TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

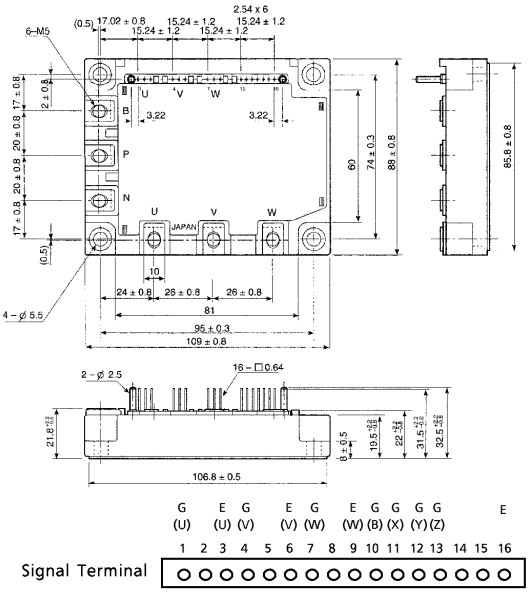
MG100J7KS50

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

- The Electrodes are isolated from Case.
- High Input Impedance
- 7 IGBTs Built into 1 Package.
- Enhancement-Mode
- High Speed Type IGBT
  : $V_{CE\,(sat)}$ = 2.5 V (Max.) ($@I_C$ = 100 A)
  : t_f = 0.5 μs (Max.) ($@I_C$ = 100 A)
  : t_{rr} = 0.3 μs (Max.) ($@I_F$ = 100 A)

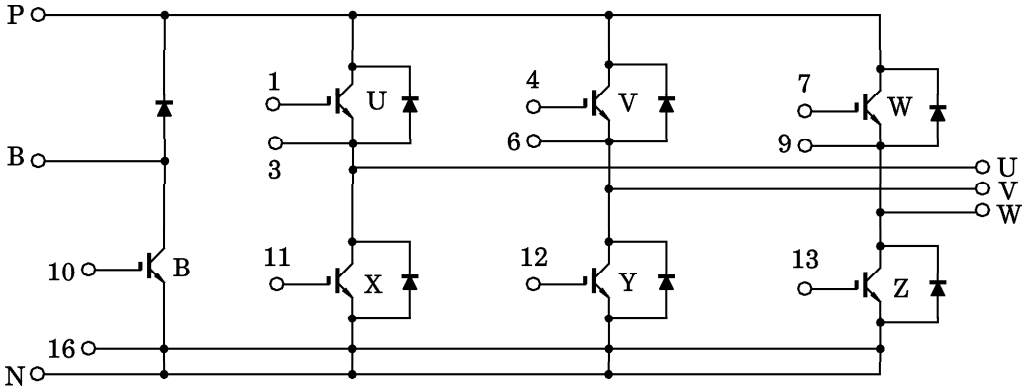
Unit in mm



JEDEC	—
EIAJ	—
TOSHIBA	2-110A1B

Weight : 520 g (Typ.)

EQUIVALENT CIRCUIT



Signal Terminal

1 : G (U)	2 : Open	3 : E (U)	4 : G (V)
5 : Open	6 : E (V)	7 : G (W)	8 : Open
9 : E (W)	10 : G (B)	11 : G (X)	12 : G (Y)
13 : G (Z)	14 : Open	15 : Open	16 : E

961001EAA1

INVERTER STAGE

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	100	A
	1 ms	I_{CP}	200	
Forward Current	DC	I_F	100	A
	1 ms	I_{FM}	200	
Collector Power Dissipation (Tc = 25°C)		P_C	300	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 / 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} = ±20 V, V_{CE} = 0 V	—	—	±500	nA
Collector Cut-Off Current		I_{CES}	V_{CE} = 600 V, V_{GE} = 0 V	—	—	1.0	mA
Gate-Emitter Cut-Off Voltage		$V_{GE\ (off)}$	V_{CE} = 5 V, I_C = 10 mA	5.0	—	8.0	V
Collector-Emitter Saturation Voltage		$V_{CE\ (sat)}$	I_C = 100 A, V_{GE} = 15 V	—	2.0	2.5	V
Input Capacitance		C_{ies}	V_{CE} = 10 V, V_{GE} = 0 V, f = 1 MHz	—	8.5	—	nF
Forward Voltage		V_F	I_F = 100 A	—	2.3	3.0	V
Switching Time	Rise Time	t_r	Inductive-Load V_{CC} = 300 V I_C = 100 A V_{GE} = ±15 V R_G = 13 Ω (Note 1)	—	0.12	0.24	μs
	Turn-On Time	t_{on}		—	0.45	0.90	
	Fall Time	t_f		—	0.20	0.50	
	Turn-Off Time	t_{off}		—	0.50	1.00	
	Reverse Recovery Time	trr		—	0.10	0.30	
Thermal Resistance		$R_{th\ (j-c)}$	Transistor Stage	—	—	0.42	°C / W
			Diode Stage	—	—	1.00	
		$R_{th\ (c-f)}$	Case to fin (Note 2)	—	0.05	—	

(Note 2) : Silicone Grease is applied.

BRAKE STAGE

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	50	A
	1 ms	I_{CP}	100	
Forward Current	DC	I_F	50	A
	1 ms	I_{FM}	100	
Collector Power Dissipation (Tc = 25°C)		P_C	80	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 / 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} = ±20 V, V_{CE} = 0 V	—	—	±500	nA
Collector Cut-Off Current		I_{CES}	V_{CE} = 600 V, V_{GE} = 0 V	—	—	1.0	mA
Gate-Emitter Cut-Off Voltage		$V_{GE\ (off)}$	V_{CE} = 5 V, I_C = 5 mA	5.0	—	8.0	V
Collector-Emitter Saturation Voltage		$V_{CE\ (sat)}$	I_C = 50 A, V_{GE} = 15 V	—	2.0	2.5	V
Input Capacitance		C_{ies}	V_{CE} = 10 V, V_{GE} = 0 V, f = 1 MHz	—	4.0	—	nF
Forward Voltage		V_F	I_F = 50 A	—	2.2	2.8	V
Switching Time	Rise Time	t_r	Inductive-Load	—	0.08	0.16	μs
	Turn-On Time	t_{on}	V_{CC} = 300 V	—	0.10	0.20	
	Fall Time	t_f	I_C = 50 A	—	0.22	0.44	
	Turn-Off Time	t_{off}	V_{GE} = ±15 V	—	0.50	1.00	
	Reverse Recovery Time	trr	R_G = 24 Ω (Note 1)	—	0.23	0.35	
Thermal Resistance		$R_{th\ (j-c)}$	Transistor Stage	—	—	1.56	°C / W
			Diode Stage	—	—	2.00	
		$R_{th\ (c-f)}$	Case to fin (Note 2)	—	0.05	—	

(Note 2) : Silicone Grease is applied.

(Note 1) : Switching Time Test Circuit & Timing Chart