SOLUCIONES PARA ENLACES 11GHZ

ALG company

ESPECTRO ELETROMAGNETICO

- **Frecuencias Libres:**
  - 900MHz;
  - 2.4GHz;
  - 5GHz

- **Frecuencias Licenciadas: 4GHz - 80GHz**

ANTENAS

FRECUENCIA LICENCIADA

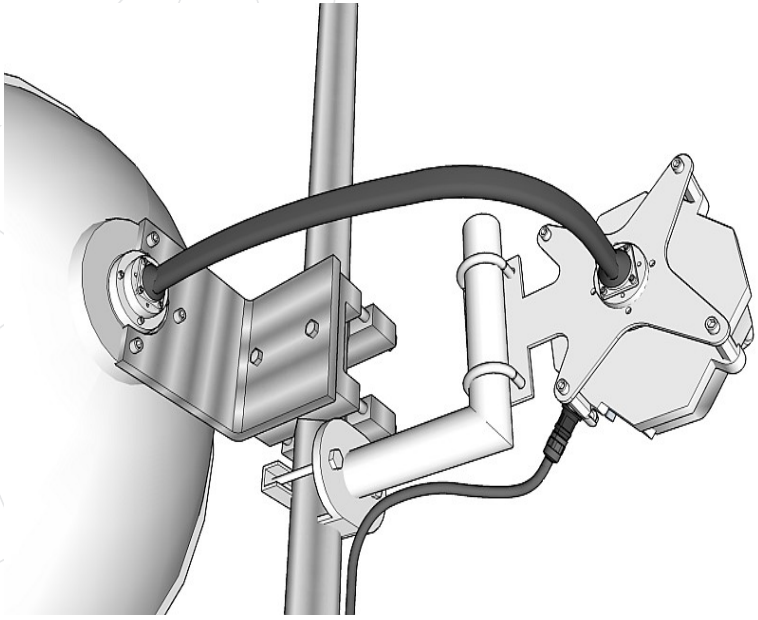
- Cables: Mayor frecuencia, más perdida;
- Se utiliza acople directo con el radio o través de guias de onda flexibles.
- Cuanto mayor sea la frecuencia, más interferirá el clima.

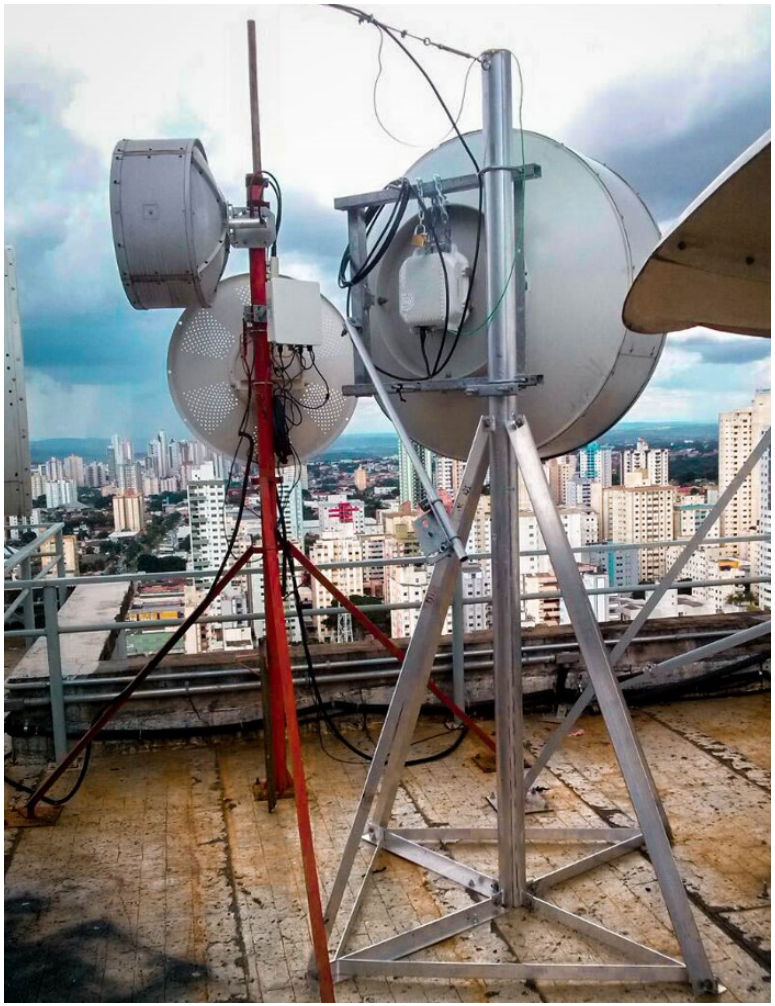
Frequency band	Frequencies, GHz	Typical maximum link length, km	Typical minimum link length, km
0.9 (unlicensed)	0.902–0.928	100	-
2.4 (unlicensed)	2.4–2.5	100	-
4	3.6–4.2	70	24
5	4.4–5.0	60	16
5 (unlicensed)	5.3, 5.4 and 5.8	50	-
L6	5.925–6.425	50	16
U6	6.425–7.125	50	16
L7	7.1–7.75	50	10
U8	7.75–8.5	50	10
10	10–10.7	20	10
11	10.7–11.7	20	10
13	12.7–13.25	20	6
15	14.4–15.35	20	6
18	17.7–19.7	20	2
23	21.2–23.6	20	2
26	24.25–26.5	20	2
28	27.5–29.5	15	2
32	31.0–33.4	10	1.5
38	37.0–40.0	10	1
42	40.5–43.5	10	1
60 (unlicensed)	57.0–66.0	1	-
80	71–76/81–86	5	-

Table 2.2: *Typical hop length for different frequency bands, defined by ITU-R Radio Regulations*

