

TENTATIVE

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

MG50Q2YS50A

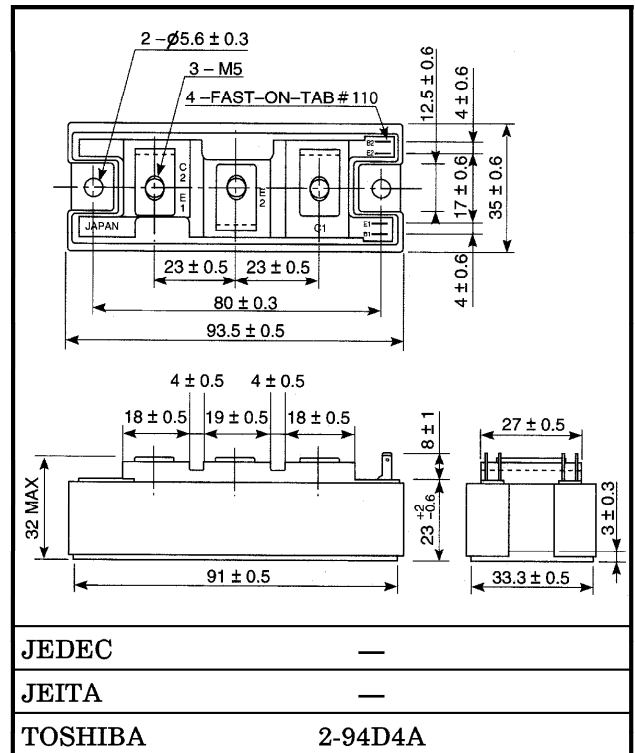
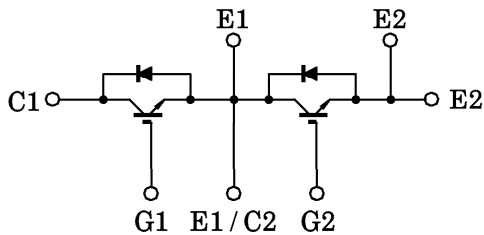
HIGH POWER SWITCHING APPLICATIONS

Unit in mm

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 : 202g

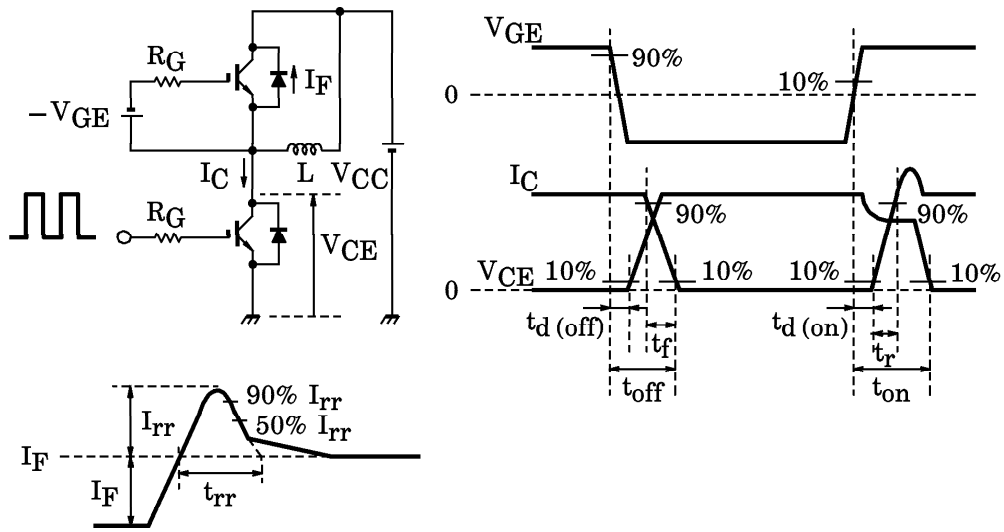
MAXIMUM RATINGS (Ta = 25°C)

