Customer Code:

DATASHEET

DAPU P/N: **CM65A-M129-10.00MHz**

Customer P/N: _____

DAPU			Customer Approval
Drew	Audited	Approved	Stamp, please! Thanks!
Amway.wei	Carry.Wang	James.Liu	
Date: 2019.11.21			

Guangdong Dapu Telecom Technology Co.,Ltd

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Table of Amendment

Version	Revision contents	Prepared by	Revised date
1.0	The first issued	Amway	2019.11.21

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1. General Description

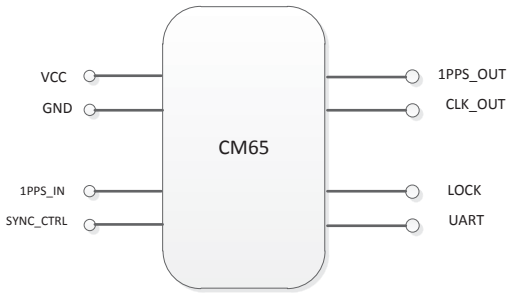

Figure 1 CM65

Figure 1 is the basic diagram of CM65. CM65 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:**±0.2ppb;
- **Holdover:**10ppb/30minutes@Δ T=±20℃ after power on/lock 24 hours;
- **Clocks Input and Output:**1*1PPS input, 1*1PPS output and 1*10MHz output;
- **Serial Interface:** 1*UART for Debug and management;
- **Mechanical Size:**65mm*65mm*19mm.

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2. Pin Definition

Table 1 Pin Definition

Pin group	Pin#	Pin Name	Type	Description
Supply Voltage	4, 9, 11,13	GND	GND	Ground
	12	VCC	PWR	Power Supply
Control and Status Pins	8	SYNC_CTRL	I	Synchronizing Procedure Control
	5	LOCKED	O	Locked Status
UART	6	RXD0	I	Asynchronous Serial Data Output/Input
	7	TXD0	O	
Input Clock	10	1PPS_IN	I	1PPS Reference Input.
Output Clocks	3	1PPS_OUT	O	1PPSOutput
	2	CLK_OUT	O	10.00MHz Output
Reserve	1，14	NC		Not connected.

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	-0.2		+0.2	$\times10^{-9}$	Vcc=5.0V; O_{load}=15pF;$T_A$varies from-20℃ to 75℃, temperature slope less than 1℃per minute.
	Accuracy	-1		+1	$\times10^{-12}$	24 hours average value when locked to 1PPS.
	Short-term Stability			5	$\times10^{-12}$	Vcc=5. 0V; T_A=25℃; 1s; using PN9000; no EMI\EMC or other interference;test after powerfor 1 hour.
	Daily Aging	-0.5		+0.5	$\times10^{-9}$	Vcc=5.0V;T_A=25℃.
	Yearly Aging	-0.05		+0.05	$\times10^{-6}$	
	Phase Noise		-125	-120	dBc/Hz	10Hz
			-140	-135		100Hz
			-148	-143		1KHz
			-152	-147		10KHz
			-155	-150		100KHz
			-155	-150		1MHz
	30minutes holdover	-10		10	ppb	ΔT=±20℃, power up and locked 24 hours
1 PPS Output	Pulse Width		100		ms	
	Accuracy (RMS)			25	ns	Steady lock status (locked time≥24hours, under the condition of 1PPSreference RMS ≤ 30ns)
Supply Voltage	Supply Voltage	4.75	5.0	5.25	V	

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	Warm up time			15	min	
	Warm Up Current			2500	mA	
	Steady Current			1000	mA	@25℃
	AC Ripple			50	mV pk-pk	10Hz to 1MHz

5. UART

UART interfacesare used for management and debug. 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. Control and Status Pins

CM65 is a clock module which synchronizes the local clock to reference such as 1 PPS retrieving from GPS. CM65 will work normally performing synchronizing algorithm when the SYNC_CTRL pin is driven high. It also could be force to work in free-run or holdover status when the SYNC_CTRL pin is driven low.

The LOCKED pin indicates the lock status of CM65. High level indicates the module is locked to external 1PPS reference. When the module never is locked to reference after power up, the status of module is free-run, the LOCKED pin outputs low. When the reference is lost, the status of module is holdover, the LOCKED pin also output low.

