

TENTATIVE

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

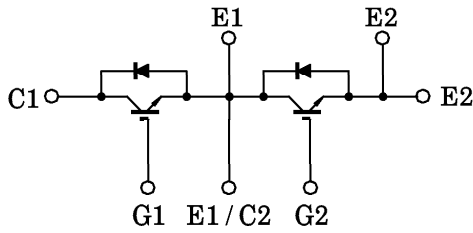
MG50Q2YS50A

HIGH POWER SWITCHING APPLICATIONS

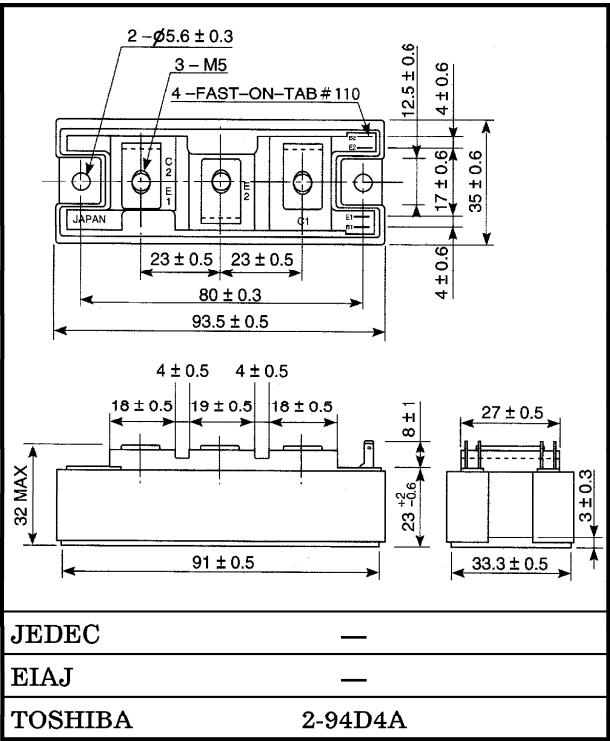
MOTOR CONTROL APPLICATIONS

- 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



Weight : 202g

961001FAA1

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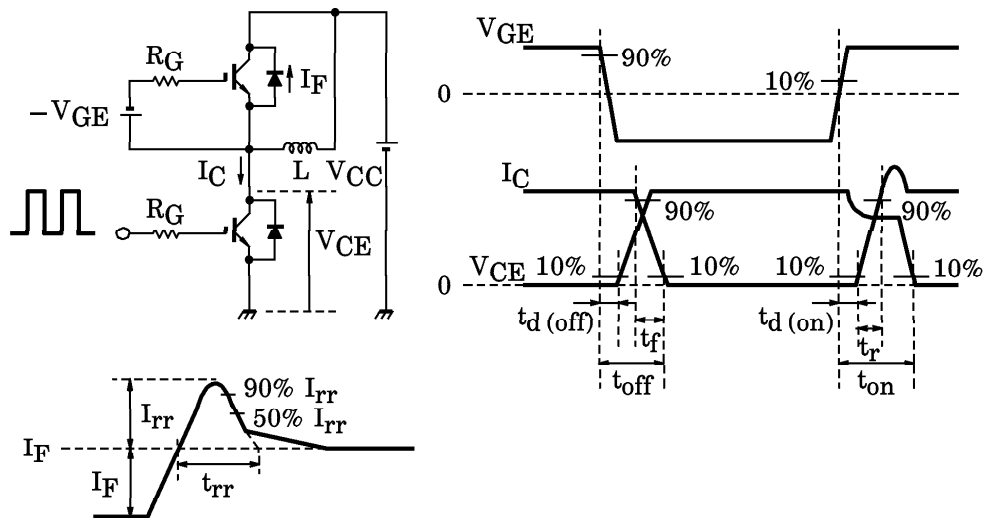
MAXIMUM RATINGS (Ta = 25°C)

