Tentative

CM100RL-12NF

Pre.	M.Koura	Rev	B	H.Harada, M.Koura
Apr.	T.Furuie 27-Nov.-'03			T.Furuie 20-May-'04

HIGH POWER SWITCHING USE

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

CM100RL-12NF
- ●Ic·····100A
- ●V_{CES}····· 600V
- ●Insulated Type
- ●7-elements in a pack

APPLICATION
AC drive inverters & Servo controls,etc

ABSOLUTE MAXIMUM RATINGS (T_j = 25 °C)

Inverter part

Symbol	Item	Conditions	Ratings	Units
V_{CES}	Collector-emitter voltage	G-E Short	600	V
V_{GES}	Gate-emitter voltage	C-E Short	±20	
I_C	Collector current	DC, Tc=99°C *1	100	A
I_{CM}		Pulse ②	200	
I_E ①	Emitter current		100	
I_{EM} ①		Pulse ②	200	
Pc ③	Maximum collector dissipation	Tc= 25 °C	540	W

Brake part

Symbol	Item	Conditions	Ratings	Units
V_{CES}	Collector-emitter voltage	G-E Short	600	V
V_{GES}	Gate-emitter voltage	C-E Short	±20	
I_C	Collector current	DC, Tc=107°C *1	50	A
I_{CM}		Pulse ②	100	
Pc ③	Maximum collector dissipation	Tc= 25 °C	320	W
V_{RRM}	Repetitive peak reverse voltage	Clamp diode part	600	V
I_{FM}	Forward current	Clamp diode part	50	A

(Common rating)

Symbol	Item	Conditions	Ratings	Units
Tj	Junction temperature		−40~+150	°C
Tstg	Storage temperature		−40~+125	
Viso	Isolation voltage	Main terminal to base plate,AC 1 min.	2500	V
—	Torque strength	Main terminal M5	2.5~3.5	N·m
—	Torque strength	Mounting holes M5	2.5~3.5	
—	Weight	Typical value	350	g

ELECTRICAL CHARACTERISTICS (T_j = 25 °C)

Inverter part

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	6	7	8	V	B
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 = 100A	—	1.7	2.2	V	
		T_j= 125 °C, V_{GE}= 15V	—	1.7	—		
Cies	Input capacitance	V_{CE}= 10V, V_{GE}= 0V	—	—	15	nF	
Coes	Output capacitance		—	—	1.9		
Cres	Reverse transfer capacitance		—	—	0.6		
Q_G	Total gate charge	V_{CC}=300V, I_C=100A, V_{GE}=15V	—	400	—	nC	
td(on)	Turn-on delay time	V_{CC}=300V, I_C=100A, $V_{GE1}=V_{GE2}$=15V, R_G=6.3Ω, Inductive load switching operation, I_E=100A	—	—	120	ns	A
tr	Turn-on rise time		—	—	100		
td(off)	Turn-off delay time		—	—	300		
tf	Turn-off fall time		—	—	300		
trr ①	Reverse recovery time		—	—	120		
Qrr ①	Reverse recovery charge		—	2.1	—	μC	A
V_{EC} ①	Emitter-collector voltage	I_E=100A, V_{GE}= 0V	—	—	2.8	V	B
Rth(j-c)Q	Thermal resistance	IGBT part (1/6 module) *1	—	—	0.23	°C/W	
Rth(j-c)R	Thermal resistance	FWDi part (1/6 module) *1			0.41		
Rth(c-f)	Contact thermal resistance	Case to fin, Thermal compound Applied (1/6module) *2	—	0.085	—		B
R_G	External gate resistance		6.3	—	63	Ω	

Brake Part

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=5.0mA		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 = 50A	—	1.7	2.2	V
		$T_j=$ 125 °C	$V_{GE}=$ 15V	—	1.7	—	
Cies	Input capacitance	$V_{CE}=$ 10V, $V_{GE}=$ 0V		—	—	7.5	nF
Coes	Output capacitance			—	—	1.0	
Cres	Reverse transfer capacitance			—	—	0.3	
Q_G	Total gate charge	V_{CC}=300V, Ic=50A, V_{GE}=15V		—	200	—	nC
V_{FM}	Forward voltage drop	I_F=50A				2.6	V
Rth(j-c)Q	Thermal resistance	IGBT part *1		—	—	0.39	°C/W
Rth(j-c)R		Clamp diode part*1		—	—	0.70	

