Guangdong Dapu Telecom Technology Co., Ltd

http://www.dptel.com

Bldg 16,.N.Ind.Zone,SSL Industry Park,
Dongguan City, Guangdong Province,
PRC China
TEL:0086-0769-88010888
FAX:0086-0769-81800098

W/DP RD-Q4187-01-A1

Customer Code : ____________________

DATASHEET

DAPU P/N: **J710-Y125-10.00MHz-A**

Customer P/N: ____________________________

DAPU			Customer Approval
Drew	Audited	Approved	
Amway.wei	Carry.Wang	James.Liu	
Date: 2017. 04.17			Stamp, please! Thanks!

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Table of amendment

Version	Revision contents	Prepared by	Revised date
1.0	The first issued	Amway	2017.04.17

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1. Electrical Parameters

<table>
<tr><td rowspan="6">1 PPS Reference Input</td><td>Parameters</td><td>Min.</td><td>Typ.</td><td>Max.</td><td>Unit.</td><td>Test Condition</td></tr>
<tr><td>Waveform</td><td colspan="3">HCMOS</td><td></td><td></td></tr>
<tr><td>High-Level Input Voltage (V_{IH})</td><td>2.7</td><td></td><td></td><td>V</td><td rowspan="3"><5mA Load</td></tr>
<tr><td>Low-Level Input Voltage (V_{IL})</td><td></td><td></td><td>0.4</td><td>V</td></tr>
<tr><td>Pulse Width</td><td>10</td><td></td><td></td><td>μs</td></tr>
<tr><td>Connector</td><td colspan="4">Pin 10</td><td></td></tr>
<tr><td colspan="7"></td></tr>
<tr><td rowspan="4">State Input</td><td>Parameters</td><td>Min.</td><td>Typ.</td><td>Max.</td><td>Unit.</td><td>Test Condition</td></tr>
<tr><td>Lock</td><td>2.7</td><td></td><td></td><td>V</td><td><5mA Load</td></tr>
<tr><td>Holdover</td><td></td><td></td><td>0.4</td><td>V</td><td><5mA Load</td></tr>
<tr><td>Connector</td><td colspan="4">Pin 8</td><td></td></tr>
<tr><td colspan="7"></td></tr>
<tr><td rowspan="18">RF Output</td><td>Parameters</td><td>Min.</td><td>Typ.</td><td>Max.</td><td>Unit.</td><td>Test Condition</td></tr>
<tr><td>Nominal Frequency</td><td colspan="3">10.00</td><td>MHz</td><td></td></tr>
<tr><td>Waveform</td><td colspan="3">HCMOS</td><td></td><td></td></tr>
<tr><td>High-level Output Voltage (V_{OH})</td><td>2.7</td><td></td><td></td><td>V</td><td>< 5mA Load</td></tr>
<tr><td>Low-level Output Voltage (V_{OL})</td><td></td><td></td><td>0.4</td><td>V</td><td>< 5mA Load</td></tr>
<tr><td>Rise/Fall Time</td><td></td><td></td><td>8</td><td>ns</td><td>< 5mA Load</td></tr>
<tr><td>Duty Cycle</td><td>45</td><td>50</td><td>55</td><td>%</td><td>< 5mA Load</td></tr>
<tr><td>Accuracy</td><td>-1</td><td></td><td>+1</td><td>$\times10^{-12}$</td><td>24 hours average when locked to 1 PPS</td></tr>
<tr><td>Short-term Stability</td><td></td><td></td><td>0.02</td><td>$\times10^{-9}$</td><td>Temperature stability, no EMI\EMC or other interference, test after power for 1 hour ref. to 25℃; 1s, using PN9000 equipment.</td></tr>
<tr><td>Aging Tolerance Per Day</td><td>-0.2</td><td></td><td>+0.2</td><td>$\times10^{-9}$</td><td rowspan="2">V_{cc} ,T_A constant measurement referenced to frequency observed with T_A=25℃, V_{cc}=5.0V, in FREE RUN condition and after 30 days of operation.</td></tr>
<tr><td>Aging Tolerance 1 Year</td><td>-0.01</td><td></td><td>+0.01</td><td>$\times10^{-6}$</td></tr>
<tr><td rowspan="6">Phase Noise (All conditions)</td><td></td><td>-118</td><td>-113</td><td rowspan="6">dBc/Hz</td><td>10Hz</td></tr>
<tr><td></td><td>-138</td><td>-133</td><td>100Hz</td></tr>
<tr><td></td><td>-148</td><td>-143</td><td>1KHz</td></tr>
<tr><td></td><td>-150</td><td>-145</td><td>10KHz</td></tr>
<tr><td></td><td>-150</td><td>-145</td><td>100KHz</td></tr>
<tr><td></td><td>-150</td><td>-150</td><td>1MHz</td></tr>
<tr><td>Connector</td><td colspan="4">Pin 14</td><td></td></tr>
</table>

