TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

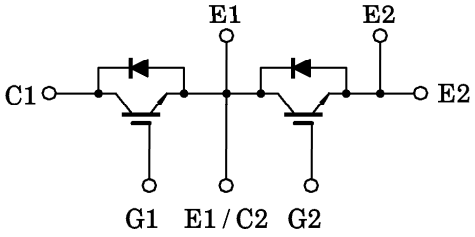
MG150Q2YS50

HIGH POWER SWITCHING APPLICATIONS

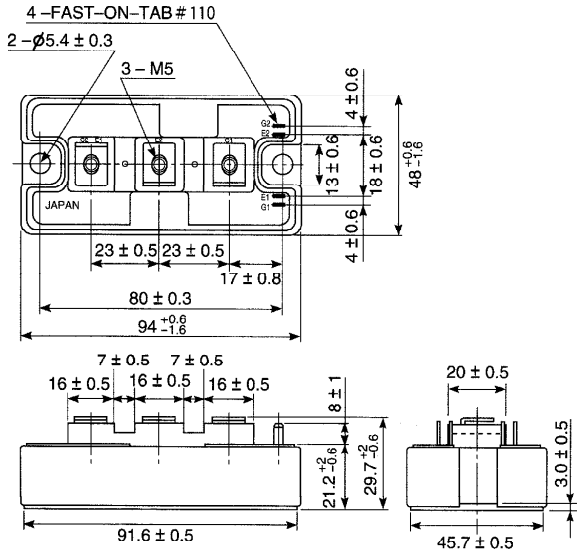
MOTOR CONTROL APPLICATIONS

- 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	2-95A4A

Weight : 255g

MAXIMUM RATINGS (Ta = 25°C)

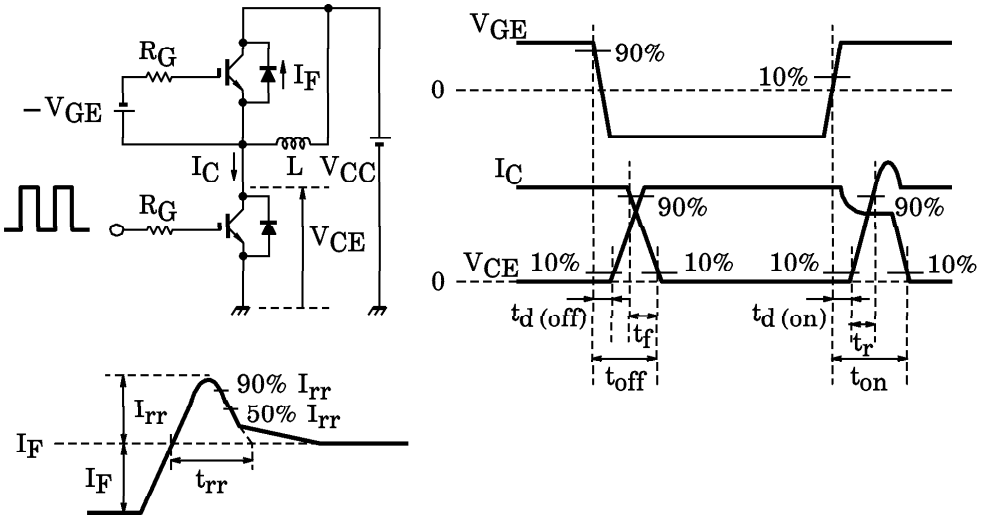
CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	±20	V
Collector Current	DC	I_C (25°C / 80°C)	200 / 150	A
	1ms	I_{CP} (25°C / 80°C)	400 / 300	
Forward Current	DC	I_F	150	A
	1ms	I_{FM}	300	
Collector Power Dissipation (Tc = 25°C)		P_C	1250	W
Junction 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

