

Customer Code : _____

DATASHEET

DAPU P/N: CM55F-Y125-10.00MHz-A

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DAPU			Customer Approval
Drew	Audited	Approved	Stamp, please! Thanks!
Date: 2015.11.27			

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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})	2.7			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	< 5mA Load	
	Duty Cycle	45	50	55	%	< 5mA Load	
	Accuracy	-1		+1	$\times 10^{-12}$	24 hours average when locked to 1 PPS	
	Short-term Stability			0.02	$\times 10^{-9}$	Temperature stability, no EMI/EMC or other interference, test after power for 1 hour ref. to 25°C; 1s, using PN9000 equipment.	
	Aging Tolerance Per Day	-0.2		+0.2	$\times 10^{-9}$	V_{cc}, T_A constant measurement referenced to frequency observed with $T_A=25^\circ C, V_{cc}=5.0V$, in FREE RUN condition and after 30 days of operation.	
	Aging Tolerance 1 Year	-0.01		+0.01	$\times 10^{-6}$		
	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						



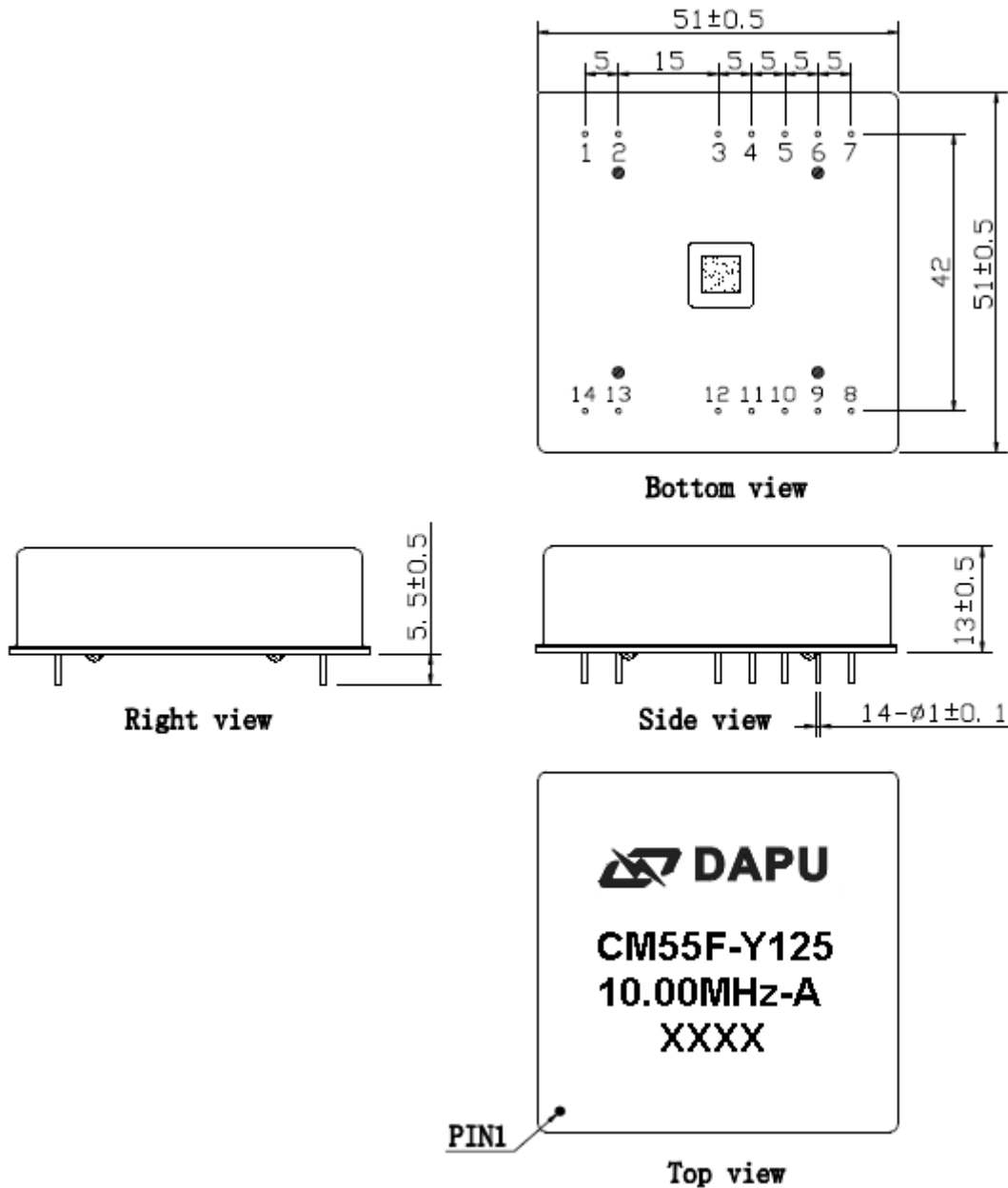
Holdover Capability	Holdover Time	Min.	Typ.	Max.	Unit.	Test Condition
	24 Hours	-50		+50	μs	ΔT=±5°C, 24 hours holdover after turn on 2hours and lock 2hours. Temperature variable speed less than 1°C per minute
	24 Hours	-20		+20	μs	ΔT=±5°C, 24 hours holdover after turn on 24hours and lock 24hours. Temperature variable speed less than 1°C per minute
Supply Voltage	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Supply Voltage	4.75	5.0	5.25	V	
	Current Consumption			1700	mA	During Warm-up
				500	mA	During steady state operation @25°C
	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
	Freerun/holdover			0.4	V	<5mA Load
	Connector	Pin 5				
Serial Interfaces	Parameters	Min.	Typ.	Max.	Unit.	Test Condition
	Rx high-level Input Voltage (V _H)	2.7			V	
	Rx low-level Input Voltage (V _L)			0.4	V	
	Tx high-level Output Voltage (V _H)	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°C to 75°C		
	Storage Temperature	-55°C to 105°C		
	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 (°C)	-10~35°C		



