Travelling Merchant:_____

DATASHEET

Standard: **CM55F-K128-10.00MHz**

P/N: _____

Plot			The Label
Drew	Audited	Approved	
Amway.wei	Steven.Sun	James.Liu	
Date: 2014.09.29			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
TEL:0086-0769-88010888
FAX:0086-0769-81800098

Table of amendment

Version	Revision contents	Prepared by	Revised date
1.0	The first issued	Amway	2014.09.29

Bldg13-16,.N.Ind.Zone,SSL Industry Park, Dongguan City, Guangdong Province, PRC China
TEL:0086-0769-88010888
FAX:0086-0769-81800098

1. Electrical Parameters

1 PPS Reference Input	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Waveform		HCMOS			
	High-Level Output Voltage (V_{IH})	2.7			V	50Ω
	Low-Level Output Voltage (V_{IL})			0.4	V	
	Pulse Width	10			μs	
	Connector		Pin 10			
State Input	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Lock	2.7			V	<5mA Load
	Holdover			0.4	V	<5mA Load
	Connector		Pin 8			
RF Output	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Nominal Frequency		10.00		MHz	
	Waveform		HCMOS			
	High-level Output Voltage (V_{OH})	2.7			V	< 5mA Load
	Low-level Output Voltage (V_{OL})			0.4	V	< 5mA Load
	Rise/Fall Time			8	ns	Load 15pF
	Duty Cycle	45	50	55	%	Load 15pF
	Accuracy	-1		+1	$\times10^{-12}$	24 hours average when locked to 1 PPS
	Short-term Stability			0.02	$\times10^{-9}$	Temperature stability, no EMI\EMC or other interference, test after power for 1 hour ref. to 25℃; 1s, using PN9000 equipment.
	Aging Tolerance Per Day	-0.2		+0.2	$\times10^{-9}$	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.
	Aging Tolerance 1 Year	-0.01		+0.01	$\times10^{-6}$	
	Phase Noise (All conditions)		-118	-113	dBc/Hz	10Hz
			-138	-133		100Hz
			-148	-143		1KHz
			-150	-145		10KHz
			-150	-145		100KHz
			-150	-150		1MHz
	Connector		Pin 14			

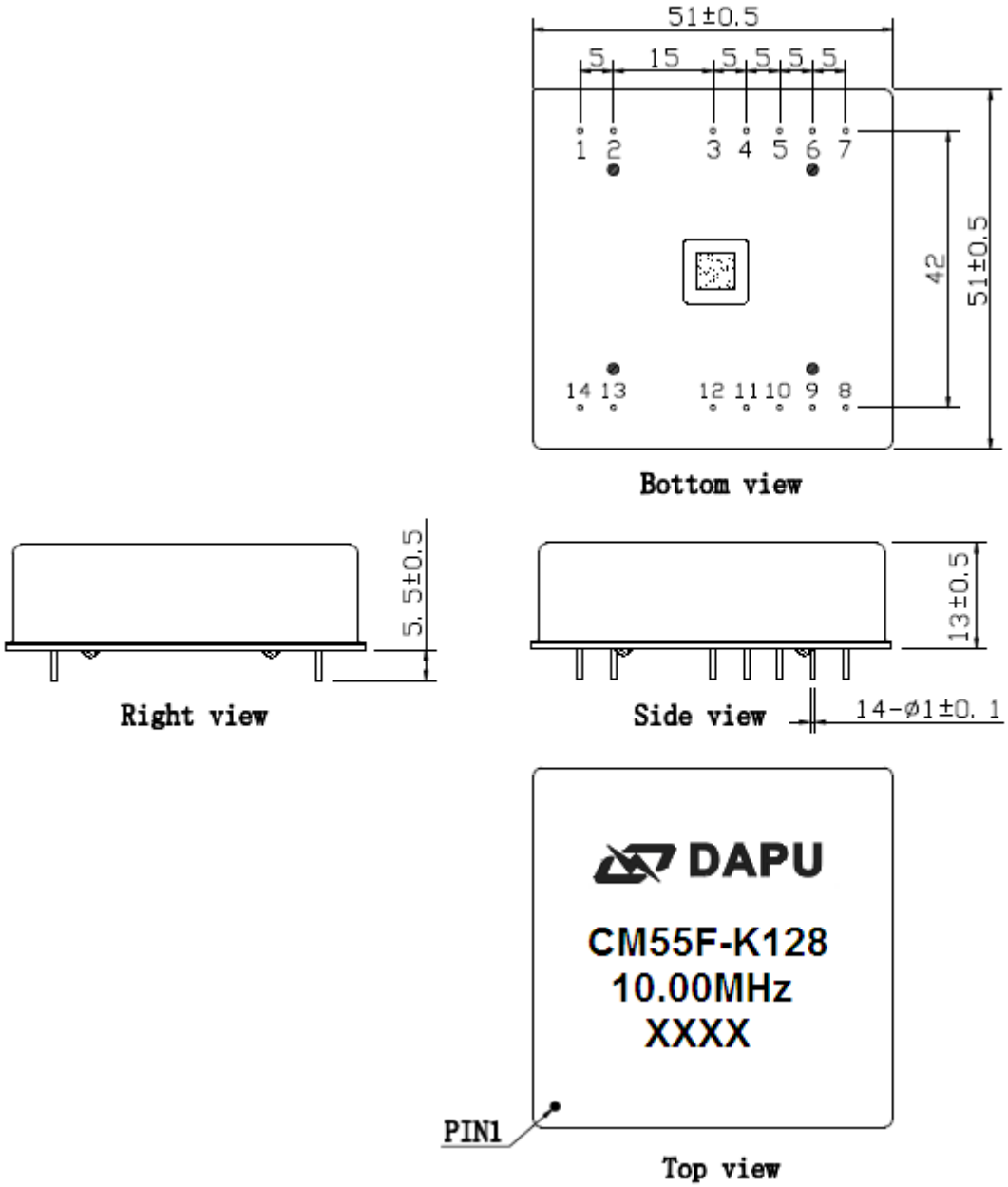
Bldg13-16,.N.Ind.Zone,SSL Industry Park, Dongguan City, Guangdong Province, PRC China
TEL:0086-0769-88010888
FAX:0086-0769-81800098