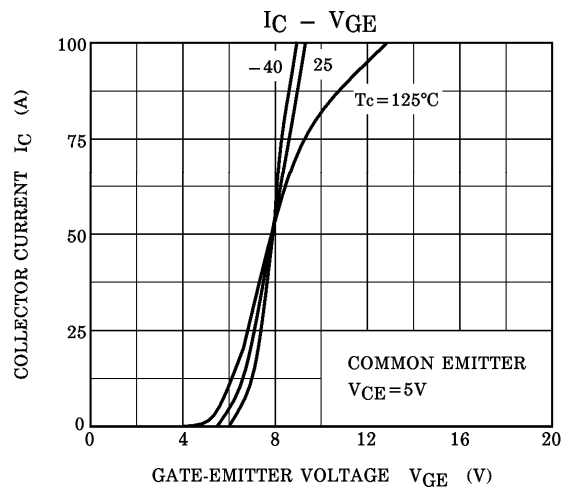
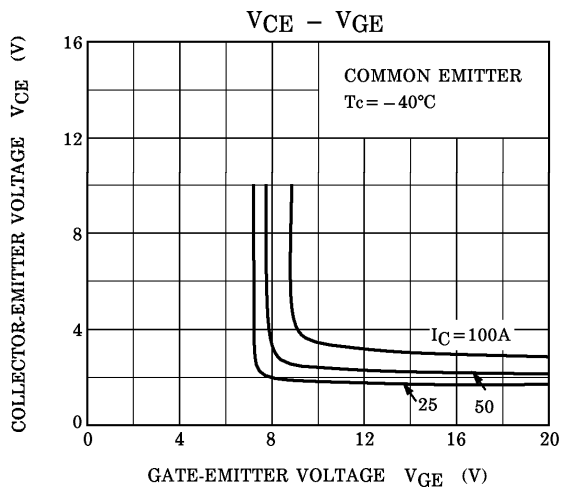
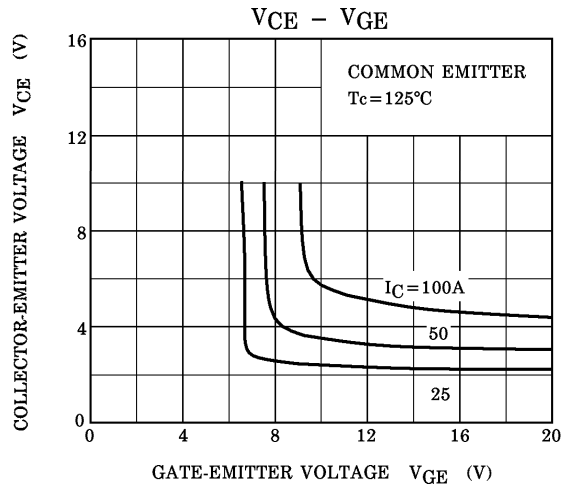
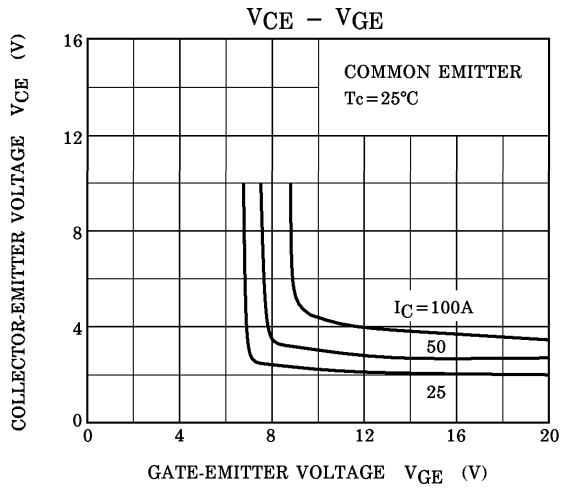
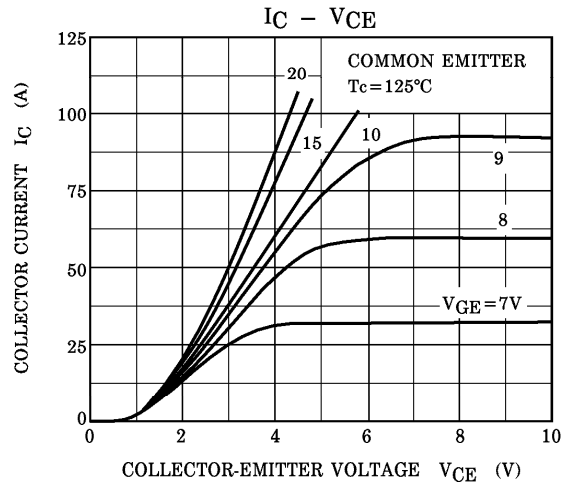
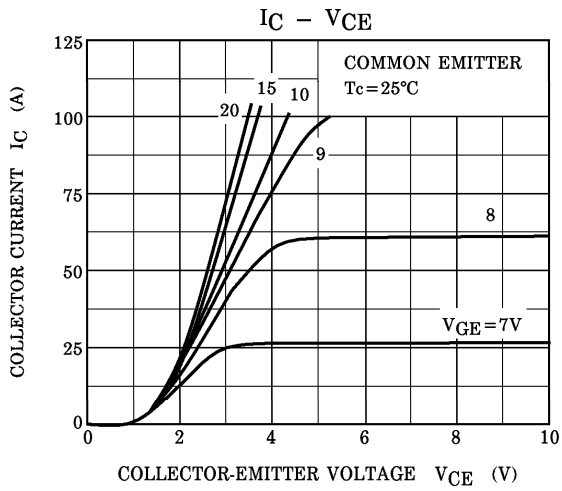
CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V _{CES}	1200	V
Gate-Emitter Voltage		V _{GES}	±20	V
Collector Current	DC	I _C (25°C / 80°C)	78 / 50	A
	1ms	I _{CP} (25°C / 80°C)	156 / 100	
Forward Current	DC	I _F	50	A
	1ms	I _{FM}	100	
Collector Power Dissipation (T _c =25°C)		P _C	400	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

