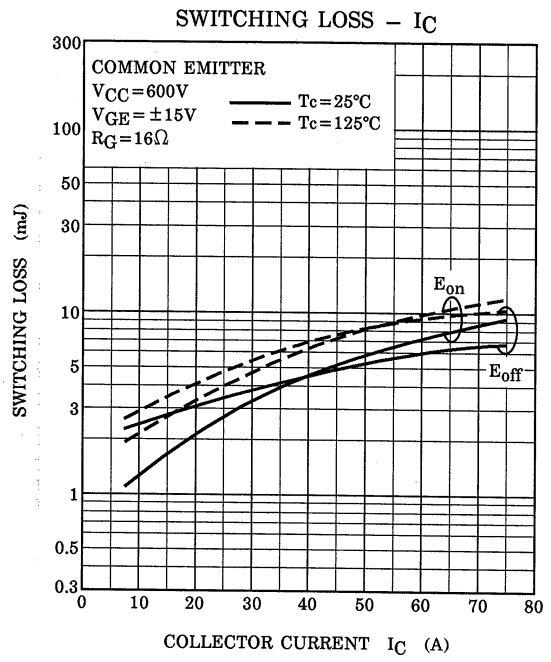
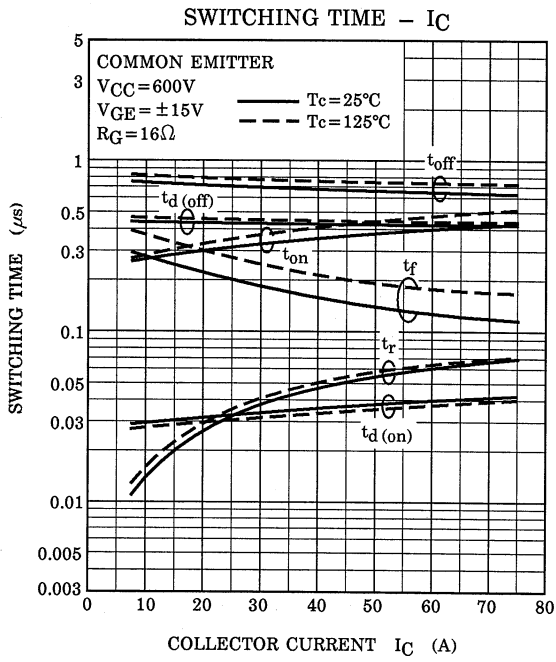
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current	$I_{GES}$	$V_{GE} = \pm 20 \text{ V}, V_{CE} = 0$	—	—	$\pm 500$	nA	
Collector cut-off current	$I_{CES}$	$V_{CE} = 1200 \text{ V}, V_{GE} = 0$	—	—	1.0	mA	
Gate-emitter cut-off voltage	$V_{GE (off)}$	$I_C = 75 \text{ mA}, V_{CE} = 5 \text{ V}$	3.0	—	6.0	V	
Collector-emitter saturation voltage	$V_{CE (sat)}$	$I_C = 75 \text{ A}, V_{GE} = 15 \text{ V}$	$T_j = 25^\circ\text{C}$	—	2.8	3.6	V
			$T_j = 125^\circ\text{C}$	—	3.1	4.0	
Input capacitance	$C_{ies}$	$V_{CE} = 10 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$	—	8.5	—	nF	
Switching time	Turn-on delay time	$t_{d (on)}$	—	0.05	—	$\mu\text{s}$	
