

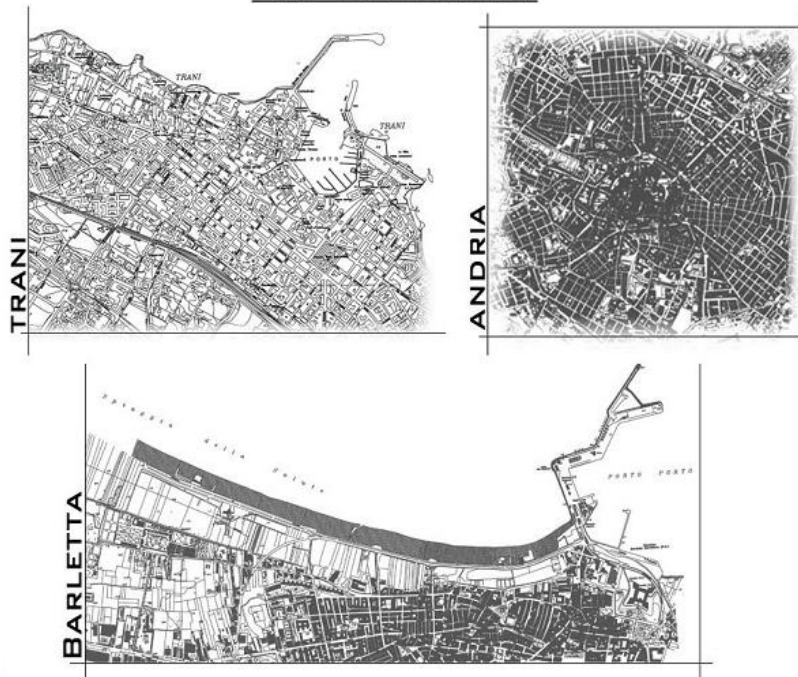


PATTI PER LE CITTÀ'
PPA PO FESR 2007-2013 - PAC
ASSE I - LINEA D'INTERVENTO 1.5 - AZIONE 1.5.2

“BAT innovation”

**Progetto per il
Miglioramento della
Vivibilità, Sicurezza e Tutela
dei Centri Storici dei
Comuni di Andria, Barletta
e Trani.**

BAT INNOVATION



PROGETTO ESECUTIVO

Il Progettista	Responsabile del Procedimento
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ELABORATO	DESCRIZIONE	REV.	DATA
B.004	Relazione di Verifica Link Hiperlan (Comune di Barletta)	1	23/03/2021

Il progettista si riserva la proprietà del documento vietandone la riproduzione e la divulgazione senza autorizzazione ai sensi delle vigenti leggi

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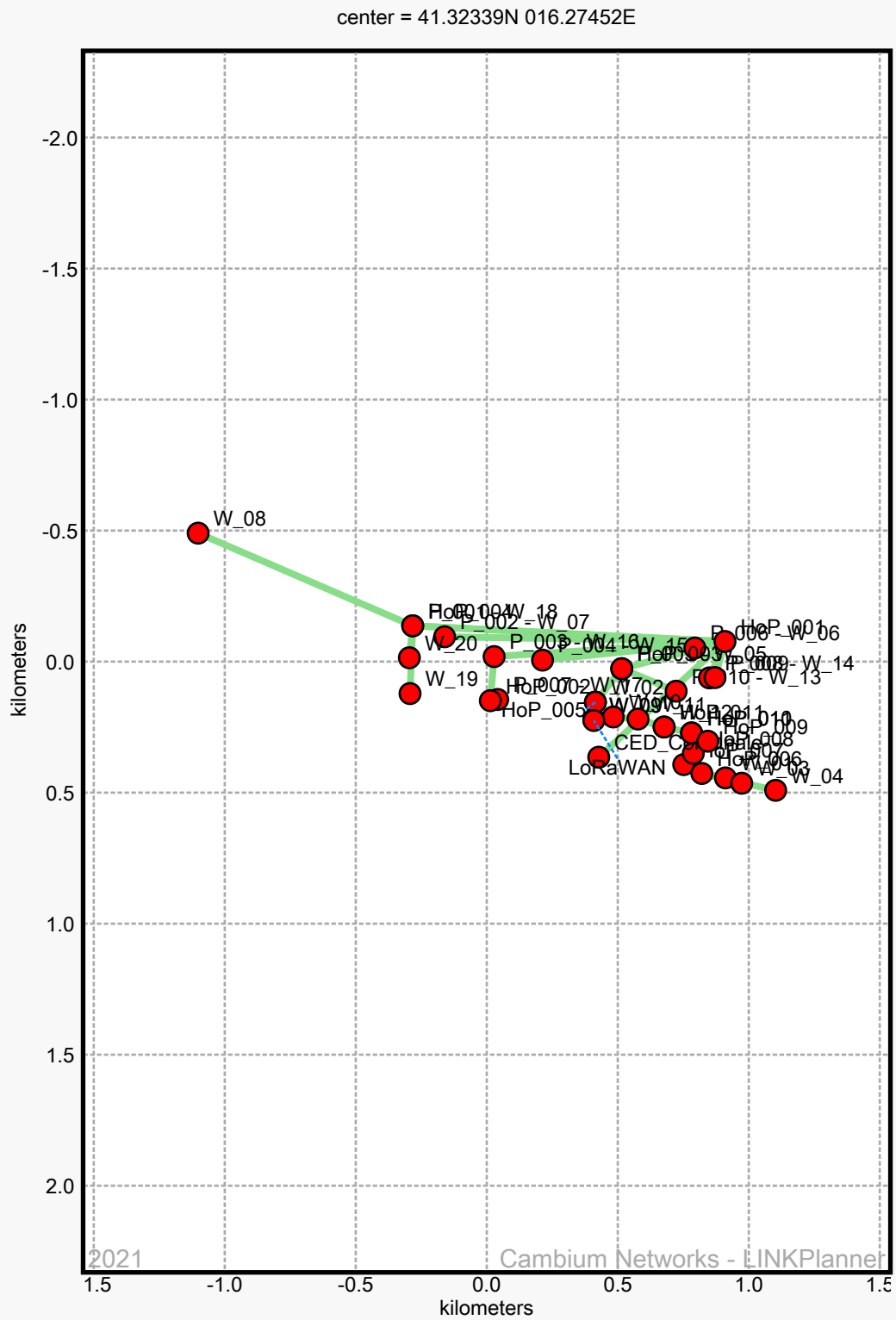
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1. Project Summary

Project: Barletta_Progetto_Radio

General Information	
Customer Name	Barletta_Progetto_Radio
Company Name	
Address	
Phone	
Cell Phone	
Email	

Network Map



Link name	Product	Remote Product	Local antenna	Remote antenna	Max aggregate IP throughput
HoP_001 direzione CED_Comunale	ePMP Force 300-25	ePMP Force 300-25	Cambium Networks ePMP Force 300-25	Cambium Networks ePMP Force 300-25	668.59 Mbps
HoP_002 direzione P_003 - W_16	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.91 Mbps
HoP_004 direzione HoP_001	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.50 Mbps
HoP_005 direzione P_005 - W_05	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.91 Mbps
HoP_006 direzione HoP_007	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.96 Mbps
HoP_007 direzione HoP_008	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.96 Mbps
HoP_008 direzione HoP_009	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.96 Mbps
HoP_009 direzione HoP_010	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.96 Mbps
HoP_010 direzione HoP_011	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	275.94 Mbps
HoP_011 direzione W_11	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.91 Mbps
P_001 - W_18 direzione HoP_001	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.50 Mbps
P_002 - W07 direzione HoP_001	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.55 Mbps
P_003 - W_16 direzione HoP_001	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.60 Mbps
P_004 - W_15 direzione HoP_001	ePMP Force 200	ePMP Force 180	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 180	276.72 Mbps
P_005 - W_05 direzione HoP_001	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.79 Mbps

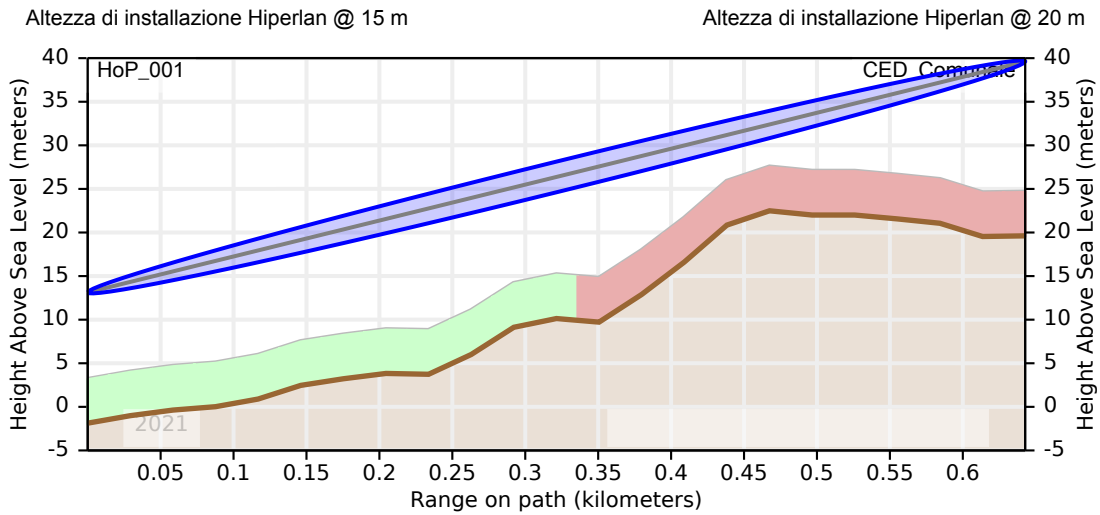
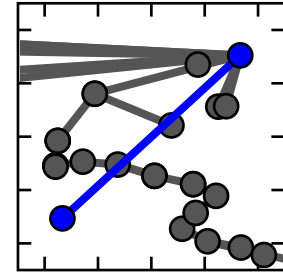
(continued)

Link name	Product	Remote Product	Local antenna	Remote antenna	Max aggregate IP throughput
P_006 - W_06 direzione HoP_001	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.91 Mbps
P_007 - W_17 direzione HoP_002	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.96 Mbps
P_008 - W_14 direzione HoP_001	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.91 Mbps
P_009 direzione HoP_001	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.72 Mbps
P_010 - W_13 direzione HoP_003	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.50 Mbps
W_01 direzione HoP_006	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.87 Mbps
W_03 direzione HoP_006	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.91 Mbps
W_04 direzione HoP_006	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.84 Mbps
W_08 direzione HoP_004	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.60 Mbps
W_09 direzione HoP_005	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.96 Mbps
W_10 direzione W_09	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.96 Mbps
W_11 direzione W_10	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	272.48 Mbps
W_12 direzione W_11	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.91 Mbps
W_19 direzione HoP_004	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	276.84 Mbps
W_20 direzione HoP_004	ePMP Force 200	ePMP Force 200	Cambium Networks ePMP Force 200	Cambium Networks ePMP Force 200	132.37 Mbps

Bill of Materials : PTP Network		
Part Number	Qty	Description
C000000L065	60	Gigabit Surge Suppressor (30V)
C050900C063	56	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
C050900C761	1	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (ROW) (Argentina cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
C050900C771	1	ePMP 1000: 5 GHz Force 180 Integrated Radio (ROW) (Argentina cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
C050910C203	2	ePMP 5 GHz Force 300-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EP10SM-WW	1	ePMP 1000 ISM/CSM/Force 180/Force 190 Extended Warranty, 2 Addl Years
EW-E2EPF200-WW	57	ePMP Force 200 Extended Warranty, 2 Addl Years
EW-E2EPF300-WW	2	ePMP Force 300 Extended Warranty, 2 Additional Years



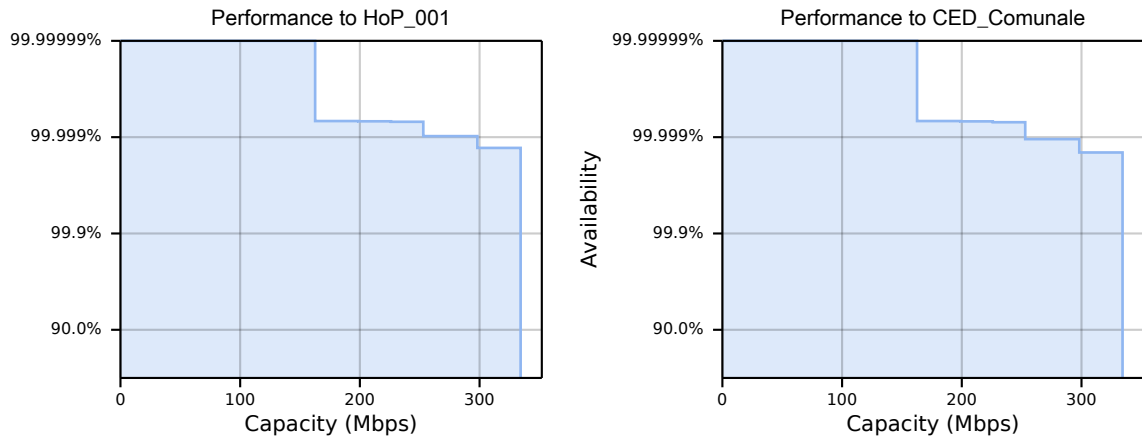
HoP_001 direzione CED_Comunale



	Performance to HoP_001	Performance to CED_Comunale
Mean IP	334.30 Mbps	334.30 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.643 km	System Gain Margin	29.43 dB
Band	5.4 GHz	Mean Aggregate Data Rate	668.59 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	80 MHz	Frame Size	1518 Bytes
Total Path Loss	103.57 dB	Prediction Model	ITU-R P.530-17
System Gain	133.00 dB		

Performance Charts



Climatic Factors, Losses and Standards

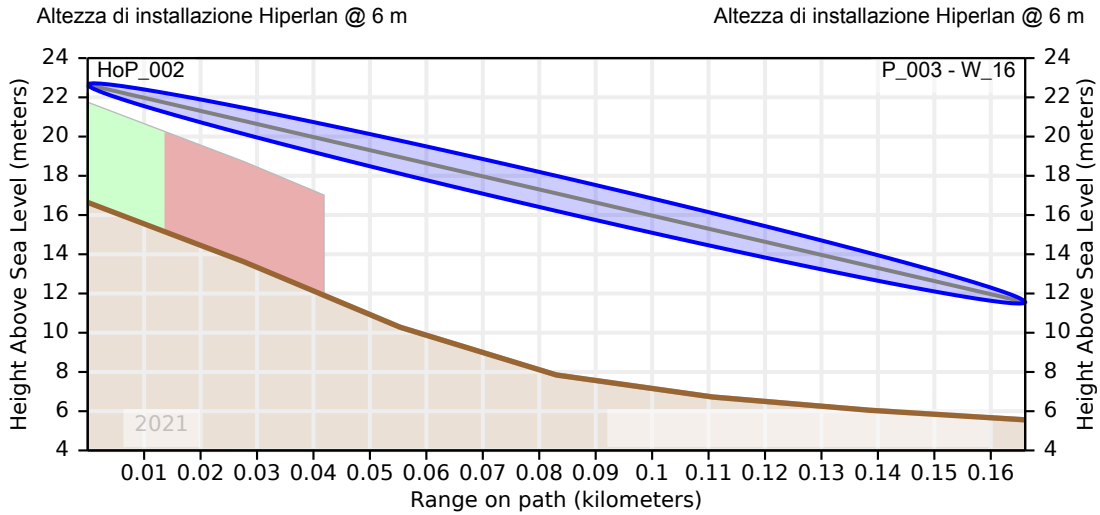
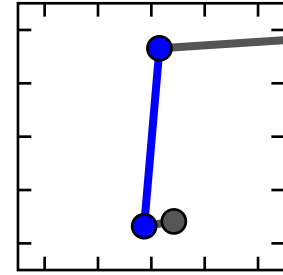
dN/dH not exceeded for 1% of time	-367.03 N units/km	Gaseous Absorption Loss	0.01 dB
Area roughness 110x110km	196.88 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.36e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	6.13e-09	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	41.21 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.02 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	103.57 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050910C203	2	ePMP 5 GHz Force 300-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF300-WW	2	ePMP Force 300 Extended Warranty, 2 Additional Years



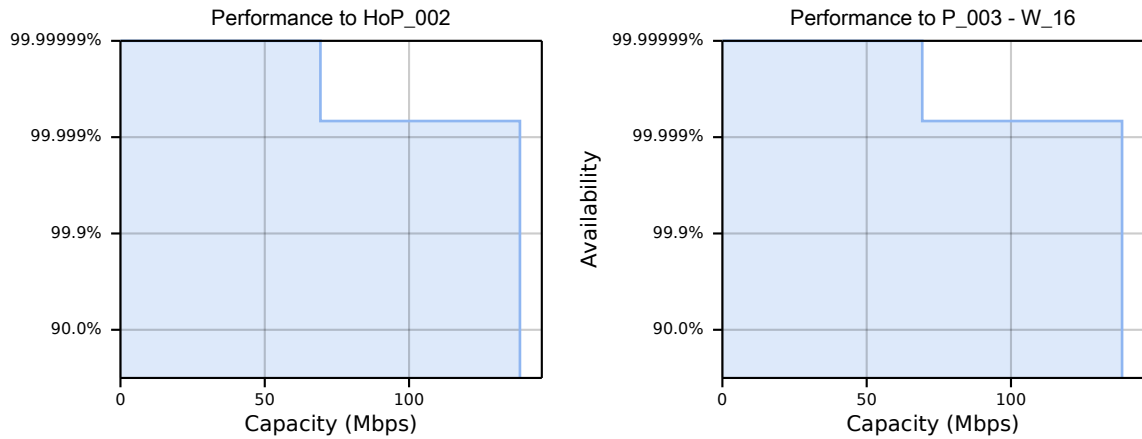
HoP_002 direzione P_003 - W_16



	Performance to HoP_002	Performance to P_003 - W_16
Mean IP	138.42 Mbps	138.49 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.166 km	System Gain Margin	41.36 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.91 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	91.82 dB	Prediction Model	ITU-R P.530-17
System Gain	133.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

