Customer Code :

DATASHEET

DAPU P/N: **CM129R-K119-10.00MHz**

Customer P/N: _____

DAPU			Customer Approval
Drew	Audited	Approved	
Amway.wei	Carry.Wang	Jason Zhao	
Date: 2020.08.05			Stamp, please! Thanks!

Guangdong Dapu Telecom TechnologyCo.,Ltd

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Table of Amendment

Version	Revision contents	Prepared by	Revised date
1.0	The first issued	Amway	2020.08.05

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1. General Description

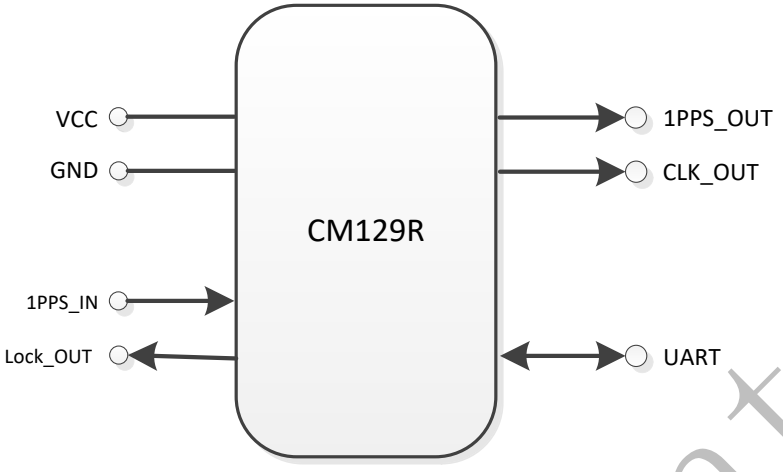

Figure 1 CM129R

Figure 1 is the basic diagram of CM129R. CM129R is a high-performance rubidium clock module designed to provide precise frequency and phase synchronizing with external time reference for telecom and other applications.

Key features:

- **Reference:** 1PPS and TOD from GNSS receiver
- **Temperature Stability:** ±0.6ppb
- **Holdover:** ±1.0μs/24h @△T=±5℃ after power up 24days
- **Clocks Input and Output:** 1*1PPS input, 1*1PPS output and 1*10MHz output
- **Serial Interface:** 1*UART for management or ToD interface
- **Mechanical Size:** 127.0mm*92.4mm*38.2mm

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2. Pin Definition

Table 1 Pin Definition

Pin group	Pin#	Pin Name	Type	Description
Supply Voltage	6	V_{CC}	PWR	Power Supply
	1	GND	GND	Ground
State Output	5	LOCK_OUT	O	Lock State output
UART	4	RXD	I	Asynchronous Serial Data Output/Input
	3	TXD	O	
Input Clock	2	1PPS_IN	I	1PPS Reference Input.
Output Clocks	7	1PPS_OUT	O	1PPS Output
	SMA	CLK_OUT	O	10.00MHz Output
Control Voltage	9	VOLTAGE IN	I	Frequency Control(≥2e-9)
Reserved	8	NC	NC	NC

3. Electrical Parameters

Table 2 Electrical Parameters

Parameter	Symbol	Minimum	Typical	Maximum	Units
LVCMOS Input					
High Level Input Voltage	V_{IH}	2.0			V
Low Level Input Voltage	V_{IL}			0.8	V
LVCMOS Output					
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.
	Waveform	Sine wave				
	Level	6		10	dBm	50Ω@10MHz
	Frequency vs. Temperature			0.6	$\times10^{-9}$	Vcc=24.0V; O_{load}=50Ω; T_A varies from-30℃ to 57℃, temperature slope less than 2℃per minute.
				0.3	$\times10^{-9}$	T_A varies from 0℃ to 50℃
	Accuracy	-5		+5	$\times10^{-12}$	24 hours average value when locked to 1PPS.
	Short-term Stability			+3.0	$\times10^{-12}$	Vcc=24.0V;T_A=25℃; 1s; no EMI\EMC or other interference.
				+5.0	$\times10^{-12}$	Vcc=24.0V;T_A=25℃; 10s; no EMI\EMC or other interference.
				+6.0	$\times10^{-12}$	Vcc=24.0V;T_A=25℃; 100s; no EMI\EMC or other interference.
	Daily Aging	-5		+5	$\times10^{-12}$	Vcc =24.0V;T_A=25℃.
	Monthly Aging	-5		+5	$\times10^{-11}$	
	Phase Noise			-95	dBc/Hz	1Hz
				-123		10Hz
				-140		100Hz
				-150		1KHz
				-155		10KHz
1 PPS Output	Pulse Width			100	ms	
	Accuracy	-50		+50	ns	Synchronizing with 1PPS reference.
	24 hours holdover	-1		+1	μs	△T=±2℃,24 hours holdover after power up 1 days;

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						temperature slope less than 2℃ per minute.
Supply Voltage	Supply Voltage	22.0	24.0	25.0	V	
	Warm Up Current			2500	mA	
	Steady Current			1000	mA	@25℃
	AC Ripple			50	mVpk-pk	10Hz to 1MHz

5. UART

UART interface is used for management and digital frequency adjustment (Pulling Range:≥±3e-7, Resolution Ratio: 6.8e-13), which has a fixed baud rate (115200) using 1 stop bit and no parity. Please contact DAPU for the detail information.

