Bluetooth & Wi-Fi antennas

Specification & Test report

Applicable to Set top boxes

Platform: UZW4054TCH

Models derived from platform (and not limited to)
UIW4054MIL – UIW4054HWC

TABLE OF CONTENT

Document revision

Version	Owner	Status	Description
0.1	I. Ben Trad	Draft	Creation
0.2	L. Beaurepaire	Proposed	Review
0.3	I. Ben Trad		Update
0.4	L. Beaurepaire		Correction

1.1 Introduction

Document does provide antenna technical data for Jade platform also known as UZW4054TCH and data are also applicable for any associated models (like but not limited to UIW4054MIL, UIW4054HWC, ...).

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	01-13-2020
Test Instruments	Network Analyzer: R&S ZNB 20, StarLab

1.3 D.U.T

The UZW4054TCH contains:
- One on-board metallic dual-band WiFi antenna: DB1
- One off-board dual-band WiFi antenna: DB2
- One on-board printed 2.4G antenna: BT

Figure 3: View of the UZW4054TCH 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	3,94	5,83	5,29	5,61
ANT2=DB2	2,78	5,61	5,26	5,67
Correlated directional gain	4,98	5,66	5,10	5,39
Uncorrelated directional gain	2,33	3,25	2,95	2,95
BT	3.2	-	-	-

1.5 Peak Gain & efficiency

DB1		
Frequency (MHz)	Efficiency (%)	Gain (dBi)
2400	79	3.84
2412	78	3.83
2417	79	3.85
2422	79	3.94
2427	79	3.82
2432	78	3.77
2437	78	3.74
2442	78	3.73
2447	77	3.72
2452	76	3.59
2457	74	3.48
2462	75	3.39
2467	76	3.37
2472	75	3.29
2477	74	3.22
2483.5	74	2.98
2484	74	2.98
2490	71	2.85
500	73	2.86

DB2		
Frequency (MHz)	Efficiency (%)	Gain (dBi)
2400	73	2.61
2412	74	2.42
2417	75	2.34
2422	74	2.24
2427	75	2.16
2432	75	2.18
2437	74	2.25
2442	74	2.27
2447	73	2.23
2452	72	2.36
2457	71	2.34
2462	72	2.51
2467	73	2.72
2472	71	2.55
2477	70	2.63
2483.5	71	2.78
2484	71	2.77
2490	68	2.57
2500	67	2.60

BT		
Frequency (MHz)	Efficiency (%)	Gain (dBi)
2400	62	3.20
2412	61	3.06
2417	62	3.05
2422	61	2.88
2427	63	2.88
2432	65	2.61
2437	67	2.80
2442	68	2.78
2447	67	2.88
2452	66	2.94
2457	64	2.93
2462	62	2.85
2467	61	2.79
2472	59	2.59
2477	58	2.48
2483.5	58	2.34
2484	58	2.34
2490	59	2.25
2500	58	1.99

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

DB1		
Frequency (MHz)	Efficiency (%)	Gain (dBi)
5150	82	5.83
5180	81	5.80
5190	82	5.83
5200	82	5.83
5210	81	5.76
5220	81	5.78
5230	81	5.74
5240	80	5.66
5250	81	5.68
5260	80	5.64
5270	79	5.53
5280	79	5.56
5290	79	5.50
5300	78	5.43
5310	79	5.46
5320	78	5.40
5350	77	5.28
5400	76	5.11
5450	77	5.16
5470	76	5.04
5500	76	5.04
5510	77	5.06
5520	76	4.99
5530	78	5.08
5540	77	5.03
5550	77	5.00
5560	79	5.12
5570	77	4.97
5580	77	4.95
5590	79	5.05
5600	77	4.91
5610	78	4.92
5620	79	5.00
5630	78	4.95
5640	79	5.08
5660	79	5.09
5670	80	5.19
5680	79	5.15
5690	80	5.20
5700	81	5.29
5710	80	5.26
5720	81	5.29
5725	80	5.28
5745	82	5.46
5755	81	5.36
5765	80	5.34
5775	82	5.47

