

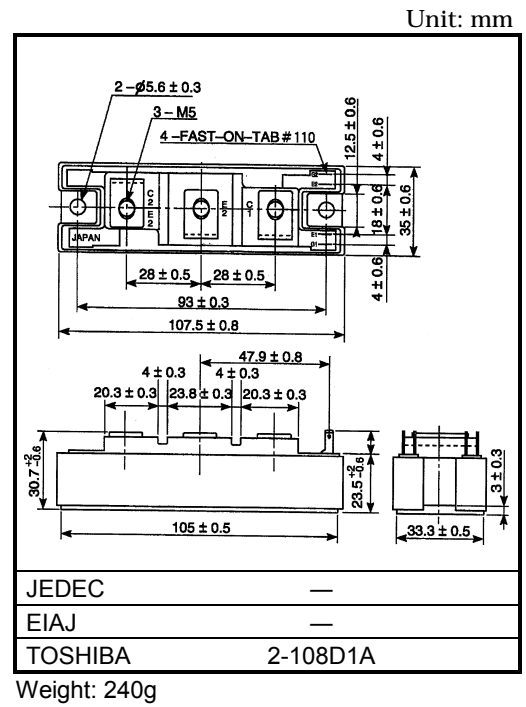
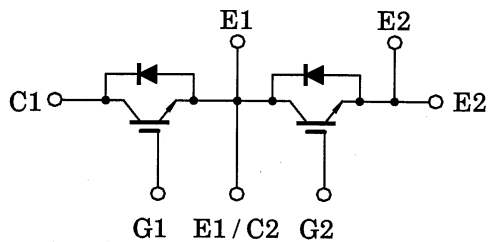
TOSHIBA GTR Module Silicon N Channel IGBT

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



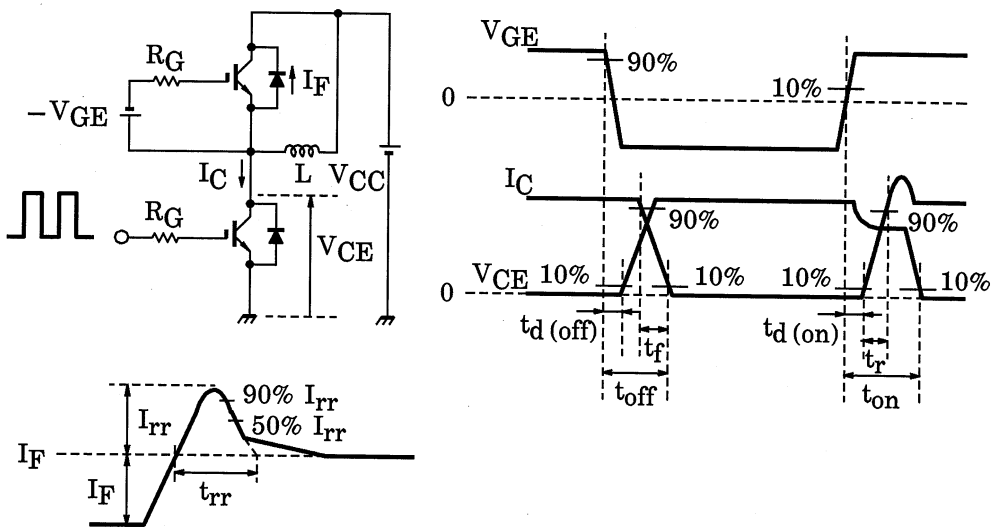
Maximum Ratings (Ta = 25°C)

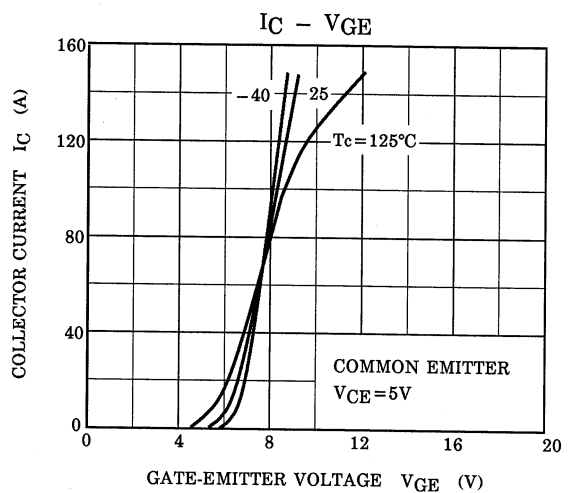
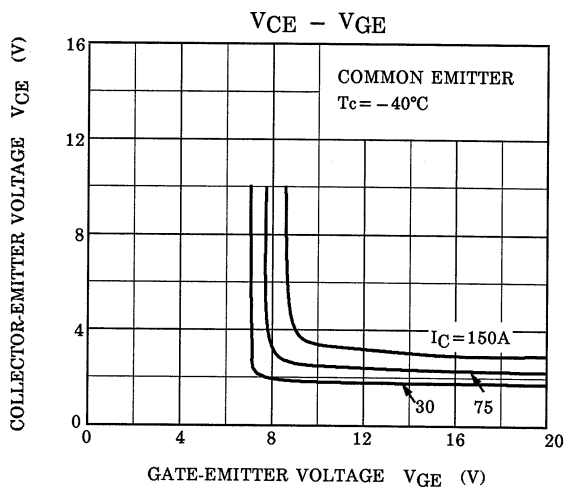
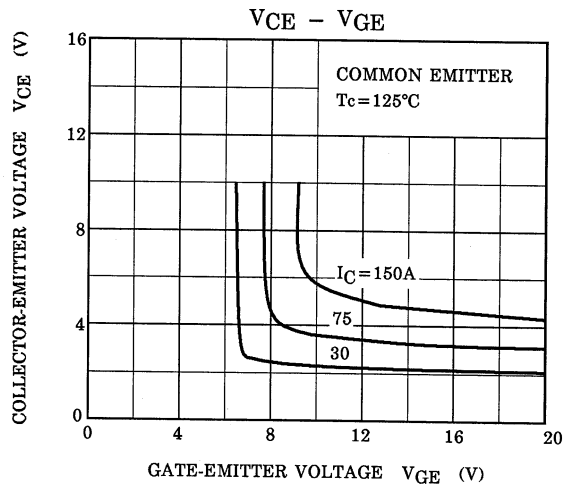
