

TCL entertainment solutions limited

TEST REPORT

SCOPE OF WORK FCC TESTING-TS9030, RAYDANZ

REPORT NUMBER 191126031SZN-005

ISSUE DATE [REVISED DATE]

16 January 2020 [-----]

PAGES

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101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen.

Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751 www.intertek.com

Intertek Report No.: 191126031SZN-005_updated

RF TEST REPORT

Report No.:	191126031SZN-005
Product:	3.1 Atmos Sound Bar with Wireless Subwoofer, Wireless Subwoofer
Model No.:	TS9030, RAYDANZ
FCC ID:	2ARUDTS9030
Applicant:	TCL entertainment solutions limited
Test Method/	FCC Part 15 Subpart E;
Standard:	KDB 789033 D02 v02r01;
	KDB 662911 D01 v02r01;
	KDB 905462 D02 v02;
	ANSI C63.10-2013
Test By:	Intertek Testing Services Shenzhen Ltd. Longhua Branch 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen, P.R. China.

Prepared and Checked by:

Approved by:

Winkey Wang Senior Project Engineer Kidd Yang Technical Supervisor Date: 16 January 2020

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101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen. Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751



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Summary of Tests

FCC Parts	Test	Section	Results
15.203	Antenna Requirement	1.3	Pass
15.407 a (1)/(3)	Maximum output power test	3	Pass
15.407 a (1)/(3)	Power Spectrum Density test	4	Pass
15.407 e	6dB Bandwidth	5	Pass
15.407 b, 15.205, 15.209	Radiated spurious emission test	6	Pass
15.207	AC line conducted emission test	7	Pass
15.407 g	Frequency Stability	8	Pass
15.407 h	DFS: Channel Closing Transmission Time	9.3	Pass
15.407 h	DFS: Channel Move Time	9.3	Pass



1. General information

1.1 Identification of the EUT

Product:	3.1 Atmos Sound Bar with Wireless Subwoofer, Wireless Subwoofer
Model No.:	TS9030, RAYDANZ
Type of Device:	Client device
Nominal Channel Bandwidth:	802.11a/n-HT20 (20 MHz), 802.11n-HT40 (40MHz), 802.11ac (20/40/80MHz)
Operating Frequency:	5150MHz~5250 MHz, 5250MHz~5350MHz, 5470MHz-5725MHZ, 5725MHz~5850MHz
Channel Number:	4 channels for 5180 MHz ~ 5240 MHz (802.11a/n/ac-HT20); 2 channels for 5190 MHz ~ 5230 MHz (802.11n/ac-HT40); 1 channels for 5210 MHz (802.11ac-HT80); 4 channels for 5260 MHz ~ 5320 MHz (802.11a/n/ac-HT20); 2 channels for 5270 MHz ~ 5310 MHz (802.11n/ac-HT40); 1 channels for 5290 MHz (802.11ac-HT80); 11 channels for 5500 MHz ~ 5700 MHz (802.11a/n/ac-HT20); 5 channels for 5510 MHz ~ 5670 MHz (802.11a/n/ac-HT40); 2 channels for 5530 MHz ~ 5610 MHz (802.11ac-HT80); 5 channels for 5745 MHz ~ 5825 MHz (802.11a/n/ac-HT20); 2 channels for 5755 MHz ~ 5795 MHz (802.11n/ac-HT40); 1 channels for 5775 MHz (802.11ac-HT80);
Modulation:	802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Kaleu Power.	AC120V, 60H2
Test Date(s):	26 November 2019 to 07 January 2020
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Note 2:	When determining the test conclusion, the Measurement Uncertainty of test has been considered.



1.2 Additional information about the EUT

The EUT is a 3.1 Atmos Sound Bar with Wireless Subwoofer, Wireless Subwoofer with 5G WIFI technology. The EUT is powered by AC 100-240V~ 50/60Hz.

For more detail features, please refer to User's description as file name "descri.pdf".

The Model: RAYDANZ are the same as the Model: TS9030 in hardware aspect (circuitry and electrical, mechanical and physical construction), the only differences is the model number and trade mark for trading purpose.

Related Submittal(s) Grants

This is an application for certification of U–NII device (5GHz Wi-Fi transmitter portion).

For the BT transmitter function was tested and demonstrated in report 191126031SZN-002.

For the 2.4GHz WIFI function was tested and demonstrated in report 191126031SZN-003.

For the Normal 2.4G TX function was tested and demonstrated in report 191126031SZN-004.

For other functions were reported in the SDOC report: 191126031SZN-001.

1.3 Antenna description (15.203)

The EUT uses Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

Antenna Gain: 4.25 dBi Max for 5G WIFI.



1.4 Peripherals equipment

Refer List:

Description	Manufacturer	Model No.
iPod (Provided by Intertek)	Apple	A1367
Test TV (Provided by Intertek)	SONY	KDL-24EX520
USB Memory (Provided by Intertek)	SanDisk	SDCZ36-002G-P36
Audio Cable (Provided by Intertek)	N/A	Unshielded, Length 120cm
HDMI In Cable (Provided by Intertek)	UGREEN	Unshielded, Length 175cm
HDMI In Cable (Provided by applicant)	Richsound	Shielded, Length 180cm
Detached AC power cord (Provided by applicant)	Richsound	Unshielded, Length 150cm
Optical Cable (Provided by applicant)	Richsound	Unshielded, Length 120cm
Dummy Load (Provided by Intertek)	N/A	75 Ω
Remote control (Provided by applicant)	Provided by applicant	N/A



2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 E, Section15.203, 15.207, 15.209, 15.407 and ANSI C63.10/2013, method of measurement: KDB 789033.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band was all meet limit requirement, thus we evaluate the EUT pass the specified test.

The AC power conducted emissions was invested over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz (15.207 paragraph).

Radiated emissions were invested cover the frequency range from 9KHz to 30MHz using a receiver RBW of 9kHz, from 30 MHz to 1000 MHz using a receiver RBW of 120 kHz record QP reading, and the frequency over 1 GHz using a spectrum analyzer RBW of 1 MHz, VBW of 3MHz, Detector=Peak record for Peak reading, RBW of 1 MHz, VBW of 3MHz, Detector=RMS record for Average reading recorded on the report.

The EUT setup configurations please refer to the photo of radiated setup photos.pdf & conducted setup photos.pdf.

2.2 Operation mode

The EUT was supplied by and it was run in TX mode that was controlled by client provided RF testing program.

The EUT was transmitted continuously during the test. The worst case test result was showed in the report.

With individual verifying, the maximum output power was found at 6 Mbps data rate for 802.11a mode, 6.5 Mbps data rate for 802.11n-HT20 mode, 13.5 Mbps data rate for 802.11n-HT40 mode, 29.3 Mbps data rate for 802.11ac. The final tests were executed under these conditions and recorded in this report individually.

Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Test Software: fw_bcm43456c5_ag_mfg V1.0



3. Maximum Output Power test (FCC 15.407)

3.1 Operating environment

Temperature:	25	°C
Relative Humidity:	55	%
Atmospheric Pressure:	1011	hPa

3.2 Test setup & procedure

The power output per FCC §15.407(a) was measured on the EUT using a 50 ohm SMA cable connected to Power Meter and the measurement method refer to 789033 D02. Power was read directly and cable loss correction (1.0dB) was added to the reading to obtain power at the EUT antenna terminals.

3.3 Limit

Operating Frequency (MHz)	Max Conducted TX Power	Max EIRP
	30dBm (1W) for master device	4W (36dBm) with
5150 5250	24dBm (250mW) for client device	6dBi antenna
5250~5350	24dBm (250mW) or 11dBm+ 10logB*	1W (30dBm) with
5470~5725	24dBm (250mW) or 11dBm+ 10logB*	6dBi antenna
	20dBm (1)()	4W (36dBm) with
5725 5650		6dBi antenna

Remark: 1) *Where B is the 26dB emission Bandwidth in MHz.

2) The device was declared as client device.

- 3) Tx Power Reduction (dBm-by-dBi) required when antenna exceeds 6dBi.
- 4) Max antenna gain= 4.25 dBi< 6 dBi.



3.4 Measured data of Maximum Output Power test results

5150 MHz ~ 5250 MHz, 5250MHz~5350MHz, 5470MHz-5725MHZ, 5725 MHz ~ 5850 MHz

Max Conducted TX Power

Test Mode	Channel	Result	Limit	Verdict
	5180	16.00	24	PASS
	5200	16.18	24	PASS
	5240	16.48	24	PASS
	5260	18.46	24	PASS
	5280	18.26	24	PASS
110	5320	17.87	24	PASS
11A	5500	15.74	24	PASS
Test Mode 11A 11N20 11N40 11AX0	5580	16.77	24	PASS
	5700	16.89	24	PASS
	5745	16.93	30	PASS
	5785	16.79	30	PASS
	5825	16.69	30	PASS
	5180	16.68	24	PASS
	5200	17.08	24	PASS
	5240	16.39	24	PASS
	5260	18.62	24	PASS
	5280	18.65	24	PASS
441120	5320	17.91	24	PASS
11N20	5500	16.21	24	PASS
	5580	17.13	24	PASS
	5700	16.56	24	PASS
	5745	16.60	30	PASS
	5785	16.23	30	PASS
	5825	16.51	30	PASS
	5190	16.79	24	PASS
11N40	5230	16.98	24	PASS
	5270	17.27	24	PASS
	5310	17.02	24	PASS
11N40	5510	3280 18.26 24 3320 17.87 24 3500 15.74 24 5500 16.77 24 5700 16.89 24 5775 16.93 30 5785 16.79 30 5825 16.69 30 580 16.69 30 5825 16.69 30 580 17.88 24 5200 17.08 24 5200 17.08 24 5200 18.62 24 5200 16.21 24 5500 16.21 24 5500 16.56 24 57745 16.60 30 5785 16.23 30 5785 16.51 30 5190 16.79 24 5200 16.79 24 5210 14.96 24 5210 14.96 24 5510 15.50 24 5755 15.44 30 <tr< td=""><td>PASS</td></tr<>	PASS	
	5550	15.50	24	PASS
	5670	15.92	24	PASS
	5755	15.44	30	PASS
	5795	15.87	30	PASS
	5180	15.59	24	PASS
	5200	15.79	24	PASS
	5240	16.19	24	PASS
	5260	18.10	24	PASS
114620	5280	18.23	24	PASS
IIAC2U	5320	17.56	24	PASS
	5500	15.60	24	PASS
	5580	16.77	24	PASS
	5700	16.32	24	PASS
	5745	16.36	30	PASS



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	5785	16.21	30	PASS
	5825	16.51	30	PASS
	5190	16.66	24	PASS
	5230	17.11	24	PASS
	5270	17.20	24	PASS
	5310	17.04	24	PASS
11AC40	5510	15.11	24	PASS
	5550	15.61	24	PASS
	5670	15.96	24	PASS
	5755	15.52	30	PASS
	5795	15.51	30	PASS
	5210	15.43	24	PASS
	5290	15.71	24	PASS
11AC80	5530	15.57	24	PASS
	5610	14.83	24	PASS
	5775	13.71	30	PASS

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MAX EIRP

Test Mode	Channel	Output Power (dBm)	ANT. Gain (dBi)	E.I.R.P (dBm)	Limit	Verdict
	5180	16.00	4.25	20.25	36	PASS
	5200	16.18	4.25	20.43	36	PASS
	5240	16.48	4.25	20.73	36	PASS
	5260	18.46	4.25	22.71	30	PASS
	5280	18.26	4.25	22.51	30	PASS
	5320	17.87	4.25	22.12	30	PASS
	5500	15.74	4.25	19.99	30	PASS
	5580	16.77	4.25	21.02	30	PASS
	5700	16.89	4.25	21.14	30	PASS
	5745	16.93	4.25	21.18	36	PASS
	5785	16.79	4.25	21.04	36	PASS
	5825	16.69	4.25	20.94	36	PASS
	5180	16.68	4.25	20.93	36	PASS
	5200	17.08	4.25	21.33	36	PASS
	5240	16.39	4.25	20.64	36	PASS
	5260	18.62	4.25	22.87	30	PASS
	5280	18.65	4.25	22.90	30	PASS
11120	5320	17.91	4.25	22.16	30	PASS
11N20	5500	16.21	4.25	20.46	30	PASS
-	5580	17.13	4.25	21.38	30	PASS
	5700	16.56	4.25	20.81	30	PASS
	5745	16.60	4.25	20.85	36	PASS
	5785	16.23	4.25	20.48	36	PASS
	5825	16.51	4.25	20.76	36	PASS
	5190	16.79	4.25	21.04	36	PASS
	5230	16.98	4.25	21.23	36	PASS
	5270	17.27	4.25	21.52	30	PASS
	5310	17.02	4.25	21.27	30	PASS
11N40	5510	14.96	4.25	19.21	30	PASS
	5550	15.50	4.25	19.75	30	PASS
	5670	15.92	4.25	20.17	30	PASS
	5755	15.44	4.25	19.69	36	PASS
	5795	15.87	4.25	20.12	36	PASS
	5180	15.59	4.25	19.84	36	PASS
	5200	15.79	4.25	20.04	36	PASS
	5240	16.19	4.25	20.44	36	PASS
	5260	18.10	4.25	22.35	30	PASS
	5280	18.23	4.25	22.48	30	PASS
114020	5320	17.56	4.25	21.81	30	PASS
117020	5500	15.60	4.25	19.85	30	PASS
	5580	16.77	4.25	21.02	30	PASS
	5700	16.32	4.25	20.57	30	PASS
	5745	16.36	4.25	20.61	36	PASS
	5785	16.21	4.25	20.46	36	PASS
	5825	16.51	4.25	20.76	36	PASS

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	5190	16.66	4.25	20.91	36	PASS
	5230	17.11	4.25	21.36	36	PASS
	5270	17.20	4.25	21.45	30	PASS
	5310	17.04	4.25	21.29	30	PASS
11AC40	5510	15.11	4.25	19.36	30	PASS
	5550	15.61	4.25	19.86	30	PASS
	5670	15.96	4.25	20.21	30	PASS
	5755	15.52	4.25	19.77	36	PASS
	5795	15.51	4.25	19.76	36	PASS
11AC80	5210	15.43	4.25	19.68	36	PASS
	5290	15.71	4.25	19.96	30	PASS
	5530	15.57	4.25	19.82	30	PASS
	5610	14.83	4.25	19.08	30	PASS
	5775	13.71	4.25	17.96	36	PASS



4. Power Spectrum Density test (FCC 15.407)

4.1 Operating environment

Temperature:	25	°C
Relative Humidity:	50	%
Atmospheric Pressure:	1011	hPa

4.2 Test setup & procedure

Method of Measurement:

The power spectrum density per FCC §15.407(a) was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set at 1MHz/500KHz, the video bandwidth set at 3 MHz/2MHz (measurement method refer to KDB 789033 D02). Power spectrum density was read directly and cable loss (1.0 dB) reading to obtain power at the EUT antenna terminals.

4.3 Limit

Operating Frequency (MHz)	Max Conducted Power Spectral Density
E1E0~E2E0	*17dBm/MHz for master device
5150 5250	11dBm/MHz for mobile/portable client device
5250~5350	11dBm/MHz
5470~5725	11dBm/MHz
5725~5850	30dBm/500KHz

Remark: 1) *The device was declared as Slave device.

2) Tx Power Reduction (dBm-by-dBi) required when antenna exceeds 6dBi.

3) Ant gain = 4.25 dBi< 6 dBi.



4.4 Measured data of Power Spectrum Density test results

5150 MHz ~ 5250 MHz, 5250MHz~5350MHz, 5470MHz-5725MHZ, 5725 MHz ~ 5850 MHz

Test Mode	Channel	Result	Limit	Verdict
	5180	6.40	11	PASS
	5200	6.64	11	PASS
	5240	6.86	11	PASS
	5260	9.25	11	PASS
	5280	8.73	11	PASS
	5320	7.87	11	PASS
11A	5500	6.12	11	PASS
	5580	7.12	11	PASS
	5700	7.32	11	PASS
	5745	6.59	30	PASS
	5785	6.15	30	PASS
	5825	6.01	30	PASS
	5180	6.85	11	PASS
	5200	7.05	11	PASS
	5240	6.27	11	PASS
	5260	8.17	11	PASS
	5280	8.49	11	PASS
44420	5320	7.93	11	PASS
11N20	5500	6.26	11	PASS
	5580	7.07	11	PASS
	5700	6.02	11	PASS
	5745	5.10	30	PASS
	5785	5.09	30	PASS
	5825	5.41	30	PASS
	5190	3.36	11	PASS
	5230	3.76	11	PASS
	5270	4.20	11	PASS
	5310	3.76	11	PASS
11N40	5510	1.70	11	PASS
	5550	2.25	11	PASS
	5670	2.76	11	PASS
	5755	1.24	30	PASS
	5795	1.70	30	PASS
	5180	5.67	11	PASS
1110000	5200	5.80	11	PASS
11AC20	5240	6.00	11	PASS
	5260	7.82	11	PASS

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	5280	7.98	11	PASS
	5320	7.11	11	PASS
	5500	5.69	11	PASS
	5580	6.48	11	PASS
	5700	6.13	11	PASS
	5745	4.70	30	PASS
	5785	4.68	30	PASS
	5825	5.44	30	PASS
	5190	3.61	11	PASS
	5230	4.39	11	PASS
	5270	4.16	11	PASS
	5310	3.63	11	PASS
11AC40	5510	1.97	11	PASS
	5550	2.32	11	PASS
	5670	2.50	11	PASS
	5755	1.22	30	PASS
	5795	-13.19	30	PASS
	5210	-14.64	11	PASS
	5290	-14.53	11	PASS
11AC80	5530	-16.59	11	PASS
	5610	-1.00	11	PASS
	5775	-2.75	30	PASS



11A_Ant1_5180



Date: 9.DEC.2019 13:43:42





Date: 9.DEC.2019 13:44:33

11A_Ant1_5240



Date: 9.DEC.2019 13:48:25



11A_Ant1_5260



Date: 6.DEC.2019 11:34:02



30 dBm	-		-		MILI	1	5.27	0.70 dBr 05500 GH
20 dBm	-	1				-		
10 dBm	-			-the-	o-man	-		
0 dBm		1			- Astron	1		
10 dBm		and a start of the				- No - No		
414	how the offer						Munster	henderwyth
40 dBm								
-50 dBm						_		

Date: 6.DEC.2019 11:39:24

11A Ant1 5320

Spectrum				
Ref Level 34.29 d Att 30 Count 100/100	Bm Offset 14.29 di dB SWT 1 m	B RBW 1 MHz s VBW 3 MHz	Mode Auto Sweep	
1Av View				
30 dBm-			M1[1]	7.07 dBn 5.0191320 GH
20 dBm	-			
10 dBm		Ma		
0 dBm	prin		manut	
-10 dBm	1			
-20 dBm	H. Huller			- Walks
Maronverter	ala-c			multi-hallenger man
-30 0811				
-40 dBm				
-50 dBm				
-60 dBm				
CF 5.32 GHz	- I I	691 pt	s	Span 40.0 MHz

Date: 6.DEC.2019 11:44:12



11A_Ant1_5500



Date: 6.DEC.2019 11:53:30





Date: 6.DEC.2019 11:58:07

11A Ant1 5700

Spectrum		_	_		
Ref Level 34.07 dBn Att 30 dE Count 100/100	n Offset 14.07 dB 8 SWT 1 ms	 RBW 1 MHz VBW 3 MHz 	Mode Auto Sweep		
1Av View					
30 dBm			M1[1]		7.32 dBm 5.6985590 GHz
20 dBm		-		-	
10 dBm		12		-	
0 dBm	pune		and many many		_
-10 dBm					
-20 dBm	- Welling -			The line	
111 100 100 100 100 100 100 100 100 100	4,~				water and the structure
-40 dBm					
-50 dBm					
-60 dBm					
CF 5.7 GHz		691 pt:	<u> </u>		Span 40.0 MHz

Date: 6.DEC.2019 13:20:14



11A_Ant1_5745



Date: 6.DEC.2019 13:31:12





Date: 6.DEC.2019 13:36:34

11A Ant1 5825

Spectrum		_	_		-			₽
Ref Level 34.32 d Att 30 Count 100/100	Bm Offset dB SWT	14.32 dB 🗰 1 ms 🖷	RBW 500 k VBW 2 M	Hz Hz Mode	Auto Swee	p		
1Av View								-
30 dBm				M1(1) 5				6.01 dBm 04950 GHz
20 dBm						-		
10 d8m		-	ME					
0 dBm		proment	munday	howard	mohamaken			
-10 dBm	- And					1		
-20 dBm	n wor					Willy		
raduatery the state of the stat						- 4	Hour Mandery	an welling
-40 dBm								
-50 dBm								
-60 dBm								
CF 5.825 GHz		1	691	pts	1	1	Span	40.0 MHz

