

technicolor



vantiva
Pushing the edge



Bluetooth & Wi-Fi antennas

Specification & Test report

Applicable to Set top boxes

Platform: UCW4060MCS



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Document revision

Version	Owner	Status	Description
0.1	I. Ben Trad	Draft	Creation

1.1 Introduction

Document does provide antenna technical data for UCW4060MCS.

1.2 Test equipment

- List of used equipment:
 - Network Analyzer: R&S ZNB 20



Figure 1 : Used network analyzer

- StarLab



Figure 2 : Used StarLab.

Test Company	Vantiva (formerly known as Technicolor)
Test Address	975 Avenue des Champs Blancs. 35576 Cesson-Sévigné Cédex, France
Test Date	06-06-2023
Test Instruments	Network Analyzer: R&S ZNB 20, StarLab

1.3 D.U.T

The UCW4060MCS contains:

- Two off-board dual-band WiFi antennas: DB1 & DB2
- One on-board printed 2.4G antenna: BT

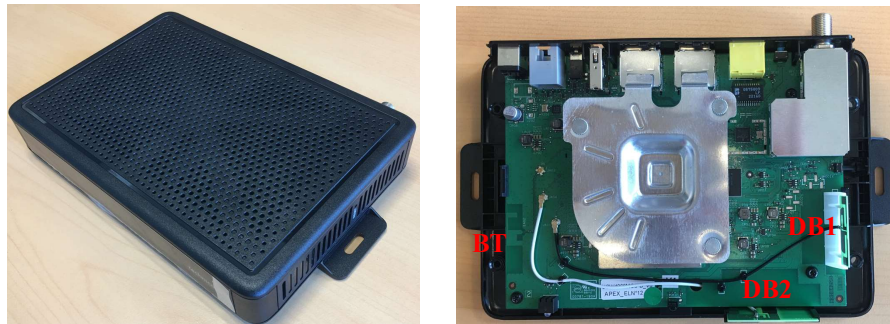


Figure 3: View of the UCW4060MCS device.

1.4 Antenna gain summary table

(maximum values)

Frequency band	2400-2483,5 MHz	5150-5350 MHz	5470-5725 MHz	5725-5850 MHz
WiFi frequency channels	CH1-13	CH36-64	CH100-140	CH149-165
ANT1=DB1	2.72	4.28	5.25	5.25
ANT2=DB2	3.37	5.05	4.65	4.32
Correlated directional gain	5.57	5.69	5.84	5.46
Uncorrelated directional gain	2.83	2.81	3.27	3.29
BT	3.03	-	-	-

1.5 Peak Gain & efficiency

DB1			DB2		
Frequency (MHz)	Efficiency (%)	Gain (dBi)	Frequency (MHz)	Efficiency (%)	Gain (dBi)
2400	75	2.19	2400	76	2.53
2412	77	2.29	2412	79	2.72
2417	76	2.4	2417	79	2.85
2422	77	2.38	2422	79	2.81
2427	78	2.45	2427	80	2.86
2432	78	2.52	2432	80	2.97
2437	78	2.59	2437	80	3.08
2442	78	2.56	2442	80	3.05
2447	79	2.66	2447	81	3.17
2452	78	2.63	2452	80	3.16
2457	78	2.63	2457	79	3.19
2462	79	2.72	2462	81	3.3
2467	80	2.72	2467	81	3.37
2472	78	2.65	2472	80	3.33
2477	77	2.58	2477	79	3.25
2483.5	77	2.63	2483.5	79	3.37
2484	77	2.62	2484	78	3.37
2490	77	2.65	2490	79	3.44
2500	78	2.71	2500	80	3.53

BT		
Frequency (MHz)	Efficiency (%)	Gain (dBi)
2400	64	2.53
2412	67	2.73
2417	67	2.78
2422	68	2.83
2427	69	2.88
2432	69	2.9
2437	70	2.91
2442	70	2.93
2447	71	2.96
2452	70	2.95
2457	70	2.95
2462	71	3.03
2467	71	2.96
2472	69	2.9
2477	68	2.84
2483.5	68	2.84
2484	68	2.8
2490	68	2.79
2500	68	2.85

