

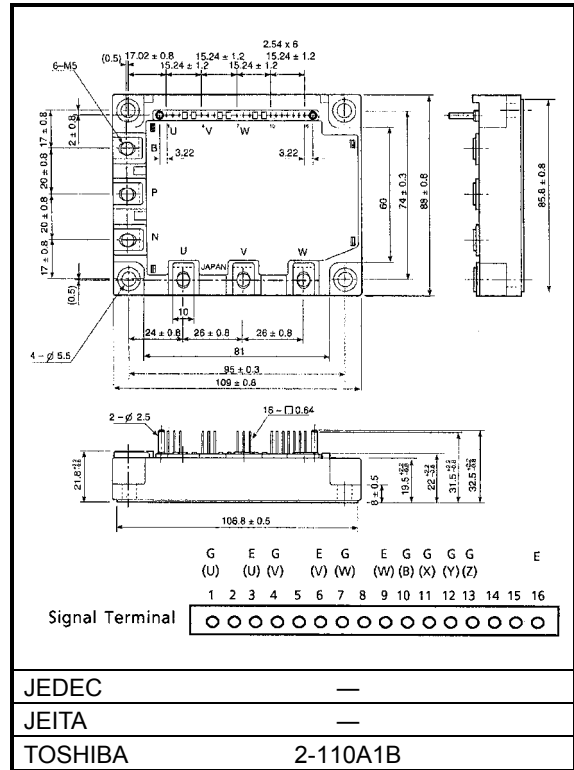
TOSHIBA GTR Module Silicon N Channel IGBT

MG100J7KS50

High Power Switching Applications
 Motor Control Applications

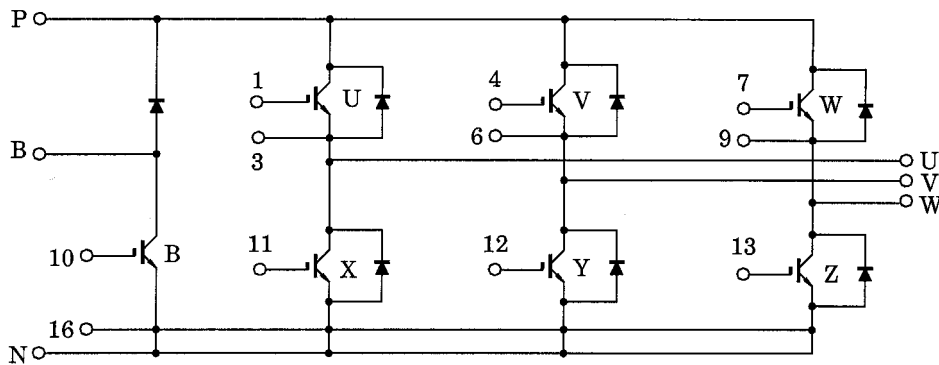
- The electrodes are isolated from case.
- High input impedance
- 7 IGBTs built into 1 package.
- Enhancement-mode
- High speed type IGBT
 - : $V_{CE(sat)} = 2.5\text{ V (max) (@}I_C = 100\text{ A)}$
 - : $t_f = 0.5\ \mu\text{s (max) (@}I_C = 100\text{ A)}$
 - : $t_{rr} = 0.3\ \mu\text{s (max) (@}I_F = 100\text{ A)}$

Unit: mm



Weight: 520g (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 |

Inverter Stage

Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	600	V
Gate-emitter voltage		V_{GES}	±20	V
Collector current	DC	I_C	100	A
	1ms	I_{CP}	200	
Forward current	DC	I_F	100	A
	1ms	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 1min.)	V
Screw torque (Terminal / mounting)		—	3 / 3	N·m