961001EAA2

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GES}	$V_{GE}=\pm20V$, $V_{CE}=0$		—	—	±500	nA
Collector Cut-off Current		I_{CES}	$V_{CE}=1200V$, $V_{GE}=0$		—	—	2.0	mA
Gate-Emitter Cut-off Voltage		$V_{GE\ (off)}$	$I_C=150mA$, $V_{CE}=5V$		3.0	—	6.0	V
Collector-Emitter Saturation Voltage		$V_{CE\ (sat)}$	$I_C=150A$, $V_{GE}=15V$	$T_j=25°C$	—	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		—	18.0	—	nF
Switching Time	Turn-on Delay Time	$t_{d\ (on)}$	Inductive Load $V_{CC}=600V$ $I_C=150A$ $V_{GE}=\pm15V$ $R_G=5.6\Omega$ (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	$I_F=150A$, $V_{GE}=0$		—	2.4	3.5	V
Reverse Recovery Time		t_{rr}	$I_F=150A$, $V_{GE}=-10V$ $di/dt=700A/\mu s$ (Note 1)		—	0.1	0.25	μs
Thermal Resistance		$R_{th\ (j-c)}$	Transistor Stage		—	—	0.1	°C / W
			Diode Stage		—	—	0.32	

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



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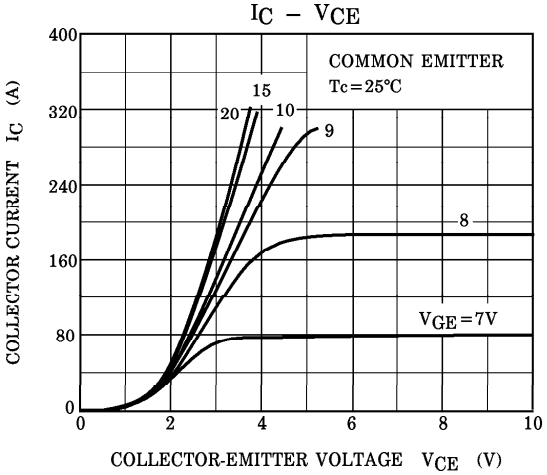
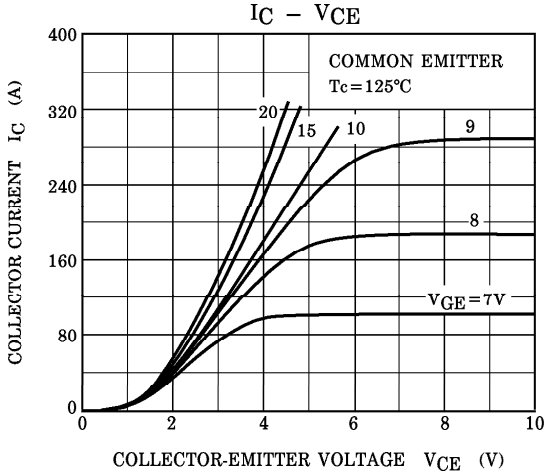
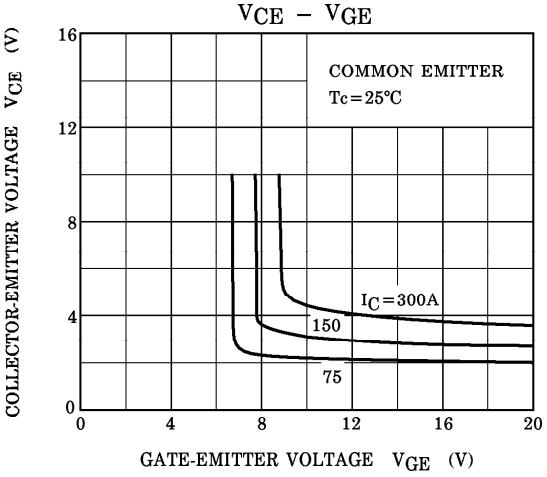
I_C – V_{CE}



