Travelling Merchant:_____

DATASHEET

Standard: **CM55F-H129-10.00MHz**

P/N:

Plot			The Label
Drew	Audited	Approved	
Amway.wei	Carry.Wang	Jason Zhao	
Date: 2022.08.04			Stamp, please! Thanks!

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Table of amendment

Version	Revision contents	Prepared by	Revised date
1.0	The first issued	Amway	2022.08.04

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1. Description

The CM55F-H129 is a high holdover performance, high integration, low noise clock module with patent compensated algorithm. After 2 days PRC level reference locking it can achieve better than 1E-12 frequency stability and holdover for 24 hours within ±1.0us (±10℃).

The CM55F-H129 provide many kinds of maintenance and alarm messages output to improve the reliability and maintainability of the network.

The CM55F-H129 is ideal for high performance frequency and time reference in wireline Telecommunications, wireless Telecommunications, substations, Test and Measurement Applications. It is the perfect replacement for rubidium clock.

2. Features

- Support all kinds of satellite receiver（GPS/GLONASS/BEIDOU/GALILEO） 1PPS output to be reference
- Ultra-Low phase noise output
- Ultra-High holdover capability close to Rubidium Clock

  - Holdover capability better than ±1.0us over 24 hours (±10℃)
- Combine high stability OCXO and patent compensated algorithm
- High integration and small size (51mm×51mm×18mm)
- Various kinds of maintenance and alarm messages output
- 5V operation and low power consumption

3. Applications

- Wireless base station
- Telecom Synchronization Network
- Power Grid Substation
- Test and Measurement
- Military/Aerospace

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4. Electrical Parameters

	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
1 PPS Reference Input	Waveform		HCMOS			
	High-Level Output Voltage (V_{IH})	2.0			V	
	Low-Level Output Voltage (V_{IL})			0.8	V	
	Pulse Width	0.001	100	500	ms	
	Stability			200	ns	
	Connector		Pin 10			
State Input	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Lock Enable	2.0			V	<5mA Load
	Lock Disable			0.8	V	<5mA Load
	Connector		Pin 8			
10M Output	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Nominal Frequency		10.00		MHz	
	Waveform		HCMOS			
	High-level Output Voltage (V_{OH})	2.7			V	<5mA Load
	Low-level Output Voltage (V_{OL})			0.4	V	<5mA Load
	Rise/Fall Time			8	ns	<5mA Load
	Duty Cycle	45	50	55	%	<5mA Load
	Frequency Tolerance vs. Operating Temperature Range	-0.05		+0.05	$\times 10^{-9}$	TA varied from -30℃ to 75℃, measurement referenced to frequency observed with TA= 25℃, Vcc=5.0V, O_{Load} =15pF. Temperature rise speed less than 1℃ per minute.
	Frequency Tolerance vs. Supply Voltage	-0.01		+0.01	$\times 10^{-9}$	Measurement referenced to frequency observed T_A=25℃, V_{cc} varied from 4.75V to 5.25V, and O_{Load}=15pF.
	Retrace	-5		+5	$\times 10^{-9}$	@25℃, frequency variation measured after 48 hours power off and 3 hours power on, referred to stable frequency before power off.
	Accuracy	-1		+1	$\times 10^{-12}$	24 hours average when locked to 1 PPS
	Short-term Stability			5	$\times 10^{-12}$	Temperature stability, no EMI\EMC or other interference, test after power

