

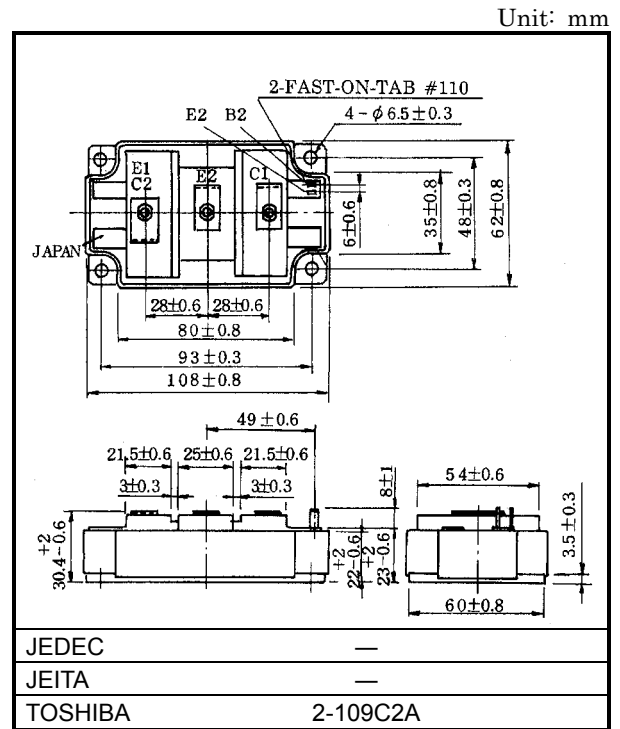
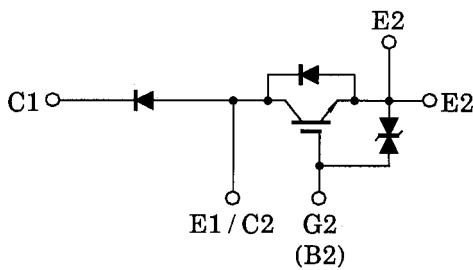
TOSHIBA GTR Module Silicon N Channel IGBT

MG200Q1ZS40

High Power Switching Applications
Motor Control Applications

- High input impedance
- High speed : $t_f = 0.5\mu s$ (max)
 $t_{rr} = 0.5\mu s$ (max)
- Low saturation voltage
: $V_{CE(sat)} = 4.0V$ (max)
- Enhancement-mode
- The electrodes are isolated from case

