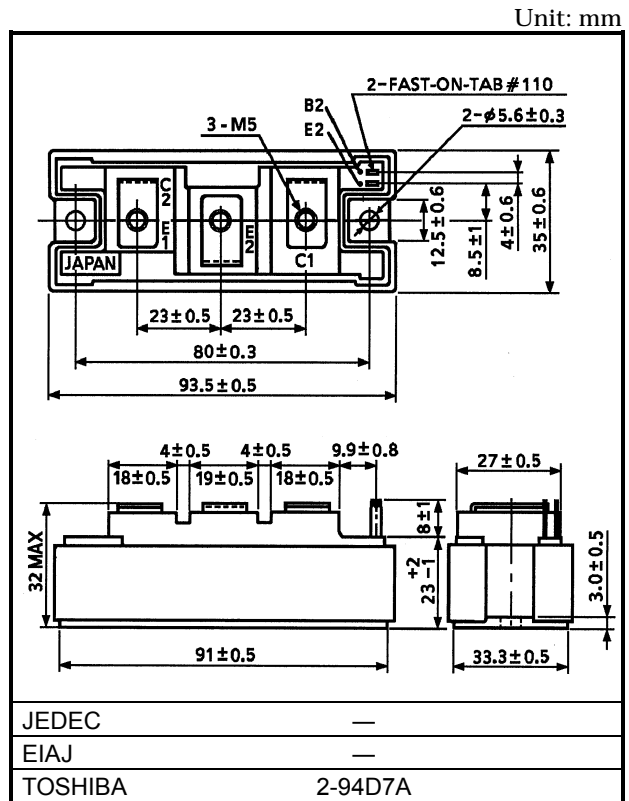
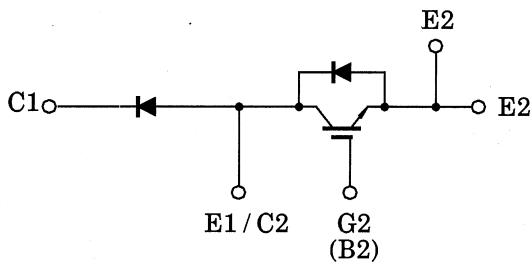


MG50Q1ZS50

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

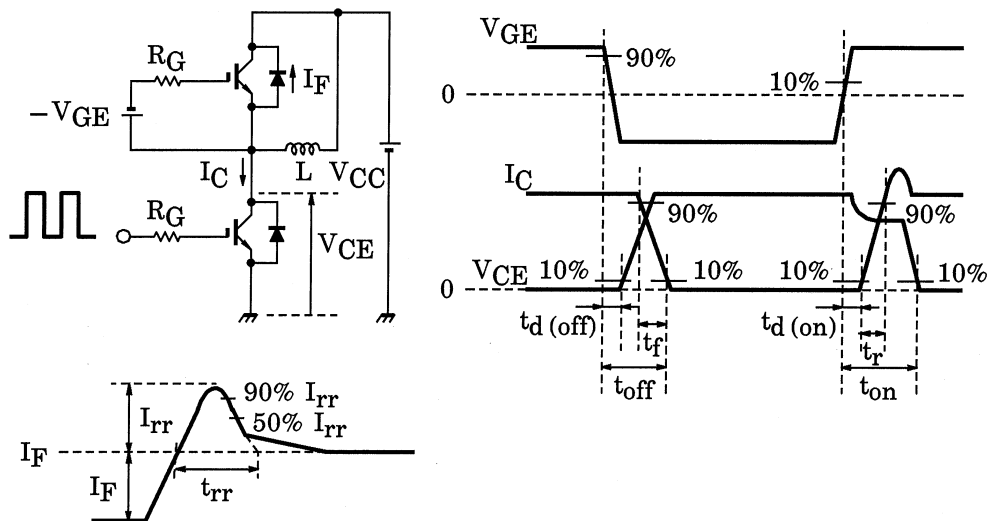
Maximum Ratings (Ta = 25°C)

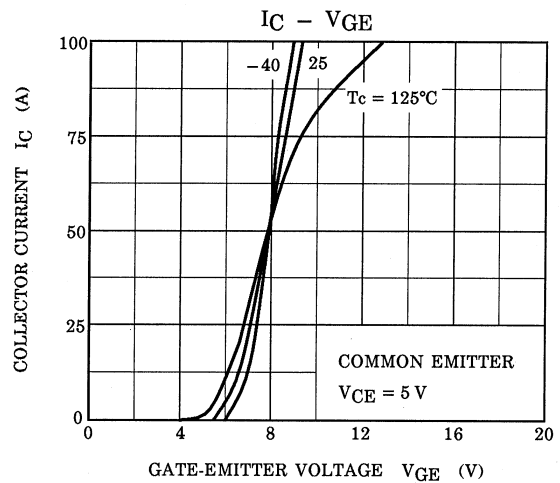
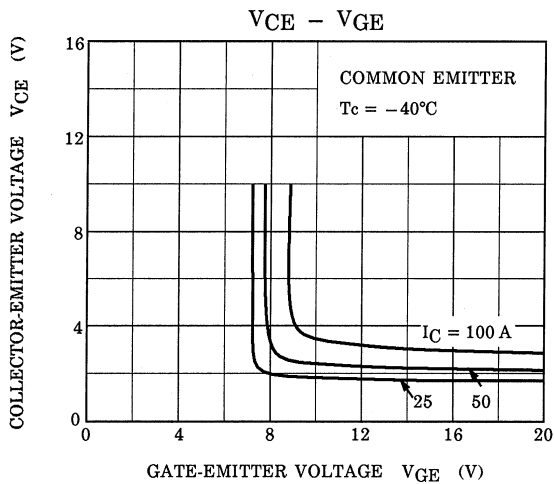
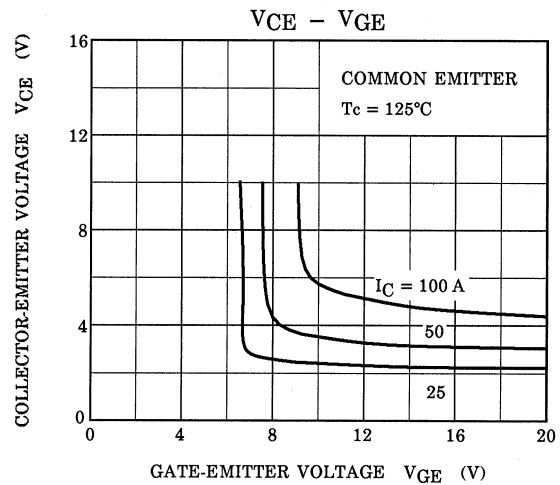
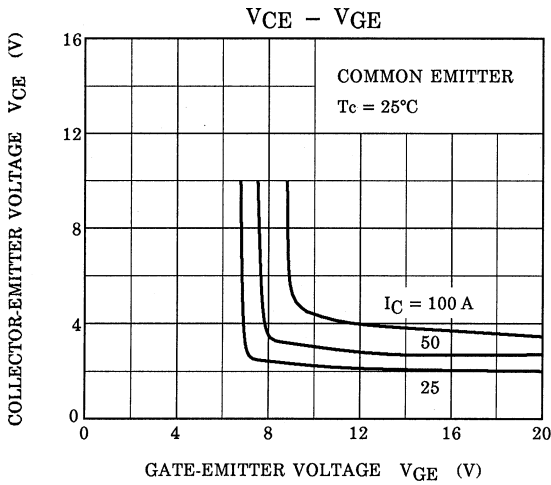
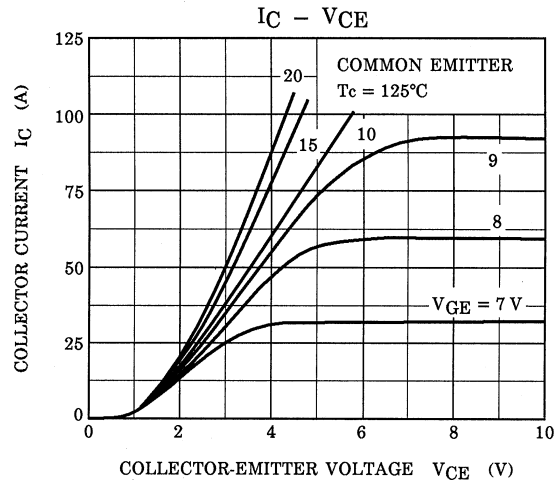
