SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch

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TEST REPORT

Application No.:	GZEM1810001272CR
Applicant:	Hex Technology Limited
Address of Applicant:	Unit 311A, 3/F, IC Development Centre, No. 6 Science Park West Avenue, Science Park, Sha Tin, Hong Kong
Manufacturer:	Beijing Pinecone Electronics Co., Ltd.
Address of Manufacturer:	Cell C, Building C Lin NO.66, Zhufang Road, Qinghe, Haidian, Beijing
Factory:	Inventec Appliance (Jiangning) Corporation
Address of Factory:	133, Jiangjun Road, Jiangning Economic and Technological Development Zone, Nanjing 211153, P.R.China
Equipment Under Test (EUT):	
EUT Name:	HERELINK
Model No.:	HERELINK Controller Unit: HX4-06075
Trade Mark:	HERELINK
Standard(s) :	47 CFR Part 15, Subpart E 15.407
Date of Receipt:	2018-10-15
Date of Test:	2019-01-14 to 2019-07-18
Date of Issue:	2019-07-19
Test Result:	**Pass**

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

Kobe Jian
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2019-07-19		Original

Authorized for issue by:				
Tested By		**Curry_Wu /Project Engineer**		2019-01-14 to 2019-07-18 **Date**
Checked By		**Ricky_Liu /Reviewer**		2019-07-19 **Date**

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2 Test Summary

Radio Spectrum Technical Requirement				
Item	**Standard**	**Method**	**Requirement**	**Result**
Antenna Requirement	47 CFR Part 15, Subpart E 15.407	N/A	47 CFR Part 15, Subpart C 15.203	Pass
Transmission in the Absence of Data	47 CFR Part 15, Subpart E 15.407	N/A	47 CFR Part 15, Subpart C 15.407 (c)	Pass

N/A: Not applicable

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
99% Bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 II D	N/A	Pass
26dB Emission bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II C 1	47 CFR Part 15, Subpart C 15.407 (a)	Pass
Minimum 6 dB bandwidth (5.725-5.85 GHz band)	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II C 2	47 CFR Part 15, Subpart C 15.407 (e)	Pass
EIRP-equivalent isotropically radiated power	47 CFR Part 15, Subpart E 15.407	N/A	47 CFR Part 15, Subpart C 15.407 (a)	Pass
Maximum Conducted output power	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II E	47 CFR Part 15, Subpart C 15.407 (a)	Pass
Peak Power spectrum density	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II F	47 CFR Part 15, Subpart C 15.407 (a)	Pass
Radiated Emissions	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	Pass
Frequency Stability	47 CFR Part 15, Subpart E 15.407	ANSI C63.10 (2013) Section 6.8	47 CFR Part 15, Subpart C 15.407 (g)	Pass

N/A: Not applicable

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4 General Information

4.1 Details of E.U.T.

Power Supply:	For Controller Unit:			
	DC 5V by USB port for charging			
	DC 3.6V rechargeable battery for working			
Test Voltage:	AC 120V 60Hz Charing& DC3.6V working for Controller Unit			
Cable:	About 1.5m unscreened USB cable			
	About 0.5m screened HDMI cable			
Antenna Gain	0dBi			
Antenna Type	Integral antenna			
Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	802.11a/n(HT20)/ac(HT20)	5180-5240	4
		802.11n(HT40)/ac(HT40)	5190-5230	2
		802.11ac(HT80)	5210	1
	UNII Band III	802.11a/n(HT20)/ac(HT20)	5745-5825	5
		802.11n(HT40)/ac(HT40)	5755-5795	2
		802.11ac(HT80)	5775	1
Modulation Type:	802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM)			
	802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)			
	802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)			
Channel Spacing:	802.11a/n(HT20)/ac(HT20): 20MHz			
	802.11n(HT40)/ac(HT40): 40MHz			
	802.11ac(HT80): 80MHz			
Remark	Slave device for outdoor use.			

4.2 Description of Support Units

The EUT has been tested as an independent unit.

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4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	±5.5 x 10^{-8}
2	Duty cycle	±0.57%
3	Occupied Bandwidth	±3%
4	RF Conducted power	±0.68dB
5	RF Power Density	±1.50dB
6	Conducted Spurious Emissions	±1.04dB
7	RF Radiated Power	±4.5dB (below 1GHz)
		±4.8dB (above 1GHz)
8	Radiated Spurious Emission Test	±4.5dB (30MHz-1GHz)
		±4.8dB (1GHz-18GHz)
9	Temperature	±0.4°C
10	Humidity	±1.3%
11	Supply Voltages	±1.5%
12	Time	±3%

4.4 Test Location

All tests were performed at:

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No tests were sub-contracted.

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4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to

ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

- **FCC Recognized 2.948 Listed Test Firm(Registration No.: 282399)**

SGS-CSTC Standards Technical Services Co., Ltd., 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 282399, May 31, 2002.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818, Jul 13, 2017.

- **Industry Canada (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-10449 and T-11179)**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584，G-10449 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

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4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

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5 Equipment List

99% Bandwidth					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2019-02-24	2020-02-23
ESG Vector Signal Generator	Keysight	E4438C	SEM006-03	2019-04-05	2020-04-04
EXG Analog Signal Generator	AgilentTechnologies	N5171B	SEM006-04	2017-07-26	2020-07-25
Power Meter	AgilentTechnologies	U2021XA_Ch2	SEM009-02	2018-09-20	2019-09-19
Power Meter	AgilentTechnologies	U2021XA_Ch3	SEM009-03	2018-09-20	2019-09-19
EXA Signal Analzer	AgilentTechnologies	N9010A	EMC2138	2018-11-19	2019-11-18
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	0.8M	EMC2137	2017-11-02	2019-11-01

26dB Emission bandwidth					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EXA Signal Analzer	AgilentTechnologies	N9010A	EMC2138	2018-11-19	2019-11-18
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	0.8M	EMC2137	2017-11-02	2019-11-01

Minimum 6 dB bandwidth (5.725-5.85 GHz band)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EXA Signal Analzer	AgilentTechnologies	N9010A	EMC2138	2018-11-19	2019-11-18
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	0.8M	EMC2137	2017-11-02	2019-11-01

Maximum Conducted output power					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EXA Signal Analzer	AgilentTechnologies	N9010A	EMC2138	2018-11-19	2019-11-18
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	0.8M	EMC2137	2017-11-02	2019-11-01

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Peak Power spectrum density					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EXA Signal Analzer	AgilentTechnologies	N9010A	EMC2138	2018-11-19	2019-11-18
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	0.8M	EMC2137	2017-11-02	2019-11-01

Frequency Stability					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2019-02-24	2020-02-23
ESG Vector Signal Generator	Keysight	E4438C	SEM006-03	2019-04-05	2020-04-04
EXG Analog Signal Generator	AgilentTechnologies	N5171B	SEM006-04	2017-07-26	2020-07-25
Power Meter	AgilentTechnologies	U2021XA_Ch2	SEM009-02	2018-09-20	2019-09-19
Power Meter	AgilentTechnologies	U2021XA_Ch3	SEM009-03	2018-09-20	2019-09-19
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	0.8M	EMC2137	2017-11-02	2019-11-01

Transmission in the Absence of Data					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2019-02-24	2020-02-23
ESG Vector Signal Generator	Keysight	E4438C	SEM006-03	2019-04-05	2020-04-04
EXG Analog Signal Generator	AgilentTechnologies	N5171B	SEM006-04	2017-07-26	2020-07-25
Power Meter	AgilentTechnologies	U2021XA_Ch2	SEM009-02	2018-09-20	2019-09-19
Power Meter	AgilentTechnologies	U2021XA_Ch3	SEM009-03	2018-09-20	2019-09-19
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2017-11-02	2019-11-01
MI CABLE	SGS	0.8M	EMC2137	2017-11-02	2019-11-01

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Radiated emission test						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	2016-12-04	2019-12-03
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2019-01-20	2020-01-19
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	100236	2019-01-20	2020-01-19
EMC2025	Trilog Broadband Antenna 30-1000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9160	9160-3372	2016-09-08	2019-09-07
SEM003-18	Trilog Broadband Antenna 25-2000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	00666	2019-02-22	2022-02-22
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	2016-09-08	2019-09-07
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	2017-05-04	2020-05-03
EMC2026	Horn Antenna 1-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	9120D-841	2016-09-09	2019-09-08
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	2019-01-11	2020-01-10
EMC2065	Amplifier	HP	8447F	N/A	2019-05-29	2020-05-28
EMC2086	PRE AMPLIFIER MH648A	ANRITSU CORP	MH648A	N/A	2018-11-19	2019-11-18
EMC0523	Active Loop Antenna	EMCO	6502	42963	2018-03-05	2020-03-04
EMC2041	Broad-Band Horn Antenna (14)15-26.5(40)GHz	SCHWARZBECK MESS-ELEKTRONI	BBHA 9170	9170-375	2017-05-23	2020-05-22
EMC2079	High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	009	2019-01-11	2020-01-10
EMC2142	966 Anechoic Chamber	C.R.T	9mX6mX6m	NA	2017-12-19	2019-12-18
EMC2139	MXE EMI Receiver	Keysight	N9038A	MY57290121	2018-11-19	2019-11-18
EMC2138	EXA Signal Analyzer	Keysight	N9010A	MY57120105	2018-11-19	2019-11-18
EMC2069	2.4GHz Filter	Micro-Tronics	BRM 50702	149	2019-01-11	2020-01-10
EMC0530	10m Semi-Anechoic Chamber	ETS	N/A	N/A	2018-12-08	2019-12-07

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General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DMM	Fluke	73	EMC0006	2018-07-20	2019-07-19
DMM	Fluke	73	EMC0007	2018-07-19	2019-07-18

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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

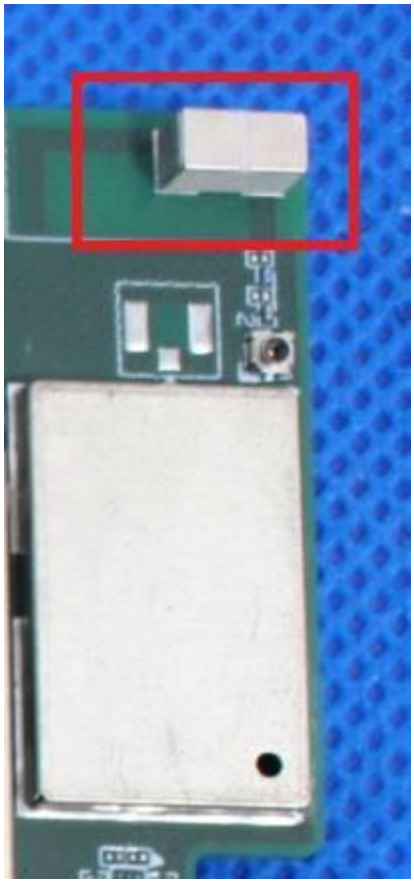
6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

6.1.2 Conclusion

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.



EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.

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6.2 Transmission in the Absence of Data

6.2.1 Test Requirement:

47 CFR Part 15, Subpart C 15.407 (c)

6.2.2 Conclusion

Standard Requirement:

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

Applicants shall include in their application for equipment authorization a description of how this requirement is met.

EUT Details:

WIFI chip support automatically discontinue transmission in case of either absence of information to transmit or operational failure, if the chip detect absence of information to transmit or operational failure, it will be automatically shut off.

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6.3 Equivalent isotropically radiated power

6.3.1 Test Requirement:

47 CFR Part 15, Subpart C 15.407 (a)

6.3.2 Conclusion

Standard Requirement:

For outdoor use:

The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 123mW(21dBm)

EUT Details:

The maximum conducted power is 6.975dBm for band 1, and the maximum antenna gain is 0 dBi, So the e.i.r.p. is lower than 21dBm at any elevation angle and meet the requirement.

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7 Radio Spectrum Matter Test Results

7.1 99% Bandwidth

Test Requirement N/A

Test Method: KDB 789033 II D

7.1.1 E.U.T. Operation

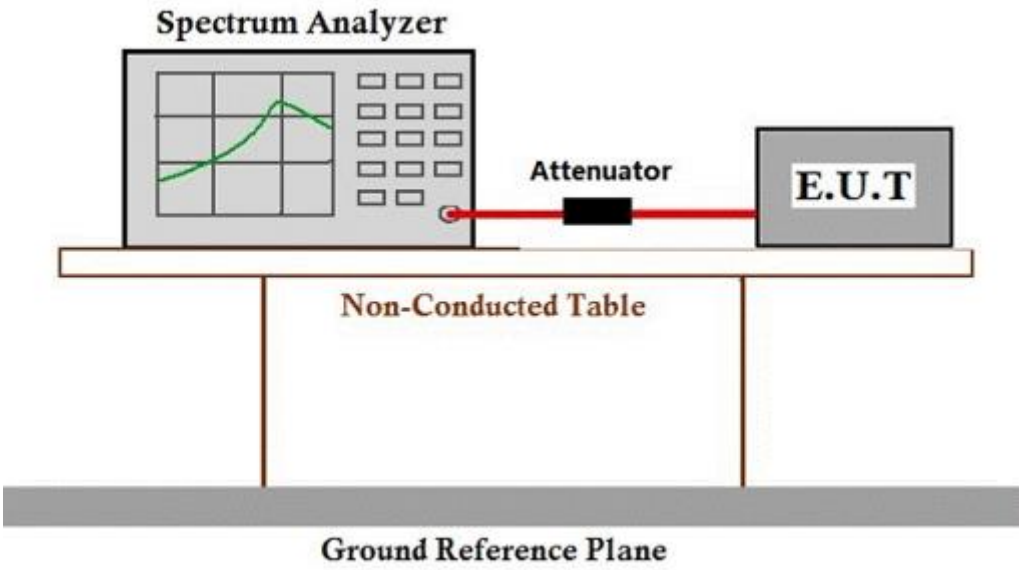
Operating Environment:

Temperature: 23.8 °C Humidity: 56 % RH Atmospheric Pressure: 1020 mbar

Test mode: b: TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c: TX mode (Band 3)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.1.2 Test Setup Diagram



7.1.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

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7.2 26dB Emission bandwidth

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

Test Method: KDB 789033 D02 II C 1

7.2.1 E.U.T. Operation

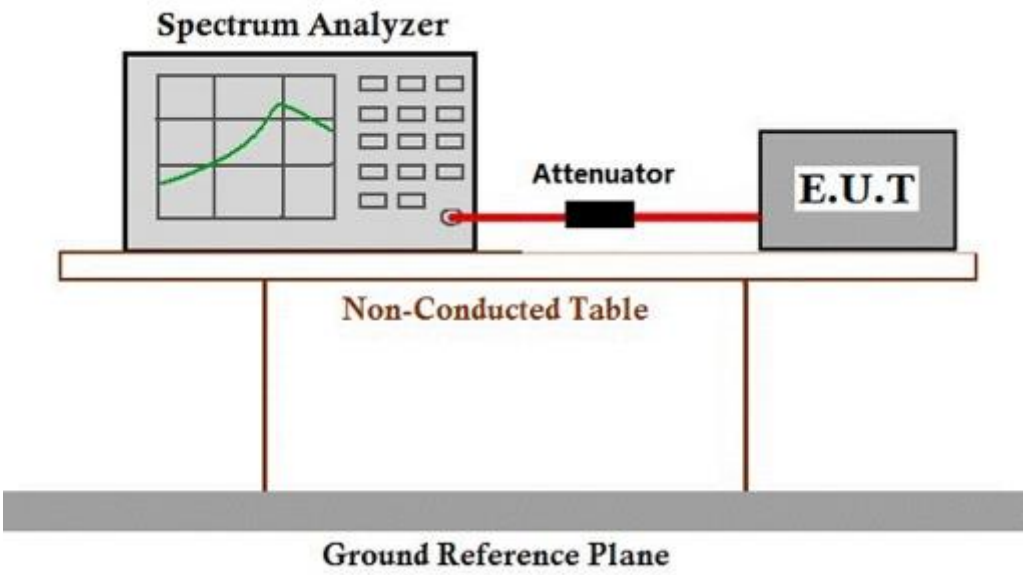
Operating Environment:

Temperature: 23.8 °C Humidity: 56.2 % RH Atmospheric Pressure: 1020 mbar

Test mode b: TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c: TX mode (Band 3)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

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7.3 Minimum 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

7.3.1 E.U.T. Operation

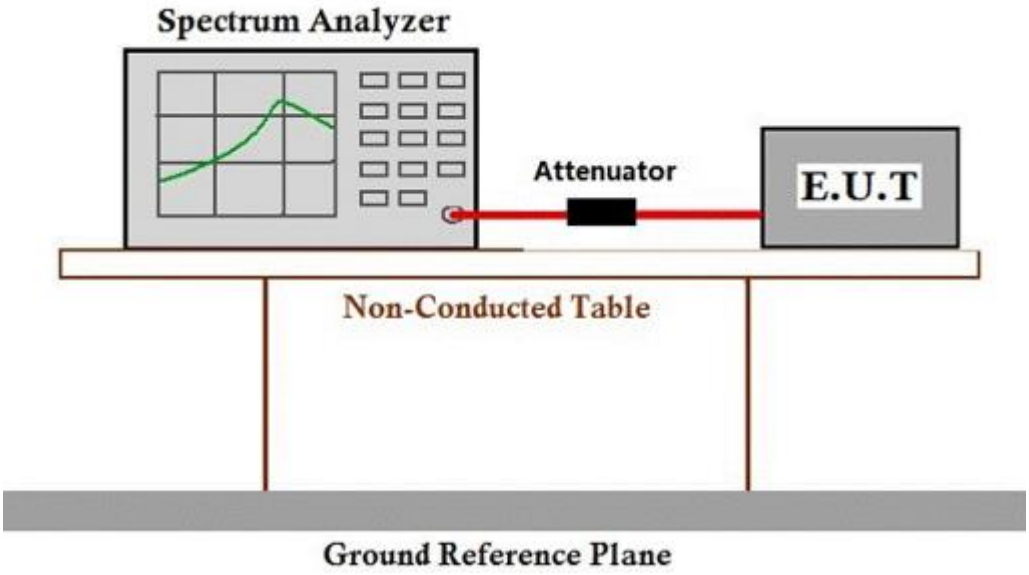
Operating Environment:

Temperature: 23.8 °C Humidity: 56.1 % RH Atmospheric Pressure: 1020 mbar

Test mode b: TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c: TX mode (Band 3)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.3.2 Test Setup Diagram



7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

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7.4 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.

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23.8 °C Humidity: 56.1 % RH Atmospheric Pressure: 1020 mbar

Test mode: b: TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c: TX mode (Band 3)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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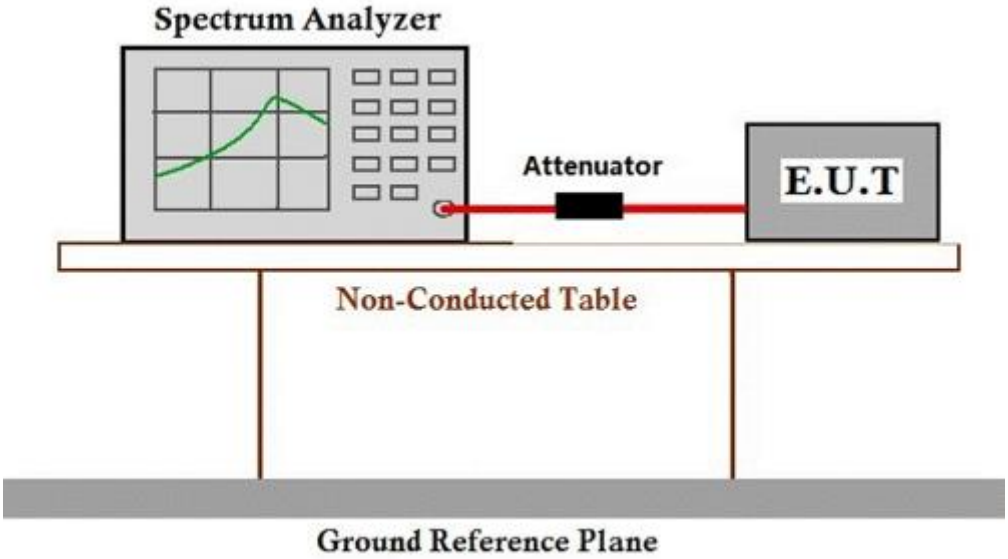
7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

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7.5 Peak Power spectrum density

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

Test Method: KDB 789033 D02 II F

Limit:

Frequency band(MHz)	Limit
5150-5250	≤17dBm in 1MHz for master device
	≤11dBm in 1MHz for client device
5250-5350	≤11dBm in 1MHz for client device
5470-5725	≤11dBm in 1MHz for client device
5725-5850	≤30dBm in 500 kHz
Remark:	The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23.8 °C Humidity: 56.1 % RH Atmospheric Pressure: 1020 mbar

Test mode: b: TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c: TX mode (Band 3)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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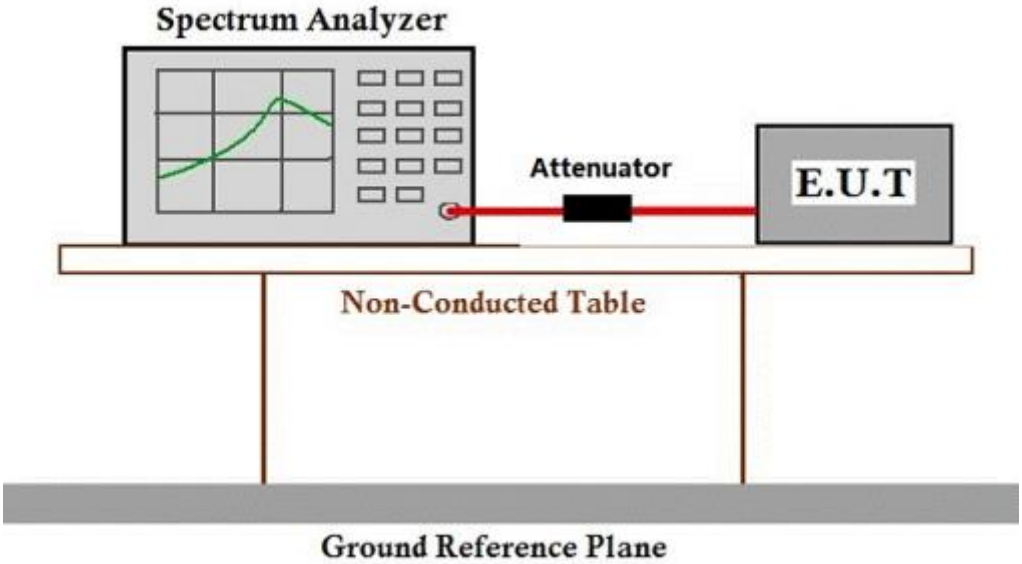
7.5.2 Test Setup Diagram



7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

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7.6 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.407(b)

Test Method: KDB 789033 D02 II G

Measurement Distance: 3m

7.6.1 E.U.T. Operation

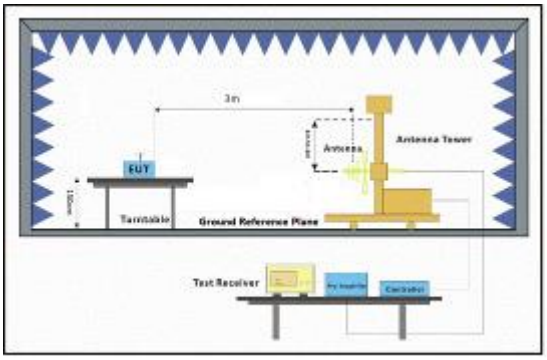
Operating Environment:

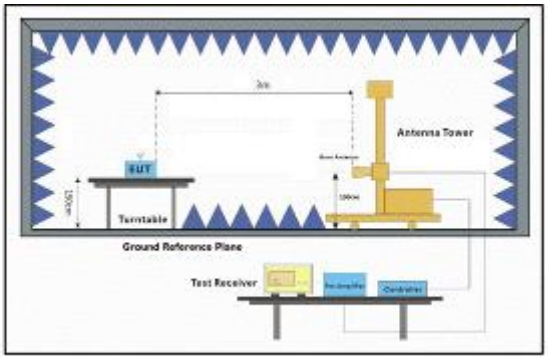
Temperature: 25.1 °C Humidity: 53.1 % RH Atmospheric Pressure: 1020 mbar

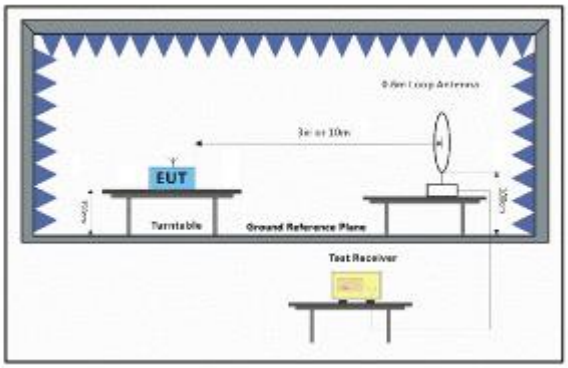
Test mode: b: TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c: TX mode (Band 3)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.6.2 Test Setup Diagram







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7.6.3 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.

i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

2. For emission below 1GHz, through the pre-scan found the worst case is the lowest channel of 802.11a. Only the worst case is recorded in the report.

3. Scan from 9kHz to 40GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

4. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

2) Scan from 9kHz to 40GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

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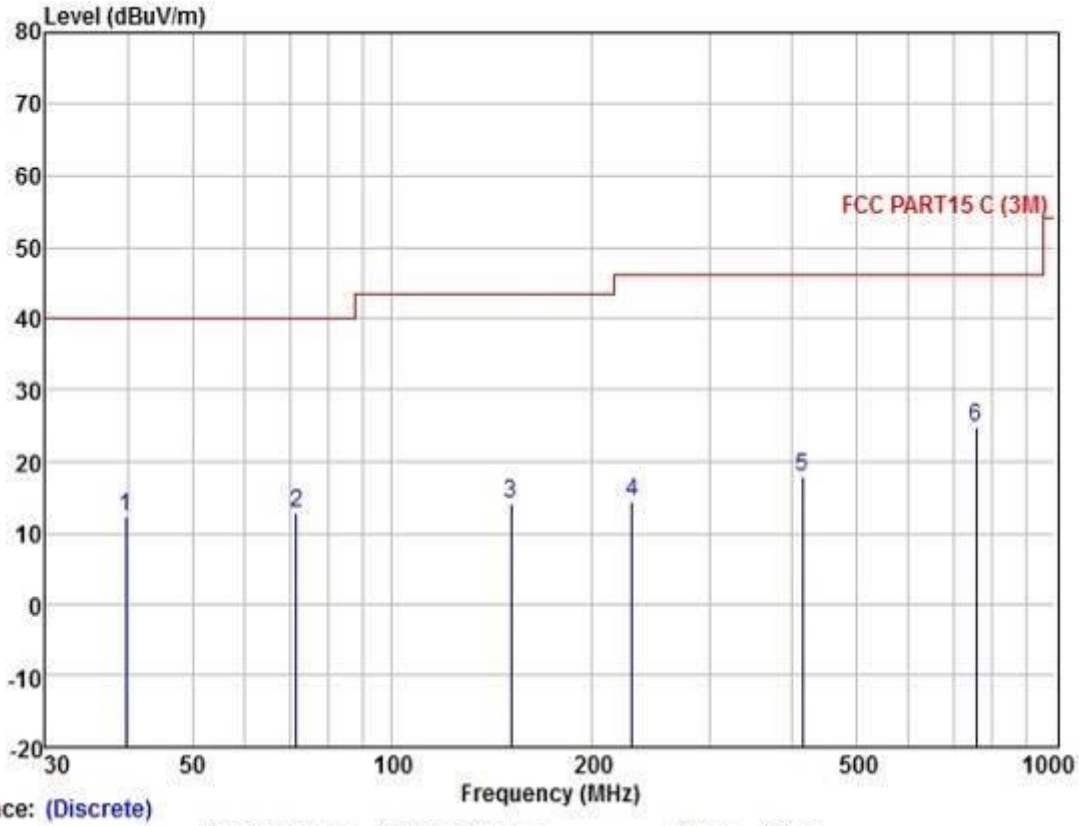
Measurement data
Band 1;5180MHz



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	39.715	22.66	12.60	0.60	23.65	12.21	40.00	-27.79	HORIZONTAL	QP
2	71.832	27.09	10.50	0.73	25.58	12.74	40.00	-27.26	HORIZONTAL	QP
3	151.067	27.83	13.29	1.19	28.12	14.19	43.50	-29.31	HORIZONTAL	QP
4	230.099	30.04	12.00	1.32	28.99	14.37	46.00	-31.63	HORIZONTAL	QP
5	416.179	28.88	16.60	2.01	29.61	17.88	46.00	-28.12	HORIZONTAL	QP
6	758.041	28.61	22.26	2.88	29.00	24.75	46.00	-21.25	HORIZONTAL	QP

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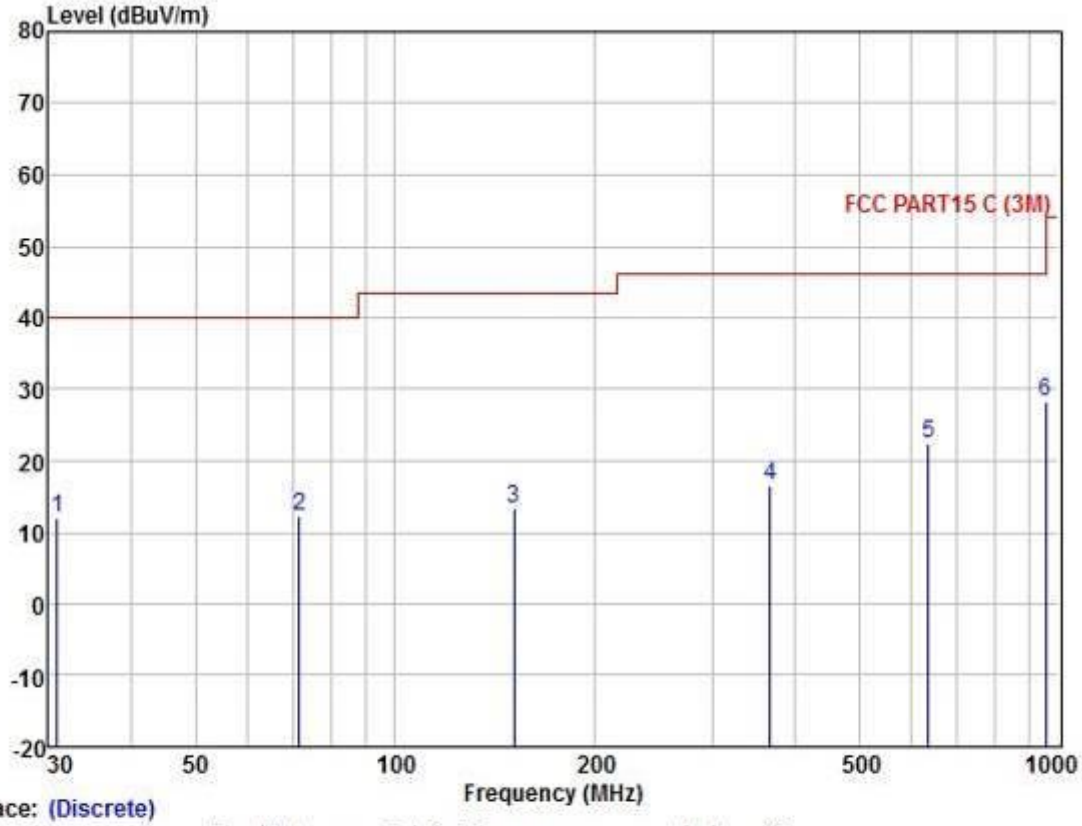
Band 1;5180MHz



