OSCILLOQUARTZ
A division of Adtran

Oscilloquartz antennas and accessories

Data sheet

OSA antennas and accessories

Antennas and accessories engineered for high-performance and optimal GPS/GNSS

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

Benefits

- **Multi-constellation GPS/GNSS antennas specifically engineered for harsh environments**
- **L1 GPS/GNSS receiver antenna covering all L1 upper band satellite constellations, including satellite-based augmentation system-SBAS**
- **Triple-band/multi-constellation antennas**
- **Low Earth orbit (LEO) STL band antenna, or mixed STL + GPS/GNSS L1 band**

Overview

Antennas and accessories are crucial for maintaining precise timing, facilitating smooth operations, and achieving optimal performance, even in adverse conditions. OSA antennas feature anti-jamming technology that significantly reduces interference from transmitters. Our comprehensive range of antenna cables and accessories deliver straightforward, end-to-end solutions that efficiently enhance your communication infrastructure. OSA antennas ensure robust, high-performance communications for GPS/GNSS receivers-improving reliability and connectivity across all environments. OSA provides an extensive range of antennas and accessories specifically engineered for flexible and easy implementation. Depending on the cable type, extended cable lengths can be achieved by incorporating in-line GPS/GNSS amplifiers at the antenna. Our antenna cable splitters allow a single antenna and cable to support up to four GPS/GNSS receivers. What's more, OSA offers a wide variety of converters that ensure connectivity with low-loss GPS/GNSS coaxial cables. These solutions are engineered to enhance the performance and reliability of your GPS/GNSS applications, providing seamless integration and optimal functionality.

- Inline GPS/GNSS amplifiers, installed directly at the antenna, provide a simple method for extending cable length (dependent on the cable type used).
- Lightning arrestors provide critical protection against electrical surges, safeguarding downstream equipment and ensuring the reliability, longevity and safety of your timing operations, components and people.
- Antenna splitters allow a single antenna and cable to be utilized for up to four GPS/GNSS receivers, maximizing efficiency and reducing the need for additional hardware.

Antenna

Cable

Amplifier

OSA antennas and accessories

Product specifications: Antennas

GPS/GNSS L1 antennas

Our GPS/GNSS L1 multi-constellation antennas are specifically engineered for tough environments. With their connectors located inside the threaded socket (pipe mount), the antenna cable is routed inside the mounting pole, protecting both the cable and connection. These antennas have all an internal active high-gain low noise amplifier (LNA) with a high rejection filter centered on GPS L1, Galileo E1, GLONASS G1 and BeiDou B1 bands. Extended cable run antenna installations can be completed with a line amplifier that extends operational distance up to 300m (refer to accessories section).

Impedance / Polarization: 50 Ω / RHCP

Part number	1047020171-02	1047020170-02	1047020134-01
Shape			
Frequency	1561 – 1602MHz	1559 – 1610MHz	1559 – 1610MHz
Gain	40dB +0/-5dB	26 dB +4/-2dB	40 dB ±4dB
Input voltage	+2.7 to 10Vdc	+2.8 to +6.0Vdc	+2.8 to +6.0Vdc
Power consumption (typical)	25mA	25mA	25mA
Noise (typical)	<2.5dB	<2.0dB	<2.0dB
VSWR (typical)	≤2.0 : 1	≤2.0 : 1	≤2.0 : 1
Group delay	30ns ±10	38ns ±8	50ns ±8
Operating temperature	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Humidity	IP67	IP67	IP67
Dimensions (H x Ø)	76 x 66.5mm	60 x 44mm	60 x 44mm
Weight	90g	50g	50g
Connector	TNC female	TNC female	TNC female
Antenna kit (antenna + mounting kit)	• Antenna + L-bracket mount (BC47020106-01) • Antenna + pipe mount (BC47020107-01)	• Antenna + L-bracket mount (BC47020108-01) • Antenna + pipe mount (BC47020101-03)	• Antenna + L-bracket mount (BC47020109-01) • Antenna + pipe mount (BC47020102-02)
Application	Cost effective L1 reception	High accuracy L1-low gain	High accuracy L1-high gain

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GPS/GNSS L1+L2+L5+L6 multiband antennas

