

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

# MG150Q2YS50

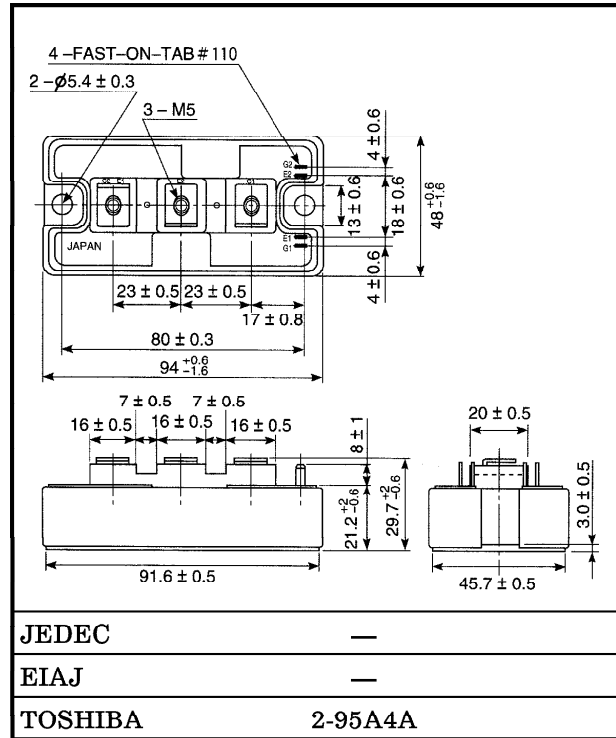
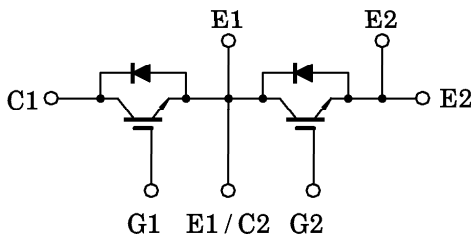
HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

Unit in mm

- 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



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
	1ms	$I_{CP}$ (25°C / 80°C)	400 / 300
Forward Current	DC	$I_F$	150
	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

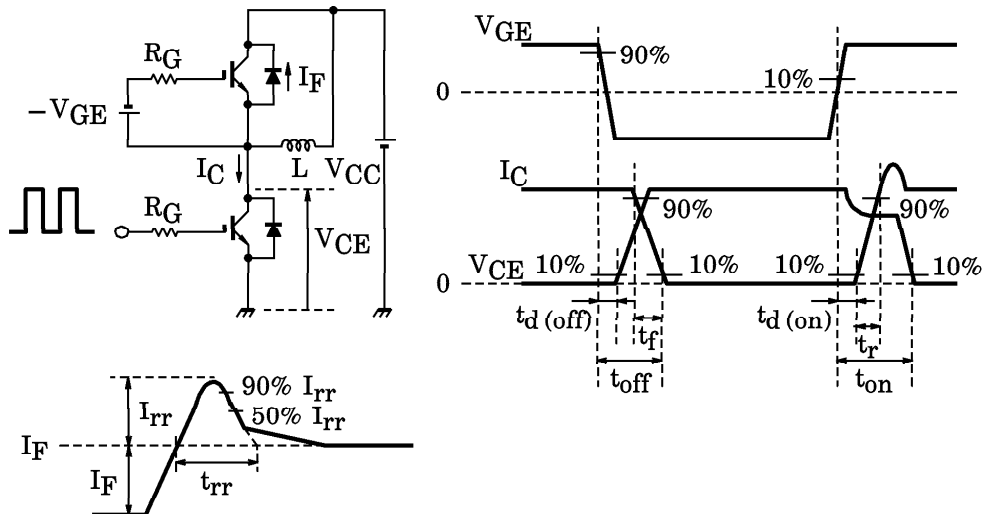
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

