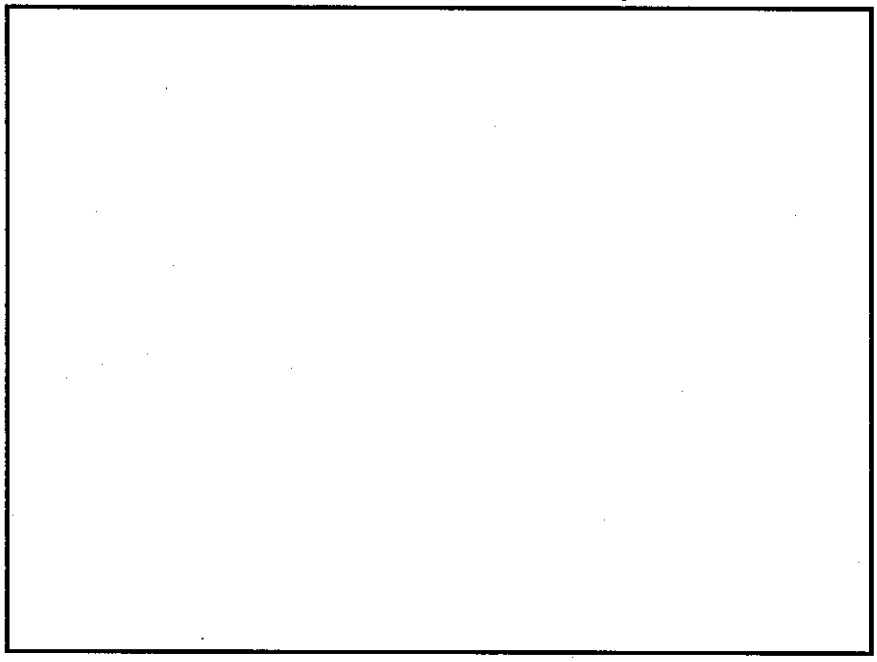
Pre.	S.Uchida	Rev	B	H.Hanada.
Apr.	M.Tabata 23-Oct.-'02			M.Tabata 21-Feb-'03

HIGH POWER SWITCHING USE

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

CM600DU-24NF

- Ic ····· 600A
- V_{CES} ····· 1200V
- 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	1200	V	
V_{GES}	Gate-emitter voltage	C-E Short	±20	V	
I_C	Collector current	DC, Tc'= 111 °C *3	600	A	B
I_{CM}		Pulse ②	1200		
I_E ①	Emitter current		600	A	B
I_{EM} ①		Pulse ②	1200		
Pc ③	Maximum collector dissipation	Tc= 25 °C	2080	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 M8	8.8 ~ 10.8	N·m	
—	Torque strength	Mounting holes M6	3.5 ~ 4.5	N·m	
—	Torque strength	G(E) Terminal M 4	1.3 ~ 1.7	N·m	
—	Weight	Typical value	1200	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=60mA, V_{CE}= 10V		6	7	8	V	
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 = 600A	—	1.95	2.65	V	
		T_j= 125 °C	V_{GE}= 15V	—	2.15	—		
Cies	Input capacitance	V_{CE}= 10V		—	—	140	nF	
Coes	Output capacitance	V_{GE}= 0V		—	—	12		
Cres	Reverse transfer capacitance			—	—	2.7		
Q_G	Total gate charge	V_{CC}=600V, Ic=600A, V_{GE}=15V		—	4000	—	nC	
td(on)	Turn-on delay time	V_{CC}=600V, Ic=600A		—	—	800	ns	A
tr	Turn-on rise time	$V_{GE1}=V_{GE2}$=15V		—	—	180		A
td(off)	Turn-off delay time	R_G= 1.0Ω, Inductive load		—	—	900		A
tf	Turn-off fall time	switching operation		—	—	350		
trr ①	Reverse recovery time	I_E=600A		—	—	300	ns	A
Qrr ①	Reverse recovery charge			—	28	—	μC	A
V_{EC} ①	Emitter-collector voltage	I_E=600A, V_{GE}= 0V		—	—	3.35	V	
Rth(j-c)Q	Thermal resistance	IGBT part (1/2 module) *1		—	—	0.06	°C/W	
Rth(j-c)R		FWDi part(1/2 module) *1		—	—	0.11		
Rth(c-f)	Contact thermal resistance	Case to fin, Thermal compound Applied (1/2module) *2		—	0.019	—		
Rth(j-c')Q	Thermal resistance	IGBT part (1/2 module) *3		—	—	0.023		B
RG	External gate resistance			1.0	—	10	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).