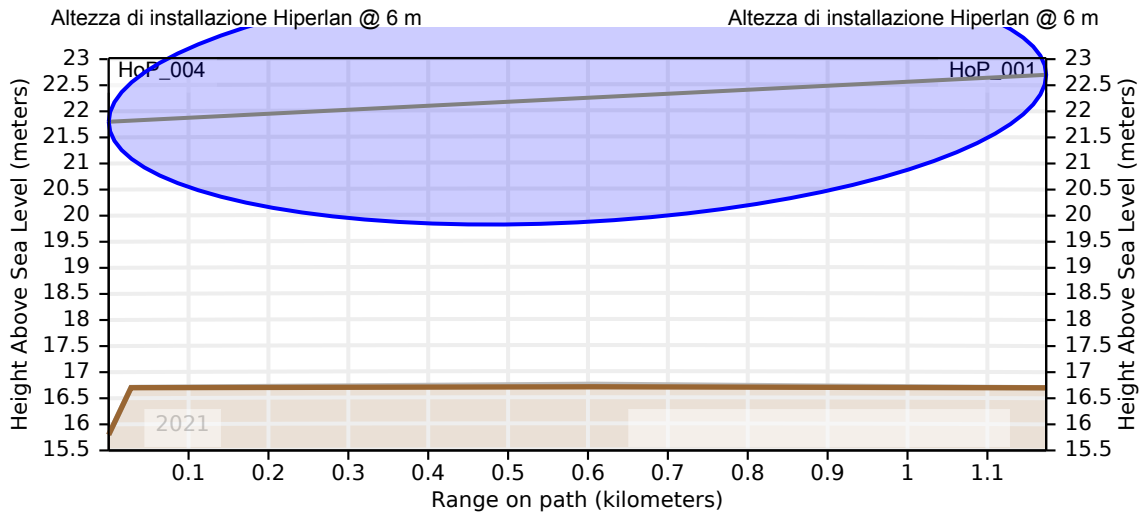
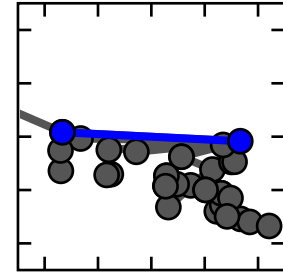
dN/dH not exceeded for 1% of time	-366.85 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	197.57 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.35e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	3.78e-11	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	66.74 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	30.99 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	91.81 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



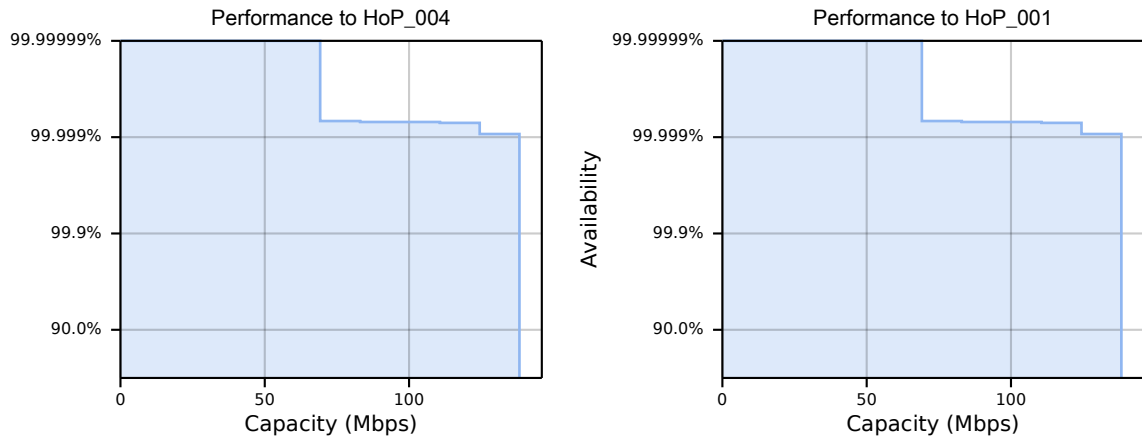
HoP_004 direzione HoP_001



	Performance to HoP_004	Performance to HoP_001
Mean IP	138.25 Mbps	138.25 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	1.174 km	System Gain Margin	26.37 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.50 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	108.81 dB	Prediction Model	ITU-R P.530-17
System Gain	135.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

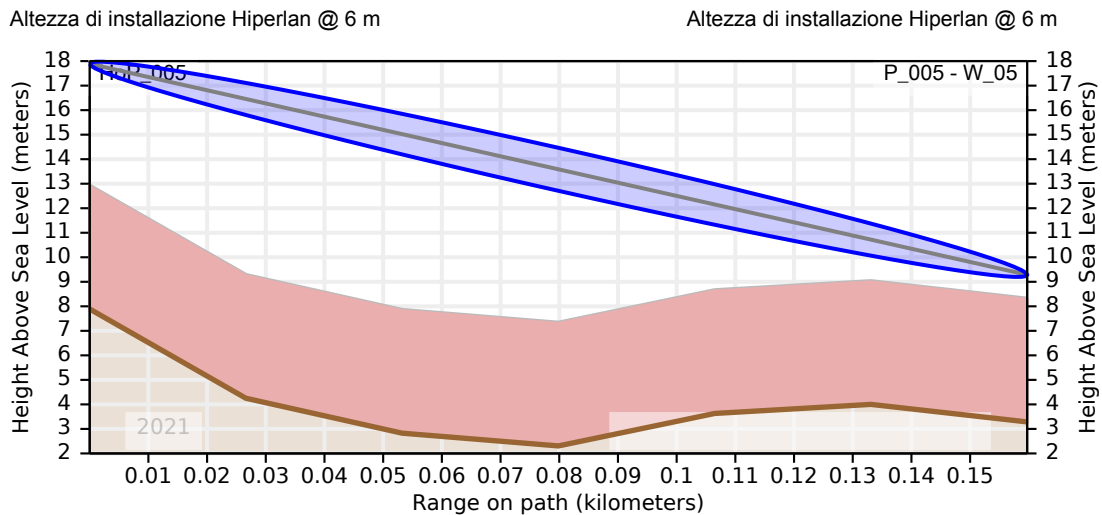
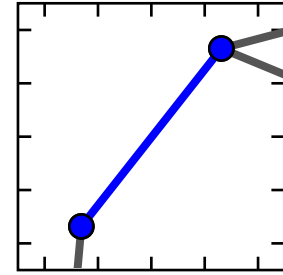
dN/dH not exceeded for 1% of time	-367.39 N units/km	Gaseous Absorption Loss	0.01 dB
Area roughness 110x110km	196.98 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.36e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	1.23e-06	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	0.77 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.01 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	108.80 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



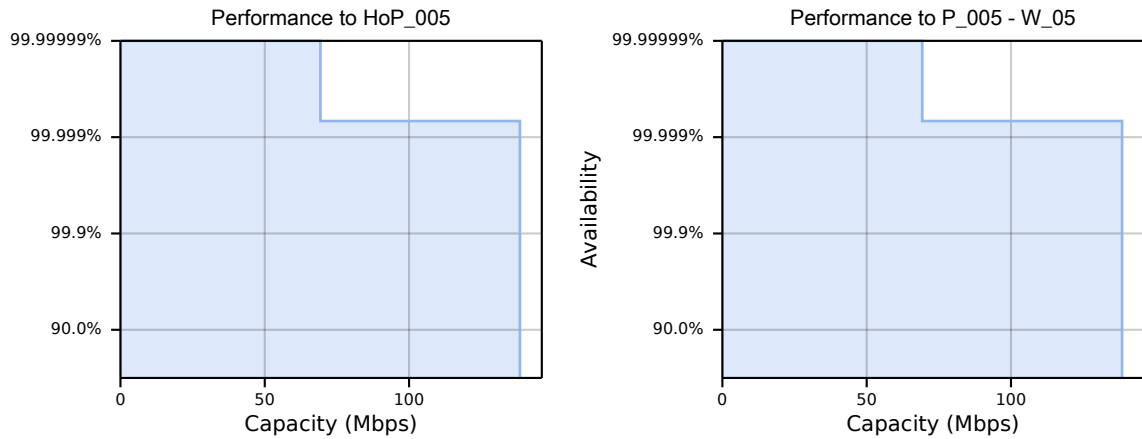
HoP_005 direzione P_005 - W_05



	Performance to HoP_005	Performance to P_005 - W_05
Mean IP	138.42 Mbps	138.49 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.160 km	System Gain Margin	41.70 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.91 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	91.48 dB	Prediction Model	ITU-R P.530-17
System Gain	133.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

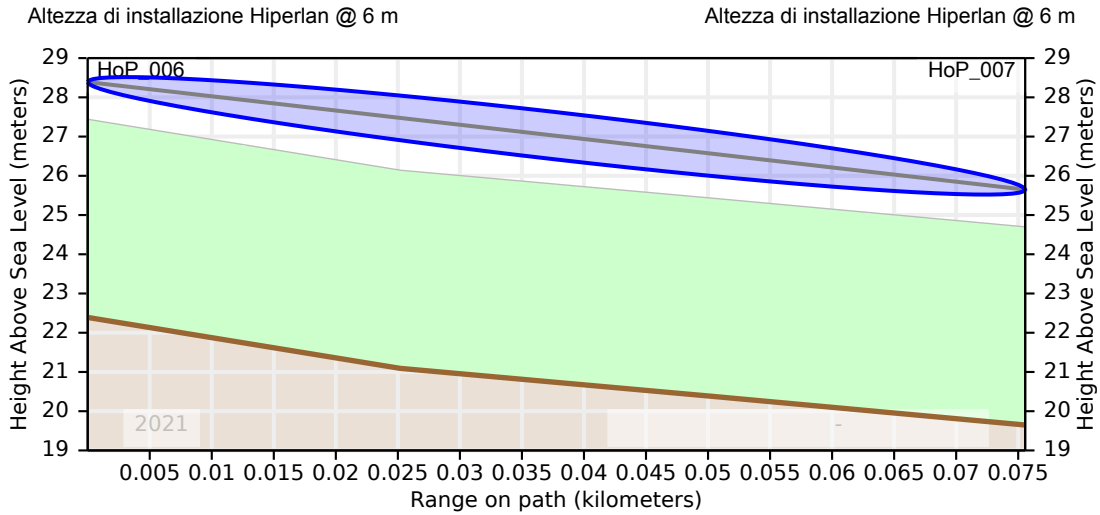
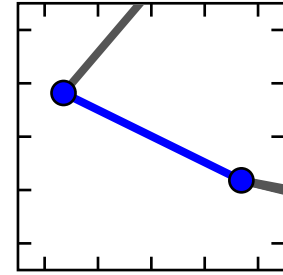
dN/dH not exceeded for 1% of time	-367.03 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	197.06 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.35e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	4.14e-11	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	53.87 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.01 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	91.47 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



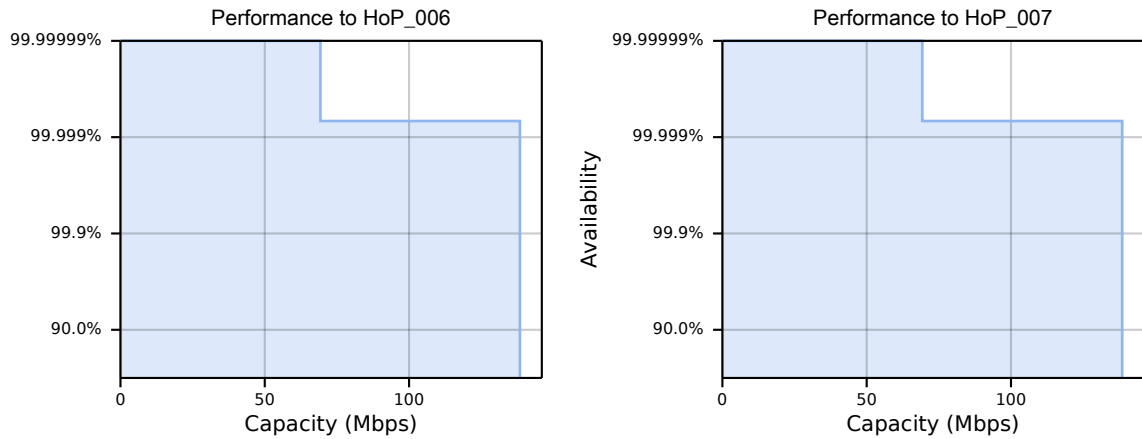
HoP_006 direzione HoP_007



	Performance to HoP_006	Performance to HoP_007
Mean IP	138.42 Mbps	138.54 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.076 km	System Gain Margin	41.21 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.96 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	84.97 dB	Prediction Model	ITU-R P.530-17
System Gain	126.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

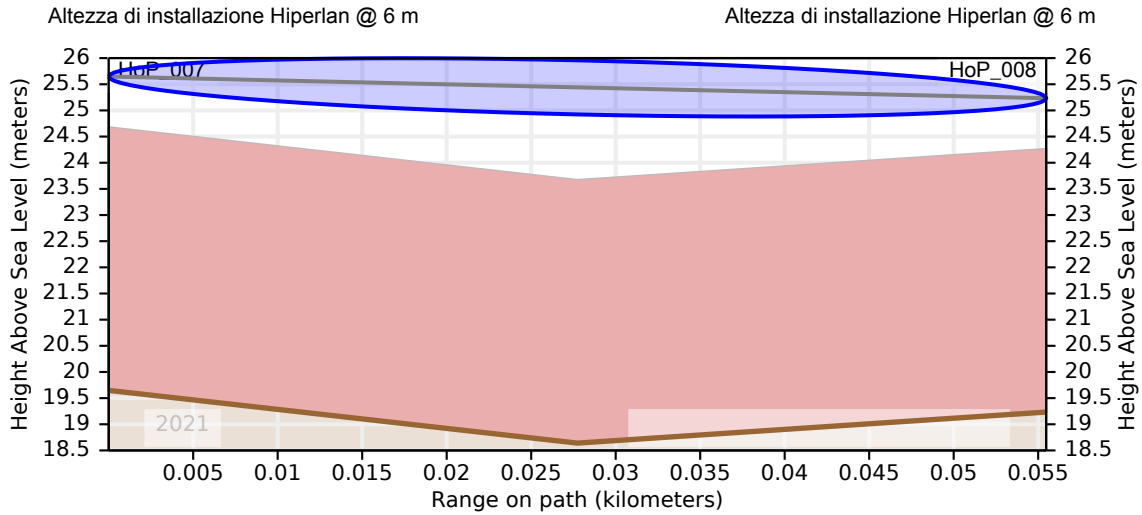
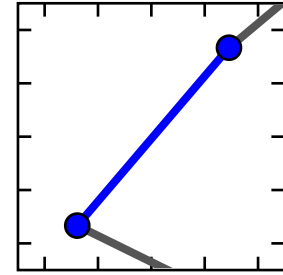
dN/dH not exceeded for 1% of time	-366.50 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	197.08 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.34e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	4.68e-12	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	36.28 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.01 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	84.97 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



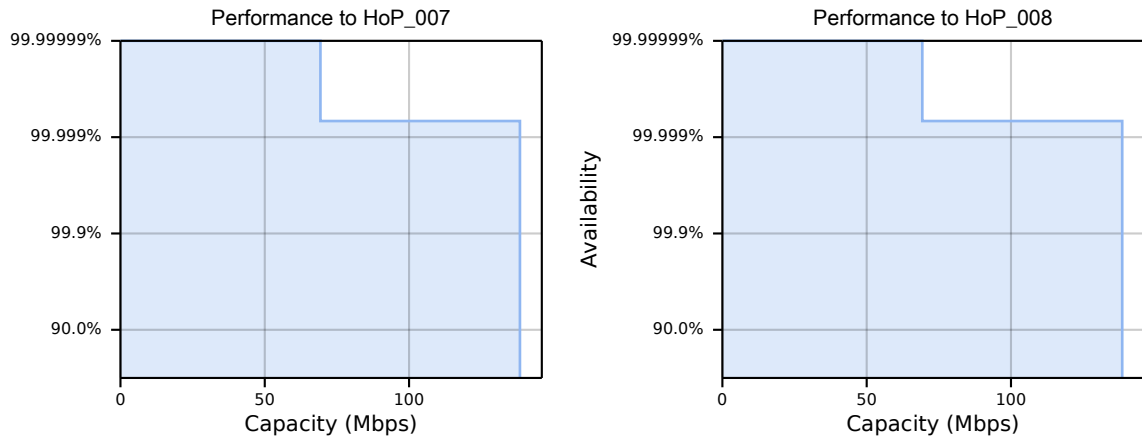
HoP_007 direzione HoP_008



	Performance to HoP_007	Performance to HoP_008
Mean IP	138.42 Mbps	138.54 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.055 km	System Gain Margin	41.89 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.96 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	82.29 dB	Prediction Model	ITU-R P.530-17
System Gain	124.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

