

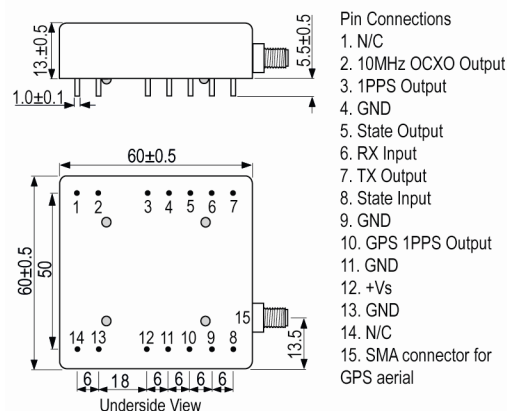
ISSUE 1; February 2016

Description

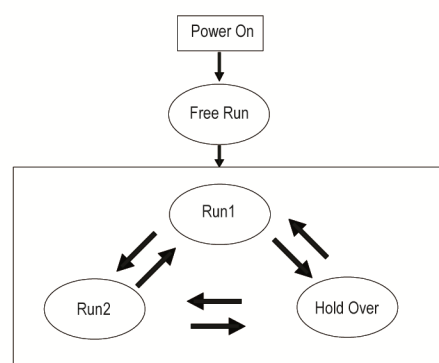
- A GPS disciplined OCXO incorporating GPS receiver unit, to give 1PPS and 10MHz output.
Holdover stability up to 1.5 μ s over 24hours, achieved using an adaptive algorithm.
Standard NMEA0183 data is available to the user via serial port.
Frequency stability better than 1E-12
- Working States (Reference Drawing):
Run1: Fast track. Adjust the OCXO 10MHz output frequency quickly to track the GPS.
Run2: Slow track. Adjust the OCXO 10MHz output frequency slowly when phase error is in the defined range.
Holdover: No GPS 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 GPS input.
- Note1: The IQCM-110 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-110 will operate in Holdover mode regardless of the 1PPS signal condition.
- NMEA data words
The following standard GNSS data is available to the user via the interface on pin 6 and pin 7. GPRMC, GPVTG, GPGGA, GPGSA, GPGSV, GPGLL, GPZDA these are broadcast every second in sync with the 1PPS output



Outline (mm)



Workflow Diagram



Frequency Parameters

- Frequency 10.0MHz
- 10MHz RF Output Details, Pin 2:
HCMOS Compatible
(Sinewave 50 Ω 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°C/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

Sales Office Contact Details:

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Electrical Parameters

- Supply Voltage 5.0V $\pm$ 5%
- 1PPS Output from internal GPS receiver, Pin 10:
Waveform: HCMOS
Test condition: 15pF
ViH: 2.7V min
ViL: 0.4V max
Pulse Width: 100ms min
- State Input, Pin 8 (<5mA load):
Lock: 2.7V min
Unlock: 0.4V max
Pin 8 has an internal pull-up cct.
- Power Supply Details, Pin 12:
Supply Voltage: 5.0V $\pm$ 5%
Current Consumption: 2A during warm up, 1A steady state @25°C
AC Ripple: 50mV pk-pk max, 10Hz to 1MHz
- GPS Internal Receiver Specification:
Type: GPS Position lock
Number of channels: 50
Frequency Band: L1 (1575.42MHz)
Tracking Code: C/A Code
Tracking Capability: 12 satellites
Sensitivity: Tracking and Navigation 162dBm
Reacquisition -157dBm
Cold Start (Autonomous) -148dBm
Antenna input SMA-KE (active antenna recommended)

Operating Temperature Ranges

- -20 to 75°C

Output Details

- Output Compatability HCMOS
- 1PPS Reference Output, Pin 3 (15pF test condition):
Waveform: HCMOS
VoH: 2.7V min
VoL: 0.4V max
Pulse Width: 100ms min
- Lock Status Indicator, Pin 5:
Module Locked: 2.7V min
Module Holdover: 0.4V max
Module Locked means Working State is = Run2
Current 5mA max
- Serial Interface (pin6 and pin7)
NMEA-0183
VoL and ViL: 0.4V max
VoH and ViH: 2.7V min
Baud rate: 9600
Bits: 8
Paraty: 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

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Environmental Parameters

- Operating Temperature Range: -20 to 75°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 axes
- Vibration: IEC 68-2-06 Test Fc, 10G, 0.75mm acceleration, 10Hz to 500Hz, 3 times in three mutually perpendicular axes

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
-20 to 75°C (Standard)
-40 to 70°C
-40 to 85°C
Note: Holdover stability options will affect capability
- 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<±2°C
±1.5us ΔT<±2°C (standard option)
- 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

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

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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, 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	SYNCNT	ddd	The synchronous 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.dd	The temperature monitor inside the module	9	
16	AlarmFlag	sdddd	Only the last 1 byte indicates Alarm flag (0=Normal, 1=OCXO warmup abnormal, 2=OCXOoutput abnormal, 3=Internal temperature sensor abnormal)	5	
17	Website		www.IQDFP.com	13	
18	Version	d.d	version	3	
19	Date	ddd-dd-dd	Date	10	
20		dd	55	2	
21	END		<CR><LF>	2	

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