Travelling Merchant:_____

DATASHEET

Standard: **CM22B-A118-25.60MHz**

P/N: _____

Plot			The Label
Drew	Audited	Approved	
Amway.wei	Steven.Sun	James.Liu	
Date: 2014.10.13			Stamp, please! Thanks!

Guangdong Dapu Telecom Technology Co.,Ltd

Bldg13-16,.N.Ind.Zone,SSL Industry Park, GuangDong City, Guangdong Province, China

TEL：0086-0769-88010888 FAX：0086-0769-81800098

Bldg13-16,.N.Ind.Zone,SSL Industry Park, Dongguan City, Guangdong Province, PRC China
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FAX:0086-0769-81800098

Table of amendment

Version	Revision contents	Prepared by	Revised date
1.0	The first issued	Amway	2014.08.15
1.1	"Short-term Stability", "Warm-Up", "Aging", "Phase Noise", "current", "Functional Block Diagram", "The External DAC Control Flow", "Workflow Diagram" and "Mechanical Structure" change	Amway	2014.10.11
1.2	"Frequency Tolerance vs. Operating Temperature Range" add	Amway	2014.10.13

Bldg13-16,.N.Ind.Zone,SSL Industry Park, Dongguan City, Guangdong Province, PRC China
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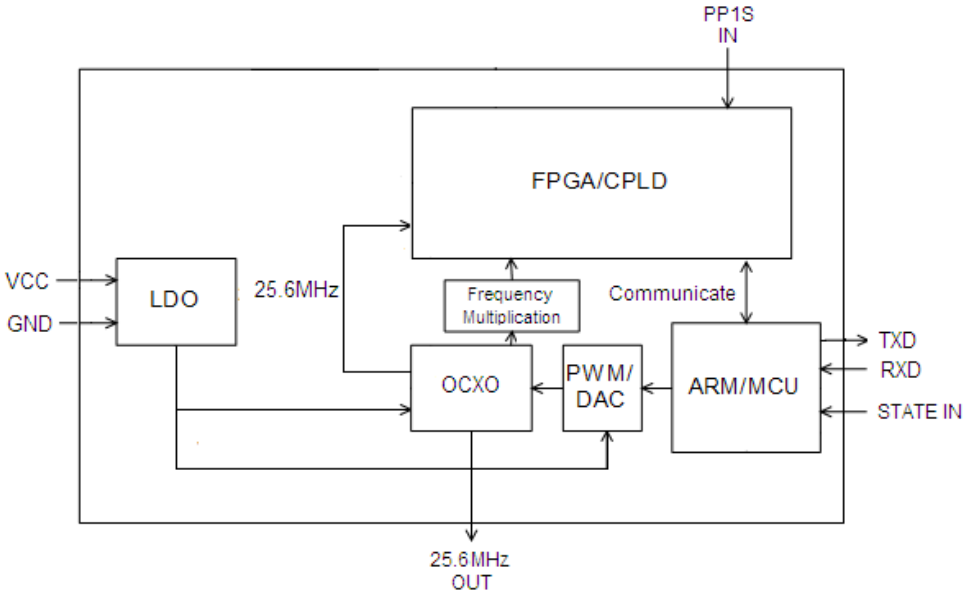
1. Electrical Parameters

