

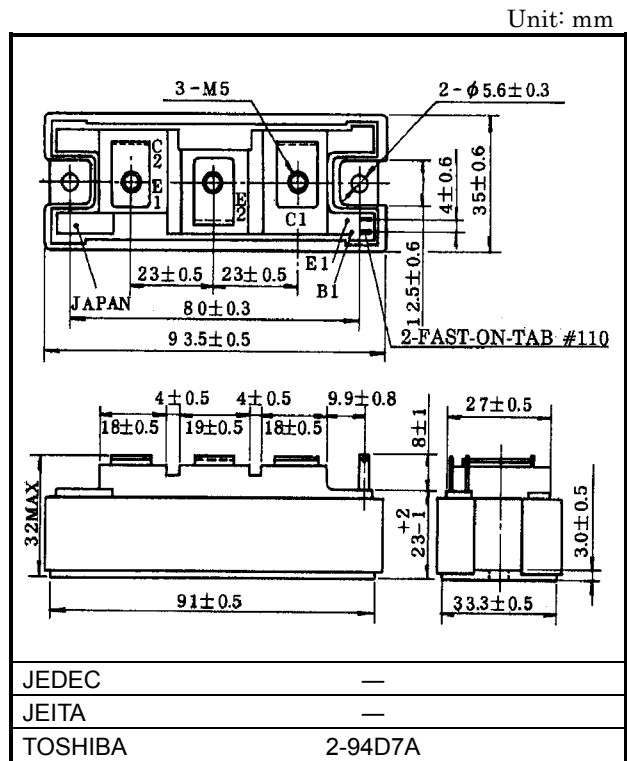
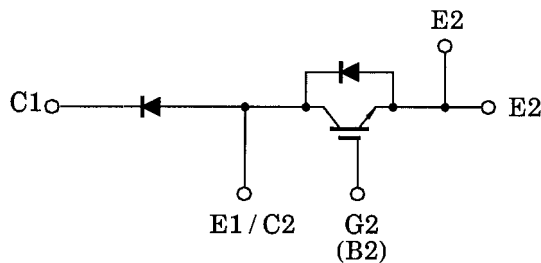
TOSHIBA GTR Module Silicon N Channel IGBT

# MG75Q1ZS50

High Power Switching Applications  
Motor Control Applications

- High input impedance
- High speed :  $t_f = 0.3 \mu s$  (max)  
@inductive load
- Low saturation voltage  
:  $V_{CE(sat)} = 3.6 V$  (max)
- Enhancement-mode
- The electrodes are isolated from case

## Equivalent Circuit



Weight: 202g

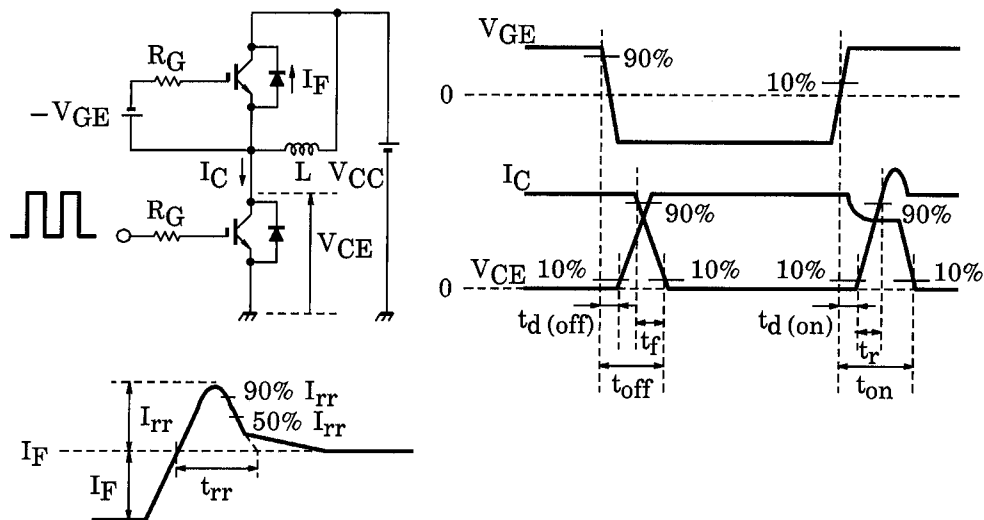
## Maximum Ratings (Ta = 25°C)

