

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

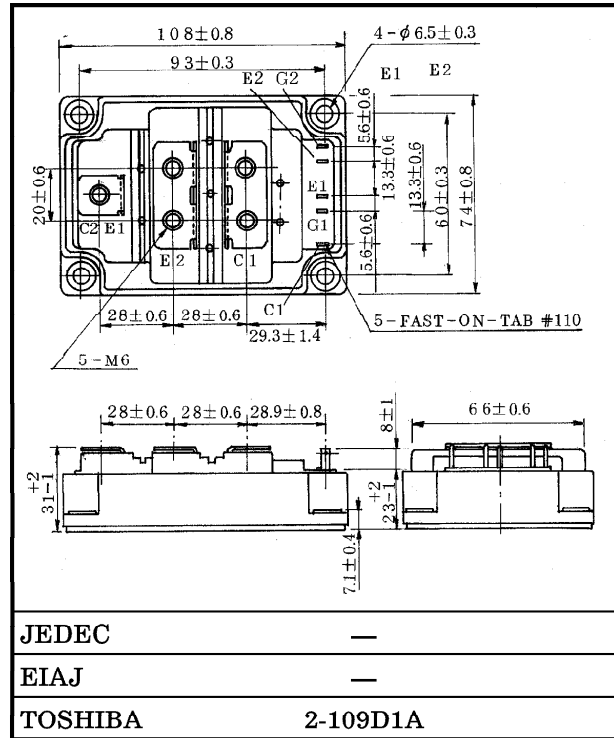
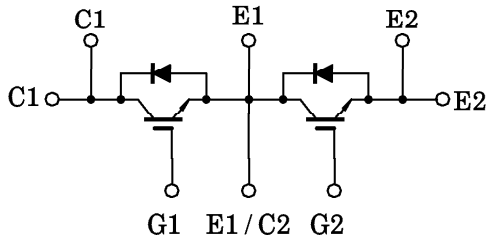
# MG400J2YS50

HIGH POWER SWITCHING APPLICATIONS.  
MOTOR CONTROL APPLICATIONS.

Unit in mm

- 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 : 540g (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	$I_C$	400
	1ms	$I_{CP}$	800
Forward Current	DC	$I_F$	400
	1ms	$I_{FM}$	800
Collector Power Dissipation (Tc = 25°C)	$P_C$	1800	W
Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_{stg}$	-40~125	°C
Isolation Voltage	$V_{Isol}$	2500 (AC 1minute)	V
Screw Torque (Terminal / Mounting)	—	3 / 3	N · m

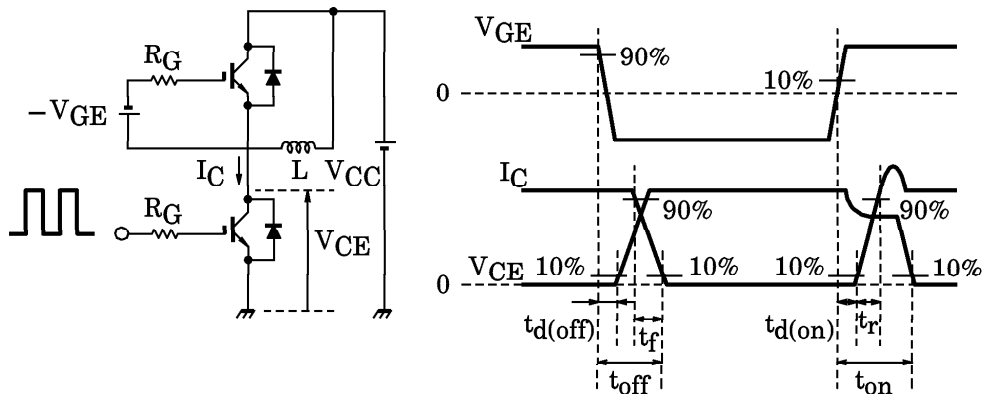
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		$I_{GES}$	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	$\pm 500$	nA
Collector Cut-off Current		$I_{CES}$	$V_{CE} = 600V, V_{GE} = 0$	—	—	3.0	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		$C_{ies}$	$V_{CE} = 10V, V_{GE} = 0$ $f = 1MHz$	—	46500	—	pF
Switching Time	Turn-on Delay Time	$t_{d(on)}$	Inductive Load $V_{CC} = 300V$ $I_C = 400A$ $V_{GE} = \pm 15V$ $R_G = 2.4\Omega$ (Note 1)	—	0.25	0.50	$\mu s$
	Rise Time	$t_r$		—	0.12	0.24	
	Turn-on Time	$t_{on}$		—	0.40	0.80	
	Turn-off Delay Time	$t_{d(off)}$		—	0.30	0.60	
	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	$\mu s$
Thermal Resistance		$R_{th(j-c)}$	Transistor Stage	—	—	0.069	$^{\circ}C/W$
			Diode stage	—	—	0.17	
		$R_{th(c-f)}$	Case to Fin (Note 2)	—	—	0.10	

Note 1 Switching Time Test Circuit & Timing Chart



Note 2 Silicone Grease is applied.

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