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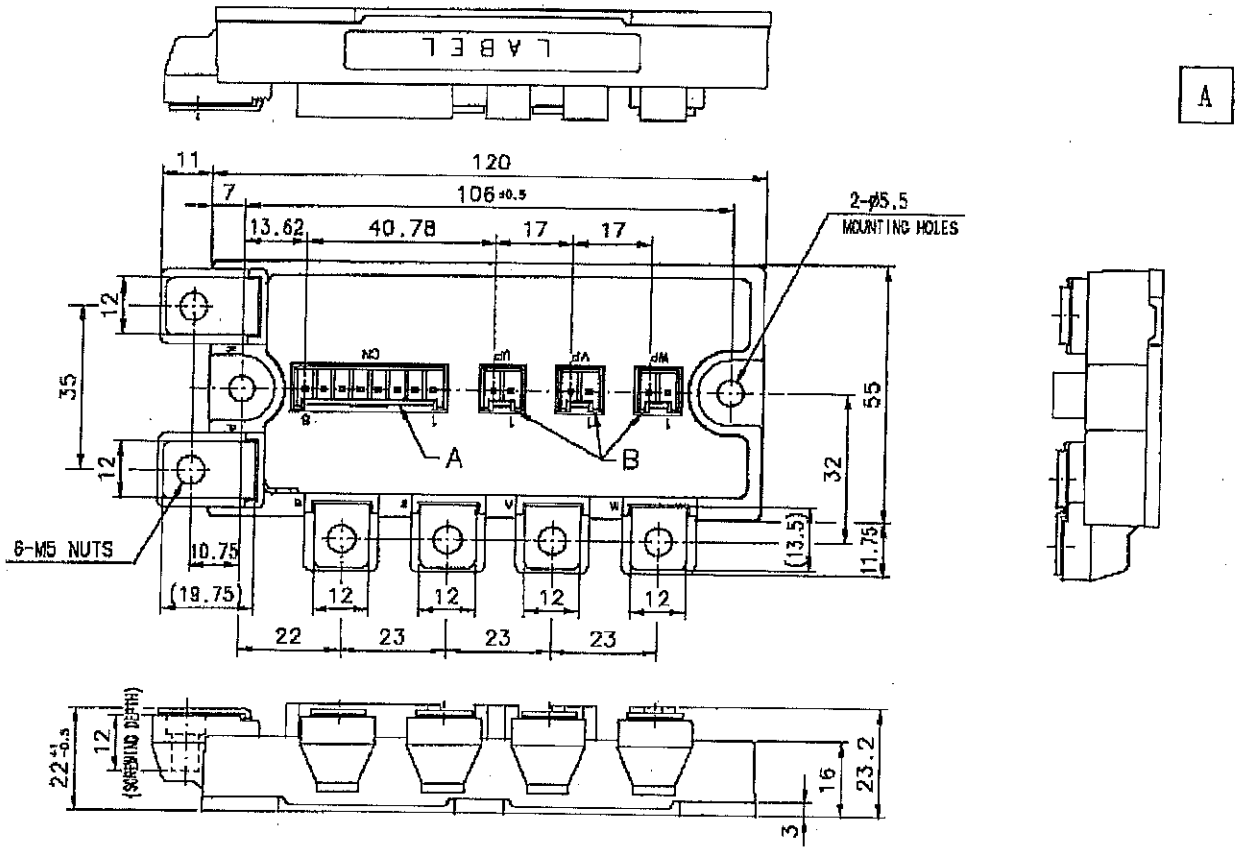
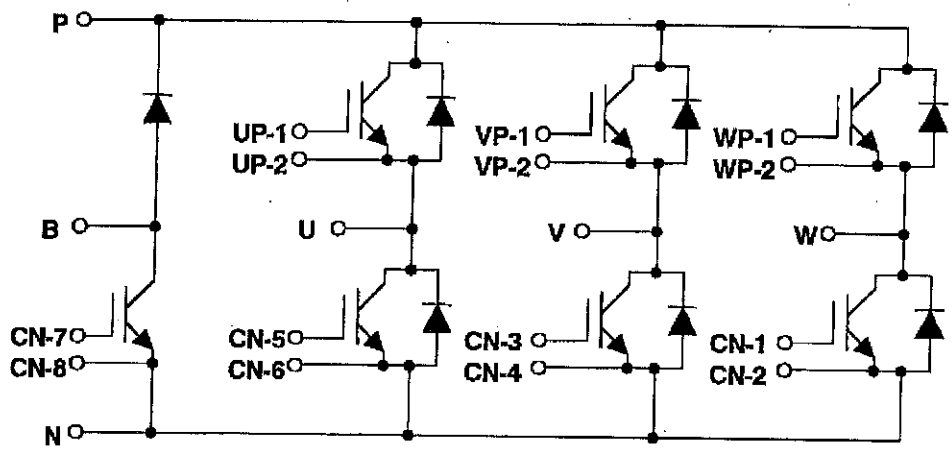
*1: Tc measured point is just under the chips.
If you use this value , Rth(f-a) should be measured just under the chips.
*2: Typical value is measured by using Shin-etsu Silicone "G-746".
① I_E,V_{EC},trr,Qrr represent characteristics of the anti-parallel,emitter to collector free-wheel diode (FWDi).
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



CHIP LAYOUT DRAWING

Dimensions in mm

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