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7. Environmental Conditions

Table 4Environmental Conditions

Parameter	Conditions	
Operating Temperature	-20℃ 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; 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

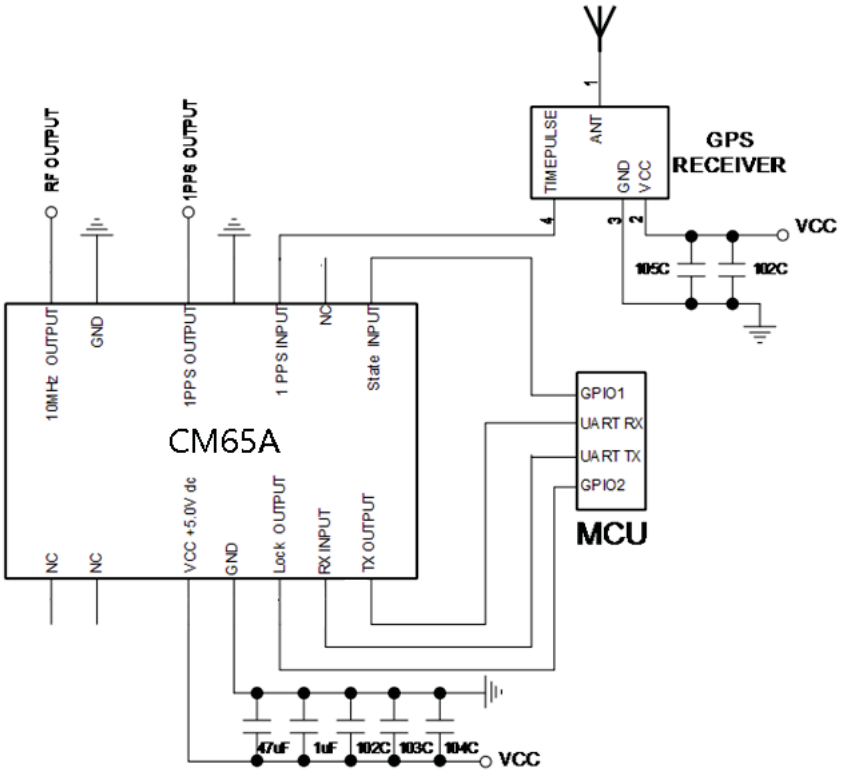

Figure 2Typical application

GNSS Receiveroffers 1PPS signal to CM65.

The MCU monitors the work state of CM65.

