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OSCILLOQUARTZ
A division of Adtran

Oscilloquartz coreSync™ Data sheet

OSA 3250 Optical pumping cesium clock

5G Mobile   Telecom   Defense   Data center   Smart grid   Transportation   Financial   Broadcast

Benefits

z **High stability and long lifetime**
12-year lifespan

z **ITU-T PRC and ePRC compliant**
Fully meets G.811 and G.811.1 timing standards

z **Ultra-high accuracy**
Better than $\pm 1 \times 10^{-12}$; meets MTIE and TDEV masks

z **Compact and robust design**
Ideal for cloud, core and enterprise deployments

z **Technology leadership**
The only vendor with deep expertise in both synchronization and optical timing

z **RoHS-compliant**
Meets the latest environmental sustainability standards

z **Secure remote management**
SNMPv3 support, fully integrated with Mosaic Network Controller management system for enhanced security

z **Comprehensive logging**
Includes SSH, syslog, alarm log, audit log and security log for full operational visibility

Overview

An increasing number of networks and applications require precise synchronization. Inaccurate timing can degrade performance or even trigger system-wide outages. While GNSS provides excellent accuracy, satellite-based timing is vulnerable to jamming and spoofing and cannot be relied on as the sole synchronization source. With their high levels of accuracy and outstanding availability, atomic clocks provide the ideal backup for GNSS.

Our OSA 3250 is specifically designed for ePRC applications that demand exceptional holdover. It enables highly stable synchronization over an extended 12-year lifetime – compared to just eight years for magnetic cesium. Thanks to its advanced optical pumping cesium technology, the OSA 3250 offers greater longevity and a more robust design than legacy magnetic deflection cesium clocks. When combined with a highly scalable grandmaster, such as our OSA 5430 or 5440 Series, it provides a reliable solution for reducing GNSS dependency in 4G and 5G networks.

OSA 3250

High-level technical specifications

High stability and accuracy

- ᶻ Outperform ITU-T G.811.1 ePRC specification

Longest lifetime
- ᶻ Opticalpumping cesium improves efficiency in utilizing Cs atoms
- ᶻ No compromise between lifetime and performance
- ᶻ Higher performance operation within tight specifications over over 12 rather than 8 years

Wide range of interfaces
- ᶻ Four BITS outputs
- ᶻ Four 1PPS outputs
- ᶻ Two analog outputs
- ᶻ One 1PPS input

Robust design
- ᶻ Improvingestablished cesium atomic clock design practices
- ᶻ Reusing unique cesium tube assembly competence
- ᶻ Operating critical components outside vacuum tube
- ᶻ Fully redundant and hotswapable PSUs

Modular design
- ᶻ Standard3RU shelf for both ETSI and 19" rack mounting
- ᶻ Wide range of synchronization input and output interfaces
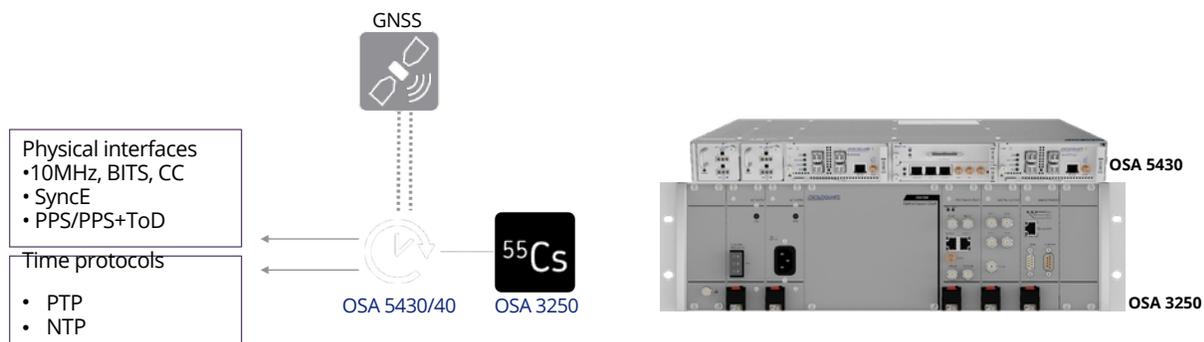- ᶻ Easy integration with grandmaster in ePRC/ePRTC applications