Holdover Capability	Holdover Time	Min.	Typ.	Max.	Unit.	Test Condition
	24 Hours	-1.5		+1.5	μs	ΔT=±2℃, 24 hours holdover after turn on 7days and lock 3days. Temperature variable speed less than 1℃per minute
Supply Voltage	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Supply Voltage	4.75	5.0	5.25	V	
	Current Consumption			2500	mA	During Warm-up
				1000	mA	During steady state operation @25℃
	AC Ripple			50	mVpk-pk	10Hz to 1MHz
	Connector	Pin 3				
1 PPS Output Waveform Characteristics	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Waveform	HCMOS				
	High-Level Output Voltage(V_{OH})	2.7			V	50Ω
	Low-level Output voltage (V_{OL})			0.4	V	
	Pulse Width	10			μs	
	Connector	Pin 12				
State Output	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Lock	2.7			V	<5mA Load
	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				

Bldg13-16,.N.Ind.Zone,SSL Industry Park, Dongguan City, Guangdong Province, PRC China
TEL:0086-0769-88010888
FAX:0086-0769-81800098

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. Mechanical Structure(mm)



Note1: Tolerance ± 0.2mm without mark

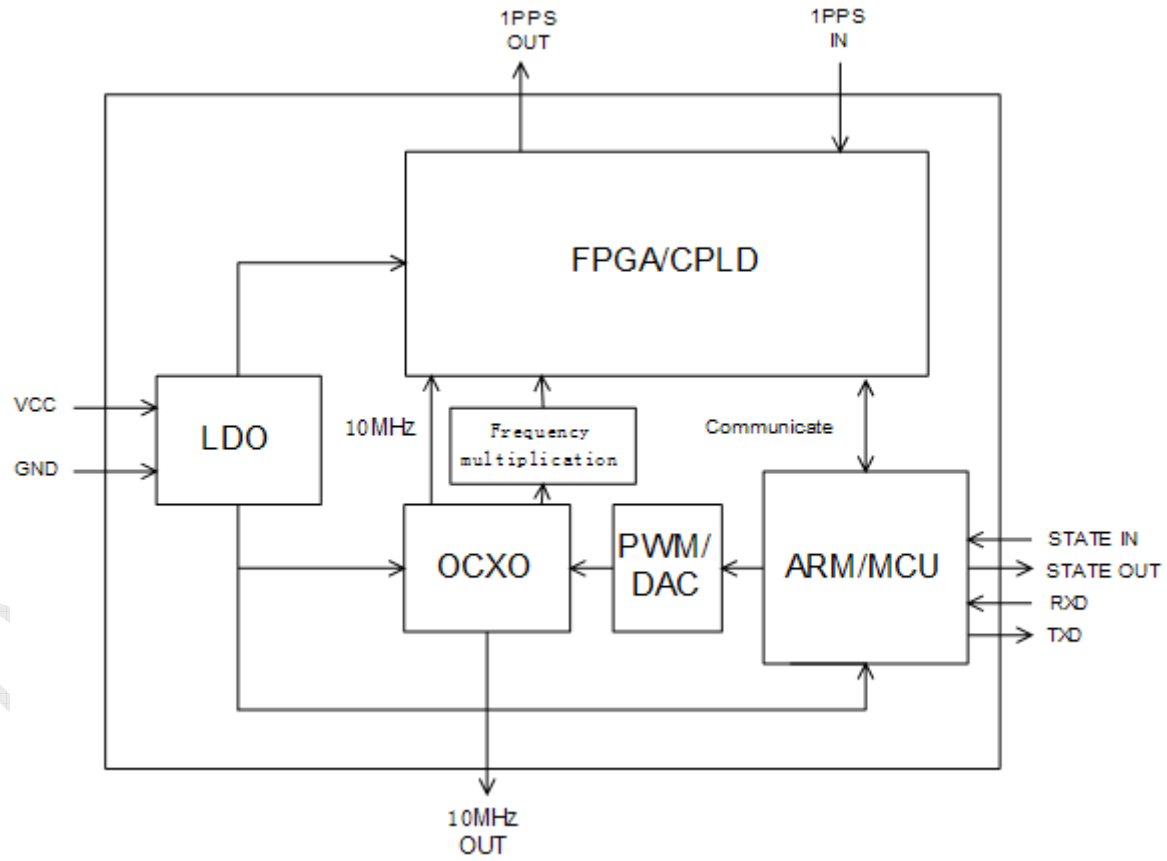
Note2: The first two xx representative: week
After two xx representative: year

Note3: Referential Weight 52±5g

Bldg13-16,.N.Ind.Zone,SSL Industry Park, Dongguan City, Guangdong Province, PRC China
TEL:0086-0769-88010888
FAX:0086-0769-81800098

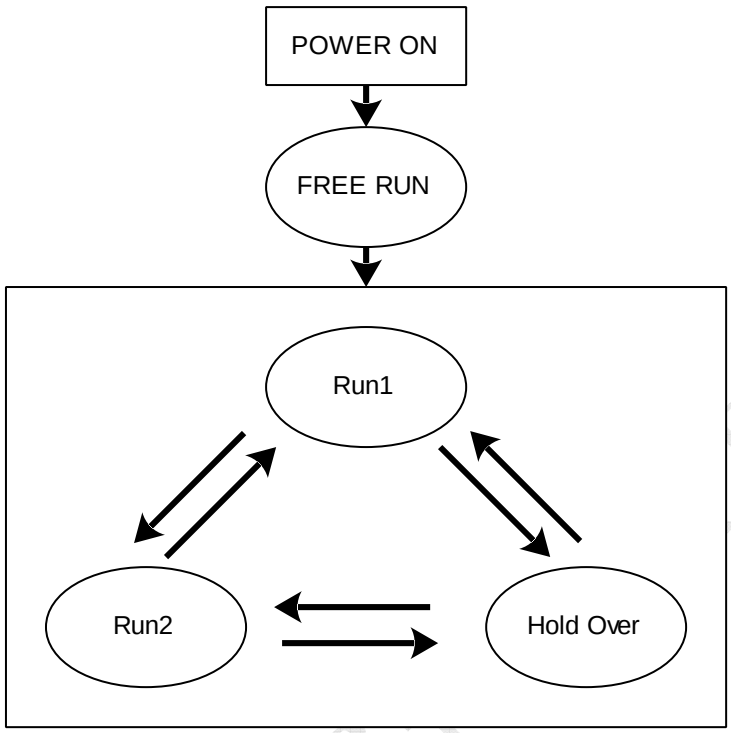
PIN DEFINITION			
PIN	**NAME**		**DESCRIPTION**
3	VCC		Power supply input, 4.75V to 5.25V.
5	State OUTPUT		State output. Output high level when the CM is locked and stable, others low level.
6	RX INPUT		Asynchronous serial data input. 9600-N-8-1.
7	TX OUTPUT		Asynchronous serial data output.9600-N-8-1.
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



Bldg13-16,.N.Ind.Zone,SSL Industry Park, Dongguan City, Guangdong Province, PRC China
TEL:0086-0769-88010888
FAX:0086-0769-81800098

4. Workflow Diagram



Run1: Fast track. Adjust the OCXO 10MHz output frequence quickly to track the 1PPS of 10MHz with 1PPS reference.
Run2: Slow track. Adjust the OCXO 10MHz output frequence 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.