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	$V_{GE} = \pm 20V, V_{CE} = 0V$	—	—	±500	nA
Collector cut-off current		I_{CES}	$V_{CE} = 600V, V_{GE} = 0V$	—	—	1.0	mA
Gate-emitter cut-off voltage		$V_{GE (off)}$	$V_{CE} = 5V, I_C = 10mA$	5.0	—	8.0	V
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = 100A, V_{GE} = 15V$	—	2.0	2.5	V
Input capacitance		C_{ies}	$V_{CE} = 10V, V_{GE} = 0V, f = 1MHz$	—	8.5	—	nF
Forward voltage		V_F	$I_F = 100A$	—	2.3	3.0	V
Switching time	Rise time	t_r	Inductive load $V_{CC} = 300V$ $I_C = 100A$ $V_{GE} = \pm 15V$ $R_G = 13\Omega$ (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	t_{rr}		—	0.10	0.30	
Thermal resistance		$R_{th (j-c)}$	Transistor stage	—	—	0.42	°C / W
		$R_{th (c-f)}$	Diode stage	—	—	1.00	
			Case to fin (Note 2)	—	0.05	—	

Note 2: Silicone grease is applied.

Brake Stage

Maximum Ratings (Ta = 25°C)

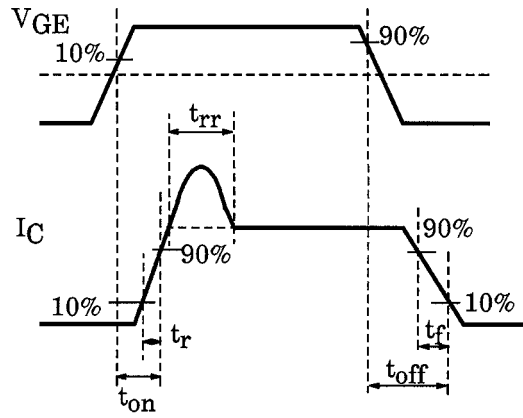
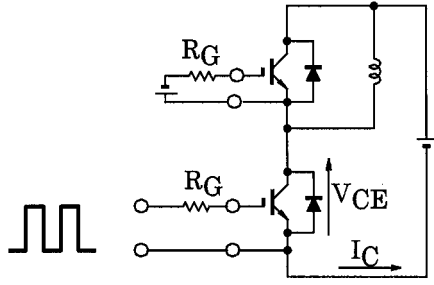
Characteristics		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	600	V
Gate-emitter voltage		V_{GES}	±20	V
Reverse voltage		V_R	600	V
Collector current	DC	I_C	50	A
	1ms	I_{CP}	100	
Forward current	DC	I_F	50	A
	1ms	I_{FM}	100	
Collector power dissipation (Tc = 25°C)		P_C	80	W
Junction temperature		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)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	$V_{GE} = \pm 20 \text{ V}, V_{CE} = 0 \text{ V}$	—	—	±500	nA
Collector cut-off current		I_{CES}	$V_{CE} = 600 \text{ V}, V_{GE} = 0 \text{ V}$	—	—	1.0	mA
Gate-emitter cut-off voltage		$V_{GE (off)}$	$V_{CE} = 5 \text{ V}, I_C = 5 \text{ mA}$	5.0	—	8.0	V
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = 50 \text{ A}, V_{GE} = 15 \text{ V}$	—	2.0	2.5	V
Input capacitance		C_{ies}	$V_{CE} = 10 \text{ V}, V_{GE} = 0 \text{ V}, f = 1 \text{ MHz}$	—	4.0	—	nF
Reverse current		I_R	$V_R = 600 \text{ V}$	—	—	1.0	mA
Forward voltage		V_F	$I_F = 50 \text{ A}$	—	2.2	2.8	V
Switching time	Rise time	t_r	Inductive-load $V_{CC} = 300 \text{ V}$ $I_C = 50 \text{ A}$ $V_{GE} = \pm 15 \text{ V}$ $R_G = 24 \Omega$ (Note 1)	—	0.08	0.16	μs
	Turn-on time	t_{on}		—	0.10	0.20	
	Fall time	t_f		—	0.22	0.44	
	Turn-off time	t_{off}		—	0.50	1.00	
	Reverserecovery time	t_{rr}		—	0.23	0.35	
Thermal resistance		$R_{th (j-c)}$	Transistor stage	—	—	1.56	°C / W
		$R_{th (c-f)}$	Diode stage	—	—	2.00	
			Case to fin (Note 2)	—	0.05	—	

Note 2: Silicone grease is applied.

Note 1: Switching time test circuit & timing chart



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