Date: 6.DEC.2019 13:41:57



11N20SISO_Ant1_5180



Date: 9.DEC.2019 13:50:29





Date: 9.DEC.2019 13:51:05

11N20SISO_Ant1_5240



Date: 9.DEC.2019 13:54:05



11N20SISO_Ant1_5260



Date: 6.DEC.2019 14:02:40





Date: 6.DEC.2019 14:07:20

11N20SISO_Ant1_5320



Date: 6.DEC.2019 14:13:42



11N20SISO_Ant1_5500



Date: 6.DEC.2019 14:25:11





Date: 6.DEC.2019 14:30:09

11N20SISO_Ant1_5700



Date: 6.DEC.2019 14:35:16



11N20SISO_Ant1_5745



Date: 6.DEC.2019 14:45:22

11N20SISO_Ant1_5785



Date: 6.DEC.2019 14:50:24

11N20SISO_Ant1_5825



Date: 6.DEC.2019 14:57:31



11N40SISO_Ant1_5190



Date: 6.DEC.2019 15:17:15

11N40SISO_Ant1_5230

Spectrum									
Ref Level Att Count 100/1	34.24 dBm 30 dB 100	Offset 1 SWT	4.24 dB = 1 ms =	VBW 3 MH	z Mode A	uto Sweep	1		
1Av View				-					
30 dBm	_				M	i(i)		5.2	3.76 dBn 20150 GH
20 dBm							-		
10 dBm	-	_		447					
0 dBm		pu	-	Here with	prime	-	-		
-10 dBm				<u> </u>					
-20 dBm							$\left \right\rangle$	u I	
-30 dBm		yhyd					ովութ	rewould libra	Marw And W
-40 dBm									
-50 dBm									
-60 dBm									
CF 5.23 GH:	z	1		691	pts	1	1	Span	80.0 MHz

Date: 6.DEC.2019 15:26:31

11N40SISO Ant1 5270

Spectrum)			_				
Ref Level 34.3 Att Count 100/100	26 dBm Offset 30 dB SWT	14.26 dB 💼 1 1 ms 🖷 1	RBW 1 MHz VBW 3 MHz	Mode A	uto Sweep			
1Av View								100
30 dBm				M	un.		5.2	4.20 dBm 66500 GHz
20 dBm	-					-		-
10 dBm	_		IMT	_				
0 dBm		-	wenter	mannen	- ولايت الم	-	_	_
-10 dBm						1		_
-20 dBm								
-38.48m 	ANUNT NUNT					UNI	therputersh	windham.
-40 dBm								- 4
-50 dBm								
-60 dBm								
CF 5.27 GHz			691	pts			Span	80.0 MHz

Date: 6.DEC.2019 15:35:00



11N40SISO_Ant1_5310



Date: 6.DEC.2019 15:40:12

11N40SISO_Ant1_5510

Spectrum		_	-			_				
Ref Level 3 Att Count 100/10	34.26 dBm 30 dB	Offse	t 14.26	dB = ms =	VBW 3 MH	z Mode	Auto Swee	P		
1Av View				_						
30 dBm	_					0	uit 1		5.5	1.70 dBr
20 d8m	_		-	_			-	-	-	
10 dBm					_	1	-			
0 dBm			- March	mark	ministry	manue	Mussie	m	-	
-10 dBm		- /								
-20 dBm			_					+		
-30 dBm	od the balance	under	_					Yurd	Mundapped	abulation
-40 dBm			_							
-50 dBm			_							
-60 dBm			_							
CE 5.51 GHz					691	pts	1		Span	80.0 MHz

Date: 6.DEC.2019 15:45:07

11N40SISO Ant1 5550

Spectrum)		_	_			l I I I I I I I I I I I I I I I I I I I
Ref Level 34.0 Att Count 100/100	4 dBm Offset 30 dB SWT	14.04 dB 🗰 R 1 ms 🗰 V	BW 1 MHz BW 3 MHz	Mode Auto Sw	еер		
1Av View							
30 dBm-				M1[1]		5.5	2.25 dBm 40300 GH
20 dBm			-				
10 dBm		-			-	-	_
0 dBm-	-	- Habron	M1	deal apply allower			
-10 d5m		2					
-20 dBm							
-30 dBm	free and Whender				luru	haller to the start	Wath when
-40 dBm							
-50 dBm							
-60 dBm							
CF 5.55 GHz			691 p	ts		Span	80.0 MHz

Date: 6.DEC.2019 15:50:00





11N40SISO Ant1 5755

Spectrum		-						□
Ref Level 34.04 dB Att 30 c Count 100/100	m Offset B SWT	14.04 dB 🗰 1 ms 📾	RBW 500 k VBW 2 M	Hz Hz Mode	Auto Swee	p		
1Av View				-				
30 d8m-				M1(1)				1.24 dBn 50370 GH
20 dBm		-						
10 dBm		-	_	-		_	_	_
0 dBm		La Line Kana a Lon	M1 Legiter					
-10 dBm	ſ				ALL AND AN EAST	1		
-20 dBm	+							
-30 dBm	Mourt					harry	the model where the second	Malata ar
40 dBm	N ** ·							a and monthly of the
-50 dBm								
-60 dBm								
CF 5.755 GHz			691	pts			Span	80.0 MHz

Date: 6.DEC.2019 16:28:53

11N40SISO_Ant1_5795

Spectrum						
Ref Level 34.29 dt Att 30 Count 100/100	Bm Offset 14.29 dB dB SWT 1 ms	RBW S00 kHz VBW 2 MHz Mo	de Auto Sweep			
1Av View						
30 dBm			MI[1]		5.7	1.70 dBm 90960 GHz
20 dBm			-	-		
10 dBm			-	-	_	
0 dBm	Junannen	name and passing	an markener and			
-10 dBm						
-20 dBm						
-30 dBm - HUUUUUU	Lothout W			Willywy	Untransite	hudunantura
-40 dBm						
-50 dBm						
-60 dBm						
CF 5.795 GHz		691 pts			Span	80.0 MHz

Date: 6.DEC.2019 16:34:29



11AC20SISO_Ant1_5180 Spectrum Ref Level 34.60 dBm Offset 14.60 dB RBW 1 MHz Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep Count 100/100 1Av Viev M1[1] 30 dBn 5.10 20 dB 10 dBr in ti dBr -10 di -20 dBm holomanger withut -30 dBm -20 apm ngguullandhichibriaith -40 dBm -50 dBm -60 dBm CF 5.18 GHz 691 pts Span 40.0 MHz Date: 9.DEC.2019 13:59:40

11AC20SISO_Ant1_5200

Spectrum								
Ref Level 34.60 d Att 30 Count 100/100	Bm Offset 14 dB SWT	.60 dB 🗰 1 ms 💼	RBW 1 MH: VBW 3 MH:	Mode A	uto Śweep			
1Av View								
30 dBm				M	i(1)		5.20	5.00 dBm 14470 GHz
20 dBm					_		-	_
10 dBm-	-	-	-	711		-	_	
0 dBm-	1	whenter	- and the second	phinese	V- CAUNT	-		
-10 dBm						t		
-20 dBm						4	un ad	
-30 dBm	M -						munnhal	muchyroly
-40 dBm								
-50 dBm								
-60 dBm								
CF 5.2 GHz			691	pts			Span	40.0 MHz

Date: 9.DEC.2019 14:00:28



11AC20SISO_Ant1_5240



Date: 9.DEC.2019 14:01:06

11AC20SISO_Ant1_5260



Date: 6.DEC.2019 16:55:02

11AC20SISO_Ant1_5280



Date: 6.DEC.2019 16:59:35



11AC20SISO_Ant1_5320



Date: 6.DEC.2019 17:04:08

11AC20SISO_Ant1_5500

Ref Level 34.1 Att	2 dBm Offset 1 30 dB SWT	14.12 dB = RBW 1 ms = VBV	/ 1 MHz / 3 MHz Mod	de Auto Swee	ep.		₽
 IAv View 							
30 dBm-				MILI	1	5,40	5.69 dBn 09500 GH
20 dBm				-		- T	
10 dBm	-		mi	_	-		
0 dBm	1	annuna lina analas	and a strain	and moundable	- form		
-10 dBm	J				X		
-20 dBm	اللي المطلقية المحمد					Կոհայիստություն	
GR. GENERAL WALKIN	Windon				-		Mulling
-40 dBm							
-50 dBm							
-60 dBm					_		
CE 5.5 GHz			691 pts			Span	40.0 MHz

Date: 6.DEC.2019 17:08:43

11AC20SISO_Ant1_5580



Date: 6.DEC.2019 17:14:13



11AC20SISO_Ant1_5700



Date: 6.DEC.2019 17:18:50

11AC20SISO_Ant1_5745

1Av View 20 dBm	1	-	-	M	1(1)			4.70 dBn
30 0011						1	5.74	40740 GH
20 d8m	-							
10 dBm	-		MI	_		-	-	
0 dBm-	1	e-marine and the	winner .	nother inspection.	meriddan	man.		
-10 dBm	1							
00 dbm						NY.		
-20 UBIN	W M W					ad y	Markelling	ul i ha a
138 raphyman of								ow how H
-40 dBm								
-50 dBm						_		
-40 dBm								
			601				0	10.0 Mile

Date: 6.DEC.2019 17:23:48

11AC20SISO Ant1 5785

Spectrum								l □
Ref Level 33.90 dB Att 30 d Count 100/100	m Offset IB SWT	13.90 dB 🗰 1 ms 🖷	RBW 500 k VBW 2 M	Hz Hz Mode	Auto Swee	p		
1Av View				_				1.1.1
30 dBm				M	1(1)		5.70	4.60 dBm 04950 GHz
20 d8m								
10 dBm	-	-	Mi	-		-	-	-
0 dBm	1	metalow	monther	approximite	holdensees	5		
-10 dBm	1					1		
-20 dBm	1. William					Ny UN		
BONNENNINNIN							an frailaithe that	40Munpel Ilu
-40 dBm								
-50 dBm								
-60 dBm								
CF 5.785 GHz	1	1	691	pts		1	Span	40.0 MHz

Date: 6.DEC.2019 17:29:22



11AC20SISO_Ant1_5825



Date: 6.DEC.2019 17:34:49

11AC40SISO_Ant1_5190

Ref Level 34.23 dB	m Offset :	14.23 dB	RBW 1 MH	z Mode (uto Sween			0
Count 100/100		- ute =		- moue -	alo shoop	_		_
30 dBm				M	i(i)		5.1	9.61 dBr 07220 GH
20 dBm	-					-		
10 dBm		_	-MX					
0 dBm	1	the resident	when	minten	the week	2		
-10 d8m								
-20 dBm	+						du at	
-30 dBm	1 migut						" WV" Louillern	Mulphan
-40 dBm								
-50 dBm								
-60 dBm								

Date: 6.DEC.2019 17:40:31

11AC40SISO_Ant1_5230

Spectrum								1
Ref Level 34.24 Att Count 100/100	dBm Offset 1 30 dB SWT	4.24 dB = F 1 ms = V	BW 1 MHz BW 3 MHz	Mode A	uto Sweep			
1Av View								
30 dBm				M	i(i)		5.2	4.09 dBm 02660 GHz
20 dBm		-	-			-		
10 dBm		-	_	MIL	-	-		
0 dBm		ann an	nimine	min	day make un	4		
-10 dBm								
-20 dBm								
-30 dBm	worm we have						and a strategy and	Murrow Marrie
-40 dBm								
-50 dBm								
-60 dBm								
CF 5.23 GHz			691	ots		1	Span	80.0 MHz

Date: 6.DEC.2019 17:46:02



11AC40SISO_Ant1_5270



Date: 6.DEC.2019 17:51:36

11AC40SISO_Ant1_5310

30 dBm			1	M1[1]			2.60 dBm
					1	5.0	07570 GH
20 dBm					-	-	
tū dBm		-	142		_		_
) dBm		- taxa a gunda	marting	6-10	presente	-	_
10 dBm			1				
20 dBm							
beydeby n dir ru	Handronalowy				- Will	mar all the	WWWW.
40 dBm							

Date: 6.DEC.2019 17:56:12

11AC40SISO_Ant1_5510

Spectrum								
Ref Level 34.26 dt Att 30 Count 100/100	am Offset : dB SWT	14.26 dB 🗰 1 ms 📾	RBW 1 MHz VBW 3 MHz	Mode	Auto Śweej	P		
1Av View	2.11							
30 dBm				0	11(1)		5.5	1.97 dBm 12320 GHz
20 dBm	-		_		-	-	-	
10 dBm	-	-	_	-	-	-		_
0 dBm	ja	and the second	in when	parent-	sur and	An		
-10 dBm		1						
-20 dBm						+		
-30 dBm	Jula					Wr.	Morthmart	and an appropriate
-40 dBm								
-50 dBm								
-60 dBm								
CF 5.51 GHz	1	1	691	pts	1	1	Span	80.0 MHz

Date: 6.DEC.2019 18:01:00



11AC40SISO_Ant1_5550



Date: 6.DEC.2019 18:05:53

11AC40SISO_Ant1_5670

AV View	1-	-	-	M	in			2 50 dBm
30 dBm					1	1-	5.0	72+00 GHz
20 dBm					-	-		
10 dBm		-	-			-	-	
0 dBm	-	-	in	- Image	-	-		
-10 d5m								
-20 dBm						+		
-30 dBm	whowhat					14h	and maker maker	wood when
-40 dBm								
-50 dBm								
-60 dBm								

Date: 6.DEC.2019 18:12:39

11AC40SISO Ant1 5755

Spectrum					-			
Ref Level 34.03 dBm Att 30 dB Count 100/100	Offset : SWT	14.03 dB 🗰 1 ms 💼	RBW 500 k VBW 2 M	Hz Hz Mode	Auto Swee	p		
1Av View								
30 dBm-			-	M	1(1)		5.7	1.22 dBm 49100 GHz
20 dBm			-		-	-		
10 dBm	_		_			-	_	_
0 dBm	jm	and a stand	Manan	for man	magnetistan			
-10 dBm-				-	1000			_
-20 dBm								
-30 dBm	wal					WW	alon Menunation	wholewhole .
-40 dBm								* WJ
-50 dBm								
-60 dBm								
CF 5.755 GHz		1	691	pts			Span	80.0 MHz

Date: 6.DEC.2019 18:18:00



11AC40SISO_Ant1_5795



Date: 6.DEC.2019 18:23:11

11AC80SISO_Ant1_5210

Spectrum								1
Ref Level 20.00 d Att 30 Count 100/100	dB SWT 1	ms RBW	1 MHZ 3 MHZ M	ode Auto S	weep			
1Av View								
	1.1.1			M	i(r)		5.9	14.64 dBm 12700 GHz
10 dBm	1						-	
0 dBm-	-	-		-				
-10 dBm		-		MI		-		
-20 dBm	p.	-	- sala hannen	Manness	Muhaninan	ng		
-30 dBm								
-40 dBm							dat i i	
1989 dBm the and the series	Marten and						er all Martin	mothermouting
-60 dBm								
-70 dBm								
CF 5.21 GHz			691	pts			Span :	160.0 MHz

Date: 6.DEC.2019 18:30:35

11AC80SISO Ant1 5290

Spectrum		-							
Ref Level 20.00 Att 30 Count 100/100	dBm DdB SWT 1 m	ms RBW	1 MHz 3 MHz M	ode Auto S	меер				
OIAV View									
1.11				MI[1]			-14,50 dBm 5.207600 GHz		
10 dBm					-		·	-	
0 dBm-	-	_	-			-			
-10 d6m-	-		M	-		_		_	
-20 dBm	por	Jeneral	of a summer of a	pulingly	montecarde	the second			
-30 dBm									
-40 dBm									
ugo dem	rown whited					Lund	Hernewsterne	Providenti	
-60 dBm									
-70 dBm									
CF 5.29 GHz			691	pts			Span 1	60.0 MHz	

Date: 6.DEC.2019 19:00:04



11AC80SISO_Ant1_5530



Date: 6.DEC.2019 19:05:06

11AC80SISO_Ant1_5610

Ref Level 34.3 Att Count 100/100	30 dBm Offs 30 dB SWT	et 14.30 1	dB = RI ms = VI	W 1 MHz W 3 MHz	Mode #	uto Śweep				
1Av View										
30 dBm			-	_	M	un.			5.6	-1.00 dBr
20 dBm		-	-	-			-	-		
10 dBm	_	-	_				H	_		
0 dBm			A	M		-		_		
-10 dBm		~					Tand			
-20 dBm							+			
-30 dBm	whether the state	_						-	Markanal as	nalaa
-40 dBm		-								Mannanana
-50 dBm							-			
-60 dBm		_								

Date: 6.DEC.2019 19:18:04

11AC80SISO Ant1 5775

Spectrum					_		1
Ref Level 33.83 dBn Att 30 di Count 100/100	n Offset 13 8 SWT	83 dB = RBV 1 ms = VBV	V SOO KHZ V 2 MHZ	Mode Auto Swa	ep		
1Av View							
30 dBm			-	M1(1)		5.7	-2.75 dBm 72920 GHz
20 dBm		-	_	-	-		
10 dBm				-	1 2	_	
0 dBm			No.	_	1	_	_
-10 dBm	land	anonch United	samine pour	and marken and	rearry		
-20 dBm							
-30 dBm					1		
-word Birth and My worth	and the second sec				"haller	Munderstand	www.
-50 dBm							
-60 dBm							
CF 5.775 GHz	1		691 pts	1	1	Span 1	.60.0 MHz

Date: 6.DEC.2019 19:42:16


5. Minimum 6 dB RF Bandwidth (FCC 15.407)

5.1 Operating environment

Temperature:	25	°C
Relative Humidity:	50	%
Atmospheric Pressure:	1011	hPa

5.2 Test setup & procedure

The Minimum 6 dB RF Bandwidth per 789033 D02 was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100KHz, and set the video bandwidth (VBW) \geq 3 x RBW. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

For 26dB down Emission Bandwidth

The 26dB down Emission Bandwidth per 789033 D02 was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set RBW = approximately 1% of the emission bandwidth. Set the VBW > RBW, Detector = Peak, Trace mode = max hold (Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%).

For 99% Occupied Bandwidth

The 99% Occupied Bandwidth per 789033 D02 was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set center frequency to the nominal EUT channel center frequency, set span = 1.5 times to 5.0 times the OBW, set RBW = 1 % to 5 % of the OBW, set VBW \geq 3x RBW, The 99% occupied bandwidth was determined from where the channel output spectrum intersected the display line.

5.3 Limit

Operating Frequency (MHz)	Minimum 6 dB RF Bandwidth Limit
5150~5250	N/A
5250~5350	N/A
5470~5725	N/A
5725~ 5850	≥500KHz

Note: 99% Occupied Bandwidth within the U-NII-1 band and 26dB Emission Bandwidth for reference. The plots are attached as below: "26dB OBW" and "99% OBW"



5.4 Measured data of 6dB down Emission Bandwidth test results

Test Mode	Channel	6dB EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
	5745	16.400	5736.840	5753.240	0.5	PASS
11A	5785	16.400	5776.840	5793.240	0.5	PASS
	5825	16.360	5816.880	5833.240	0.5	PASS
	5745	17.360	5736.280	5753.640	0.5	PASS
11N20	5785	17.360	5776.280	5793.640	0.5	PASS
	5825	17.640	5816.280	5833.920	0.5	PASS
11140	5755	36.240	5736.840	5773.080	0.5	PASS
11N40	5795	36.240	5776.840	5813.080	0.5	PASS
	5745	17.640	5736.240	5753.880	0.5	PASS
11AC20	5785	17.400	5776.240	5793.640	0.5	PASS
	5825	16.960	5816.280	5833.240	0.5	PASS
110040	5755	35.920	5736.840	5772.760	0.5	PASS
11AC40	5795	36.080	5776.840	5812.920	0.5	PASS
11AC80	5775	75.520	5737.240	5812.760	0.5	PASS

The test plots are attached as below.



