ISSUE 1; February 2016

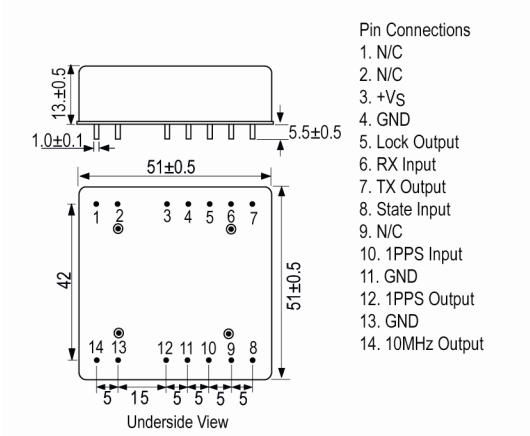
Description

- A GNSS disciplined OCXO incorporating sync to a 1pps input and 1pps output. Compatible with GPS, GLONASS, BEIDOU and GALILEO.
  Holdover stability up to 1.5µs over 24hours, achieved using an adaptive algorithm.
  Internal parameters of the algorithm, including maintenance alarms and message are available to the user via serial port.
  Frequency stability better than 1E-12
- Application Information (Reference Drawing):
  Connect the 1PPS output of your GPS system to the IQCM-200. A MCU can be used to monitor the working state of the IQCM-200.
- Working States (Reference Drawing):
  Run1: Fast track. Adjust the OCXO 10MHz output frequency quickly to track the 1PPS to 10MHz with 1PPS reference.
  Run2: Slow track. Adjust the OCXO 10MHz output frequency slowly when phase error is in the defined range.
  Holdover: No 1PPS input present; an algorithm enables adaptive modelling of the frequency stability of an OCXO with reference to the GPS timing signal.
  Free Run: Clock module powered up with no 1PPS input.
- Note1: The IQCM-200 should be left powered and running for 7 days minimum before operation to allow for the OCXO's internal drift to stabilise.
  Note2: The adaptive module algorithm can be built after two days operation with good GPS signal, however this data will be lost at power down.
  Note3: When State input (Pin 8) is set low the IQCM-200 will operate in Holdover mode regardless of the 1PPS signal condition.
- Output Data Word 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.iqdfp.com,1.1,2011-05-16*55

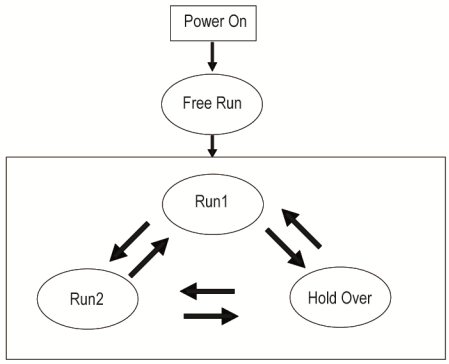
  (See table for full description)



Outline (mm)



Workflow Diagram



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Email: info@iqdfrequencyproducts.com
Germany: 0800 1808 443
USA: +1.760.318.2824
Web: www.iqdfrequencyproducts.com

Frequency Parameters

- Frequency 10.0MHz
- 10MHz RF Output Details, Pin 14:
  HCMOS Compatible, 15pF load
  (Sinewave 50Ω option available)
  VoH: 2.7V min
  VoL: 0.4V max
  Rise and Fall time: 8ns max
  Duty Cycle: 45/55% max
  Accuracy (24-hour averaging when locked to 1PPS): ±1E-12
  Short Term Stability (tested after power for 1hr ref to 25°C, 1s, using PN9000 test equipment): 2E-11 max
  Ageing (Vs and temperature constant, reference to T=25°C, Vs = 5.0V and after 30 days operation): ±0.2ppb per day, ±10ppb per year
- 24Hrs Holdover Capability
  Reference 7 days powered on, 2 days GPS lock
  Temperature varied <1°C/min within operating temperature range

Total temperature change	Holdover capability
ΔT<±2°C	±1.5µs

  Note: Other options availible on request

Electrical Parameters

- Supply Voltage 5.0V ±5%
- 1PPS Reference Input, Pin 10 (15pF test condition):
  Waveform: HCMOS
  ViH: 2.7V min
  ViL: 0.4V max
  Pulse Width: 10us min
- State Input, Pin 8 (<5mA load):
  Lock: 2.7V min
  Unlock: 0.5V max
- Power Supply Details, Pin 3:
  Supply Voltage: 5.0V ±5%
  Current Consumption: 1.4A during warm up, 600mA steady state @25°C
  AC Ripple: 50mV pk-pk max, 10Hz to 1MHz

Operating Temperature Ranges

- -10 to 70°C

Output Details

- Output Compatability HCMOS
- 1PPS Reference Output, Pin 12 (50Ω test condition):
  Waveform: HCMOS
  VoH: 2.7V min
  VoL: 0.4V max
  Pulse Width: 10µs min
- Lock Status Indicator, Pin 5:
  Module Locked: 2.7V min
  Module Holdover: 0.4V max
  Module Locked means Working State is = Run2
- Serial interface (pin6 and pin7)
  UART
  VoL and ViL: 0.4V max
  VoH and ViH: 2.7V min
  Baud rate: 9600
  Bits: 8
  Paraty: N
  Stop Bit: 1

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Noise Parameters

- Phase Noise on 10MHz RF output signal (dBm/Hz)