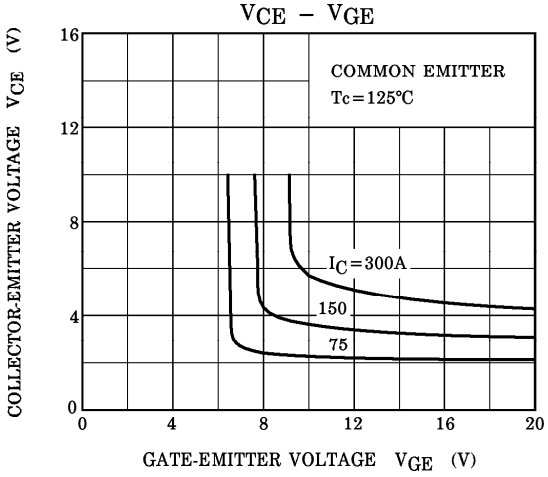
I_C – V_{CE}



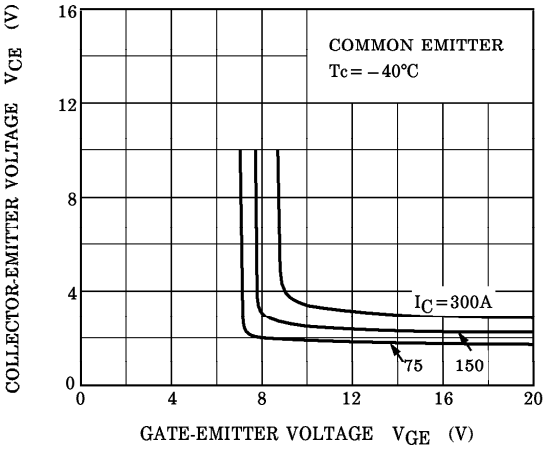
V_{CE} – V_{GE}



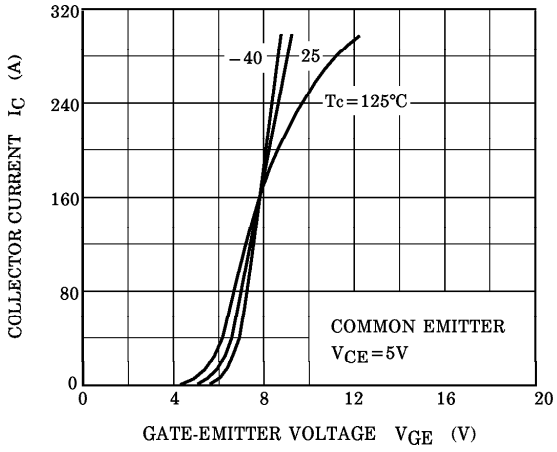
V_{CE} – V_{GE}



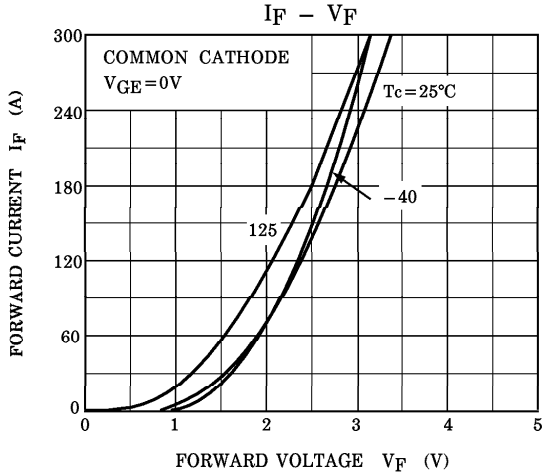
V_{CE} – V_{GE}