Equivalent Circuit

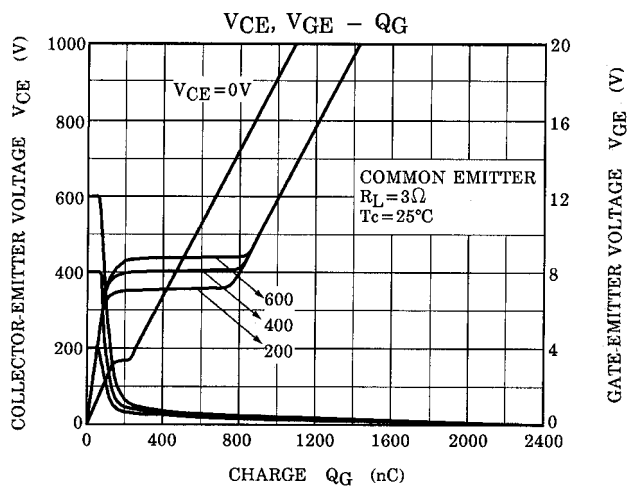
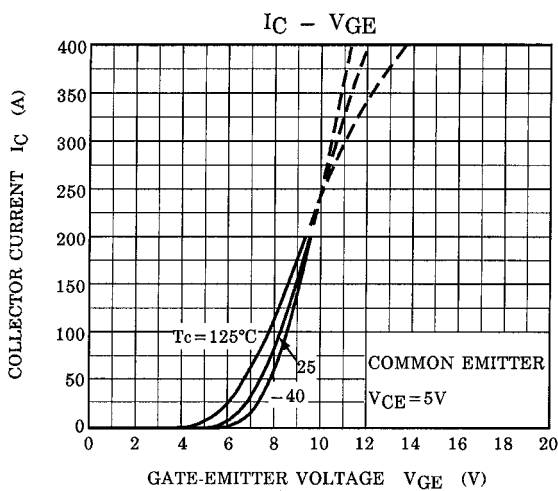
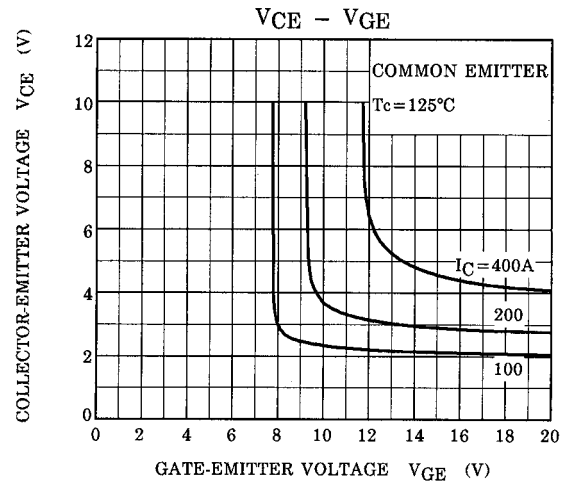
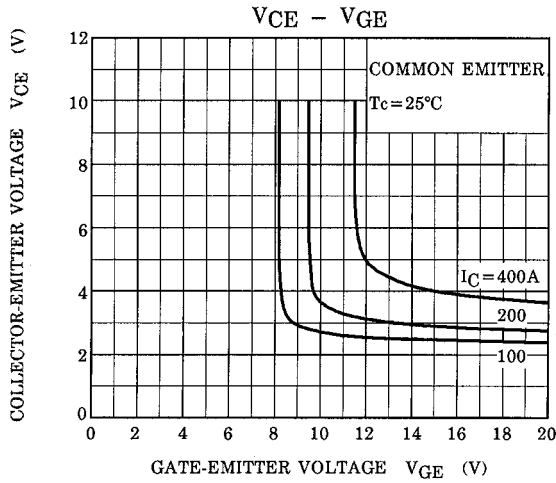
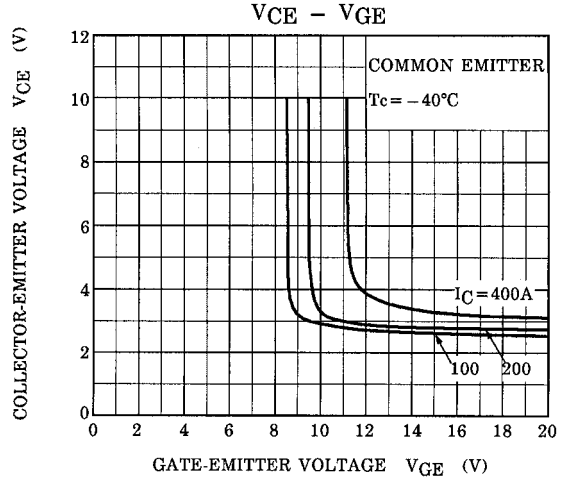
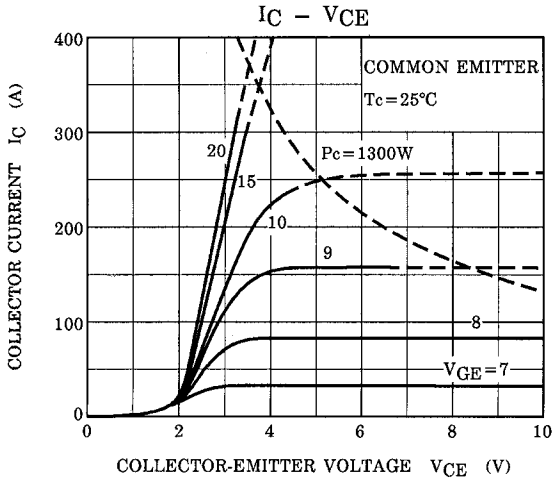


