

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

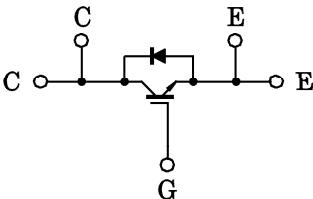
MG600J1US51

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}	± 20	V
Collector Current	DC	I_C	600	A
	1ms	I_{CP}	1200	
Forward Current	DC	I_F	600	A
	1ms	I_{FM}	1200	
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

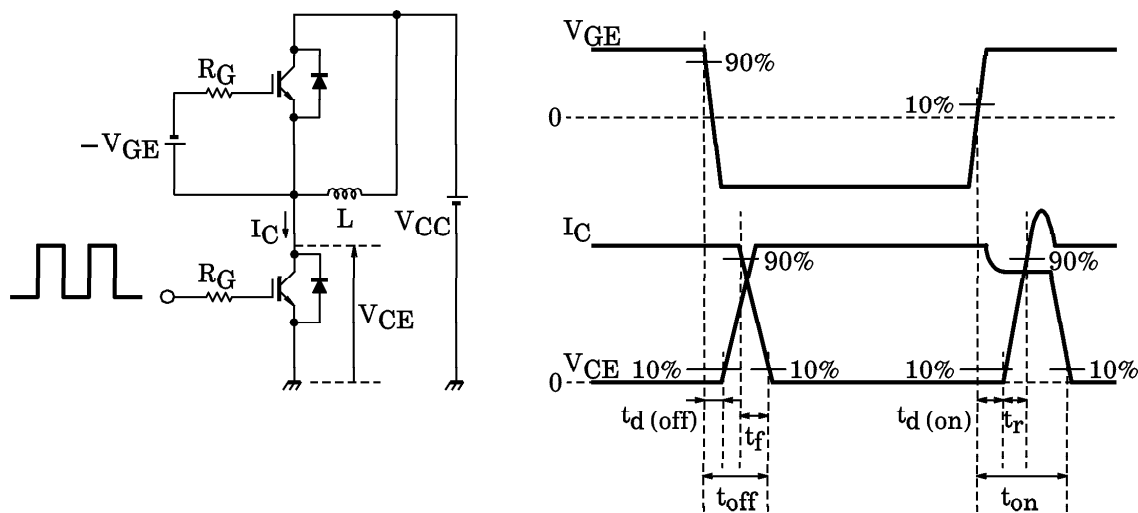
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ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

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

(Note 1) Switching Time Test Circuit & Timing Chart



OUTLINE : TOSHIBA 2-109E1A

Unit in mm

