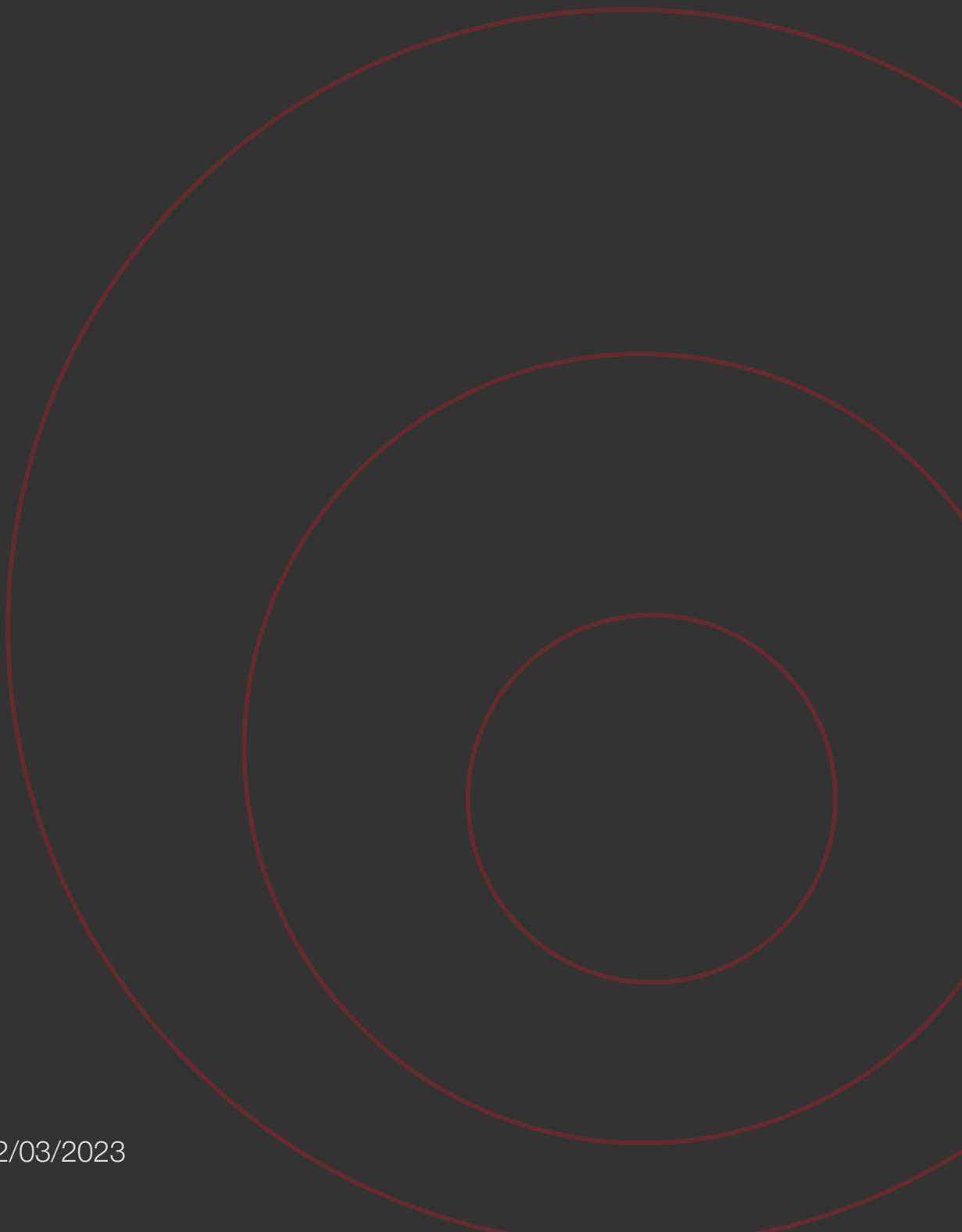
Anteral

Product Catalogue



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Content list

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About us

Anteral is formed by a high-qualified and multidisciplinary team able to face the most demanding challenges. Our main goal is to impulse the technological innovation while we try to meet the needs of modern society.

Our committment with the client necessities results in a company with a culture based on innovation, team building and self-improvement. Following this culture, Anteral develops innovative technology in the fields of antennas, passives and radar technology for space, telecommunications, defence, smart cities and industry and academia sectors, among others.

ANTENNAS & PASSIVE COMPONENTS

Anteral counts with a large heritage in the development of antennas and passive components fulfilling the most demanding requirements and state-of-the-art specifications. Anteral designs, fabricates, and tests its devices based on high quality rules and processes. Thanks to its large heritage on the Aerospace sector, where Anteral counts with its developments on board of more than 12 satellites, Anteral offers outstanding performance products that can be of great relevance for many applications and uses.

RADAR TECHNOLOGY

R&D is part of Anteral´s DNA and this is how the radar technology development line was born. Anteral has made used of its knowhow on the RF field to develop its own radar products with the aim of boosting innovative applications. Anteral´s radar technology can be employed on Smart Cities, Industrial, Education and Health sectors. Anteral is always taking care of the R&D part and creating new and innovative products and applications. This development line is known under the brand uRAD (Universal Radar, www.urad.es) and counts with a proprietary international patent.

AD-HOC DEVELOPMENTS

Apart from Anteral´s products, the company also offers ad-hoc designs considering the client´s requirements and developing custom solutions for them.

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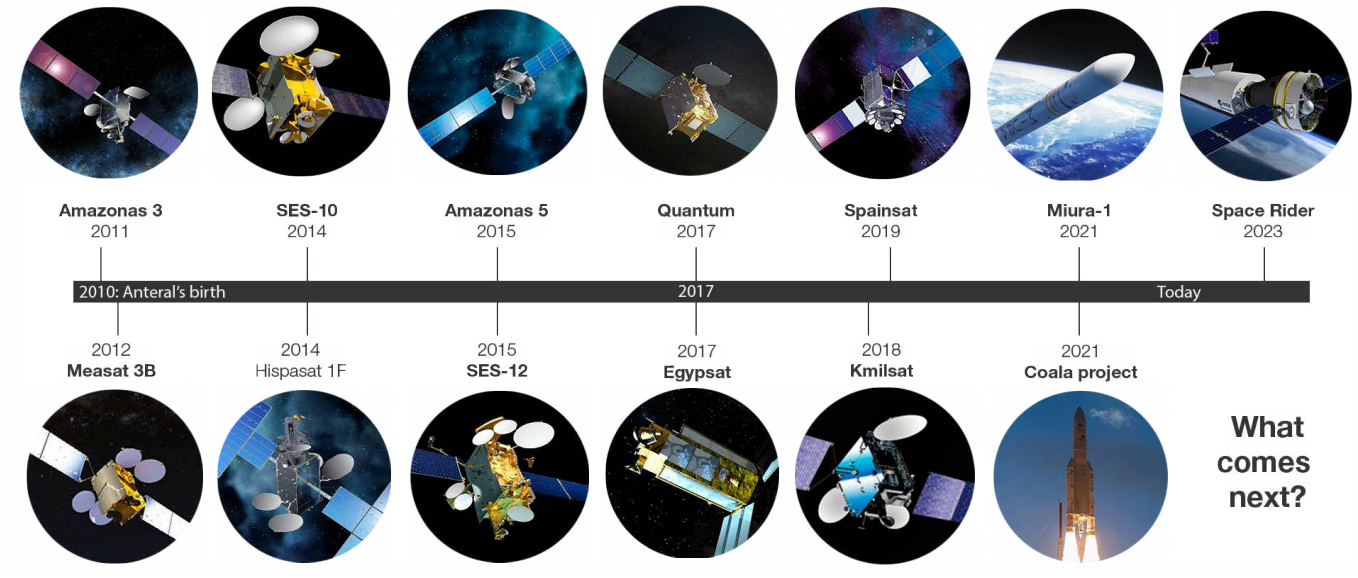
FROM NAVARRA TO SPACE

Clients in more than 50 different countries trust in us. Leading companies all over the world believe in our capabilities to face the most demanding challenges.

OUR HERITAGE

Thanks to the participation in more than 12 satellite programs, we offer the best of our experience in each new project, combining our know-how with the fulfillment of the highest quality standards.



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Quality Products and Services

QUALITY MANAGEMENT SYSTEM

Anteral works with high quality standards that provide assurance management procedures. At the moment, Anteral counts with the **ISO9001:2015** certification, that provides quality and control processes for the complete business structure which is renewed every year, and with the **EN9100:2018**, which is the highest standard in terms of quality for the aerospace sector, covering aviation, space and defense.

The Quality Management Procedures gathered within Anteral´s certification documentation (ISO9001:2015 and EN9100:2018) are divided into different processes that determine the way to proceed for Commercial Management (FP01), Design & Development (FP02), Procurement Management (FP03), Production Management (FP04), Human Resources (FP05), Infrastructure & Equipment (FP06), Information & Communication (FP07), Management Responsibility (FP08), Test & Evaluation (FP09) and Progress Management (FP10). These procedures gather the complete management structure and assures a high-quality management system.

TÜVRheinland® CERTIFIED

Management System
ISO 9001:2015
EN 9100:2018

CHAIN OF SUPPLIERS

Anteral always works with workshops and companies that also count with ISO 9001, and ISO 9100 for space programs, in order to maintain a high-quality protocol. In this way, a product assurance plan is guaranteed following both certifications and having always a fluent an easy communication between the parts involved.
In this way, Anteral can provide outstanding products developed under the most restrictive quality procedures complying with the client´s requirements and necessities.

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ANTENNAS

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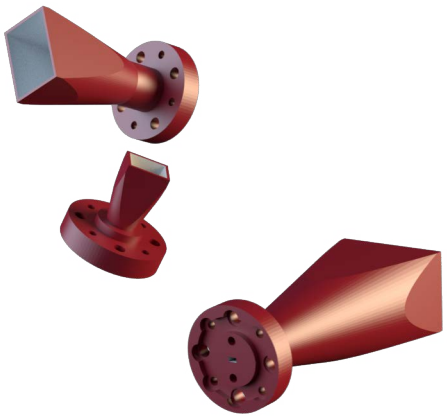
1. SGH - Standard Gain Horn Antenna

FEATURES

- High performance standard gain horn
- From 8.2 to 750 GHz (WR90 to WR1.5)
- Low VSWR
- Specific gain values can be requested



PRODUCT DESCRIPTION

Anteral's Standard Gain Horns are high performance antennas designed to cover the frequency range of **8.2 to 750 GHz** in different bands with 20 dBi and 26 dBi nominal mid-band gain and very low VSWR (<1.1).

The antennas are mechanically designed to minimize weight, improve robustness, and offer a sharp aperture. Models from WR28 to WR1.5 are manufactured from a single aluminum rod. No soldering for flanges and no screws for attaching parts are included. These antennas are equipped with the standard and precision style flange. The flanges are specially manufactured to provide the most accurate and repeatable mechanical alignment possible.

This type of horns is especially suitable for laboratory test measurements, electromagnetic measurements, and gain calibration. Moreover, **custom bands** and gain values can be requested.

ELECTRICAL SPECIFICATIONS

				3 dB beamwidth (deg)		Sidelobe (db)		
Model	**Frequency (GHz)**	**VSWR**	**Directivity (dBi)**	**E-Plane**	**H-Plane**	**E-Plane**	**H-Plane**	**Length (mm)**
SGH-20-WR90	8.2 - 12.4	1.1	20	19	17.2	-12.8	-22.5	408.5
SGH-20-WR75	10 - 15	1.1	20	19	17.1	-15	-22.3	340.4
SGH-20-WR62	12.4 - 18	1.1	20	18.6	17	-13.9	-22.2	282.3
SGH-20-WR51	15 - 22	1.1	20	18.8	17	-14.2	-22.5	231.5
SGH-20-WR42	18 - 26.5	1.1	20	19.4	17.3	-13.7	-22.3	190.6
SGH-26-WR34	22 - 33	1.1	26	8.2	8.6	-10.2	-31.7	259.1
SGH-26-WR28	26.5 - 40	1.1	26	6.7	7.8	-8.4	-33.9	266.9
SGH-26-WR22	33 - 50	1.1	26	7.9	8.4	-9.8	-31.2	179.2
SGH-26-WR19	40 - 60	1.1	26	7.7	8.5	-10	-33	150.4
SGH-26-WR15	50 - 75	1.1	26	7.7	8.5	-10	-33	118.4
SGH-26-WR12	60 - 90	1.1	26	7.7	8.5	-10	-33	97.6
SGH-26-WR10	75 - 110	1.1	26	7.7	8.5	-10	-33	80
SGH-26-WR08	90 - 140	1.1	26	7.7	8.5	-10	-33	64
SGH-26-WR06	110 - 170	1.1	26	7.7	8.5	-10	-33	52
SGH-26-WR05	140 - 220	1.1	26	7.7	8.5	-10	-33	40.8

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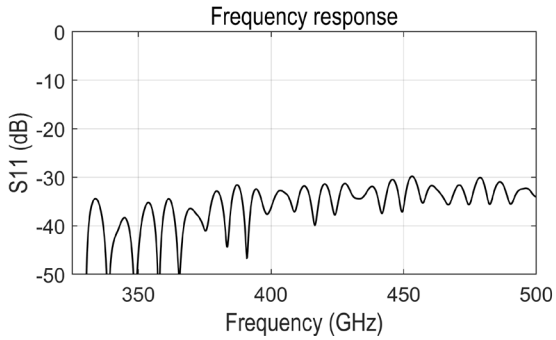
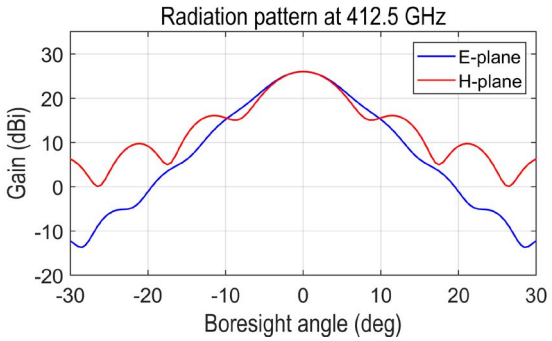
				3 dB beamwidth (deg)		Sidelobe (db)		
Model	Frequency (GHz)	VSWR	Directivity (dBi)	E-Plane	H-Plane	E-Plane	H-Plane	Length (mm)
SGH-26-WR04	170 - 260	1.1	26	7.7	8.5	-10	-33	34.4
SGH-26-WR03	220 - 330	1.1	26	7.7	8.5	-10	-33	27.2
SGH-26-WR2.8	260 - 400	1.2	26	7.7	8.5	-10	-33	22
SGH-26-WR2.2	330 - 500	1.2	26	7.7	8.5	-10	-33	17.6
SGH-26-WR1.9	400 - 600	1.2	26	7.7	8.5	-10	-33	15.2
SGH-26-WR1.5	500 - 750	1.2	26	7.7	8.5	-10	-33	12

This table contains only a few SGH examples. All data are typical values. Contact us for other SGH and more information.

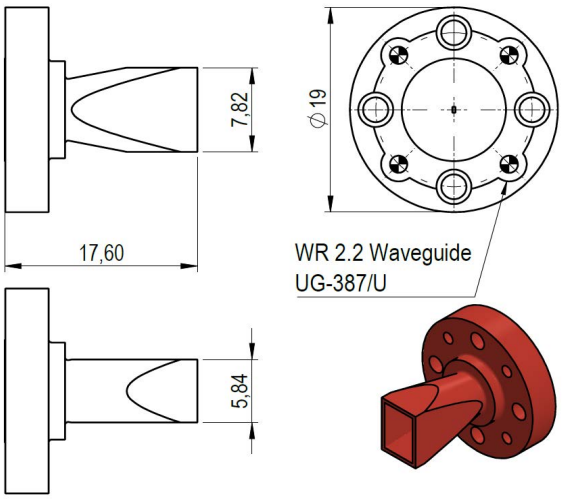
TYPICAL PERFORMANCE





MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
Fabrication	In a single aluminum piece
External color	Ruby Red
Material	Aluminum
Operating temperature	-40ºC to +85ºC



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2. SFHA - Scalar Feed Horn Antenna

FEATURES

- High performance feed horn
- From 18 to 110 GHz (WR42 to WR10)
- 12 dBi, 15 dBi or 18 dBi nominal mid-band gain
- Low VSWR and sidelobe level
- Custom specifications can be requested
- Circular waveguide that supports both linear and circular polarization

PRODUCT DESCRIPTION

Anteral's Scalar Feed Horn Antennas (SFHA) operate at different frequency bands between 18 GHz and 110 GHz. Depending on the SFHA, the antenna offers 18 dBi, 15 dBi, and 12 dBi directivity.

The SFHA are equipped with a **circular waveguide** that supports both l**inear and circular polarization**. A rectangular waveguide port configuration that only supports linear polarization is available using our circular-to-rectangular transitions (CRWT).

The **dual linear polarized option**, the Dual Polarized Scalar Feed Horn Antennas (DPSFHA), is also available using our high-performance orthomode transducers (OMT) and polarizers (POL). Besides, Anteral offers ad-hoc design service to make our products fulfill any requirement you have on mind.