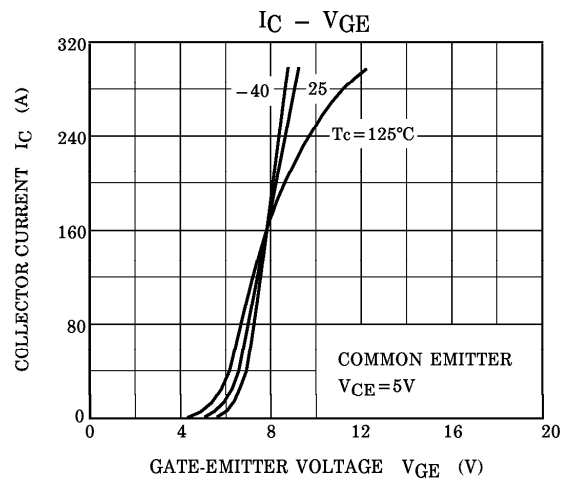
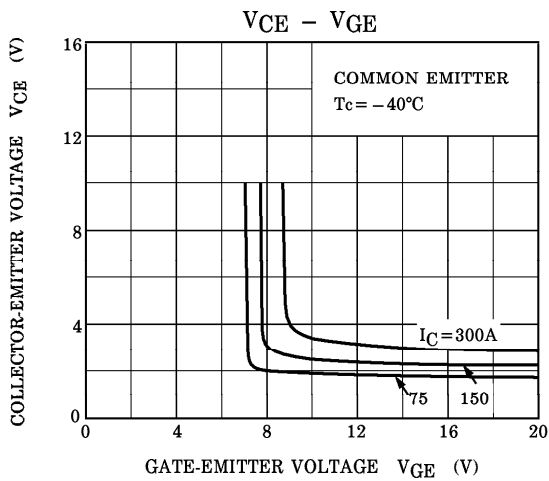
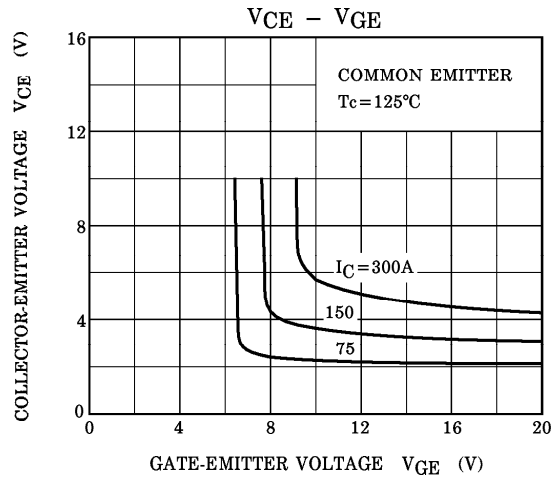
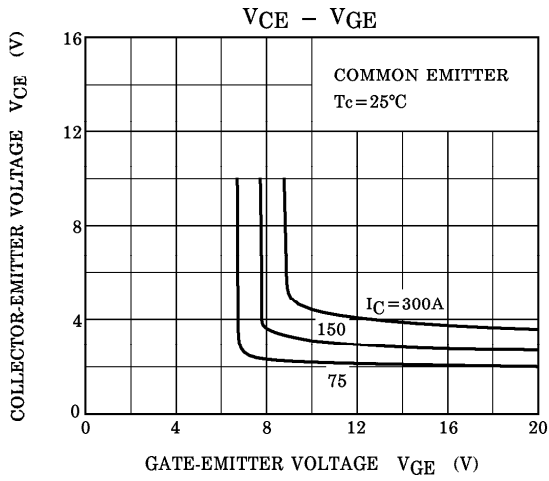
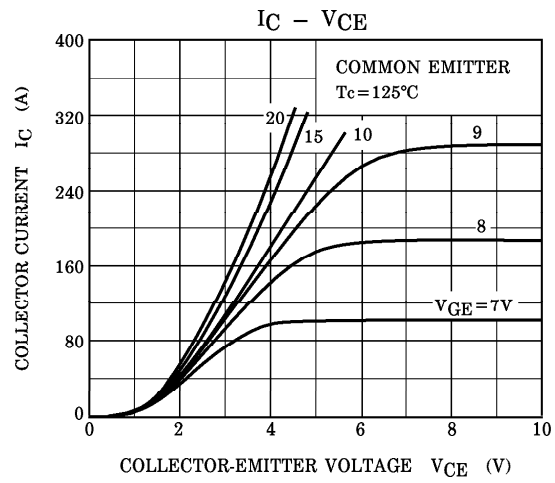
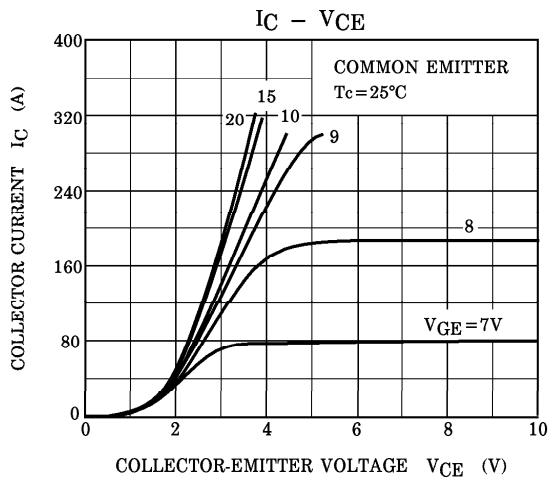
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current		$I_{GES}$	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	$\pm 500$	nA	
Collector Cut-off Current		$I_{CES}$	$V_{CE} = 1200V, V_{GE} = 0$	—	—	2.0	mA	
Gate-Emitter Cut-off Voltage		$V_{GE} (off)$	$I_C = 150mA, V_{CE} = 5V$	3.0	—	6.0	V	
Collector-Emitter Saturation Voltage		$V_{CE} (sat)$	$I_C = 150A, V_{GE} = 15V$	$T_j = 25^\circ C$	—	2.8	3.6	V
				$T_j = 125^\circ C$	—	3.1	4.0	
Input Capacitance		$C_{ies}$	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	18.0	—	nF	
Switching Time	Turn-on Delay Time	$t_d (on)$	Inductive Load $V_{CC} = 600V$ $I_C = 150A$ $V_{GE} = \pm 15V$ $R_G = 5.6\Omega$  (Note 1)	—	0.05	—	$\mu s$	
	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	$\mu s$	
Thermal Resistance		$R_{th} (j-c)$	Transistor Stage	—	—	0.1	$^\circ C / W$	
			Diode Stage	—	—	0.32		