ANTENAS

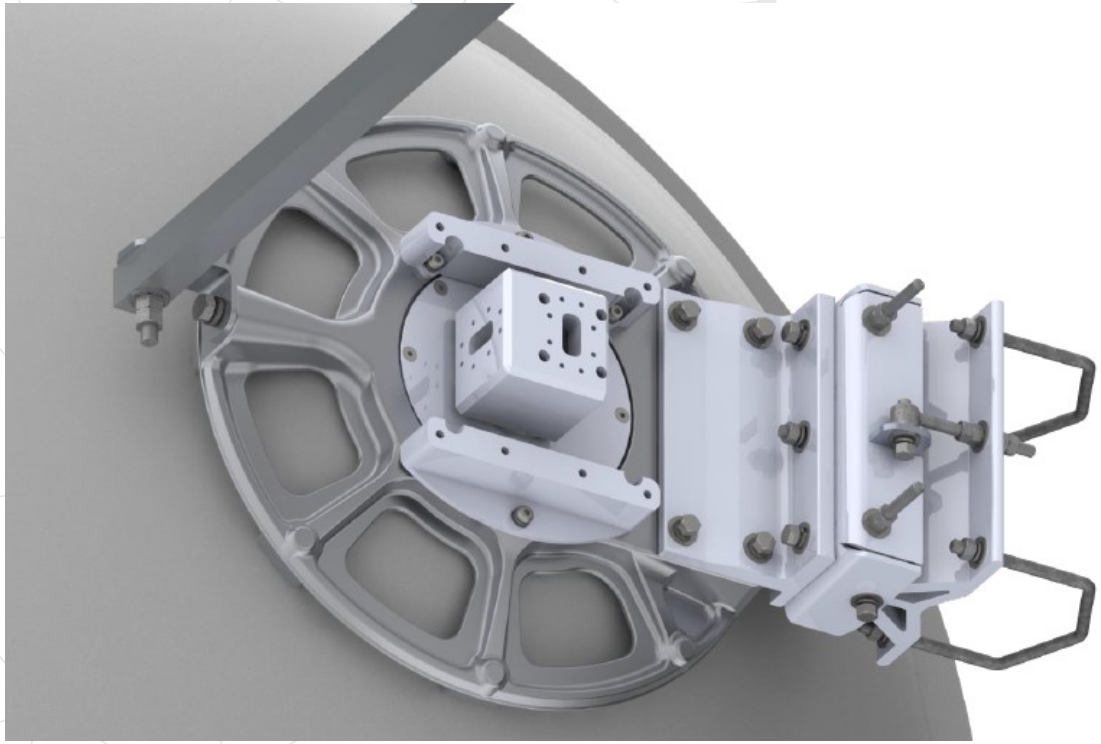
ACOPLE 1+0



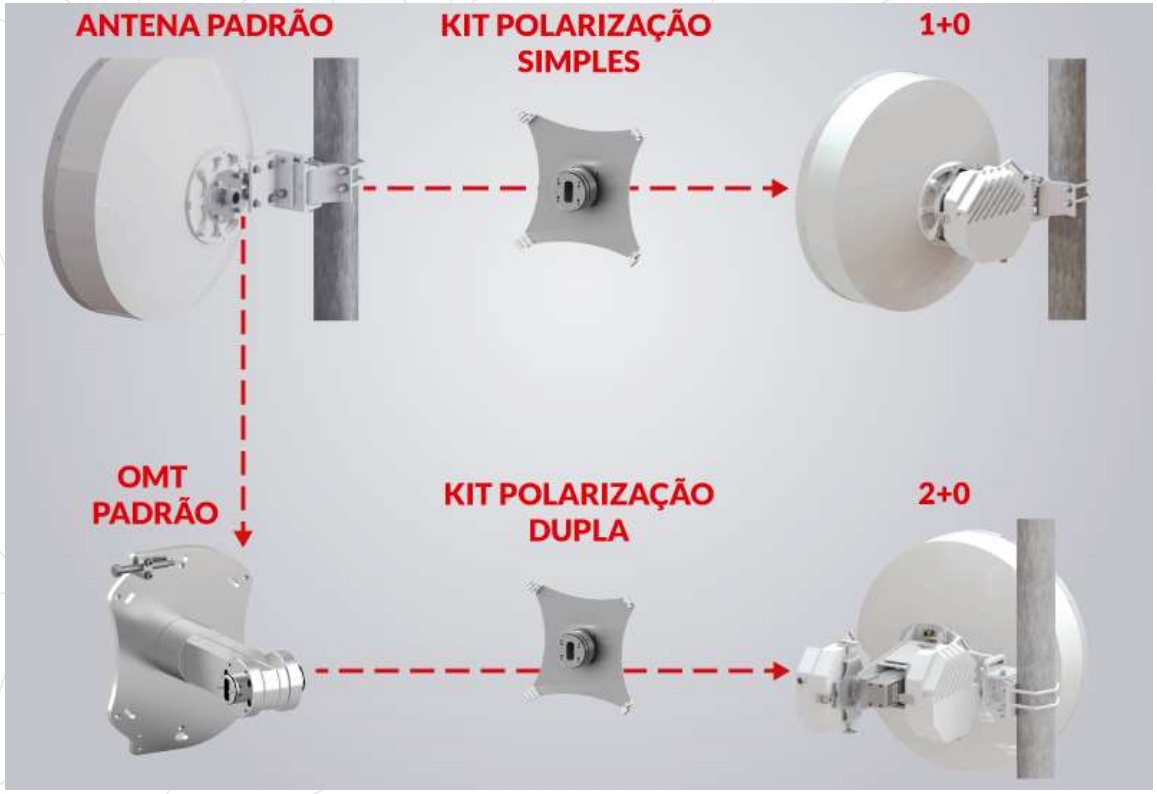


ANTENAS

ACOPLE 2+0



ANTENAS
FLEXIBILIDAD ALGCOM



Cambium Networks™

NEC

CERAGON

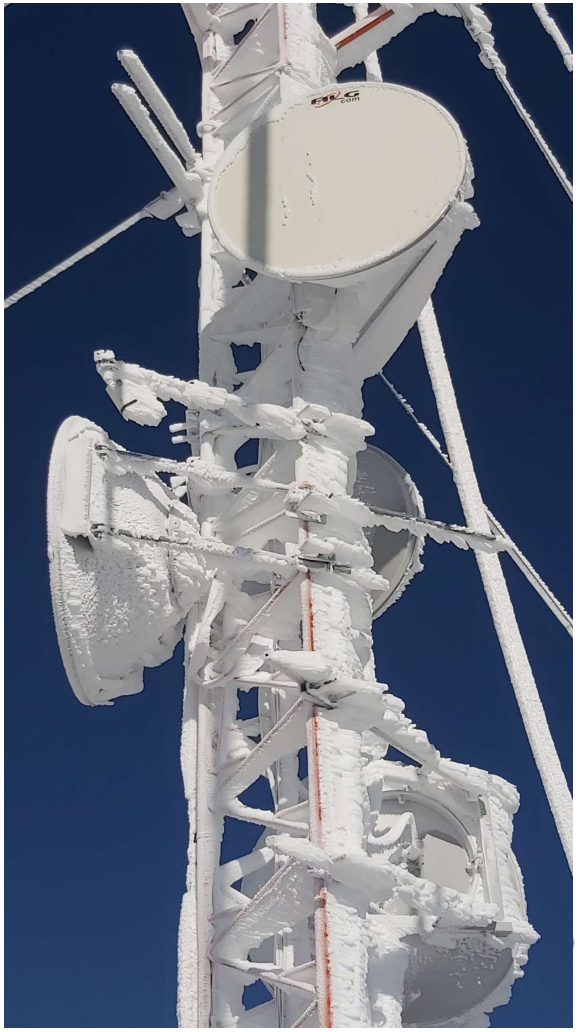
SM€ siae microelettronica

ERICSSON

HUAWEI

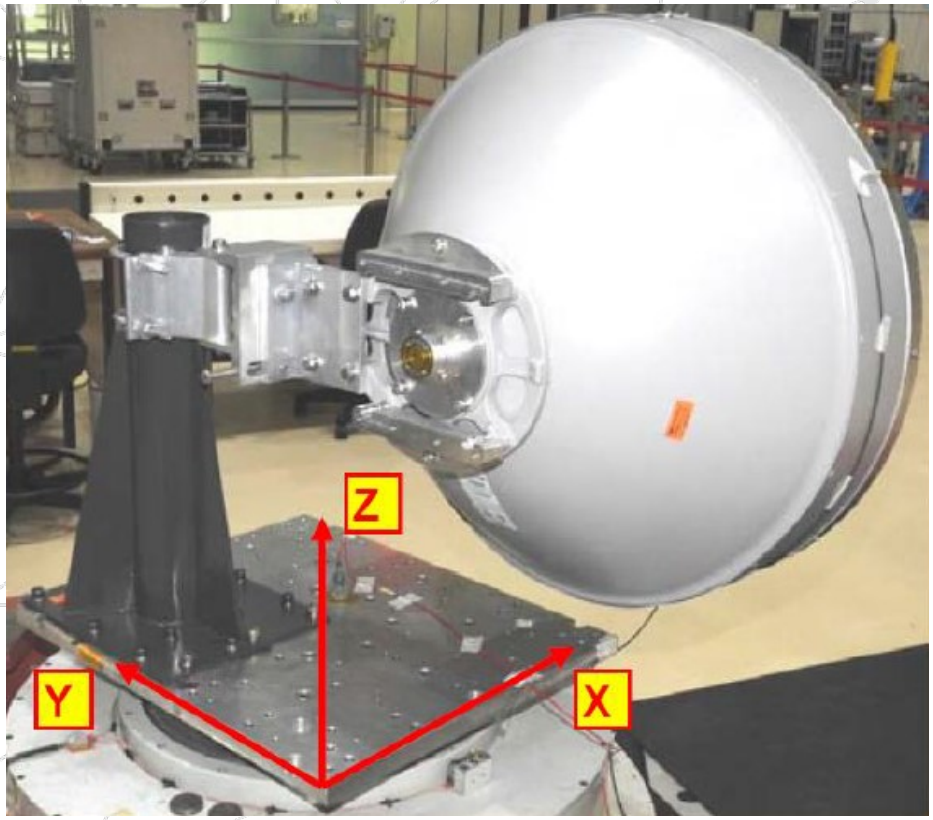
PRUEBAS DE LABORATORIO

Temperatura



PRUEBAS DE LABORATORIO

Vibración



- Garantizar que la antena quedará fija mismo con la vibración existente en las torres.

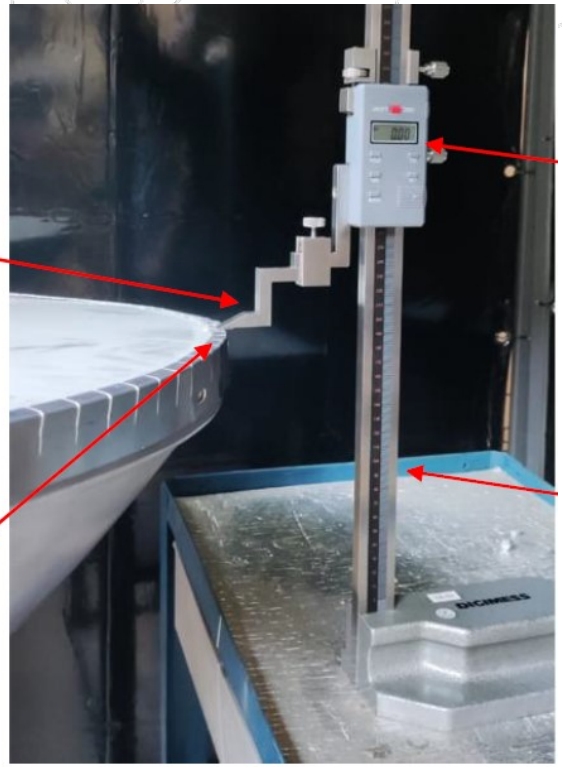
https://www.youtube.com/watch?v=gZjmY6qT-Wc

