

TOSHIBA POWER MODULE

MP7002

1. MAXIMUM RATINGS (Ta = 25°C)

DIODE

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Reverse Voltage	VRRM	600	V
Peak One Cycle Surge Forward Current (D1, D2, D3, D4) (50 Hz, Non-Repetitive)	IFSM	220	A
Forward Current	IF	25	A
Junction Temperature	Tj	150	°C
Storage Temperature Range	Tstg	-40~125	°C

IGBT

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	VCES	600	V
Gate-Emitter Voltage	VGES	±20	V
Collector Current	DC IC	40	A
	1 ms ICP	80	A
Collector Power Dissipation (Tc = 25°C)	PC	37	W
Junction Temperature	Tj	150	°C
Storage Temperature Range	Tstg	-40~125	°C

ALL SYSTEM

CHARACTERISTIC	SYMBOL	CONDITION	RATING	UNIT
Isolation Voltage	VISO	AC 1 minute	2500	V

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2. ELECTRICAL CHARACTERISTICS (Ta = 25°C)

DIODE

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Peak Forward Voltage (1)	V _{FM} (1)	I _F = 12.5 A	—	1.0	1.2	V
Peak Forward Voltage (2)	V _{FM} (2)	I _F = 30 A	—	1.20	1.55	V
Repetitive Peak Reverse Current	I _{RRM}	V _{RRM} = 600 V			10	μA
Peak Reverse Current (D1, D2, D3, D4)	I _{rr}	I _F = 30 A			100	A
Thermal Resistance	R _{th(j-c)}		—	—	3.5	°C/W

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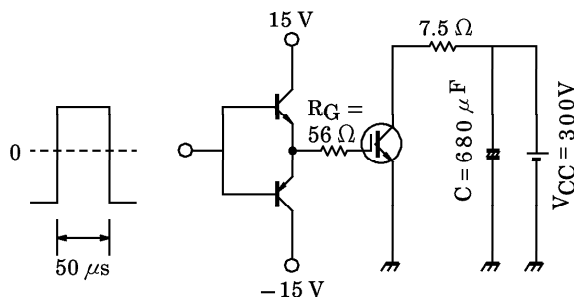
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current	I _{GES}	V _{GE} = ±20 V, V _{CE} = 0	—	—	±500	nA
Collector Cut-off Current	I _{CES}	V _{CE} = 600 V, V _{GE} = 0	—	—	1.0	mA
Gate-Emitter Cut-off Voltage	V _{GE(OFF)}	I _C = 40 mA, V _{CE} = 5 V	3.0	—	6.0	V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _C = 40 A, V _{GE} = 15 V	—	1.9	2.7	V
Input Capacitance	C _{ies}	V _{CE} = 10 V, V _{GE} = 0, f = 1 MHz	—	2900	—	pF
Switching Time	Rise Time	Load Resistance V _{CC} = 300 V, I _C = 40 A V _{GE} = ±15 V, (R _G = 56 Ω) (Note 1)	—	0.4	—	μs
	Turn-on Time		—	0.7	—	
	Fall Time		—	0.3	0.42	
	Turn-off Time		—	0.7	—	
Thermal Resistance	R _{th(j-c)}		—	—	3.3	°C/W

3. Mechanical Rating

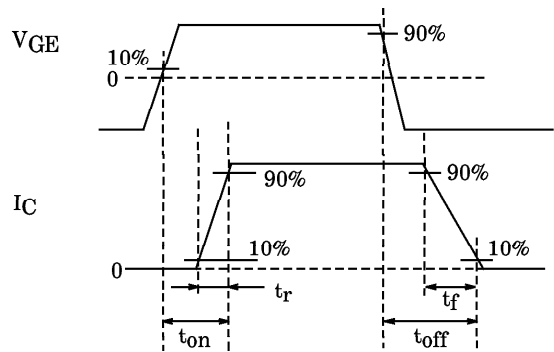
CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT
Fastening Torque	—	—	1.5	Nm

