



WIRELESS MOBILE MESH NETWORKS

$$e = \sum_{n=0}^{\infty} \frac{1}{n!} = \lim_{n \rightarrow \infty} \left( \frac{1}{0!} + \frac{1}{1!} + \frac{1}{2!} + \dots + \frac{1}{n!} \right)$$

# Hypercable Radio SkyMesh

## SkyMesh-MIMO

Fixed & Mobile wireless solution

## HYC-N1051C-53

20 km No LOS Wireless  
Field Performance



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# HYC-N1051C-53 20 km PTP Link Site Setup



BS setup: HYC-N1051C-53  
with 26dBi MIMO panel embedded



Remote setup: HYC-N1051C-53  
with 26dBi MIMO panel embedded



# HYC-N1051C-53

## 20 km PTP Link Site Setup

### Test Equipment at each site

- Hypercable HYC-N1051C-53, with 26dBi MIMO panel embedded

### Purpose of Trial

1. To obtain link performance of HYC-N1051C-53 3 under high Noise Floor areas
2. To prove the high spectral efficiency & resistance of narrow channel bandwidth in highly congested area.

### Sites Condition

- Both selected sites are highly congested with 5GHz noise over a City with an average Noise Floor exceed -70dBm.

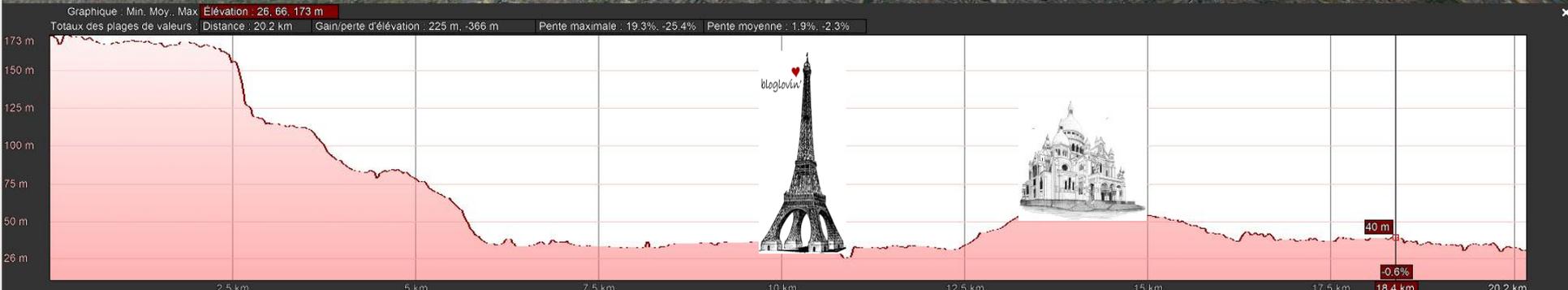
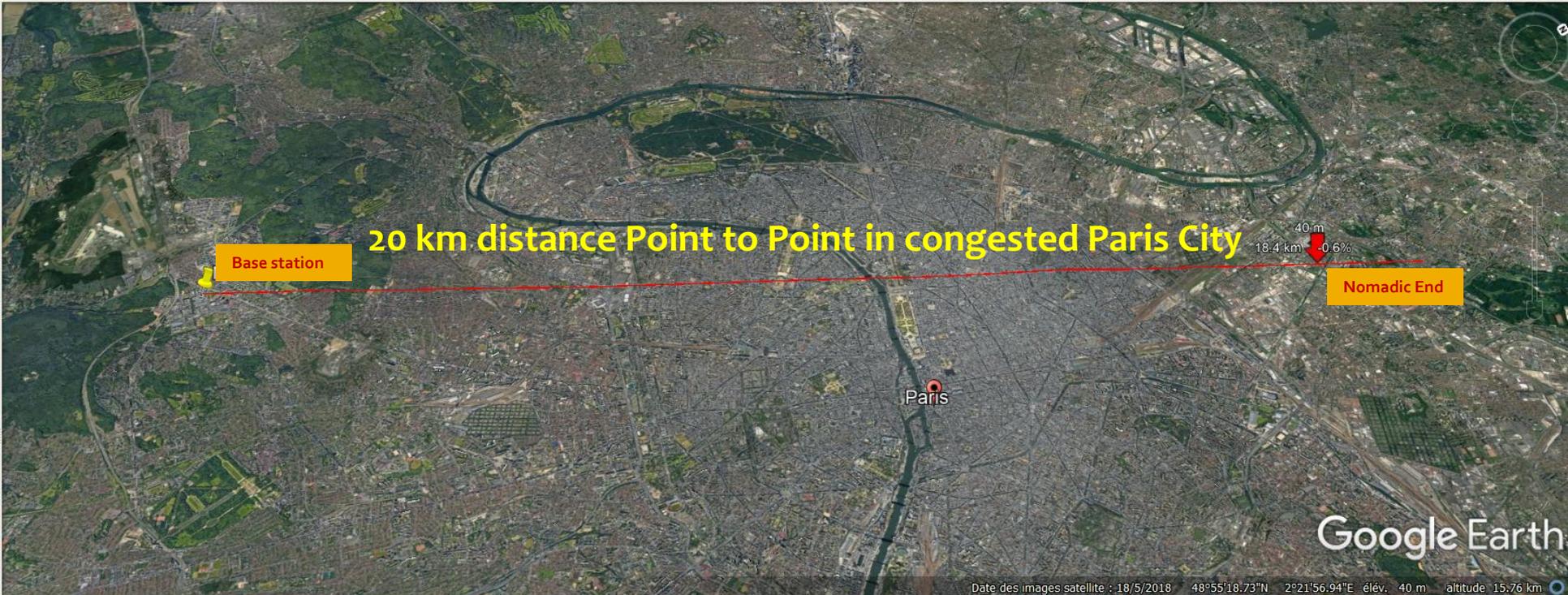
### Note: Features of Narrower Channel Bandwidth of SkyMesh-MIMO

