

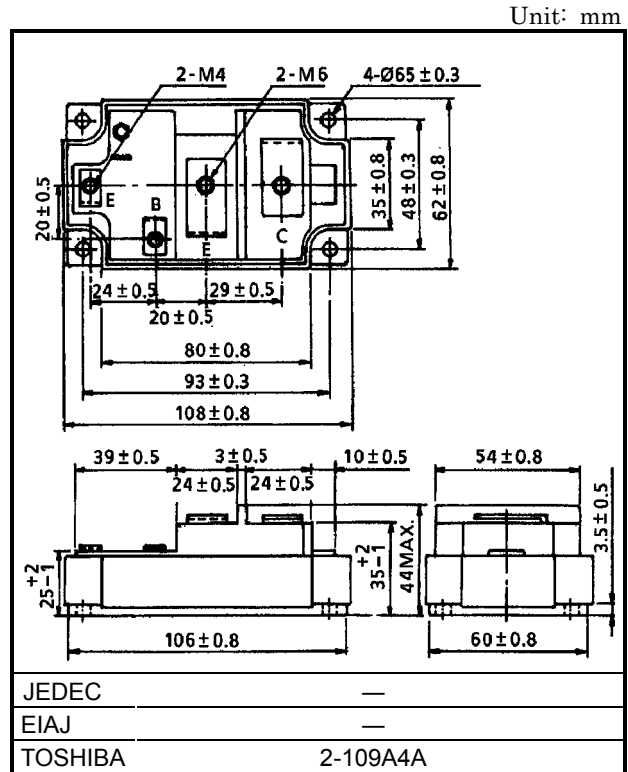
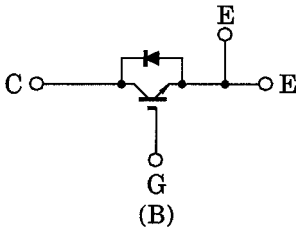
TOSHIBA GTR Module Silicon N Channel IGBT

# MG240V1US41

High Power Switching Applications  
 Motor Control Applications

- The electrodes are isolated from case
- High input impedance
- Enhancement-mode
- High speed :  $t_f = 1.5\mu s$  (Max.)( $I_C = 240A$ )  
 $t_{rr} = 0.6\mu s$  (Max.)( $I_F = 240A$ )

### Equivalent Circuit



Weight: 465g(Typ.)

### Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector-emitter voltage	$V_{CES}$	1700	V
Gate-emitter voltage	$V_{GES}$	±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)	$P_C$	2400	W
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	-40 ~ 125	°C
Isolation voltage	$V_{isol}$	4000 (AC 1 min.)	V
Screw torque (M4/M6 / mounting)	—	2 / 3 / 3	N·m

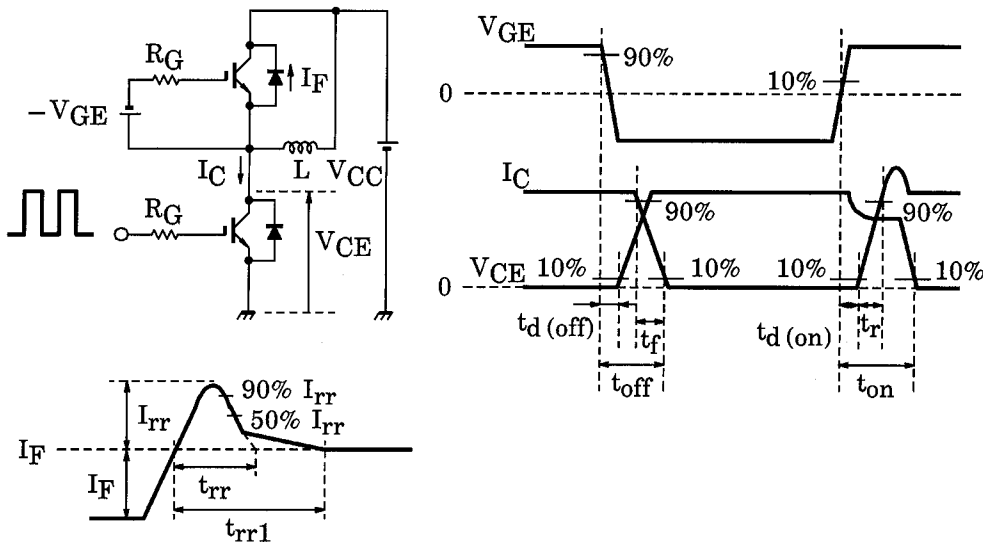
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**Electrical Characteristics (Ta = 25°C)**

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		$I_{GES}$	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	$\pm 200$	nA
Collector cut-off current		$I_{CES}$	$V_{CE} = 1700V, V_{GE} = 0$	—	—	2.0	mA
Gate-emitter cut-off voltage		$V_{GE (off)}$	$I_C = 240mA, V_{CE} = 5V$	4.0	—	8.0	V
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = 240A, V_{GE} = 15V$	—	3.2	4.5	V
Input capacitance		$C_{ies}$	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	32800	—	pF
Switching time	Turn-on delay time	$t_d (on)$	Inductive load $V_{CC} = 900V$ $I_C = 240A$ $V_{GE} = \pm 15V$ $R_G = 2.4\Omega$  (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		$V_F$	$I_F = 240A, V_{GE} = 0$	—	3.7	5.0	V
Reverse recovery time		$t_{rr}$	$I_F = 240A, V_{GE} = -15V$ $di / dt = 1000A / \mu s$ (Note 1)	—	0.3	0.6	$\mu s$
Thermal resistance		$R_{th (j-c)}$	Transistor stage	—	—	0.052	$^{\circ}C / W$
			Diode stage	—	—	0.2	

Note 1: Switching time and reverse recovery time test circuit & timing chart



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