TOSHIBA GTR Module Silicon N Channel IGBT

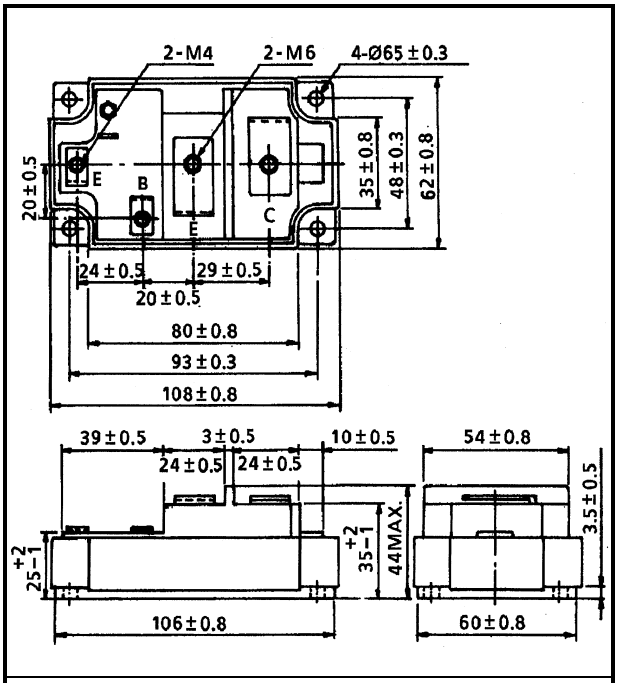
MG500Q1US1

High Power Switching Applications

Motor Control Applications

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

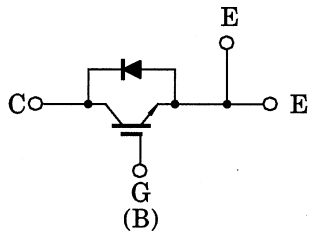
Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-109A4A

Weight: 465g

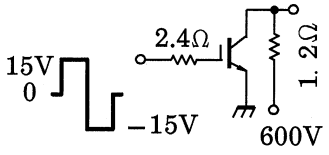
Equivalent Circuit



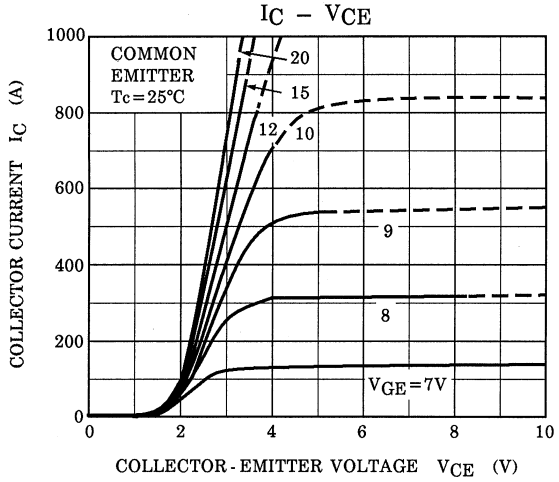
Maximum Ratings (Ta = 25°C)

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	2400	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 : M4 / M6 / mounting)		—	2 / 3 / 3	N·m

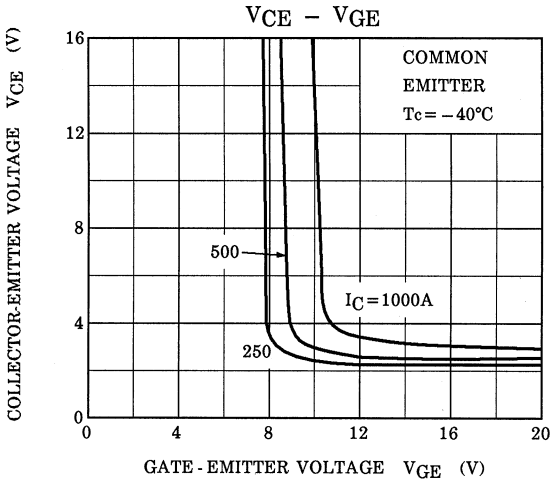
Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	V_{GE} = ±20V, V_{CE} = 0	—	—	±500	nA
Collector cut-off current		I_{CES}	V_{CE} = 1200 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 = 500 A, V_{GE} = 0	—	—	3.0	V
Reverse recovery time		t_{rr}	I_F = 500 A, V_{GE} = −10 V, di / dt = 300 A / μs	—	0.25	0.5	μs
Thermal resistance		$R_{th\ (j-c)}$	Transistor	—	—	0.042	°C / W
			Diode	—	—	0.20	