2. Mechanical Structure(mm)

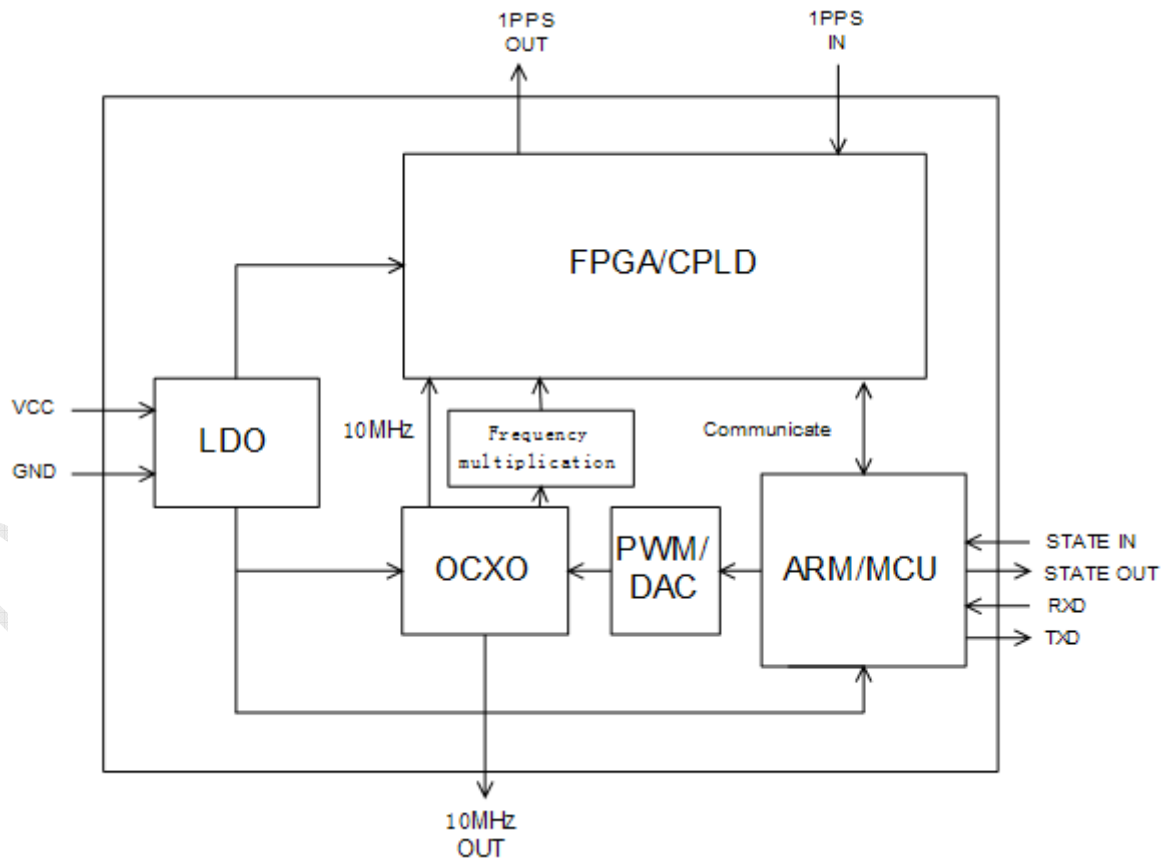


- Note1:** Tolerance ± 0.20 mm without mark
- Note2:** The first two xx representative: week
After two xx representative: year
- Note3:** Referential Weight 52 ± 5 g



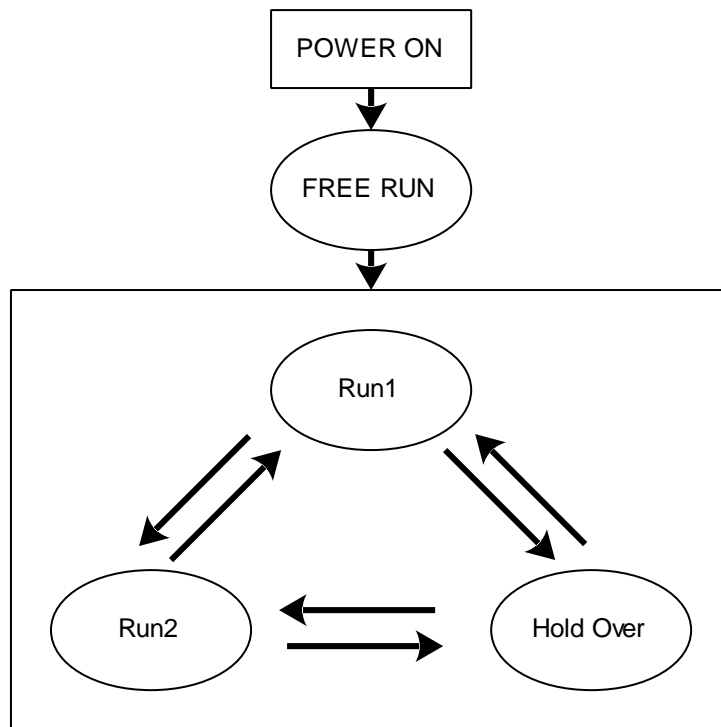
PIN DEFINITION			
PIN	NAME	DESCRIPTION	
3	VCC	Power supply input, 4.75V to 5.25V.	
5	State OUTPUT	State output. Output high level when the CM is locked and stable, others low level.	
6	RX INPUT	Asynchronous serial data input. 9600-N-8-1.	
7	TX OUTPUT	Asynchronous serial data output.9600-N-8-1.	
8	State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





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.