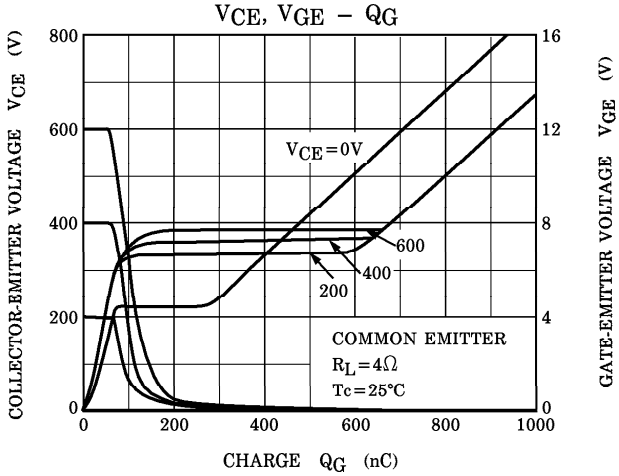
I_C – V_{GE}



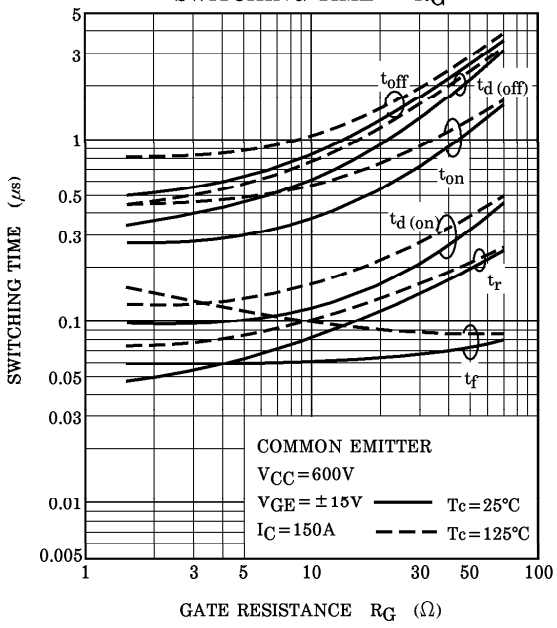
I_F – V_F



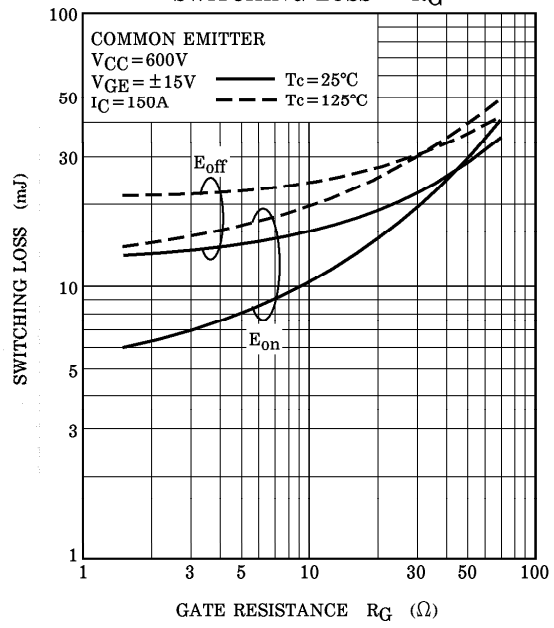
V_{CE}, V_{GE} – Q_G



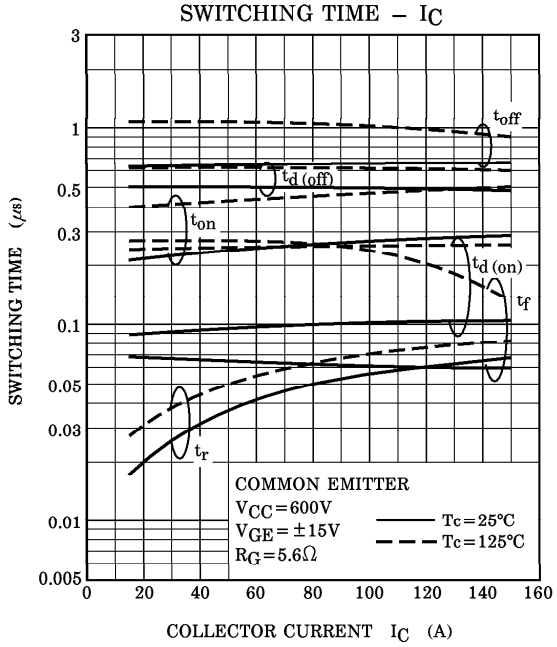
SWITCHING TIME – R_G