Figure 4 : Efficiency and peak gain of DB1, DB2 and BT in 2.4GHz band

DB1		
Frequency (MHz)	Efficiency (%)	Gain (dBi)
5150	72	4.14
5180	72	4.16
5190	72	4.2
5200	73	4.22
5210	71	4.21
5220	73	4.22
5230	72	4.21
5240	72	4.19
5250	73	4.18
5260	72	4.13
5270	72	4.11
5280	71	4.12
5290	71	4.14
5300	71	4.14
5310	71	4.18
5320	72	4.19
5350	71	4.28
5400	72	4.37
5450	73	4.43
5470	72	4.44
5500	73	4.46
5510	73	4.47
5520	72	4.43
5530	72	4.48
5540	71	4.53
5550	71	4.58
5560	72	4.69
5570	70	4.66
5580	73	4.68
5590	70	4.8
5600	70	4.8
5610	71	4.86
5620	72	4.96
5630	72	4.96
5640	73	5.05
5660	73	5.08
5670	74	5.18
5680	74	5.19
5690	73	5.17
5700	74	5.23
5710	73	5.23
5720	74	5.25
5725	73	5.22
5745	75	5.25
5755	74	5.24
5765	71	5.13
5775	71	5.14

DB2		
Frequency (MHz)	Efficiency (%)	Gain (dBi)
5150	64	5.05
5180	63	4.75
5190	65	4.65
5200	66	4.67
5210	66	4.68
5220	66	4.62
5230	67	4.63
5240	68	4.49
5250	68	4.48
5260	70	4.49
5270	68	4.35
5280	69	4.29
5290	68	4.25
5300	67	4.12
5310	68	4.19
5320	68	4.14
5350	67	4.13
5400	71	4.37
5450	74	4.75
5470	72	4.65
5500	72	4.62
5510	72	4.56
5520	72	4.53
5530	71	4.53
5540	69	4.42
5550	70	4.43
5560	70	4.42
5570	68	4.32
5580	69	4.4
5590	70	4.4
5600	70	4.41
5610	72	4.55
5620	72	4.53
5630	72	4.51
5640	73	4.53
5660	72	4.47
5670	72	4.45
5680	71	4.39
5690	70	4.34
5700	69	4.24
5710	69	4.19
5720	69	4.19
5725	68	4.1
5745	72	4.3
5755	70	4.2
5765	69	4.11
5775	69	4.14

5785	73	5.24	5785	71	4.17
5795	72	5.14	5795	72	4.32
5800	71	5.15	5800	72	4.27
5805	69	5.09	5805	70	4.19
5825	68	5.16	5825	71	4.08
5850	68	5.08	5850	70	4.08

