

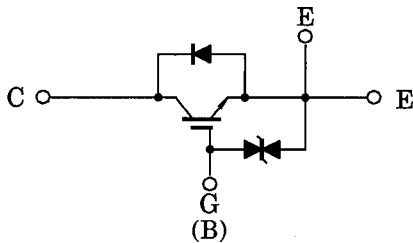
TOSHIBA GTR Module Silicon N Channel IGBT

# MG400Q1US41

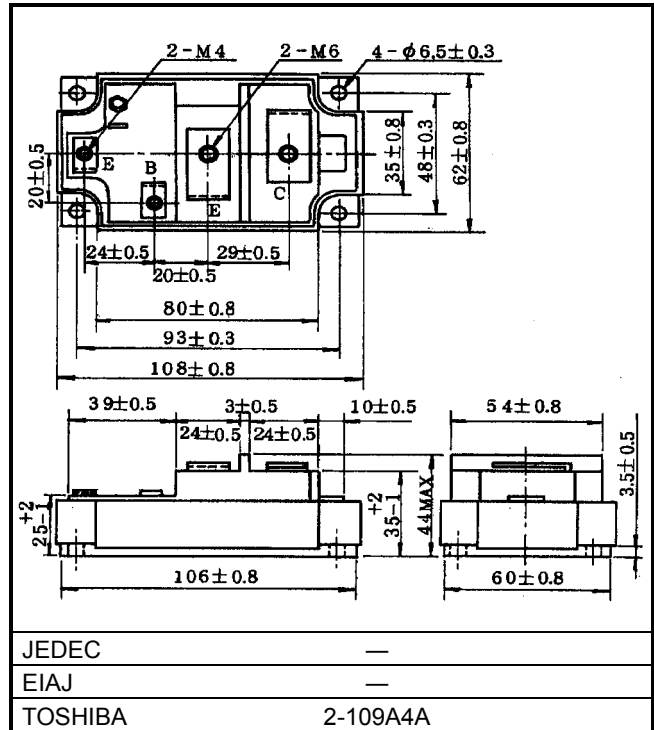
High Power Switching Applications  
 Motor Control Applications