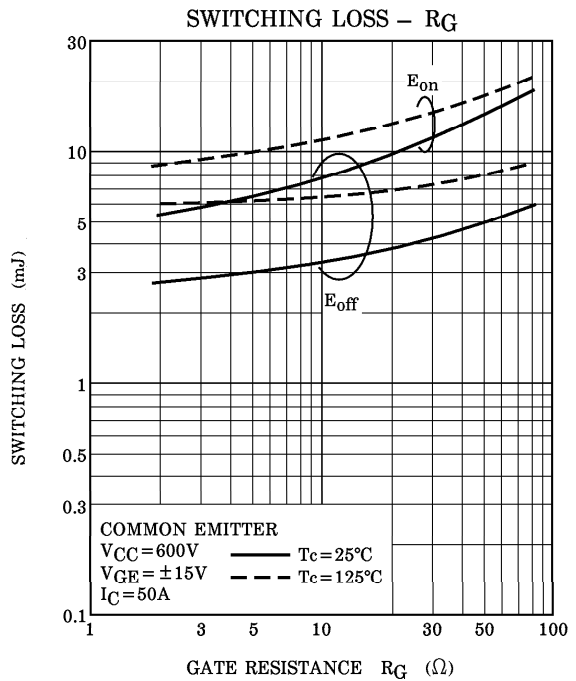
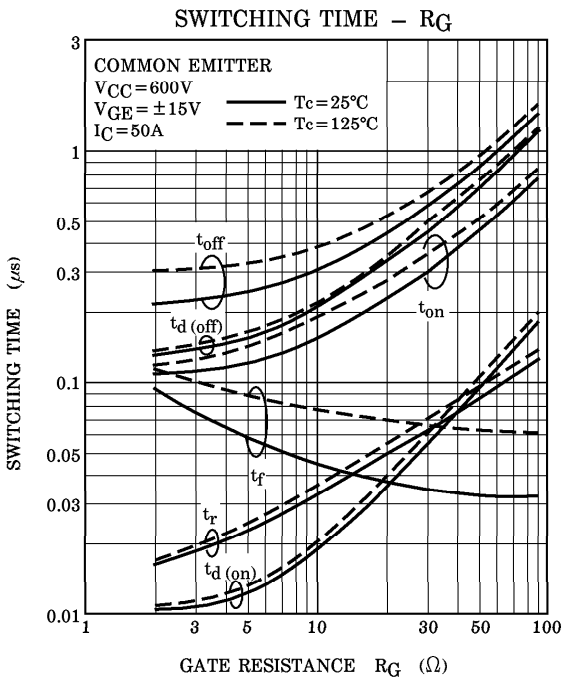
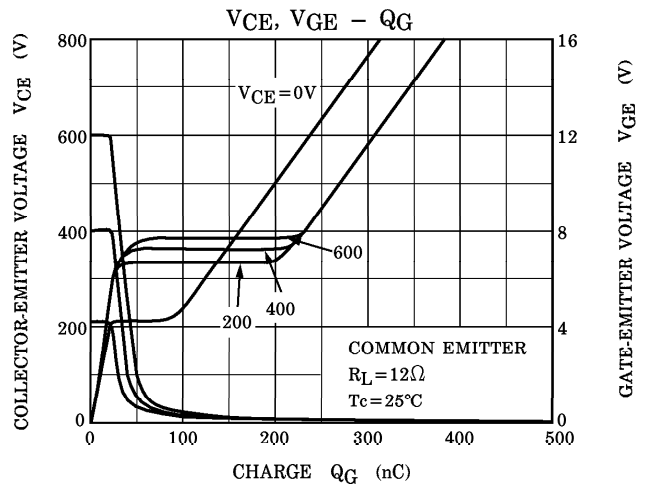
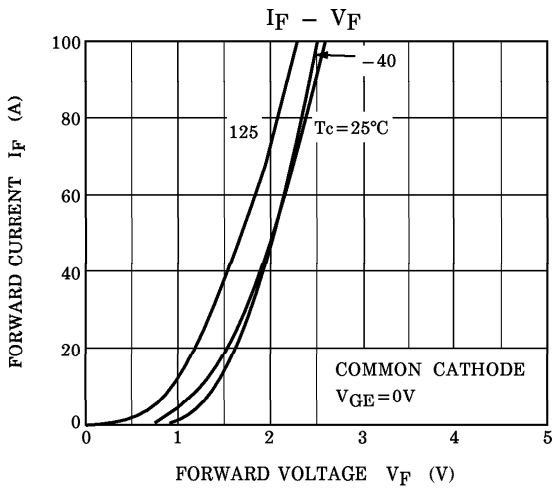
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current		I _{GES}	V _{GE} = ±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°C	—	2.8	3.6	V
				T _j = 125°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} = ±15V R _G = 24Ω (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	—	1.9	3.0	V	
Reverse Recovery Time		t _{rr}	I _F = 50A, V _{GE} = -10V di / dt = 700A / μs (Note 1)	—	0.1	0.25	μs	
Thermal Resistance		R _{th (j-c)}	Transistor Stage	—	—	0.31	°C / W	
			Diode Stage	—	—	0.47		

