

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

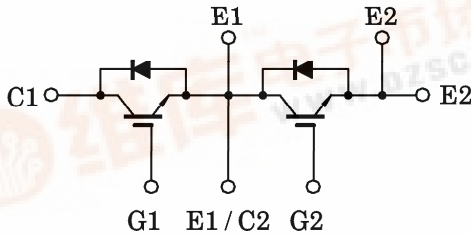
# MG75Q2YS51

HIGH POWER SWITCHING APPLICATIONS

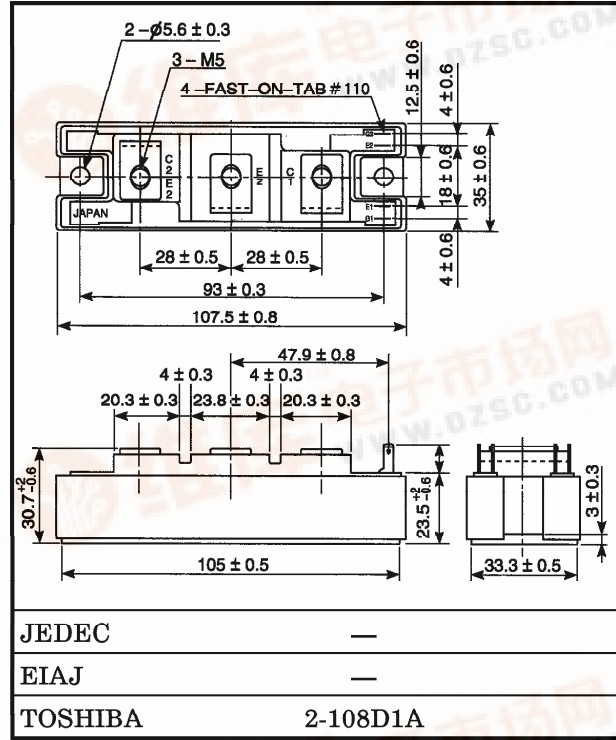
MOTOR CONTROL APPLICATIONS

- 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 : 240g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	$V_{CES}$	1200	V
Gate-Emitter Voltage	$V_{GES}$	$\pm 20$	V
Collector Current	DC	$I_C$ (25°C / 80°C)	100 / 75
	1ms	$I_{CP}$ (25°C / 80°C)	200 / 150
Forward Current	DC	$I_F$	75
	1ms	$I_{FM}$	150
Collector Power Dissipation (Tc = 25°C)	$P_C$	600	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

