TENTATIVE

CM450TJ-24NF

HIGH POWER SWITCHING USE

Pre.	S.Uchida	Rev	D	K. Kurachi
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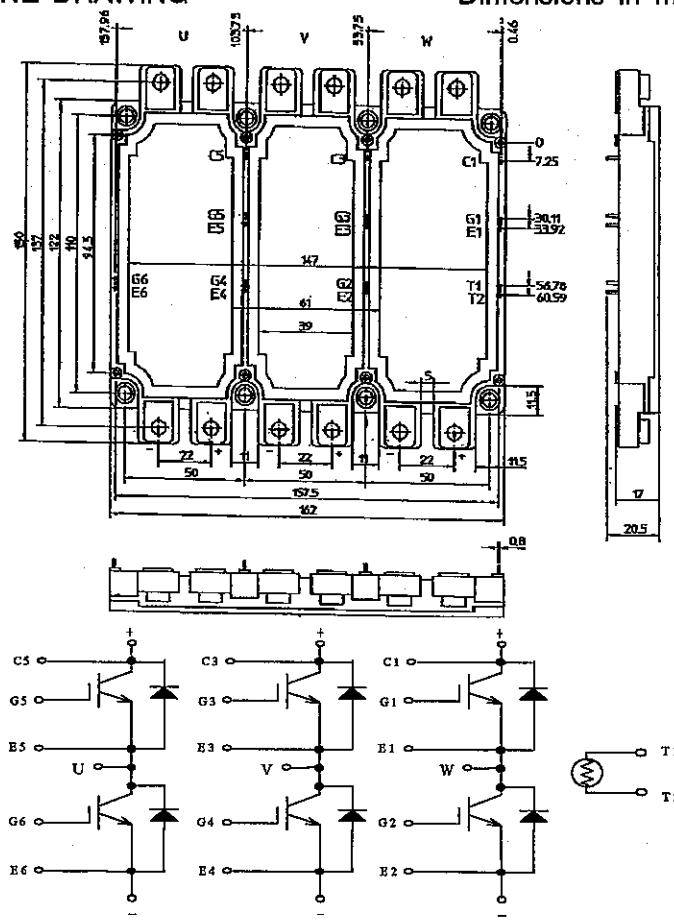
Notice : This is not a final specification. Some parametric limits ar e subject to change.

CM450TJ-24NF

- Ic ····· 450A
- V_{CES} ····· 1200V
- Insulated Type
- 6-elements in a pack

OUTLINE DRAWING Dimensions in mm



CIRCUIT DIAGRAM

APPLICATION

General purpose inverters & Servo controls,etc

ABSOLUTE MAXIMUM RATINGS (T_j = 25 °C)

Symbol	Item	Conditions	Ratings	Units	
V_{CES}	Collector-emitter voltage	G-E Short	1200	V	
V_{GES}	Gate-emitter voltage	C-E Short	±20	V	
I_C	Collector current	DC, Tc'= 96 °C *1	450	A	D
I_{CM}		Pulse ②	900		
I_E ①	Emitter current		450	A	D
I_{EM} ①		Pulse ②	900		
Pc ③	Maximum collector dissipation	Tc' = 25 °C	3040	W	B
Tj	Junction temperature		−40~+150	°C	
Tstg	Storage temperature		−40~+125	°C	
Viso	Isolation voltage	Main terminal to base plate,AC 1 min.	2500	V	
—	Torque strength	Main terminal M6	3.5~4.5	N·m	
—	Torque strength	Mounting holes M5	2.5~3.5	N·m	
—	Weight	Typical value	1100	g	A

ELECTRICAL CHARACTERISTICS (T_j = 25 °C)

Symbol	Item	Conditions	Min.	Typ.	Max.	Units	
I_{CES}	Collector cutoff current	$V_{CE}=V_{CES}, V_{GE}$= 0V	–	–	2	mA	
$V_{GE(th)}$	Gate-emitter threshold voltage	I_C=45mA, V_{CE}= 10V	6	7	8	V	C
I_{GES}	Gate leakage current	$V_{GE}=V_{GES}$, V_{CE}= 0V	–	–	0.5	μA	A
$V_{CE(sat)}$	Collector to emitter saturation voltage	T_j= 25 °C, I_C = 450A	–	2.0**	2.6**	V	
		T_j= 125 °C, V_{GE}= 15V	–	2.2**	–		
Cies	Input capacitance	V_{CE}= 10V, V_{GE}= 0V	–	–	70	nF	B
Coes	Output capacitance		–	–	8.1		B
Cres	Reverse transfer capacitance		–	–	1.5		B
Q_G	Total gate charge	V_{CC}=600V, Ic=450A, V_{GE}=15V	–	2400	–	nC	A
td(on)	Turn-on delay time	V_{CC}=600V, Ic=450A, $V_{GE1}=V_{GE2}$=15V, R_G=0.7Ω, Inductive load switching operation	–	–	500	ns	B D
tr	Turn-on rise time		–	–	150		B D
td(off)	Turn-off delay time		–	–	600		B
tf	Turn-off fall time		–	–	300		B
trr ①	Reverse recovery time	I_E=450A	–	–	250	ns	B D
Qrr ①	Reverse recovery charge		–	15	–	μC	B D
V_{EC} ①	Emitter-collector voltage	I_E=450A, V_{GE}= 0V	–	–	3.2**	V	
Rth(j-c')Q	Thermal resistance*1	IGBT part	–	–	0.041	°C/W	B
Rth(j-c')R		FWDi part	–	–	0.048		B
Rth(c-f)	Contact thermal resistance	Case to fin, Thermal compound Applied (1/6module)	–	0.048*2	–		
RG	External gate resistance		0.7	–	7	Ω	B D

** : without package drop voltage

*1: Tc' measured point is just under the chips.
If you use this value , Rth(f-a) should be measured just under the chips.

*2: Typical value is measured by using Shin-etsu Silicone "G-746".

Thermistors part

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
R_{TH}	Resistance	T_C=25°C	–	5	–	kΩ
B	B Constant	Resistance at 25°C,50°C ⑤	–	3375	–	K

① I_E, V_{EC}, trr, Qrr & die/dt represent characteristics of the anti-parallel, emitter to collector free-wheel diode (FWDi).

② Pulse width and repetition rate should be such that the device junction temp.(T_j) dose not exceed Tjmax rating.

③ Junction temperature (T_j) should not increase beyond 150°C.

④ Pulse width and repetition rate should be such as to cause neglible temperature rise.

⑤ $B = (\ln R_1 - \ln R_2)/(1/T_1 - 1/T_2)$ R_1: Resistance at T_1(K) R_2: Resistance at T_2(K)