

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

# MG500Q1US1

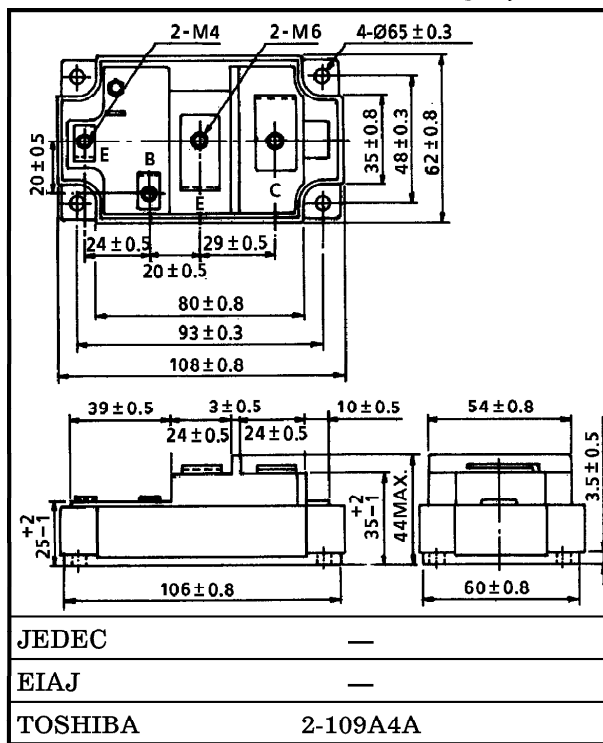
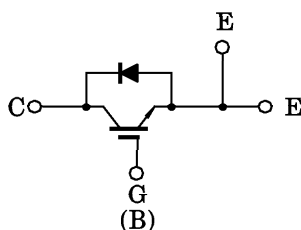
HIGH POWER SWITCHING APPLICATIONS

Unit in mm

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



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)	$P_C$	2900	W
Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_{stg}$	-40~125	°C
Isolation Voltage	$V_{Isol}$	2500 (AC, 1min.)	V
Screw Torque (Terminal : M4 / M6 / Mounting)	—	2 / 3 / 3	N·m