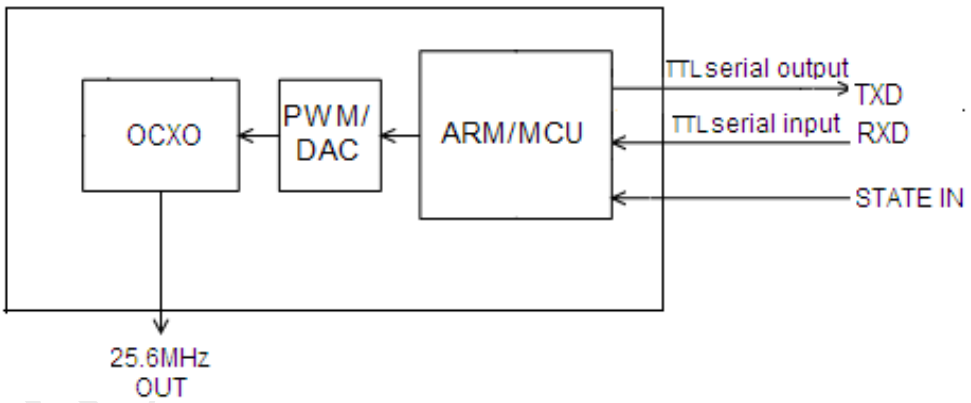
1 PPS Reference Input	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Waveform		HCMOS			
	High-Level Output Voltage (V_{IH})	2.4		3.4	V	50Ω
	Low-Level Output Voltage (V_{IL})			0.4	V	
	Pulse Width	10			μs	
	Connector		Pin 4			
State Input	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	1PPS IN	2.4		3.4	V	<5mA Load
	DAC IN			0.4	V	<5mA Load
	Connector		Pin 1			
RF Output	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Nominal Frequency		25.60		MHz	Synchronization with input 1PPS
	Waveform		Sine wave			
	Level	6		10	dBm	
	Load		50		Ω	
	Harmonics Suppression			-30	dBc	
	Spurious Suppression			-60	dBc	
	Frequency Tolerance vs. Operating Temperature Range	-0.01		+0.01	$\times 10^{-6}$	T_A varied from-40℃ to 85℃, measurement referenced to frequency observed with $f_{ref}=(f_{max}+f_{min})/2$, V_{cc}=3.3V , O_{load}=50Ω, temperature variable speed less than 2℃per minute.
	Accuracy	-0.01		+0.01	$\times 10^{-9}$	24 hours average when locked to 1PPS after power on 2days.
	Short-term Stability	-0.1		+0.1	$\times 10^{-9}$	Temperature stability, no EMI\EMC or other interference, test after power for 1 hour ref. to 25℃; 1s, using PN9000 equipment.
	Warm-Up	-1		+1	$\times 10^{-6}$	T_A=25℃, V_{cc}=3.3V constant measurement referenced to 25.6MHz, after power on 3min with GPS lock.
	Aging Tolerance Per Day	-5		+5	$\times 10^{-9}$	Constant measurement referenced to frequency observed with T_A=25℃, Vcc =3.3V, after 30days of operation.
	Aging Tolerance 1 Year	-0.5		+0.5	$\times 10^{-6}$	

	Phase Noise (All conditions)		-100	-90	dBc/Hz	10Hz
			-130	-120		100Hz
			-148	-143		1KHz
			-152	-148		10KHz
			-155	-150		100KHz
			-155	-150		1MHz
	Connector	Pin8				
Holdover Capability	Holdover Time	Min.	Typ.	Max.	Unit.	Test Condition
	24 Hours	-0.2		+0.2	$\times 10^{-6}$	($f_{max}-f_{min}$) @ΔT=±15℃, 24 hours holdover after lock 1PPS and power on 1day. Temperature variable speed less than 2℃per minute
Supply Voltage	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Supply Voltage	3.13	3.3	3.47	V	
	Warm up current			450	mA	
	Steady Consumption			250	mA	@25℃
	AC Ripple			50	mVpk-pk	10Hz to 1MHz
	Connector	Pin 2				
RXD/TXD Characteristics	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	high-level Input Voltage (VH)	2.4		3.4	V	
	low-level Input Voltage (VL)			0.4	V	
	Serial Protocol	9600-N-8-1				
	Connector	Pin5 / Pin6				
Environmental Conditions	Parameter	Conditions				
	Operating Temperature	-40℃ to 85℃				
	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 hours. (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.				

2. Functional Block Diagram



3. The External DAC Control Flow



When the State In was set low or the Satellite lost, the module can adjust the OCXO 25.6MHz output frequency to track the DAC Signal of 25.6MHz with DAC Signal.

