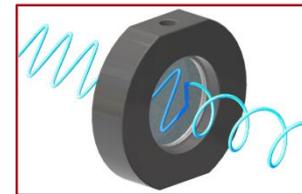
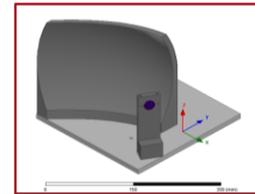




Anteral Products



Who We Are

Anteral was born in 2011 as a spin-off of the Public University of Navarra (UPNA) Antenna Group. It is a technological company with an innovative profile.

Anteral is focused on 3 main areas:

Antennas



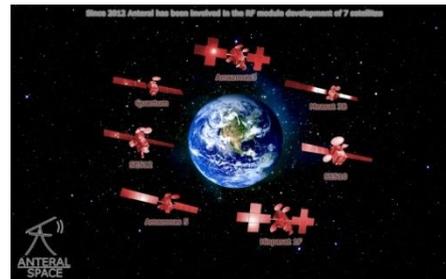
Development of high performance antennas for radio astronomy, communications and science.



Space



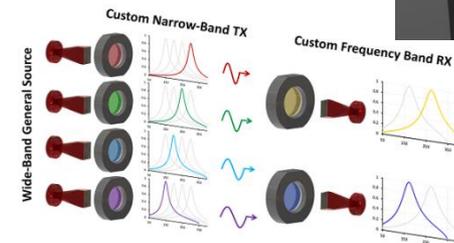
Development of high performance antennas for space



Terahertz



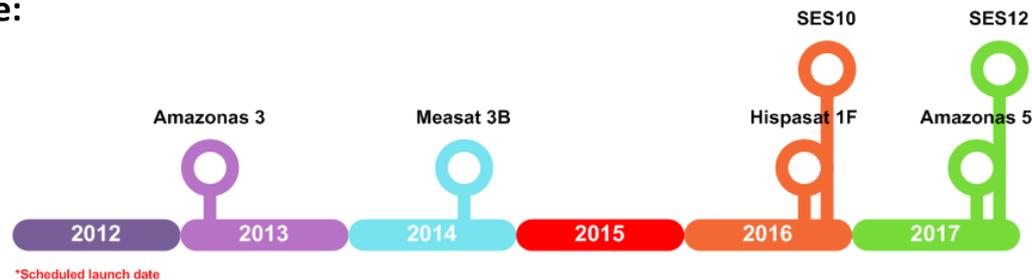
Development of mmW and THz sensing and communication systems for laboratory and industrial applications



Main Clients



Our Antennas in Space:



SGH Antennas

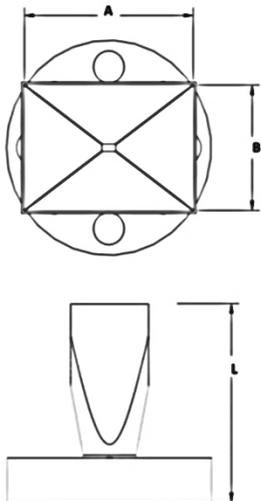
HIGH PERFORMANCE SGH:

Description:

This type of horn is suitable for laboratory test measurements, electromagnetic measurements and gain calibration. Models presented have around 26 dB gain at center frequency, but any customer-required gain value is achievable. These antennas are equipped with a standard UG-387 U/M precision style flange, which is manufactured in special way to provide the most accurate and repeatable mechanical alignment possible.

Properties:

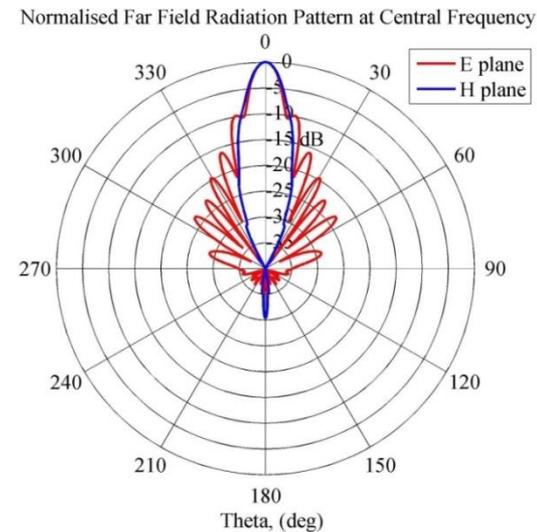
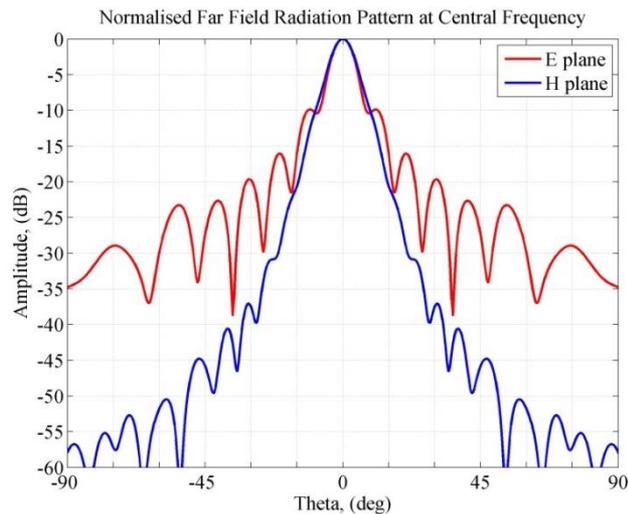
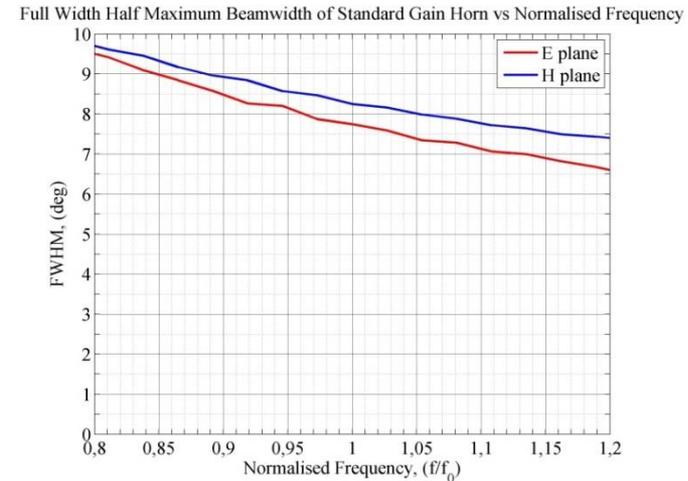
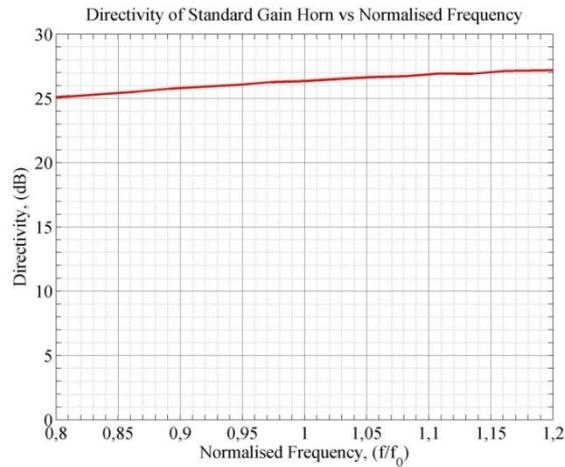
- High performance Standard Gain Horn.
- Standard WR input with UG-387 U/M flange.
- 26dB nominal gain at center frequency.
- Specific gain values can be requested.