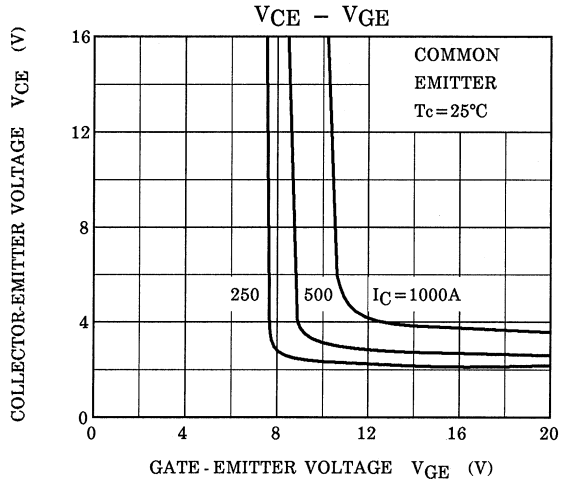
I_C – V_{CE}



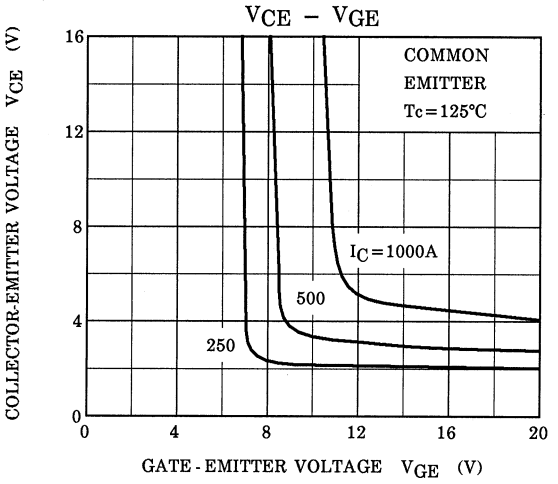
V_{CE} – V_{GE}



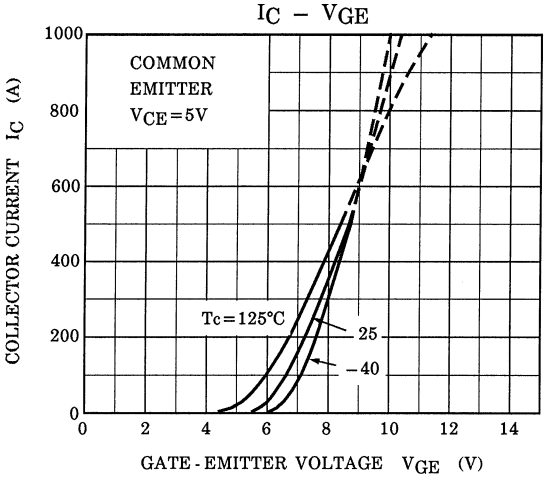
V_{CE} – V_{GE}



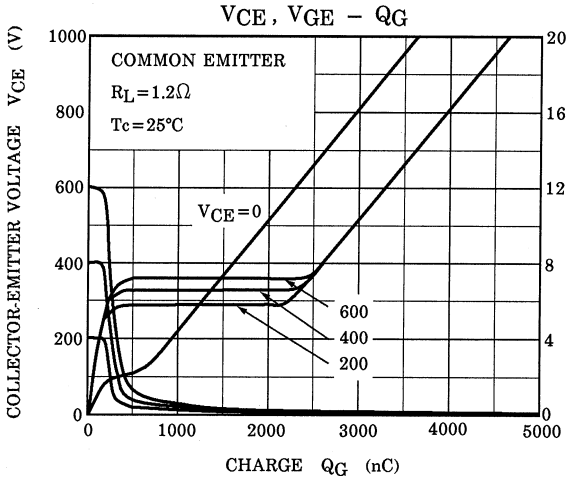
V_{CE} – V_{GE}



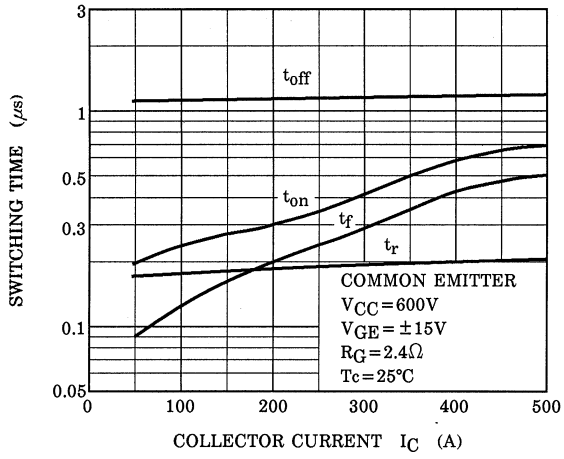
