

Customer Code:

DATASHEET

DAPU P/N: CM22B-L328-10.00MHz

Customer P/N: _____

DAPU			Customer Approval
Drew	Audited	Approved	Stamp, please! Thanks!
Date: 2019.08.15			

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Table of Amendment

Version	Revision contents	Prepared by	Revised date
1.0	The first issued	<i>Amway</i>	2019.07.28
1.1	The “Pin Definition” changed	<i>Amway</i>	2019.08.15

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1. General Description

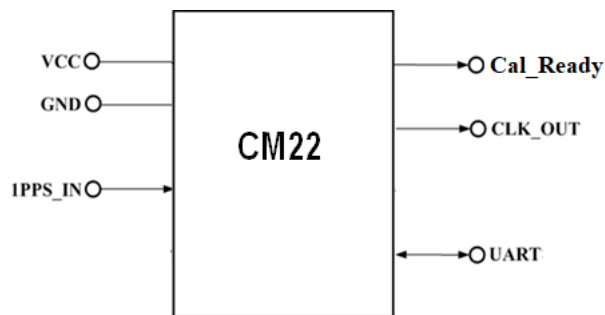


Figure 1 CM22

Figure 1 is the basic diagram of CM22. CM22 is a high-performance clock module designed to provide precise frequency and can be calibrated automatically via a high level reference 1PPS input.

Key features:

- **Reference:** 1PPS from GNSS receiver, IEEE1588 etc. to calibrate the 10M CLK_OUT accuracy;
- **Temperature Stability:** ± 0.3 ppb;
- **Frequency accuracy:** $5E-8$, power on 5 minutes;
- **Clocks Input and Output:** 1*1PPS input and 1*10MHz output;
- **Calibration Ready Output:** Output high when calibration completed;
- **Serial Interface:** 1*UART for management;
- **Mechanical Size:** 20.2mm*20.2mm*13mm.



2. Pin Definition

Table 1 Pin Definition

Pin group	Pin#	Pin Name	Type	Description
Supply Voltage	3	GND	GND	Ground
	2	VCC	PWR	Power Supply
Status Pin	1	Cal_Ready	O	Calibration completed
UART	5	RXD	I	Asynchronous Serial Data Output/Input
	6	TXD	O	
Input Clock	4	1PPS_IN	I	1PPS Reference Input.
Output Clocks	7	NC	O	NC
	8	CLK_OUT	O	10.00MHz Output

3. Electrical Parameters

Table 2 Electrical Parameters

Parameter	Symbol	Minimum	Typical	Maximum	Units
LVC MOS Input					
High Level Input Voltage	V_{IH}	2.4			V
Low Level Input Voltage	V_{IL}			0.4	V
LVC MOS Output					
High Level Output Voltage	V_{OH}	2.4			V
Low Level Output Voltage	V_{OL}			0.4	V



4. Performance

Table 3 Performance

Item	Parameter	Minimum	Typical	Maximum	Units	Test Condition
Clock Output	Nominal Frequency	10.00			MHz	Synchronizing with 1PPS reference.
	Duty Cycle	45	50	55	%	Load 15pF
	Frequency vs. Temperature	-0.3		+0.3	$\times 10^{-9}$	$V_{cc}=3.3V$; $O_{load}=15pF$; T_A varies from $-40^{\circ}C$ to $85^{\circ}C$, temperature slope less than $2^{\circ}C$ per minute.
	Accuracy	-1		+1	$\times 10^{-8}$	Power on 1 hour after calibrated
		-5		+5	$\times 10^{-8}$	power on 5 minutes after power off in the first year
		-8		+8	$\times 10^{-8}$	power on 5 minutes after power off in the second year
	Short-term Stability	-0.01		+0.01	$\times 10^{-9}$	$V_{cc}=3.3V$; $T_A=25^{\circ}C$; 1s; using PN9000; no EMI\EMC or other interference.
	Daily Aging	-0.5		+0.5	$\times 10^{-9}$	$V_{cc}=3.3V$; $T_A=25^{\circ}C$.
	Yearly Aging	-0.03		+0.03	$\times 10^{-6}$	
	Phase Noise			-110	-100	dBc/Hz
			-143	-138	100Hz	
			-155	-150	1KHz	
			-155	-150	10KHz	
			-155	-150	100KHz	
			-160	-155	1MHz	
Supply Voltage	Supply Voltage	3.135	3.3	3.465	V	
	Warm Up Current			750	mA	
	Steady Current			350	mA	@ $25^{\circ}C$
	AC Ripple			50	mVpk-pk	10Hz to 1MHz



5. UART

UART interface is used for management, which has a fixed baud rate (115200) using 1 stop bit and no parity. It is a LVTTTL-compatible port and needs an external translator to work with other signal types (such as RS-232C or RS-485).

6. Status Pin

This clock module can be calibrated via a high level reference 1PPS input from GNSS receiver, IEEE1588 etc.The status pin will output high once calibration is completed and the frequency reappear accuracy is in 5E-8 after power on 5 minutes, and up to 1E-8 after power on 1 hour.