Model	Input waveguide	fmin [GHz]	f0 [GHz]	fmax [GHz]	Length [mm]	A [mm]	B [mm]	VSWR
SGH-26-WR10	WR-10.0	75	92	110	80	31	22	<1,1
SGH-26-WR08	WR-8.0	90	110	140	64	25	18	<1,1
SGH-26-WR06	WR-6.5	110	140	170	52	20	14	<1,15
SGH-26-WR05	WR-5.1	140	180	220	41	16	11	<1,2
SGH-26-WR04	WR-4.3	170	215	260	35	13	9	<1,2
SGH-26-WR03	WR-3.4	220	275	330	27	11	8	<1,25
SGH-26-WR2.8	WR-2.8	260	330	400	23	9	7	<1,3
SGH-26-WR2.2	WR-2.2	330	415	500	18	7	5	<1,3

SGH Antennas

Performance:



SGH Antennas

GENERAL PURPOSE SGH:

Description:

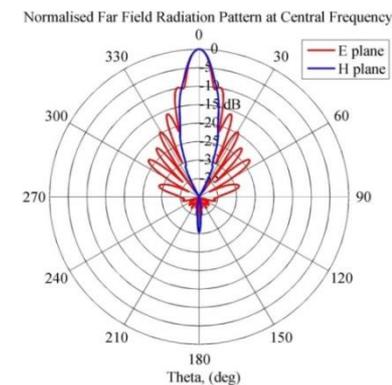
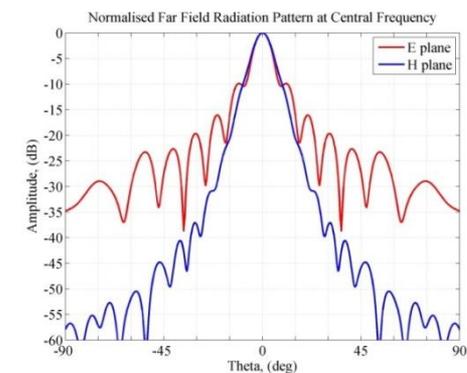
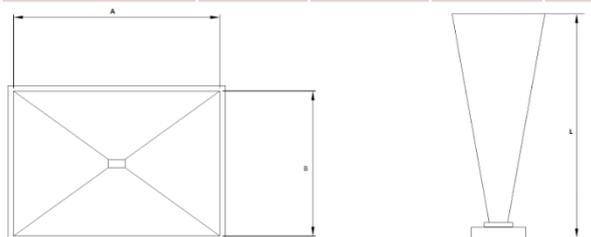
This type of horn is suitable for general purpose applications such as transmission systems, automotive radar applications, multi-pixel imaging systems... These antenna models have around 26 dB gain at center frequency, but any customer-required gain value is achievable. These antennas are manufactured with a flange compatible with UG-387U.

Properties:

- Brass Die-Cast Standard Gain Horn.
- Standard WR input with UG-387 U compatible flange.
- 26 dB nominal gain at center freq.
- Specific gain values can be requested

Performance:

Model	Input waveguide	fmin [GHz]	f0 [GHz]	fmax [GHz]	Length [mm]	A [mm]	B [mm]
SGH-26-WR12	WR-12.2	60	75	90	96	37	26
SGH-26-WR10	WR-10.0	75	92	110	80	31	22
SGH-26-WR08	WR-8.0	90	110	140	64	25	18
SGH-26-WR06	WR-6.5	110	140	170	52	20	14
SGH-26-WR05	WR-5.1	140	180	220	41	16	11



Reflector Antennas

Description:

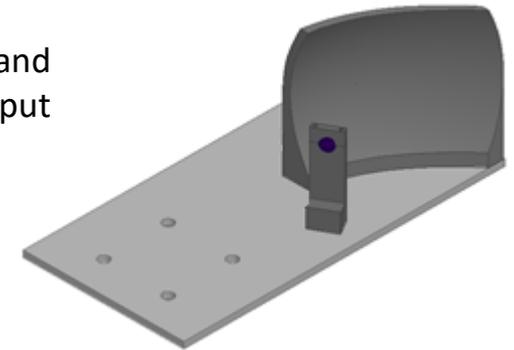
Anteral offers different high directivity reflector Antenna configurations (offset, confocal, cassegrain...) depending on the customer's requirements up to 500 GHz.