ELECTRICAL SPECIFICATIONS

				3 dB beamwidth (deg)		Sidelobe (db)		
Model	Frequency (GHz)	VSWR	Directivity (dBi)	E-Plane	H-Plane	E-Plane	H-Plane	XP (dB)
SFHA-10-WR42	18 - 26.5	1.15	12.3	43.6	43.6	-26.4	-26.4	30
SFHA-18-WR42	18 - 26.5	1.15	19.4	21	21	-33.6	-33.6	30
SFHA-10-WR28	26.5 - 40	1.15	11.7	46.4	46.4	-25.8	-25.8	25
SFHA-15-WR28	24.5 - 43.5	1.15	16	31.8	31.8	-16.3	-16.3	20
SFHA-18-WR28	26.5 - 40	1.15	19.4	21	21	-33.6	-33.6	30
SFHA-15-WR22	33 - 50	1.15	15.1	38.2	38.2	-32.1	-32.1	20
SFHA-17-WR19	40 - 60	1.15	16.9	25.8	25.8	-34	-34	30
SFHA-13-WR19	40 - 60	1.15	12.7	43.2	43.2	-24.9	-24.9	25
SFHA-17-WR15	50 - 75	1.15	17	26	26	-36.3	-36.3	30
SFHA-13-WR15	50 - 75	1.15	12.5	45.6	45.6	-24.6	-24.6	25
SFHA-18-WR12	60 - 90	1.15	17.9	22.1	22.1	-26	-26	30
SFHA-17-WR12	60 - 90	1.15	17.2	26.3	26.3	-36.3	-36.3	30
SFHA-13-WR12	60 - 90	1.15	12.6	43	43	-25.4	-25.4	25
SFHA-17-WR10	75 - 110	1.15	16.9	26.3	26.3	-35.1	-35.1	30
SFHA-13-WR10	75 - 110	1.15	13.2	39.2	39.2	-25.3	-25.3	25

This table contains only a few SFHA examples. All data are typical values. Contact us for other SFHA and more information.

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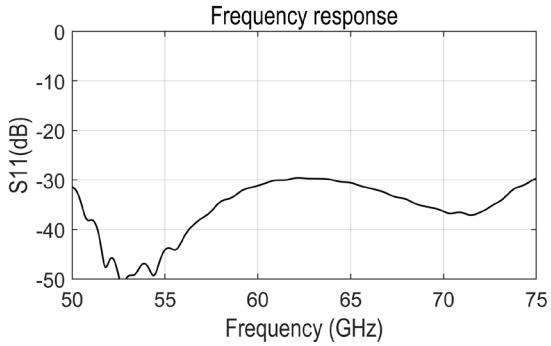
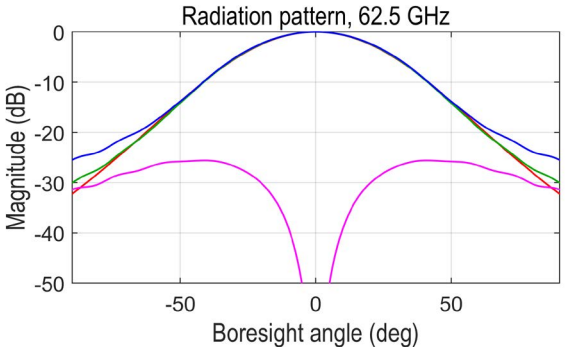
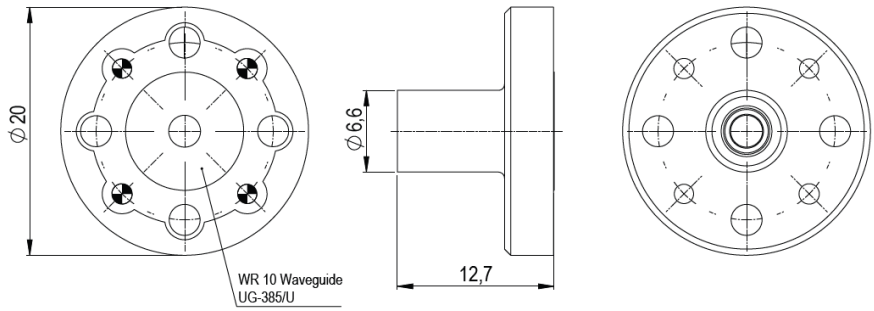
TYPICAL PERFORMANCE





MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
Fabrication	In a single aluminum piece
External color	Gold
Material	Aluminum. Gold plated.



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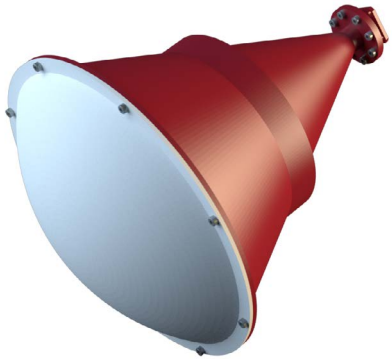
3. LHA - Lens Horn Antenna

FEATURES

- 30 dBi nominal mid-band gain
- From 8.2 to 170 GHz (WR90 to WR06)
- Very compact size
- Low VSWR
- Linear or circular polarization
- Custom specifications can be requested



PRODUCT DESCRIPTION

Anteral's Lens Horn Antennas (LHA) are **conical horn antennas** with a plano-convex **Teflon (PTFE) or High-density Polyethylene (HDPE) lens** added in the aperture, in order to apply phase correction and achieve superior performance with minimum size.

They are designed to cover the frequency range of 8 to 170 GHz in 14 bands with 30 dBi nominal mid-band gain. Anteral optimizes all designs to show not only high gain, but also low VSWR (< 1.3) and low side lobes. Moreover, custom bands and gain values can be requested. Anteral offers LHAs with linear or circular polarization.

Lens Horn Antennas are especially **useful when high gain is required with the minimum size**. Therefore, these antennas are widely used in radar applications, communication links and meteorological systems among others. New cutting-edge space applications include LHA's for MiniSat, MicroSat, NanoSat and CubeSat communications.

ELECTRICAL SPECIFICATIONS

				3 dB beamwidth (deg)		Sidelobe (db)		
Model	Frequency (GHz)	VSWR	Directivity (dBi)	E-Plane	H-Plane	E-Plane	H-Plane	Length (mm)
LHA-30-WR90	8.2 - 12.4	1.25	30.4	4.5	6.4	-18	-28	456.2
LHA-30-WR75	10 - 15	1.25	30.8	4.3	5.9	-15.9	-30.9	326.4
LHA-30-WR62	12.4 - 18	1.25	31.1	4.1	5.9	-17	-28	335
LHA-30-WR51	15 - 22	1.25	31.9	3.7	5.5	-19.7	-23.4	226.6
LHA-30-WR42	18 - 26.5	1.25	31	4.2	5.6	-17	-29	226.6
LHA-30-WR34	22 - 33	1.25	30.4	4.6	6	-13.7	-24.9	155.5
LHA-30-WR28	26.5 - 40	1.25	30.8	4.5	5.7	-16	-28	152.4
LHA-30-WR22	33 - 50	1.25	30.5	4.8	5.9	-15	-26	124.3
LHA-30-WR19	40 - 60	1.25	30.5	4.6	5.9	-14	-28	104.3
LHA-30-WR15	50 - 75	1.25	30.3	4.9	6.3	-14	-28	74.4
LHA-30-WR12	60 - 90	1.25	30.2	4.8	6.1	-13	-28	62.2
LHA-30-WR10	75 - 110	1.25	30.1	5.1	5.1	-13	-26	51.3
LHA-30-WR08	90 - 140	1.25	30.3	5	5.5	-12	-24	40.7
LHA-30-WR06	110 - 170	1.25	30.2	4.9	5.4	-12	-24	33.4

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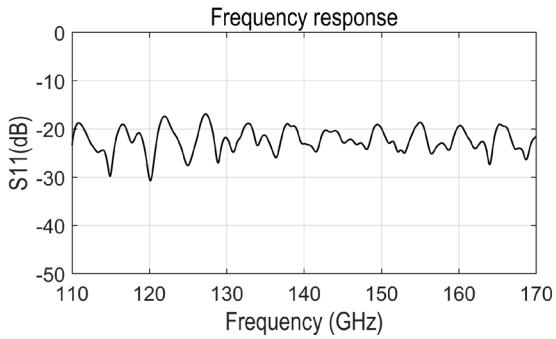
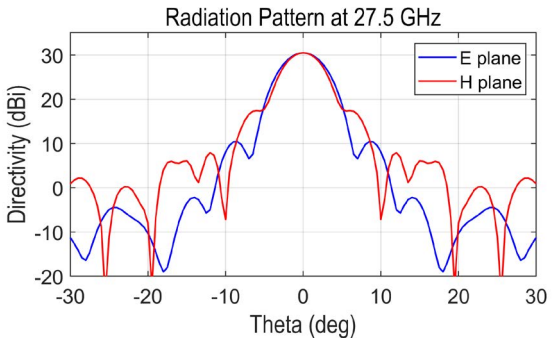
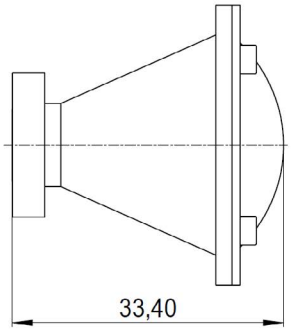
TYPICAL PERFORMANCE

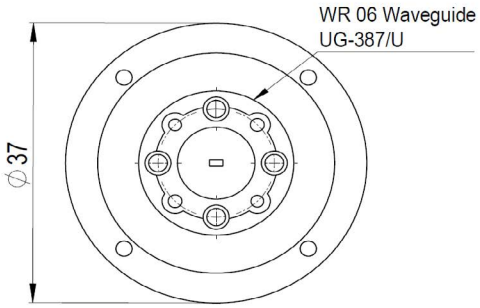




MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
External color	Ruby Red
Horn Material	Aluminum
Lens Material	PTFE or HDPE
Operating temperature	-40ºC to +85ºC





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4. LHA-F - Focusing Lens Horn Antenna

FEATURES

- From 5.85 to 220 GHz (WR137 to WR05)
- Optimized focus performance
- Best for material characterization
- Very compact size and robust design
- Low VSWR an Sidelobe level
- Linear or circular polarization
- Custom specifications can be requested

PRODUCT DESCRIPTION

Anteral's Focusing Lens Horn Antennas (FLHA) are conical horn antennas with a **double-convex Teflon (PTFE) or High-density Polyethylene (HDPE) lens** added in the aperture, in order to apply **phase correction** and achieve superior focusing performance with minimum size.

Anteral optimizes all designs to show not only the **best focusing performance**, but also low VSWR (< 1.3) and low side lobes. Moreover, custom focus performance can be requested. Anteral offers FLHAs with linear or circular polarization.

Focusing Lens Horn Antennas are especially useful when **focusing beam is required with short focal distances**. Therefore, these antennas are widely used for testing and material characterization.

ELECTRICAL SPECIFICATIONS

				3 dB beamwaist (deg)		
Model	**Frequency (GHz)**	**VSWR**	**Focal Length (mm)**	**E-Plane**	**H-Plane**	**Length (mm)**
LHA-F-WR187	3.95 - 5.85	1.25	203	67	67	476
LHA-F-WR137	5.85 - 10.4	1.25	275	46	60	417
LHA-F-WR112	7.05 - 10	1.25	226	40	48	356
LHA-F-WR90	8.2 - 12.4	1.25	181	34	38	285.4
LHA-F-WR75	10 - 15	1.25	Tbc	Tbc	Tbc	Tbc
LHA-F-WR62	12.4 - 18	1.25	133	23	30	198
LHA-F-WR51	15 - 22	1.25	Tbc	Tbc	Tbc	Tbc
LHA-F-WR42	18 - 26.5	1.25	147.5	17.8	22.5	174.5
LHA-F-WR34	22 - 33	1.25	231	15.2	18.7	140.5
LHA-F-WR28	26.5 - 40	1.25	146.2	13.1	16.9	152.4
LHA-F-WR22	33 - 50	1.25	120.1	10.5	13.6	124.3
LHA-F-WR19	40 - 60	1.25	99.2	8.6	11	104.3
LHA-F-WR15	50 - 75	1.25	83.8	7.5	9.3	74.3
LHA-F-WR12	60 - 90	1.25	71	6.3	8	62.3
LHA-F-WR10	75 - 110	1.25	58.2	5.1	6.4	51.3
LHA-F-WR08	90 - 140	1.25	63.7	4.4	5.6	51.3
LHA-F-WR06	110 - 170	1.25	79.3	4.2	5.3	51.3
LHA-F-WR05	140 - 220	1.25	73.1	3.3	4.2	51.3

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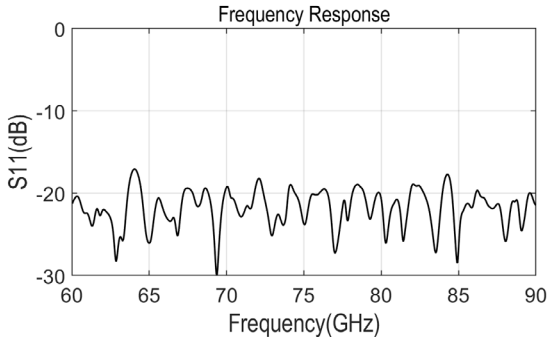
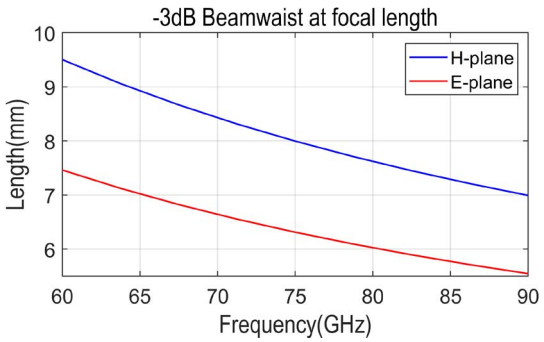
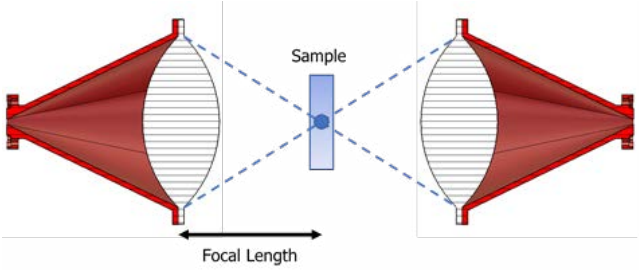
TYPICAL PERFORMANCE

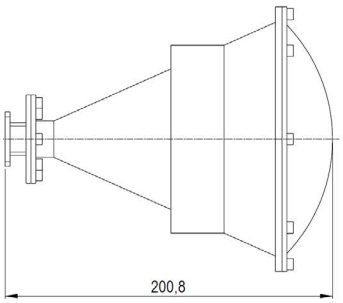


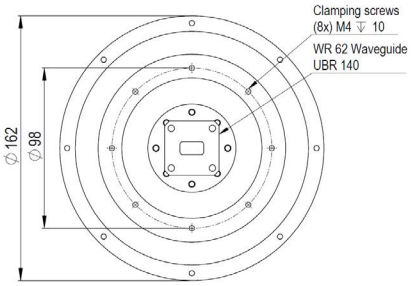




MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
External color	Ruby Red
Horn Material	Aluminum
Lens Material	PTFE or HDPE
Operating temperature	-40ºC to +85ºC





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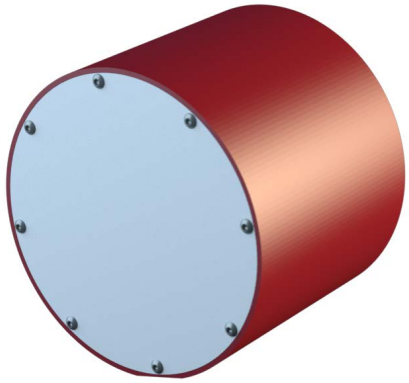
5. LHA-HG - High Gain Lens Horn Antenna

FEATURES

- From 40 to 750 GHz (WR19 to WR1.5)
- 40 dBi nominal mid-band gain
- Very compact size and robust design
- Low VSWR an Sidelobe level
- Linear or circular polarization
- Custom specifications can be requested



PRODUCT DESCRIPTION

Anteral's High Gain Lens Horn Antennas (HGLHA) are **high frequency lens horn antennas** which exhibit a nominal gain above 40 dBi. They are composed by a rectangular waveguide feeder with high quality standard flange that illuminates a plano-convex Teflon (PTFE) lens in order to apply phase correction and achieve **superior performance with minimum size**. The lenses are designed with optimized hyperbolic profile to reduce the aberration to the minimum. The whole system is encapsulated inside an aluminum cylinder that gives high robustness and it counts with a flat side to be the antenna able to stand in a flat surface.

They are designed to cover the frequency range of 40 to 750 GHz in eleven bands. Anteral optimizes all designs to show not only high gain, but also low VSWR (< 1.5) and low side lobes. Moreover, custom bands and gain values can be requested.

High Gain Lens Horn Antennas are especially **useful when high gain is required with the minimum size**. Therefore, these antennas are widely used in radar applications, communication and meteorological systems among others.