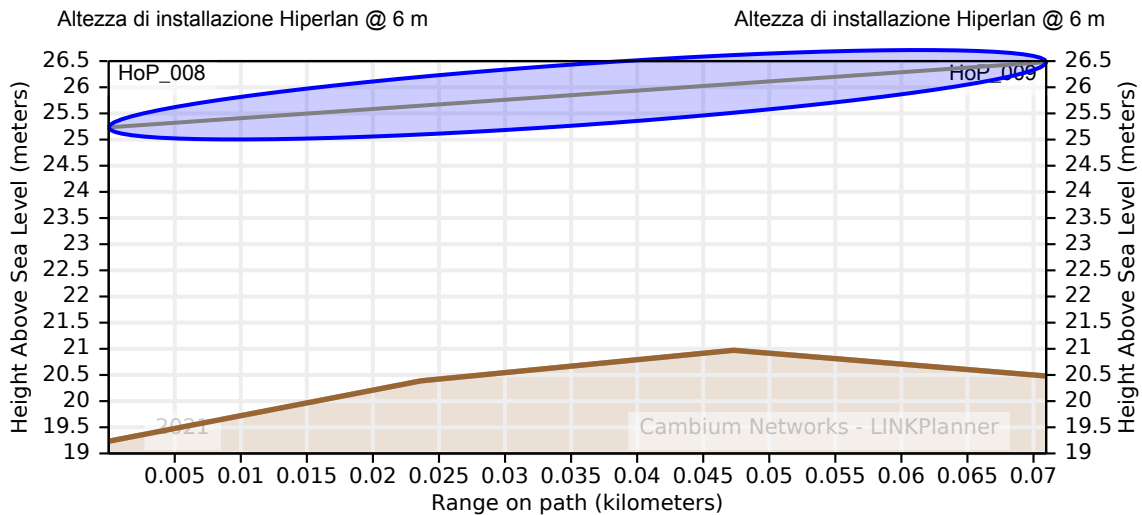
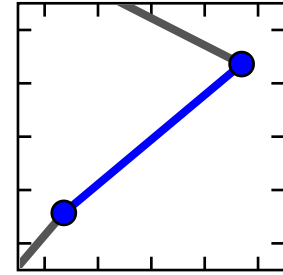
dN/dH not exceeded for 1% of time	-366.58 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	197.05 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.34e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	7.54e-12	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	7.48 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.01 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	82.29 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



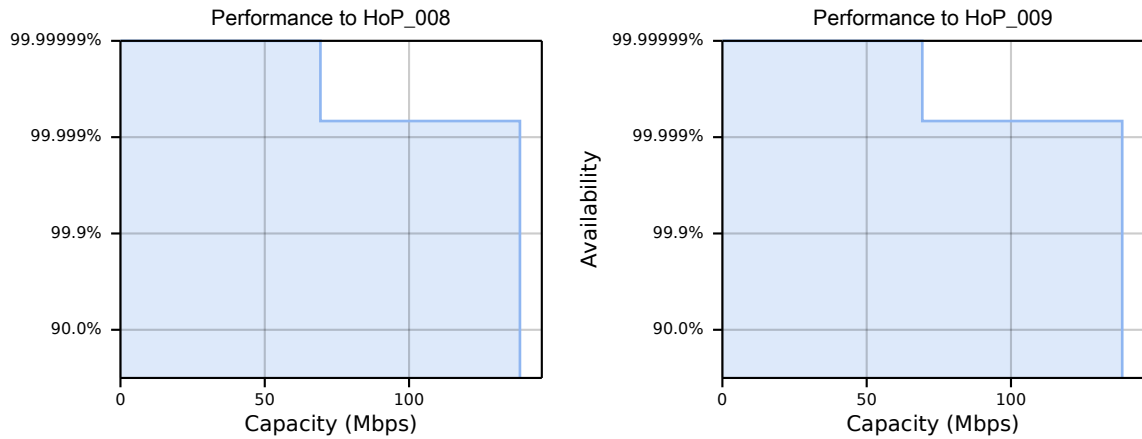
HoP_008 direzione HoP_009



	Performance to HoP_008	Performance to HoP_009
Mean IP	138.42 Mbps	138.54 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.071 km	System Gain Margin	41.75 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.96 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	84.43 dB	Prediction Model	ITU-R P.530-17
System Gain	126.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

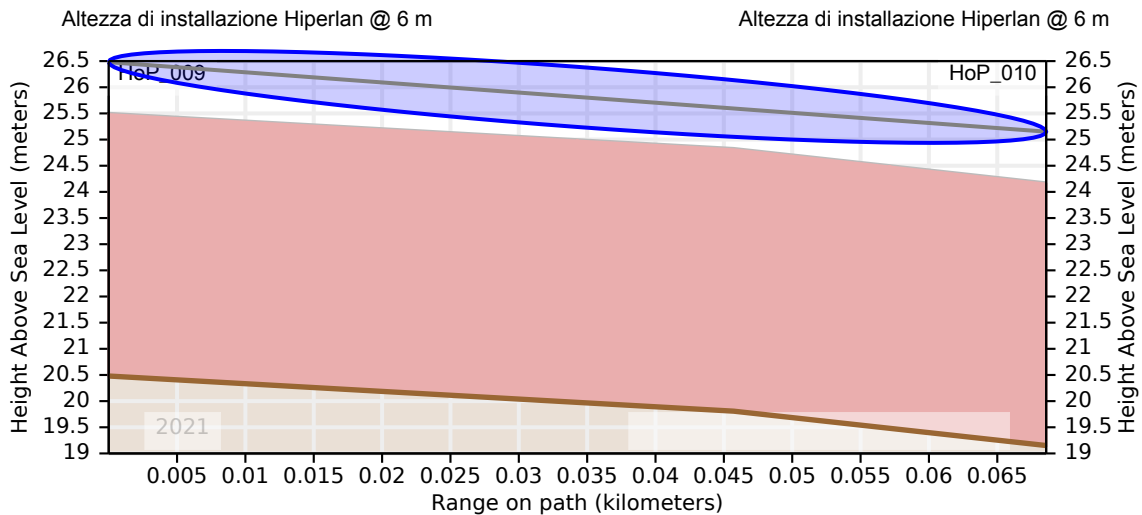
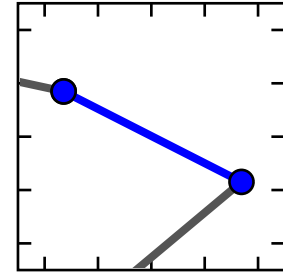
dN/dH not exceeded for 1% of time	-366.70 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	196.93 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.35e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	7.77e-12	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	17.57 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.02 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	84.43 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



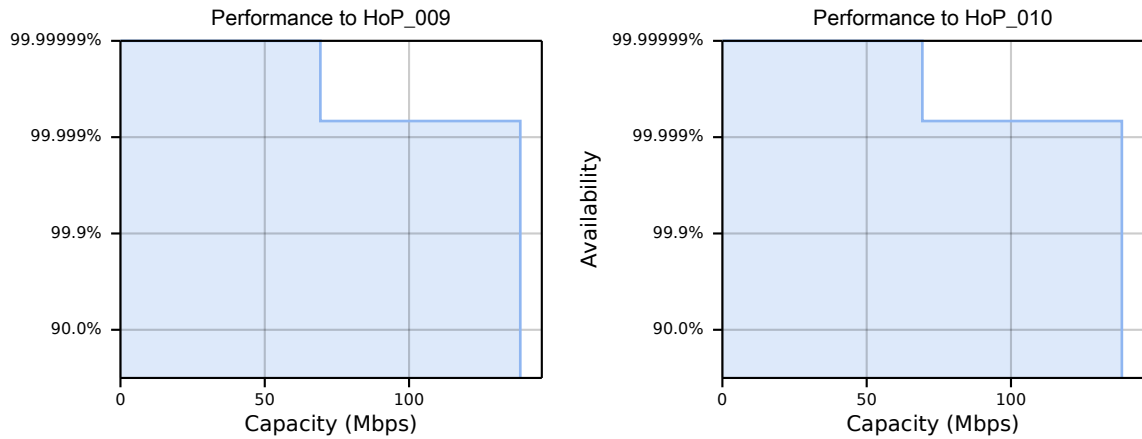
HoP_009 direzione HoP_010



	Performance to HoP_009	Performance to HoP_010
Mean IP	138.54 Mbps	138.42 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.069 km	System Gain Margin	42.05 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.96 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	84.13 dB	Prediction Model	ITU-R P.530-17
System Gain	126.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

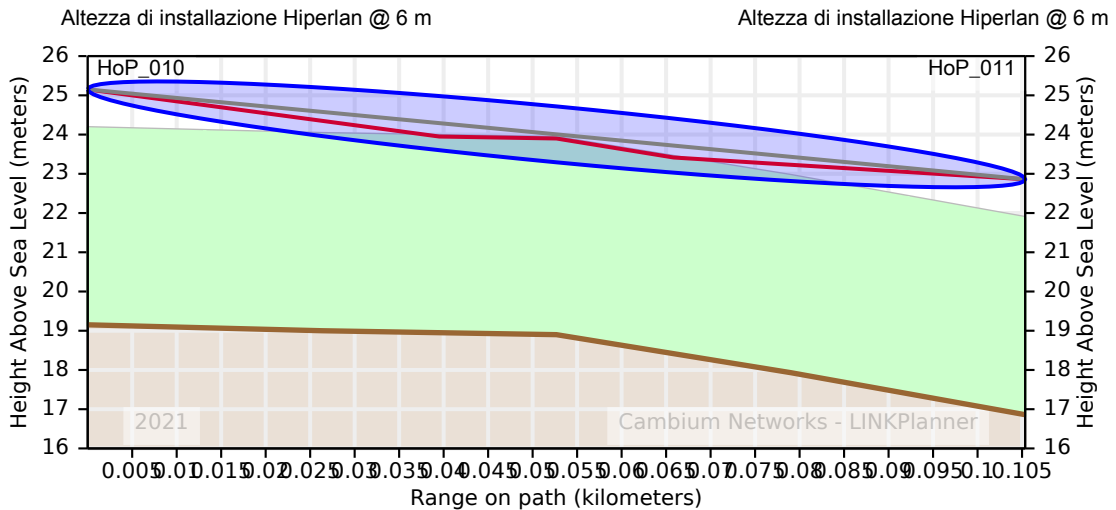
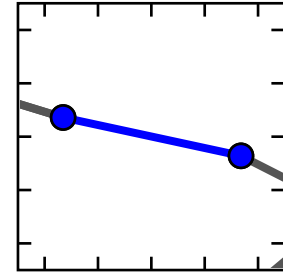
dN/dH not exceeded for 1% of time	-366.78 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	196.89 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.35e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	6.29e-12	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	19.38 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.02 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	84.13 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



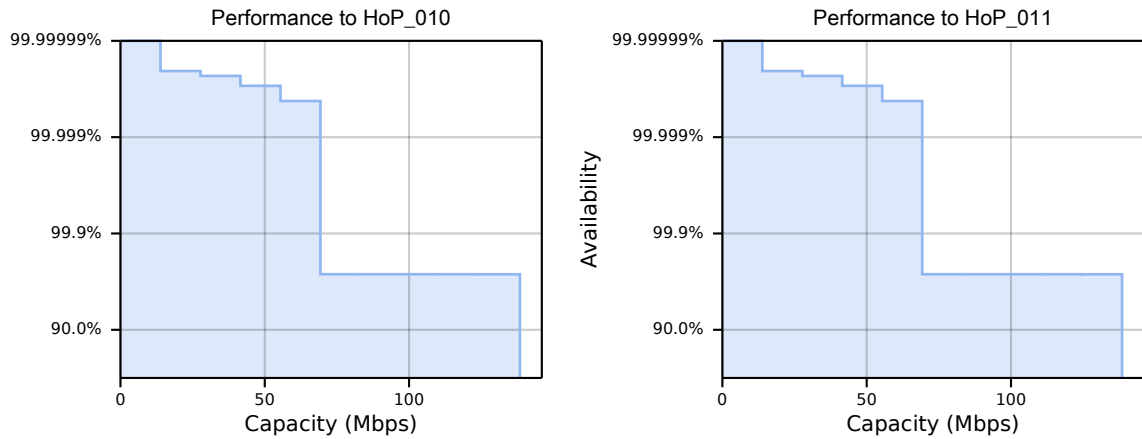
HoP_010 direzione HoP_011



	Performance to HoP_010	Performance to HoP_011
Mean IP	137.93 Mbps	138.00 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.105 km	System Gain Margin	36.74 dB
Band	5.4 GHz	Mean Aggregate Data Rate	275.94 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	98.44 dB	Prediction Model	ITU-R P.530-17
System Gain	135.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

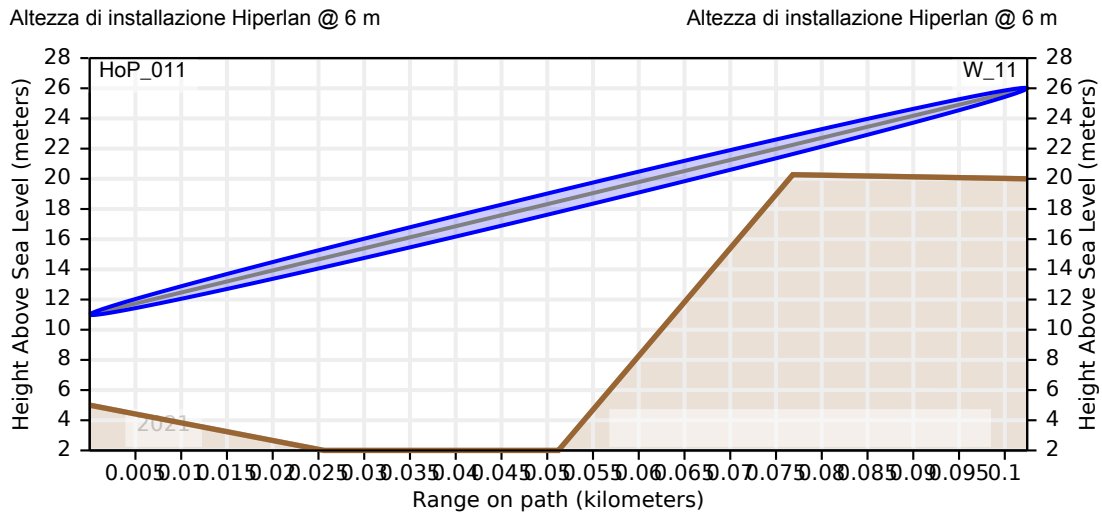
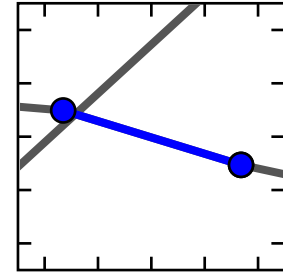
dN/dH not exceeded for 1% of time	-366.80 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	196.95 metre	Link Type	Non Line-of-Sight
Geoclimatic factor	3.35e-05	Excess Path Loss	10.58 dB
Fade Occurrence Factor (P0)	2.43e-11	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	21.75 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	10.59 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.01 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	87.86 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



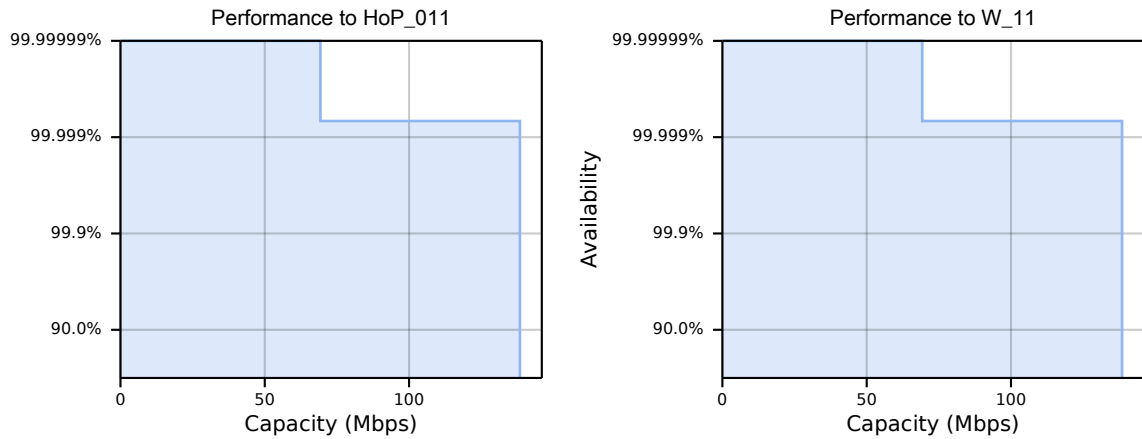
HoP_011 direzione W_11



	Performance to HoP_011	Performance to W_11
Mean IP	138.42 Mbps	138.49 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.102 km	System Gain Margin	41.56 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.91 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	87.62 dB	Prediction Model	ITU-R P.530-17
System Gain	129.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

