

TOSHIBA Power Module

MP7001**1. Maximum Ratings (Ta = 25°C)****Diode**

Characteristics	Symbol	Rating	Unit
Repetitive peak reverse voltage	V_{RRM}	600	V
Peak one cycle surge forward current (D1, D2) (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

Characteristics	Symbol	Rating	Unit	
Collector-emitter voltage	V_{CES}	600	V	
Gate-emitter voltage	V_{GES}	±20	V	
Collector current	DC	I_C	30	A
	1 ms	I_{CP}	60	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

Characteristics	Symbol	Condition	Rating	Unit
Isolation voltage	V_{ISO}	AC 1 minute	2500	V

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2. Electrical Characteristics (Ta = 25°C)

Diode

Characteristics	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)	I_{rr}	$I_F = 30 A$			100	A
Thermal resistance	$R_{th(j-c)}$	—	—	—	3.5	$^{\circ}C/W$

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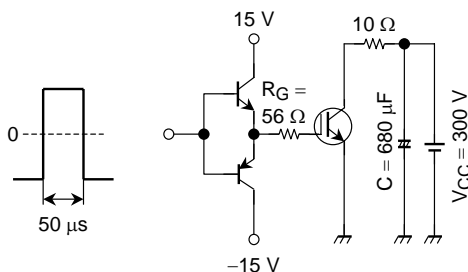
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	I_{GES}	$V_{GE} = \pm 20 V, V_{CE} = 0$	—	—	± 500	nA
Collector cut-off current	I_{CES}	$V_{CE} = 600 V, V_{GE} = 0$	—	—	1.0	mA
Gate-emitter cut-off voltage	$V_{GE(OFF)}$	$I_C = 30 mA, V_{CE} = 5 V$	3.0	—	6.0	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 30 A, V_{GE} = 15 V$	—	2.0	2.7	V
Input capacitance	C_{ies}	$V_{CE} = 10 V, V_{GE} = 0,$ $f = 1 MHz$	—	2100	—	pF
Switching time	Rise time	Load resistance $V_{CC} = 300 V, I_C = 30 A$ $V_{GE} = \pm 15 V, (R_G = 56 \Omega)$ (Note)	—	0.36	—	μs
	Turn-on time		—	0.59	—	
	Fall time		—	0.27	0.42	
	Turn-off Time		—	0.51	—	
Thermal Resistance	$R_{th(j-c)}$		—	—	3.3	$^{\circ}C/W$

3. Mechanical Rating

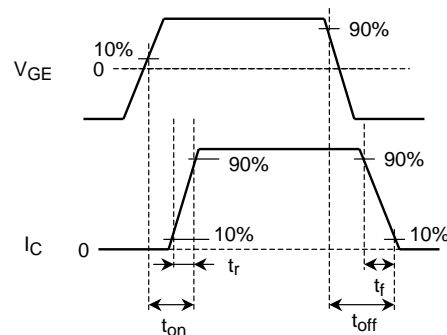
Characteristics	Min	Typ.	Max	Unit
Fastening torque	—	—	1.5	Nm

Note: Switching time test circuit & timing chart

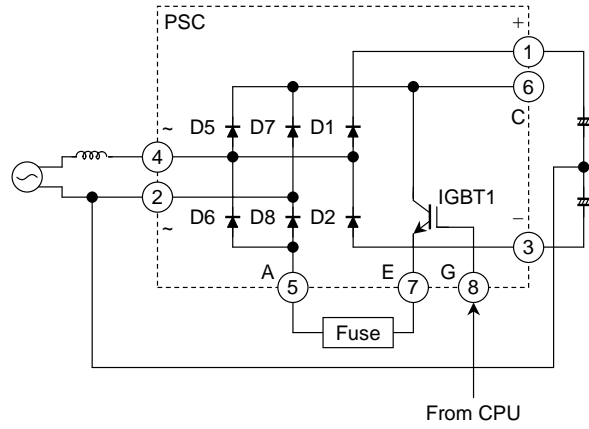
Load Resistance Test Circuit



Waveform



6. PSC Equivalent Circuit Diagram (including application circuit)



7. Pin Assignment