Offset	Typical	Max
10Hz	-118	-113
100Hz	-138	-133
1kHz	-148	-143
10kHz	-150	-145
100kHz	-150	-145
1MHz	-150	-150

Environmental Parameters

- Operating Temperature Range: -10 to 70°C
- Storage Conditions:
  Temperature: -55 to 105°C
  Humidity: 30 to 80%
- Shock: IEC68-2-27 Test Ea, severity 50A, 50G 11ms half sinewave, 3 times in three mutually perpendicular axies
- Vibration: IEC 68-2-06 Test Fc, 10G, 0.75mm acceleration, 10Hz to 500Hz, 3 times in three mutually perpendicular axies

Manufacturing Details

- ESD Level:
  ANSI/ESDA/JEDEC JS-001-2010; HBM Class 2; 2kV to 4kV
  ANSI/ESDA/JEDEC JS-001-2010; Machine Model Class B
  200V to 400V

Ordering Information

- 10MHz Output Compatability Options
  HCMOS (Standard)
  Sinewave
- Operating Temperature Range Options
  0 to 80°C
  -10 to 70°C (Standard)
  -20 to 75°C
- Holdover Options ref 24hrs holdover period

Max error	Max temp change
±1.5us	0 to 60°C
±3.0us	0 to 60°C
±8.0us	0 to 60°C
±1.5us	ΔT<±5°C
±3.0us	ΔT<±5°C
±8.0us	ΔT<±5°C
±1.5us	ΔT<±2°C
±3.0us	ΔT<±2°C
±8.0us	ΔT<±5°C
±1.5us	ΔT<±2°C (standard)

- Holdover Options ref 12hrs holdover period

Max error	Max temp change
±12.0us	ΔT<±5°C

- Holdover Options ref 8hrs holdover period

Max error	Max temp change
±1.5us	ΔT<±5°C
±3.0us	ΔT<±5°C
±8.0us	ΔT<±5°C
±1.5us	ΔT<±2°C
±3.0us	ΔT<±2°C
±8.0us	ΔT<±2°C

For other combinations please contact our sales offices

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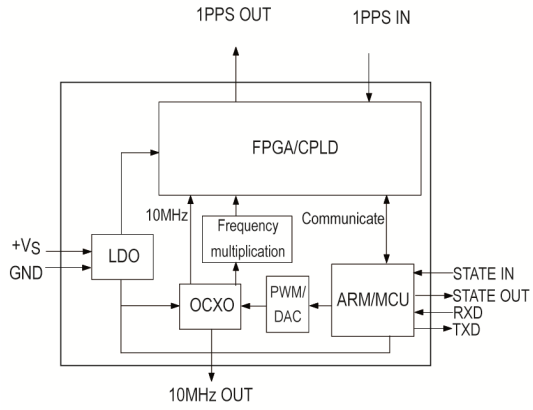
Compliance

- RoHS Status (2011/65/EU) Compliant
- REACh Status Compliant
- MSL Rating (JDEC-STD-033): Not Applicable

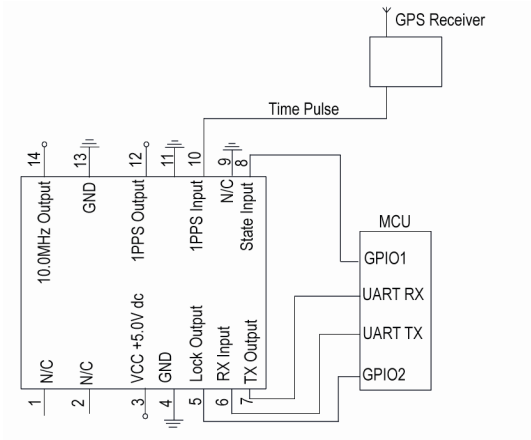
Packaging Details

- Pack Style: Bulk Loose in bulk pack
  Pack Size: 1

Functional Block Diagram



Application Information



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Output Data Word (Format Key: c=Character, d=Numerical Digit, s=Sign)

Field NO.	Name	Format	Description	Length	
0	$PDP	$ccc	Message ID, Protocal Header	4	
1	No	dd	Message No	2	
2	TxRxFlag	d	Transmit and Receive Flag (0=upper computer transmit, 1=upper computer receive)	1	
3	CStatus	c	Current Status (F=warm up, L=lock, H=holdover)	1	
4	TrackStatus	d	Track status (Q= fast track, S = slow track)	1	
5	cPHDiff	sdddd	Current phase difference, 1 unit = 6.25ns	5	
6	cPWM1	ddddd.dddd	Current PWM1 (Voltage control value1)	10	
7	cPWM2	ddddd.dddd	Current PWM2 (Voltage Controlled Value 2), not used, defult value =32769.000000	10	
8	SYNCNT	ddd	The synchornous times	3	
9	HCNT	ddd	Power on hours count	3	
10	HPAVG	ddddd.dddd	The average of the PWM in the last half hour	10	
11	VCH1	ddddd.dddd	Voltage Controlled compensation value every half hour	10	
12	HPMOD	ddddd.dddd	The Module PWM Value	10	
13	VCM10	ddddd.dddd	Voltage controlled compensation value every 10mins	10	
14	POS	d-dd	The position of the product. (Layer-No), just for the inner test.	4	
15	inT	sdddd.ddd	NA	9	
16	TcPHDiff	sdddd	The product current phase difference	5	
17	Website		www.IQDFP.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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