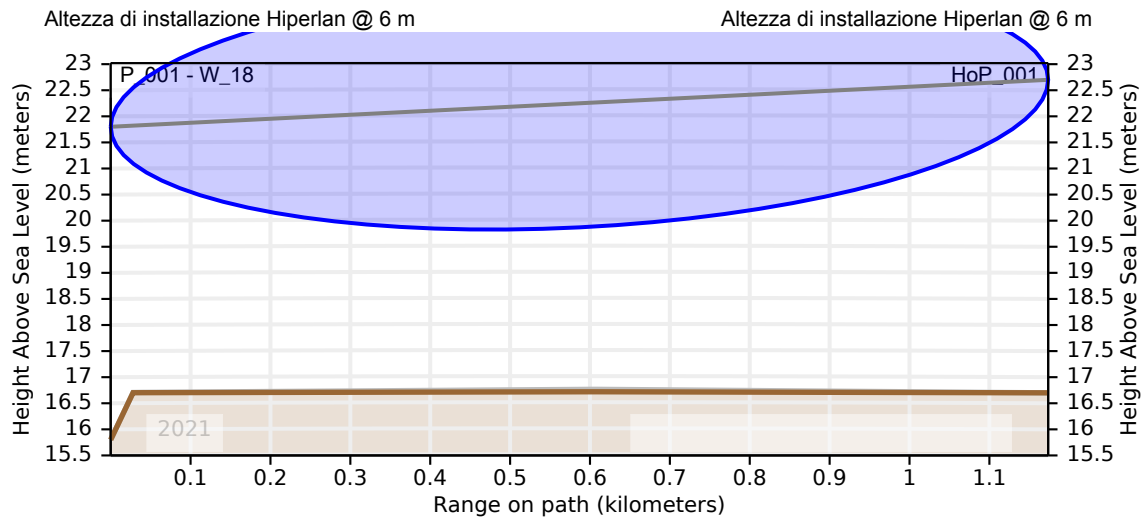
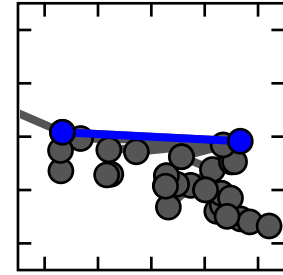
dN/dH not exceeded for 1% of time	-366.80 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	197.04 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.35e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	3.29e-12	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	146.42 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.01 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	87.62 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



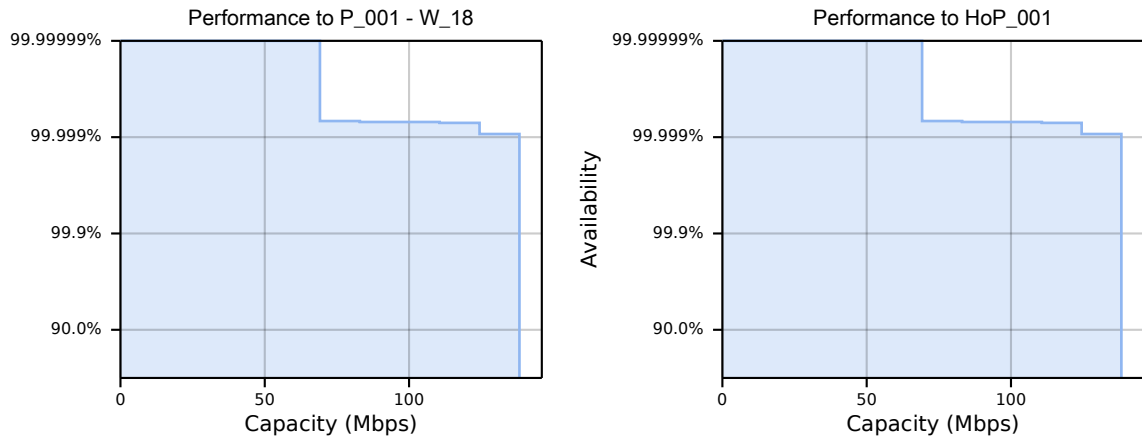
P_001 - W_18 direzione HoP_001



	Performance to P_001 - W_18	Performance to HoP_001
Mean IP	138.25 Mbps	138.25 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	1.174 km	System Gain Margin	26.37 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.50 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	108.81 dB	Prediction Model	ITU-R P.530-17
System Gain	135.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

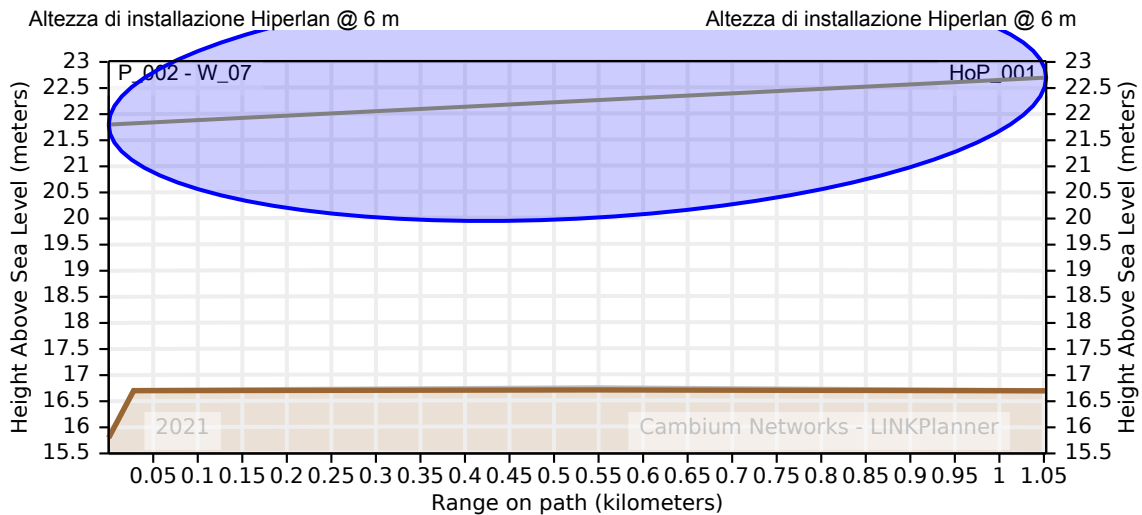
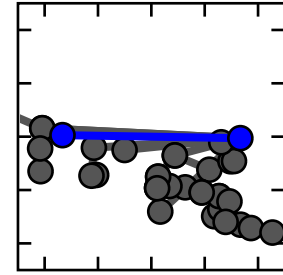
dN/dH not exceeded for 1% of time	-367.39 N units/km	Gaseous Absorption Loss	0.01 dB
Area roughness 110x110km	196.98 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.36e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	1.23e-06	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	0.77 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.01 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	108.80 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



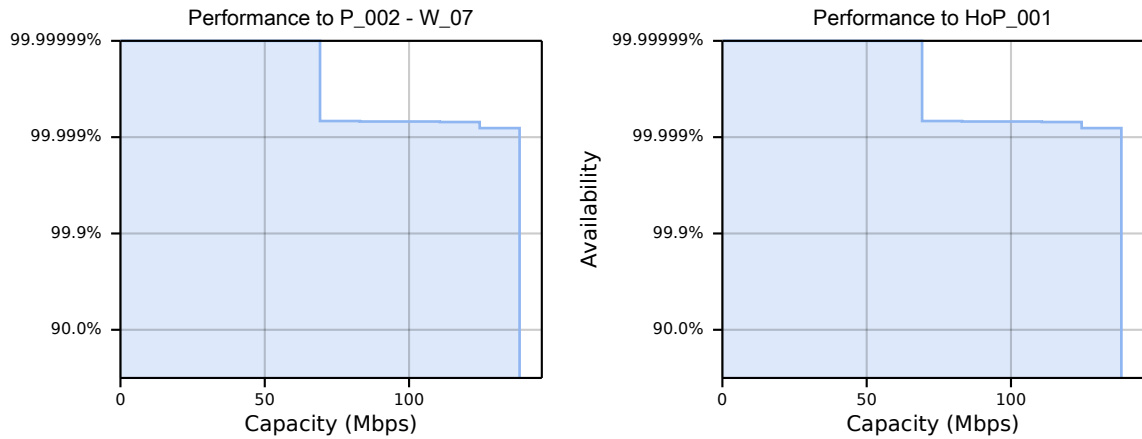
P_002 - W07 direzione HoP_001



	Performance to P_002 - W_07	Performance to HoP_001
Mean IP	138.30 Mbps	138.25 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	1.053 km	System Gain Margin	27.32 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.55 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	107.86 dB	Prediction Model	ITU-R P.530-17
System Gain	135.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

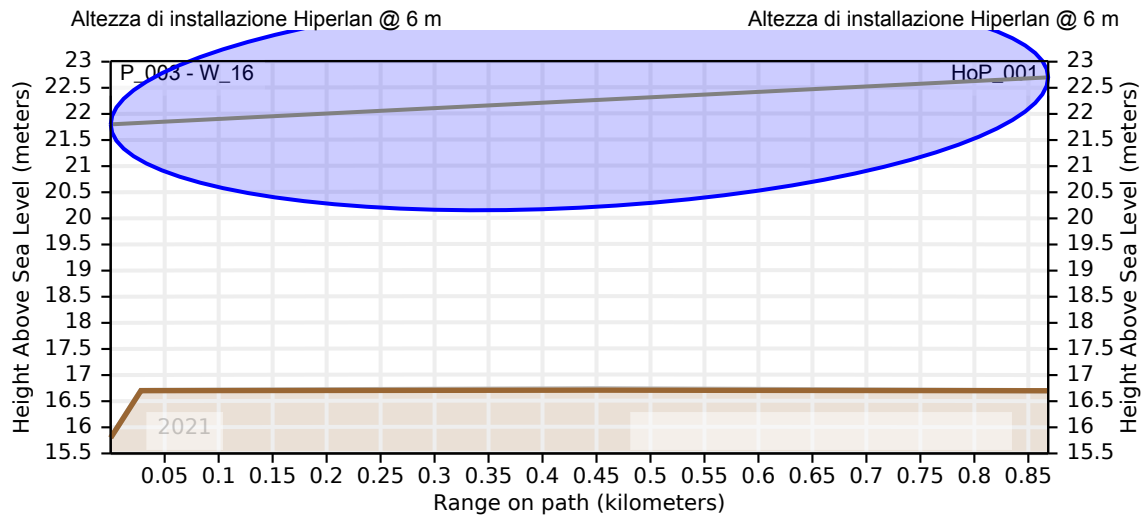
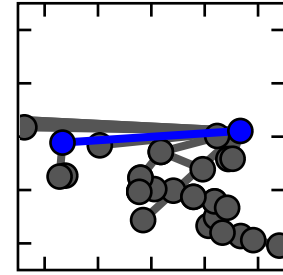
dN/dH not exceeded for 1% of time	-367.37 N units/km	Gaseous Absorption Loss	0.01 dB
Area roughness 110x110km	196.94 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.36e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	8.08e-07	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	0.86 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.01 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	107.85 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



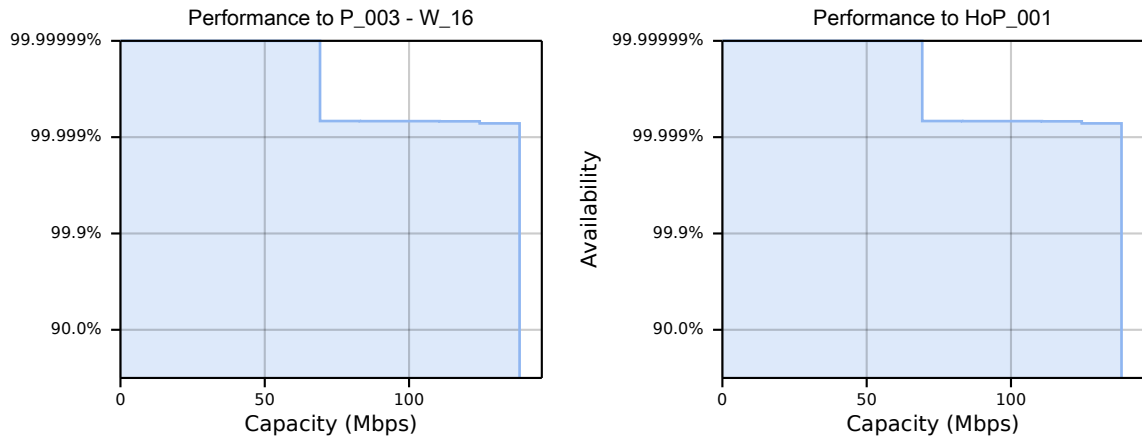
P_003 - W_16 direzione HoP_001



	Performance to P_003 - W_16	Performance to HoP_001
Mean IP	138.30 Mbps	138.30 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.868 km	System Gain Margin	28.99 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.60 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	106.19 dB	Prediction Model	ITU-R P.530-17
System Gain	135.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

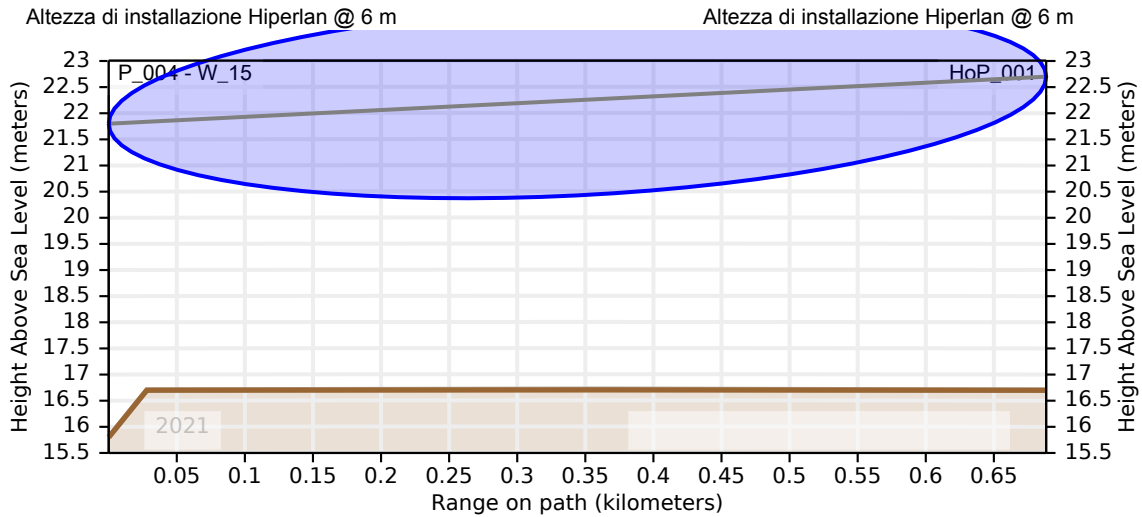
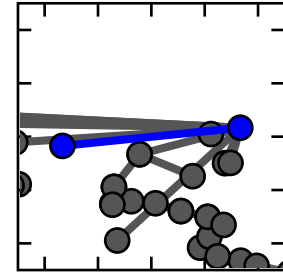
dN/dH not exceeded for 1% of time	-367.34 N units/km	Gaseous Absorption Loss	0.01 dB
Area roughness 110x110km	196.87 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.36e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	3.82e-07	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	1.04 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.01 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	106.18 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



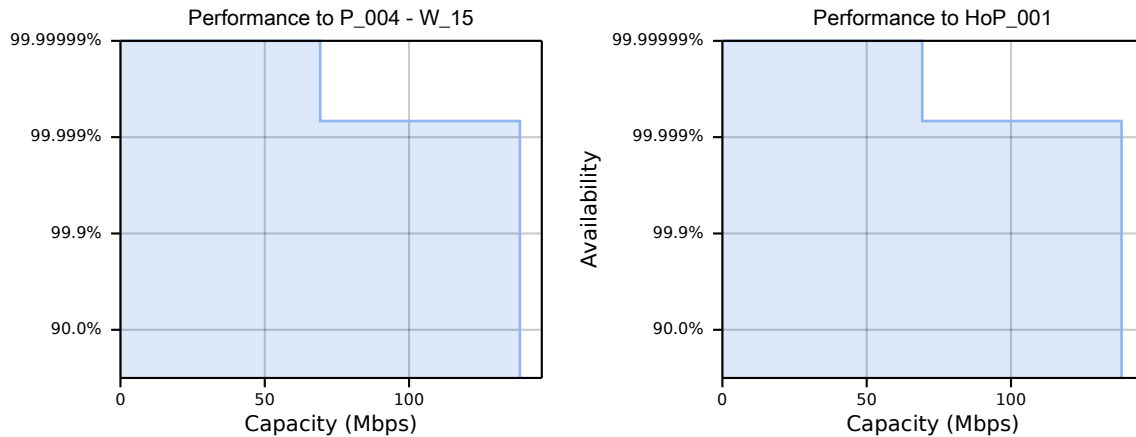
P_004 - W_15 direzione HoP_001



	Performance to P_004 - W_15	Performance to HoP_001
Mean IP	138.42 Mbps	138.30 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.688 km	System Gain Margin	41.42 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.72 Mbps
Regulation	Argentina	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	104.17 dB	Prediction Model	ITU-R P.530-17
System Gain	145.59 dB		

