



GPTiMe™

Stratum 1, 2, 3 or 3E, GPS Integrated, Feature-Rich Synchronizer

- *Designed for WiMAX, TDM over IP and Ethernet Equipment*
- *On Your Board reference design availability*
- *Complete Stratum 1, 2, 3 or 3E timing and synchronization solution*
- *The only solution that combines lock-on to GPS, back-haul signals and (optional) Ethernet data for Over IP synchronization (IPSync Technology) for perfect phase and frequency accuracy in all base stations*
- *Fully compliant with the applicable standards of Telcordia GR-1244-CORE, Telcordia GR-499-CORE, IEEE 802.16e (WiMAX), ITU-T G.812, IS-2000*

DWDM



Applications

- Next generation wireless base-stations
- WiMAX, WCDMA and WAN
- Master Clock for IEEE 1588
- ATCA
- E911 location systems
- Ethernet edge synchronizer for TDM over IP and other CBR (Constant Bit Rate) Ethernet and IP solutions (optional)
- Core and access IP switches
- DWDM, SONET, SDH, Cross-Connect and
- Standard reference
- Low cost TCXO version available
- SMT version available with GPS Receiver and OCXO/TCXO on-board
- Holdover stability of 8 usec per 24 hours
- 1 PPS output signal synchronized with GPS/UTC
- Supports a wide range of output frequencies
- Low phase noise output is available (-80 dBc @ 10 Hz offset typical)
- Comprehensive host management capabilities

Features

- IS-2000 compliant
- Telcordia GR-1244-CORE Stratum 1,2,3, 3E standard compliant
- Telcordia GR-499-CORE standard compliant
- Selective pull-in ranges and hysteresis ranges as per Telcordia GR-253-CORE and/or GR-1244-CORE
- ITU-T G.812 type II recommendations compliant
- Input reference switchover:
 - Automatic or manual hitless switchover
 - Revertive or non-Revertive switchover, user selectable
- Master/Slave redundancy of 2 or more GPTiMe modules
- Phase-copy functionality where the (in system) slaves follow the master's phase
- Host interface and on-board software field upgrade functionality
- 3.3V or 5V power source (12V for Rb)

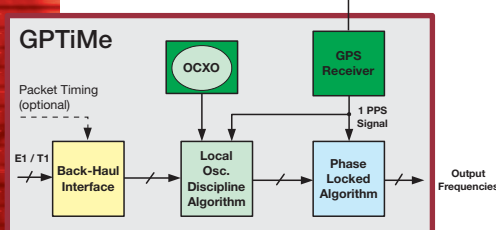
Description:

GPTiMe™ is an OEM digital PLL with a GPS receiver that performs the special signal processing required for delivering the output frequencies free of the input impairments (such as jitter, wander, On/Off and phase hits) as per the Telcordia, ITU-T and IS-2000 standards.

Based on TeraSync's internationally acclaimed ATiMe platform, GPTiMe™ is the most advanced unit available in the marketplace today, providing a unique ability to lock onto the back-haul signal and the GPS signal as well as combining both of these signals for perfect phase and frequency accuracy.

It is equipped with a GPS receiver used for obtaining GPS satellite transmissions from which a jittered 1PPS signal is derived.

GPTiMe™ locks onto the derived GPS signal, enabling the synchronization of a base station to GPS/UTC time.



GPTiMe™ utilizes two references, the GPS 1PPS pulse reference and the back-haul (E1/T1, E3/T3...) reference, or DATA MII/GMII input.

GPTiMe™ is capable of providing a 1PPS clock derived from the back-haul interface, instead of deriving a 1PPS clock from the GPS transmission, while receiving a periodic phase adjustment from the GPS 1PPS reference. In this manner, the resulting phase will always be the correlated average of the GPS 1PPS reference, a unique feature of GPTiMe™.

The module receives input controls and indications that affect and/or enable a complete hitless switchover between the input references as per the various international synchronization standards.

GPTiMe™ provides the host with the mode of operation, the status indications and the alarm output indications. The host card manages the GPTiMe™ via serial host interface and an external reference quality indicators.

The three provided modes of operation are free-run, holdover and enslaved (locked to one of the reference inputs).

According to the user's requirements, GPTiMe™ may be either manually or automatically operated.

The phase build out (PBO) mechanism: This mechanism, required for Stratum 2 and Stratum 3E, provides a smoother response to input phase hits.

A local oscillator discipline algorithm is used to estimate the parameters of the local oscillator (e.g. aging), hence improving its performance in extreme temperature ranges, for example, during holdover.

Specifications:

Input Signals

Input 1	1 PPS, 8 KHz, 2.048MHz, 1.544MHz or others upon request
Input 2	1 PPS, 8 KHz, 2.048MHz, 1.544MHz or others upon request
Signal level.....	LVC MOS

Output Frequency Signals

Output 1	1 PPS
Output 2.....	10MHz (low phase noise available)
Output 3.....	8kHz or any other predetermined choice
Output 4	N x (1.544MHz or 2.048MHz), 77.76MHz, 19.44MHz or 38.88MHz
Signal level.....	LVC MOS

Input and Output Reference Signal Characteristics

Jitter tolerance	Telcordia: GR-1244-CORE-4.2 & ITU-T: G.812 Type II 9.2
Phase transient tolerance	Telcordia: GR-1244-CORE-4.4
Wander generation.....	Telcordia: GR-1244-CORE-5.3 & ITU-T: G.812 Type II 8.1
MTIE	Telcordia: GR-1244-CORE-5.3 & ITU-T: G.812 Type II 8.1
TDEV	Telcordia: GR-1244-CORE-5.3 & ITU-T: G.812 Type II 8.1
Wander tolerance.....	Telcordia: GR-1244-CORE-4.3 & ITU-T: G.812 Type II 9.1
Wander transfer.....	Telcordia: GR-1244-CORE-5.4 & ITU-T: G.812 Type II 10

DPLL Performance Stratum 2

Free run accuracy	±16 PPB
Holdover stability	0.1 PPB/day
Pull in range	±1 PPM or 29 PPM
Lock accuracy.....	0.001 PPB

DPLL Performance Stratum 3E

Free run accuracy	4.6 PPM
Holdover stability	<12 PPB
Pull in range	29.5 PPM or ±11 PPM
Lock accuracy.....	< 0.01 PPB

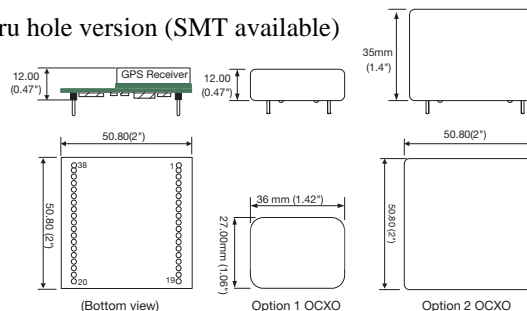
Power

Input	3.3 or 5 V
Power consumption during warm-up.....	1.2 A (3.3V), 0.7A (5V)
Power consumption during steady-state.....	0.5 A (3.3V), 0.4A (5V)

Environmental specifications

Operating temperature.....	0°C to 65°C (-40°C to 85°C optional)
Operating humidity.....	95%

Thru hole version (SMT available)



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