ELECTRICAL SPECIFICATIONS

				3 dB beamwidth (deg)		Sidelobe (db)		
Model	Frequency (GHz)	VSWR	Directivity (dBi)	E-Plane	H-Plane	E-Plane	H-Plane	Length (mm)
LHA-HG-WR19	40 - 60	1.5	31.5	4.4	4..4	-26.9	-31.5	117
LHA-HG-WR15	50 - 75	1.5	32.8	3.5	3.7	-25.7	-26.3	112
LHA-HG-WR10	75 - 110	1.5	36.7	2.6	2.5	-25	-27	107
LHA-HG-WR06	110 - 170	1.5	40	1.6	1.6	-29	-35	107
LHA-HG-WR05	140 - 220	1.5	42.5	1.3	1.3	-32	-38	107
LHA-HG-WR04	170 - 260	1.5	44.5	1.1	1.1	-34	-34	107
LHA-HG-WR03	220 - 330	1.5	46	1.1	1.0	-33	-36	107
LHA-HG-WR2.8	260 - 400	1.5	48.5	0.7	0.7	-33	-36	107
LHA-HG-WR2.2	330 - 500	1.5	50	1.1	1.0	-33	-36	107
LHA-HG-WR1.9	400 - 600	1.5	51	1.1	1.0	-33	-36	107
LHA-HG-WR1.5	500 - 750	1.5	53.5	0.35	0.35	-29	-29	107

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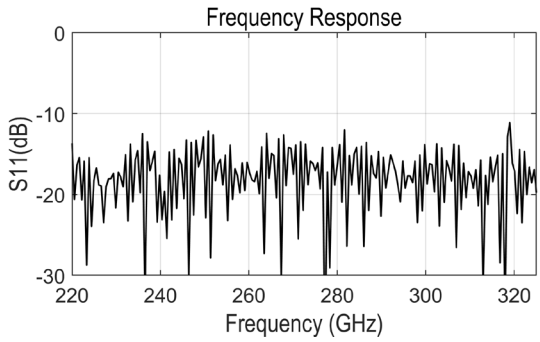
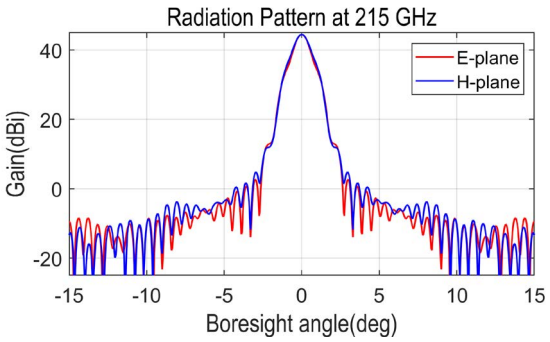
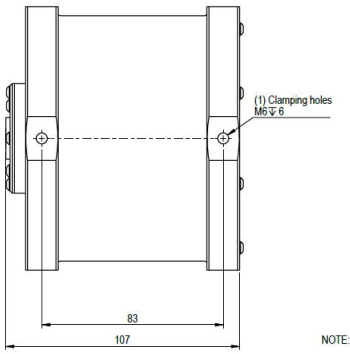
TYPICAL PERFORMANCE

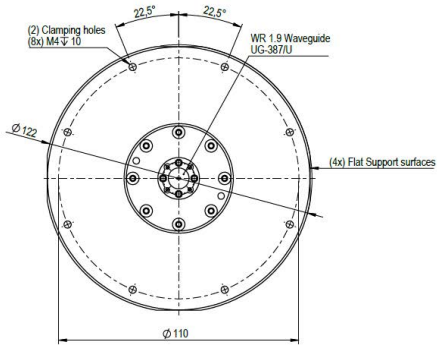




MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
External color	Ruby Red
Horn Material	Aluminum
Lens Material	PTFE
Operating temperature	-40ºC to +85ºC





NOTE: This antenna have two ways of clamping (Clamping holes 1 and Clamping holes 2)

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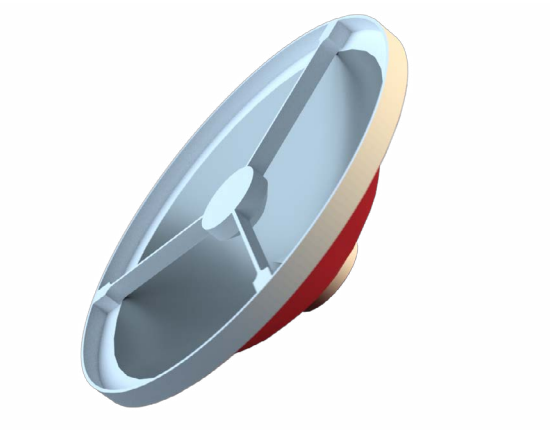
6. CRS - Cassegrain Reflector System

FEATURES

- From 50 to 600 GHz (WR15 to WR1.9)
- Different directivity values in each frequency band
- Optimized Spillover efficiency
- Low loss values
- Robust design
- Specific directivity values can be requested



PRODUCT DESCRIPTION

Anteral's Cassegrain Reflector Systems (CRS) are **high frequency parabolic antennas** composed by a pyramidal feedhorn antenna, a primary parabolic mirror, and a secondary hyperbolical mirror. The feed and the primary mirror are designed to **maximize the spillover efficiency while reducing the blockage** to the minimum.

All CRS are single linear polarization. Dual linear polarization is also available using our standard orthomode transducers (OMT) up to WR-10. The secondary mirror is specially manufactured to have the best reflecting surface at the highest frequencies. The whole structure presents a robust design, and it is covered with a **radome** for outdoor applications.

The CRS are especially useful for high-capacity data links at the new high frequency bands as well as any application where maximum gain is required. Anteral also offers custom clamping structures. Specific directivity values can be requested. Contact us for further information.

ELECTRICAL SPECIFICATIONS

CRS-140-WRxx

Model	Frequency (GHz)	VSWR	Directivity (dBi)	XP (dB)	Sidelobe level (dB)	D x L (mm)
CRS-140-WR15	50 - 75	1.2	34.5 - 37.6	-35	-17	176 x 73
CRS-140-WR12	60 - 90	1.2	36.4 - 39.2	-35	-17	176 x 73
CRS-140-WR10	75 - 110	1.2	38.6 - 40.9	-35	-17	176 x 73
CRS-140-WR08	90 - 140	1.2	40.0 - 43.0	-35	-17	176 x 73
CRS-140-WR06	110 - 170	1.2	41.6 - 44.8	-35	-17	176 x 73
CRS-140-WR05	140 - 220	1.2	44.0 - 47.0	-35	-17	176 x 73
CRS-140-WR04	170 - 260	1.33	45.6 - 48.8	-35	-17	176 x 73
CRS-140-WR03	220 - 330	1.33	47.9 - 50.7	-35	-17	176 x 73
CRS-140-WR2.8	260 - 400	1.33	49 - 52.5	-35	-17	176 x 73
CRS-140-WR2.2	330 - 500	1.33	51.5 - 54.4	-35	-17	176 x 73
CRS-140-WR1.9	400 - 600	1.33	53.2 - 56.1	-35	-17	176 x 73

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CRS-240-WRxx

Model	Frequency (GHz)	VSWR	Directivity (dBi)	XP (dB)	Sidelobe level (dB)	D x L (mm)
CRS-240-WR15	50 - 75	1.2	39.5 - 41.9	-35	-17	288 x 101
CRS-240-WR12	60 - 90	1.2	41.2 - 44.1	-35	-17	288 x 101
CRS-240-WR10	75 - 110	1.2	43.3 - 45.8	-35	-17	288 x 101
CRS-240-WR08	90 - 140	1.2	44.8 - 47.9	-35	-17	288 x 101
CRS-240-WR06	110 - 170	1.2	46.6 - 46.6	-35	-17	288 x 101
CRS-240-WR05	140 - 220	1.2	48.7 - 51.8	-35	-17	288 x 101
CRS-240-WR04	170 - 260	1.33	50.2 - 53.5	-35	-17	288 x 101
CRS-240-WR03	220 - 330	1.33	52.6 - 55.4	-35	-17	288 x 101
CRS-240-WR2.8	260 - 400	1.33	54.0 - 57.2	-35	-17	288 x 101
CRS-240-WR2.2	330 - 500	1.33	56.3 - 59.1	-35	-17	288 x 101
CRS-240-WR1.9	400 - 600	1.33	57.8 - 60.8	-35	-17	288 x 101

CRS-340-WRxx

Model	Frequency (GHz)	VSWR	Directivity (dBi)	XP (dB)	Sidelobe level (dB)	D x L (mm)
CRS-340-WR15	50 - 75	1.2	42.5 - 47.2	-35	-17	400 x 129
CRS-340-WR12	60 - 90	1.2	44.3 - 47.2	-35	-17	400 x 129
CRS-340-WR10	75 - 110	1.2	46.2 - 49.1	-35	-17	400 x 129
CRS-340-WR08	90 - 140	1.2	47.8 - 51	-35	-17	400 x 129
CRS-340-WR06	110 - 170	1.2	49.6 - 52.7	-35	-17	400 x 129
CRS-340-WR05	140 - 220	1.2	51.6 - 54.9	-35	-17	400 x 129
CRS-340-WR04	170 - 260	1.33	53.4 - 56.6	-35	-17	400 x 129
CRS-340-WR03	220 - 330	1.33	55.7 - 58.4	-35	-17	400 x 129
CRS-340-WR2.8	260 - 400	1.33	57.1 - 60.2	-35	-17	400 x 129
CRS-340-WR2.2	330 - 500	1.33	59.3 - 62.1	-35	-17	400 x 129
CRS-340-WR1.9	400 - 600	1.33	60.8 - 63.8	-35	-17	400 x 129

CRS-440-WRxx

Model	Frequency (GHz)	VSWR	Directivity (dBi)	XP (dB)	Sidelobe level (dB)	D x L (mm)
CRS-440-WR15	50 - 75	1.2	44.6 - 47.8	-35	-17	500 x 154
CRS-440-WR12	60 - 90	1.2	46.2 - 49.6	-35	-17	500 x 154
CRS-440-WR10	75 - 110	1.2	48.7 - 51.5	-35	-17	500 x 154
CRS-440-WR08	90 - 140	1.2	50 - 53.5	-35	-17	500 x 154
CRS-440-WR06	110 - 170	1.2	51.8 - 55.2	-35	-17	500 x 154
CRS-440-WR05	140 - 220	1.2	53.9 - 57.4	-35	-17	500 x 154
CRS-440-WR04	170 - 260	1.33	55.6 - 59.1	-35	-17	500 x 154
CRS-440-WR03	220 - 330	1.33	57.9 - 60.9	-35	-17	500 x 154
CRS-440-WR2.8	260 - 400	1.33	59.4 - 62.7	-35	-17	500 x 154
CRS-440-WR2.2	330 - 500	1.33	61.5 - 64.7	-35	-17	500 x 154
CRS-440-WR1.9	400 - 600	1.33	63.1 - 66.3	-35	-17	500 x 154

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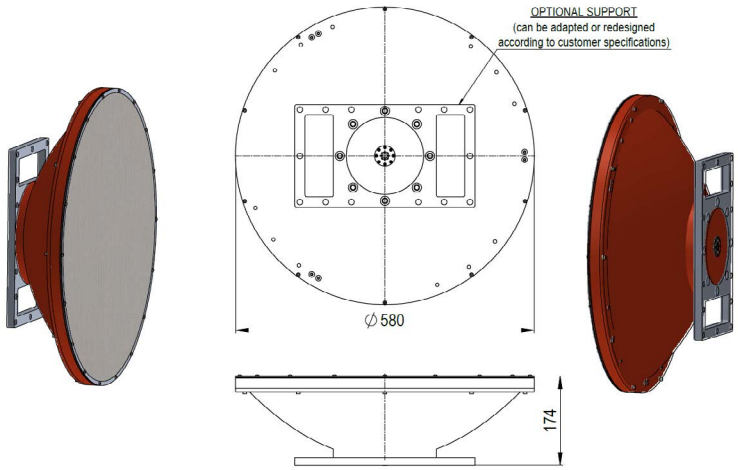
CRS-520-WRxx

Model	Frequency (GHz)	VSWR	Directivity (dBi)	XP (dB)	Sidelobe level (dB)	D x L (mm)
CRS-520-WR15	50 - 75	1.2	46.4 - 49.4	-35	-17	580 x 174
CRS-520-WR12	60 - 90	1.2	47.9 - 51.2	-35	-17	580 x 174
CRS-520-WR10	75 - 110	1.2	50 - 53	-35	-17	580 x 174
CRS-520-WR08	90 - 140	1.2	51.5 - 55	-35	-17	580 x 174
CRS-520-WR06	110 - 170	1.2	53.2 - 56.7	-35	-17	580 x 174
CRS-520-WR05	140 - 220	1.2	55.3 - 58.9	-35	-17	580 x 174
CRS-520-WR04	170 - 260	1.33	57 - 60.6	-35	-17	580 x 174
CRS-520-WR03	220 - 330	1.33	59.3 - 62.4	-35	-17	580 x 174
CRS-520-WR2.8	260 - 400	1.33	60.8 - 64.2	-35	-17	580 x 174
CRS-520-WR2.2	330 - 500	1.33	62.9 - 66.1	-35	-17	580 x 174
CRS-520-WR1.9	400 - 600	1.33	64.5 - 67.8	-35	-17	580 x 174

MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
External color	Ruby Red
Material	Aluminum
Radome	Included
Operating temperature	-40ºC to +85ºC



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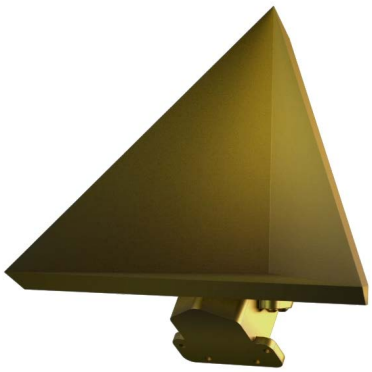
7. TTCR - Trihedral Corner Reflector

FEATURES

- From 8.4 to 300 GHz
- High directivity and gain
- Low cost and simple installation
- Wide range of available beamwidth and reflector sizes
- Specific performance can be requested

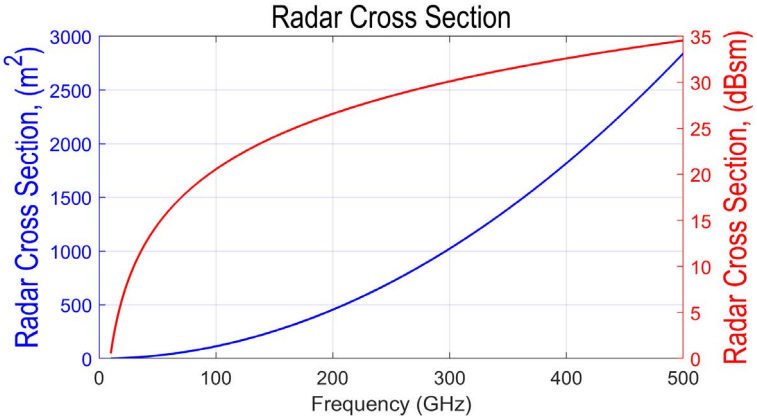


PRODUCT DESCRIPTION

Anteral's **triangular trihedral reflectors** (TTCRs) are used for simulating radar target precisely and radar system calibration. The TTCR are available from 8 GHz to 300 GHz in standard sizes. The TTCRs are fabricated in aluminum with a gold chemical film finish. The TTCRs can be easily mounted onto a tripod for rapid system setup thanks to the mounting bracket with four M3 threaded holes but any custom holes can be added. We can manufacture to any custom size or specification.

Anteral's triangular trihedral reflectors (TTCRs) are used for simulating radar target precisely and radar system calibration and radar system calibration.

TYPICAL PERFORMANCE



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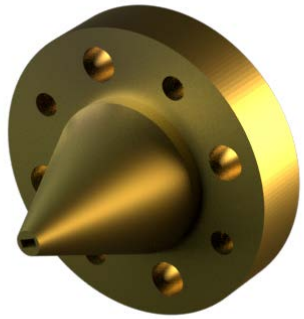
8. NFP - Near Field Probe

FEATURES

- From 8.2 to 750 GHz (WR90 to WR1.5)
- Sharp edged
- Single piece aluminum probes
- Long-length probes



PRODUCT DESCRIPTION

Anteral's Near Field Probes (NFP) are high performance **open-ended waveguides probes** designed to cover the frequency range of 8.2 to 750 GHz. Moreover, custom bands can be requested. The antennas have a sharp edge or a special opening design to minimize reflections.

There are **two types** of NFPs:
• Larger size NFPs, from WR-90 to WR-6.5 standard waveguide, are manufactured from a **single aluminium rod** and their length is between 150 and 30 mm. The opening of these NFP probes is sharp to reduce/minimize reflections.
• Smaller size NFPs, from WR-5.1 to WR-1.5 standard waveguide, are manufactured in **split-block configuration** and the sharp edge is converted to a conical shape to scatter reflections. The length of these smaller models is 15 mm.

Both types of NFPs are fabricated by **high accurate manufacturing processes**. All NFPs can include adequate absorber material to reduce backscattering reflections from flanges.

Anteral has extensive background in the design and fabrication of open-ended waveguides. Our NFPs are currently being used in many laboratories around the world including the ESA's mm-wave and submm-wave laboratory.