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						for 1 hour ref. to 25℃; 1s.
	Aging Tolerance Per Day	-0.2		+0.2	$\times10^{-9}$	V_{cc},T_A constant measurement referenced to frequency observed with T_A=25℃,V_{cc}=5.0V, in FREE RUN condition and after 30 days of operation.
	Aging Tolerance 1 Year	-0.01		+0.01	$\times10^{-6}$	
	Phase Noise (All conditions)		-125	-120	dBc/Hz	10Hz
			-140	-135		100Hz
			-148	-143		1KHz
			-152	-147		10KHz
			-155	-150		100KHz
			-155	-150		1MHz
	Connector	Pin 14				
Holdover Capability	Holdover Time	Min.	Typ.	Max.	Unit.	Test Condition
	24 Hours	-1.0		+1.0	μs	△T = ±10℃, 24 hours holdover after turn on and locked more than 1days. Temperature variable speed less than 1℃ per minute
Supply Voltage	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Supply Voltage	4.75	5.0	5.25	V	
	Warm up time			15	mins	
	Current Consumption			2500	mA	During Warm-up
				1000	mA	During steady state operation @25℃
	AC Ripple			50	mVpk-pk	10Hz to 1MHz
	Connector	Pin 3				
1 PPS Output Waveform Characteristics	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Waveform	HCMOS				
	High-Level Output Voltage (V_{OH})	2.7			V	
	Low-level Output voltage (V_{OL})			0.4	V	
	Pulse Width	0.001	100	500	ms	
	Phase Accuracy	-50		+50	ns	lock status (locked time ≥ 30mins, under the condition of 1PPS reference RMS ≤ 30ns)
	Phase Accuracy（RMS）			25	ns	Steady lock status (locked time≥ 24hours, under the condition of 1PPS

