

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

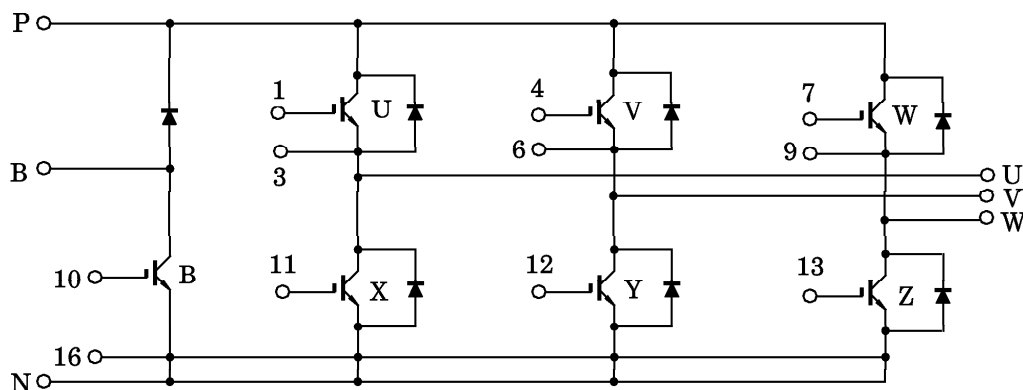
M G 150 J7 KS50

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 : Inverter Stage
 - : $V_{CE(sat)} = 2.8V$ (Max.) (@ $I_C = 150A$)
 - : $t_f = 0.5\mu s$ (Max.) (@ $I_C = 150A$)
 - : $t_{rr} = 0.3\mu s$ (Max.) (@ $I_F = 150A$)
- Outline :
- Weight : 520g

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

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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	150	A
	1ms	I_{CP}	300	
Forward Current	DC	I_F	150	A
	1ms	I_{FM}	300	
Collector Power Dissipation (Tc = 25°C)		P_C	320	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}	$V_{GE} = \pm 20V, V_{CE} = 0V$	—	—	± 500	nA
Collector-Emitter Cut-Off Current		I_{CES}	$V_{CE} = 600V, V_{GE} = 0V$	—	—	1.0	mA
Gate-Emitter Cut-Off Voltage		$V_{GE} (off)$	$V_{CE} = 5V, I_C = 15mA$	5.0	—	8.0	V
Collector-Emitter Saturation Voltage		$V_{CE} (sat)$	$I_C = 150A, V_{GE} = 15V$	—	2.2	2.8	V
Input Capacitance		C_{ies}	$V_{CE} = 10V, V_{GE} = 0V,$ $f = 1MHz$	—	12.0	—	nF
Forward Voltage		V_F	$I_F = 150A$	—	2.5	3.5	V
Switching Time	Rise Time	t_r	Inductive-Load $V_{CC} = 300V$ $I_C = 150A$ $V_{GE} = \pm 15V$ $R_G = 9.2\Omega$ (Note 1)	—	0.15	0.3	μs
	Turn-On Time	t_{on}		—	0.23	0.46	
	Fall Time	t_f		—	0.25	0.50	
	Turn-Off Time	t_{off}		—	0.50	1.00	
	Reverse Recovery Time	t_{rr}		—	0.15	0.30	
Thermal Resistance		$R_{th(j-c)}$	Transistor Stage	—	—	0.39	°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)

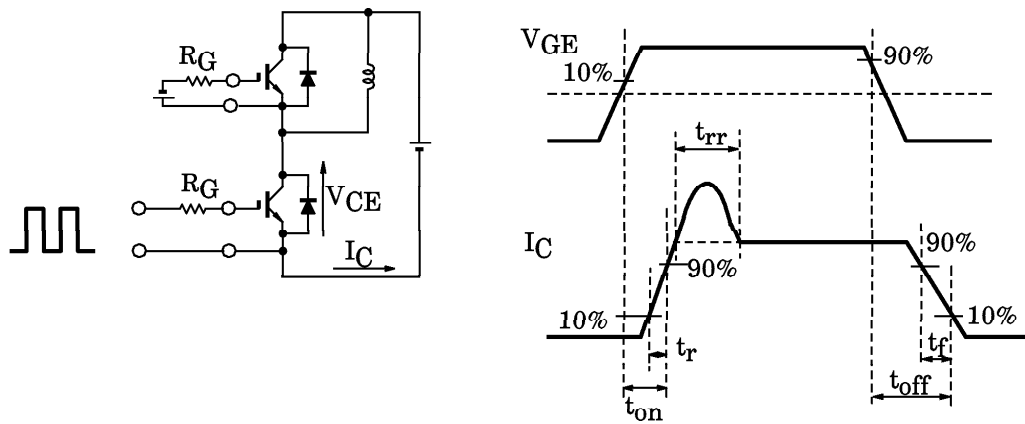
CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	600	V
Gate-Emitter Voltage		V_{GES}	± 20	V
Collector Current	DC	I_C	50	A
	1ms	I_{CP}	100	
Forward Current	DC	I_F	50	A
	1ms	I_{FM}	100	
Collector Power Dissipation (Tc = 25°C)		P_C	120	W
Junction Temperature		T_j	150	°C
Storage Temperature 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}	$V_{GE} = \pm 20V, V_{CE} = 0V$	—	—	± 500	nA
Collector-Emitter Cut-Off Current		I_{CES}	$V_{CE} = 600V, V_{GE} = 0V$	—	—	1.0	mA
Gate-Emitter Cut-Off Voltage		$V_{GE} (off)$	$V_{CE} = 5V, I_C = 5mA$	5.0	—	8.0	V
Collector-Emitter Saturation Voltage		$V_{CE} (sat)$	$I_C = 50A, V_{GE} = 15V$	—	2.0	2.5	V
Input Capacitance		C_{ies}	$V_{CE} = 10V, V_{GE} = 0V, f = 1MHz$	—	4.0	—	nF
Forward Voltage		V_F	$I_F = 50A$	—	2.2	2.8	V
Switching Time	Rise Time	t_r	Inductive-Load $V_{CC} = 300V$ $I_C = 50A$ $V_{GE} = \pm 15V$ $R_G = 24\Omega$ (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	
	Reverse Recovery Time	t_{rr}		—	0.23	0.35	
Thermal Resistance		$R_{th(j-c)}$	Transistor Stage	—	—	1.04	°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



OUTLINE

(Unit in mm)

