

OSA WiMAX Series GPS receiver clocks

Synchronization of WiMAX Base Stations



OSA 5208 WiMAX Series
19" x 1U

Exceeds WiMAX TDD and IEEE
802.16e requirements :

- optimal use of spectrum
- fast synchronization BTS-CPE
- reliable hand-over, no drop call

OSA 4500
WiMAX Series
123,5x98x27mm



OSA 4530
WiMAX Series
50,8x101,5x127mm



OSA 4580
Ad-hoc
form factor



www.oscilloquartz.com
osa@oscilloquartz.com

Neuchâtel - Switzerland
Tel.: +41 32 722 55 55
Fax: +41 32 722 55 56

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Versatile products for all
WiMAX Base Stations

- Various form factors
- 1 to 4 frequency outputs
- Several performance levels
- Specific connectivity and formats on request
- Precisely phase aligned outputs

WiMAX Series by Oscilloquartz

Precise synchronization of WiMAX Base Stations

Neuchâtel - Switzerland, May 03 2006,

Neuchâtel, Switzerland – Oscilloquartz SA, your leading partner in Synchronization and timing solutions for legacy and NGN networks, is proud to unveil its **WiMAX Series of GPS receiver clocks**, tailored for the synchronization of WiMAX Base Stations.

As WiMAX projects develop it becomes clear that licensed spectrum implementations are calling for Time Division Duplexing WiMAX (TDD WiMAX) to optimize their efficiency and usage of a limited spectrum. TDD WiMAX, WiBro and the soon available 802.16e (mobile WiMAX) put stringent phase timing constraints to the synchronization of base stations.

The solution is to phase synchronize all base stations with highly accurate and perfectly phase aligned GPS receiver docks. Oscilloquartz has developed several specific WiMAX GPS receivers, based on a highly stable Double Oven Crystal Oscillator (DOXO). The product line represented under **OSA WiMAX series** exceeds TDD WiMAX requirements especially in the domain of phase alignment. Beyond the several limited field trials, the OSA WiMAX series was chosen for the synchronization of the largest WiMAX Metropolitan Area Network in TOKYO where more than 1200 base stations are being deployed. Higher grade Base Station synchronization is required where operators do not compromise between Quality of Service, Speed of transmission and optimal usage of the limited bandwidth.

OSA WiMAX series is a versatile solution that can be integrated in different available form factors to accommodate the different types of Base Stations.

About Oscilloquartz

Oscilloquartz designs, manufactures and installs the most precise frequency sources and synchronization systems. It supplies Telecommunication integrators, public and private network operators in over 90 countries. Oscilloquartz' success relies on the unrivalled performance and reliability of its quartz oscillators and Network Synchronization solutions.

The products and systems, involving a combination of various technologies and know-how, meet and exceed all standards (ITU-T, ETSI, ANSI), norms (GSM, UMTS, or CDMA) and references (PRC, Cesium and GPS). Oscilloquartz is a leader in the field of GPS Receiver Clocks geared toward the O.E.M. market and serving the fast growing wireless telecom markets (TD-SCDMA version of UMTS, WiMax, Digital Video Broadband, cable TV and Satellite Backhauls). OSA builds up its OEM success on a highly versatile product platform and fast turn around development time to meet ad-hoc customer requirements.

OSA WiMAX Series

GPS Receiver clocks for WiMAX Base Stations

HIGHLIGHTS

- 1 PPS aligned to UTC
- 10 MHz low phase noise output
- Phase alignment +/- 10 ns on the raising edge of 1 PPS
- Economic, reliable and compact units
- Available in 3 different form factors :
 - 5" x 4" x 2" format
 - Integrated piggy back PCB
 - 19" x 1U unit
- Highly configurable firmware
- Integrated high stability holdover functionality with Frequency stability < 1 x10⁻¹⁰ /day (typical)
- ITU-T G.811 / ST1 compliant when locked to GPS
- ITU-T G.812 (I, V, VI) compliant holdover
- Available at 2 performance levels with 2 different OCXO: OSA8663 and OSA8625 DIL



GENERAL INFO

The synchronization of WMAX base stations requires highly accurate and perfectly phase aligned GPS receiver clocks. Oscilloquartz developed a specific series of WiMAX GPS receiver clocks based on a highly stable Double Oven Crystal Oscillator (OCXO). The product line is known as the **OSA WiMAX series** exceeds TDD WiMAX requirements especially in the domain of phase alignment and low phase noise. OSA WiMAX series is a versatile solution that can be integrated in several ways to better accommodate the different type of Base Stations: Outdoor versus Indoor, Macro versus Micro, FDD versus TDD, single versus multiple RF modules.