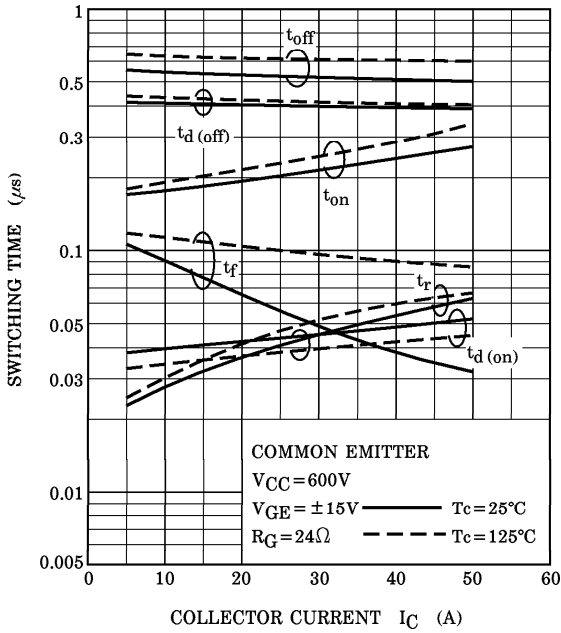
(Note 1) Switching Time and Reverse Recovery Time Test Circuit & Timing Chart



