Shenzhen Huaxia Testing Technology Co., Ltd

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

Telephone: +86-755-26648640
Fax: +86-755-26648637
Website: www.cqa-cert.com

Report Template Version: V05
Report Template Revision Date: 2018-07-06

Test Report

Report No.:	CQASZ20241202717E-01
Applicant:	Shenzhen Chengyisheng Electronics Co., Ltd
Address of Applicant:	1901, Block A, Building 1, Anhongji Xingyao Plaza, No. 32 Huaxing Road, Tongsheng Community, Dalang Street, Longhua District, Shenzhen
Equipment Under Test (EUT):	
Product:	HDMI Transmitter and Receiver
Model No.:	X1, X2, X3, X4, X5
Teat Model No.:	X1
Brand Name:	N/A
FCC ID:	2BM35-X1
Standards:	47 CFR Part 15, Subpart E
	KDB 789033 D02 General UNII Test Procedures New Rules v02r01
Date of Receipt:	2024-12-25
Date of Test:	2024-12-25 to 2025-01-08
Date of Issue:	2025-01-14
Test Result:	**PASS***

*In the configuration tested, the EUT complied with the standards specified above.

Tested By: lewis zhou

(Lewis Zhou)

Reviewed By: Timo Lei

(Timo Lei)

Approved By:

(Jack Ai)

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20241202717E-01	Rev.01	Initial report	2025-01-14

2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203	ANSI C63.10-2013; KDB789033	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart E Section 15.207	ANSI C63.10-2013; KDB789033	PASS
Maximum Conducted Output Power	47 CFR Part 15 Subpart C Section 15.407 (a)	ANSI C63.10-2013; KDB789033	PASS
Emission Bandwidth	47 CFR Part 15 Subpart C Section 15.407 (a)(e)	ANSI C63.10-2013; KDB789033	PASS
Maximum Power Spectral Density	47 CFR Part 15 Subpart E Section 15.407 (a)	ANSI C63.10-2013; KDB789033	PASS
Band Edge Measurements	47 CFR Part 15 Subpart C Section 15.209 &15.407(b)	ANSI C63.10-2013; KDB789033	PASS
Frequency stability	47 CFR Part 15 Subpart E Section 15.407 (g)	ANSI C63.10-2013; KDB789033	PASS
Operation in the absence of information to the transmit	47 CFR Part 15 Subpart E Section 15.407 (c)	47 CFR Part 15 Subpart E	PASS
Radiated Spurious Emissions	47 CFR Part 15 Subpart E Section 15.407 (b)	ANSI C63.10-2013; KDB789033	PASS

Remark:
The tested sample(s) and the sample information are provided by the client.
Tx: In this whole report Tx (or tx) means Transmitter.
Rx: In this whole report Rx (or rx) means Receiver.
RF: In this whole report RF means Radiated Frequency.
CH: In this whole report CH means channel.
Volt: In this whole report Volt means Voltage.
Temp: In this whole report Temp means Temperature.
Humid: In this whole report Humid means humidity.
Press: In this whole report Press means Pressure.
N/A: In this whole report not application

3 Content

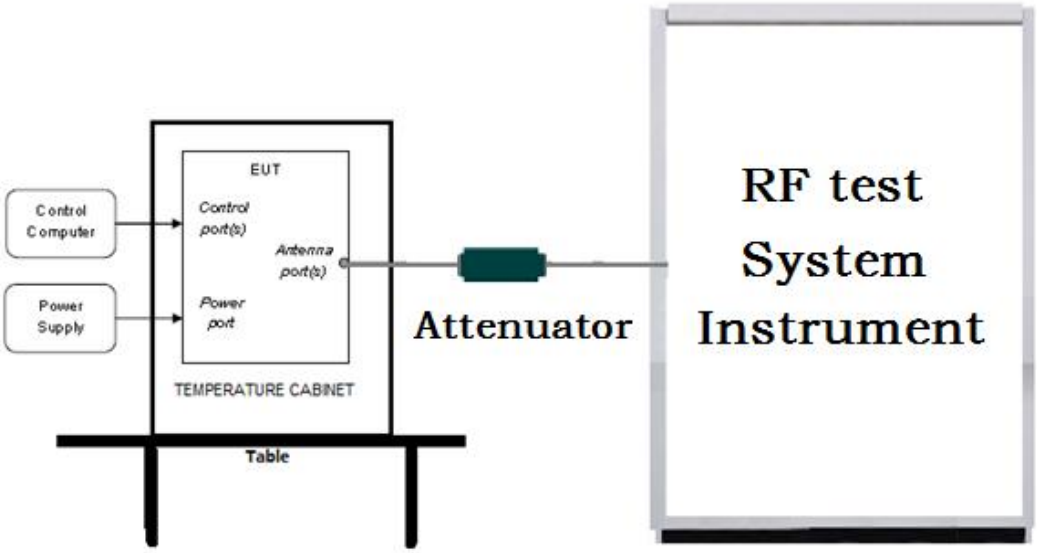
Page

1 VERSION 2
2 TEST SUMMARY 3
3 CONTENT 4
4 TEST REQUIREMENT 5
4.1 TEST SETUP 5
4.1.1 *For Conducted test setup* 5
4.1.2 *For Radiated Emissions test setup* 5
4.1.3 *For Conducted Emissions test setup* 6
4.2 TEST ENVIRONMENT 6
4.3 TEST CONDITION 7
5 GENERAL INFORMATION 9
5.1 CLIENT INFORMATION 9
5.2 GENERAL DESCRIPTION OF EUT 9
5.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD 10
5.4 DESCRIPTION OF SUPPORT UNITS 11
5.5 TEST LOCATION 12
5.6 TEST FACILITY 12
5.7 DEVIATION FROM STANDARDS 12
5.8 ABNORMALITIES FROM STANDARD CONDITIONS 12
5.9 OTHER INFORMATION REQUESTED BY THE CUSTOMER 12
5.10 MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS, K=2) 12
6 EQUIPMENT LIST 13
7 RADIO TECHNICAL REQUIREMENTS SPECIFICATION 14
Appendix A): Emission Bandwidth 15
Appendix B): Maximum Conduct Output Power 22
Appendix C): Maximum Power Spectral Density 38
Appendix D): Band Edge Measurements 46
7.1.1 *Test Result B1* 48
7.1.2 *Test Result B4* 48
7.1.3 *Test Graphs B1* 49
7.1.4 *Test Graphs B4* 51
Appendix E): Frequency Stability 53
Appendix F): Antenna Requirement 55
Appendix G): Operation in the absence of information to the transmit 56
Appendix H): AC Power Line Conducted Emission 57
Appendix I): Restricted bands around fundamental frequency (Radiated Emission) 60
Appendix J): Radiated Spurious Emissions 63
8 PHOTOGRAPHS - EUT TEST SETUP 70
8.1 RADIATED SPURIOUS EMISSION 70
8.2 CONDUCTED EMISSION 71
9 PHOTOGRAPHS - EUT CONSTRUCTIONAL DETAILS 72