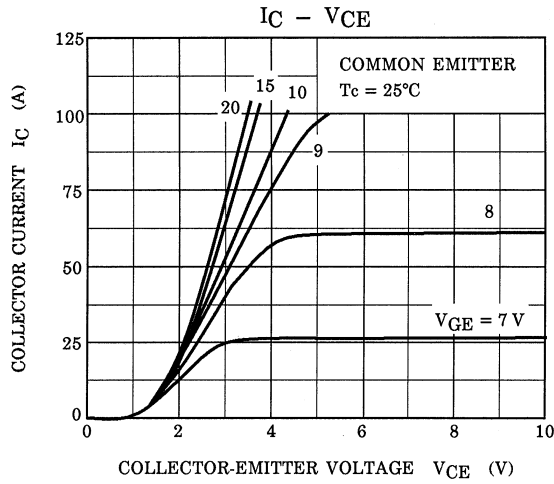
Characteristic	Symbol	Rating	Unit	
Collector-emitter voltage	V_{CES}	1200	V	
Gate-emitter voltage	V_{GES}	±20	V	
Collector current	DC	I_C (25°C / 80°C)	78 / 50	A
	1ms	I_{CP} (25°C / 80°C)	156 / 100	
Forward current	DC	I_F	50	A
	1ms	I_{FM}	100	
Collector power dissipation (Tc = 25°C)	P_C	400	W	
Junction 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	

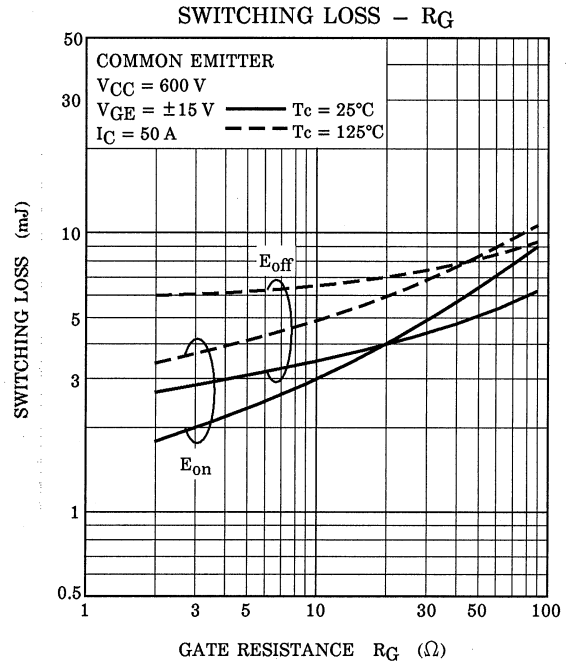