	Holdover Time	Min.	Typ.	Max.	Unit.	Test Condition
Holdover Capability	24 Hours	-20		+20	μs	ΔT=±30℃, 24 hours holdover after turn on 2hours and lock 2 hours. Temperature variable speed less than 3℃per minute
	24 Hours	-10		+10	μs	ΔT=±30℃, 24 hours holdover after turn on 24hours and lock 24 hours. Temperature variable speed less than 3℃per minute
	168 Hours	-200		+200	μs	ΔT=±30℃, 24 hours holdover after turn on 24hours and lock 24 hours. Temperature variable speed less than 3℃per minute
	24 Hours	-10		+10	μs	ΔT=±10℃, 24 hours holdover after turn on 2hours and lock 2 hours. Temperature variable speed less than 3℃per minute
	24 Hours	-5		+5	μs	ΔT=±10℃, 24 hours holdover after turn on 24hours and lock 24 hours. Temperature variable speed less than 3℃per minute
	168 Hours	-100		+100	μs	ΔT=±10℃, 24 hours holdover after turn on 24hours and lock 24 hours. Temperature variable speed less than 3℃per minute

	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
Supply Voltage	Supply Voltage	4.75	5.0	5.25	V	
	Current Consumption			1700	mA	During Warm-up
				500	mA	During steady state operation @25℃
	AC Ripple			50	mVpk-pk	10Hz to 1MHz
	Connector	Pin 3				

	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
1 PPS Output Waveform Characteristics	Waveform	HCMOS				
	High-Level Output Voltage(V_{OH})	2.7			V	<5mA Load
	Low-level Output voltage (V_{OL})			0.4	V	
	Pulse Width	10			μs	
	Connector	Pin 12				

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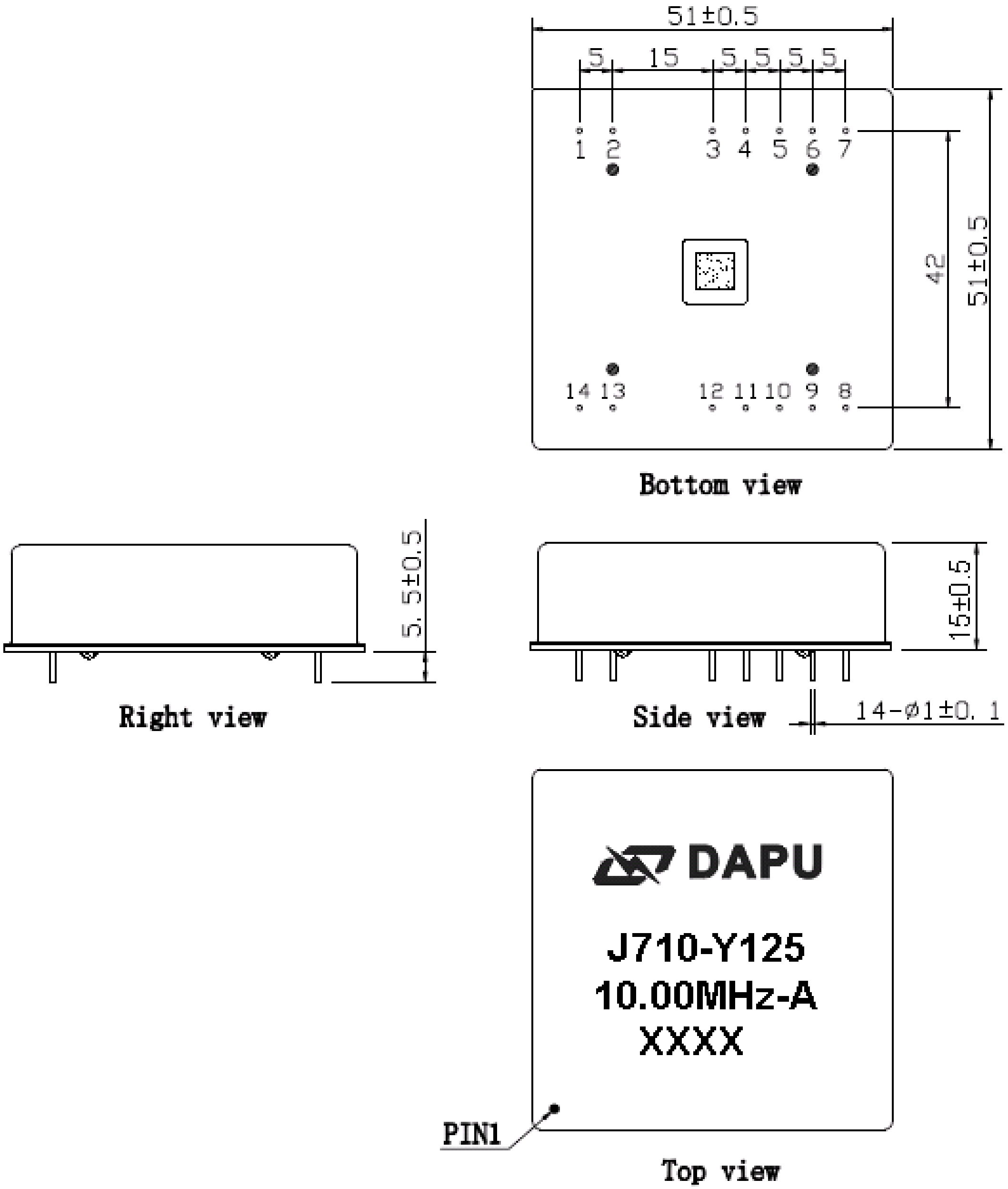
State Output	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Lock	2.7			V	<5mA Load
	Free run/Holdover			0.4	V	<5mA Load
	Connector	Pin 5				