Performance Charts



Climatic Factors, Losses and Standards

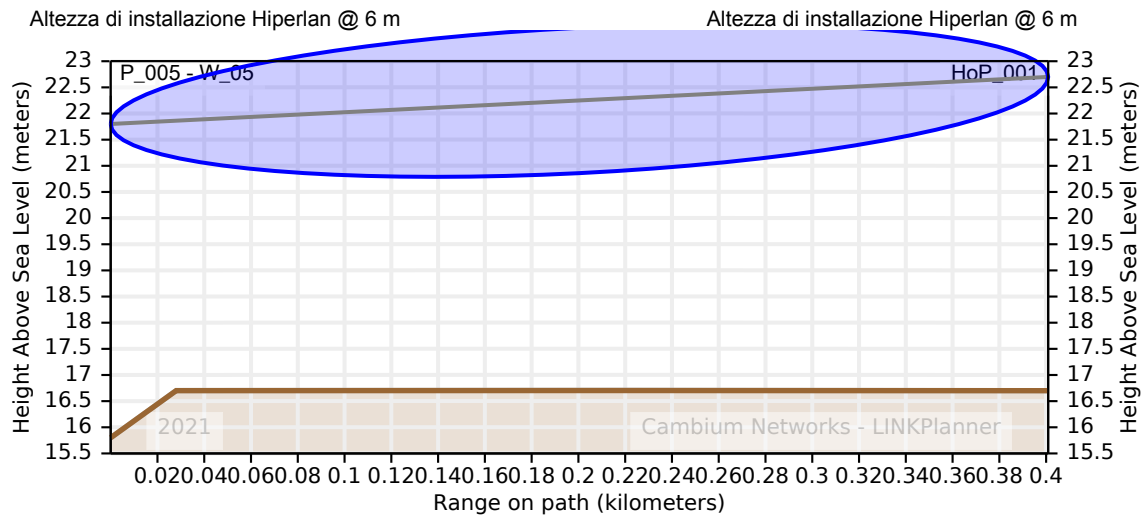
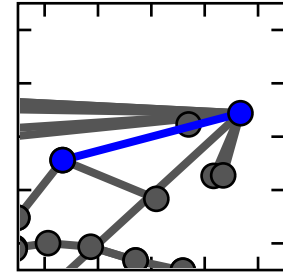
dN/dH not exceeded for 1% of time	-367.38 N units/km	Gaseous Absorption Loss	0.01 dB
Area roughness 110x110km	196.76 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.36e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	1.53e-07	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	1.31 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.02 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	104.16 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C761	1	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (ROW) (Argentina cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
C050900C771	1	ePMP 1000: 5 GHz Force 180 Integrated Radio (ROW) (Argentina cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EP10SM-WW	1	ePMP 1000 ISM/CSM/Force 180/Force 190 Extended Warranty, 2 Addl Years
EW-E2EPF200-WW	1	ePMP Force 200 Extended Warranty, 2 Addl Years



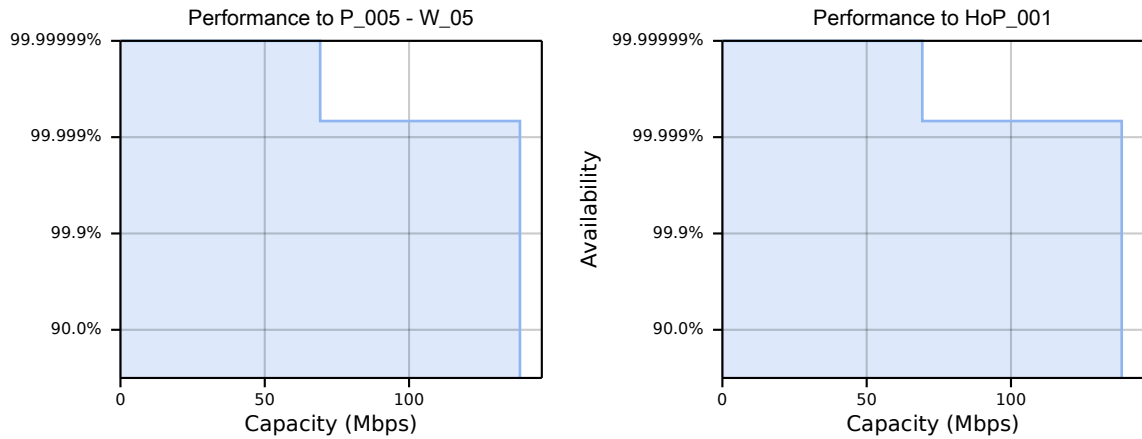
P_005 - W_05 direzione HoP_001



	Performance to P_005 - W_05	Performance to HoP_001
Mean IP	138.42 Mbps	138.37 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.401 km	System Gain Margin	35.71 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.79 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	99.47 dB	Prediction Model	ITU-R P.530-17
System Gain	135.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

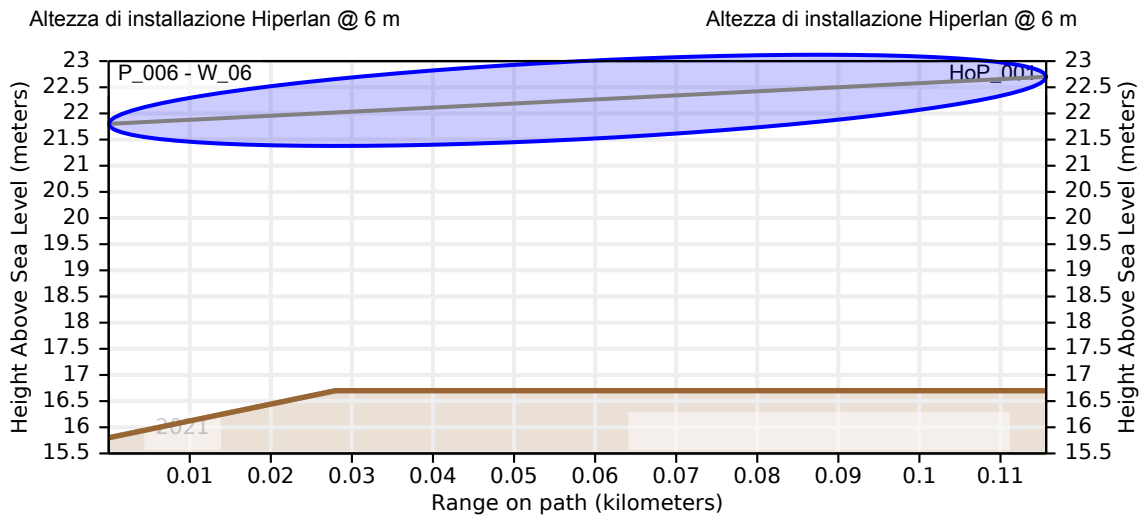
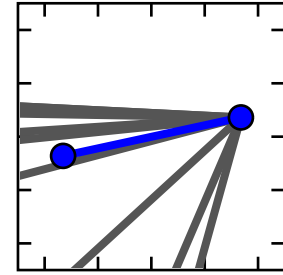
dN/dH not exceeded for 1% of time	-367.42 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	196.60 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.37e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	1.71e-08	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	2.25 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.02 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	99.47 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



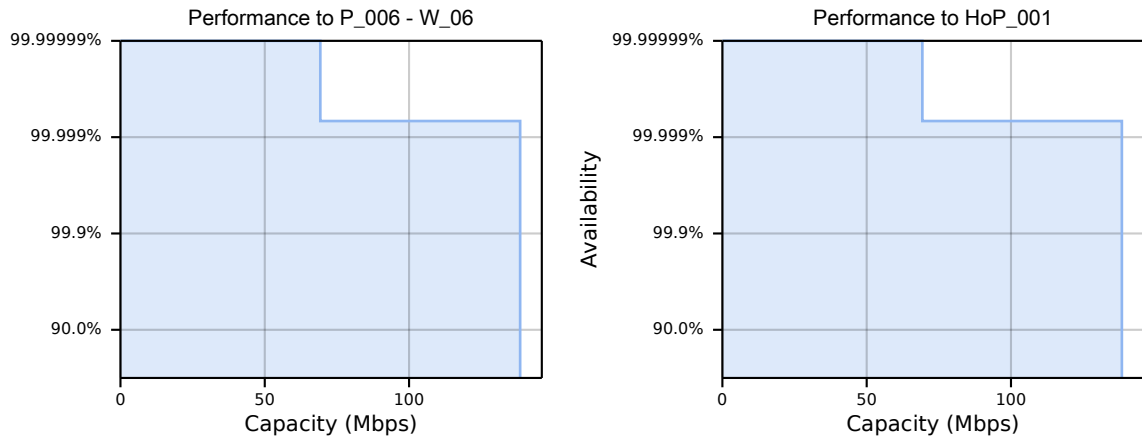
P_006 - W_06 direzione HoP_001



	Performance to P_006 - W_06	Performance to HoP_001
Mean IP	138.49 Mbps	138.42 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.116 km	System Gain Margin	41.51 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.91 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	88.67 dB	Prediction Model	ITU-R P.530-17
System Gain	130.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

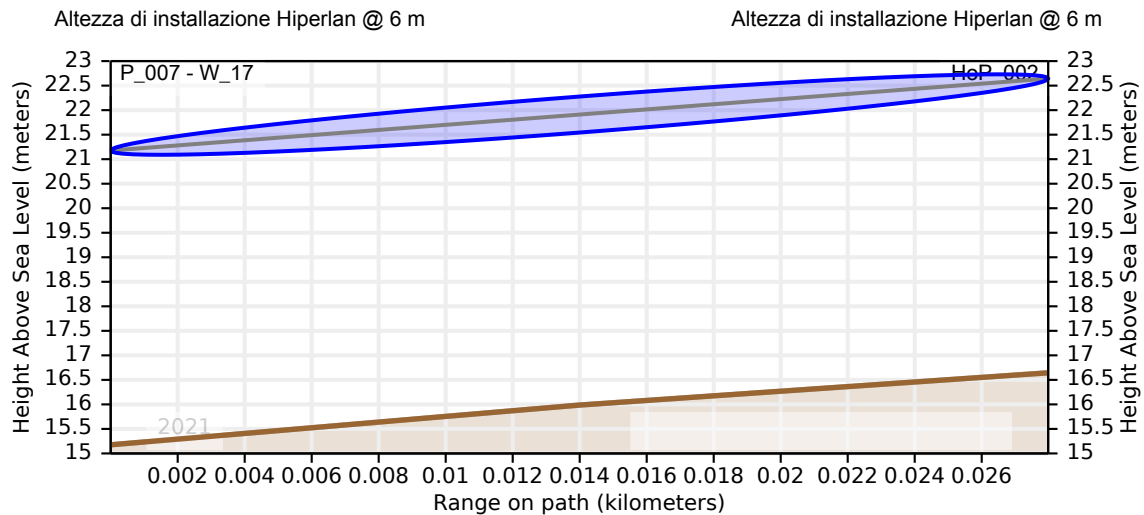
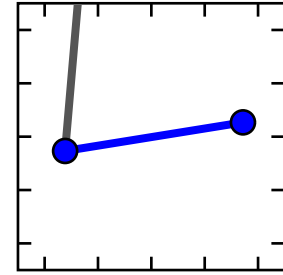
dN/dH not exceeded for 1% of time	-367.59 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	196.38 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.37e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	8.96e-11	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	7.78 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.03 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	88.67 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



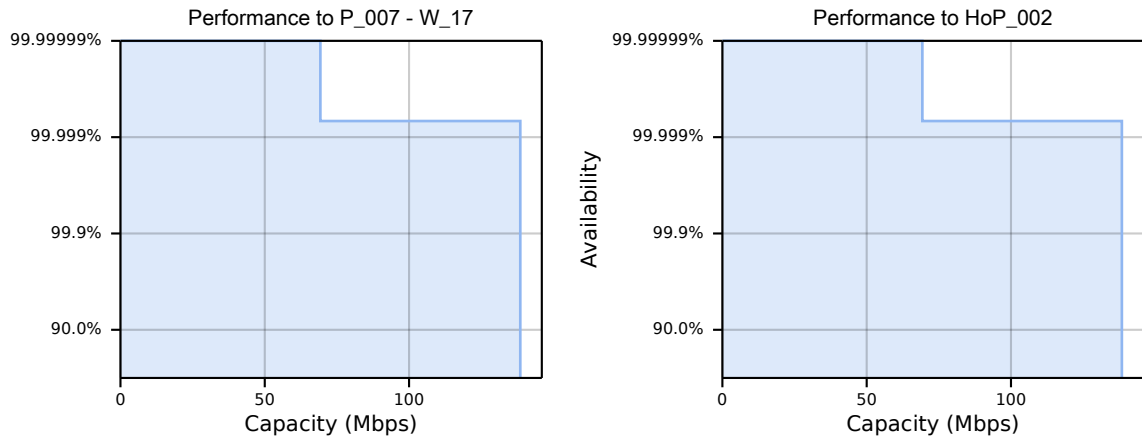
P_007 - W_17 direzione HoP_002



	Performance to P_007 - W_17	Performance to HoP_002
Mean IP	138.54 Mbps	138.42 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.028 km	System Gain Margin	41.83 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.96 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	76.35 dB	Prediction Model	ITU-R P.530-17
System Gain	118.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

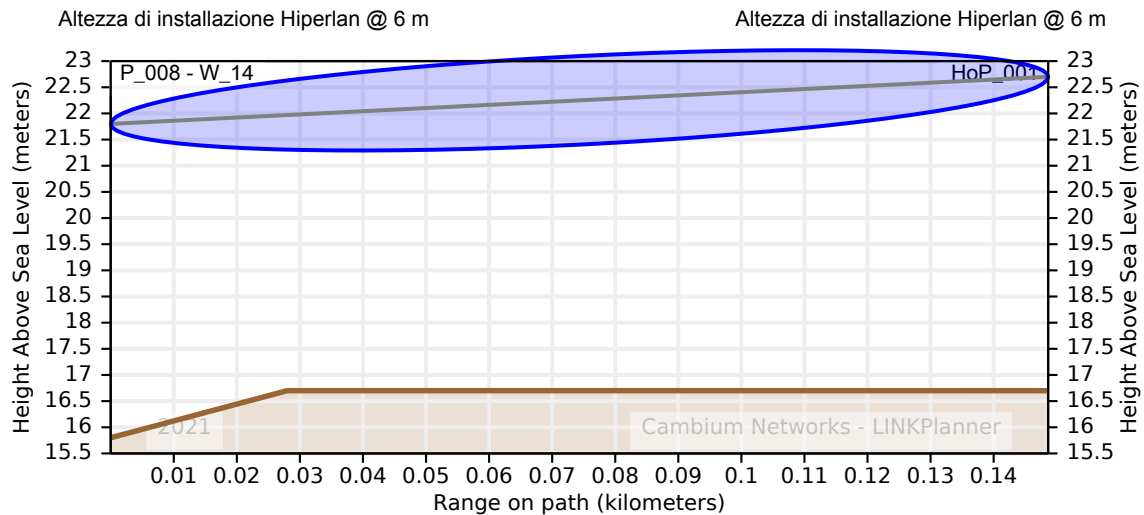
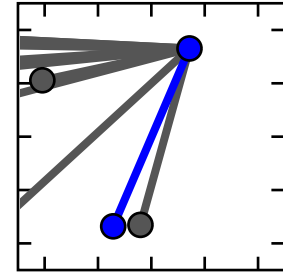
dN/dH not exceeded for 1% of time	-366.67 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	197.67 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.34e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	1.11e-13	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	52.46 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	30.99 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	76.35 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



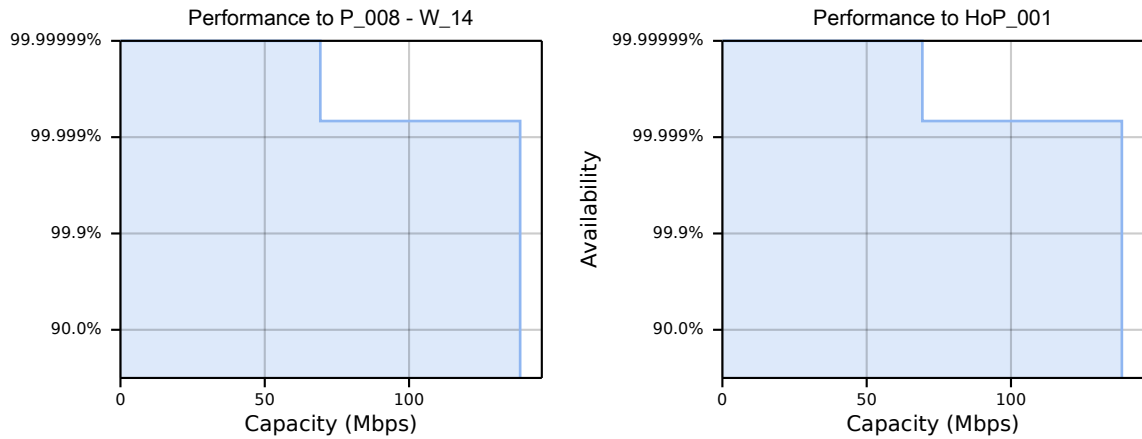
P_008 - W_14 direzione HoP_001



	Performance to P_008 - W_14	Performance to HoP_001
Mean IP	138.49 Mbps	138.42 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.149 km	System Gain Margin	41.33 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.91 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	90.85 dB	Prediction Model	ITU-R P.530-17
System Gain	132.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