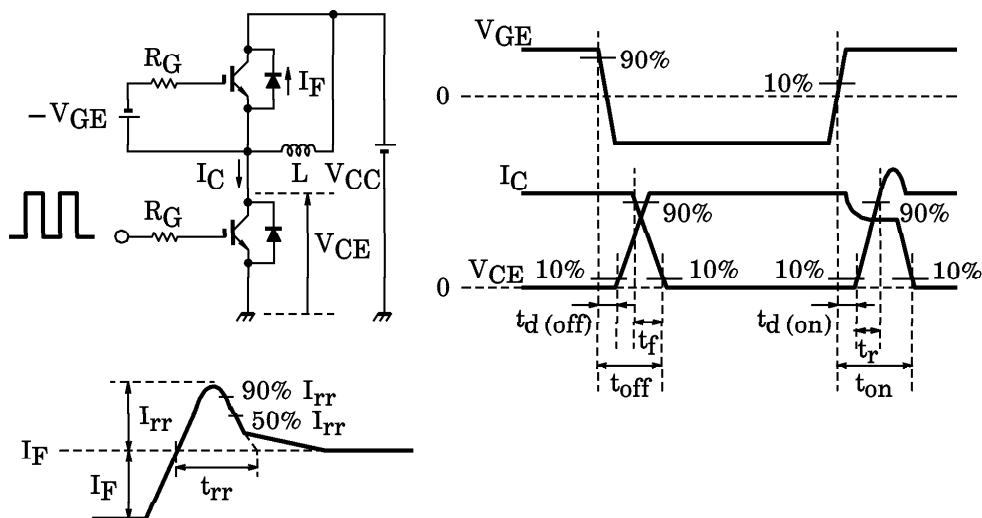
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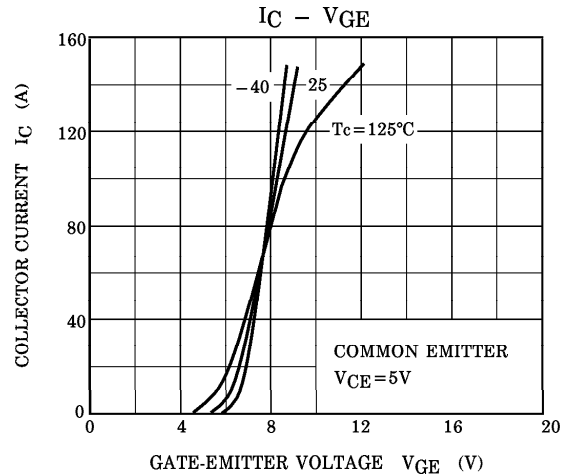
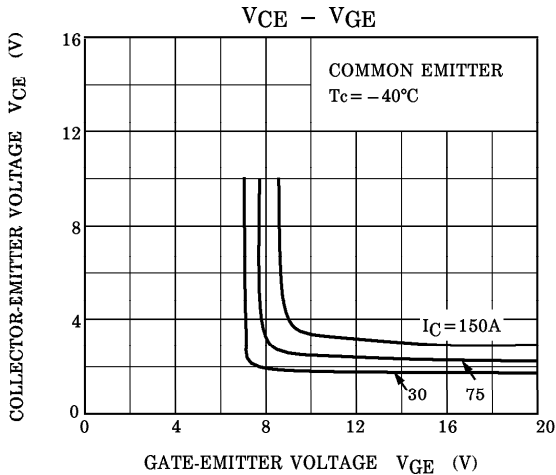
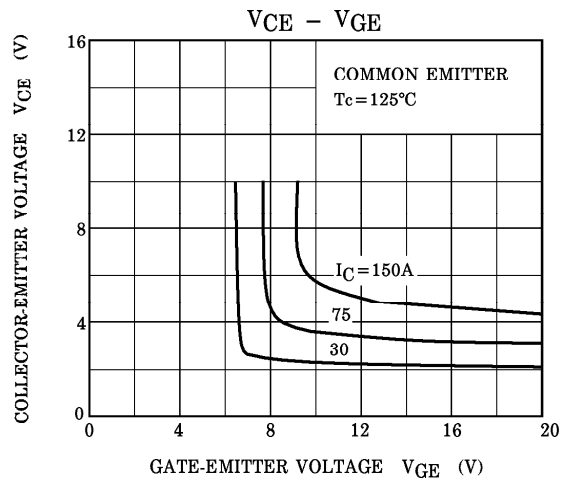
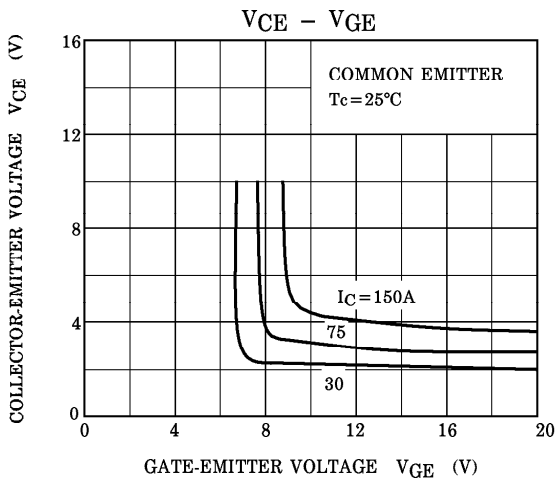
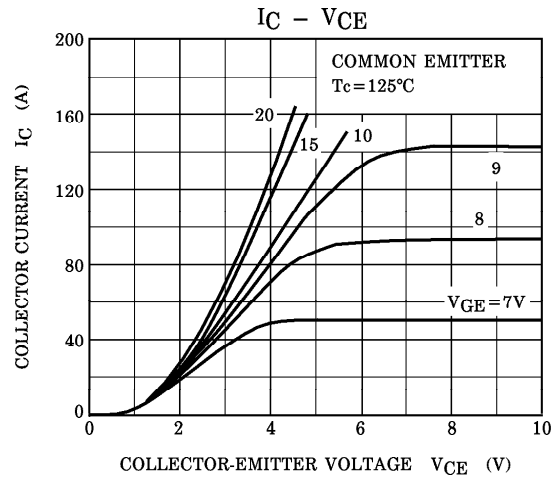
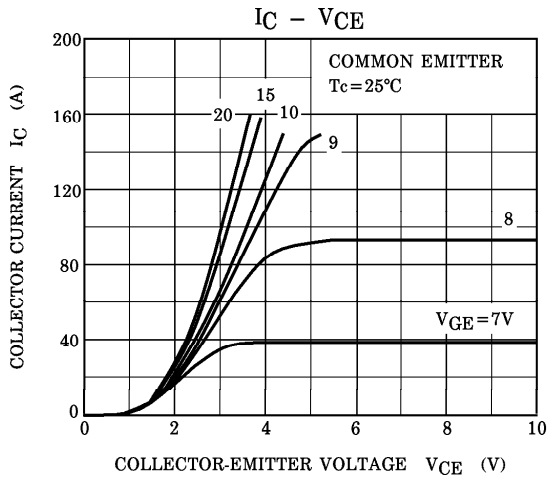
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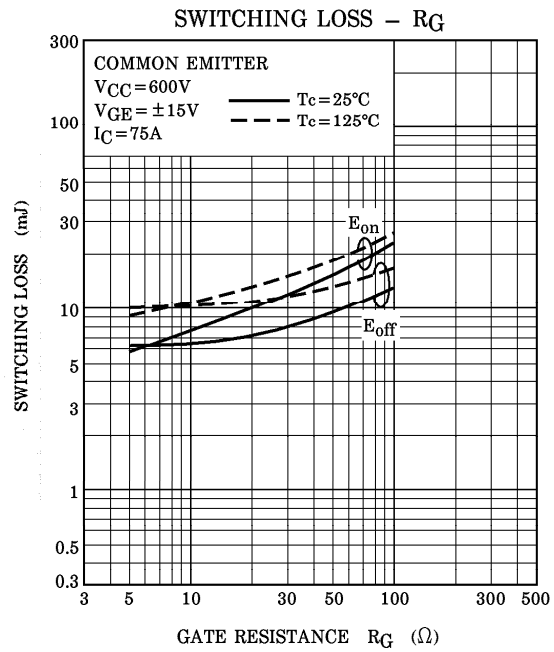
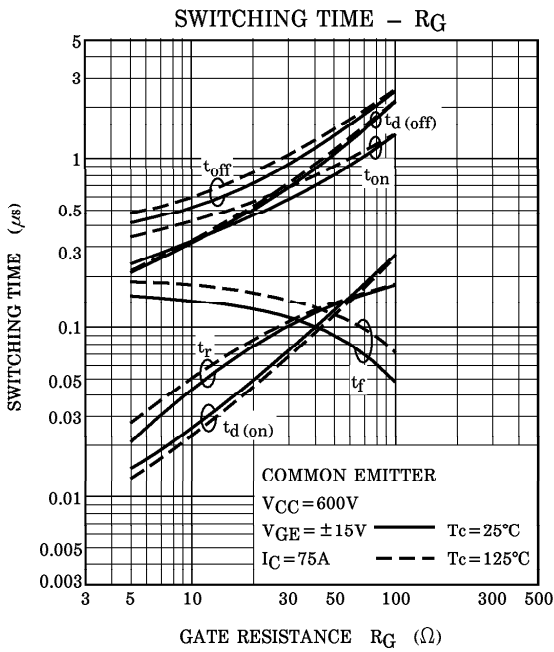
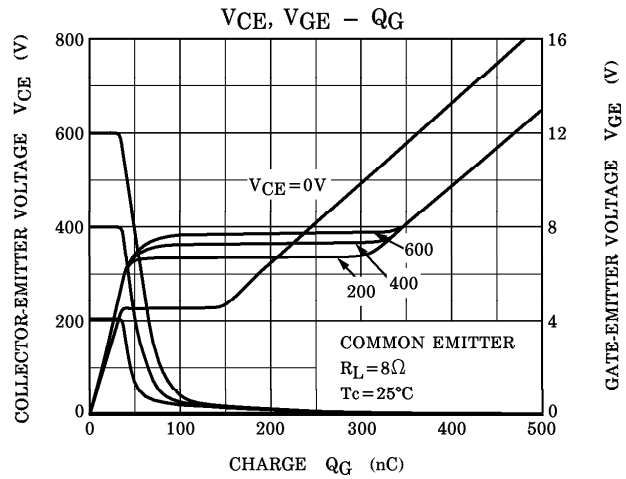
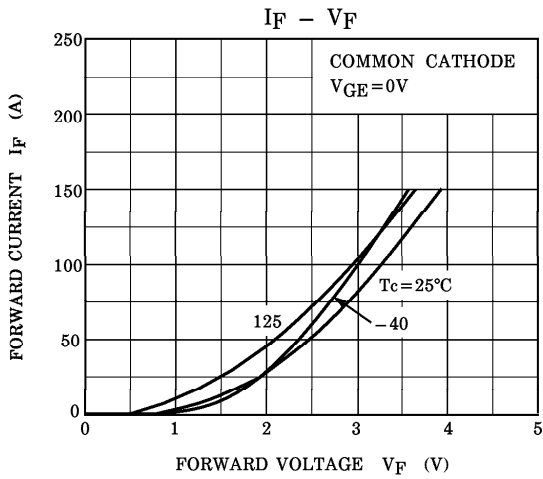
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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		$I_{CES}$	$V_{CE} = 1200V, V_{GE} = 0$	—	—	1.0	mA	
Gate-Emitter Cut-off Voltage		$V_{GE (off)}$	$I_C = 75mA, V_{CE} = 5V$	3.0	—	6.0	V	
Collector-Emitter Saturation Voltage		$V_{CE (sat)}$	$I_C = 75A, V_{GE} = 15V$	$T_j = 25^\circ C$	—	2.8	3.6	V
				$T_j = 125^\circ C$	—	3.1	4.0	
Input Capacitance		$C_{ies}$	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	8.5	—	nF	
Switching Time	Turn-on Delay Time	$t_{d (on)}$	Inductive Load $V_{CC} = 600V$ $I_C = 75A$ $V_{GE} = \pm 15V$ $R_G = 16\Omega$  (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		$V_F$	$I_F = 75A, V_{GE} = 0$	—	2.4	3.5	V	
Reverse Recovery Time		$t_{rr}$	$I_F = 75A, V_{GE} = -10V$ $di / dt = 700A / \mu s$ (Note 1)	—	0.1	0.25	$\mu s$	
Thermal Resistance		$R_{th (j-c)}$	Transistor Stage	—	—	0.2	$^\circ C / W$	
			Diode Stage	—	—	0.47		