Figure 5 : Efficiency and peak gain of DB1 and DB2 in 5GHz band

1.6 BT antenna: 2D radiation pattern

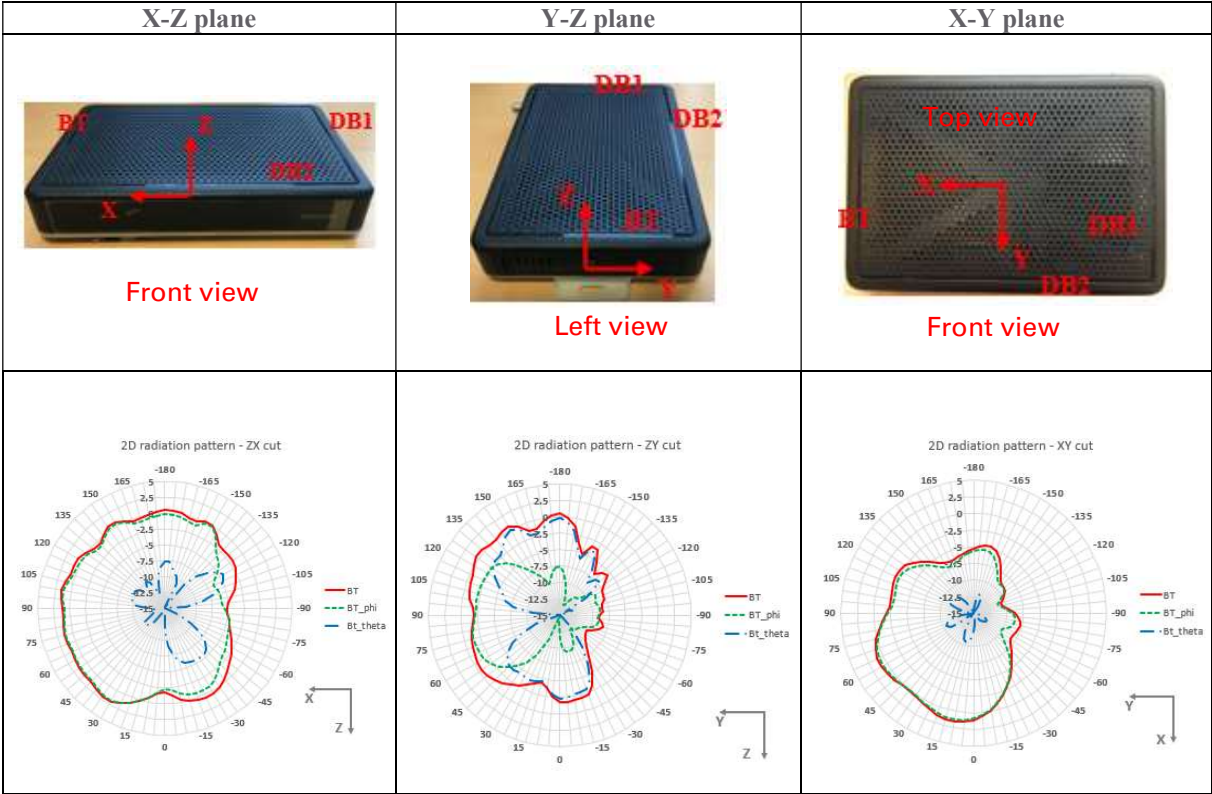


Figure 6 : 2D cuts of peak gain for BT antenna @2.45GHz.

1.7 Directional gain

Frequency (MHz)	Peak directional gain 1S2T (DB1+DB2) (dBi)	Peak directional gain 2S2T (DB1, DB2) (dBi)
2400	5.02	2.17
2412	5.15	2.32
2417	5.28	2.45
2422	5.19	2.37
2427	5.23	2.43
2432	5.34	2.55
2437	5.43	2.65
2442	5.35	2.58
2447	5.47	2.71
2452	5.43	2.67
2457	5.43	2.66
2462	5.56	2.81
2467	5.57	2.83
2472	5.50	2.76
2477	5.39	2.66
2483.5	5.49	2.77
2484	5.49	2.76
2490	5.51	2.80
2500	5.55	2.85

Figure 7 : Directional gain for correlated signals of Wi-Fi antennas @2G.