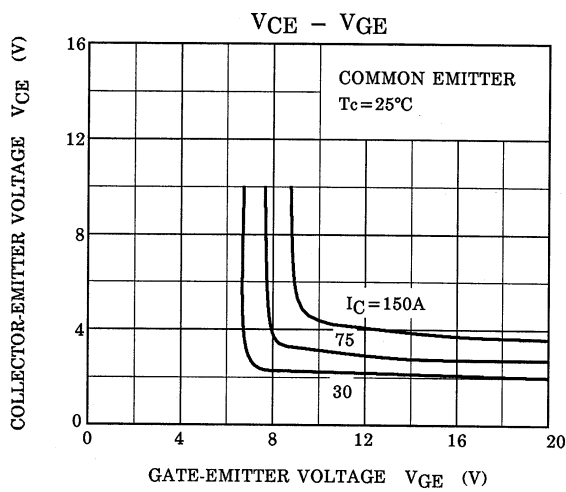
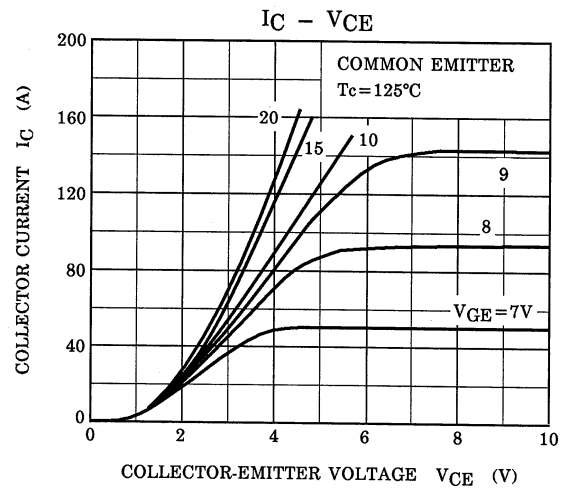
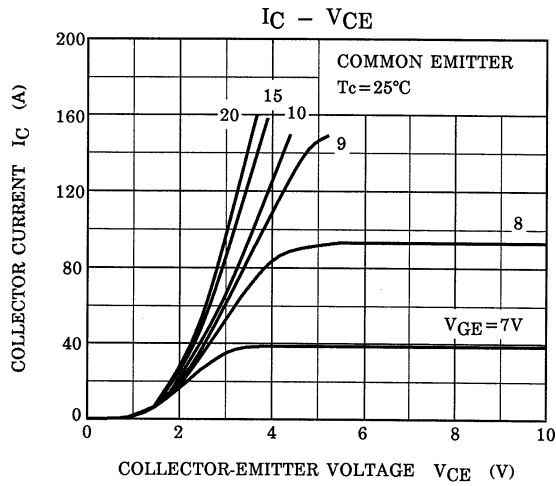
Characteristic	Symbol	Rating	Unit
Collector-emitter voltage	V_{CES}	1200	V
Gate-emitter voltage	V_{GES}	± 20	V
Collector current	DC	I_C (25°C / 80°C)	100 / 75
	1ms	I_{CP} (25°C / 80°C)	200 / 150
Forward current	DC	I_F	75
	1ms	I_{FM}	150
Collector power dissipation (Tc = 25°C)	P_C	600	W