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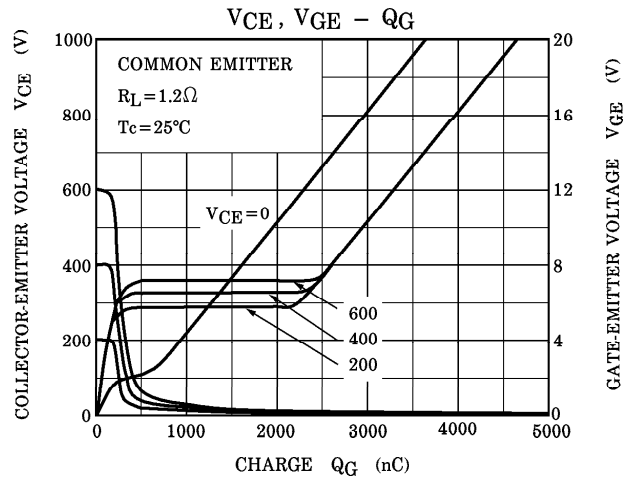
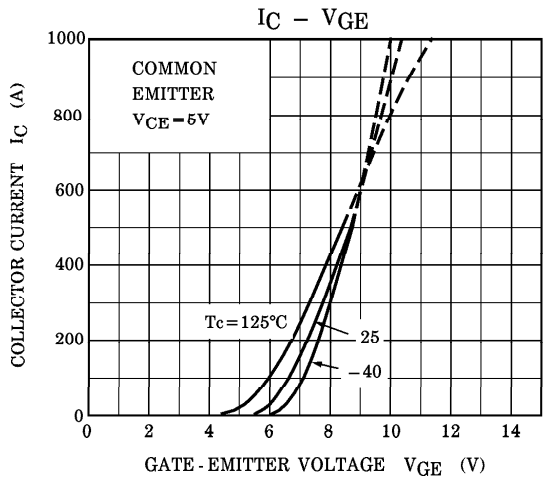
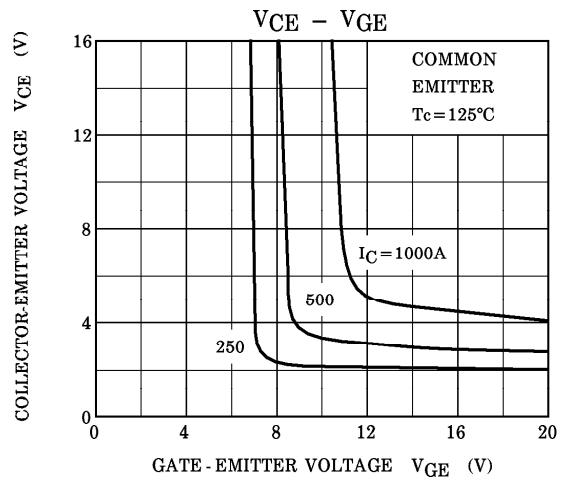
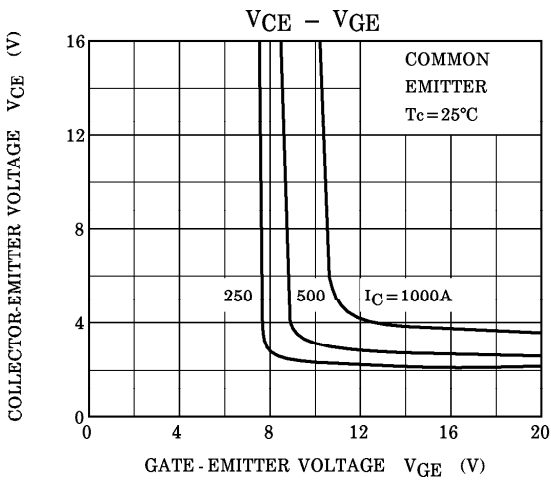
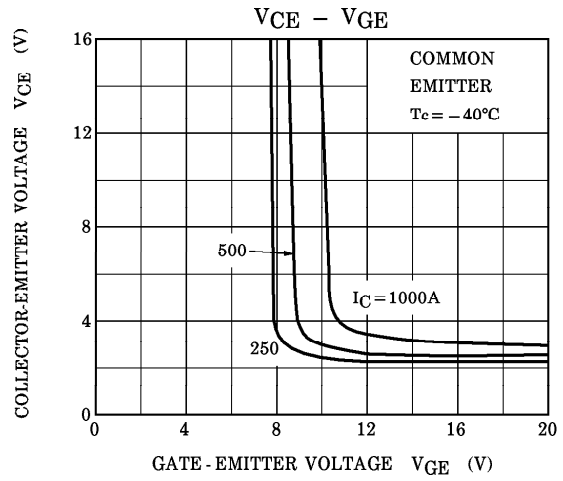
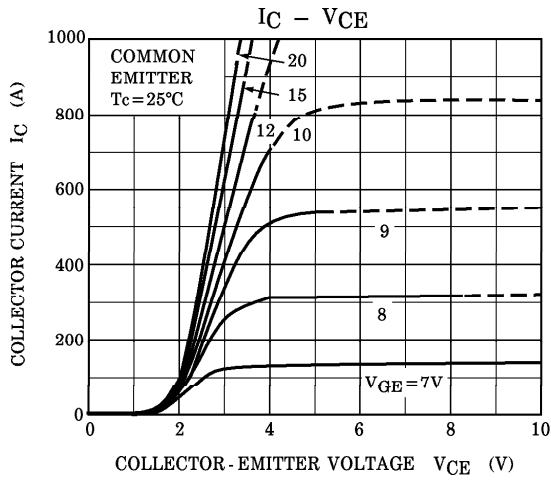