DAC communication protocol:

1. Write DAC

START	ADDRESS	R/W	RESERVED	MSB	LSB	CK	STOP

START: 0x24

ADDRESS: 0x50

R/W: Read: 0x00

Write: 0x01

RESERVED: 0x02

CK: CHECKOUT. CK=START xor ADDRESS xor R/W xor RESERVED xor STOP

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MSB: the 16 bite DAC big eight

LSB: the 16 bite DAC low eight

STOP: 0x01

Eg.

When the RXD sent “24 50 01 02 00 01 76 01”, that means write DAC “0x0001”

TXD sent “24 50 02 02 00 01 75 01”

2. Read DAC

START	ADDRESS	R/W	RESERVED	MSB	LSB	CK	STOP

START: 0x24

ADDRESS: 0x50

R/W: Read: 0x00

Write: 0x01

RESERVED: 0x02

CK: CHECKOUT. CK=START xor ADDRESS xor RESERVED xor RESERVED xor STOP

MSB: the 16 bite DAC big eight

LSB: the 16 bite DAC low eight

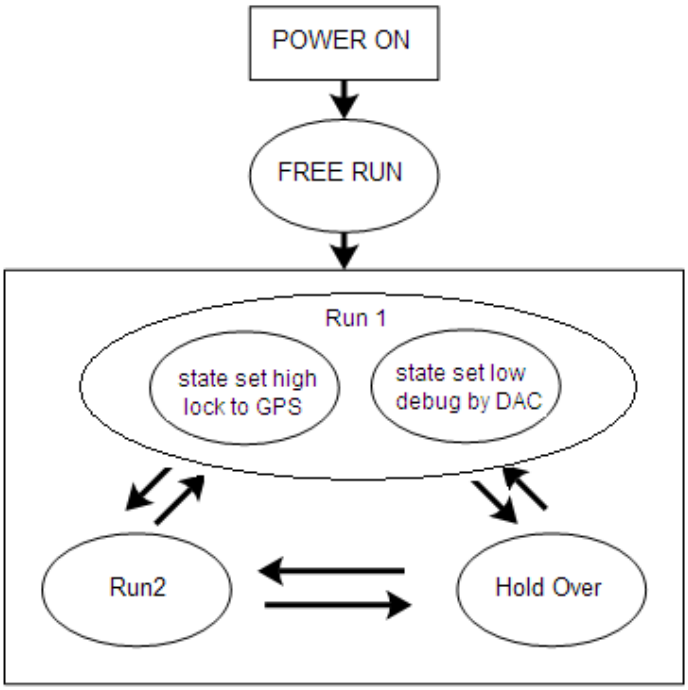
STOP: 0x01

Eg.

IF the DAC was set “0x8000”

When the RXD sent “24 50 00 02 XX XX 77 01”, TXD sent “24 50 00 02 80 00 75 01”.

4. Workflow Diagram



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Run1: Fast track.

State High : adjust the OCXO 25.6MHz output frequency quickly to track the PP1S of 25.6MHz with PP1S reference.

