Radio Test Report
ETSI EN 300440 Test Report

Client Information:

Applicant:	DOKE COMMUNICATION (HK) LIMITED
Applicant add.:	RM 1902 EASEY COMM BLDG 253-261 HENNESSY ROAD WANCHAI HK CHINA

Product Information:

Product Name:	Tablet
Model No.:	Tab 70 WiFi
Serial Model:	N/A
Brand Name:	Blackview

Prepared By:

Dongguan Yaxu (AiT) Technology Limited

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Date of Receipt:	July 13, 2023	Date of Test:	July 13, 2023~July 26, 2023
Date of Issue:	July 27, 2023	Test Result:	Pass

This device has been tested and found to comply with the stated standard(s), which is (are) required by the council directive of 2014/53/EU and indicated in the test report and are applicable only to the tested sample identified in the report.

Reviewed by: Simba Huang
Simba huang

Approved by: Seal.chen
Seal.chen

1 Contents

Revision Record			
Version	**Date**	**Modifier**	**Remark**
00	July 26, 2023	--	Original

2 Test Summary

2.1 Compliance with ETSI EN 300 440 V2.2.1 (2018-07)

Radio Spectrum Matter (RSM) Part of Tx					
Test	**Test Requirement**	**Test method**	**Limit/Severity**	**Uncertainty**	**Result**
Equivalent Isotropically Radiated Power	EN 300 440 clause 4.2.2	EN 300 440 clause 4.2.2.3	EN 300 440 clause 4.2.2.4	± 4.89 dB	PASS
Permitted range of operating frequencies	EN 300 440 clause 4.2.3	EN 300 440 clause 4.2.3.3	EN 300 440 clause 4.2.3.5	± 1 x 10^{-7}	PASS
Spurious radiations	EN 300 440 clause 4.2.4	EN 300 440 clause 4.2.4.3	EN 300 440 clause 4.2.4.4	± 4.68 dB	PASS
Duty cycle	EN 300 440 clause 4.2.5	EN 300 440 clause 4.2.5.3.	EN 300 440 clause 4.2.5.4	± 5%	N/A
Radio Spectrum Matter (RSM) Part of Rx					
Test	**Test Requirement**	**Test method**	**Limit/Severity**	**Uncertainty**	**Result**
Adjacent channel selectivity	EN 300 440 clause 4.3.3	EN 300 440 clause 4.3.3.3	EN 300 440 clause 4.3.3.4	± 2 dB	PASS
Blocking or desensitization	EN 300 440 clause 4.3.4	EN 300 440 clause 4.3.4.3	EN 300 440 clause 4.3.4.4	± 2 dB	PASS
Spurious radiations	EN 300 440 clause 4.3.5	EN 300 440 clause 4.3.5.3	EN 300 440 clause 4.3.5.4	± 4.68 dB	PASS

Remark:
EUT: In this whole report EUT means Equipment Under Test.
N/A: not applicable. Refer to the relevant section for the details.

ERC 70-03 is the abbreviation of CEPT/ERC/Recommendation 70-03: "Relating to the use of Short Range Devices (SRD)" in the whole report.

Tx: In this whole report Tx (or tx) means Transmitter function.

Rx: In this whole report Rx (or rx) means Receiver f function.

RF: In this whole report RF means Radio Frequency.

The EUT belongs to the list of 'Class-1' equipment in accordance with the Commission Decision 2000/299/EC (6 April 2000).

Temperature (Uncertainty): ±1℃ Humidity (Uncertainty): ±5%

3 Test Facility

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

.CNAS- Registration No: L6177

Dongguan Yaxu (AiT) technology Limited is accredited to ISO/IEC 17025:2017 general Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the competence of testing and calibration laboratories) on April 18, 2022

FCC-Registration No.: 703111 Designation Number: CN1313

Dongguan Yaxu (AiT) technology Limited 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.

IC —Registration No.: 6819A CAB identifier: CN0122

The 3m Semi-anechoic chamber of Dongguan Yaxu (AiT) technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 6819A

A2LA-Lab Cert. No.: 6317.01

Dongguan Yaxu (AiT) technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

3.1 Deviation from standard

None

3.2 Abnormalities from standard conditions

None

4 General Information

4.1 General Description of EUT

Manufacturer:	Shenzhen DOKE Electronic Co.,Ltd
Manufacturer Address:	801, Building3, 7th Industrial Zone, Yulv Community, Yutang Road, Guangming District, Shenzhen, China.
Product Name:	Tablet
Model No.:	Tab 70 WiFi
Serial Model:	N/A
Brand Name:	Blackview
Operating Frequency	5.725GHz-5.875GHz
Type of Modulation:	IEEE for 802.11a: OFDM (BPSK/QPSK/16QAM/64QAM) IEEE for 802.11n: OFDM (BPSK/QPSK/16QAM/64QAM) IEEE for 802.11ac/ax:OFDM (QPSK/BPSK/16QAM/64QAM/256QAM)
Number of Channels	Please see Channel List.
Duty Cycle:	Continuous operation possible for testing purposes
Antenna Type	FPC Antenna
Antenna gain:	-1.7dBi
Function:	Wireless function to transmit and receive signal.
H/W No.:	R863T-RK3562-V1.0
S/W No.:	Tab_70_WiFi_EEA_R863T_V1.0_20230713V01
Power:	Adapter: QZ-01000EA00 INPUT:100-240V 50/60Hz 0.3A Max OUTPUT:5V2A(10.0W)
Battery:	3.8V 6580mAh
Note:	
1.	For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

Wifi 5G with 5725MHz-5875MHz Band channel list

Frequency and Channel list for 802.11a/n(HT20)/ac(VHT20)/ax(HE20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825
153	5765	161	5805	-	-

Frequency and Channel list for 802.11n(HT40)/ac(VHT40)/ax(HE40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795	-	-

Frequency and Channel list for 802.11ac(VHT80) /ax(HE80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775	-	-	-	-

Test Frequency and Channel for 802.11a/n(HT20)/ac(VHT20) /ax(HE20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825

Test Frequency and channel for 802.11n(HT40)/ac(VHT40) /ax(HE40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	N/A	N/A	159	5795

Test Frequency and channel for 802.11ac(VHT80) /ax(HE80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775	-	-	-	-

4.2 EUT Peripheral List

No.	Equipment	Manufacturer	EMC Compliance	Model No.	Serial No.	Power cord	signal cable
1	Adapter	Guangdong Quanzhi Technology Co., Ltd.	QZ-01000EA00	N/A	N/A	N/A	N/A

4.3 Peripheral List

No.	Equipment	Manufacturer	EMC Compliance	Model No.	Serial No.	Power cord	signal cable
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A

4.4 Equipments List for All Test Items

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	R&S	FSV40	101470	2022.09.02	2023.09.01
2	EMI Measuring Receiver	R&S	ESR	101160	2022.09.02	2023.09.01
3	Low Noise Pre Amplifier	HP	HP8447E	1937A01855	2022.09.02	2023.09.01
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2022.09.02	2023.09.01
5	Passive Loop	ETS	6512	00165355	2022.09.04	2024.09.03
6	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2021.08.28	2024.08.27
7	Broadband Horn Antenna	SCHWARZBECK	BBHA9120D	452	2021.08.28	2024.08.27
8	SHF-EHF Horn Antenna 15-40GHz	SCHWARZBECK	BBHA9170	BBHA9170367d	2020.11.24	2023.11.23
9	EMI Test Receiver	R&S	ESCI	100124	2022.09.02	2023.09.01
10	LISN	Kyoritsu	KNW-242	8-837-4	2022.09.02	2023.09.01
11	LISN	R&S	ESH3-Z2	0357.8810.54-101161-S2	2022.09.02	2023.09.01
12	Pro.Temp&Humi.chamber	MENTEK	MHP-150-1C	MAA08112501	2022.09.02	2023.09.01
13	RF Automatic Test system	MW	MW100-RFCB	21033016	2022.09.02	2023.09.01
14	Signal Generator	Agilent	N5182A	MY50143009	2022.09.02	2023.09.01
15	Wideband Radio communication tester	R&S	CMW500	1201.0002K50	2022.09.02	2023.09.01
16	RF Automatic Test system	MW	MW100-RFCB	21033016	2022.09.02	2023.09.01
17	DC power supply	ZHAOXIN	RXN-305D-2	28070002559	N/A	N/A
18	RE Software	EZ	EZ-EMC_RE	Ver.AIT-03A	N/A	N/A
19	CE Software	EZ	EZ-EMC_CE	Ver.AIT-03A	N/A	N/A
20	RF Software	MW	MTS 8310	2.0.0.0	N/A	N/A
21	temporary antenna connector(Note)	NTS	R001	N/A	N/A	N/A
Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.						

5 Radio Technical Requirements Specification in EN 300 440-2

5.1 Test conditions

5.1.1 Normal conditions

Ambient:	Temperature:	-20°C to +40°C
	Relative humidity:	20% to 75%
Power supply:	AC:	230V

5.1.2 Extreme conditions

Ambient:	Temperature:	- Category I (General): -20 °C to +55 °C; - Category II (Portable): -10 °C to +55 °C; - Category III (Equipment for normal indoor use): 5 °C to +35 °C.
Power supply:	AC:	230V ±10%,49Hz to 51Hz
	Battery:	**Regulated lead-acid battery power sources** 1,3 and 0,9 multiplied by the nominal voltage for regulated lead-acid battery power sources. 0.85 and 1.15 multiplied by the nominal for "gel-cell" type batteries. **Power sources using other types of batteries** The lower extreme test voltages for equipment with power sources using batteries shall be as follows: ● for equipment with a battery indicator, the end point voltage as indicated; ● for equipment without a battery indicator the following end point voltages shall be used: —0.85 multiplied by the nominal for the Leclanché or the lithium type of battery. —0.9 multiplied by the nominal for nickel-cadmium type of battery. ● for other types of battery or equipment, the lower extreme test. voltage for the discharged condition shall be declared by the equipment provider. The nominal voltage is considered to be the upper extreme test voltage in this case. **Other power sources** For equipment using other power sources, or capable of being operated from a variety of power sources, the extreme test voltages shall be those agreed between the equipment provider and the test laboratory.

