

Customer Code :

# DATASHEET

DAPU P/N: CM55F-Z129-10.00MHz

Customer P/N: \_\_\_\_\_

DAPU			Customer Approval
Drew	Audited	Approved	Stamp, please! Thanks!
Date: 2024.09.02			

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## 1. General Description

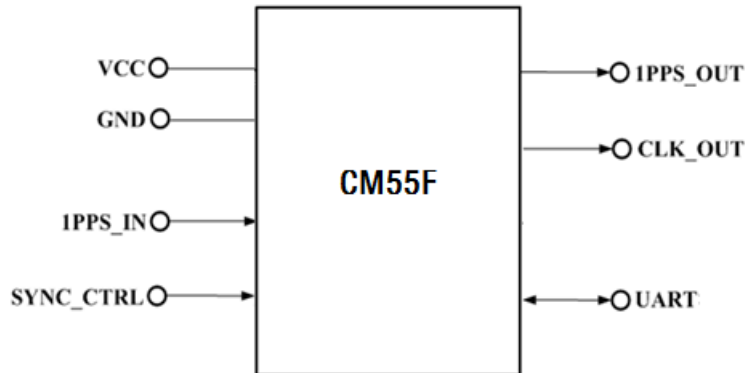


Figure 1 CM55

Figure 1 is the basic diagram of CM55. CM55 is a high-performance 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, IEEE1588 etc.;
- **Temperature Stability:**  $\pm 0.1$ ppb;
- **Holdover:**  $\pm 1.5\mu\text{s}/24\text{h}$  @  $\Delta T = \pm 10^\circ\text{C}$  after power up 7days;
- **Clocks Input and Output:** 1\*1PPS input, 1\*1PPS output and 1\*10MHz output;
- **Serial Interface:** 1\*UART for management;
- **Mechanical Size:** 51mm\*51mm\*13.0mm.



## 2. Pin Definition

**Table 1 Pin Definition**

Pin group	Pin#	Pin Name	Type	Description
Supply Voltage	3	VCC	PWR	Power Supplyinput,4.75V to 5.25V.
	4、11、 13	GND	GND	Ground
Control Pins	8	SYNC_CTRL	I	Synchronizing Procedure Control
UART	6	RXD	I	Asynchronous Serial Data Output/Input
	7	TXD	O	
Input Clock	10	1PPS_IN	I	1PPS Reference Input.
Output Clocks	12	1PPS_OUT	O	1PPSOutput
	14	CLK_OUT	O	10.00MHz Output
State output Pins	5	LOCK_OUTPUT	O	State output
NC	1、 2、 9	NC		Not connected

## 3. Electrical Parameters

**Table 2 Electrical Parameters**

Parameter	Symbol	Minimum	Typical	Maximum	Units
<b>LVC MOS Input</b>					
High Level Input Voltage	$V_{IH}$	2.7			V
Low Level Input Voltage	$V_{IL}$			0.4	V
<b>LVC MOS Output</b>					
High Level Output Voltage	$V_{OH}$	2.7			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	-0.1		+0.1	$\times 10^{-9}$	T <sub>A</sub> varies from -40°C to 85°C, temperature slope less than 2°C per minute.	
	Accuracy	-1		+1	$\times 10^{-12}$	24 hours average value when locked to 1PPS.	
	Short-term Stability			2	$\times 10^{-11}$	Temperature stability, no EMI/EMC or other interference, test after power for 1 hour ref. to 25°C; 1s.	
	Daily Aging	-0.2		+0.2	$\times 10^{-9}$	T <sub>A</sub> =25°C.	
	Phase Noise			-118	-113	dBc/Hz	10Hz
				-138	-133		100Hz
				-148	-143		1KHz
				-150	-145		10KHz
			-150	-145	100KHz		
			-150	-150	1MHz		
1PPS Input	Waveform	HCMOS					
	High Level	2.7		3.47	V		
	Low Level	-0.3		0.4	V		
	Pulse Width	0.01		500	ms		
1 PPS Output	Pulse Width	10			uSec		
	Accuracy	-30		+30	ns	Synchronizing with 1PPS reference.	
	24 hours holdover	-1.5		+1.5	μs	ΔT=±10°C, 24 hours holdover after power up 7 days; temperature slope less than 2°C per minute.	