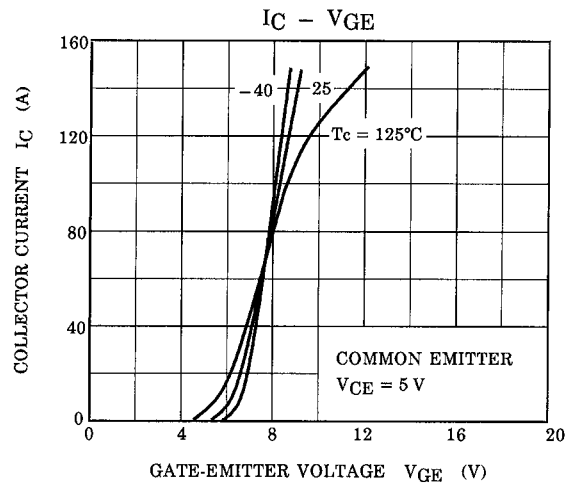
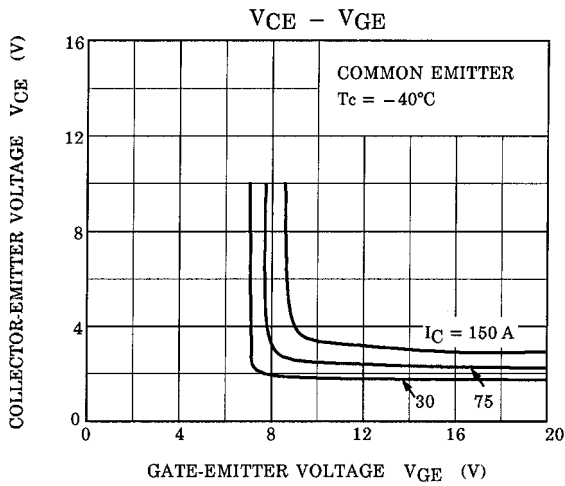
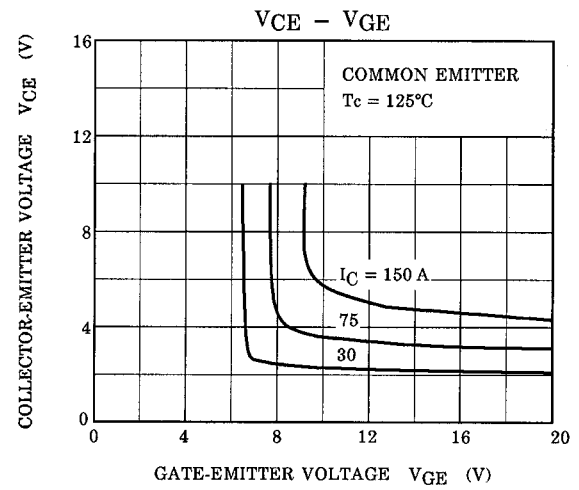
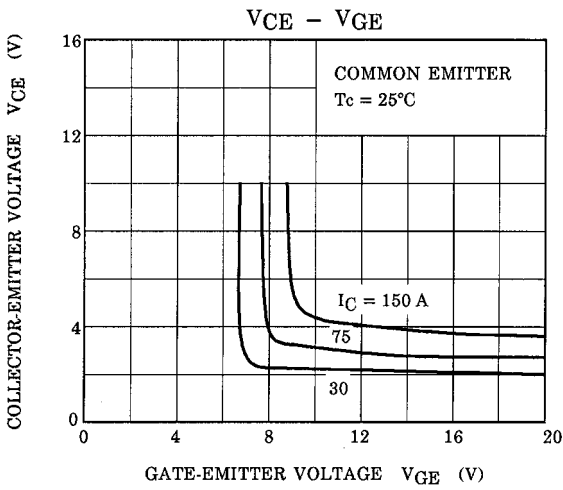
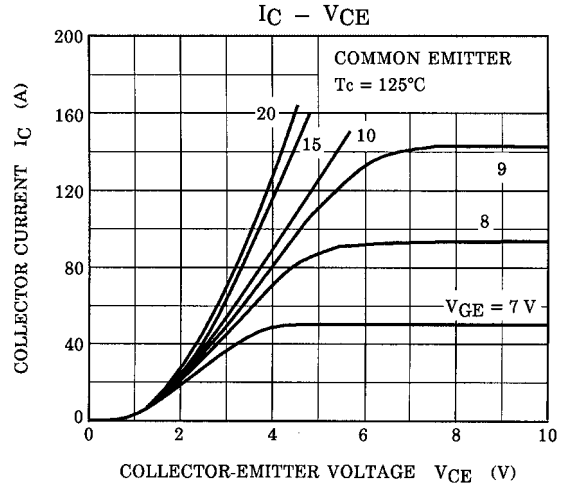
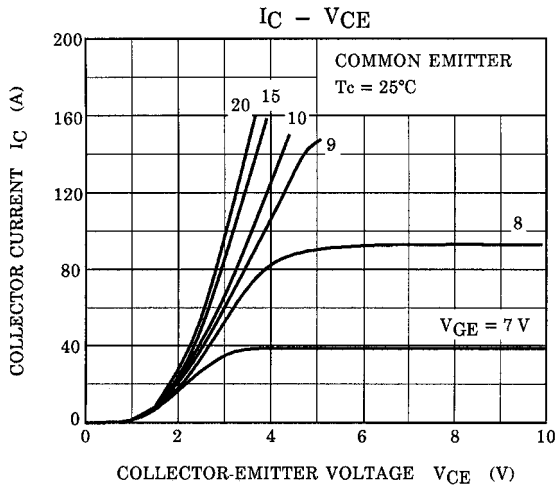
Characteristics		Symbol	Rating	Unit
Collector-emitter voltage		$V_{CES}$	1200	V
Gate-emitter voltage		$V_{GES}$	±20	V
Reverse voltage		$V_R$	1200	V
Collector current	DC	$I_C$ (25°C / 80°C)	100 / 75	A
	1ms	$I_{CP}$ (25°C / 80°C)	200 / 150	
Forward current	DC	$I_F$	75	A
	1ms	$I_{FM}$	150	
Collector power 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 1 minute)	V
Screw torque (Terminal / mounting)		—	3 / 3	N·m

