Tentative

Pre.	H.Hanada	Rev	A	H.Hanada. Kouzu.
Apr.	T.Furuie 07-Oct-'03			T.Furuie 04-Nov-'03

CM400HA-24A

HIGH POWER SWITCHING USE

CM400HA-24A

- Ic ····· 400A
- V_{CES} ····· 1200V
- Insulated Type
- 1-elements in a pack

APPLICATION

AC drive 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=87 °C *1	400	A	
I_{CM}		Pulse ②	800		
I_E ①	Emitter current		400	A	
I_{EM} ①		Pulse ②	800		
Pc ③	Maximum collector dissipation	Tc= 25 °C *1	2350	W	A
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	1.96 ~ 2.94	N·m	
–	Torque strength	Mounting holes M6	1.96 ~ 2.94	N·m	
–	Torque strength	G(E) terminal M4	0.98 ~ 1.47	N·m	
–	Weight	Typical value	400	g	

ELECTRICAL CHARACTERISTICS (T_j = 25 °C)

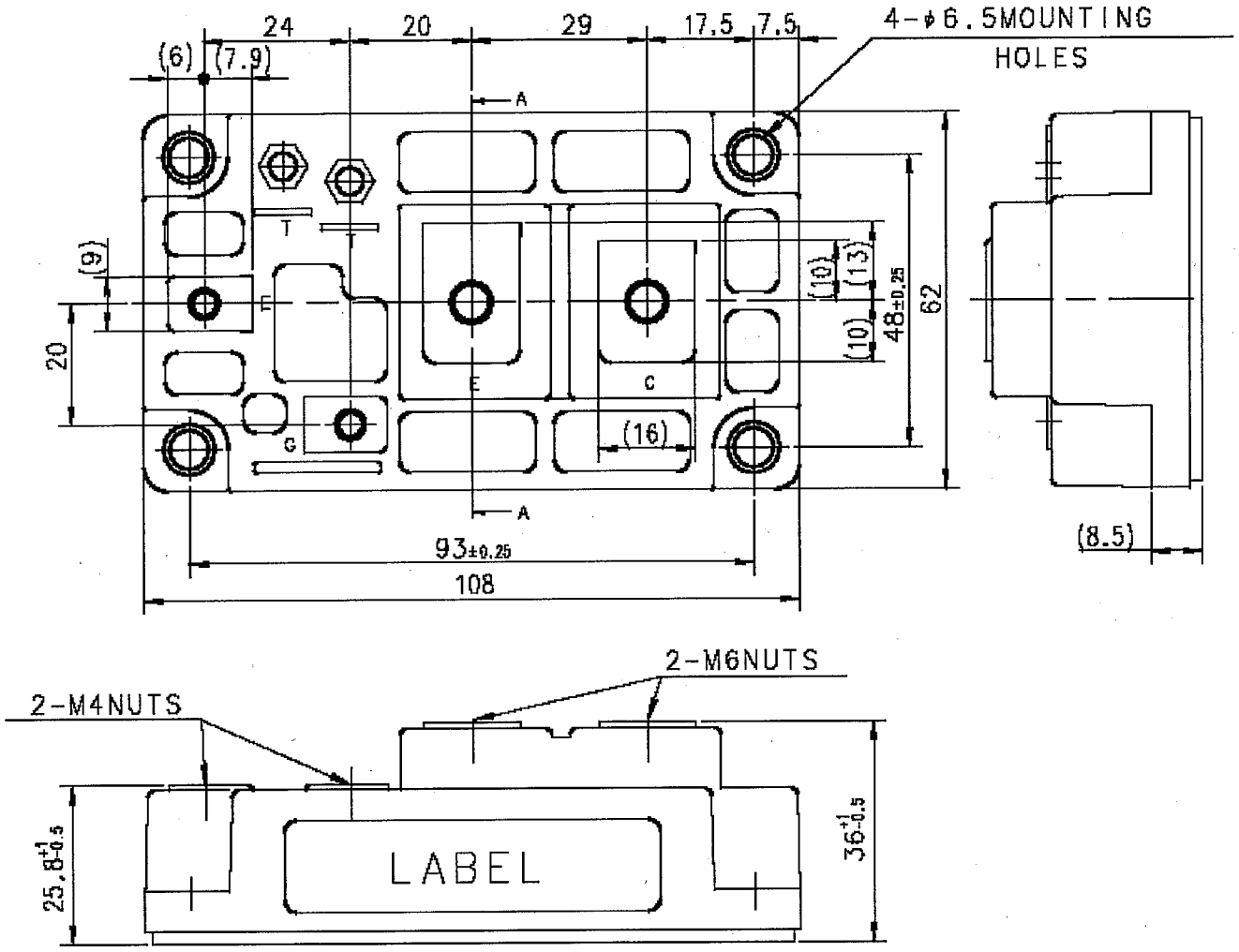
Symbol	Item	Conditions		Min.	Typ.	Max.	Units
I_{CES}	Collector cutoff current	$V_{CE}=V_{CES}, V_{GE}$= 0V		—	—	1	mA
$V_{GE(th)}$	Gate-emitter threshold voltage	I_C=40mA, V_{CE}= 10V		6	7	8	V
I_{GES}	Gate leakage current	$V_{GE}=V_{GES}$, V_{CE}= 0V		—	—	0.5	μA
$V_{CE(sat)}$	Collector to emitter saturation voltage	T_j= 25 °C	I_C = 400A	—	2.1	3.0	V
		T_j= 125 °C	V_{GE}= 15V	—	2.4	—	
Cies	Input capacitance	V_{CE}= 10V		—	—	70	nF
Coes	Output capacitance	V_{GE}= 0V		—	—	6	
Cres	Reverse transfer capacitance			—	—	1.4	
Q_G	Total gate charge	V_{CC}=600V, Ic=400A, V_{GE}=15V		—	2000	—	nC
td(on)	Turn-on delay time	V_{CC}=600V, Ic=400A		—	—	550	ns
tr	Turn-on rise time	$V_{GE1}=V_{GE2}$=15V		—	—	180	
td(off)	Turn-off delay time	R_G=0.78Ω, Inductive load		—	—	600	
tf	Turn-off fall time	switching operation		—	—	350	
trr ①	Reverse recovery time	I_E=400A		—	—	250	ns
Qrr ①	Reverse recovery charge			—	16	—	μC
V_{EC} ①	Emitter-collector voltage	I_E=400A, V_{GE}= 0V		—	—	3.8	V
Rth(j-c)Q	Thermal resistance	IGBT part *1		—	—	0.053	°C/W
Rth(j-c)R		FWDi part *1		—	—	0.085	
Rth(c-f)	Contact thermal resistance	Case to fin, Thermal compound Applied *2		—	0.02	—	
RG	External gate resistance			0.78	—	10	Ω

*1: Tc, Tf measured point is just under the chips.
*2: Typical value is measured by using Shin-etsu Silicone "G-746".

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



CIRCUIT DIAGRAM