Tentative

Pre.	S.Uchida	Rev	B	H. Hayada.
Apr.	M.Tabata 25-Sep.-'02			M. Tabata 21-Feb.-'03

CM400DY-12NF

HIGH POWER SWITCHING USE

Notice : This is not a final specification. Some parametric limits are subject to change.

CM400DY-12NF

- Ic ····· 400A
- V_{CES} ····· 600V
- Insulated Type
- 2-elements in a pack

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	600	V	
V_{GES}	Gate-emitter voltage	C-E Short	±20	V	
I_C	Collector current	DC, Tc'= 92 °C *3	400	A	B
I_{CM}		Pulse ②	800		
I_E ①	Emitter current		400	A	B
I_{EM} ①		Pulse ②	800		
Pc ③	Maximum collector dissipation	Tc= 25 °C	1130	W	
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 M6	3.5 ~ 4.5	N·m	
—	Weight	Typical value	400	g	

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	—	—	1	mA	
$V_{GE(th)}$	Gate-emitter threshold voltage	I_C=40mA,V_{CE}= 10V	5	6	7.5	V	A
I_{GES}	Gate leakage current	V_{GE}=V_{GES} ,V_{CE}= 0V	—	—	0.5	μA	
$V_{CE(sat)}$	Collector to emitter saturation voltage	T_j= 25 °C, I_C = 400A	—	1.7	2.2	V	
		T_j= 125 °C, V_{GE}= 15V	—	1.7	—		
Cies	Input capacitance	V_{CE}= 10V, V_{GE}= 0V	—	—	60	nF	A
Coes	Output capacitance		—	—	7.3		
Cres	Reverse transfer capacitance		—	—	2.4		
Q_G	Total gate charge	V_{CC}=300V,Ic=400A,V_{GE}=15V	—	1600	—	nC	
td(on)	Turn-on delay time	V_{CC}=300V,Ic=400A	—	—	300	ns	A
tr	Turn-on rise time	V_{GE1}=V_{GE2}=15V	—	—	200		A
td(off)	Turn-off delay time	R_G= 3.1Ω,Inductive load	—	—	450		A
tf	Turn-off fall time	switching operation	—	—	300		
trr ①	Reverse recovery time	I_E=400A	—	—	250	ns	A
Qrr ①	Reverse recovery charge		—	6.8	—	μC	A
V_{EC} ①	Emitter-collector voltage	I_E=400A,V_{GE}= 0V	—	—	2.6	V	
Rth(j-c)Q	Thermal resistance	IGBT part (1/2 module) *1	—	—	0.11	°C/W	
Rth(j-c)R		FWDi part(1/2 module) *1	—	—	0.19		A
Rth(c-f)	Contact thermal resistance	Case to fin,Thermal compound Applied (1/2module) *2	—	0.04	—		
Rth(j-c')Q	Thermal resistance	IGBT part (1/2 module) *3	—	—	0.066		B
RG	External gate resistance		1.6	—	16	Ω	A

*1: Tc measured point is shown in page OUTLINE DRAWING.
*2: Typical value is measured by using Shin-etsu Silicone "G-746".
*3: Tc' measured point is just under the chips. B
If you use this value , Rth(f-a) should be measured just under the chips.

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.

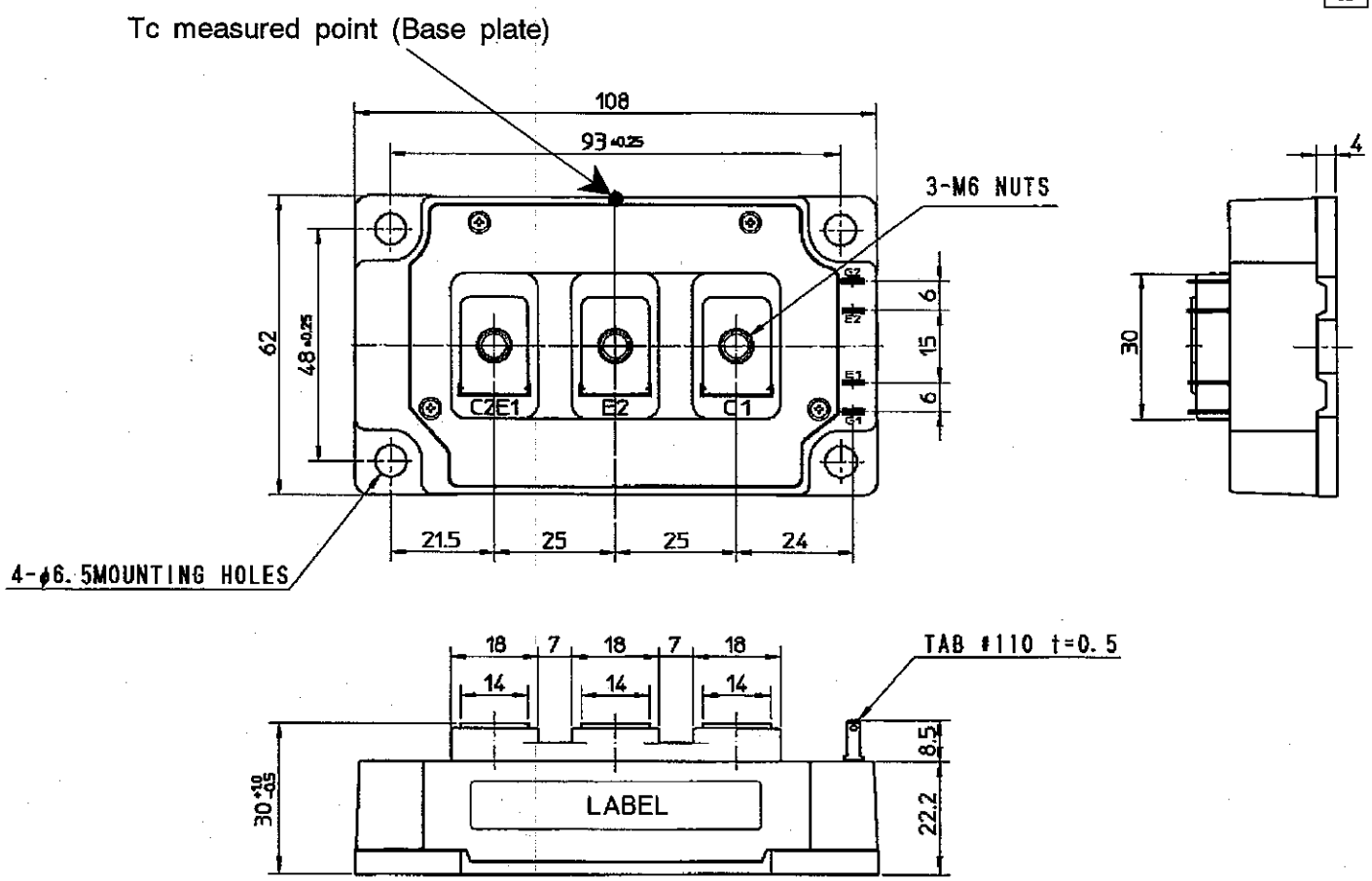
③ Junction temperature (T_j) should not increase beyond 150°C.

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

OUTLINE DRAWING

Dimensions in mm

A



CIRCUIT DIAGRAM