

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

# MG300J1US51

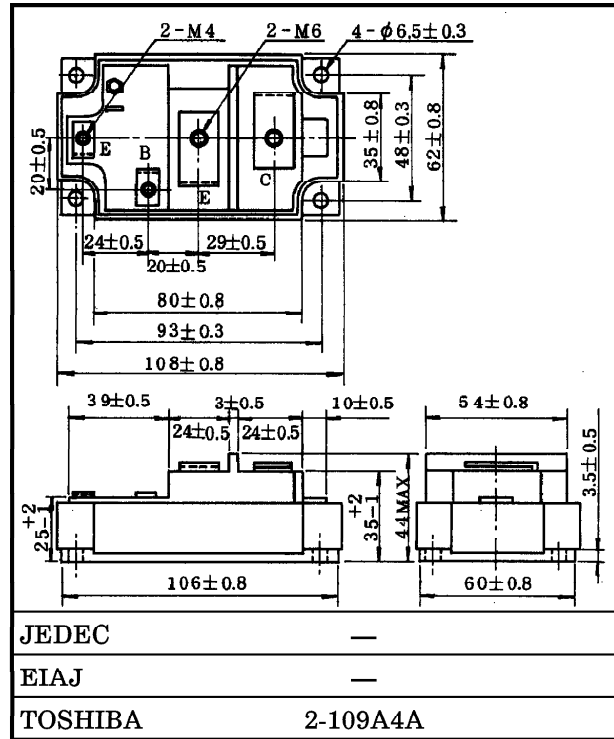
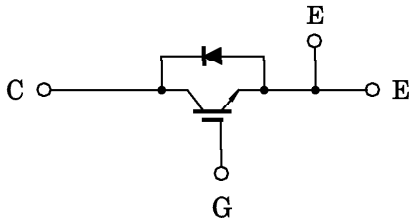
HIGH POWER SWITCHING APPLICATIONS.

Unit in mm

MOTOR CONTROL APPLICATIONS.

- The Electrodes are Isolated from Case.
- High Input Impedance
- Includes a Complete Half Bridge in One Package.
- Enhancement-Mode
- High Speed :  $t_f=0.30\mu s$  (MAX.) ( $I_C=300A$ )  
 $t_{rr}=0.15\mu s$  (MAX.) ( $I_F=300A$ )
- Low Saturation Voltage  
:  $V_{CE(sat)}=2.70V$  (MAX.) ( $I_C=300A$ )

EQUIVALENT CURCUIT



Weight : 465g (Typ.)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		$V_{CES}$	600	V
Gate-Emitter Voltage		$V_{GES}$	± 20	V
Collector Current	DC	$I_C$	300	A
	1ms	$I_{CP}$	600	
Forward Current	DC	$I_F$	300	A
	1ms	$I_{FM}$	600	
Collector Power Dissipation (Tc=25°C)		$P_C$	1300	W
Junction Temperature		$T_j$	150	°C
Storage Temperature Range		$T_{stg}$	-40~125	°C
Isolation Voltage		$V_{Isol}$	2500 (AC 1 min.)	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		$I_{CES}$	$V_{CE} = 600V, V_{GE} = 0$	—	—	4.0	mA
Gate-Emitter Cut-off Voltage		$V_{GE (off)}$	$I_C = 30mA, V_{CE} = 5V$	5.0	7.0	8.0	V
Collector-Emitter Saturation Voltage		$V_{CE (sat)}$	$I_C = 300A, V_{GE} = 15V$	—	2.10	2.70	V
Input Capacitance		$C_{ies}$	$V_{CE} = 10V, V_{GE} = 0$ $f = 1MHz$	—	28400	—	pF
Switching Time	Turn-on Delay Time	$t_d (on)$	Inductive Load $V_{CC} = 300V$ $I_C = 300A$ $V_{GE} = \pm 15V$ $R_G = 3.0\Omega$ (Note 1)	—	0.20	0.40	$\mu s$
	Rise Time	$t_r$		—	0.15	0.30	
	Turn-on Time	$t_{on}$		—	0.60	1.20	
	Turn-off Delay Time	$t_d (off)$		—	0.20	0.40	
	Fall Time	$t_f$		—	0.15	0.30	
	Turn-off Time	$t_{off}$		—	0.50	1.00	
Forward Voltage		$V_F$	$I_F = 300A, V_{GE} = 0$	—	2.30	3.00	V
Reverse Recovery Time		$t_{rr}$	$I_F = 300A, V_{GE} = -10V$ $di / dt = 400A / \mu s$	—	0.08	0.15	$\mu s$
Thermal Resistance		$R_{th (j-c)}$	Transistor Stage	—	—	0.096	$^{\circ}C / W$
			Diode Stage	—	—	0.20	

Note 1 Switching Time Test Circuit & Timing Chart