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	30.962	21.43	12.22	0.07	21.63	12.09	40.00	-27.91	VERTICAL	QP
2	71.832	26.52	10.50	0.73	25.58	12.17	40.00	-27.83	VERTICAL	QP
3	151.067	26.85	13.29	1.19	28.12	13.21	43.50	-30.29	VERTICAL	QP
4	368.112	28.27	15.93	2.05	29.60	16.65	46.00	-29.35	VERTICAL	QP
5	636.134	28.37	20.86	2.10	28.99	22.34	46.00	-23.66	VERTICAL	QP
6	955.438	28.11	24.66	3.48	27.98	28.27	46.00	-17.73	VERTICAL	QP

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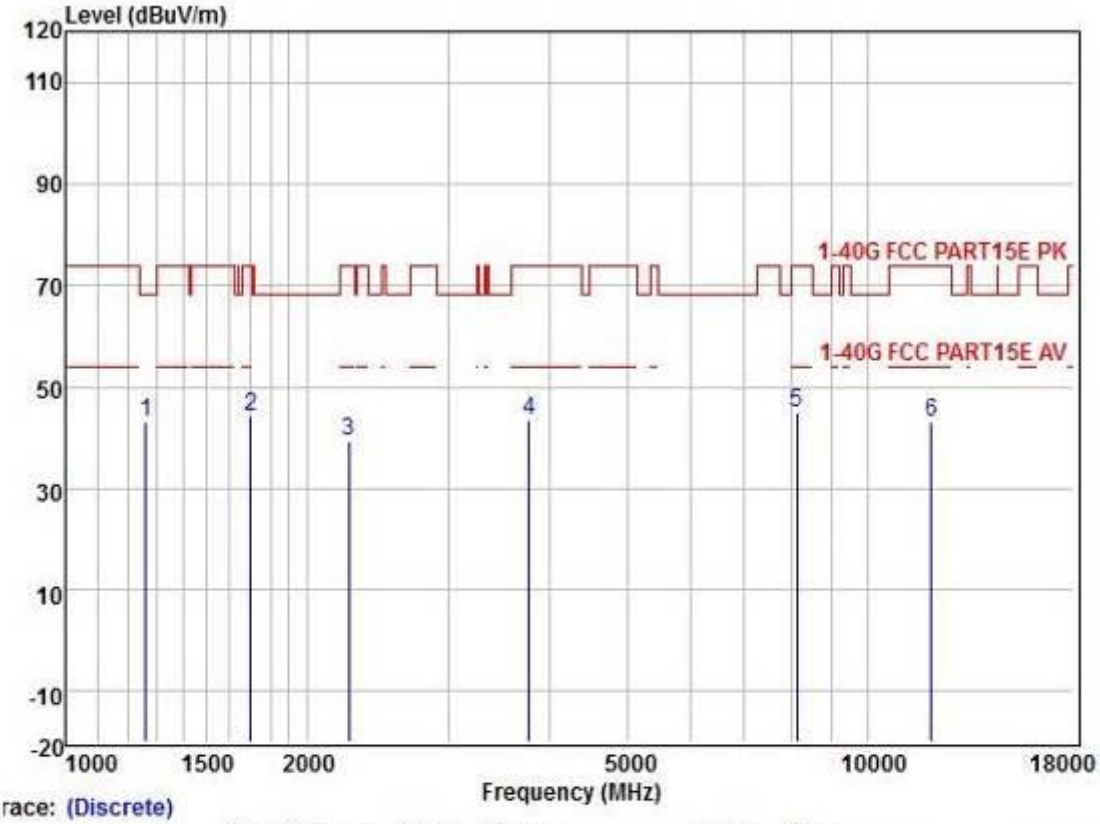
Band 1;5180MHz



	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1260.149	53.50	24.70	3.16	38.15	43.21	68.20	-24.99	HORIZONTAL	Peak
2	1702.042	52.78	25.07	3.94	37.59	44.20	74.00	-29.80	HORIZONTAL	Peak
3	2252.846	44.65	26.02	6.01	37.45	39.23	74.00	-34.77	HORIZONTAL	Peak
4	3779.422	43.71	28.92	7.78	36.92	43.49	74.00	-30.51	HORIZONTAL	Peak
5	8129.664	37.08	36.41	8.29	36.91	44.87	74.00	-29.13	HORIZONTAL	Peak
6	11975.100	30.00	39.48	10.63	37.20	42.91	74.00	-31.09	HORIZONTAL	Peak

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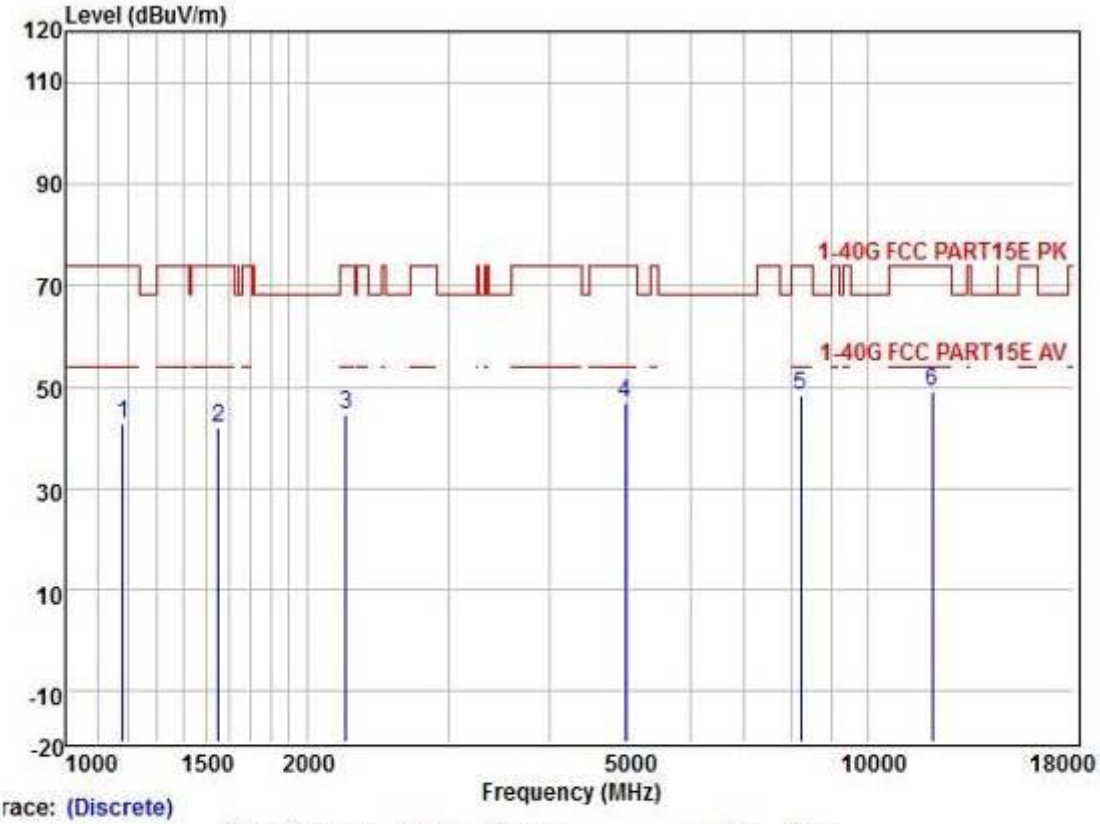
Band 1;5180MHz



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1179.100	53.66	24.37	2.82	38.21	42.64	74.00	-31.36	VERTICAL	Peak
2	1551.677	51.57	25.01	3.14	37.68	42.04	74.00	-31.96	VERTICAL	Peak
3	2233.396	49.48	25.90	6.58	37.46	44.50	74.00	-29.50	VERTICAL	Peak
4	4973.662	44.83	31.07	8.00	36.96	46.94	74.00	-27.06	VERTICAL	Peak
5	8224.200	40.59	36.33	8.23	36.92	48.23	74.00	-25.77	VERTICAL	Peak
6	12009.760	36.25	39.50	10.67	37.20	49.22	74.00	-24.78	VERTICAL	Peak

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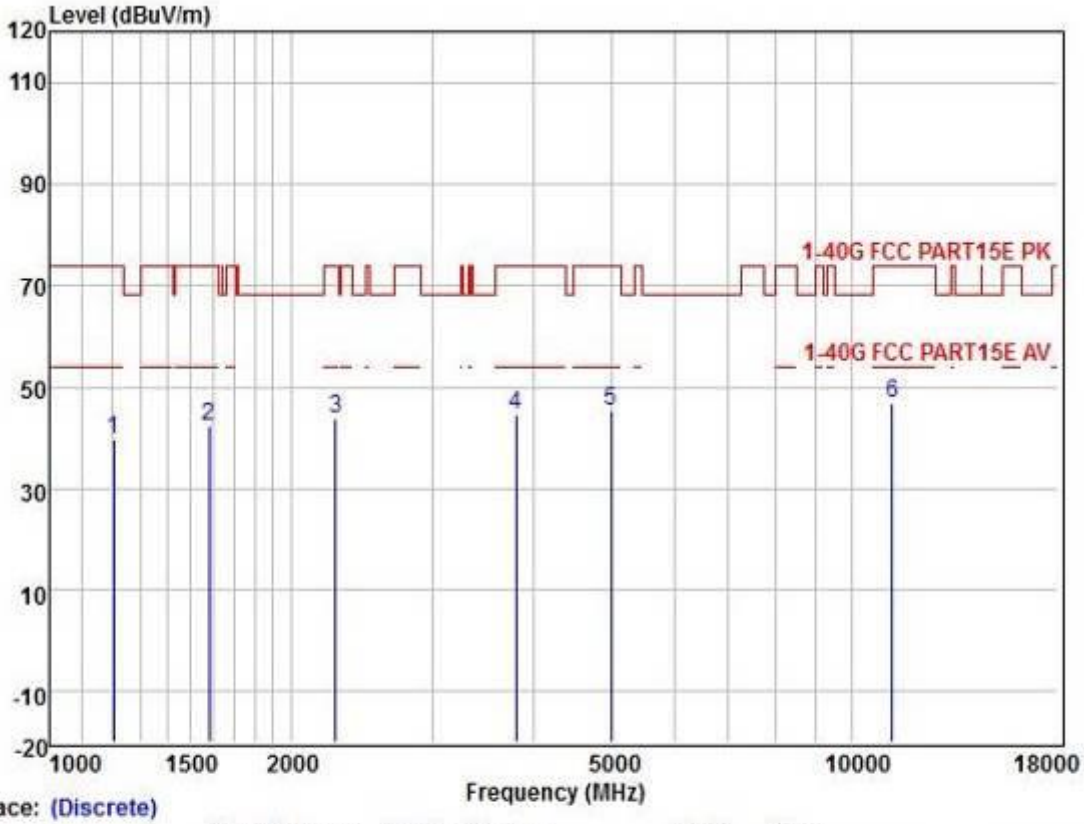
Band 1;5240MHz



race: (Discrete)

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1203.199	50.50	24.45	2.99	38.19	39.75	74.00	-34.25	HORIZONTAL	Peak
2	1578.822	51.55	25.02	3.24	37.66	42.15	74.00	-31.85	HORIZONTAL	Peak
3	2272.466	49.69	26.11	5.54	37.45	43.89	74.00	-30.11	HORIZONTAL	Peak
4	3812.336	44.46	29.05	7.86	36.92	44.45	74.00	-29.55	HORIZONTAL	Peak
5	5002.497	42.87	31.10	8.28	36.96	45.29	74.00	-28.71	HORIZONTAL	Peak
6	11204.900	34.25	39.69	9.96	37.17	46.73	74.00	-27.27	HORIZONTAL	Peak

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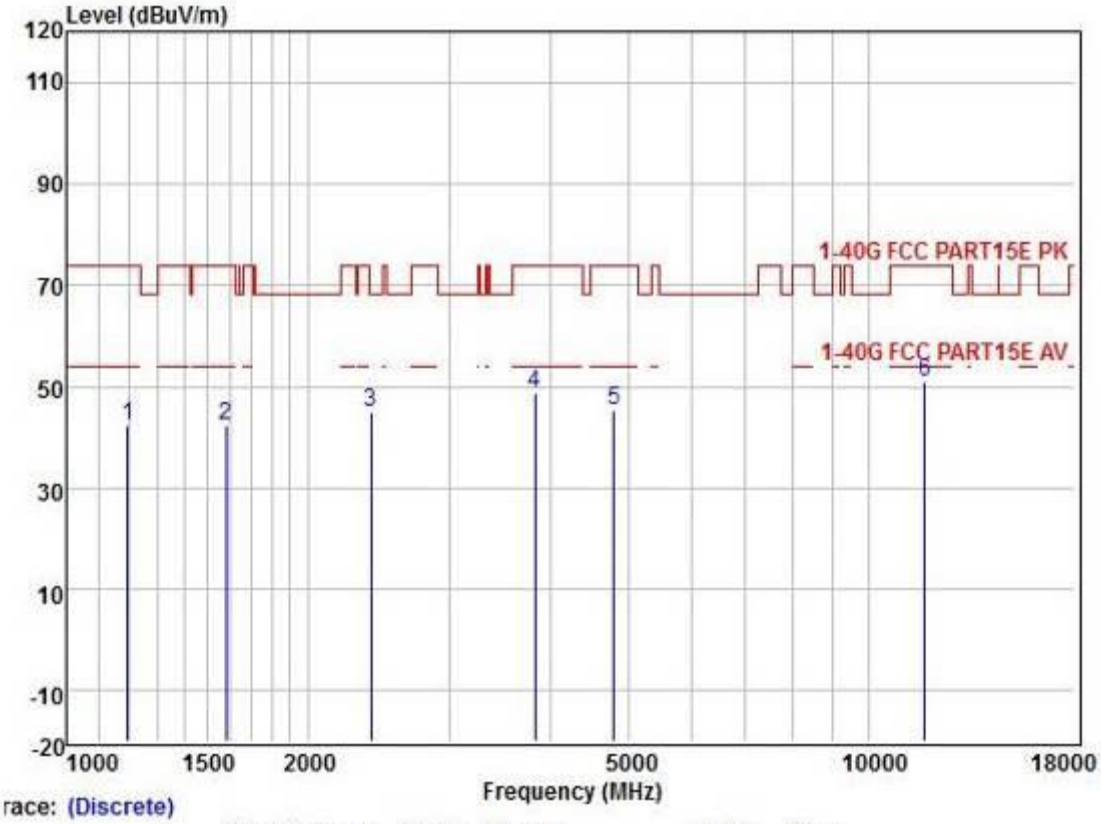
Band 1;5240MHz



race: (Discrete)

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1192.811	53.28	24.41	2.91	38.20	42.40	74.00	-31.60	VERTICAL	Peak
2	1578.822	51.58	25.02	3.24	37.66	42.18	74.00	-31.82	VERTICAL	Peak
3	2393.824	51.17	26.44	4.87	37.42	45.06	68.20	-23.14	VERTICAL	Peak
4	3834.438	48.62	29.12	7.80	36.91	48.63	74.00	-25.37	VERTICAL	Peak
5	4804.110	45.42	30.79	5.87	36.94	45.14	74.00	-28.86	VERTICAL	Peak
6	11701.380	38.61	39.26	10.37	37.19	51.05	74.00	-22.95	VERTICAL	Peak