5.2 Transmitter Requirements

5.2.1 Equivalent Isotrapically Radiated Power

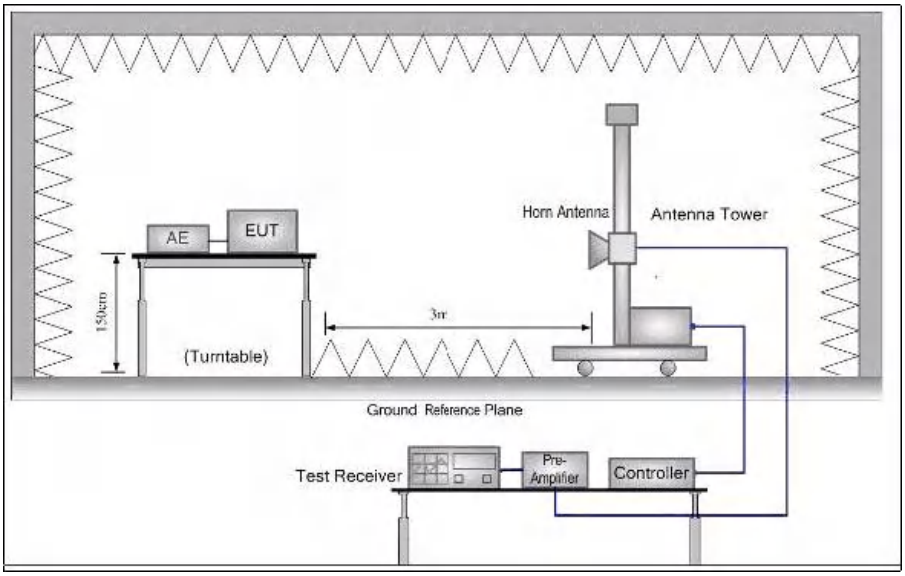
Test Requirement: EN 300 440 clause 4.2.2

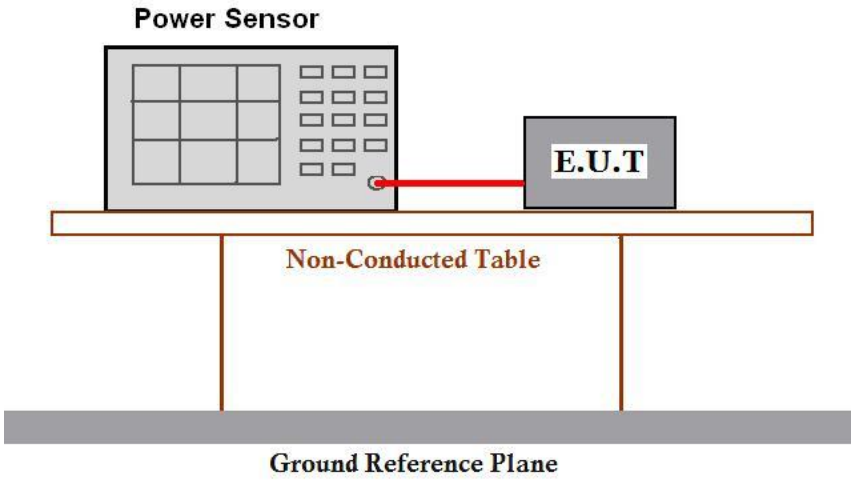
Test Method: EN 300 440 clause 4.2.2.3

EUT Operation:

Status: Test the EUT in continuously transmitting mode with modulation.

Test setup:





Test procedure : Step 1

In order to measure e.i.r.p. it is first necessary to determine the appropriate method of measurement to be used: see clauses 7.1.2.1 “Non spread spectrum transmitters with a -6 dB bandwidth of up to 20 MHz and spread spectrum transmitters with channel bandwidth of up to 1 MHz” and 7.1.2.2. “Other transmitters than defined in clause 7.1.2.1”. The -6 dB transmitter bandwidth shall be determined using a 100 kHz measuring bandwidth in order to establish which measurement method is applicable.

Test procedure : Step 2

Since the EUT is a spread spectrum equipment with a -6 dB channel bandwidth above 1 MHz, according to clause 7.1.2.2, The peak powers were measured as follows:

Number 1:

• using a suitable means, the output of the transmitter shall be coupled to a matched diode detector;

• the output of the diode detector shall be connected to the vertical channel of an oscilloscope;

the combination of the diode detector and the oscilloscope shall be capable of faithfully reproducing the envelope peaks and the duty cycle of the transmitter output signal;

• the observed duty cycle of the transmitter (Tx on/(Tx on + Tx off)) shall be noted as x, (0 < x < 1) and recorded.

Number 2:

• the average output power of the transmitter shall be determined using a wideband, calibrated RF power meter with a matched thermocouple detector or an equivalent thereof and, where applicable, with an integration period that exceeds the repetition period of the transmitter by a factor 5 or more. The observed value shall be recorded as "A" (in dBm);

• the e.i.r.p. shall be calculated from the above measured power output A, the observed duty cycle x, and the applicable antenna assembly gain "G" in dBi, according to the formula:

- P = A + G + 10 log (1/x);

- P shall not exceed the value specified in clause 7.1.3.

The measurement shall be repeated at the lowest, the middle, and the highest frequency of the stated frequency range.

These frequencies shall be recorded. FHSS equipment shall be made to hop continuously to each of these three frequencies separately.

5.2.1.1 Measurement Record

Equivalent Isotrapically Radiated Power of the transmitter:

TEST CONDITIONS		IEEE 802.11a TRANSMITTER POWER (dBm)				
		Temp (25)°C 3.8V	Temp (-10)°C 3.42V	Temp (-10)°C 4.18V	Temp (50)°C 3.42V	Temp (50)°C 4.18V
5745MHz	EIRP	11.01	10.98	10.96	10.95	10.99
5785MHz	EIRP	11.35	11.31	11.34	11.30	11.34
5825MHz	EIRP	11.60	11.52	11.57	11.55	11.58
Limit		14dBm				

TEST CONDITIONS		IEEE 802.11n20 TRANSMITTER POWER (dBm)				
		Temp (25)°C 3.8V	Temp (-10)°C 3.42V	Temp (-10)°C 4.18V	Temp (50)°C 3.42V	Temp (50)°C 4.18V
5745MHz	EIRP	10.45	10.43	10.41	10.40	10.42
5785MHz	EIRP	11.12	11.05	11.08	11.06	11.09
5825MHz	EIRP	11.38	11.35	11.37	11.36	11.34
Limit		14dBm				

TEST CONDITIONS		IEEE 802.11n40 TRANSMITTER POWER (dBm)				
		Temp (25)°C 3.8V	Temp (-10)°C 3.42V	Temp (-10)°C 4.18V	Temp (50)°C 3.42V	Temp (50)°C 4.18V
5755MHz	EIRP	10.53	10.50	10.48	10.51	10.47
5795MHz	EIRP	10.65	10.63	10.62	10.59	10.62
Limit		14dBm				

TEST CONDITIONS		IEEE 802.11ac20 TRANSMITTER POWER (dBm)				
		Temp (25)°C 3.8V	Temp (-10)°C 3.42V	Temp (-10)°C 4.18V	Temp (50)°C 3.42V	Temp (50)°C 4.18V
5745MHz	EIRP	10.5	10.45	10.49	10.47	10.46
5785MHz	EIRP	10.92	10.88	10.90	10.87	10.85
5825MHz	EIRP	11.34	11.29	11.33	11.31	11.28
Limit		14dBm				

TEST CONDITIONS		IEEE 802.11ac40 TRANSMITTER POWER (dBm)				
		Temp (25)°C 3.8V	Temp (-10)°C 3.42V	Temp (-10)°C 4.18V	Temp (50)°C 3.42V	Temp (50)°C 4.18V
5755MHz	EIRP	10.87	10.85	10.83	10.82	10.84
5795MHz	EIRP	10.62	10.61	10.59	10.55	10.58
Limit		14dBm				

TEST CONDITIONS		IEEE 802.11ac80 TRANSMITTER POWER (dBm)				
		Temp (25)°C 3.8V	Temp (-10)°C 3.42V	Temp (-10)°C 4.18V	Temp (50)°C 3.42V	Temp (50)°C 4.18V
5775MHz	EIRP	10.42	10.39	10.37	10.36	10.38
Limit		14dBm				

TEST CONDITIONS		IEEE 802.11ax20 TRANSMITTER POWER (dBm)				
		Temp (25)°C 3.8V	Temp (-10)°C 3.42V	Temp (-10)°C 4.18V	Temp (50)°C 3.42V	Temp (50)°C 4.18V
5745MHz	EIRP	10.69	10.64	10.68	10.65	10.63
5785MHz	EIRP	11.07	11.04	11.03	11.05	11.03
5825MHz	EIRP	11.45	11.41	11.39	11.42	11.40
Limit		14dBm				

TEST CONDITIONS		IEEE 802.11ax40 TRANSMITTER POWER (dBm)				
		Temp (25)°C 3.8V	Temp (-10)°C 3.42V	Temp (-10)°C 4.18V	Temp (50)°C 3.42V	Temp (50)°C 4.18V
5755MHz	EIRP	10.73	10.68	10.67	10.69	10.71
5795MHz	EIRP	10.43	10.41	10.39	10.38	10.40
Limit		14dBm				

TEST CONDITIONS		IEEE 802.11ax80 TRANSMITTER POWER (dBm)				
		Temp (25)°C 3.8V	Temp (-10)°C 3.42V	Temp (-10)°C 4.18V	Temp (50)°C 3.42V	Temp (50)°C 4.18V
5775MHz	EIRP	10.27	10.24	10.26	10.22	10.23
Limit		14dBm				

Remark: e.i.r.p= read level(dBm) +cable loss+ Product antenna gain

5.2.2 Permitted range of operating frequencies

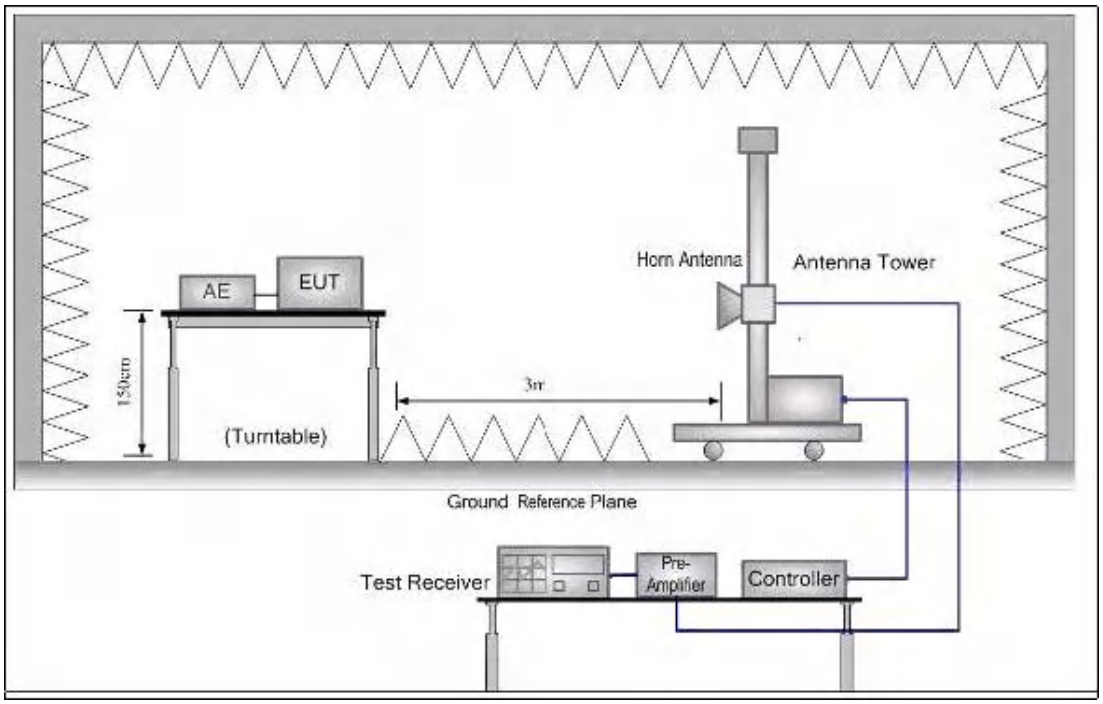
Test Requirement: EN 300 440clause 4.2.3

Test Method: EN 300 440 clause 4.2.3.3

EUT Operation:

Status: Test the EUT in continuously transmitting mode with modulation.
(For FHSS, test in hopping mode with normal modulation)

Test setup:



Test procedure:

1. put the spectrum analyser in video averaging mode with a minimum of 50 sweeps selected;
2. selected the lowest hop frequency of the equipment under test and activate the transmitter with modulation applied
3. found the lowest frequency below the operating frequency at which the spectral power density dropped below the level of -75 dBm/Hz spectral power density (e.g. -30 dBm if measured in a 30 kHz reference bandwidth) e.i.r.p. This frequency was recorded in the test report
4. selected the highest hop frequency of the equipment under test and found the highest frequency at which the spectral power density dropped below the level of -75 dBm/Hz spectral power density (e.g. -30 dBm if measured in a 30 kHz reference bandwidth) e.i.r.p.. This frequency was recorded in the test report.
5. the difference between the frequencies measured in steps c) and d) is the frequency range. It was recorded in the test report.
6. The measurements were performed under both normal and extreme operating conditions.