Junction temperature	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

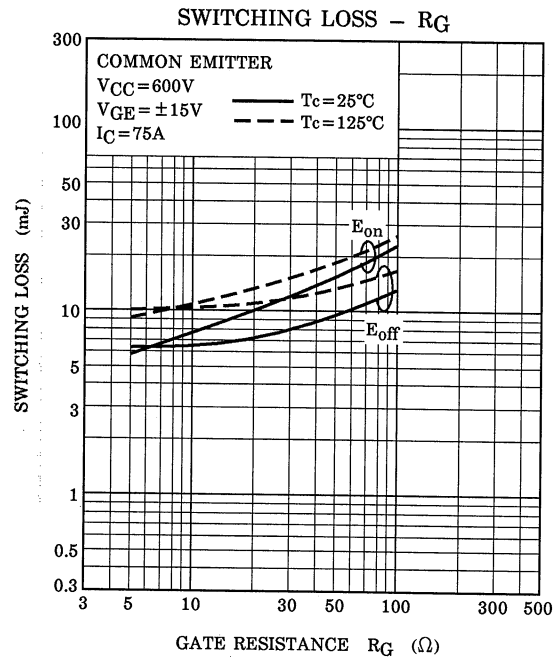
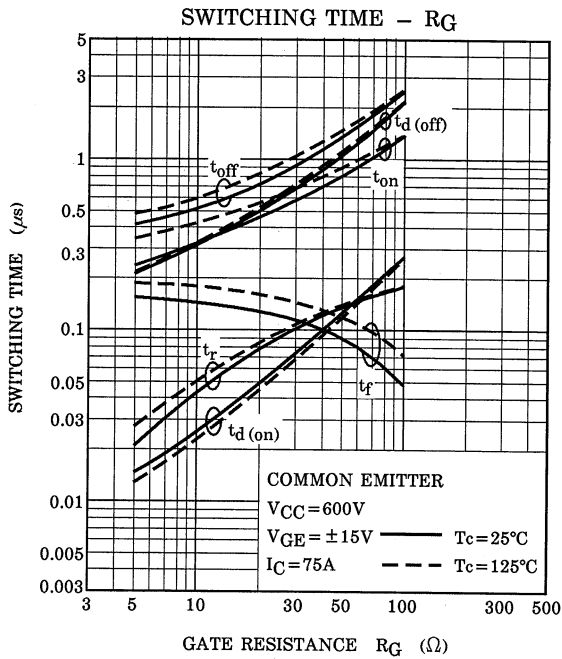
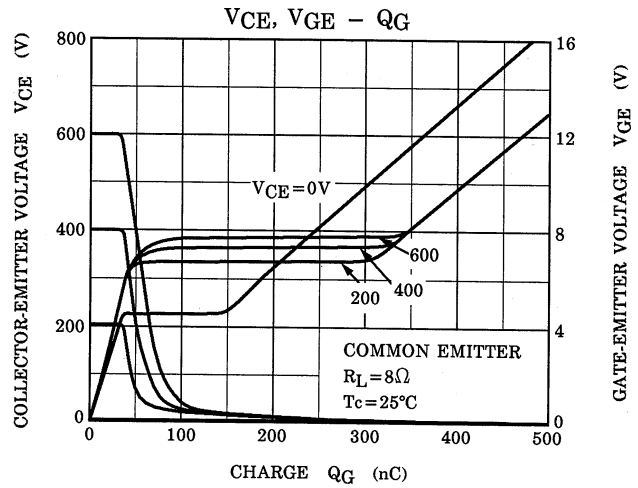
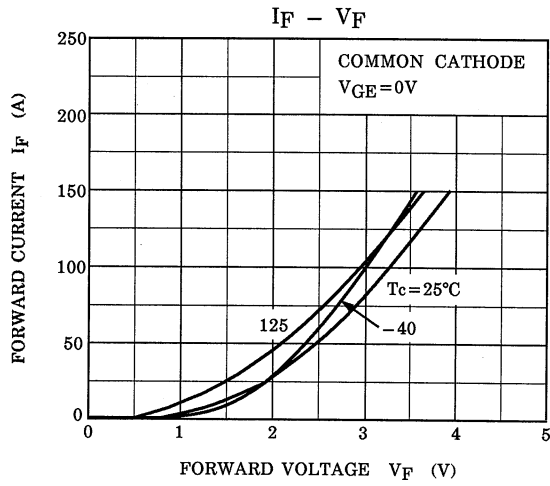
Electrical Characteristics (Ta = 25°C)

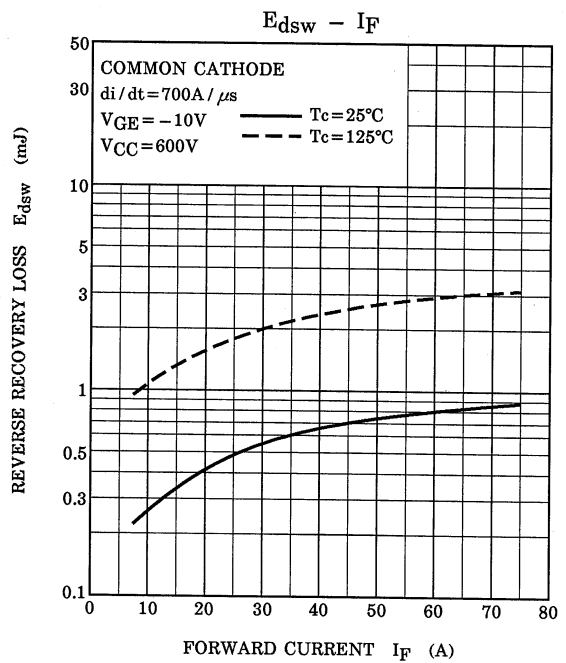
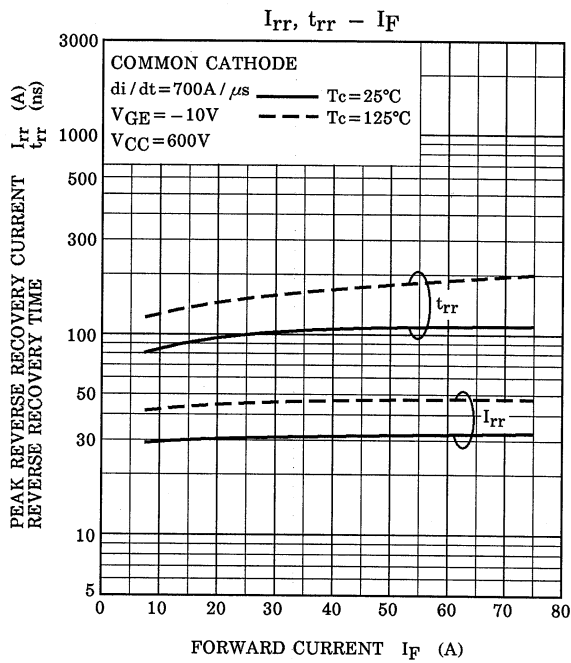