11A_Ant1_5745



Date: 6 DEC 2019 13:30:30

11A_Ant1_5785

Spect	mur						
Ref Lo Att Count	evel :	20.00 dBn 30 dB	offset 13.76 dB 8 SWT 94.8 µs	RBW 100 kHz VBW 300 kHz	Mode Auto FF1	i i	
• 1Pk Vi	ew						
10 dBm	-		M	7	M1[1]		-6.90 dBm 5.7768400 GHz 0.54 dBm 5.7000400 GHz
0 dBm-	-		Malanhar	re hupber her pe	Montralial	da .	
-10 dBm		1 10.405	dEme	1		T.	
-20 dBm	+		John	-		tray	
-30 dBm	mille	me halforda	r l			2m	Manualicanores
-50 dBm	+	_					
-60 dBm	+	-				-	
-70 dBm	+				-	-	
CF 5.7	35 GH	z		1001 p	ts	_	Span 40.0 MHz
Marker	Pot	Trel	Varature 1	Murahan	Euroption	E.m.	ation Docult
M1	roef	inc	5.77684 GHz	-6.90 dBm	Punction	Fun	cation Result
M2	-	1	5.78004 GHz	0.54 dBm	1		
03	M2	4	16:4 MHz	0.69 dB	I		

Date: 6 DEC 2019 13:35:52

11A Ant1 5825

Spect	nim						l⊞
Ref Lo Att Count	evel :	20.00 dBr 30 di 00	n Offset 14.01 dB 8 SWT 94.8 μs	 RBW 100 kHz VBW 300 kHz 	Mode Auto F	FŤ	
• 1Pk Vi	ew						
10 dBm	-	_	M	2	M1[1]		- 5.47 dBn 5.8108800 GH 0.60 dBn 5.8200400 GH
0 dBm-	-		MAR 1	damber they a	the fundadion	the	
-10 dBm	0	1 -5.374	dBm- Mietelitur	-	and a second second	AMAGE	
-20 dBm	+	-	www	-		time	
-30 dBm	-		1 de la constanción de la constancición de la constanción de la constanción de la constanción de la co	-		7	
Che den	MM	M-Annabal M	r				Monandmension
-50 dBm	+	_				-	
-60 dBm	+	-				-	
-70 dBm	+	-				-	
CF 5.8	25 GH	z		1001 p	ts		Span 40.0 MHz
Marker		1	Harden 1	M suchas	I munther I		ation frank
Type	Ker	Inc	5.81688 CHz	T-Value	Function	Fun	ction Result
M2	-	1	5.82004 GHz	0.63 dBm			
03	M2	4	16.36 MHz	-0:64 dB		100	

Date: 6 DEC 2019 13:41:15



11N20SISO_Ant1_5745



Date: 6 DEC 2019 14 44 39

11N20SISO_Ant1_5785

Spect	1111										
Ref Le Att	evel :	20.00 dBr 30 d	n Offset 13.7 8 SWT 94.	6 dB 8 µs	RBW 100 k VBW 300 k	Hz Hz	Mode A	uto FF	r		
• 1Pk Vie	ew.			-							
10 dBm-		-		M2			MI	11		5.77	-6.14 dBn 62800 GH 0.30 dBn 00600 GH
0 dBm-	-		M1	1.	hardrentra	pre	housense	h.h.			
-10 dBm	- 4	1 -5,610	GB(T)			V.	-		A	-	_
-20 dBm	-	_	1	_		-	_	_	1	-	
-30 dBm	-		1 Alexandre		-			_	1		
MANAN	M								_	Monny	with
and obli					1 1				1		-
-50 dBm	+				+	-		_	-	+	
-60 dBm	+	-		_		-	-	_	-	-	-
-70 dBm	-	-		_	-	-		_	-	-	
CF 5.76	IS CH	z		_	1001	, pts		_		Span	40.0 MHz
Marker		1	No. or Man	1	N	1	French	. I.		metion Discut	
Type	Ker	Inc	5.77628.0	447	-6.14 di	im	Function	un I	51	incuon Result	-
M2		1	5.78008 G	Hz	0.38 dB	m					
03	M2		17.36 M	HE	-0:22	đB					

Date: 6 DEC 2019 14 49 42

11N20SISO Ant1 5825

Spect	rum		_	-			-			E
Ref Lo Att Count	evel 500/5	20.00 dE 30	im Offset 1 dB SWT	4.01 dB 94.8 µs	RBW 100 kH VBW 300 kH	z N	tode Auto FF	t I		
1Pk Vi	ew									-
10 dBm	-	-		_			M1[1] M2[1] M2		5.8	-6.11 dBm 102800 GH 0.17 dBm 000000 GH
d uptit-	-0	1 -5.832	dam P	Anialant	allowhere	webu	almetholist	luga	-	
-10 den -20 dBn -30 dBn			abaument					1		
40 dBm	hours	Nedar				_			Warn Mar	Avenau
-50 dBm		-	-	-		-		1.1	-	
-60 dBm	7	-						1 1 1	-	
-70 dBm								1.1.2		
CF 5.8	25 GH	z	-		1001	pts			Spar	140.0 MHz
Marker Type	Ref	Tre	X-value	1	Y-value	13	Function	Fur	iction Resul	t
M1 M2	M	1	5.8163	B GHz	-6 11 dBn 0 17 dBn	a n				
03	m1		17-0	or mole	-1.70 00					

Date: 6 DEC 2019 14:56:49



11N40SISO_Ant1_5755



Date: 6 DEC 2019 16:26 11

11N40SISO_Ant1_5795

Spect	PHILE								
Ref Le Att Count	evel 500/5	20.00 dBr 30 di 00	n Offset 14.01 dB B SWT 1.1 ms	RBW 100 kHz VBW 300 kHz	Mode	Auto Swee	p		
• 1Pk Vi	ew								
10 dBm	+				M	5[1] 1[1]		5.7	-11.12 dBm 768400 GH -2.80 dBm 901200 GH
0 dBm-	-			No.	710.73			1	1
-10 dem	-0	1 -8.827	dBm Miledylight	All had been presented and	- the deducted	-	14-	-	
-20 dBm	4	_		Y		_		-	-
-30 dBm	-	_				_		-	
-AN- John	June	hallpupel	alcolor at				Web	confliction who	Margaret
-50 dBm		-			_	_	1	-	
an dra					1		1.00		
-00 06/									
-70 dBm	+	-				-		-	-
CF 5.79	95 GH	z		1001 p	ts	-		Spar	1 60.0 MHz
Marker	-		Sector 1		1.	-			
Type	Ref	Trc	X-value	Y-value	Fund	tion	Fur	iction Resul	
MT2 MT2		1	5.7684 GHZ	-11 12 GBM	-				
03	M2	1	36.24 MHz	D.86 dB	1.				-
10.00			and a minute	0100 40					

Date: 6 DEC 2019 16:33:47

11AC20SISO Ant1 5745

Spect	and	L					E E
Ref Le Att Count	soo/5	20.00 di 30 00	Bm Offset 13,76 dB dB SWT 94.8 μs	 RBW 100 kHz VBW 300 kHz 	Mode Auto P	FT	
1Pk Vie	2W						
10 d8m-		_			M1[1]		-7.49 dBn 5.7362400 GH 0.47 dBn
0 dBm-		-	in the	A. Jamberry of	Andread I.		5.7400400 GH
-10 dBm	0	1 -5,53	4 dBm	aga www.est.est		mangent	
-20 dBm	-	_	pt	-		1	
-30 dBm	-	And	have	-		- Jul	Manne
ADBAA	MIN	4-UW	-			-	mounting
-50 dBm	-	_				-	
-60 dBm	+	-				-	
-70 dBm	+			-		-	
CF 5.7	IS GH	2		1001 p	ts		Span 40.0 MHz
Marker		-	and the second s	at such as	1		dia manda
Type	Ker	Irc	X Value	T-Value	Function	Fund	alon Result
ALC: NO	-		5173024 GHZ	D 47 dBm			
02	MI		17.64 MHz	0.57 dB	1.		

Date: 6 DEC 2019 17:23:06



11AC20SISO_Ant1_5785



Date: 6 DEC 2019 17 28:40

11AC20SISO_Ant1_5825

Spect	rum									E Star
Ref L Att Count	evel :	20.00 dB 30 d	m Offset 14.01 B SWT 94.8	dB = RBW 100 µs = VBW 300	kHz kHz	Mode Auto	FFT			
1Pk V	ew									
10 dBm	-			M2		M1[1]		_	5.85	-5.06 dBn 162800 GH 0.97 dBn 200800 GH
-10 dBn	D	1 -5.031	dam Tweeluw	malas her hard	rypea	henderstande	e And	ANA ANA		
-20 dBn	-		1		-	-	_	X		
-30 dBn	-win	Martin	MAR.						timining	Alexander
-50 dBn	-	-		-	+		-			
-60 dBn	-				-		-	1.1	-	
-70 dBn	1							1.1		
CF 5.8	25 GH	z		10	01 pts			1	Spar	40.0 MHz
Marker Type	Ref	Tre	X value	Y-value	- 1	Function	1	Fu	nction Resul	
M1 M2		1	5.81628 GH 5.82008 GH	z +5.05 z 0.97	dām dām					
03	Ma	4	16.96 MH	t -0:3	1 dB	-				_

Date: 6 DEC 2019 17:34.07

11AC40SISO Ant1 5755

Spectru	1111					
Ref Lev Att Count 50	el 20.00 d 30 0/500	dBm Offset 13,76 dB dB SWT 1.1 ms	RBW 100 kHz VBW 300 kHz	Mode Auto	Sweep	
• 1Pk View	v					
				M1[1]		-11.30 dBm
10 d8m-	-			M2[1]		-3.31 dBm
0 dBm-	-		M	1	1	1.7000400 011
1.1	1. 1. 1.	Millelidelin	the production pre	while I a	LULIA	
-10 UBIII-	01 -9.41	11 060			4	
-20 dBm-	-		1			
100						
-30 dBm-	-		-		- Low	Marke State
ad an Ash	-the state	yuturne				and and the stand of the state
Ale south of						
-50 dBm-	-				_	
the design						
-00 dbm-						
-70 dBm-	-	1				
			1.1			
CF 5.755	GHz		1001 pt	s		Span 60.0 MHz
Marker	ini a	The second secon				
Type R	tef Trc	X-value	Y-yaloe	Function	Fu	nction Result
M1	1	5.73684 GHz	-11.30 dBm			
M2	1	5.75004 GHz	~3.31 dBm		-	
03	m1 1	35,92 MHZ	0.95 08			

Date: 6 DEC 2019 18:17:18



11AC40SISO_Ant1_5795

Spect	mur								
Ref Lo Att Count	evel :	20.00 dBr 30 d	m Offset 14.01 dB B SWT 1.1 ms	 RBW 100 kH VBW 300 kH 	z Mode A	uto Swee	≥p		
1Pk Vi	ew								
10 dBm	-			MO	M1[ŋ IJ		5.75	10.99 dBm 68400 GHz -2.92 dBm 01200 GHz
		-8.925	Millelik	which had been go	miduhalalal	-	Ida		
-20 dBm	-				-	_	1	-	
-30 dBm	1.1.10	امد. الولدان	and				Your	manachiohogas	an card
-50 dBm	_						1		
-ô0 dBm	+	-						-	
-70 dBm	+	_			-	-	1		
CF 5.79	95 GH	2	1 1	1001	pts	-	1	Spar	60.0 MHz
Marker	0.0	-	Marcalum	M scalars	1 months	- L	-	ation Disaid	
M1 M2 03	Ma	1 1 1 1	5.77684 GHz 5.79012 GHz 36.08 MHz	-10.99 dBm -2.92 dBm -2.02 dBm	I Functio	n I	Fur	iction Resul	

Date: 6 DEC 2019 18:22:29

11AC80SISO_Ant1_5775

Milij -14.16 dBr 10 dBm 5.73 2240 04 0 dBm Milij -10 dBm 5.76 7640 0H -20 dBm -10 dBm -30 dBm	10 d8m	11		1 1					
0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -0	and the second sec		_		M	st 11 11 11		5.7	14:16 dB# 37240 GH: -7.29 dBm 67640 GH:
-20 dBm -30 dBm -30 dBm -50 dBm -00	-10 dBm-01 //	2 200 dBm Allt		MAN WAL	allan Lett	L. MIL	IIII		
-30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 5.775 GHz 1001 pts Span 160.0 MHz	-20 dBm		_			(Second	handle.		
-00 dbm	-30 dBm								_
-50 dBm -00 dBm -70 dBm CF 5.775 GHz 1001 pts Span 160.0 MHz	-40 dBm	nonument					Here	Mary inchasts	dimber de sinceres
-80 dBm	-50 dBm			-				-	
-70 dBm-	-60 dBm-	-	-	-	-				_
CF 5.775 CHz 1001 pts Span 160.0 MHz	-70 dBm-		-						
	CF 5.775 GHz	_	_	1001	pts			Span 1	60.0 MHz

Date: 6 DEC 2019 19:41:33

intertek Total Quality. Assured.

TEST REPORT

Intertek Report No.: 191126031SZN-005_updated

26dB OBW

Test Mode	Channel	26dB FBW [MHz]			Limit[MHz]	Verdict
Test Widde				F100 C80	LIIIICIIVIIIZJ	DACC
	5180	21.240	5169.440	5190.680		PASS
	5200	21.400	5189.400	5210.800		PASS
	5240	21.440	5229.360	5250.800		PASS
	5260	21.240	5249.360	5270.600		PASS
	5280	21.160	5269.400	5290.560		PASS
11A	5320	21.280	5309.360	5330.040		PASS
	5500	21.100	5469.400	5510.500		PASS
	5580	21.200	5509.400	5590.000		PASS
	5700	21.300	5724 400	5755 560		PASS
	5745	21.100	5754.400	5755.500		PASS
	5825	21.100	581/ 320	5835 560		PASS
	5120	21.240	5169.400	5192.400		DASS
	5200	23.000	5189.320	5210.840		PASS
	5240	21.320	5220 280	5251 160		PASS
	5240	21.880	52/0 280	5251.100		PASS
	5200	21.920	5269.220	5200 760		PASS
	5280	21.440	5209.320	5250.700		PASS
11N20	5520	21.460	5309.400	5550.000		PASS
	5500	21.440	5489.360	5510.800		PASS
	5580	21.520	5569.360	5590.880		PASS
	5700	21.680	5689.400	5711.080		PASS
	5745	21.680	5734.360	5756.040		PASS
	5785	21.600	5774.320	5795.920		PASS
	5825	21.920	5813.920	5835.840		PASS
	5190	47.440	5170.000	5217.440		PASS
	5230	45.520	5210.000	5255.520		PASS
	5270	48.800	5248.960	5297.760		PASS
44940	5310	41.840	5289.680	5331.520		PASS
11N40	5510	41.760	5489.680	5531.440		PASS
	5550	42.560	5527.920	5570.480		PASS
	5670	41.680	5649.920	5691.600		PASS
	5755	49.360	5732.840	5782.200		PASS
	5795	44.720	5770.520	5815.240		PASS
	5180	21.600	5169.400	5191.000		PASS
	5200	21.480	5189.320	5210.800		PASS
	5240	21.720	5229.280	5251.000		PASS
	5260	21.600	5249.200	5270.800		PASS
	5280	21.600	5269.240	5290.840		PASS
11AC20	5320	21.960	5308.840	5330.800		PASS
	5500	21.600	5489.280	5510.880		PASS
	5580	21.720	5569.080	5590.800		PASS
	5700	21.480	5689.320	5710.800		PASS
	5745	21.800	5734.200	5756.000		PASS
	5785	23.080	5773.280	5796.360		PASS
	5825	22.320	5813.720	5836.040		PASS
	5190	48.880	5169.920	5218.800		PASS
	5230	41.920	5210.000	5251.920		PASS
	5270	41.200	5249.840	5291.040		PASS
110040	5310	41.280	5289.760	5331.040		PASS
11AC40	5510	42./20	5490.000	5532.720		PASS
	5550	41.120	5529.920	55/1.040		PASS
	5670	41.840	5649.920	5691.760		PASS
	5755	42.160	5/34./60	5776.920		PASS
	5/95	40.640	5774.680	5815.320		PASS
	5210	84.160	5169.200	5253.360		PASS
	5290	82.080	5249.040	5331.120		PASS
11AC80	5530	81.760	5489.200	5570.960		PASS
	5610	83.360	5568.880	5652.240		PASS
	5775	88.000	5733.560	5821.560		PASS



11A_Ant1_5180



Date: 6 DEC 2019 11:16:03

11A_Ant1_5200

Spectrum	
RefLevel 20.00 dBm Offset 13.96 dB RBW 200 kHz Att 30 dB SWT 47.4 µs VBW 1 MHz Mode Auto FFT Count 500/500 Count 500/500 1 MHz Mode Auto FFT 1 MHz	
1Pk View	
10 d8m	-22.80 dBm 5.1894800 GHz 3.50 dBm 5.2004800 GHz
0 dBm - Andrew Manus manus and a start of the	
-10 dBm	
-20 dBm	
-36 /Barrow MA	manny
-50 dBm	
-60 dBm	
-70 dBm	
CF 5.2 GHz 1001 pts 5	Span 40.0 MHz
Marker	
Type Ref Trc X-value Y-value Function Function Re	esult
M1 1 5.1894 GHz -22.80 dBm	
D3 M1 1 21.4 MHz -0.26 dB	

Date: 6.DEC.2019 11:23:09

11A Ant1 5240

Spect	rum				_		_					E □
Ref Lo Att Count	evel :	20.00 31 00	dBm Offset : 0 dB SWT	13.96 dB 47.4 μs	RBW 2001 VBW 1 M	(Hz 1Hz	Mode	Auto F	FŤ			
1Pk Vi	ew											
10 dBm	-				:ME		N	2[1]			-2 5.229 5.238	2.31 dBm 3600 GH 3.73 dBm 4400 GH
0 dBm-	-			Agula	ALLAN DE STOR	1	The second	fermine	- John Carl	1	-	
-10 dBm	+				-	-	-	-	1		-	_
-20 dBm	0	1 -22	275 dBm	_	-	-	_	-	-		-	_
-30 dBm	m	-	m		-	-	_		_	mon	1sto	minn
-40 dBm	-					-					-	and by
-50 dBm	-				_							
-60 dBm	+											
-70 dBm	+				_						_	
CF 5.2	4 GHz				100	1 pts	;				Span 4	40.0 MHz
Marker	D-f	T ur	¥	. 1	v	- 1	F				0It	
M1	Rel	1	5.229	36 GHZ	-22.31 di	Bm	Func			runction	result	
M2		1	5.238	44 GHz	3.73 di	Bm						
D3	M1	1	21.	44 MHz	-1.11	dB						

Date: 6.DEC.2019 11:28:03



11A_Ant1_5260



Date: 6.DEC.2019 11:33:19

11A_Ant1_5280

	B.M.									
10 dêm	-				Me	and a	M1[1] M2[1]		5.2	21.71 dBm 594000 GH 4.34 dBm 764000 GH
0 dBm+		-		ing all a give	and the second s	1 mar	mar and a start of the start of	w	1	
-10 dBm	-			-	-	-	-	-1	-	-
-20 dBm	-01	-21.659	dBo	_	-	-	-	123	-	-
-30 dBr	Note	m	10		-			V	man	
-in day	-			_	_			-	_	marin
10 0101					1.1			1111		
-50 dBm		-			1	-	1		1	
-ò0 dBm	-	-		-	-	-	-	-	-	
-70 dBm	+	-		-		-	-	-	-	-
CF 5.2	GHZ	-			100	L pts	-	-	Spar	1 40.0 MHz
Marker	Pof	Tecl	Vouslue	1	V-ualon	1 Euro	etion 1	E.	action Decul	
M1		1	5.26	94 GHz	-21.71 di	im		7.0	The second second	
M2		4	5.27	84 GHz	4.34 di	im				
03	M2	- 4	-21.	10 MHz	0:05	dB				

Date: 6 DEC 2019 11:38:43

11A Ant1 5320

Spect	runn				_		_		E
Ref Le Att Count	evel .	20.00 3 00	dBm Offset 13 0 dB SWT 4	.98 dB 7.4 µs	RBW 200 k VBW 1 M	Hz	Mode Auto F	FT	
1Pk Vie	ew.								
10 dBm-	-			_	M2		M1[1]		-22.61 dBm 5.3093600 GH 3.60 dBm
0 dBm-	+	_		Andread	manting	m	m Monthly when a	half	5.3104000 GH
-10 dBm	+	_	A		-	-			
-20 dBm	-	1 -22	400 dBm					- de	
-38 dBrp	w.w	and	no	_		-	1.	~	minum
-40 dBm	+					-		-	
-50 dBm	+								
-60 dBm	-								
-70 dBm	-								
CF 5.32	2 GHz				1001	l pts	;		Span 40.0 MHz
Marker	Def	T uo	Y	- 1	V	- 1	Function	Fue	ation Desult
M1	ĸer	1	5 3093	5 GHz	-22.61.dF	lm	Function	Fun	ction Result
M2		1	5.318	4 GHz	3.60 dE	sm			
D3	M1	1	21.28	MHz	-0.12	dB			

Date: 6.DEC.2019 11:43:32



11A_Ant1_5500



Date: 6 DEC 2019 11:52:48

11A_Ant1_5580

Spect	mun						
Ref Le Att Count	evel 2	20.00 dB 30 c	m Offset 13.76 dB B SWT 47.4 μs	 RBW 200 kH VBW 1 MH 	iz Mode Auto Fi	FŤ	
• 1Pk Vi	ew.						
10 dBm				Ma	M1[1]		-23.28 dBn 5.5694000 GH 2.82 dBn 5.5704000 GH
0 dBm-		-	phinter	and and a start	- Constrant Carlo	with	
-10 dBm	-		1	-		1	
-20 dBm	0	-23 16	4 dBn			Y	
-30 dBm	N	Auron parts	W			2	mon
-40 dBm	-	-				1 1 1 1	
-50 dBm	-	-				1	
-ò0 dBm	+	-				-	
-70 dBm	+	-		-		-	
CF 5.5	B GHz	· · · ·		1001	pts		Span 40.0 MHz
Marker	221	2.1	Actes 1	0.000	1 months 1	1	
Type	Ker	Irc	X Value	Y-yalue	Function	Fun	ction Result
M2	-	1	5.5784 GHz	2.82 dBr	n		
03	M		21.2 MHz	-0:10 d	B		
0.0	1014		care mine	-0.10 0			