5.2.2.1 Measurement Record

802.11a

Measurement Conditions (in Normal & Extreme)		Bandwidth Measured (MHz) (-30 dBm/30 kHz)		Limit (MHz)	
Temperature (°C)	Voltage (V DC)	Lowest frequency	Highest frequency	Lower	Higher
T_{nom} = +25 ℃	V_{nom}	5734.52	5835.56	> 5725.0	< 5875.0
T_{max} = +40 ℃	V_{max}	5734.56	5835.59		
	V_{min}	5734.59	5835.62		
T_{min} = -20 ℃	V_{max}	5734.58	5835.61		
	V_{min}	5734.58	5835.61		

802.11n HT 20

Measurement Conditions (in Normal & Extreme)		Bandwidth Measured (MHz) (-30 dBm/30 kHz)		Limit (MHz)	
Temperature (°C)	Voltage (V DC)	Lowest frequency	Highest frequency	Lower	Higher
T_{nom} = +25 ℃	V_{nom}	5734.52	5835.56	> 5725.0	< 5875.0
T_{max} = +40 ℃	V_{max}	5734.56	5835.59		
	V_{min}	5734.59	5835.62		
T_{min} = -20 ℃	V_{max}	5734.58	5835.61		
	V_{min}	5734.58	5835.61		

802.11n HT 40

Measurement Conditions (in Normal & Extreme)		Bandwidth Measured (MHz) (-30 dBm/30 kHz)		Limit (MHz)	
Temperature (°C)	Voltage (V DC)	Lowest frequency	Highest frequency	Lower	Higher
T_{nom} = +25 ℃	V_{nom}	5735.86	5813.96	> 5725.0	< 5875.0
T_{max} = +40 ℃	V_{max}	5735.83	5813.96		
	V_{min}	5735.87	5813.94		
T_{min} = -20 ℃	V_{max}	5735.96	5813.98		
	V_{min}	5735.99	5814.05		

802.11ac VHT 20

Measurement Conditions (in Normal & Extreme)		Bandwidth Measured (MHz) (-30 dBm/30 kHz)		Limit (MHz)	
Temperature (°C)	Voltage (V DC)	Lowest frequency	Highest frequency	Lower	Higher
T_{nom} = +25 ℃	V_{nom}	5734.6	5835.56	> 5725.0	< 5875.0
T_{max} = +40 ℃	V_{max}	5734.59	5835.60		
	V_{min}	5734.59	5835.63		
T_{min} = -20 ℃	V_{max}	5734.56	5835.62		
	V_{min}	5734.60	5835.62		

802.11ac VHT 40

Measurement Conditions (in Normal & Extreme)		Bandwidth Measured (MHz) (-30 dBm/30 kHz)		Limit (MHz)	
Temperature (°C)	Voltage (V DC)	Lowest frequency	Highest frequency	Lower	Higher
T_{nom} = +25 ℃	V_{nom}	5735.8	5813.96	> 5725.0	< 5875.0
T_{max} = +40 ℃	V_{max}	5735.80	5813.93		
	V_{min}	5735.77	5813.97		
T_{min} = -20 ℃	V_{max}	5735.82	5814.04		
	V_{min}	5735.90	5814.08		

802.11ac VHT 80

Measurement Conditions (in Normal & Extreme)		Bandwidth Measured (MHz) (-30 dBm/30 kHz)		Limit (MHz)	
Temperature (°C)	Voltage (V DC)	Lowest frequency	Highest frequency	Lower	Higher
T_{nom} = +25 ℃	V_{nom}	5735.64	5814.12	> 5725.0	< 5875.0
T_{max} = +40 ℃	V_{max}	5735.70	5814.35		
	V_{min}	5735.68	5814.27		
T_{min} = -20 ℃	V_{max}	5735.68	5814.29		
	V_{min}	5735.65	5814.14		

802.11ax HE 20

Measurement Conditions (in Normal & Extreme)		Bandwidth Measured (MHz) (-30 dBm/30 kHz)		Limit (MHz)	
Temperature (°C)	Voltage (V DC)	Lowest frequency	Highest frequency	Lower	Higher
T_{nom} = +25 ℃	V_{nom}	5734.72	5835.6	> 5725.0	< 5875.0
T_{max} = +40 ℃	V_{max}	5734.75	5835.71		
	V_{min}	5734.75	5835.71		
T_{min} = -20 ℃	V_{max}	5734.75	5835.73		
	V_{min}	5734.77	5835.73		

802.11ax HE 40

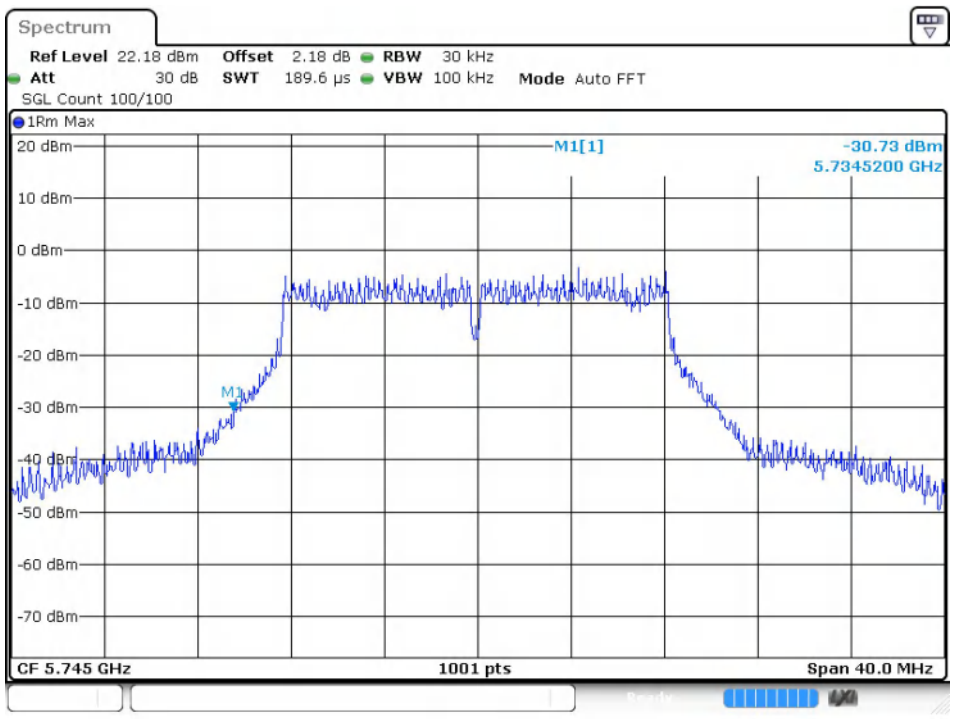
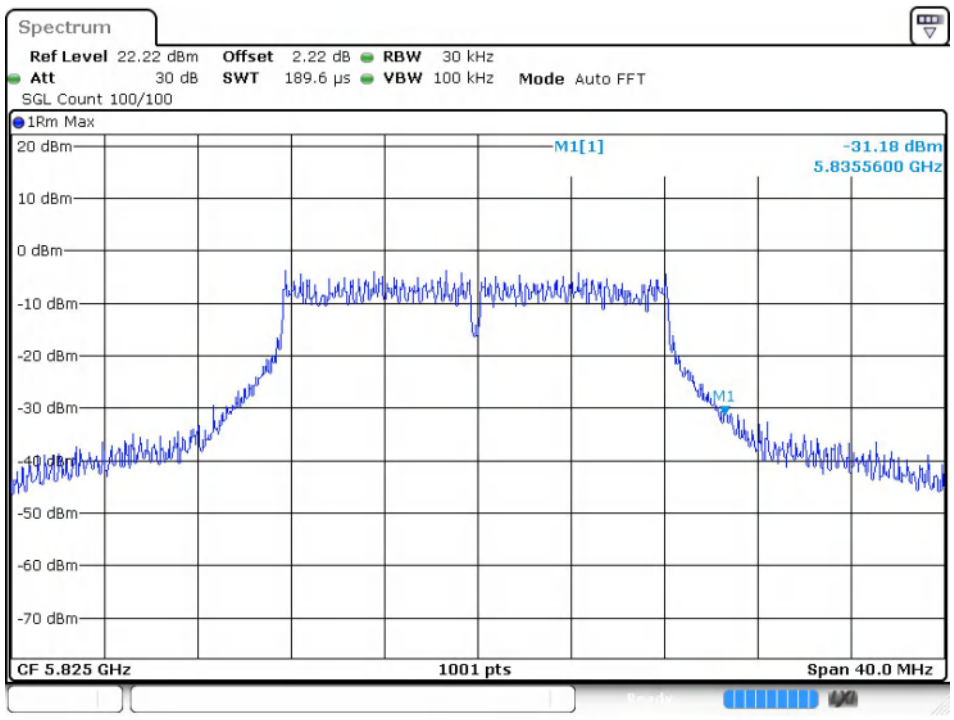
Measurement Conditions (in Normal & Extreme)		Bandwidth Measured (MHz) (-30 dBm/30 kHz)		Limit (MHz)	
Temperature (°C)	Voltage (V DC)	Lowest frequency	Highest frequency	Lower	Higher
T_{nom} = +25 ℃	V_{nom}	5735.5	5814.26	> 5725.0	< 5875.0
T_{max} = +40 ℃	V_{max}	5735.53	5814.27		
	V_{min}	5735.54	5814.29		
T_{min} = -20 ℃	V_{max}	5735.56	5814.29		
	V_{min}	5735.56	5814.29		

802.11ax HE 80

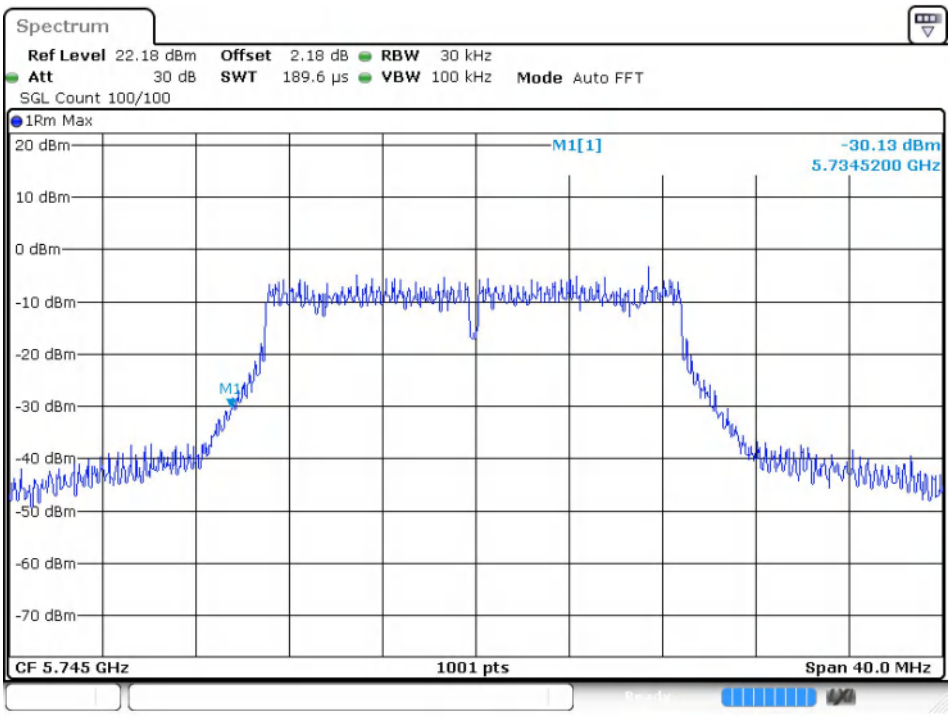
Measurement Conditions (in Normal & Extreme)		Bandwidth Measured (MHz) (-30 dBm/30 kHz)		Limit (MHz)	
Temperature (°C)	Voltage (V DC)	Lowest frequency	Highest frequency	Lower	Higher
T_{nom} = +25 ℃	V_{nom}	5735.64	5814.12	> 5725.0	< 5875.0
T_{max} = +40 ℃	V_{max}	5735.74	5814.50		
	V_{min}	5735.77	5814.65		
T_{min} = -20 ℃	V_{max}	5735.77	5814.65		
	V_{min}	5735.78	5814.68		

