TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

MG500Q1US1

HIGH POWER SWITCHING APPLICATIONS

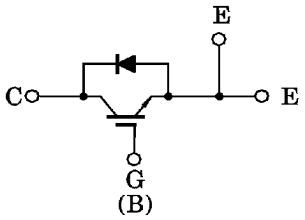
MOTOR CONTROL APPLICATIONS

- High Input Impedance
- High Speed : $t_f = 0.5\mu s$ (Max.)

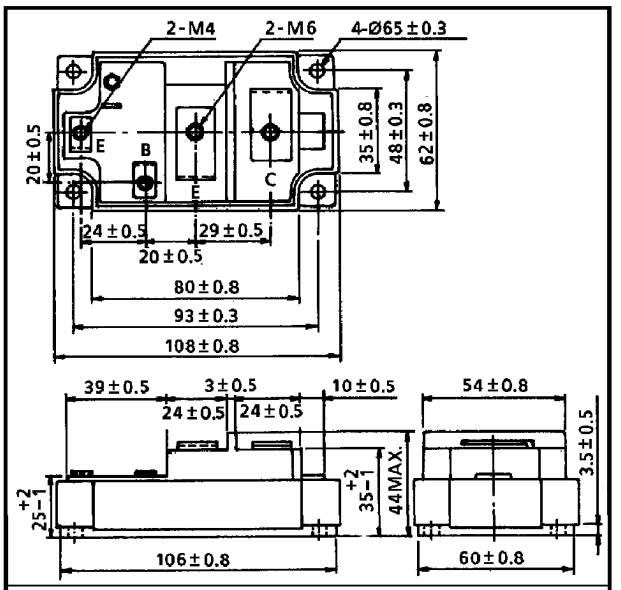
  $t_{rr} = 0.5\mu s$ (Max.)
- Low Saturation Voltage

  : $V_{CE\ (sat)} = 4.0V$ (Max.)
- Enhancement-Mode
- The Electrodes are Isolated from Case.

EQUIVALENT CIRCUIT



Unit in mm



JEDEC	—
EIAJ	—
TOSHIBA	2-109A4A

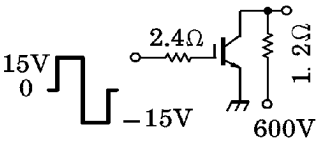
Weight : 465g

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	500	A
	1ms	I_{CP}	1000	
Forward Current	DC	I_F	500	A
	1ms	I_{FM}	1000	
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

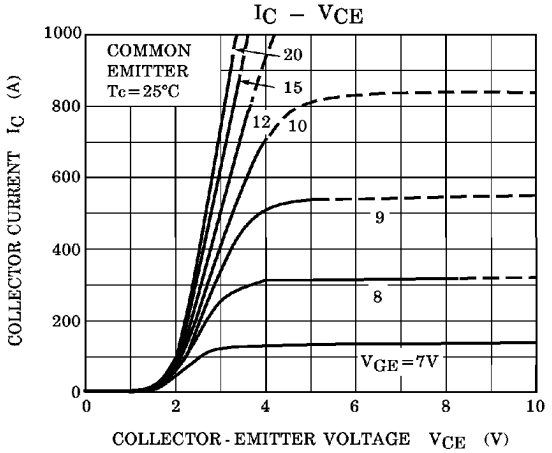
961001EAA2

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

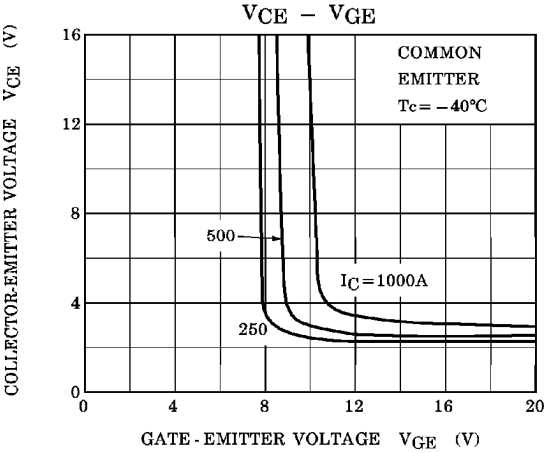
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GES}	$V_{GE} = \pm 20V$, $V_{CE} = 0$	—	—	±500	nA
Collector Cut-off Current		I_{CES}	$V_{CE} = 1200V$, $V_{GE} = 0$	—	—	4.0	mA
Gate-Emitter Cut-off Voltage		$V_{GE\ (OFF)}$	$I_C = 500mA$, $V_{CE} = 5V$	3.0	—	6.0	V
Collector-Emitter Saturation Voltage		$V_{CE\ (sat)}$	$I_C = 500A$, $V_{GE} = 15V$	—	3.0	4.0	V
Input Capacitance		C_{ies}	$V_{CE} = 10V$, $V_{GE} = 0$, f = 1MHz	—	80000	—	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	
Forward Voltage		V_F	$I_F = 500A$, $V_{GE} = 0$	—	—	3.0	V
Reverse Recovery Time		t_{rr}	$I_F = 500A$, $V_{GE} = -10V$ $di/dt = 300A/\mu s$	—	0.25	0.5	μs
Thermal Resistance		$R_{th\ (j\text{-}c)}$	Transistor	—	—	0.042	°C / W
			Diode	—	—	0.20	

