

Pre.	I. Uchida	Rev	
Apr.	A. Takahashi 11-Mar-99		

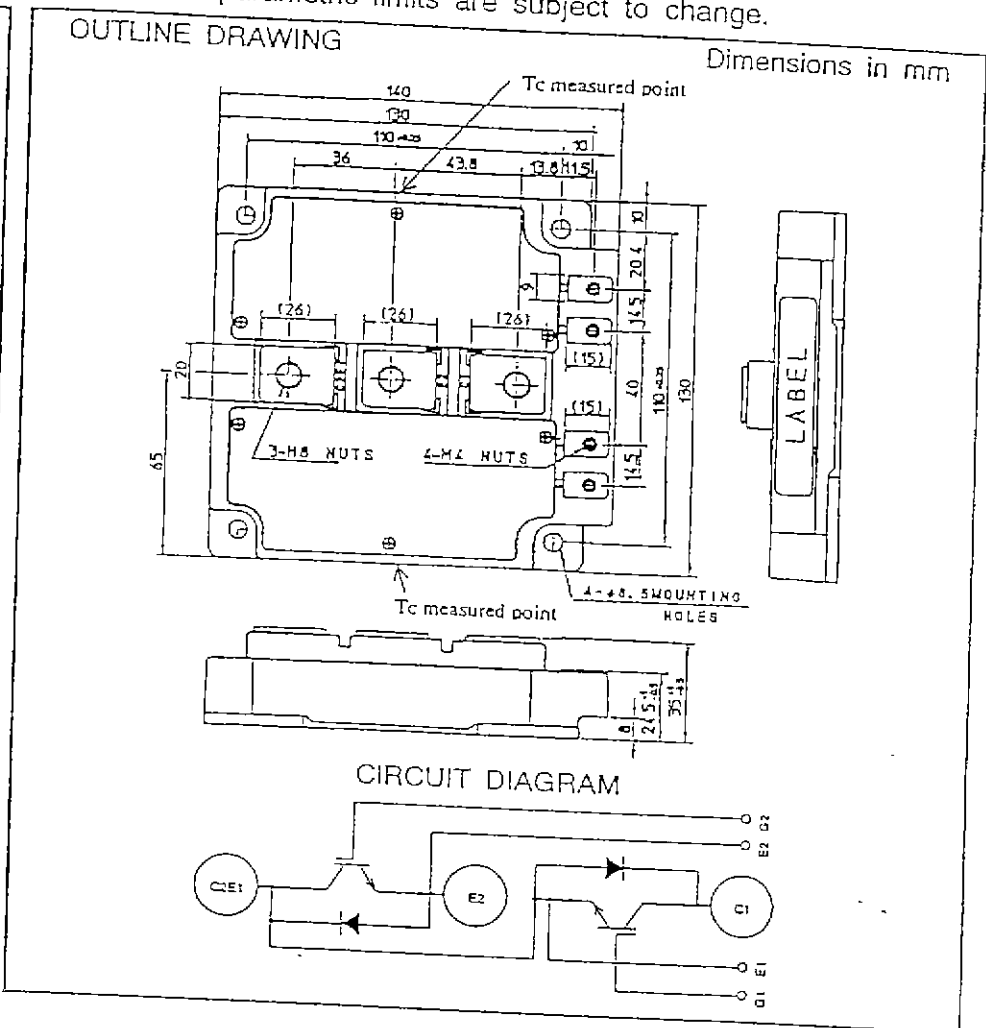
HIGH POWER SWITCHING USE

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

CM400DU-24F

- $I_{C_{max}}$ 400A
- V_{CES} 1200V
- Insulated Type
- 2-elements in a pack

APPLICATION
General purpose inverters &
Servo controllers, etc



ABSOLUTE MAXIMUM RATINGS ($T_j = 25\text{ }^\circ\text{C}$)

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	$T_c = 25\text{ }^\circ\text{C}$	400	A
I_{CM}		Pulse (2)	800	A
I_E (1)	Emitter current	$T_c = 25\text{ }^\circ\text{C}$	400	A
I_{EM} (1)		Pulse (2)	800	A
P_c (3)	Maximum collector dissipation	$T_c = 25\text{ }^\circ\text{C}$	(1600)	W
T_j	Junction temperature		-40~+150	$^\circ\text{C}$
T_{stg}	Storage temperature		-40~+125	$^\circ\text{C}$
Viso	Isolation voltage	Main terminal to base plate, AC 1 min.	2500	V
—	Torque strength	Main Terminal M 8	8.8~10.8	N·m
		Mounting holes M 6	3.5~4.5	N·m
		G(E) Terminal M 4	1.3~1.7	N·m
—	Weight	Typical value	—	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	—	—	2	mA	
V _{GE(th)}	Gate-emitter threshold voltage	I _C =40 mA, V _{CE} = 10V	5	6	7	V	
I _{GES}	Gate leakage current	V _{GE} =V _{CES} , V _{CE} = 0V	—	—	80	μA	
V _{CE(sat)}	Collector to emitter saturation voltage	I _C = 400A V _{GE} = 15V	T _j = 25 °C	—	1.8	2.4	V
			T _j = 125 °C	—	1.9	—	
C _{ies}	Input capacitance	V _{CE} = 10V V _{GE} = 0V	—	—	160	nF	
C _{oes}	Output capacitance		—	—	6.8		
C _{res}	Reverse transfer capacitance		—	—	4		
Q _G	Total gate charge	V _{CC} = 600V, I _C = 400A V _{GE} = 15V	—	4400	—	nC	
t _{d(on)}	Turn-on delay time	V _{CC} = 600V, I _C = 400A V _{GE1} =V _{GE2} =15V R _G =0.78 Ω, Inductive load switching operation I _E = 400 A	—	—	—	ns	
t _r	Turn-on rise time		—	—	—		
t _{d(off)}	Turn-off delay time		—	—	—		
t _f	Turn-off fall time		—	—	300		
t _{rr} ①	Reverse recovery time		—	—	—		ns
Q _{rr} ①	Reverse recovery charge	—	—	—	μC		
V _{EC} ①	Emitter-collector voltage	I _E = 400 A, V _{GE} = 0V	—	—	3.2	V	
R _{th(j-c)Q}	Thermal resistance ¹	IGBT part	—	—	(0.078)	°C/W	
R _{th(j-c)R}		FWDi part	—	—	(0.09)		
R _{th(c-f)}	Contact thermal resistance	Case to fin, Thermal compound applied(1/2 module) ²	—	(0.019)	—		
R _{th(j-c)Q}	Thermal resistance	T _c measured point is just under the chips	—	(0.04) ³	—		

- ① I_E, V_{EC}, t_{rr}, Q_{rr} & die/dt represent characteristics of the anti-parallel, emitter to collector free-wheel diode (FWD).
- ② Pulse width and repetition rate should be such that the device junction temp. (T_j) dose not exceed T_{jmax} rating.
- ③ Junction temperature (T_j) should not increase beyond 150°C.
- ④ Pulse width and repetition rate should be such as to cause negligble temperature rise.

*1:T_c measured point is shown in page "1-2".

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

*3:If you use this value , R_{th(f-a)} should be measured just under the chips.