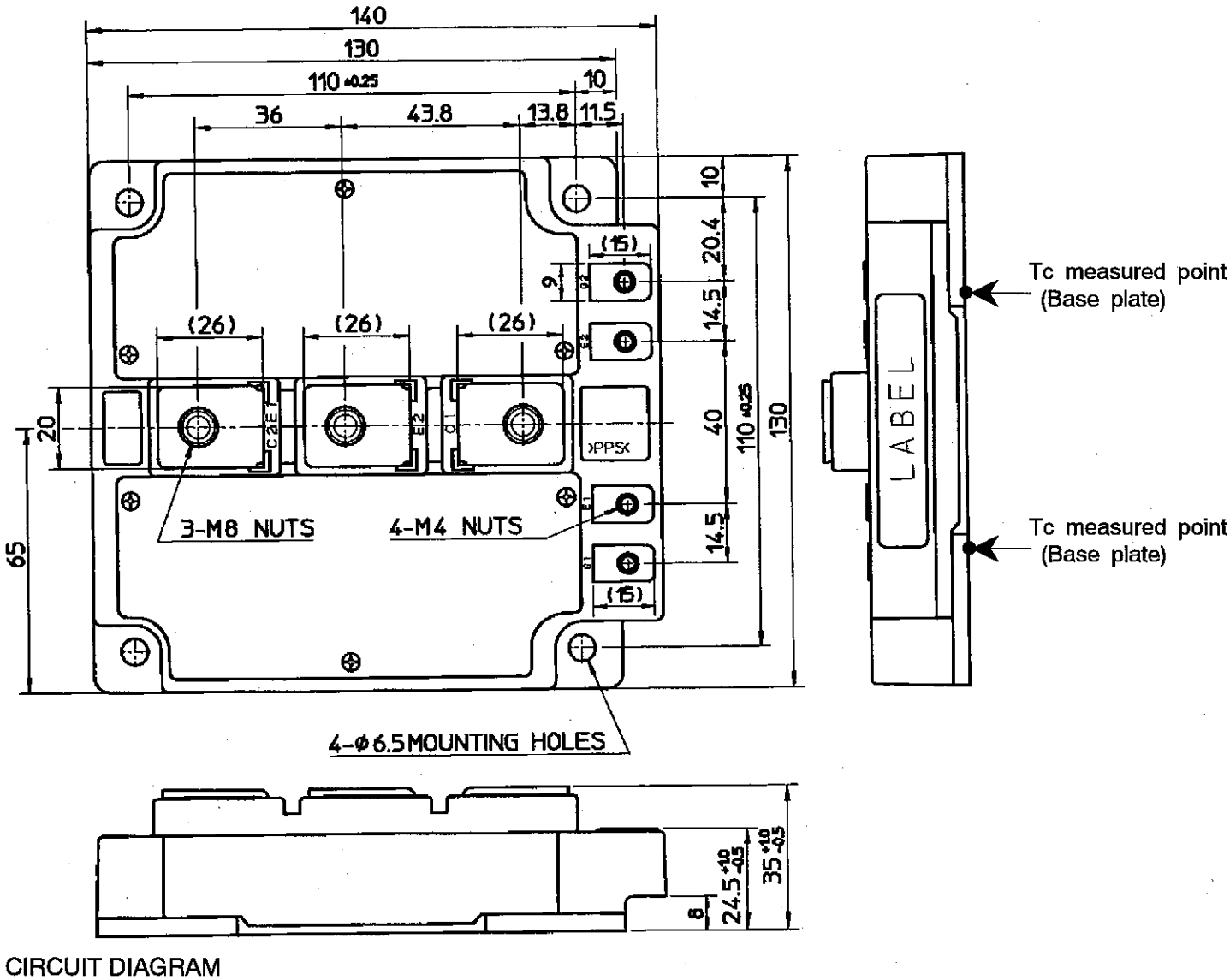
② Pulse width and repetition rate should be such that the device junction temp.(T_j) dose not exceed Tjmax rating.

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



CIRCUIT DIAGRAM