OSA GPS/GNSS multiband / multi-constellation antennas are engineered for outdoor and rooftop installations in tough environments. With their connectors located inside the threaded socket (pipe mount), the antenna cable is routed inside the mounting pole, effectively protecting both the cable and connection. OSA antennas have an internal, active high-gain low-noise amplifier(LNA) combined with a high-rejection filter centered on GPS/GNSS L2/L5/L6 lower bands at 1160-1300MHz, as well as GPS/GNSS L1 higher bands at 1559-1610MHz, including particular efficient out-of-band rejection for noisy RF environment. Extented cable run antenna installations can be completed with a line amplifier that extends the operational distance up to 300m (refer to accessories section).

Impedance / Polarization : 50 Ω / RHCP

Part number	1047020177-01	1047020173-01	1047027436-01
Shape			
Frequency	1160 – 1255MHz 1559 – 1606MHz	1160 – 1255MHz 1559 – 1606MHz	1150 - 1300MHz 1500 - 1615MHz
Constellations	GPS: L1/L2/L5 GLONASS: G1/G2/G3 Galileo: E1/E5 Beidou: B1/B1-2/B2 Navic L5 L Band	GPS: L1/L2/L5 GLONASS: G1/G2/G3 Galileo: : E1/E5 Beidou: B1/B1-2/B2 Navic L5 L Band	GPS: L1/L2/L5 GLONASS: G1/G2/G3 Galileo: E1/E5/E6 Beidou: B1/B1-2/B2/B3 QZSS: L1/L2/L5/L6 Navic L5/L6 L Band
Gain	3B ±2dB	37dB ±2dB	40dB ±5dB
Input voltage	+3.3 to +12.0Vdc	+2.5 to +16.0Vdc	+2.5 to +5.5Vdc
Power consumption (typical)	<50mA	<25mA	<37mA
Noise (typical)	<2.0dB	<2.5dB	<3.0dB
VSWR (typical)	≤2.0 : 1	≤1.8 : 1	≤2.0 : 1
Group delay	8ns ±4	10ns ±2	17ns ±2
Operating temperature	-40°C to +85°C	-70°C to +85°C	-40°C to +85°C
Humidity	IP67	IP69K	IP67
Dimensions (H x Ø)	66.5 x 77 mm	60 x 100 mm	40 x 105 mm
Weight	180g	210g	400g
Connector	TNC female	TNC female	TNC female
Antenna kit __(antenna + mounting kit)	• Antenna + L-bracket mount (BC47020225-01) • Antenna + pipe mount (BC47020224-01)	• Antenna + L-bracket mount (BC47020221-01) • Antenna + pipe mount (BC47020220-01)	• Antenna + L-bracket mount (BC47020233-01) • Antenna + pipe mount (BC47020232-01)
Application	Cost effective MB reception	High accuracy / ePRTC	High accuracy / ePRTC in hostile RF conditions (enhanced out-of-band signal rejection) – QZSS + L6 band

