

TENTATIVE

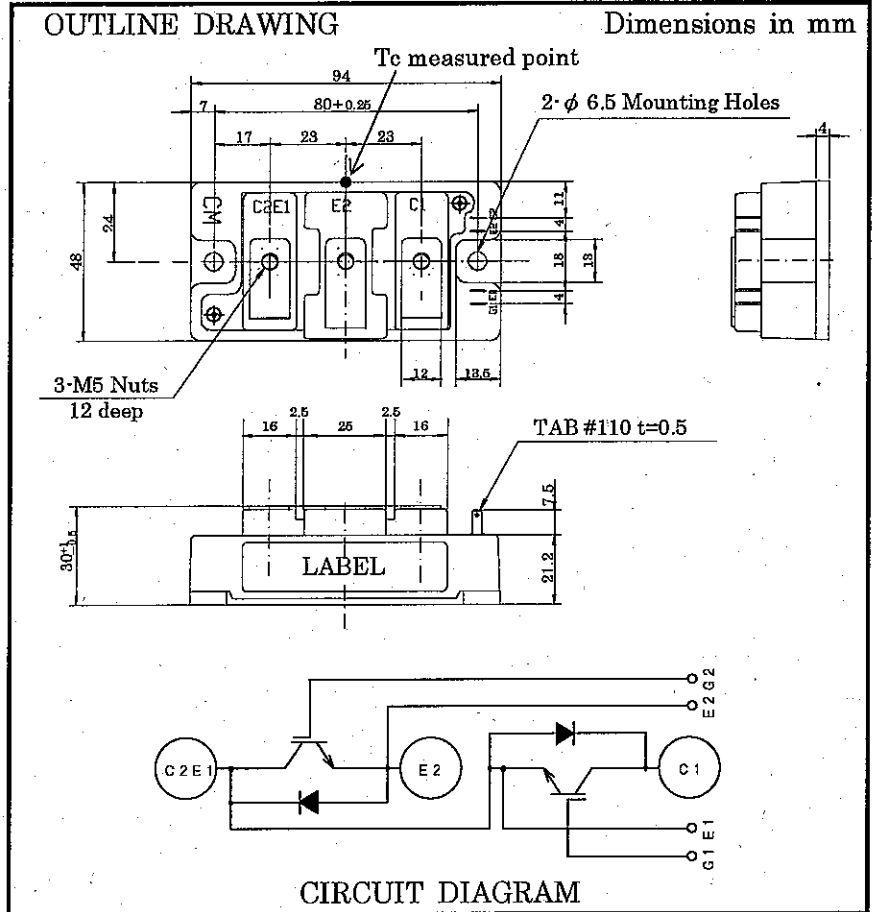
CM200DU-12NFH

Pre.	M.Koura	Rev	B	M. Koura
Apr.	M.Tabata 13-Dec.'02			M. Tabata 11-Jun.'03

HIGH POWER SWITCHING USE

CM200DU-12NFH

- I_c200A
- V_{CES}600V
- Insulated Type
- 2-elements in a pack



APPLICATION

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

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

Symbol	Item	Conditions	Ratings	Unit
V_{CES}	Collector-emitter voltage	G-E Short	600	V
V_{GES}	Gate-emitter voltage	C-E Short	±20	V
I_c	Collector current	$T_c = 25\text{ }^\circ\text{C}$	200	A
I_{CM}		Pulse ②	400	
I_E ①	Emitter current	$T_c = 25\text{ }^\circ\text{C}$	200	A
I_{EM} ①		Pulse ②	400	
P_c ③	Maximum collector dissipation	$T_c = 25\text{ }^\circ\text{C}$	590	W
P_c' ③	Maximum collector dissipation	$T_c = 25\text{ }^\circ\text{C}$	830	
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
—	Mounting torque	Main Terminal M 5	2.5~3.5	N·m
		Mounting M 6	3.5~4.5	N·m
—	Weight	Typical value	310	g

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 HIGH POWER SWITCHING USE
ELECTRICAL CHARACTERISTICS ($T_j = 25\text{ }^\circ\text{C}$)

Symbol	Item	Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cutoff current	$V_{CE}=V_{CES}, V_{GE}=0V$	—	—	1	mA
$V_{GE(th)}$	Gate-emitter threshold voltage	$I_C=20mA, V_{CE}=10V$	5	6	7	V
I_{GES}	Gate leakage current	$V_{GE}=V_{CES}, V_{CE}=0V$	—	—	0.5	μA
$V_{CE(sat)}$	Collector to emitter saturation voltage ④	$T_j = 25\text{ }^\circ\text{C}$ $I_C = 200A$	—	2.0	2.7	V
		$T_j = 125\text{ }^\circ\text{C}$ $V_{GE} = 15V$	—	1.95	—	
C_{ies}	Input capacitance	$V_{CE}=10V$	—	—	55	nF
C_{oes}	Output capacitance	$V_{GE}=0V$	—	—	3.6	
C_{res}	Reverse transfer capacitance		—	—	2.0	
Q_G	Total gate charge	$V_{CC}=300V, I_C=200A$ $V_{GE}=15V$	—	1240	—	nC
$t_{d(on)}$	Turn-on delay time	$V_{CC}=300V, I_C=200A$	—	—	250	ns
t_r	Turn-on rise time	$V_{GE1}=V_{GE2}=15V$	—	—	150	
$t_{d(off)}$	Turn-off delay time	$R_G=6.3\Omega$, Inductive load	—	—	500	
t_f	Turn-off fall time	switching operation	—	—	150	
t_{rr} ①	Reverse recovery time	$I_E=200A$	—	—	150	ns
Q_{rr} ①	Reverse recovery charge		—	3.5	—	μC
V_{EC} ①	Emitter-collector voltage	$I_E=200A, V_{GE}=0V$	—	—	2.6	V
$R_{th(j-c)Q}$	Thermal resistance*1	IGBT part(1/2 module)	—	—	0.21	$^\circ\text{C/W}$
$R_{th(j-c)R}$		FWDi part(1/2 module)	—	—	0.35	
$R_{th(c-f)}$	Contact thermal resistance	Case to fin, Thermal compound applied*2(1/2 module)	—	0.07	—	
$R_{th(j-c)Q}$	Thermal resistance	T_c measured point is just under the chips (1/2module)	—	—	0.15^*3	
R_G	External gate resistance		3.1	—	31	Ω

*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.

- ① $I_E, V_{EC}, t_{rr}, Q_{rr}$ & di/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 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 neglible temperature rise.
- ⑤ No short circuit capability is designed.