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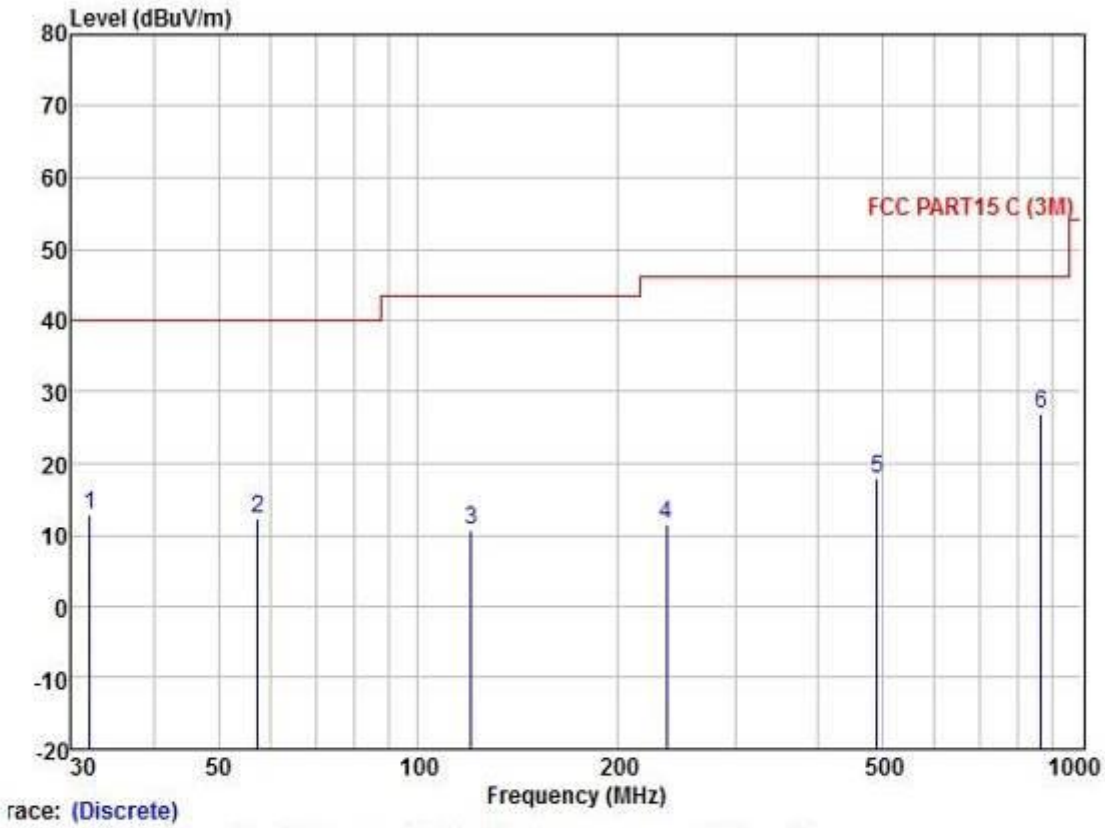
Band 3;5745MHz



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	31.955	22.32	12.25	0.11	21.90	12.78	40.00	-27.22	HORIZONTAL	QP
2	57.191	24.60	12.35	0.58	25.16	12.37	40.00	-27.63	HORIZONTAL	QP
3	120.277	26.37	11.52	0.92	28.19	10.62	43.50	-32.88	HORIZONTAL	QP
4	236.645	26.78	12.30	1.51	29.15	11.44	46.00	-34.56	HORIZONTAL	QP
5	492.469	27.24	18.14	2.13	29.51	18.00	46.00	-28.00	HORIZONTAL	QP
6	869.130	28.70	23.70	2.94	28.33	27.01	46.00	-18.99	HORIZONTAL	QP

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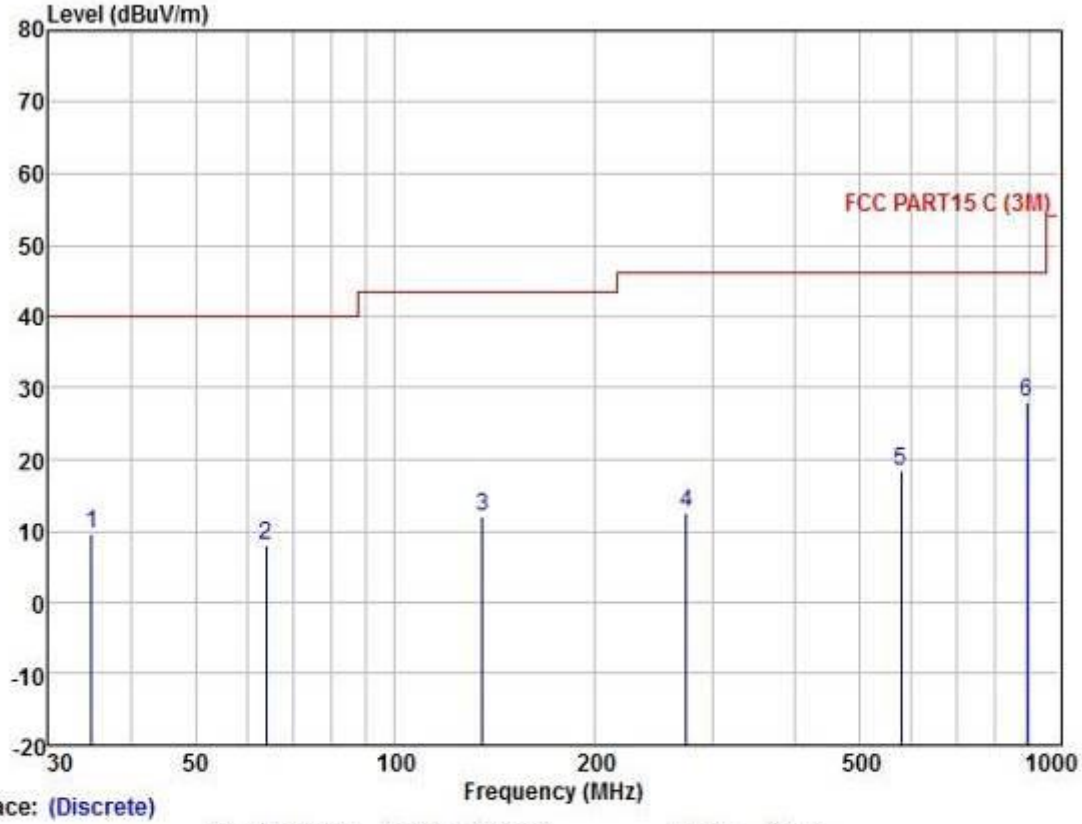
Band 3;5745MHz



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	34.882	19.58	12.42	0.22	22.69	9.53	40.00	-30.47	VERTICAL	QP
2	63.983	21.04	11.70	0.63	25.33	8.04	40.00	-31.96	VERTICAL	QP
3	135.506	26.32	12.87	1.00	28.17	12.02	43.50	-31.48	VERTICAL	QP
4	275.157	26.25	13.44	1.74	28.89	12.54	46.00	-33.46	VERTICAL	QP
5	578.670	25.49	20.30	1.90	29.21	18.48	46.00	-27.52	VERTICAL	QP
6	893.857	29.11	23.95	2.86	27.97	27.95	46.00	-18.05	VERTICAL	QP

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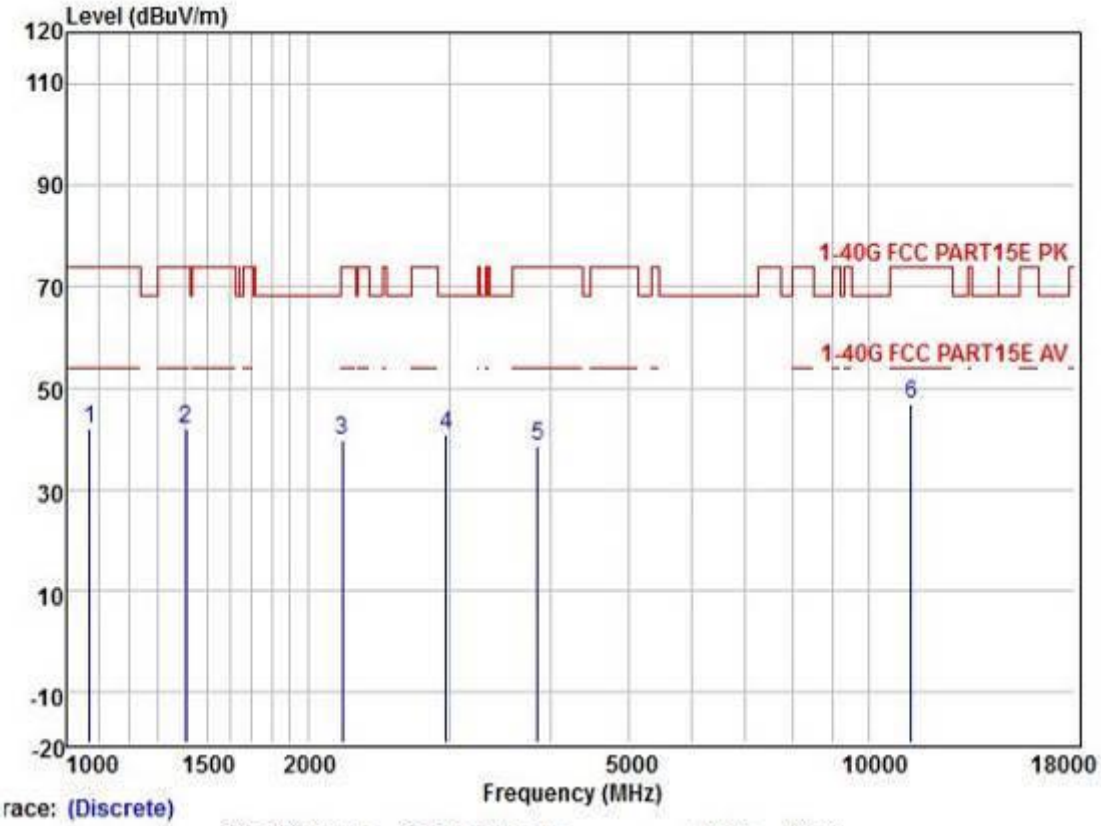
Band 3;5745MHz



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1068.738	53.29	24.17	2.66	38.27	41.85	74.00	-32.15	HORIZONTAL	Peak
2	1410.514	51.64	24.93	3.30	37.90	41.97	74.00	-32.03	HORIZONTAL	Peak
3	2207.723	44.13	25.75	7.20	37.46	39.62	74.00	-34.38	HORIZONTAL	Peak
4	2973.293	45.37	27.87	4.67	37.09	40.82	68.20	-27.38	HORIZONTAL	Peak
5	3856.668	38.47	29.19	7.73	36.91	38.48	74.00	-35.52	HORIZONTAL	Peak
6	11269.860	34.48	39.55	9.95	37.17	46.81	74.00	-27.19	HORIZONTAL	Peak

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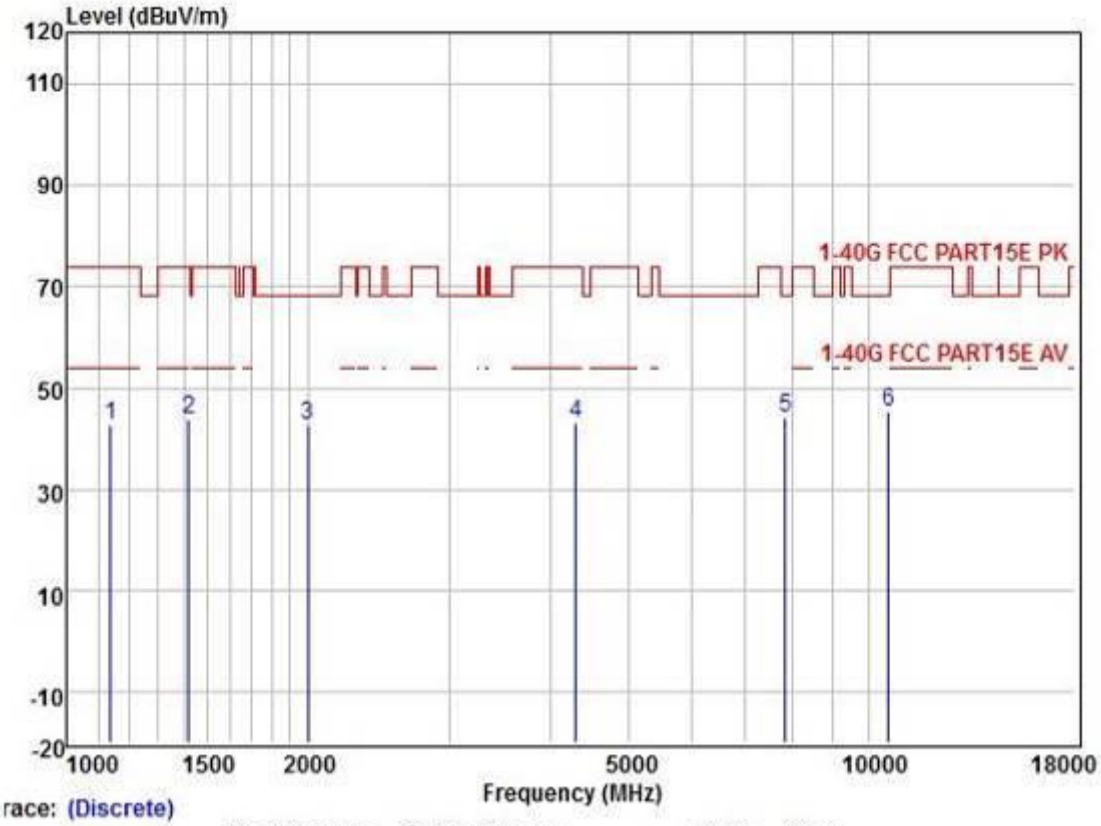
Band 3;5745MHz



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1135.617	53.91	24.27	2.60	38.23	42.55	74.00	-31.45	VERTICAL	Peak
2	1418.692	53.48	24.94	3.27	37.88	43.81	74.00	-30.19	VERTICAL	Peak
3	2001.084	43.80	25.20	11.08	37.50	42.58	68.20	-25.62	VERTICAL	Peak
4	4304.400	43.60	29.91	6.34	36.91	42.94	74.00	-31.06	VERTICAL	Peak
5	7852.524	36.19	36.39	8.32	36.90	44.00	68.20	-24.20	VERTICAL	Peak
6	10545.010	33.69	39.05	9.58	37.12	45.20	68.20	-23.00	VERTICAL	Peak

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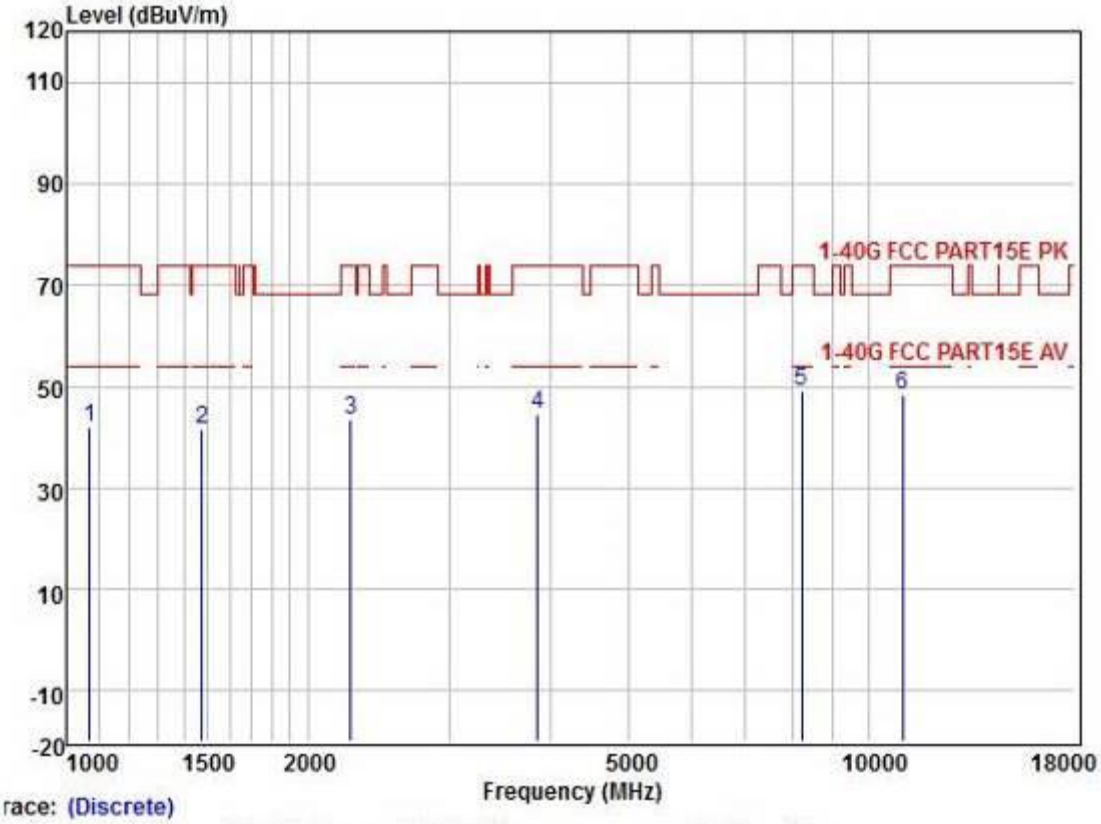
Band 3;5825MHz



race: (Discrete)