Note:

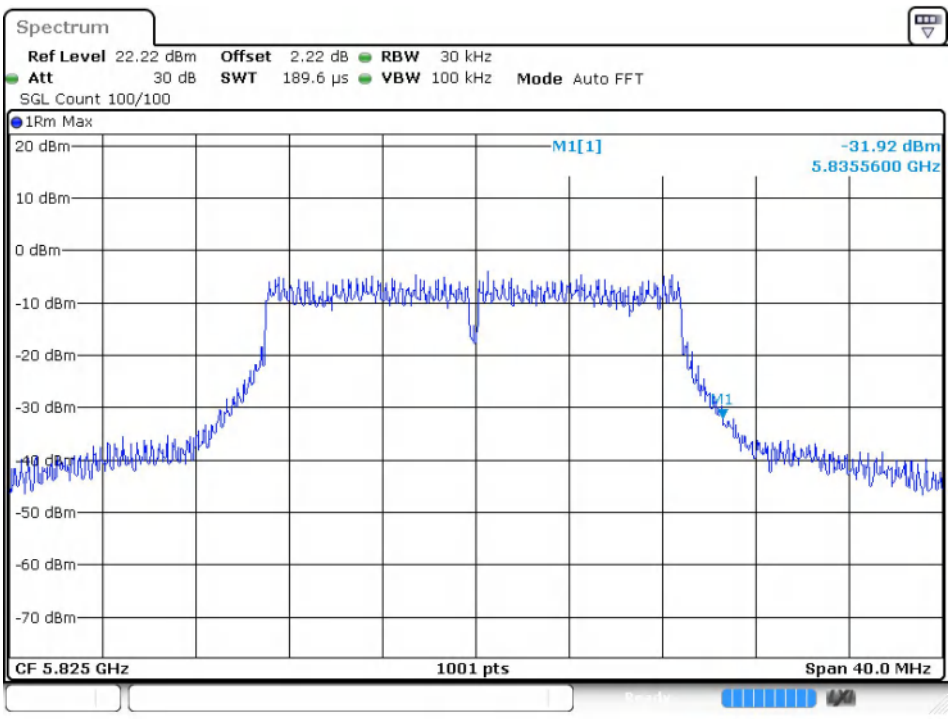
- **FL**: Lowest frequency of the power envelope, it is the frequency furthest below the frequency of maximum power where the output power drops below the level of –75 dBm/Hz spectral power density (-30 dBm if measured in a 30 kHz bandwidth) eirp.
- **FH**: Highest frequency of the power envelope, it is the frequency furthest above the frequency of maximum power where the output power drops below the level of –75 dBm/Hz spectral power density (-30 dBm if measured in a 30 kHz bandwidth) eirp.

Test Plot
Freq. Range NVNT a 5745MHz

Freq. Range NVNT a 5825MHz


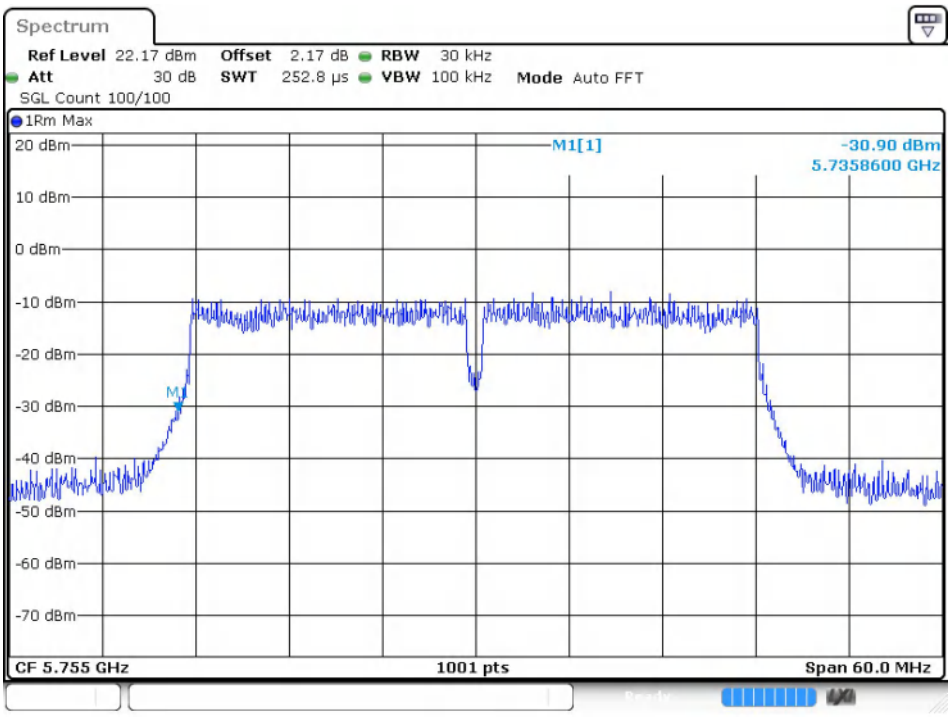
Freq. Range NVNT n20 5745MHz



Freq. Range NVNT n20 5825MHz



Freq. Range NVNT n40 5755MHz



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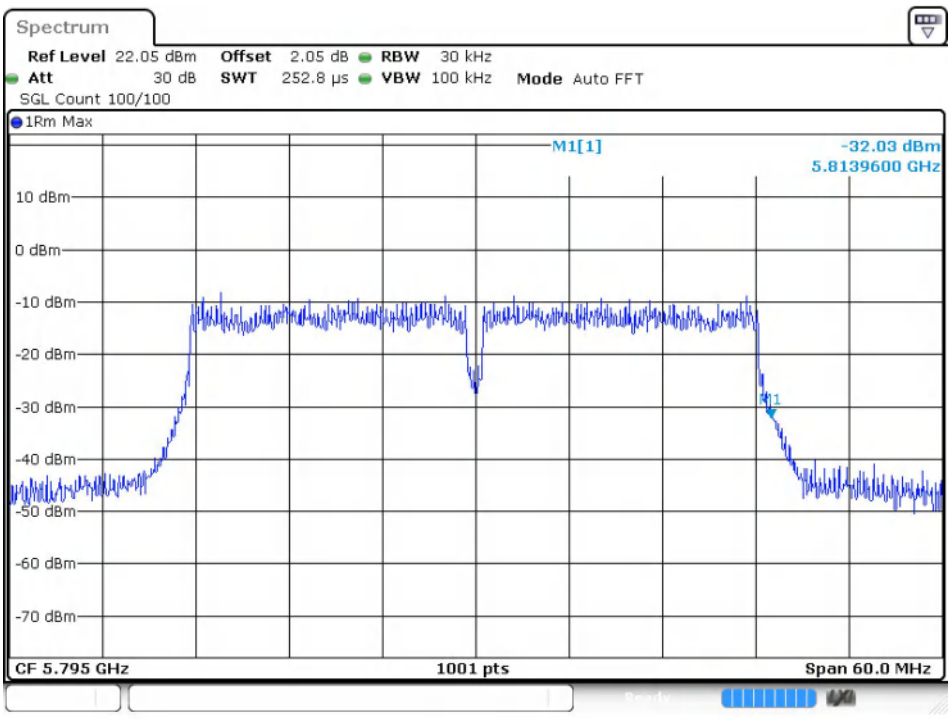
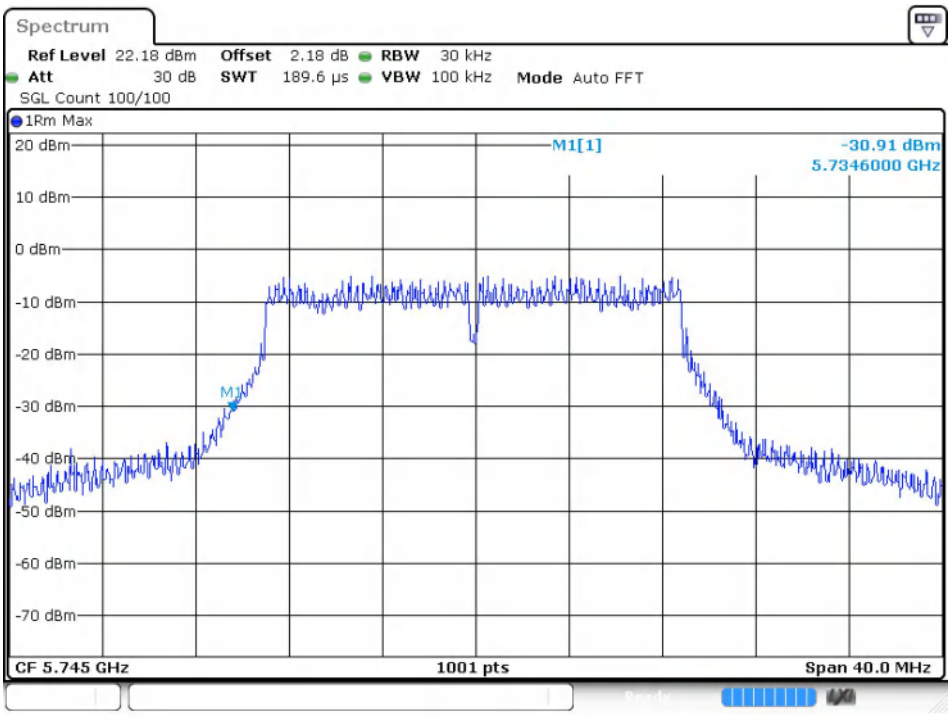