4 Test Requirement

4.1 Test setup

4.1.1 For Conducted test setup



4.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

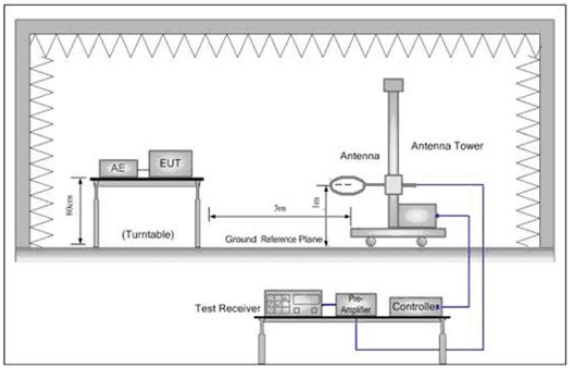


Figure 1. Below 30MHz

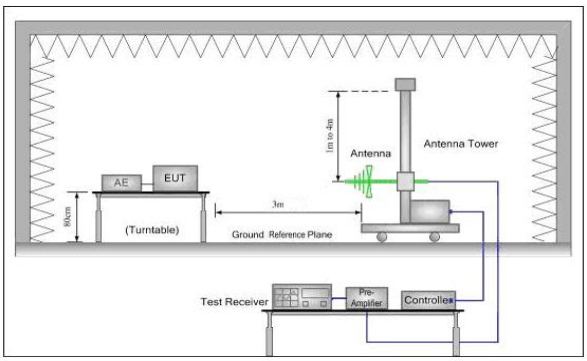


Figure 2. 30MHz to 1GHz

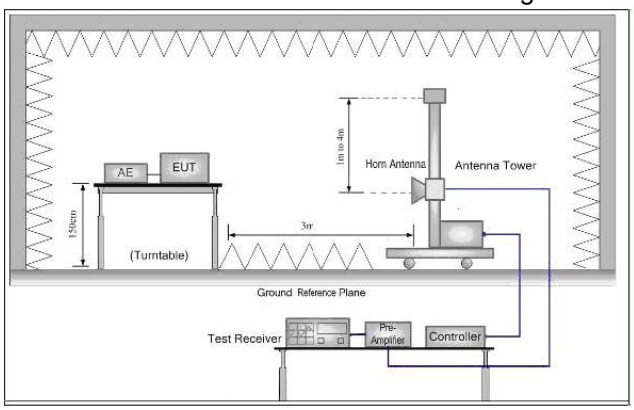
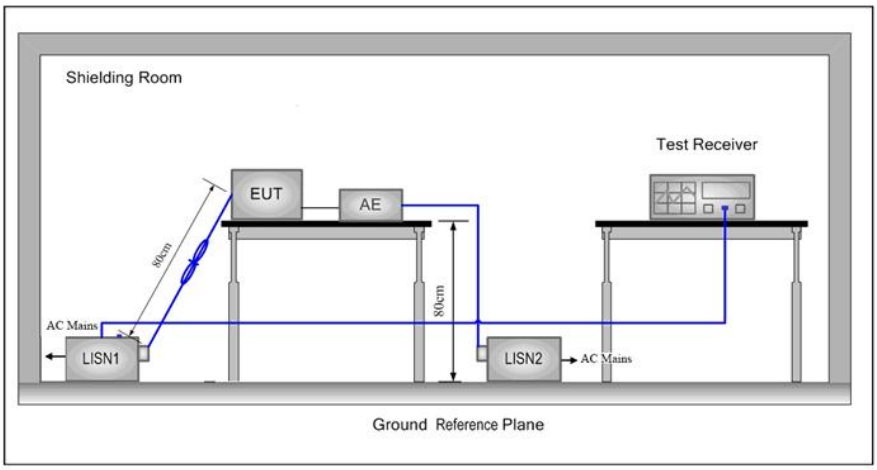


Figure 3. Above 1GHz

4.1.3 For Conducted Emissions test setup

Conducted Emissions setup



4.2 Test Environment

Operating Environment:		
Conducted Emissions:		
Temperature:	25.6 °C	
Humidity:	60 % RH	
Atmospheric Pressure:	1009 mbar	
Radiated Emissions:		
Temperature:	25.5 °C	
Humidity:	54 % RH	
Atmospheric Pressure:	1009mbar	
Radio conducted item test (RF Conducted test room):		
Temperature:	25.3 °C	
Humidity:	50 % RH	
Atmospheric Pressure:	1009 mbar	
Test Condition	Temperature (°C)	Voltage (V)
TN/VN	+15 to +35	5
TL/VL	0	4.5
TH/VL	50	4.5
TL/VH	0	5.5
TH/VH	50	5.5

Remark:

1)The EUT just work in such extreme temperature of 0 °C to 50 °C and the extreme voltage of 6.84V to 8.36V, so here the EUT is tested in the temperature of 0 °C to 50 °C and the voltage of 6.84V to 8.36V.

2)VN: Normal Voltage; TN: Normal Temperature;

TL: Low Extreme Test Temperature; TH: High Extreme Test Temperature;

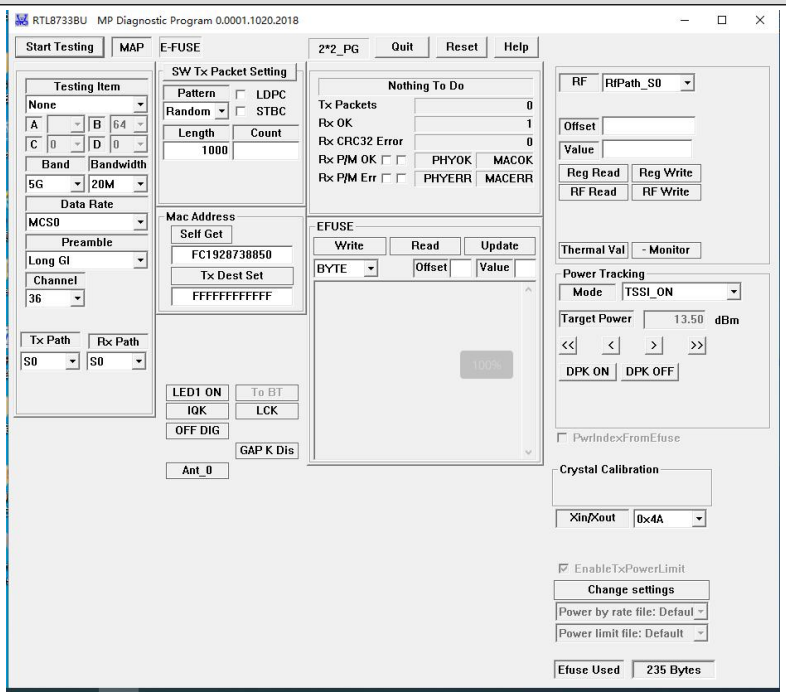
VL: Low Extreme Test Voltage; VH: High Extreme Test Voltage.

4.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
802.11a/n(20M)	5150MHz ~5250 MHz	Channel 36	Channel 40	Channel 48
		5180MHz	5200MHz	5240MHz
802.11a/n(20M)	5725MHz ~5850 MHz	Channel 149	Channel 157	Channel 165
		5745MHz	5785MHz	5825MHz

Run Software:



Test mode:

Pre-scan under all rate at lowest channel for Ant1

Through Pre-scan, 6Mbps is the worst case of 802.11a (20M); MCS0 is the worst case of 802.11n (20M).