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1068.738	53.29	24.17	2.66	38.27	41.85	74.00	-32.15	HORIZONTAL	Peak
2	1477.276	51.44	24.99	3.05	37.76	41.72	74.00	-32.28	HORIZONTAL	Peak
3	2259.367	48.97	26.05	5.84	37.45	43.41	74.00	-30.59	HORIZONTAL	Peak
4	3856.668	44.47	29.19	7.73	36.91	44.48	74.00	-29.52	HORIZONTAL	Peak
5	8224.200	41.25	36.33	8.23	36.92	48.89	74.00	-25.11	HORIZONTAL	Peak
6	10980.470	35.55	39.95	9.98	37.15	48.33	74.00	-25.67	HORIZONTAL	Peak

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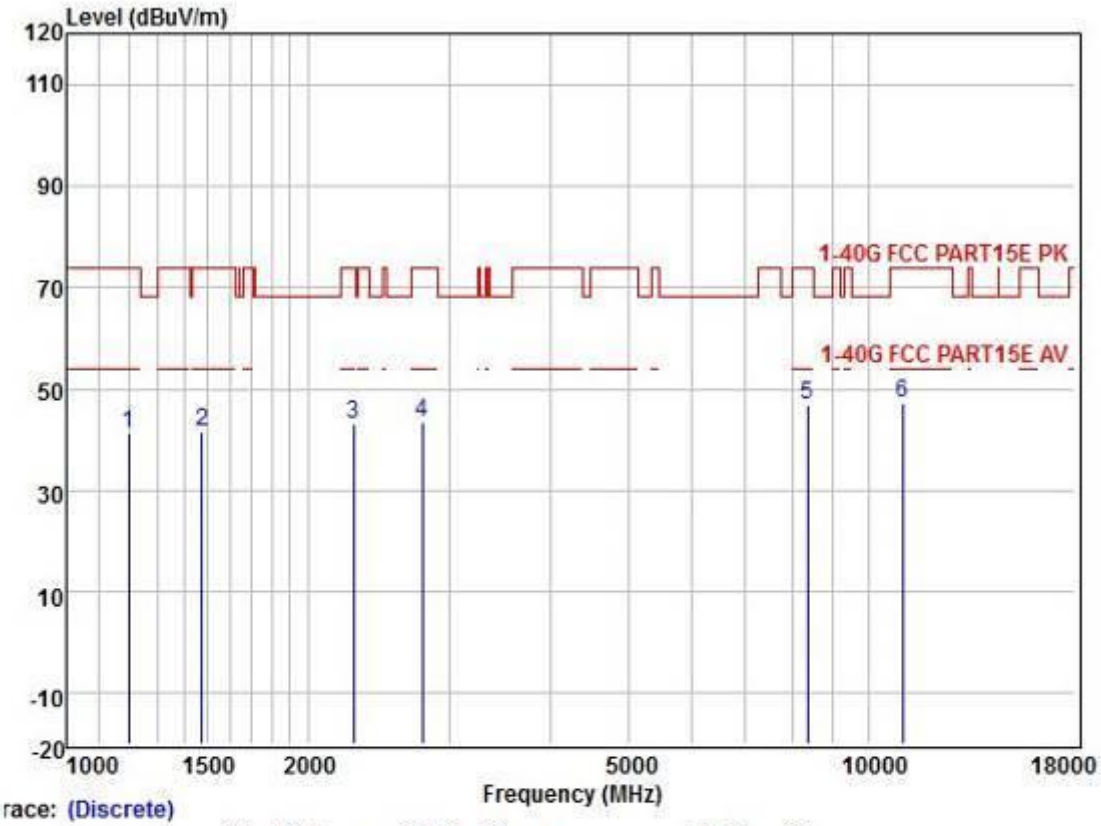
Band 3;5825MHz



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1196.264	51.98	24.42	2.93	38.20	41.13	74.00	-32.87	VERTICAL	Peak
2	1477.276	51.44	24.99	3.05	37.76	41.72	74.00	-32.28	VERTICAL	Peak
3	2279.044	48.96	26.13	5.40	37.45	43.04	74.00	-30.96	VERTICAL	Peak
4	2774.030	48.63	27.43	4.72	37.26	43.52	74.00	-30.48	VERTICAL	Peak
5	8368.069	39.57	36.18	8.11	36.93	46.93	74.00	-27.07	VERTICAL	Peak
6	10980.470	34.55	39.95	9.98	37.15	47.33	74.00	-26.67	VERTICAL	Peak

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7.7 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.407(b)

Test Method: KDB 789033 D02 II G

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.		

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 25.1 °C Humidity: 52.4 % RH Atmospheric Pressure: 1020 mbar

Test mode: b: TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c: TX mode (Band 3)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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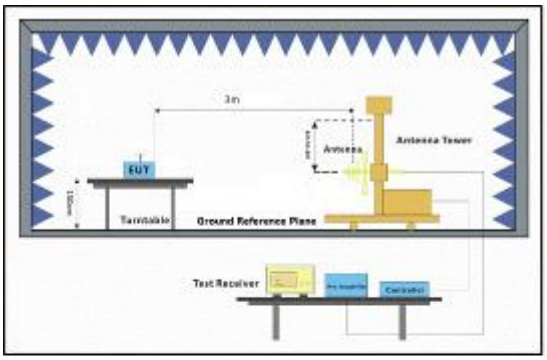
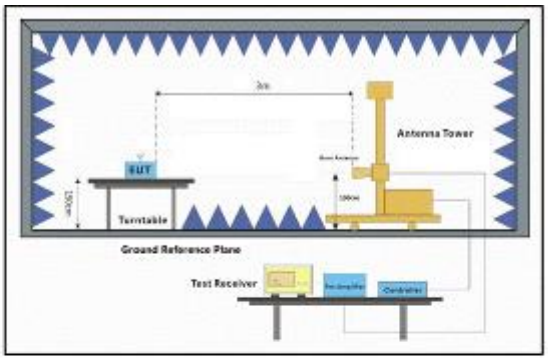
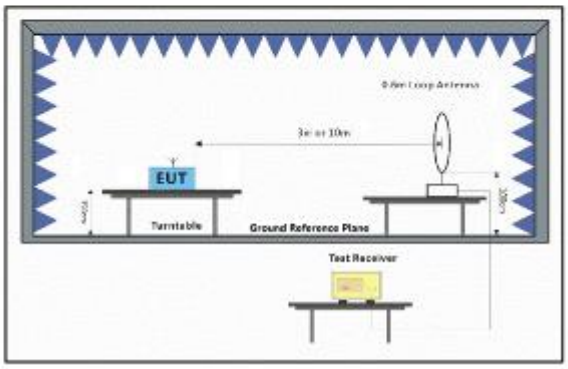
7.7.2 Test Setup Diagram







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7.7.3 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.

i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

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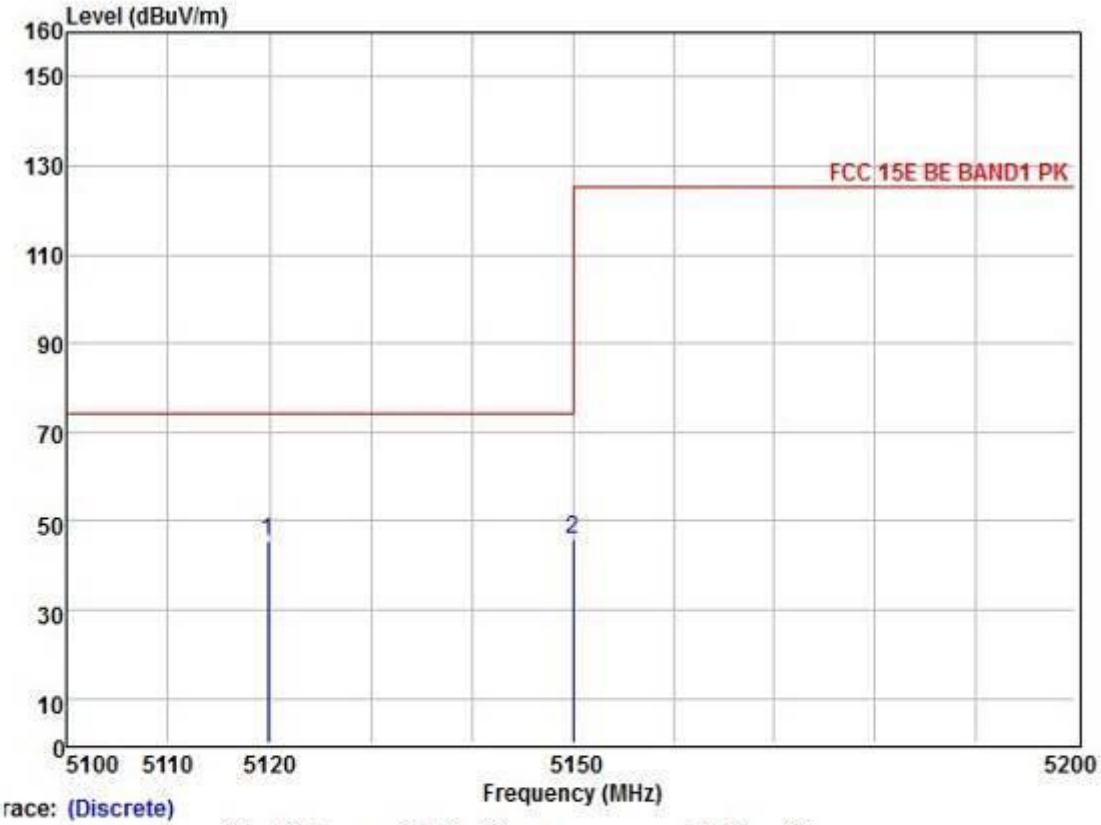
Measurement data
Band 1;5180MHz



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	5119.845	43.68	31.24	7.62	36.97	45.57	74.00	-28.43	HORIZONTAL	Peak
2	5150.000	44.04	31.29	7.42	36.97	45.78	74.00	-28.22	HORIZONTAL	Peak

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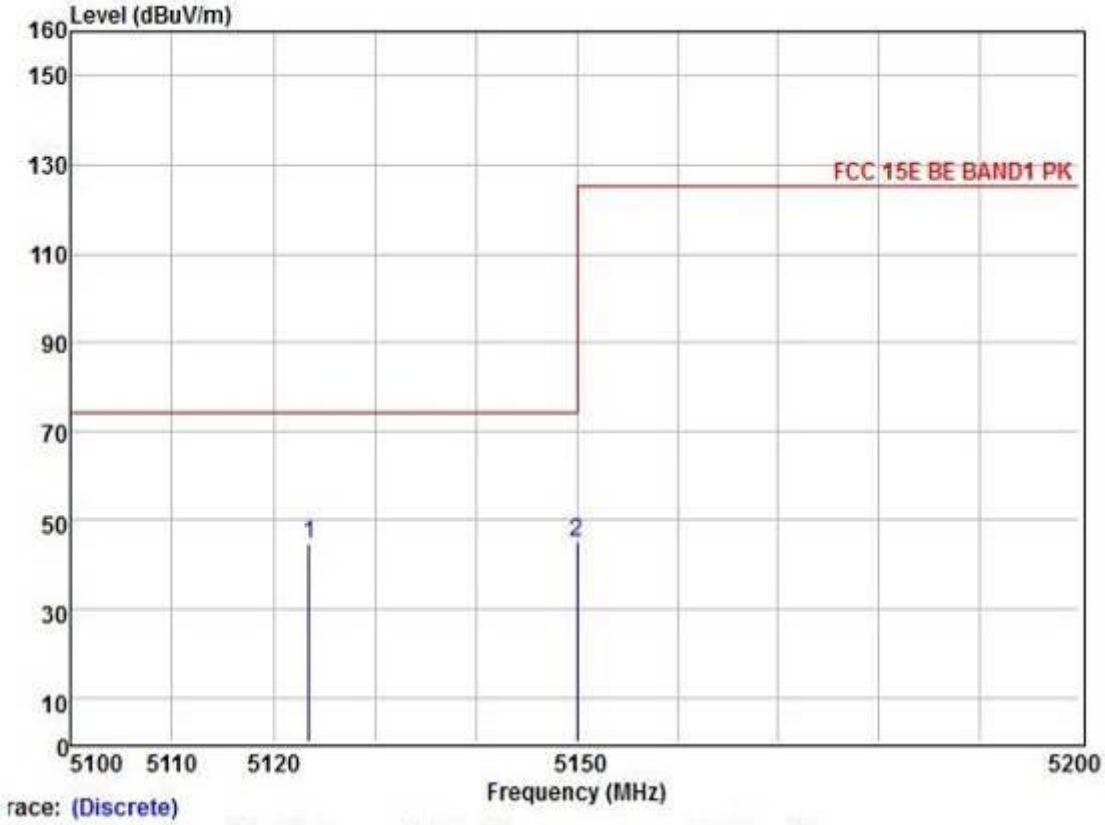
Band 1;5180MHz



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	5123.525	42.60	31.24	7.62	36.97	44.49	74.00	-29.51	VERTICAL	Peak
2	5150.000	43.23	31.29	7.42	36.97	44.97	74.00	-29.03	VERTICAL	Peak