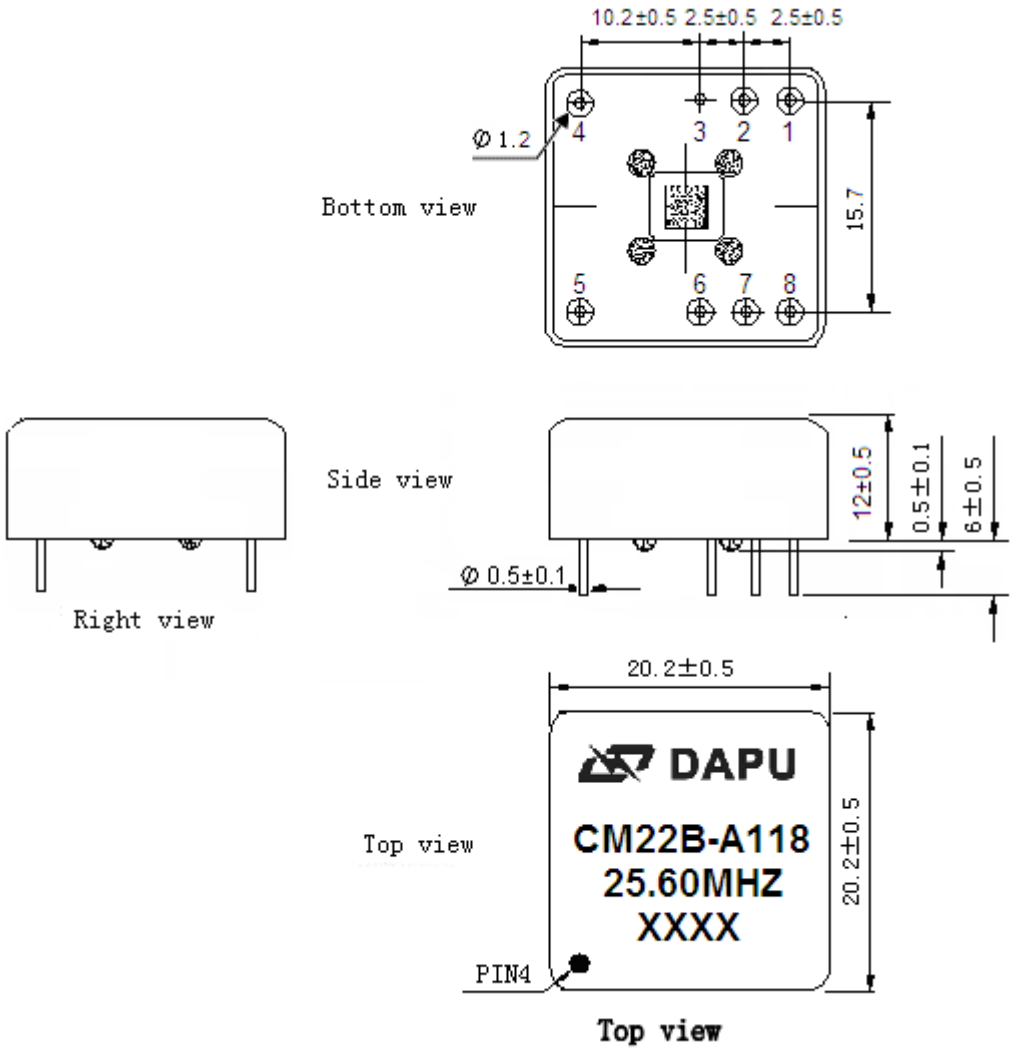
State Low : adjust the OCXO 25.6MHz output frequency quickly to track the DAC Signal of 25.6MHz with DAC Signal.

Run2: Slow track. Adjust the OCXO 25.6MHz output frequency slowly in order to synchronization with the PP1S reference when the phase error is in the define range.

Hold Over: PP1S reference and DAC Signal fixed, an algorithm has been developed which enables adaptive modeling of the frequency stability of OCXO with reference to PP1S signal.

Free Run: Clock module power on without PP1S reference or DAC fixed before Fast track.