Freq. Range NVNT ac20 5745MHz



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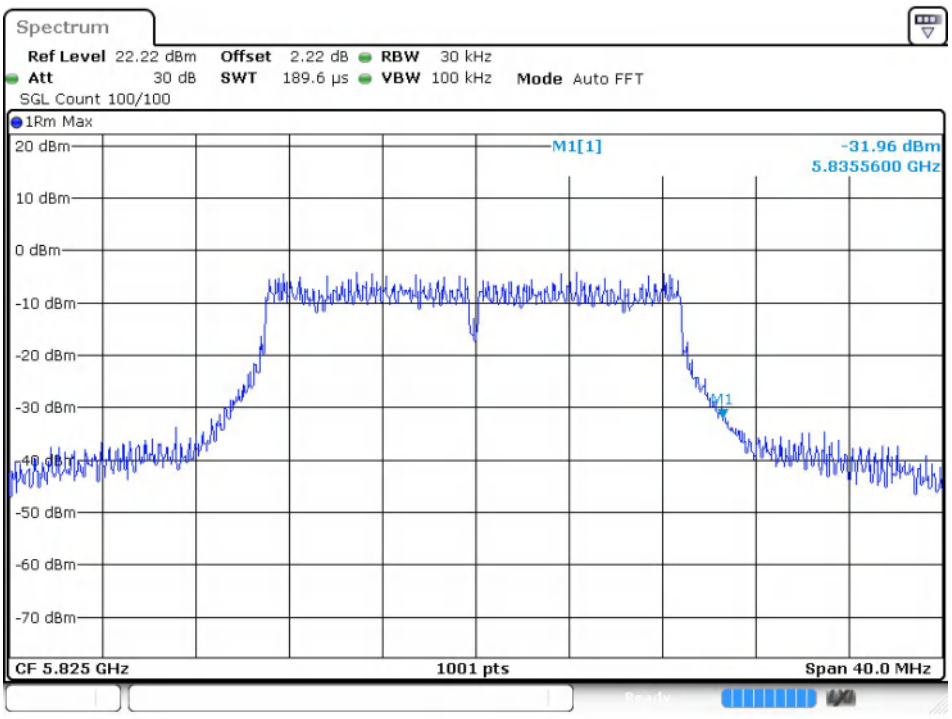

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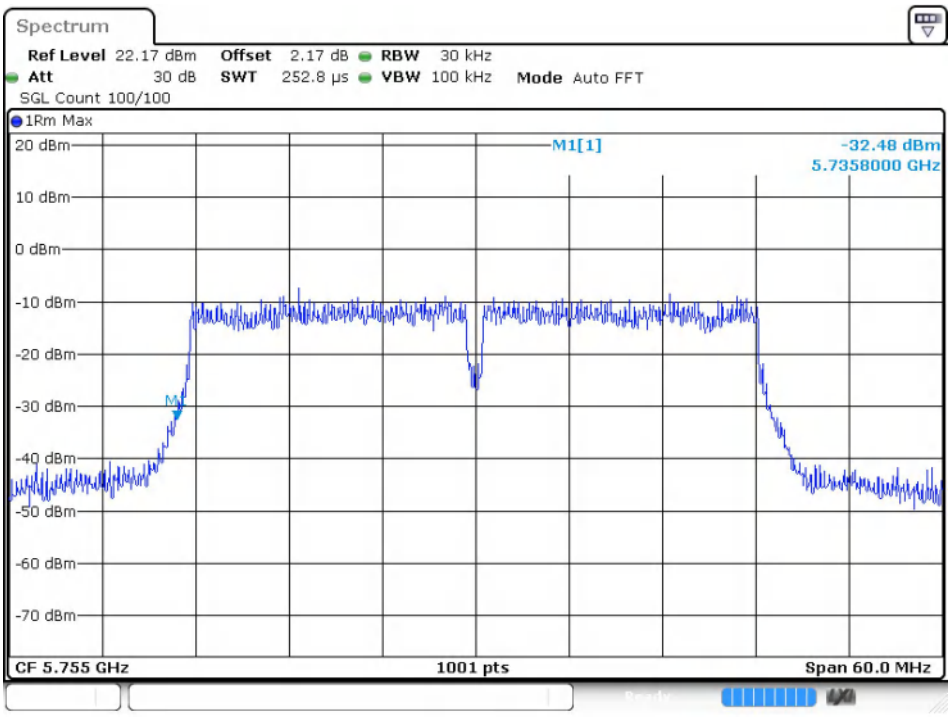
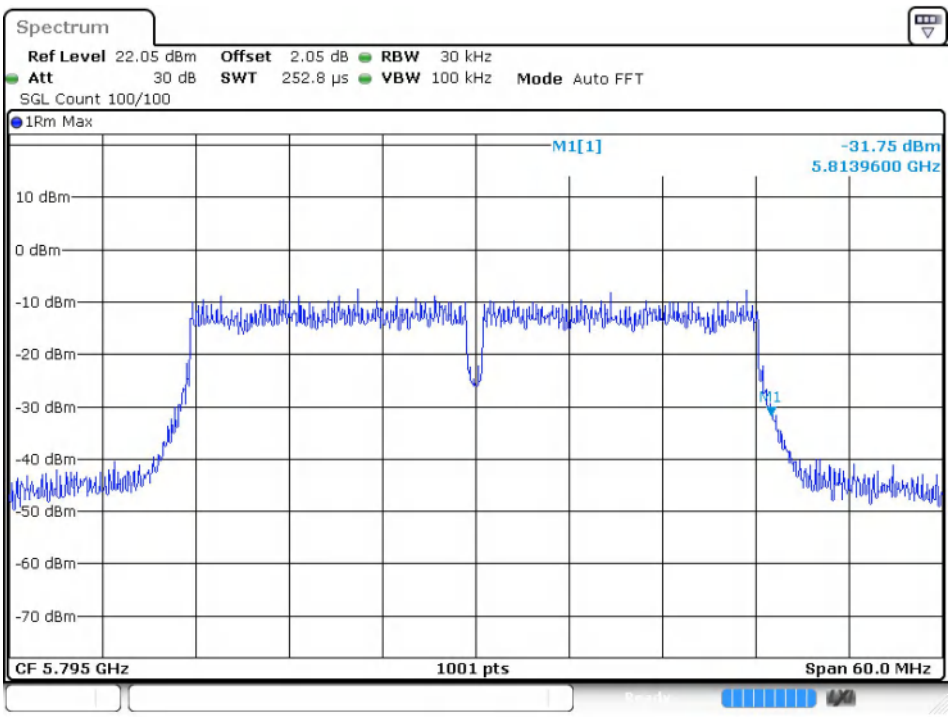
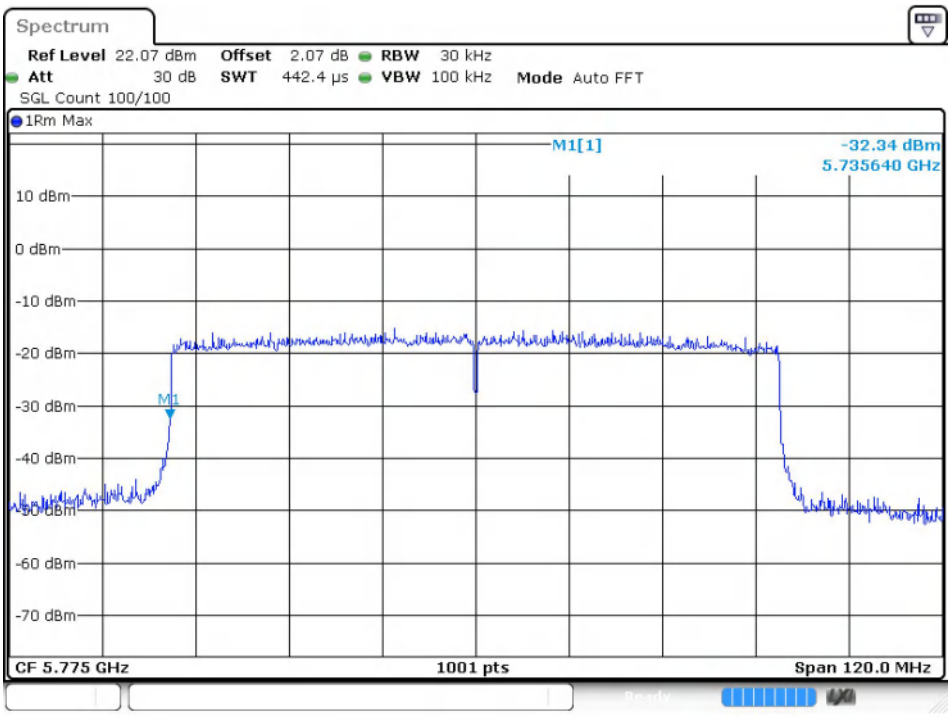