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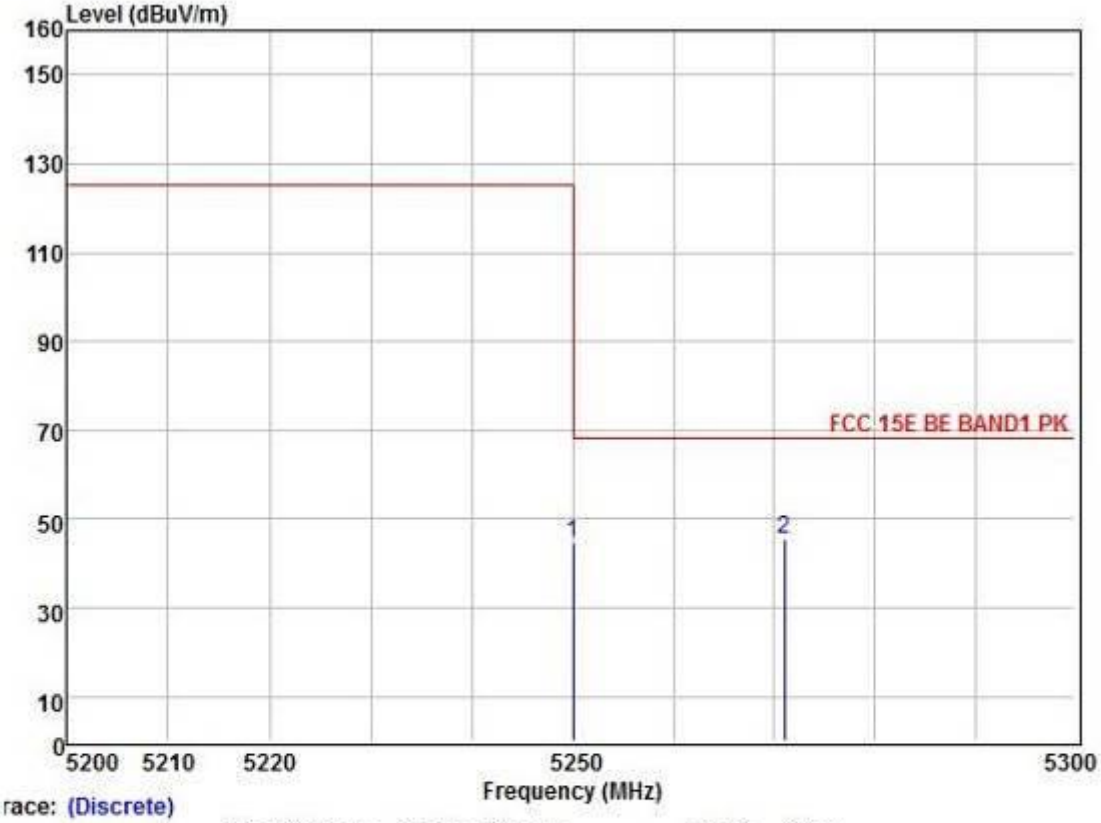
Band 1;5240MHz



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	5250.000	42.50	31.50	7.39	36.98	44.41	68.20	-23.79	HORIZONTAL	Peak
2	5271.004	43.53	31.54	7.43	36.98	45.52	68.20	-22.68	HORIZONTAL	Peak

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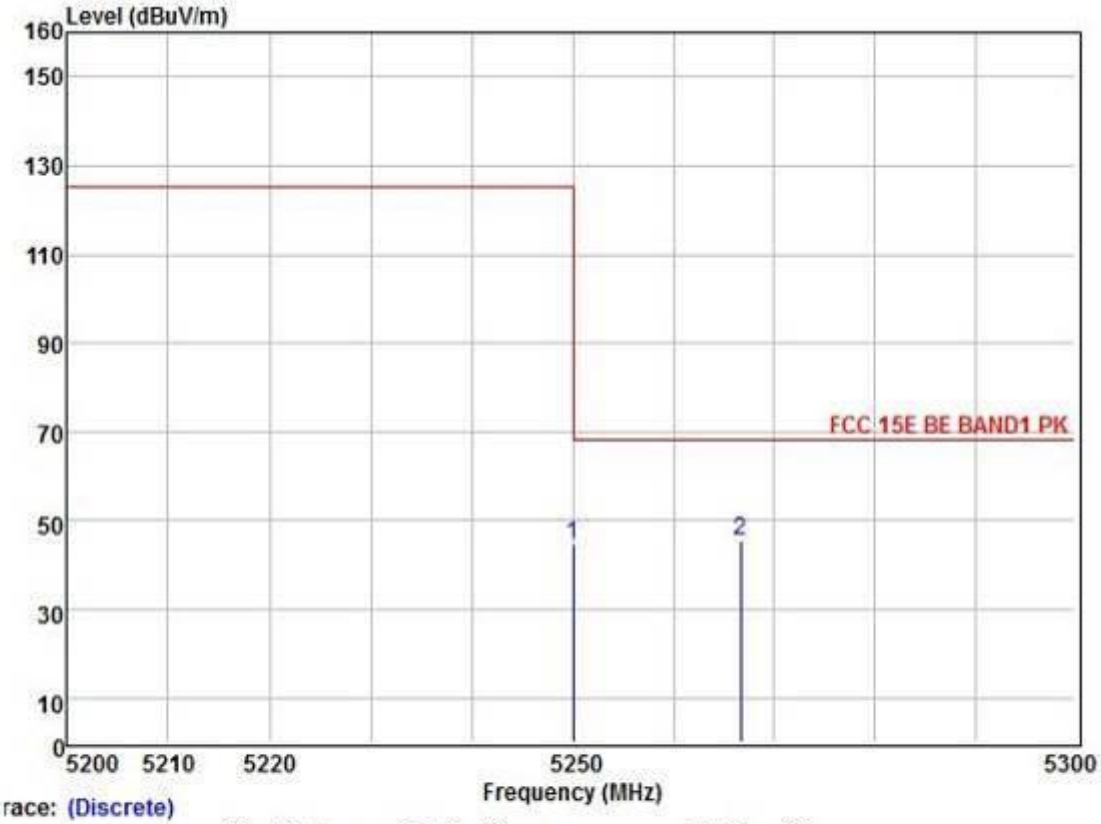
Band 1;5240MHz



race: (Discrete)

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	5250.000	42.77	31.50	7.39	36.98	44.68	68.20	-23.52	VERTICAL	Peak
2	5266.689	43.68	31.54	7.43	36.98	45.67	68.20	-22.53	VERTICAL	Peak

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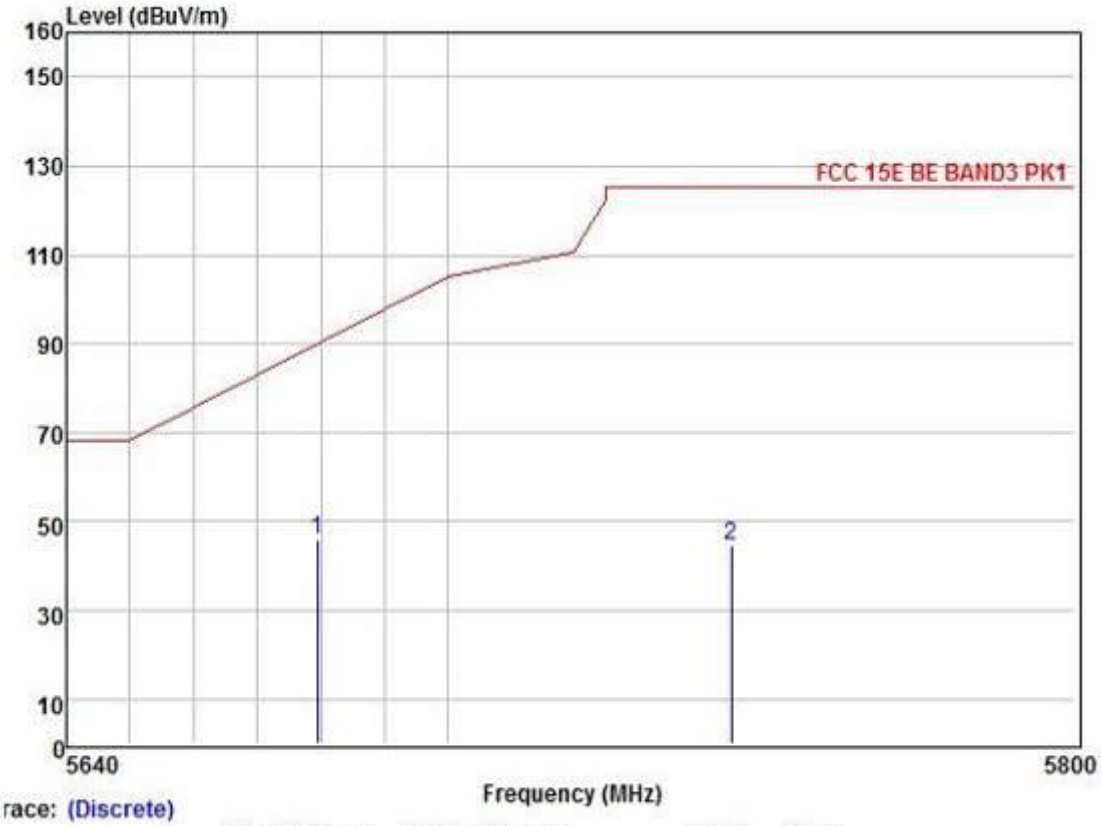
Band 3;5745MHz



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	5679.358	43.84	32.03	6.90	36.99	45.78	89.96	-44.18	HORIZONTAL	Peak
2	5745.000	42.63	32.10	7.05	36.99	44.79	125.20	-80.41	HORIZONTAL	Peak

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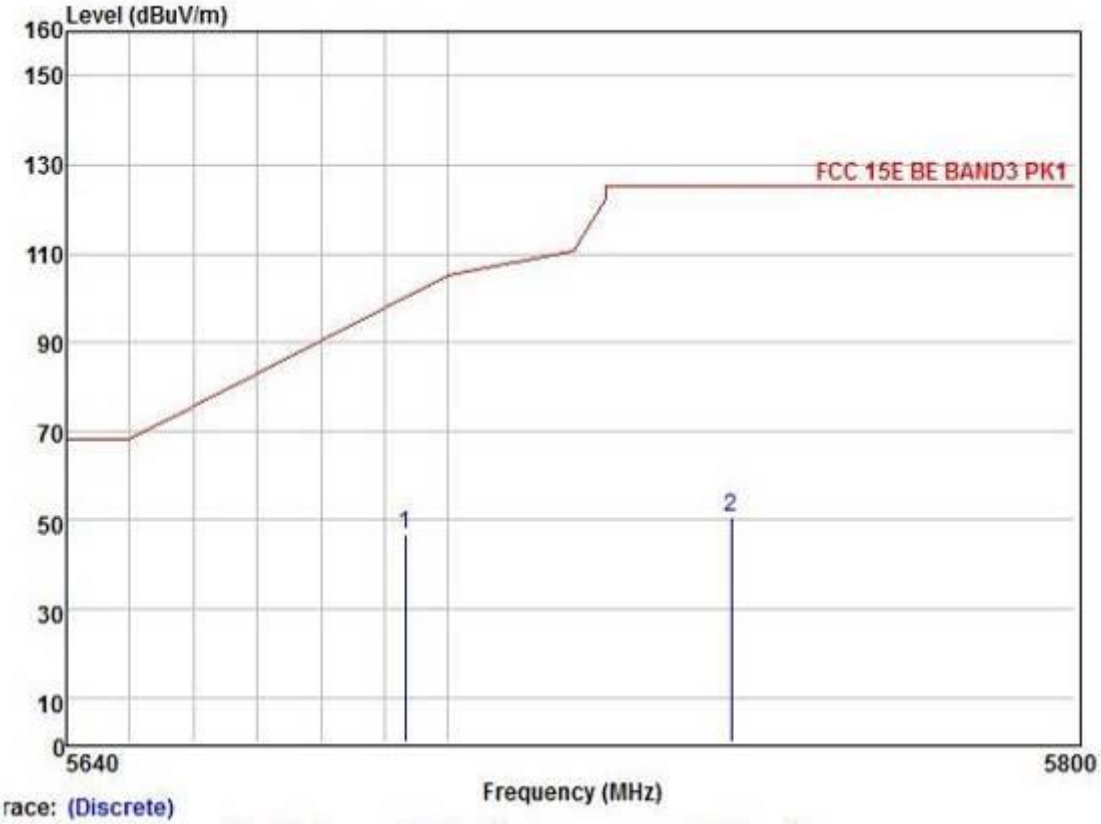
Band 3;5745MHz



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	5693.326	44.86	32.04	6.83	36.99	46.74	100.28	-53.54	VERTICAL	Peak
2	5745.000	48.47	32.10	7.05	36.99	50.63	125.20	-74.57	VERTICAL	Peak

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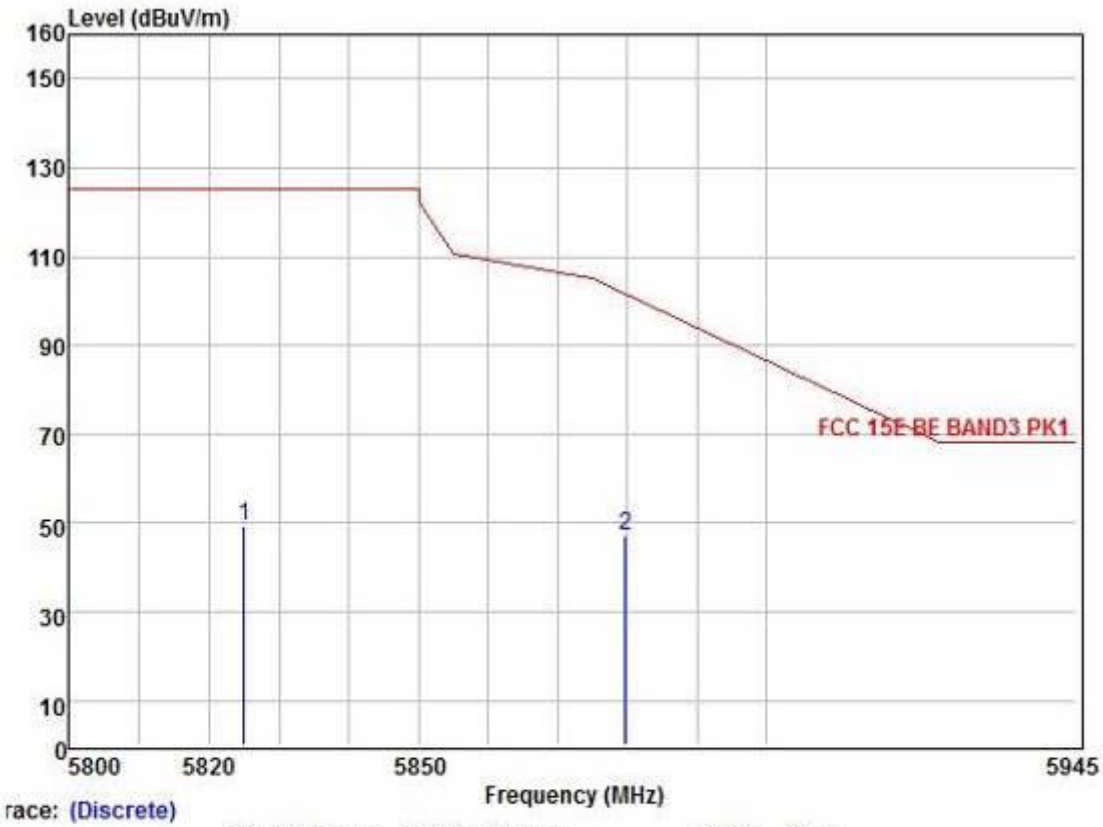
Band 3;5825MHz



	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	5825.000	46.59	32.19	7.45	37.00	49.23	125.20	-75.97	HORIZONTAL	Peak
2	5879.597	44.54	32.23	7.43	37.00	47.20	101.78	-54.58	HORIZONTAL	Peak

