Customer Code :

DATASHEET

DAPU P/N: **CM22B-L328-10.00MHz**

Customer P/N: _____

DAPU			Customer Approval
Drew	Audited	Approved	
Amway.wei	Carry.Wang	James.Liu	
Date：2019.07.28			Stamp, please! Thanks!

Guangdong Dapu Telecom TechnologyCo.,Ltd

Bldg16,.N.Ind.Zone,SSL Industry Park,DongguanCity, Guangdong Province, China

TEL：0086-0769-88010888 FAX：0086-0769-81800098

Bldg16,.N.Ind.Zone,SSL Industry Park,
Dongguan City, Guangdong Province,
PRC China
TEL:0086-0769-88010888
FAX:0086-0769-81800098

Table of Amendment

Version	Revision contents	Prepared by	Revised date
1.0	The first issued	Amway	2019.07.28

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PRC China
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1. General Description

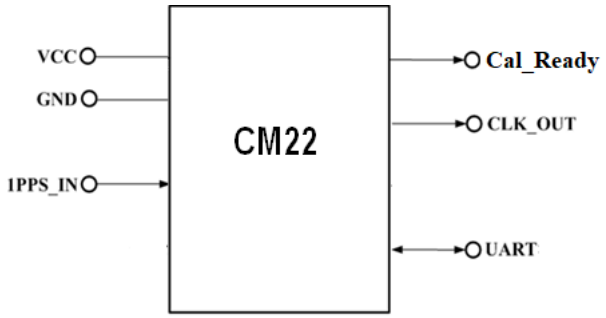

Figure 1 CM22

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:** ±0.3ppb;
- **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.

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2. Pin Definition

Table 1 Pin Definition

Pin group	Pin#	Pin Name	Type	Description
Supply Voltage	2	GND	GND	Ground
	3	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
LVCMOSInput					
High Level Input Voltage	V_{IH}	2.4			V
Low Level Input Voltage	V_{IL}			0.4	V
LVCMOSOutput					
High Level Output Voltage	V_{OH}	2.4			V
Low Level Output Voltage	V_{OL}			0.4	V

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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	$\times10^{-9}$	Vcc=3.3V; O_{load}=15pF;$T_A$varies from-40℃ to 85℃, temperature slope less than 2℃ per minute.
	Accuracy	-1		+1	$\times10^{-8}$	Power on 1 hourafter calibrated
		-5		+5	$\times10^{-8}$	power on 5 minutes after power off in the first year
		-8		+8	$\times10^{-8}$	power on 5 minutes after power off in the second year
	Short-term Stability	-0.01		+0.01	$\times10^{-9}$	Vcc=3.3V;T_A=25℃; 1s; using PN9000; no EMI\EMC or other interference.
	Daily Aging	-0.5		+0.5	$\times10^{-9}$	Vcc=3.3V;T_A=25℃.
	Yearly Aging	-0.03		+0.03	$\times10^{-6}$	
	Phase Noise		-110	-100	dBc/Hz	10Hz
			-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℃
	AC Ripple			50	mVpk-pk	10Hz to 1MHz

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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 LVTTL-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℃ to 85℃	
Storage Temperature	-55℃ to 105℃	
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℃~35℃	

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8. Typical Application

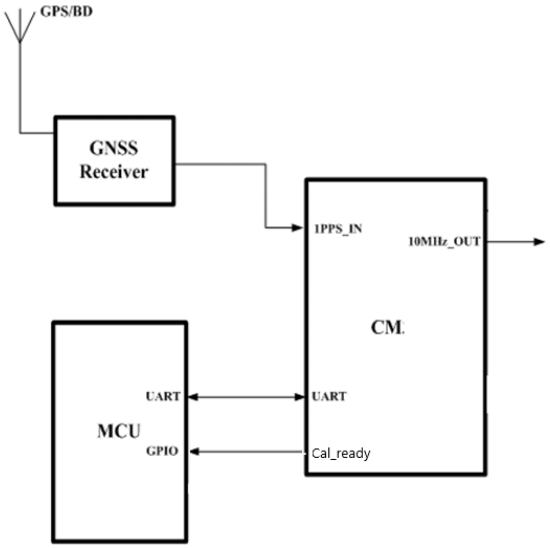

Figure 2Typical application

GNSS Receiveroffers 1PPS signal to CM22.

The MCU monitors the work state of CM22.