Applications:

These antennas can be used for scientific applications, like radiometers and radiotelescopes, as well as for civil applications like point-to-point high throughput communication links and cellular backhaul networks.

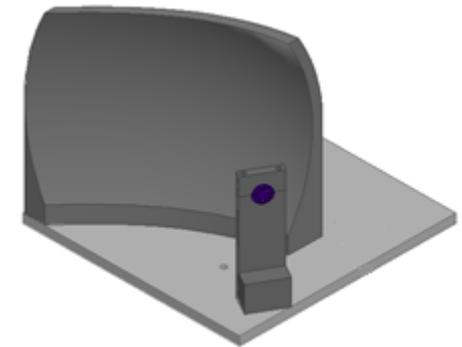
Properties:

- From 100 GHz to 400 GHz.
- > 50 dBi gain.
- Pyramidal feedhorns.
- Single polarization.
- High Data Rate.



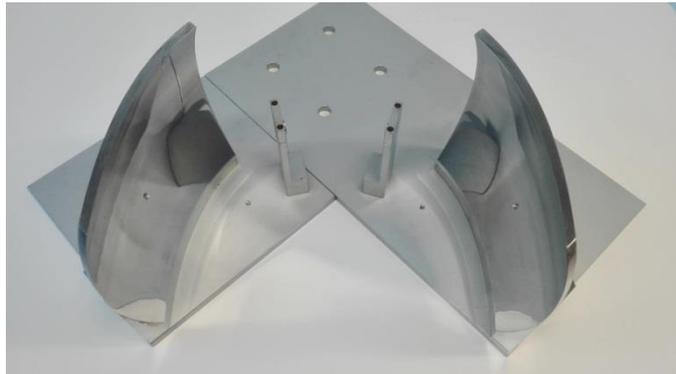
Requirements & specifications example:

Parameter	Value
Qty	2 antenna units: Type A TX & Type B RX
Antenna Type	Single-reflector Offset Parabolic Antenna
Central Frequency	330 GHz
Bandwidth	70 GHz (295GHz-365GHz)
Gain	> 50 dBi (typically >53dBi)
Polarization	Linear. Horizontal
Input waveguide	Standard WR2.8
Flange	UG-387/U or specified by customer
VSWR	< 1.4

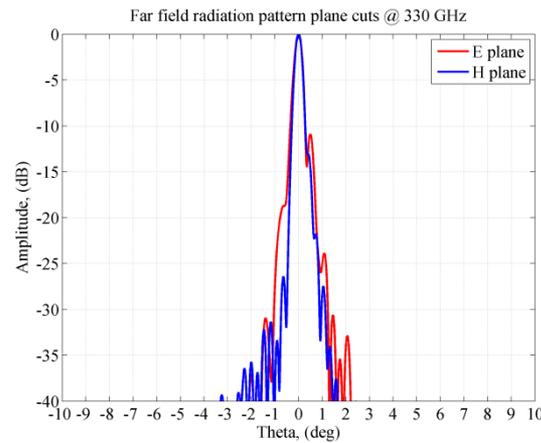
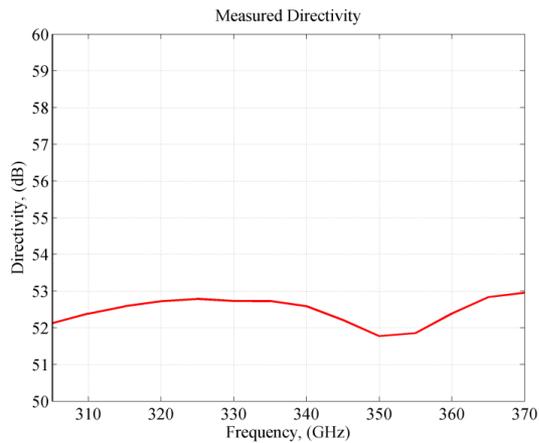
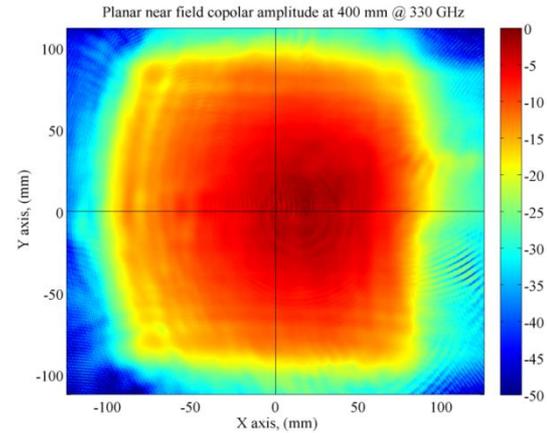


Reflector Antennas

Performance:



Near-field measurement



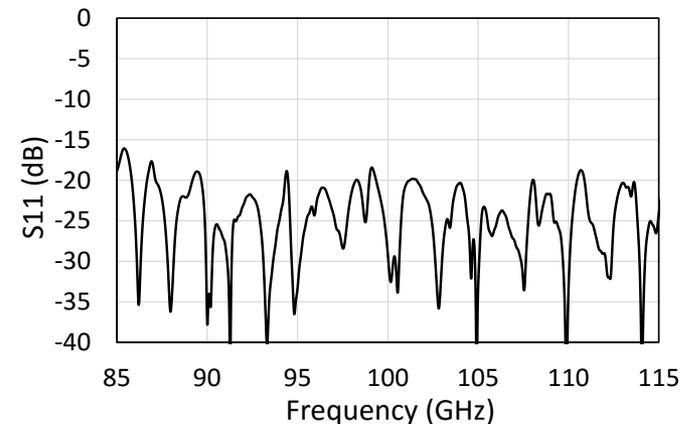
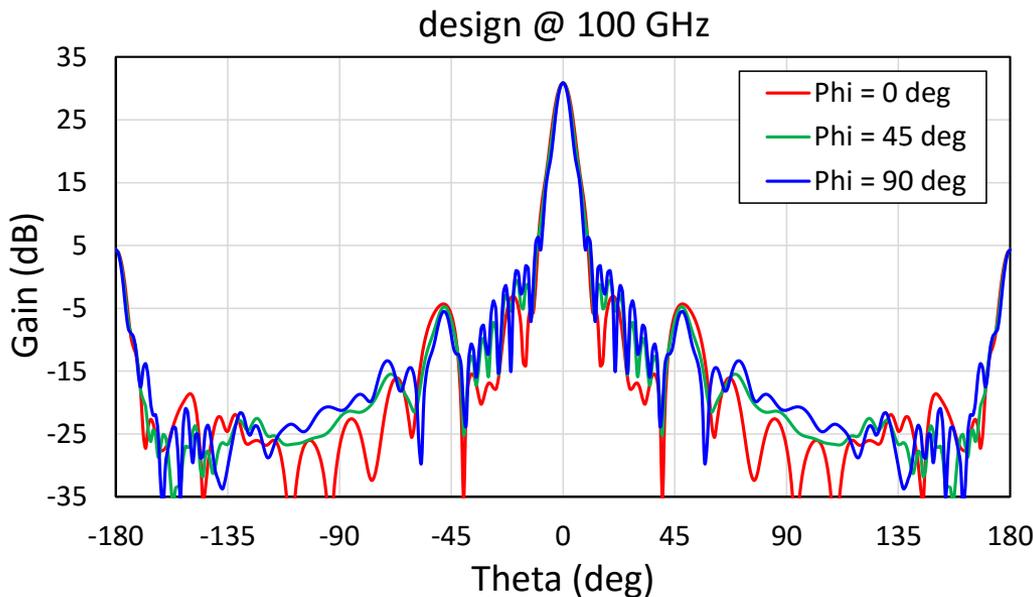
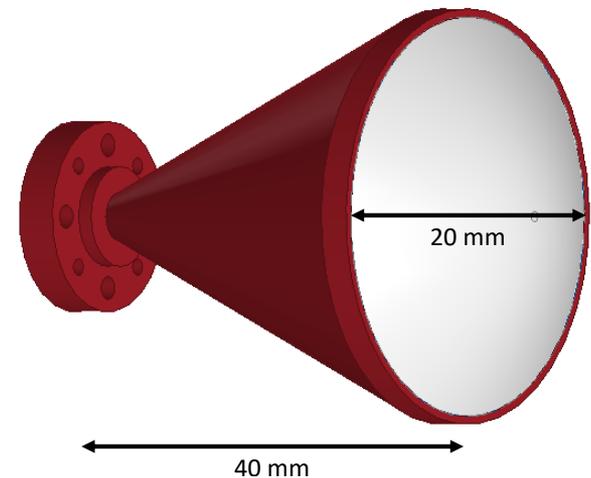
Far-field measurement

Lens Antennas

Description:

Anteral also offers custom-designed compact lens antennas, which have low profiles thanks to the integration of the lenses. The lenses are made of Teflon and allow the antenna to increase its directivity without an increment in size.

W-Band Horn Lens Antenna



Antenna Arrays

Description:

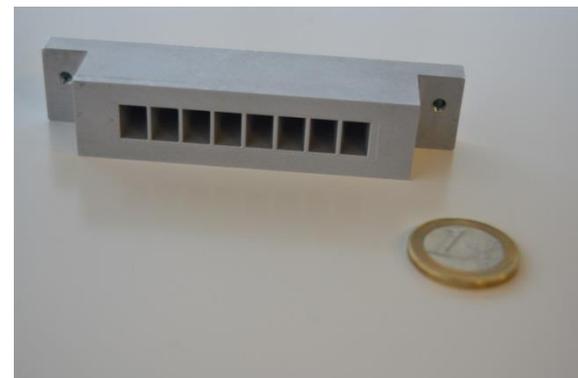
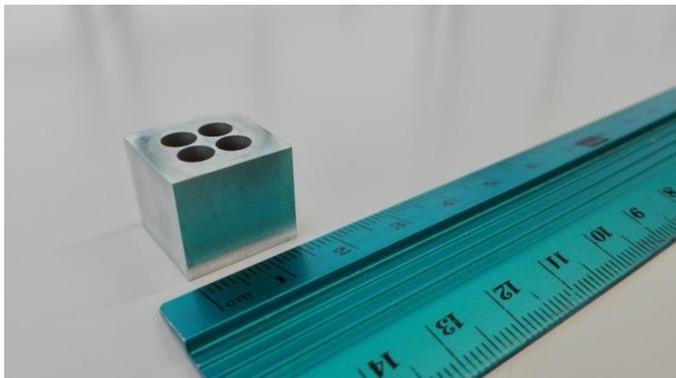
Anteral offers custom-designed antenna array (planar and horn) with operating frequencies of up to 500 GHz.

Properties:

- From 800 MHz to 500 GHz
- > 15 dBi Gain
- Single or dual polarization
- Custom radiation pattern

Applications:

These arrays can be used for scientific and industrial applications like communications, measurement, imaging, scanning or radar systems.