5 General Information

5.1 Client Information

Applicant:	Shenzhen Chengyisheng Electronics Co., Ltd
Address of Applicant:	1901, Block A, Building 1, Anhongji Xingyao Plaza, No. 32 Huaxing Road, Tongsheng Community, Dalang Street, Longhua District, Shenzhen
Manufacturer:	Shenzhen Chengyisheng Electronics Co., Ltd
Address of Manufacturer:	1901, Block A, Building 1, Anhongji Xingyao Plaza, No. 32 Huaxing Road, Tongsheng Community, Dalang Street, Longhua District, Shenzhen
Factory:	Huizhou Chengyisheng Electronics Co., Ltd
Address of Factory:	5F and 6F of Building 19, No. 8, Junluo 6th Road, Shuikou Street, Huicheng District, Huizhou City

5.2 General Description of EUT

Product Name:	HDMI Transmitter and Receiver
Model No.:	X1, X2, X3, X4, X5
Test Model No.:	X1
Trade Mark:	N/A
Software Version:	16467036
Hardware Version:	CYS-TX-V1
EUT Power Supply:	Power supply DC 5V
EUT Supports Radios application:	5GHz: Wi-Fi: U-NII-1: 5.15-5.25GHz; U-NII-3: 5.725-5.850GHz
EUT Type:	Client devices

5.3 Product Specification subjective to this standard

Operation Frequency:	IEEE 802.11a/n(20M): 5150MHz ~5250 MHz IEEE 802.11a/n(20M): 5725MHz ~5850 MHz
Channel Numbers:	IEEE 802.11a/n(20M): 5150MHz ~5250MHz/ 4 channel IEEE 802.11a/n(20M): 5725MHz ~5850MHz/ 5 channel
Type of Modulation:	OFDM
Sample Type:	☐ Mobile ☒ Portable
Test Software of EUT:	RTL8733BU
Antenna Type:	PCB antenna
Antenna gain:	1.76dBi@5GHz: Wi-Fi: U-NII-1, 2.03dBi@5GHz: Wi-Fi: U-NII-3
Cable loss:	1.0 dB

Operation Frequency each of channel

For 802.11a/n(20M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	Channel	Frequency
36	5180MHz	44	5220MHz
40	5200MHz	48	5240MHz
For 802.11a/n(20M) Operation in the 5725MHz ~5850 MHz band			
Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz	NA	NA

5.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Certification	Supplied by
/	/	/	/	/

5.5 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua New District, Shenzhen, Guangdong, China

5.6 Test Facility

- **A2LA (Certificate No. 4742.01)**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

- **FCC Registration No.: 522263**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

5.10 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	3×10^{-8}
2	RF power, conducted	0.86dB
3	Radiated Spurious emission test	5.12dB (Below 1GHz)
		4.6dB (Above 1GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.8°C
6	Humidity test	2.0%
7	DC power voltages	0.5%

6 Equipment List

Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2024/9/2	2025/9/1
Spectrum analyzer	R&S	FSU26	CQA-038	2024/9/2	2025/9/1
Spectrum analyzer	R&S	FSU40	CQA-075	2024/9/2	2025/9/1
Preamplifier	MITEQ	AFS4-00010300-18-10P-4	CQA-035	2024/9/2	2025/9/1
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2024/9/2	2025/9/1
Preamplifier	EMCI	EMC184055SE	CQA-089	2024/9/2	2025/9/1
Loop antenna	Schwarzbeck	FMZB1516	CQA-060	2023/9/8	2026/9/7
Bilog Antenna	R&S	HL562	CQA-011	2023/11/01	2026/10/31
Horn Antenna	R&S	HF906	CQA-012	2023/11/01	2026/10/31
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2023/9/7	2026/9/6
Coaxial Cable (Above 1GHz)	CQA	N/A	C007	2024/9/2	2025/9/1
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2024/9/2	2025/9/1
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2024/9/2	2025/9/1
Antenna Connector	CQA	RFC-01	CQA-080	2024/9/2	2025/9/1
Power Sensor	KEYSIGHT	U2021XA	CQA-30	2024/9/2	2025/9/1
N1918A Power Analysis Manager Power Panel	Agilent	N1918A	CQA-074	2024/9/2	2025/9/1
Power meter	R&S	NRVD	CQA-029	2024/9/2	2025/9/1
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2024/9/2	2025/9/1
EMI Test Receiver	R&S	ESR7	CQA-005	2024/9/2	2025/9/1
LISN	R&S	ENV216	CQA-003	2024/9/2	2025/9/1
Coaxial cable	CQA	N/A	CQA-C009	2024/9/2	2025/9/1
DC power	KEYSIGHT	E3631A	CQA-028	2024/9/2	2025/9/1

Test software:

	Manufacturer	Software brand
Radiated Emissions test software	Tonscend	JS1120-3
Conducted Emissions test software	Audix	e3
RF Conducted test software	Audix	e3

7 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15E	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicesed Wireless Devices
3	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	Guidelines for compliance testing of unlicensed national information infrastructure (U-NII) device part 15, subpart E

Appendix A): Emission Bandwidth

26dB Emission bandwidth

Test Requirement: 47 CFR Part 15, Subpart C 15.407 (a)

Test Method: KDB 789033 D02 II C 1

6 dB bandwidth (5.725-5.85 GHz band)

Test Requirement 47 CFR Part 15, Subpart C 15.407 (e)

Test Method: KDB 789033 D02 II C 2

Limit: ≥500 kHz

Test Procedure:

a) Set RBW = approximately 1% of the emission bandwidth.

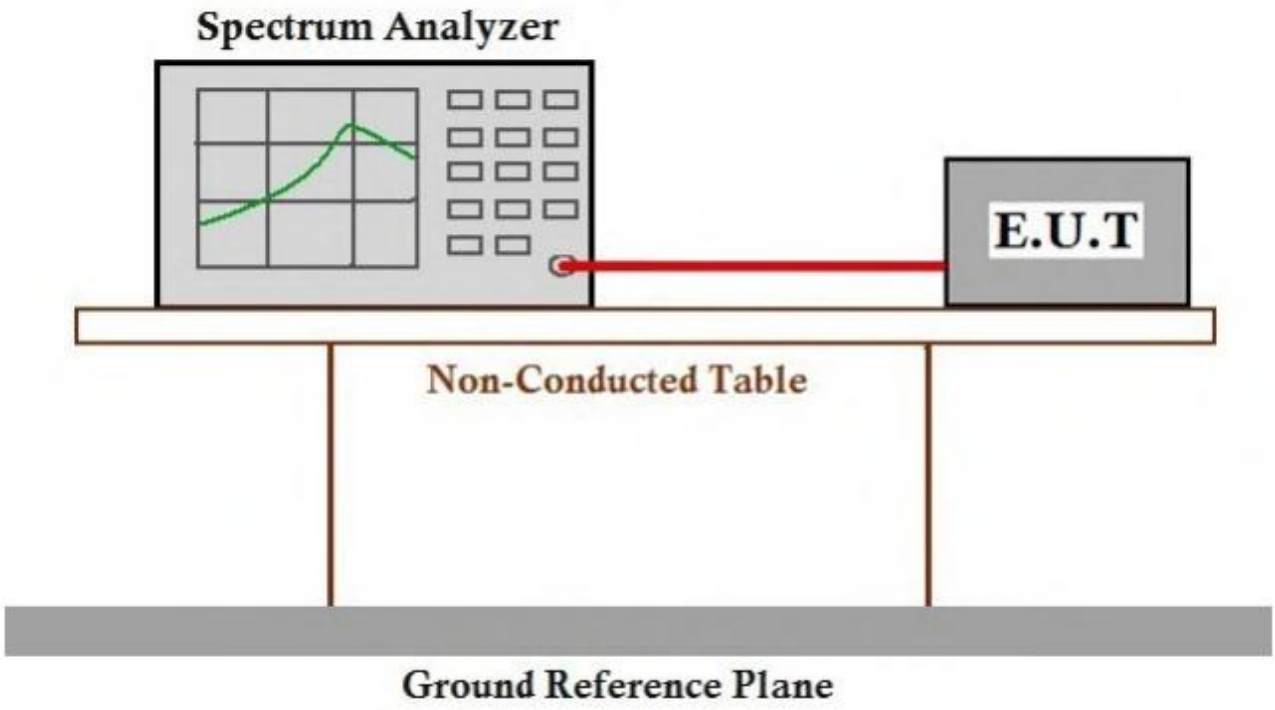
b) Set the VBW > RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) 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%.

