

TENTATIVE

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

MG600Q1US51

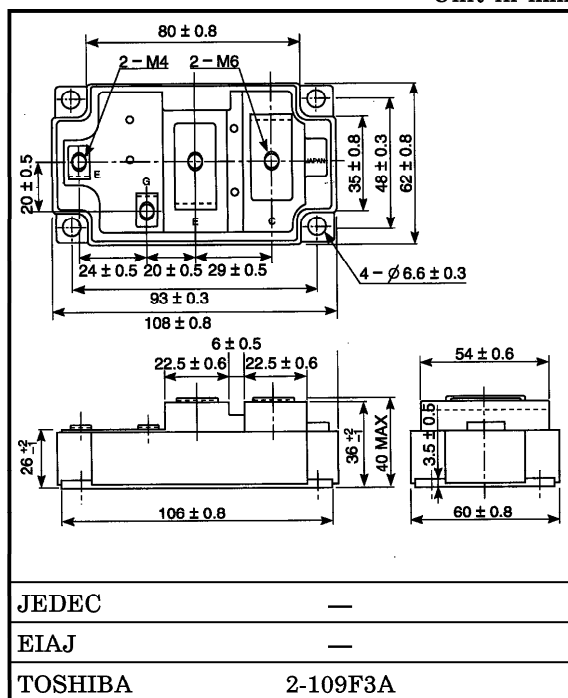
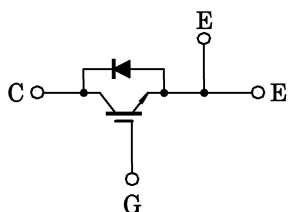
HIGH POWER SWITCHING APPLICATIONS

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
- Includes a Complete Half Bridge in One Package.
- The Electrodes are Isolated from Case.

EQUIVALENT CIRCUIT



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	600 A
	1ms	I_{CP}	1200 A
Forward Current	DC	I_F	600 A
	1ms	I_{FM}	1200 A
Collector Power Dissipation (Tc = 25°C)	P_C	4100	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}	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	± 500	nA	
Collector Cut-Off Current		I_{CES}	$V_{CE} = 1200V, V_{GE} = 0$	—	—	4.0	mA	
Gate-Emitter Cut-Off Voltage		$V_{GE} (off)$	$I_C = 600mA, V_{CE} = 5V$	3.0	—	6.0	V	
Collector-Emitter Saturation Voltage		$V_{CE} (sat)$	$I_C = 600A, V_{GE} = 15V$	$T_j = 25^\circ C$	—	2.8	3.6	V
				$T_j = 125^\circ C$	—	3.1	4.0	
Input Capacitance		C_{ies}	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	60.0	—	nF	
Switching Time	Turn-On Delay Time	$t_d (on)$	Inductive Load $V_{CC} = 600V$ $I_C = 600A$ $V_{GE} = \pm 15V$ $R_G = 2.0\Omega$ (Note 1)	—	0.3	—	μs	
	Rise Time	t_r		—	0.3	—		
	Turn-On Time	t_{on}		—	0.6	—		
	Turn-Off Delay Time	$t_d (off)$		—	1.0	—		
	Fall Time	t_f		—	0.15	0.3		
	Turn-Off Time	t_{off}		—	1.2	—		
Forward Voltage		V_F	$I_F = 600A, V_{GE} = 0$	—	2.4	3.5	V	
Reverse Recovery Time		t_{rr}	$I_F = 600A, V_{GE} = -10V$ $di/dt = 1000A/\mu s$ (Note 1)	—	0.25	0.4	μs	
Thermal Resistance		$R_{th} (j-c)$	Transistor Stage	—	—	0.03	$^\circ C/W$	
			Diode Stage	—	—	0.12		

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

