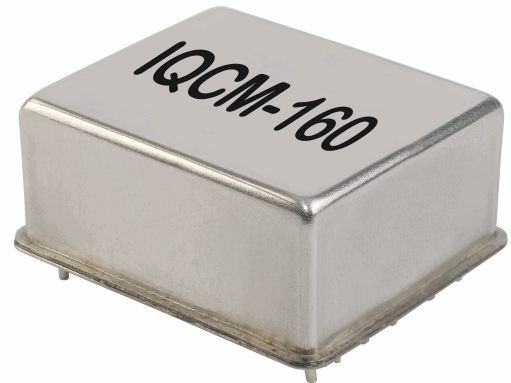


ISSUE 1; June 2019

### Description

- A disciplined OCXO incorporating synchronization to a 1PPS input and compatible with GPS, GLONASS, BEIDOU and GALILEO or alternative 1PPS source. Holdover stability up to 1.5µs over 8hours, achieved using an adaptive algorithm.
- Key features:
  - Reference input: 1PPS
  - Temperature Stability: ±0.2ppb
  - Holdover: ±1.5µs/8h @ ΔT=±10°C after power up 7 days.
  - Input and Output: 1PPS input, 1PPS output and 10MHz output.
  - Internal parameters of the algorithm, including maintenance alarms and message are available to the user via serial port.
  - Mechanical Size: 30mmx25mmx15mm



### Frequency Parameters

- Frequency: 10.0MHz
- Frequency Stability: ±0.20ppb
- Frequency Stability: @ Vs=3.3V; load=15pF; TA varies from -40°C to 85°C, temperature slope less than 2°C per minute.
- Accuracy (24 hours average value when locked to 1PPS): ±0.005ppb max
- Short Term Stability (@ Vs=3.3V, TA=25°C, 1s): ±0.01ppb max
- Ageing (Vs=3.3V and TA=25°C): ±0.5ppb max per day, ±30ppb max per year

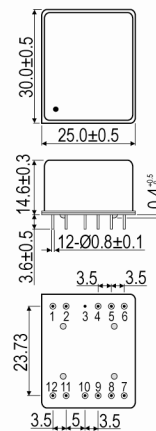
### Electrical Parameters

- Supply Voltage: 3.3V ±5%
- 1PPS Input (pin 2): 1PPS input signal from GNSS receiver or reference signal.
- Warm-up current: 750mA max  
Steady state current (@ 25°C): 350mA max
- AC ripple (10Hz to 1MHz): 50mV pk-pk max

### Operating Temperature Ranges

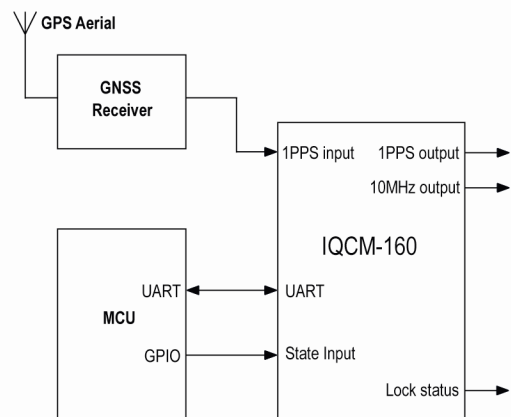
- -40 to 85°C

### Outline (mm)



- Pin Connections
1. State input
  2. 1PPS input
  3. GND
  4. No connection
  5. 1PPS output
  6. 10MHz output
  7. +Vs
  8. UART RXD0
  9. UART TXD0
  10. UART RXD1
  11. UART TXD1
  12. Lock status

### Application Schematic Diagram



### Sales Office Contact Details:

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#### Output Details

- Output Compatibility CMOS
- Drive Capability 15pF
- CMOS input and output levels:  
Input/Output High: 2.4V min  
Input/Output Low: 0.4V max
- 1PPS Output (pin 5):  
Pulse width: 100ms typ  
Accuracy (synchronizing with 1PPS reference):  $\pm 50$ ns max  
Holdover ( $\Delta T = \pm 10^\circ\text{C}$ , 8 hours holdover after power up for 7 days; temperature slope less than  $2^\circ\text{C}$  per minute)  $\pm 1.5\mu\text{s}$  max
- 10MHz Output (pin 6): CMOS
- State Input (pin 1): the clock module synchronizes its local clock to a reference input such as 1PPS from GPS. It will perform normal synchronization algorithm when the state input pin is driven high. It can also be forced to work in free-run or holdover status when the state input pin is driven low. Note: pin 1 (state-input) must be asserted 'high' or 'low' and should not be left unconnected.
- Lock Status:  
Indicates the lock status of the clock module. High level indicates the module is locked to the external 1PPS reference. After power-up and before the module locks to 1PPS input, the status of the module is in 'free-run' and the lock output is low. If the 1PPS reference is lost, the module switches to holdover mode and the lock output is low.

#### Output Control

- UART: is an LVTTTL-compatible port and needs an external translator to work with other signal types (such as RS-232C or RS-485).
- UART Serial Interface (Pins 8, 9, 10 & 11)  
Baud rate: 115200  
Parity: N  
Stop Bit: 1
- UART Tx port 0: Data word output in synch with 1PPS output.

#### Noise Parameters

- Phase Noise (typ @  $25^\circ\text{C}$ ):
  - 110dBc/Hz @ 10Hz
  - 143dBc/Hz @ 100Hz
  - 155dBc/Hz @ 1kHz
  - 155dBc/Hz @ 10kHz
  - 155dBc/Hz @ 100kHz
  - 160dBc/Hz @ 1MHz
- Phase Noise (max @  $25^\circ\text{C}$ ):
  - 100dBc/Hz @ 10Hz
  - 138dBc/Hz @ 100Hz
  - 150dBc/Hz @ 1kHz
  - 150dBc/Hz @ 10kHz
  - 150dBc/Hz @ 100kHz
  - 155dBc/Hz @ 1MHz

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#### Environmental Parameters

- 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 axis.
- Vibration (IEC 68-2-06 Test Fc): 0.75mm acceleration, 10g, 10Hz to 500Hz, one cycle per 30min, test 2 hours. 3 times in three mutually perpendicular axis.
- ESD Level:  
Human Body Model (HBM): ANSI/ESDA/JEDEC JS-001-2010; HBM class 2, 2kV to 4kV  
Machine Model (MM): ANSI/ESDA/JEDEC JS-001-2010; MM class B, 200V to 400V

#### Ordering Information

- Ordering Example:  
Frequency\*  
Model\*  
Holdover\* (std  $\pm 1.5\mu\text{s}$ )\*  
Time (std 8hrs)\*  
Temperature change (std  $\pm 10^\circ\text{C}$ )\*

#### Compliance

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

#### Packaging Details

- Pack Style: Bulk      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 value2, 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	VC10M	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	AlarmFlag	sdddd	Only the last 1 byte indicates Alarm flag (0=Normal, 1=OCXO warm-up abnormal, 2=OCXO output abnormal, 3=internal temperature sensor abnorm)	5
17	Website		www.IQDFT.com	13
18	Version	d.d	version	3
19	Date	ddd-dd-dd	Date	10
20		dd	55	2
21	END		<CR><LF>	2

[Click for FOQs on IQD Advance Clock Modules](#)

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