Test Setup Diagram

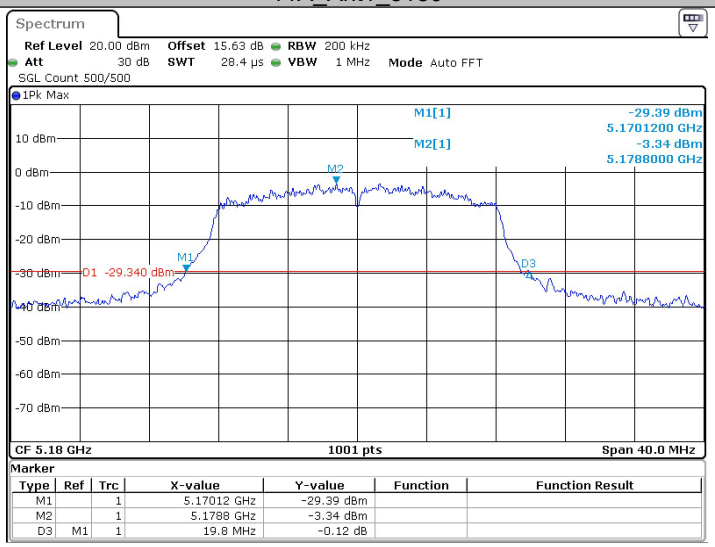


Result Table

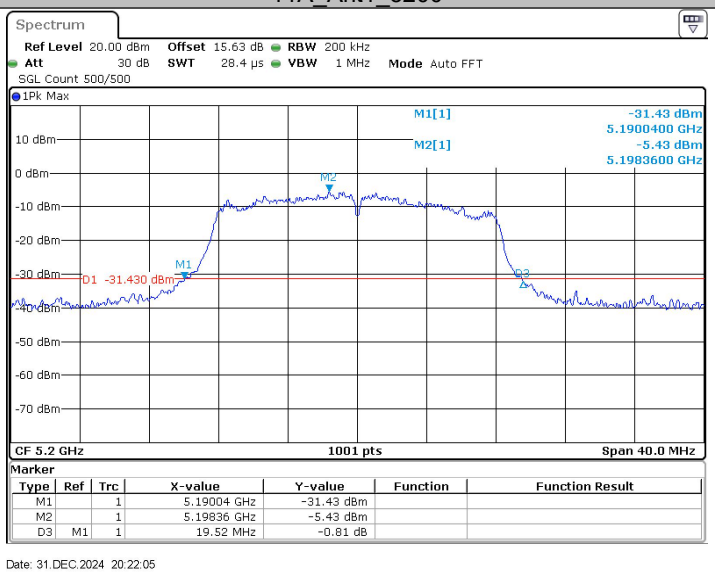
Test Mode	Antenna	Channel	EBW[MHz]	Verdict
11A	Ant1	5180	19.80	PASS
11A	Ant1	5200	19.52	PASS
11A	Ant1	5240	19.48	PASS
11A	Ant1	5745	20.56	PASS
11A	Ant1	5785	18.96	PASS
11A	Ant1	5825	19.40	PASS
11N20	Ant1	5180	20.60	PASS
11N20	Ant1	5200	20.12	PASS
11N20	Ant1	5240	20.28	PASS
11N20	Ant1	5745	20.76	PASS
11N20	Ant1	5785	19.64	PASS
11N20	Ant1	5825	19.40	PASS

Test Graph

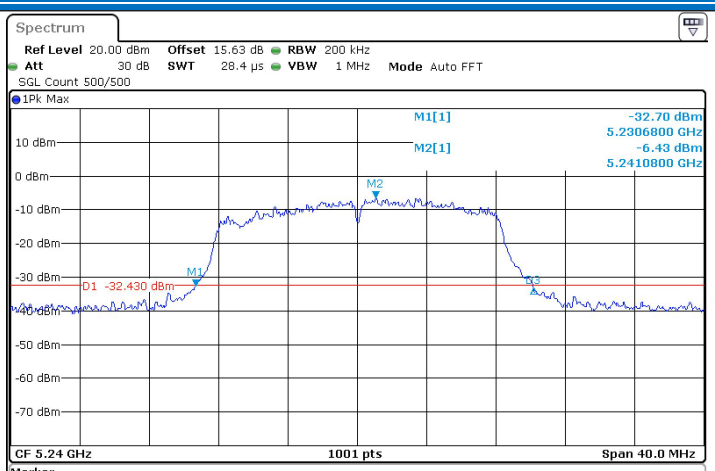
11A_Ant1_5180



11A_Ant1_5200



11A_Ant1_5240

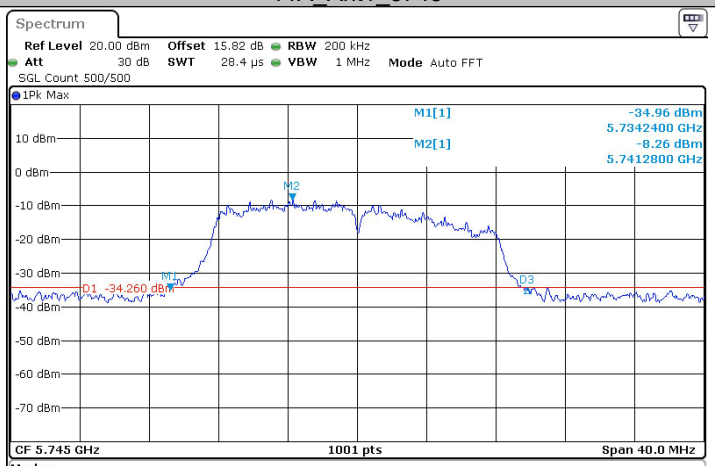


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.23068 GHz	-32.70 dBm		
M2		1	5.24108 GHz	-6.43 dBm		
D3	M1	1	19.48 MHz	-0.46 dB		

Date: 31.DEC.2024 20:26:20

11A_Ant1_5745

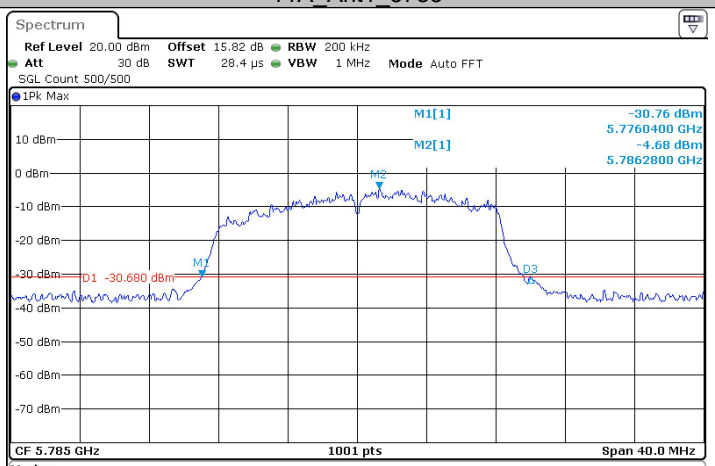


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.73424 GHz	-34.96 dBm		
M2		1	5.74128 GHz	-8.26 dBm		
D3	M1	1	20.56 MHz	0.64 dB		

