Unit in mm

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

MG500Q1US1

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

• High Input Impedance

• High Speed : $t_f = 0.5 \mu s$ (Max.)

 $t_{rr} = 0.5 \mu s$ (Max.)

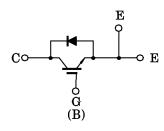
• Low Saturation Voltage

: $V_{CE (sat)} = 4.0 V (Max.)$

• Enhancement-Mode

• The Electrodes are Isolated from Case.

EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta = 25°C)

$2-M4$ $2-M6$ $4-Ø65\pm0.3$
SO TO
108±0.8
39±0.5 3±0.5 10±0.5 54±0.8
24±0.5 24±0.5
JEDEC —
EIAJ —
TOSHIBA 2-109A4A

Weight: 465g

MAXIMON NATINGS (14 – 23 C)									
CHARACTERISTI	SYMBOL	RATING	UNIT						
Collector-Emitter Voltage	v_{CES}	1200	V						
Gate-Emitter Voltage	v_{GES}	±20	V						
Collector Current	DC	$I_{\mathbf{C}}$	500	A					
Conector Current	1ms	I_{CP}	1000						
Forward Current	DC	$I_{\mathbf{F}}$	500	A					
Forward Current	1ms	$I_{\mathbf{FM}}$	1000						
Collector Power Dissipation (Tc=25°C)	PC	2900	w						
Junction Temperature	T_{j}	150	$^{\circ}\mathrm{C}$						
Storage Temperature Rang	$\mathrm{T_{stg}}$	-40~125	°C						
Isolation Voltage	V_{Isol}	2500 (AC, 1min.)	V						
Screw Torque (Terminal : M 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		$I_{ ext{GES}}$	$V_{GE} = \pm 20V, V_{CE} = 0$	_	_	±500	nA
Collector Cut-off Current		ICES	$V_{CE} = 1200V, V_{GE} = 0$	_		4.0	mA
Gate-Emitter Cut-off Voltage		V _{GE (OFF)}	$I_{\text{C}} = 500 \text{mA}, V_{\text{CE}} = 5 \text{V}$	3.0	_	6.0	V
Collector-Emitter Saturation Voltage		V _{CE} (sat)	$I_{C} = 500A, V_{GE} = 15V$	_	3.0	4.0	V
Input Capacitance		$c_{ m ies}$	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	_	80000	_	pF
Switching Time	Rise Time	t_r	2.4Ω C C C C C C C C C C C C C C C C C C C	_	0.3	0.6	μs
	Turn-on Time	ton		_	0.4	0.8	
	Fall Time	t_f		_	0.2	0.5	
	Turn-off Time	$t_{ m off}$		_	0.8	1.5	
Forward Voltage V _F		$v_{\mathbf{F}}$	$I_{F} = 500A, V_{GE} = 0$	_	_	3.0	V
Reverse Recovery Time t _{rr}		t _{rr}	$I_F = 500A$, $V_{GE} = -10V$ di/dt=300A/ μ s	_	0.25	0.5	μs
Thermal Resistance R _t		D.	Transistor	_	_	0.042	°C/W
		$ m R_{th~(j-c)}$	Diode	_		0.20] C/ W

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400

200

Tc = 125°C

 $GATE - EMITTER \ VOLTAGE \quad V_{GE} \quad (V)$

COMMON

EMITTER

 $T_c = -40$ °C

COMMON

EMITTER

Tc = 125°C

20

3

GATE-EMITTER VOLTAGE VGE

 $I_{\rm C} = 1000{\rm A}$

500

 $I_{\hbox{\scriptsize C}}\!=\!1000\hbox{\scriptsize A}$