ELECTRICAL SPECIFICATIONS

Model	Frequency (GHz)	VSWR	Directivity (dBi)	Length (mm)
NFP-WR90	8.2 - 12.4	1.6	6.5	150
NFP-WR75	10 - 15	1.6	6.5	150
NFP-WR62	12.4 - 18	1.6	6.5	150
NFP-WR51	15 - 22	1.6	6.5	150
NFP-WR42	18 - 26.5	1.6	6.5	150
NFP-WR34	22 - 33	1.6	6.5	100
NFP-WR28	26.5 - 40	1.6	6.5	100
NFP-WR22	33 - 50	1.6	6.5	60
NFP-WR19	40 - 60	1.6	6.5	60
NFP-WR15	50 - 75	1.6	6.5	40
NFP-WR12	60 - 90	1.6	6.5	40

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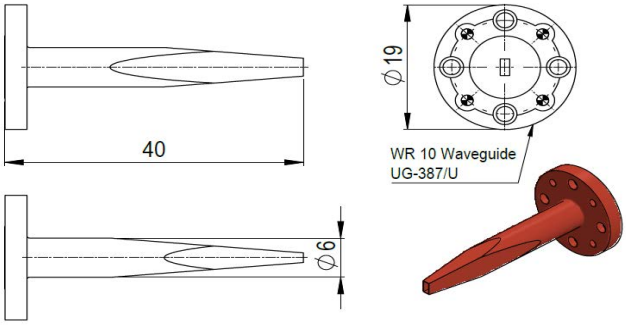
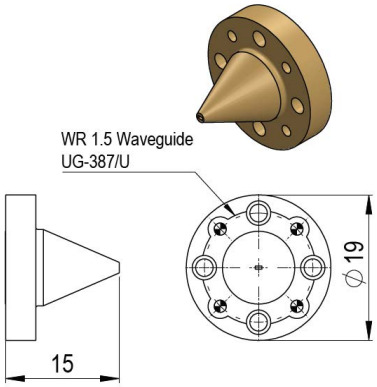
Model	Frequency (GHz)	VSWRW	Directivity (dBi)	Length (mm)
NFP-WR10	75 -110	1.58	6.5	40
NFP-WR08	90 - 140	1.58	6.5	30
NFP-WR06	110 - 170	1.58	6.5	30
NFP-WR05	140 - 220	1.58	6.5	15
NFP-WR04	170 - 260	1.58	6.5	15
NFP-WR03	220 - 330	1.58	6.5	15
NFP-WR2.8	260 - 400	1.58	6.5	15
NFP-WR2.2	330 - 500	1.58	6.5	15
NFP-WR1.9	400 - 600	1.58	6.5	15
NFP-WR1.5	500 - 750	1.58	6.5	15

MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
Fabrication	In a single aluminum piece
External color	Ruby Red
Material	Aluminum
Operating temperature	-40ºC to +85ºC





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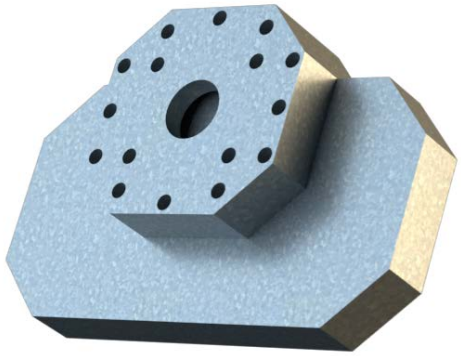
9. OMT - Orthomode Transducer

FEATURES

- High performance
- From 2.6 to 160 GHz (WR284 to WR06)
- High Isolation and Cross Polarization level (XP)
- Low VSWR
- Specific performance can be requested



PRODUCT DESCRIPTION

Anteral designs and manufactures **compact** orthomode transducers (OMTs) for communication and radar systems. Depending on the client requirements, we offer the **best optimized design in terms of complexity and price**. Anteral has developed multiple designs of OMTs up to 160 GHz, but higher frequencies can be requested. Moreover, the phase difference between the orthogonal polarizations can be reduce to the minimum, thus enabling applications where **phase-matched** outputs are required.

This kind of components are used for either combine two orthogonal signals into one at a circular waveguide or to separate a signal that is input through a circular waveguide in two orthogonal signals. Both full waveguide band models and narrow band models with **enhanced cross polarization and isolation can be requested**.

ELECTRICAL SPECIFICATIONS

Model	Frequency (GHz)	VSWR	Insertion Loss (dB)	Isolation (dB)	XP (dB)	Length (mm)
OMT-WR284-01	2.6 - 3.95	1.15	0.15	45	50	278
OMT-WR137-01	5.85 - 8.2	1.15	0.15	45	50	129
OMT-WR112-01	7 - 10.2	1.15	0.2	45	50	108
OMT-WR90-01	8.2 - 10.4	1.15	0.2	45	45	99.4
OMT-WR75-01	10 - 15	1.15	0.2	45	45	85
OMT-WR62-01	12.4 - 18	1.15	0.2	40	45	70
OMT-WR51-01	15 - 22	1.15	0.2	40	40	94.9
OMT-WR42-01	18 - 26.5	1.15	0.3	40	40	76.2
OMT-WR34-01	22 - 33	1.2	0.3	40	40	69.2
OMT-WR28-01	26.5 - 40	1.2	0.3	35	40	45.34
OMT-WR28-02	24.5 - 43.5	1.2	0.4	35	40	61.37
OMT-WR22-01	33 - 50	1.2	0.4	35	35	47.4
OMT-WR19-01	40 - 60	1.3	0.4	35	35	44.4
OMT-WR15-01	50 - 75	1.3	0.5	35	35	35.5
OMT-WR12-01	60 - 90	1.45	0.5	35	35	32
OMT-WR10-01	75 - 110	1.45	0.6	35	30	32
OMT-WR06-01	120 - 160	1.45	1	35	30	28

This table contains only a few OMT examples. All data are typical values. Contact us for other OMT and more information.

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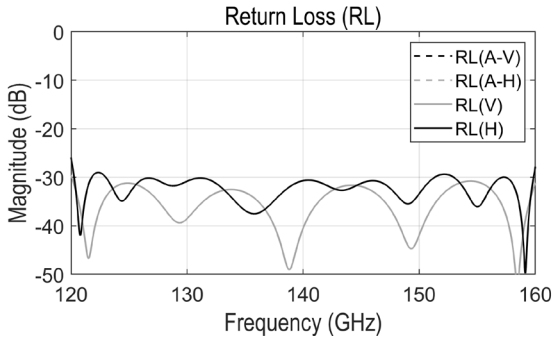
Model	Frequency (GHz)	VSWR	Insertion Loss (dB)	Isolation (dB)	XP (dB)	Length (mm)
OMT-WR137-PM-01*	5.85 - 8.2	1.15	0.15	45	50	74
OMT-WR112-PM-01*	7.05 - 10	1.15	0.2	45	50	62.2
OMT-WR90-PM-01*	8.2 - 12.4	1.15	0.2	45	45	54.5
OMT-WR75-PM-01*	10 - 15	1.15	0.2	45	45	48
OMT-WR62-PM-01*	12.4 - 18	1.15	0.2	45	45	35.3
OMT-WR51-PM-01*	15 - 22	1.15	0.2	40	40	30
OMT-WR42-PM-01*	18 - 26.5	1.15	0.3	40	40	25
OMT-WR34-PM-01*	22 - 33	1.2	0.3	40	40	20
OMT-WR28-PM-01*	26.5 - 40	1.2	0.3	40	40	20

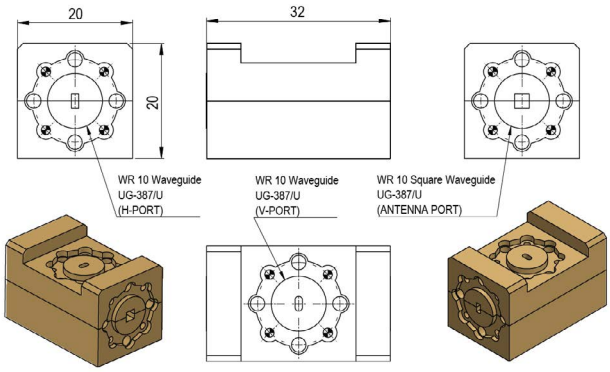
* Phased matched design. This table contains only a few OMT examples. All data are typical values. Contact us for other OMT and more information.

TYPICAL PERFORMANCE



MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
Operating temperature	40ºC to +85ºC
Material	Aluminum
Fabrication	In two or three pieces
External color	Aluminum, WR284 to WR42 Gold plated, WR34 to WR06



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10. POL - Polarizer

FEATURES

- High performance
- From 7 to 110 GHz (WR112 to WR10)
- Low Axial Ratio
- Low VSWR
- Specific performance can be requested

PRODUCT DESCRIPTION

Anteral designs and manufactures **high-performance polarizers** (POLs) for communication systems. Depending on the client requirements, we offer the **best optimized design in terms of complexity and price**. Anteral has developed multiple designs of POLs up to 110 GHz.

This kind of components are used for either combine two orthogonal signals into one at a circular waveguide or to separate a signal that is input through a circular waveguide in two orthogonal signals. Both full waveguide band models and narrow band models with **enhanced axial ratio and isolation can be requested**.

ELECTRICAL SPECIFICATIONS

Model	Frequency (GHz)	VSWR	Isolation (dB)	Axial Ratio (dB)	Polarization
POL-RL-SAT-X-01	7.25 - 7.75	1.15	35	0.25	Linear to RHCP&LHCP
POL-RL-SAT-X-02	7.9 - 8.4	1.15	35	0.25	Linear to RHCP&LHCP
POL-RL-SAT-X-03	7.25-7.75 | 7.9 - 8.4	1.15	70	0.3	Linear to RHCP(F1/F2)&LHCP(F2/F1)
POL-RL-SAT-X-04	7.25 - 8.4	1.15	35	0.25	Linear to RHCP&LHCP
POL-RL-SAT-KU-01	10.7 - 12.75 | 14-14.5	1.15	18	0.8	Linear to RHCP&LHCP
POL-RL-SAT-KKA-01	20.2 - 21.2 | 30 - 31	1.15	30	1	Linear to RHCP&LHCP
POL-RL-SAT-Q-01	37.5 - 42.5	1.1	25	0.3	Linear to RHCP&LHCP
POL-RL-SAT-V-01	47.2 - 52.4	1.1	25	0.3	Linear to RHCP&LHCP
POL-RL-SAT-5G-E-01	71 - 76 | 81 - 86	1.25	20	0.8	Linear to RHCP&LHCP
POL-RL-WR10-01	80 - 95	1.25	23	1	Linear to RHCP&LHCP
POL-RL-WR10-02	92 - 100	1.25	35	1	Linear to RHCP&LHCP

All these models feature a three-port configuration, presenting dual circular polarization at the common port.
This table contains only a few POL examples. All data are typical values. Contact us for other POL and more information.

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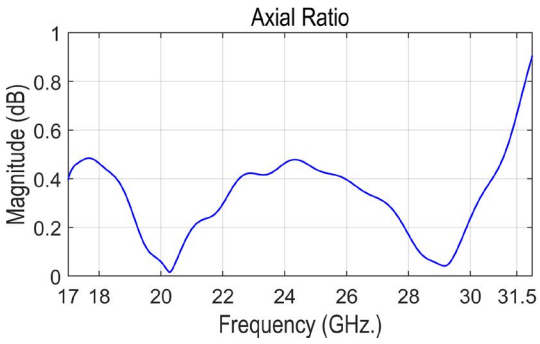
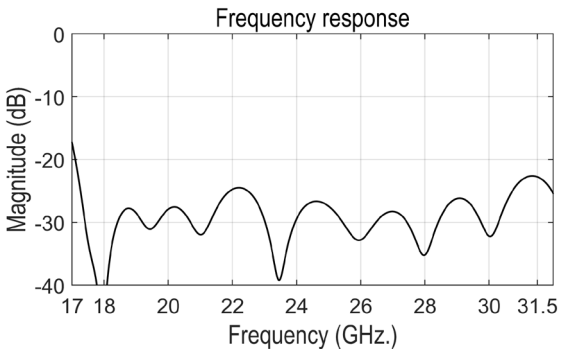
Model	Frequency (GHz)	VSWR	Isolation (dB)	Axial Ratio (dB)	Polarization
POL-R-SAT-X-01	7.25 - 8.4	1.1	30	0.1	Linear to RHCP/LHCP
POL-R-WR112-01	7.05 - 10	1.1	30	0.4	Linear to RHCP/LHCP
POL-R-WR90-01	8.2 - 12.4	1.1	30	0.4	Linear to RHCP/LHCP
POL-R-WR75-01	10 - 15	1.1	30	0.5	Linear to RHCP/LHCP
POL-R-WR62-01	12.4 - 18	1.1	30	0.5	Linear to RHCP/LHCP
POL-R-WR51-01	15 - 22	1.1	30	0.5	Linear to RHCP/LHCP
POL-R-SAT-KKA-01	17.3 - 31	1.15	25	1	Linear to RHCP/LHCP
POL-R-SAT-KKA-01	17.3 - 21.2 | 27 - 31	1.15	25	0.5	Linear to RHCP/LHCP
POL-R-WR42-01	18 - 26.5	1.1	30	0.6	Linear to RHCP/LHCP
POL-R-WR34-01	22 - 33	1.1	28	0.7	Linear to RHCP/LHCP
POL-R-WR28-01	26.5 - 40	1.1	28	0.7	Linear to RHCP/LHCP
POL-R-WR22-01	33 - 50	1.1	25	0.7	Linear to RHCP/LHCP
POL-R-SAT-QV-01	37.5 - 42.5 | 47.2 - 52.4	1.1	28	0.4	Linear to RHCP/LHCP
POL-R-SAT-5G-E-01	71 - 76 | 81 - 86	1.25	20	0.8	Linear to RHCP/LHCP

All these models feature a two-port configuration, presenting single circular polarization at the output port. This table contains only a few POL examples. All data are typical values. Contact us for other POL and more information.

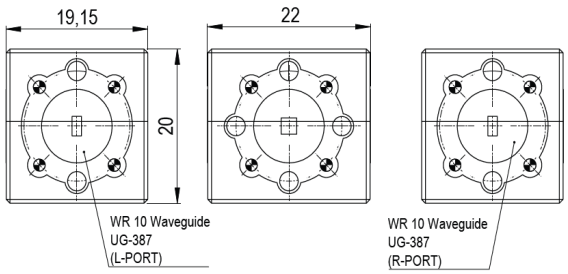
TYPICAL PERFORMANCE





MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
Operating temperature	40ºC to +85ºC
Material	Aluminum
Fabrication	In two half pieces
External color	Aluminum, WR112 to WR42 Gold plated, WR34 to WR10



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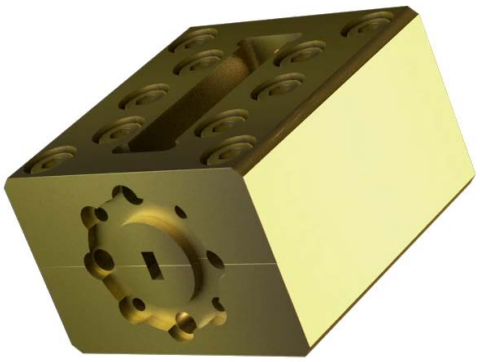
11. FILT - Filter

FEATURES

- High performance and low cost
- From 3 to 110 GHz (WR229 to WR10)
- High Rejection and low VSWR
- Low-Pass, High-Pass and Band-Pass performance
- Narrow and wide bandwidths
- COTS and custom designs can be requested



PRODUCT DESCRIPTION

Anteral's filters are available in **different bands** covering a frequency range between 3 GHz and 110 GHz. COTSs and custom designs are available. All filters are designed for **minimum footprint and low mass**. Optimized assemblies for custom topologies.

RF and thermo-mechanical design, material and finish selection targeted at critical parameter optimization or best compromise performance. Material is selectioned for optimum thermal stability.

Filters are **small and compact by design**. Low insertion losses and cutoff rejections are obtained depending on the structure. Most of the components are turning less. Can be integrated as part of antennas feed network. Contact Anteral for dimensions and other specifications due to the wide range of waveguide sizes and frequency ranges.

Low-pass, band-pass and high-pass filters are available. Narrow-band and wide-band performance.

- **Waveguide Low-Pass Filters:** Typically used for harmonic rejection. Corrugated, waffle-iron and more advanced solutions. High Performance in Power Handling, Multipaction and Corona.
- **Waveguide Band-Pass Filters:** Elliptic or pseudo-elliptic transfer functions for increased selectivity. High Performance in Power Handling, Multipaction and Corona.
- **Waveguide High-Pass Filters:** High Performance in Power Handling, Multipaction and Corona.

ELECTRICAL SPECIFICATIONS

Model	Pass band (GHz)	Return Loss (dB)	Insertion Loss (dB)	Rejected Band (dB)	Attenuation (dB)	Interface Ports
LPF-SAT-C-01	3.4 - 4.2	25	0.05	5.35 - 14.5	60	WR-229
LPF-SAT-X-01	7.25 - 7.75	25	0.6	7.9 - 8.4	100	WR-112
LPF-SAT-KU-01	10.7 - 12.75	25	0.1	13.75 - 40	75	WR-75
LPF-SAT-KU-02	10.7 - 12.75	25	0.15	13.75 - 15	75	WR-75
LPF-SAT-K-01	17 - 21	25	0.15	25.8 - 50	75	WR-51
BPF-SAT-X-01	7.25 - 7.75	25	0.2	DC - 7 | 7.9 - 8.4	40 | 35	WR-112
BPF-SAT-X-02	7.25 - 7.75	20	0.55	DC - 7 | 7.9 - 10.2	20 | 70	WR-112
BPF-SAT-X-08	7.9 - 8.4	23	0.55	DC - 7.75 | 9 - 10.2	80 | 60	WR-112
BPF-SAT-KU-01	10.7 - 12.7	25	0.15	DC - 9 | 13.75 - 15	20 | 75	WR-75
BPF-SAT-K-01	20.2 - 21.2	20	0.5	DC - 18.75 | 23 - 40	60 | 55	WR-42 & 2.92mm
BPF-SAT-KA-01	26.5 - 32.5	20	0.3	DC - 22.5 | 35 - 50	50 | 50	WR-28
BPF-SAT-KA-02	29 - 31	20	0.5	DC - 25.5 | 31.75 - 33	60 | 25	WR-28 & 2.92mm

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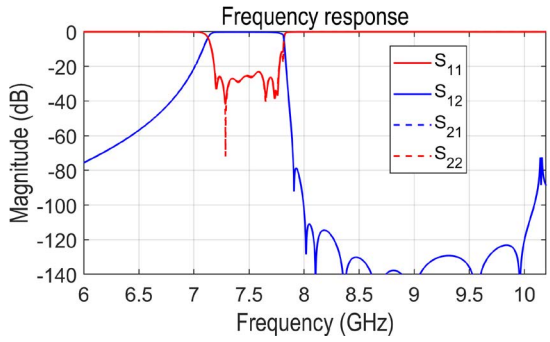
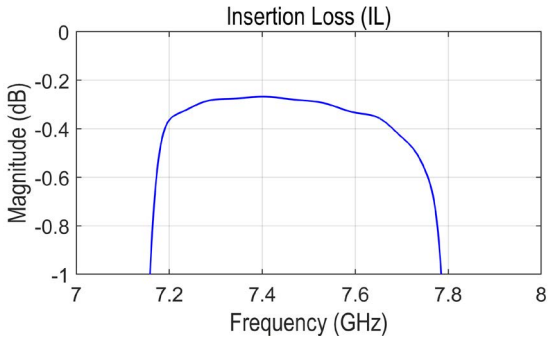
Model	Pass band (GHz)	Return Loss (dB)	Insertion Loss (dB)	Rejected Band (dB)	Attenuation (dB)	Interface Ports
BPF-SAT-Q-01	37.5 - 42.5	20	0.5	33 - 35 | 45 - 50	60 | 75	WR-22
BPF-5G-V-01	58.5 - 59.5	18	0.5	DC - 56.5 | 61 - 70	60 | 60	WR-15
BPF-5G-V-02	61 - 62	18	0.5	DC - 59.5 | 65 - 70	60 | 60	WR-15
BPF-5G-E-01	71 - 76	18	1	DC - 65 | 81 - 86	60 | 60	WR-12
BPF-5G-E-02	81 - 86	18	1	DC - 76 | 85 - 90	60 | 60	WR-12
BPF-WR10-01	90 - 100	18	1	75 - 85 | 105 - 110	55 | 55	WR-10
BPF-WR06-01	134 - 141	15	1	110 - 125 | 150 - 165	80 | 80	WR-06
HPF-SAT-X-01	7.9 - 8.4	25	0.6	DC - 7.75	100	WR-112

This table contains only a few filter examples. All data are typical values. Contact us for other filters and more information.