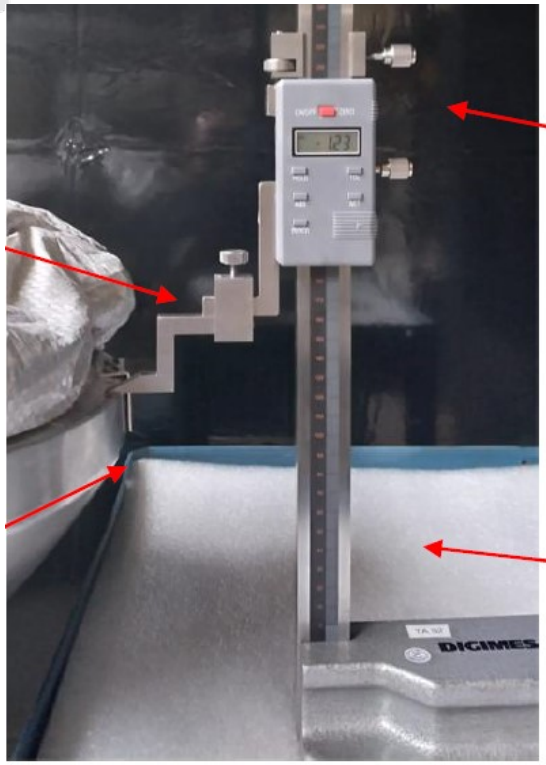
PRUEBAS DE LABORATORIO

Carga de Viento simulando 200Km/h - Sobrevivir

PRUEBAS DE LABORATORIO

Carga de Viento simulando 110Km/h - Funcionamento





Scriber

Measuring point

Vertical displacement measure

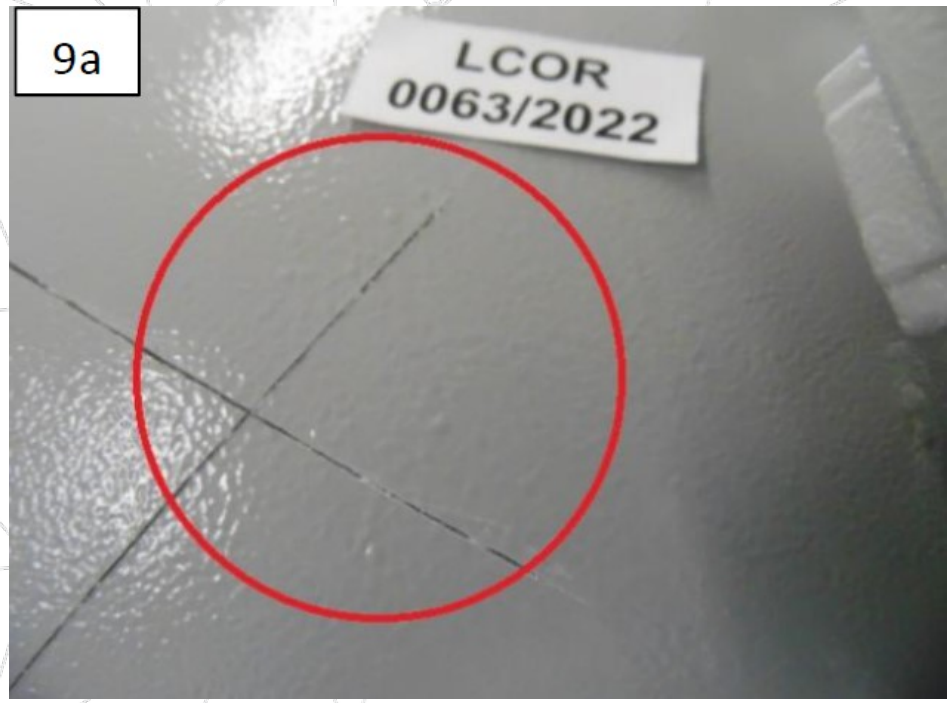
Height gauge

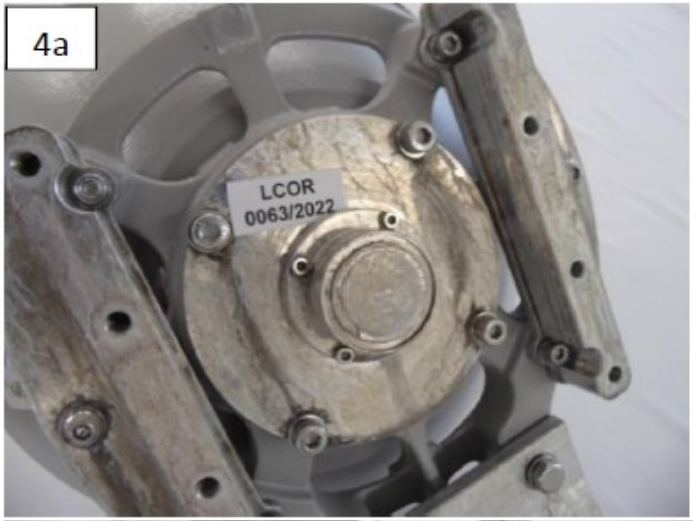
PRUEBAS DE LABORATORIO

LLUVIA Y HUMEDAD

PRUEBAS DE LABORATORIO

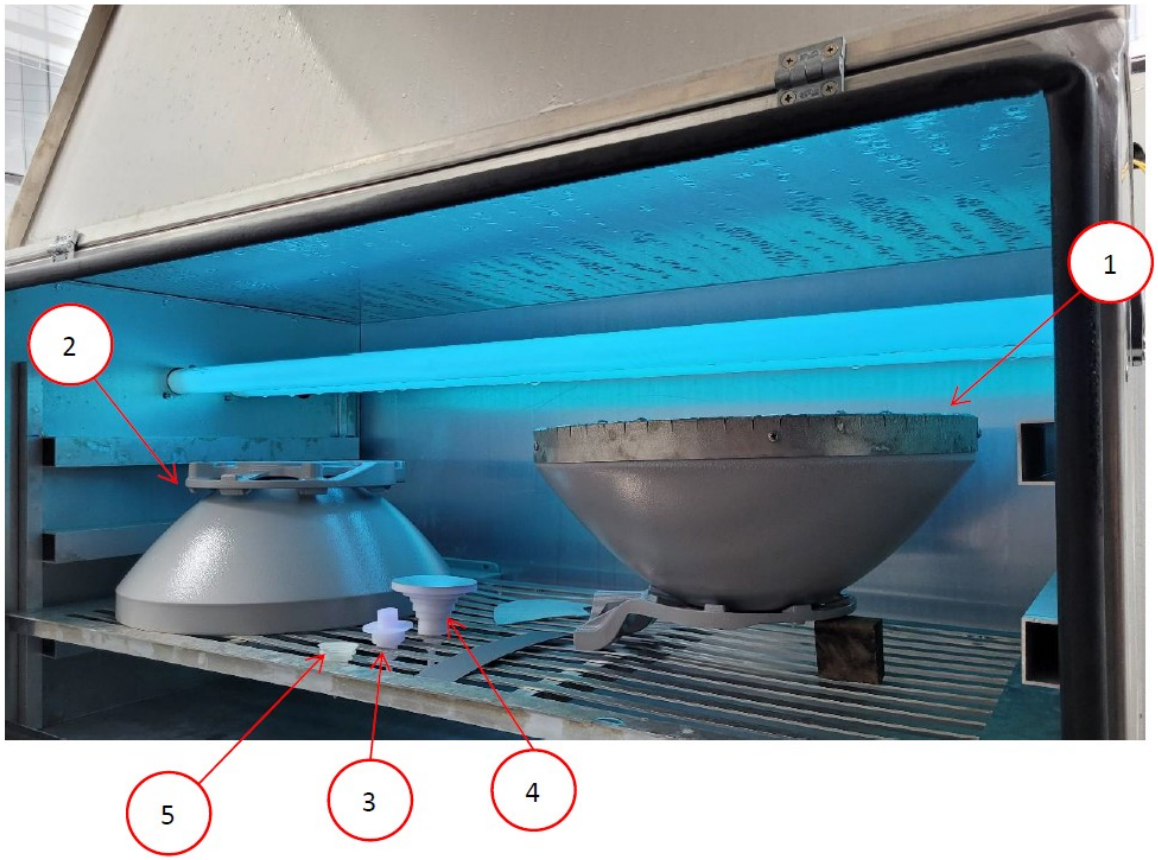
