TENTATIVE TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

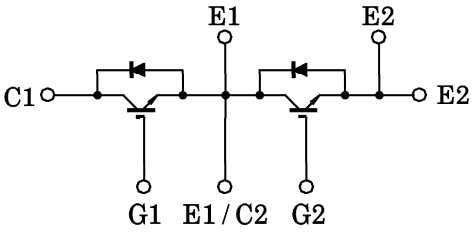
MG300Q2YS50

HIGH POWER SWITCHING APPLICATIONS.

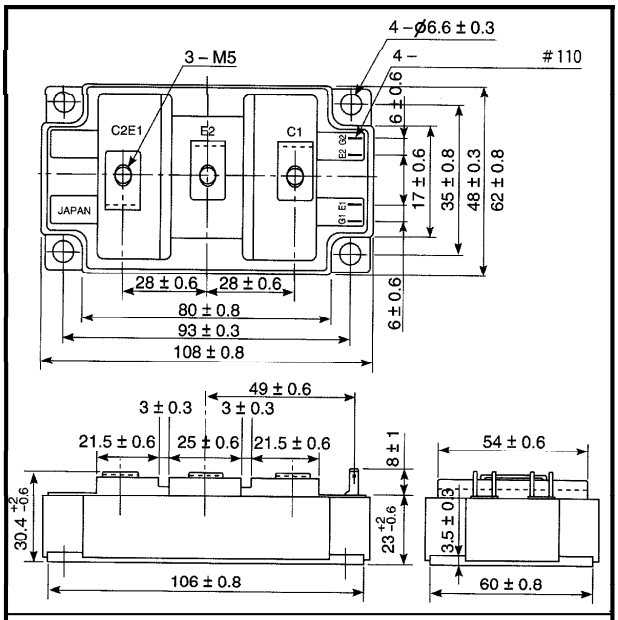
MOTOR CONTROL APPLICATIONS.

- High Input Impedance
- High Speed : $t_f = 0.3\mu s$ (Max.)
  ◎ Inductive Load
- Low Saturation Voltage
  : $V_{CE\ (sat)} = 3.6V$ (Max.)
- Enhancement-Mode
- Includes a Complete Half Bridge in One Package.
- The Electrodes are Isolated from Case.

EQUIVALENT CIRCUIT



Unit in mm



JEDEC	—
EIAJ	—
TOSHIBA	2-109C1A

Weight : 430g

961001EAA1

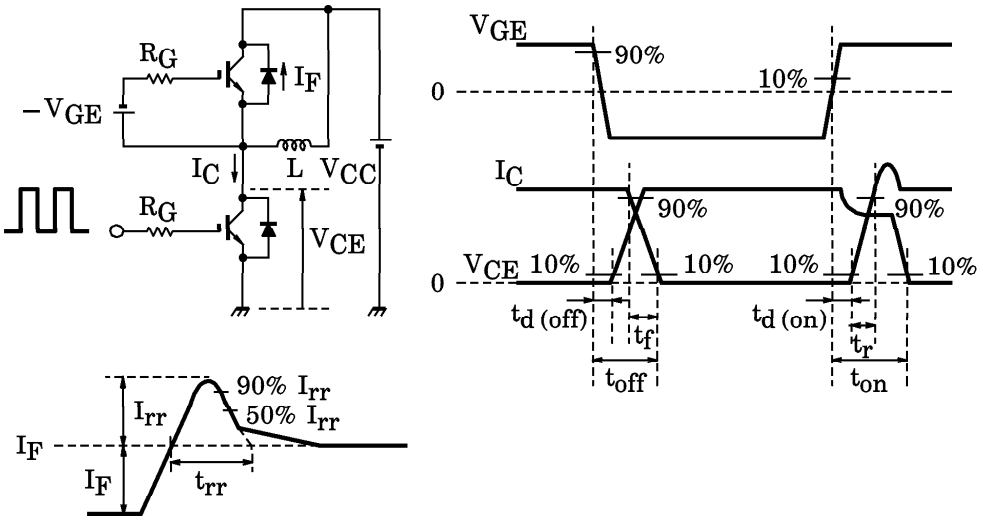
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	±20	V
Collector Current	DC	I_C (25°C / 80°C)	400 / 300	A
	1ms	I_{CP} (25°C / 80°C)	800 / 600	A
Forward Current	DC	I_F	300	A
	1ms	I_{FM}	600	A
Collector Power Dissipation (Tc = 25°C)		P_C	2000	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 / Mounting)		—	3 / 3	N·m