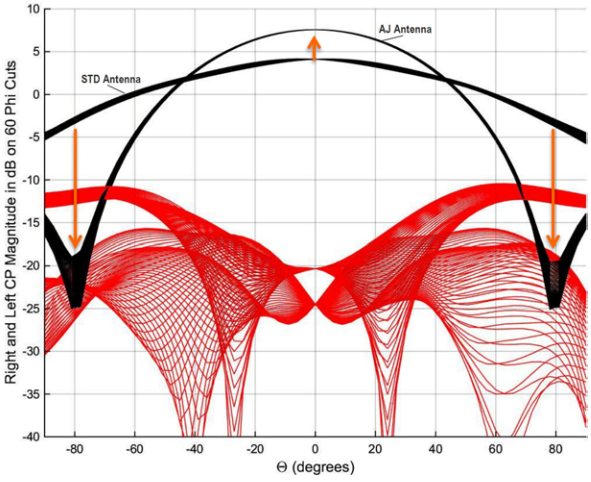
OSA antennas and accessories

Anti-jamming antennas

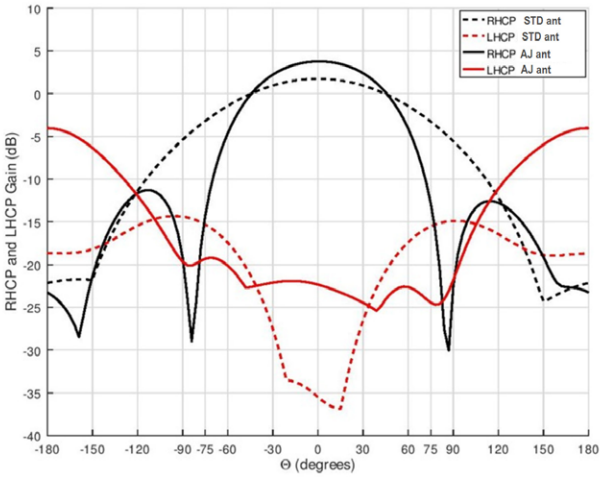
OSA antennas are engineered with anti-jamming features that significantly mitigate interference and jamming from ground-based transmitters (typically 15° and lower). The radiation patterns of anti-jamming antennas provide high attenuation and wide band suppression for all signals received at low elevation angles and increases for signals received near zenith. This feature effectively mitigates high-power jamming signals which, without anti-jamming antennas, would be received and could potentially saturate the GPS/GNSS receiver.

Depending on the GPS/GNSS receiver model, anti-jamming antennas are available in single-band GPS/GNSS L1 or multiband L1+L2+L5. All primary global satellite constellations are supported (GPS/QZSSL1/L2/L5, GLONASS-G1/G2/G3, GalileoE1/E5a/E5b, BeiDou-B1/ B2/B2a, NavIC-L5 frequency bands and SBAS). Extended cable run antenna installations can be completed with a line amplifier that extends the operational distance up to 300m (please refer to the accessories section).

L1 band – anti-amming rejection capability



Multiband– anti-jamming rejection capability



OSA antennas and accessories

Impedance / polarization : 50 Ω / RHCP

Part number	1047027431-01	1047027432-01
Shape		
Frequency	1575.42MHz (GPS - QZSS L1 / Glonass G1 / Galileo E1 / Beidou B1)	1164 – 1254MHz 1559 – 1606MHz
Constellations	GPS: L1 GLONASS: G1 Galileo: E1 Beidou: B1	GPS: L1/L2/L5 GLONASS: G1/G2/G3 Galileo: E1/E5 Beidou: B1/B1-2/B2 QZSS: L1/L2/L5 Navic L5
Gain	40dB ±2dB	40dB ±2dB
Input voltage	+2.5 to +16.0Vdc	+2.5 to +16.0Vdc
Power consumption (typical)	<19mA	<62mA
Noise (typical)	<3.0dB	<2.5dB
VSWR (typical)	≤1.8 : 1	≤1.8 : 1
Group delay	31ns ±2	L1: 10ns / L2: 4ns / L5: 11ns
Operating temperature	-40°C to +85°C	-40°C to +85°C
Humidity	IP67	IP67
Dimensions (H x Ø)	127 x 100mm	178 x 91mm
Weight	370g	245g
Connector	TNC female	TNC female
Antenna kit (antenna + mounting kit)	• Antenna + L-bracket mount (BC47020223-01) • Antenna + pipe mount (BC47020222-01)	• Antenna + L-bracket mount (BC47020228-01) • Antenna + pipe mount (BC47020229-01)
Application	GNSS L1 receiver in jammed environment	GNSS multiband receiver in jammed environment

OSA antennas and accessories

STL antennas

GPS/GNSS signals are easily susceptible to jamming (intentionally or accidentally) and spoofing. The STL signal, with its 66 low Earth orbit (LEO) based satellites constellation, is a reliable and resilient alternative to GPS/GNSS.

The STL LEO signal being 1,000 times stronger than GPS/GNSS, makes seamless and secure reception possible using OSA devices configured with an outdoor antenna (mixed reception GPS/GNSS L1 + STL) but also inside buildings* with an indoor antenna (STL reception).