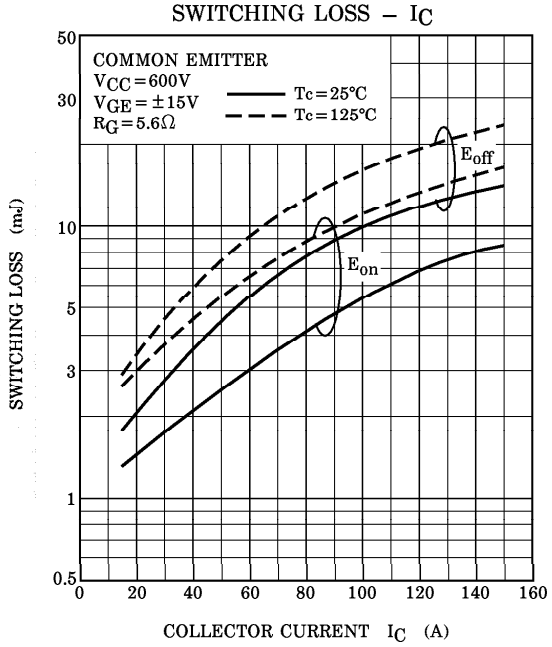
SWITCHING LOSS – R_G



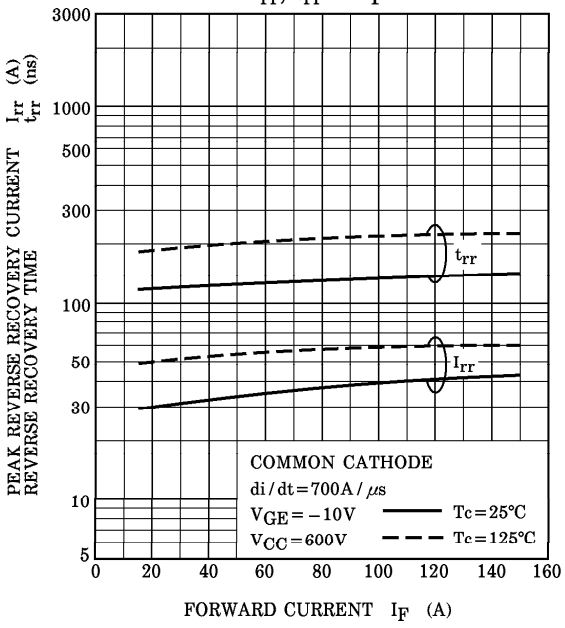
SWITCHING TIME – I_C



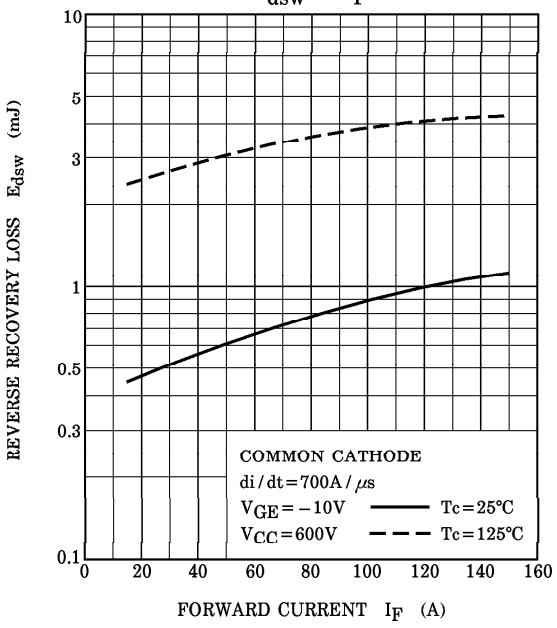
SWITCHING LOSS – I_C



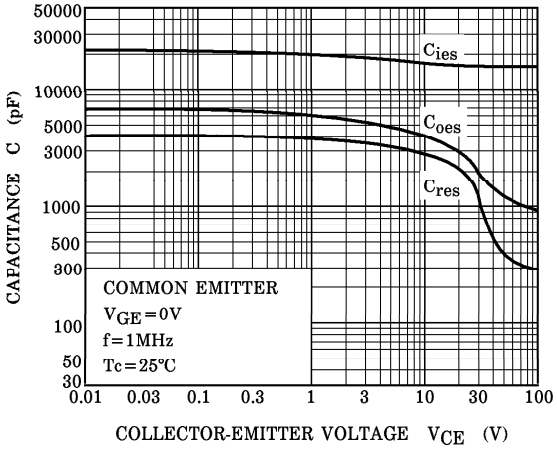
I_{rr}, t_{rr} – I_F