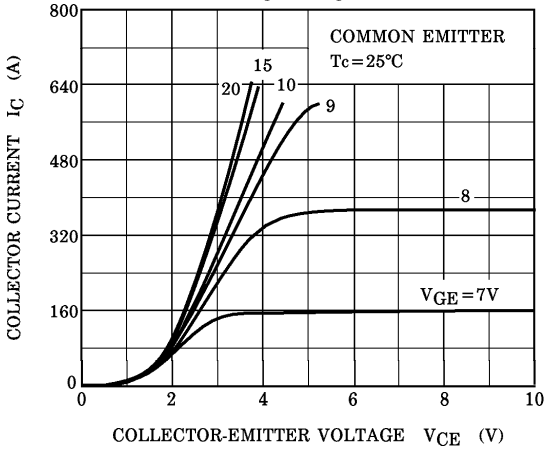
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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} = 1200V, V_{GE} = 0		—	—	1.0	mA
Gate-Emitter Cut-Off Voltage		$V_{GE\ (off)}$	I_C = 300mA, V_{CE} = 5V		3.0	—	6.0	V
Collector-Emitter Saturation Voltage		$V_{CE\ (sat)}$	I_C = 300A, V_{GE} = 15V	T_j = 25°C	—	2.8	3.6	V
				T_j = 125°C	—	3.1	4.0	
Input Capacitance		C_{ies}	V_{CE} = 10V, V_{GE} = 0, f = 1MHz		—	30.0	—	nF
Switching Time	Turn-On Delay Time	$t_{d\ (on)}$	Inductive Load V_{CC} = 600V I_C = 300A V_{GE} = ±15V R_G = 2.7Ω (Note 1)		—	0.05	—	μs
	Rise Time	t_r			—	0.05	—	
	Turn-On Time	t_{on}			—	0.2	—	
	Turn-Off Delay Time	$t_{d\ (off)}$			—	0.5	—	
	Fall Time	t_f			—	0.1	0.3	
	Turn-Off Time	t_{off}			—	0.6	—	
Forward Voltage		V_F	I_F = 300A, V_{GE} = 0		—	2.4	3.5	V
Reverse Recovery Time		t_{rr}	I_F = 300A, V_{GE} = −10V di / dt = 1000A / μs (Note 1)		—	0.2	0.3	μs
Thermal Resistance		$R_{th\ (j-c)}$	Transistor Stage		—	—	0.06	°C / W
			Diode Stage		—	—	0.19	

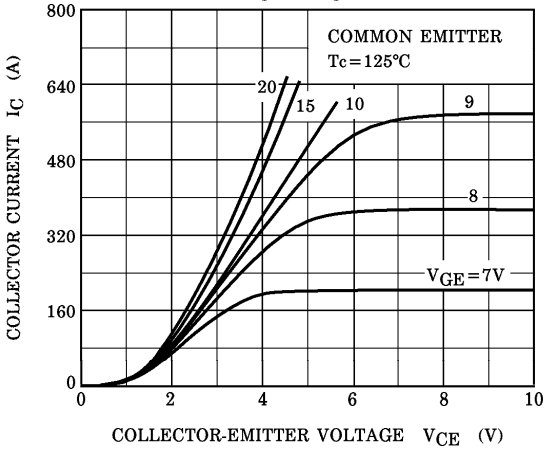
(Note 1) Switching Time and Reverse Recovery Time Test Circuit & Timing Chart



