

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

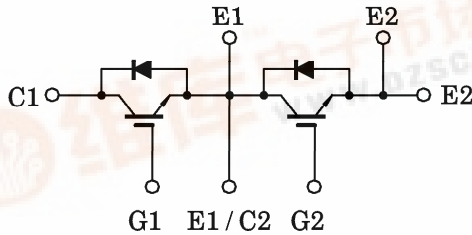
# MG50Q2YS50

HIGH POWER SWITCHING APPLICATIONS

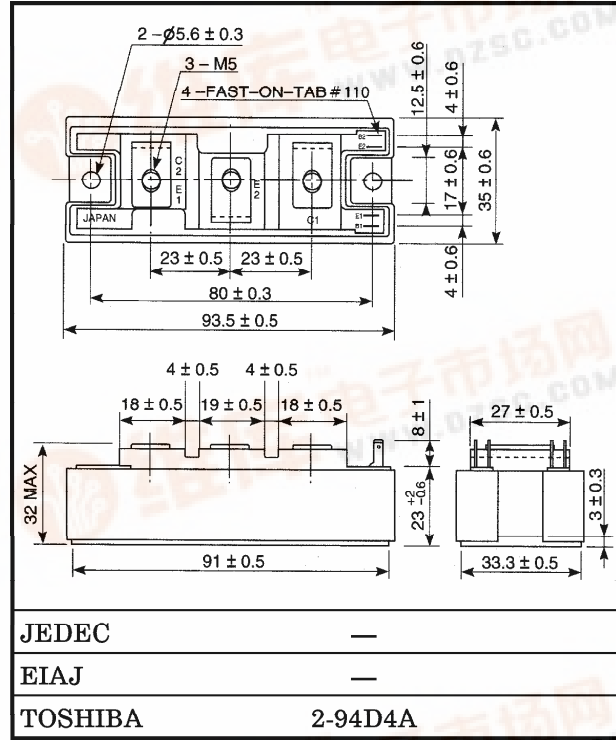
MOTOR CONTROL APPLICATIONS

- 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



Unit in mm



Weight : 202g

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)	78 / 50
	1ms	$I_{CP}$ (25°C / 80°C)	156 / 100
Forward Current	DC	$I_F$	50
	1ms	$I_{FM}$	100
Collector Power Dissipation (Tc = 25°C)	$P_C$	400	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

961001FAA2

TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

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		$I_{CES}$	$V_{CE} = 1200V, V_{GE} = 0$	—	—	1.0	mA	
Gate-Emitter Cut-off Voltage		$V_{GE (off)}$	$I_C = 50mA, V_{CE} = 5V$	3.0	—	6.0	V	
Collector-Emitter Saturation Voltage		$V_{CE (sat)}$	$I_C = 50A, V_{GE} = 15V$	$T_j = 25^\circ C$	—	2.8	3.6	V
				$T_j = 125^\circ C$	—	3.1	4.0	
Input Capacitance		$C_{ies}$	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	6.0	—	nF	
Switching Time	Turn-on Delay Time	$t_{d (on)}$	Inductive Load $V_{CC} = 600V$ $I_C = 50A$ $V_{GE} = \pm 15V$ $R_G = 24\Omega$  (Note 1)	—	0.05	—	$\mu s$	
	Rise Time	$t_r$		—	0.05	—		
	Turn-on Time	$t_{on}$		—	0.2	—		
	Turn-off Delay Time	$t_{d (off)}$		—	0.5	—		
	Fall Time	$t_f$		—	0.1	0.3		
	Turn-off Time	$t_{off}$		—	0.6	—		
Forward Voltage		$V_F$	$I_F = 50A, V_{GE} = 0$	—	2.4	3.5	V	
Reverse Recovery Time		$t_{rr}$	$I_F = 50A, V_{GE} = -10V$ $di / dt = 700A / \mu s$ (Note 1)	—	0.1	0.25	$\mu s$	
Thermal Resistance		$R_{th (j-c)}$	Transistor Stage	—	—	0.31	$^\circ C / W$	
			Diode Stage	—	—	0.94		

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