Supply Voltage	Supply Voltage	4.75	5.0	5.25	V	
	Warm Up Current			1400	mA	
	Steady Current			600	mA	@25°C
	AC Ripple			50	mVpk-pk	10Hz to 1MHz

### 5. UART

UART interfaces are used for management and TOD, which has a fixed baud rate (9600-8-1-N) 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. Control Pins

CM55 is a clock module which synchronizes the local clock to reference such as 1 PPS retrieving from GPS. CM55 will work normally performing synchronizing algorithm when the SYNC\_CTRL pin is driven high. It also could be forced to work in free-run or holdover status when the SYNC\_CTRL pin is driven low.

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## 7. The Product Test Output Message

Example:

\$PDP,00,0,F,Q,-3095,32768.0000,32768.0000,000,000,00000.0000,00000.0000,00000.0000,00000.0000,3-23,+000.00  
00,-0000,www.dptel.com,1.1,2011-05-16\*55

Notes:

In the Format column, c stand for char ,d stand for digit, s stand for sign.

Field No.	Name	Format	Description	Length (byte)
0	\$PDP	\$ccc	Message ID, DAPU Telecom Technology protocol header	4
1	No	dd	Message No.	2
2	TxRxFlag	d	The transmit and receive flag.(0: upper computer transmit; 1: upper computer receive)	1
3	CStatus	c	Current status.(F: warm-up; L: Lock; H: Hold over)	1
4	TrackStatus	d	Track status (Q: fast track;S: slow track)	1
5	cPHDiff	sdddd	Current phase difference	5
6	cPWM1	dddd.dddd	Current PWM1 (Voltage-controlled value1)	10
7	cPWM2	dddd.dddd	Current PWM2 (Voltage-controlled value2)	10
8	SYNCNT	ddd	The synchronous times	3
9	HCNT	ddd	Hours after enter slow track	3
10	HPAVG	dddd.dddd	The average of the PWM in the last 1 hour	10
11	VCH1	dddd.dddd	Voltage-controlled compensation value every 1 hour	10
12	HPMOD	dddd.dddd	The Module PWM Value	
13	VCM10	dddd.dddd	Voltage-controlled compensation value every 10 minutes	10
14	POS	d-dd	The position of the product.(Layer-No), just for the inner test.	4
15	inT	sddd.dddd	NA	9
16	TcPHDiff	sdddd	The product current phase difference	5
17	Website		www.dptel.com	13
18	Version	d.d	version	3
19	Date	dddd-dd-dd	Date	10
20		dd	55	2
21	END		<CR><LF>	2