Salinidad



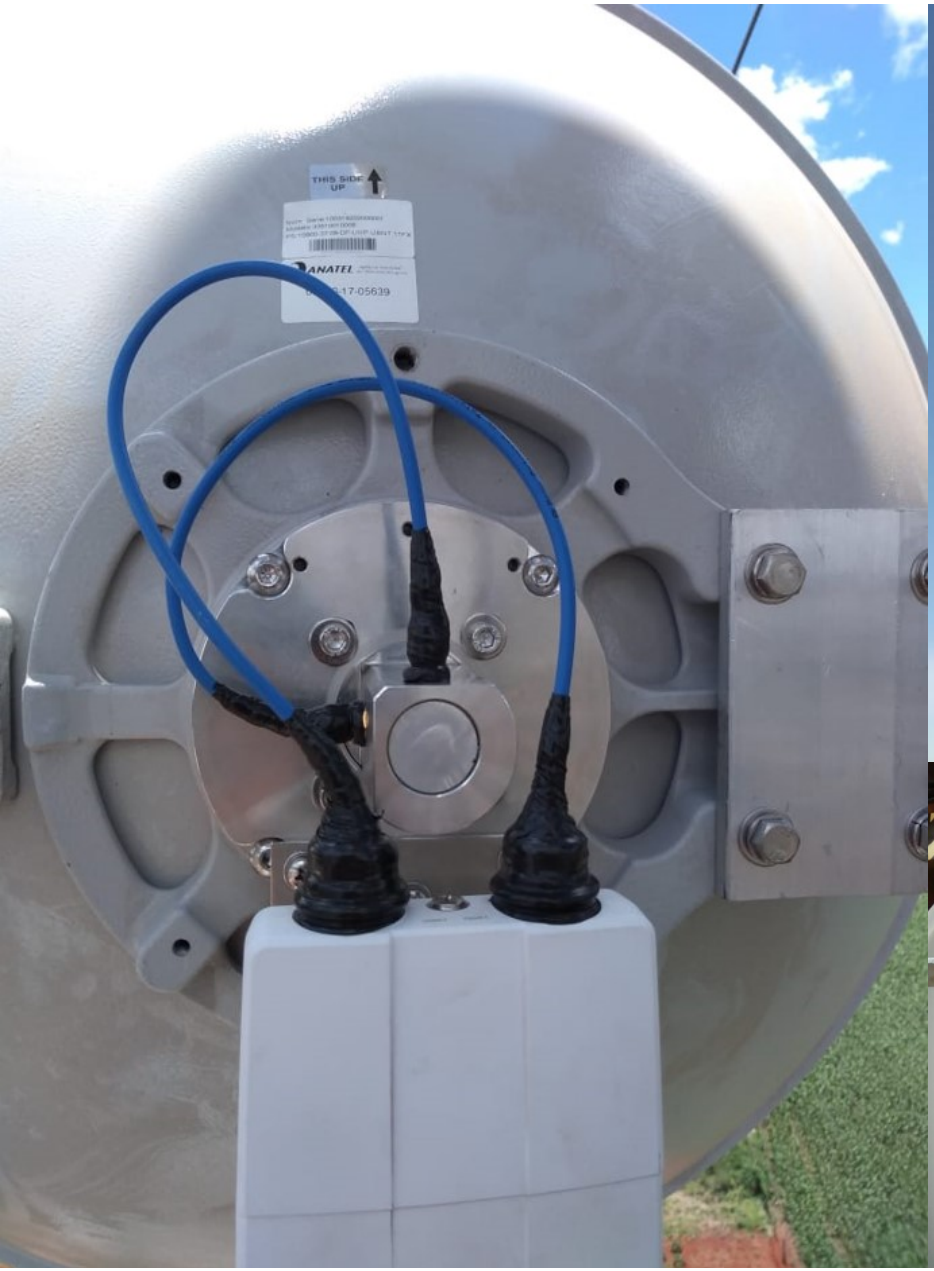


PRUEBAS DE LABORATORIO

Radiación UV



ANTENAS 11GHZ


THIS SIDE UP
ANATEL

PRUEBAS DE LABORATORIO

Foto 1 – Antena sob teste.

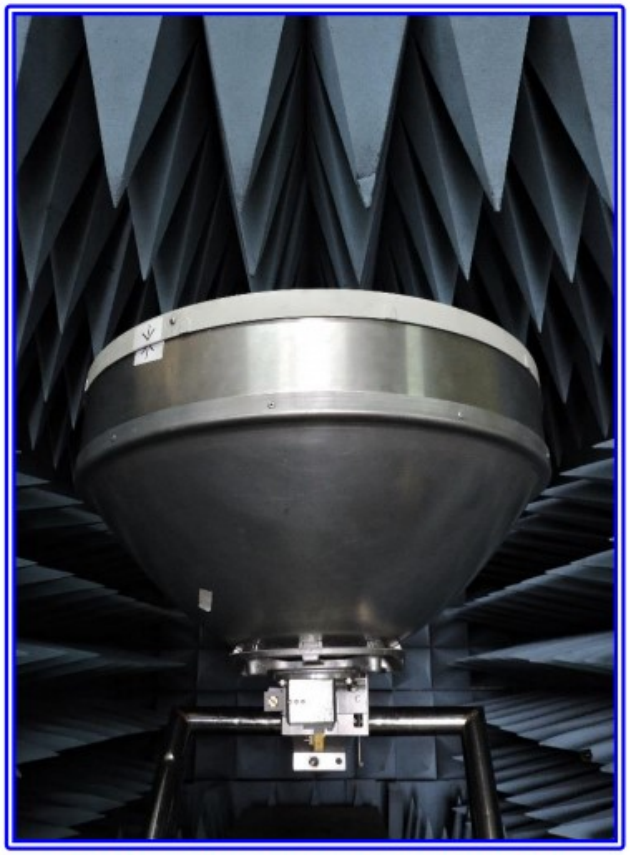


Foto 2 – Detalhes da antena testada.

SUMÁRIO

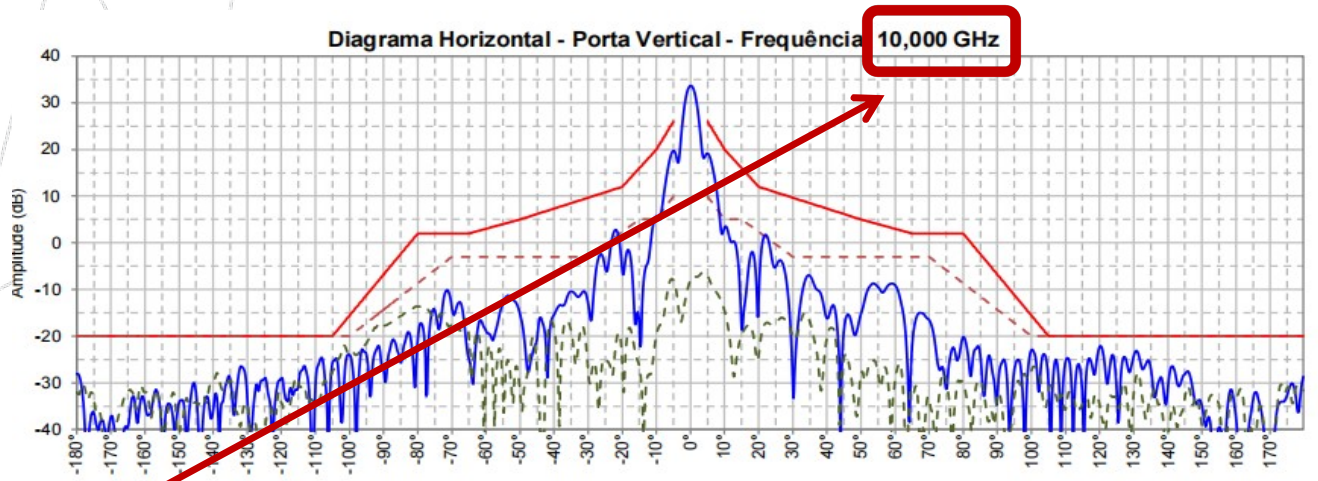
MINISTÉRIO DA CIÊNCIA, TECNOLOGIA, INOVAÇÕES E COMUNICAÇÕES
INSTITUTO NACIONAL DE PESQUISAS ESPACIAIS