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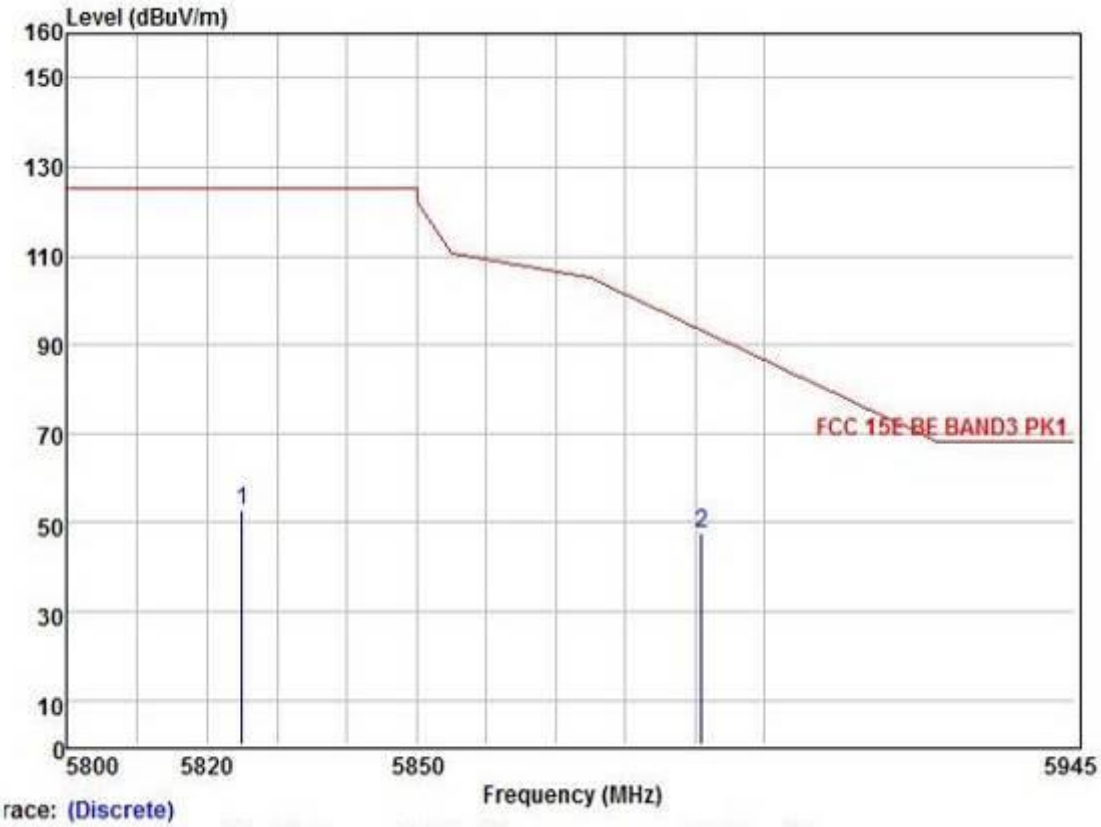
Band 3;5825MHz



race: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	5825.000	49.92	32.19	7.45	37.00	52.56	125.20	-72.64	VERTICAL	Peak
2	5890.932	44.81	32.24	7.42	37.00	47.47	93.38	-45.91	VERTICAL	Peak

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7.8 Frequency Stability

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

Test Method: ANSI C63.10 (2013) Section 6.8

Limit: The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

7.8.1 E.U.T. Operation

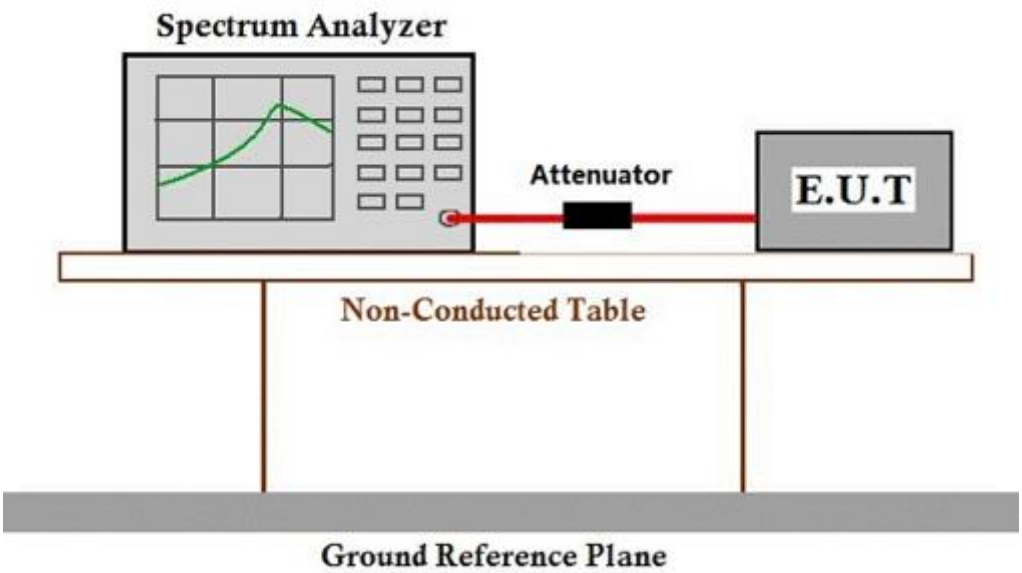
Operating Environment:

Temperature: 23.8 °C Humidity: 56 % RH Atmospheric Pressure: 1020 mbar

Test mode: b: TX mode (Band 1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

c: TX mode (Band 3)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.8.2 Test Setup Diagram



7.8.3 Measurement Procedure and Data

The test result is pass and the test data are not show in this report according to KDB 789033.

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8 Appendix

8.1 Appendix 15.407

1. 6dB Emission Bandwidth

Test Channel	Ant	Test mode	OBW[MHz]	Limit[MHz]	Verdict
5180	Ant1	a	16.434	NA	PASS
5240	Ant1	a	16.453	NA	PASS
5745	Ant1	a	16.457	>=0.5	PASS
5825	Ant1	a	16.431	>=0.5	PASS
5180	Ant1	N20	17.631	NA	PASS
5240	Ant1	N20	17.599	NA	PASS
5745	Ant1	N20	17.623	>=0.5	PASS
5825	Ant1	N20	17.655	>=0.5	PASS
5190	Ant1	N40	35.938	NA	PASS
5230	Ant1	N40	36.149	NA	PASS
5755	Ant1	N40	36.162	>=0.5	PASS
5795	Ant1	N40	36.213	>=0.5	PASS
5180	Ant1	ac20	17.659	NA	PASS
5240	Ant1	ac20	17.643	NA	PASS
5745	Ant1	ac20	17.625	>=0.5	PASS
5825	Ant1	ac20	17.634	>=0.5	PASS
5190	Ant1	ac40	36.091	NA	PASS
5230	Ant1	ac40	36.184	NA	PASS
5755	Ant1	ac40	36.219	>=0.5	PASS
5795	Ant1	ac40	36.256	>=0.5	PASS
5210	Ant1	ac80	75.396	NA	PASS

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5775	Ant1	ac80	75.433	>=0.5	PASS

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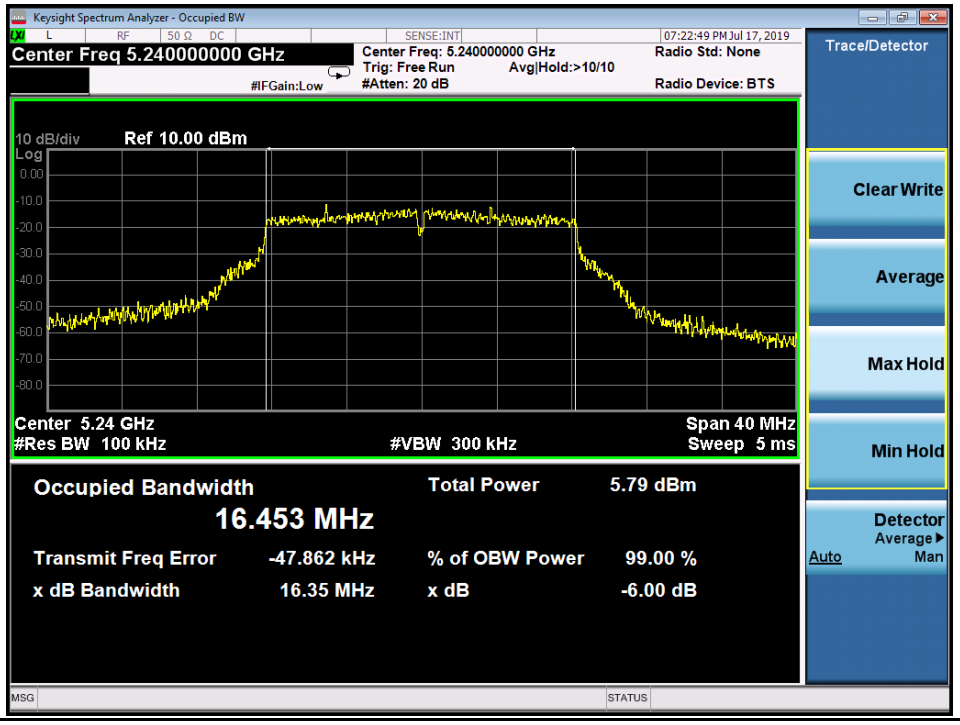
Emission Bandwidth Measurement_5180_Ant1 a mode

Emission Bandwidth Measurement_5240_Ant1 a mode



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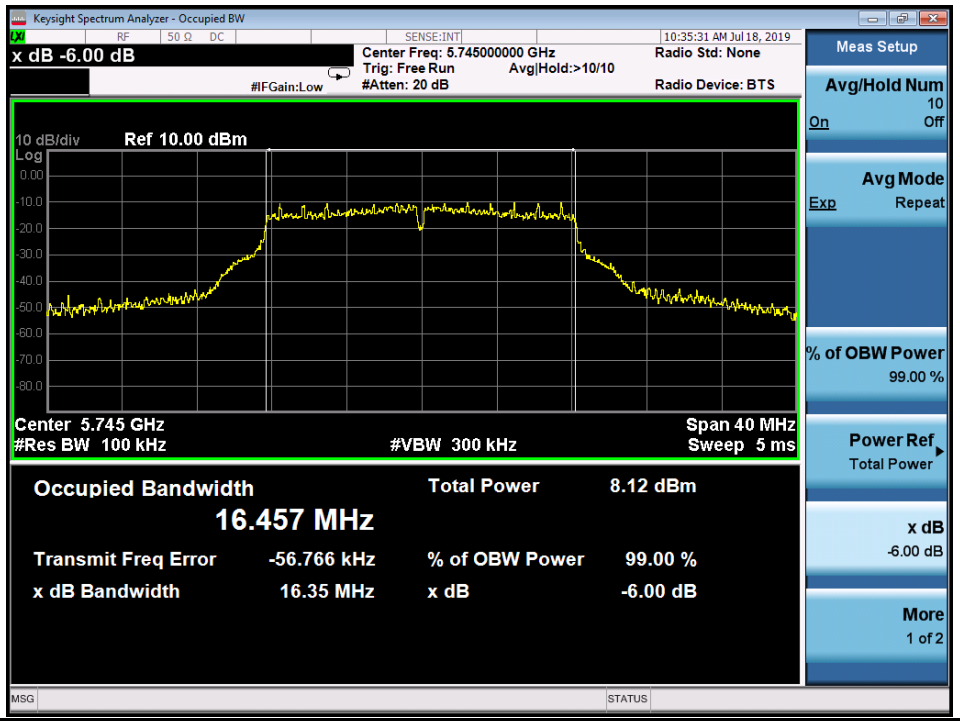
Emission Bandwidth Measurement 5745_Ant1 a mode



Emission Bandwidth Measurement 5825_Ant1 a mode

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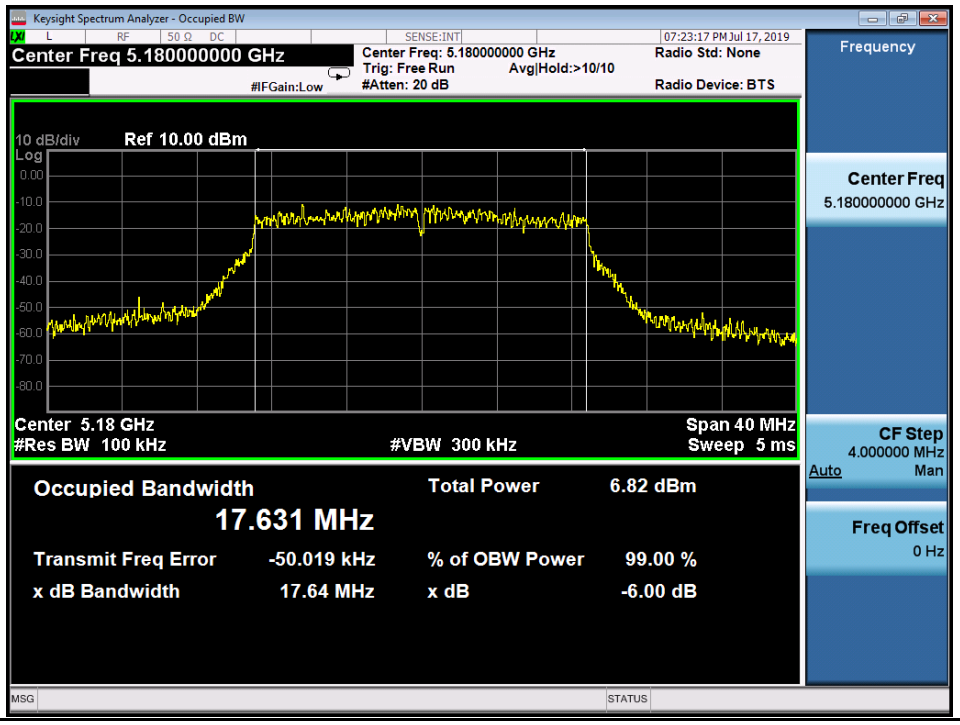
Emission Bandwidth Measurement 5180_Ant1 n20 mode



Emission Bandwidth Measurement 5240_Ant1 n20 mode

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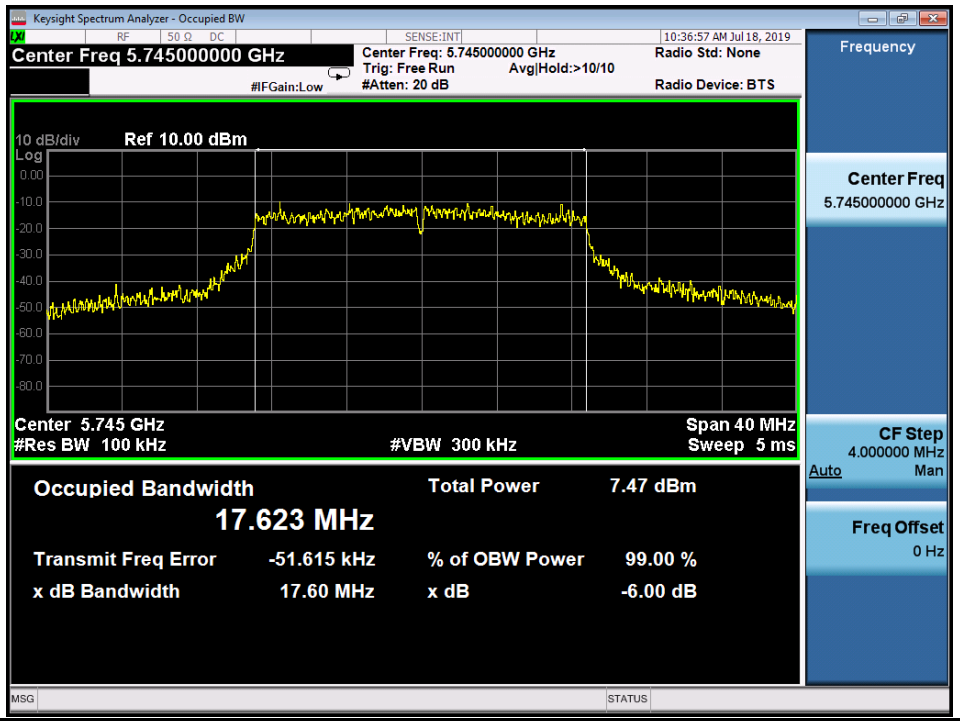
Emission Bandwidth Measurement 5745_Ant1 n20 mode



