

Travelling Merchant: _____

DATASHEET

Standard: CM66H-M122-19.6608MHz

P/N: _____

Plot			The Label
Drew	Audited	Approved	Stamp, please! Thanks!
Date: 2012.08.06			

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1. Electrical Parameters

	PARAMETERS						NOTES
	Type	Auto Position Lock					
Internal Receiver Characteristics	Number Of Channels	50					
	Frequency Band	L1 (1575.42 MHz)					
	Tracking Code	C/A Code					
	Tracking Capability	12 Satellites					
	Sensitivity	Tracking & Navigation	-160dBm				
		Reacquisition	-160dBm				
		Cold Start (Autonomous)	-144dBm				
	Antenna INPUT	SMA-KE				CN1	
State Input	Parameters	Min.	Typ.	Max.	Unit.		
	Lock	2.7			Vdc	<5mA Load	
	Holdover			0.4	Vdc	<5mA Load	
	Connector	Pin 8					
PP1S/PP2S Output	Parameters	Min.	Typ.	Max.	Unit.	Test Condition	
	Waveform	HCMOS					
	High-Level Output Voltage (V _{IH})	2.7			Vdc		
	Low-Level Output Voltage (V _{IL})			0.4	Vdc		
	Pulse Width		100			ms	For 1st requirement
			50.86			ns	For 2nd requirement
	Phase	For the 1st requirement. See Appendix 1 for more details.					
		For the 2st requirement. See Appendix 2 for more details.					
Connector	Pin 12						
State Output	Parameters	Min.	Typ.	Max.	Unit.		
	Lock	2.7			Vdc	<5mA Load	
	Holdover			0.4	Vdc	<5mA Load	
	Connector	Pin 5					
RF Output1	Parameters	Min.	Typ.	Max.	Unit.	Test Condition	
	Nominal Frequency		19.6608		MHz		



	Waveform	HCMOS				
	High-level Output voltage (V_{OH})	2.7			Vdc	< -0.5mA Load
	Low-level Output voltage (V_{OL})			0.4	Vdc	< 0.5mA Load
	Rise/Fall Time			6	nSec	Load 15pF
	Duty Cycle	45	50	55	%	Load 15pF
	Accuracy	-1		1	$\times 10^{-12}$	24 hour average when locked to GPS
	Short-term stability			0.02	$\times 10^{-9}$	Temperature stability,no EMI\EMC or other interference,test after power for 1 hour ref. to 25°C; 1s, using PN9000 equipment.
	Aging Tolerance Per Day	-0.2		+0.2	$\times 10^{-9}$	Vcc,TA constant measurement referenced to frequency observed with TA=25°C,Vcc=5.0V, in FREE RUN condition and after 30 days of operation.
	Aging Tolerance 1 Year	-0.01		+0.01	$\times 10^{-6}$	
	Phase Noise (All conditions)		-85	-80	dBc/Hz	10Hz
			-115	-110		100Hz
			-138	-133		1KHz
			-150	-145		10KHz
			-155	-150		100KHz
			-155	-150		1MHz
	Connector	Pin2				
RF Output2	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Nominal Frequency	61.44			MHz	
	Waveform	Sine wave				
	Level	6		10	dBm	
	Load	50			Ω	
	Harmonics Suppression			-30	dBc	
	Spurious Suppression			-60	dBc	
	Accuracy	-1		+1	$\times 10^{-12}$	24 hours average when locked to 1 PPS
	Short-term Stability			0.02	$\times 10^{-9}$	Temperature stability, no EMI\EMC or other interference, test after power for 1 hour ref. to 25°C; 1s, using PN9000 equipment.