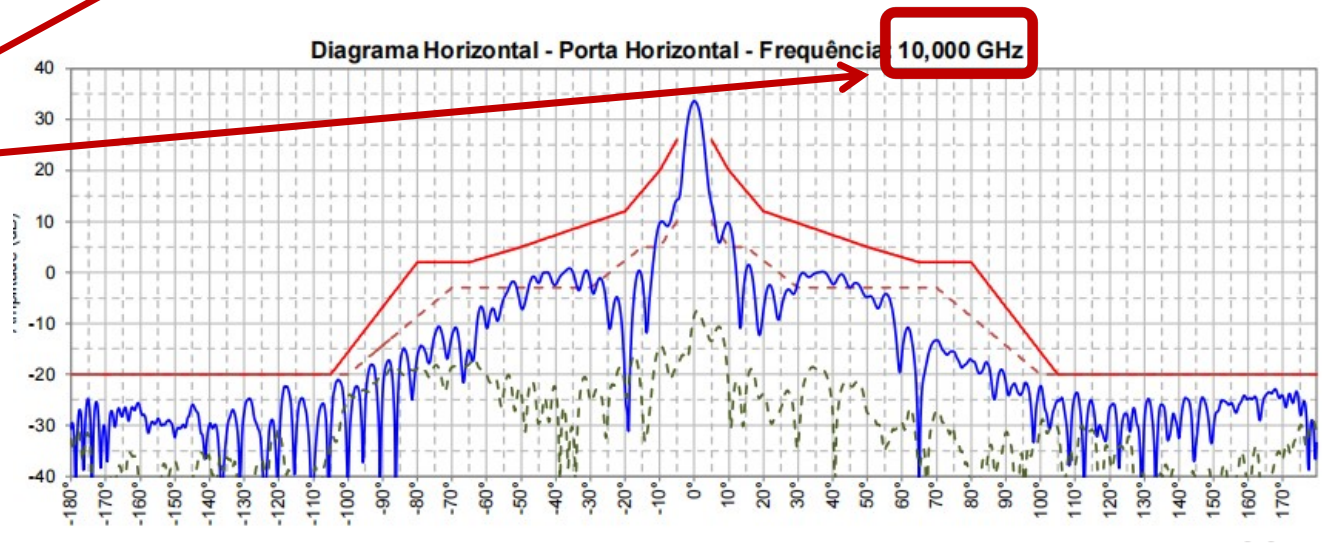
ALG com

PRUEBAS DE LABORATORIO

Patrón de Radiacíon Vertical y Horizontal

- Frequência: 10,850 GHz
- Frequência: 11,700 GHz





PRUEBAS DE LABORATORIO

Cuanto más alta la frecuencia, menor el angulo de media potencia

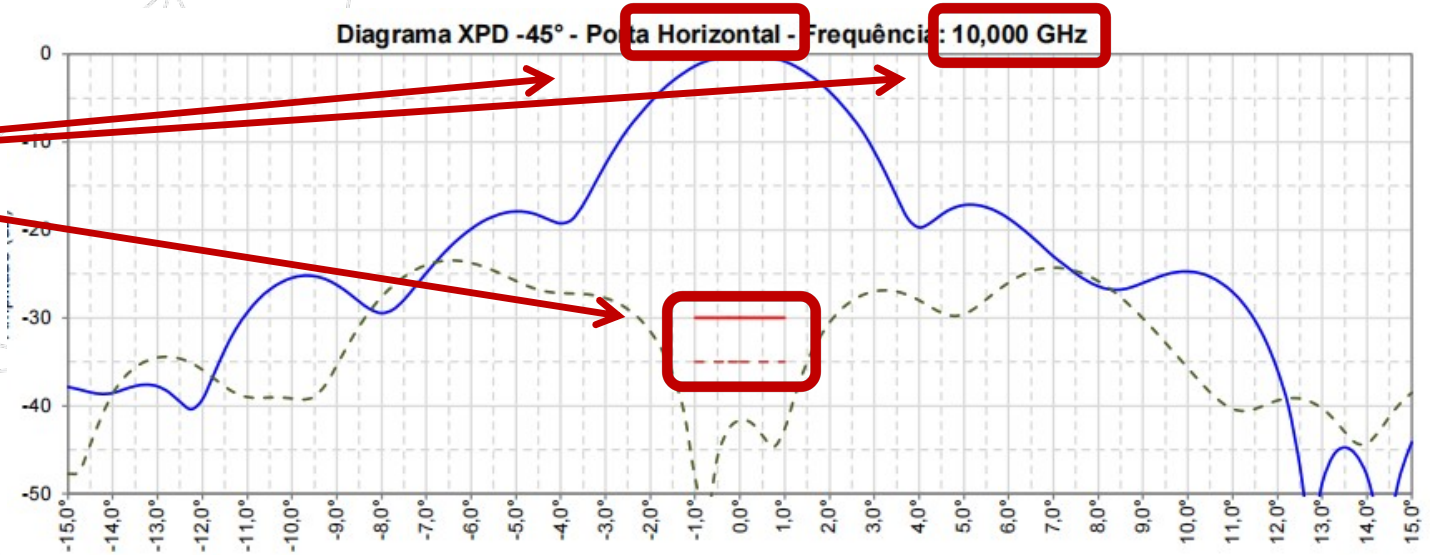
Valores de Radiacíon Vertical y Horizontal

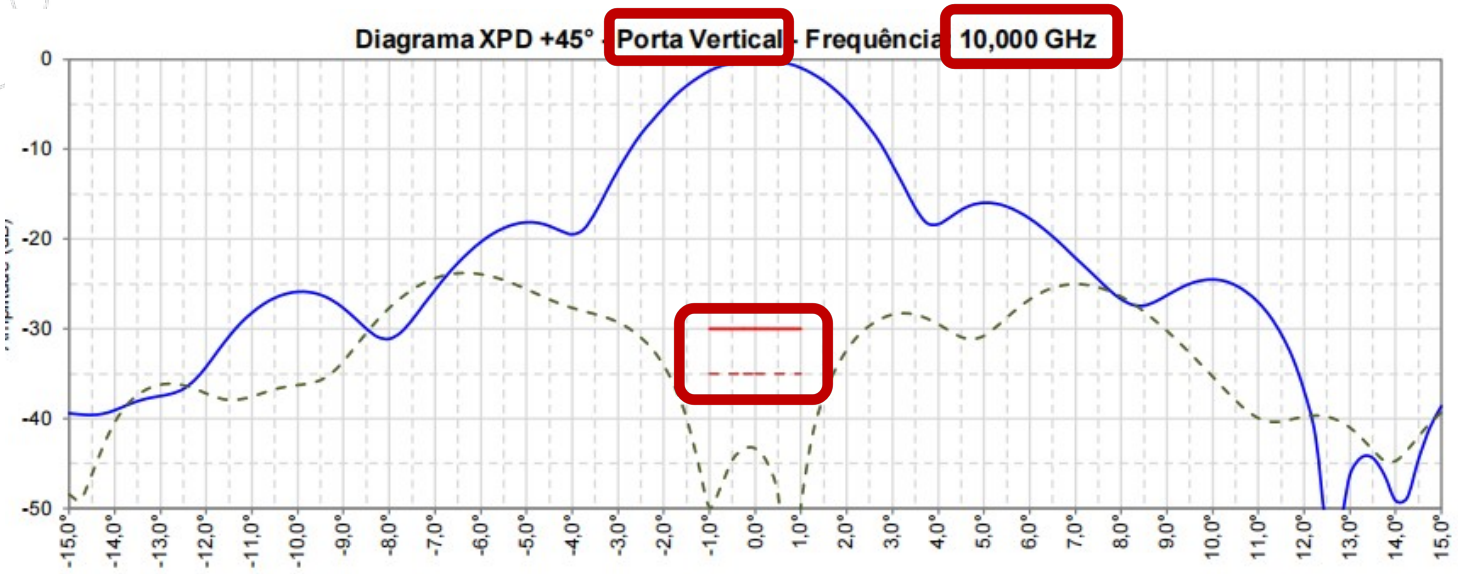
Freq. [GHz]	Ganho [dBi]	Largura de feixe de 3 dB	Rejeição de polarização	Relação frente-costas	
				180°	165° a 180°
10,000	33,62	3,44°	n/a	64,24	56,49
10,850	33,19	2,94°	n/a	63,94	53,99
11,700	34,95	2,67°	n/a	65,17	55,44

Freq. [GHz]	Ganho [dBi]	Largura de feixe de 3 dB	Rejeição de polarização	Relação frente-costas	
				180°	165° a 180°
10,000	33,63	3,13°	n/a	61,78	61,74
10,850	33,52	2,77°	n/a	58,53	58,49
11,700	34,91	2,68°	n/a	53,14	52,83

PRUEBAS DE LABORATORIO

Patron XPD (Horizontal y vertical)





Legenda:
- Diagrama co-polar
- Diagrama x-pol
- XPD Classe 2
- XPD Classe 3

PRUEBAS DE LABORATORIO

Valores XPD (Horizontal y vertical) en dB

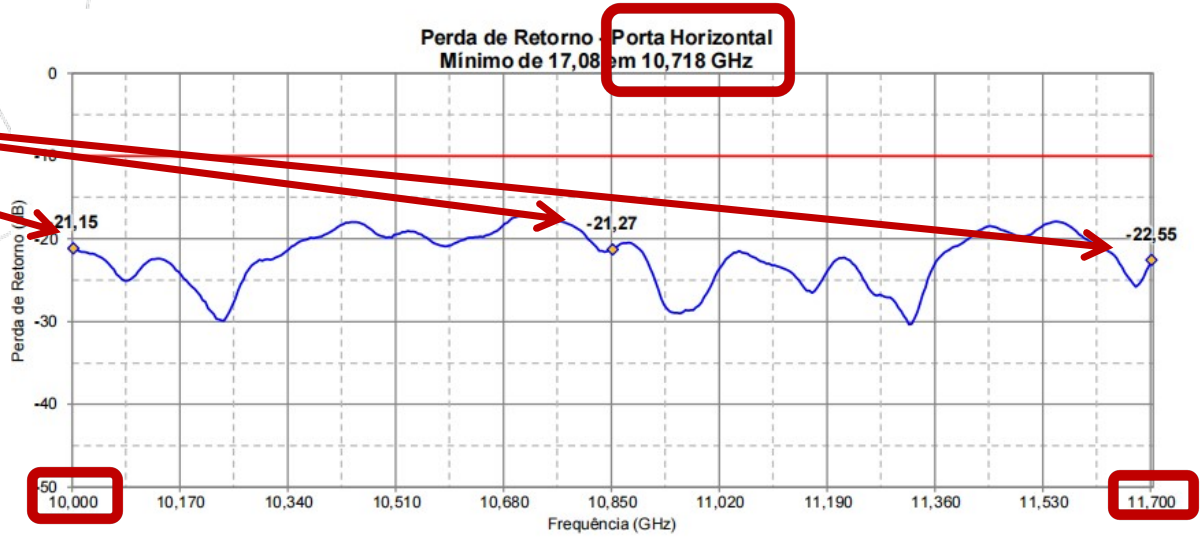
Freq. [GHz]	Ganho [dBi]	Largura de feixe de 1 dB	Rejeição de polarização	Relação frente-costas	
				180°	165° a 180°
10,000	33,62	1,90°	41,46	n/a	n/a
10,850	33,19	1,67°	54,43	n/a	n/a
11,700	34,95	1,59°	36,72	n/a	n/a