TYPICAL PERFORMANCE





MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
Operating temperature	40ºC to +85ºC
Material	Aluminum
Fabrication	In two half pieces
External color	Aluminum, WR112 to WR42 Gold plated, WR34 to WR10

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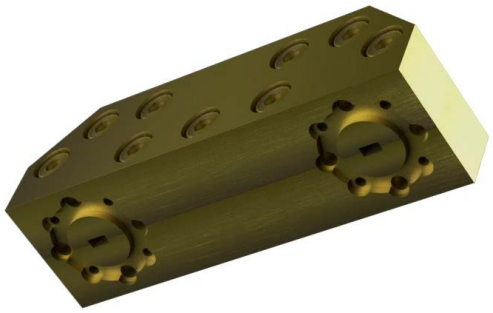
12. MUX - Multiplexer

FEATURES

- High performance and low cost
- From 3 to 110 GHz (WR229 to WR10)
- High Rejection and low VSWR
- Low-Pass, High-Pass and Band-Pass performance
- Narrow and wide bandwidths
- COTS and custom designs can be requested



PRODUCT DESCRIPTION

Anteral's multiplexer are available in **different bands** covering a frequency range between 3 GHz and 110 GHz. COTSs and custom designs are available. All filters are designed for **minimum footprint and low mass**. Optimized assemblies for custom topologies.

RF and thermo-mechanical design, material and finish selection targeted at critical parameter optimization or best compromise performance. Material is selectioned for optimum thermal stability.

Filters are **small and compact by design**. Low insertion losses and cutoff rejections are obtained depending on the structure. Most of the components are turning less. Can be integrated as part of antennas feed network. Contact Anteral for dimensions and other specifications due to the wide range of waveguide sizes and frequency ranges.

Narrow-band and wide-band performance. In the following table are summarized some of the available multiplexers.

- **Diplexers, Multiplexers:** Typically used for TTC and Payload subsystems. Input and output sections. High Performance in Power Handling, Multipaction, Corona and PIM.

ELECTRICAL SPECIFICATIONS

Model	Pass band (GHz)	Rejected band (dB)	Return Loss (dB)	Insertion Loss (dB)	Attenuation (dB)	Interface Ports
DPLX-SAT-X-01	7.25 - 7.75 | 7.9 - 8.4	7.9 - 8.4 | 7.25 - 7.75	25	0.4	90 | 90	WR112
DPLX-SAT-KU-01	10.7 - 12.7 | 13.75 - 14.5	13.75-14.5 | 10.7-12.75	25	0.2	60 | 90	WR75
DPLX-SAT-KU-02	11 - 12.1 | 13 - 14	13 - 14 | 11 - 12.1	25	0.2	50 | 70	WR75
DPLX-SAT-K/KA-01	20.2 - 21.2 | 30 - 31	30 - 31 | 20.2 - 21.2	25	0.3	60 | 70	WR34
DPLX-SAT-K/KA-02	17.3 - 21.2 | 27 - 31	27 - 31 | 17.3 - 21.2	25	0.3	60 | 70	WR34
DPLX-5G-V-01	58.8 - 59.5 | 61 - 62	61 - 62 | 58.5 - 59.5	18	1	60 | 60	WR15
DPLX-5G-E-01	71 - 76 | 81 - 86	81 - 86 | 71 - 76	18	1	60 | 60	WR12

This table contains only a few diplexer examples. All data are typical values. Contact us for other multiplexers and more information.

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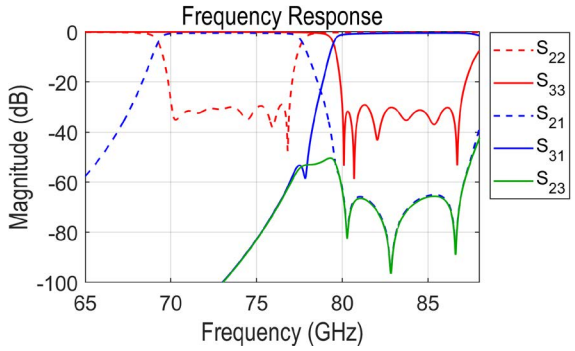
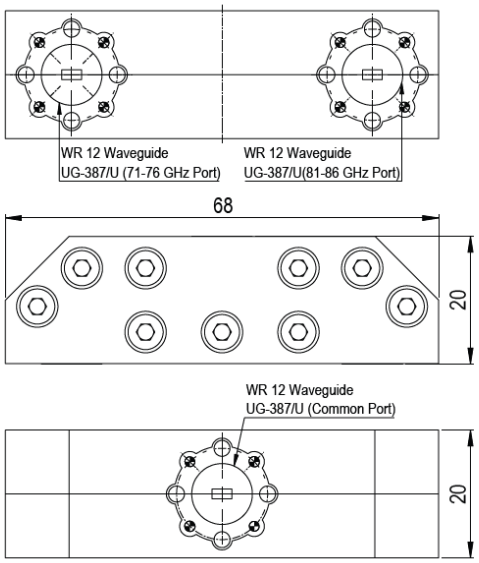
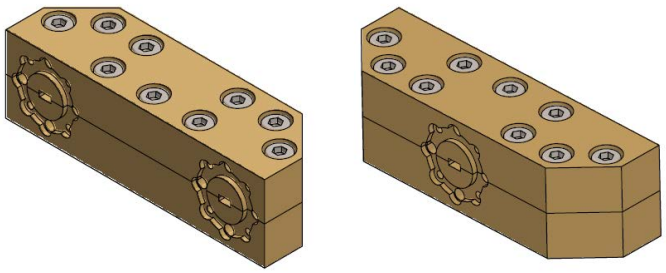
TYPICAL PERFORMANCE



MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
Operating temperature	40ºC to +85ºC
Material	Aluminum
External color	Aluminum, WR112 to WR42 Gold plated, WR34 to WR10





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13. CPL - Coupler

FEATURES

- Custom coupling values
- Full band operation
- Low Insertion Loss
- Testing applications

PRODUCT DESCRIPTION

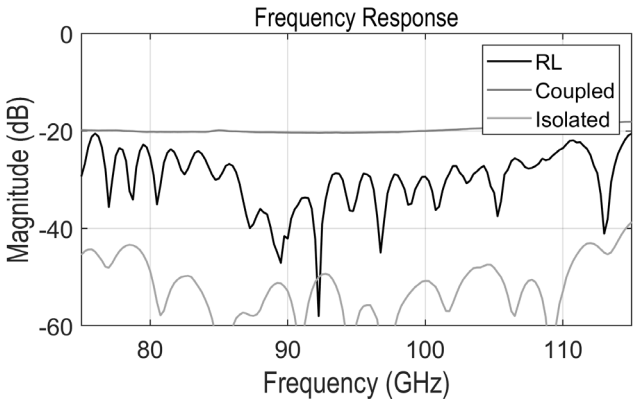
Anteral's **couplers (CPL)** are available in different bands covering the frequency range from 7 GHz to 110 GHz. COTSs and custom designs are available.

All couplers are designed for the required **coupling level with minimum insertion** loss and coupling accuracy. In addition, optimized assemblies for custom coupling levels and accuracy or topologies can be requested.

Couplers are widely used in **test setups** where power reflection measurements are required that might involve frequency monitoring and power sampling with minimal signal loss to the main transmission path.

Anteral also offers their Filters (FIL) and Diplexers (DPX) from 3 GHz to 110 GHz.

TYPICAL PERFORMANCE



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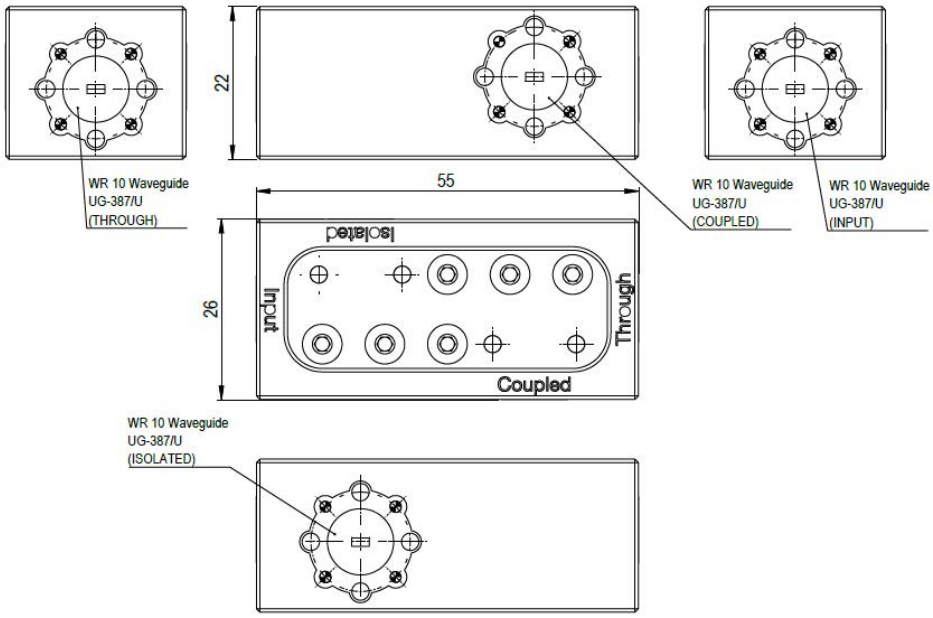
MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
Operating temperature	40ºC to +85ºC
Material	Brass
External color	Brass



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14. WGP - Wire Grid Polarizer

FEATURES

- DC up to 2 THz frequencies
- 40 dB isolation
- One layer of patterned Cu-Au micro grid array of strips
- Mounted in high-performance rotating frames
- Clear apertures of 50 mm and 25 mm

PRODUCT DESCRIPTION

Anteral's Wire Grid Polarizers (WGPs) consist of **one layer of patterned Cu-Au micro grid array of strips**. The micro grid array is patterned via **photolithography process** on very thin (135 µm) and ultra-low loss substrate for THz frequencies with low dielectric constant. The electric field is transmitted if polarized perpendicularly and reflected if polarized parallel to the grid array.

WGP are mounted with protection layers made of a high-performance polymethacrylimide foam without degradation of the quality.

The Polarizer can be used from DC up to 2 THz systems for enhancement of the polarization sensitivity, beam splitting and generation of circular polarization.

Anteral also offers their Quarter Wave Plates for generating reflected circularly polarized waves from linearly polarized waves.

ELECTRICAL SPECIFICATIONS

Model	Gap Width (µm)	Strip Width (µm)	Clear Aperture (mm)	Transmission loss (dB)	Parallel Isolation (dB)
WGP-25-40	5	10	23.9	< 1	> 35
WGP-50-40	5	10	48.3	< 1	> 38

All data are typical values.

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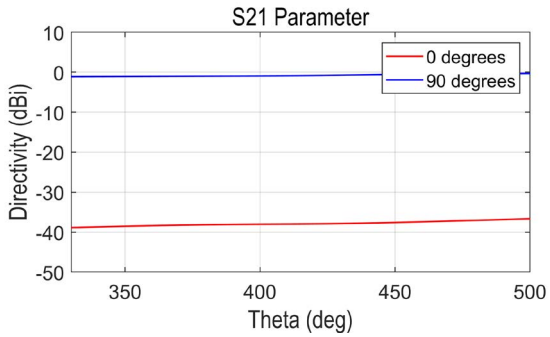
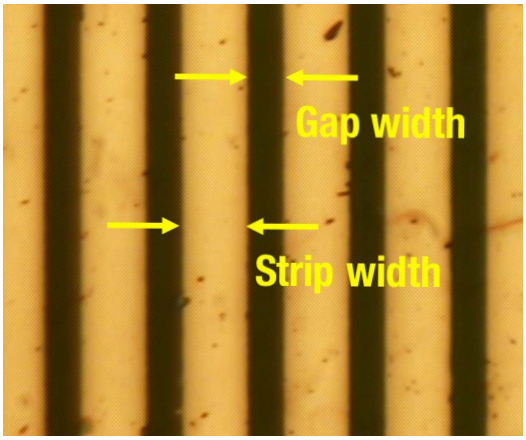
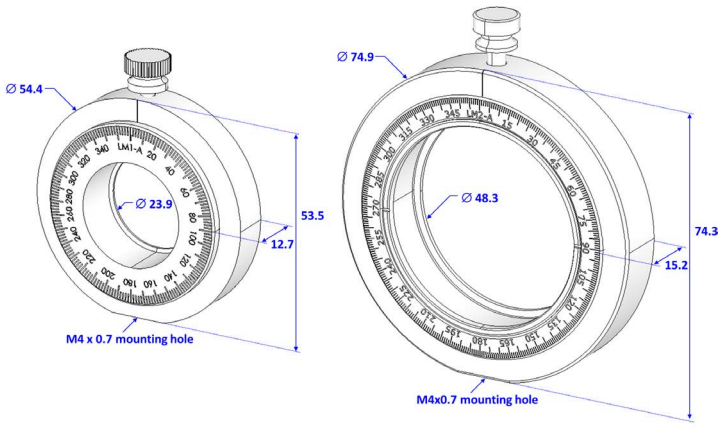
TYPICAL PERFORMANCE



MECHANICAL OUTLINE

Environmental Specifications	Operating ambient temperature range
Construction	Cu-Au micro grid array of strips
Substrate	135 µm ultra-low loss substrate
Process	Photolithography





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SYSTEMS

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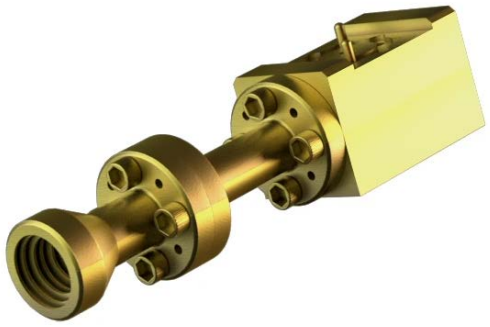
15. DLPSFHA - Dual Linear Polarized Scalar Feed Horn Antenna

FEATURES

- Composed of SFHA + OMT
- From 7 to 110 GHz (WR112 to WR10)
- 12 dBi to 18 dBi nominal mid-band gain
- Very compact size
- Low VSWR
- Linear polarization
- Custom specifications can be requested



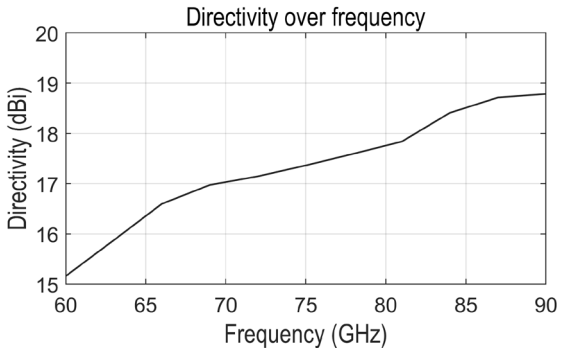
PRODUCT DESCRIPTION

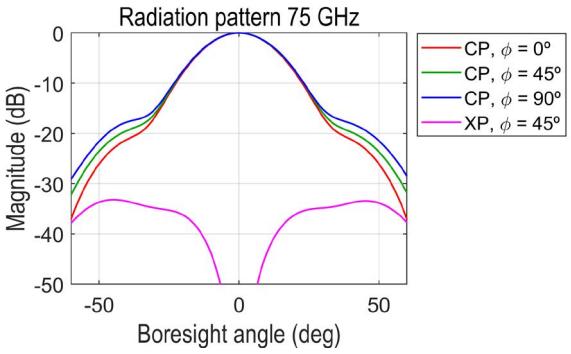
Anteral's Dual Linear Polarized Scalar Feed Horn Antenna (DLPSFHA) is an integrated system composed of an **orthomode transducer** (OMT) that provides high isolation and cross-polarization (XP) cancellation and a broad band **scalar feed horn antenna** (SFHA) that provides high gain, low VSWR and low side-lobes, with minimum size. Client can choose the OMT and SFHA and Anteral will design the DLPSFHA that suits their needs.

They are designed to cover the frequency range of 7 to 110 GHz with different nominal mid-band gain and a low VSWR. The OMT supports either horizontal or vertical polarized signals with more than 35 dB cross-polarization rejections and 35 dB isolation. Besides, custom bands, gain values and flanges can be requested.

Dual Polarized Scalar Feed Horn Antennas are especially useful when high isolation and high cross polarization is required. They are widely used in 5G systems, radar applications, communication, and antenna ranges, among others.

TYPICAL PERFORMANCE





MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
Operating temperature	-40ºC to +85ºC
Construction	Aluminum.