	Aging Tolerance Per Day	-0.2		+0.2	$\times 10^{-9}$	V _{cc} , T _A constant measurement referenced to frequency observed with T _A =25°C, V _{cc} =5.0V, in FREE RUN condition and after 30 days of operation.	
	Aging Tolerance 1 Year	-0.01		+0.01	$\times 10^{-6}$		
	Phase Noise (All conditions)			-70	-65	dBc/Hz	10Hz
				-103	-100		100Hz
				-133	-128		1KHz
				-143	-140		10KHz
				-152	-150		100KHz
		-155	-150	1MHz			
Connector	Pin 14						
Holdover Capability	Holdover Time	Min.	Typ.	Max.	Unit.		
	24 hours			3	uSec	$\Delta T = \pm 2^\circ C$, 24 hours holdover after turn on 7days and GPS lock 3days	
Supply Voltage	Parameters	Min.	Typ.	Max.	Unit.		
	Supply voltage	4.75	5.0	5.25	Vdc		
	Current consumption			2000	mA	During Warm-up	
				1000	mA	During steady state operation @25°C	
	AC ripple			50	mVpk-pk	10Hz to 1MHz	
Connector	Pin 3						
Serial Interfaces	Parameters	Min.	Typ.	Max.	Unit.		
	Rx high-level input voltage (VH)	2.7			Vdc		
	Rx low-level input voltage (VL)			0.4	Vdc		
	Tx high-level output voltage (VH)	2.7			Vdc		
	Tx low-level output voltage (VL)			0.4	Vdc		
	Serial protocol	9600-N-8-1					
	Connector	Pin6 and Pin7					
Environmental Conditions	Parameter	Conditions					
	Operating temperature	-10°C to +70°C					
	Storage Temperature	-55°C to +105°C					
	Storage humidity	30%~80%					
	ESD Level	Human Body Model,class2: 2000V to 4000V; ANSI/ESDA/JEDEC JS-001-2010.					
Machine Model, class B: 200V to 400V; ANSI/ESDA/JEDEC JS-001-2010.							