Serial Interfaces	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Rx high-level Input Voltage (VH)	2.7			V	
	Rx low-level Input Voltage (VL)			0.4	V	
	Tx high-level Output Voltage (VH)	2.7			V	
	Tx low-level Output Voltage (VL)			0.4	V	
	Serial Protocol	9600-N-8-1				
	Connector	Pin6 and Pin7				

Environmental Conditions	Parameter	Conditions
	Operating Temperature	-40℃ 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 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.
Full Package Storage	Relative humidity (%)	20%～70%
	Temperature (℃)	-10~35℃

2. Mechanical Structure(mm)



Note1: Tolerance ± 0.20mm without mark

Note2: The first two xx representative: week

After two xx representative: year

Note3: Referential weight 52±5g

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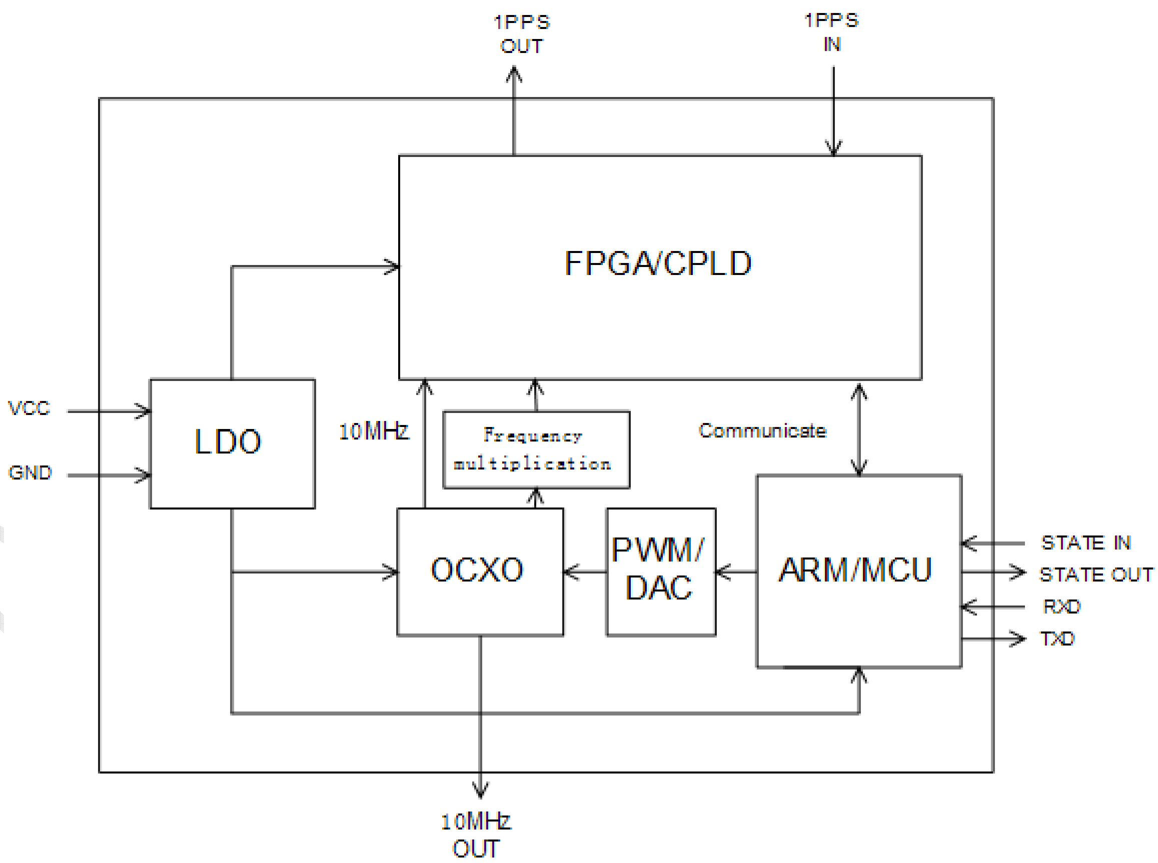
PIN DEFINITION			
PIN	**NAME**		**DESCRIPTION**
3	VCC		Power supply input, 4.75V to 5.25V.
5	State OUTPUT		State output. Output high level when the CM is locked and stable, others low level.
6	RX INPUT		Asynchronous serial data input. 9600-N-8-1.
7	TX OUTPUT		Asynchronous serial data output.9600-N-8-1.
8	State INPUT	H: Lock	The work state is set to normal operation when the state input is high.
		L: Holdover	The work state is set to hold over when the state input is low.
10	1PPS INPUT		1PPS reference input.
12	1PPS OUTPUT		The clock module 1PPS output .
14	10MHz OUTPUT		10MHz OCXO frequency output .
1、2、9	NC		Not connected.
4、11、13	GND		GND