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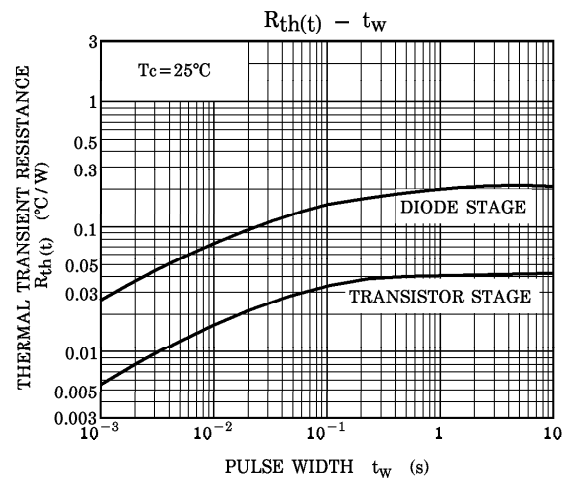
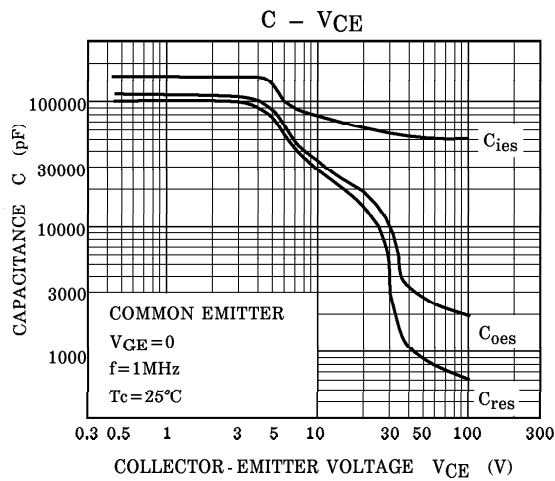
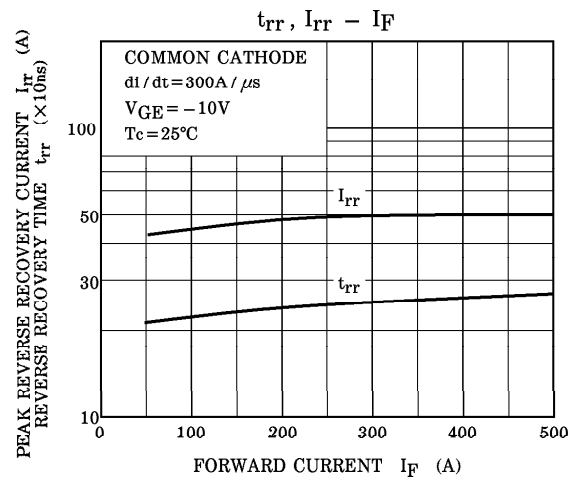
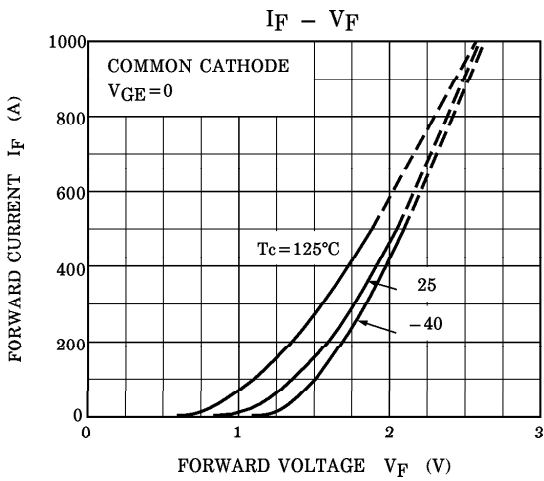
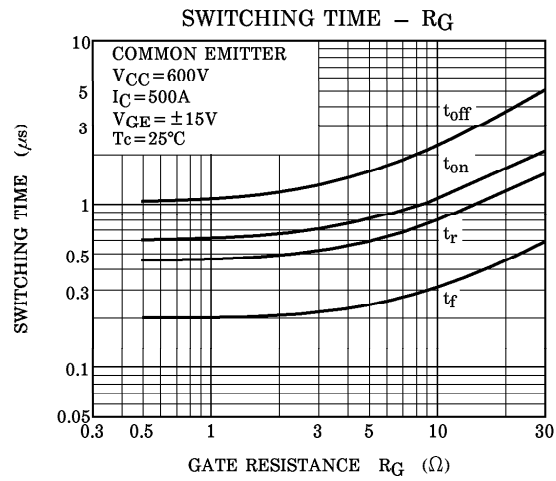
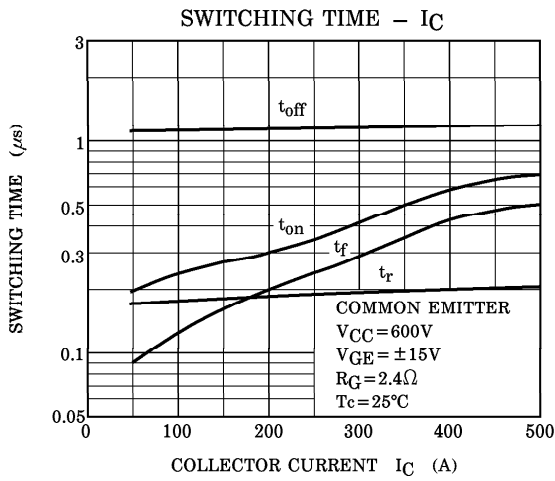
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

