Pre.	J.Yamada	Rev	D	M. Kouzu
Apr.	M.Yamamoto Dec.14 '01			T. Fumio 20-Oct-03

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

CM1000DU-34NF

- Ic 1000A
- V_{CES} 1700V
- 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	1700	V	
V_{GES}	Gate-emitter voltage	C-E Short	±20	V	
I_C	Collector current	Tc'=104 °C	1000	A	B
I_{CM}		Pulse ②	2000		
I_E ①	Emitter current	Tc=25°C	1000	A	
I_{EM} ①		Pulse ②	2000		
Pc ③	Maximum collector dissipation	Tc=25°C	3900	W	B
Tj	Junction temperature		−40~+150	°C	D
Tstg	Storage temperature*3		−40~+125	°C	B
Viso	Isolation voltage	Main terminal to base plate,AC 1 min.	3500	V	C
–	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	1400	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=100mA,V_{CE}= 10V	6	7	8	V	B
I_{GES}	Gate leakage current	V_{GE}=V_{GES} ,V_{CE}= 0V	—	—	5	μA	B
$V_{CE(sat)}$ (chip)	Collector to emitter saturation voltage(without lead resistance)	T_j= 25 °C, I_C = 1000A	—	2.2	2.8	V	B
		T_j= 125 °C, V_{GE}= 15V ④	—	2.45	—		D
R(lead)	Module lead resistance	I_C = 1000A, terminal-chip	—	0.286	—	mΩ	A B
Cies	Input capacitance	V_{CE}= 10V, V_{GE}= 0V	—	—	220	nF	B
Coes	Output capacitance		—	—	25		
Cres	Reverse transfer capacitance		—	—	4.7		
Q_G	Total gate charge	V_{CC}=1000V,Ic=1000A,V_{GE}=15V	—	6000	—	nC	B D
td(on)	Turn-on delay time	V_{CC}=1000V,Ic=1000A, V_{GE1}=V_{GE2}=15V, R_G=0.47Ω,Inductive load switching operation	—	—	600	ns	B
tr	Turn-on rise time		—	—	150		B
td(off)	Turn-off delay time		—	—	900		B
tf	Turn-off fall time		—	—	200		B
trr	Reverse recovery time	I_E=1000A	—	—	450	ns	B
Qrr	Reverse recovery charge		—	90	—	μC	B D
V_{EC} ①	Emitter-collector voltage (without lead resistance)	I_E=1000A,V_{GE}= 0V	—	2.3	3	V	B
Rth(j-c)Q	Thermal resistance*3	IGBT part (1/2module)	—	—	0.032	°C/W	D
Rth(j-c)R		FWDi part (1/2module)	—	—	0.053		
Rth(c-f)	Contact thermal resistance*2	Case to fin,Thermal compound Applied (1/2module)	—	0.016	—		
Rth(j-c')Q	Thermal resistance*1	Tc measured point is just under the chips(IGBT part)	—	—	0.014	°C/W	
Rth(j-c')R		Tc measured point is just under the chips(FWDi part)	—	—	0.023		
RG	External gate resistance		0.47	—	4.7	Ω	B

*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".
*3: Tc measured point is shown in page "3-3".
*4: The operation temperature is restrained by the permission temperature of female connector.

D
B

① I_E,V_{EC},trr & Qrr 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.

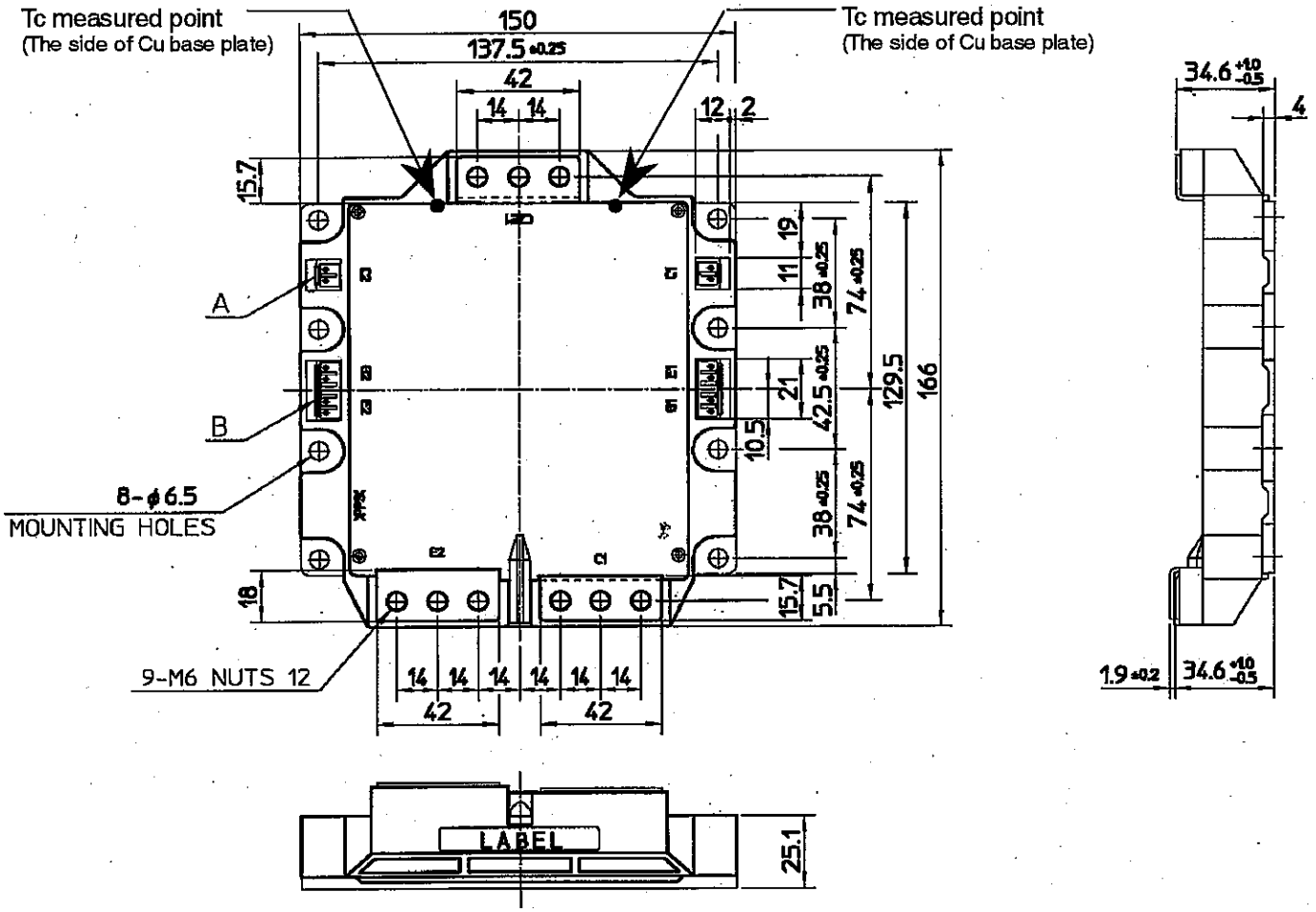
OUTLINE DRAWING

Dimensions in mm

A
B

A,B HOUSING Type
(J.S.T.Mfg.Co,Ltd)

A : VHR-2N
B : VHR-5N



CIRCUIT DIAGRAM