

Customer Code : _____

DATASHEET

DAPU P/N: **DP1617-DPSYNC**

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DAPU			Customer Approval
Drew	Audited	Approved	Stamp, please! Thanks!
Date: 2022.06.13			

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Table of amendment

Version	Revision contents	Prepared by	Revised date
1.0	The first issued	Chen Jian	2022.06.13



1 Description

The CC1617-DPSYNC is a high- performance PTP card. The PTP card is IEEE 1588-2008(1588V2) standard compliant and uses GNSS timing satellite signal as a primary time reference. The GNSS system supports GPS, Galileo, GIONASS, BeiDou and QZSS. The PTP card is equipped with a high quality internal oscillator (OCXO) developed by DAPU, that supports it to provide excellent performance of frequency and time outputs, including 1PPS+TOD,PTP.

The CC1617-DPSYNC uses an advanced PTP chip developed by DAPU, which supports adaptive timing algorithm. The card deploys a centralized Grand Master to provide highly precision synchronization information.

2 Features

- Built-in GNSS receiver, GPS/GLONASS/BeiDou/QZSS/Galileo supported.
- Timing accuracy $\leq 50\text{ns}$.
- Better than $1.5\mu\text{s}$ over 4hours @ $\pm 10^{\circ}\text{C}$ variation without SyncE.
- Reference clock could be derived from GNSS.
- Firmware could be updated remotely.
- Operation temperature $0^{\circ}\text{C}\sim 75^{\circ}\text{C}$.



3 Interfaces Definition

3.1 SMA Connector

A SMA-KWE(P9) connector is placed on the top of the PCB for GNSS RF input.

3.2 1X2 RJ45 Connector

1X2 RJ45(J6), 6368459-1, is the interface for 1PPS+TOD output(A) and CONSOLE(B), 115200-N-1-1, placed on the top of the PCB.

3.3 SFP Connector

Two SFP(J3,J5), are IEEE 1588v2 1000Base-X with SyncE connectors.

3.4 Other Connectors

Connector	Pin	Description
J1	1、 2	+5V
	3、 4	+12V, Supply Voltage
	5、 6	GND
J4	1	GND
	2	+12V
J2	1	GNSS state, LVTTTL
	2	NC
	3	GND
	4	GNSS lock, LVTTTL
	5	+5V
	6	MPOW_ALM_IN, LVTTTL
	7	SPOW_ALM_IN, LVTTTL
	8	10M_OUT, LVTTTL
	9	GND
	10	UART_RX, LVTTTL
	11	UART_TX, LVTTTL
J4	1	GND, NC
	2	+12V, NC
J7	1	GND
	2	RS232-RX
	3	RS232-TX

Table 1 Interfaces Definition



4 Electrical Characteristics

GNSS Timing Modules Input	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Connector	SMA-KWE				
Supply Voltage	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Supply Voltage	7	12	17	V	
	Current Consumption			1000	mA	
	Steady Consumption		500		mA	During steady state @25°C
	Connector	Refer to Table 1				
SFP Indication	Parameters	Description				
	Color	Green				
	Status	Once per second: Link up: Off: Link down				
	PCB silk-screen	D5:SFP2 D6:SFP1				
Performance	Parameters	Min.	Typ.	Max	Unit.	
	Warm-up Time			15	min	V _C =12.0V@25°C
	Frequency Tolerance vs. Temperature	-0.2		+0.2	× 10 ⁻⁹	V _C =12.0V, temperature slope is less than 2°C per minute.
	Aging Tolerance Per Day	-0.2		+0.2	× 10 ⁻⁹	T _A =25°C V _C =12V
	Aging Tolerance 1 Year	-0.01		+0.01	× 10 ⁻⁶	T _A =25°C V _C =12.0V after power on 30 days
	Lock-In Time			30	minute	T _A =25°C V _C =5.0V After warm-up is finished.
	Time Accuracy	-50		+50	ns	T _A =25°C V _C =12.0V



						An hour after locking to reference
	Holdover	-1.5		+1.5	us	$\Delta T = \pm 10^\circ\text{C}$, 4hours holdover after power on 7days and 2 days lock.