- 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



Unit: mm



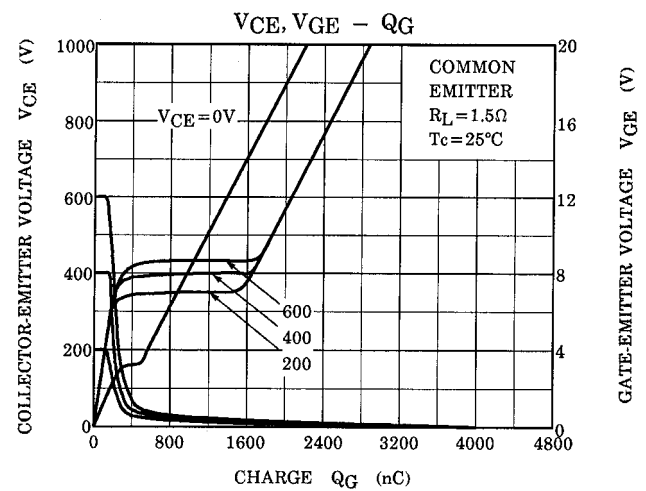
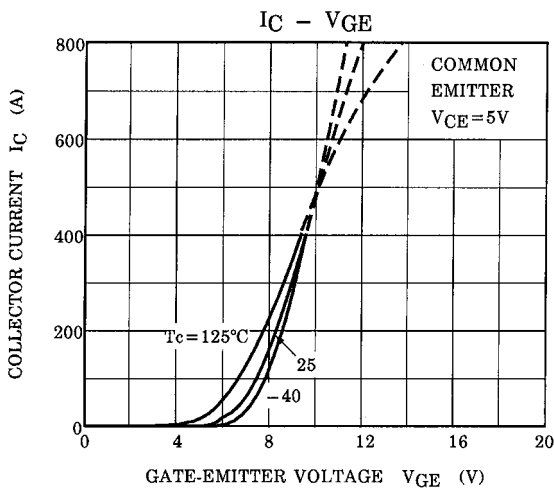
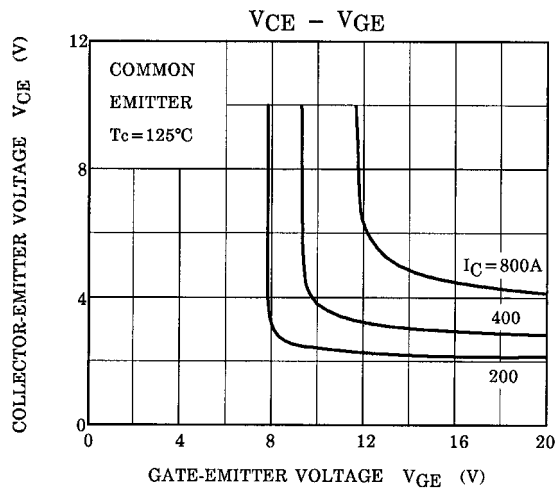
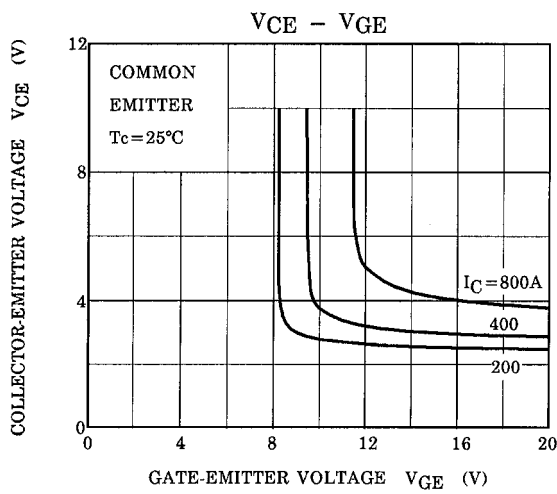
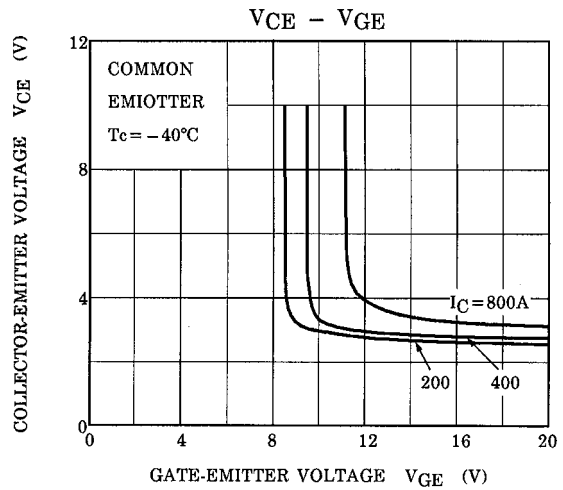
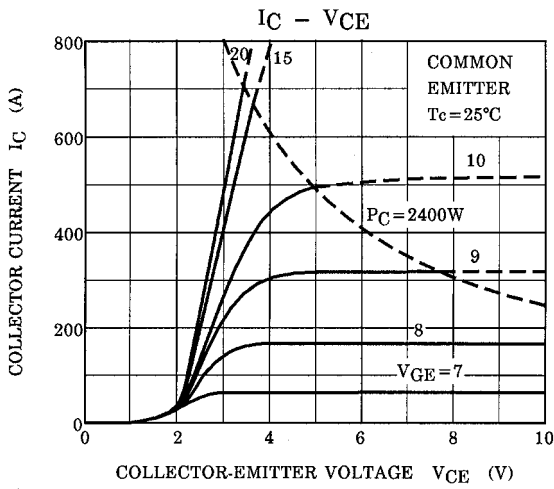
Weight: 465g