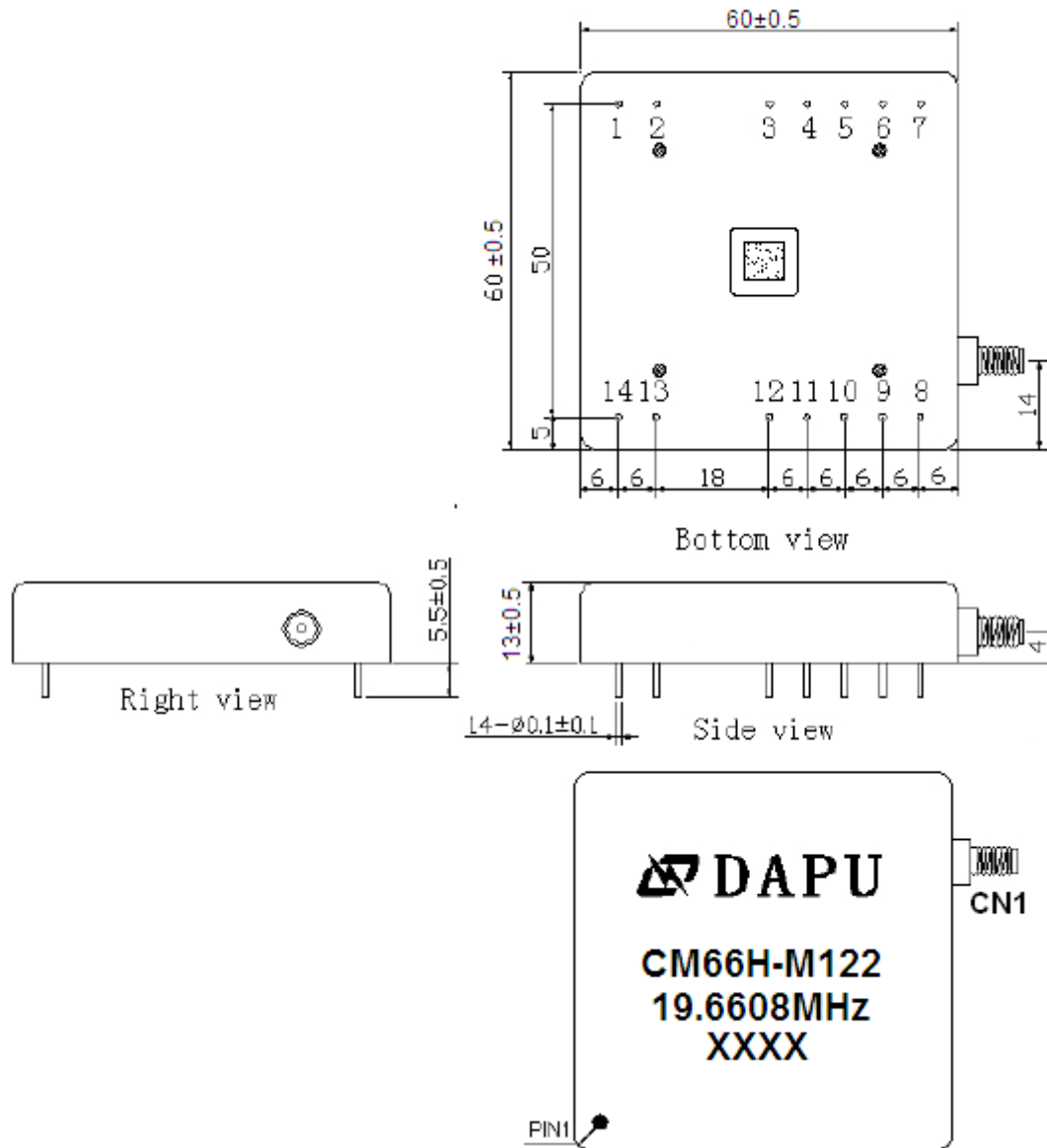


	Moisture Sensitivity Level	Not humidity sensitive.
	Vibration	Test Condition: 0.75mm ;acceleration:10g;10Hz~500Hz, one cycle per 30 min, test 2 hours. (3 times for each 3 directions X ,Y , Z), IEC 68-2-06 Test Fc.
	Shock	50g; 11ms; half sine wave (3 times for each 3 directions X ,Y, Z),IEC 68-2-27 Test Ea/Severity 50A.

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2. Mechanical Structure(mm)



Note1: Tolerance ± 0.2 mm without mark

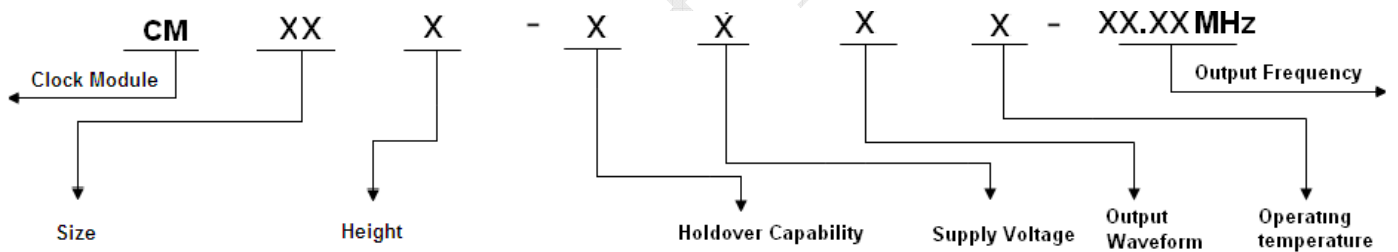
Note2: The first two xx representative: week
After two xx representative: year

Note3: The bottom view means that the stitches are against the people



PIN DEFINITION		
PIN	NAME	DESCRIPTION
1	GPS_BCKP	GPS receiver backup battery supply, 1.4V to 3.6V.if not use, please connect to GND.
2	19.6608MHz OUTPUT	19.6608MHz frequency output
3	VCC	Power supply input, 4.75V to 5.25V
5	State OUTPUT	State output. Output high level when the CM is locked and stable, others low level.
6	RX INPUT	Asynchronous serial data input. 9600-N-8-1
7	TX OUTPUT	Asynchronous serial data output. 9600-N-8-1
8	State INPUT	H: Lock The work state is set to normal operation when the state input is high
		L: Holdover The work state is set to hold over when the state input is low
10	GPS 1PPS OUTPUT	1PPS from the internal GPS receiver
12	PP2S OUTPUT	Synchronous with 19.6608MHz falling edge in even second of 1pps.For the 1st requirement
	PP1S OUTPUT	The clock module PP1S and GPS time information output. For the 2nd requirement
14	61.44MHz OUTPUT	61.44MHz frequency output
4、9、11、13	GND	GND