3. Functional Block Diagram



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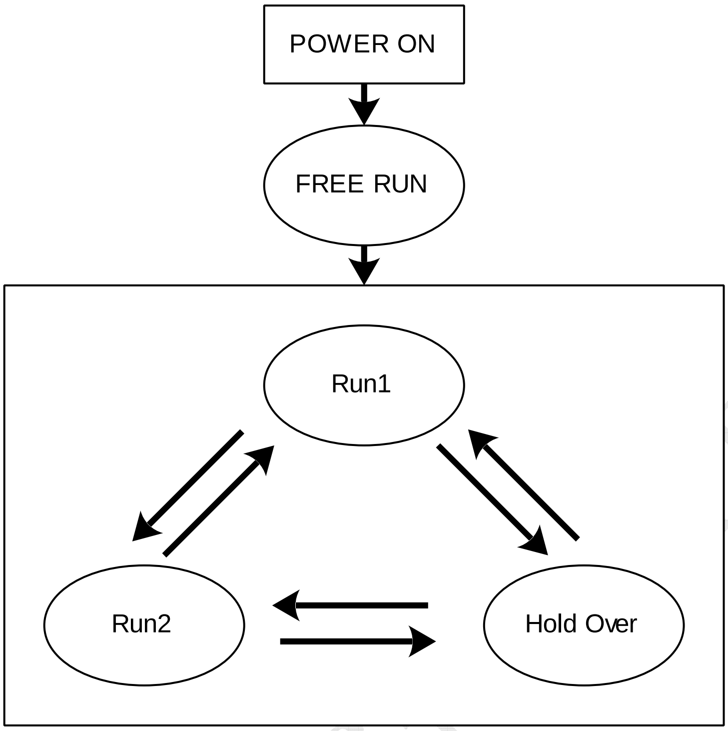
4. Workflow Diagram



Run1: Fast track. Adjust the OCXO 10MHz output frequency quickly to track the 1PPS of 10MHz with 1PPS reference.
Run2: Slow track. Adjust the OCXO 10MHz output frequency slowly when the phase error is in the define range.
Hold Over: GPS 1PPS reference miss, an algorithm has been developed which enables adaptive modeling of the frequency stability of an OCXO with reference to a GPS timing signal.
Free Run: Clock module power on without 1PPS reference anyway.