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9. Mechanical Structure (mm)

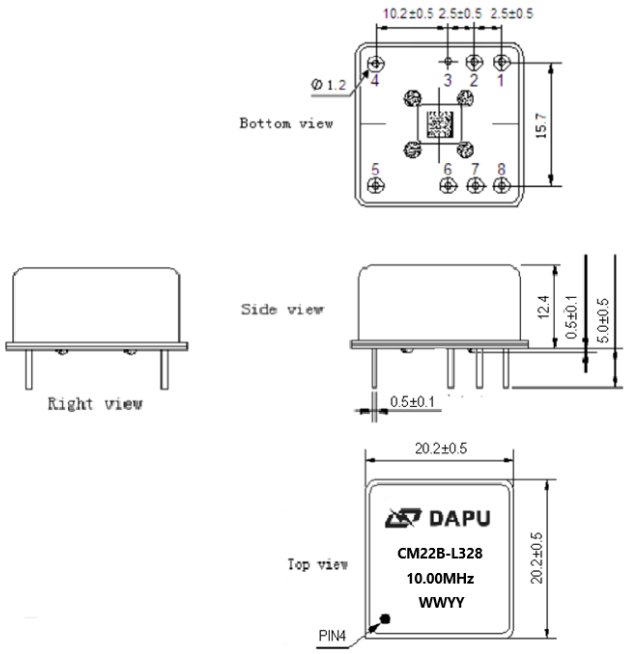

Figure 3 Mechanical structure

Note1: Tolerance ±0.3mm without mark.

Note2: WW represents Week.

YY representsYear.

10. Wave Soldering Curve(RoHS)

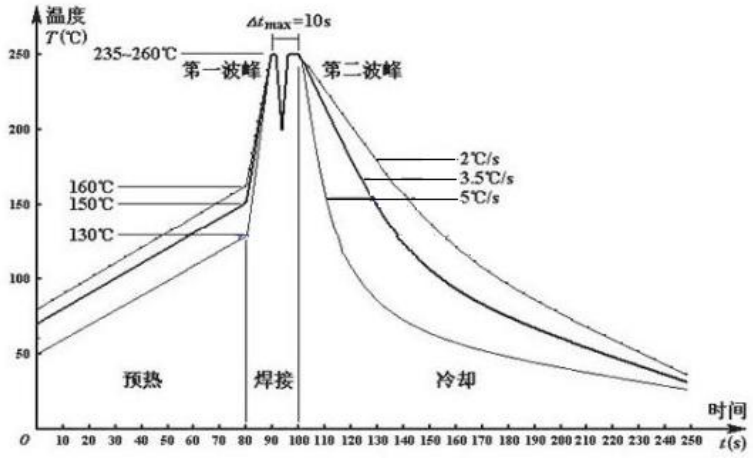

Figure 4 Wave soldering curve

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11. Package（mm）

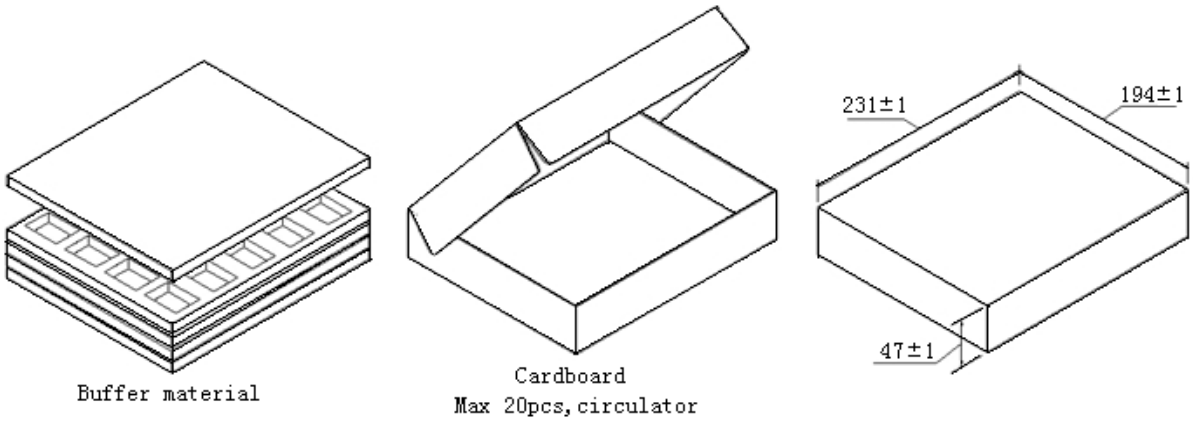

Figure 5 Package