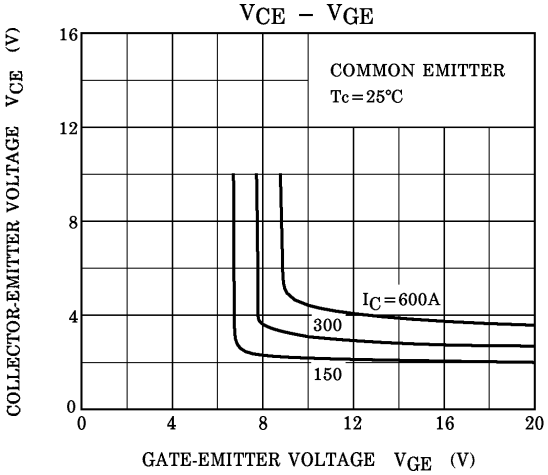
I_C – V_{CE}



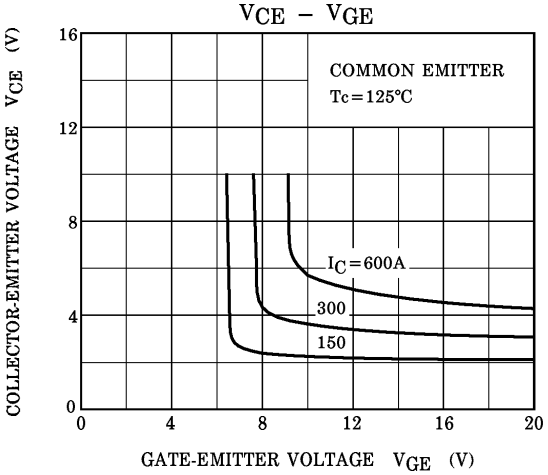
I_C – V_{CE}



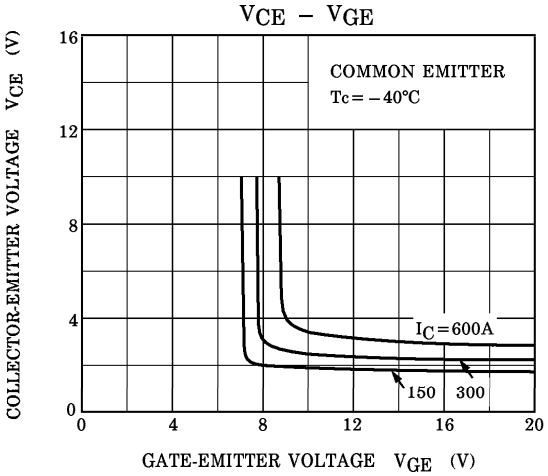
V_{CE} – V_{GE}



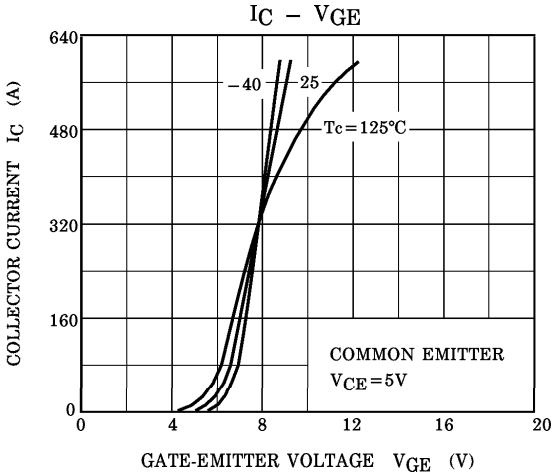
V_{CE} – V_{GE}



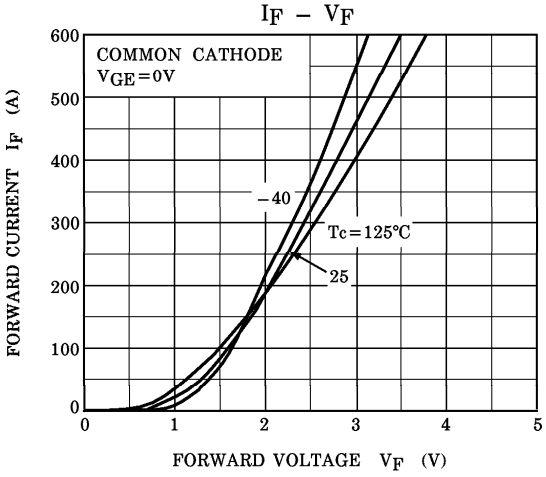