Impedance / polarization : 50 Ω / RHCP

Part number	Outdoor antenna 1047020174-01	Indoor antenna 1047027433-01
Shape		
Frequency	1559 – 1626.5MHz	1616 – 1626.5MHz
Gain	>35dB	28dB
Input voltage	+2.7 to +10.0Vdc	+2.2 to +12.0Vdc
Power consumption (typical)	<25mA	15mA
Noise (typical)	<2.5dB	<2.0dB
VSWR (typical)	≤2.0 : 1	≤1.5 : 1
Group delay		
Operating temperature	-40°C to +85°C	-40° C to +85°C
Humidity	IP67	IP67
Dimensions (H x Ø)	77 x 66.5mm	54.2 x 33.3mm
Weight	180g	24g
Connector	TNC female	SMA male
Antenna kit (antenna + mounting kit)	• Antenna + L-bracket mount (BC47020227-01) • Antenna + pipe mount (BC47020226-01)	• Antenna + L-bracket mount + 2m cable (BC47020230-01) • Antenna + L-bracket mount + 5m cable (BC47020231-01)
Application	Roof antenna installation GNSS L1 + STL	Indoor STL reception

*Note : the quality of the reception of the signal indoor can vary and is dependent on different factors like where the antenna is placed (how deep inside the building), the material from which the building is made of, its architecture, its location, etc… for better results it is recommended to test different places and select the best one.

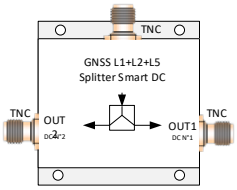
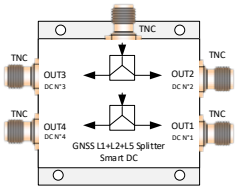
OSA antennas and accessories

Product specifications: Accessories

Smart splitters

Unlike regular splitters, “smart” splitters are powered directly from a receiver connected to one output (OUT 1 to OUT 4 priorities). This feature greatly improves GPS/GNSS signal availability and redundancy. In situations where an antenna fails, all receivers connected to the smart splitter will recognize the antenna failure, triggering an alarm to the operator. An internal active low-noise amplifier operates to compensate for the signal attenuation taking place when splitting one signal into several outputs. Therefore using a smart splitter does not reduce the maximum antenna cable length. Smart splitters are compatible with L1 + L2 + L5 GPS/GNSS bands (GPS, QZSS, GLONASS, Galileo, BeiDou, NavIC-L5 + L-band correction) as well as LEO orbit satellites like STL.

Impedance: 50 Ω

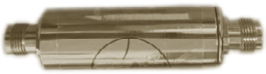
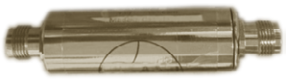
Part number	1047020213-01	1047020218-01
Shape		
Frequency	1100 – 1700MHz	1100 – 1700MHz
Gain	0 ±1dB	0 ±1dB
Input voltage	+3.0 to +12.5Vdc	+3.0 to +12.5Vdc
Power consumption (typical)	<25mA	<25mA
Noise (typical)	<4.0dB	<4.0dB
VSWR (typical)	≤1.5 : 1	≤1.5 : 1
Group delay	≤2ns	≤2ns
Operating temperature	-40°C to +85°C	-40°C to +85°C
Humidity	IEC-60529- IP67 (enclosure)	IEC-60529- IP67 (enclosure)
Dimensions (L x W x H)	117 x 112x 38mm	117 x 112x 38mm
Weight	270g	280g
Connector	TNC female	TNC female
Application	One antenna distributed to 2 receivers	One antenna distributed to 4 receivers

OSA antennas and accessories

Line amplifiers

These are rugged, waterproof wideband in-line amplifiers, specially designed to boost weak frequency signals from 1100 to 1700 MHz, including L-Band and all GPS/GNSS bands (GLONASS, Galileo QZSS, BeiDou, NavIC-L5) as well as LEO orbit satellites like STL. Directly connected to the antenna, these line amplifiers are placed directly within the mounting mast*, keeping them out of sight and well protected against hard weather conditions. These line amplifiers are powered directly from the GPS/GNSS receiver over the coaxial cable (no need for an external power supply).