Planar Antennas

Description:

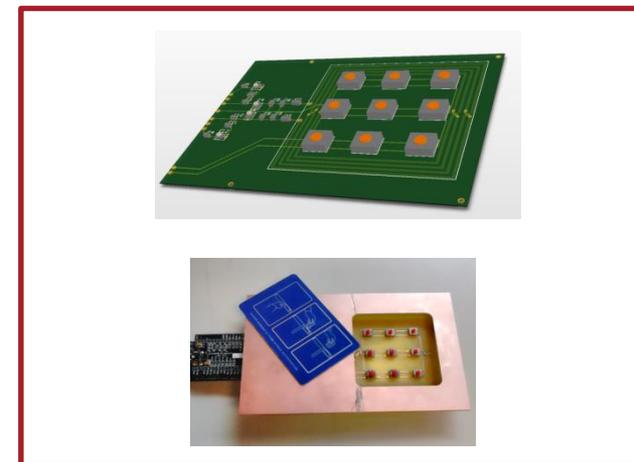
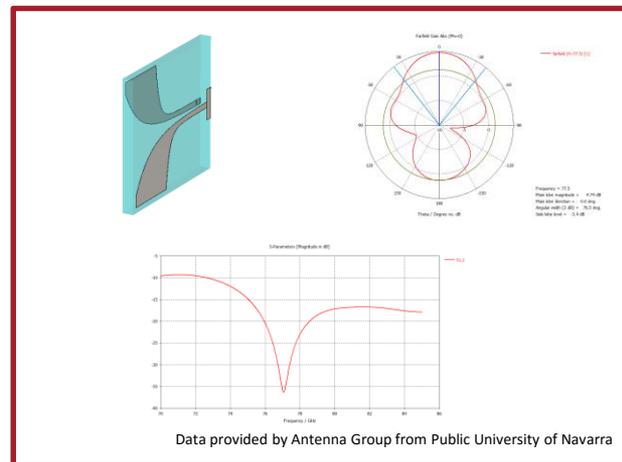
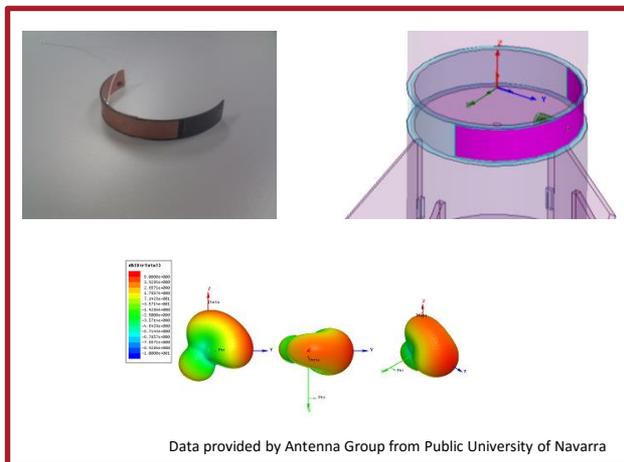
Anteral has the knowledge to design, manufacture and measure different types of antennas (patch, Vivaldi, EBG), either as single elements or in array configurations.

Properties:

- From 5 MHz to 110 GHz
- Single or dual polarization
- Integrated matching network
- Custom radiation pattern

Applications:

Custom design planar antennas for applications such as communications, GPS, radar or space. They can be also be integrated in small devices for RF communications (Wi-Fi, GPRS, Bluetooth, RFID...).



Space Antennas

Description:

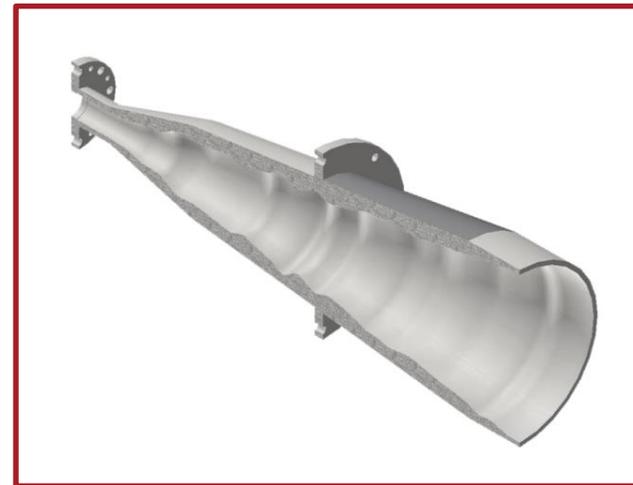
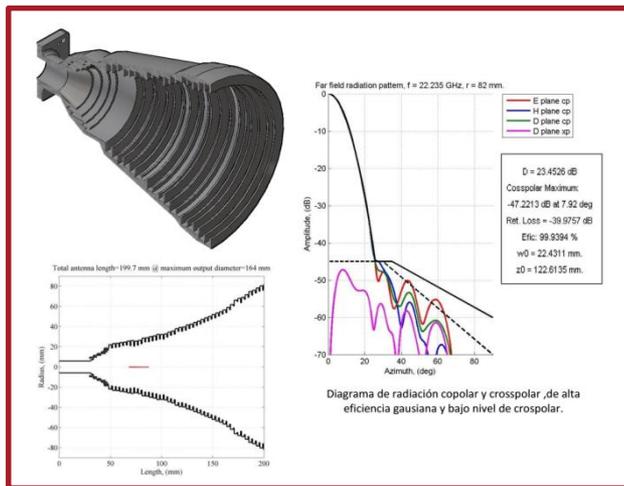
Design, manufacture and measurement of horn antennas for satellite reflector systems.

Properties:

- Horn antennas with axial and radial corrugations
- Spline profile antennas
- Other components such as OMTs and Septums

Applications:

Custom-designed antennas for satellites (communications and science).