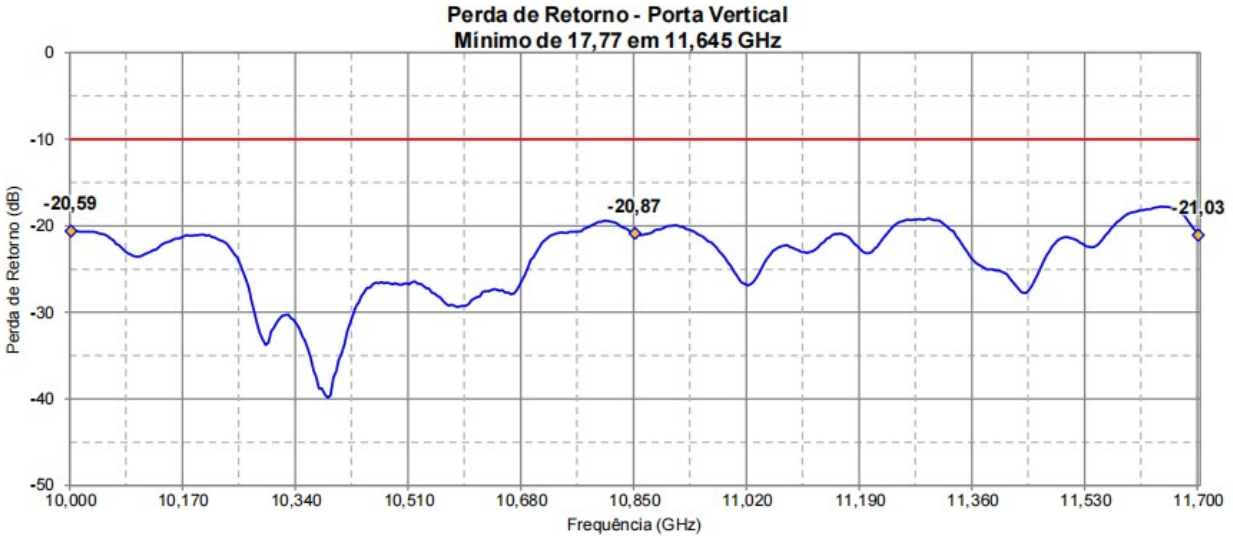
Freq. [GHz]	Ganho [dBi]	Largura de feixe de 1 dB	Rejeição de polarização	Relação frente-costas	
				180°	165° a 180°
10,000	33,63	1,89°	43,33	n/a	n/a
10,850	33,52	1,67°	48,44	n/a	n/a
11,700	34,91	1,60°	36,09	n/a	n/a

PRUEBAS DE LABORATORIO

VSWR (Horizontal y vertical)

VSWR (Voltage Standing Wave Radio) se puede definir como un indicador de la cantidad de señal reflejada de regreso al transmisor en un circuito de RF.





PUNTO-A-PUNTO

ANTENAS 11GHZ

PARABOLIC SHIELDED| PS

Aplicacíon

Links para B11 y AFF- 11

Ganancia Disponible

30dBi, 34dBi, 37dBi and 39dBi

Rango de Frecuencia

10 – 11.7 GHz

Front-to-back

30dBi >48dB, 34dBi >55dB, 37dBi >58dB, 39dB > 60 dB

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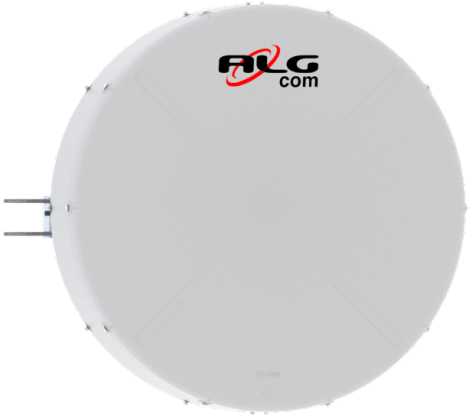
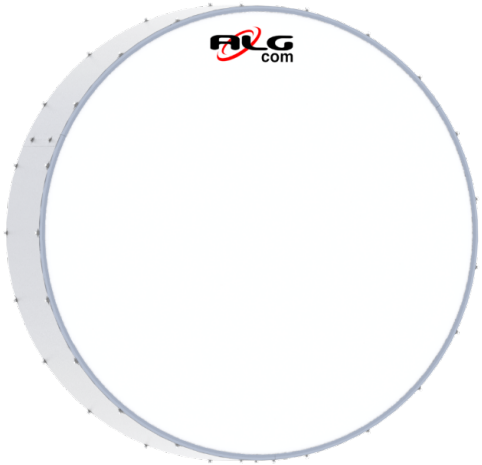
ANTENAS MICROONDAS

PS-10900-30-03-DP-UHP
GANANCIA: 30 dB
FRECUENCIA:10 - 11,7 GHzi

PS-10900-34-06-DP-UHP
GANANCIA: 34.9 dBi
FRECUENCIA:10 - 11,7 GHz



PS-10900-37-09-DP-UHP
GANANCIA: 37.4 dBi
FRECUENCIA:10 - 11,7 GHz



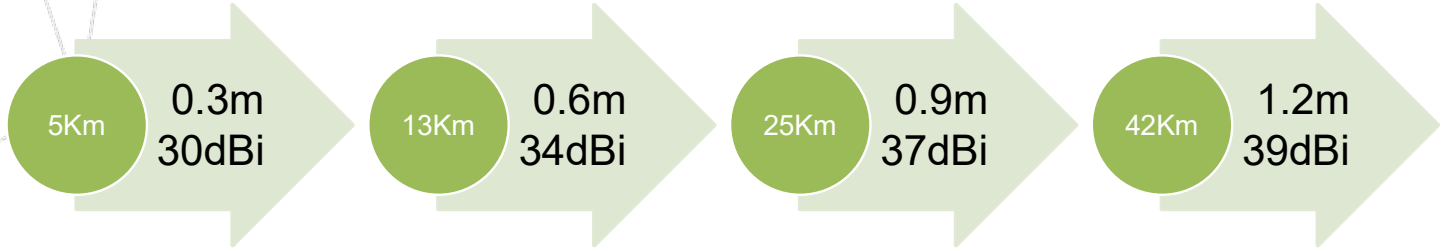
PS-10900-39-12-DP-UHP
GANANCIA: 39.6 dB
FRECUENCIA:10 - 11,7 GHz

ELEGINDO LA ANTENA

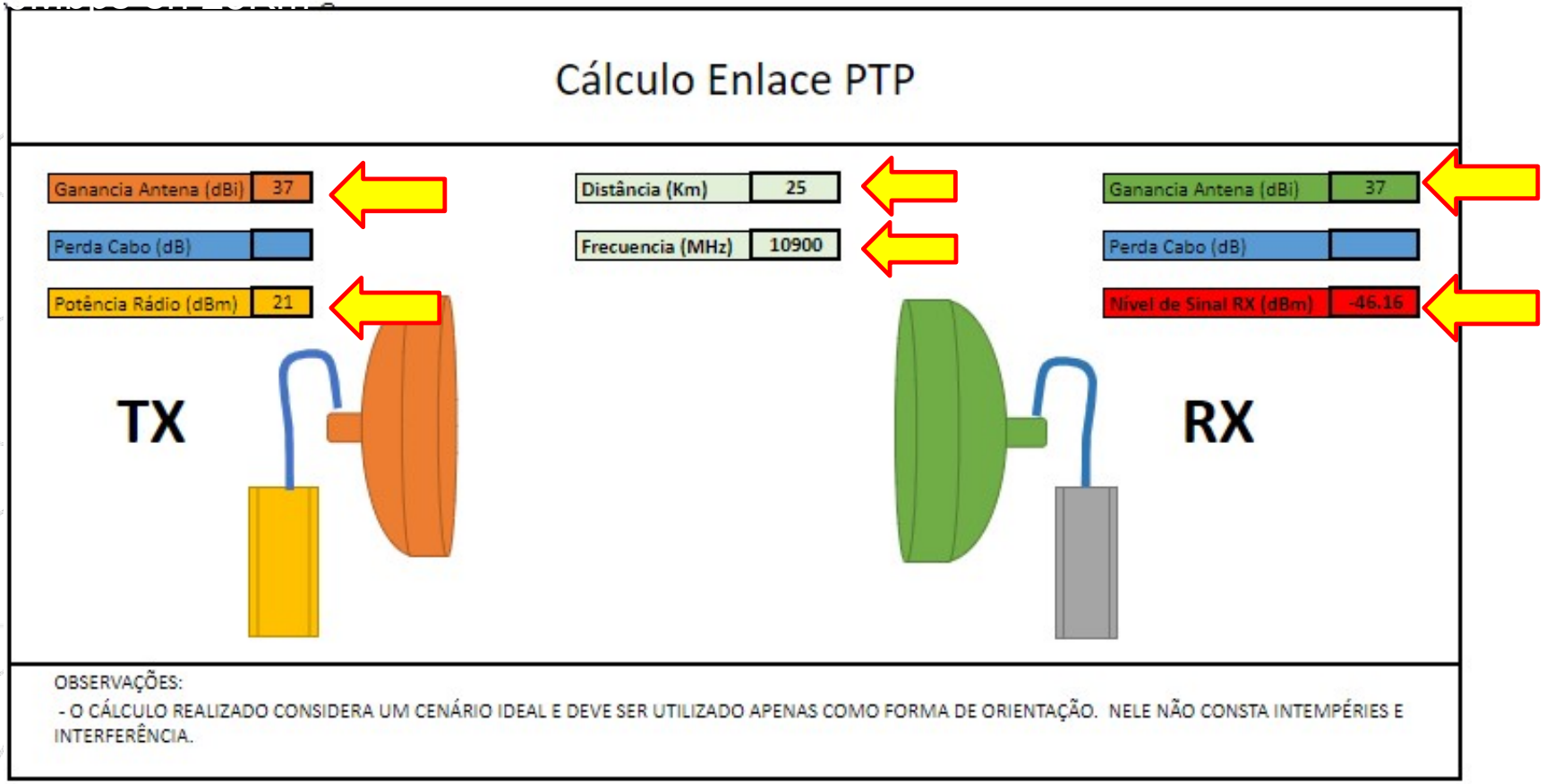
1º Paso: Elija la ganancia/tamaño de la antena

Cuál es la distancia del enlace?