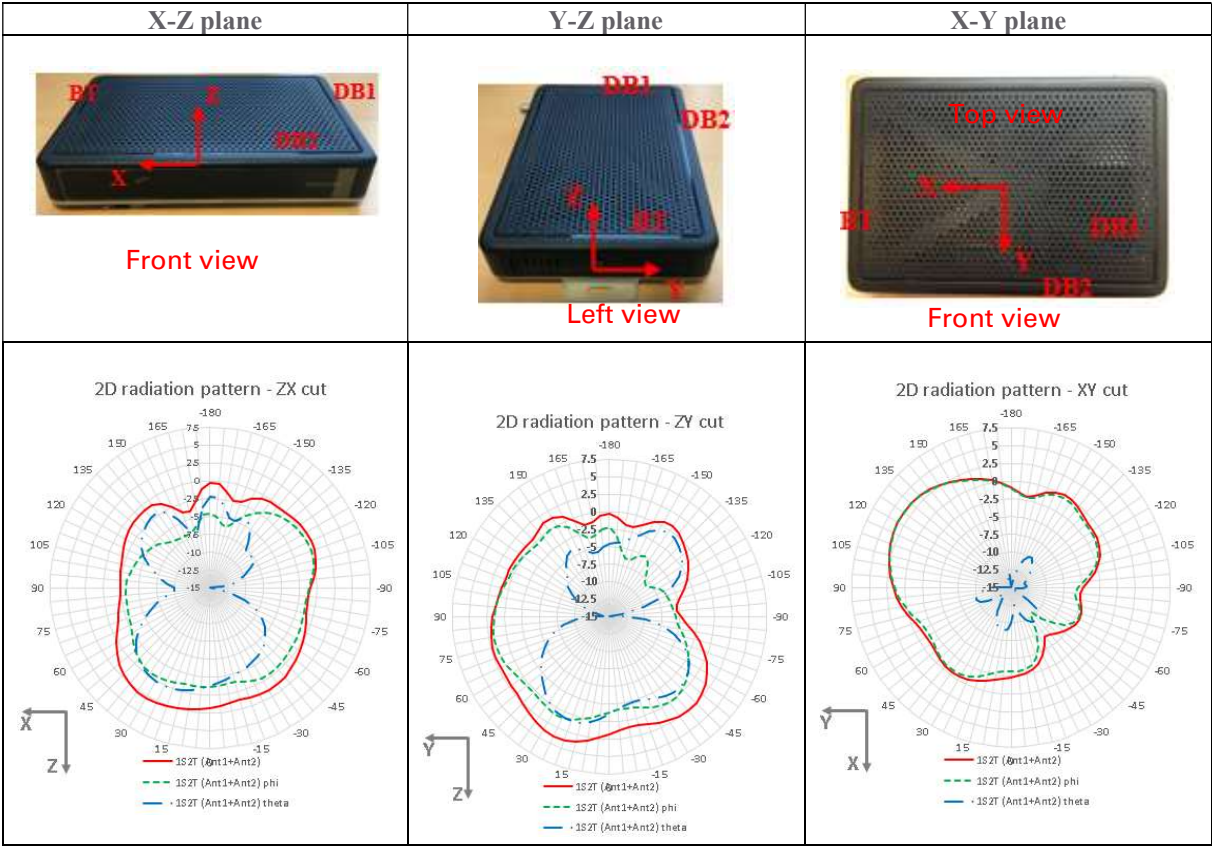


Figure 8 : 2D cuts of the directional gain for correlated signals of Wi-Fi antennas @2.45GHz.

Frequency (MHz)	Peak directional gain 1S2T (DB1+DB2) (dBi)	Peak directional gain 2S2T (DB1, DB2) (dBi)
5150	5.57	2.77
5180	5.53	2.69
5190	5.53	2.70
5200	5.57	2.71
5210	5.58	2.69
5220	5.60	2.72
5230	5.64	2.76
5240	5.63	2.75
5250	5.64	2.76
5260	5.66	2.78
5270	5.62	2.74
5280	5.63	2.76
5290	5.63	2.76
5300	5.61	2.74
5310	5.68	2.81
5320	5.68	2.81
5350	5.69	2.81
5400	5.77	2.87
5450	5.92	3.01

5470	5.84	2.93
5500	5.76	2.84
5510	5.70	2.79
5520	5.63	2.75
5530	5.62	2.81
5540	5.56	2.78
5550	5.54	2.78
5560	5.55	2.87
5570	5.43	2.83
5580	5.41	2.87
5590	5.41	2.96
5600	5.36	2.96
5610	5.40	3.03
5620	5.40	3.10
5630	5.39	3.10
5640	5.45	3.18
5660	5.41	3.19
5670	5.44	3.25
5680	5.41	3.25
5690	5.39	3.23
5700	5.42	3.26
5710	5.42	3.25
5720	5.42	3.27
5725	5.38	3.22
5745	5.46	3.29
5755	5.36	3.24
5765	5.38	3.17
5775	5.41	3.18
5785	5.42	3.26
5795	5.37	3.20
5800	5.38	3.21
5805	5.36	3.16
5825	5.32	3.21
5850	5.27	3.12

Figure 9 : Directional gain for correlated signals of Wi-Fi antennas @5G.