Date: 31.DEC.2024 20:28:29

11A_Ant1_5785

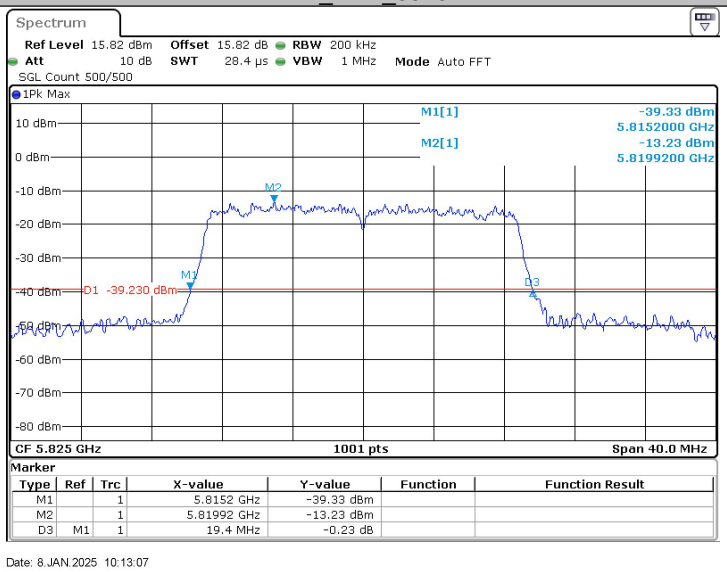


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.77604 GHz	-30.76 dBm		
M2		1	5.78628 GHz	-4.68 dBm		
D3	M1	1	18.96 MHz	0.05 dB		

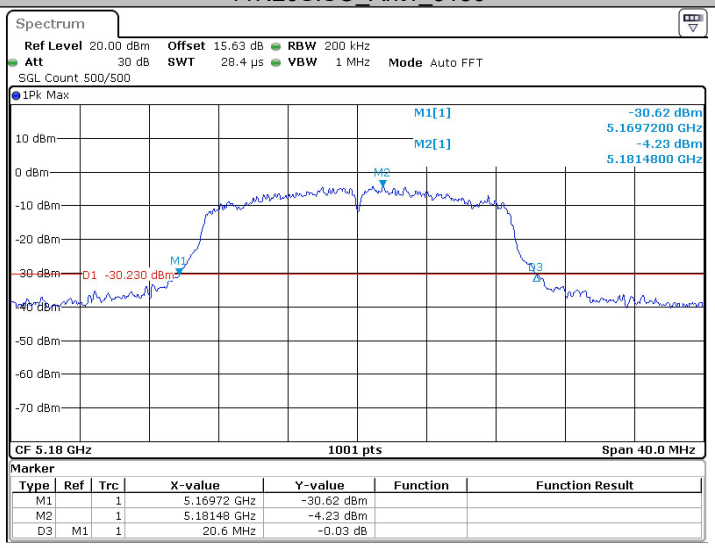
Date: 31.DEC.2024 20:30:22

11A_Ant1_5825



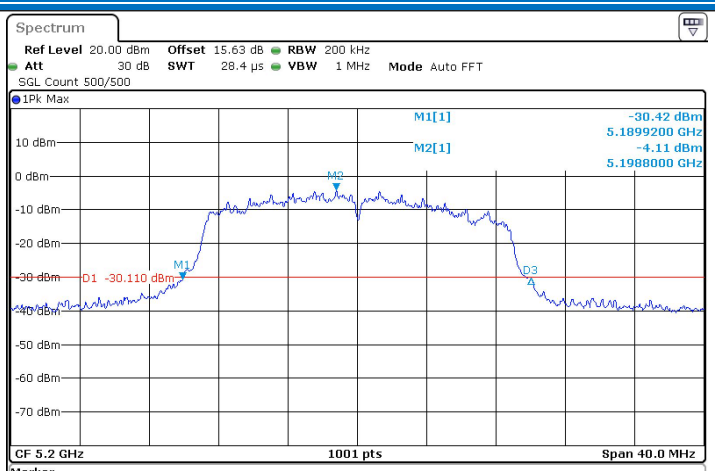
Date: 8.JAN.2025 10:13:07

11N20SISO_Ant1_5180



Date: 31.DEC.2024 20:33:16

11N20SISO_Ant1_5200

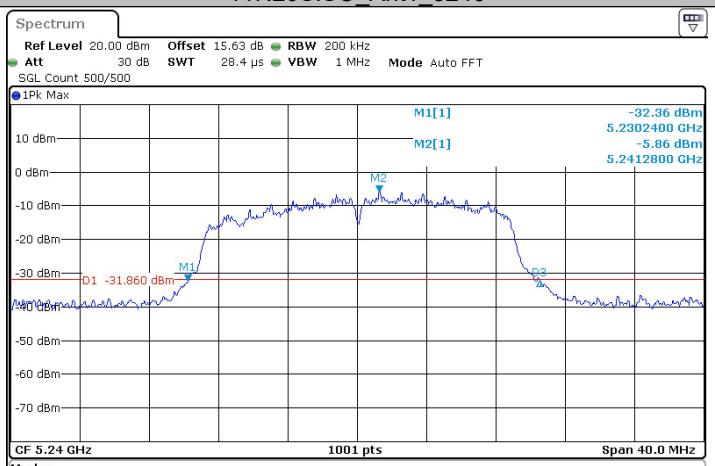


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.18992 GHz	-30.42 dBm		
M2		1	5.1988 GHz	-4.11 dBm		
D3	M1	1	20.12 MHz	0.15 dB		

Date: 31.DEC.2024 20:36:50

11N20SISO_Ant1_5240

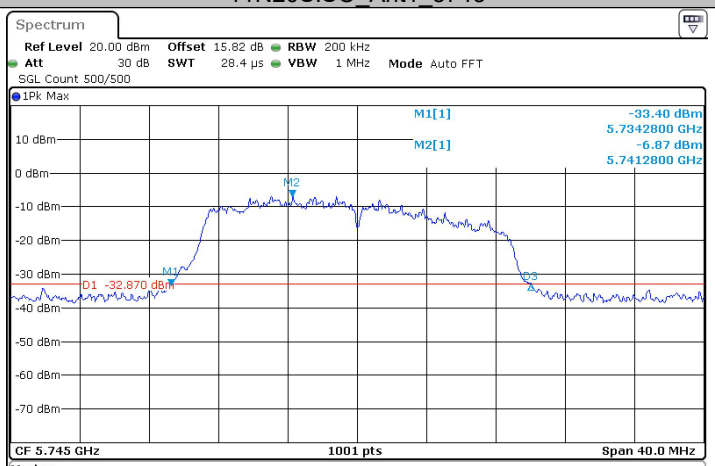


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.23024 GHz	-32.36 dBm		
M2		1	5.24128 GHz	-5.86 dBm		
D3	M1	1	20.28 MHz	0.35 dB		

Date: 31.DEC.2024 20:42:07

11N20SISO_Ant1_5745

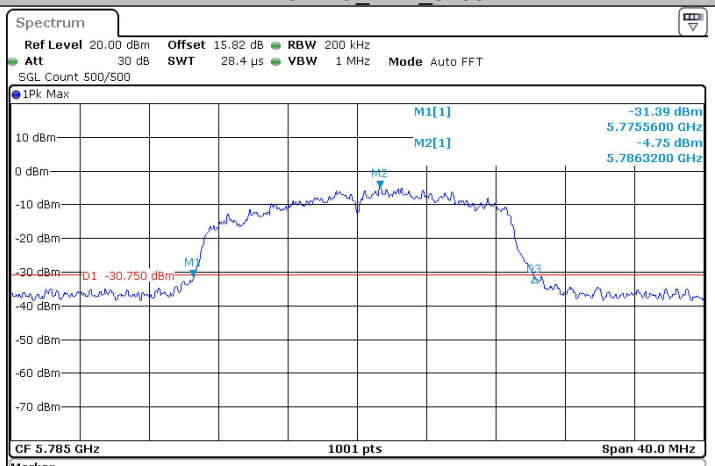


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.73428 GHz	-33.40 dBm		
M2		1	5.74128 GHz	-6.87 dBm		
D3	M1	1	20.76 MHz	0.50 dB		