Date: 6 DEC 2019 11:57:24

11A Ant1 5700

Spect	rum								8
RefL	evel	20.00 dBr	n Offset 1	3.76 dB	RBW 200 kH	7			
Att		30 d	B SWT	47.4 US	VBW 1 MH	z Mr	de Auto FE	T	
Count	500/5	00		for the	140 500		And Barrett		
1Pk Vi	ew			_			_		
	1		1	-	1 1	_	MILLI		-24.38 dBm
									5.6893600 GH
10 dBm	-						MELLI		1.94 dBm
					1	12			5.7004800 GHz
0 dBm-	-		-	And And	the second	Non 10	month and	cald.	
			1					N	
-10 dBm			1		+				
			1					1	
-20 dBm			mal	_	-			1	-
	-0	1 -24.060	dam		-			23	
-30 dBn			11				1		phane the
where a	s	MUCH 41	r				1111		1 Journal
an dia	_		1						
-10 000	· · · ·							-	
No dite			1					-	
-Ju upn	1								
an and									
-ou den	1		1			-			
-	- 1		· · · · · · · · · · · · · · · · · · ·						
-70 dBm							11		
	100								
CF 5.7	GHZ			-	1001	pts			Span 40.0 MHz
Marker	1.0		-						
Type	Ref	Trc	X-value		Y-value	I F	unction	Fun	ction Result
M1	1.00	1	5.689	36 GHz	-24.38 dBr	σ			
M2		- A -	5.700	48 GHz	1.94 dBr	n			
03	M2	- 4	21.3	6 MHz	0:10 d	3			

Date: 6 DEC 2019 13 19 35



11A_Ant1_5745



Date: 6 DEC 2019 13:30-12

11A_Ant1_5785

Spectr	um						E
Ref Le Att	evel :	20.00 dB 30 c	m Offset 13.76 dB B SWT 47.4 μs	RBW 200 kH VBW 1 MH	z Z Mode Auto FF	Ť	
• 1Pk Vie	ew.						
10 dBm-		_		MT	M1[1]		-23.79 dBn 5.7743200 GH 2.39 dBn 5.7834000 GH
0 dBm-	-		protect	-former and	- Marty	why	
-10 dBm	-		A	-			
-20 dBm	Ó	1.23.61	D dBa	-		13	
-30 dBm	NY	m	¥″			m	monum
-40 dBm	-	_		-		-	-
-50 dBm	+	_				-	
-60 dBm	+	-				-	
-70 dBm	+	-				-	-
CF 5.76	IS GH	2		1001	pts		Span 40.0 MHz
Marker	Pot	Tral	Variation 1	Waterlan	L Exection 1	Due	ation Decult
M	rolf	inc	5.77432 GHz	-23.79 dBn	I runation	Fun	clinit Result
M2		1	5.7834 GHz	2.39 dBn	7		
03	M2	4	21.16 MHz	-0:19 di			

Date: 6 DEC 2019 13:35:34

11A Ant1 5825

Spectrum								
Ref Level	20.00 dB	m Offset 1	4.01 dB	RBW 200 k	42			v
Att	30 0	B SWT	47.4 µs	VBW 1 M	iz Mo	de Auto FF	T	
Count 500/5	00							
1Pk View								
	_				-	M1[1]		-24.04 dBm
10 40 -			-					5.8143200 GH
10 dbm	-	1			12	W5[1]		2.18 dBn
D dDm		diam'r ar		warm	Jan in			5.8254800 GH
Q ODIII			OW MELL.	1			and .	
-10 dBm-		1					1	
10 00111		1						
-20 dBm		mart					1	
D	1 -23.81	6 dBm		-			A.	
-30 dBm	m	4/*		-			h	1 Anna
www.								- markener
-40 dBm		-	-				-	
1.00								
-50 dBm		-	-	+				
-b0 dBm				1	-		-	
-							-	
-70 dBm	-	1				11	-	
	-		1				1	
CF 5.825 GH	2		-	1001	pts			Span 40.0 MHz
Marker	1.0	- Contractor	100	0.000	1.1			
Type Ref	Irc	x value	27 644	T-yalue	I FI	unction	Fun	ction Result
M2	4	5.825	48 GHz	2.18 dB	10			
03 M3	4	21.2	14 MHZ	-9.01.0	B			

Date: 6 DEC 2019 13:40:57



11N20SISO_Ant1_5180



Date: 6 DEC 2019 13:47:55

11N20SISO_Ant1_5200

Spectrur	n					
Ref Leve Att Count 500	1 20.00 dB 30 c /500	m Offset 13.96 dB B SWT 47.4 µs	RBW 200 k VBW 1 M	Hz Hz Mode Auto F	FT	
1Pk View						
10 d8m			winner	M1[1] M2 M2[1]		-22.94 dBn 5.1893200 GH 3.27 dBn 5.2008800 GH
0 dBm		parte		1 maan	many	
-10 dBm			-			
-20 dBm-	D1 /22.72	9 dBm	-		The second	0.00
-30 dBm-	1	and in	-			for bon harden and
HAMM -40 dBm-						
-50 dBm-			-		-	
-60 dBm-					-	
-70 dBm-					-	
CF 5.2 GH	2	1	1001	pts		Span 40.0 MHz
Marker	i mil	Marchine 1	H makes	1 Provention		and the Division in the
M1 M1	aluc	5.18932 GHz	-22.94 HB	in Function	- Fur	iction Result
M2	1	5.20088 GHz	3.27 dB	im		
03 1	42 2	-21.52 MHz	0:11 (4B		

Date: 6 DEC 2019 13:52.29

11N20SISO_Ant1_5240

in					□
el 20.00 d 30 0/500	Bm Offset 13.96 dB dB SWT 47.4 μs	 RBW 200 kHz VBW 1 MHz 	Mode Auto F	FT	
-					
		n de initian	M1[1] M2[1]		-23.10 dBn 5.2292800 GH 3.38 dBn 5.2390400 GH
01 -22.6	10 dBr			- Ja	
howan	- And				under with
-			_	-	-
-				-	
			-		
Hz	1	1001 p	ts		Span 40.0 MHz
of I Ten I	Vision	Manalon	L Exection	Euror	tion Decult
es me	5,22028 GHz	-23, 10 dBm	runation [Func	uuti nesuk
1 M3 4	5.23904 GHz	3.33 dBm			
	-01 -22.6	Image: constraint of the second dam Offset 13.96 dB 30 dB SWT 47.4 µs 0/500	Mill Offset 13.96 dB RBW 200 kHz 30 dB SWT 47.4 μs VBW 1 MHz 0/500 A A A Mill Mill 01 -22.610 dB/F - <t< td=""><td>Image: Constraint of the second sec</td><td>Image: Product of the second second</td></t<>	Image: Constraint of the second sec	Image: Product of the second

Date: 6 DEC 2019 13:57:23



11N20SISO_Ant1_5260



Date: 6.DEC.2019 14:01:58

11N20SISO_Ant1_5280

Spect	rum										E.
Ref Lo Att Count	evel :	20.00	dBm Offset D dB SWT	13.98 dB 47.4 µs	• RBW 200 k	Hz Hz	Mode	Auto FF	Ť		
1Pk Vi	ew										
10 dBm	+				MZ		M	1[1] 2[1]		5.20	22.78 dBn 93200 GH 3.83 dBn
0 dBm-	+	_	1	hache	An ADMANNA	p.m.	mothing	half	Apr	0.23	77600 GH
-10 dBm	+	-				-			1	-	
-20 dBm	0	1 92	171 dBt	-	-	-	_	-	-		
-30 dBm	nind	~	m			-				many	my
-40 dBm	1-										
-50 dBm	+				-						
-60 dBm									-		
-70 dBm	+										
CF 5.2	B GHz				100:	L pts				Spar	40.0 MHz
Marker											
Type	Ref	Trc	X-value	30.00-	Y-value		Funct	ion	Fi	unction Result	
M1 M2		1	5.209	32 GHZ	-22.78 ut	Am					
D3	M1	1	21.	44 MHz	0.44	dB					

Date: 6.DEC.2019 14:06:37

11N20SISO_Ant1_5320



Date: 6 DEC 2019 14:13:00



11N20SISO_Ant1_5500



Date: 6 DEC 2019 14:24:29

11N20SISO_Ant1_5580

		A444 1 5 125	Mode Autory			
91Pk View	-1	, ,				
100 100 100 100			MILI		5.569	4.01 dBn 3600 GH
10 d8m-			M2111			2.05 dBn
1	Ma No			1	5.575	0400 GH
0 dBm	Montoon	- marine -	manuforderates	alfin	1 1	
54 m 2				1		
-10 dBm-				1		
no dans	unt			1	1 1	
-20 ubm	254 dBm			D3		
30 dBm	Mark V			2	Vienne	
munter					human with	the.
-40 dam				-		W.
				11.1		
-50 dBm			-	-	+ +	_
-60 dBm				-	1 1	
and the second sec				_		
-70 dBm			11	-		
CF 5.58 GHz		1001 pt	5	_	Span 4	IO.0 MHz
Marker	- Second A		Sector 1		The Cold State	
Type Ref Trc	X value	Y-value	Function	Fur	ction Result	_
M2 1 M2 3	5-36938 GH2 5-57504 GH2	29.01 GBm				-
02 M3 1	OT EQUALLA	-0:04 49				_

Date: 6 DEC 2019 14:29:27

11N20SISO Ant1 5700

				1205150_/	<u>_</u> 5700		
Spect	rum						
Ref L	evel :	20.00 dE	m Offset 13.76 dB	RBW 200 kHz	10. A. A. A. A. A.		
Att		30 1	地 SWT 47.4 µs	WBW 1 MHz	Mode Auto FFT		
Count	500/5	00					
IPk Vi	ew						111.4
					M1[1]		-24.29 dBm
							5.6894000 GH
10 dBm	-	-			M2111		1.77 dBn
				M2			5.6992400 GH
0 dBm-	-	-	tute	to the man post	ment which at a	AL	
			(mm m			M	
-10 dBn		_		-			
-20 dBa	-		and the			- h-	
no out	0	1 .24.22	dam -	-		N3	
20 484			1			2	AL AN
-30 UBI	10	SW	V.				the party have
Nin	m					-	- V W
HO GBI							
2.5							All and a second
-50 dBn	7			-		-	
-90 qBu	1						
-70 dBn	-+-					-	
	_					1.1	
CF 5.7	GHZ	-	1	1001 pt	5		Span 40.0 MHz
Marker							
Tyne	Ref	Tre	Xevalue	Y-value	Function	Fund	tion Result
M1	-	1	5.6894 GHz	-24.29 dBm		1.001	
M2		- 1	5.69924 GHz	1.77 dBm			
03	M2		21.68 MHz	-0:35 dB			
and the second second	-	_		1.00			

Date: 6 DEC 2019 14:34:34



11N20SISO_Ant1_5745



Date: 6 DEC 2019 14:44:21

11N20SISO_Ant1_5785

Spectrum						8
Ref Level Att Count 500/	20.00 dB 30 d	m Offset 13.76 dB B SWT 47.4 µs	RBW 200 kHz VBW 1 MHz	Mode Auto FFT	1	
1Pk View						
10 d8m			MZ	M1[1]		-25.39 dBn 5.7743200 GH 1.55 dBn 5.7842400 GH
0 dBm		returned	manage	manuthatin	hin	
-10 dBm	_			_	1	
-20 dBm	01 .24 45	- m	-		13	
-30 dBm-	at the two	1			92	mAnn
www.	-utr					a war
-40 dBm-	-	1			-	-
-50 dBm						
-60 dBm	-					-
-70 dBm-					-	-
CF 5.785 0	HZ		1001 p	ts		Span 40.0 MHz
Marker	1.	areas 1	0.000	1		
Jype Rel	Inc	5.77437 GHz	-35.39 dam	Function	Funct	ion Result
M2	1	5.78424 GHz	1.55 dBm			
03 M	2 1	21.6 MHz	0:79 dB	1 million (1997) 1 million (1997)		

Date: 6 DEC 2019 14 49 24

11N20SISO_Ant1_5825



Date: 6 DEC 2019 14:56:31



11N40SISO_Ant1_5190



Date: 6.DEC.2019 15:16:33

11N40SISO_Ant1_5230

Spectru	m										
Ref Lev Att Count 50	el 20.00	dBm Offset 30 dB SWT	13,96 dB 1 ms	 RBW 500 k VBW 2 M 	Hz	Mode	Auto S	weep			
1Pk View	r										
10 d8m-				ME	-	M1 M2	(1)			5.21	22.20 dBm 00000 GHz 4.34 dBm 53600 GHz
0 dBm-	-	1	and an and a star		1		- Change	anda/	_	1	
-10 dBm-	-		-	-	-				-	-	
-20 dBm-	01 -21	660 dBm	-	-	-	_	_	-	true	dillogra	
-30 dBm-	the tables	- WWW	-	-	-			-		Nu antinati	Mineraly
V Manuel an											
-40 dBm—											
-50 dBm—	+			-	-			-			
-60 dBm—				-							
-70 dBm—	-			_							
CF 5.23 (GHz			100:	1 pts	;				Span	80.0 MHz
Marker											
Type R	ef Trc	X-valu	91 CH2	Y-value	200	Functi	ion		Fun	ction Result	
M1 M2	1	5.225	36 GHz	4.34 di	3m						
D3	M1 1	45.	52 MHz	-4.15	dB						

Date: 6.DEC.2019 15:25:49

11N40SISO Ant1 5270

Spect	mun					-	_					₩
Ref Lo Att Count	soo/5	20.00 31 00	dBm Offset 13.9 D dB SWT	98 dB 🖷 1 ms 🖷	RBW SOO k VBW 2 M	Hz Hz	Mode	Auto S	weep			
• 1Pk Vi	ew											-
10 dBm	-	_		_			M2 M	1[1] 2[1]			5.2	-23.80 dBm 189600 GHz 4.20 dBm 248800 GHz
0 dBm+	+	-	- parto	- Mar	Here and	1	T STORE D	mantri	manging	_	1	1
-10 dBm	+	_			-	_	-		-	\vdash	-	
-20 dBm	-0	1 -21	767 dB	_	-	-	_	_	-	Jun	A . 50 .	-
dp.Hew	4640	h.dul	V MANANA MANANA		-	_	_		-	(card)	A PUPPING AN	meronaling
-40 dBm	+											
-50 dBm	+								_			
-60 dBm	-											
-70 dBm	+								_			
CF 5.2	7 GHz				1001	. pts	;				Spar	1 80.0 MHz
Marker												
Туре	Ref	Trc	X-value		Y-value		Func	tion		Fun	ction Resul	t
M1		1	5.24896	GHz	-23.80 dB	m						
M2 D3	M1	1	5.27488	GHZ MHZ	4.23 dB -1.85 c	dB						

Date: 6.DEC.2019 15:34:18



11N40SISO_Ant1_5310



Date: 6.DEC.2019 15:39:30

11N40SISO_Ant1_5510

Spect	mun	1										
Ref Lo Att Count	evel :	20.00 3 00	dBm Offset : 0 dB SWT	13.98 dB 1 ms	 RBW 500 k VBW 2 M 	Hz	Mode	Auto S	Sweep			
1Pk Vi	ew											
10 dBm	-		-		ME		M	u 11 2(11)			5.48	24.10 dBm 196800 GHz 2.00 dBm 159200 GHz
0 dBm+	-		1	Contractor		m		thomas	unenter		T	1
-10 dBm	+	-		-	-	-	-		-	+		
-20 dBm	-	1 -23	996 dBm		-	-	-		-	102	-	
-30 dBm	-	baik	Marth		-	-		_	-	-10ADA	with annu a	- Harriston
لالتعريق	- UNK											1 10
-40 dBm	-											
-50 dBm	-				-							
-60 dBm	-											
-70 dBm	+				_				_			
CF 5.5	1 GHz				1001	L pts	5				Spar	80.0 MHz
Marker												
Type	Ref	Trc	X-value	9 60 CU2	Y-value	1	Funct	ion		Fun	ction Result	t
M1 M2		1	5.489	92 GHz	-24.18 dE	3m						
D3	M1	1	41.	76 MHz	-1.20	dB						

Date: 6.DEC.2019 15:44:24

11N40SISO Ant1 5550

Spect	rum			-		-	_					l≣ ⊽
Ref L Att Count	evel :	20.00 3 00	dBm Offset 13 D dB SWT	3,76 dB 1 ms	RBW 500 k VBW 2 M	Hz Hz	Mode	Auto S	Sweep			
1Pk Vi	iew					_						
10 dBm	_			_	Ma		M	511J 111J			5.5	-27.39 dBn 279200 GH 2.43 dBn 467200 GH
0 dBm-	+	_	10		manuting	5	Linkens		anding	-	1	1
-10 dBn	n	_		_	-	_				_	-	
-20 dBn	n	1 -23	565 dbWn		-	_	_	-		8		
-30 dBn	north-	WIN	AND HARA		-					894al	ho build have	Mitale
mange					1.1							- manapatal
-40 dBn	n											
-50 dBn	n								_			
-60 dBn	n				_							
-70 dBn	n											
CF 5.5	5 GHz				1001	pts	;				Spa	n 80.0 MHz
Marker												
Туре	Ref	Trc	X-value		Y-value		Func	tion		Fur	nction Resu	t
M1 M2		1	5.5279	2 GHZ	-27.39 dB 2 43 dB	m						
D3	M1	1	42.5	5 MHz	1.71 0	iВ						

Date: 6.DEC.2019 15:49:18



11N40SISO_Ant1_5670



Date: 6.DEC.2019 15:54:12

11N40SISO_Ant1_5755

Spect	rum	1								
Ref L Att Count	evel 500/5	20.00 3 00	dBm Offset 13 D dB SWT	76 dB 🗰 1 ms 🖷	RBW 500 ki VBW 2 Mi	Hz Hz Mode	a Auto S	weep		
1Pk Vi	ew			_						
10 dBm	-				MP	1	12[1]		5.73	27.22 dBm 28400 GHz 2.55 dBm 21200 GHz
0 dBm-				Sternin .				reducing		
-10 dBn		_		_	-	-			-	
-20 dBn		+ .046	w dat d	_		_	-	1		
-30 dBa	hor	HAN	dimine	_		_	-	tu,	ot weithing he	-
-40 dBn										
-50 dBn	n									
-60 dBn	- +									
-70 dBn	- +-									
CF 5.7	55 GH	Iz			1001	pts			Span	80.0 MHz
Marker										
Туре	Ref	Trc	X-value		Y-value	Fun	ction	Fur	iction Result	:
M1 M2		1	5.73284	GHZ	-27.22 dB	m				
D3	M1	1	49.36	MHz	2.55 UB 1.98 d	B				
P				1						

Date: 6.DEC.2019 16:27:51

11N40SISO Ant1 5795

Spect	nn			_		-	_		E
Ref Le Att Count	soo/5	20.00 d 30 00	Bm Offset 14 dB SWT	1.01 dB	RBW SDO ki VBW 2 Mi	łz łz N	lode Auto Si	weep	
1Pk Vie	2W								
10 dBm-	-	_			Mb		M1[1] M2[1]		-23.06 dB# 5.7705200 GH 3.01 dBm
0 dBm-	+	-	1	and the second	monenter	porten		entra	a.1922000 (m
-10 dBm	+	_	+ /		-	_		1	
-20 dBm	-	1 393	M dBmc			_		1	
30 dem	المعيدة	ny wijen he	THIM AND A			_		anny	aran Wieden and and
-40 dBm	+	-	1						
-50 dBm	+								
-60 dBm	+								
-70 dBm	+								
CF 5.79	95 GH	z			1001	pts			Span 80.0 MHz
Marker									
Туре	Ref	Trc	X-value		Y-value		Function	Fun	ction Result
M1		1	5.7705	2 GHz	-23.06 dBi	n			
M2 D3	M1	1	44.7	2 GHZ 2 MHZ	-0.85 d	B			