(Note 1) Switching Time Test Circuit & Timing Chart

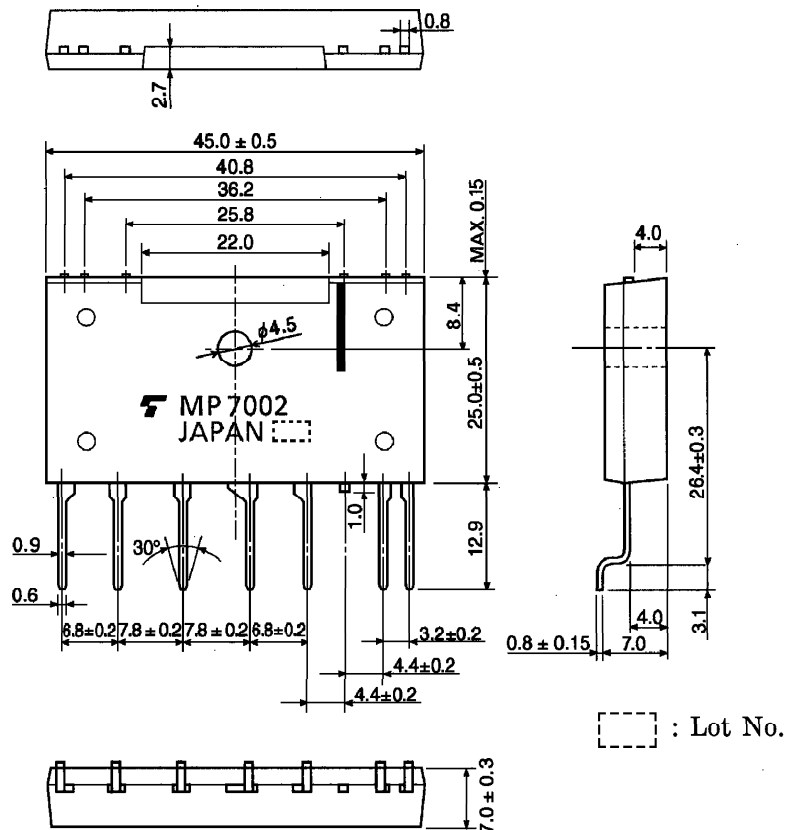
Load Resistance Test Circuit



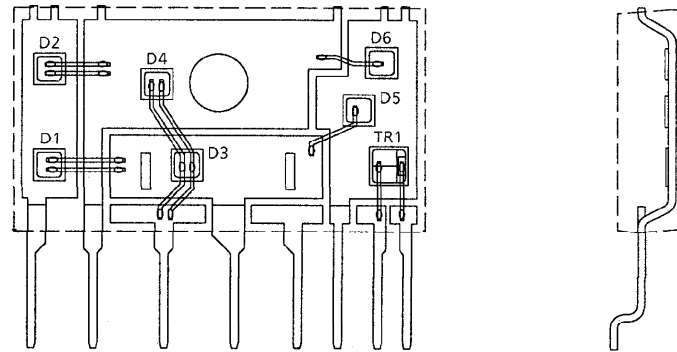
Waveform



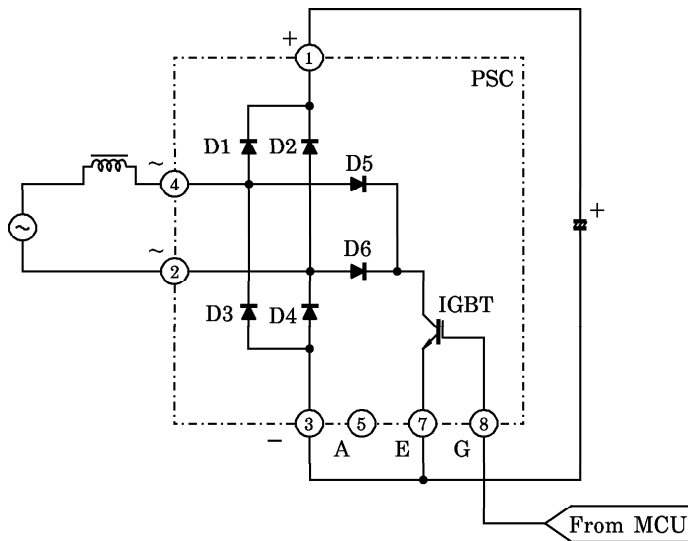
4. Package Dimension



5. Image of Chips Mounting



6. PSC Equivalent Circuit Diagram (including application circuit)



7. Pin Assignment