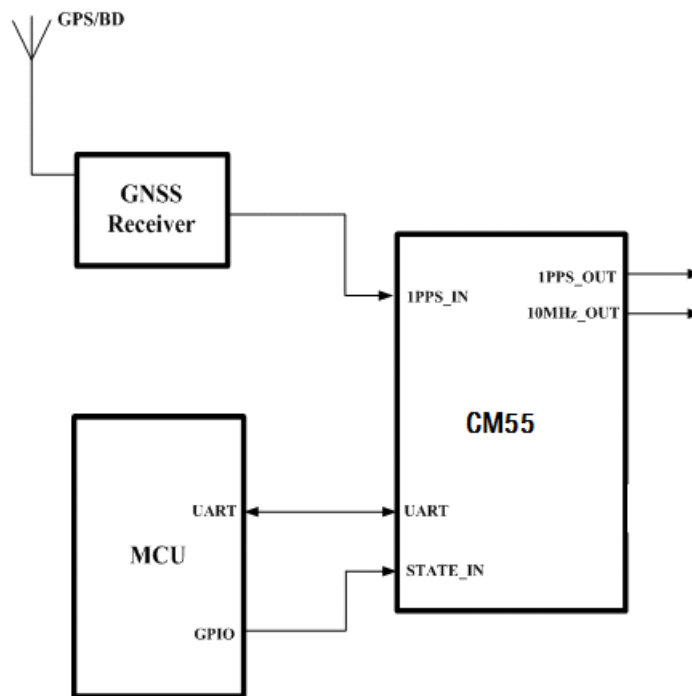
## 8. Environmental Conditions

**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; 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°C~35°C	



## 9. Typical Application

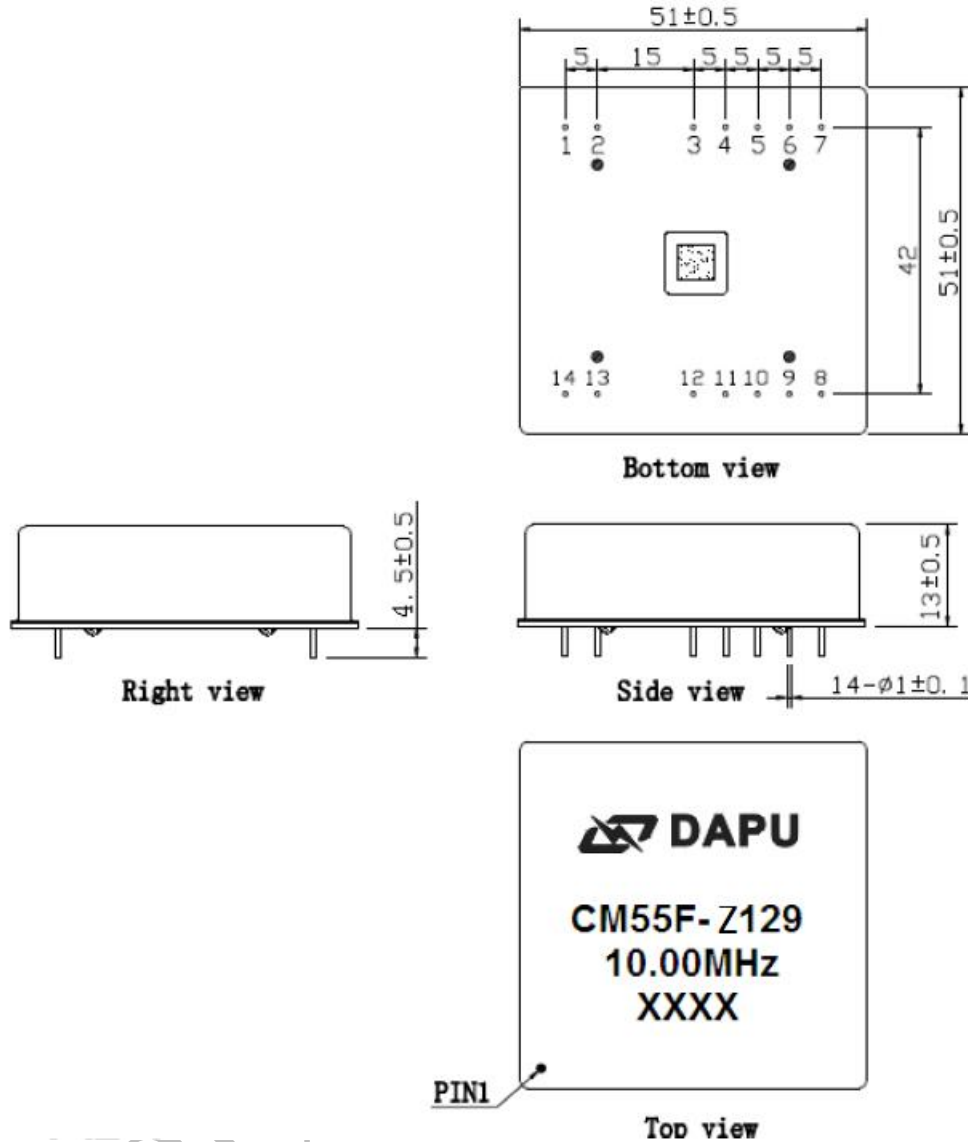


GNSS Receive offers 1PPS signal to CM55.  
The MCU monitors the work state of CM55.

