APPLICATION NOTE

MITSUBISHI<IGBT MODULE>

TENTATIVE

CM100DUS-12F

HIGH POWER SWITCHING USE

Pre.	N.Honda	Rev	A	S. Uchida
Apr.	M.Tabata 28-Jan-'99			M. Yamamoto May 16 '02

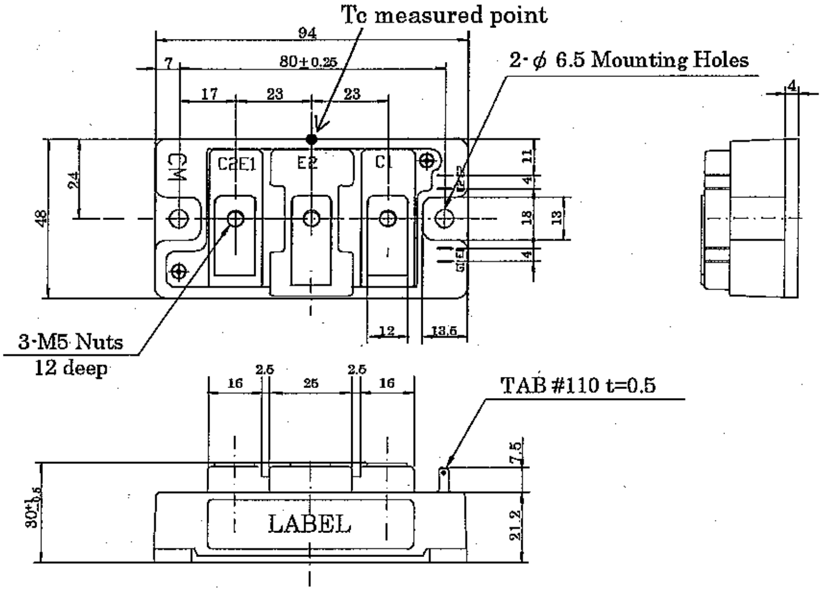
Notice : This is not a final specification. Some parametric limits are subject to change.

CM100DUS-12F

- ●Ic·························100A
- ●V_{CES}······················600V
- ●Insulated Type
- ●2-elements in a pack

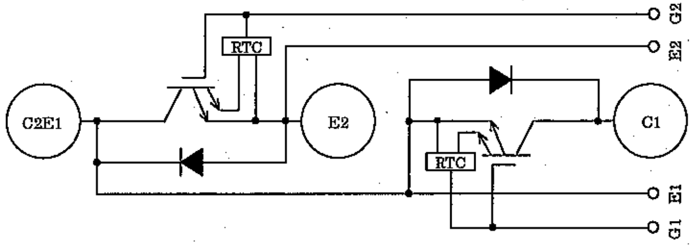
APPLICATION
Welder

OUTLINE DRAWING Dimensions in mm



CIRCUIT DIAGRAM

A



ABSOLUTE MAXIMUM RATINGS (T_j = 25 °C)

Symbol	Item	Conditions	Ratings	Units	
V_{CES}	Collector-emitter voltage	G-E Short	600	V	
V_{GES}	Gate-emitter voltage	C-E Short	±20	V	
I_C	Collector current	Tc= 25 °C	100	A	
I_{CM}		Pulse ②	200		
I_E ①	Emitter current	Tc= 25 °C	100	A	
I_{EM} ①		Pulse ②	200		
Pc ③	Maximum collector dissipation	Tc= 25 °C	350	W	A
Tj	Junction temperature		-40 ~ +150	°C	
Tstg	Storage temperature		-40 ~ +125	°C	
Viso	Isolation voltage	Charged part to base plate , AC 1 min.	2500	V	
-	Torque strength	Main Terminals M 5	2.5 ~ 3.5	N·m	
		Mounting holes M 6	3.5 ~ 4.5	N·m	
-	Weight	Typical value	310	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=10mA,V_{CE}= 10V	5	6	7	V	
I_{GES}	Gate leakage current	V_{GE}=V_{CES} ,V_{CE}= 0V	-	-	20	μA	
$V_{CE(sat)}$	Collector to emitter saturation voltage	T_j= 25 °C, I_C = 100A	1.7	2.0	2.7	V	
		T_j= 125 °C, V_{GE}= 15V	-	1.95	-		
Cies	Input capacitance	V_{CE}= 10V	-	-	27	nF	
Coes	Output capacitance	V_{GE}= 0V	-	-	1.8		
Cres	Reverse transfer capacitance		-	-	1		A
Q_G	Total gate charge	V_{CC}= 300V,Ic= 100A V_{GE}= 15V	-	620	-	nC	
td(on)	Turn-on delay time	V_{CC}=300V,Ic= 100A	-	-	100	ns	
tr	Turn-on rise time	V_{GE1}=V_{GE2}=15V	-	-	80		
td(off)	Turn-off delay time	R_G=6.3Ω,Inductive load	-	-	300		
tf	Turn-off fall time	switching operation	-	-	150		
trr ①	Reverse recovery time	I_E= 100 A	-	-	150	ns	
Qrr ①	Reverse recovery charge		-	1.9	-	μC	
V_{EC} ①	Emitter-collector volatge	I_E= 100 A,V_{GE}= 0V	-	-	2.6	V	
Rth(j-c)Q	Thermal resistance[*1]	IGBT part(1/2 module)	-	-	0.35	°C/W	A
Rth(j-c)R		FWDi part(1/2 module)	-	-	0.70		A
Rth(c-f)	Contact thermal resistance	Case to fin,Thermal compound applied[*2](1/2 module)	-	0.07	-		A
Rth(j-c')Q	Thermal resistance	Tc measured point is just under the chips	-	0.23[*3]	-		A

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.

*1:Tc 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 , Rth(f-a) should be measured just under the chips.