

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

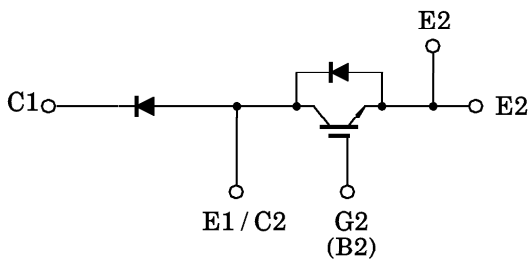
MG50Q1ZS50

HIGH POWER SWITCHING APPLICATIONS

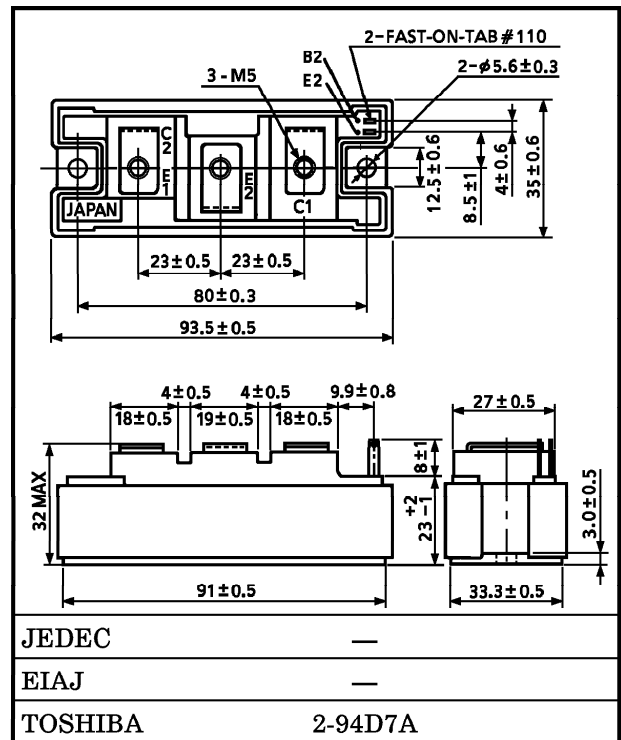
MOTOR CONTROL APPLICATIONS

- High Input Impedance
- High Speed : $t_f = 0.3 \mu s$ (Max.)
@Inductive Load
- Low Saturation Voltage
: $V_{CE(sat)} = 3.6 V$ (Max.)
- Enhancement-Mode
- The Electrodes are Isolated from Case.

EQUIVALENT CIRCUIT



Unit in mm



Weight : 202 g

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
	1 ms	I_{CP} (25°C / 80°C)	156 / 100
Forward Current	DC	I_F	50
	1 ms	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

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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GES}	$V_{GE} = \pm 20\text{ V}, V_{CE} = 0$	—	—	± 500	nA
Collector Cut-off Current		I_{CES}	$V_{CE} = 1200\text{ V}, V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-off Voltage		$V_{GE}(\text{off})$	$I_C = 50\text{ mA}, V_{CE} = 5\text{ V}$	3.0	—	6.0	V
Collector-Emitter Saturation Voltage		$V_{CE}(\text{sat})$	$I_C = 50\text{ A},$	—	2.8	3.6	V
			$V_{GE} = 15\text{ V}$				
Input Capacitance		C_{ies}	$V_{CE} = 10\text{ V}, V_{GE} = 0,$ $f = 1\text{ MHz}$	—	6.0	—	nF
Switching Time	Turn-on Delay Time	$t_d(\text{on})$	Inductive Load $V_{CC} = 600\text{ V}$ $I_C = 50\text{ A}$ $V_{GE} = \pm 15\text{ V}$ $R_G = 24\ \Omega$ (Note 1)	—	0.05	—	μs
	Rise Time	t_r		—	0.05	—	
	Turn-on Time	t_{on}		—	0.2	—	
	Turn-off Delay Time	$t_d(\text{off})$		—	0.5	—	
	Fall Time	t_f		—	0.1	0.3	
	Turn-off Time	t_{off}		—	0.6	—	
Forward Voltage		V_F	$I_F = 50\text{ A}, V_{GE} = 0$	—	2.4	3.5	V
Reverse Recovery Time		t_{rr}	$I_F = 50\text{ A}, V_{GE} = -10\text{ V}$ $di/dt = 700\text{ A}/\mu\text{s}$ (Note 1)	—	0.1	0.25	μs
Thermal Resistance		$R_{th(j-c)}$	Transistor Stage	—	—	0.31	$^\circ\text{C}/\text{W}$
			Diode Stage	—	—	0.94	

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