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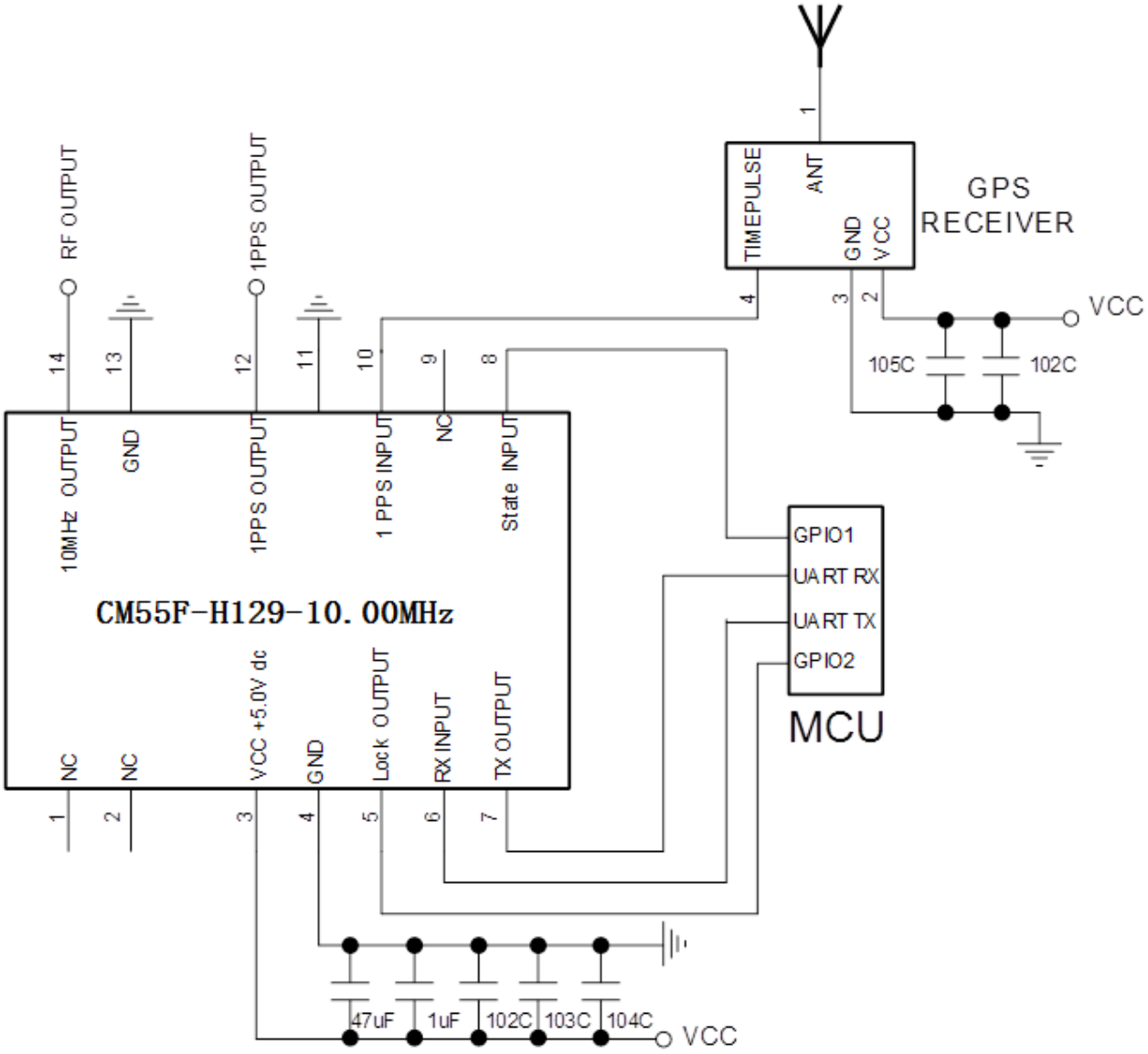
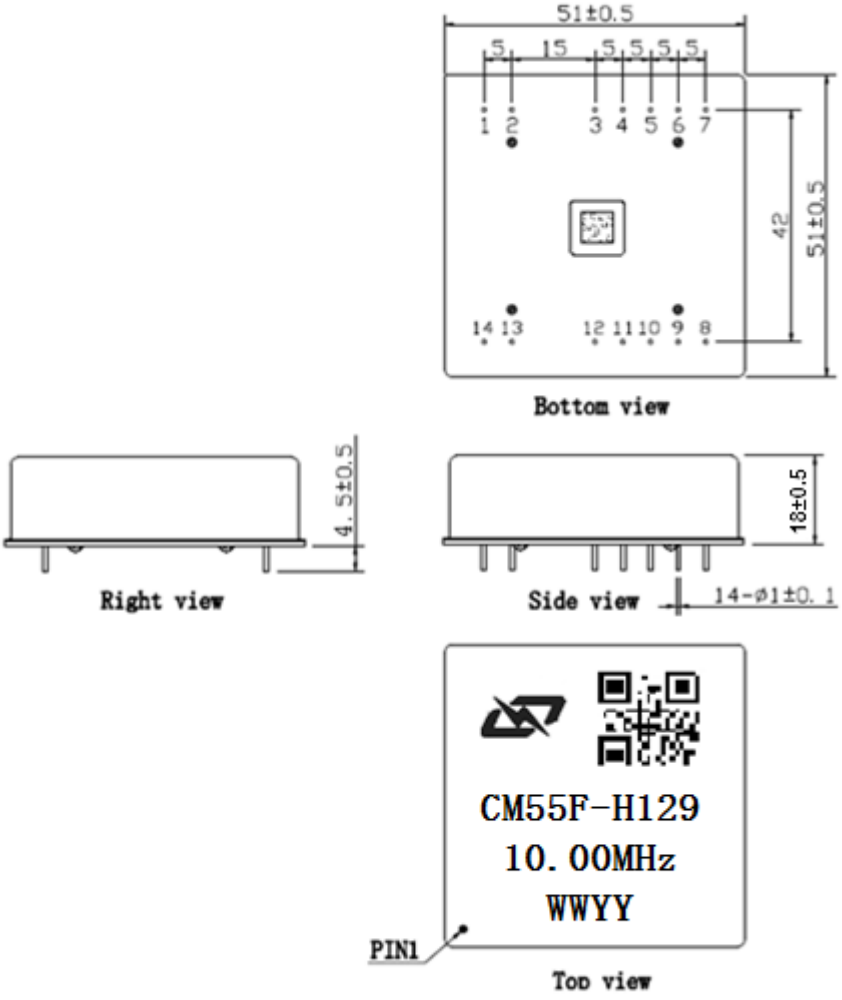
						reference RMS ≤ 30ns)
	Connector	Pin 12				
State Output	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Lock	2.7			V	<5mA Load
	Free run/Holdover			0.4	V	<5mA Load
	Connector	Pin 5				
UART	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Rx high-level Input Voltage (V_H)	2.0			V	
	Rx low-level Input Voltage (V_L)			0.8	V	
	Tx high-level Output Voltage (V_H)	2.7			V	
	Tx low-level Output Voltage (V_L)			0.4	V	
	Connector	Pin6 and Pin7				