Date: 31.DEC.2024 20:44:56

11N20SISO_Ant1_5785

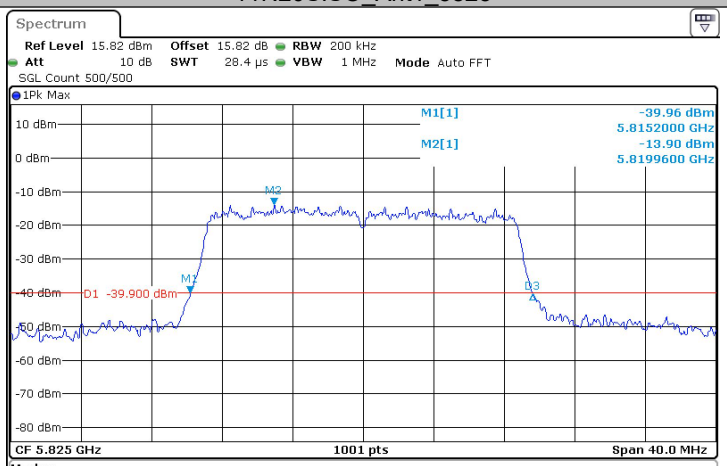


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.77556 GHz	-31.39 dBm		
M2		1	5.78632 GHz	-4.75 dBm		
D3	M1	1	19.64 MHz	0.14 dB		

Date: 31.DEC.2024 20:47:57

11N20SISO_Ant1_5825



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.8152 GHz	-39.96 dBm		
M2		1	5.81996 GHz	-13.90 dBm		
D3	M1	1	19.4 MHz	-0.36 dB		

Date: 8.JAN.2025 10:16:04

Appendix B): Maximum Conduct Output Power

1.Duty Cycle (x)

Test Requirement KDB 789033 D02 II B 1

Test Method: KDB 789033 II B 1

Test Procedure:

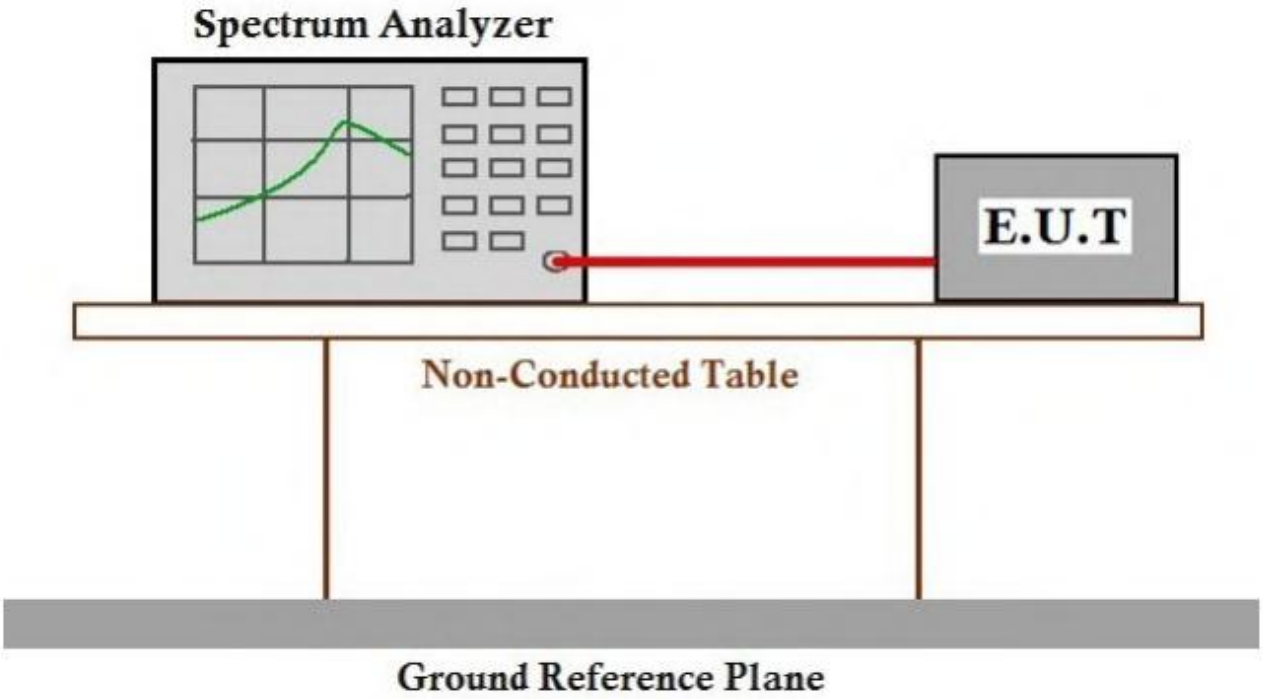
Set RBW = 20MHz

Set VBW = 40MHz

Set detector = peak.

Set span =0Hz

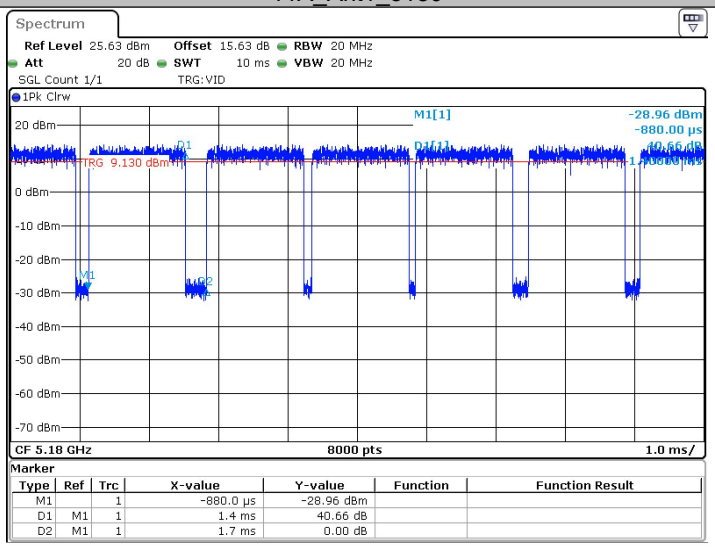
Test Setup Diagram



Measurement Data

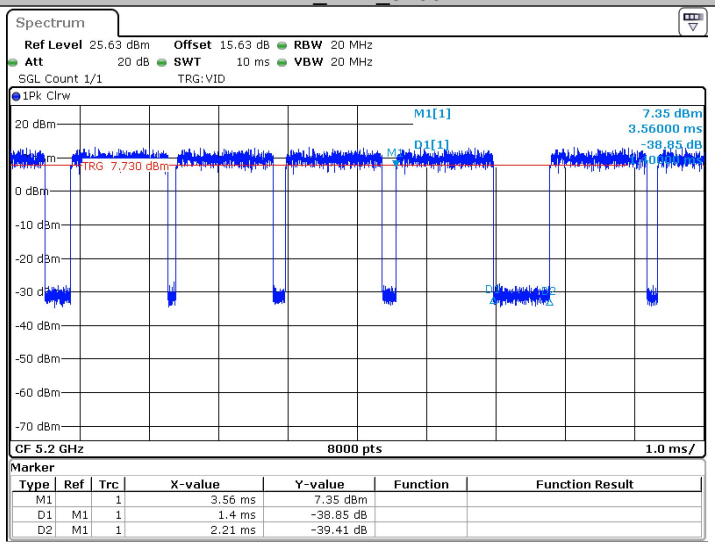
TestMode	Freq(MHz)	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11A	5180	1.40	1.70	82.35
	5200	1.40	2.21	63.35
	5240	1.40	1.63	85.89
	5745	1.39	1.74	79.89
	5785	1.40	1.61	86.96
	5825	1.40	1.62	86.42
11N20SISO	5180	1.31	1.96	66.84
	5200	1.31	1.52	86.18
	5240	1.31	2.01	65.17
	5745	1.31	2.04	64.22
	5785	1.30	1.53	84.97
	5825	1.31	1.51	86.75

