

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

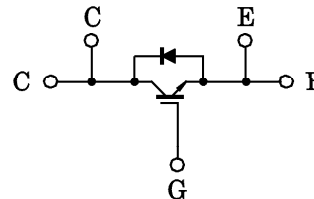
# MG600J1US51

HIGH POWER SWITCHING APPLICATIONS.

MOTOR CONTROL APPLICATIONS.

- The Electrodes are Isolated from Case.
- High Input Impedance
- Enhancement-Mode
- High Speed :  $t_f=0.30\mu s$  (Max.) ( $I_C=600A$ )  
 $t_{rr}=0.15\mu s$  (Max.) ( $I_F=600A$ )
- Low Saturation Voltage  
:  $V_{CE(sat)}=2.70V$  (Max.) ( $I_C=600A$ )
- Outline : TOSHIBA 2-109E1A  
See page 3 for the device outline

**EQUIVALENT CIRCUIT**



**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	$V_{CES}$	600	V
Gate-Emitter Voltage	$V_{GES}$	$\pm 20$	V
Collector Current	DC	$I_C$	A
	1ms	$I_{CP}$	
Forward Current	DC	$I_F$	A
	1ms	$I_{FM}$	
Collector Power Dissipation (Tc = 25°C)	$P_C$	2200	W
Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_{stg}$	-40~125	°C
Isolation Voltage	$V_{Isol}$	2500 (AC 1 min.)	V
Screw Torque (Terminal : M4 / M6 / Mounting)	—	2 / 3 / 3	N·m

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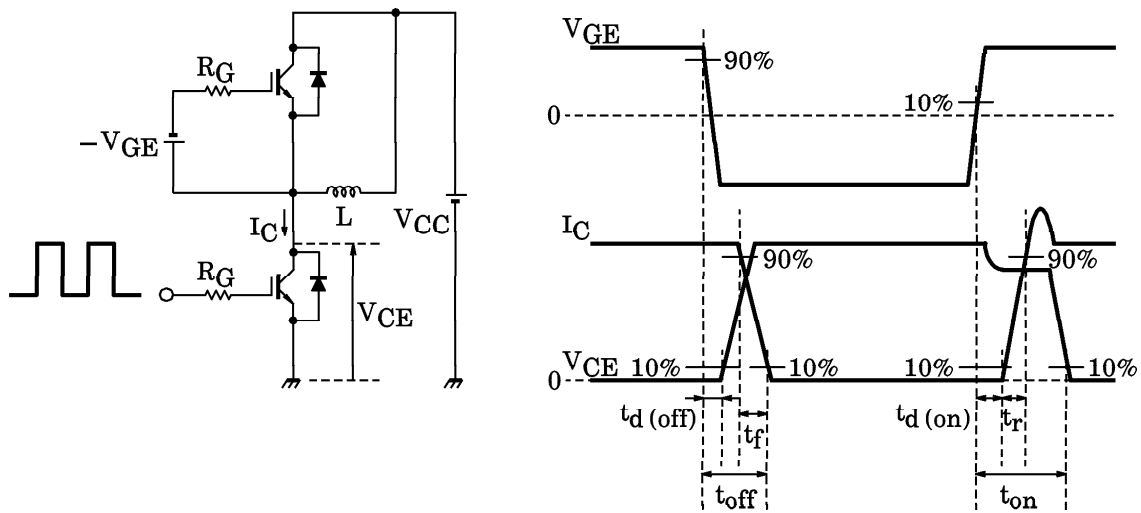
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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		$I_{CES}$	$V_{CE} = 600V, V_{GE} = 0$	—	—	4.0	mA
Gate-Emmitter Cut-off Voltage		$V_{GE} (off)$	$I_C = 60mA, V_{CE} = 5V$	5.0	7.0	8.0	V
Collector-Emmitter Saturation Voltage		$V_{CE} (sat)$	$I_C = 600A, V_{GE} = 15V$	—	2.10	2.70	V
Input Capacitance		$C_{ies}$	$V_{CE} = 10V, V_{GE} = 0$ $f = 1MHz$	—	56800	—	pF
Switching Time	Turn-on Delay Time	$t_d (on)$	Inductive Load $V_{CC} = 300V$ $I_C = 600A$ $V_{GE} = \pm 15V$ $R_G = 1.3\Omega$ (Note 1)	—	0.20	—	$\mu s$
	Rise Time	$t_r$		—	0.25	—	
	Turn-on Time	$t_{on}$		—	0.60	—	
	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		$V_F$	$I_F = 600A, V_{GE} = 0$	—	2.30	3.00	V
Reverse Recovery Time		$t_{rr}$	$I_F = 600A, V_{GE} = -10V$ $di / dt = 800A / \mu s$	—	0.08	0.15	$\mu s$
Thermal Resistance		$R_{th} (j-c)$	Transistor Stage	—	—	0.057	$^{\circ}C / W$
			Diode Stage	—	—	0.10	

(Note 1) Switching Time Test Circuit & Timing Chart



OUTLINE : TOSHIBA 2-109E1A

Unit in mm

