

Customer Code :

DATASHEET

DAPU P/N: CM55F-Z129-10.00MHz

Customer P/N: _____

DAPU			Customer Approval
Drew	Audited	Approved	Stamp, please! Thanks!
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Date: 2020.08.27			

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Version	Revision contents	Prepared by	Revised date
1.0	The first issued	<i>Amway</i>	2020.05.06

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1. General Description

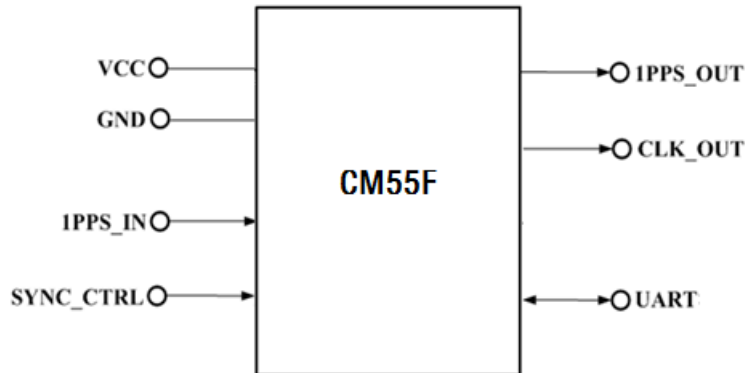


Figure 1 CM55

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:** ± 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
LVC MOS Input					
High Level Input Voltage	V_{IH}	2.7			V
Low Level Input Voltage	V_{IL}			0.4	V
LVC MOS Output					
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_A 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	$\times 10^{-9}$	$T_A = 25^{\circ}\text{C}$.	
	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	$\Delta T = \pm 10^{\circ}\text{C}$, 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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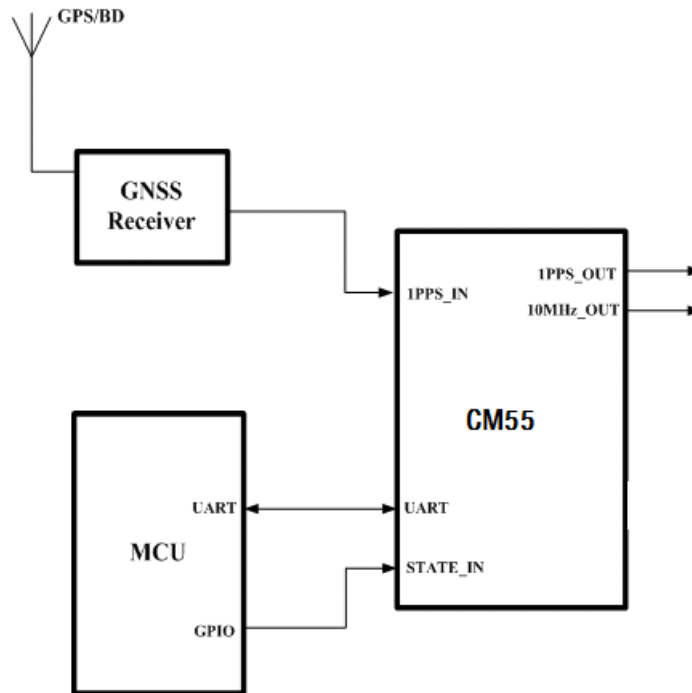
7. Environmental Conditions

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	



8. Typical Application



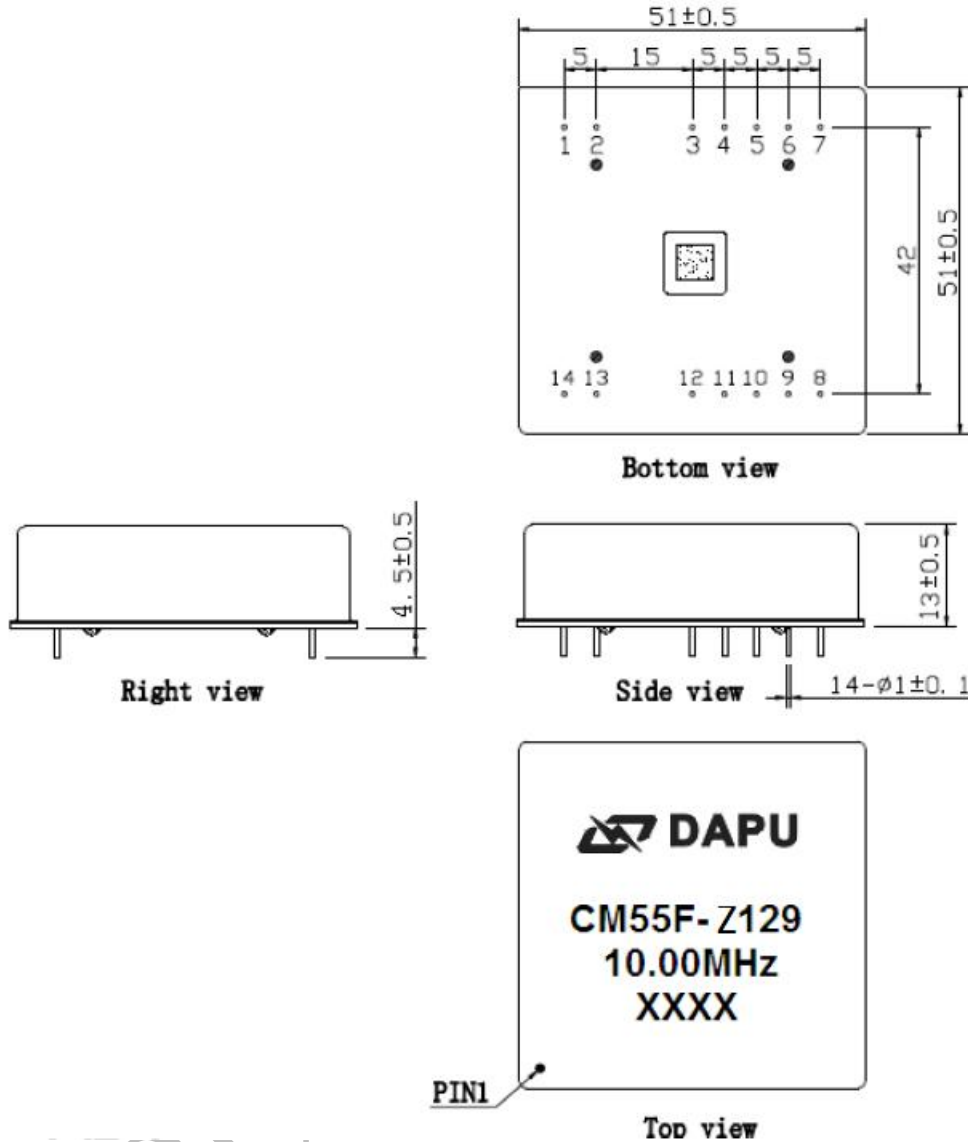
GNSS Receive offers 1PPS signal to CM55.
The MCU monitors the work state of CM55.