- Easier to find out available spectrum range to allocate operating channels under congested area
- The narrower channel size, the lower minimum SNR value



# HYC-N1051C-53

## 20 km PTP Link Site Condition

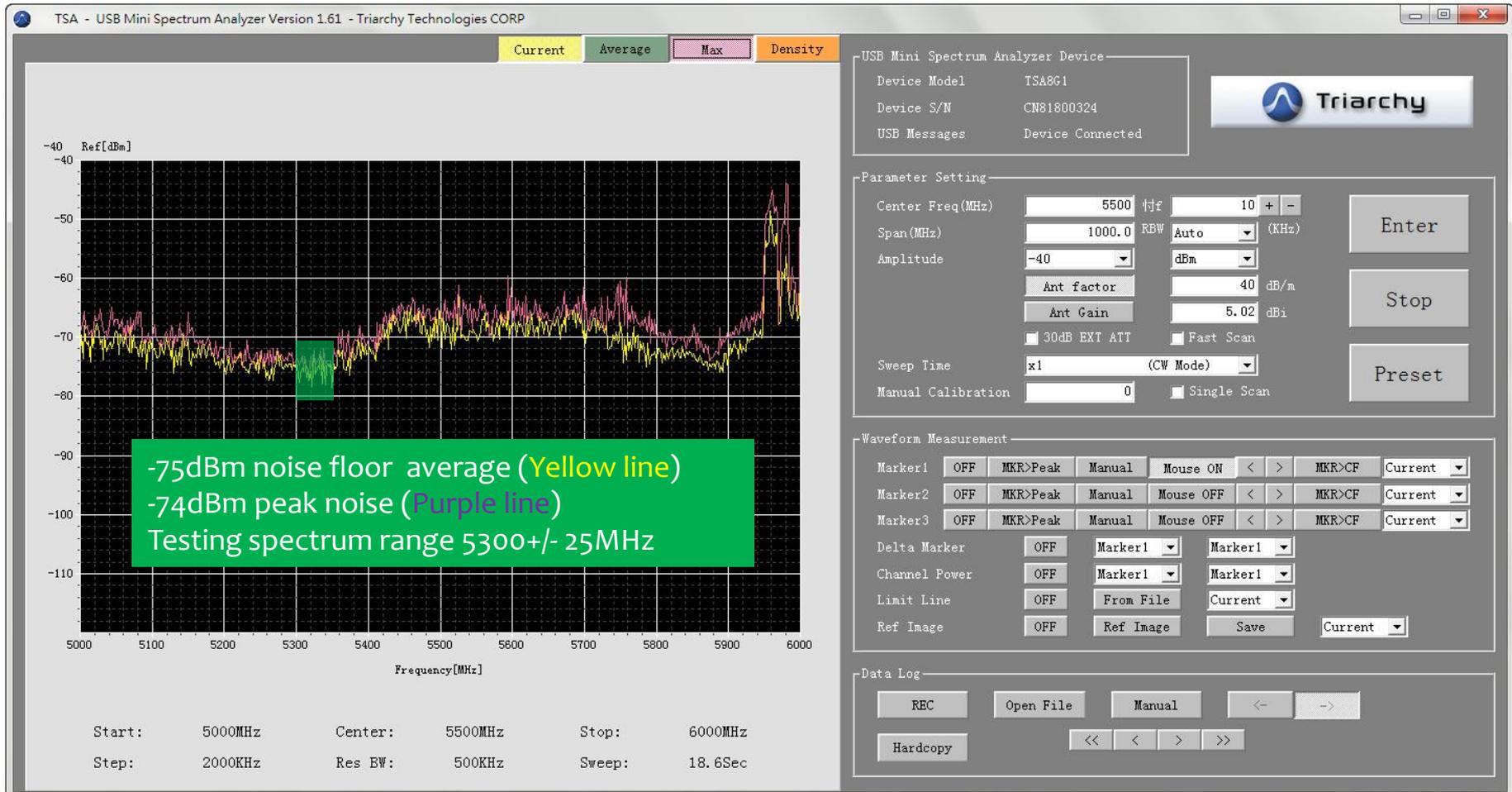




# HYC-N1051C-53

## 20 km PTP Link Site Setup

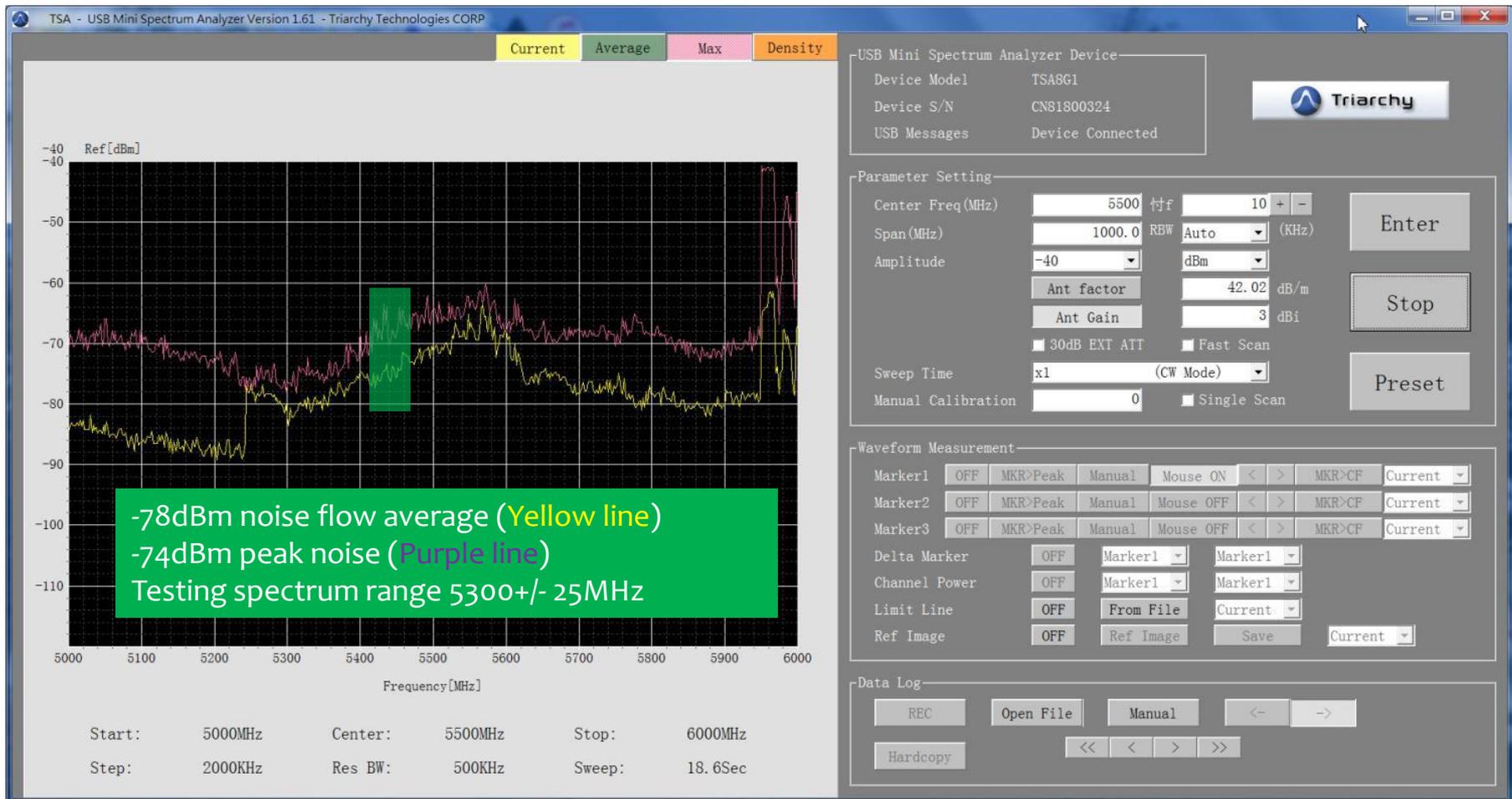
### Environmental Noise Spectrum Analysis @ BS Site