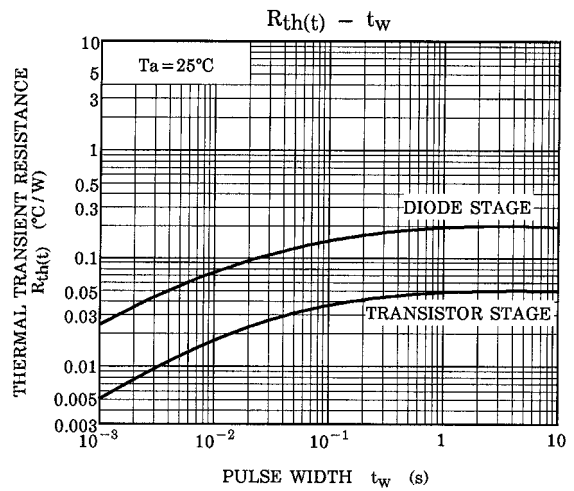
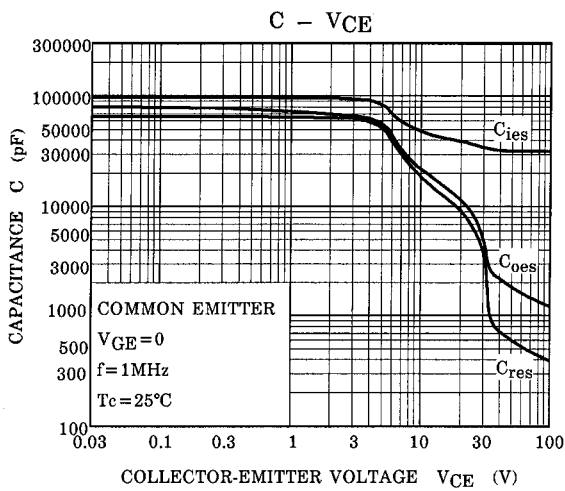
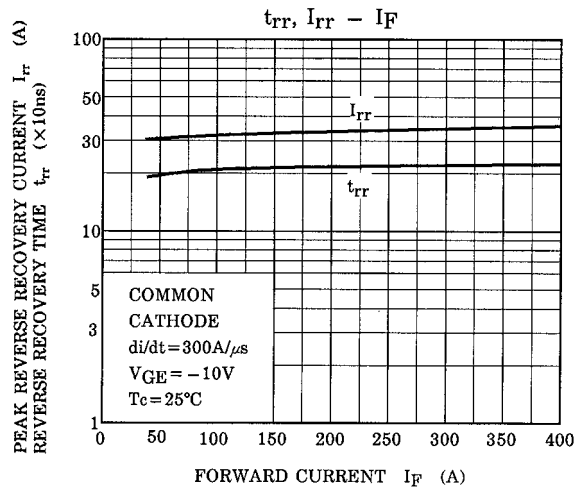
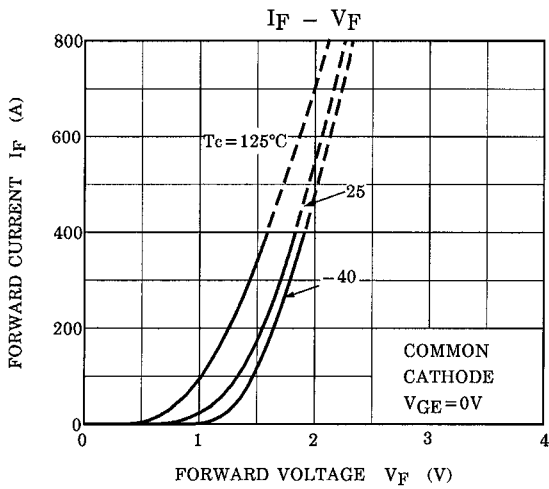
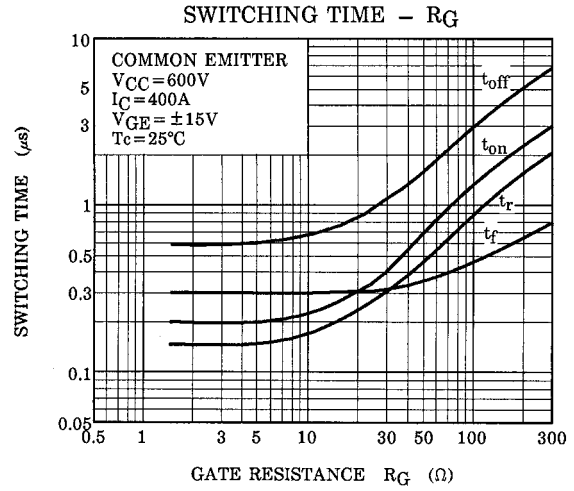
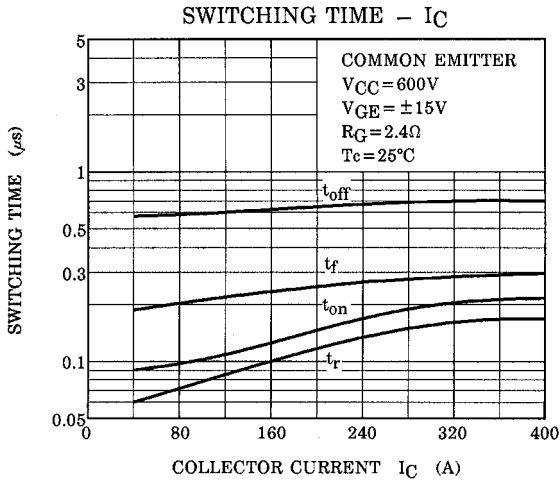
### Maximum Ratings (Ta = 25°C)