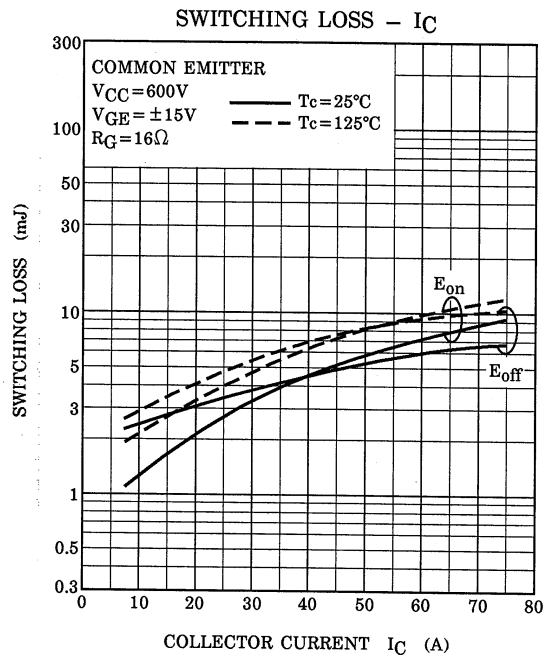
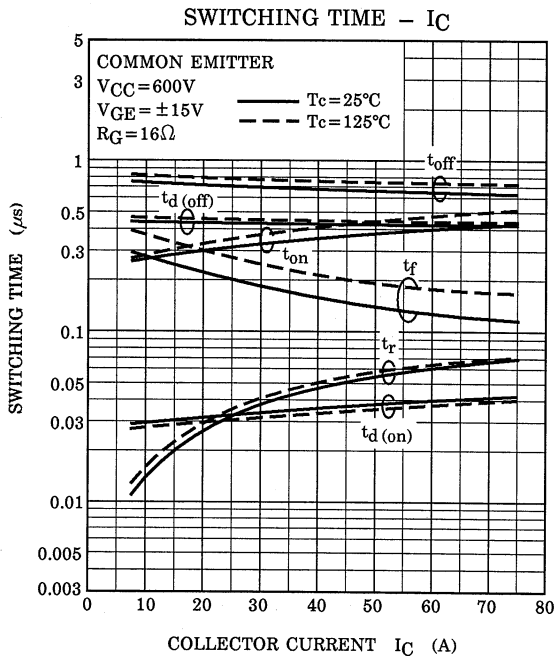
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current	I_{GES}	$V_{GE} = \pm 20 \text{ V}, V_{CE} = 0$	—	—	± 500	nA	
Collector cut-off current	I_{CES}	$V_{CE} = 1200 \text{ V}, V_{GE} = 0$	—	—	1.0	mA	
Gate-emitter cut-off voltage	$V_{GE (off)}$	$I_C = 75 \text{ mA}, V_{CE} = 5 \text{ V}$	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	—	μs	