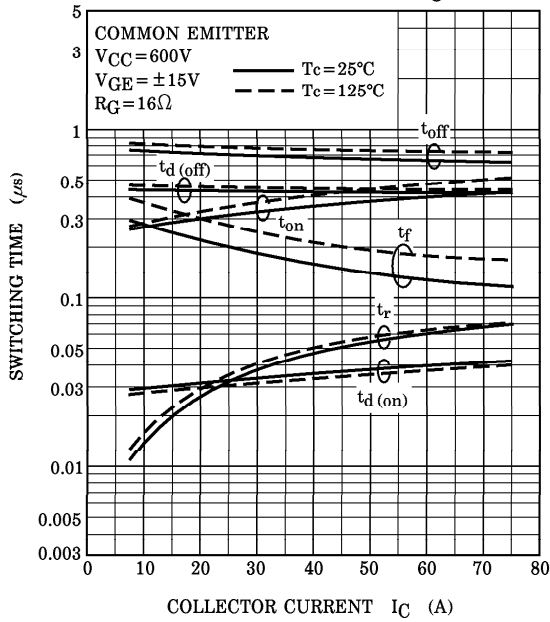
Note 1 : Switching Time and Reverse Recovery Time Test Circuit & Timing Chart



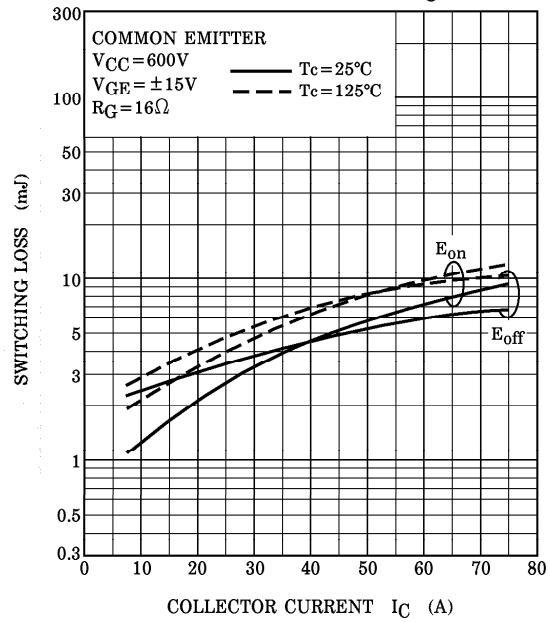




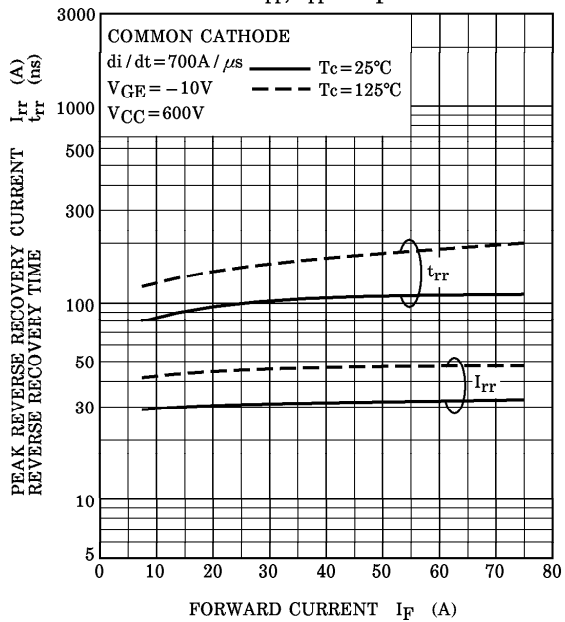
**SWITCHING TIME - I<sub>C</sub>**



**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>**