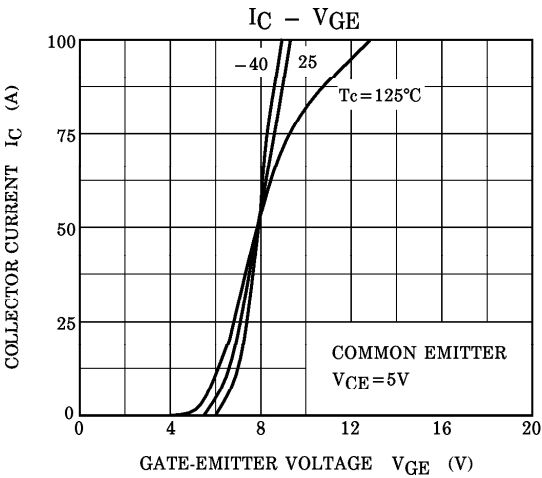
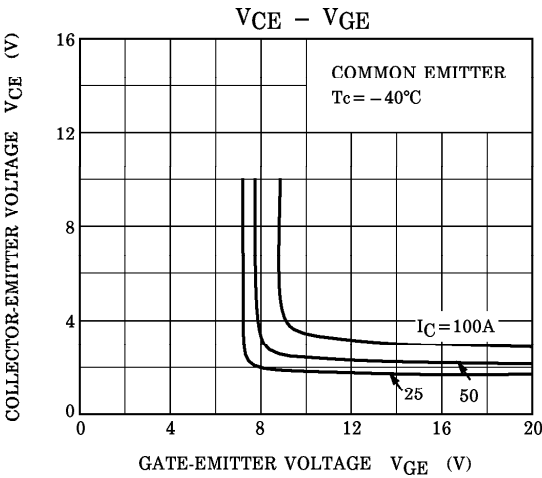
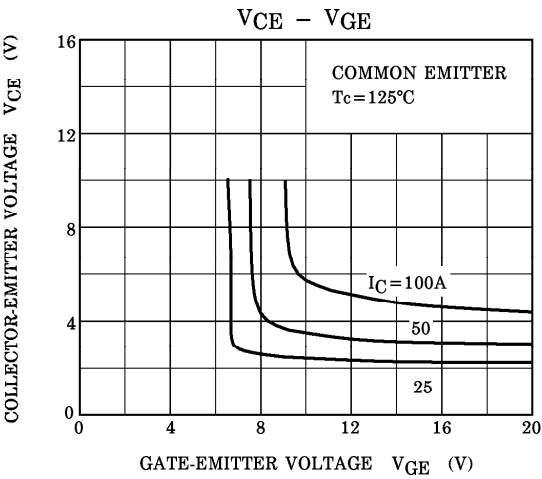
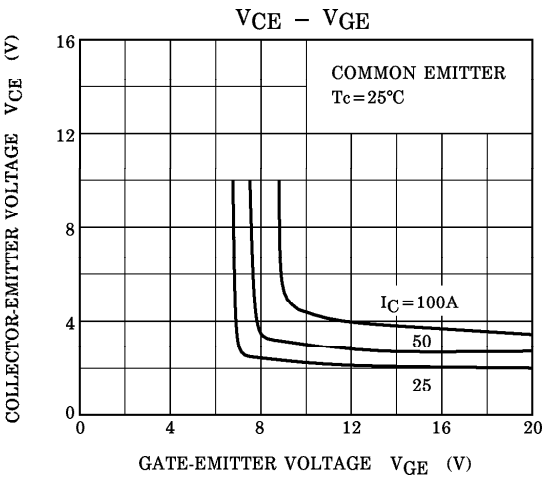
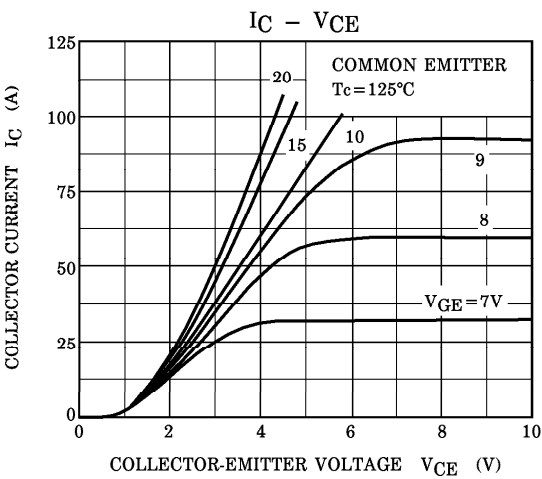
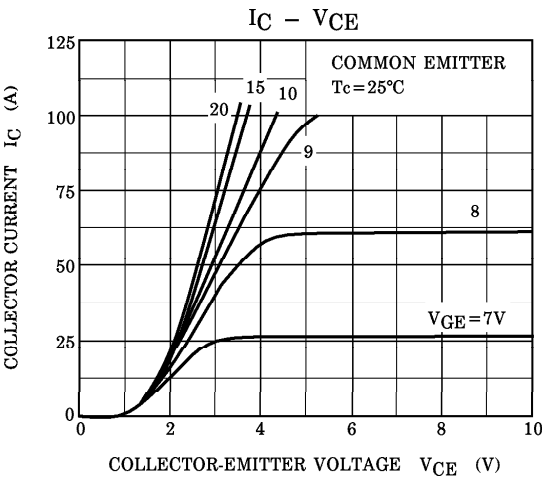
CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	± 20	V
Collector Current	DC	I_C (25°C / 80°C)	78 / 50	A
	1ms	I_{CP} (25°C / 80°C)	156 / 100	
Forward Current	DC	I_F	50	A
	1ms	I_{FM}	100	
Collector Power Dissipation (Tc = 25°C)		P_C	400	W
Junction 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

