Tentative

CM300DU-24NFH

Pre.	M.Koura	Rev	D	M. Koura
Apr.	M.Tabata 9-Aug.-'02			M. Tabata 19-Jun.-'03

HIGH POWER SWITCHING USE

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

CM300DU-24NFH

- Ic ····· 300A
- V_{CES} ····· 1200V
- Insulated Type
- 2-elements in a pack

APPLICATION

High frequency switching use (30kHz to 60kHz).
Gradient amplifier,Induction heating,power supply,etc. A

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	Tc= 25 °C	300	A	
I_{CM}		Pulse ②	600		
I_E ①	Emitter current	Tc= 25 °C	300	A	
I_{EM} ①		Pulse ②	600		
Pc ③	Maximum collector dissipation	Tc= 25 °C	1130	W	B
Pc ③	Maximum collector dissipation	Tc' = 25 °C*4	1900	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	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)

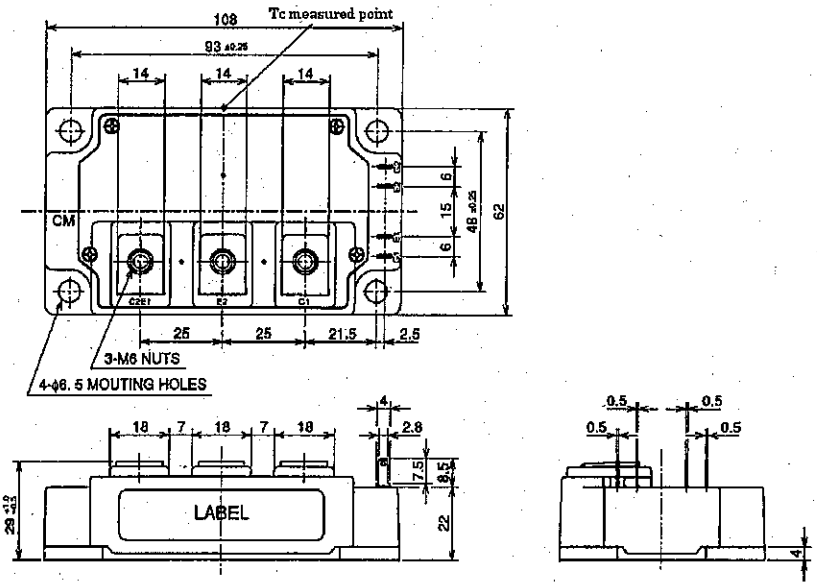
Symbol	Item	Conditions	Min.	Typ.	Max.	Units	
I_{CES}	Collector cutoff current	$V_{CE}=V_{CES}, V_{GE}$= 0V	–	–	1	mA	
$V_{GE(th)}$	Gate-emitter threshold voltage	I_C=30mA, V_{CE}= 10V	4.5	6	7.5	V	D
I_{GES}	Gate leakage current	$V_{GE}=V_{GES}$, V_{CE}= 0V	–	–	1	μA	A
$V_{CE(sat)}$	Collector to emitter saturation voltage ④	T_j= 25 °C, I_C = 300A	–	5	6.5	V	B
		T_j= 125 °C, V_{GE}= 15V	–	5	–		
Cies	Input capacitance	V_{CE}= 10V, V_{GE}= 0V	–	–	47	nF	A
Coes	Output capacitance		–	–	4		A
Cres	Reverse transfer capacitance		–	–	0.9		A
Q_G	Total gate charge	V_{CC}=600V, Ic=300A, V_{GE}=15V	–	1360	–	nC	C
td(on)	Turn-on delay time	V_{CC}=600V, Ic=300A, $V_{GE1}=V_{GE2}$=15V, R_G=1Ω, Inductive load switching operation	–	–	300	ns	B
tr	Turn-on rise time		–	–	80		
td(off)	Turn-off delay time		–	–	500		
tf	Turn-off fall time		–	–	150		
trr ①	Reverse recovery time	I_E=300A	–	–	250		
Qrr ①	Reverse recovery charge		–	13	–	μC	B
V_{EC} ①	Emitter-collector voltage	I_E=300A, V_{GE}= 0V	–	–	3.5	V	B
Rth(j-c)Q	Thermal resistance	IGBT part (1/2 module)	–	–	0.11	°C/W	B
Rth(j-c)R		FWDi part(1/2 module)	–	–	0.18		
Rth(c-f)	Contact thermal resistance	Case to fin, Thermal compound Applied (1/2module) *2	–	0.04	–		
Rth(j-c')Q	Thermal resistance *4	IGBT part (1/2 module)	–	–	0.066*3		
Rth(j-c')R		FWDi part(1/2 module)	–	–	0.1*3		
RG	External gate resistance		1	–	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: If you use this value , Rth(f-a) should be measured just under the chips.
*4: Tc' measured point is 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.
⑤ No short circuit capability is designed. A

OUTLINE DRAWING

Dimensions in mm



CIRCUIT DIAGRAM