Date: 6.DEC.2019 16:33:27



11AC20SISO_Ant1_5180



Date: 6 DEC 2019 16:39:21

11AC20SISO_Ant1_5200

Spect	rum	1										
Ref Lo Att Count	evel :	20.00 dB 30 c	m Offset B SWT	13.96 dB = 47.4 µs =	RBW 200 k VBW 1 M	Hz Hz	Mode	Auto FF	FT.			
0 1Pk Vi	ew											
10 dBm	-			0. 6. 0	Man		M	(1) (1)	1		5.10	22.75 dBn 193200 GH 3.69 dBn 196400 GH
U dBm-		-	1	- and a start		Y			control 1			
-10 dBm		-	+ /		-	-	-	-	1	-	-	-
-20 dBm	0	1 -22.81	2 dBa	-	-		_	-	-	E	_	-
-30 dBm	-Mar	mm	M		-	_		-			Mussenson	www
-40 dBm	pril v		-				-		-	_	-	
-50 dBm	-		-	-	-	-			-	-	-	
-90 dBm	-	-			-	-	-		-	-	-	
-70 dBm	-		-			-	-		-	-	-	
CF 5.2	GHz	-			1001	pts			1	_	Spar	40.0 MHz
Marker		- 61	3000	- A		- 1	la mor	-			The second second	
Type	Ref	Trc	X valu	22 644	Y-value	im.	Funct	ion		Func	tion Resul	
M2		1	5.109	64 GHz	3,69 08	im		-		-		
03	M2	4	-21.	48 MHz	0:30	dB			1			

Date: 6 DEC 2019 16:44:17

11AC20SISO_Ant1_5240

Spectru	in							(E
Refleve	al 20.00 d	Bm Offset 1	3.06 dB	RBW 200 kHz				
Att	20.00 0	da SML	47 4 115	VAW I MUT	Mode 4	TO FET		
Count CO	1/200	00 000	Acta his a	FRAME A POINT	moue Au	AU PPT		
Count Sol	0/-500		_					
The Alew	-					-		
					M111	L)		-23.13 dB
10 d8m-		1 10 mm			-			5.2292800 GF
10 0011				Ma	W121.1	1		3.39 dB
			A . A	Kapan mint	Mary Margaret	4 . 4 . 4		5.2396400 GF
0 dBm-		1	A. 101 A.	V		Jan and		
-10 dBm-				+ +				
		5					1	
-20 dBm-	-	Mar					1	
	01 -22.6	10 dBm					Ste	
-30 dBm-	N	W.					1	PUT WM MAR
- AM	T							. Lawing
AD down								
and onlin-		1.						
	-	i di secondo di second						And and a second
-50 dBm-	-	-	-	+ +				
-60 dBm-	-	-	-	+				
-70 dBm-	-	-	_	-			_	
							-	
CE 5 24 C	142	1		1001 0	te			Span 40 0 MHz
dendine.	1.14			1001 p			_	open tota intra
harker	diam'r	No. Con	1	il color	1 months			the state of the
Type R	erinc	x value	IR CITY	T-Value	Functio	n_1	Func	tion Result
112	-	5,229	CO LEM2	-23 13 GBM			_	
mi2	4	5.2390	24 GHZ	3.39 GBm				
03	W2 - 2)	-21.7	< MHZ	-0.05 dB	1.1			

Date: 6 DEC 2019 16:48:57



11AC20SISO_Ant1_5260



Date: 6 DEC 2019 16:54:20

11AC20SISO_Ant1_5280

Spect	rum	1.1							V
Ref Le Att Count	evel : 500/5	20.00 d 30 00	Bm Offset 13.98 d dB SWT 47.4 μ	B RBW 200 k S VBW 1 M	Hz Hz	Mode Auto FF	r		
0 1Pk Vi	ew				_				-
10 d8m-			And	M. Martin	page	M1[1] M2[1]	A.	5.26	22.97 dBm 92400 GHz 3.06 dBm 92400 GHz
-10 dBm	-	-					1	-	
-20 dBm	0	1 -22.6	39 dBM				X	man	An or
-40 dBm								1	- month
-50 dBm	+								
-60 dBm									
CE E D				1001	Inte			Coop	40.0 MUS
Markor	U GHZ			1001	. pts	,		эран	TO.0 MINZ
Type	Ref	Trc	X-value	Y-value		Function	Fun	iction Result	
M1 M2		1	5.26924 GHz 5.27924 GHz	-22.97 dB 3.36 dB	im Sm				
D3	M1	1	21.6 MHz	0.24 (ЗB				

Date: 6.DEC.2019 16:58:53

11AC20SISO_Ant1_5320

Spect	um					-	E
Ref Le Att Count	soo/5	20.00 3 00	dBm Offset 13.98 d 0 dB SWT 47.4 p	IB = RBW 200 kH IS = VBW 1 MH	z Mode Auto F	FT	
1Pk Vi	9W						
10 dBm-	-		1		M1[1] M2 M2[1]		-23.18 dBn 5.3088400 GH 2.90 dBn
0 dBm-	+	-	And	manny	at many when a	hally 1	5.3211200 GH
-10 dBm	-	-					
-20 dBm	-0	1 -23	097 dBm			- Au	
-30 dBm	An	No.N	W	-		m	and the strange
-40 dBm	-					-	
-50 dBm	+						
-60 dBm	-						
-70 dBm	+						
CF 5.32	2 GHz			1001	pts		Span 40.0 MHz
Marker				1	1		
Type	Ret	Irc	E 20004 CH-	-22 10 dbm	Function	Func	tion Kesult
M2		1	5.32112 GHz	-23.18 UBr	1		
D3	M1	1	21.96 MHz	-0.18 dB	3		

Date: 6.DEC.2019 17:03:26



11AC20SISO_Ant1_5500



Date: 6 DEC 2019 17:08:00

11AC20SISO_Ant1_5580

Spect	rum	1							~
Ref L Att Count	evel :	20.00 dB 30 c 00	m Offset 13.76 d8 B SWT 47.4 µ	8 = RBW 200 k s = VBW 1 M	Hz Hz Mode	Auto FFT	ŕ		
• 1Pk Vi	ew								
10 dBm	+				M2 M	5[1] 1[1]		5.5	24.40 dBm 90800 GHz 1.76 dBm 125600 GHz
0 dBm-	-	-	marchin	Auman	1 sana starrage	tuberty	alla	1	-
-10 dBn	-	-					1	-	
-20 dBn	0	1 -24.24	4 dBm	-		-	da da		_
-30 dBn	-	mond	AP.W	_			V	Man	
min	m						-	1.000	W. Marylen
-40 dBy						1.			
-50 dBn	-	-		-			-	-	
-60 dBn	-	-		-				-	
-70 dBn	r+	-						-	
CF 5.5	8 GHz	-	1	1001	pts			Spar	40.0 MHz
Marker	21	2.1	10000	1 00000	1	1. I.			
1ype M1	Kef	Irc	5.56908 GHz	-24.40 dB	Func	tion	Fun	ction Resul	
M2	-	1	5.58256 GHz	1.76 dB	m	- 1			
03	M2	- 4	-21.72 MHz	0:11 0	fa				-

Date: 6 DEC 2019 17:13:31

11AC20SISO_Ant1_5700

		± ±,		<u>_</u>	0	
Spectrur	n					
Ref Leve Att	1 20.00 di 30	am Offset 13.76 dB dB SWT 47.4 µs	 RBW 200 kHz VBW 1 MHz 	Mode Auto F	FT	
1Pk View						
10 d8m			1	M1[1]		-24.31 dBm 5.6893200 GH 1.72 dBn 5.7009200 GH
0 dBm	-	ponde	1 months	tour de la serie	halfer	
-10 dBm					1	
-20 dBm-	01 24 0	11	-		43	
-30 dBm-	01 -24.20				Ann.	minte
26 dam-	www	Y				mont
-50 dBm	-				-	
-60 dBm	-				-	
-70 dBm-	-				1.1	
CF 5.7 GH	2		1001 p	ts		Span 40.0 MHz
Marker	FITEL	Visualup	V-value	Eurortion	Euro	tion Decult
M1	1	5.68932 GHz	-24.31 dBm	ranchion	Func	anon Aesur
M2 03 M	42 4	5.70092 GHz 21.48 MHz	1.72 dBm 10:02 dB			

Date: 6 DEC 2019 17:18:00



11AC20SISO_Ant1_5745



Date: 6 DEC 2019 17:22:47

11AC20SISO_Ant1_5785

RefL	evel :	20.00 dBr	offset 13.76 dB	RBW 200 k	Hz				1.
Att		30 di	3 SWT 47.4 μs	VBW 1M	Hz M	tode Auto FF	Ť		
1Pk Vi	8W	50			_				
10 dBm					MT.	M1[1] M2[1]		5.75	24.92 dBn 32800 GH 1.34 dBn 161200 GH
0 dBm-	-		million	- Arren and	how	man white	unt in		
-10 dBm	+	-		-		-	1	-	
-20 dBm	-	ma	~/	-	-		10		
-30 dBm	-	W-24.004	ppiu.	-			VA	handren	monto
-10 dan	-	_		-	-		-	-	
-50 dBm	-	_		-	-	-	-	-	
-60 dBm	+	-		-	-	-	-	-	
-70 dBm	+	-		-	-	-	-	-	
CF 5.7	15 GH	2		100	pts			Span	40.0 MHz
Marker	n.c.	-	Marchine 1	N	1	Proposition 1		ation Division	
M	reer	inci	5.77328 GHz	-24.92 di	im	runction	Fun	CLION RESUL	-
M2		1	5.76612 GHz	1.34 di	im ata	_	_		_

Date: 6 DEC 2019 17:20,22

11AC20SISO_Ant1_5825



Date: 6 DEC 2019 17:33:49



11AC40SISO_Ant1_5190



Date: 6.DEC.2019 17:39:48

11AC40SISO_Ant1_5230

Spect	1mi	1								
Ref Le Att Count	soo/5	20.00 d 30 00	Bm Offset 13,96 dB SWT 1	dB = RBW 500 ms = VBW 2) kHz MHz	Mode	Auto S	iweep		
1Pk Vie	ew.									
10 dBm-	-			Mar Langer Long	2	M2 M2	(11) (11)		5.21	21.60 dBm 00000 GHz 4.40 dBm 67200 GHz
0 dBm-			1		Y			and the second		
-10 dBm	+	-		-	-		-		-	_
-20 dBm	-0	1 -21.5	65 dBm	_	+	_	_	Lite	Margan L	
-30 dBm	A	-	pulle part		-		_		and and they	HALL WELL
and they		-				1.1				
-40 dBm	-									
-50 dBm	+							-		
-60 dBm	-									
-70 dBm	+				_					
CE 5 25	3 6 H 7			10	01 nt				Snan	80.0 MHz
Marker	/ 0112			10	or pt.	,			opun	00.0 1112
Type	Ref	Trc	X-value	Y-value	1	Funct	ion	Fun	ction Result	
M1		1	5.21 G	Hz -21.60	dBm					
M2		1	5.22672 G	Hz 4.43	dBm					
D3	M1	1	41.92 M	Hz -2.0	6 dB					

Date: 6.DEC.2019 17:45:19

11AC40SISO_Ant1_5270

Spectr	um					-			-			E
Ref Le Att Count S	ovel :	20.00 3 00	dBm Offset 1 0 dB SWT	3.98 dB 1 ms	RBW 500 k VBW 2 M	Hz	Mode	Auto S	iweep			
1Pk Vie	2W											
10 dBm-	-				M2		M	811) 8111			5.2	-21.97 dBm 498400 GHz 4.20 dBm
0 dBm-	+	-	T	- Irel to -	warman	3 mar	- Aller	and the second days	market my	-	1 0.2	678400 GHz
-10 dBm	+		++	-	-	-			-	-	-	_
-20 dBm	-0	1 -21.	802 dBm		-	-		-	-	(and	1.11	-
-30,dBm	3.	hand	Marian		-	-				- 1	hours	Melandia
-40 dBm	-								-			
-50 dBm	+											
-60 dBm	+											
-70 dBm	+								_			
CF 5.27	' GHz	:			1001	. pts	5				Spa	n 80.0 MHz
Marker												
Туре	Ref	Trc	X-value		Y-value	_	Func	tion		Fun	ction Resu	lt
M2		1	5.249 E 267	34 GHZ	-21.97 dB	m						
D3	M1	1	41	.2 MHz	-0.50 (dВ						

Date: 6.DEC.2019 17:50:53



11AC40SISO_Ant1_5310



Date: 6.DEC.2019 17:55:30

11AC40SISO_Ant1_5510

Ref Level 20.00 dBm Offset 13.98 dB RBW S00 kHz Att 30 dB SWT 1 ms VBW 2 MHz Outs 500/500 1Pk View M1[1] -23.75 dBm 10 dBm M1[1] -23.75 dBm S.400000 GHz 0 dBm M2[1] 2.74 dBm -10 dBm M2 M2[1] S.5077600 GHz -20 dBm M1 23.26 dBm M2[1] S.5077600 GHz -30 dBm M1 23.26 dBm M2[1] S.5077600 GHz -30 dBm M1 1 S.507760 GHz M2[1] S.507760 GHz -50 dBm M1 1 S.491 GHz M1 M2[1] S.507760 GHz -70 dBm M1 1 S.491 GHz M1 Span 80.0 MHz M1 1 S.491 GHz Y-value Function Function Result M1 1 S.50776 GHz 2.74 dBm Oc6 dB M1 M1	Spect	nun	1										
19k View M111 -23.75 dbr 5.400000 GH 10 dbm M2 11 5.400000 GH 0 dbm M2 11 5.507760 GH -10 dbm -01 23.262 dbm -01 23.262 dbm -30 dbm 01 23.262 dbm -01 40 dbm -30 dbm -01 23.262 dbm -01 40 dbm -50 dbm -01 40 dbm -01 40 dbm -50 dbm -01 40 dbm -01 40 dbm -50 dbm -01 40 dbm -01 40 dbm -70 dbm -01 40 dbm -01 40 dbm -70 dbm -01 40 dbm -01 40 dbm -70 dbm -01 40 dbm -00 40 dbm -70 dbm -01 40 dbm -01 40 dbm -70 dbm -00 40 dbm -00 40 dbm -70 dbm -23.75 dbm -00 6 db	Ref L Att Count	evel 500/5	20.00 3 00	dBm Offset 1 0 dB SWT	3.98 dB 1 ms	RBW 500 k VBW 2 M	Hz Hz	Mode	Auto S	iweep			
10 dBm -23.75 dBm 0 dBm 5.490000 GHz 0 dBm -27.4 dBm -10 dBm -27.4 dBm -10 dBm -27.4 dBm -20 dBm -12.252 dBm -20 dBm -12.252 dBm -30 dBm -10 dBm -30 dBm -10 dBm -30 dBm -10 dBm -30 dBm -10 dBm -50 dBm -10 dBm -50 dBm -10 dBm -50 dBm -10 dBm -50 dBm -10 dBm -60 dBm -10 dBm -70 d	0 1Pk Vi	ew						-					
0 dBm -10 dBm -20 dBm -20 dBm -20 dBm -30 dBm -30 dBm -30 dBm -40 dBm -50 dBm -50 dBm -60 dBm -60 dBm -70 d	10 dBm	-				Ma		M	(11) (11)			5.45	23.75 dBm 00000 GHz 2.74 dBm 077600 GHz
10 dBm -20 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -60 dBm -70 dBm -70 dBm -70 dBm -70 dBm -80 dBm -80 dBm -80 dBm -10	0 dBm-	-	-	m	and an other	and	1	Tratter	Mary Mary	motoring	_		
20 dBm 01 22.262 dbm -30 dBm -40 dBm -40 dBm -40 dBm -40 dBm -40 dBm -50 dBm -50 dBm -50 dBm -60 dBm -50 dBm -50 dBm -60 dBm -50 dBm -50 dBm -70 dBm -50 dBm -50 dBm	-10 dBn		-		-	-	-		-	-	$\left - \right $		
-30 dBm -40 dBm -50 dBm -50 dBm -50 dBm -70	-20 dBn		1.93	262 dBm		-	-	_		-	UIDE		
40 dBm Image: Constraint of the second	-30 dBr	m	tout	Jahanser		-	-	-		-	A.A.	physical part	and and a start
S0 dBm Image: Constraint of the second	-40 dBn	-				-							
-60 dBm -70	-50 dBn												
-70 dBm CF 5.51 CHz 1001 pts Span 80.0 MHz Varker Type Ref Trc X-value Y-value Function Result M1 1 5.49 GHz -23.75 dBm M2 1 5.50776 GHz 2.74 dBm D3 M1 1 42.72 MHz -0.06 dB	-60 dBn	- +											
Type Ref Trc X-value Y-value Function Result M1 1 5.49 GHz -23.75 dBm -23.75 dBm	-70 dBn	- +											
Marker Type Ref Trc X-value Y-value Function Function Result M1 1 5.49 GHz -23.75 dBm <td>CF 5.5</td> <td>1 GHz</td> <td></td> <td></td> <td></td> <td>1001</td> <td>l pts</td> <td></td> <td></td> <td></td> <td></td> <td>Spar</td> <td>80.0 MHz</td>	CF 5.5	1 GHz				1001	l pts					Spar	80.0 MHz
Type Ref Trc X-value Yu-value Function Function Result M1 1 5.49 GHz -23.75 dBm - - - M2 1 5.50776 GHz 2.74 dBm -	Marker												
M1 1 5.49 GHz -2.3.75 UBM M2 1 5.50776 GHz 2.74 dBm D3 M1 1 42.72 MHz -0.06 dB	Type	Ref	Trc	X-value	0.011-	Y-value		Funct	ion		Fund	tion Result	t
D3 M1 1 42.72 MHz -0.06 dB	M1 M2		1	5.4	6 GHZ	-23.75 dB	sm Sm						
	D3	M1	1	42.7	2 MHz	-0.06 c	dB						

Date: 6.DEC.2019 18:00:17

11AC40SISO_Ant1_5550

Spect	um					
Ref Le Att Count	soo/5	20.00 31 00	dBm Offset 13,76 d8 D dB SWT 1 m	s RBW 500 kHz s VBW 2 MHz	Mode Auto S	Sweep
1Pk Vie	B.M.					
10 dBm-	-			Ma	M1[1]	-23.92 dBr 5.5299200 GH 2.80 dBr
0 dBm-	+	-		- former -	manual second	Castoring 3.0477000 Gr
-10 dBm	-	_		_		
-20 dBm	-0	1 -23	203 d8m			10
-30 dBm	-	And the second	outobilities w			Werner and the stand and the s
-40 dBm	+					
-50 dBm	+					
-60 dBm	+					
-70 dBm	-					
CF 5.5	5 GHz			1001 pt	s	Span 80.0 MHz
Marker	D -6	T		l Martine I		L Function Description
Type	ĸet	1	x-value	-22.02 dBm	Function	Function Result
M2		1	5.54776 GHz	2.80 dBm		
D3	M1	1	41.12 MHz	-0.71 dB		

Date: 6.DEC.2019 18:05:11



11AC40SISO_Ant1_5670



Date: 6.DEC.2019 18:11:56

11AC40SISO_Ant1_5755

Spect	rum	1								
Ref Li Att Count	evel :	20.00 dB 30 c 00	m Offset 13,76 d B SWT 1 m	B = RBW 500 1 IS = VBW 2 M	(Hz MHz	Mode Au	to Swe	ер		
1Pk Vi	ew									-
10 dBm	-				142	M1[1 M2[1	1		5.73	23.88 dBn 147600 GH 2.49 dBn 166000 GH
-10 dBm	-				-			hours	_	
-20 dBm	0	1 -23.51	2 dBm 7	_	-	_	_	Lifter	10	
-30 dBn	m	ton Ama	aun		-				a month and the	M. Mahaling
-40 dBm										
-50 dBm					-					
-60 dBm	+									
-70 dBm	1				+					
CF 5.7	55 GH	z		100	1 pts	s		-	Span	80.0 MHz
Marker										
Туре	Ref	Trc	X-value	Y-value		Function	1	Fund	tion Result	t
M1		1	5.73476 GHz	-23.88 d	Bm		_			
M2 D3	M1	1	5.7566 GHz 42.16 MHz	2.49 d -0.63	BM dB					

Date: 6.DEC.2019 18:16:58

11AC40SISO Ant1 5795

Spect	um		-					-			B
Ref Le Att Count	soo/5	20.00 31 00	dBm Offset 14.0. D dB SWT 1	1 dB 🗰 RB 1 ms 🗰 VB	W 500 kHz W 2 MHz	Mode	Auto S	iweep		-	
1Pk Vie	B.M.										
10 dBm-	+				M2	M	1111 2111			5.7	-23.93 dBm 746800 GH 2.62 dBm 931600 GH
0 dBm-	+	-	The	-	man and a	mine		Marchan	-	Ť	1
-10 dBm	-	_		-	-	_	-		-	-	-
-20 dBm	-	+ .50	214					-	43		-
-30,484	nut	rankl	and the A		-			-	4-14	Markelle	in the state and
-40 dBm								-			1.000.000
-50 dBm	-										
-60 dBm	-							_			
-70 dBm	+							_			
CF 5.79	95 GH	Iz			1001 p	its				Spa	n 80.0 MHz
Marker											
Туре	Ref	Trc	X-value	Y	-value	Func	tion		Fun	ction Resu	lt
M1		1	5.77468 G	HZ ·	-23.93 dBm	-					
D3	М1	1	40.64 M	Hz	0.32 dB						