V_{CE} – V_{GE}



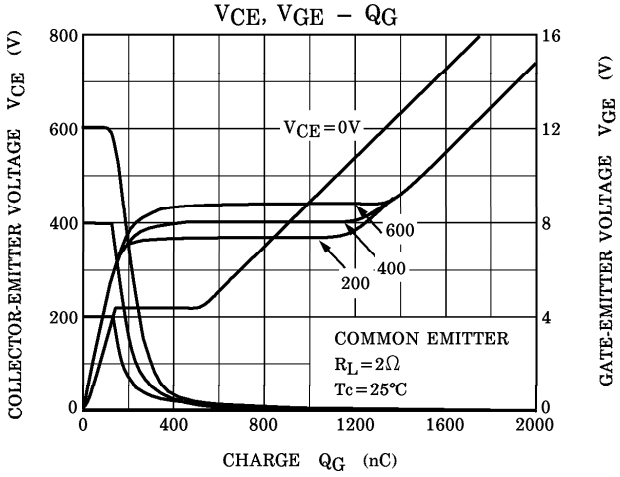
I_C – V_{GE}



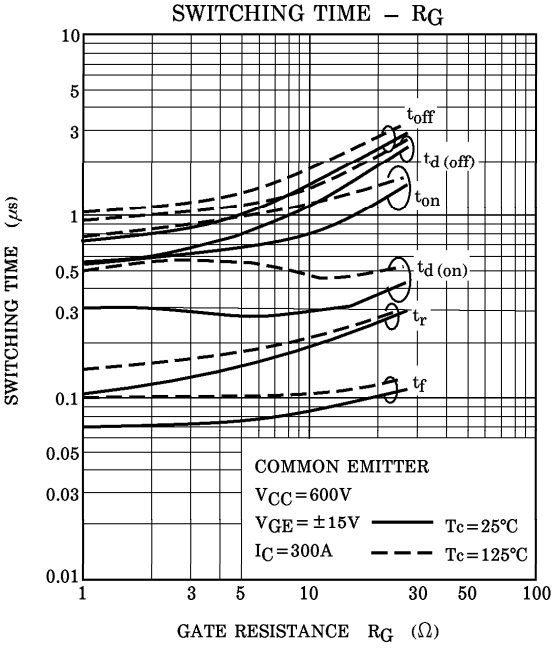
I_F – V_F



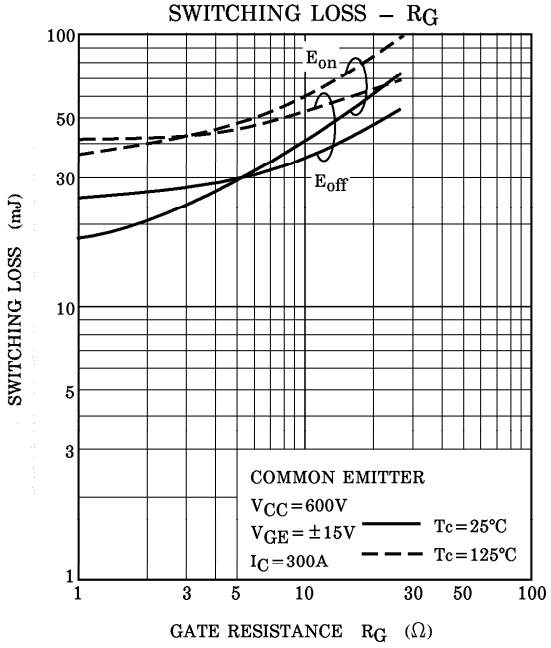
V_{CE}, V_{GE} – Q_G



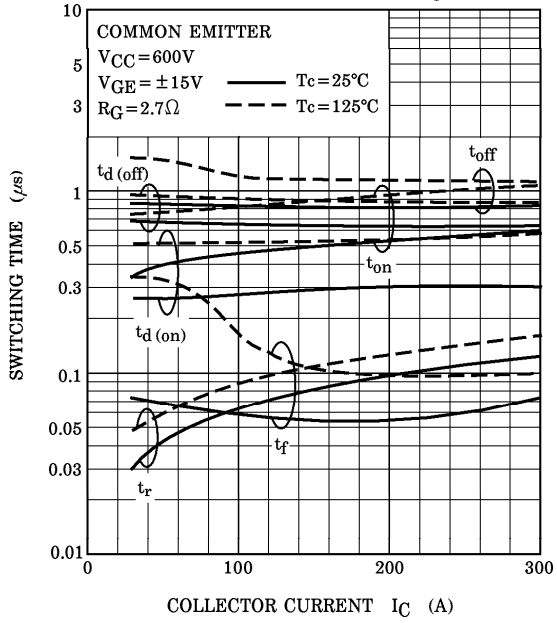