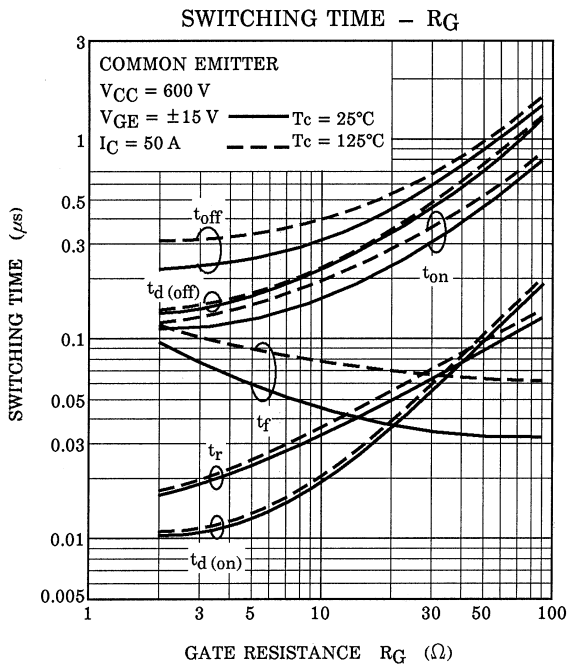
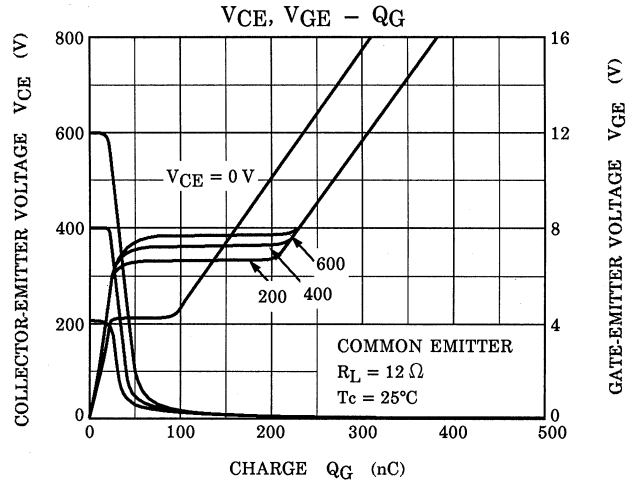
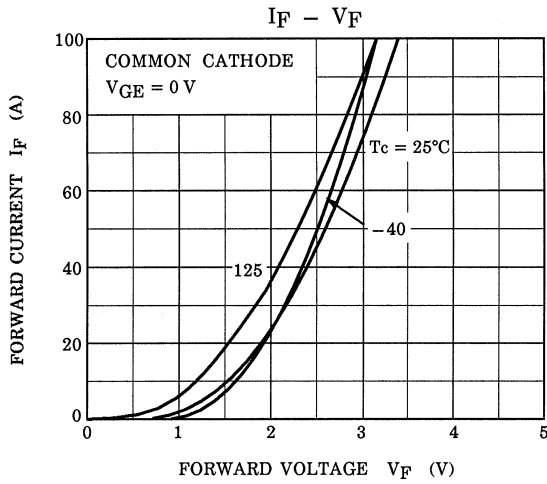
Electrical Characteristics (Ta = 25°C)

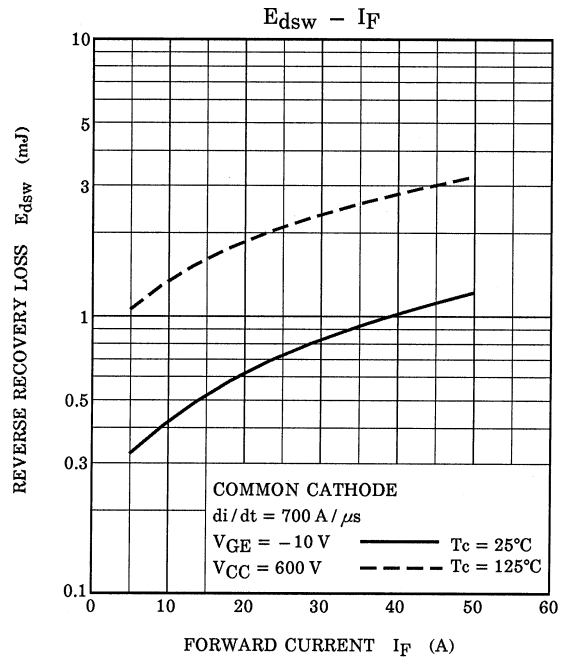
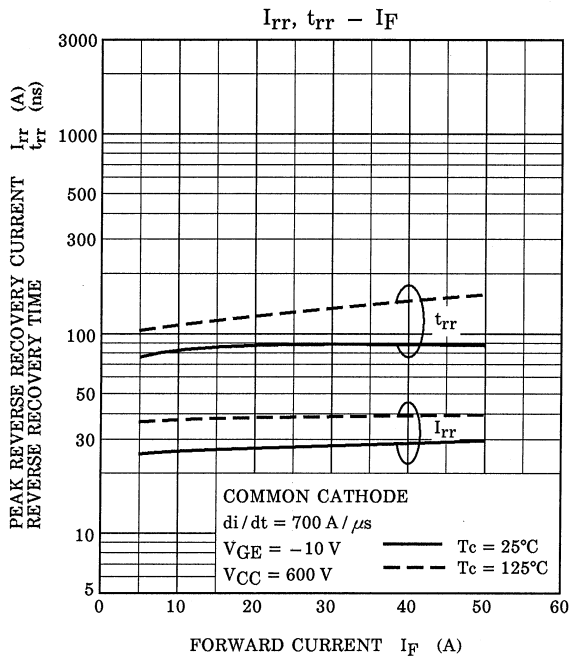
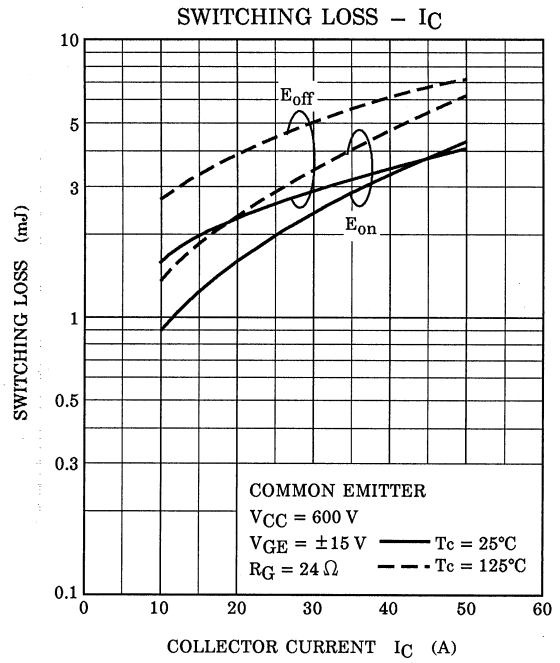
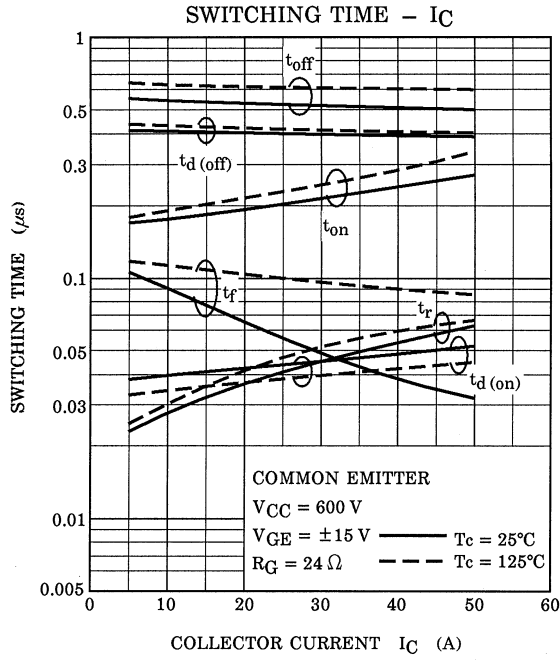
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current		I_{GES}	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	± 500	nA	