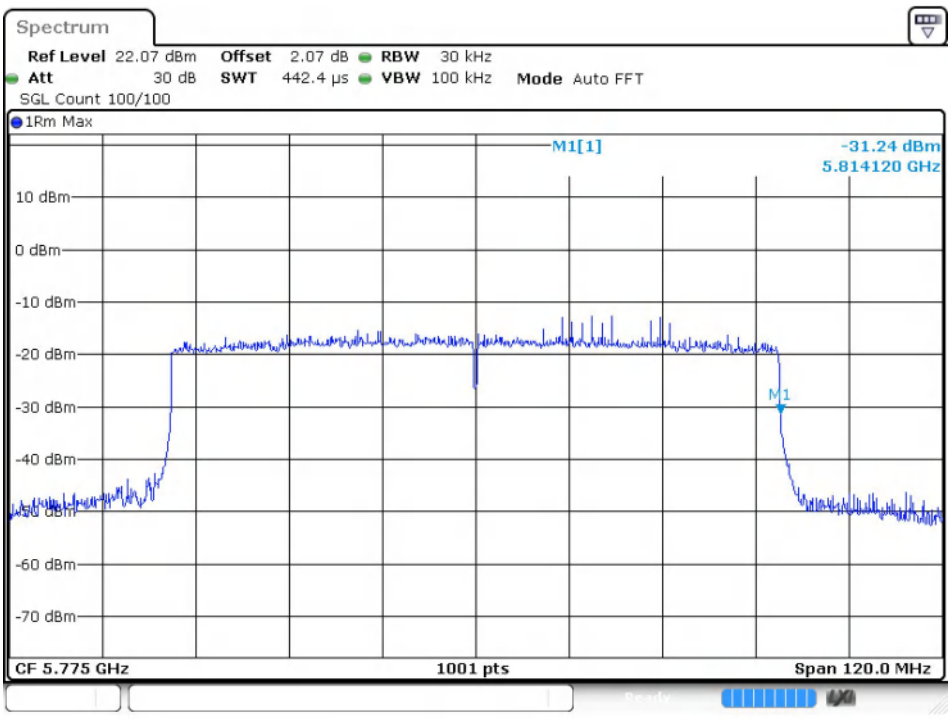
Freq. Range NVNT ac40 5795MHz



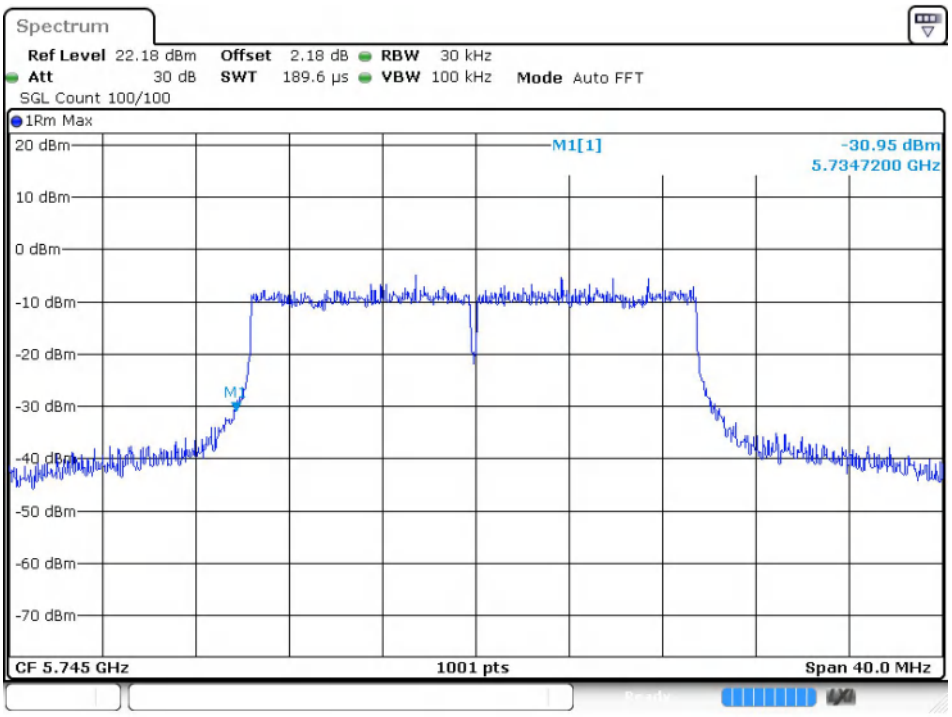
Freq. Range NVNT ac80 5775MHz



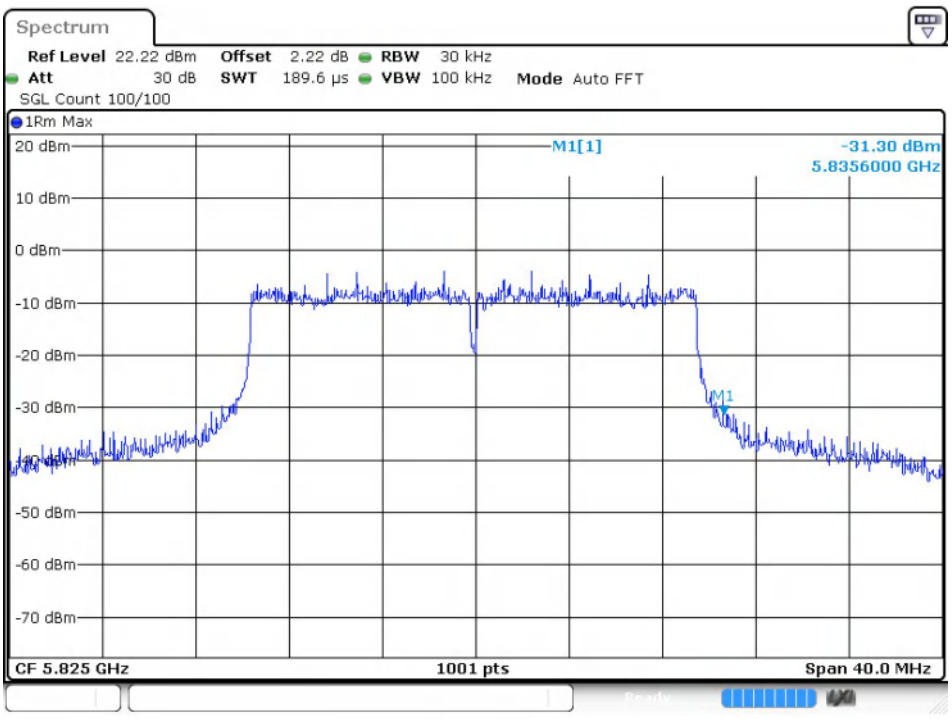
Freq. Range NVNT ac80 5775MHz



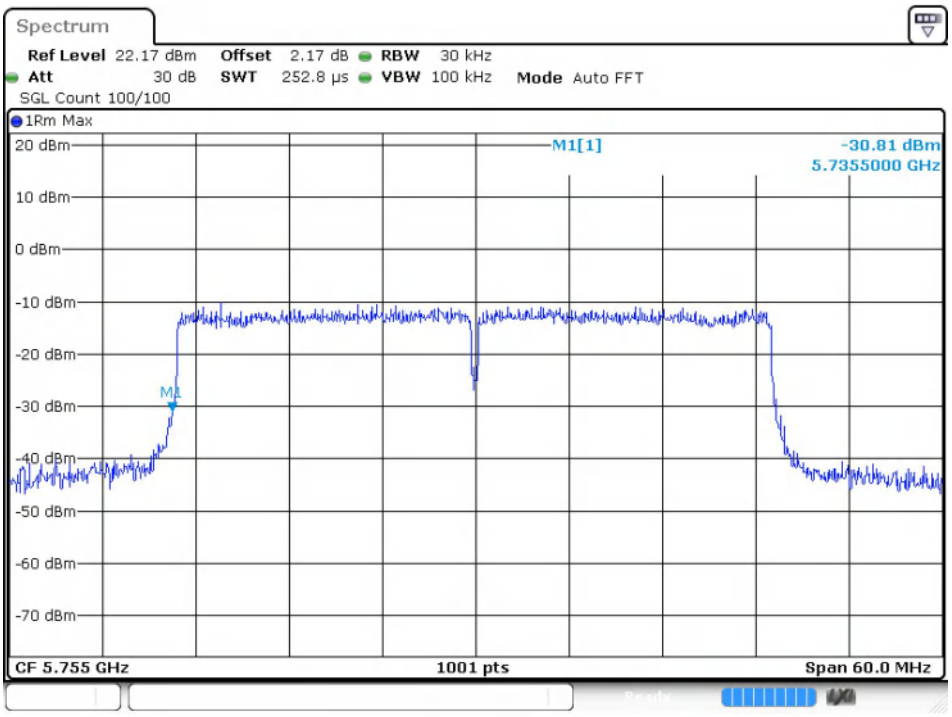
Freq. Range NVNT ax20 5745MHz



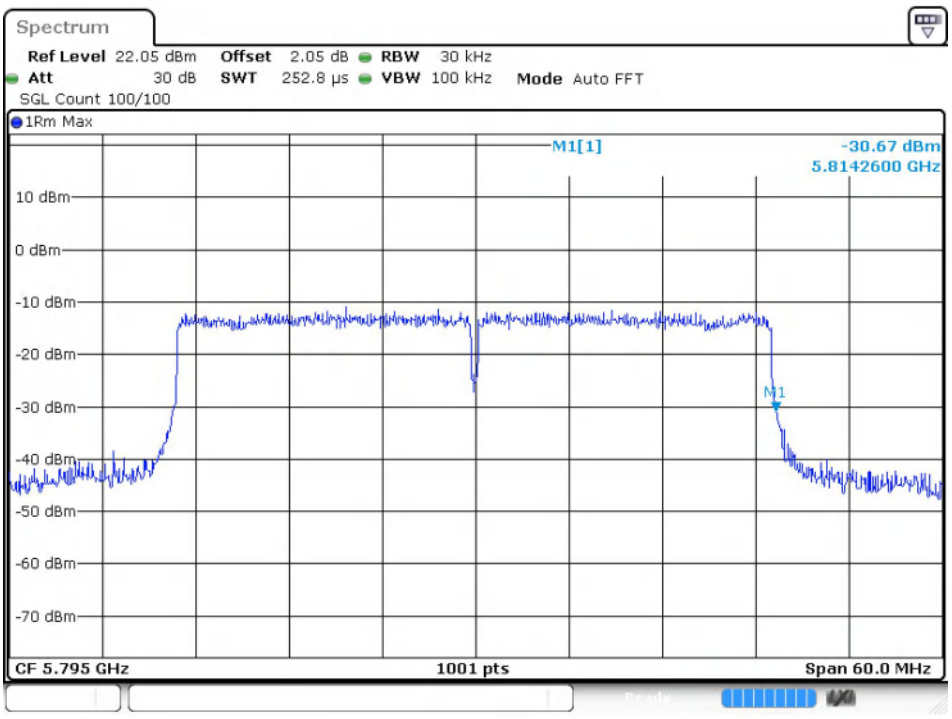
Freq. Range NVNT ax20 5825MHz



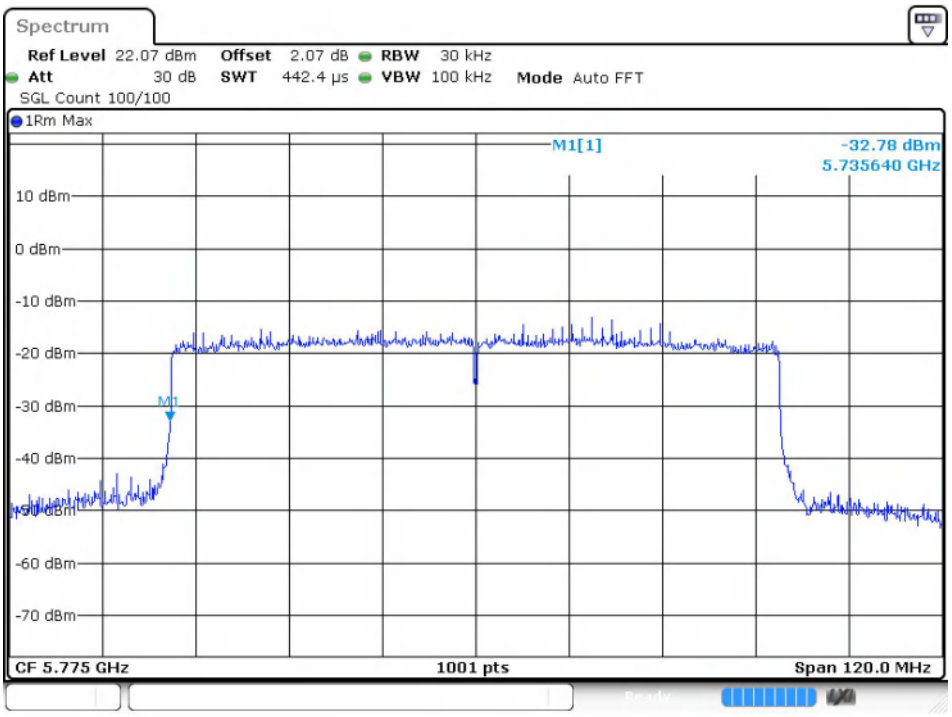
Freq. Range NVNT ax40 5755MHz



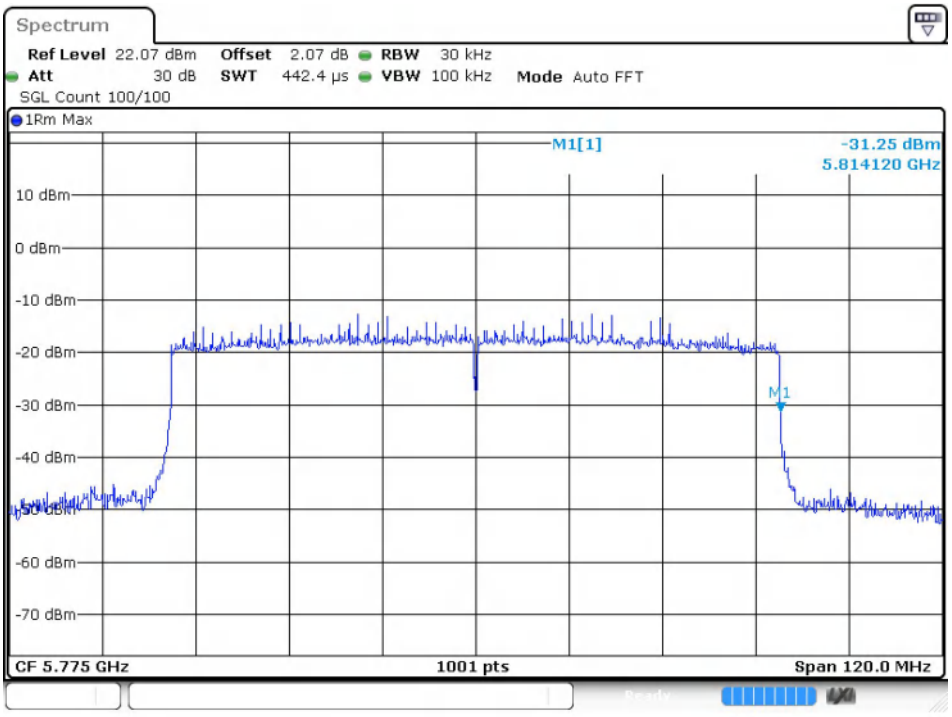
Freq. Range NVNT ax40 5795MHz



Freq. Range NVNT ax80 5775MHz



Freq. Range NVNT ax80 5775MHz



5.2.3 Spurious Emissions

Test Requirement: EN 300 440 clause 4.2.4

Test Method: EN 300 440 clause 4.2.4.3

EUT Operation:

Status: Test Tx in continuously transmitting with modulation and standby mode.

