

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

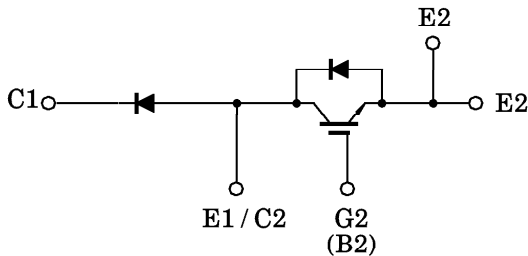
# MG100Q1ZS50

HIGH POWER SWITCHING APPLICATIONS

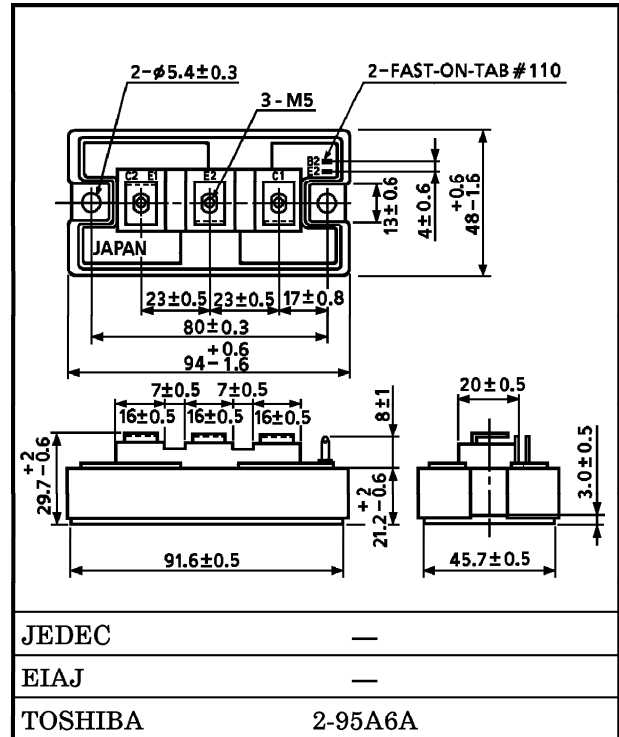
MOTOR CONTROL APPLICATIONS

- 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 : 255 g

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	$V_{CES}$	1200	V
Gate-Emitter Voltage	$V_{GES}$	$\pm 20$	V
Collector Current	DC	$I_C$ ( $25^\circ C / 80^\circ C$ )	150 / 100
	1 ms	$I_{CP}$ ( $25^\circ C / 80^\circ C$ )	300 / 200
Forward Current	DC	$I_F$	100
	1 ms	$I_{FM}$	200
Collector Power Dissipation ( $T_c = 25^\circ C$ )	$P_C$	660	W
Junction Temperature	$T_j$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-40~125	$^\circ C$
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		$I_{GES}$	$V_{GE} = \pm 20\text{ V}, V_{CE} = 0$	—	—	$\pm 500$	nA	
Collector Cut-off Current		$I_{CES}$	$V_{CE} = 1200\text{ V}, V_{GE} = 0$	—	—	2.0	mA	
Gate-Emmitter Cut-off Voltage		$V_{GE}(\text{off})$	$I_C = 100\text{ mA}, V_{CE} = 5\text{ V}$	3.0	—	6.0	V	
Collector-Emmitter Saturation Voltage		$V_{CE}(\text{sat})$	$I_C = 100\text{ A},$	$T_j = 25^\circ\text{C}$	—	2.8	3.6	V
			$V_{GE} = 15\text{ V}$	$T_j = 125^\circ\text{C}$	—	3.1	4.0	
Input Capacitance		$C_{ies}$	$V_{CE} = 10\text{ V}, V_{GE} = 0,$ $f = 1\text{ MHz}$	—	12.0	—	nF	
Switching Time	Turn-on Delay Time	$t_d(\text{on})$	Inductive Load $V_{CC} = 600\text{ V}$ $I_C = 100\text{ A}$ $V_{GE} = \pm 15\text{ V}$ $R_G = 9.1\ \Omega$  (Note 1)	—	0.05	—	$\mu\text{s}$	
	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		$V_F$	$I_F = 100\text{ A}, V_{GE} = 0$	—	2.4	3.5	V	
Reverse Recovery Time		$t_{rr}$	$I_F = 100\text{ A}, V_{GE} = -10\text{ V}$ $di/dt = 700\text{ A}/\mu\text{s}$ (Note 1)	—	0.1	0.25	$\mu\text{s}$	
Thermal Resistance		$R_{th(j-c)}$	Transistor Stage	—	—	0.16	$^\circ\text{C}/\text{W}$	
			Diode Stage	—	—	0.47		

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