I_C – V_{GE}



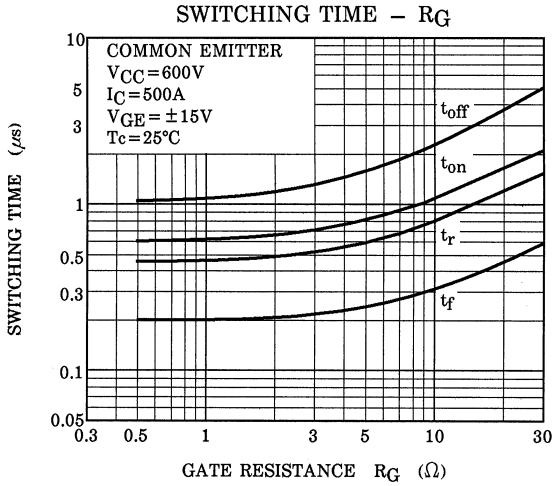
V_{CE}, V_{GE} – Q_G



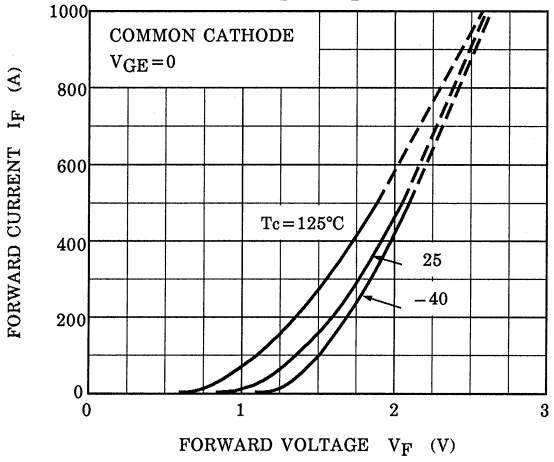
SWITCHING TIME – I_C



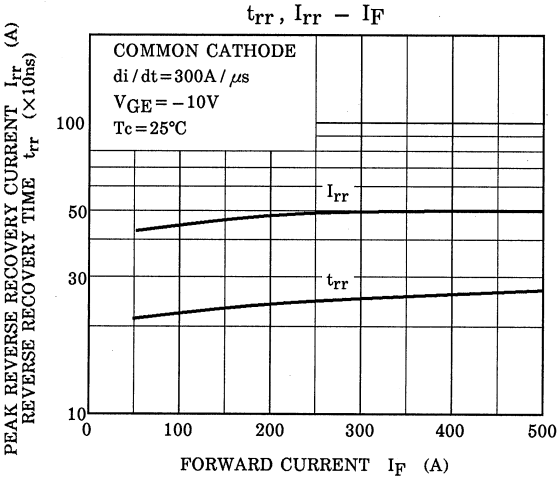
SWITCHING TIME – R_G



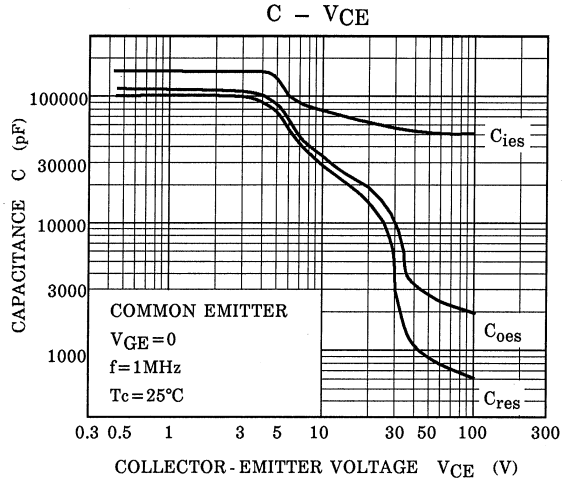
I_F – V_F