Test Frequency Range: 25 MHz to 40 GHz

Detector function: RBW = 100 kHz and VBW = 300 kHz, for frequency band 30MHz-1GHz;
RBW = 1MHz and VBW = 3MHz, for frequency band 1 GHz-40 GHz
Detector mode = Peak. Trace = Max hold

Test Setup:

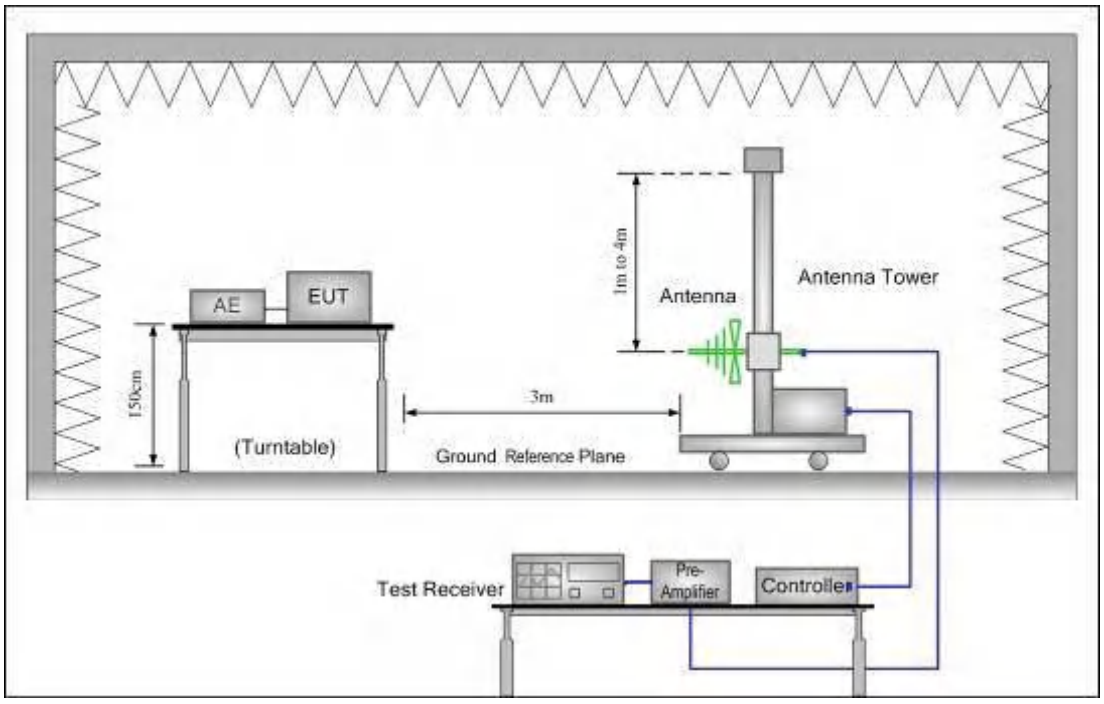


Figure 1. 25 MHz to 1 GHz

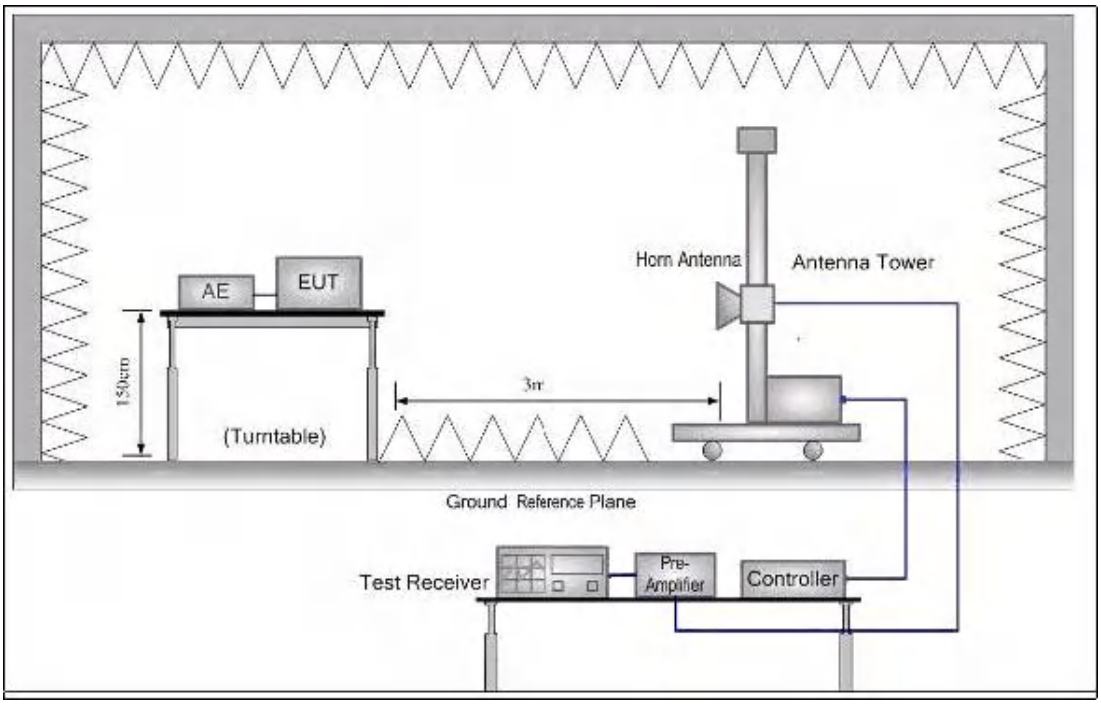


Figure 2. Above 1GHz

Test procedure:

Substitution method was performed to determine the actual spurious emission levels of the EUT. The following test procedure as below:

1) Below 1GHz test procedure:

1. On the test site as test setup graph above, the EUT shall be placed at the 1.5m support on the turntable and in the position closest to normal use as declared by the provider.
2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the test frequency of the transmitter. The output of the test antenna shall be connected to the measuring receiver.
3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the test frequency of the transmitter under test.
4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
5. Repeat step 4 for test frequency with the test antenna polarized horizontally.
6. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At the lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.
7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output

until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

8. Repeat step 7 with both antennas horizontally polarized for each test frequency.
9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:

ERP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBd)

where:

Pg is the generator output power into the substitution antenna.

2) Above 1GHz test procedure:

Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber, and the test antenna do not need to raise from 1 to 4m, just test in 1.5m height.

5.2.3.1 Measurement Record

All the modulation modes were tested, the data of the worst mode are recorded in the following pages and the others modulation methods do not exceed the limits.

802.11a Low channel: 5745

below 1 GHz				
Maximum Frequency	**Spurious Emission polarization and Level**		**Limit**	**Over Limit**
MHz	**polarization**	**dBm**	**dBm**	**dB**
75.9600	Vertical	-64.24	-36.00	-28.24
427.4355	Vertical	-60.72	-36.00	-24.72
509.3661	Vertical	-65.10	-54.00	-11.10
46.5635	Horizontal	-69.28	-36.00	-33.28
293.9624	Horizontal	-65.76	-36.00	-29.76
339.4770	Horizontal	-69.48	-36.00	-33.48
Above 1 GHz				
Maximum Frequency	**Spurious Emission polarization and Level**		**Limit dBm**	**Over Limit**
MHz	**polarization**	**dBm**	**dB**	**dB**
1994.820	Vertical	-40.69	-30.00	-10.69
2508.011	Vertical	-44.30	-30.00	-14.30
4806.184	Vertical	-40.11	-30.00	-10.11
2409.339	Horizontal	-41.82	-30.00	-11.82
2653.427	Horizontal	-43.13	-30.00	-13.13
4896.371	Horizontal	-41.42	-30.00	-11.42

802.11a High channel: 5825

below 1 GHz				
Maximum Frequency	**Spurious Emission polarization and Level**		**Limit**	**Over Limit**
MHz	**polarization**	**dBm**	**dBm**	**dB**
64.8760	Vertical	-65.63	-54.00	-11.63
219.0103	Vertical	-67.67	-54.00	-13.67
636.1672	Vertical	-62.56	-54.00	-8.56
112.0275	Horizontal	-61.10	-54.00	-7.10
317.1263	Horizontal	-64.99	-36.00	-28.99
769.3223	Horizontal	-60.89	-36.00	-24.89
Above 1 GHz				
Maximum Frequency	**Spurious Emission polarization and Level**		**Limit dBm**	**Over Limit**
MHz	**polarization**	**dBm**	**dB**	**dB**
2058.765	Vertical	-42.63	-30.00	-12.63
2794.903	Vertical	-44.95	-30.00	-14.95
5135.510	Vertical	-42.21	-30.00	-12.21
2584.321	Horizontal	-39.00	-30.00	-9.00
3055.210	Horizontal	-43.64	-30.00	-13.64
5248.688	Horizontal	-39.95	-30.00	-9.95

Remark:

- In **47M to 74 MHz, 87.5M to 118MHz, 174M to 230 MHz, 470M to 862MHz**, the limit was 4nW **(–54dBm**) for Operation & 2nW **(**–**57dBm**) for Standby mode; other frequency **below 1GHz**, the limit was 250nW (–**36dBm**) & 2nW (–**57dBm**) respectively; while **over 1GHz**, 1μW **(**–**30 dBm**) & 20nW (**–47dBm**) applied**.**
- –70dBm was the minimum level which could be detected by measuring facility when below 1GHz, -60dBm at over 1GHz.
- No any other emission level margin less than 10dB can be observed and be reported.

Standby mode:
N/A, Not applicable, for the ERP level of the EUT was too weak to be detected.

5.2.4 Duty Cycle

Not applicable, since the duty cycle no restriction in frequency band 5 725 MHz to 5 875 MHz.

5.3 Receiver Requirements

Receiver Classification, Table 5 of EN 300 440.

Receiver category	Relevant Rx Clauses	Risk assessment of Rx performance
1	4.3.3, 4.3.4 and 4.3.5	Highly reliable SRD communication media; e.g. serving human life inherent systems (may result in a physical risk to a person).
2	4.3.4 and 4.3.5	Medium reliable SRD communication media e.g. causing inconvenience to persons, which cannot simply be overcome by other means.
3	4.3.4 and 4.3.5	Standard reliable SRD communication media and radiodetermination devices. E.g. Inconvenience to persons, which can simply be overcome by other means (e.g. manual).
Note: If receiver category 1 or 2 is selected, this shall be stated in both the test report and in the user's manual for the equipment.		

The EUT (Rx part) belong to Category 1.