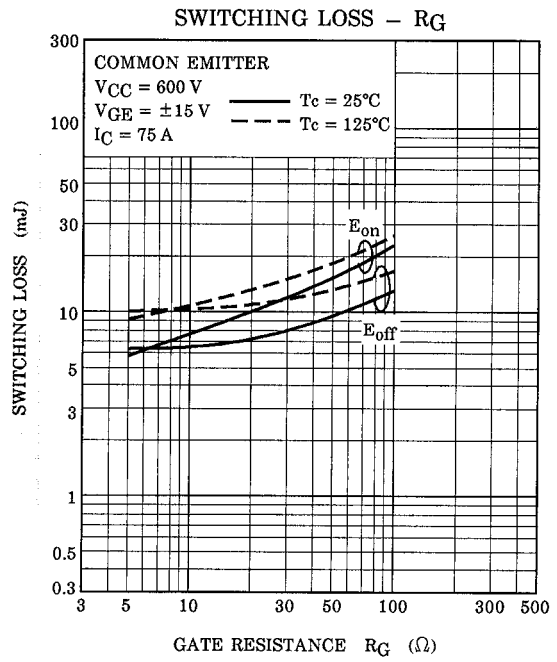
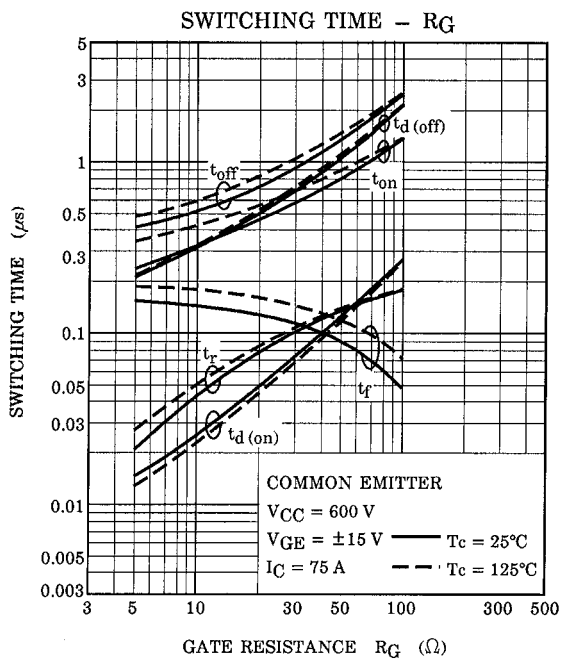
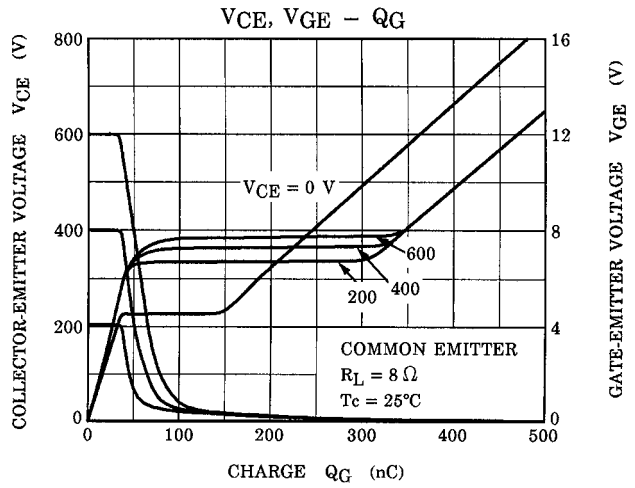
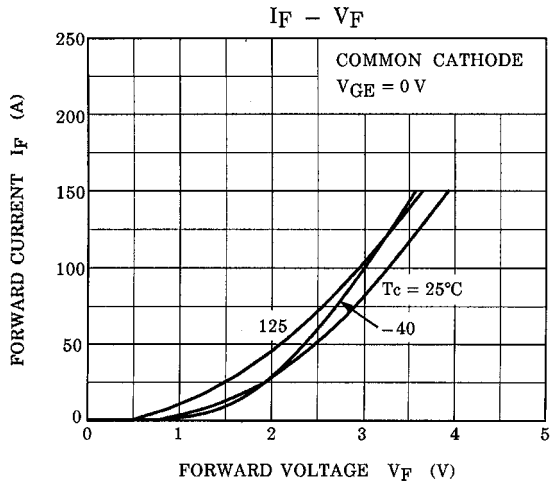
## Electrical Characteristics (Ta = 25°C)