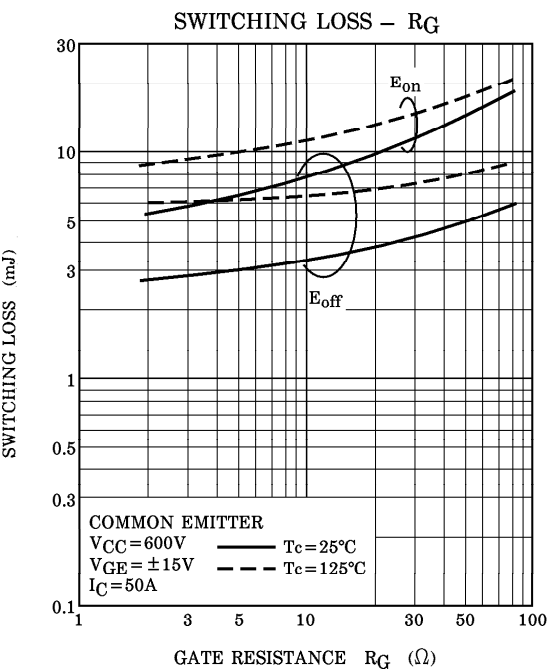
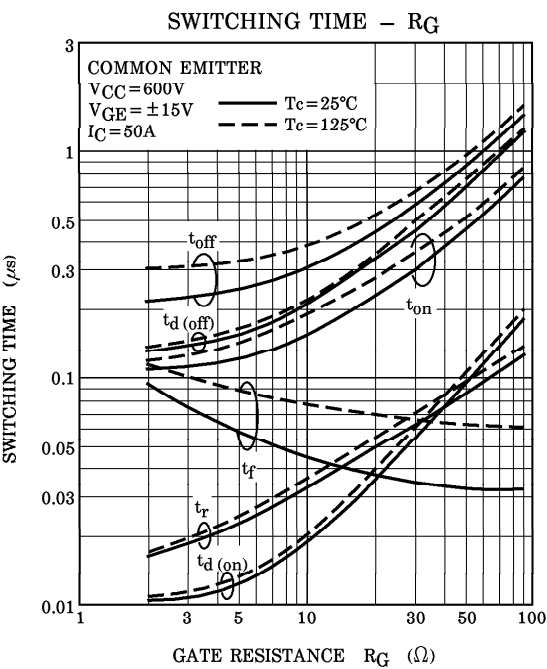
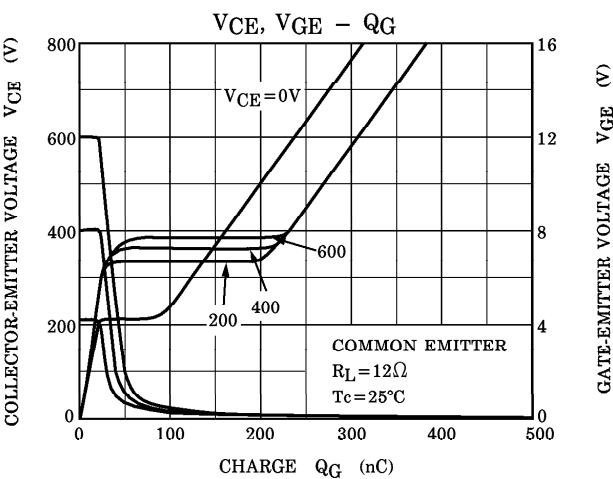
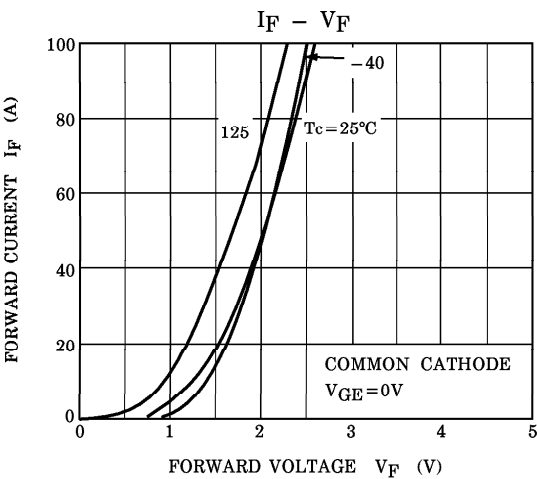
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