Date: 6.DEC.2019 18:22:09



11AC80SISO_Ant1_5210



Date: 6.DEC.2019 18:29:52

11AC80SISO_Ant1_5290

Spect	rum	1									
Ref Lo Att Count	evel . 500/5	20.00 0 30 00	dBm Offset 1 IdB SWT	3.98 dB 1 ms	BBW 1 MH	z	Mode A	uto Sw	eep		
1Pk Vi	ew										
10 dBm	-				Ma	~	M	5[1] 1[1]		5.3	22.52 dBn 249040 GH 3.99 dBn 283280 GH
0 dBm-	-	-	1	In the second		1		- and	and and	1	
-10 dBm	+			-	-	-				-	
-20 dBm	0	1 122.0	meb 900	_	-	-		_		-	
-60'H8H	pela pol	maren 1	when	_	-	-		-	V.	al population of the	Rithmand
-40 dBm	+					-			_		
-50 dBm	-		_								
-60 dBm	+										
-70 dBm	-										
CF 5.2	9 GHz				1001	l pts	5			Span	160.0 MHz
Marker											
Type	Ref	Trc	X-value	4 GHz	-22 52 de	um l	Funct	tion	Fu	nction Resul	t
M2		1	5.2832	8 GHz	3.99 dE	sm					
D3	M1	1	82.0	8 MHz	-0.62	dB					

Date: 6.DEC.2019 18:59:21

11AC80SISO_Ant1_5530

Spect	m						_			
Ref Le Att Count	soo/5	20.00 3 00	dBm Offset 13.76 D dB SWT 1	odB 🖷 🖡	RBW 1 MHz VBW 3 MHz	Mod	le Auto Swi	eep		
1Pk Vie	2W				-		217			
10 dBm-					- 1		M1[1]		5:4	24.40 dBm 89200 GHz 1.65 dBm
1.1					C	M2			5.5	33520 GHz
0 dBm-	-		mate	un	- and the second		allene	maria	1 1	
-10 dBm	+	-		-		_		7		_
-20 dBm	-	1 .24	349 dBm		-	_		t)3		_
-30 dBm	u	diane	with				-	Sud.	Aluchaterdo	they despice
-40 dBm	-									
-50 dBm	+									
-60 dBm	+									
-70 dBm	_							_		
CE 5 55	3 6H2				1001	nts			Snan 1	60 0 MHz
Marker					1001	P 10			- span i	
Type	Ref	Trc	X-value	1	Y-value	L F	unction	Fun	ction Result	1
M1		1	5.4892 G	Hz	-24.40 dB	m				
M2		1	5.53352 G	Hz	1.65 dB	m				
D3	M1	1	81.76 M	Hz	-0.65 c	iB				

Date: 6.DEC.2019 19:04:24



11AC80SISO_Ant1_5610



Date: 6.DEC.2019 19:17:21

11AC80SISO_Ant1_5775

Spect	rum										
Ref Lo Att Count	evel :	20.00 dBr 30 di 00	n Offset 13. B SWT	76 dB 1 ms	RBW 1 MHz VBW 3 MHz	M	ode Auto :	Sweep			
0 1Pk Vi	ew.					_					
10 dBm	-			_	Mz		M1[1]			5.7	26.32 dBn 33560 GH 2.08 dBn 67320 GH
0 dBm-	_					_	-		7		
-20 dBm	0	1 -23.922	dBin			_			1.2		
-30 dBr	handth	that the	ADD-P						SV4N	thirestofer the ap	all the second for
-50 dBr	· ·										
-60 dBn	+										
-70 dBm	+										
CF 5.7	75 GH	z			1001	pts				Span 1	160.0 MHz
Marker											
Туре	Ref	Trc	X-value		Y-value		Function		Func	tion Result	
M1		1	5.73356	GHz	-26.32 dB	m					
M2		1	5.76732	GHz	2.08 dB	m		_			
D3	M1	1	88.0	MHz	1.12 c	iB					

Date: 6.DEC.2019 19:41:15

Total Quality. Assured. TEST REPORT

Intertek Report No.: 191126031SZN-005_updated

			55/0 0011			
Test Mode	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
	5180	17.662	5171.249	5188.911		PASS
	5200	17.982	5191.049	5209.031		PASS
	5240	17.942	5230.969	5248.911		PASS
	5260	17.902	5251.009	5268.911		PASS
	5280	17.862	5271.009	5288.871		PASS
	5320	18.022	5310.969	5328.991		PASS
11A	5500	17.902	5491.009	5508.911		PASS
	5580	17.942	5571.009	5588.951		PASS
	5700	17.942	5691.089	5709.031		PASS
	5745	17.942	5735.969	5753.911		PASS
	5785	18.022	5775.889	5793.911		PASS
	5825	17.982	5815.889	5833.871		PASS
	5180	18.741	5170.769	5189.510		PASS
	5200	18.901	5190.689	5209.590		PASS
	5240	18.821	5230.649	5249.471		PASS
	5260	18.941	5250.569	5269.510		PASS
	5280	18.781	5270.649	5289.431		PASS
441120	5320	18.861	5310.609	5329.471		PASS
11N20	5500	18.861	5490.609	5509.471		PASS
	5580	18.821	5570.649	5589.471		PASS
	5700	18.821	5690.729	5709.550		PASS
	5745	18.941	5735.569	5754.510		PASS
	5785	18.861	5775.609	5794.471		PASS
	5825	18.901	5815.569	5834.471		PASS
	5190	36.763	5171.858	5208.621		PASS
	5230	36.843	5211.698	5248.541		PASS
	5270	36.763	5251.698	5288.462		PASS
	5310	36.763	5291.698	5328.462		PASS
11N40	5510	36.923	5491.618	5528.541		PASS
	5550	36.923	5531.618	5568.541		PASS
	5670	36.923	5651.778	5688.701		PASS
	5755	36.923	5736.618	5773.541		PASS
	5795	36.923	5776.538	5813.462		PASS
	5180	18.781	5170.769	5189.550		PASS
	5200	18.821	5190.729	5209.550		PASS
	5240	18.861	5230.649	5249.510		PASS
	5260	18.821	5250.649	5269.471		PASS
	5280	18.781	5270.649	5289.431		PASS
	5320	18.901	5310.649	5329.550		PASS
11AC20	5500	18.821	5490.649	5509.471		PASS
	5580	18.821	5570.649	5589.471		PASS
	5700	18.821	5690.729	5709.550		PASS
	5745	18.901	5735.609	5754.510		PASS
	5785	18.901	5775.569	5794.471		PASS
	5825	19.021	5815.490	5834.510		PASS
	5190	36.843	5171.858	5208.701		PASS
	5230	36.843	5211.698	5248.541		PASS
	5270	36.763	5251.698	5288.462		PASS
	5310	36.923	5291.618	5328.541		PASS
11AC40	5510	36.843	5491.698	5528.541		PASS
-	5550	36.923	5531.618	5568.541		PASS
	5670	36.763	5651.858	5688.621		PASS
	5755	36.923	5736.618	5773.541		PASS
	5795	36.843	5776.618	5813.462		PASS
	5210	75.604	5172.438	5248.042		PASS
	5290	75.924	5251.958	5327.882		PASS
11AC80	5530	75.924	5492.118	5568.042		PASS
	5610	75.924	5572.118	5648.042		PASS
	5775	75.924	5736.958	5812.882		PASS

99% OBW



11A_Ant1_5180



Date: 6.DEC.2019 11:16:15

11A_Ant1_5200

Spectrum								₩
Ref Level 20.00 Att 31 Count 500/500	dBm Offset 0 dB SWT	13.96 dB 🗰 RB 1 ms 👜 VB	W SOO kHz W 2 MHz	Mode	Auto Swee	p		
1Pk View								
10 dBm-			MI	M	1[1] cc BW		5.19 17.9820	8.00 dBn 184420 GH 17982 MH
0 dBm	T#		-			12		
-10 dBm	1					1		
-20 dBm	and the second s						mon	herman series
-30 dBm								
-50 dBm								
-60 dBm								
-70 dBm								
CF 5.2 GHz			1001 pt	ts			Spar	40.0 MHz

Date: 6.DEC.2019 11:23:21

11A_Ant1_5240



Date: 6.DEC.2019 11:28:15



11A_Ant1_5260



Date: 6.DEC.2019 11:33:31

11A_Ant1_5280

Spectrum							
Ref Level 20.00 Att Count 500/500	dBm Offset 30 dB SWT	13.98 dB 🗰 R 1 ms 📾 V	BW SOO KHZ BW 2 MHZ	Mode Aut	o Sweep		
1Pk View							
10 dBm-		man	me		w	5.27 17.8621	8.24 dBm 84820 GHz 37862 MHz
0 dBm-	Y			_	F		
-10 dBm							
-20 dBm	and					Land	
-30 dBm							Mr. Josef
-40 dBm							
-50 dBm							
-60 dBm							
-70 dBm							
CF 5.28 GHz			1001 pt	s		Span	40.0 MHz

Date: 6.DEC.2019 11:38:54

11A Ant1 5320

The Algen							-
10 dBm			Ret .	M1[1]		5.010	7.74 dBn 14820 GH 18022 MH
0 dBm-	ŢĮ	Junear		- me	12		_
-10 dBm	1				1		
-20 dBm						mon	how when
-30 dBm							
-50 dBm							
-60 dBm							
70 d8m							

Date: 6.DEC.2019 11:43:43



11A_Ant1_5500



Date: 6.DEC.2019 11:52:59

11A_Ant1_5580

Spectrum							1
Ref Level 20.01 Att Count 500/500	0 dBm Offset 30 dB SWT	13.76 dB 🗰 RI 1 ms 🗰 Vi	BW 500 kHz BW 2 MHz	Mode Auto Sw	еер		
1Pk View							
10 dBm-	1		145	M1[1]		5.5	6.68 dBn 784820 GH; 157942 MH;
		monto	all	man	_		· · ·
0 dBm	V				13		
-10 d5m-					X		-
-20 dBm-							
-30 dBm						more	www.manplet
-40 dBm							
-50 dBm							
-60 dBm							
-70 dBm							
CF 5.58 GHz			1001 pt	s		Spar	1 40.0 MHz

Date: 6.DEC.2019 11:57:36

11A Ant1 5700

		±±/ (_//				(m)
Spectrum	_				_		₩
Ref Level 20.00 Att 3 Count 500/500	dBm Offset 0 dB SWT	13.76 dB 🗰 RBW 1 ms 🗰 VBW	2 MHz Mc	ode Auto Swe	ер		
1Pk View						_	
10 dBm	1			MI[1]		5.69	6.54 dBm 064620 GHz 157942 MHz
0 dBm	Ţ¥	proven	m	min	V2		
-10 dBm-	1				1		
-20 dBm	mand				\	the second	manpus
-40 dBm							
-50 dBm							
-60 dBm							
-70 dBm							
CF 5.7 GHz			1001 pts			Spar	40.0 MHz

Date: 6.DEC.2019 13:19:46



11A_Ant1_5745



Date: 6.DEC.2019 13:30:41

11A_Ant1_5785

Spectrum							E
Ref Level 20.00 Att Count 500/500	0 dBm Offset 30 dB SWT	13,76 dB 🗰 🖡 1 ms 🗰 V	BW SOO KH	2 Mode Auto Sv	weep		1.
• 1Pk View							
10 dBm-			X	MI[1] Occ Bw	-	5.76	6.63 dBr 334820 GH 78022 MH
0 dBm-	11	forman		- mar	m te		
-10 d5m	/				1		
-20 dBm	mont		_		+	- Martin	
-30 dBm					_		to warrante
-40 dBm					_		
-50 dBm					_		
-60 dBm					_		
-70 dBm					_		
CF 5.785 GHz			1001 (ots		Spar	40.0 MHz

Date: 6.DEC.2019 13:36:03

11A Ant1 5825

1Pk View	-1-		1		1.8.1.40
10 dBm	1	No.	OCC BW	1 1	6.54 dBn 5.8234820 GH 17.982017982 MH
0 dBm	T/	menter	4 marine	12	_
-10 d5m	-			1	
-20 dBm					Land market way
-40 dBm					
-50 dBm					
-60 dBm					
-70 dBm					

Date: 6.DEC.2019 13:41:27



11N20SISO_Ant1_5180



Date: 6.DEC.2019 13:48:07

11N20SISO_Ant1_5200

Spectrum					
Ref Level 20.0 Att Count 500/500	0 dBm Offset 1 30 dB SWT	3:96 dB = RBW 500 1 ms = VBW 2	0 kHz MHZ Mode Auto Swa	әер	
1Pk View					_
10 dBm-		M	M1[1]	5. 18.90	8.44 dBm 1989610 GHz 1098901 MHz
0 dBm	1			the second	-
-10 d5m	. J			John sulle in	
-20 dBm	AND			- Changel	and hard made
-40 dBm					
-50 dBm					
-60 dBm					
-70 dBm					
CF 5.2 GHz		10	01 pts	Sp	an 40.0 MHz

Date: 6.DEC.2019 13:52:40

11N20SISO_Ant1_5240



Date: 6.DEC.2019 13:57:35



11N20SISO_Ant1_5260



Date: 6.DEC.2019 14:02:09

11N20SISO_Ant1_5280

Spectrum					[
Ref Level 20.00 Att Count 500/500	0 dBm Offset 13 30 dB SWT	98 dB = RBW 500 1 ms = VBW 21	kHz MHz Mode Auto Swi	эер	
1Pk View					
10 dBm-		Marine March 100	M1[1]	1	0.06 df 5.2021560 G 18.701218781 M
Q dBm	Y			Y	
-10 d5m	and the			1	- 6-2
-20 dBm					with the all the start of the s
-40 dBm					
-50 dBm					
-60 dBm					
-70 dBm					
CF 5.28 GHz		100	11 pts		Span 40.0 MH

Date: 6.DEC.2019 14:06:49

11N20SISO_Ant1_5320



Date: 6.DEC.2019 14:13:11



11N20SISO_Ant1_5500



Date: 6.DEC.2019 14:24:40

11N20SISO_Ant1_5580

Spectrum							
Ref Level 20.00 Att 3 Count 500/500	dBm Offset 1 30 dB SWT	3.76 dB 🗰 RBW 1 ms 📾 VBW	SDO kHz 2 MHz Mor	de Auto Swe	ер		
1Pk View							
10 dBm-		M	Changestan	M1[1] -Occ BW		5.57	7.85 dBm 80420 GHz 78821 MHz
0 dBm	- F	had also and a second			1		
-10 dBm	1				X		
-20 dBm	adjuble of the				ų	www.uline	Tomontony
-40 dBm							
-50 dBm							
-60 dBm							
-70 dBm							
CF 5.58 GHz			1001 pts		1	Span	40.0 MHz

Date: 6.DEC.2019 14:29:39

11N20SISO_Ant1_5700



Date: 6.DEC.2019 14:34:45


11N20SISO_Ant1_5745



Date: 6.DEC.2019 14:44:51

11N20SISO_Ant1_5785

Spectrum							
Ref Level 20.00 Att Count 500/500	dBm Offset 1 30 dB SWT	3.76 dB = RBV 1 ms = VBV	V SDO KHZ V 2 MHZ N	tode Auto Swee	ер		
1Pk View							
10 dBm-		James Alle Program	nitre-prese	MI[1]		5.76 18.9611	6.44 dBm 92020 GHz 38861 MHz
0 dBm-	V				F		
-10 d5m-	1				1	-	
-20 dBm	AN ARCHE				*	antrappart	o untrony yelly made
-40 dBm							
-50 dBm							
-60 dBm							
-70 dBm							
CF 5.785 GHz			1001 pts			Span	40.0 MHz

Date: 6.DEC.2019 14:49:53

11N20SISO_Ant1_5825



Date: 6.DEC.2019 14:57:00



11N40SISO_Ant1_5190



Date: 6.DEC.2019 15:16:45

11N40SISO_Ant1_5230

Spectrum							
Ref Level 20.00 Att 3 Count 500/500	dBm Offset	13.96 dB 🗰 🖡 1 ms 📟 V	BW 1 MHz BW 3 MHz	Mode Auto S	Sweep		
1Pk View							
10 dBm			Mi	M1[1]		5.22 36.8431	7,79 dBm 53650 GHz 56843 MHz
Q dBm-	1		-		Y		
-10 dBm	- 1				1		
-20 dBm	mille				Julia	erutsilatiphen	Wood Hard
-40 dBm							
-50 dBm							
-60 dBm							
-70 dBm							
CF 5.23 GHz			1001	pts		Span	80.0 MHz

Date: 6.DEC.2019 15:26:00

11N40SISO_Ant1_5270



Date: 6.DEC.2019 15:34:29



11N40SISO_Ant1_5310



Date: 6.DEC.2019 15:39:41

11N40SISO_Ant1_5510

Spectrum							
Ref Level 20.00 Att 3 Count 500/500	dBm Offset : 0 dB SWT	13.98 dB 🗰 RBW 1 ms 👜 VBW	1 MHz 3 MHz Mod	e Auto Sweep			
1Pk View							
10 dBm		M	-	MI(I) -Occ BW	-	5,50 36,9230	5.51 dBn 56840 GH 76923 MH
0 dBm-	1	in and	myan	- and man and	T		
-10 dBm-				-	+		
-20 dBm	withit				hat	annalulara	Marylanda, 1
AD dam							ų
-50 dBm							
-60 dBm							
-70 dBm							
CF 5.51 GHz			1001 pts			Span	80.0 MHz

Date: 6.DEC.2019 15:44:36

11N40SISO_Ant1_5550



Date: 6.DEC.2019 15:49:29



11N40SISO_Ant1_5670



Date: 6.DEC.2019 15:54:23

11N40SISO_Ant1_5755

Spectrum							
Ref Level 20.00 0 Att 30 Count 500/500	dBm Offset 1 0 dB SWT	3.76 dB 🗰 RE 1 ms 🗰 VE	W 1 MHz W 3 MHz	Mode Auto S	weep		
1Pk View							
10 dBm				Mi[1]	1	5.75 36.9230	5.87 dBm 57990 GHz 76923 MHz
0 dBm-	Y	and and a second			- y		
-10 dBm-							
-20 dBm-	unerriv				Wa.	e-midledus	Youbsould
-40 dBm							
-50 dBm							
-60 dBm							
-70 dBm							
CF 5.755 GHz	1		1001	its	1	Span	80.0 MHz

Date: 6.DEC.2019 16:28:22

11N40SISO_Ant1_5795



Date: 6.DEC.2019 16:33:58



11AC20SISO_Ant1_5180



Date: 6.DEC.2019 16:39:32

11AC20SISO_Ant1_5200

Spectrum					E Star
Ref Level 20.00 Att Count 500/500	dBm Offset 13.96 30 dB SWT 1	dB 🗰 RBW 500 k ms 📾 VBW 2 M	KHZ MHZ Mode Auto Swa	eep	
1Pk View					
10 dBm		and more	M1[1]	4 1	7.63 dBm 5.2008790 GHz 18.921178821 MHz
0 dBm-	T			F	
-10 d5m-	1			1	
-20 dBm	Ather			Marki	adultaterenteriting
1230 dBm					
-50 dBm					
-60 dBm					
-70 dBm					
CF 5.2 GHz		100	1 pts		Span 40.0 MHz

Date: 6.DEC.2019 16:44:29

11AC20SISO_Ant1_5240



Date: 6.DEC.2019 16:49:08



11AC20SISO_Ant1_5260



11AC20SISO_Ant1_5280



Date: 6.DEC.2019 17:03:37



11AC20SISO_Ant1_5500



Date: 6.DEC.2019 17:08:12

11AC20SISO_Ant1_5580

Spectrum					
Ref Level 20.00 Att Count 500/500	dBm Offset 13.7 30 dB SWT	6 dB ■ RBW \$00 1 ms ■ VBW 2 M	kHz MHz Mode Auto Swa	ер	
1Pk View					
10 dBm	m- Milil				6.98 dBm 5.5791210 GHz 18.821178821 MHz
0 dBm		where the second se	and a second and a second and a second	- Ve	
-10 dBm	1			Y.	
-20 dBm	1 HAR			Mestro -	Contraction of the Court
-40 dBm					
-50 dBm					
-60 dBm					
-70 dBm					
CF 5.58 GHz		100	1 pts		Span 40.0 MHz

Date: 6.DEC.2019 17:13:42

11AC20SISO_Ant1_5700



Date: 6.DEC.2019 17:18:19



11AC20SISO_Ant1_5745



Date: 6.DEC.2019 17:23:17

11AC20SISO_Ant1_5785

Spectrum								
Ref Level 20.0 Att Count 500/500	0 dBm Offset 1 30 dB SWT	3,76 dB 🗰 RI 1 ms 🔳 Vi	BW 500 ki BW 2 Mi	Hz Hz Mode	Auto Swee	p		
1Pk View			-					
10 dBm-	1			MI[1] Occ BW			6.12 5.7836010 18.901098901	
	1.0	-	munting	un march	Tethe man			
0 dBm-	TY					12	-	
-10 dBm	1			-		1		
-20 dBm	and a start of the					1		
-30 dBm							up the high	Whole making
-40 dBm								
-50 dBm								
-60 dBm								
-70 dBm								
CF 5.785 GHz			1001	pts			Span	40.0 MHz