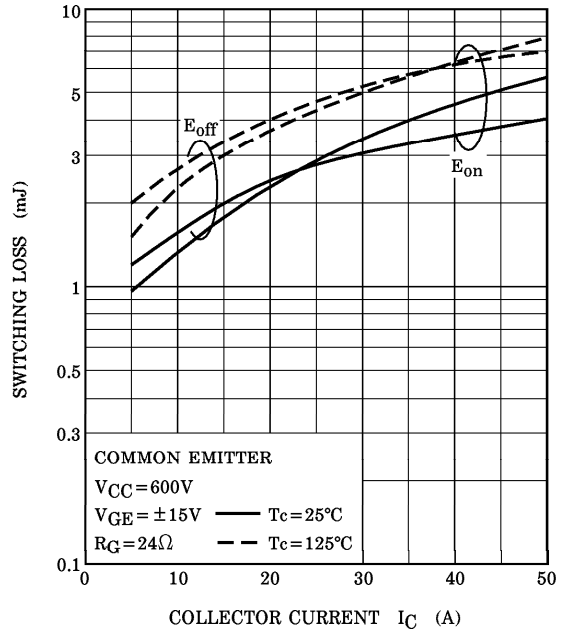




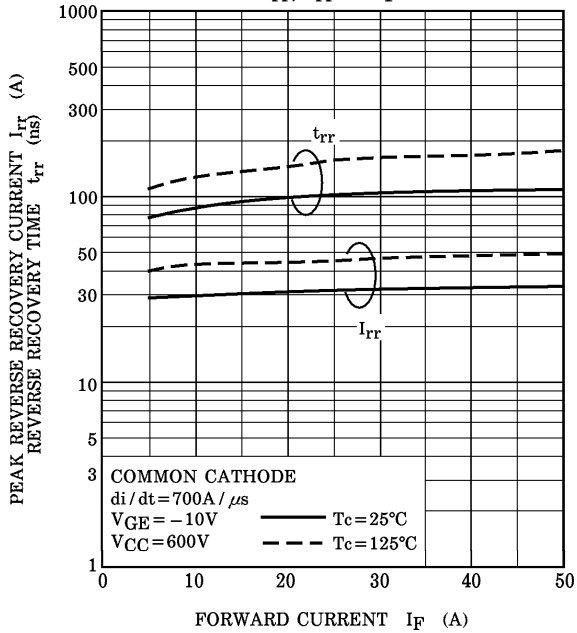
SWITCHING TIME - I_C



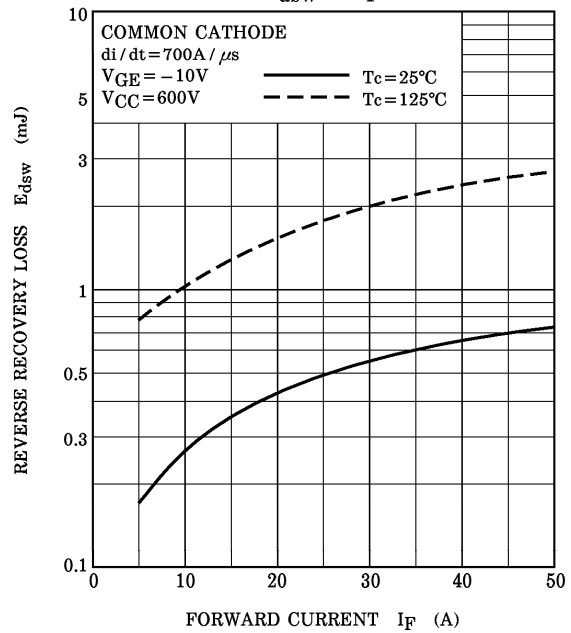
SWITCHING LOSS - I_C

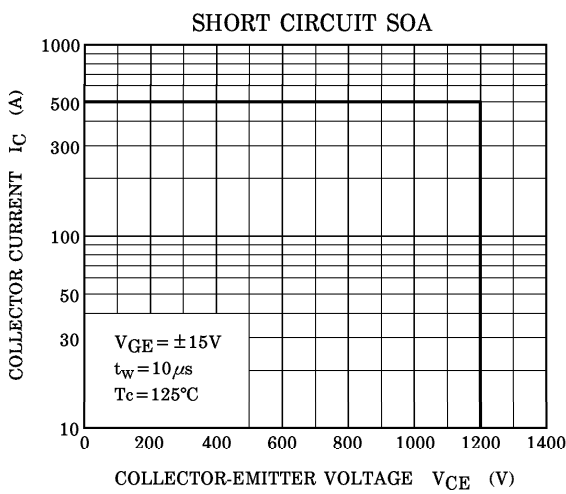
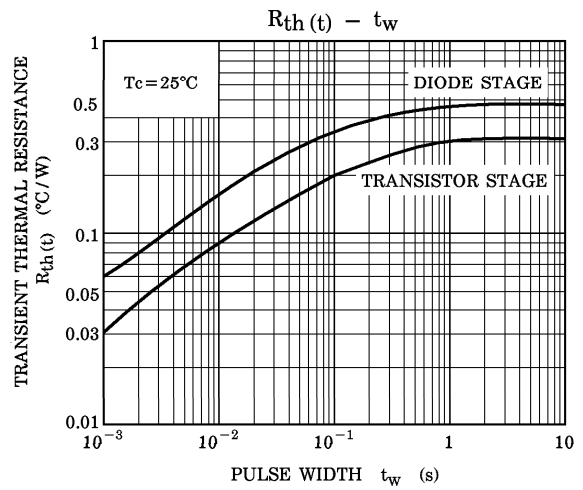
