PRODUCT DATASHEET

SGTM16HP-UW

HIGH PERFORMANCE TIMING MODULE FOR UNDERWATER SYSTEMS

PRODUCT OVERVIEW

SGTM16HP-UW is the best trade-off between low aging drift and low power consumption within Syrlinks' SGTM portfolio. It uses the EWOS16HP OCXO at 16.384 MHz. The Timing module can be used as a PPS time keeper in all highly battery-constraint underwater systems needing a precision OCXO-based clock. The module will automatically adjust the OCXO frequency and phase to an external 1PPS reference signal given by a GNSS receiver. Once locked and disciplined, it can be deployed in GNSS-denied environment (underwater) and the module will keep a precise synchronization in hold-over mode for the embedded electronics (typical aging ±0.2 ppb/day). SGTM16HP is ideal to reduce battery size and extend underwater mission time. Its thermal sensitivity is typically ±15 ppb but can be improved down to typically ±1ppb thanks to a specific firmware calibration on demand (-CT model).

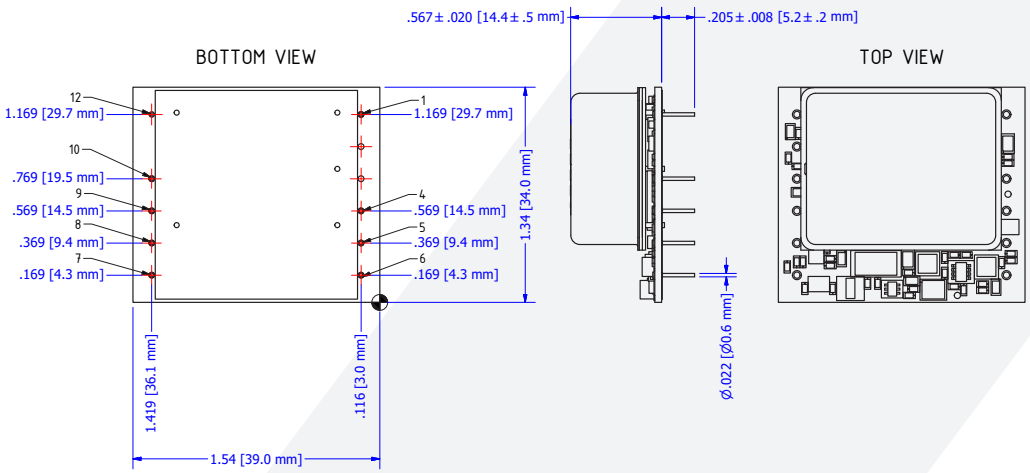
KEY FEATURES

- 16.384 MHz HCMOS output
- Thermal sensitivity: ±15 ppb or ±1 ppb (typ.)
- 145 mW @ 25°C (typ.)
- ±0.2 ppb/day after 30 days (typ.)
- Pin-to-pin compatible replacement of Chip Scale Atomic clock

ORDERING INFORMATIONS IS AVAILABLE ON THE LAST PAGE

DIMENSIONS & PIN-OUT

PIN	FUNCTION
1	Vtune
4	Tune Enable
5	TX
6	RX
7	Vcc
8	GND
9	1PPS IN
10	1PPS OUT
12	RF OUT



For further information, please contact us: **sales@slx-timing.com** - **www.slx-timing.com** - Tel: +33 (0)2 99 00 94 52