Environmental Conditions	Parameter	Conditions	
	Operating temperature	-30℃ to +75℃	
	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; JEDEC JESD22-A115C.	
	Moisture Sensitivity Level	Not humidity sensitive.	
	Vibration	Test Condition: 30 min per direction X, Y and Z. 12Hz～2000Hz, PSD (Power Spectral Density) 0.01g^2/Hz.	
		Narrow-Band Parameter	
		Frequency (Hz)	PSD（g^2/Hz）
		80-100	0.4
		160-200	0.1
		240-300	0.025
	Shock	40g; 11ms; 3 times for each 3 directions X, Y, Z. Waveform refers to GJB150.18A-2009, Part 18: Shock Test.	

5. Typical Application



6. Mechanical Structure(mm)



Note1: Tolerance ± 0.2mm without mark

Note2: The first two WW representative: week
After two YY representative: year

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PIN DEFINITION			
PIN	**Name**		**DESCRIPTION**
3	Vcc +5.0Vdc		Power supply input,4.75V to 5.25V.
5	Lock OUTPUT		State output. Output high level when the work state is Run2(See section 4),others low level.
6	RX INPUT		Asynchronous serial data input.
7	TX OUTPUT		Asynchronous serial data output.
8	State INPUT	H: Lock Enable	The work state is set to normal operation when the state input is high.
		L: Lock Disable	The work state is set to hold over when the state input is low.
9	NC		Not connected.
10	1PPS INPUT		1PPS reference input.
12	1PPS OUTPUT		The clock module 1PPS output.
14	10MHz OUTPUT		10MHz OCXO frequency output.
1、2	NC		Not connected.
4、11、13	GND		GND

7. UART

UART interfaces are used for management and TOD, 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).

a) TOD input sentence format

$GPZDA, <1>,<2>,<3>,<4>,<5>,<6>*HH<CR><LF>

Parameter Number	Parameter Name	Format	Description
<1>	UTC time	hhmmss.ss	Hour, minute, second,9 characters
<2>	day	dd	Range: 01~31, 2 characters
<3>	month	mm	Range: 01~12, 2 characters
<4>	year	yyyy	4 characters
<5>	NA	00	Filled with 00
<6>	NA	00	Filled with 00

Note：All sentences begin with “$”， end with<CR><LF>

* HH represents the bitwise XOR result of all characters between “$” and “*”

<CR><LF>: Carriage Return and Line Feed.

Example：$GPZDA,010516.00,26,11,2008,00,00*6B

b) TOD output sentence format

$DPZDA, <1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<10>,<11>,<12>,<13>,<14>*HH<CR><LF>

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Parameter Number	Parameter Name	Format	Description
<1>	UTCtime	hhmmss	Hour,minute,second, 6 characters
<2>	Day	dd	Range: 01~31, 2 characters
<3>	Month	mm	Range: 01~12, 2 characters
<4>	Year	yyyy	4 characters
<5>	System state	xx	00-Freerun，01-fast track，10-lock，11-holdover
<6>	Lock indicator	x	0-unlock，1-locked
<7>	temperature	xxx	Unit：0.1℃。 e.g.234means23.4℃
<8>	Input identifier	x	1-1PPS Input，0-no1PPS Input.
<9>	GPZDA input identifier	x	1 means GPZDA Input， 0 means no GPZDA Input.
<10>	reserve	0	--
<11>	T1	xxxxx	Test parameter1: range +8192~-8192, 5 parameters
<12>	T2	xxxxxxxxxx	Test parameter2: range 65535.0000~00000.0000, 10 parameters
<13>	T3	xxxxxxxxxx	Test parameter3: 10 parameters
<14>	reserve	xxxxxxx	7 characters

Note：All sentences begin with“$”，end with<CR><LF>

* HH represents the bitwise XOR result of all characters between “$”and“*”

<CR><LF>: Carriage Return and Line Feed.