11A_Ant1_5180



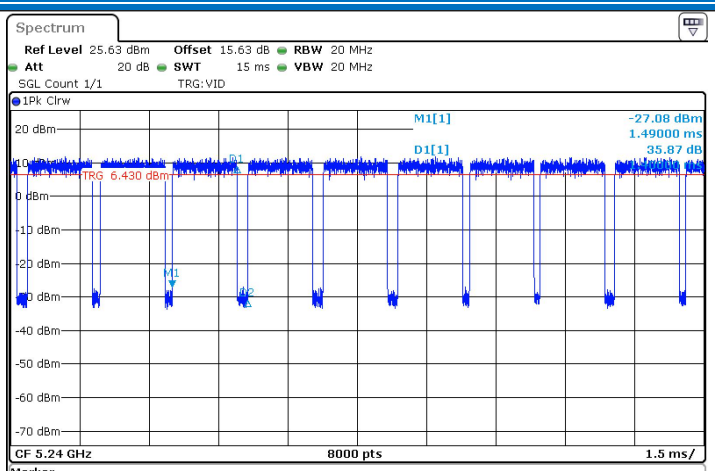
Date: 31.DEC.2024 20:19:56

11A_Ant1_5200



Date: 31.DEC.2024 20:22:32

11A_Ant1_5240

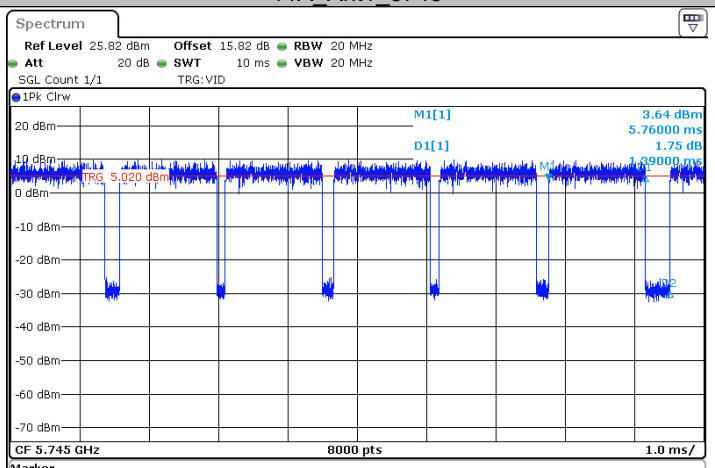


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.49 ms	-27.08 dBm		
D1	M1	1	1.4 ms	35.87 dB		
D2	M1	1	1.63 ms	-3.99 dB		

Date: 31.DEC.2024 20:26:51

11A_Ant1_5745

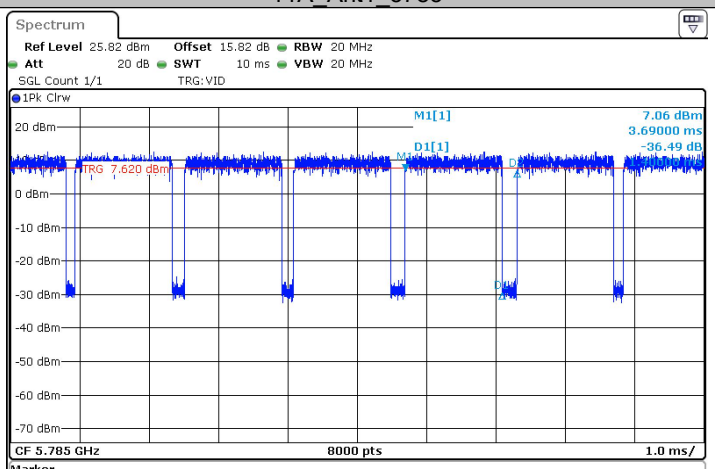


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.76 ms	3.64 dBm		
D1	M1	1	1.39 ms	1.75 dB		
D2	M1	1	1.74 ms	-32.94 dB		

Date: 31.DEC.2024 20:28:56

11A_Ant1_5785

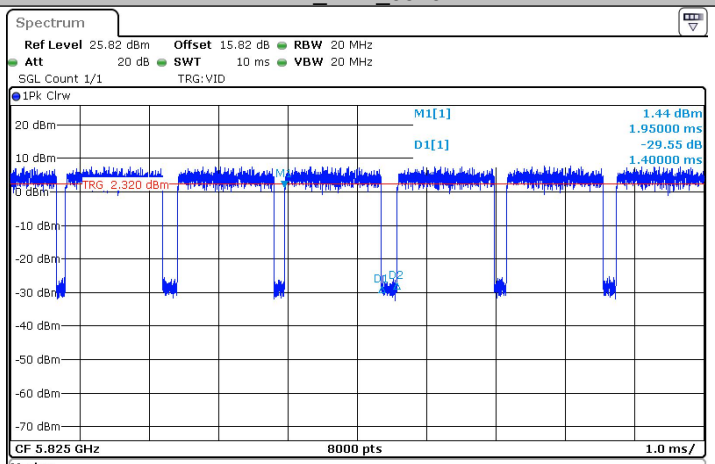


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	3.69 ms	7.06 dBm		
D1	M1	1	1.4 ms	-36.49 dB		
D2	M1	1	1.61 ms	-0.06 dB		

Date: 31.DEC.2024 20:30:50

11A_Ant1_5825

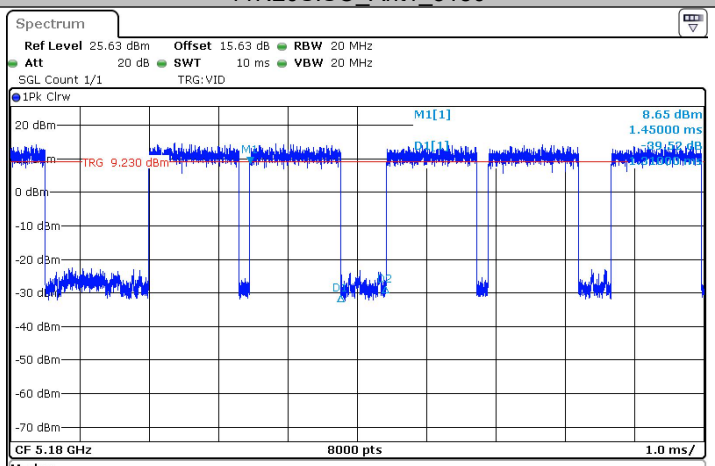


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.95 ms	1.44 dBm		
D1	M1	1	1.4 ms	-29.55 dB		
D2	M1	1	1.62 ms	-28.55 dB		