5 Software Description

5.1 Protocol Key Features

CC1617-DPSYNC supports a UBX proprietary protocol to communicate with a host computer. This protocol has the following key features:

- Compact - uses 8-bit Binary Data.
- Checksum Protected - uses a low-overhead checksum algorithm

5.2 CBM-STA

<i>Message</i>	CBM-STA		
<i>Description</i>	Status		
<i>Firmware</i>	Supported on: version = " 1.0"		
<i>Type</i>	Get		
<i>Comment</i>	Output the status of PTP card		
<i>Message Structure</i>	<i>Header</i>	<i>Payload</i>	<i>Checksum</i>
	CBM	See below	CK_A CK_B
<i>Payload Contents:</i>			
<i>Byte Offset</i>	<i>Name</i>	<i>Description</i>	
0	Software version	00~0F	
1	Hardware version	00~0F	
2	BD satellite number	00~0F	
3	GPS satellite number	00~0F	
4	GNSS mode	50:BD;0A:GPS;5A:GPS+BD	
5	Power alarm	sys_run=1,bakup=1:11; sys_run=0,bakup=1: 01; sys_run=1,bakup=0 :10; sys_run=0,bakup=0: 00	
6	Synchronous status	Sync: AA; out-sync: 55	
7	Synchronous accuracy	-8ns:08; 99ns: 99. Exceed 256ns: FF	
8	PTP0 status	00:down;01:10M full duplex optical port ;02: 10M half duplex optical port; 03:100M full duplex optical port ;04: 100M half duplex optical port; 05:1000M full duplex optical port ;06: 1000M half duplex optical port; 11:10M full duplex electric port ;12: 10M half duplex electric port; 13:100M full duplex electric port ;14: 100M half duplex electric	