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16. DCPSFHA - Dual Circular Polarized Scalar Feed Horn Antenna

FEATURES

- Composed of SFHA + POL
- From 7 to 110 GHz (WR112 to WR10)
- 12 dBi to 18 dBi nominal mid-band gain
- Very compact size
- Low VSWR
- Circular LHCP and RHCP polarization
- Custom specifications can be requested

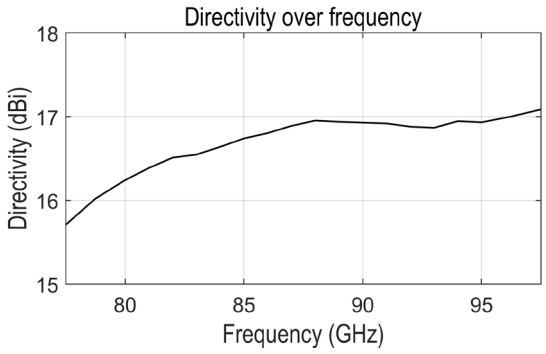
PRODUCT DESCRIPTION

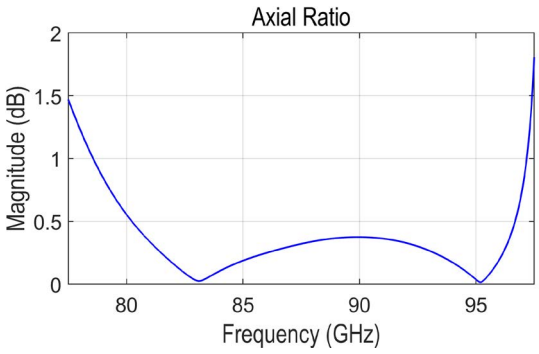
Anteral's Dual Circular Polarized Scalar Feed Horn Antenna (DCPSFHA) is an integrated system composed of a **waveguide polarizer** (POL) that provides high isolation and cross-polarization (XP) cancellation and a **broad band scalar feed horn antenna** that provides high gain, low VSWR and low side-lobes, with minimum size. Client can choose the POL and SFHA and Anteral will design the DCPSFHA that suits their needs.

They are designed with different nominal mid-band gain and a low VSWR. The polarizer (POL) supports either **LHCP and RHCP polarized signals with high cross-polarization rejections and isolation**. The polarizer is configured with two WR waveguides for the LHCP and RHCP waveguide ports. Custom bands, gain values and flanges can be requested.

Dual Polarized Scalar Feed Horn Antennas are especially useful when high isolation and high cross polarization is required. They are widely used in 5G systems, radar applications, communication, and antenna ranges, among others.

TYPICAL PERFORMANCE





MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
Operating temperature	-40ºC to +85ºC
Construction	Aluminum.

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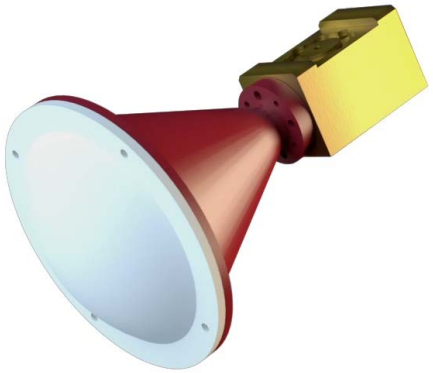
17. DLPLHA - Dual Linear Polarized Lens Horn Antenna

FEATURES

- Composed of LHA + OMT
- From 8.2 to 110 GHz (WR90 to WR10)
- 30 dBi nominal mid-band gain
- Very compact size
- Low VSWR
- Linear polarization
- Custom specifications can be requested



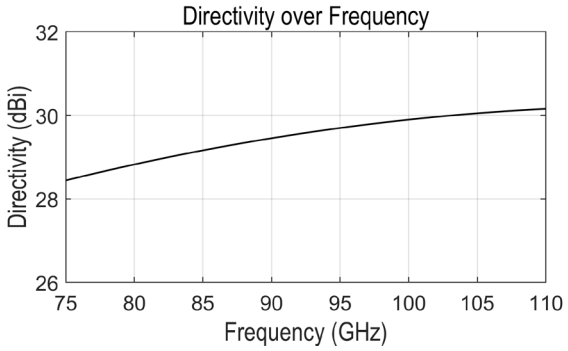
PRODUCT DESCRIPTION

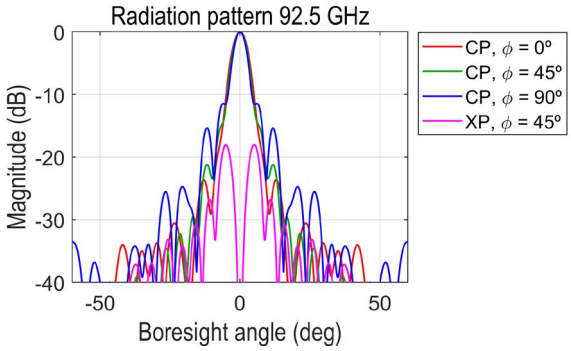
Anteral's Dual Polarized Lens Horn Antenna (DPLHA) is an integrated system composed of an **orthomode transducer** (OMT) that provides high isolation and cross-polarization (XP) cancellation and a **lens horn antenna** (LHA), in order to apply achieve **high gain**, low VSWR and low side-lobes, with **minimum size**. Client can choose the OMT and LHA and Anteral will design the DLPLHA that suits their needs.

They are designed to cover the frequency range of 8 to 110 GHz in 12 bands with 30 dBi nominal mid-band gain and a typical VSWR of 1.25. The OMT supports **either horizontal or vertical** polarized signals with more than 35 dB cross-polarization rejections and 35 dB isolation. Besides, custom bands and gain values can be requested.

These antennas are widely used in radar applications, communication links and meteorological systems, among others. New cutting-edge space applications include LHA's for MiniSat, MicroSat, NanoSat and CubeSat communications.

TYPICAL PERFORMANCE





MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
Horn Material	Aluminum
Lens Material	PTFE or HDPE
Operating temperature	-40ºC to +85ºC

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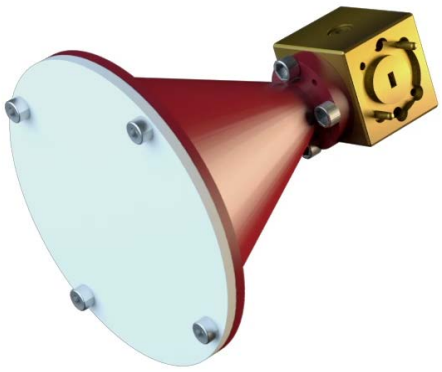
18. DCPLHA - Dual Circular Polarized Lens Horn Antenna

FEATURES

- Composed of LHA + POL
- From 7 to 110 GHz (WR112 to WR10)
- Very compact size
- Low VSWR
- Circular LHCP and RHCP polarization
- Custom specifications can be requested



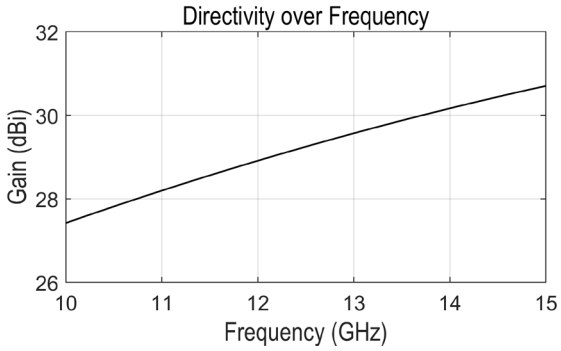
PRODUCT DESCRIPTION

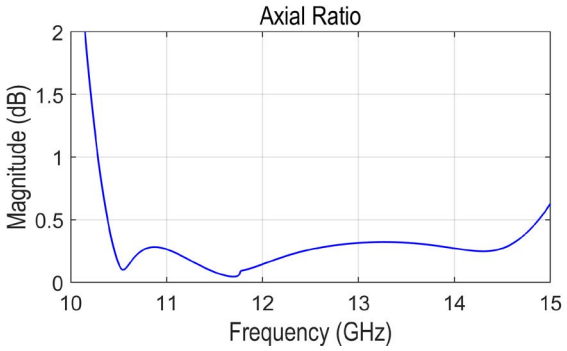
Anteral's Dual Circular Polarized Lens Horn Antenna (DCPLHA) is an integrated system composed of a **waveguide polarizer** (POL) that provides high isolation and cross-polarization (XP) cancellation and a **lens horn antenna** (LHA) that provides **high gain**, low VSWR and low side-lobes, with **minimum size**. Client can choose the POL and LHA and Anteral will design the DCPLHA that suits their needs.

They are designed with around 30 dBi mid-band gain and a low VSWR. The polarizer (POL) supports **either LHCP and RHCP** polarized signals with high cross-polarization rejections and isolation. Besides, custom bands, gain values and flanges can be requested. Anteral offers DPSFHA with linear or circular polarization.

Dual Polarized Scalar Feed Horn Antennas are especially useful when high isolation and high cross polarization is required. They are widely used in 5G systems, radar applications, communication, and antenna ranges, among others.

TYPICAL PERFORMANCE





MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
Horn Material	Aluminum
Lens Material	PTFE or HDPE
Operating temperature	-40ºC to +85ºC

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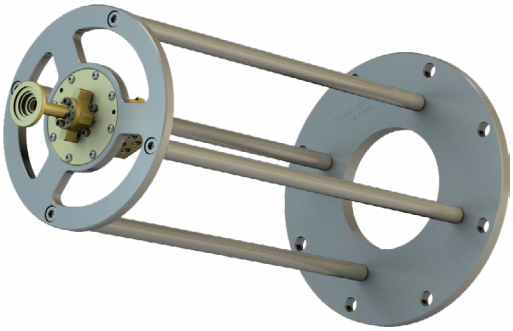
19. CATR - Compact Antenna Test Range Feed

FEATURES

- Specially designed for measurements
- From 7 to 110 GHz (WR112 to WR10)
- 15 dBi nominal mid-band gain
- Custom clamping structure
- Low VSWR
- Linear or circular polarization
- Custom specifications can be requested



PRODUCT DESCRIPTION

Anteral's Compact Antenna Test Range Feeds (CATR) are **complete systems** composed of antenna, polarizer (in case of circular polarization), orthomode transducer and diplexers (in case of four-port configuration). They present low VSWR, high cross-polarization (XP) cancellation and low axial ratio.

The CATR systems are **completely custom**, choosing between linear or circular polarization and two-port or four-port configuration. Moreover, the mechanical design can be adapted to the client requirements in terms of **clamping structure**.

They are designed to cover the frequency range of 7 to 110 GHz in several bands with 15 dBi nominal mid-band gain, typical **VSWR of 1.25** and typical **axial ratio below 1 dB**. Besides, custom values can be requested.

These antennas are widely used in **measurement applications** like anechoic chambers.

ELECTRICAL SPECIFICATIONS

Model	Frequency (GHz)	VSWR	Gain (dBi)	Polarizacion	Isolation (Linear/Circular)	Axial Ratio (dB)	XP (dB)	Input Ports
CATR-WR137	5.85 - 8.2	1.15	14	Linear or Circular	45/20	0.4	25	WR-137
CATR-WR112	7.05 - 10	1.15	14	Linear or Circular	45/20	0.4	25	WR-112
CATR-WR90	8.2 - 12.4	1.15	14	Linear or Circular	45/20	0.5	25	WR-90
CATR-WR75	10 - 15	1.15	14	Linear or Circular	45/20	0.5	25	WR-75
CATR-WR62	12.4 - 18	1.15	14	Linear or Circular	40/20	0.5	25	WR-62
CATR-WR51	15 - 22	1.15	14	Linear or Circular	40/20	0.5	25	WR-51
CATR-WR42	18 - 26.5	1.2	14	Linear or Circular	40/20	0.6	25	WR-42
CATR-SAT-KKA-01	17.3 - 31	1.25	14	Linear or Circular	40/20	0.8	25	(WR-42 & WR-28) or 2.92 mm
CATR-SAT-KKA-02	18 - 30	1.25	14	Linear or Circular	40/20	1	25	2.92 mm
CATR-WR34	22 - 33	1.2	14	Linear or Circular	40/20	0.7	25	WR-34

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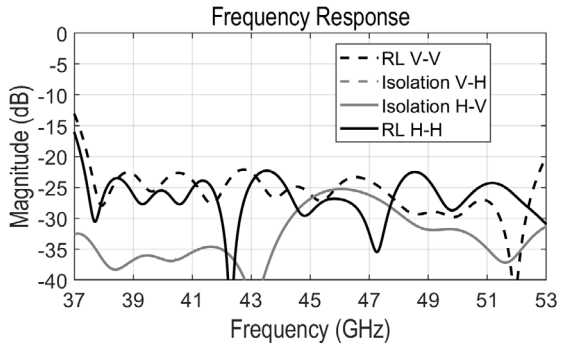
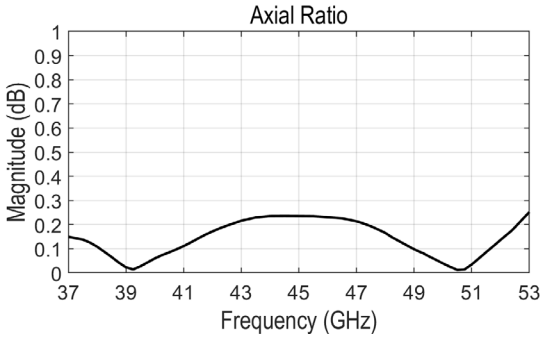
Model	Frequency (GHz)	VSWR	Gain (dBi)	Polarizacion	Isolation (Linear/Circular)	Axial Ratio (dB)	XP (dB)	Input Ports
CATR-WR28	26.5 - 40	1.2	14	Linear or Circular	35/20	0.7	25	WR-28
CATR-WR22	33 - 50	1.25	14	Linear or Circular	35/20	0.8	25	WR-22
CATR-SAT-QV-01	37.5 - 52.4	1.3	14	Linear or Circular	35/20	0.5	25	1.85 mm
CATR-WR19	40 - 60	1.25	14	Linear	35/-	-	25	WR-19
CATR-WR15	50 - 75	1.25	14	Linear	35/-	-	25	WR-15
CATR-WR12	60 - 90	1.3	14	Linear	35/-	-	25	WR-12

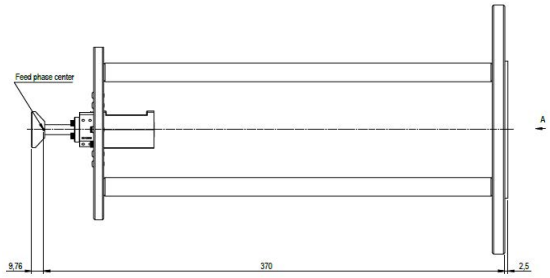
TYPICAL PERFORMANCE

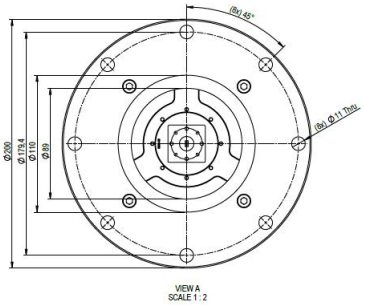




MECHANICAL OUTLINE

Flange	Standard UG-xxx/U
Operating temperature	40ºC to +85ºC
Material	Aluminum
Other	Absorbent material included





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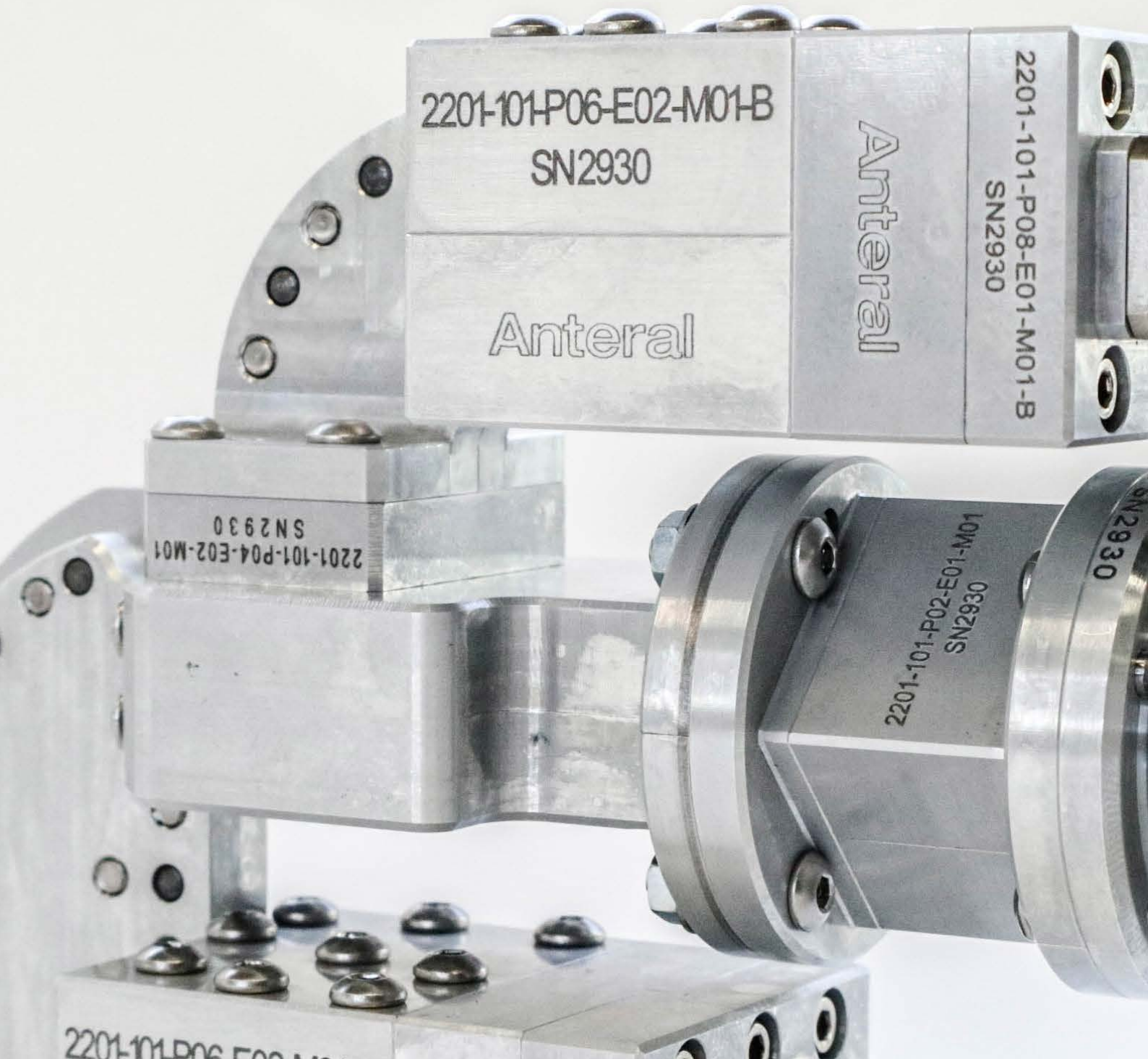
AEROSPACE & DEFENSE



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Our capabilities

Thanks to the participation in more than **12 satellite programs**, we offer the best of our experience in each new project, combining our know-how with the fulfillment of the highest quality standards (EN9001:2015). We manage the design, fabrication and each verification test necessary for the project.