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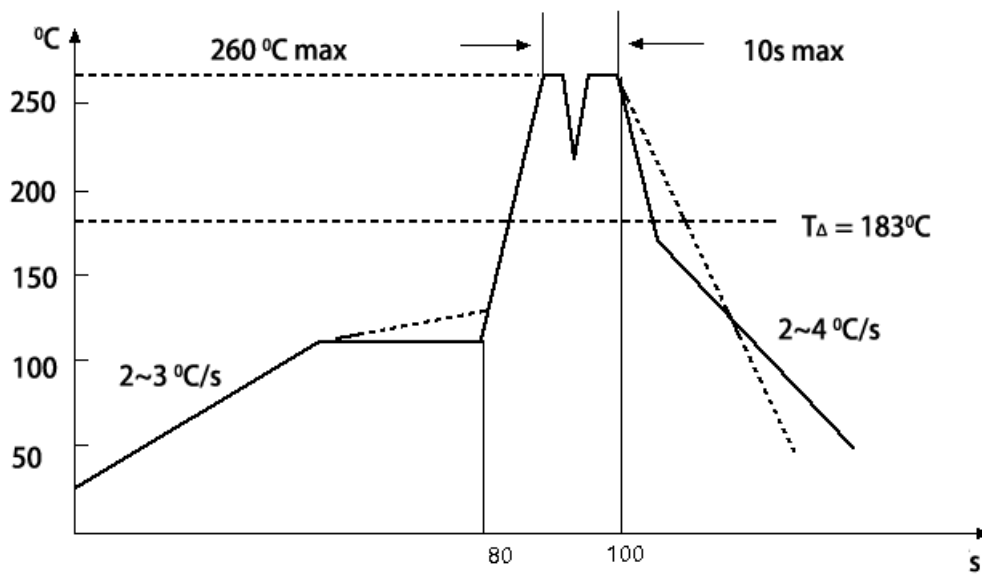
### 10. Mechanical Structure (mm)



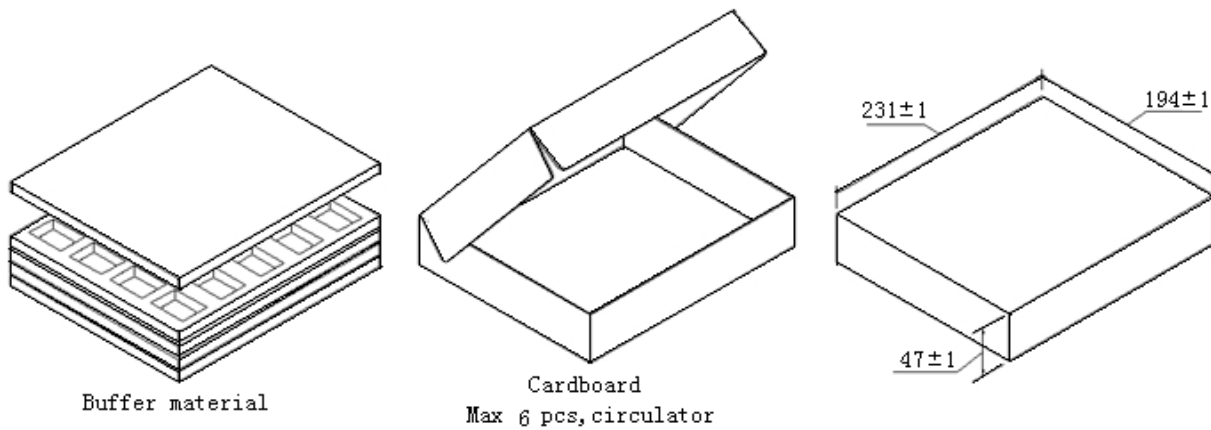
- Note1:** Tolerance  $\pm 0.2$ mm without mark.
- Note2:** The first two xx representative: year  
After two xx representative: week



### 11. Wave Soldering Curve (RoHS)



### 12. Package (mm)



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