Impedance: 50 Ω

Part number	1047027428-01	1047027427-02
Shape		
Frequency	1100 – 1700MHz	1100 – 1700MHz
Gain	18 ±1dB	42 ±2dB
Input voltage	+3.0 to +12Vdc	+3.3 to +10.0Vdc
Power consumption (typical)	<11mA	<25mA
Noise (typical)	<2.0dB	<2.0dB
VSWR (typical)	≤1.3 : 1	≤2.0 : 1
Group delay	<1ns	<1ns
Operating temperature	-40°C to +85°C	-40°C to +85°C
Humidity	IP67	IP67
Dimensions (L x Ø)	59x 20mm	59x 20mm
Weight	85g	85g
Connector	TNC female	TNC female
Application	Long GNSS cables	Very long GNSS cables

OSA antennas and accessories

Coaxial cables

OSA low-loss and high-performance GPS/GNSS cables (type HPC-400) are available in various lengths and are pre-fitted with TNC connectors at both ends. These high-quality cables are the best choice for connecting GPS/GNSS receivers with their antennas for distances up to 300m (depending on the configuration, a line amplifier may be required).

HPC-400 Main characteristics	
Impedance	50Ω
Frequency range	Up to 6000MHz
Max attenuation @ 1500 MHz	16.8 dB/100m
VSWR	≤1.22
Outer jacket diameter	10.29mm
Minimum bend radius	25.4mm
Weight	0.1 kg/m
Velocity of propagation	85% ±0.5%
Delay	3.92 ns/m (typ.)
Operating temperature	-40/+85°C
Connectors	TNC male (plug) connector pre-installed at each end
Halogen free	Yes

GNSS cable items

Part number	Distance	Attenuation	Cable compensation delay
1047014324-01	10m	1.68dB	39.2ns
1047014325-01	20m	3.36dB	78.5ns
1047023807-01	30m	5.04dB	117.7ns
1047014326-01	60m	10.08dB	235.5ns
1047023808-01	90m	15.12dB	353.2ns
1047014327-01	120m	20.16dB	470.9ns
1047023809-01	130m	21.84dB	510.2ns
1047015901-01	150m	25.2dB	588.6ns

OSA antennas and accessories

EMP

Outdoor antenna installations must be protected against electromagnetic discharges created by lightning and other atmospheric events. OSA offers two types of EMP protection kits: gas discharge tube arrestor (GDT) technology with 350uJ residual energy and, for a higher degree of protection, hybrid technology (GDT + fine arrestor) providing 6uJ of residual energy. To safeguard installations where the main cable inside the building is operating in an environment susceptible to strong electromagnetic interferences, a combination of both technologies is preferred: GDT at the building entrance and fine arrestor placed before the equipment installation.

Impedance: 50 Ω

Spec	1047024187-01	1047020133-01
Shape		
Protection technology	Hybrid GDT + Fine arrestor	GDT
Frequencies	800 – 2500MHz	0 – 2000MHz
Insertion loss	≤0.3dB	≤0.2dB
Return loss	≥23dB	≥20dB
Surge current handling capability	20 single kA (test pulse 8/20 µs)	10 single / 5 multiple kA (test pulse 8/20 µs)
Residual pulse energy (test pulse 4 kV 1.2/50 µs / 2 kA 8/20 µs)	6µJ typically	350µJ typically
Weight	90g	50g
Waterproof degree	IP67	IP65
Operating temperature	-40°C to +85°C	-40°C to +85°C
Compliance	IEC 61643-21	IEC 61643-21
Connectors	TNC female	TNC female
Application	Very small residual energy at cable building entrance or before the equipment	EMP at cable building entrance

OSA antennas and accessories

Antenna mounting accessories

Pipe mount kit

This kit includes one mast (1047010083-02) and two metallic clamps (1047012879-01) for installing the antenna on an existing pole. The recommended pole diameter is 45 mm (1.77″) to 90 mm (3.5″). The antenna mast is made of a high-resistance material (polyoxymethylene) to accommodate a wide array of challenging environments and also used ‘spacer’ to improves antenna performance during strong winds or external forces(1013904039).

The mast dimensions are: length = 250mm x diameter = 30mm (9.84″ x 1.18″).

Pipe Mount

L-bracket 1013904034

This stainless steel L-mounting bracket allows easy installation with two M4 screws (not included) or clamps (not included). This bracket is designed to support the most space-constrained environments.

L-bracket mount

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