Date: 6.DEC.2019 17:28:51

11AC20SISO_Ant1_5825



Date: 6.DEC.2019 17:34:19



11AC40SISO_Ant1_5190



Date: 6.DEC.2019 17:40:00

11AC40SISO_Ant1_5230

Spectrum				1
Ref Level 20.00 Att Count 500/500	30 dB SWT	13.96 dB = RBW 1 1 ms = VBW 3	MHz MHz Mode Auto Sweep	0
1Pk View				
10 dBm-			M1[1]	7.35 dBr 5.2360740 GH 36.843156843 MH
		manna	Jonehren	
0 dBm	1			1 -
-10 dBm				
-20 dBm				handrander
430 dBm	worker			to swowingh
-40 dBm				
-50 dBm				
-60 dBm				
-70 dBm				
CE 5.23 GHz			001 nts	Snan 80.0 MHz

Date: 6.DEC.2019 17:45:31

11AC40SISO_Ant1_5270



Date: 6.DEC.2019 17:51:05



11AC40SISO_Ant1_5310



Date: 6.DEC.2019 17:55:41

11AC40SISO_Ant1_5510

Spectrum					
Ref Level 20.00 Att 3 Count 500/500	dBm Offset : 0 dB SWT	3.98 dB 🗰 RBW 1 ms 👜 VBW	1 MHz 3 MHz Mode Auto	Sweep	
1Pk View					
10 dBm-			M1[1]	w	5.27 dBn 5.5127970 GH 36.843156843 MH
		and an and and and	- I mary		
0 dBm-	T			A	
-10 dBm-					
-20 dBm	11				de c
LBC dBM	النظرية والر			- Wh	and any address stopped
-40 dBm					
-50 dBm					
-60 dBm					
-70 dBm					
CF 5.51 GHz			1001 pts		Span 80.0 MHz

Date: 6.DEC.2019 18:00:29

11AC40SISO_Ant1_5550



Date: 6.DEC.2019 18:05:22



11AC40SISO_Ant1_5670



Date: 6.DEC.2019 18:12:08

11AC40SISO_Ant1_5755

Spectrum					-
Ref Level 20.00 Att 3 Count 500/500	dBm Offset 13 0 dB SWT	76 dB = RBW 1 M 1 ms = VBW 3 M	Hz Hz Mode Auto Sweep	2	
1Pk View					
10 dBm			M1(1) OCC BW	5.93 5.751963 36.923076923	0 GH 3 MH
Q dBm	y	and a start	for the management	marge -	_
-10 dBm-					
-20 dBm	markened			this phone under other	walny
-40 dBm					
-50 dBm					
-60 dBm					
-70 dBm					
CF 5.755 GHz		100	11 pts	Span 80.0	MHz

Date: 6.DEC.2019 18:17:29

11AC40SISO_Ant1_5795



Date: 6.DEC.2019 18:22:40



11AC80SISO_Ant1_5210



Date: 6.DEC.2019 18:30:04

11AC80SISO_Ant1_5290

2 Print of Suite				
Ref Level 20.00 BBW Offset 13.98 BBW 2 MH Att 30 30 B SWT 1 ms VBW 10 MH Count 500/500 30	z Mode Auto Sweep	-1		
1Pk View				
10 dBm-	MI(1) //// Occ Bw			
	the second s	12		
o dam		1		
-10 dBm				
-20 dBm				
Aladha alaa alaa alaa alaa alaa alaa ahaa		the partition of the state of t		
-40 dBm				
-50 dBm				
-60 dBm				
-70 dBm				
		Span 160 0 Mila		

Date: 6.DEC.2019 18:59:33

11AC80SISO Ant1 5530

	1.	1 1	-	1	1011			E 00 d0 -
10 d8m					CC BW		5.5	33360 GH
TO ODHI	Th	a hidamana a	anter my los	riturentium		1.75		
0 dBm-	1	A had a fear of the			which the	HOLYS	-	
-10 dBm		-						
20 dBm-		-						
39. dBtophyslad	shutterpres					histo	Myrdillyshpulw	harden
-40 dBm								
-50 dBm								
-60 dBm								
-70 d8m								

Date: 6.DEC.2019 19:04:35



11AC80SISO_Ant1_5610



Date: 6.DEC.2019 19:17:33

11AC80SISO_Ant1_5775

Spectrum					
Ref Level 20.00 Att 3 Count 500/500	dBm Offset 13,76 d 0 dB SWT 1 m	8 • RBW 2 MHz s • VBW 10 MHz	Mode Auto Swee	p	
1Pk View					
10.47			M1[1]		6.00 dBr 5.770200 GH
TO GBM	Thereward	mounting	- 1 - Martine Brown	La l	73.324073374 004
U dBm-	1				
-10 dBm-					
-20 dBm- worth hand hand hand hand hand hand hand han	unhand			Hige	Heiden marthum
-40 dBm					
-50 dBm					
-60 dBm					
-70 dBm					
CF 5.775 GHz		1001 pt	s		Span 160.0 MHz

Date: 6.DEC.2019 19:41:45



6. Radiated Emission test (FCC 15.205 & 15.209 & 15.407)

6.1 Operating environment

Temperature:	22	°C
Relative Humidity:	55	%
Atmospheric Pressure	1010	hPa

6.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



Radiated emission measurements were performed from 9KHz to tenth harmonic or 40GHz. The EUT for testing is arranged on a styrene turntable with the height of 0.8m up to 1GHz and 1.5m above 1GHz. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.



The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

Testing settings (refer to KDB 789033 D02)

Peak Measurements below 1GHz

- 1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
- 2, Span=encompass the entire emission
- 3, RBW=120KHz
- 4, Detector=Quasi-Peak
- 5, Trace was allowed to stabilize

Peak Measurements above 1GHz

- 1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
- 2, Span=encompass the entire emission
- 3, RBW=1MHz
- 4, VBW=3MHz
- 4, Detector= Peak (Max-hold)
- 5, Trace was allowed to stabilize

Average Measurements above 1GHz

- 1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
- 2, Span=encompass the entire emission
- 3, RBW=1MHz
- 4, VBW=3MHz
- 4, Detector= RMS (Max-hold)
- 5, Trace was allowed to stabilize



6.3 Limit

The spurious Emission shall test through the 10th harmonic or 40GHz (whichever is lower). In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

Notes:

1, All emission out-side of the 5.15-5.35GHz & 5.47-5.725GHz band shall not exceed an EIRP of -27dBm/MHz (68.2dBuV/m, test distance: 3 meter); for band 5.725-5.85GHz, all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at 5 MHz above or below the band edge.

2, The spectrum is measured from 9KHz to the 10th harmonic of the fundamental frequency of the transmitter using QP detector below 1GHz, above 1GHz, average & peak measurements were taken using for test. The worst-case emission are reported however emission whose levels were not within 20dB of the respective limited were not reported.

3, The test was performed on EUT under 802.11a/n-HT20/40/ac-HT20/40/80 continuously transmitting mode. Simultaneous transmitting was considered during the testing. All mode had been tested, but only the worst-case is recorded in the following graph and table.



Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD

Where	FS = Field Strength in dBμV/m
	RA = Receiver Amplitude (including preamplifier) in dBµV
	CF = Cable Attenuation Factor in dB
	AF = Antenna Factor in dB
	AG = Amplifier Gain in dB
	PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD

Example

Assume a receiver reading of 62.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 32 dBµV/m. This value in dBµV/m was converted to its corresponding level in μ V/m.

RA = 62.0 dBµV AF = 7.4 dB CF = 1.6 dB AG = 29.0 dB PD = 0 dB FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dBµV/m

Level in mV/m = Common Antilogarithm [(42 dB μ V/m)/20] = 125.9 μ V/m



6.4 Radiated spurious emission test data

6.4.1 Measurement results: frequencies equal to or less than 1 GHz

Applicant: TCL entertainment solutions limited Date of Test: January 06, 2020 Worst Case Operating Mode:

Model: TS9030 Transmitting (802.11ac-HT40)

ANT Polarity: Horizontal



ANT Polarity: Vertical





Applicant: TCL entertainment solutions limited Date of Test: January 06, 2020 Worst Case Operating Mode:

Model: TS9030 Transmitting (802.11ac-HT40)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	89.655000	45.0	20.0	9.6	34.6	43.5	-8.9
Horizontal	113.420000	45.5	20.0	9.6	35.1	43.5	-8.4
Horizontal	312.270000	41.2	20.0	17.2	38.4	46.0	-7.6
Vertical	88.685000	45.4	20.0	9.5	34.9	43.5	-8.6
Vertical	418.000000	38.5	20.0	20.3	38.8	46.0	-7.2
Vertical	594.027000	37.7	20.0	24.2	41.9	46.0	-4.1

NOTES: 1. Quasi-Peak detector is used for frequency below 1GHz.

- All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. All emissions are below the QP limit.





6.4.2 Measurement results: frequency above 1GHz

The worst case occurred at 802.11ac-VHT40

Channel 38/27 Mbps

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	10380.000	51.1	36.3	38.9	53.7	68.2	-14.5
Horizontal	15570.000	51.5	34.7	41.0	57.8	68.2	-10.4

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	10380.000	41.6	36.3	38.9	44.2	54.0	-9.8
Horizontal	15570.000	39.4	34.7	41.0	45.7	54.0	-8.3

Channel 46/27Mbps

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	10460.000	50.1	36.3	38.9	52.7	68.2	-15.5
Horizontal	15690.000	49.3	34.7	41.0	55.6	68.2	-12.6

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	10460.000	41.6	36.3	38.9	44.2	54.0	-9.8
Horizontal	15690.000	39.0	34.7	41.0	45.3	54.0	-8.7

Channel 54/27Mbps

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	10540.000	49.6	36.3	38.9	52.2	68.2	-16.0
Horizontal	15810.000	46.0	34.7	41.0	52.3	68.2	-15.9

Polarization	Frequency	Reading	Pre-	Antenna	Net	Average Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	10540.000	40.6	36.3	38.9	43.2	54.0	-10.8
Horizontal	15810.000	37.3	34.7	41.0	43.6	54.0	-10.4



Channel 62/27Mbps

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	10620.000	50.6	36.3	38.9	53.2	68.2	-15.0
Horizontal	15930.000	50.2	34.7	41.0	56.5	68.2	-11.7

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	10620.000	40.6	36.3	38.9	43.2	54.0	-10.8
Horizontal	15930.000	39.1	34.7	41.0	45.4	54.0	-8.6

Channel 102/27Mbps

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	11020.000	52.1	36.3	38.9	54.7	68.2	-13.5
Horizontal	16530.000	48.3	34.7	41.0	54.6	68.2	-13.6

Polari	zation	Frequency	Reading	Pre-	Antenna	Net	Average Limit	Margin
		(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
				Gain	(dB)	(dBµV/m)	(dBµV/m)	
				(dB)				
Horiz	ontal	11020.000	41.0	36.3	38.9	43.6	54.0	-10.4
Horiz	ontal	16530.000	38.6	34.7	41.0	44.9	54.0	-9.1

Channel 118/27Mbps

Polarization	Frequency	Reading	Pre-	Antenna	Net	Peak Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	11180.000	52.2	36.3	39.0	54.9	68.2	-13.3
Horizontal	16770.000	48.6	34.7	41.2	55.1	68.2	-13.1

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	11180.000	40.7	36.3	39.0	43.4	54.0	-10.6
Horizontal	16770.000	38.6	34.7	41.2	45.1	54.0	-8.9

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Channel 134/27Mbps

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	11340.000	2.3	36.3	39.0	5.0	68.2	-63.2
Horizontal	17010.000	47.1	34.7	41.2	53.6	68.2	-14.6

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	11340.000	39.6	36.3	39.0	42.3	54.0	-11.7
Horizontal	17010.000	37.1	34.7	41.2	43.6	54.0	-10.4

Channel 151/27Mbps

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	11510.000	50.9	36.3	39.0	53.6	68.2	-14.6
Horizontal	17265.000	48.3	34.7	41.2	54.8	68.2	-13.4

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	11510.000	38.6	36.3	39.0	41.3	54.0	-12.7
Horizontal	17265.000	37.4	34.7	41.2	43.9	54.0	-10.1

Channel 159/27Mbps

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	11590.000	51.6	36.3	39.0	54.3	68.2	-13.9
Horizontal	17385.000	47.2	34.7	41.2	53.7	68.2	-14.5

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	11590.000	39.6	36.3	39.0	42.3	54.0	-11.7
Horizontal	17385.000	37.1	34.7	41.2	43.6	54.0	-10.4

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



7. Power Line Conducted Emission test

7.1 Operating environment

Temperature:	23	°C
Relative Humidity:	55	%
Atmospheric Pressure	1011	hPa

7.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50 uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm/50 uH coupling impedance with 50 ohm termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10/2013 on conducted measurement.

The bandwidth of the field strength meter (R & S Test Receiver ESCI 30) is set at 9 kHz.

7.3 Limit

Freq.	Conducted Limit (dBuV)				
(MHz)	Q.P.	Ave.			
0.15~0.50	66 – 56*	56 – 46*			
0.50~5.00	56	46			
5.00~30.0	60	50			

*Decreases with the logarithm of the frequency.



7.4 Power Line Conducted Emission test data

Applicant: TCL entertainment solutions limited Date of Test: January 06, 2020 Worst Case Operating Mode: Phase: Live

Model: TS9030 WIFI Link



Result Table QP

Frequency	QuasiPeak	Bandwidth	Line	Corr.	Margin	Limit
(MHz)	(dBuV)	(kHz)		(dB)	(dB)	(dBuV)
0.250000	45.8	9.000	L1	9.7	16.0	61.8
0.770000	41.3	9.000	L1	9.7	14.7	56.0
1.538000	38.7	9.000	L1	9.7	17.3	56.0
2.306000	35.8	9.000	L1	9.7	20.2	56.0
9.638000	40.1	9.000	L1	9.9	19.9	60.0
26.342000	40.3	9.000	L1	11.0	19.7	60.0

Result Table AV

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.250000	27.2	9.000	L1	9.7	24.6	51.8
0.770000	41.0	9.000	L1	9.7	5.0	46.0
1.538000	39.1	9.000	L1	9.7	6.9	46.0
2.306000	33.6	9.000	L1	9.7	12.4	46.0
9.638000	26.3	9.000	L1	9.9	23.7	50.0
26.342000	23.5	9.000	L1	11.0	26.5	50.0

Remark:

- 1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
- 2. Margin (dB) = Limit (dBuV) Level (dBuV)

Applicant: TCL entertainment solutions limited Date of Test: 06 February 2020 Worst Case Operating Mode: Phase: Neutral

Model: TS9030 WIFI Link



Result Table QP

Frequency	QuasiPeak	Bandwidth	Line	Corr.	Margin	Limit
(MHz)	(dBuV)	(kHz)		(dB)	(dB)	(dBuV)
0.222000	47.1	9.000	Ν	9.7	15.6	62.7
0.770000	40.2	9.000	Ν	9.7	15.8	56.0
1.538000	38.3	9.000	Ν	9.7	17.7	56.0
2.302000	32.9	9.000	Ν	9.8	23.1	56.0
6.154000	37.9	9.000	Ν	9.9	22.1	60.0
16.510000	40.2	9.000	Ν	10.3	19.8	60.0

Result Table AV

Frequency	Average	Bandwidth	Line	Corr.	Margin	Limit
(MHz)	(dBuV)	(kHz)		(dB)	(dB)	(dBuV)
0.222000	22.3	9.000	Ν	9.7	30.4	52.7
0.770000	40.2	9.000	Ν	9.7	5.8	46.0
1.538000	37.1	9.000	Ν	9.7	8.9	46.0
2.302000	32.1	9.000	Ν	9.8	13.9	46.0
6.154000	26.8	9.000	N	9.9	23.2	50.0
16.510000	30.1	9.000	Ν	10.3	19.9	50.0

Remark:

- 1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
- 2. Margin (dB) = Limit (dBuV) Level (dBuV)



8. Frequency Stability Test

8.1 Test setup & procedure



- Note1: The frequency stability is measured with the temperature variation range of 0°C to +45°C (5°C increment), and voltage supply variation range of 85% to 115% of nominal AC supply voltage.
 - To ensure emission at the band-edge is maintained within the authorized band, the frequency 802.11a/n-HT20/40/ac-HT20/40/80 channel 36, 48, 52, 64, 100, 140, 149, 165, 38, 46, 54, 62, 102, 134, 151, 159, 42, 58, 106, 122,155 are selected to test and the worst case was reported.

8.2 Frequency Stability Test Data

20°C is taken as temperature in normal condition.

Total Quality. Assured. TEST REPORT

		Voltage	Temperatu	Deviation	Deviation	
Test Mode	Channel		re	(Hz)	(nnm)	Verdict
		[100]	(°C)	()	(pp)	
		120	20	60000	11.583012	PASS
	5180	102	20	75000	14.478764	PASS
		138	20	75000	14.478764	PASS
		120	20	60000	11.450382	PASS
	5240	102	20	60000	11.450382	PASS
		138	20	60000	11.450382	PASS
		120	20	60000	11.406844	PASS
	5260	102	20	60000	11.406844	PASS
		138	20	60000	11.406844	PASS
		120	20	60000	11.278195	PASS
	5320	102	20	60000	11.278195	PASS
11.0		138	20	60000	11.278195	PASS
AIT		120	20	60000	10.909091	PASS
	5500	102	20	60000	10.909091	PASS
		138	20	60000	10.909091	PASS
		120	20	75000	13.157895	PASS
	5700	102	20	75000	13.157895	PASS
		138	20	45000	7.894737	PASS
		120	20	60000	10.443864	PASS
	5745	102	20	45000	7,832898	PASS
	07.10	138	20	45000	7 832898	PASS
		120	20	75000	12 875536	PASS
	5825	102	20	60000	10 300429	PASS
		138	20	60000	10 300429	PASS
		130	20	60000	11 583012	PASS
	5190	102	20	20000	5 701506	DASS
	5180	102	20	45000	9 697250	PASS
		138	20	45000	8.087259	PASS
	5240	120	20	60000	11.450382	PASS
	5240	102	20	60000	11.450382	PASS
		138	20	60000	11.450382	PASS
		120	20	60000	11.406844	PASS
	5260	102	20	60000	11.406844	PASS
		138	20	/5000	14.258555	PASS
		120	20	75000	14.097744	PASS
	5320	102	20	60000	11.278195	PASS
11N20SISO		138	20	60000	11.278195	PASS
1111200.000		120	20	45000	8.181818	PASS
	5500	102	20	60000	10.909091	PASS
		138	20	60000	10.909091	PASS
		120	20	75000	13.157895	PASS
	5700	102	20	75000	13.157895	PASS
		138	20	75000	13.157895	PASS
		120	20	75000	13.05483	PASS
	5745	102	20	60000	10.443864	PASS
		138	20	90000	15.665796	PASS
		120	20	90000	15.450644	PASS
	5825	102	20	90000	15.450644	PASS
		138	20	90000	15.450644	PASS
		120	20	90000	17.34104	PASS
	5190	102	20	60000	11.560694	PASS
		138	20	30000	5.780347	PASS
		120	20	20000	3.824091	PASS
	5230	102	20	90000	17.208413	PASS
11N40SISO		138	20	90000	17.208413	PASS
		120	20	90000	17.077799	PASS
	5270	102	20	60000	11,385199	PASS
	5270	138	20	60000	11 385199	ΡΔςς
		120	20	annnn	16 0/0152	DACC
	5310	102	20	60000	11 299/25	ΡΔςς
	1	102	20	00000		17.55