# HYC-N1051C-53 20 km PTP Link Site Setup

## Environmental Noise Spectrum Captured @ Remote Site

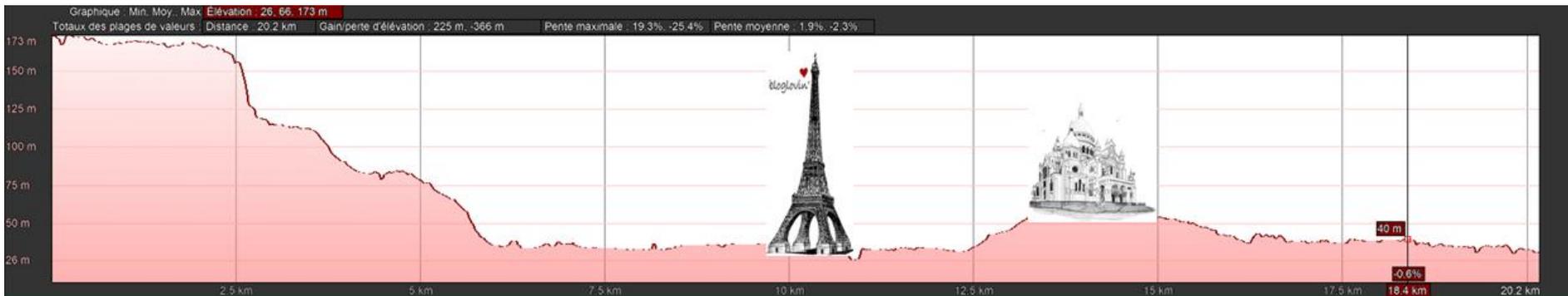




# HYC-N1051C-53 20 km PTP Link Result Obtained

Performance of HYC-N1051C-53, 26dBi MIMO Panel antenna embedded over 20 km:

Channel BW	5MHz	10MHz	20MHz	40MHz	NOTE
RSSI (field)	-68 ~ -71dBm	-68 ~ -71dBm	-70 ~ -73dBm	-70 ~ -73dBm	
Modulation (Expected)	64QAM5/6	64QAM5/6	64QAM2/3	64QAM2/3	RSSI @ 1% error rate
Modulation (Actual)	64QAM5/6	64QAM5/6	64QAM2/3	16QAM3/4~64QAM2/3	Noise Floor Level: -70 ~ -75dBm
Throughput (Expected)	23Mbps	50Mbps	80Mbps	120 ~ 160Mbps	
Throughput (Actual)	23Mbps (As expected)	50Mbps (As expected)	86Mbps (As expected)	131Mbps (As expected)	Noise Floor Level: -70 ~ -75dBm





# HYC-N1051C-53 Point-to-Point Calculator for over 20KM Distance

## 5GHz Radio Performance

Distance	30KM	40KM	50KM	Environment Noise Flood	NOTE
Antenna Type	30dBi MIMO Dish – ANT5030D-P	30dBi MIMO Dish – ANT5030D-P	30dBi MIMO Dish – ANT5030D-P		
Channel BW	20MHz	20MHz	10MHz		
Min. SNR	18 ~ 20dBm	18 ~ 20dBm	12 ~ 15dBm		
RSSI	-68 ~ -71dBm	-71 ~ -73dBm	-73 ~ -76dBm		
Throughput 1	90Mbps	80Mbps	40Mbps	NF = -90dBm	Rural area
Throughput 2	70Mbps	60Mbps	30 ~ 40Mbps	NF = -70 ~ -75dBm	Congested area

- Narrower channel bandwidth require lower SNR to operation. Better performance in highly crowded area can be expected.
- The values of both throughput1 and throughput2 is for different ambient noise level.
- The table is for **LOS** applications.