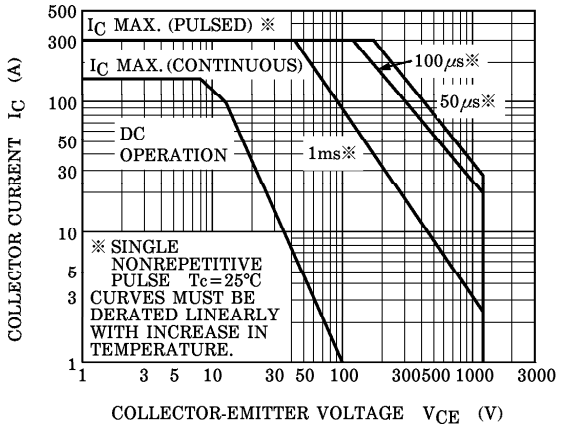
E_{dsw} – I_F



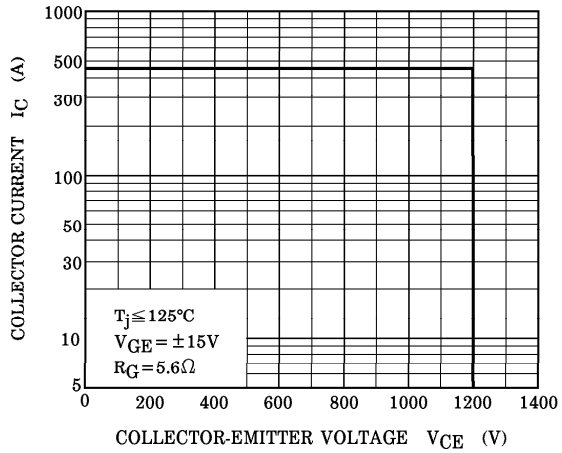
C – V_{CE}



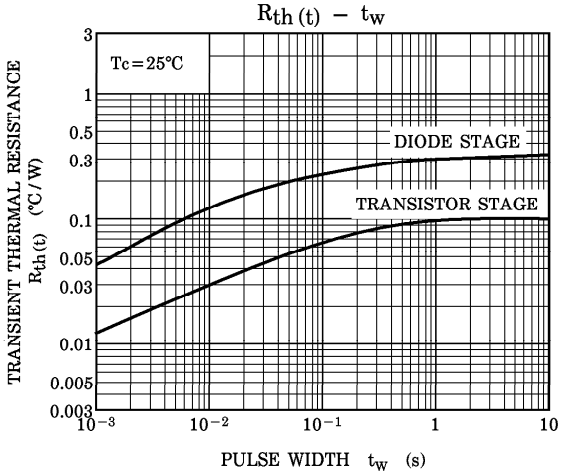
SAFE-OPERATING AREA



REVERSE BIAS SOA



R_{th} (t) – t_w



SHORT CIRCUIT SOA