SWITCHING TIME – R_G



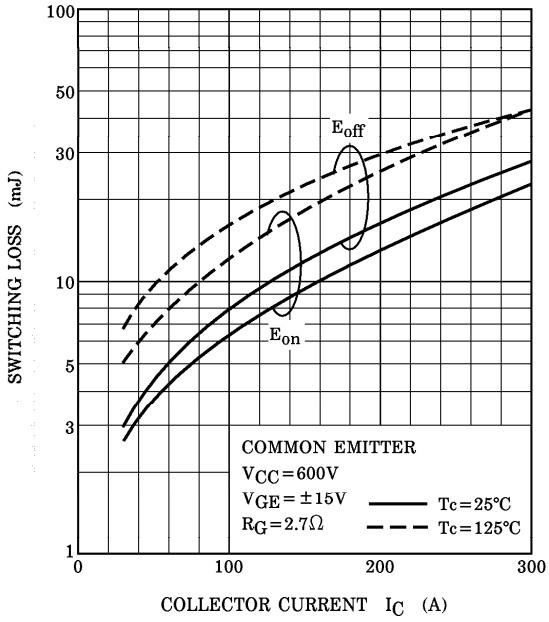
SWITCHING LOSS – R_G



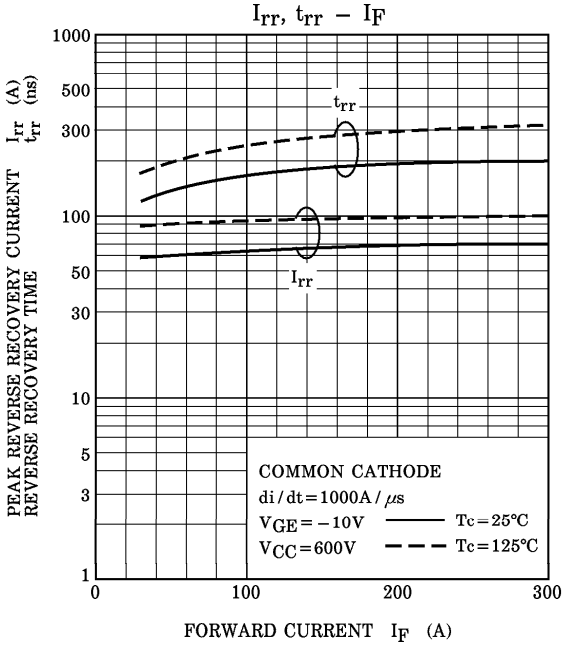
SWITCHING TIME – I_C



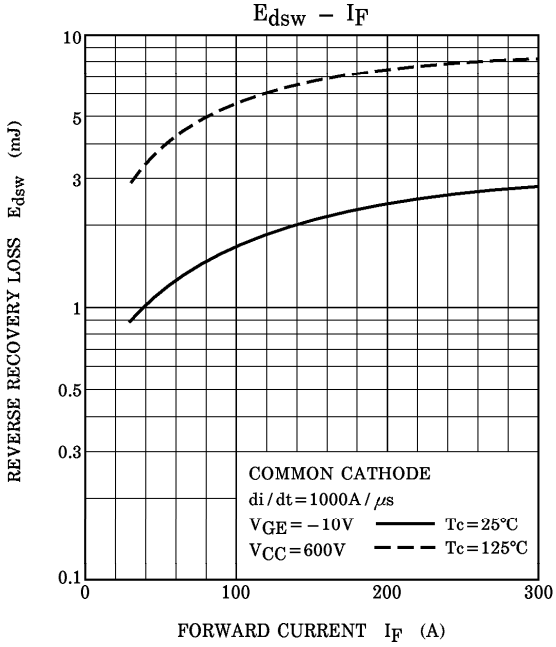
SWITCHING LOSS – I_C



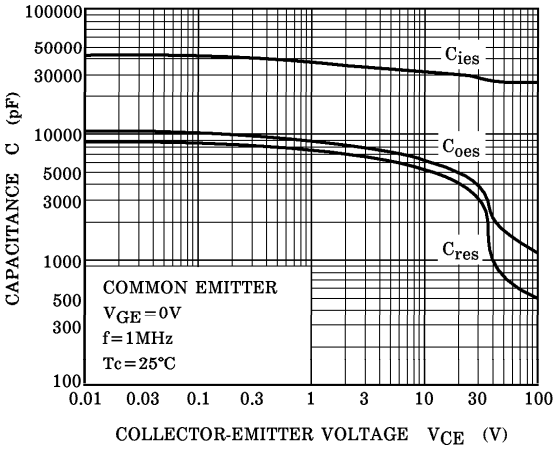