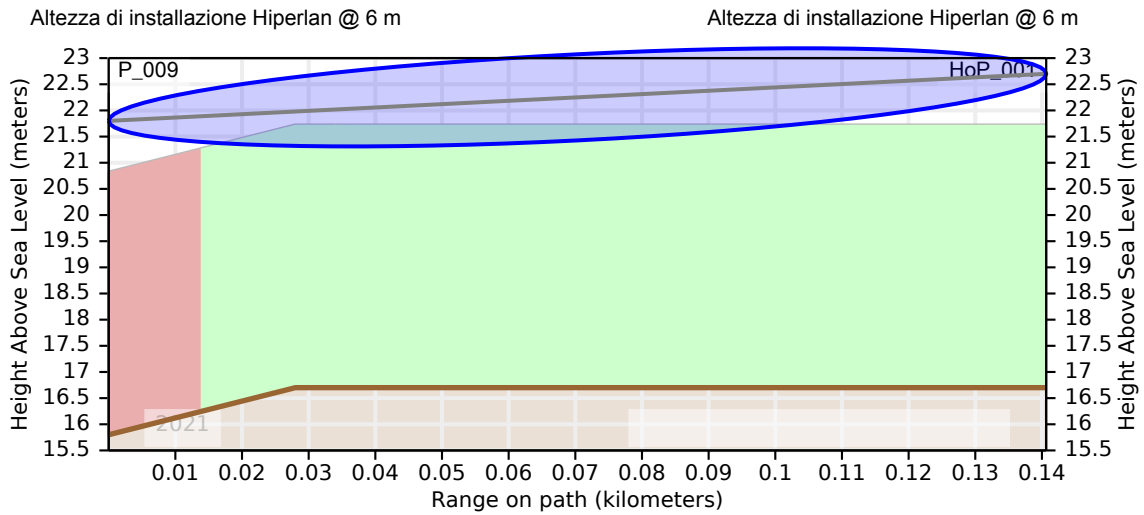
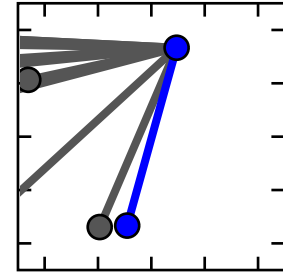
dN/dH not exceeded for 1% of time	-367.48 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	196.42 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.37e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	2.63e-10	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	6.05 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.03 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	90.85 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



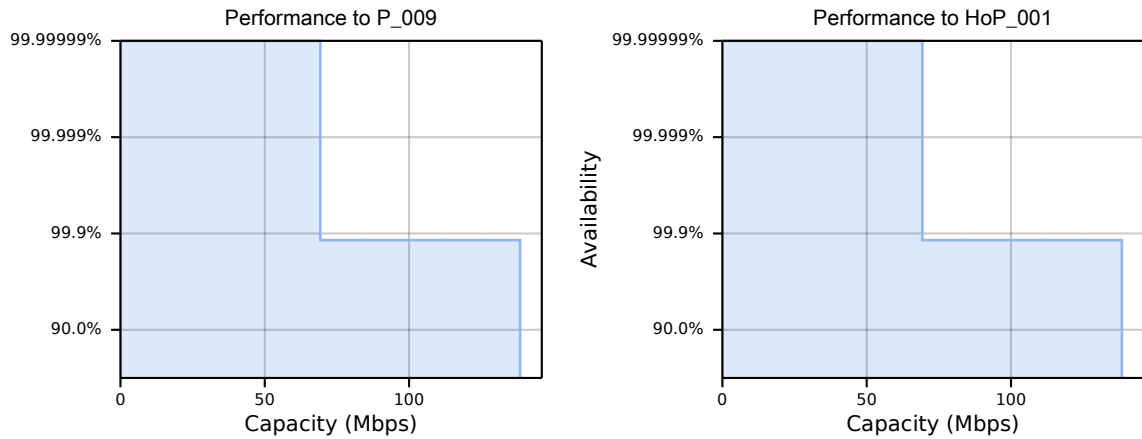
P_009 direzione HoP_001



	Performance to P_009	Performance to HoP_001
Mean IP	138.39 Mbps	138.33 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.141 km	System Gain Margin	37.81 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.72 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	97.37 dB	Prediction Model	ITU-R P.530-17
System Gain	135.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

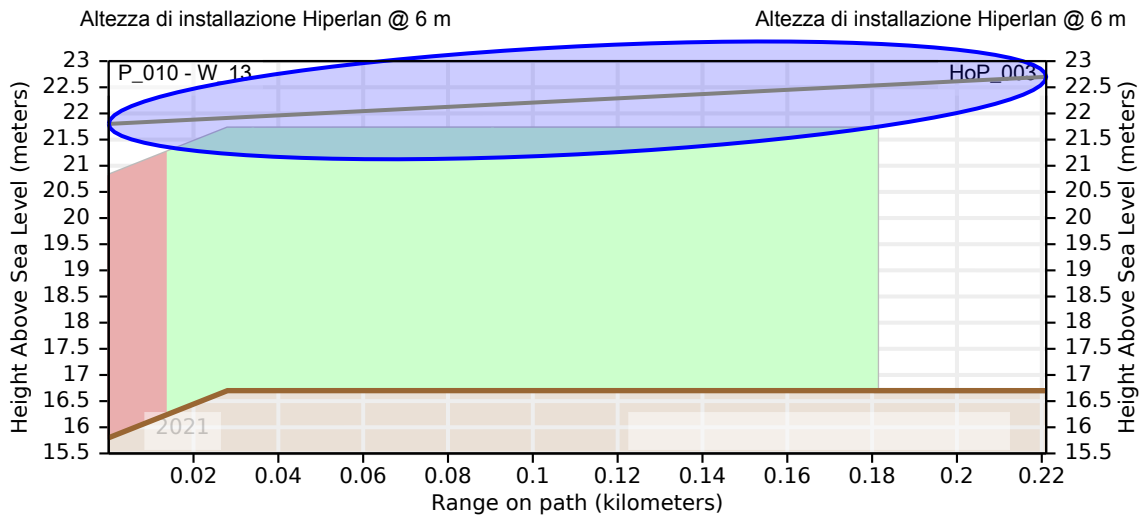
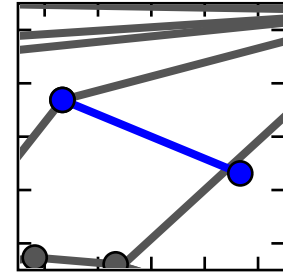
dN/dH not exceeded for 1% of time	-367.48 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	196.40 metre	Link Type	Near Line-of-Sight
Geoclimatic factor	3.37e-05	Excess Path Loss	7.00 dB
Fade Occurrence Factor (P0)	2.08e-10	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	6.40 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	7.01 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.03 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	90.37 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



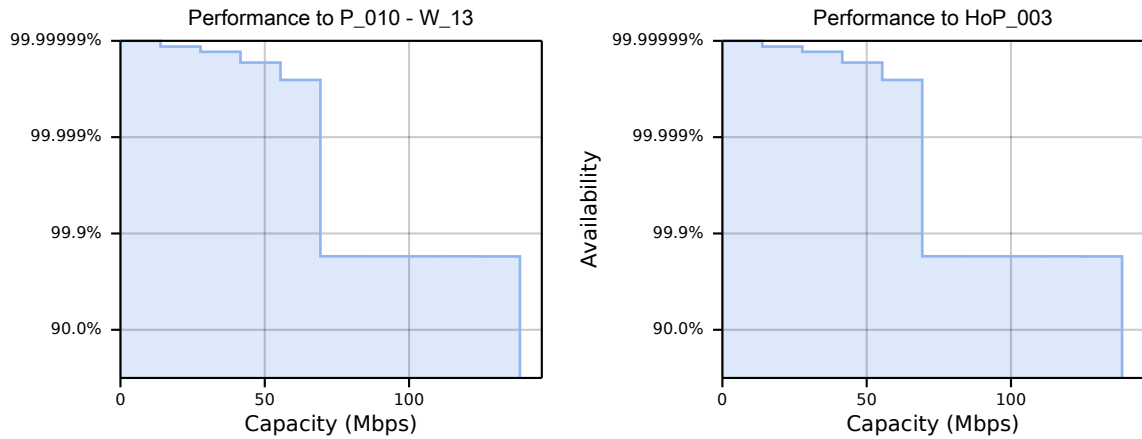
P_010 - W_13 direzione
HoP_003



	Performance to P_010 - W_13	Performance to HoP_003
Mean IP	138.21 Mbps	138.28 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.221 km	System Gain Margin	32.38 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.50 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	102.80 dB	Prediction Model	ITU-R P.530-17
System Gain	135.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

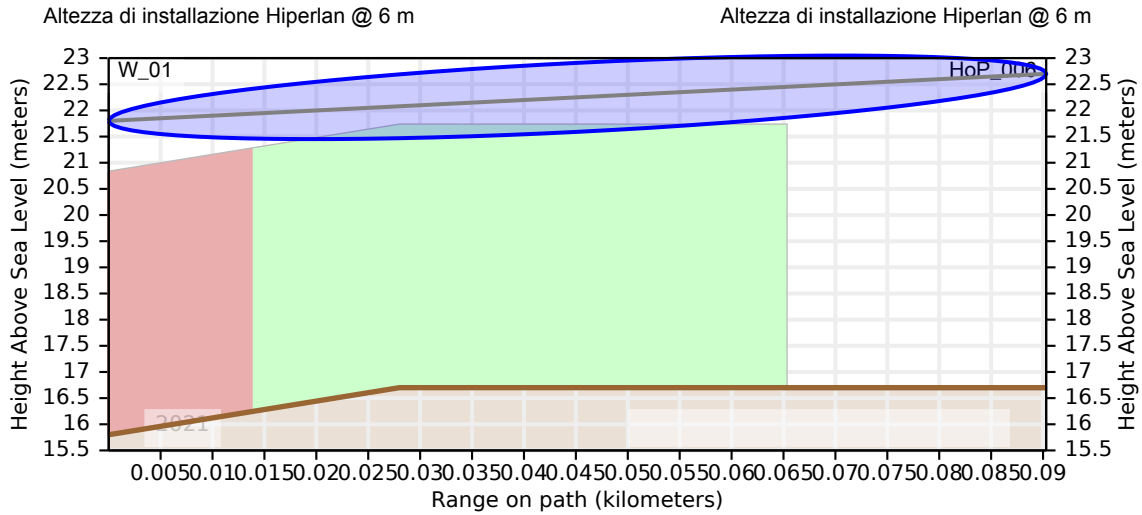
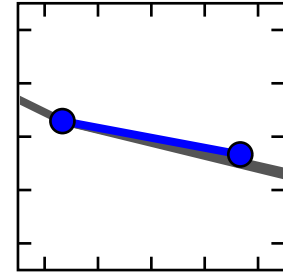
dN/dH not exceeded for 1% of time	-367.16 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	196.84 metre	Link Type	Near Line-of-Sight
Geoclimatic factor	3.36e-05	Excess Path Loss	8.50 dB
Fade Occurrence Factor (P0)	1.42e-09	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	4.07 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	8.51 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.02 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	94.30 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



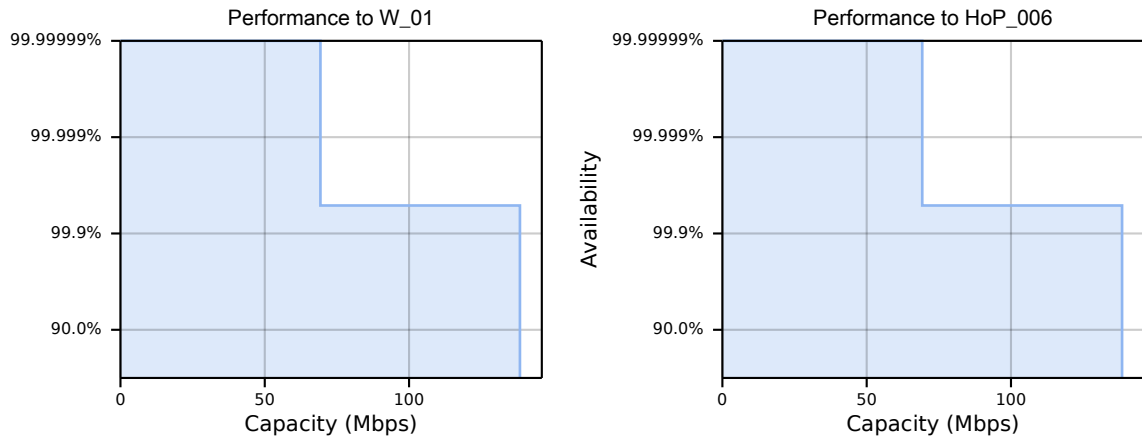
W_01 direzione HoP_006



	Performance to W_01	Performance to HoP_006
Mean IP	138.40 Mbps	138.47 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.090 km	System Gain Margin	40.35 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.87 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	90.83 dB	Prediction Model	ITU-R P.530-17
System Gain	131.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

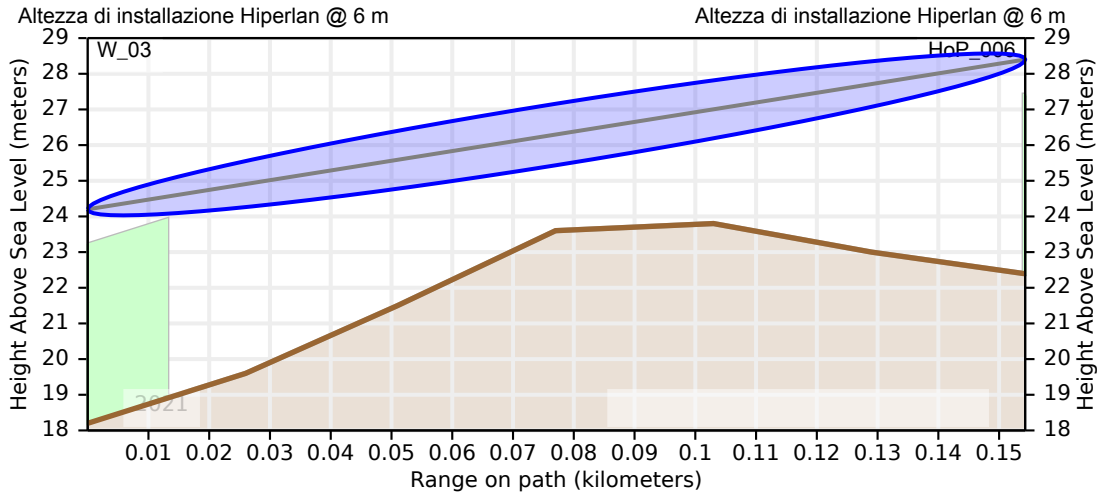
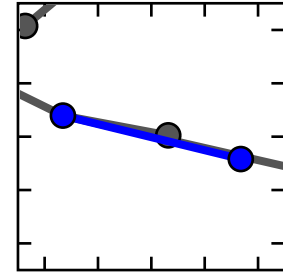
dN/dH not exceeded for 1% of time	-366.49 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	197.02 metre	Link Type	Near Line-of-Sight
Geoclimatic factor	3.34e-05	Excess Path Loss	4.30 dB
Fade Occurrence Factor (P0)	3.05e-11	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	9.97 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	4.31 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.02 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	86.52 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



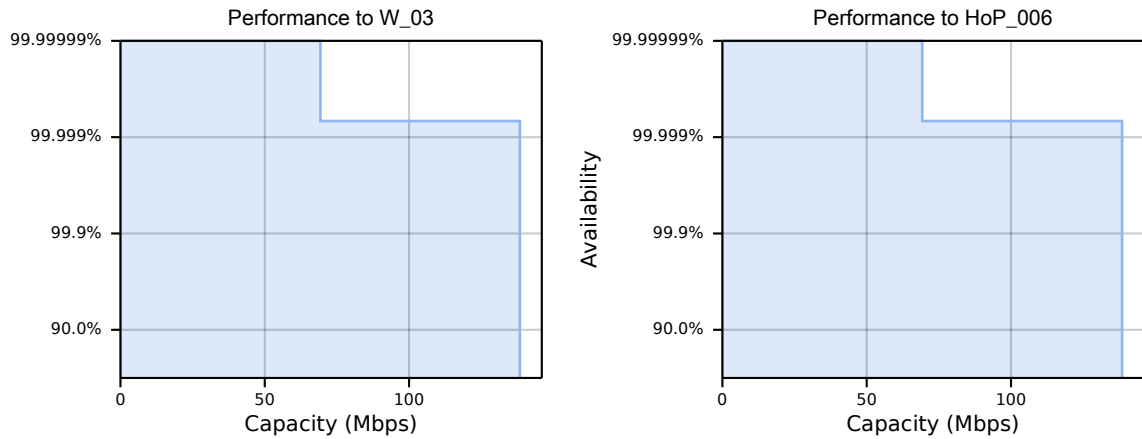
W_03 direzione HoP_006



	Performance to W_03	Performance to HoP_006
Mean IP	138.42 Mbps	138.49 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.154 km	System Gain Margin	42.00 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.91 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	91.18 dB	Prediction Model	ITU-R P.530-17
System Gain	133.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