5. Mechanical Structure(mm)

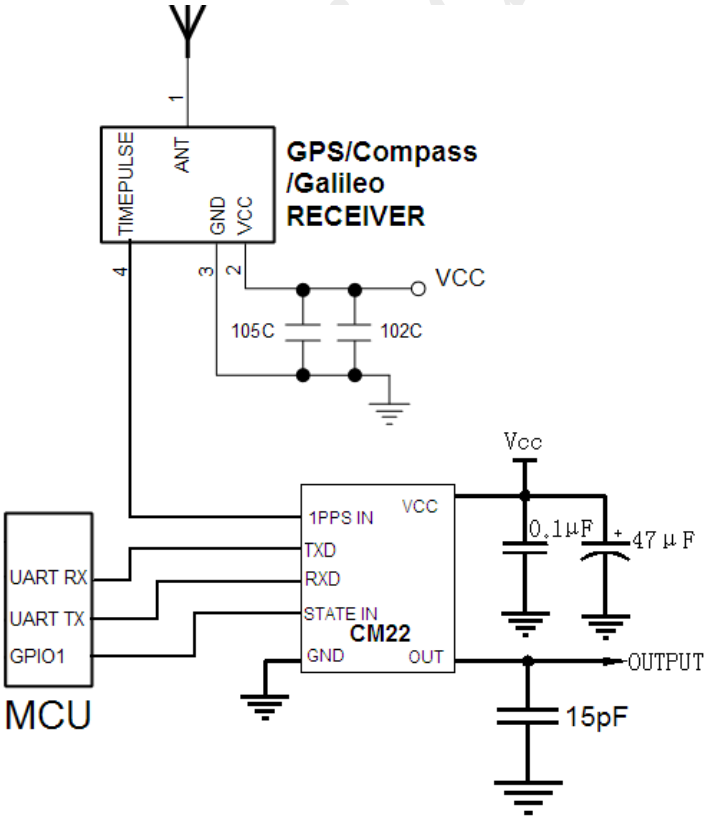


Note1: Tolerance ±0.2mm without mark

Note2: The first two xx representative: week
After two xx representative: year

PIN DEFINITION			
PIN	**NAME**		**DESCRIPTION**
1	State Input	H: Lock	The clock module lock to PP1S reference when the state pin set high
		L: DAC	The clock module debug the output frequency by DAC when the state pin set low
2	VCC		Power supply: 3.13V to 3.47V
3	GND		GND
4	PP1S Input		PP1S reference input
5	RXD		The external DAC signal input. Asynchronous serial data input.9600-N-8-1.
6	TXD		Output the DAC signal when read DAC. Asynchronous serial data input.9600-N-8-1.
7	NC		NC
8	25.6MHz OUTPUT		25.6MHz OCXO frequency output, synchronization with PP1S reference.

6. Typical Application



Satellite receiver offer 1PPS signal to the clock module CM22B.
The MCU offer DAC signal to the clock module CM22B.
The MCU monitor the work state of CM22B.
The CM22B power of 3.3V.

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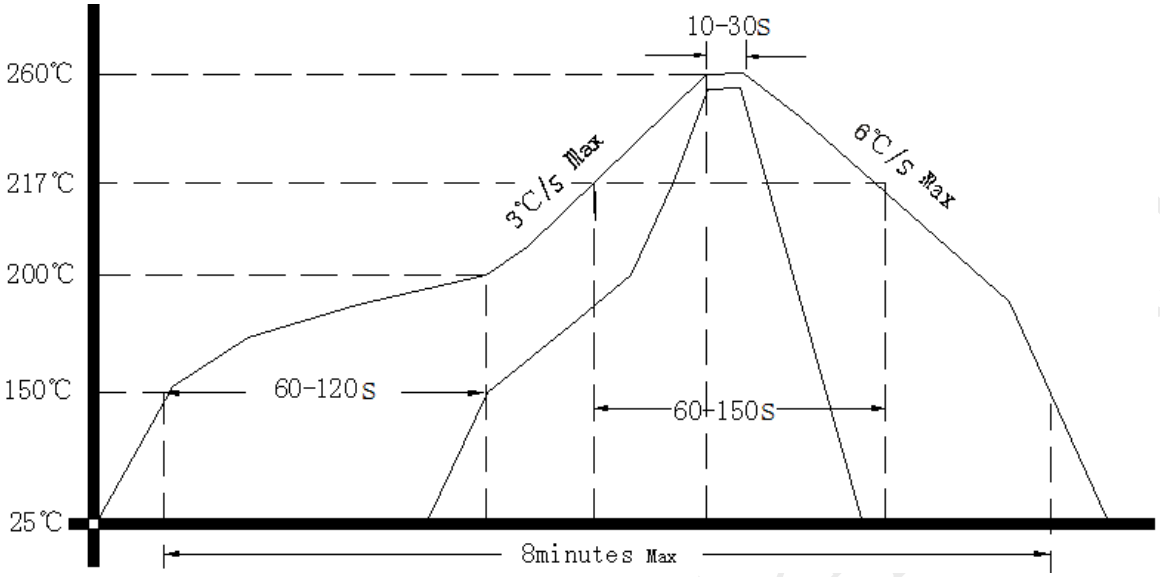
7. Reflow Soldering Curve (RoHS)



8. Package（mm）