

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

# MG300Q1US51

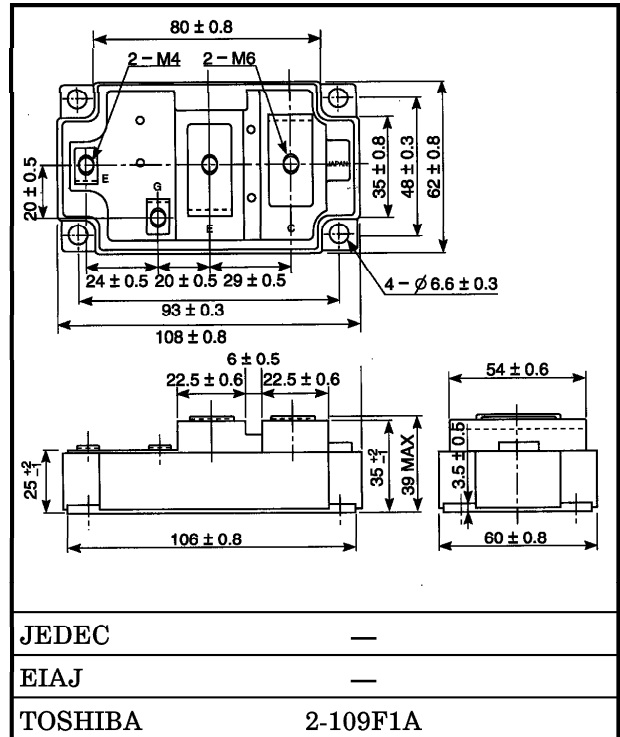
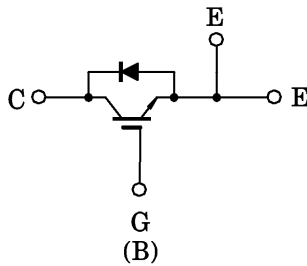
HIGH POWER SWITCHING APPLICATIONS

Unit in mm

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
- The Electrodes are Isolated from Case.

EQUIVALENT CIRCUIT



Weight : 465g

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	
Forward Current	DC $I_F$	300	A
	1ms $I_{FM}$	600	
Collector Power Dissipation (Tc = 25°C)	$P_C$	2500	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 : M4 / M6 / Mounting)	-	2 / 3 / 3	N·m

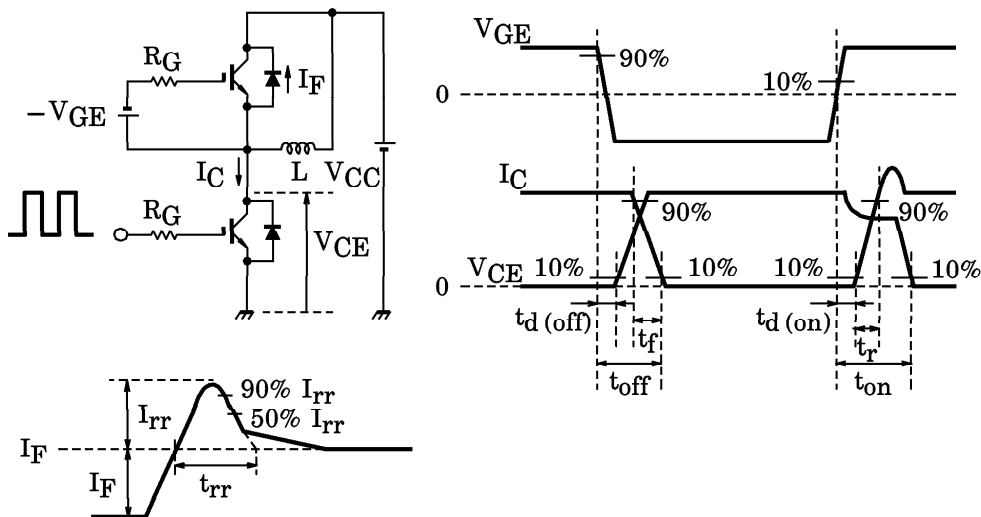
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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	$I_{CES}$	$V_{CE} = 1200V, V_{GE} = 0$	—	—	4.0	mA	
Gate-Emmitter Cut-off Voltage	$V_{GE} (off)$	$I_C = 300mA, V_{CE} = 5V$	3.0	—	6.0	V	
Collector-Emmitter Saturation Voltage	$V_{CE} (sat)$	$I_C = 300A, V_{GE} = 15V$	$T_j = 25^\circ C$	—	2.8	3.6	V
			$T_j = 125^\circ C$	—	3.1	4.0	
Input Capacitance	$C_{ies}$	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	36.0	—	nF	
Switching Time	Turn-on Delay Time	Inductive Load $V_{CC} = 600V$ $I_C = 300A$ $V_{GE} = \pm 15V$ $R_G = 2.7\Omega$ (Note 1)	—	0.05	—	$\mu s$	
	Rise Time		—	0.05	—		
	Turn-on Time		—	0.2	—		
	Turn-off Delay Time		—	0.5	—		
	Fall Time		—	0.1	0.3		
	Turn-off Time		—	0.6	—		
Forward Voltage	$V_F$	$I_F = 300A, V_{GE} = 0$	—	2.4	3.5	V	
Reverse Recovery Time	$t_{rr}$	$I_F = 300A, V_{GE} = -10V$ $di/dt = 1000A/\mu s$ (Note 1)	—	0.25	0.4	$\mu s$	
Thermal Resistance	$R_{th} (j-c)$	Transistor Stage	—	—	0.05	$^\circ C/W$	
		Diode Stage	—	—	0.12		

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



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