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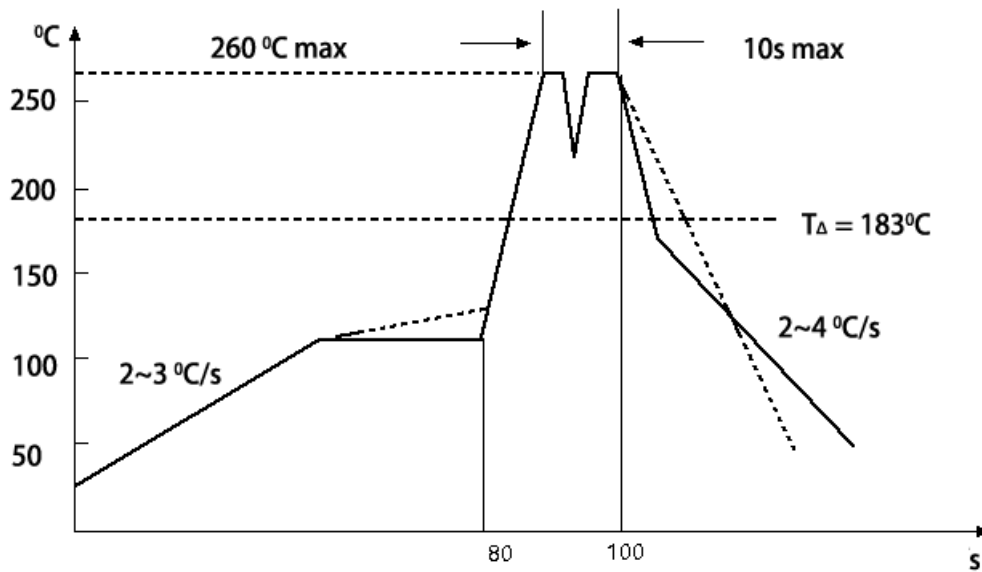
9. Mechanical Structure (mm)



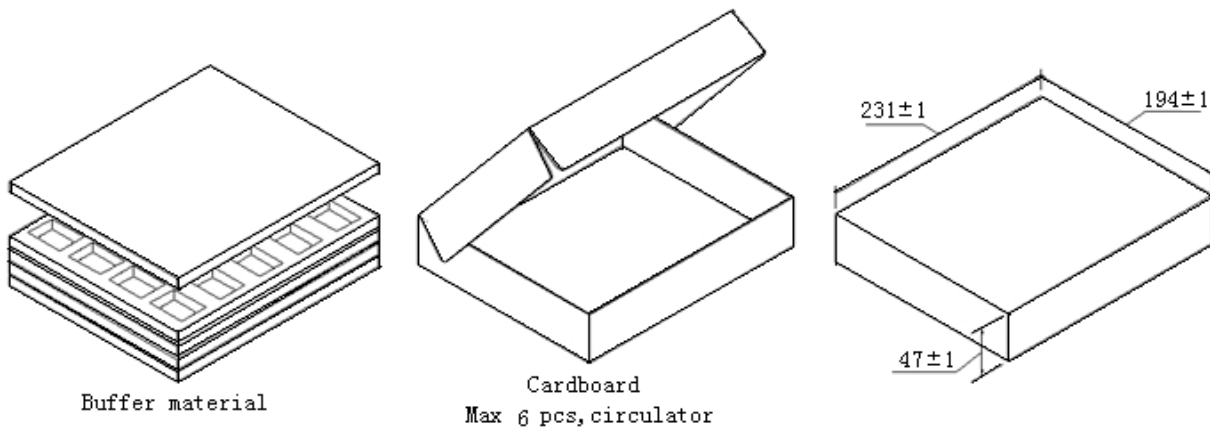
Note1: Tolerance ± 0.2 mm without mark.
Note2: The first two xx representative: week
After two xx representative: year



10. Wave Soldering Curve (RoHS)



11. Package (mm)



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