



Features and Benefits

Frequency: 16.384MHz
Supply voltage: 3.3V
Steady current: 20mA Typ.
Output waveform: HCMOS
Hold over stability: ±600us over 24h
Aging: ±5ppb per day
Operating temperature: -10°C to +45°C (-40C to +85C optional)
Size: 39*34*5.2mm

Typical Applications

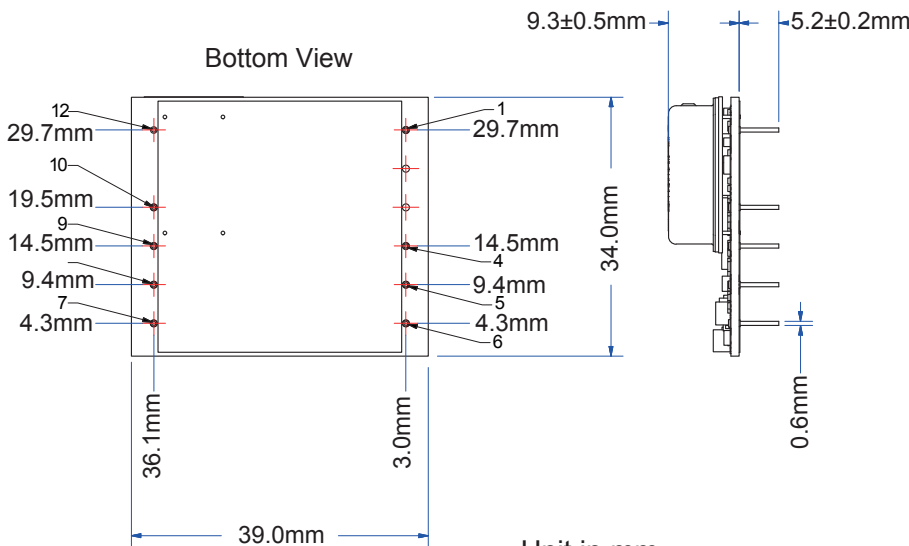
Underwater

Description

TM3934CJ-LP-16.384MHz-A is the least consuming precision clock module of DEI. It uses a 50mW 16.384 EWOS and the TM3934CJ-LP-16.384MHz-A can be used as a PPS time keeper in all highly battery-constraint underwater systems. The Module will automatically adjust the OCXO frequency and phase to the external PPS reference (under GNSS) with a record high precision at 10-11 level (0,02ppb). Once locked, it can be deployed in GNSS-denied environment (underwater) and will keep a precise synchronization in free- running mode for the embedded electronics. TM3934CJ-LP-16.384MHz-A is ideal to reduce battery size and extend underwater mission time. Its thermal sensitivity is about ±30ppb but can be improved down to ±2ppb thanks to a specific firmware on demand.

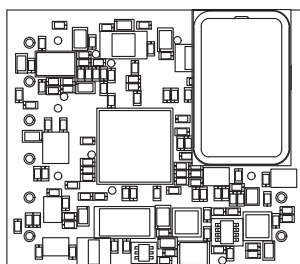
Mechanical Drawing & Pin Connections

Drawing No: MD210005-1



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

Top View





Specifications

Oscillator Specification	Sym	Condition	Value			Unit	Note	
			Min.	Typ.	Max.			
Operational Frequency	F _{nom}			16.384		MHz		
RF Output								
Output wave form				HCMOS				
H-level voltage			2.4			V		
L-level voltage					0.4	V		
Duty cycle			45		55	%		
Rise/Fall time		10% - 80%			8	ns		
Load				15pF			1 MΩ	
1 PPS Output Parameters								
H-level voltage			2.4			V		
L-level voltage					0.4	V		
Level			0		V _{cc}	V		
Rise/Fall time		10% - 80%			8	ns		
Load				10pF			1 MΩ	
1 PPS Input Parameters								
H-level voltage			2.4		V _{cc}	V		
L-level voltage					0.4	V		
Format				Rising edge				
Load				1 MΩ				
Serial Communications								
Protocol				RS-232				
Format			0		V _{cc}		CMOS	
Baud Rate				57600				
Power Supply								
Supply Voltage	V _s	±5%	3.15	3.3	3.45	V	+5V on request	
Supply Current								
Warm-up		During 10s max @ 25°C / 20s max @ 5°C			230	mA		
Steady state / -10°C				38	43	mA		
Steady state / +5°C				27	32	mA		
Steady state / +25°C				20	25	mA		
Steady state / +45°C				10	15	mA		
Warm-up Time	T _{up}	to ± 1 ppm of final frequency (1 hour) at 25°C			10	s		
		to ± 100 ppb of final frequency (1 hour) at 25°C			60	s		
Frequency Stability								
Versus Operating Temperature Range		-10°C to +45°C		±30	±50	ppb	Forced airflow environment	
Initial frequency accuracy		+25°C referred to nominal frequency		±0.5	±1.0	ppm		
Versus supply voltage		±5%		±0.1	±0.2	ppm		
Versus load		10kΩ // 15 pF load ±10%		±0.1	±0.2	ppm		
1 PPS accuracy 1σ				±32		ns		
Hold over stability		over 24h (at +25°C)	±100		±600	us		
Short-term		τ = 0.1s		2	10	10 ⁻¹¹		
		τ = 1s		3	10	10 ⁻¹¹		
Versus acceleration		Worst direction	±1.0			ppb/G		
Retrace		24h work after 24 off			±10	ppb		
Aging Per Day		After 30 days of operation		±2	±5	ppb		
Aging 1 st Year						±1	ppm	
Aging After 10 years						±5	ppm	
Environmental, Mechanical Conditions								
Operating temperature range	-10°C to +45°C (-40°C to +85°C optional)							
Storage temperature range	-55°C to +95°C							
Weight	10 grams							
Soldering instructions	Hand soldering only, with recommended pins soldering temperature : 235°C ±5°C, t=10s ±0.5s (260°C max for 5s max)							
Mounting instructions	Pin receptacles mounted into PCB can be used.							
PCB cleaning/washing	Not washable							
OXCXO HERMETICITY	Metallic housing hermetically sealed; Fine Leaks and Gross Leaks tests performed 100%							