DB2		
Frequency (MHz)	Efficiency (%)	Gain (dBi)
5150	73	5.57
5180	72	5.53
5190	73	5.59
5200	73	5.58
5210	73	5.54
5220	74	5.58
5230	73	5.52
5240	73	5.43
5250	73	5.49
5260	73	5.53
5270	73	5.52
5280	73	5.56
5290	73	5.56
5300	73	5.58
5310	74	5.61
5320	73	5.59
5350	73	5.55
5400	73	5.45
5450	73	5.31
5470	73	5.26
5500	73	2.28
5510	73	5.26
5520	72	5.20
5530	72	5.19
5540	72	5.18
5550	72	5.11
5560	72	5.10
5570	72	5.06
5580	71	4.95
5590	71	4.98
5600	72	4.93
5610	71	4.92
5620	70	5.05
5630	70	5.01
5640	69	4.97
5660	69	5.06
5670	69	5.11
5680	69	5.15
5690	68	5.15
5700	69	5.21
5710	68	5.21
5720	67	5.15
5725	65	5.07
5745	68	5.24
5755	67	5.30
5765	68	5.33
5775	68	5.39

5785	83	5.61
5795	81	5.46
5800	81	5.45
5805	80	5.33
5825	81	5.36
5850	80	5.23

5785	70	5.67
5795	68	5.46
5800	67	5.38
5805	65	5.17
5825	67	5.47
5850	68	5.47

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

1.6 Directional gain

Frequency (MHz)	Peak directional gain 1S2T (DB1+DB2) (dBi)	Peak directional gain 2S2T (DB1, DB2) (dBi)
2400	5.14	2.16
2412	**4.98**	2.17
2417	4.93	2.23
2422	4.86	**2.33**
2427	4.78	2.29
2432	4.68	2.26
2437	4.64	2.25
2442	4.57	2.31
2447	4.46	2.30
2452	4.51	2.20
2457	4.33	2.13
2462	4.41	2.07
2467	4.57	2.08
2472	4.37	1.97
2477	4.42	1.90
2483.5	4.50	1.75
2484	4.48	1.72
2490	4.29	1.58
2500	4.34	1.56

Figure 6 : Directional gain for correlated signals of Wi-Fi antennas @2G.

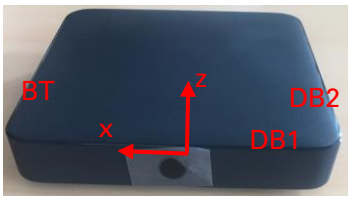
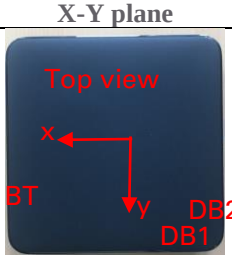
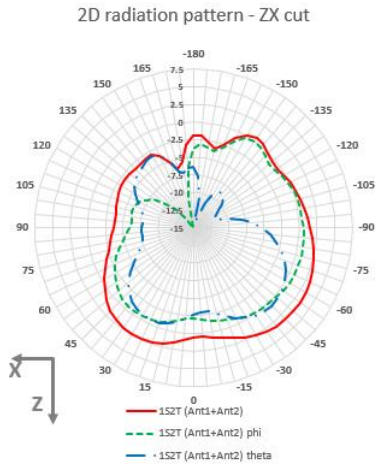
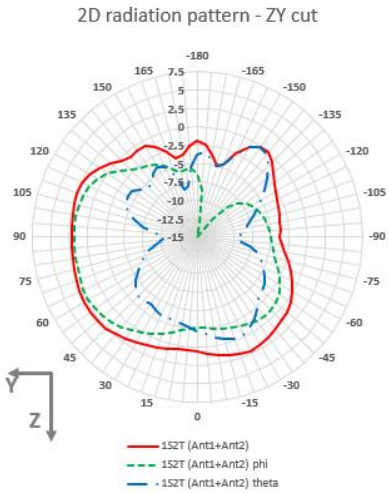
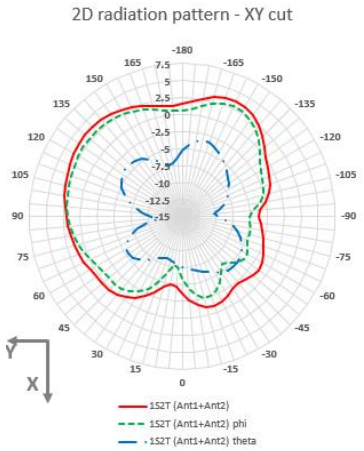
X-Z plane	Y-Z plane	X-Y plane
 Front view	 Left view	 Front view
		