	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	—		
		(Note 1)					
Forward voltage	V_F	$I_F = 75 \text{ A}, V_{GE} = 0$	—	2.4	3.5	V	
Reverse recovery time	t_{rr}	$I_F = 75 \text{ A}, V_{GE} = -10 \text{ V}$ $di / dt = 700 \text{ A} / \mu\text{s}$	—	0.1	0.25	μs	
Thermal resistance	$R_{th (j-c)}$	Transistor stage	—	—	0.2	$^\circ\text{C} / \text{W}$	
		Diode stage	—	—	0.47		

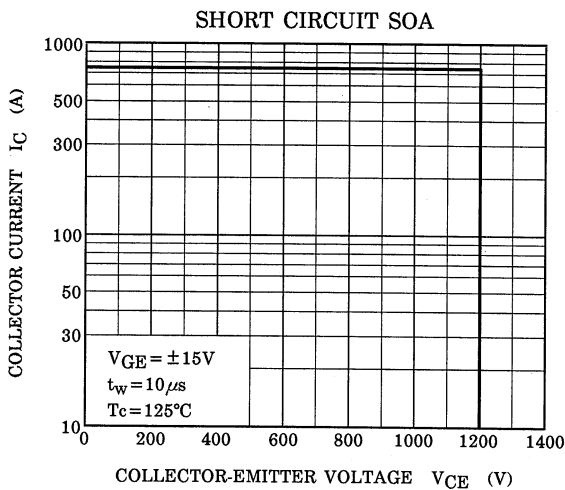
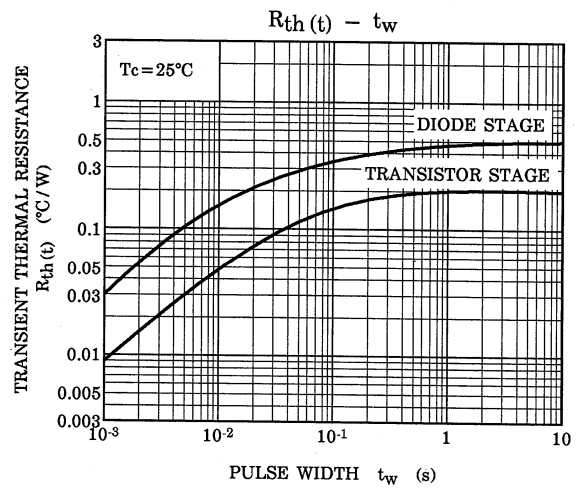
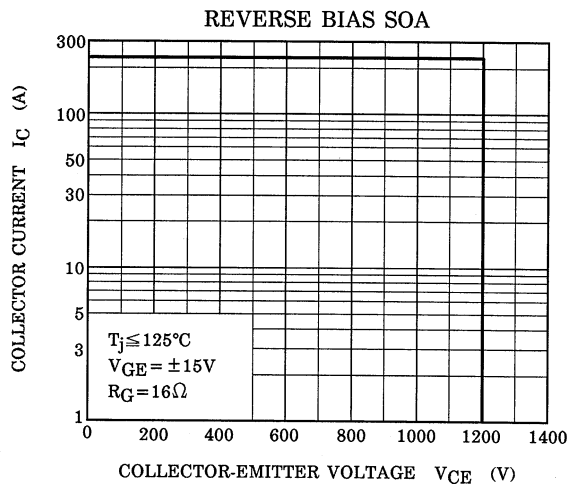
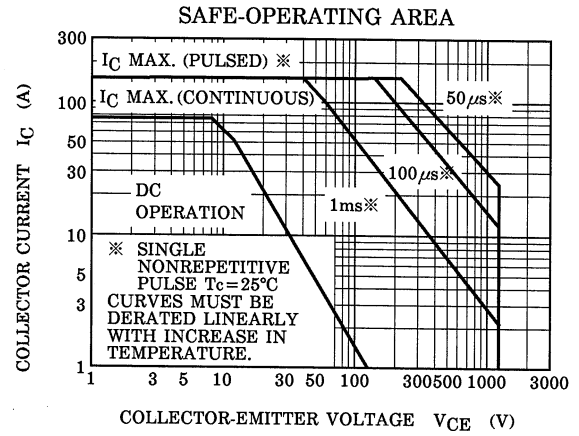
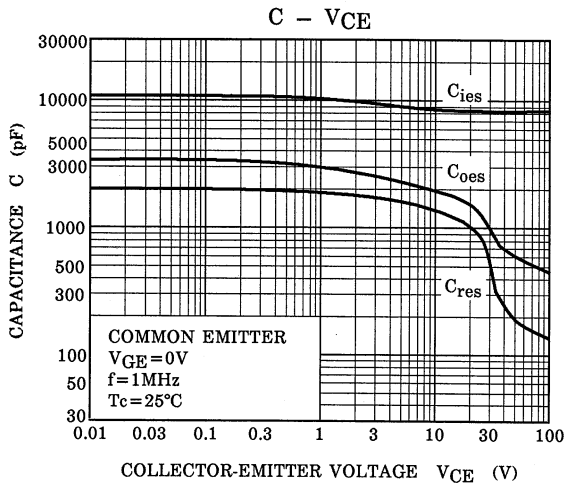
Note 1: Switching time and reverse recovery time test circuit & timing chart











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