Bldg13-16,.N.Ind.Zone,SSL Industry Park, Dongguan City, Guangdong Province, PRC China
TEL:0086-0769-88010888
FAX:0086-0769-81800098

5. The Product Test Output Message

Example:

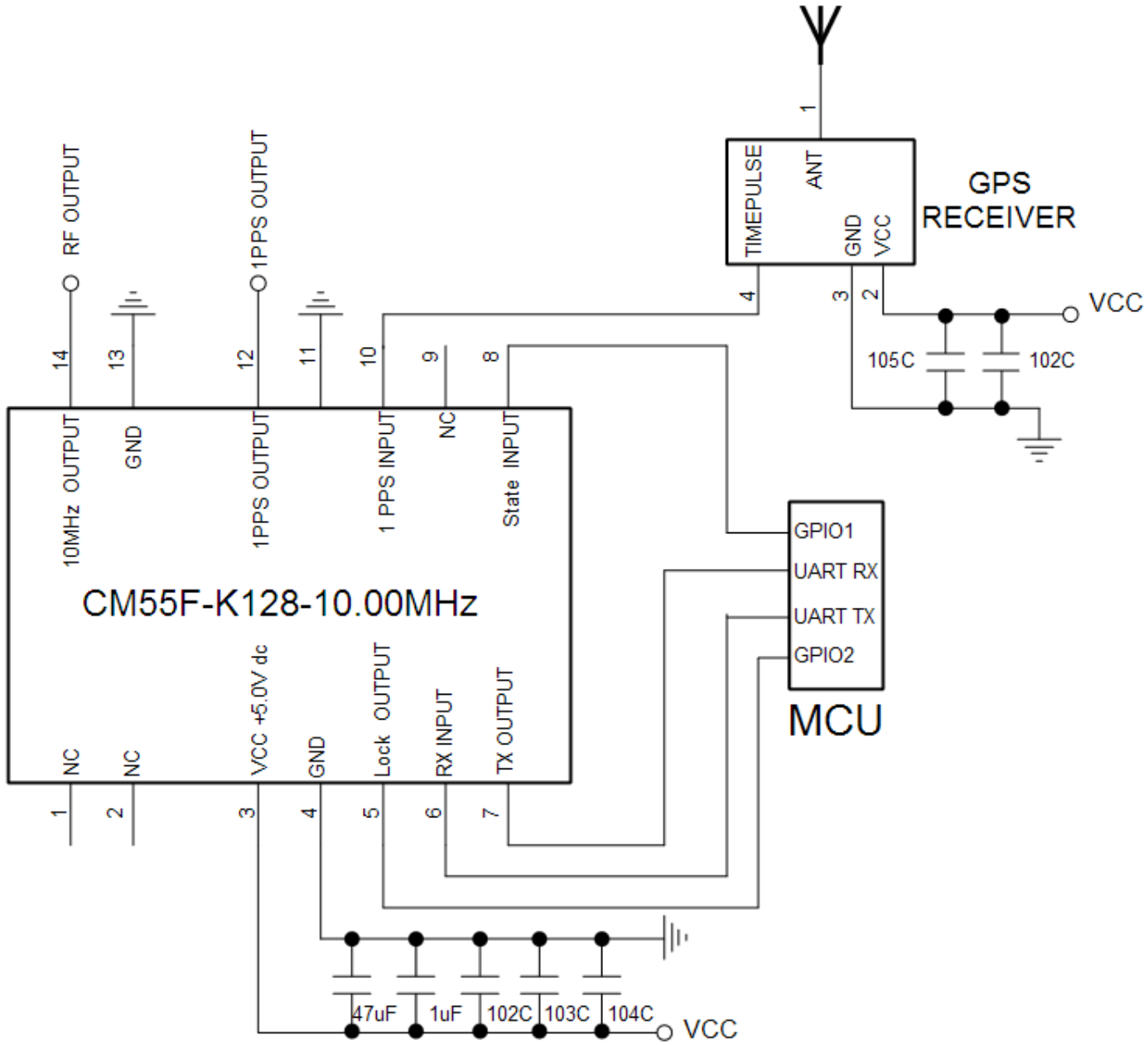
$PDP,00,0,F,Q,-3095,32768.0000,32768.0000,000,000,00000.0000,00000.0000,00000.0000,00000.0000,3-23,+000.0000,-0000,www.dptel.com,1.1,2011-05-16*55

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

6. Aplication Information



GPS RECEIVER supplys 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 adptive 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.