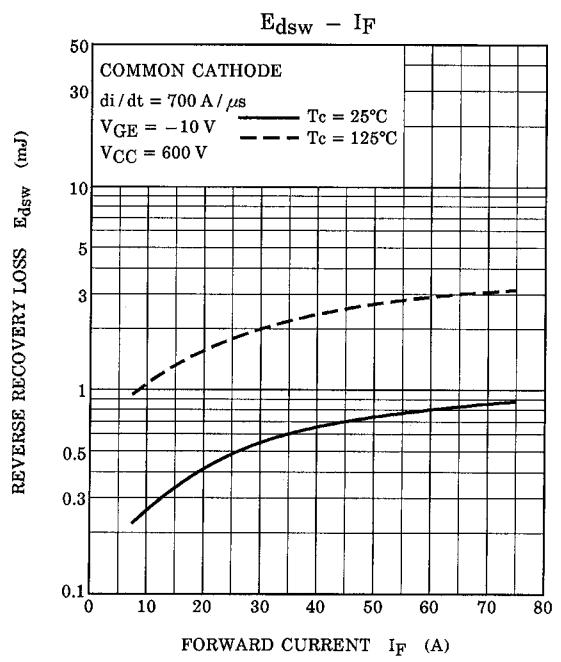
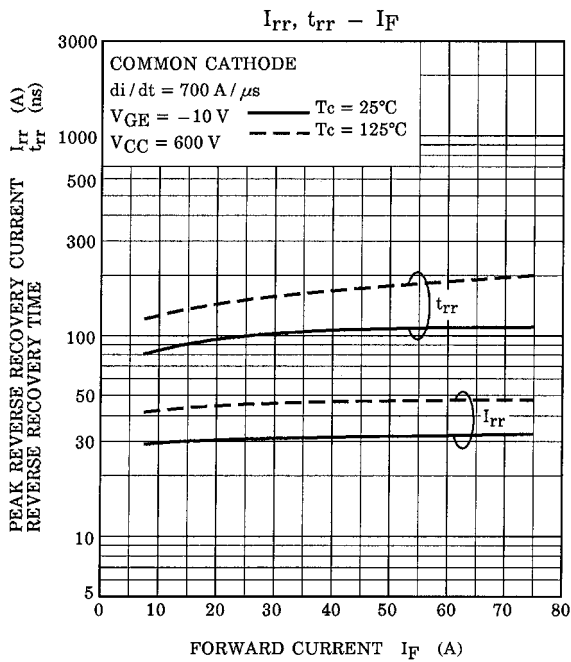
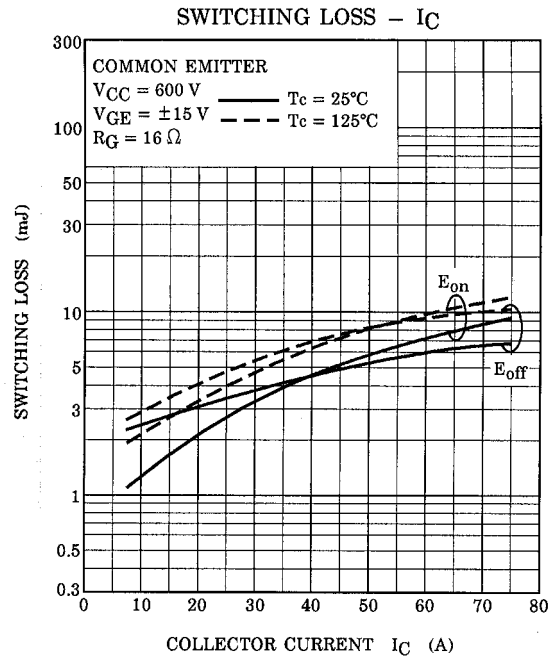
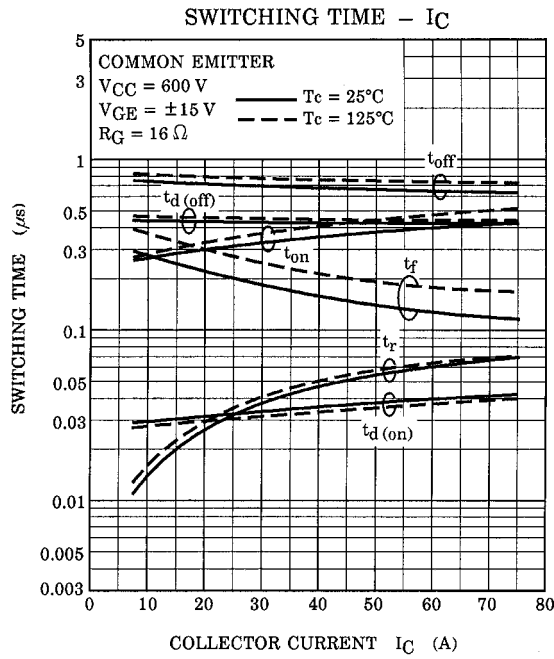
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current		$I_{GES}$	$V_{GE} = \pm 20\text{ V}, V_{CE} = 0$	—	—	$\pm 500$	nA	
Collector cut-off current		$I_{CES}$	$V_{CE} = 1200\text{ V}, V_{GE} = 0$	—	—	1.0	mA	
Gate-emitter cut-off voltage		$V_{GE (off)}$	$I_C = 75\text{ mA}, V_{CE} = 5\text{ V}$	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	$t_{d (on)}$	Inductive load $V_{CC} = 600\text{ V}$ $I_C = 75\text{ A}$ $V_{GE} = \pm 15\text{ V}$ $R_G = 16\ \Omega$	(Note 1)	—	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	0.3	
	Turn-off time	$t_{off}$			—	0.6	—	
Reverse current		$I_R$	$V_R = 1200\text{ V}$	—	—	1.0	mA	
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		