Common management
- ᶻ Nativesupportfor remote and secured management
- ᶻ Common Mosaic Network Controller and Sync Director
- ᶻ Supporting SNMP v3 for ease of integration into third-party NMS
- ᶻ SSH
- ᶻ Syslog, alarm log, audit log, security log and clock data

Applications in your network

ePRCandePRTCforcommunicationandcloud service providers, power utilities, enterprises and governments
- ᶻ Highlyaccurate andstable frequencysource asper PRCG.811 / ePRC G.811.1
- ᶻ ePRC/ePRTC solutions for communication networks, in combination with satellite-based timing and grandmasters
- ᶻ Replacement of magnetic cesium clocks for higher accuracy and longer lifetime
- ᶻ Highly stable back-up to GNSS in cloud data centers and with power utilities
- ᶻ Cloud service providers, enterprises, governments and defense organizations benefit from highest precision and an extended lifetime


GNSS

Physical interfaces
•10MHz, BITS, CC
• SyncE
• PPS/PPS+ToD

Time protocols
• PTP
• NTP

^{55}Cs

OSA 5430/40   OSA 3250

OSA 5430

OSA 3250

OSA 3250

Product specifications

Frequency accuracy and settability
- Frequency accuracy atfactory ≤ +/- $1x10^{-12}$
- Frequency reproducibility after power cycle ≤ +/- $1x10^{-12}$
- Frequency settability resolution: +/-$1x10^{-15}$
- Frequency settability range: +/- $1x10^{-9}$

Stability of frequency outputs meeting ITU-T
- OSA3250 meets the G.811.1ePRCspecification
- Combined with the OSA ePRTC solution, complies with G.8272.1 ePRTC
- Maintains 30 ns accuracy to UTC during locked operation and 100 ns holdover for 14 days
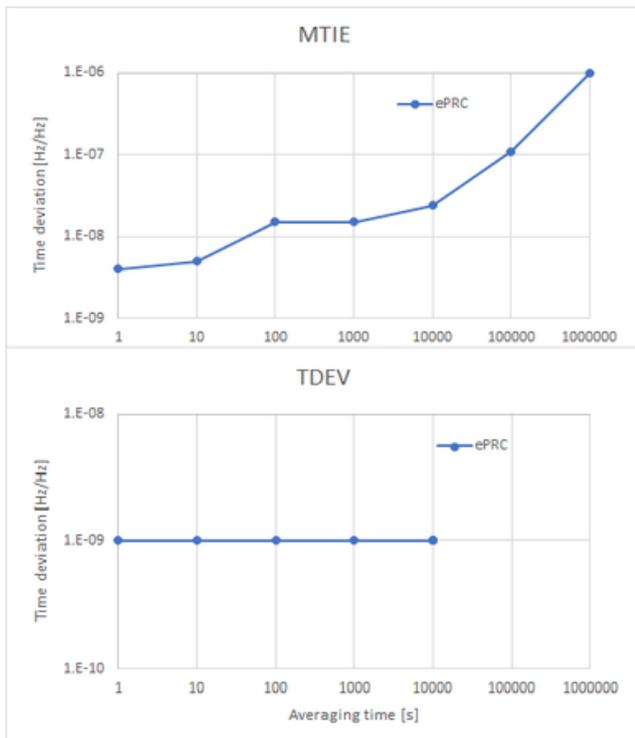
Telecom BITS outputs
- Number of BITSoutputs:4
- Signal type: E1/T1/2048KHz
- SSM support
- Connectors:
  - 2 x BNC for E1/T1/2048KHz
  - 2 x RJ-48 for E1/T1/2048KHz
- Impedance:
  - 120Ω for RJ-48
  - 75Ω for BNC

Analog frequency outputs
- Numberof analog outputs:2
- Frequency: 5MHz and 10MHz
- Signal format: sine wave
- Connector: BNC
- Load impedance: 50Ω +/- 5%
- Amplitude: 13dBm +/- 1dBm
- Harmonics: ≤ -40dBc
- Non harmonics (spurious) ≤ -70dBc

