

Customer Part:

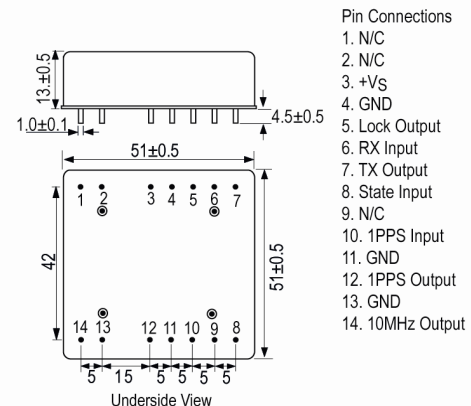
Description

- A GPS disciplined OCXO incorporating sync to a 1pps input and 1pps output with 1.5µs holdover stability achieved by using an adaptive algorithm. Current internal parameters of the algorithm are available to the user via Tx and Rx commands.
- Model IQCM-200
- Model Issue number 3
- 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.
0000,000000.0000,00000.0000,00000.0000,3-23,+000.0000,-00
00,www.iqdfp.com,1.1,2011-05-16*55

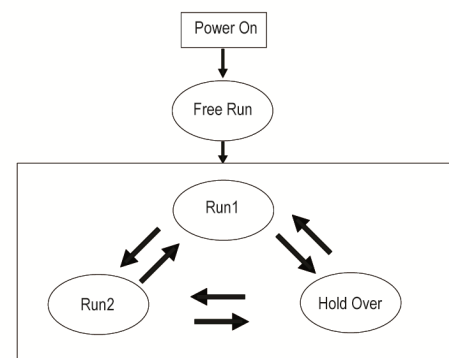
(See table for full description)



Outline (mm)



Workflow Diagram



Sales Office Contact Details:

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Email: info@iqdfrequencyproducts.com
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Customer Part:**Frequency Parameters**

- Frequency 10.0MHz
- Operating Temperature Range -10.00 to 70.00°C
- 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): $\pm 1E-12$
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): ± 0.2 ppb per day, ± 10 ppb per year
- 24Hrs Holdover Capability
Reference 7 days powered on, 2 days GPS lock
Temperature varied $< 1^\circ\text{C}/\text{min}$ within operating temperature range

Total temperature change Holdover capability
 $\Delta T < \pm 2^\circ\text{C}$ $\pm 1.5\mu\text{s}$

Note: Other options available on request

Electrical Parameters

- Supply Voltage 5.0V $\pm 5\%$
- Note: Pins 4 to 13 should not be subjected to a voltage greater 3.6V. If subjected to a higher voltage the processor will be damaged and the unit will not work correctly.
- 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 ($< 5\text{mA}$ load):
Lock: 2.7V min
Unlock: 0.5V max
- Power Supply Details, Pin 3:
Supply Voltage: 5.0V $\pm 5\%$
Current Consumption: 1.4A during warm up, 600mA steady state @25°C
AC Ripple: 50mV pk-pk max, 10Hz to 1MHz

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Customer Part:

Output Details

- Output Compatibility 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 (Pin 6 and Pin 7)
UART
VoL and ViL: 0.4V max
VoH and ViH: 2.7V min
Baud rate: 9600
Bits: 8
Parity: N
Stop Bit: 1

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 sine wave, 3 times in three mutually perpendicular axis
- Vibration: IEC 68-2-06 Test Fc, 10G, 0.75mm acceleration, 10Hz to 500Hz, 3 times in three mutually perpendicular axis

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

Compliance

- RoHS Status (2015/863/EU) Compliant
- REACH Status Compliant
- MSL Rating (JDEC-STD-033): Not Applicable

Packaging Details

- Pack Style: Bulk Loose in bulk pack
Pack Size: 1
- *Alternative packing option available*

Technical Notes

- *Holdover stability 1.5μs in 24hrs ref ±2°C*

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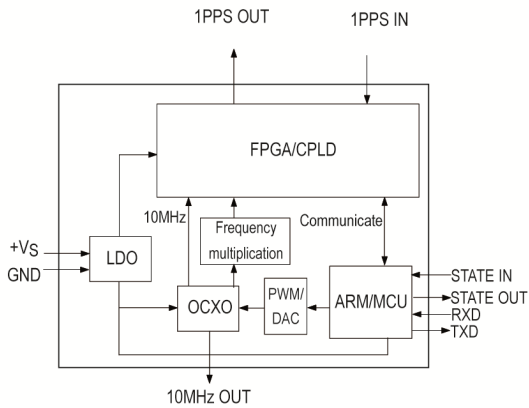
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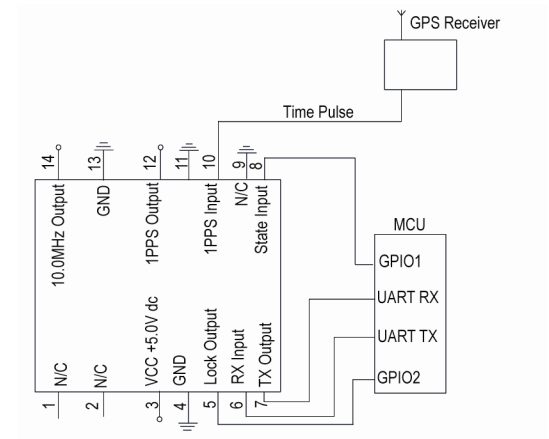
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Customer Part:

Functional Block Diagram



Application Information



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

Field No.	Name	Format	Description	Length	
0	\$PDP	\$ccc	Message ID, Protocol 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	dddd.dddd	Current PWM1 (Voltage control value1)	10	
7	cPWM2	dddd.dddd	Current PWM2 (Voltage Controlled Value 2), not used, default value =32769.000000	10	
8	SYNCT	ddd	The synchronism times	3	
9	HCNT	ddd	Power on hours count	3	
10	HPAVG	dddd.dddd	The average of the PWM in the last half hour	10	
11	VCH1	dddd.dddd	Voltage Controlled compensation value every half hour	10	
12	HPMOD	dddd.dddd	The Module PWM Value	10	
13	VCM10	dddd.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	TEMP	sdddd.ddd	The temperature monitor inside the module	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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