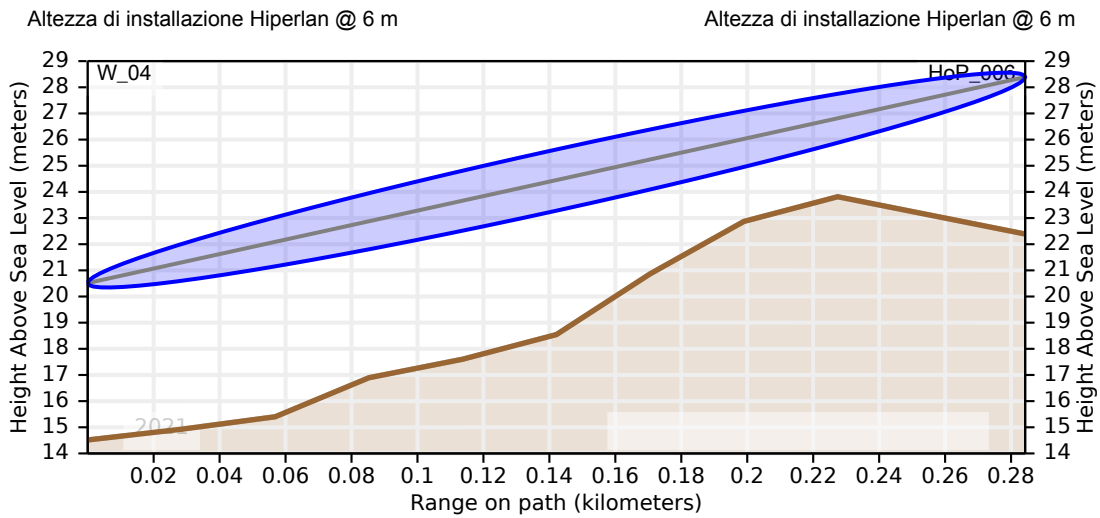
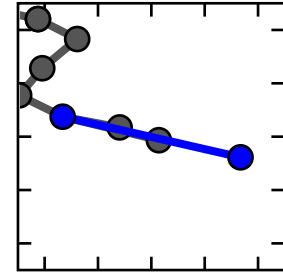
dN/dH not exceeded for 1% of time	-366.48 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	196.99 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.34e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	7.09e-11	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	27.22 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.02 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	91.17 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



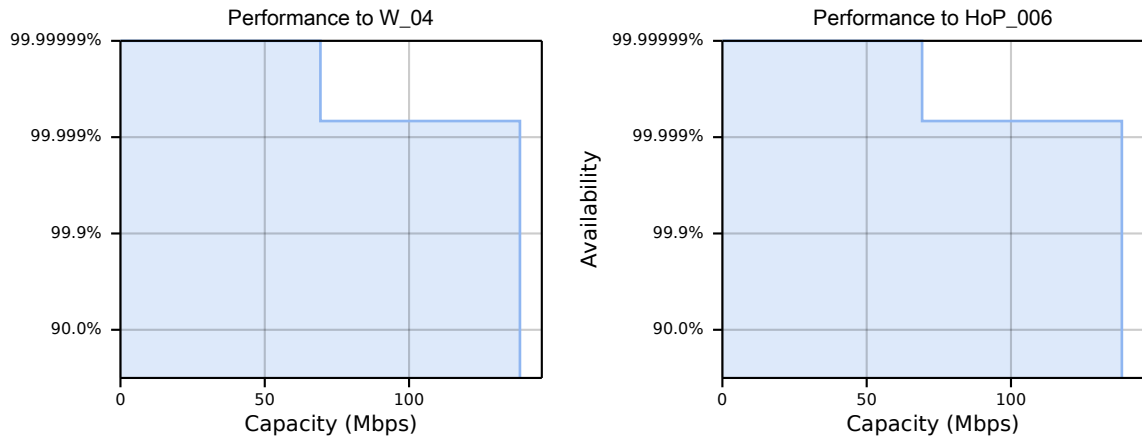
W_04 direzione HoP_006



	Performance to W_04	Performance to HoP_006
Mean IP	138.42 Mbps	138.42 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.284 km	System Gain Margin	38.69 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.84 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	96.49 dB	Prediction Model	ITU-R P.530-17
System Gain	135.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

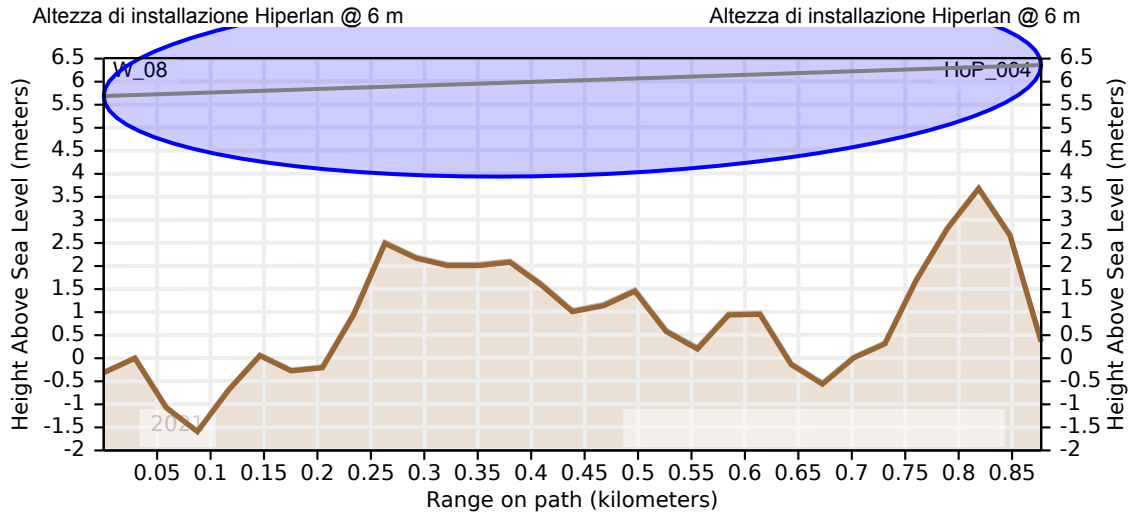
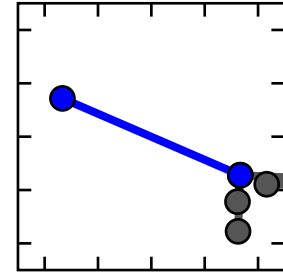
dN/dH not exceeded for 1% of time	-366.49 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	196.93 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.34e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	5.60e-10	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	27.70 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.02 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	96.48 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



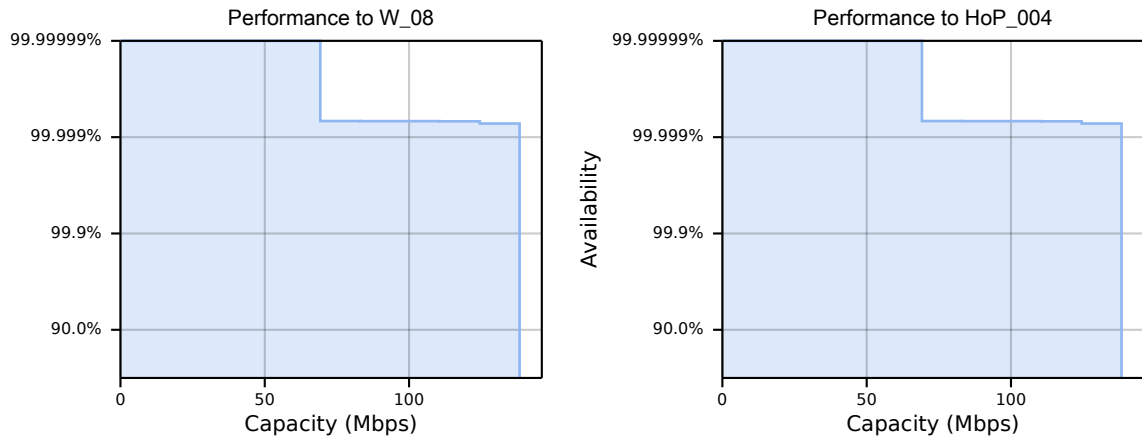
W_08 direzione HoP_004



	Performance to W_08	Performance to HoP_004
Mean IP	138.30 Mbps	138.30 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.877 km	System Gain Margin	28.90 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.60 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	106.28 dB	Prediction Model	ITU-R P.530-17
System Gain	135.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

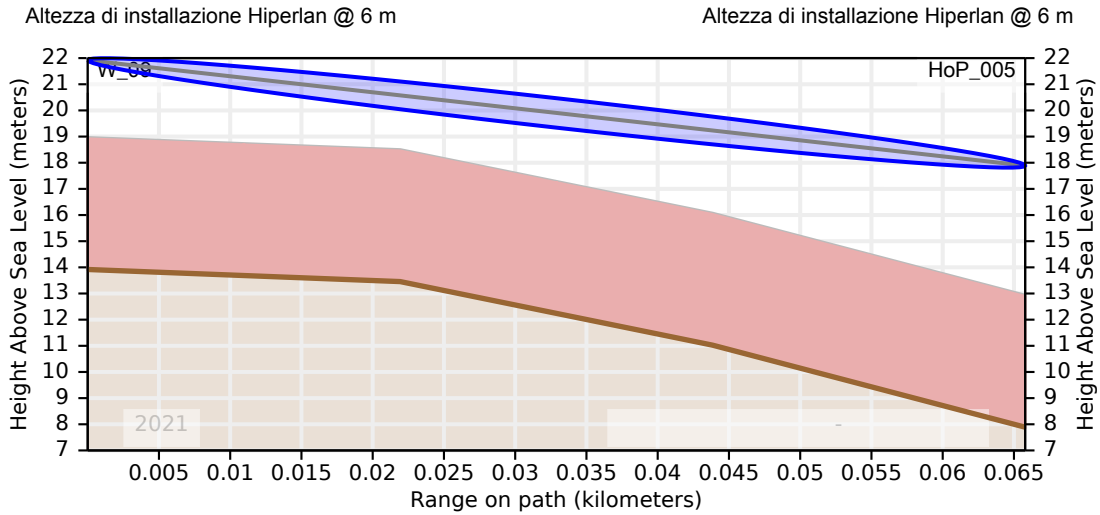
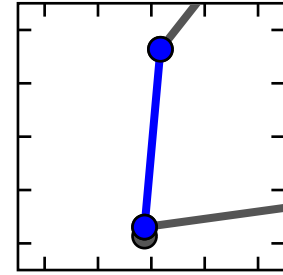
dN/dH not exceeded for 1% of time	-367.29 N units/km	Gaseous Absorption Loss	0.01 dB
Area roughness 110x110km	197.95 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.35e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	4.69e-07	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	0.77 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	30.97 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	106.27 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



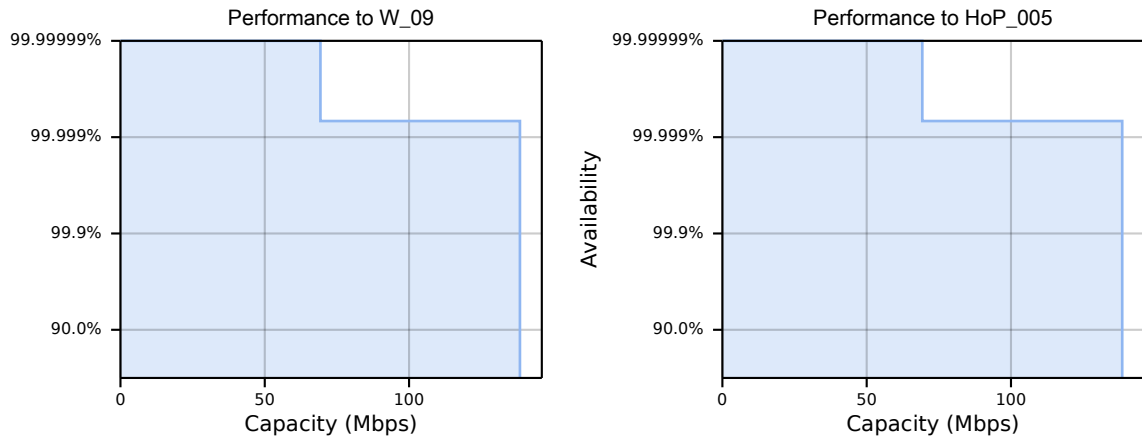
W_09 direzione HoP_005



	Performance to W_09	Performance to HoP_005
Mean IP	138.42 Mbps	138.54 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.066 km	System Gain Margin	41.41 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.96 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	83.77 dB	Prediction Model	ITU-R P.530-17
System Gain	125.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

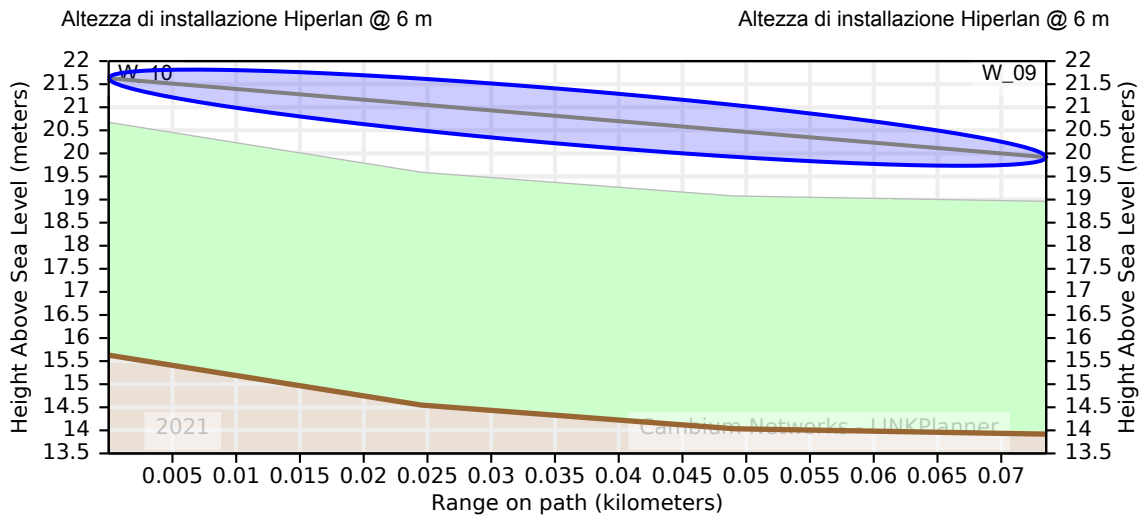
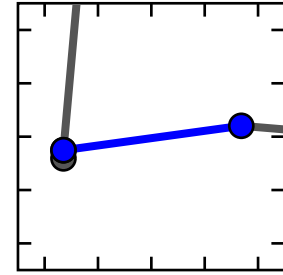
dN/dH not exceeded for 1% of time	-366.79 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	197.25 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.35e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	1.75e-12	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	61.24 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.00 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	83.77 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



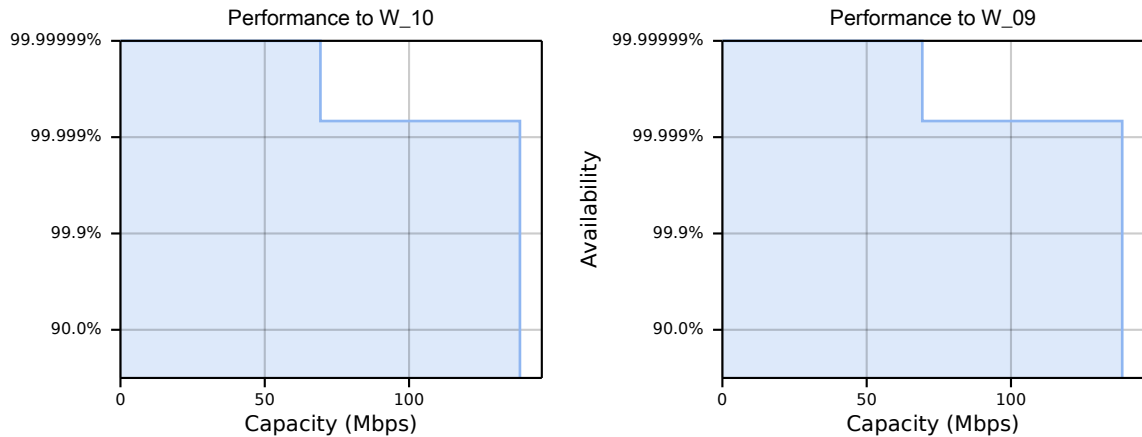
W_10 direzione W_09



	Performance to W_10	Performance to W_09
Mean IP	138.42 Mbps	138.54 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.074 km	System Gain Margin	41.44 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.96 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	84.74 dB	Prediction Model	ITU-R P.530-17
System Gain	126.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