Digital frequency outputs
- Numberof digitalfrequencyoutputs: 1
- Signal format: square wave
- Frequency: 2.048MHz, 1.544MHz, 1MHz, 5MHz,10MHz, 25MHz,50MHz,100KHz
- Connector: SMA
- Amplitude: < 2.5VPP @ 50Ω load

Timing digital outputs 1PPS
- Numberof 1PPSoutputs:4
- Frequency: 1 Hz
- Connector: BNC/F
- Signal format: pulse LVCMOS
- Load impedance: 50Ω
- Amplitude: 2.5 Vpp with 50Ω load
- Jitter ≤1ns RMS
- Rising edge ≤5ns (10% to 90%)
- Output shape: pulse
- Output timing signal significant slope: positive
- Pulse width: 100 µs (adjustable)

Timing synchronization input 1PPS
- Numberof 1PPSinput:1
- Frequency: 1Hz
- Connector: BNC/F
- Signal format: pulse LVCMOS
- Load impedance: 50Ω or 1MΩ (programmable)
- Amplitude: min. 2.5V; max. 5V
- Pulse width: 100ns-100µs
- Input timing signal significant slope: positive or negative (programmable)

Synchronisation of 1PPS timing outputs
- Synchronisationrange: +/-500µs
- One shot external sync resolution (sync on 1PPS Input) ≤ ± 10 ns
- Manual phase adjustment of 1PPS outputs
- 4 outputs adjustable independently
- Resolution of manual adjustment: 1 ns

OSA 3250

Power supply

- Numberofpower supply modules: 2
- Fully redundant power blocks
- Hot swappable
- Automatic switching
- Option 1
  - AC 110-240V, C15 connector
  - Range 88V up to 264V
  - Range 45Hz up to 65Hz
- Option 2
  - DC +24V (range 18V up to 30V)
- Option 3
  - DC-48V (accepted range -36V up to -72V)
- Power consumption steady state @ 25ºC ≤50W
- Power consumption at warm-up ≤90W

Environment

- Operating temperature: 10ºC - +50ºC
- Non-operating temperature: -40ºC - +70ºC
- Operating relative humidity: 10% - 90% non condensing
- Operating DC magnetic field: 0 Gauss to 2 Gauss any direction
- Random vibration/storage/transportation/drop
  - IEC 60068-2
  - Basis ETSI EN 300019-2 test specification T1.1 environmental class 1.1
  - Basis ETSI EN 300019-2 test specification T2.2 environmental class 2.2
- Altitude (storage): 0 -15,000 m
- Safety: IEC 62368-1:2023
- EMC and ESD
  - EN / IEC 61326-1:2020 Group 1, class A
  - CISPR 11:2024
  - CISPR 32:2015/AMD:2019
  - CISPR 35:2016
  - 47 CFR, Part 15, Subpart B, class A
  - ICES-003 Issue 7, class A
  - ICES-001 Issue 5, & 3.2.1 & 3.2.2
  - EN 55011:2026
  - EN 55032:2015
  - EN 55035:2017/A11:2020
  - IEC 61000-3-2:2018/AMD2:2024
  - IEC 61000-3-3:2013/AMD2:2021
  - IEC 61000-3-11:2017
  - IEC 61000-3-12:2011/AMD12021
  - Comply with Directive 2011/65/EU of the European Parliament and Commission Delegated Directive (EU) 2015/863

Mechanical

- Table topor rack mountable 19''
- Width/with rack ears: 450mm/482.6mm
- Depth: 510mm
- Height: 132mm
- Weight: 16kg

Management features

Status LED

- 3x (ALARM-STATUS-POWER)
- On the front panel (management card)

Alarm relay

- Alarm relay: 3
- Maximum rating: U= 50 VDC, I = 250 mA
- connector: SUB-D 9/F
- On the front panel (management card)

Local management port

- RS-232C
- Connector: SUB-D9/M
- Port Configuration: Baud rate 115200 bps
- Port Configuration: 8 data bits, 1 StopBit
- Port Configuration: No Parity, No Handshake
- Management commands: CLI
- Management software: Windows GUI
- Remote management port

Remote management port

- Remote management port: Ethernet - TCP-IP Connector: RJ45
- Management commands: SNMP v3 (including authentication and encryption)
- Management software: Mosaic Network Controller and Sync Director
- SSH
- Syslog: alarm log, audit log, security log and clock data

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