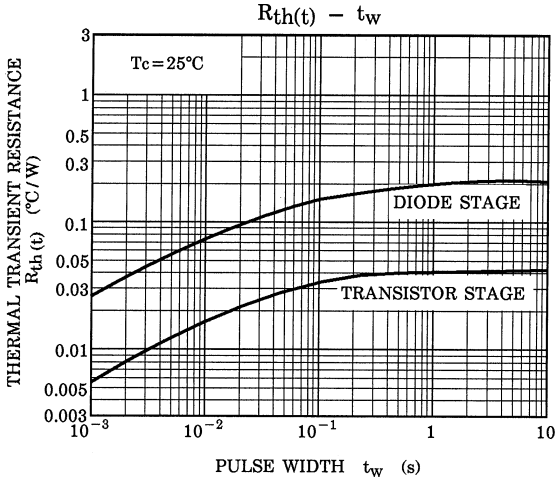
t_{rr}, I_{rr} – I_F



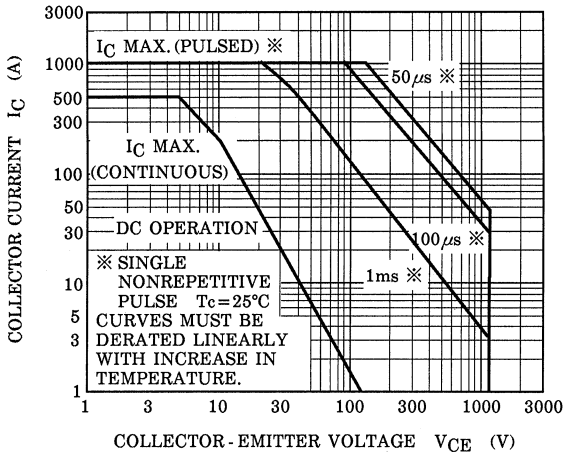
C – V_{CE}



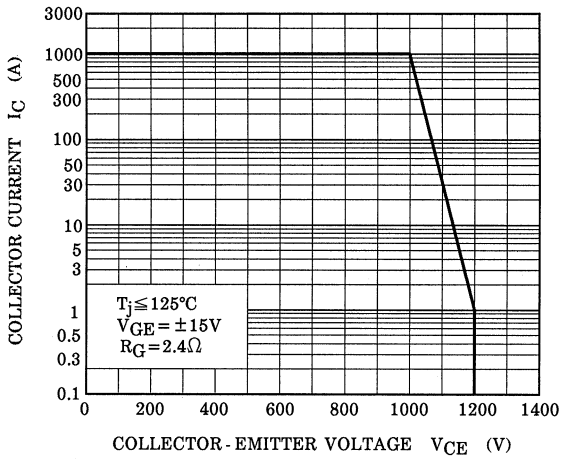
$R_{th(t)}$ – t_w



SAFE OPERATING AREA



REVERSE BIAS SOA



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