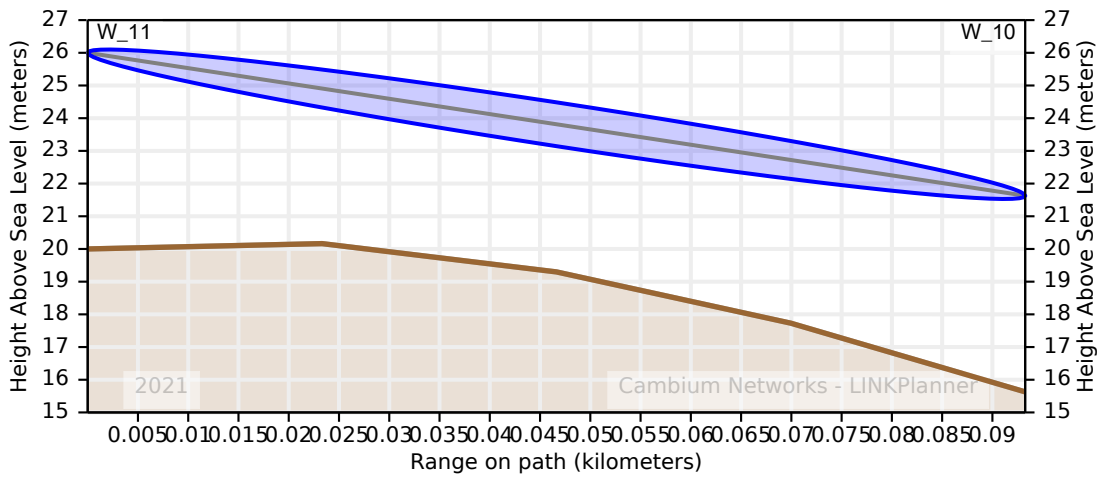
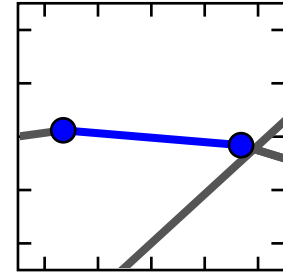
dN/dH not exceeded for 1% of time	-366.74 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	197.25 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.35e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	6.72e-12	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	23.27 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.00 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	84.74 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



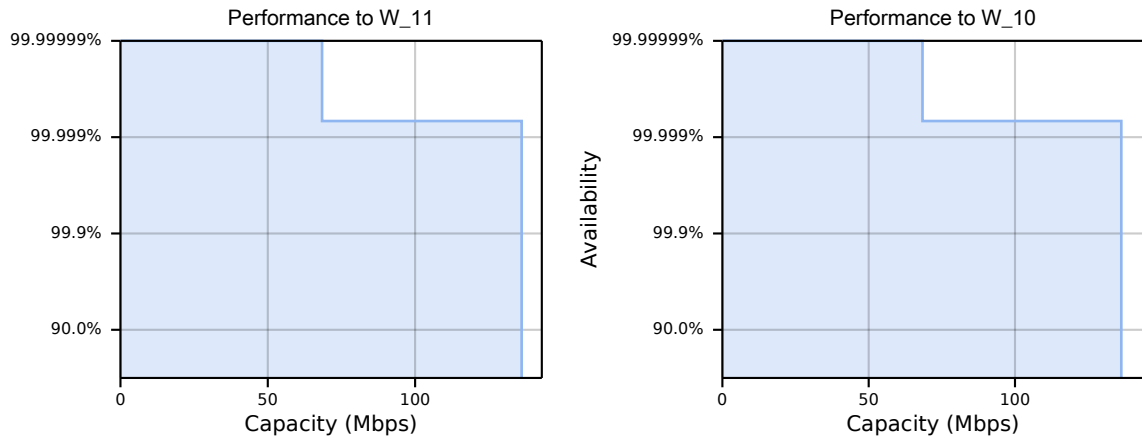
W_11 direzione W_10



	Performance to W_11	Performance to W_10
Mean IP	136.15 Mbps	136.33 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.093 km	System Gain Margin	41.38 dB
Band	5.4 GHz	Mean Aggregate Data Rate	272.48 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1024 Bytes
Total Path Loss	86.80 dB	Prediction Model	ITU-R P.530-17
System Gain	128.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

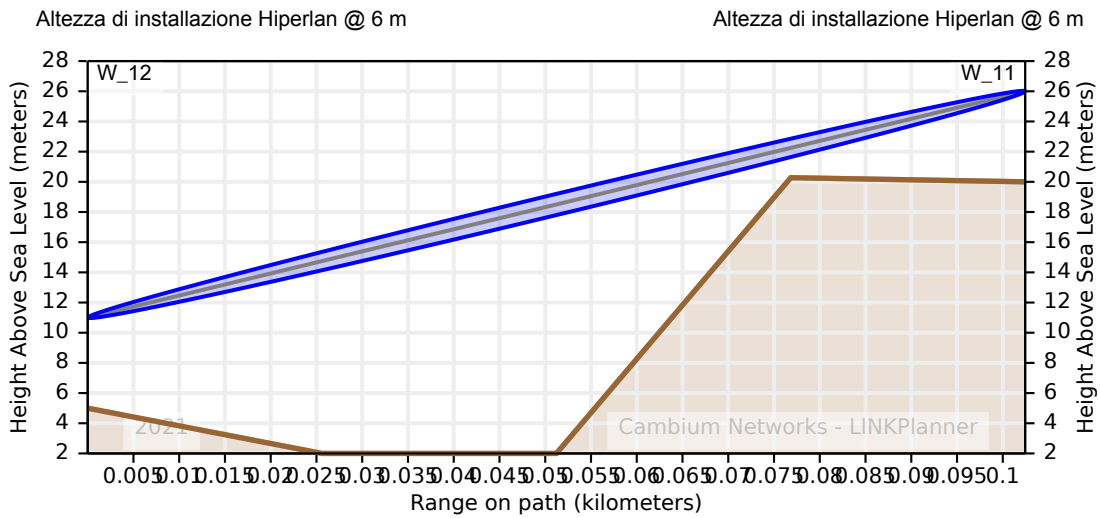
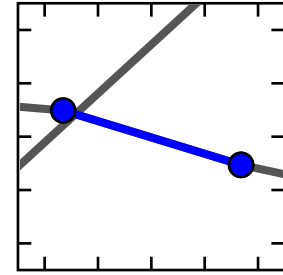
dN/dH not exceeded for 1% of time	-366.79 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	197.14 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.35e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	7.47e-12	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	46.87 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.01 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	86.80 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



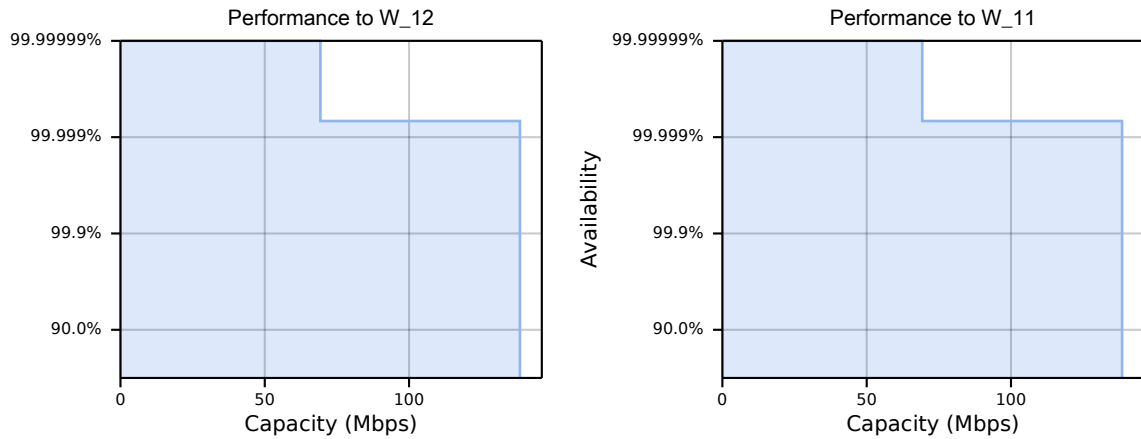
W_12 direzione W_11



	Performance to W_12	Performance to W_11
Mean IP	138.42 Mbps	138.49 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.102 km	System Gain Margin	41.56 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.91 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	87.62 dB	Prediction Model	ITU-R P.530-17
System Gain	129.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

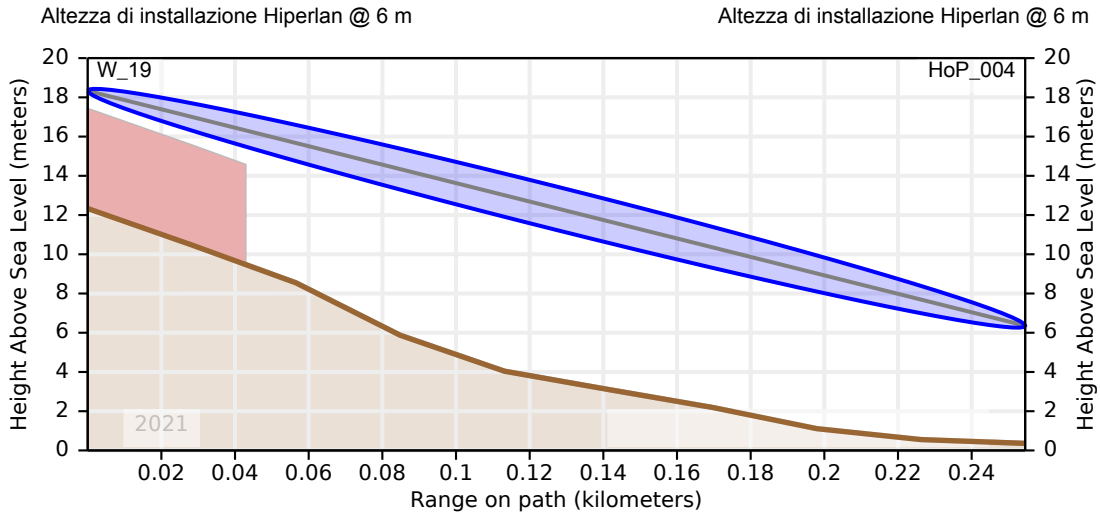
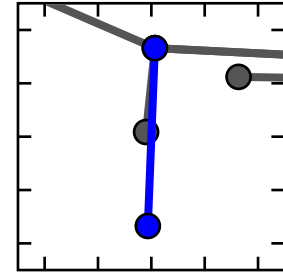
dN/dH not exceeded for 1% of time	-366.80 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	197.04 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.35e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	3.29e-12	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	146.42 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	31.01 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	87.62 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years



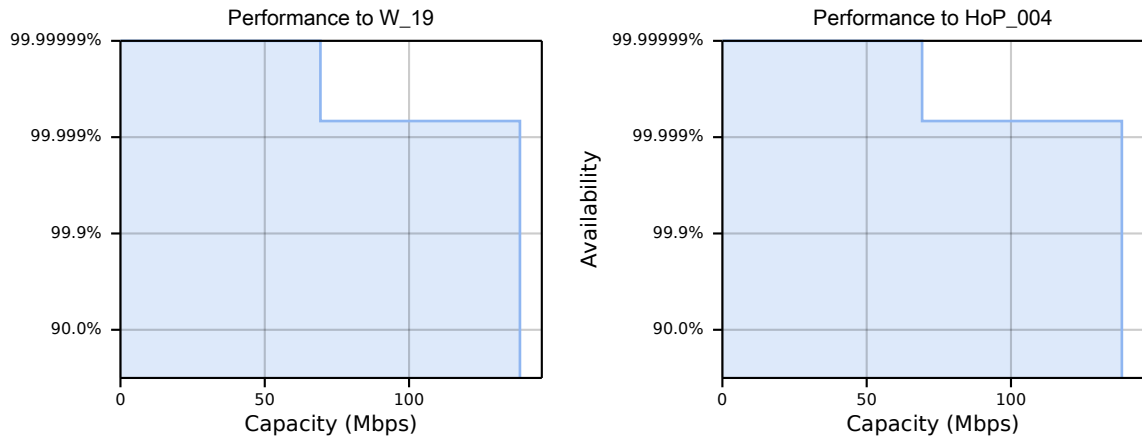
W_19 direzione HoP_004



	Performance to W_19	Performance to HoP_004
Mean IP	138.42 Mbps	138.42 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.255 km	System Gain Margin	39.66 dB
Band	5.4 GHz	Mean Aggregate Data Rate	276.84 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	40 MHz	Frame Size	1518 Bytes
Total Path Loss	95.52 dB	Prediction Model	ITU-R P.530-17
System Gain	135.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

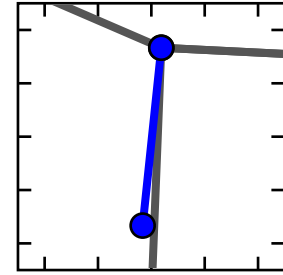
dN/dH not exceeded for 1% of time	-366.84 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	197.86 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.34e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	2.32e-10	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	47.04 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	30.98 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	95.52 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years

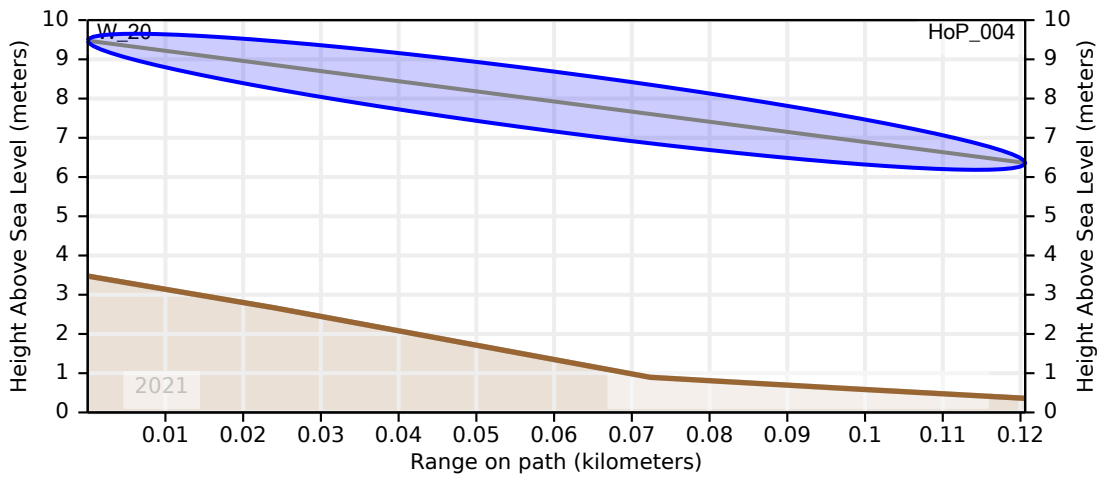


W_20 direzione HoP_004



Altezza di installazione Hiperlan @ 6 m

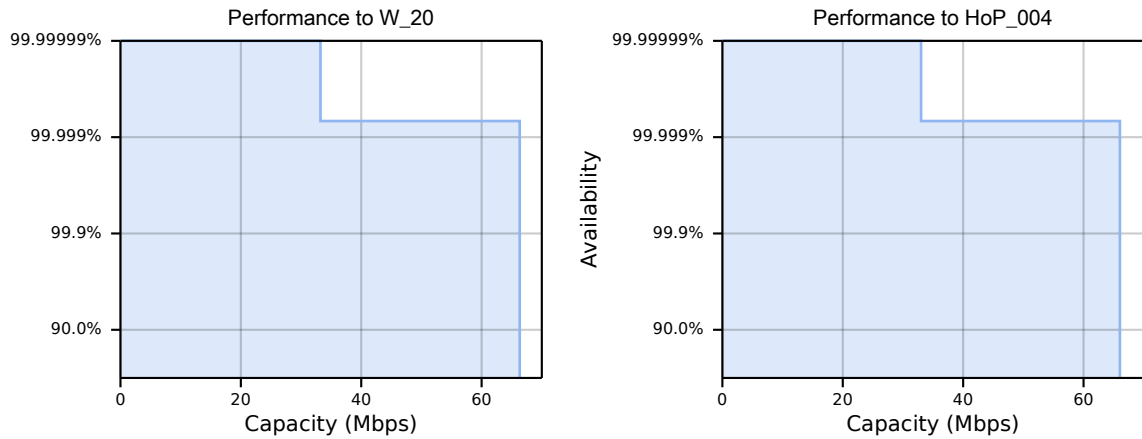
Altezza di installazione Hiperlan @ 6 m



	Performance to W_20	Performance to HoP_004
Mean IP	66.33 Mbps	66.04 Mbps
IP Availability	100.0000 % for 1.0 Mbps	100.0000 % for 1.0 Mbps

Link Summary			
Link Length	0.121 km	System Gain Margin	45.14 dB
Band	5.4 GHz	Mean Aggregate Data Rate	132.37 Mbps
Regulation	Italy	Annual Link Availability	100.0000 %
Modulation	Adaptive	Annual Link Unavailability	1 secs/year
Bandwidth	20 MHz	Frame Size	1518 Bytes
Total Path Loss	89.04 dB	Prediction Model	ITU-R P.530-17
System Gain	134.18 dB		

Performance Charts



Climatic Factors, Losses and Standards

dN/dH not exceeded for 1% of time	-366.98 N units/km	Gaseous Absorption Loss	0.00 dB
Area roughness 110x110km	197.77 metre	Link Type	Line-of-Sight
Geoclimatic factor	3.35e-05	Excess Path Loss	0.00 dB
Fade Occurrence Factor (P0)	3.34e-11	Atmospheric Gasses	ITU-R P.676-12, ITU-R P.835-6
Path inclination	25.84 mr	Diffraction Loss	ITU-R P.526-15
Value of K Exceeded for 99.99% (ke)	0.40	Propagation	ITU-R P.530-17
Excess Path Loss at ke	0.00 dB	Rain Rate	ITU-R P.837-7
0.01% Rain rate	30.98 mm/hr	Refractivity Index	ITU-R P.453-14
Free Space Path Loss	89.03 dB		

Bill of Materials

Part Number	Qty	Description
C000000L065	2	Gigabit Surge Suppressor (30V)
C050900C063	2	ePMP 1000: 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord). Kit includes radio with antenna, power supply, line cord and mounting bracket
EW-E2EPF200-WW	2	ePMP Force 200 Extended Warranty, 2 Addl Years

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