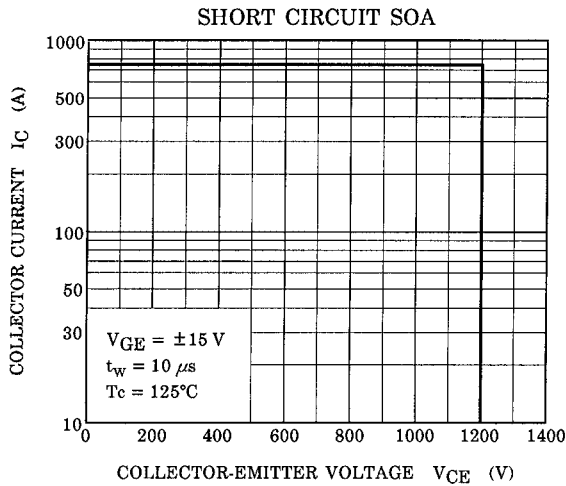
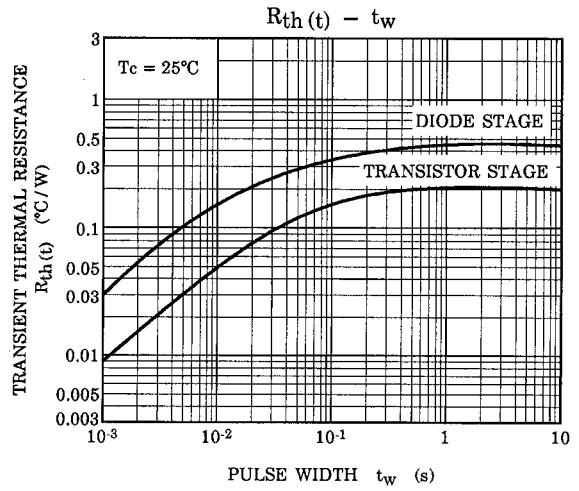
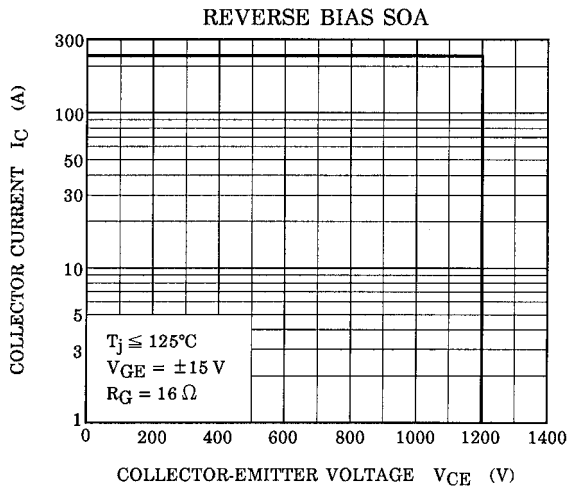
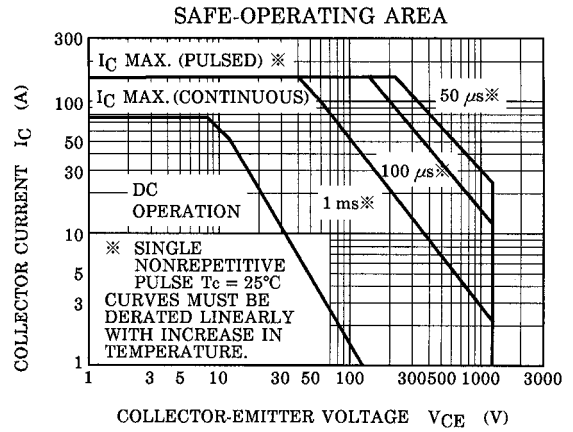
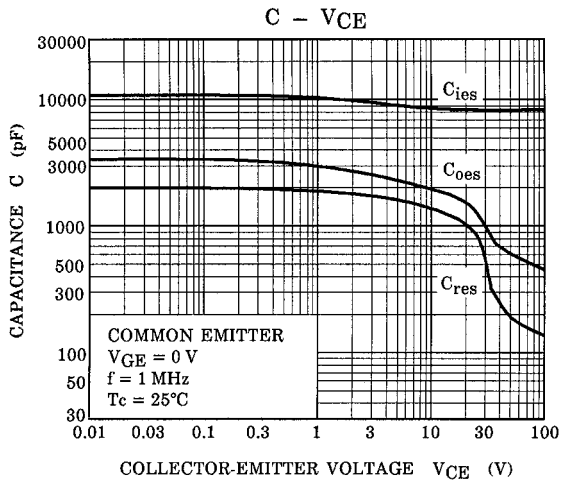
Note 1: Switching time and reverse recovery time test circuit & timing chart











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