Field Polarizers

Description:

Anteral's polarizers consist of:

- A simple patterned Cr-Cu-Au micro grid array of strips
- Two layers of patterned Cr-Cu-Au micro grid array of strips

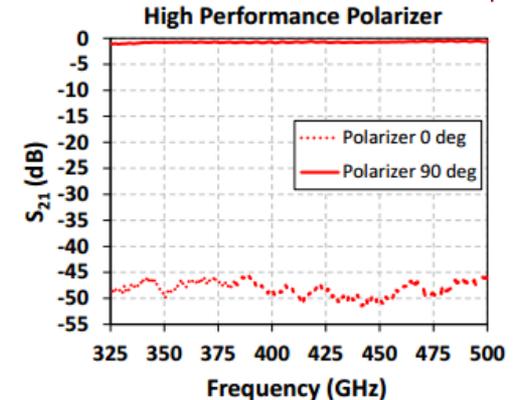
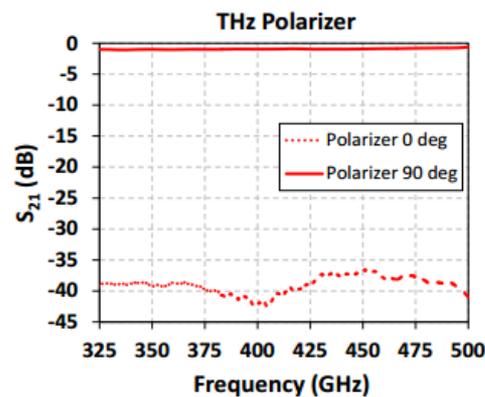
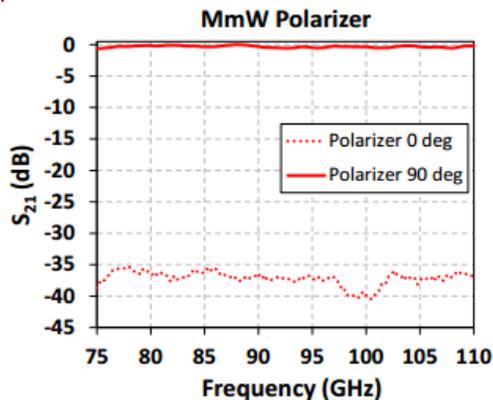
The micro grid arrays are patterned via a photolithography process on each side of a very thin (100 μ m) and ultra-low loss substrate for THz frequencies with low dielectric constant.

Properties:

- Very low transmission loss (< 0.5 dB)
- High parallel isolation (> 35 dB)
- Rotating frame with angular scale
- Ultra-low loss flexible and low dielectric constant substrate material



Designs



Field Polarizers

Comparative table:

Type	Gap width (μm)	Strip width (μm)	Strip thickness (μm)	Layers	Substrate thickness (μm)	Transmission Loss* (dB)	Parallel Isolation* (dB)	Frequency Band (GHz)
General Purpose MmW	50	100	2	1	100	< 0.5	35	0 - 250
General Purpose THz	10	25	2	1	100	< 1	35	250 - 750
High Performance	10	25	2	2	100	< 1	45	0 - 1000

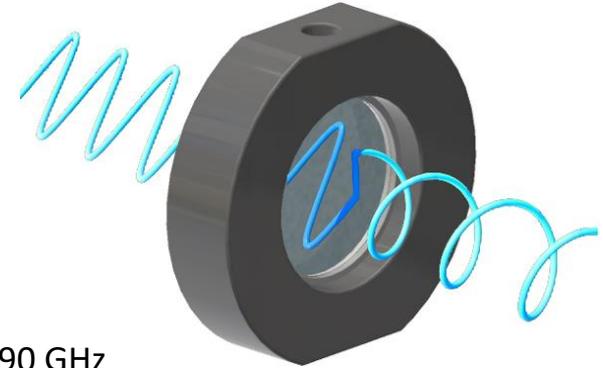
Applications:

- The Polarizer can be used from DC up to 1 THz systems for enhancement of the polarization sensitivity, beam splitting and generation of circular polarization.
- Circular polarization is generated for a 45 degrees incidence. Several thicknesses of the dielectric material can be selected for creating circular polarizations between 50 GHz and 1 THz.

Circular polarizer

Description:

Anteral's Circular Polarizer Quarter-Wave Plate (QWP) consists on a birefringent frequency selective surface that changes the polarization from linear to circular (or vice versa) in the frequency band between 56 GHz and 96 GHz.



Properties:

- Specially designed for new communication bands operating between 60 – 90 GHz
- Very low insertion losses < 1dB
- Operational bandwidth from 56 GHz to 96 GHz with Axial Ratio > -3dB
- Possibility of custom operational frequency up to 300 GHz
- Ultra-low loss, flexible and low dielectric constant substrate material

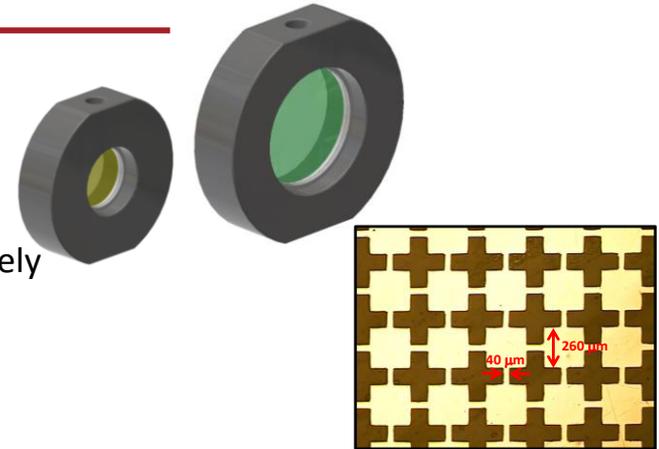
Applications:

- Circular polarization offers numerous performance advantages over traditional linear technologies due to its advanced signal propagation properties.
- It is ideal for addressing challenges associated with mobility, adverse weather conditions and non-line-of-sight applications.
- Anteral has specifically designed its QWP to cover the new wireless backhaul communication bands (that operate at 57-64 GHz, 71-76 GHz, 81-86 GHz and 92-95 GHz) with one device.
- This device offers high performance for radio-communications, astronomy or imaging applications, among others.