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ELECTRICAL CHARACTERISTICS

PARAMETERS	UNIT	MIN	TYP.	MAX	NOTE	COMMENTS
Output Frequency	MHz		16.384		1	
Temperature Range						
Operating	°C	-10		+45		Stay functional at +50°C but stability may not be met
Storage	°C	-55		+95		
Supply Voltage	V	3.15	3.3	3.45		± 5% or 5V on request
Supply Current						
Warm up	mA			230	3	During 10s max @25°C / 40s max @ 5°C
Steady state / -10°C	mA		82	88.5	1	
Steady state / +5°C	mA		68	73.5	1	
Steady state / +25°C	mA		45	48	1	
Steady state / +45°C	mA		28	34	1	
Frequency Stability						
Initial frequency accuracy	ppm		±0.05	±0.1	1	+25°C referred to nominal frequency
Vs operating temperature range	ppb		±15	±30	1	Ordering code -CO (without thermal calibration firmware)
			±1	±3	1	Ordering code -CT (without thermal calibration firmware)
Vs supply voltage variation	ppb			±2	3	3.3V ± 5%
Vs load	ppb			±2	3	(10 kΩ//15 pF) ± 10%
Short-term *(τ=0.1s)*	10^{-11}		0.5	1	3	Allan deviation @16.384 MHz
(τ=1s)	10^{-11}		1	5	3	
Aging						
Per day	ppb		±0.2	±0.5	3	After 30 days
First year	ppb			±50	3	
After 10 years	ppb			±300	3	
Acceleration sensitivity	ppb/G			±1	3	Worst direction
Warm-Up Time	sec			30	3	To ±1 ppm of final frequency (1 hour) at 25°C
	min			3	3	To ±100 ppb of final frequency (1 hour) at
Retrace	ppb			±10	3	24h work after 24 offw
HCMOS RF Output Level						
Load	pF		15		3	1 MΩ
Signal Level - Vh	V	2.4			3	
Signal Level - Vl	V			0.4	3	
Rise \ Fall Time	ns			8	3	10% - 80%
Duty Cycle	%	45		55	3	
1 PPS Output Parameters						
Load	pF		10		3	1 MΩ
Rise \ Fall Time	ns			8	3	10% - 80%
Signal Level - Vh	V	2.4			3	
Signal Level - Vl	V			0.4	3	
Level	V	0		Vcc	3	
1 PPS Input Parameters						
Format			Rising edge			
Load	MΩ		1		3	
Logic low level	V	< 0.4			3	
Logic high level	V			2.4 to VCC	3	

NOTES

1. Parameter inspected at 100%
2. Parameter inspected by sampling
3. Parameter guaranteed by design & characterization

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PARAMETERS	UNIT	MIN	TYP.	MAX	NOTE	COMMENTS
Serial Communications						
▪ Protocol			RS-232		3	
▪ Format	V	0		Vcc		CMOS
▪ Baud Rate			57600		3	
1 PPS accuracy 1σ	ns		±32			
Holdover stability	µs	±10		±60		over 24h (at +25°C)
Weight	grams		20			

ENVIRONMENTAL CONDITIONS

Shocks	1500G peak / 0.5 ms / 3 axis ; MIL-STD-883 method 2002, Test Condition B
Vibrations	16.91 Grms / 10 to 2000 Hz Random / 3 min per axis, MIL STD 202-214 cond E
Soldering instructions	Hand soldering with recommended pins temperature: 235°C ±5°C, t=10s ±05s *(260°C max for 5s max)* Selective wave soldering with limitation of pre-heating to reach the max temperature of 85°C *(body of component)* and 3 s max at max temperature Use of no-clean solder paste When connecting a pad to a copper plane, thermal pads are recommended
Mounting instructions	Metallic case glued onto the PCB, without glue overflow into the metallized holes No spacer material between OCXO and PCB
PCB cleaning/washing	Washable with a temperature below 85°C

OCXO HERMETICITY

Metallic housing hermetically sealed
Fine Leaks and Gross Leaks tests performed 100%

ORDERING INFORMATION

SGTM 16HP - 3V3 - A - H4 - XX

FREQUENCY (MHz)

CODE	SPECIFICATION
16	16.384

POWER SUPPLY

CODE	SPECIFICATION
3V3	3V3

OUTPUT

CODE	SPECIFICATION
H	HCMOS

SW OPTIONS

CODE	SPECIFICATION
CO	Compensation OFF
CT	Thermal Compensation

RESONATOR TYPE

CODE	SPECIFICATION
HP	SC-cut

TEMPERATURE RANGE

CODE	SPECIFICATION
A	-10°C/+45°C

PACKAGE

CODE	SPECIFICATION
4	Europack High

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