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		138	20	60000	11.299435	PASS
		120	20	90000	16.333938	PASS
	5510	102	20	90000	16.333938	PASS
		138	20	90000	16.333938	PASS
		120	20	60000	10.582011	PASS
	5670	102	20	90000	15.873016	PASS
		138	20	90000	15.873016	PASS
		120	20	30000	5.212858	PASS
	5755	102	20	30000	5.212858	PASS
	0,00	138	20	30000	5 212858	PASS
		120	20	60000	10 353753	PASS
	5795	102	20	90000	15 53063	PASS
	5755	138	20	90000	15 53063	DASS
		130	20	75000	14 478764	PASS
	5180	102	20	60000	11 583012	
	5180	120	20	75000	11.303012	PASS
		130	20	75000	14.476704	PASS
	5240	120	20	75000	14.512977	PASS
	5240	102	20	45000	8.587786	PASS
		138	20	60000	11.450382	PASS
	5262	120	20	60000	11.406844	PASS
	5260	102	20	60000	11.406844	PASS
		138	20	60000	11.406844	PASS
		120	20	75000	14.097744	PASS
	5320	102	20	75000	14.097744	PASS
11AC205ISO		138	20	75000	14.097744	PASS
11/10/00/00		120	20	60000	10.909091	PASS
	5500	120	20	90000	16.363636	PASS
		102	20	60000	10.909091	PASS
		138	20	75000	13.157895	PASS
	5700	120	20	75000	13.157895	PASS
		102	20	60000	10.526316	PASS
		138	20	75000	13.05483	PASS
	5745	120	20	60000	10.443864	PASS
		102	20	60000	10.443864	PASS
		138	20	75000	12.875536	PASS
	5825	120	20	75000	12.875536	PASS
		102	20	75000	12.875536	PASS
		138	20	90000	17.34104	PASS
	5190	120	20	90000	17.34104	PASS
		102	20	90000	17.34104	PASS
		138	20	90000	17.208413	PASS
	5230	120	20	90000	17.208413	PASS
		102	20	90000	17.208413	PASS
		138	20	90000	17.077799	PASS
	5270	120	20	60000	11,385199	PASS
		102	20	90000	17.077799	PASS
		138	20	60000	11,299435	PASS
	5310	120	20	90000	16,949153	PASS
	5510	102	20	60000	11 299/25	ΡΔςς
11AC40SISO		132	20	90000	16 222028	DACC
	5510	120	20	6000	10.333330	PACC
	3310	102	20	00000	16 222020	DACC
		120	20	0000	15 072016	DACC
	5670	120	20	90000	15 072016	DACC
	5070	102	20	00000	15 072016	
		102	20	90000	15.8/3010	PASS
	F 7 F F	130	20	90000	10 425747	PASS
	5755	120	20	60000	10.425/1/	PASS
		102	20	90000	15.6385/5	PASS
		138	20	30000	5.1/6877	PASS
	5795	120	20	90000	15.53063	PASS
		102	20	60000	10.353753	PASS
11AC805ISO	5210	138	20	60000	13.03263	PASS
	5210	120	20	60000	11.516315	PASS



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	102	20	60000	11.516315	PASS
	138	20	0	0	PASS
5290	120	20	60000	11.342155	PASS
	102	20	60000	11.342155	PASS
	138	20	60000	10.84991	PASS
5530	120	20	60000	10.84991	PASS
	102	20	0	0	PASS
	138	20	60000	10.695187	PASS
5610	120	20	60000	10.695187	PASS
	102	20	60000	11.390374	PASS
	138	20	60000	10.779221	PASS
5775	120	20	60000	10.38961	PASS
	102	20	60000	10.38961	PASS

Test Mode	Channel	Voltage [Vdc]	Temperatu re (°C)	Deviation (Hz)	Deviation (ppm)	Verdict
		120	0	75000	14.478764	PASS
		120	5	75000	14.478764	PASS
		120	15	75000	14.478764	PASS
	5180	120	25	75000	14.478764	PASS
		120	35	60000	11.583012	PASS
		120	45	75000	14.478764	PASS
		120	0	60000	11.450382	PASS
		120	5	75000	14.312977	PASS
	5340	120	15	60000	11.450382	PASS
	5240	120	25	60000	11.450382	PASS
		120	35	60000	11.450382	PASS
		120	45	60000	11.450382	PASS
		120	0	75000	14.258555	PASS
		120	5	75000	14.258555	PASS
	5260	120	15	60000	11.406844	PASS
	5260	120	25	60000	11.406844	PASS
		120	35	60000	11.406844	PASS
		120	45	60000	11.406844	PASS
		120	0	60000	11.363636	PASS
11A		120	5	60000	11.363636	PASS
	5220	120	15	60000	11.363636	PASS
	5320	120	25	60000	11.363636	PASS
		120	35	60000	11.363636	PASS
		120	45	60000	11.363636	PASS
		120	0	75000	13.636364	PASS
		120	5	60000	10.909091	PASS
	5500	120	15	60000	10.909091	PASS
	5500	120	25	60000	10.909091	PASS
		120	35	60000	10.909091	PASS
		120	45	60000	10.909091	PASS
		120	0	60000	10.526316	PASS
		120	5	60000	10.526316	PASS
	5700	120	15	60000	10.526316	PASS
	5700	120	25	60000	10.526316	PASS
		120	35	75000	13.157895	PASS
		120	45	60000	10.526316	PASS
		120	0	45000	7.832898	PASS
	5745	120	5	45000	7.832898	PASS
		120	15	60000	10.443864	PASS



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		120	25	45000	7.832898	PASS
		120	35	45000	7.832898	PASS
		120	45	60000	10.443864	PASS
		120	0	75000	12.875536	PASS
		120	5	60000	10.300429	PASS
	5025	120	15	60000	10.300429	PASS
	5825	120	25	60000	10.300429	PASS
		120	35	60000	10.300429	PASS
		120	45	60000	10.300429	PASS
		120	0	45000	8.687259	PASS
		120	5	75000	14.478764	PASS
		120	15	60000	11.583012	PASS
	5180	120	25	45000	8.687259	PASS
		120	35	45000	8.687259	PASS
		120	45	75000	14.478764	PASS
		120	0	60000	11.450382	PASS
		120	5	60000	11.450382	PASS
		120	15	60000	11.450382	PASS
	5240	120	25	60000	11.450382	PASS
		120	35	45000	8.587786	PASS
		120	45	60000	11.450382	PASS
		120	0	60000	11.406844	PASS
		120	5	60000	11.406844	PASS
		120	15	60000	11.406844	PASS
	5260	120	25	60000	11.406844	PASS
		120	35	60000	11.406844	PASS
		120	45	45000	8 555133	PASS
		120	0	60000	11 278195	PASS
		120	5	60000	11 278195	PASS
		120	15	60000	11 278195	PASS
	5320	120	25	60000	11.278195	PASS
		120	35	60000	11 278195	PASS
		120	45	60000	11.278195	PASS
11N20SISO		120	0	45000	8 181818	PASS
		120	5	45000	8 181818	PASS
		120	15	60000	10 909091	PASS
	5500	120	25	45000	8 181818	PASS
		120	35	75000	13 636364	PASS
		120	45	45000	8 181818	PASS
		120		75000	13 157895	PASS
		120	5	90000	15 789/7/	
		120	15	90000	15 789474	DASS
	5700	120	25	60000	10 526316	PASS
		120	25	75000	13 157905	DVCC
		120	/5	75000	13 157805	<u>ρ</u> Δςς
		120		60000	10 // 286/	<u>ρ</u> Δςς
		120	5	75000	13 05/182	DVCC
		120	15	9000	15.03403	<u>ΡΛ33</u>
	5745	120	25	75000	13 05/90	DVCC
		120	25	75000	13 05400	PACC
		120	22	75000	13 05403	PASS
		120	45	75000	12.05483	PASS
		120		75000	12.904304	PACC
		120) 1E	00000	15 5574504	PASS
	5825	120	10	90000	15.33/4/0	PASS
		120	25	90000	15.55/4/6	PASS
		120	35	90000	15.55/4/6	PASS
		120	45	90000	15.55/4/6	PASS
		120		90000	17.34104	PASS
		120	5	90000	17.34104	PASS
11N40SISO	5190	120	15	90000	17.34104	PASS
		120	25	90000	17.34104	PASS
		120	35	90000	1/.34104	PASS
		120	45	60000	11.560694	PASS

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		120	0	60000	11.472275	PASS
		120	5	60000	11.472275	PASS
		120	15	60000	11.472275	PASS
	5230	120	25	60000	11.472275	PASS
		120	35	90000	17.208413	PASS
		120	45	60000	11 472275	PASS
		120	45	90000	17.077700	
		120	U F	90000	11.077799	PASS
		120	5	60000	11.385199	PASS
	5270	120	15	60000	11.385199	PASS
		120	25	30000	5.6926	PASS
		120	35	60000	11.385199	PASS
		120	45	90000	17.077799	PASS
		120	0	90000	16.949153	PASS
		120	5	30000	5.649718	PASS
	5340	120	15	90000	16.949153	PASS
	5310	120	25	30000	5.649718	PASS
		120	35	60000	11.299435	PASS
		120	45	60000	11 299435	PASS
		120	0	90000	16 333038	DASS
		120	5	90000	16 222020	DVCC
		120	ر ۱۲	60000	10.000000	PACC PACC
	5510	120	15	00000	10.889292	PASS
		120	25	30000	5.444646	PASS
		120	35	60000	10.889292	PASS
		120	45	90000	16.333938	PASS
		120	0	90000	15.873016	PASS
		120	5	90000	15.873016	PASS
	F (70	120	15	90000	15.873016	PASS
	5670	120	25	90000	15.873016	PASS
		120	35	90000	15.873016	PASS
		120	45	90000	15 873016	PASS
		120	4 <u>5</u>	90000	15 638575	DASS
		120	5	60000	10.425717	
		120	5	00000	10.425717	PASS
	5755	120	15	90000	15.638575	PASS
		120	25	30000	5.212858	PASS
		120	35	60000	10.425717	PASS
		120	45	60000	10.425717	PASS
		120	0	60000	10.353753	PASS
		120	5	90000	15.53063	PASS
	EZOE	120	15	30000	5.176877	PASS
	5795	120	25	90000	15.53063	PASS
		120	35	90000	15.53063	PASS
		120	45	90000	15.53063	PASS
		120	0	90000	17,374517	PASS
		120	5	60000	11 583012	PASS
		120	15	75000	14 478764	ΡΔςς
	5180	120	25	75000	1/1 / 7876/	DACC
		120	25	60000	11 502042	PACC PACC
		120	35	75000	11.583012	PASS
		120	45	75000	14.478764	PASS
		120	0	75000	14.312977	PASS
		120	5	45000	8.587786	PASS
	5240	120	15	60000	11.450382	PASS
	5240	120	25	75000	14.312977	PASS
11AC20SISO		120	35	60000	11.450382	PASS
		120	45	75000	14.312977	PASS
		120	0	60000	11.406844	PASS
		120	5	75000	14,258555	PASS
		120	15	75000	14 258555	 ₽Δ\$\$
	5260	120	25	6000	11 /060//	DVCC
		120	25	75000		PACC
		120	35	75000	14.258555	PA55
		120	45	/5000	14.258555	PASS
		120	0	60000	11.278195	PASS
	5320	120	5	75000	14.097744	PASS
		120	15	75000	14.097744	PASS

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		120	25	60000	11.278195	PASS
		120	35	75000	14.097744	PASS
		120	45	75000	14.097744	PASS
		120	0	75000	13.636364	PASS
		120	5	75000	13.636364	PASS
		120	15	60000	10.909091	PASS
	5500	120	25	60000	10.909091	PASS
		120	35	75000	13.636364	PASS
		120	45	60000	10.909091	PASS
		120	0	60000	10.526316	PASS
		120	5	75000	13 157895	PASS
		120	15	75000	13 157895	PASS
	5700	120	25	75000	13 157895	PASS
		120	35	60000	10 526316	PASS
		120	45	75000	13 157895	PASS
		120	0	75000	13 05/83	PASS
		120	5	75000	13.05483	PASS
		120	15	60000	10//386/	DASS
	5745	120	25	75000	12 05/92	PASS
		120	25	60000	10//386/	PASS
		120	/5	75000	13 05/02	PACC
		120	-+-J 0	6000	10 200/20	DVCC
		120		75000	10.300429	PASS DVCC
		120) 15	75000	12.0/000	DVCC
	5825	120	25	75000	12.0/3330	PASS DVCC
		120	25	75000	12.875550	PASS
		120	35	75000	12.875550	PASS
		120	45	75000	17 24104	PASS
519		120	U F	90000	17.34104	PASS
		120		90000	17.34104	PASS
	5190	120	15	90000	17.34104	PASS
		120	25	90000	17.34104	PASS
		120	35	90000	17.34104	PASS
		120	45	90000	17.34104	PASS
		120	<u>с</u>	50000	11.208413	PASS
		120	15	90000	17 208/12	PASS
	5230	120	25	90000	17.208413	PASS
		120	25	60000	11 / 72275	DASS
		120	35	60000	11.472275	PASS
		120	45	90000	17.077700	PASS
		120	<u>с</u>	50000	11 295100	PASS
		120		60000	11.365199	PASS
	5270	120	15	00000	11.365199	PASS
		120	25	90000	17.077799	PASS
		120	22	50000	11 205100	PASS
11AC40SISO		120	45	00000	16 0/0152	PACC
		120	F	60000	11 200425	PASS DACC
		120) 15	60000	11 200/25	PASS DVCC
	5310	120	25	60000	11 200/25	PASS DACC
		120	20	00000	16 040152	PASS
		120	33 1E	90000	16 040153	PASS DACC
		120	45	90000	16 222020	PASS
		120		50000	10.00000	PACC
		120) 10	60000	10.003232	PASS DACC
	5510	120	10	60000	10.889292	PASS
		120	25	00000	16.333030	PASS
		120	30	90000	16 222020	PASS
		120	45	90000	15 072016	PASS DACC
		120	U E	90000	15.8/3010	PASS DACC
		120	2 1F	90000	15.8/3010	PASS
	5670	120	10	90000	15.8/3010	PASS
		120	20	90000	15.8/3010	PASS
		120	35	90000	15.8/3010	PASS
	1	120	45	90000	12.8/3010	PASS



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		120	0	90000	15.638575	PASS
		120	5	90000	15.638575	PASS
	F7FF	120	15	60000	10.425717	PASS
	5755	120	25	60000	10.425717	PASS
		120	35	90000	15.638575	PASS
		120	45	90000	15.638575	PASS
		120	0	90000	15.53063	PASS
		120	5	60000	10.353753	PASS
	5705	120	15	90000	15.53063	PASS
	5795	120	25	90000	15.53063	PASS
		120	35	90000	15.53063	PASS
		120	45	60000	10.353753	PASS
		120	0	60000	11.516315	PASS
		120	5	60000	11.516315	PASS
	5310	120	15	60000	13.03263	PASS
	5210	120	25	60000	11.516315	PASS
		120	35	60000	11.516315	PASS
		120	45	80000	15.355086	PASS
		120	0	60000	11.342155	PASS
		120	5	60000	11.342155	PASS
	5300	120	15	60000	11.342155	PASS
	5290	120	25	0	0	PASS
		120	35	60000	11.342155	PASS
		120	45	0	0	PASS
		120	0	60000	11.699819	PASS
		120	5	60000	10.84991	PASS
4446006160	5520	120	15	60000	11.699819	PASS
1140805150	5530	120	25	60000	10.84991	PASS
		120	35	60000	10.84991	PASS
		120	45	60000	10.84991	PASS
		120	0	60000	10.695187	PASS
		120	5	60000	10.695187	PASS
	5610	120	15	60000	10.695187	PASS
	5610	120	25	60000	10.695187	PASS
		120	35	90000	16.042781	PASS
		120	45	60000	11.390374	PASS
		120	0	60000	10.38961	PASS
		120	5	60000	10.38961	PASS
		120	15	60000	10.38961	PASS
	5775	120	25	60000	10.38961	PASS
		120	35	60000	10.38961	PASS
		-		İ		

Note: All emissions are maintained within the band of operation under all conditions of normal operation as specified in the user manual. It fulfills the requirement of 15.407(g).



9. Dynamic Frequency Selection (DFS) (FCC 15.407)

9.1 Requirement

Applicability of DFS Requirements Prior to Use of a Channel

	Operational Mode		
Requirement	Master	Client Without Radar Detection	
Non-Occupancy Period	Yes	Not Required	Yes
DFS Detection Threshold	Yes	Not Required	Yes
Channel Availability Check Time	Yes	Not Required	Not Required
U-NII Detection Bandwidth	Yes	Not Required	Yes

Applicability of DFS requirements during normal operation

	Operational Mode		
Requirement	Master Device or Client with Radar Detection	Client Without Radar Detection	
DFS Detection Threshold	Yes	Not Required	
Channel Closing Transmission Time	Yes	Yes	
Channel Move Time	Yes	Yes	
U-NII Detection Bandwidth	Yes	Not Required	

Additional requirements for devices with	Master Device or Client with	Client Without Radar
multiple bandwidth modes	Radar Detection	Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

Note: EUT is a client without DFS detection capabilities.





9.1.1 DFS Detection Thresholds for Master or Client Devices with DFS Detection

Maximum Transmit Power	Values (See Notes 1, 2, and 3)	
EIRP ≥ 200 milliwatt	-64 dBm	
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm	
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm	
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test		

transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01

Parameter	Value	
Non-Occupancy Period	Minimum 30 minutes	
Channel Availability Check Time	60 Seconds	
Channel Move Time	10 seconds (see note 1)	
Channel Closing Transmission Time	200 ms + an aggregate of 60 ms over remaining 10 Second period. (see note 1 and 2)	
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. (see note 3)	
Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control		

signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

9.1.2 Radar Test Waveforms

Test procedures were made in accordance to KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02, for more radar test waveform details please refer section 6 of KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02.



9.2 Test setup





Note: EUT is a client without DFS detection capabilities. Test procedures were made in accordance to KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02. DFS testing was setup as a client with injection into the master.


9.3 In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period

9.3.1 Test Procedure

The EUT was configured to communicate with a master device. The test file was streamed from the Master to the Client (EUT) on the selected test channel. Measurements were made while utilizing the widest bandwidth of the EUT.

Channel closing transmission time and channel move time were measured by applying a radar type 0 at threshold + 1dB to the EUT. The EUT transmissions were observed on the EUT center channel. The time between the end of the applied radar waveform and the final transmission on the channel is the channel move time. The channel closing transmission time comprises only those fragments of the channel move time during which the EUT transmits.

The Channel Move time shall be less than 10 seconds The Channel Close time shall be 200ms +60ms of aggregate time. The Non-occupancy time shall 30 minutes or greater.



9.3.2 Calibration Results

Radar Type 0 Calibration:

Frequency	Radar Waveform Length:	Detection Threshold level		
5290 MHz	0.025704s	-63.85 dBm		



Frequency	Radar Waveform Length:	Detection Threshold level		
5530 MHz	0.025704s	-63.51 dBm		





9.3.3 Channel Move time and Channel Closing Transmission Time Test Results

Frequency	Bandwidth	Channel Move Time [ms]	Limit[ms]	Channel Closing Transmission [ms]	Limit[ms]	Verdict
5290MHz	80 MHz	465.4	10000	16.9	260	PASS
5530 MHz	80 MHz	491.4	10000	16.9	260	PASS

Test Graph:





9.3.4 Non-Occupancy Period Test Results

Frequency	Bandwidth	Measured Value	Limit Requirements	Verdict
5290MHz	80 MHz	> 30min	30min	Pass
5530 MHz	80 MHz	> 30min	30min	Pass

Test Graph:





Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date	
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	28-May-2019	28-May-2020	
SZ182-02-01	Pulse Power Sensor	Anritsu	MA2411B	1207429	28-May-2019	28-May-2020	
SZ070-24	Open Switch and Control Unit with TS8997 option for power measurement test	R&S	OSP120+B157		30-Oct-2019	30-Oct-2020	
SZ070-20	Combiner	Mini-Circuits	ZN2PD-63-S+		28-May-2019	28-May-2020	
SZ070-21	Combiner	Mini-Circuits	ZN2PD-63-S+		28-May-2019	28-May-2020	
SZ056-05	Spectrum Analyzer	Agilent	E4407B	US40522113	24-Dec-2018 24-Dec-2019	24-Dec-2019 24-Dec-2020	
SZ180-13	MXG Vector Signal Generator	Keysight	N5182B	MY53051328	29-Oct-2019	29-Oct-2020	
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	14-Sep-2018	14-Sep-2020	
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	24-May-2019	24-May-2020	
SZ061-09	Horn Antenna	ETS	3115	00092346	24-Aug-2019	24-Aug-2021	
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	13-Aug-2019	13-Aug-2021	
SZ185-01	EMI Receiver	R&S	ESCI	100547	24-Dec-2018 24-Dec-2019	24-Dec-2019 24-Dec-2020	
SZ056-06	Signal Analyzer	R&S	FSV40	101101	28-May-2019	28-May-2020	
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	5-Jul-2019	5-Jul-2020	
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	15-Dec-2018	15-Dec-2020	
SZ062-02	RF Cable	RADIALL	RG 213U		10-Jun-2019	10-Jun-2020	
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz		10-Jun-2019	10-Jun-2020	
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz		10-Jun-2019	10-Jun-2020	
SZ067-25	Notch Filter	Micro-Tronics	BRM50716		22-Mar-2019	22-Mar-2020	
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02		22-Mar-2019	22-Mar-2020	
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	29-Oct-2019	29-Oct-2020	
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	29-Oct-2019	29-Oct-2020	
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	28-May-2019	28-May-2020	
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Jan-2017	16-Jan-2020	
SZ016-12	Programmable Temperature & Humidity Chamber	Taili	MHK-120NK	AB0105	17-Jan-2019	17-Jan-2020	
SZ006-30	DC Power Supply	Guwei	SPS-3610	GEQ920551	15-Jan-2019	15-Jan-2020	

Appendix A: Test equipment list

Expanded uncertainty of radiated emission measurement is ±4.9 dB. Expanded uncertainty of conducted emission measurement is ±3.6 dB.