5.3.1 Adjacent channel selectivity

5.3.1.1 Applicable Standard

ETSI EN 300 440 Subclasses 4.3.3

5.3.1.2 Conformance Limit

The adjacent channel selectivity of the equipment under specified conditions shall not be less than the levels of the unwanted signal as stated below

Receiver category	Limit
1	-30 dBm + k
2	No limit
3	No limit

5.3.1.3 Measurement Record

fc (MHz)		Measured Value (dBm)	Limit (dBm)
5775	Upper Channel	-54.11	≤ -62.2
	Lower Channel	-54.58	≤ -62.2

5.3.2 Blocking or desensitization

5.3.2.1 Applicable Standard

ETSI EN 300 440 Subclasses 4.3.4

5.3.2.2 Conformance Limit

The blocking level, for any frequency within the specified ranges, shall not be less than the values given in table 6, except at frequencies on which spurious responses are found.

Table 6: Limits for blocking or desensitization

Receiver category	Limit
1	-30 dBm + k
2	-45 dBm + k
3	-60 dBm + k

The correction factor, k, is as follows:

Where:

$$k = -20\log f - 10\log BW$$

- *f* is the frequency in GHz;
- *BW* is the occupied bandwidth in MHz.

The factor *k* is limited within the following:

$$-40 \text{ dB} < k < 0 \text{ dB}.$$

5.3.2.3 Measurement Record

fc (MHz)	Measured Value (dBm)	Limit (dBm)
5775	-53.55	≤ -62.2

5.3.3 Spurious Radiations

Test Requirement: EN 300 440 clause 4.3.3

Test Method: EN 300 440 clause 4.3.3.3

EUT Operation:

Status: Pre-test in Channel lowest and middle & highest keep in receiving mode. The worse case is highest channel mode, compliance the worse case and reported it.

Test Frequency Range: 25 MHz to 40 GHz.

Detector function: RBW = 100 kHz and VBW = 300 kHz, for frequency band 30MHz-1GHz;
RBW = 1MHz and VBW = 3MHz, for frequency band 1 GHz-40 GHz
Detector mode = Peak. Trace = Max hold

Test Setup:

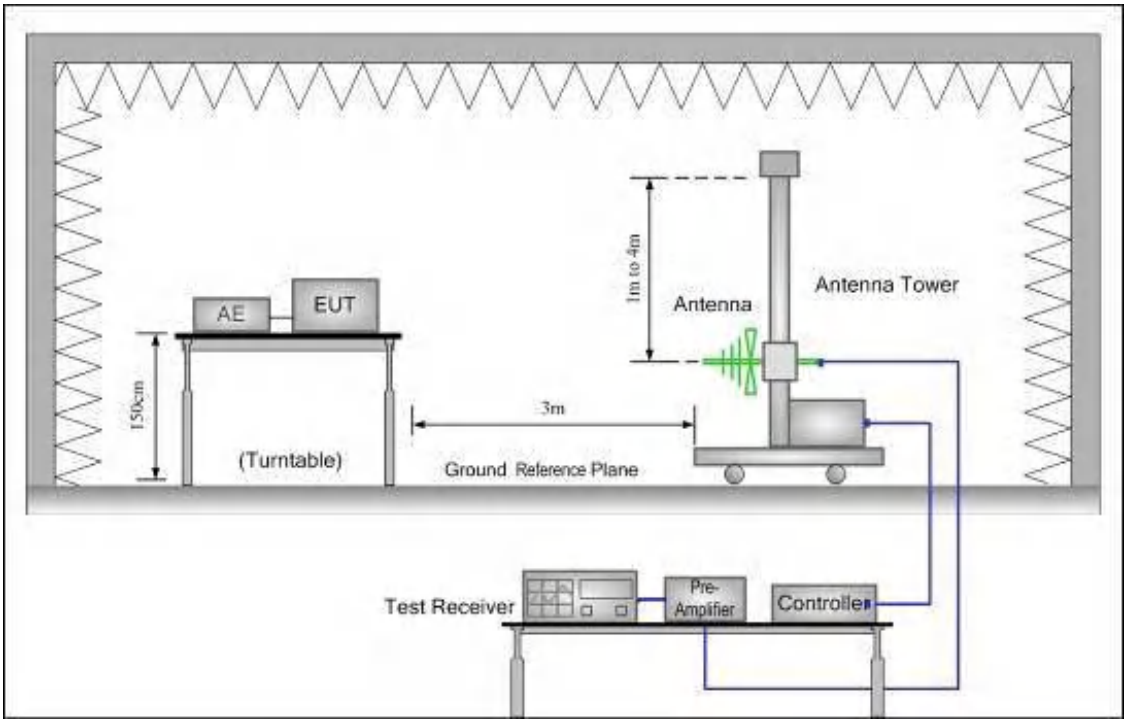


Figure 1. 25 MHz to 1 GHz

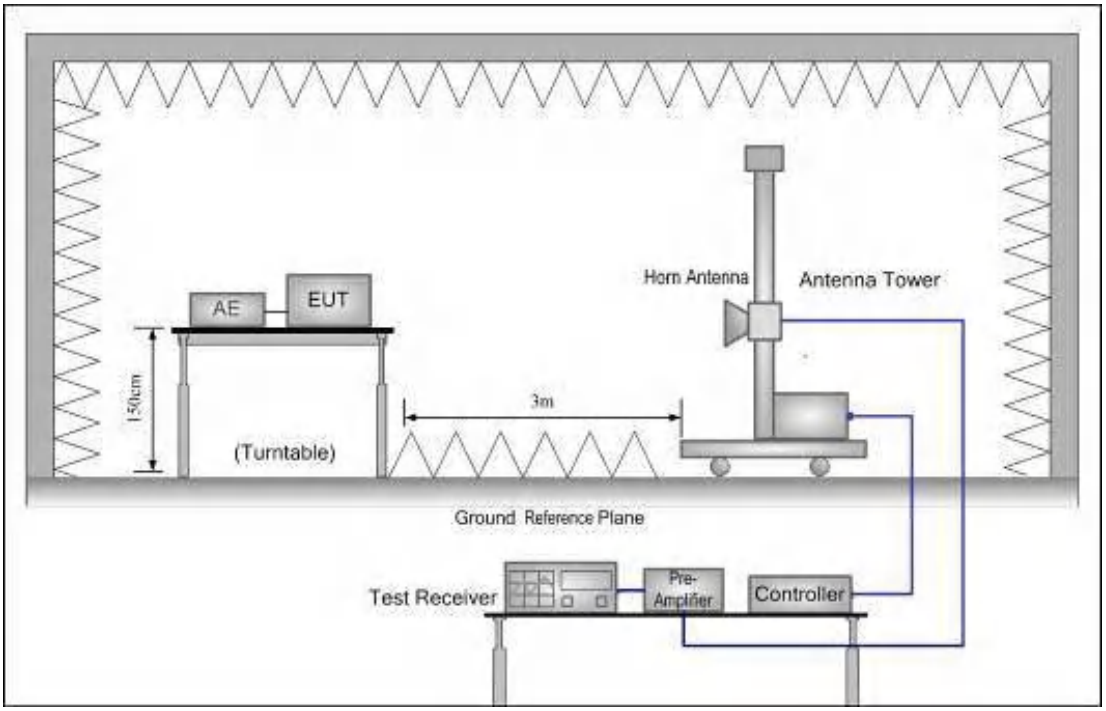


Figure 2. Above 1GHz

Test procedure:

Substitution method was performed to determine the actual spurious emission levels of the EUT. The following test procedure as below:

1) Below 1GHz test procedure:

1. On the test site as test setup graph above, the EUT shall be placed at the 1.5m support on the turntable and in the position closest to normal use as declared by the provider.
2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the test frequency of the transmitter. The output of the test antenna shall be connected to the measuring receiver.
3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the test frequency of the transmitter under test.
4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
5. Repeat step 4 for test frequency with the test antenna polarized horizontally.
6. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At the lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.
7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output

until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

8. Repeat step 7 with both antennas horizontally polarized for each test frequency.
9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:

ERP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBd)

where:

Pg is the generator output power into the substitution antenna.

2) Above 1GHz test procedure:

1. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber, and the test antenna do not need to raise from 1 to 4m, just test in 1.5m height.

5.3.3.1 Measurement Record

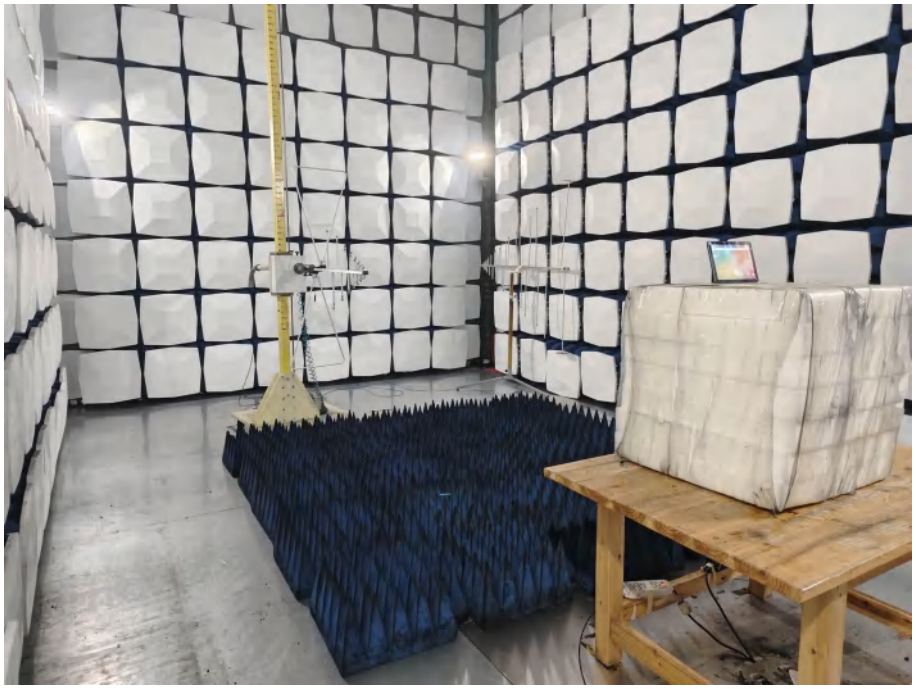
below 1 GHz				
Maximum Frequency	**Spurious Emission polarization and Level**		**Limit of Table 4&5**	**Over Limit**
MHz	**polarization**	**dBm**		**dB**
62.318	Vertical	-72.18	**2nW/-57 dBm**	-15.18
138.728	Vertical	-71.63		-14.63
457.436	Vertical	-68.11		-11.11
105.028	Horizontal	-70.65		-13.65
224.740	Horizontal	-70.90		-13.90
418.051	Horizontal	-67.21		-10.21
Above 1 GHz				
Maximum Frequency	**Spurious Emission polarization and Level**		**Limit of Table 4&5**	**Over Limit**
MHz	**polarization**	**dBm**		**dB**
1615.421	Vertical	-57.84	**20nW/-47 dBm**	-10.84
2832.774	Vertical	-57.59		-10.59
4827.606	Vertical	-59.37		-12.37
2567.635	Horizontal	-52.08		-5.08
2767.642	Horizontal	-58.24		-11.24
5131.995	Horizontal	-53.28		-6.28

Remark:

- 2nW/ -57dBm below 1GHz; 20nW/ -47dBm above1GHz
- –70dBm was the minimum level which could be detected by measuring facility when below 1GHz, -60dBm at over 1GHz.
- No any other emission level margin less than 10dB can be observed and be reported.

6 Photographs

6.1 Spurious Emission Test Setup (below 1GHz)



6.2 Spurious Emission Test Setup (above 1GHz)

End of report