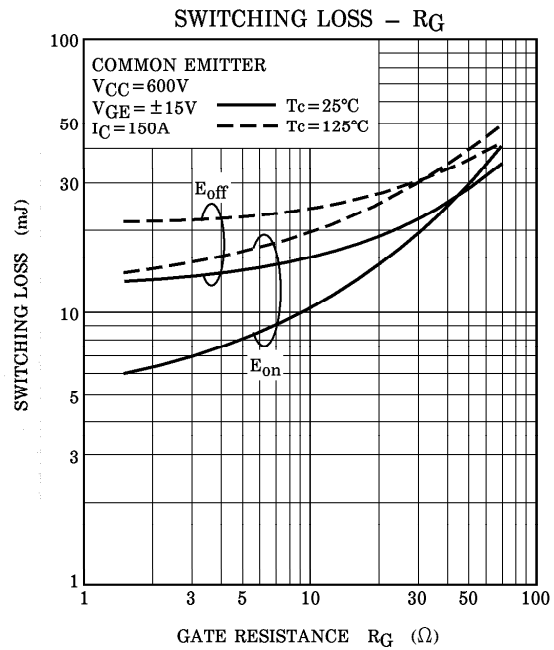
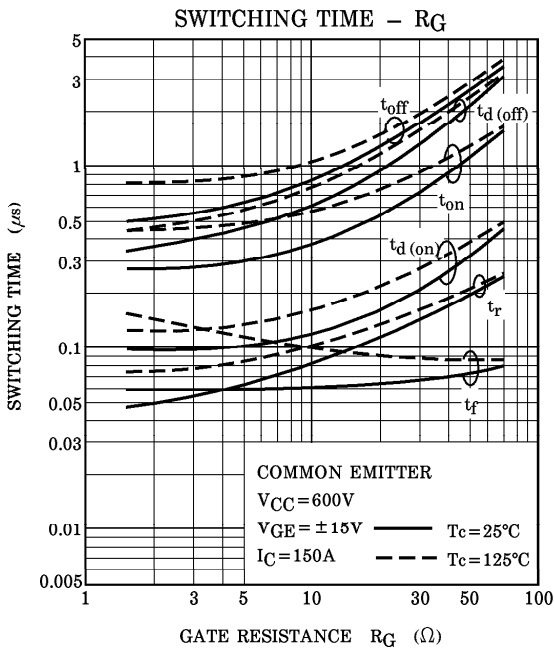
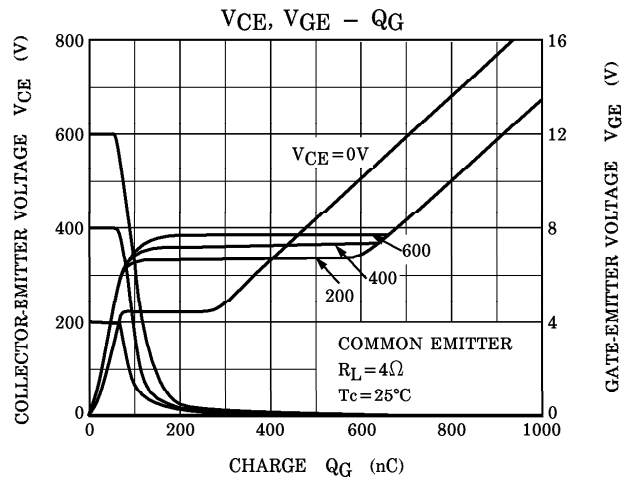
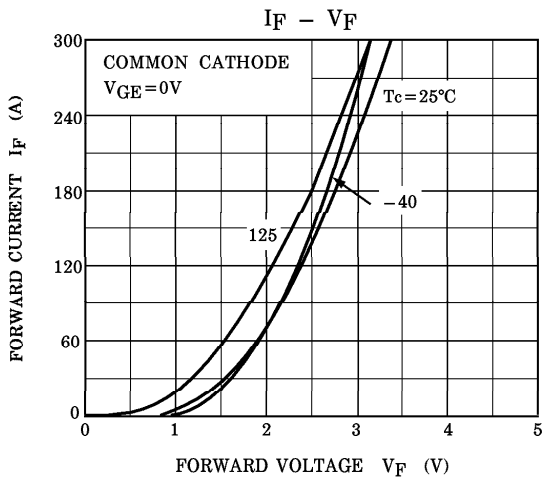
Note 1 : Switching Time and Reverse Recovery Time Test Circuit & Timing Chart