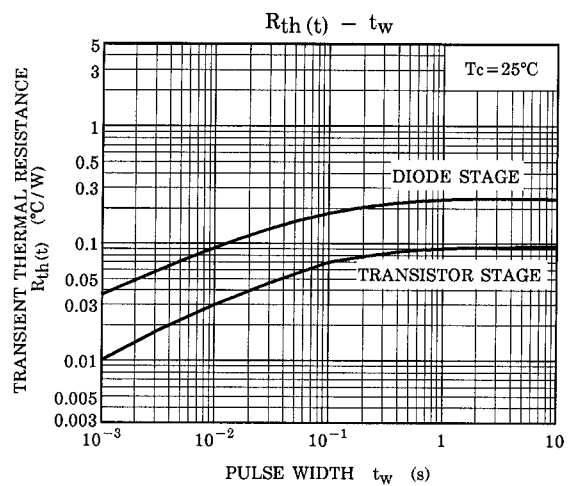
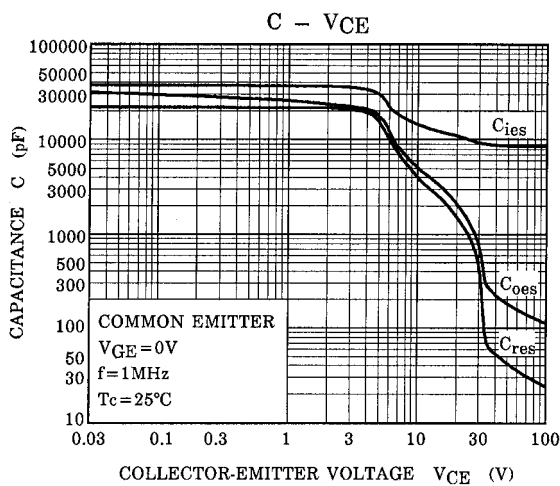
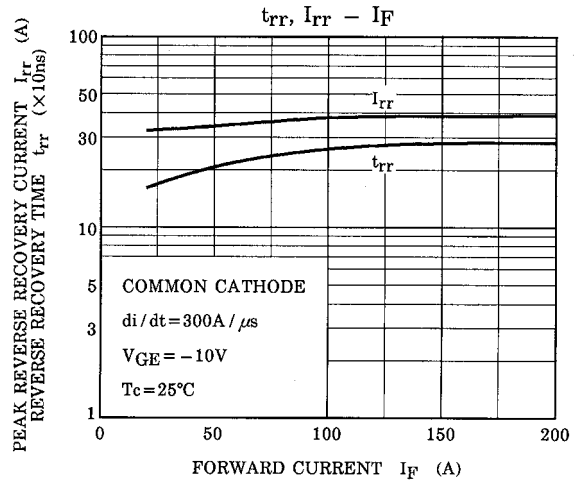
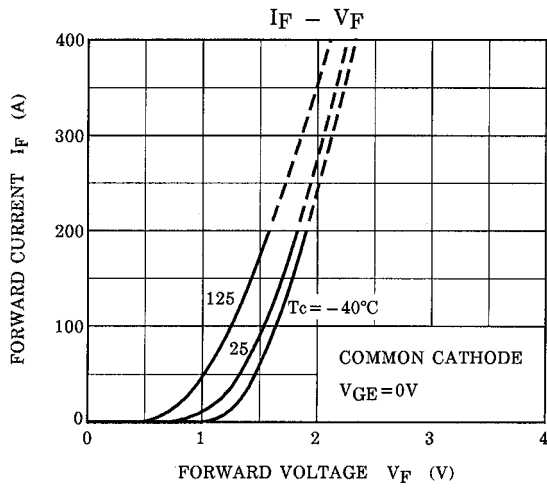
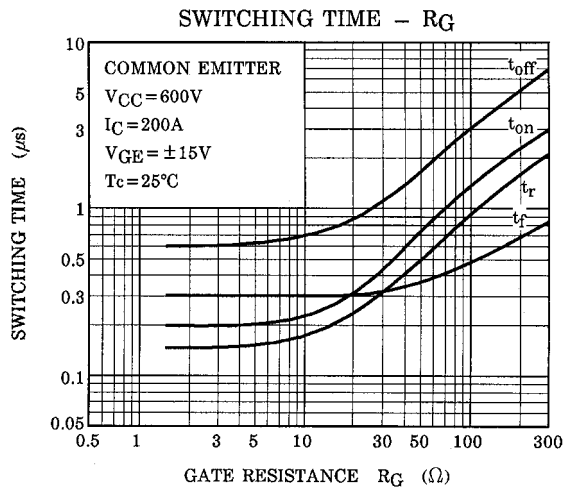
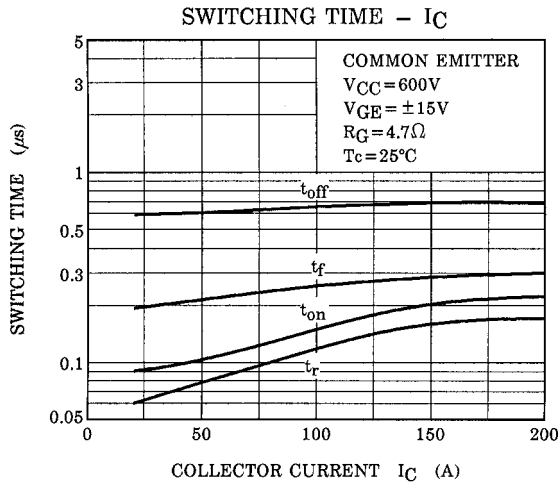
Maximum Ratings (Ta = 25°C)