961001EAA2'

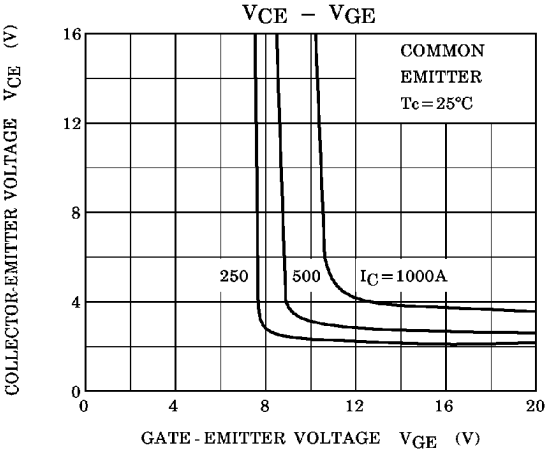
I_C – V_{CE}



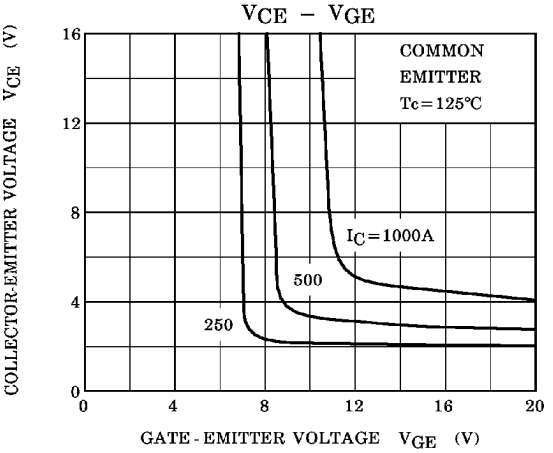
V_{CE} – V_{GE}



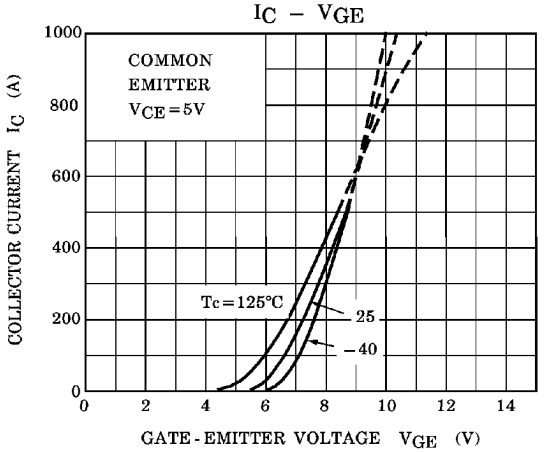
V_{CE} – V_{GE}



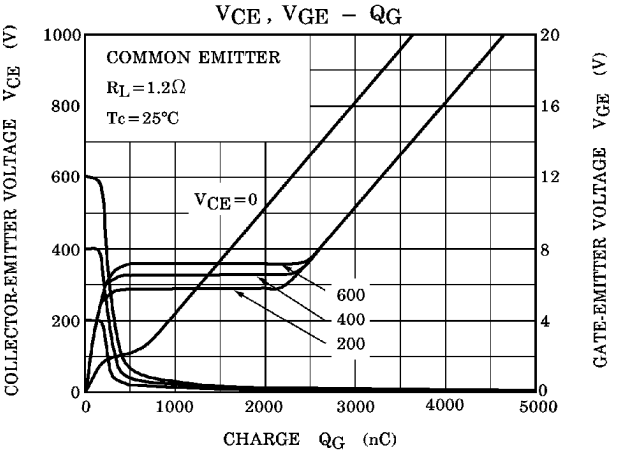
V_{CE} – V_{GE}



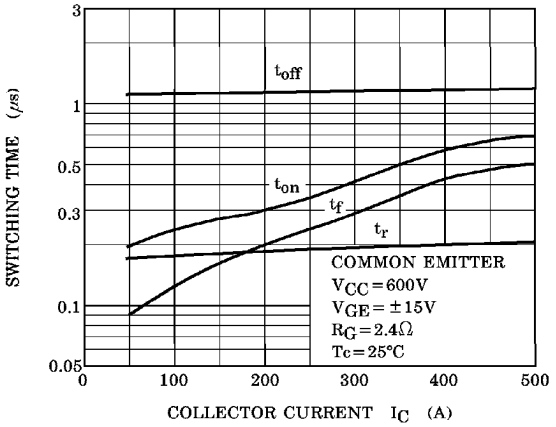
I_C – V_{GE}



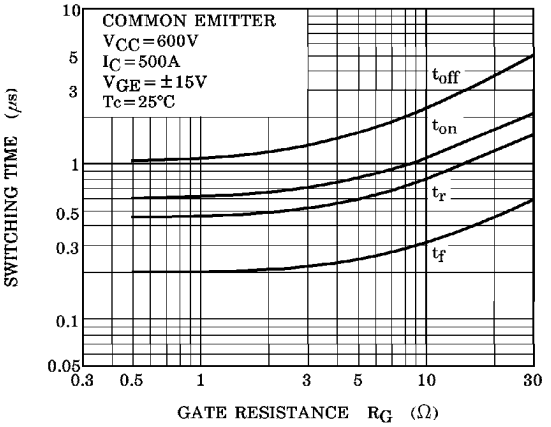
V_{CE}, V_{GE} – Q_G