DISTANCIA X GANANCIA

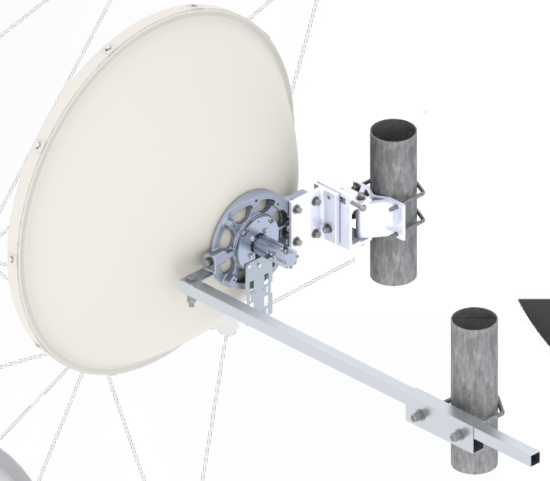


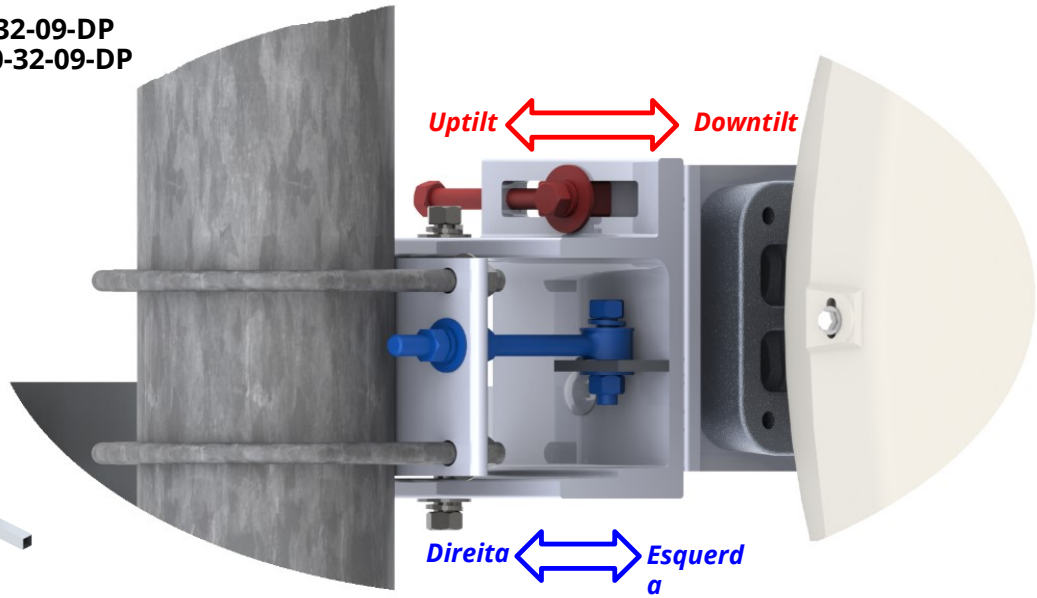
ELEGINDO LA ANTENA



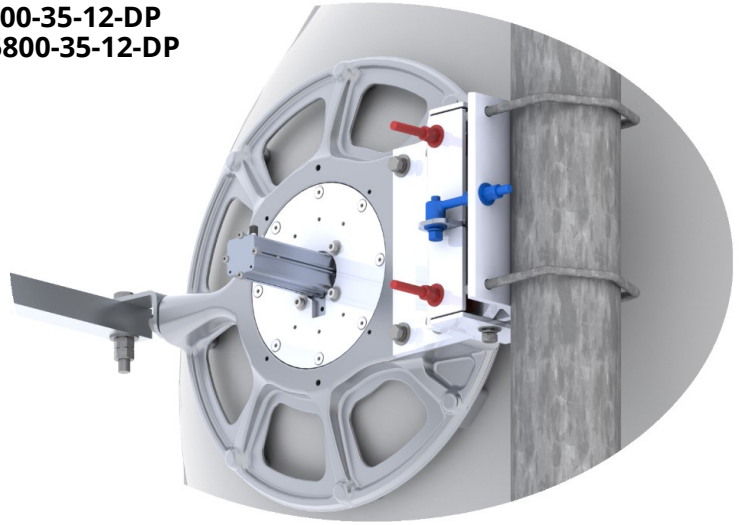
SOPORTE

UHP-5800-32-09-DP
UHPX-5800-32-09-DP





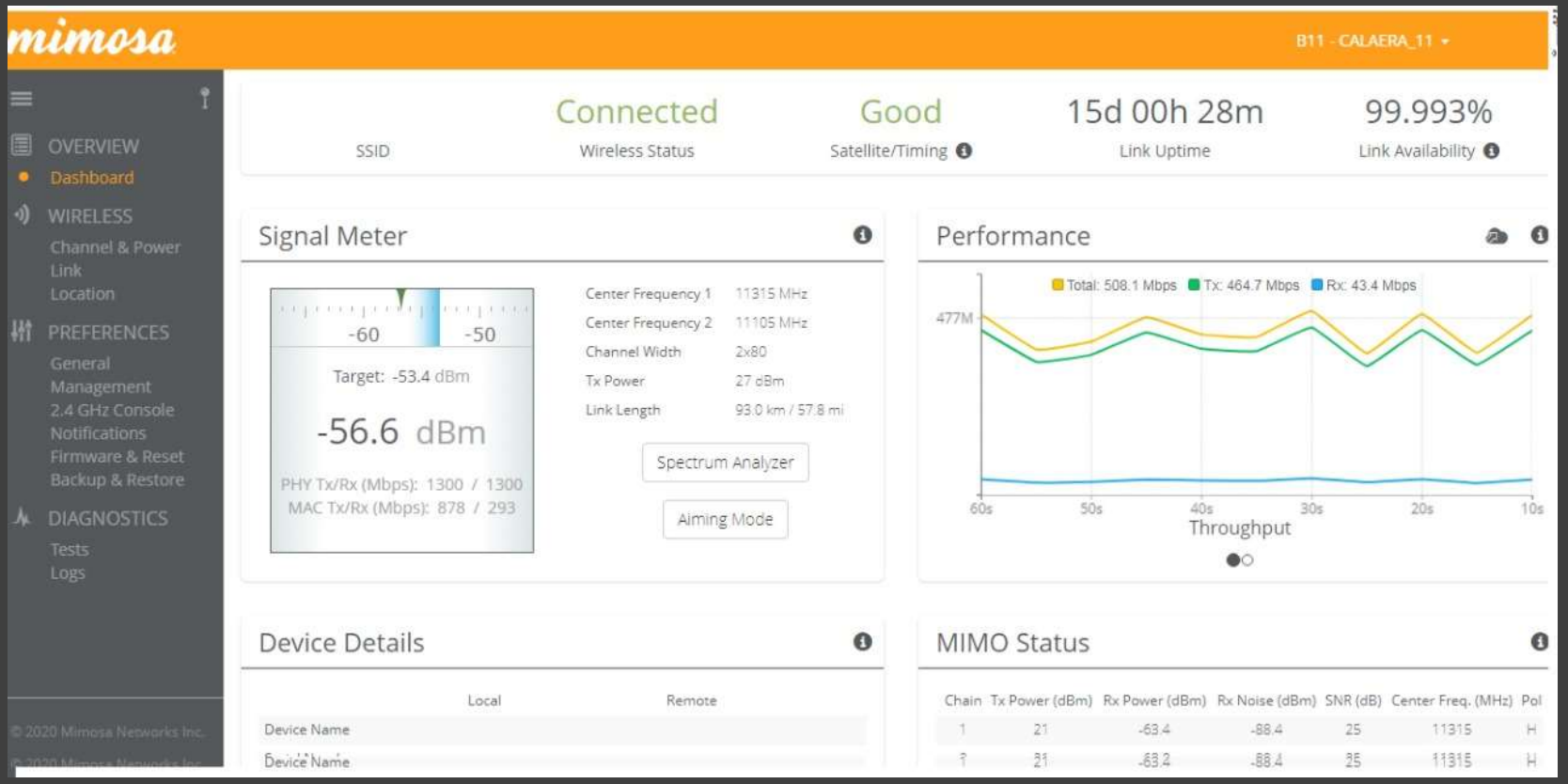
UHP-5800-35-12-DP
UHPX-5800-35-12-DP



https://youtu.be/qB7lOS-pg30?t=114


CASE 1

CASE 1



Client: Mexico customer

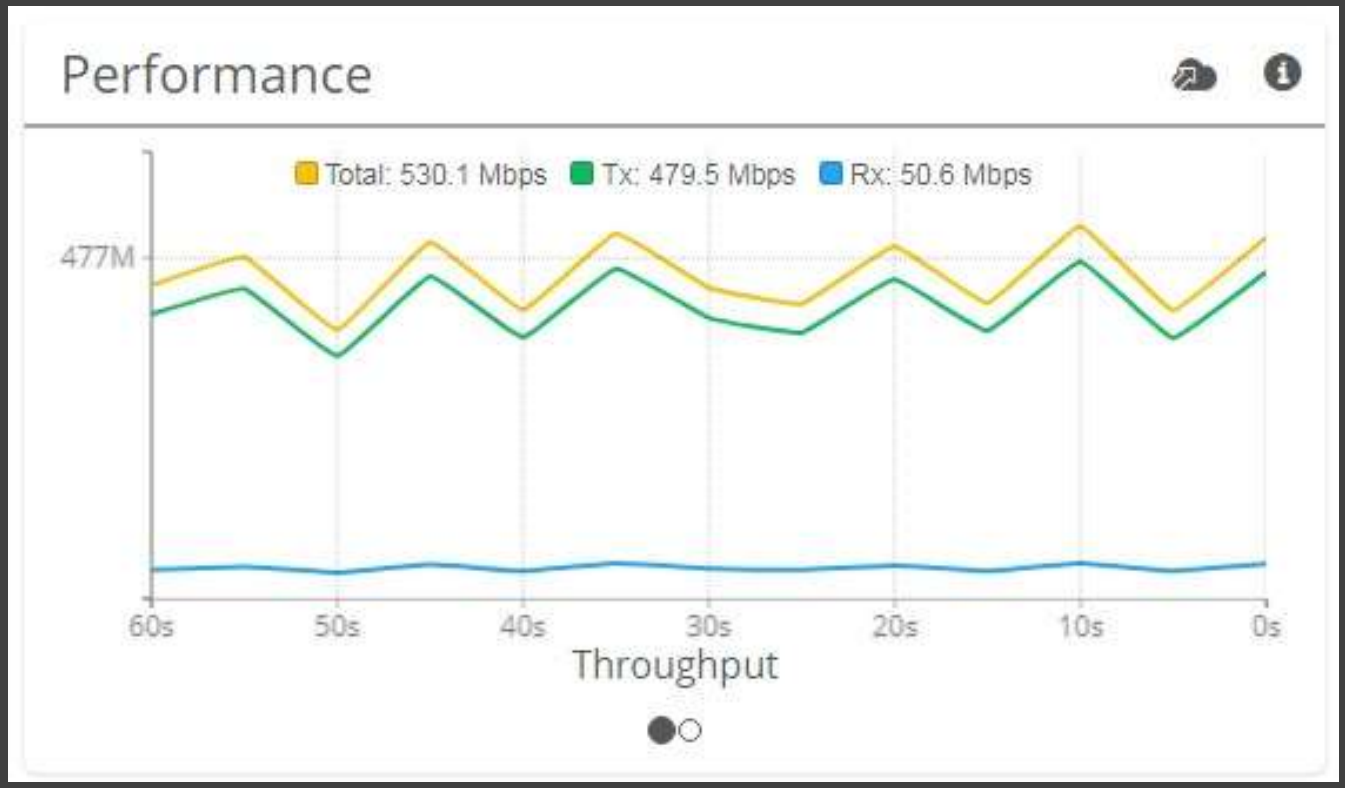
Radio: Mimosa B11

Antenna: PS-10900-37-09-DP-UHP

Distance: 93 km

Throughput: 530.1 mbps

CASE 1



Client: Mexico customer

Antenna: PS-10900-37-09-DP-UHP

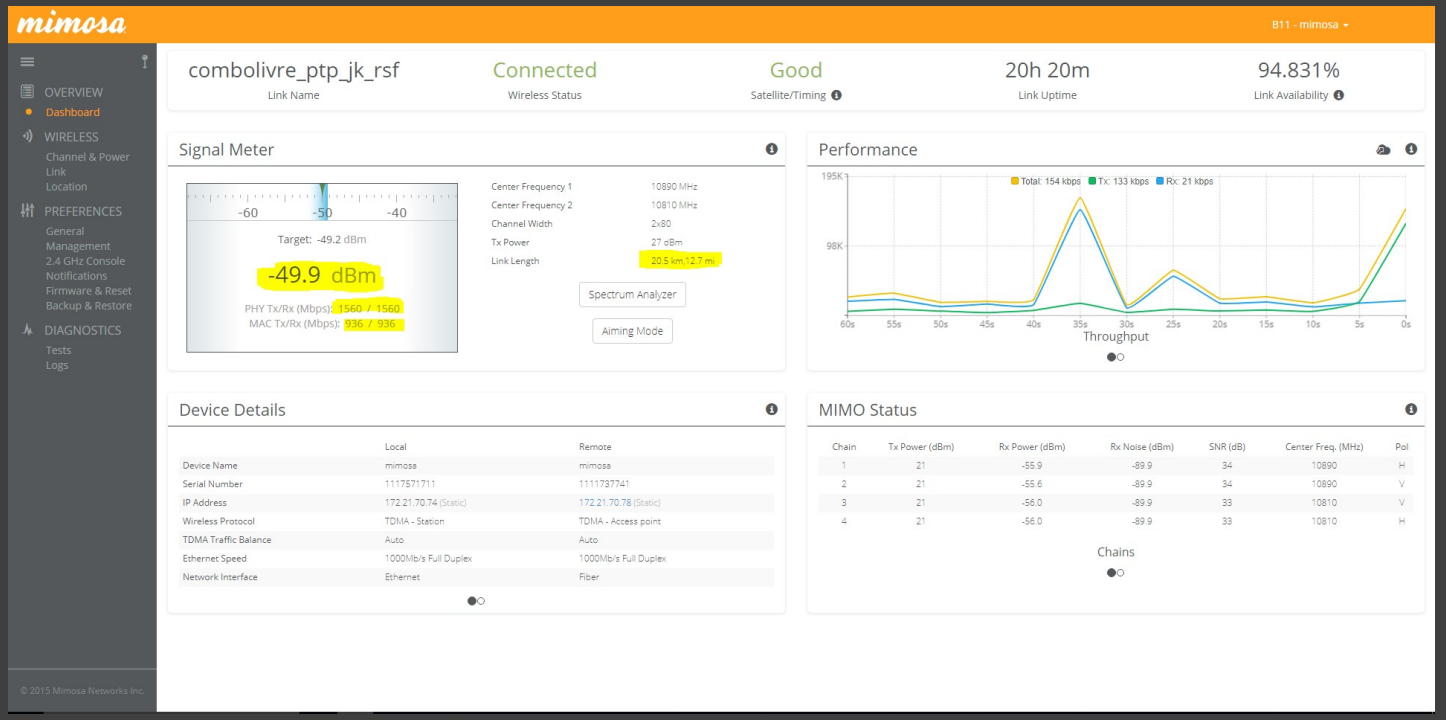
Radio: Mimosa B11

Distance: 93 km

Throughput: 530.1 mbps


CASE 2

CASE 2



Client: WISP Sadnet

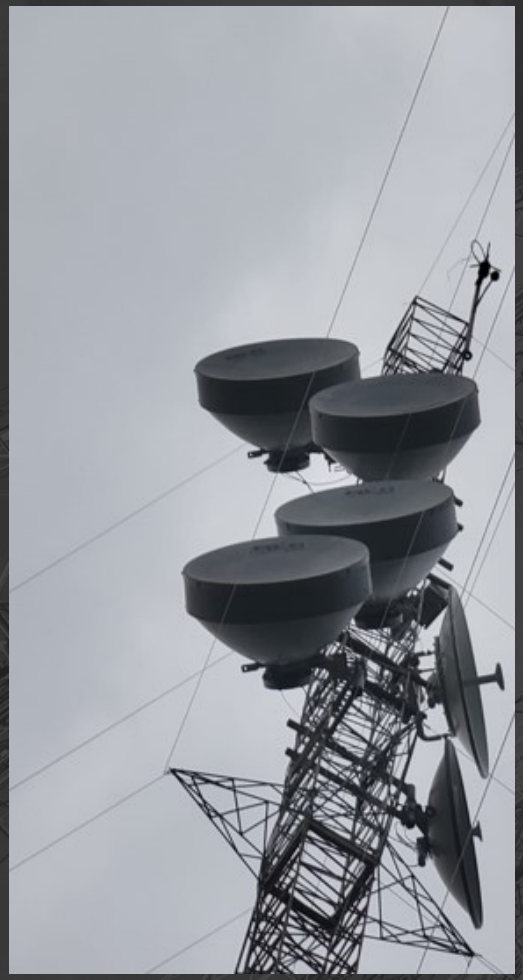
Antenna: PS-10900-34-06-DP

Radio: Mimosa B11

Distance: 20.5 km

Throughput: 1.4 Giga full


CASE 3



SSID	Wireless Status	Satellite/Timing	Link Uptime	Link Availability