Bldg13-16,.N.Ind.Zone,SSL Industry Park, Dongguan City, Guangdong Province, PRC China
TEL:0086-0769-88010888
FAX:0086-0769-81800098

7. Coding Rules

CM XX X - X X X X - XX.XX MHz

Clock Module

Output Frequency

Size

33	36×36 (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	0℃~60℃	24hours
B	±3.0μs	0℃~60℃	24hours
C	±8.0μs	0℃~60℃	24hours
D	±1.5μs	ΔT=±5℃	24hours
E	±3.0μs	ΔT=±5℃	24hours
F	±8.0μs	ΔT=±5℃	24hours
G	±1.5μs	ΔT=±5℃	8hours
H	±3.0μs	ΔT=±5℃	8hours
I	±8.0μs	ΔT=±5℃	8hours
K	±1.5μs	ΔT=±2℃	24hours
L	±3.0μs	ΔT=±20℃	12hours
M	±3.0μs	ΔT=±2℃	24hours
N	±8.0μs	ΔT=±2℃	24hours
O	±1.5μs	ΔT=±2℃	8hours
P	±3.0μs	ΔT=±2℃	8hours
Q	±8.0μs	ΔT=±2℃	8hours
Z	±12 μs	ΔT=±5℃	12hours

Supply Voltage

1	5.0V

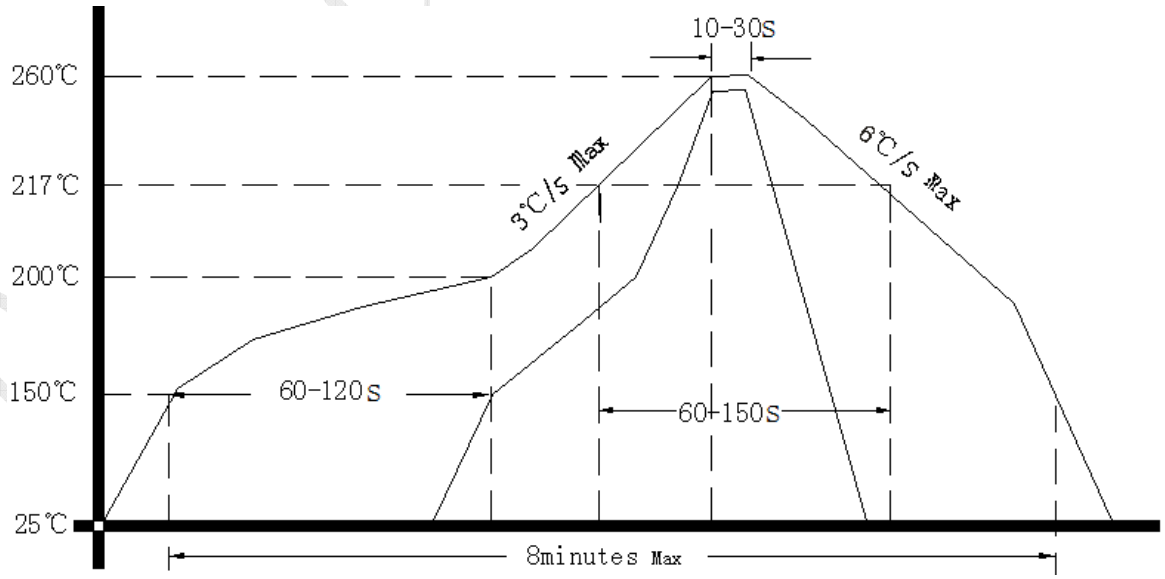
Output Waveform

1	Sine Wave
2	HCMOS

Operating temperature

1	0℃~80℃
2	-10℃~70℃
6	-30℃~75℃
8	-40℃~85℃
9	-20℃~75℃

8. Reflow Soldering Curve (RoHS)



Bldg13-16,.N.Ind.Zone,SSL Industry Park, Dongguan City, Guangdong Province, PRC China
TEL:0086-0769-88010888
FAX:0086-0769-81800098

9. Package（mm）