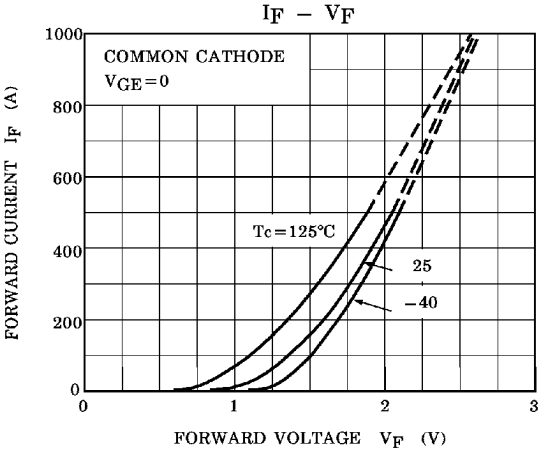
SWITCHING TIME – I_C



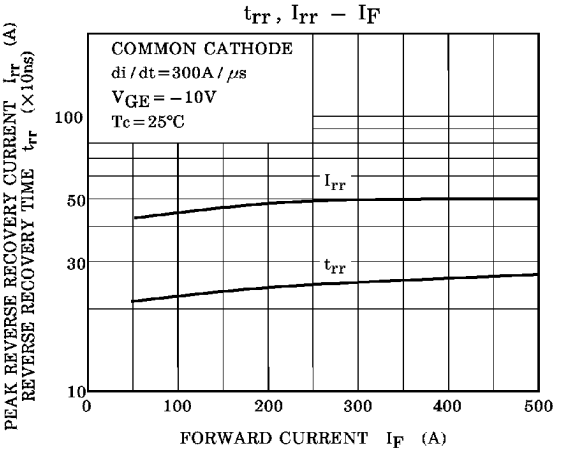
SWITCHING TIME – R_G



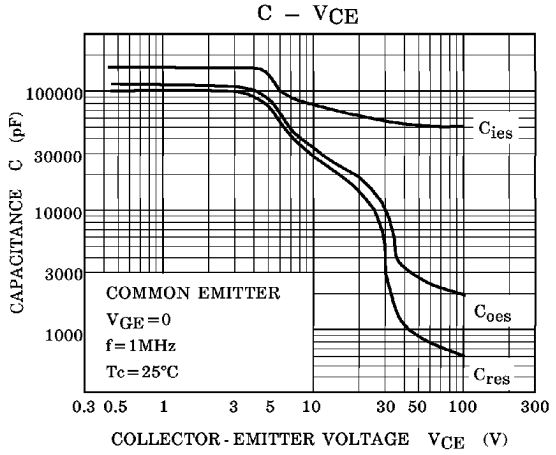
I_F – V_F



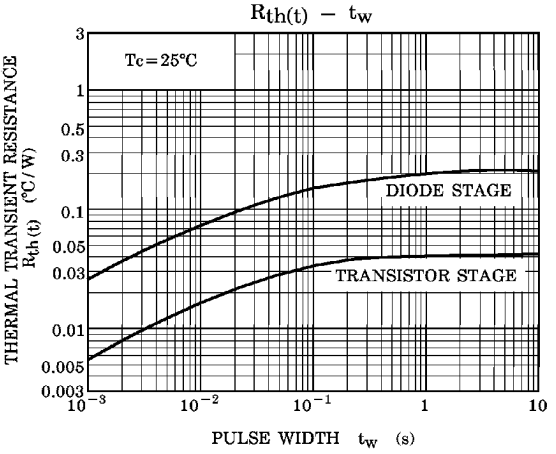
t_{rr}, I_{rr} – I_F



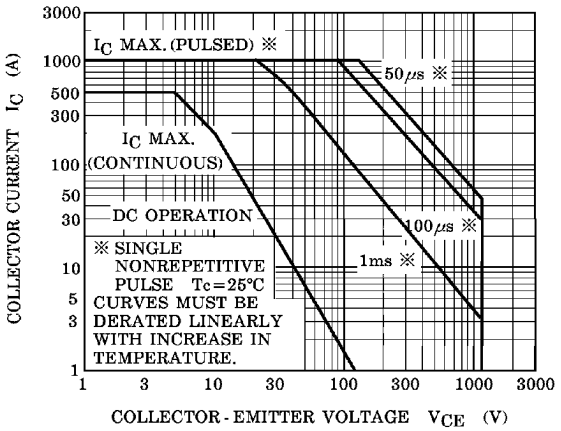
C – V_{CE}



$R_{th(t)}$ – t_w



SAFE OPERATING AREA



REVERSE BIAS SOA