I_{rr}, t_{rr} – I_F



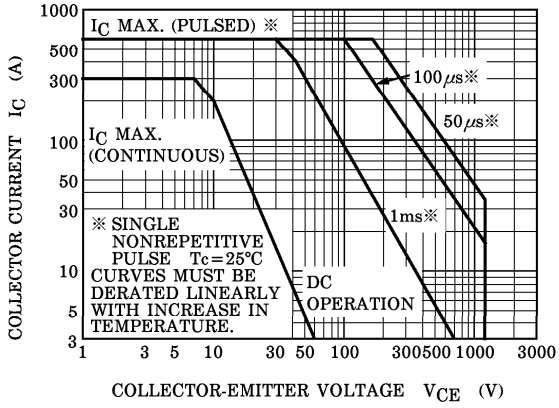
E_{dsw} – I_F



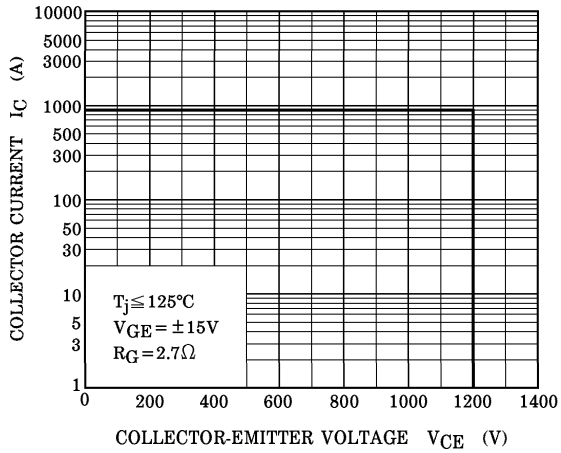
C – V_{CE}



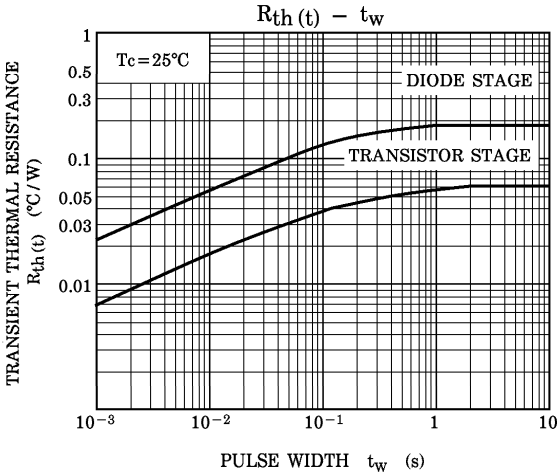
SAFE-OPERATING AREA



REVERSE BIAS SOA



$R_{th\,(t)}$ – t_w



SHORT CIRCUIT SOA