With more than **10 years of experience within the aerospace sector**, Anteral has a large heritage that applies in the development of high technology products within everyone's reach.

Anteral counts with different **products and ad-hoc designs** for numerous applications such as security and defense, telecommunications, R&D, etc. We have designed different high-performance systems in the **main frequency bands for space applications**. Apart from complete systems, our most relevant aerospace products are horn antennas & filters and passive components.

+ 20 space projects
+ 10 years of experience in the space sector
+ 10 developments in orbit

CONVENTIONAL SATELLITES

LAUNCHERS

GROUND SEGMENT

NEW SPACE & SMALLSATS

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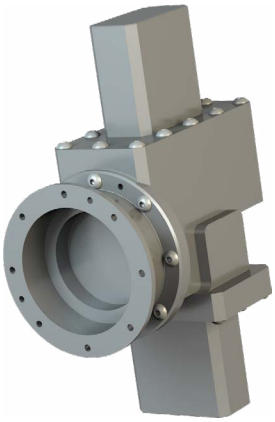
20. C-band SAT Feeding Network

FEATURES

- C band
- Very compact and lightweight design
- Transitions to SMA or TNC
- Perfect for satellites and smallsats



PRODUCT DESCRIPTION

Anteral's C-band Feeding Network is designed to **feed an antenna with dual-linear polarization**. This system is composed by an orthomode transducer (OMT) and two transitions to SMA or TNC connectors. OMTs are used in communication systems for either combine or separate two orthogonal linear polarized signals.

The main advantage is the compact and lightweight design, suitable for applications where mass and size are critical, such as satellite communications.

ELECTRICAL SPECIFICATIONS

Parameter	Typical value
Frequency band	4.4 - 5 GHz
Polarization	Linear (vertical and horizontal)
Return Loss	30 dB
Isolation	50 dB
Size	77 x 190 x 127 mm
Mass	800 g
TRL	6

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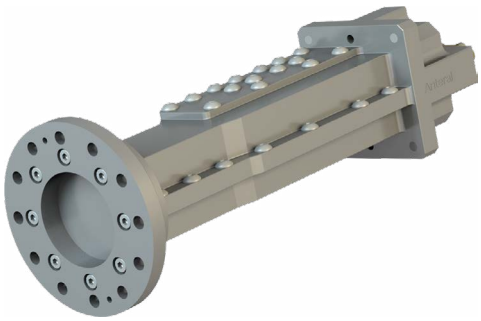
21. X-band SAT Feeding Network

FEATURES

- X band
- Circumplexer, innovative design
- High Isolation
- Low PIM
- Perfect for satellites and smallsats



PRODUCT DESCRIPTION

Anteral's X-band Feeding Network is designed to **feed an antenna** operating RHCP in TX channel and LHCP in RX channel. This system is a **Circumplexer**, an innovative passive device designed by our team to compact an antenna feeding network by integrating a polarizer and a diplexer in a single component. We disrupt established approaches by looking for new ways of making.

The use of a Circumplexer is beneficial because the reduction of flanges and screws allows not only mass and size reduction, but also makes the structure better in terms of PIM.

ELECTRICAL SPECIFICATIONS

Parameter	Typical value
Frequency band	X band
Polarization	Linear (vertical and horizontal)
Return Loss	20 dB
Isolation	65 dB
Axial Ratio	< 1 dB
Size	50 x 50 x 185 mm
Mass	310 g
TRL	6

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22. X-band SAT DRA

FEATURES

- X band
- High-power applications
- DRA (Directive Radiating Array)
- 7 feed chains
- Compact size
- Perfect for satellites and smallsats

PRODUCT DESCRIPTION

Antenna arrays play a very important role into the space industry, in order to achieve directive patterns while guaranteeing the capability to steer the pattern or even to reconfigure it.

Anteral's X-band DRA is a **Directive Radiating Array** of seven feed chains. Each single radiating element is composed by a spline horn antenna, a very compact circular waveguide filter that exhibits low losses and a septum polarizer.

Lightness is one of the most highlighted features of this system, which has been especially optimized to be as **compact** as possible, due to the importance of size and mass for space applications.

The table shows the specifications for each radiating element.

ELECTRICAL SPECIFICATIONS

Parameter	Typical value
Frequency band	7.9 - 8.4 GHz
Polarization	RHCP & LHCP
Return Loss	25 dB
Directivity	17 dBi
Cross-Polar Level	35 dB
Rejection bands	7.25 - 7.75 and 20.2 - 21.2 GHz
Size	87 x 87 x 251 mm
Mass	270 g
TRL	7

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23. X-band SAT System

FEATURES

- X band
- High-power applications
- Compact size
- Designed for illuminating reflectors
- Perfect for satellites and smallsats

PRODUCT DESCRIPTION

X-band SAT System has been specially designed for **illuminating reflectors with circular polarization**. For this purpose, low directivity values, low side-lobe level and low cross-polar levels are needed in the radiation pattern.

This system is composed of a corrugated antenna, a polarizer and a transition, and it stands out for being suitable for high-power applications. Moreover, the design is optimized for being **lightweight and compact**.

ELECTRICAL SPECIFICATIONS

Parameter	Typical value
Frequency band - Pass band RX	7.145 - 7.19 GHz
Frequency band - Pass band TX	8.4 - 8.45 GHz
Polarization	RHCP or LHCP
Axial Ratio	0.3 dB
Return Loss	30 dB
Directivity	14.5 dBi
Cross-Polar Level	30 dB
Size	125 x 125 x 245 mm
Mass	~ 500 g
TRL	6

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24. Spline Horn Antennas

FEATURES

- Custom design
- Lightweight and compact
- Design for additive manufacturing
- Perfect for satellites and smallsats

PRODUCT DESCRIPTION

Anteral team has its longest heritage in the design of horn antennas since 1997. In particular, we design and fabricate **spline horn antennas** in a wide frequency range for many applications, such as satellite communications.

This kind of antennas are **completely custom**, designed to fulfil the client specifications with outstanding performance. We have designs in the most important satellite frequency bands (Ka, Ku, X…). Apart from RF performance, they are also optimized for being as lightweight and compact as possible, features that are critical for space payloads.

Moreover, we have experience in the design of spline horn antennas for **additive manufacturing**, considering the benefits and limitations of this kind of manufacturing technology.

During these years, we have designed spline horn antennas for different **satellite programs**. Here there are some of them:

HERITAGE IN SPLINE HORN ANTENNAS FOR SPACE PROGRAMS

Year	Frequency band	Satellite
2011	Ka band	Amazonas 3
2014	Ka band	Hispasat 1F
2015	Ka and Ku bands	Amazonas 5
2017	Ku band	Quantum
2019	X band	Spainsat-NG

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25. Corrugated Horn Antennas

FEATURES

- Custom design
- In-house design methods with axial corrugations
- Low crosspolar levels
- Perfect for satellites and smallsats

PRODUCT DESCRIPTION

Anteral team has its longest heritage in the design of horn antennas since 1997. It must be highlighted our expertise in the design of **corrugated horn antennas** in a wide frequency range for many applications, such as satellite communications.

Anteral corrugated horn antennas are **completely custom**, designed to meet the client requirements with outstanding performance. We have experience in the most important satellite frequency bands (Ka, Ku, X…). Apart from RF performance, they are also optimized for being as lightweight and compact as possible, features that are vital for space payloads.

Anteral has the in-house knowledge to design corrugated horn antennas that include **axial corrugations** in the throat and **radial corrugation** in the flare. This type of corrugated horn antennas offers outstanding specifications (low crosspolar levels, low sidelobe levels, improved return loss and wideband performance) in a much compact size than a normal corrugated horn antenna **reducing manufacture complexity and improving performance**.

During these years, we have designed corrugated horn antennas for different satellite programs. Here there are some of them:

HERITAGE IN SPLINE HORN ANTENNAS FOR SPACE PROGRAMS

Year	Frequency band	Satellite
2012	X band	Measat 3B
2014	Ku band	SES-10
2015	Ka and Ku bands	Amazonas 5
2015	Ku band	SES-12
2017	Ka band	Egypsat
2018	X band	Kmilsat

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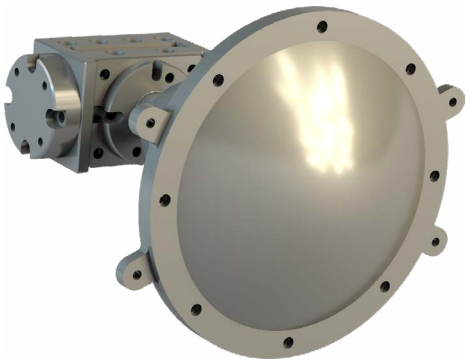
26. Q-band SAT System

FEATURES

- Q band
- High Gain: 28 dBi of directivity
- 0.3 dB of Axial Ratio
- Compact size
- Perfect for satellites and smallsats



PRODUCT DESCRIPTION

Driven by our experience in antennas and passives, we can quickly design **high-performance systems** that fulfill the most demanding requirements. Being **agile** is one of our main values, since space sector is changing and now more quick proposals are needed.

Anteral's Q-band SAT system has two ports and it has been designed for dual-circular polarization, exhibiting an outstanding performance with less than 0.3 dB of measured Axial Ratio. It can work only in one circular polarization under request. Moreover, the lens antenna provides high Gain while being compact.

This system is perfect for **smallsats and NewSpace** applications due to its compact design, since size and weight are crucial parameters for this kind of applications. Moreover, this system includes several clamping-points that can be customized according to the client requirements.

ELECTRICAL SPECIFICATIONS

Parameter	Typical value
Frequency band	37.5 - 42.5 GHz
Return Loss	23 dB
Isolation between ports	20 dB
Directivity	28 dBi
Axial Ratio	0.3 dB
Cross-Polar Level	20 dB
Angular Beamwidth	6.5º
Polarization	RHCP & LHCP
Ports	WR22
Size	99 x 99 x 118 mm
Mass	275 g
TRL	7

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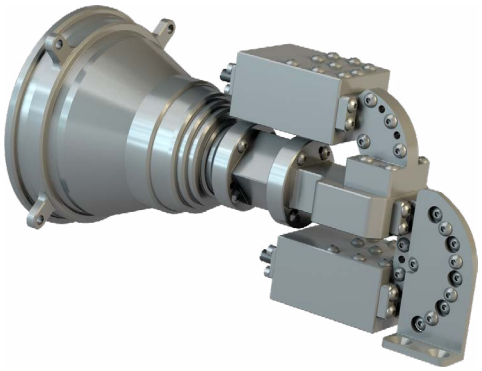
27. K/Ka-band SAT System

FEATURES

- K/Ka band
- 21 dB of Directivity
- Less than 1 dB of Axial Ratio
- Compact size (2U)
- Perfect for satellites and smallsats



PRODUCT DESCRIPTION

Thanks to our in-house innovative design methods and our expertise in RF design, we develop high-performance systems in an agile and flexible way, in order to help our clients to go further.

This K/Ka-band system has four ports and dual-circular polarization, showing less than 1 dB of measured Axial Ratio, thanks to an innovative technology used in the polarizer.

Due to its compact design of 2U, this system is perfect for smallsats and NewSpace applications, where size is a crucial parameter. Moreover, this system includes several clamping-points that can be customized according to the client requirements.

ELECTRICAL SPECIFICATIONS

Parameter	Typical value
Frequency band - Pass band RX	17.3 - 21.2 GHz
Frequency band - Pass band TX	27 - 31 GHz
Return Loss	18 dB
Isolation TX/RX & RX/TX	80 - 100 dB
Directivity	21 dBi
Axial Ratio	0.8 dB
Cross-Polar Level	-20 dB
Angular Beamwidth	10º
Polarization	RHCP & LHCP for both TX and RX
Connectors	Coaxial 2.92 mm (F)
Size	102 x 102 x 197 mm (2U)
Mass	620 g
TRL	7

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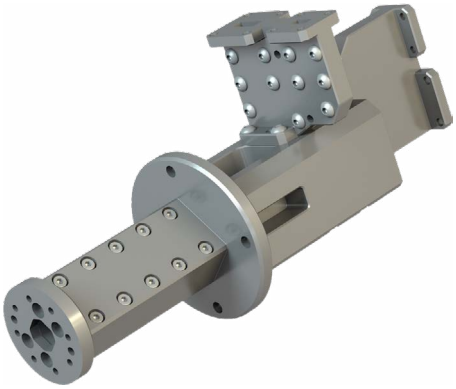
28. K/Ka-band GND Feeding Network

FEATURES

- K/Ka band
- High Isolation between ports
- Reconfigurable system with 4 ports
- Ideal for feeding an antenna for satellite applications
- SATCOM Ground segment



PRODUCT DESCRIPTION

Anteral's K/Ka-band GND Feeding Network is a dual-circular polarization system with two ports, ideal for feeding an antenna for satellite applications in K/Ka band.

It benefits from a high-performance polarizer which achieves RHCP and LHCP with less than 1 dB typical axial ratio. It is fed by a high-performance orthomode transducer whose inputs are matched to a diplexer, which achieves more than 80-dB isolation between the transmission and reception channels.

Therefore, this system benefits from two RHCP and LHCP transmission ports and two RHCP and LHCP reception ports, providing a full reconfigurable subsystem.

ELECTRICAL SPECIFICATIONS

Parameter	Typical value
Frequency band - RX band	17.7 - 21.2 GHz
Frequency band - TX band	27.5 - 31 GHz
Return Loss	18 dB
Axial Ratio	1 dB
Isolation RX-TX & TX-RX	80 dB
Size	56 x 75 x 189 mm
Mass	400 g

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29. C-band GND System

FEATURES

- C band
- Designed to illuminate reflectors
- LHCP & RHCP polarizations
- High Isolation
- SATCOM Ground segment

PRODUCT DESCRIPTION

Anteral's C-band GND System has been specially designed for **illuminating reflectors** of 1.8 m of diameter with dual-circular polarization, although the design can be adjusted to other reflector configurations. It has two ports and the polarizations can be switched between TX and RX ports.

This system is composed by a chokes antenna with the desired radiation pattern to illuminate the reflector, a wideband polarizer and an orthomode transducer – OMT.

ELECTRICAL SPECIFICATIONS

Parameter	Typical value
Frequency band - RX band	3.45 - 4.2 GHz
Frequency band - TX band	5.775 - 6.425 GHz
Polarization	LHCP & RHCP
Axial Ratio	1.5 dB
Directivity	13 dBi
Cross-Polar Level	20 dB
Return Loss	15 dB
Isolation RX-TX & TX-RX	90 dB
Size	150 x 220 x 370 mm
Mass	1.8 Kg

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30. X-band GND System

FEATURES

- X band
- Designed to illuminate big reflectors
- Reconfigurable system with 4 ports
- High-power performance
- SATCOM Ground segment

PRODUCT DESCRIPTION

X-band GND System is designed to illuminate big reflectors for satellite ground stations, in particular reflectors of 15m of diameter. The device has four ports and works with dual-circular polarization in the typical X-band frequencies.

The system is made up of a high-performance corrugated horn antenna, a polarizer and two diplexers. The highlighted features are less than 0.5 dB of Axial Ratio, high Isolation of more than 100 dB and the high-power performance.

ELECTRICAL SPECIFICATIONS

Parameter	Typical value
Frequency band - Band 1	7.25 - 7.75 GHz
Frequency band - Band 2	7.9 - 8.4 GHz
Polarization	RHCP & LHCP
Axial Ratio	0.5 dB
Gain	20 dBi
Cross-Polar Level	25 dB
Return Loss	25 dB
Isolation RX-TX & TX-RX	110 dB
Size	285 x 182 x 407 mm
Mass	3 Kg

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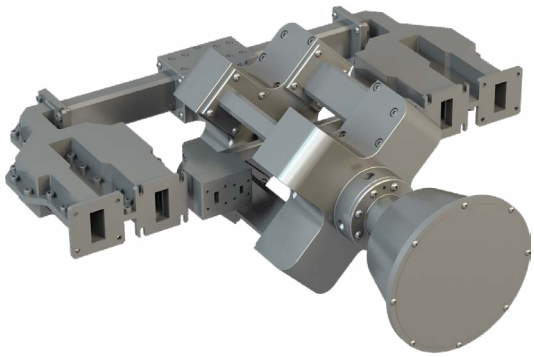
30. X/K/Ka-band GND System

FEATURES

- X/K/Ka bands
- Reconfigurable system with 8 ports
- High Isolation
- Low Insertion Loss
- High-power handling
- SATCOM Ground segment



PRODUCT DESCRIPTION

This high-performance **eight-port terminal** provides the capability of receiving and transmitting data from/to a satellite at X and K/Ka bands within any specific **on-site infrastructure**, since it can be easily mounted on a vehicle. Our experience in not only RF but also in mechanical design makes us capable of facing the most demanding challenges in terms of **integration**.