Band-Pass FSS

Properties:

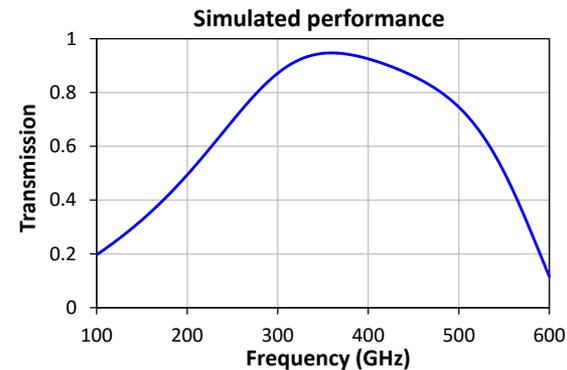
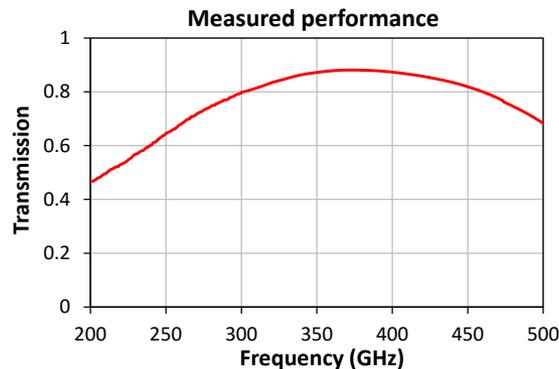
- High transmittance (>85%) in pass band
- Low transmittance (<5%) in stop band
- Custom band-pass in the frequency range from 75 GHz to 500 GHz
- Narrow and wide fractional bandwidth up to 15% and 120% respectively
- Ultra-low loss flexible and low dielectric constant substrate material



Applications:

The Field Filters can be used in MmW and THz systems to filter signals in transmission or reception. Anteral's Band-Pass Filters are suitable for radio-communications, astronomy, material research, imaging or meteorological applications among others.

Performance:



Band-Pass FSS

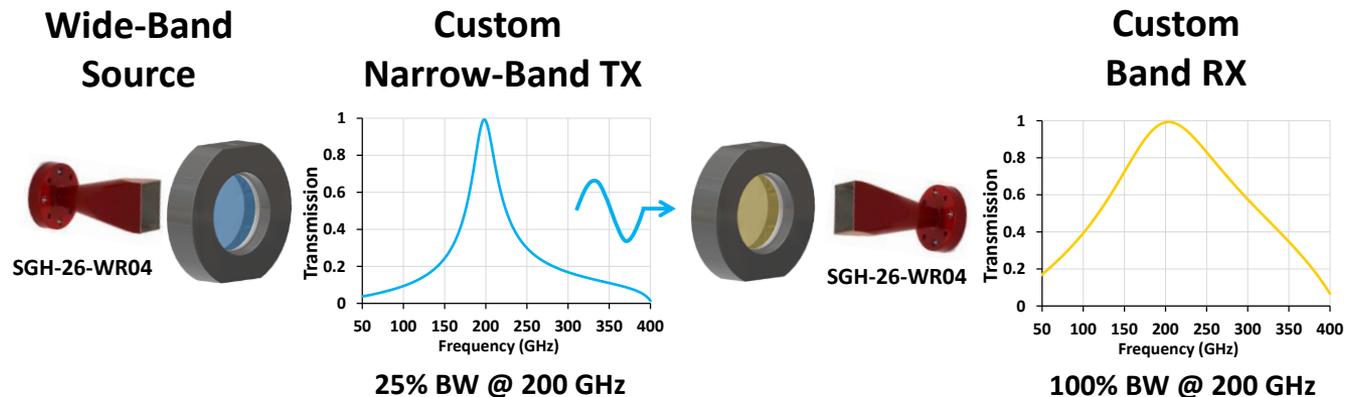
Application example:

Radio-communication channels

Anteral's Band-Pass THz Field Filters can be used in numerous applications, radio-communications being one of the most relevant.

The filters are especially useful in an antenna-filter system to select a specific transmission/reception channel, preventing interference at unwanted frequencies at the same time.

In the following example, a communication channel example is illustrated. An Anteral SGH-26-WR04 with operational bandwidth between 170-260 GHz is used together with a specifically designed Band-Pass THz Field Filter to transmit information at 200 GHz with a narrow bandwidth of 50 GHz. For reception, a SGH-26-WR04 and a filter with center frequency at 200 GHz and 100 GHz bandwidth are used.

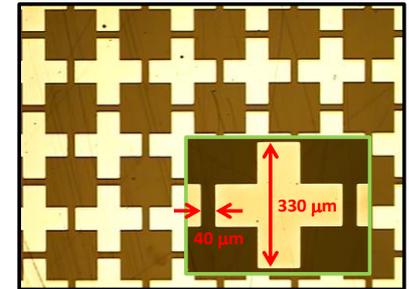


Anteral offers custom solutions in the frequency range from 75 GHz to 500 GHz with narrow and wide fractional bandwidth up to 15% and 120%, respectively.

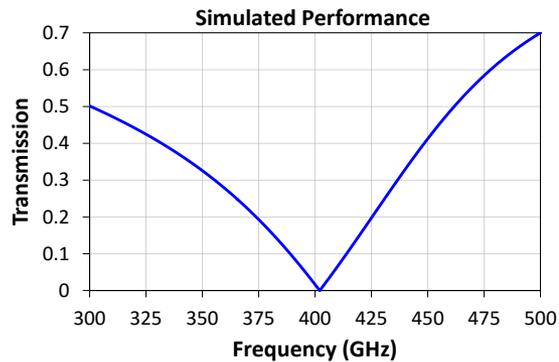
Band-Stop FSS

Properties:

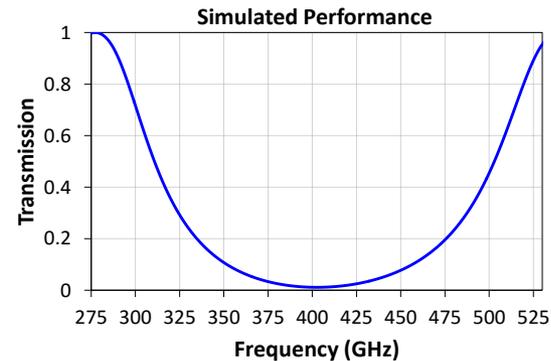
- Low transmittance (<5%) in stop bands
- High transmittance (60-90%) in pass bands
- Custom band stop in the frequency range from 75 GHz to 500 GHz
- Very wide fractional bandwidth up to 70%
- Ultra-low loss flexible and low dielectric constant substrate material