[redacted]	Connected	Good	11d 12h 06m	99.980%

Signal Meter

-70 -60 -50 -40

Target: --

-55.0 dBm

PHY Tx/Rx (Mbps): 1560 / 1560
MAC Tx/Rx (Mbps): 936 / 936

Center Frequency 1	10660 MHz
Center Frequency 2	10570 MHz
Channel Width	2x80
Tx Power	24 dBm
Link Length	33.3 km / 20.7 mi

Spectrum Analyzer

Aiming Mode

Performance

Throughput

Device Details

	Local	Remote
Device Name	mimosa	
Serial Number	1112483457	
IP Address	10.3.1.2 (Static)	
Wireless Protocol	TDMA - Access point	- undefined
TDMA Traffic Balance	Auto	--
Ethernet Speed	1000Mb/s Full Duplex	
Network Interface	Fiber	Ethernet

MIMO Status

Chain	Rx Power (dBm)	Rx Noise (dBm)	SNR (dB)	Center Freq. (MHz)	Pol
1	-60.8	-88.9	28	10660	H
2	-61.4	-88.9	27	10660	V
3	-60.5	-89.9	29	10570	V
4	-61.3	-89.9	28	10570	H

Chains

Encaminhada
Esto me da cada antena 08:31

Encaminhada
así que puedo pasar 4GB 08:31

¡GRACIAS POR SU ATENCIÓN!