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5. 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,+000.0000,-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	ddddd.dddd	Current PWM1 (Voltage-controlled value1)	10
7	cPWM2	ddddd.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	ddddd.dddd	The average of the PWM in the last 1 hour	10
11	VCH1	ddddd.dddd	Voltage-controlled compensation value every 1 hour	10
12	HPMOD	ddddd.dddd	The Module PWM Value	
13	VCM10	ddddd.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

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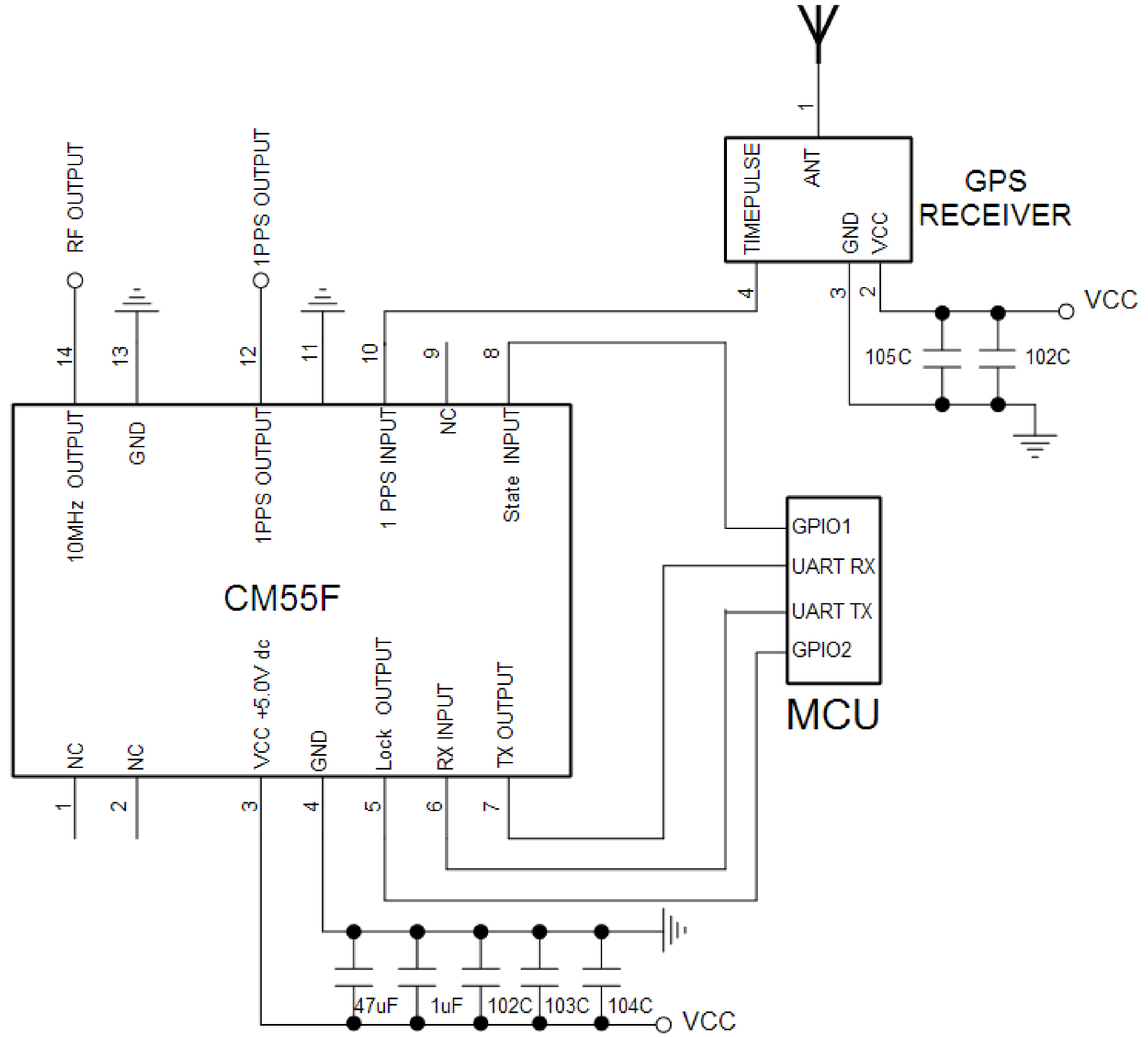
6. Application Information



GPS RECEIVER supply 1PPS signal to the clock module CM55F.

The MCU Monitors the work state of CM55F.