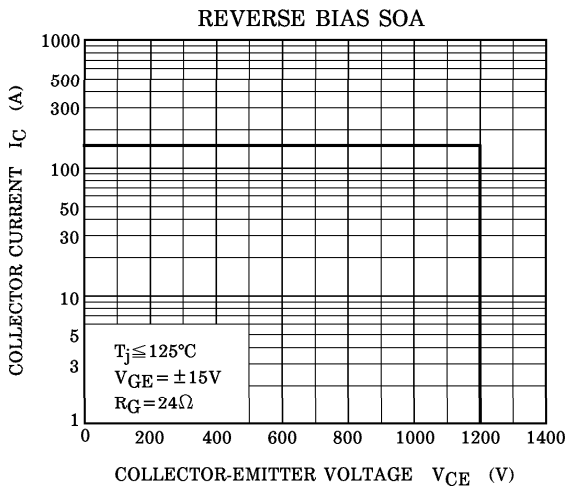
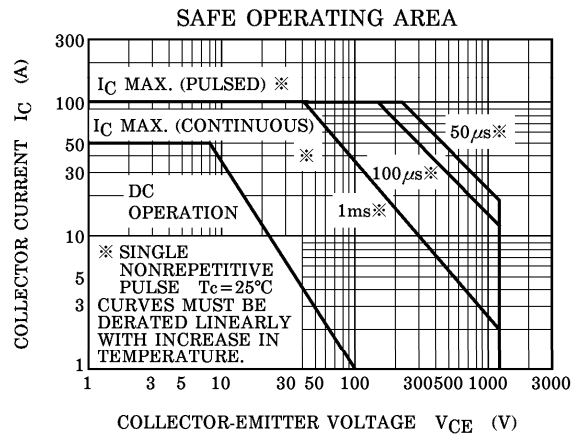
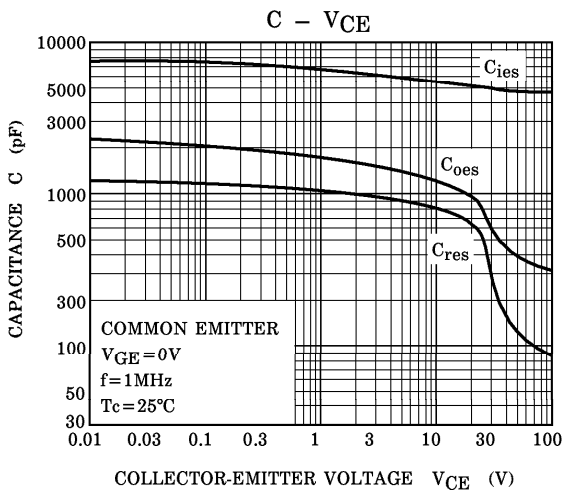


I_{rr} , t_{rr} - I_F



E_{dsw} - I_F





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