

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

MG400J1US51

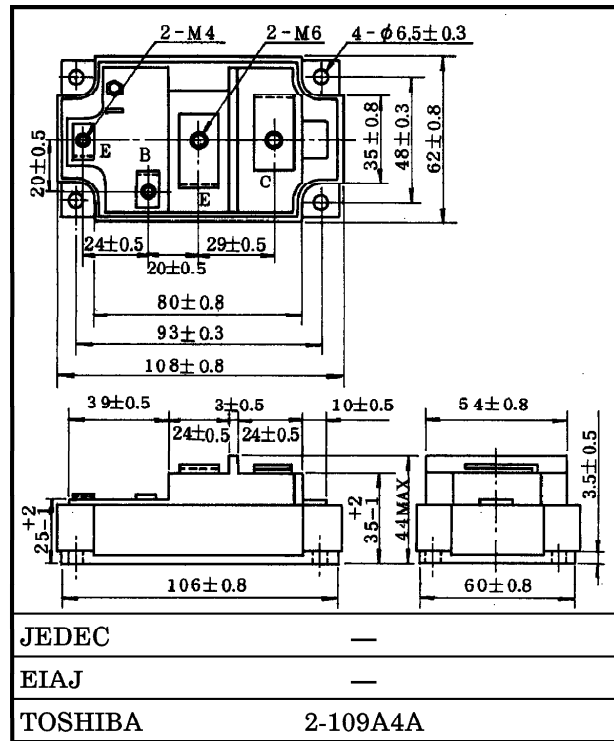
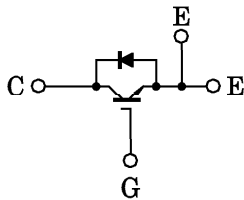
HIGH POWER SWITCHING APPLICATIONS.

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.) ($I_C = 400A$)
 $t_{rr} = 0.15 \mu s$ (Max.) ($I_F = 400A$)
- Low Saturation Voltage
: $V_{CE(sat)} = 2.70V$ (Max.) ($I_C = 400A$)

EQUIVALENT CIRCUIT



Weight : 465g (Typ.)

MAXIMUM RATINGS ($T_a = 25^\circ C$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	V_{CES}	600	V
Gate-Emitter Voltage	V_{GES}	± 20	V
Collector Current	DC	I_C	A
	1ms	I_{CP}	
Forward Current	DC	I_F	A
	1ms	I_{FM}	
Collector Power Dissipation ($T_c = 25^\circ C$)	P_C	1500	W
Junction Temperature	T_j	150	$^\circ C$
Storage Temperature Range	T_{stg}	-40~125	$^\circ C$
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}	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	± 500	nA
Collector Cut-off Current		I_{CES}	$V_{CE} = 600V, V_{GE} = 0$	—	—	4.0	mA
Gate-Emitter Cut-off Voltage		$V_{GE} (off)$	$I_C = 40mA, V_{CE} = 5V$	5.0	7.0	8.0	V
Collector-Emitter Saturation Voltage		$V_{CE} (sat)$	$I_C = 400A, V_{GE} = 15V$	—	2.10	2.70	V
Input Capacitance		C_{ies}	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	36000	—	pF
Switching Time	Turn-on Delay Time	$t_d (on)$	Inductive Load $V_{CC} = 300V$ $I_C = 400A$ $V_{GE} = \pm 15V$ $R_G = 2\Omega$ (Note 1)	—	0.20	0.40	μs
	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	$I_F = 400A, V_{GE} = 0$	—	2.30	3.00	V
Reverse Recovery Time		t_{rr}	$I_F = 400A, V_{GE} = -10V$ $di / dt = 400A / \mu s$	—	0.08	0.15	μs
Thermal Resistance		$R_{th} (j-c)$	Transistor Stage	—	—	0.083	$^{\circ}C / W$
			Diode Stage	—	—	0.20	

Note 1 Switching Time Test Circuit & Timing Chart