It is composed of an antenna which operates in both X and K/Ka bands simultaneously that has been designed to illuminate a 2.4m diameter reflector. Behind that, an orthomode transducer – OMT is responsible of incorporating the signals through different branches. In order to generate the different circular polarizations (RHCP and LHCP) a high-performance polarizer is used while four high-power diplexers provide high isolation between the different sub-bands.

The system also includes a **radome** to protect the antenna and ensure its proper performance under bad weather conditions.

ELECTRICAL SPECIFICATIONS

Parameter	Typical value
X Frequency band	7.25 - 7.75 and 7.9 - 8.4 GHz
K/Ka Frequency band	20.2 - 21.2 and 30 - 31 GHz
Polarization	RHCP & LHCP for all channels
Isolation	120 dB for X band | 85 dB for K/Ka band
Axial Ratio	1 dB
Return Loss	18 dB
Size	134 x 464 x 412 mm
Mass	8.4 Kg

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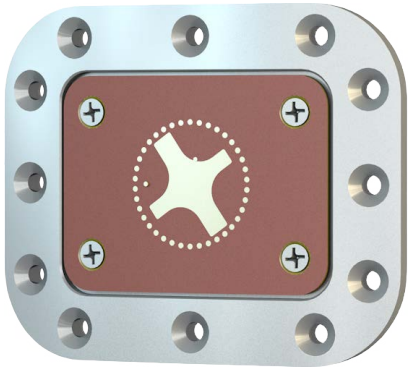
31. Plannar and Conformal Antennas

FEATURES

- UHF, L, S and C bands
- TT&C, navigation and FTS applications
- Ideal for launchers and sounding-rockets



PRODUCT DESCRIPTION

The **launchers** and **sounding-rockets** market is currently undergoing a significant growth due to the **NewSpace** arrival. For that, easy-to-manufacture and reusable antennas are needed.

In this framework, we have developed **substrate-based single-layer antennas** that, due to their lightweight, conformability, low profile, extreme temperature tolerances and large coverage areas, are ideal for space applications, especially for launchers.

Each model has been designed especially for different applications. All designs are frequency-scalable within their operation bands.

- S-band antennas: oriented to TT&C, operating both in transmission for telemetry and in reception for telecommand.
- L-band antennas: designed for navigation systems (GNSS).
- C-band and UHF-band antennas: ideal for ground safety issues, in particular for Flight Termination Systems (FTS).

ELECTRICAL SPECIFICATIONS

Frequency Band	Operation Frequency	Polarization	TRL
UHF	424.5 - 425.5 MHz	Linear	8
UHF	419.5 - 420.5 MHz	Linear	6
LS	L [1.57 - 1.58 GHz] S1 [2.299 - 2.309 GHz] S2 [2.346 - 2.357 GHz]	Circular Circular Circular	8
L	1.57 - 1.58 GHz	Circular	6
C	5.643 - 5.757 GHz	Linear	6
C	5.643 - 5.757 GHz	Circular	8

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Custom developments

Anteral provides the best quality products based on antennas and RF components, offering **ad-hoc design service** to make our products fulfill any requirements you have on mind. Application areas include Aerospace, Satellite and Terrestrial Communications, Radars and Military applications.

We develop **both conventional and innovative solutions** based on advanced technologies, selecting the most suitable one to fulfil the client specifications. We develop novel and innovative designs for both conventional machining and **additive manufacturing (AM)** techniques.

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Radar Technology

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uRAD - Universal Radar - by Anteral

FEATURES

- Three frequency bands: 24 GHz, 60 GHz and 77 GHz
- Detection of range, angle, velocity and SNR
- Open libraries and software
- Flexibility, robustness, accuracy in a compact size
- Custom radars can be requested

PRODUCT DESCRIPTION

Anteral, under its brand uRAD, develops **microwave radar solutions** with the aim to bring closer radar technology to everyone. **Five different standard products** are already available at **three frequency bands**. uRAD radars are perfect tools for developers or students of all ages.

uRAD is conceived as an evaluation platform to develop new and innovative applications or endowing intelligence to other common objects. With uRAD, you will be able to develop and create new applications for **industry, smart cities, automotive** and much more, such as area scanner, robotics, traffic monitoring, people counting, vital signs, etc.

uRAD platform provides full hardware, user manuals, tutorials, technical support and all the necessary software, including open libraries, examples of use and a graphical interface so that it is as easy as **plug & play**.

The easiest way to develop new and innovative radar applications

Velocity
Measure the velocity of different targets up to 270 km/h.

3D Positioning
Precisely calculate the position (xyz coordinates) of many targets at the same time.

Presence
Use the presence mode to detect any movement within its coverage range.

What advantages can uRAD offer to you?

1 Versatility
3 sensors in 1. Create any kind of application.

2 High Tech
Enjoy the specifications of a professional radar at a much lower price.

3 Multiplatform
Compatible with Arduino, Raspberry Pi, USB and serial port.

4 Portable
Place it anywhere thanks to its compact design and energy-saving.

5 Easy use
Plug & Play. Intuitively, program applications thanks to open-source libraries.

6 Educational
Learn about radar technology and boost your creativity.

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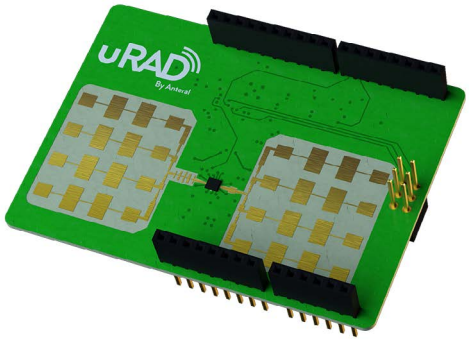
Open-source 24 GHz uRAD

FEATURES

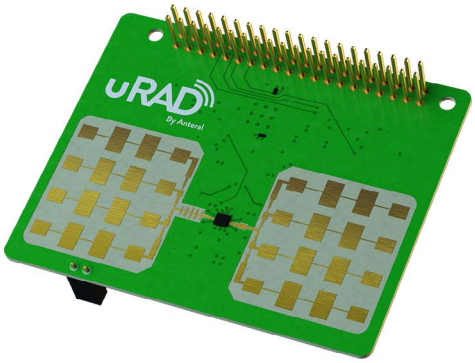
- Free emission **24 GHz** ISM frequency band
- Ideal for frontal detection (FoV 30 x 30 deg)
- Velocity, 1D distance and presence detection modes
- Point cloud and raw signal data
- Perfect for learning about radar technology

Thanks to uRAD, you will be able to develop and create new applications such as vibration sensors, distance and speed meters, vital signs controllers, movement sensors, etc. Furthermore, thanks to its ease of use, it is the perfect tool for schools and universities.



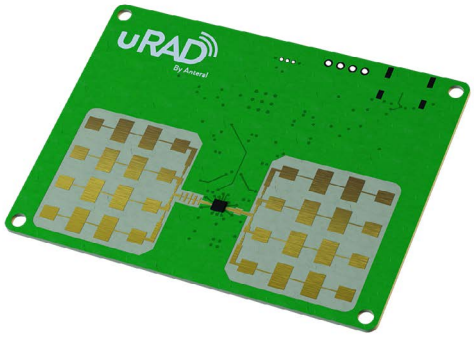
uRAD FOR ARDUINO

Arduino model of uRAD has specific connectors for directly plugging in on your **Arduino** board and transforms it into a completely functional microwave radar.
In this version, all libraries and examples are available for Arduino IDE.



uRAD FOR RASPBERRY PI

This model of uRAD is specificaly designed for easily connecting it with your **Raspberry Pi** and get microwave radar advanced capabilities.
In this version, all libraries and examples are programmed in **Phyton**.



uRAD FOR USB

This version is designed to be used with USB and UART (serial port) communication thanks to its specific connectors. All libraries and examples of uRAD USB are programmed in **Phyton**.

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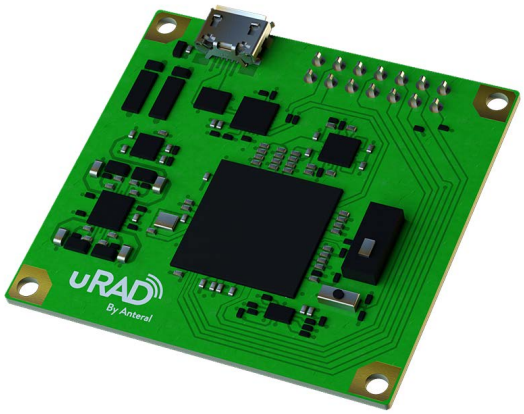
uRAD Industrial at 60 GHz

FEATURES

- 60 - 64 GHz regulated frequency band
- Industrial applications
- Velocity and 3D positioning of multiple targets
- Ultrawide field of view of 160 x 160 deg
- Superior detection accuracy
- USB, serial port and Raspberry Pi adaptor



PRODUCT DESCRIPTION

uRAD Industrial is one of the latest high-performance solution of uRAD. Working at the regulated **60-64 GHz frequency band,** it is the perfect device for developing industrial sensors. uRAD exhibits up to three times higher spatial and velocity resolution than others solutions in the market.

Based on the IWR6843AoP chip of Texas Instruments, uRAD measures the velocity, 3D position and reflectivity of objects with unprecedented accuracy and robustness. Multiple targets can be detected at the same time thanks to its ultrawide field of view.

uRAD opens you the door of next generation of industrial and smart cities applications.

APPLICATIONS

uRAD is conceived as an evaluation platform to develop new and innovative applications. Leverage the open and free software of Texas Instruments to develop your own projects. You will have access to many of their laboratories to test different applications from the beginning:

Points cloud visualizer	Gesture recognition	Robotics
Area scanner	Level sensing	Traffic monitoring
Automated doors	People counting	Vital signs

We also support our clients in their developments with **additional proprietary software and open libraries** to ease the integration of our sensors in their projects.

uRAD team, as experts in radar technology, also **develops custom software and firmware** to exploit the most out of capabilities of our radars. Contact us if you want to know more about these additional services.

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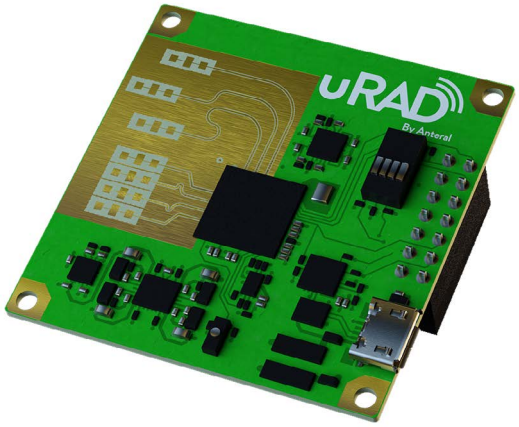
uRAD Automotive at 77 GHz

FEATURES

- 76 - 81 GHz regulated frequency band
- Automotive applications
- Velocity and 3D positioning of multiple targets
- Specially optimized field of view of 140 x 30 deg
- Superior angular resolution
- USB, serial port and Raspberry Pi adaptor



PRODUCT DESCRIPTION

uRAD Automotive is one of the latest high-performance solution of uRAD. This model is ideal for working as a on-board sensor in any vehicle thanks to it performance at the regulated **76-81 GHz frequency band** for automotion. Moreover, it can be used in many other applications.

Being based on the AWR1843 chip of Texas Instruments, uRAD exhibits up to three times higher spatial and velocity resolution than others solutions in the market. uRAD measures the velocity, 3D position and reflectivity of objects with unprecedented accuracy and robustness. The antenna configuration has been specially designed for achieving superior angular resolution and further detection range.

uRAD opens you the door of next generation of automotive and smart cities applications.

APPLICATIONS

uRAD is conceived as an evaluation platform to develop new and innovative applications. Leverage the open and free software of Texas Instruments to develop your own projects. You will have access to many of their laboratories to test different applications from the beginning:

Obstacle detection	Medium range radar	Robotics
Automated parking	Short range radar	Traffic monitoring
Points cloud visualizer	Gesture recognition	Vital signs

We also support our clients in their developments with **additional proprietary software and open libraries** to ease the integration of our sensors in their projects.

uRAD team, as experts in radar technology, also **develops custom software and firmware** to exploit the most out of capabilities of our radars. Contact us if you want to know more about these additional services.

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uRAD Smart Traffic Solutions

DESCRIPTION

uRAD Smart Traffic are specific solutions in the field of **smart cities** for **non-invasive traffic monitoring** in urban environments.

These **finished customizable solutions for vehicle counting** integrates our radars along with additional specific software and hardware.

FEATURES

- Vehicle counting up to 6 lanes in both directions.
- Individual velocity measurement.
- Distinction between different types of vehicles.
- Optional camera for license plate recognition.

FUNCTIONALITIES AND SERVICES

- Traffic statistics: Individual velocity, average velocity, occupancy, traffic flow, seasonality, direction, etc.
- Vehicle discrimination: Discern between different types of vehicles (large and regular), bikes and people.
- License plates recognition: Our most advanced solutions include high-resolution camera and license plates recognition software up to 2 lanes.
- Real time web application: Control panel to display statistics in real time. Customizable for each client.
- Reports: Periodic reports are provided for urban mobility projects.

TECHNICAL CHARACTERISTICS

- Protection: Equipment encapsulated in polycarbonate boxes with protection IP65, NEMA 1,2,4,4X,12,13, UL-508 y UL94 HB.
- Wireless connectivity: WiFi and 4G.
- Power supply: Wired power supply and integrated 24h battery.
- Autonomous solution: Optional solar panel to manage without wired power.
- Installation: Brackets for vertical installation in streetlights, traffic lights, etc.

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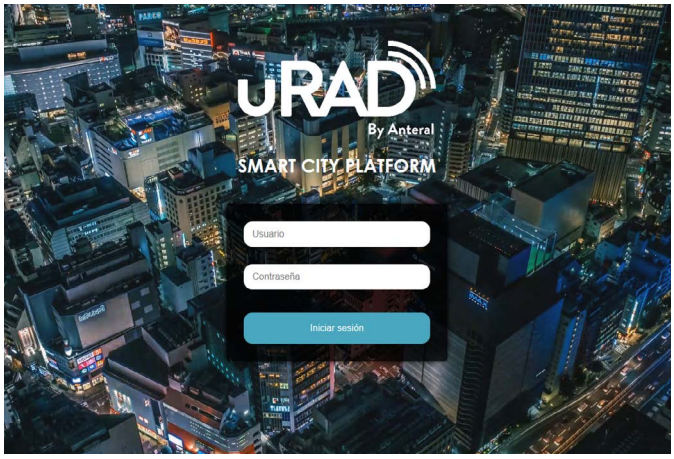
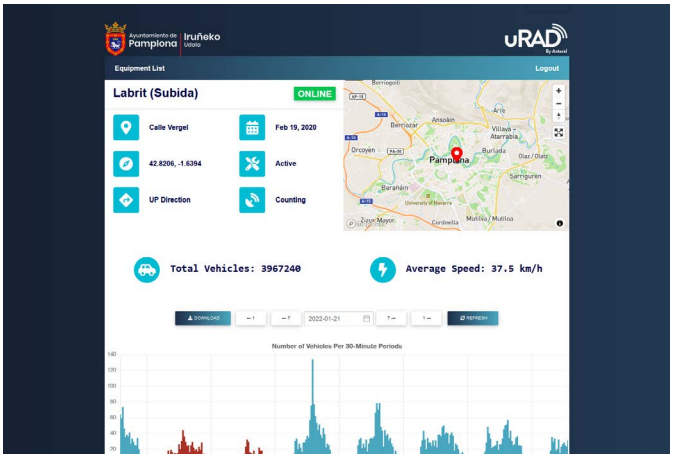
SMART CITY PLATFORM

We also offer an **online platform to visualize real-time statistics**, that is customizable to each client according to specific necessities. The users can also download **reports** with all the information quickly and easily.

The platform lists the devices of the installations, so the user can accesses to each one and visualize the particular information. The control panel shows details about the status, location and installation parameters. Real-time traffic statistics are also displayed, including the number of vehicles per hour and per day (data period selectionable), the percentage of vehicles according to velocity and other global statistics such as total vehicles or average velocity.





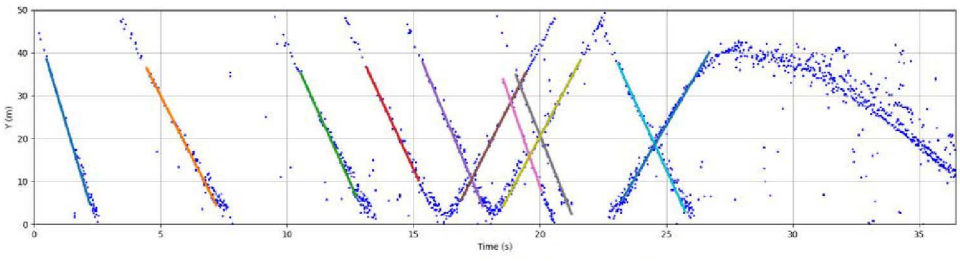
uRAD TRACKING SOFTWARE

In case the users want to integrate their own solution, Anteral also offers only the radar and the specific software to **develop applications on their own**.

It allows to count vehicles in multiple lanes, measuring the velocity and classifying them, with high accuracy and minimal configuration. The system works with **uRAD Industrial**, at the 60 GHz band, an available frequency band for emission all over the world, which ease the certification of any product.

The **Tracking Software** consists of a **Python program** that has to be run in the master device that controls uRAD Industrial. This software together with the master devices:

- Sends to uRAD Industrial the corresponding configuration parameters.
- Receive from uRAD Industrial the 3D point cloud with X, Y, Z space coordinates, velocity and SNR (Signal to Noise Ratio).
- Process the point cloud to identify vehicles, extract their velocity and classify them.
- Save a counting list with the relevant information.



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Do you have an idea?
Contact us and we will
make it real.

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