Example：

$DPZDA,010517,26,11,2008,10,1,315,1,1,0,-0000,31945.0000,-0000.1146,0000000*78

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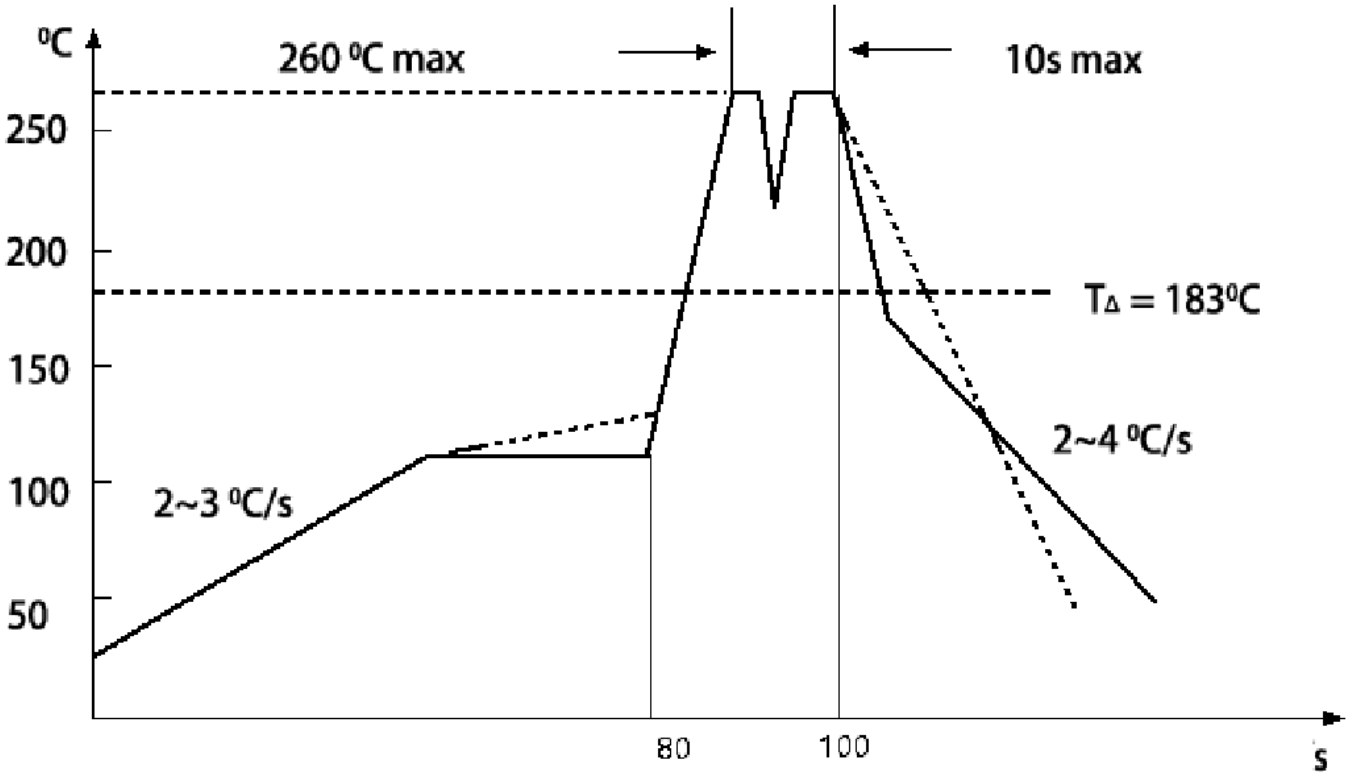
8. Wave Soldering Curve (RoHS)



9. Package（mm）