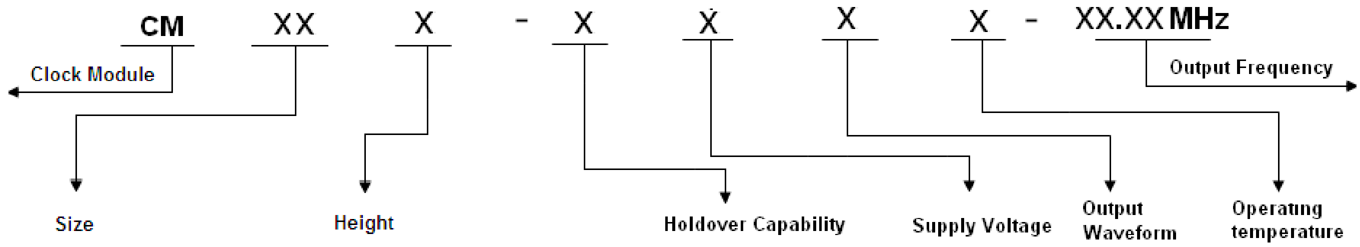
The CM55F is operated with a supply of 5V.

Note1: Power on more than seven days is necessary for the OCXO drift fast in the first four days.

Note2: The adaptive model can be built with at least two days good GPS signal. Every time power off will lose the model.

Note3: The work state is set to hold over when the state input is low, no matter the GPS 1PPS effective or not.

7. Coding Rules



Size

22	20×20 (mm)
55	50×50 (mm)
66	60×60 (mm)
65	65×65 (mm)
77	75×75 (mm)

Height

A	19mm,single Freq,external GPS receiver
B	19mm,single Freq,internal GPS receiver
C	19mm,single Freq,internal dual-mode receiver
F	13mm,single Freq,external GPS receiver
G	13mm,single Freq,internal GPS receiver
H	13mm,dual-Freqs,internal GPS receiver
K	13mm,single Freq,internal dual-mode receiver
L	13mm,dual-Freqs,internal dual-mode receiver
P	13mm,for PTP,1588 applications

Holdover Capability

A	±1.5μs	ΔT=±30℃	24hours
B	±3.0μs	ΔT=±30℃	24hours
C	±8.0μs	ΔT=±30℃	24hours
D	±1.5μs	ΔT=±5℃	24hours
E	±3.0μs	ΔT=±5℃	24hours
F	±8.0μs	ΔT=±5℃	24hours
K	±1.5μs	ΔT=±2℃	24hours
L	±3.0μs	ΔT=±20℃	12hours
M	±3.0μs	ΔT=±2℃	24hours
N	±8.0μs	ΔT=±2℃	24hours
Y	±8.0μs	ΔT=±5℃	24hours

Supply Voltage

1	5.0V

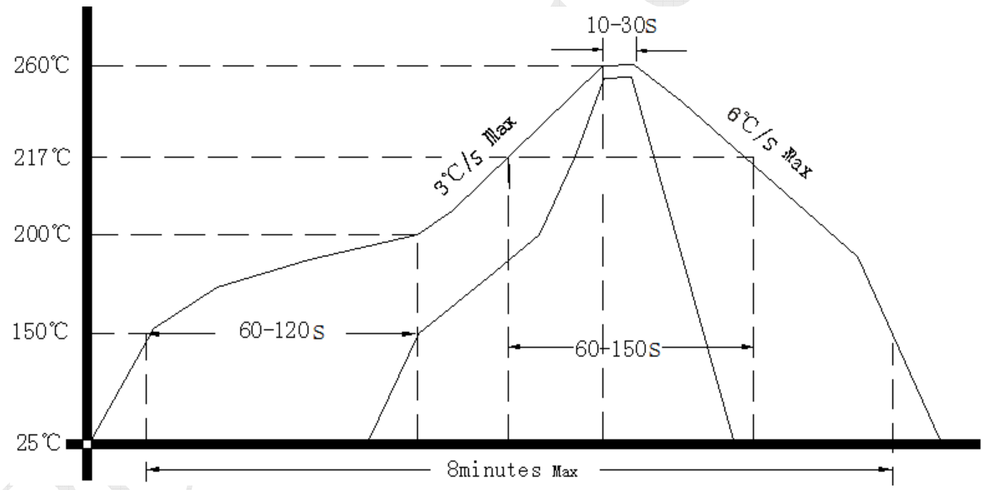
Output Waveform

1	Sine Wave
2	HCMOS

Operating temperature

1	0℃~80℃
2	-10℃~70℃
5	-40℃~75℃
9	-20℃~75℃

8. Reflow Soldering Curve (RoHS)



9. Package（mm）