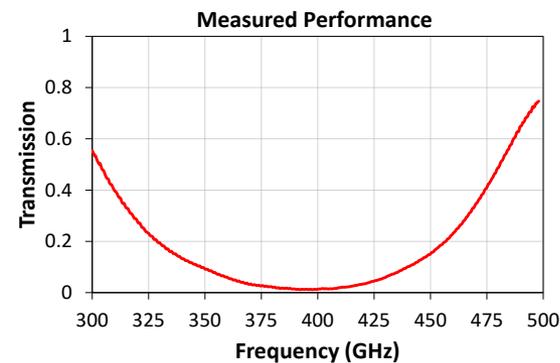
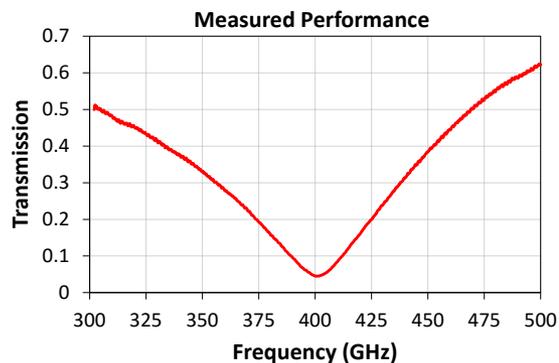
Performance:



Single layer



Double layer



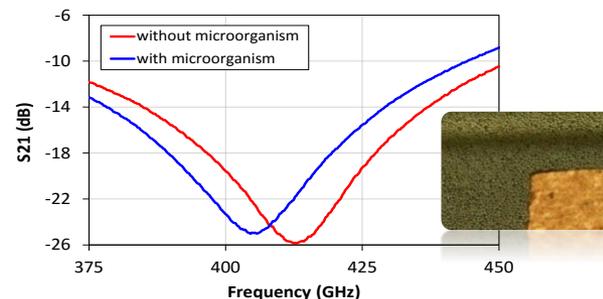
Band-Stop FSS

Application example:

Biological and Chemical Sensing

One of the most cutting-edge applications of Anteral's THz Filed Filters is the biological and chemical sensing. Since the filters provide sharp peaks with high rejection at the resonant frequency, they can be used as sensing or detecting devices. By placing the element to be sensed on the surface, a redshift in the resonant frequency occurs which allows identifying the element.

In the following example, a band-stop filter is used to detect microorganisms. The filter has a resonant frequency at 412 GHz. However, when a single drop of a *Candida parapsilosis* colony diluted in water is deposited on the surface of the filter, its resonant frequency changes to 404 GHz (2%). In the following image, the filter response with and without the microorganism and a picture of one of the metallic crosses of the filter surrounded by the colony are depicted. The structure is previously heated in order to evaporate the water of the solution and measure the influence of the microorganism exclusively. Different types of microorganism will produce different resonant frequencies, which allows for a quick identification.



The filters' functionality is not limited to biological samples. They can be used to sense chemical compounds as well. For example, to determine the percentage of a specific compound diluted in a different one. The possibilities are endless.

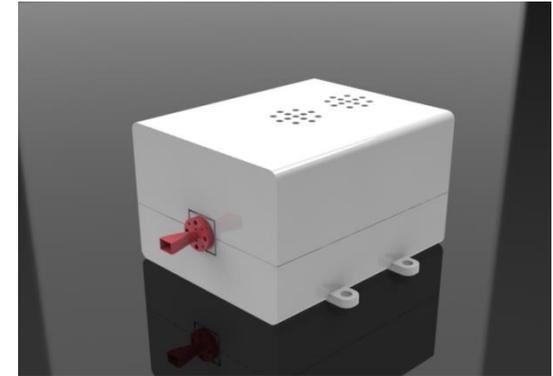
THz Source

Description:

Anteral's THz Source offers high RF output power at 300 GHz. Anteral's source is optimized to work at 300 GHz but could reach 400 GHz with an output RF power decrement, request more information if interested.

Properties:

- Operational frequency 300 GHz
- Typical output RF power 2.5 mW
- Custom antenna or WR-2.8 standard flange
- Easy plug & play

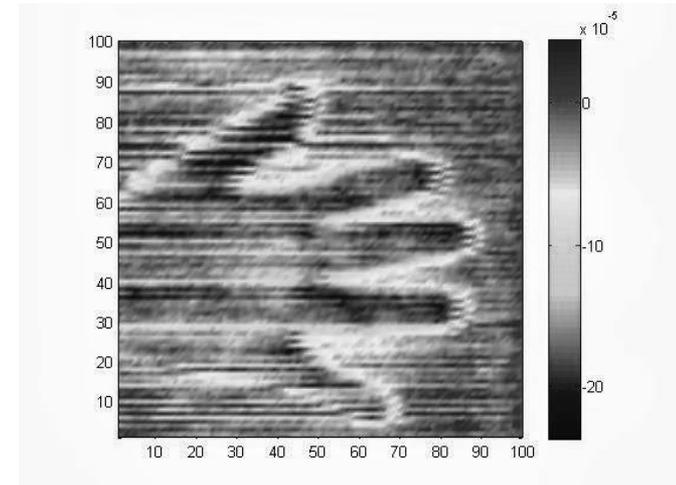


Application example:

THz Imaging

Anteral's THz Source can be used in numerous applications, imaging being one of the most relevant. The source is especially useful as the transmitter part of a THz imaging system to provide enough power for active imaging at high THz frequencies.

In the following example, a THz imaging photo is presented as an example of the possibilities this source offers. An Anteral THz source can be used together with a specifically designed receiver in order to produce a THz image at 300 GHz.





Contact Information

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