

TOSHIBA GTR Module Silicon N Channel IGBT

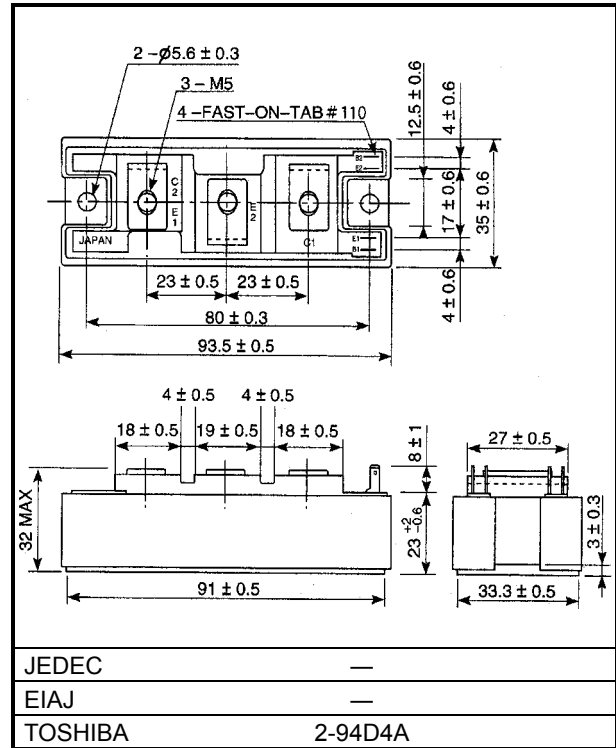
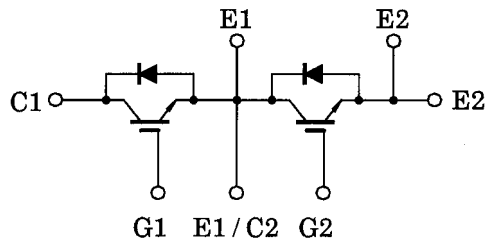
MG50Q2YS50

High Power Switching Applications
Motor Control Applications

Unit: mm

- High input impedance
- High speed : $t_f = 0.3\mu s$ (Max)
@Inductive load
- Low saturation voltage
: $V_{CE(sat)} = 3.6V$ (Max)
- Enhancement-mode
- Includes a complete half bridge in one package.
- The electrodes are isolated from case.

Equivalent Circuit



Weight: 202g

Maximum Ratings ($T_a = 25^\circ C$)

Characteristic		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	1200	V
Gate-emitter voltage		V_{GES}	± 20	V
Collector current	DC	I_C ($25^\circ C / 80^\circ C$)	78 / 50	A
	1ms	I_{CP} ($25^\circ C / 80^\circ C$)	156 / 100	
Forward current	DC	I_F	50	A
	1ms	I_{FM}	100	
Collector power dissipation ($T_c = 25^\circ C$)		P_C	400	W
Junction temperature		T_j	150	$^\circ C$
Storage temperature range		T_{stg}	$-40 \sim 125$	$^\circ C$
Isolation voltage		V_{Isol}	2500 (AC 1 minute)	V
Screw torque (Terminal / mounting)		—	3 / 3	N·m

Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	± 500	nA
Collector cut-off current		I_{CES}	$V_{CE} = 1200V, V_{GE} = 0$	—	—	1.0	mA
Gate-emitter cut-off voltage		$V_{GE (OFF)}$	$I_C = 50mA, V_{CE} = 5V$	3.0	—	6.0	V
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = 50A, V_{GE} = 15V$	$T_J = 25^\circ C$	2.8	3.6	V
				$T_J = 125^\circ C$	3.1	4.0	
Input capacitance		C_{ies}	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	6.0	—	nF
Switching time	Turn-on delay time	$t_d (on)$	Inductive load $V_{CC} = 600V$ $I_C = 50A$ $V_{GE} = \pm 15V$ $R_G = 24\Omega$ (Note 1)	—	0.05	—	μs
	Rise time	t_r		—	0.05	—	
	Turn-on time	t_{on}		—	0.2	—	
	Turn-off delay time	$t_d (off)$		—	0.5	—	
	Fall time	t_f		—	0.1	0.3	
	Turn-off time	t_{off}		—	0.6	—	
Forward voltage		V_F	$I_F = 50 A, V_{GE} = 0$	—	2.4	3.5	V
Reverse recovery time		t_{rr}	$I_F = 50 A, V_{GE} = -10 V,$ $di / dt = 700 A / \mu s$ (Note 1)	—	0.1	0.25	μs
Thermal resistance		$R_{th (j-c)}$	Transistor stage	—	—	0.31	$^\circ C / W$
			Diode stage	—	—	0.94	

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

