

**TOSHIBA**

**MG300Q1US51**

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

# MG300Q1US51

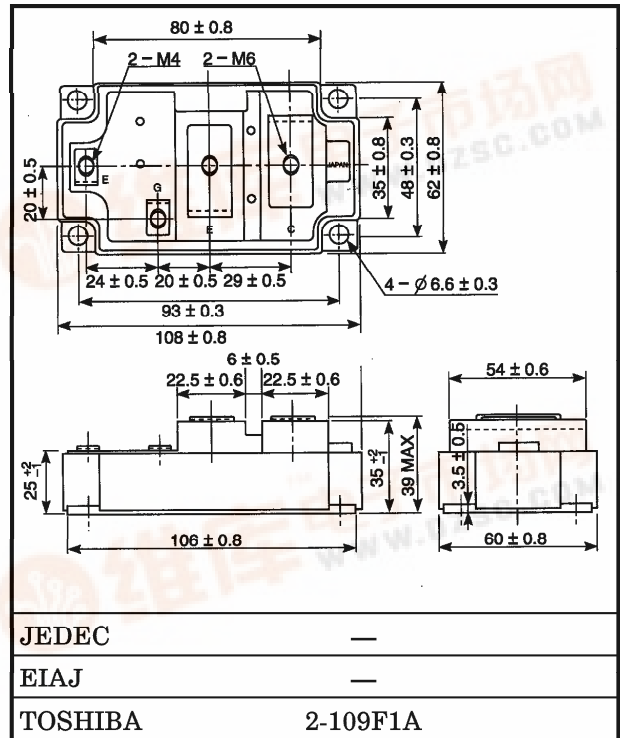
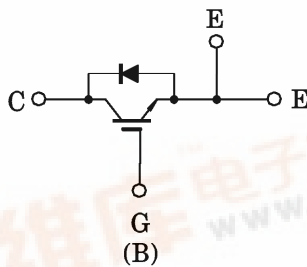
HIGH POWER SWITCHING APPLICATIONS

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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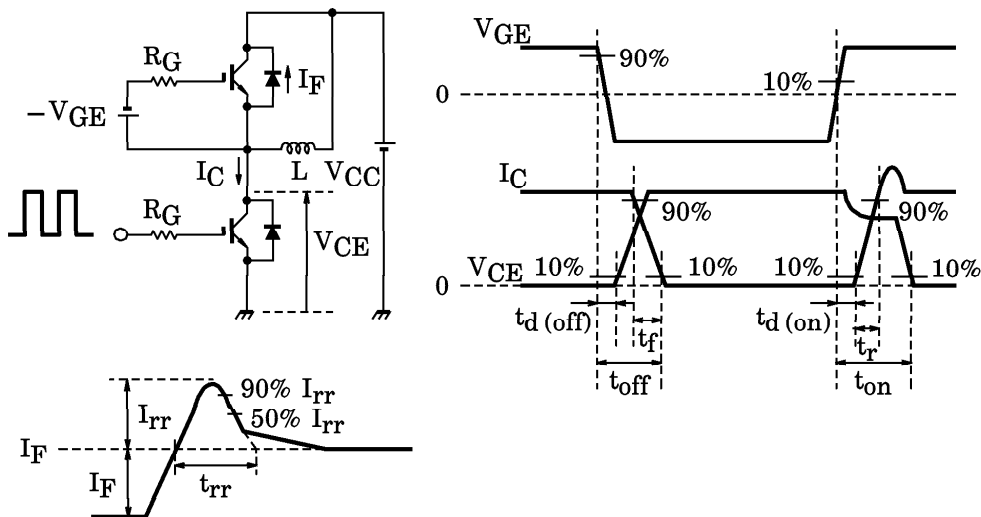
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current		IGES	VGE = ±20V, VCE = 0	—	—	±500	nA	
Collector Cut-off Current		ICES	VCE = 1200V, VGE = 0	—	—	4.0	mA	
Gate-Emitter Cut-off Voltage		VGE (off)	IC = 300mA, VCE = 5V	3.0	—	6.0	V	
Collector-Emitter Saturation Voltage		VCE (sat)	IC = 300A, VGE = 15V	Tj = 25°C	—	2.8	3.6	V
				Tj = 125°C	—	3.1	4.0	
Input Capacitance		Cies	VCE = 10V, VGE = 0, f = 1MHz	—	36.0	—	nF	
Switching Time	Turn-on Delay Time	td (on)	Inductive Load VCC = 600V IC = 300A VGE = ±15V RG = 2.7Ω (Note 1)	—	0.05	—	μs	
	Rise Time	tr		—	0.05	—		
	Turn-on Time	ton		—	0.2	—		
	Turn-off Delay Time	td (off)		—	0.5	—		
	Fall Time	tf		—	0.1	0.3		
	Turn-off Time	ttoff		—	0.6	—		
Forward Voltage		VF	IF = 300A, VGE = 0	—	2.4	3.5	V	
Reverse Recovery Time		trr	IF = 300A, VGE = -10V di/dt = 1000A/μs (Note 1)	—	0.25	0.4	μs	
Thermal Resistance		Rth (j-c)	Transistor Stage	—	—	0.05	°C/W	
			Diode Stage	—	—	0.12		

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



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