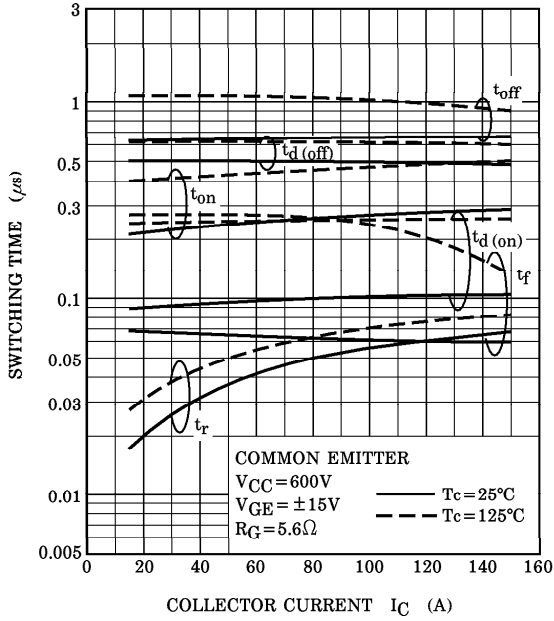
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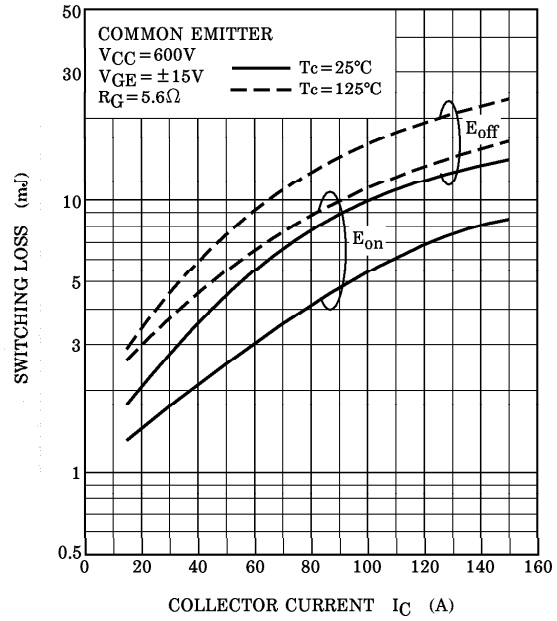




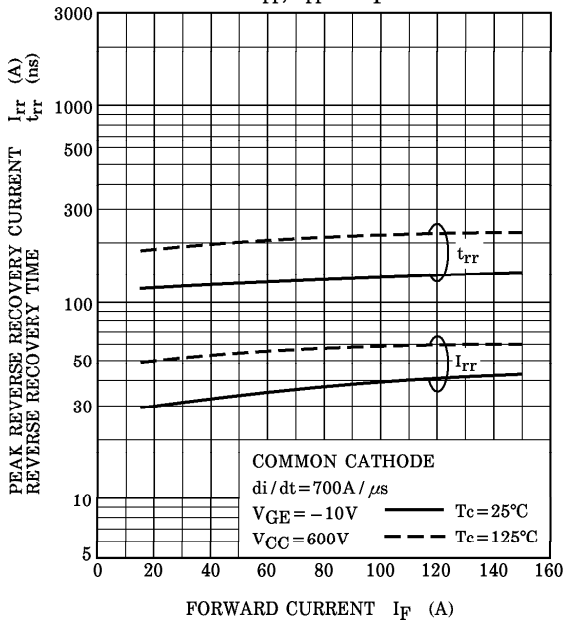
SWITCHING TIME - I<sub>C</sub>



SWITCHING LOSS - I<sub>C</sub>



I<sub>rr</sub>, t<sub>rr</sub> - I<sub>F</sub>



E<sub>dsw</sub> - I<sub>F</sub>