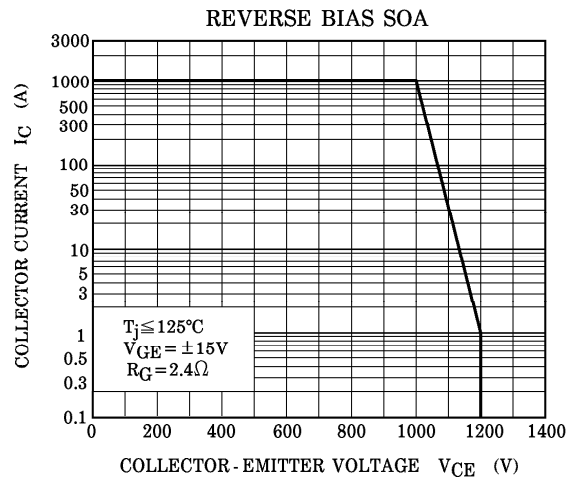
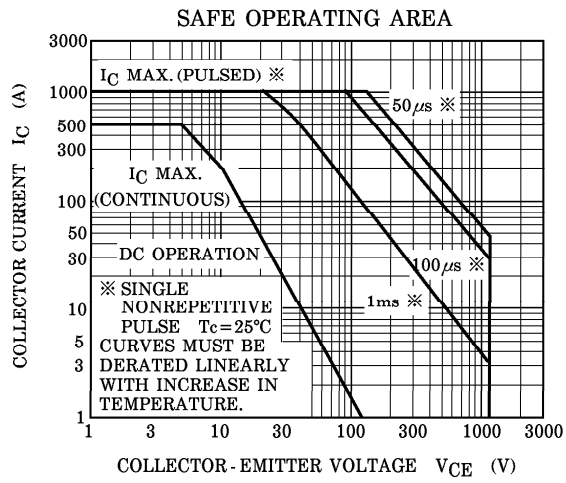
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I <sub>GES</sub>	V <sub>GE</sub> = ±20V, V <sub>CE</sub> = 0	—	—	±500	nA
Collector Cut-off Current		I <sub>CES</sub>	V <sub>CE</sub> = 1200V, V <sub>GE</sub> = 0	—	—	4.0	mA
Gate-Emitter Cut-off Voltage		V <sub>GE (OFF)</sub>	I <sub>C</sub> = 500mA, V <sub>CE</sub> = 5V	3.0	—	6.0	V
Collector-Emitter Saturation Voltage		V <sub>CE (sat)</sub>	I <sub>C</sub> = 500A, V <sub>GE</sub> = 15V	—	3.0	4.0	V
Input Capacitance		C <sub>ies</sub>	V <sub>CE</sub> = 10V, V <sub>GE</sub> = 0, f = 1MHz	—	80000	—	pF
Switching Time	Rise Time	t <sub>r</sub>		—	0.3	0.6	μs
	Turn-on Time	t <sub>on</sub>		—	0.4	0.8	
	Fall Time	t <sub>f</sub>		—	0.2	0.5	
	Turn-off Time	t <sub>off</sub>		—	0.8	1.5	
Forward Voltage		V <sub>F</sub>	I <sub>F</sub> = 500A, V <sub>GE</sub> = 0	—	—	3.0	V
Reverse Recovery Time		t <sub>rr</sub>	I <sub>F</sub> = 500A, V <sub>GE</sub> = -10V di / dt = 300A / μs	—	0.25	0.5	μs
Thermal Resistance		R <sub>th (j-c)</sub>	Transistor	—	—	0.042	°C / W
			Diode	—	—	0.20	

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