7. Environmental Conditions

Table 5 Environmental Conditions

Parameter	Conditions	
Operating Temperature	-40°C to 85°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 hour. (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.	
Relative Humidity	20% ~70%	Full Package Storage
Temperature	-10°C ~35°C	



8. Typical Application

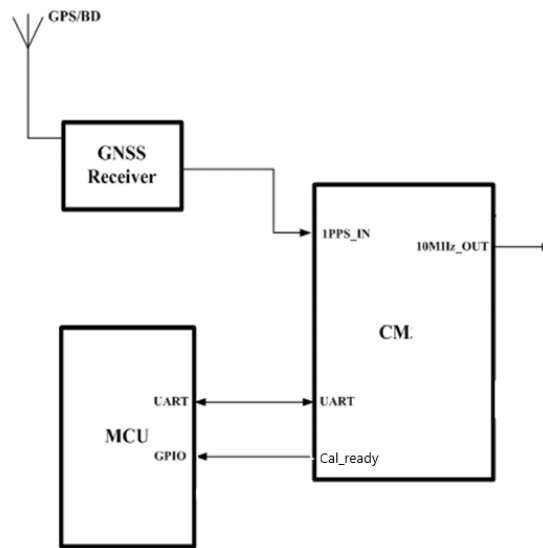


Figure 2Typical application

GNSS Receiver offers 1PPS signal to CM22.
The MCU monitors the work state of CM22.

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9. Mechanical Structure (mm)

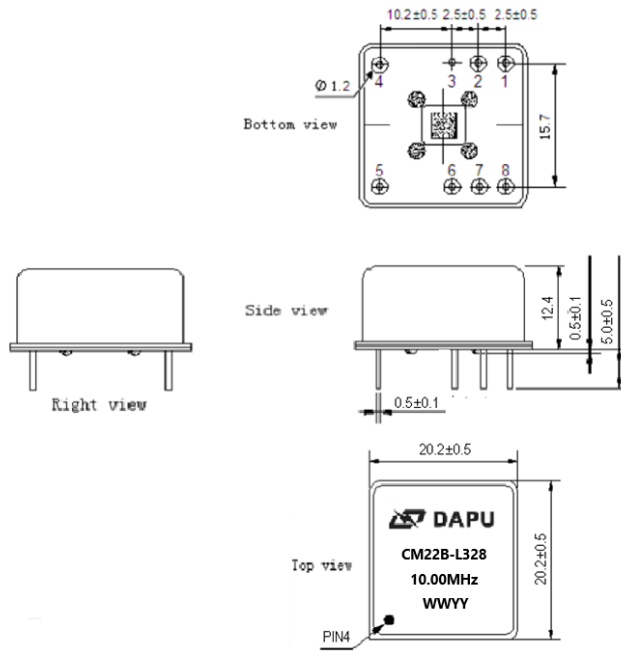


Figure 3 Mechanical structure

Note1: Tolerance $\pm 0.3\text{mm}$ without mark.

Note2: WW represents Week.

YY represents Year.

10. Wave Soldering Curve (RoHS)

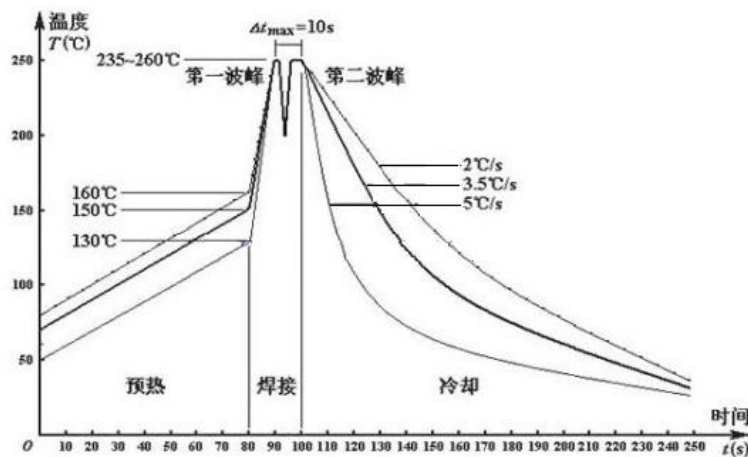


Figure 4 Wave soldering curve



11. Package (mm)

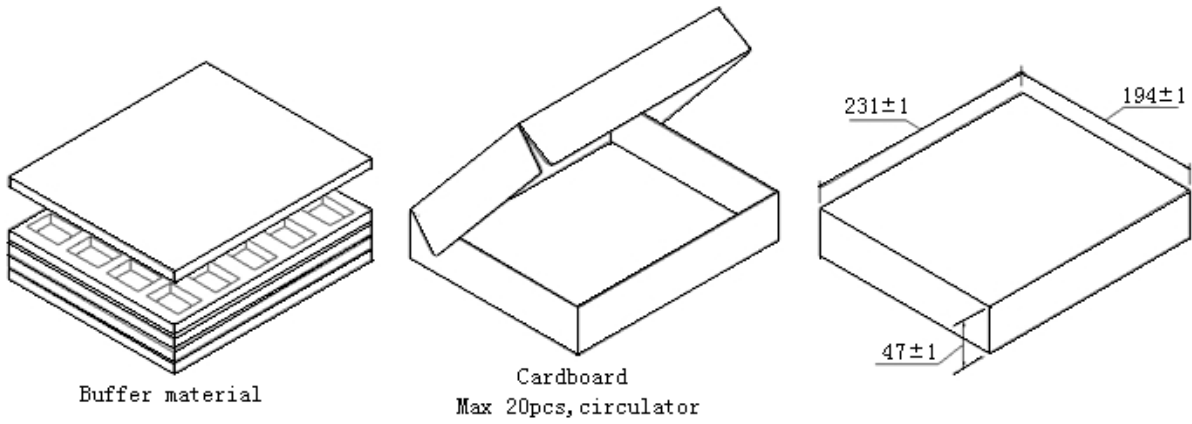


Figure 5 Package

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