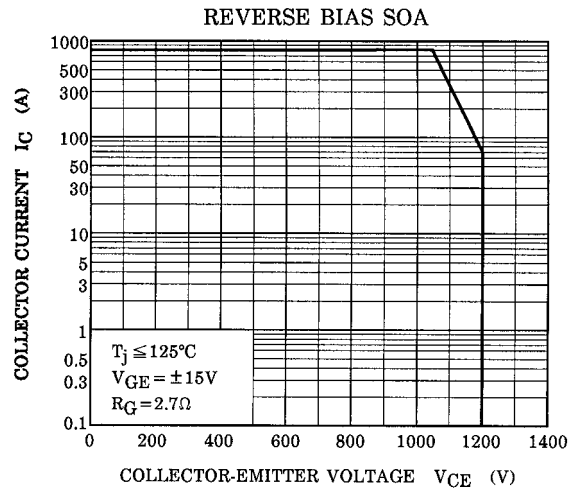
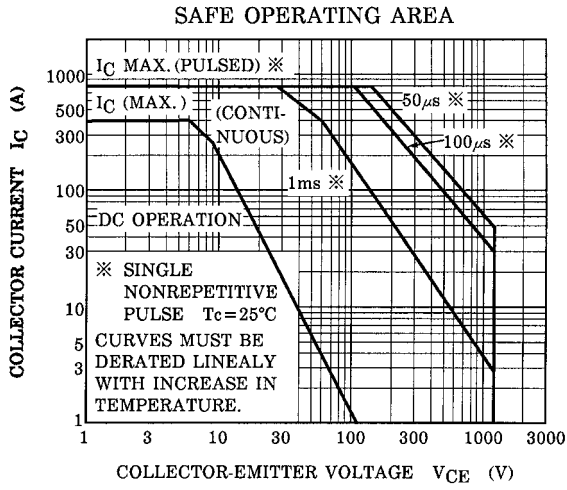
Characteristic	Symbol	Rating	Unit
Collector-emitter voltage	$V_{CES}$	1200	V
Gate-emitter voltage	$V_{GES}$	±20	V
Collector current	DC	$I_C$	A
	1ms	$I_{CP}$	
Forward current	DC	$I_F$	A
	1ms	$I_{FM}$	
Collector power dissipation (Tc = 25°C)	$P_C$	2400	W
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	-40 ~ 125	°C
Isolation voltage	$V_{isol}$	2500 (AC 1 minute)	V
Screw torque (Terminal : M4 / M6 / mounting)	—	2 / 3 / 3	N·m

## Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		$I_{GES}$	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	$\pm 40$	$\mu A$
Collector cut-off current		$I_{CES}$	$V_{CE} = 1200V, V_{GE} = 0$	—	—	4	mA
Gate-emitter cut-off voltage		$V_{GE(OFF)}$	$I_C = 400mA, V_{CE} = 5V$	3.0	—	6.0	V
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 400A, V_{GE} = 15V$	—	3.0	4.0	V
Input capacitance		$C_{ies}$	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	48000	—	pF
Switching time	Rise time	$t_r$		—	0.3	0.6	$\mu s$
	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	
Forward voltage		$V_F$		—	2.0	3.0	V
Reverse recovery time		$t_{rr}$	$I_F = 400 A, V_{GE} = -10 V, P_{di} / dt = 300 A / \mu s$	—	0.25	0.5	$\mu s$
Thermal resistance		$R_{th(j-c)}$	Transistor	—	—	0.052	$^{\circ}C / W$
			Diode	—	—	0.2	







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