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

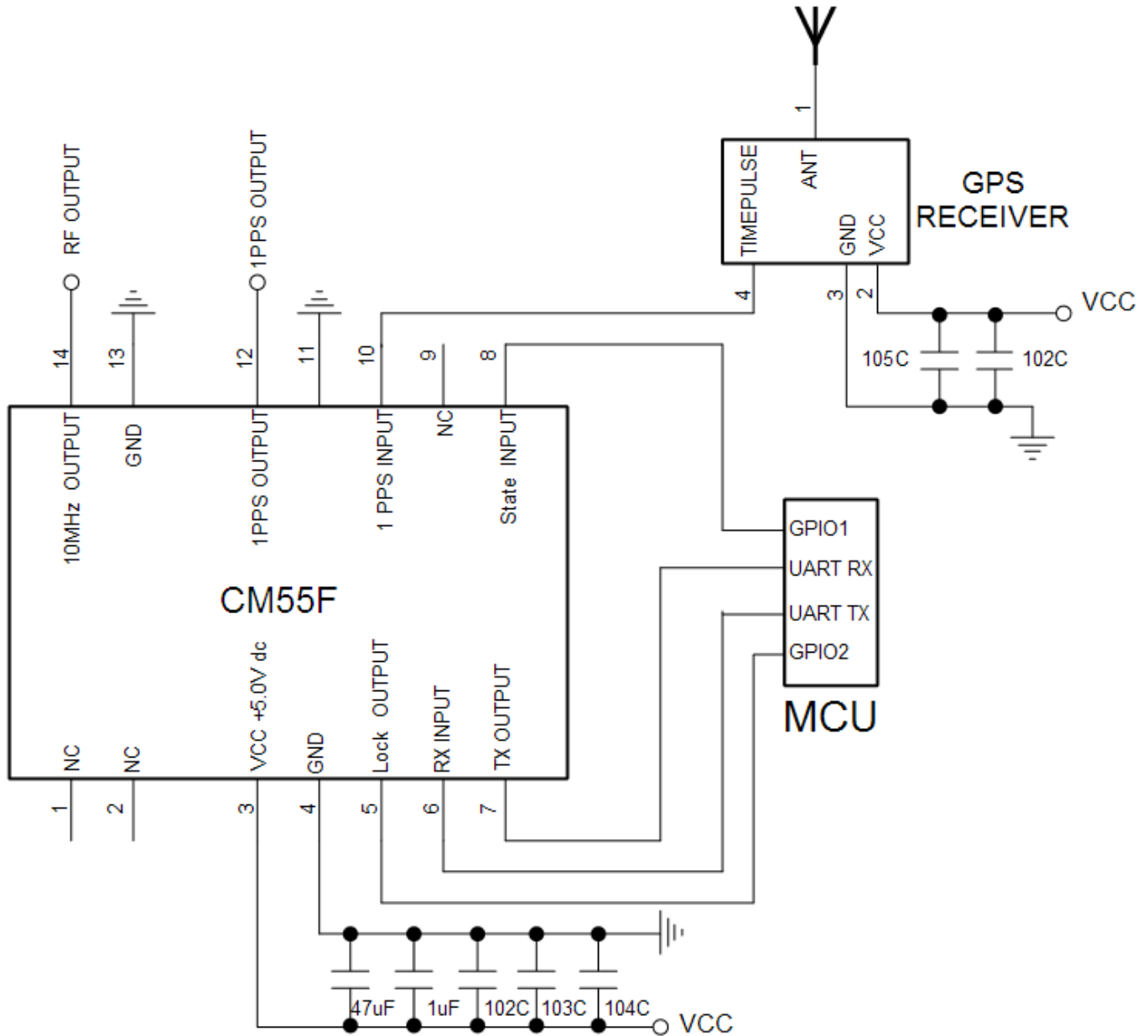
Notes:

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



GPS RECEIVER supplies 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.