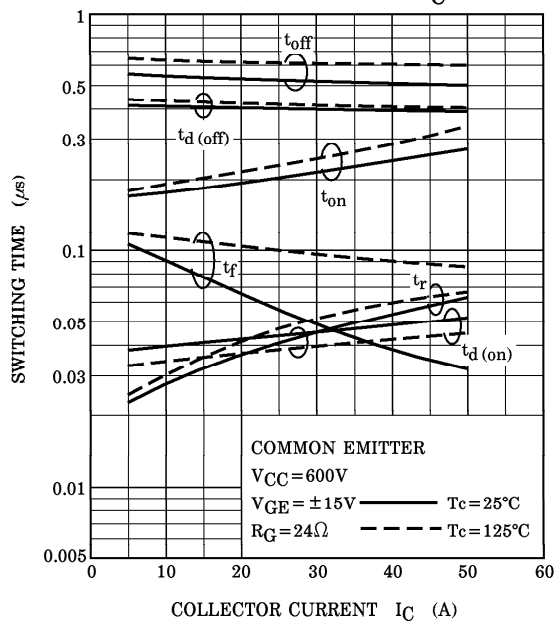
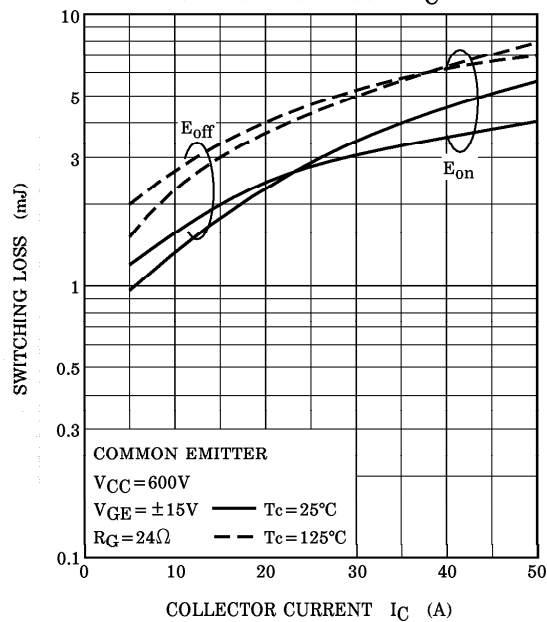
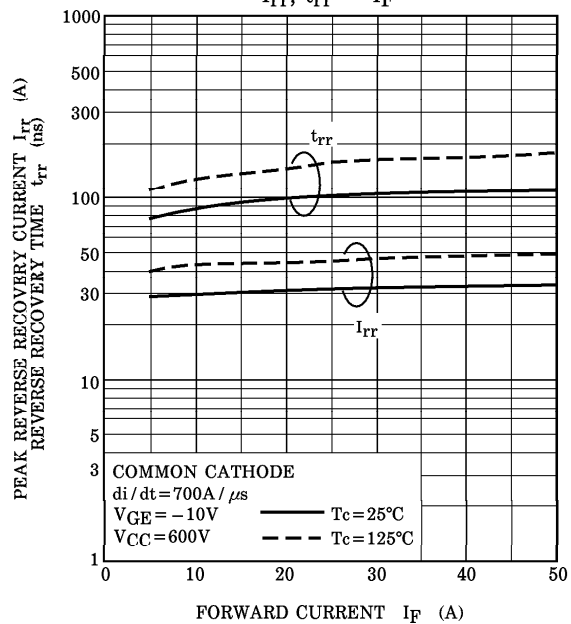
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GES}	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	± 500	nA
Collector Cut-Off Current		I_{CES}	$V_{CE} = 1200V, V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-Off Voltage		$V_{GE(off)}$	$I_C = 50mA, V_{CE} = 5V$	3.0	—	6.0	V
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	$I_C = 50A, V_{GE} = 15V$	$T_j = 25^\circ C$	2.8	3.6	V
				$T_j = 125^\circ C$	3.1	4.0	
Input Capacitance		C_{ies}	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	6.0	—	nF
Switching Time	Turn-On Delay Time	$t_d(on)$	Inductive Load $V_{CC} = 600V$ $I_C = 50A$ $V_{GE} = \pm 15V$ $R_G = 24\Omega$ (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	$I_F = 50A, V_{GE} = 0$	—	1.9	3.0	V
Reverse Recovery Time		t_{rr}	$I_F = 50A, V_{GE} = -10V$ $di/dt = 700A/\mu s$ (Note 1)	—	0.1	0.25	μs
Thermal Resistance	$R_{th(j-c)}$	Transistor Stage		—	—	0.31	°C / W
		Diode Stage		—	—	0.47	

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







SWITCHING TIME - I_C SWITCHING LOSS - I_C  I_{rr} , t_{rr} - I_F  E_{dsw} - I_F 