Date: 31.DEC.2024 20:32:05

11N20SISO_Ant1_5180

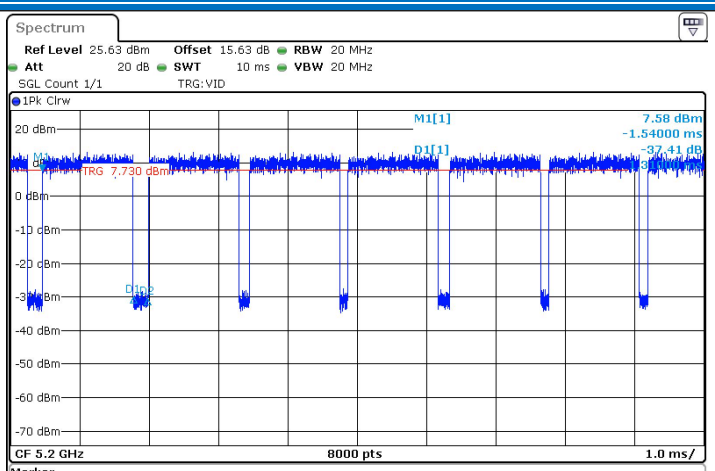


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.45 ms	8.65 dBm		
D1	M1	1	1.31 ms	-39.52 dB		
D2	M1	1	1.96 ms	-36.83 dB		

Date: 31.DEC.2024 20:34:10

11N20SISO_Ant1_5200

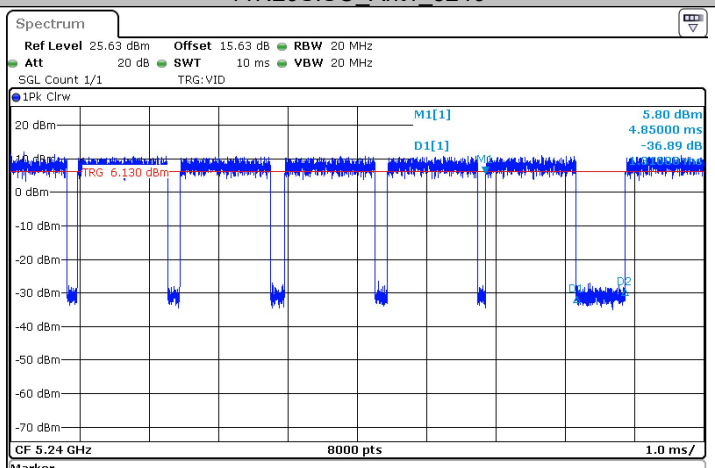


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	-1.54 ms	7.58 dBm		
D1	M1	1	1.31 ms	-37.41 dB		
D2	M1	1	1.52 ms	-38.16 dB		

Date: 31.DEC.2024 20:37:17

11N20SISO_Ant1_5240

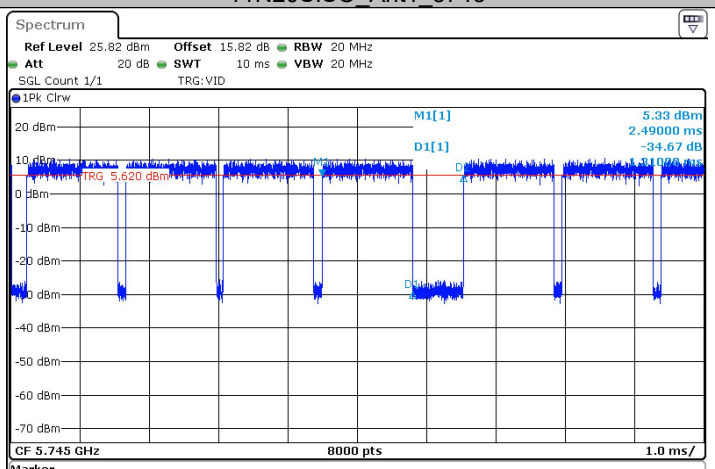


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	4.85 ms	5.80 dBm		
D1	M1	1	1.31 ms	-36.89 dB		
D2	M1	1	2.01 ms	-34.71 dB		

Date: 31.DEC.2024 20:42:35

11N20SISO_Ant1_5745

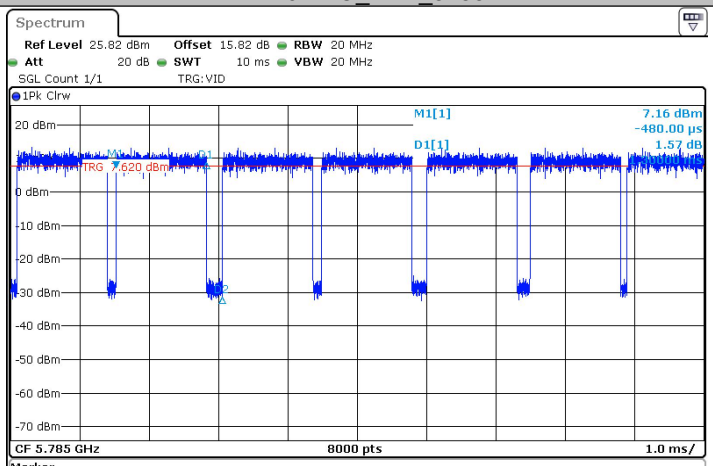


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.49 ms	5.33 dBm		
D1	M1	1	1.31 ms	-34.67 dB		
D2	M1	1	2.04 ms	0.16 dB		

Date: 31.DEC.2024 20:45:24

11N20SISO_Ant1_5785

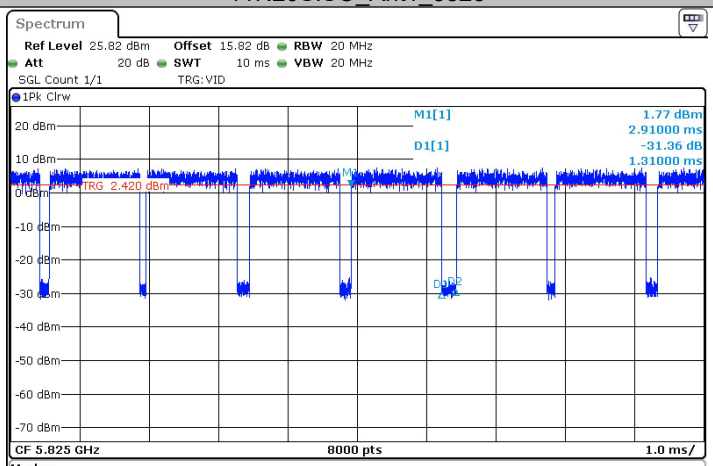


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	-480.0 µs	7.16 dBm		
D1	M1	1	1.3 ms	1.57 dB		
D2	M1	1	1.53 ms	-38.56 dB		

Date: 31.DEC.2024 20:48:25

11N20SISO_Ant1_5825



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.91 ms	1.77 dBm		
D1	M1	1	1.31 ms	-31.36 dB		
D2	M1	1	1.51 ms	-30.58 dB		

Date: 31.DEC.2024 20:52:10

2. Maximum Conducted Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.407 (a)

Test Method: KDB 789033 D02 II E

Limit:

Frequency band(MHz)	Limit
5150-5250	≤1W(30dBm) for master device
	≤250mW(24dBm) for client device
5250-5350	≤250mW(24dBm) for client device or 11dBm+10logB*
5470-5725	≤250mW(24dBm) for client device or 11dBm+10logB*
5725-5850	≤1W(30dBm)
Remark:	* Where B is the 26dB emission bandwidth in MHz. The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

Test Procedure:

Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

(1) Set RBW = 1 MHz.

(2) Set VBW ≥ 3 MHz.

(3) Detector = power average

(4) Sweep time = auto.

(5) Add duty cycle to the measured average power.