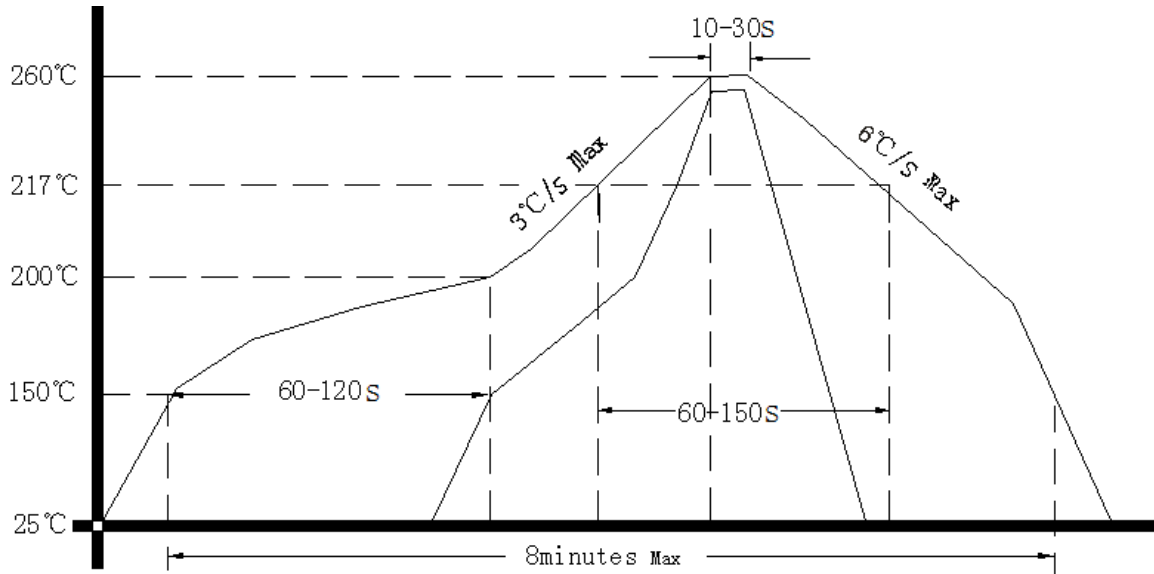
3. Coding Rules



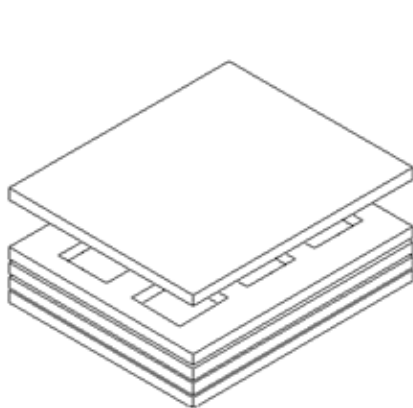
Size	Height	Holdover Capability	Supply Voltage	Output Waveform	Operating temperature
55 50×50 (mm)	A 19mm, single Freq, external GPS receiver	A ±1.5µs 0°C~60°C 24hours	1 5.0V	1 Sine Wave 2 HCMOS	1 0°C~80°C 2 -10°C~70°C 9 -20°C~75°C
66 60×60 (mm)	B 19mm, single Freq, internal GPS receiver	B ±3.0µs 0°C~60°C 24hours			
65 65×65 (mm)	C 19mm, single Freq, internal dual-mode receiver	C ±8.0µs 0°C~60°C 24hours			
	F 13mm, single Freq, external GPS receiver	D ±1.5µs ΔT=±5°C 24hours			
	G 13mm, single Freq, internal GPS receiver	E ±3.0µs ΔT=±5°C 24hours			
	H 13mm, dual-Freqs, internal GPS receiver	F ±8.0µs ΔT=±5°C 24hours			
	K 13mm, single Freq, internal dual-mode receiver	G ±1.5µs ΔT=±5°C 8hours			
	L 13mm, dual-Freqs, internal dual-mode receiver	H ±3.0µs ΔT=±5°C 8hours			
		I ±8.0µs ΔT=±5°C 8hours			
		K ±1.5µs ΔT=±2°C 24hours			
		M ±3.0µs ΔT=±2°C 24hours			
		N ±8.0µs ΔT=±2°C 24hours			
		O ±1.5µs ΔT=±2°C 8hours			
		P ±3.0µs ΔT=±2°C 8hours			
		Q ±8.0µs ΔT=±2°C 8hours			