9. Mechanical Structure (mm)

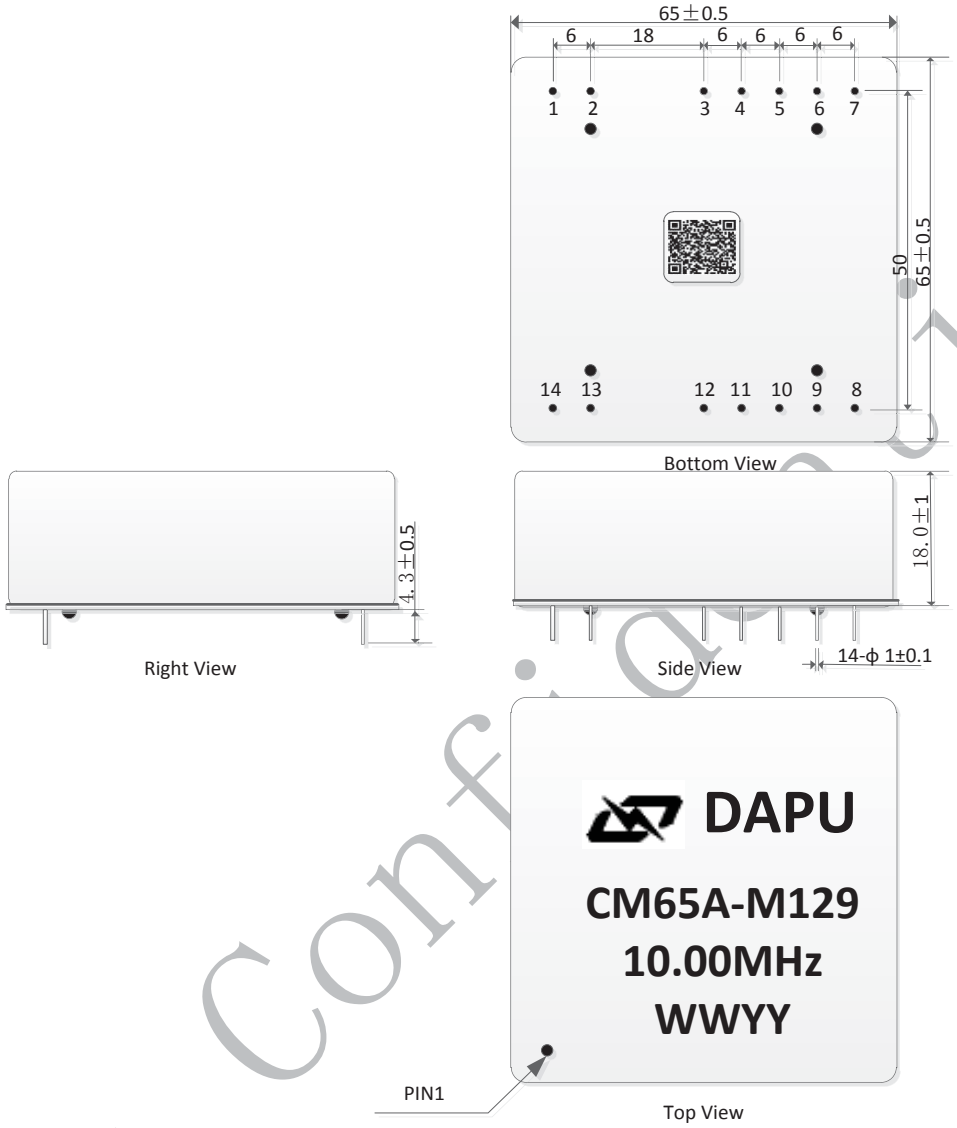

Figure 3 Mechanical structure

Note1: Tolerance ± 0.2mm without mark.

Note2: WW represents Week.

YY represents Year.

Note3: Referential Weight 135g±15g

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10. Wave Soldering Curve(RoHS)

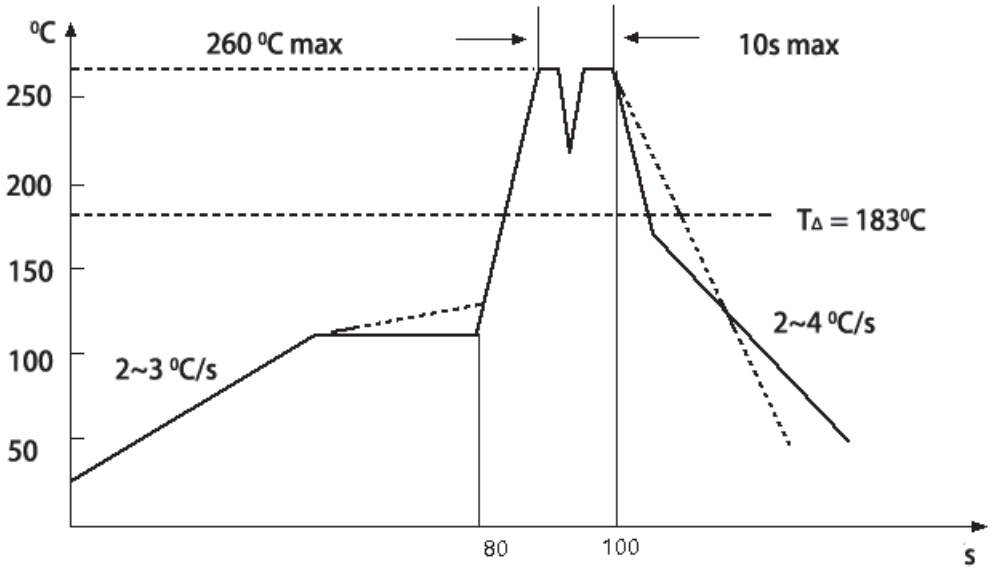
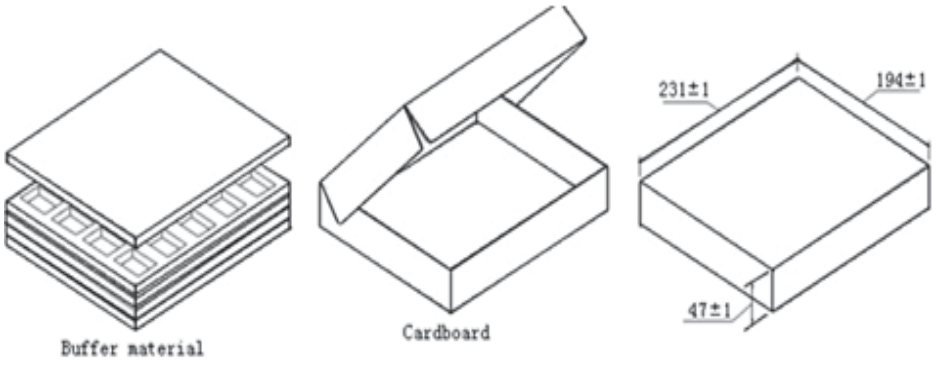


Figure 4 Wave soldering curve

11. Package（mm）



Max 4pcs. Circulator