	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	—		
	Turn-off time	$t_{off}$	—	0.6	—		
Forward voltage	$V_F$	$I_F = 75 \text{ A}, V_{GE} = 0$	—	2.4	3.5	V	
Reverse recovery time	$t_{rr}$	$I_F = 75 \text{ A}, V_{GE} = -10 \text{ V}$ $di / dt = 700 \text{ A} / \mu\text{s}$ (Note 1)	—	0.1	0.25	$\mu\text{s}$	
Thermal resistance	$R_{th (j-c)}$	Transistor stage	—	—	0.2	$^\circ\text{C} / \text{W}$	
		Diode stage	—	—	0.47		

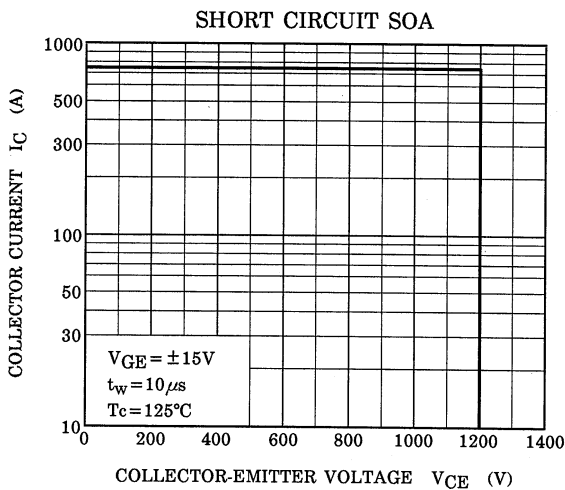
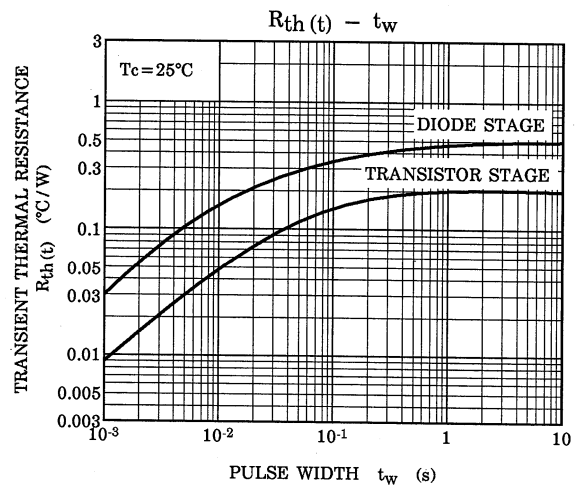
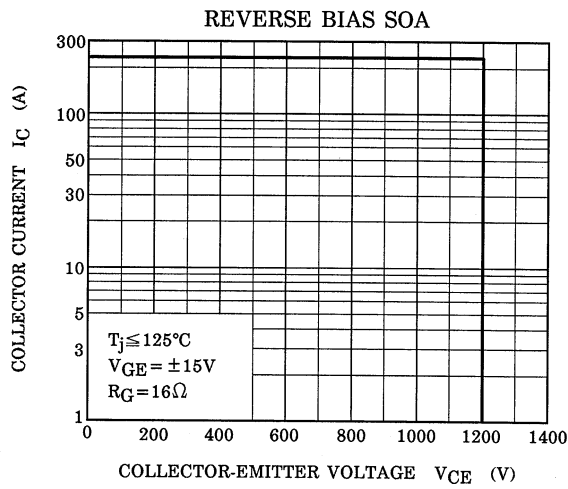
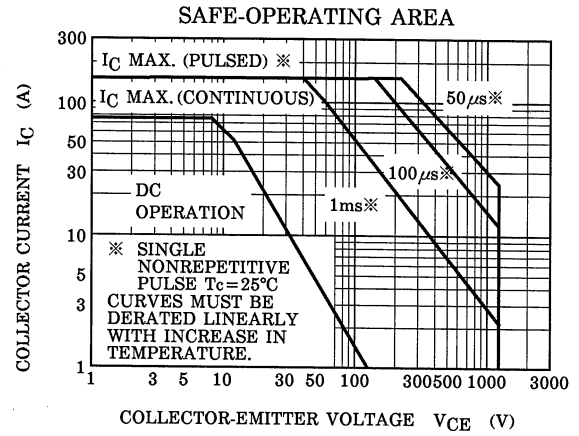
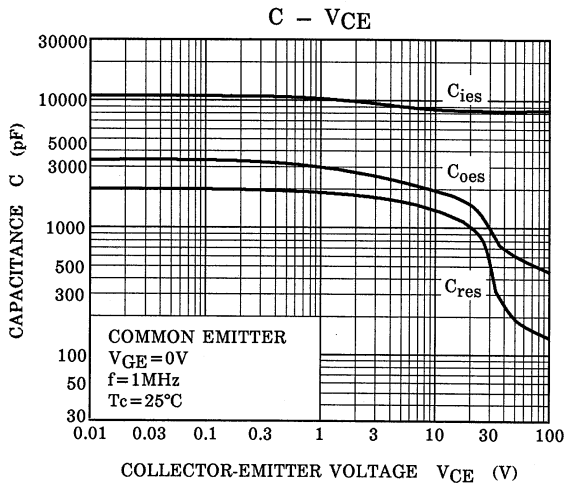
Note 1: Switching time and reverse recovery time test circuit & timing chart











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