

TOSHIBA POWER MODULE

MP7002

1. MAXIMUM RATINGS (Ta = 25°C)

DIODE

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Reverse Voltage	V _{RRM}	600	V
Peak One Cycle Surge Forward Current (D1, D2, D3, D4) (50 Hz, Non-Repetitive)	I _{FSM}	220	A
Forward Current	I _F	25	A
Junction Temperature	T _j	150	°C
Storage Temperature Range	T _{stg}	−40~125	°C

IGBT

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	V _{CES}	600	V
Gate-Emitter Voltage	V _{GES}	±20	V
Collector Current	DC I _C	40	A
	1 ms I _{CP}	80	A
Collector Power Dissipation (Tc = 25°C)	P _C	37	W
Junction Temperature	T _j	150	°C
Storage Temperature Range	T _{stg}	−40~125	°C

ALL SYSTEM

CHARACTERISTIC	SYMBOL	CONDITION	RATING	UNIT
Isolation Voltage	V _{ISO}	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)	$V_{FM}(1)$	$I_F = 12.5\text{ A}$	—	1.0	1.2	V
Peak Forward Voltage (2)	$V_{FM}(2)$	$I_F = 30\text{ A}$	—	1.20	1.55	V
Repetitive Peak Reverse Current	I_{RRM}	$V_{RRM} = 600\text{ V}$			10	μA
Peak Reverse Current (D1, D2, D3, D4)	I_{rr}	$I_F = 30\text{ A}$			100	A
Thermal Resistance	$R_{th(j-c)}$		—	—	3.5	$^{\circ}\text{C/W}$

IGBT

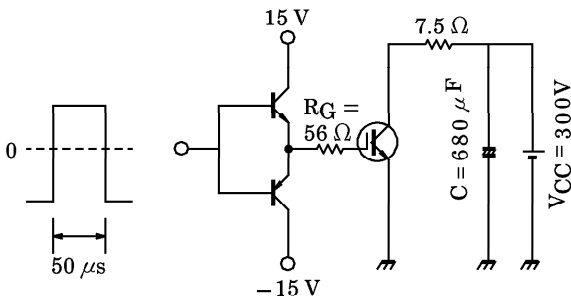
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current	I_{GES}	$V_{GE} = \pm 20\text{ V}$, $V_{CE} = 0$	—	—	± 500	nA
Collector Cut-off Current	I_{CES}	$V_{CE} = 600\text{ V}$, $V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-off Voltage	$V_{GE(OFF)}$	$I_C = 40\text{ mA}$, $V_{CE} = 5\text{ V}$	3.0	—	6.0	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 40\text{ A}$, $V_{GE} = 15\text{ V}$	—	1.9	2.7	V
Input Capacitance	C_{ies}	$V_{CE} = 10\text{ V}$, $V_{GE} = 0$, $f = 1\text{ MHz}$	—	2900	—	pF
Switching Time	Rise Time	Load Resistance $V_{CC} = 300\text{ V}$, $I_C = 40\text{ A}$ $V_{GE} = \pm 15\text{ V}$, ($R_G = 56\ \Omega$) (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	$^{\circ}\text{C/W}$

3. Mechanical Rating

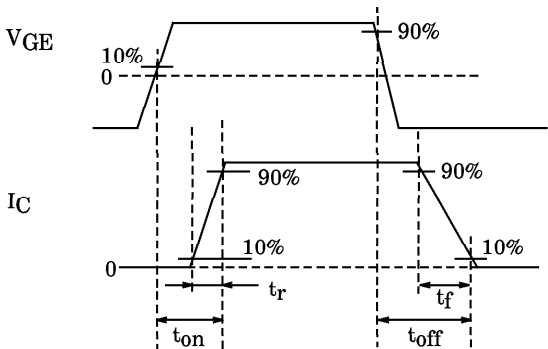
CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT
Fastening Torque	—	—	1.5	Nm

(Note 1) Switching Time Test Circuit & Timing Chart

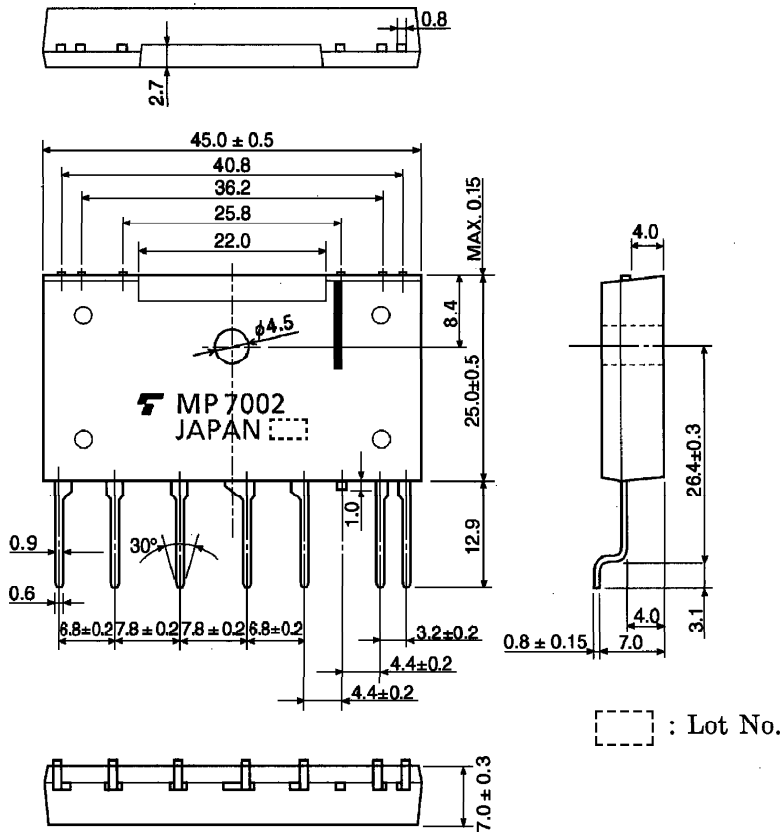
Load Resistance Test Circuit



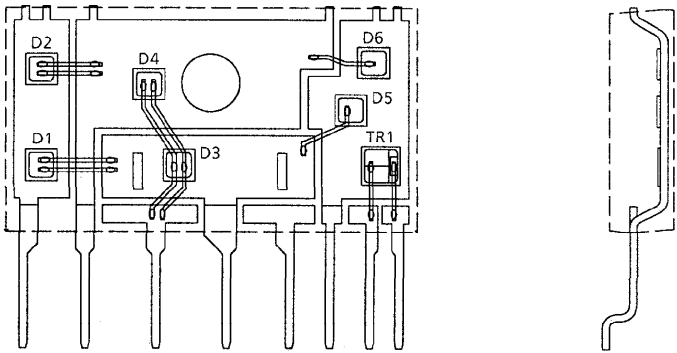
Waveform



4. Package Dimension



5. Image of Chips Mounting



6. PSC Equivalent Circuit Diagram (including application circuit)