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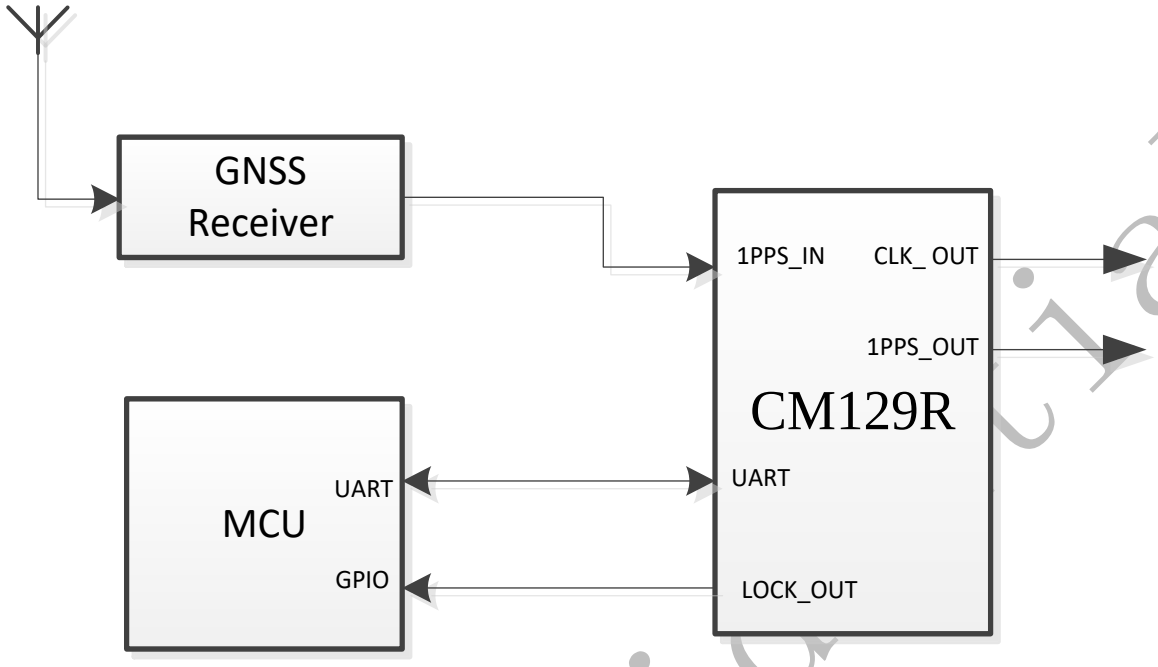
6. Environmental Conditions

Table 5 Environmental Conditions

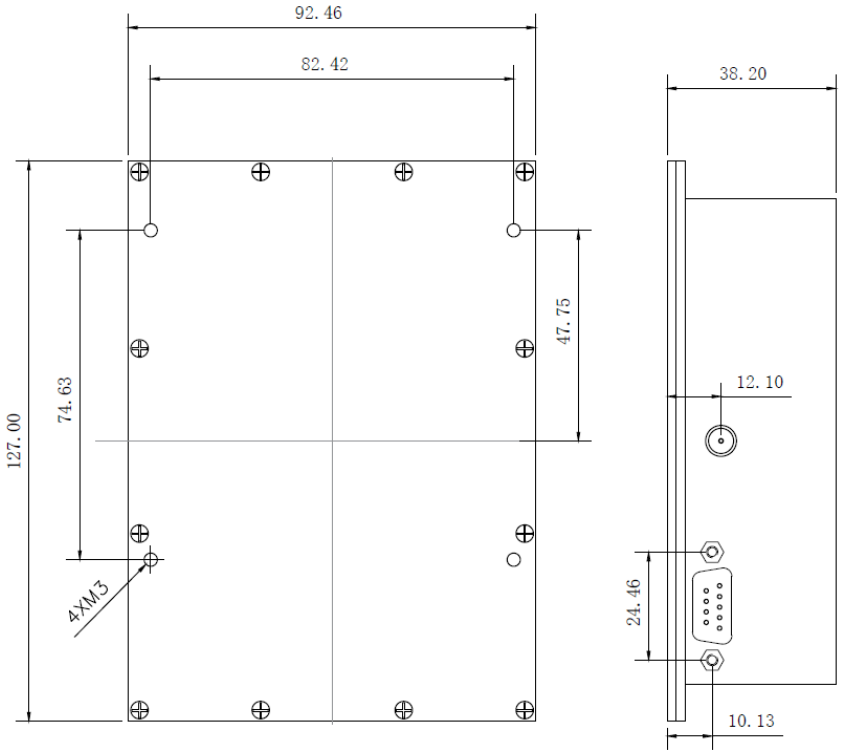
Parameter	Conditions	
Operating Temperature	-30℃ to 57℃	
Storage Temperature	-40℃ to 70℃	
Storage Humidity	30%~80%	
ESD Level	Human Body Model, class2: 2000V to 4000V; ANSI/ESDA/JEDEC JS-001-2010.	
	Machine Model, class B: 200V to 400V; JEDEC JESD22-A115C.	
Moisture Sensitivity Level	Not humidity sensitive.	
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℃	

7. Typical Application



GNSS Receive offers 1PPS signal to CM129R.
The MCU monitors the work state of CM129R.

8. Mechanical Structure (mm)



Note1: Tolerance ± 0.3mm without mark.

9. Package（mm）