

**TOSHIBA**

**MG180V2YS40**

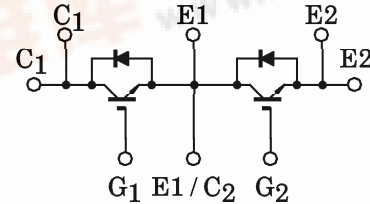
TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

# MG180V2YS40

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

EQUIVALENT CIRCUIT



- The Electrodes are Isolated from Case
- High Input Impedance
- Includes a Complete Half Bridge in One Package.
- Enhancement-Mode
- High Speed :  $t_f = 1.5\mu s$  (Max.) ( $I_C = 180A$ )  
 $t_{rr} = 0.6\mu s$  (Max.) ( $I_F = 180A$ )
- Outline : TOSHIBA 2-109D2A  
(See page 3 for the device outline)
- Weight : 550g (Typ.)

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	$V_{CES}$	1700	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 ( $T_c = 25^\circ C$ )	$P_C$	1800	W
Junction Temperature	$T_j$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-40~125	$^\circ C$
Isolation Voltage	$V_{Isol}$	4000 (AC 1 min.)	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		$I_{GES}$	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	$\pm 150$	nA
Collector Cut-off Current		$I_{CES}$	$V_{CE} = 1700V, V_{GE} = 0$	—	—	1.5	mA
Gate-Emitter Cut-off Voltage		$V_{GE(off)}$	$I_C = 180mA, V_{CE} = 5V$	4.0	—	8.0	V
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	$I_C = 180A, V_{GE} = 15V$	—	3.2	4.5	V
Input Capacitance		$C_{ies}$	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	24600	—	pF
Switching Time	Turn-on Delay Time	$t_{d(on)}$	Inductive Load $V_{CC} = 900V$ $I_C = 180A$ $V_{GE} = \pm 15V$ $R_G = 2.7\Omega$ (Note 1)	—	0.1	—	$\mu s$
	Rise Time	$t_r$		—	0.1	—	
	Turn-on Time	$t_{on}$		—	0.5	—	
	Turn-off Delay Time	$t_{d(off)}$		—	0.4	—	
	Fall Time	$t_f$		—	0.5	1.5	
	Turn-off Time	$t_{off}$		—	1.0	—	
Forward Voltage		$V_F$	$I_F = 180A, V_{GE} = 0$	—	3.7	5.0	V
Reverse Recovery Time		$t_{rr}$	$I_F = 180A, V_{GE} = -15V$ $di/dt = 1000A/\mu s$ (Note.1)	—	0.3	0.6	$\mu s$
Thermal Resistance		$R_{th(j-c)}$	Transistor Stage	—	—	0.069	$^{\circ}C/W$
			Diode Stage	—	—	0.25	

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