Collector cut-off current		I_{CES}	$V_{CE} = 1200V, V_{GE} = 0$	—	—	1.0	mA	
Gate-emitter cut-off voltage		$V_{GE (off)}$	$I_C = 50mA, V_{CE} = 5V$	3.0	—	6.0	V	
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = 50A, V_{GE} = 15V$	$T_j = 25^\circ C$	—	2.8	3.6	V
				$T_j = 125^\circ C$	—	3.1	4.0	
Input capacitance		C_{ies}	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	6.0	—	nF	
Switching time	Turn-on delay time	$t_d (on)$	Inductive load $V_{CC} = 600V$ $I_C = 50A$ $V_{GE} = \pm 15V$ $R_G = 24\Omega$ (Note 1)	—	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	0.3		
	Turn-off time	t_{off}		—	0.6	—		
Forward voltage		V_F	$I_F = 50A, V_{GE} = 0$	—	2.4	3.5	V	
Reverse recovery time		t_{rr}	$I_F = 50A, V_{GE} = -10V, di/dt = 700A/\mu s$ (Note 1)	—	0.1	0.25	μs	
Thermal resistance		$R_{th (j-c)}$	Transistor stage	—	—	0.31	$^\circ C / W$	
			Diode stage	—	—	0.94		

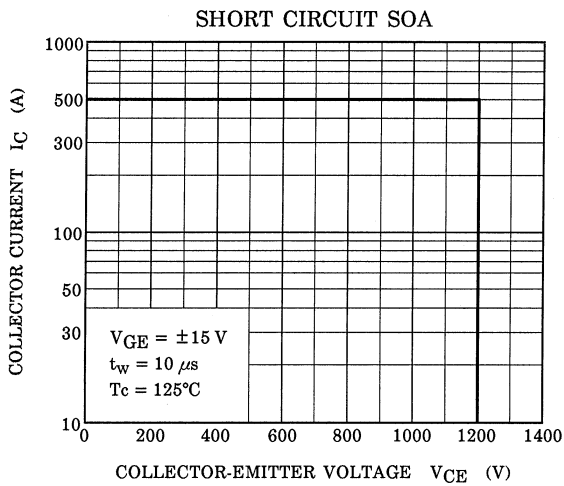
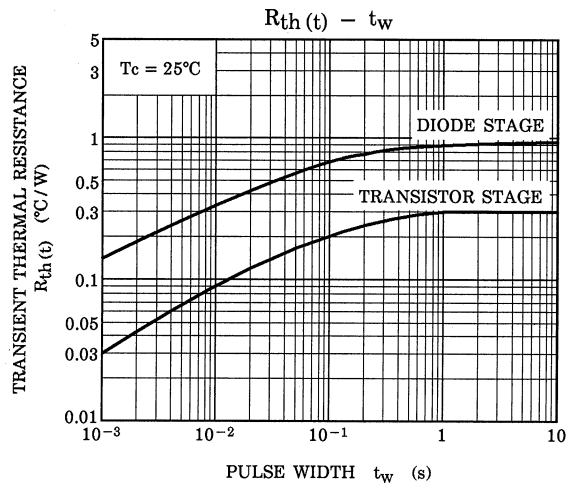
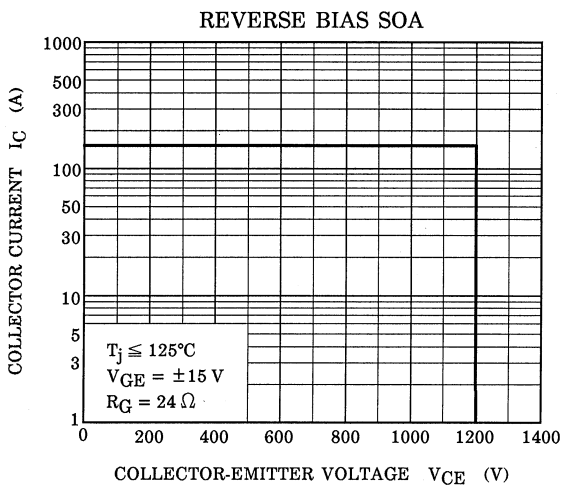
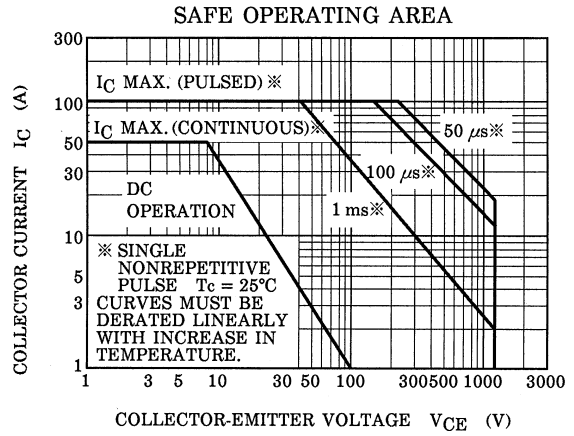
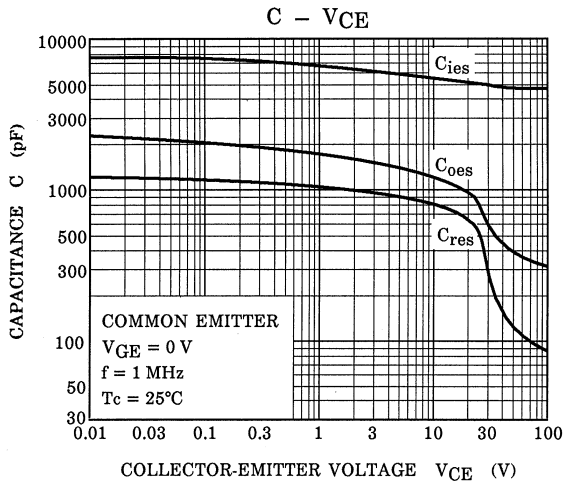
Note 1: Switching time and reverse recovery time test circuit & timing chart











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