Figure 7 : 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	5.50	3.27
5180	5.50	3.22
5190	5.58	**3.25**
5200	5.63	3.24
5210	5.62	3.17
5220	**5.66**	3.17
5230	5.63	3.15
5240	5.56	3.11
5250	5.58	3.16
5260	5.56	3.19
5270	5.50	3.18
5280	5.52	3.21
5290	5.50	3.19
5300	5.48	3.19
5310	5.50	3.23
5320	5.44	3.20
5350	5.30	3.15

5400	5.04	3.07
5450	4.97	2.99
5470	4.91	2.93
5500	4.95	**2.95**
5510	4.96	2.93
5520	4.92	2.85
5530	4.98	2.84
5540	4.98	2.81
5550	4.95	2.73
5560	5.02	2.77
5570	5.00	2.70
5580	4.97	2.63
5590	5.07	2.73
5600	5.03	2.63
5610	5.02	2.64
5620	5.06	2.67
5630	5.02	2.58
5640	4.99	2.60
5660	4.98	2.53
5670	5.03	2.57
5680	5.02	2.51
5690	5.00	2.49
5700	**5.10**	2.54
5710	5.07	2.49
5720	5.06	2.56
5725	5.00	2.47
5745	5.20	2.65
5755	5.17	2.59
5765	5.20	2.66
5775	5.28	2.74
5785	**5.39**	**2.95**
5795	5.31	2.83
5800	5.15	2.68
5805	5.06	2.58
5825	5.05	2.77
5850	5.04	2.77

Figure 8 : Directional gain for correlated signals of Wi-Fi antennas @5G.

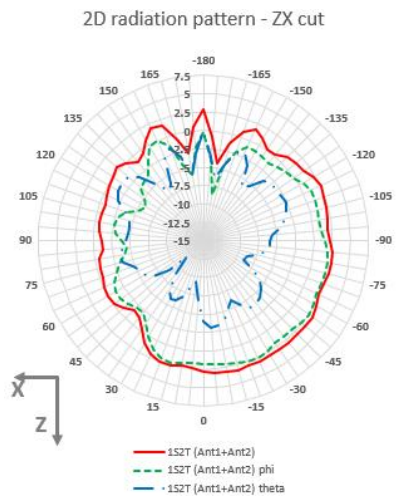
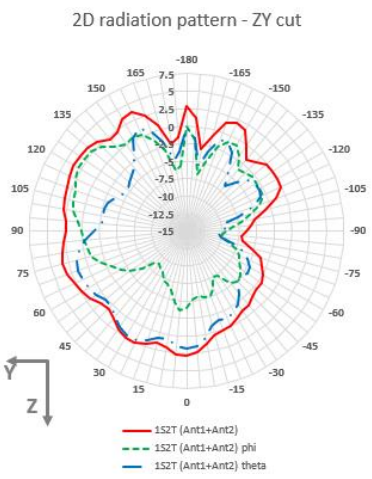
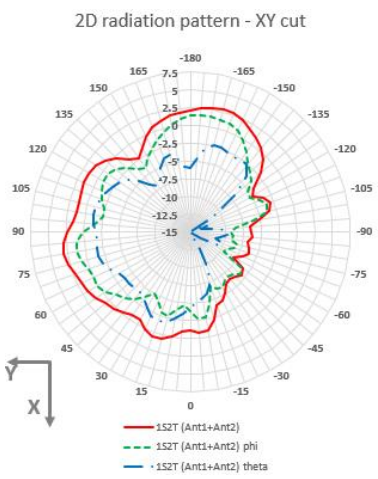
X-Z plane	Y-Z plane	X-Y plane
 Front view	 Left view	 Front view
		

Figure 9 : 2D cuts of the directional gain for correlated signals of Wi-Fi antennas @5.5GHz.

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