The precise and stable frequency and Phase Time of OSA WiMAX Series allows the WMAX Base Station:

- Frequency optimization with minimal frequency guard-bands
- Minimal Transmit and Receive Transition gaps
- Faster BTS/CPE synchronization
- Fully reliable hand-over of voice and data sessions (mobility IEEE 802.16-e)
- Manageable coexistence of FDD and TDD
- Multiple output for multiple RF modules (multi-sector antennas)

AVAILABLE FORM FACTORS



OSA 5200 WiMAX Series
19" x 1U



OSA 4530 WiMAX Series
50,8mm x 101.5mm x 127.0mm



OSA 4500 WiMAX Series
123.5 mm x 98 mm x 27 mm

TECHNICAL SPECIFICATIONS

1 PPS Output

- 200 ms width (configurable)
- < 20 ns rise time
- 2.5 V_{pp}/50 Ω

10 MHz Low Noise Output

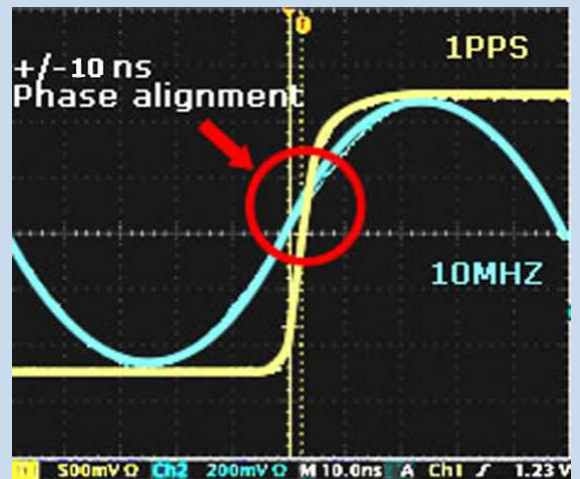
- Amplitude: 1.5 dBm ≤ V_{out} ≤ 4.5 dBm
- Impedance: 50 ohms

Performance when locked to GPS-signal

- 1 PPS accuracy:
 - < 100 ns pp (at constant temp.)
 - < 150 ns pp (at variable temperature, -5°C to +55°C)
- ADEV < 10⁻¹² (10 000 seconds)

Hold-Over performances (with 8663 OCXO)

1 PPS / 10 MHz alignment



- Long term stability : 1x10⁻¹⁰/day, 2x10⁻⁸/year
- Frequency stability: 6x10⁻¹⁰ pp (-5°C to +55°C)
- Phase drift 10 µsec / Day (typical)

Management

- RS -232C on DB9 connector with comprehensive set of commands for the control by the base Station
- 1 alarm relay contact
- TOD (Time-Of-Day) output compliant to NMEA0183
- GUI-based Configuration and Monitorings software

GPS Antenna and Cable

- Choice of antenna cable :
 - 20 m (LMR-400)
 - 60 m (LMR-400)
 - 120 m (LMR-400 w/ amplifier)
 - up to 300 m (CellFlex cable)
 - other cable lengths on request
- Choice of Active GPS Antennas
 - Frequency L1 (1'575 MHz)
 - -40 °C to 85 °C

Environmental characteristics

- Operational: -5 °C to +55 °C
- Storage: -40 °C to +85 °C
- Humidity: 95% non-condensing

Oscilloquartz offices

> Headquarter

Oscilloquartz SA
16, Rue de Brévards
2002 Neuchatel 2
SWITZERLAND
Tel: +41-32-722.5555
Fax: +41-32-722.5556
osa@oscilloquartz.com
www.oscilloquartz.com

> French-speaking Europe & Africa

The Swatch Group (France) SAS
Division Oscilloquartz products
49 avenue Hoche
75008 Paris
France
Tel: +33-1-5381.2246
Fax: +33-1-4574.6246
osafrance@oscilloquartz.com

> China

SMH International Trading (Shanghai) Co. Ltd.
Division Oscilloquartz products
Room 501, Metro Tower
200030 Shanghai
China
Tel: +86 13818976046
Fax: +86 2164267960
Alex.Zhang@sh.cn.swatchgroup.com

> U.S.A, Canada & Mexico

Oscilloquartz USA
5475 Mark Dabling Boulevard, Suite 200
Colorado Springs, CO 80918-3848
USA
Tel: +1-719-264-1777
Fax: +1-719-264-1911
osausa@oscilloquartz.com

Br_WiMAX_Ed.02/March 2007

osa@oscilloquartz.com

www.oscilloquartz.com

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