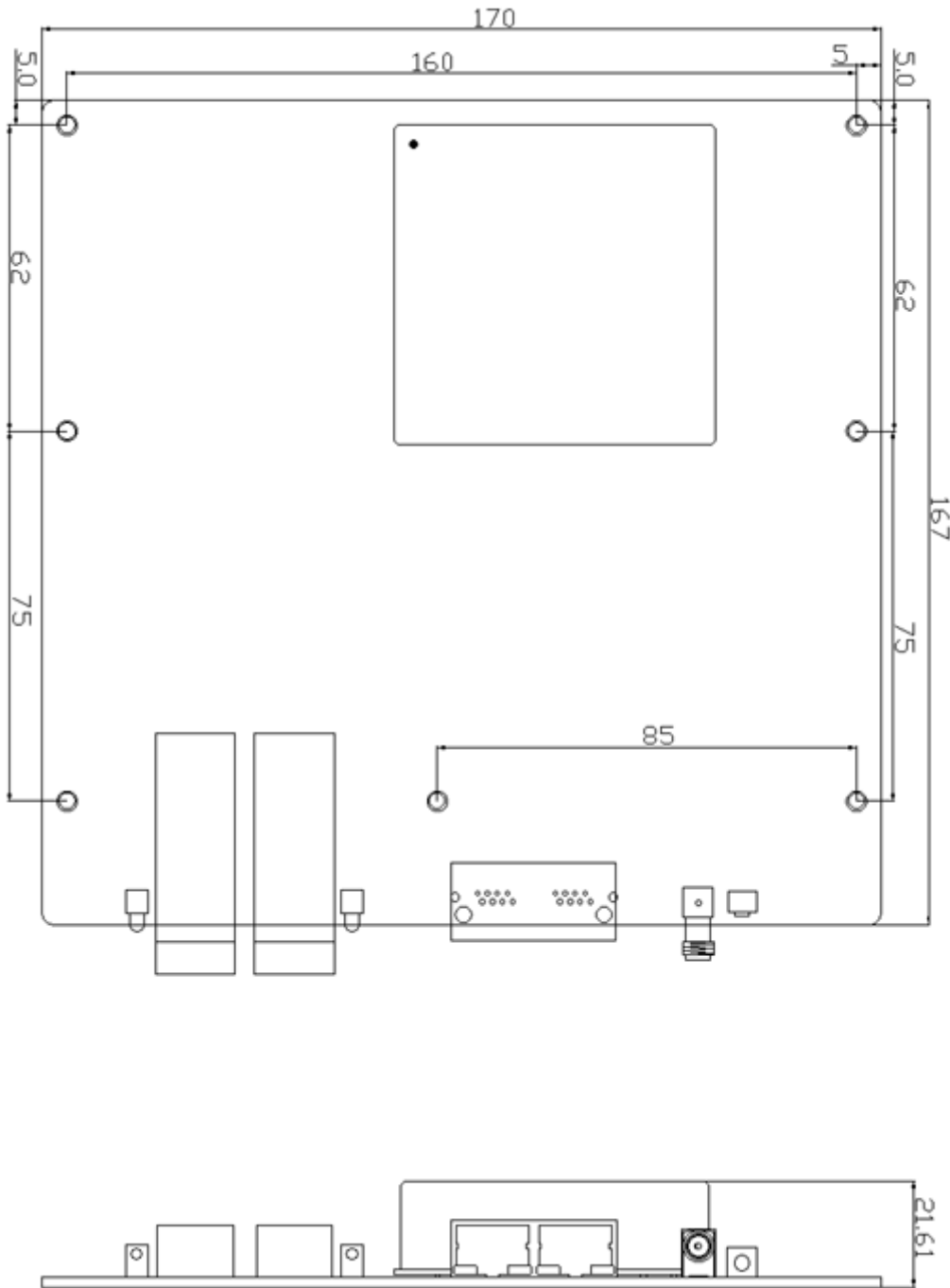
		port; 15:1000M full duplex electric port ;16: 1000M half duplex electric port
9	PTP1 status	00:down;01:10M full duplex optical port ;02: 10M half duplex optical port; 03:100M full duplex optical port ;04: 100M half duplex optical port; 05:1000M full duplex optical port ;06: 1000M half duplex optical port; 11:10M full duplex electric port ;12: 10M half duplex electric port; 13:100M full duplex electric port ;14: 100M half duplex electric port; 15:1000M full duplex electric port ;16: 1000M half duplex electric port
10	GNSS status	Normal: AA; Short: FF; Open: 00
11	Reserve	AA
12	Product SN	Get Core-board CPU SN, High numbers
13	Product SN	Get Core-board CPU SN
14	Product SN	Get Core-board CPU SN
15	Product SN	Get Core-board CPU SN, Low numbers
16	Checksum	XOR

6 Environmental Characteristics

		Min.	Typ.	Max	Unit.	
Environmental Conditions	Operable Temperature	0		+75	°C	
	Storage Temperature	0		+75	°C	
	ESD Level	Human Body Model, class 2: 2000V to 4000V; ANSI/ESDA/JEDEC JS-001-2010.				
		Machine Model, class B: 200V to 400V; JEDEC JESD22-A115C.				
	Moisture Sensitivity Level	Level 2.				
	Vibration	Test Condition:0.75mm;acceleration:10g;10Hz~500Hz,one cycle per 30min,test 2 hours.(3 times for each direction X, Y, Z),IEC 68-2-06 Test Fc.				
	Shock	50g;11ms;half sine wave(3 times for each direction X,Y,Z),IEC 68-2-27 Test Ea/Severity 50A.				



7 Mechanical Structure(mm)



Note1: Tolerance $\pm 1.0\text{mm}$



8 ROHS-6

The CC1617-DPSYNC meets the ROHS-6 requirements.

- 1、Pd < 1000ppm.
- 2、Cd < 100ppm.
- 3、Hg < 1000ppm.
- 4、Cr+6 < 1000ppm.
- 5、PBBS < 1000ppm.
- 6、PBDEs < 1000ppm.

9 Package(mm)