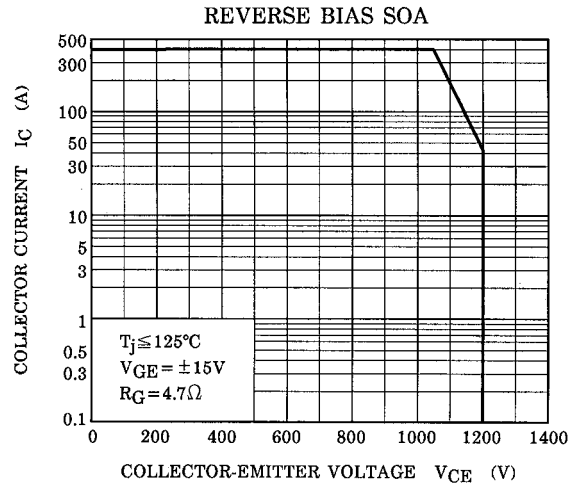
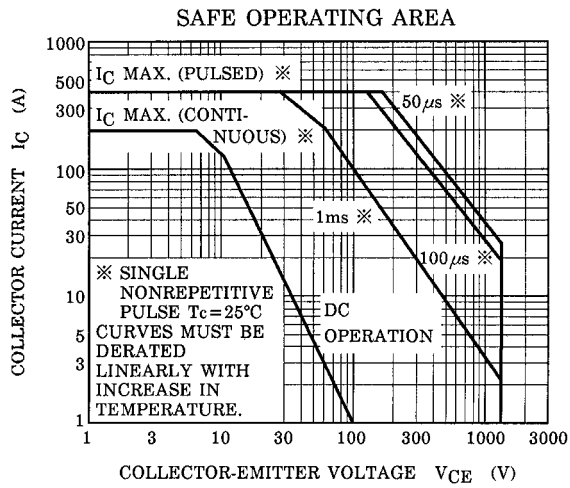
Characteristics		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	1200	V
Gate-emitter voltage		V_{GES}	±20	V
Reverse voltage		V_R	1200	V
Collector current	DC	I_C	200	A
	1ms	I_{CP}	400	
Forward current	DC	I_F	200	A
	1ms	I_{FM}	400	
Collector power dissipation (Tc = 25°C)		P_C	1300	W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	-40 ~ 125	°C
Isolation voltage		V_{isol}	2500 (AC 1 min.)	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}	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	± 20	μA
Collector cut-off current		I_{CES}	$V_{CE} = 1200V, V_{GE} = 0$	—	—	2.0	mA
Gate-emitter cut-off voltage		$V_{GE (off)}$	$V_{CE} = 5V, I_C = 200mA$	3.0	—	6.0	V
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = 200A, V_{GE} = 15V$	—	3.0	4.0	V
Input capacitance		C_{ies}	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	24000	—	pF
Switching time	Rise time	t_r		—	0.3	0.6	μs
	Turn-on time	t_{on}		—	0.4	0.8	
	Fall time	t_f		—	0.2	0.5	
	Turn-off Time	t_{off}		—	0.8	1.5	
Reverse current		I_R	$V_R = 1200V$	—	—	2.0	mA
Forward voltage		V_F	$I_F = 200A, V_{GE} = 0$	—	2.0	3.0	V
Reverse recovery time		t_{rr}	$I_F = 200A, V_{GE} = -10V$ $di / dt = 300A / \mu s$	—	0.25	0.5	μs
Thermal resistance	Transistor	$R_{th (j-c)}$		—	—	0.096	$^{\circ}C / W$
	Diode			—	—	0.25	







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