Emission Bandwidth Measurement 5825_Ant1 n20 mode

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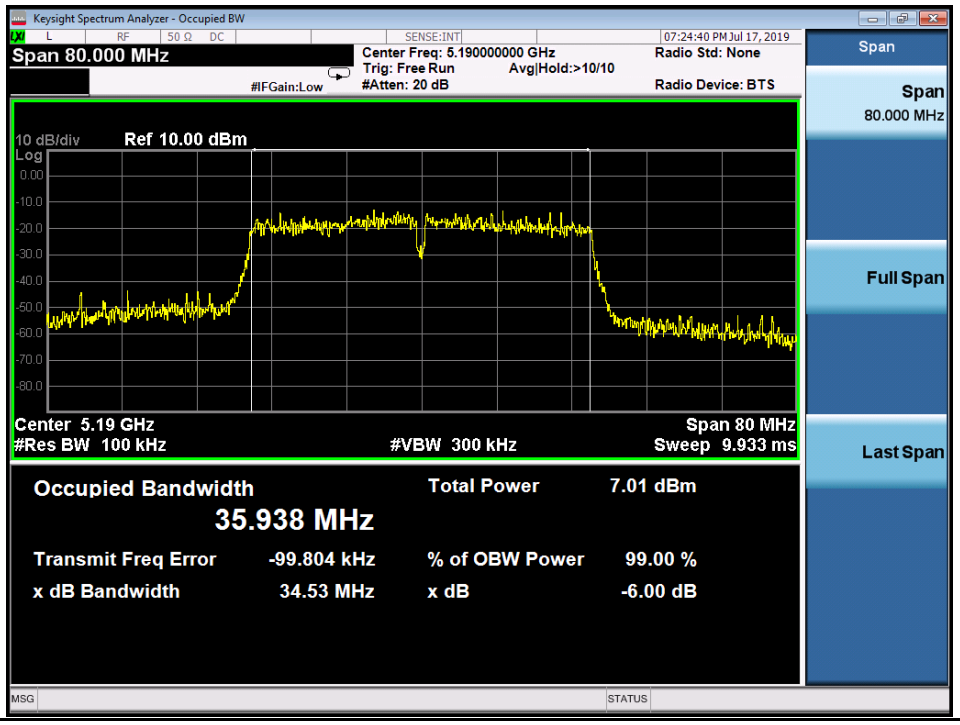
Emission Bandwidth Measurement 5190_Ant1 n40 mode



Emission Bandwidth Measurement 5230_Ant1 n40 mode

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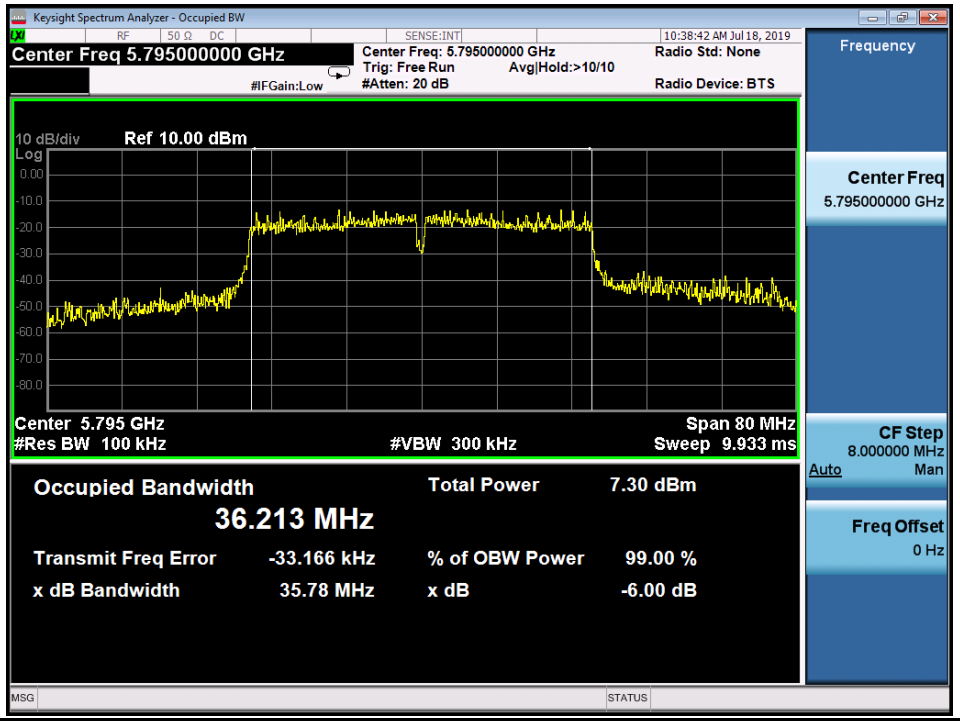
Emission Bandwidth Measurement 5755_Ant1 n40 mode

Emission Bandwidth Measurement 5795_Ant1 n40 mode



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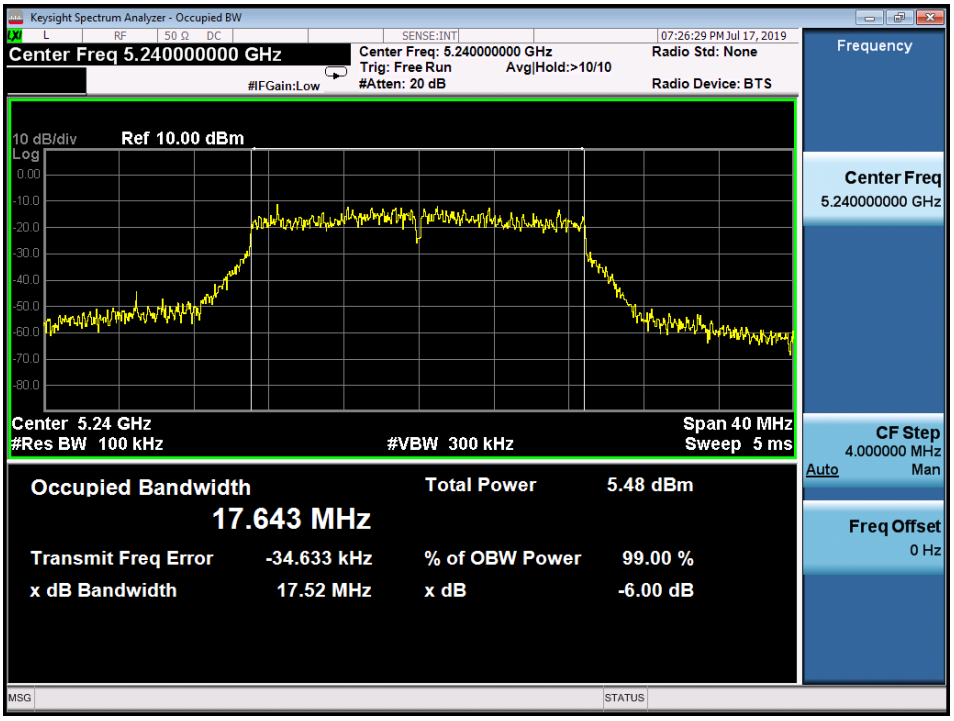
Emission Bandwidth Measurement 5180_Ant1 ac20 mode

Emission Bandwidth Measurement 5240_Ant1 ac20 mode



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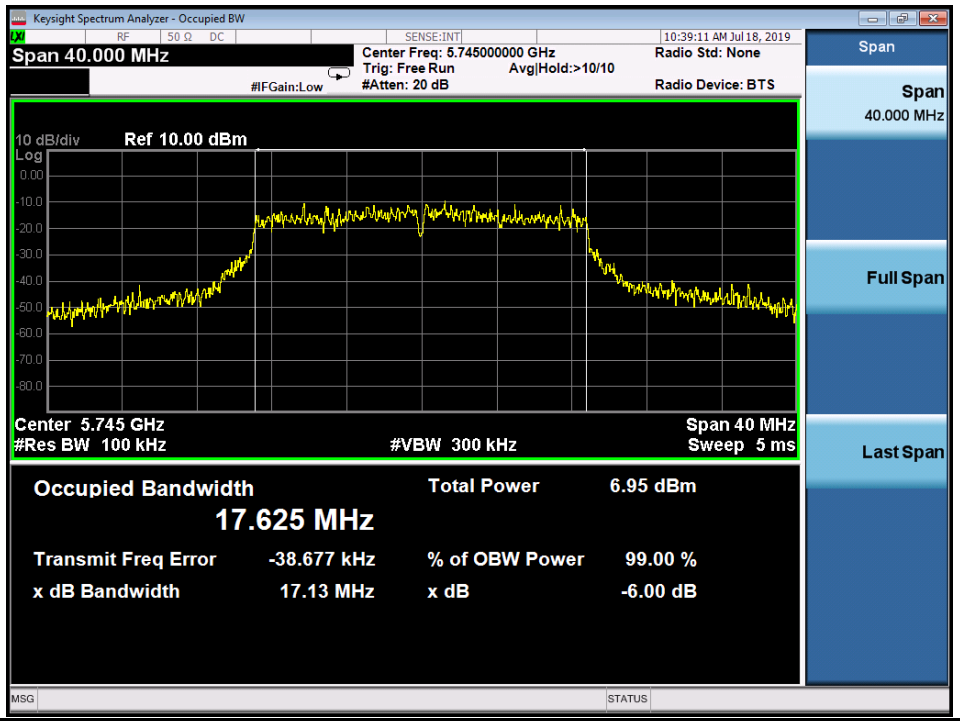
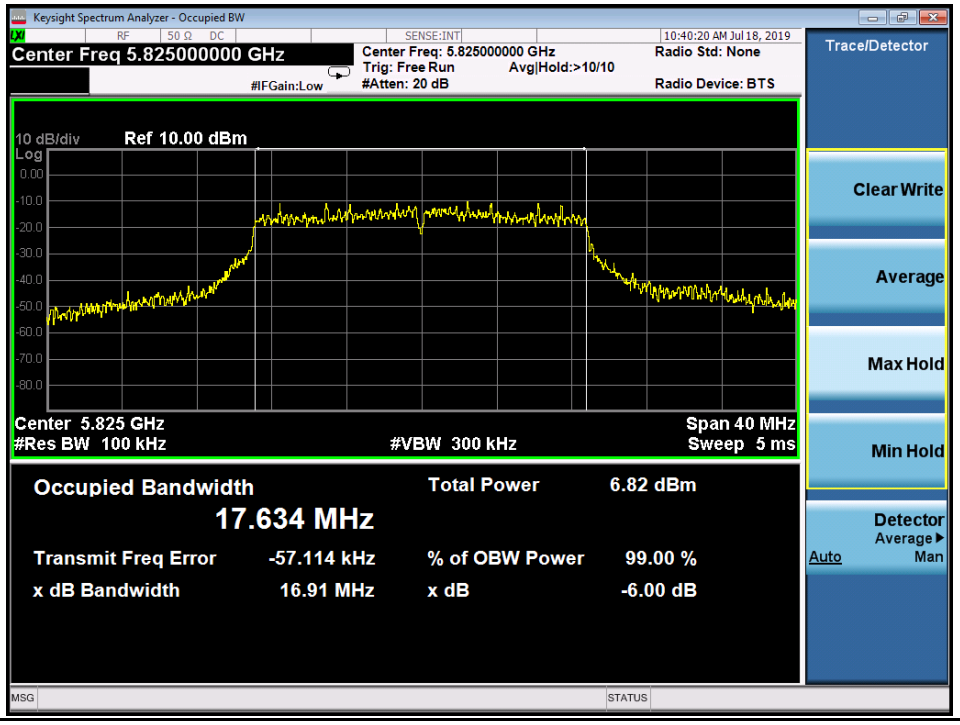
Emission Bandwidth Measurement 5745_Ant1 ac20 mode



Emission Bandwidth Measurement 5825_Ant1 ac20 mode



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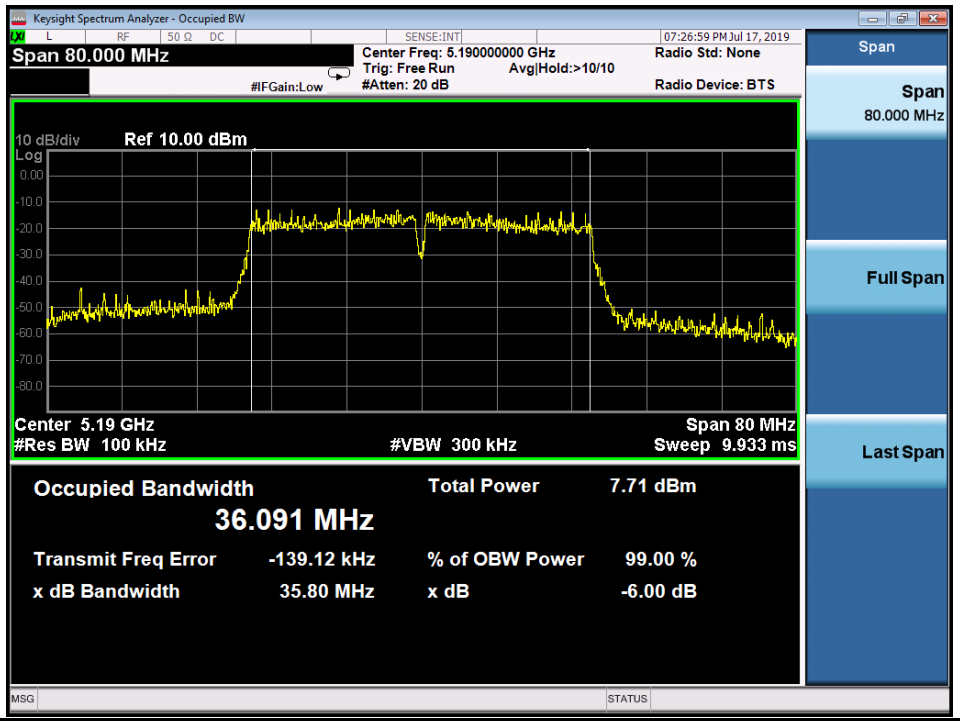
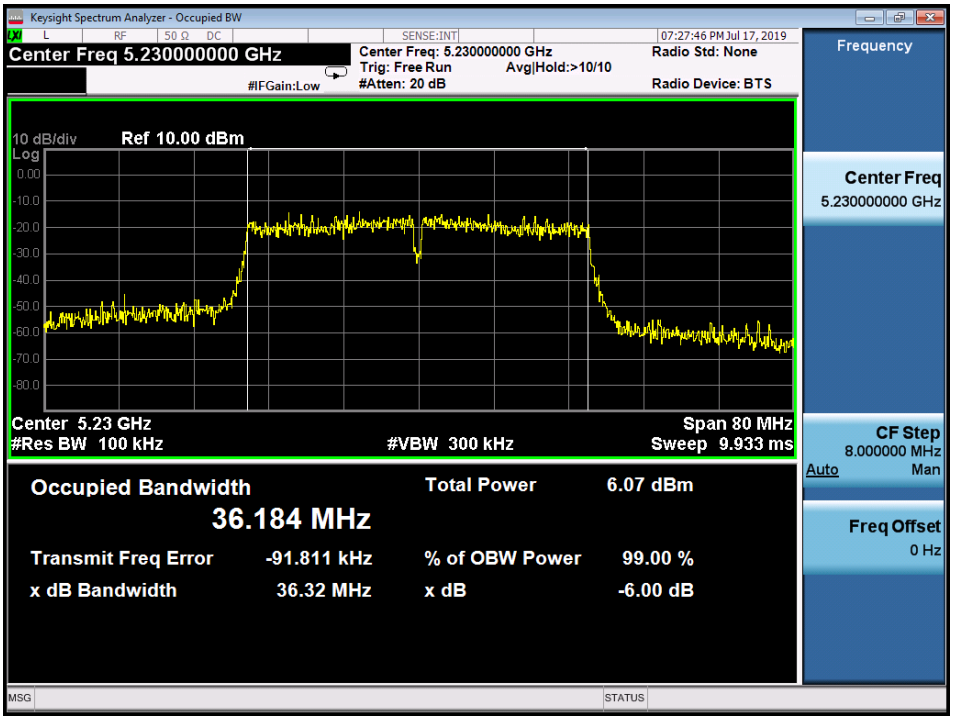
Emission Bandwidth Measurement 5190_Ant1 ac40 mode



Emission Bandwidth Measurement 5230_Ant1 ac40 mode



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