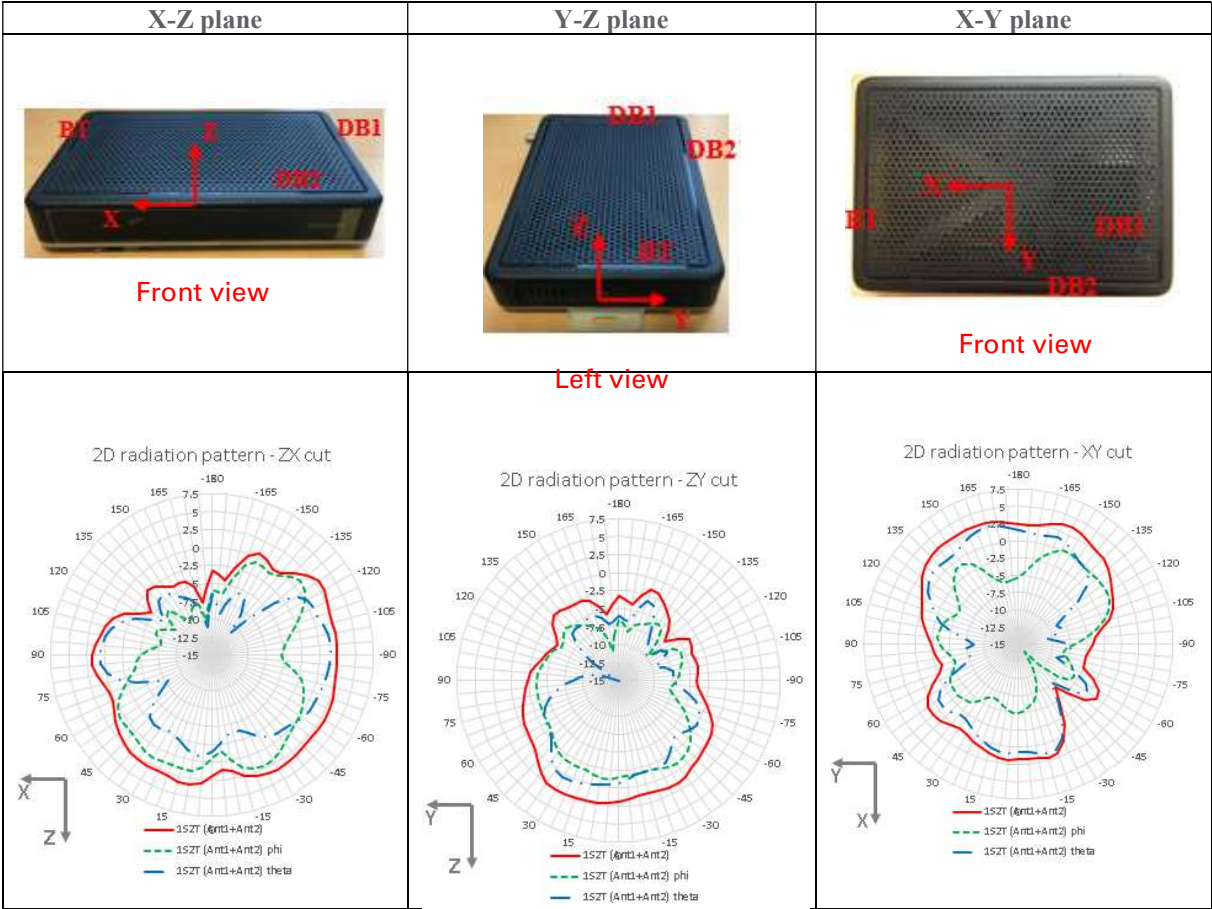


Figure 10 : 2D cuts of the directional gain for correlated signals of Wi-Fi antennas @5.5GHz.

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