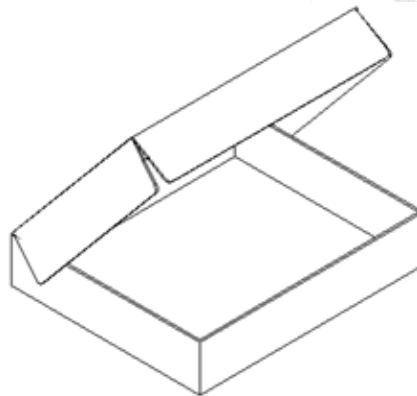
4. Reflow Soldering Curve (RoHS)



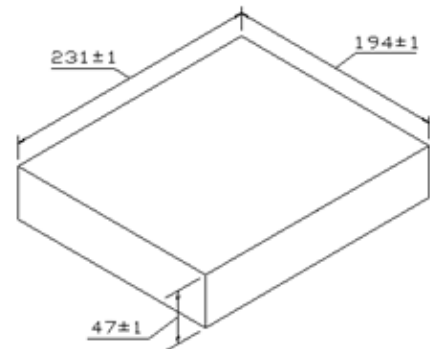
5. Package (mm)



Buffer material

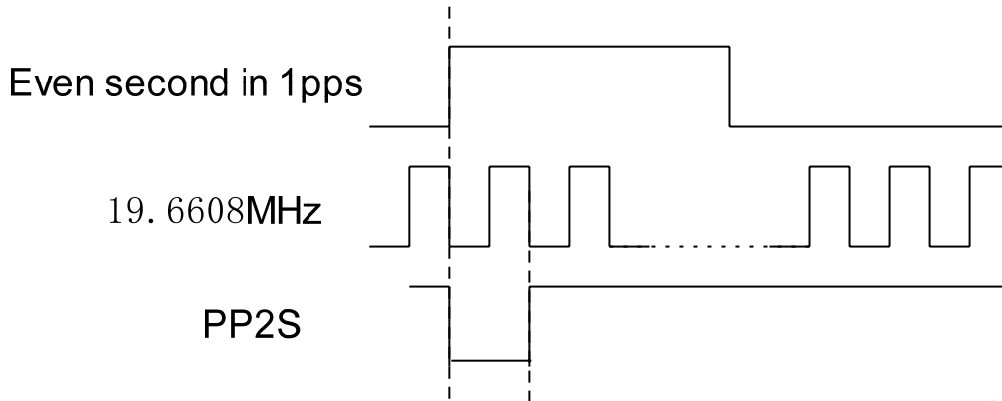


Cardboard
Max 6pcs. circulator

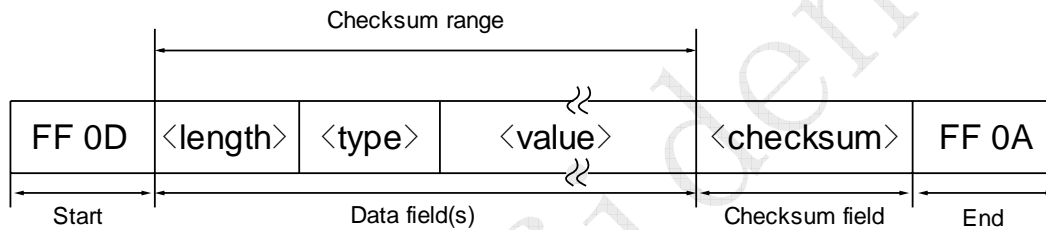




Appendix 1: PP2S Synchronization



The Protocol Frame



Description: GPS clock communication protocol

Field Number:22

Example:

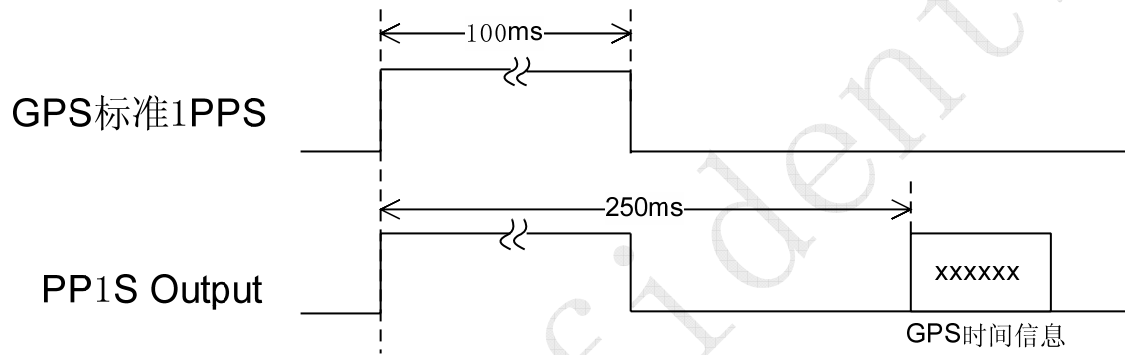
FF 0D 00 13 2A 05 07 DB 06 01 0B 22 34 07 DB 06 01 03 23 07 00 00 00 01 07 FF 0A

Byte No.	Example	Name	Description
00-01#	FF 0D	Start Header	This is the start header of the message
02-03#	00 13	Length	The length of Data field except the <length> field
04#	2A	Type	-
05#	05	Subtype	-
06-07#	07 DB	LYear	Local Time
08#	06	LMonth	
09#	01	LDay	
10#	0B	LHour	
11#	22	LMinute	
12#	34	LSecond	
13-14#	07 DB	GYear	GPS Time
15#	06	GMonth	
16#	01	GDay	
17#	03	GHour	
18#	23	GMinute	
19#	07	GSecond	

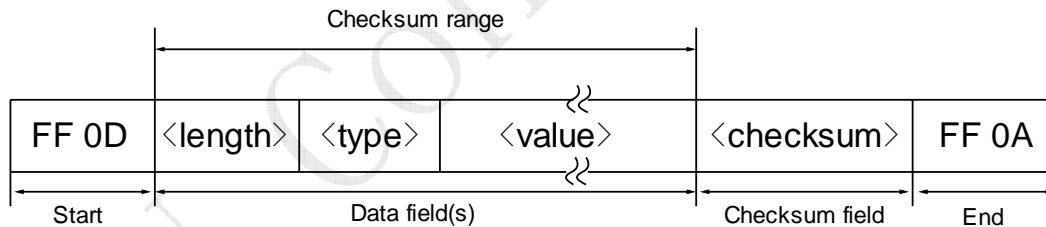


20#	00	OXState	Local oscillator state. 0: work 1: not work
21#	00	OutputState	The main output signal state. 0: normal 1: abnormal
22#	00	GPSState	GPS State. 0: work 1: not work
23#	01	LockState	The lock state of output signal. 0: lock 1: not lock
24#	07	CheckSum	The checksum is the exclusive OR of all characters in Data field
25-26#	FF 0A	End	-

Appendix 2: PP1S Output and GPS Time Information Format



The GPS Time Information Frame



Description: The GPS Time Information protocol

Field Number: 16

Example:

FF 0D 00 09 2A 06 14 CB DE 28 06 A3 00 A9 FF 0A

Byte No.	Example	Name	Description
00-01#	FF 0D	Start Header	This is the start header of the message
02-03#	00 09	Length	The length of Data field except the <length> field
04#	2A	Type	-
05#	06	Subtype	-
06#	14	S1	GPS Millisecond time of Week, unit:ms. S=0x14CBDE28.
07#	CB	S2	
08#	DE	S3	



09#	28	S4	
10#	06	W1	GPS week.
11#	A3	W2	W=0x06A3.
12#	00	GPSTimeValid	GPS Time Valid. 0:ready 1:not ready
13#	A9	CheckSum	The checksum is the exclusive OR of all characters in Data field
14-15#	FF 0A	End	-

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