



Test Report

**5G Network Trial at 26/28GHz mmWave band
in Sheltered bus stop,
337 Cheung Sha Wan Road**

Temporary Permit No. T00713

China Mobile Hong Kong Co. Ltd (CMHK)

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Version 1.0



1. Introduction

On 21 March 2017, the CA promulgated its work plan for making available additional radio spectrum for public mobile services to meet the increasing aspirations of service users towards 2020 and beyond. The work plan has identified a number of frequency bands, including the 3.4 – 3.6 GHz band (“3.5 GHz band”), the 24.25 – 27.5 GHz band and the 27.5 – 28.35 GHz band (“26/28 GHz bands”), that can be made available for reallocation to mobile services to prepare for the launch of fifth generation mobile (“5G”) services.

CMHK has set up a trial outdoor mmWave site located at Sheltered bus stop, 337 Cheung Sha Wan Road. The test report will describe the setup and trial result of 5G mmWave HAAU conducted on 10-May-2020 with two carriers (2*200MHz bandwidth). The trial period approved in temp permit T00713 is from 15-Feb-2020 to 14-Aug-2020.

2. Trial Location

- Location: Sheltered bus stop, 337 Cheung Sha Wan Road
- Testing Area : Cheung Sha Wan Road
- 5G site type: Outdoor

5G 26/28GHz mmWave HAAU is installed at sheltered bus stop, 337 Cheung Sha Wan Road as shown below.



Figure 2-1 HAAU trail location at Sheltered KMB Bus Stop

3. Trial Setup

3.1 Test Equipment



Figure 3-1 HAAU exterior

Item	Device or software	Count
1	5G HAAU	2 sets
2	5G Huawei CPE 2.0	1 set

28GHz Huawei HAAU specification:

Table 3-1 Operating frequency band

Frequency Band (GHz)	Operating Frequency Band (GHz)	Bandwidth (MHz)	IBW (MHz)
28	26.5 to 29.5	100 / 200	3000

Table 3-2 Capacity

Mode	Capacity	Tx/Rx Channel
NR	2 carrier with 200MHz each	4T4R

Table 3-3 Output Power

Frequency Band (GHz)	Maximum Output Power
28	31.5 dBm@400 MHz

Table 3-4 Antenna electrical specifications

Frequency range (GHz)	Gain (dBi)	Polarization Mode	Directionality
26.5 to 29.5	28.5 dBi	+45 and -45	directional

3.2 Test Configuration

Below is 5G cell configurations for the test at Sheltered bus stop, 337 Cheung Sha Wan Road.

	NR Cell Configuration
Frequency Band	n257
Downlink NARFCN	2063333, 2066665
Downlink Bandwidth	200MHz x 2
Subcarrier Spacing(KHz)	120
Slot Assignment	4:1
Max Transmit Power (EIRP)	33 dBm
EN-DC	Off

4. Measurement Result

13 test positions (highlighted in green) at Cheung Sha Wan Road were measured for coverage and throughput.



Figure 4-1 mmWave Test position



5G Huawei CPE 2.0 was being used to test the OFCA throughput.

Test position	Distance to HAAU	RSRP (dBm)	SINR (dB)	Download (Mbps)	Upload (Mbps)	Network Latency (ms)
P1	25	Cannot Attach NR				
P2	47	-113	20.1	412	243	7
P3	27	-110	18.1	455	106	7
P4	14	-94	26	542	412	7
P5	10	-97	21	551	530	7
P6	0	-103	20	551	524	8
P7 (Bus stop)	6	-104	22	454	258	9
P8	0	-102	20	503	229	9
P9	7	-94	22	458	449	7
P10	15	-94	23	505	286	7
P11	27	-96	23	594	289	8
P12	49	-109	20	156	183	8
P13	65	Cannot Attach NR				

Overall test summary:

Avg RSRP (dBm)	Avg SINR (dB)	Avg Download (Mbps)	Avg Upload (Mbps)	Avg Latency (ms)
-101	21.4	471	319	7.5

5. Conclusion

The 5G outdoor site with HAAU at 26/28GHz mmWave band is successfully deployed and tested at Sheltered bus stop, 337 Cheung Sha Wan Road. This demonstrates the feasibility of outdoor 5G mmWave site deployment at urban area. The measurement results verified that the coverage and data throughput of 5G NR.