RF TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

Computer Multimedia Speaker

ISSUED TO
SHENZHEN FENDA TECHNOLOGY CO., LTD.

Fenda Hi-Tech Park, Zhoushi Road, Shiyan, Baoan, Shenzhen, China 518108

Tested by: Ye Hongji
Date: Sep. 28, 2021

Approved by: Liao Jianming
(Technical Director)
Date: Sep. 28, 2021

Report No.:	BL-SZ2170989-601
EUT Name:	Computer Multimedia Speaker
Model Name:	V720 (refer section 2.4)
Brand Name:	N/A
Test Standard:	ETSI EN 300 328 V2.2.2 (2019-07)
Test Conclusion:	Pass
Test Date:	Aug. 19, 2021 ~ Sep. 15, 2021
Date of Issue:	Sep. 28, 2021

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Revision History

Version	Issue Date	Revisions Content
Rev. 01	Sep. 28, 2021	Initial Issue

TABLE OF CONTENTS

1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	20℃ to 35℃
Ambient Relative Humidity	30% to 75%
Ambient Pressure	98 kPa to 102 kPa

1.4 Announce

(1) The test report reference to the report template version v2.1.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

(7) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	SHENZHEN FENDA TECHNOLOGY CO., LTD.
Address	Fenda Hi-Tech Park, Zhoushi Road, Shiyan, Baoan, Shenzhen, China 518108

2.2 Manufacturer Information

Manufacturer	SHENZHEN FENDA TECHNOLOGY CO., LTD.
Address	Fenda Hi-Tech Park, Zhoushi Road, Shiyan, Baoan, Shenzhen, China 518108

2.3 Factory Information

Factory	SHENZHEN FENDA TECHNOLOGY CO., LTD.
Address	Fenda Hi-Tech Park, Zhoushi Road, Shiyan, Baoan, Shenzhen, China 518108

2.4 General Description for Equipment under Test (EUT)

EUT Name	Computer Multimedia Speaker
Model Name Under Test	V720
Series Model Name	V620 Plus, V620 Pro, V720 Pro, V720 Plus, V720X, V780, V780 Plus, V780 Pro, V780X
Description of Model name differentiation	All models are same with electrical parameters and internal circuit structure, but only differ in market and customer.
Hardware Version	N/A
Software Version	N/A
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Technical Information

EUT Type	Stand-alone equipment
Network and Wireless connectivity	Bluetooth (BR+EDR)

The requirement for the following technical information of the EUT was tested in this report:

Modulation Technology	Bluetooth(For Classic): FHSS
Modulation Type	Bluetooth(For Classic): GFSK, π/4-DQPSK, 8-DPSK
Transfer Rate	DH5: 1 Mbps 2DH5: 2 Mbps 3DH5: 3 Mbps
Frequency Range	The frequency range used is 2402 MHz – 2480 MHz; The frequency block is 2400 MHz to 2483.5 MHz.
Number of channel	Bluetooth(For Classic): 79 (at intervals of 1 MHz)
Tested Channel	Bluetooth(For Classic): 0 (2402 MHz), 39 (2441 MHz), 78 (2480 MHz)
Nominal Channel Bandwidth	1 MHz
Antenna Type	PCB Antenna
Antenna Gain	2.0 dBi (In test items related to antenna gain, the final results reflect this figure. This value is provided by the applicant.)
Beamforming Gain	N/A
Adaptive or non-adaptive	Adaptive
LBT Based	Yes (Load Based)
The Max RF Output power	Bluetooth (For Classic): 3.0 dBm
Receiver Category	Bluetooth (For Classic): 2

Description	Modulation Type (BT for Classic)	Transfer Rate (BT for Classic)
Transmitter Parameters		
RF output power	GFSK, π/4-DQPSK, 8-DPSK	DH5: 1 Mbps 2DH5: 2 Mbps 3DH5: 3 Mbps
Power Spectral Density	--	--
Duty Cycle, Tx-sequence, Tx-gap	N/A	N/A
Accumulated Transmit Time, Frequency Occupation and Hopping Sequence	GFSK, 8-DPSK	DH5: 1 Mbps 3DH5: 3 Mbps
Hopping Frequency Separation	GFSK, 8-DPSK	DH5: 1 Mbps 3DH5: 3 Mbps
Medium Utilization (MU) factor	N/A	N/A
Adaptivity	N/A	N/A
Occupied Channel Bandwidth	GFSK, 8-DPSK	DH5: 1 Mbps 3DH5: 3 Mbps
Transmitter unwanted emissions in the out-of-band domain	GFSK, 8-DPSK	DH5: 1 Mbps 3DH5: 3 Mbps
Transmitter unwanted emissions in the spurious domain	GFSK, 8-DPSK	DH5: 1 Mbps 3DH5: 3 Mbps
Receiver Parameters		
Receiver spurious emissions	GFSK, 8-DPSK	DH5: 1 Mbps 3DH5: 3 Mbps
Receiver Blocking	GFSK	DH1: 1 Mbps
Other Parameters		
Geo-location capability	--	--
Note: π/4-DQPSK is the EDR 2M rate mode, 8-DPSK is the EDR 3M rate mode. The consistency of test results in π/4-DQPSK and 8-DPSK is very high. So that 8-DPSK is choosed as a typical representative to appear on the report. Another all the modes on the RF output power test item will be shown.		

2.6 Additional Instructions

Bluetooth (For Classic)

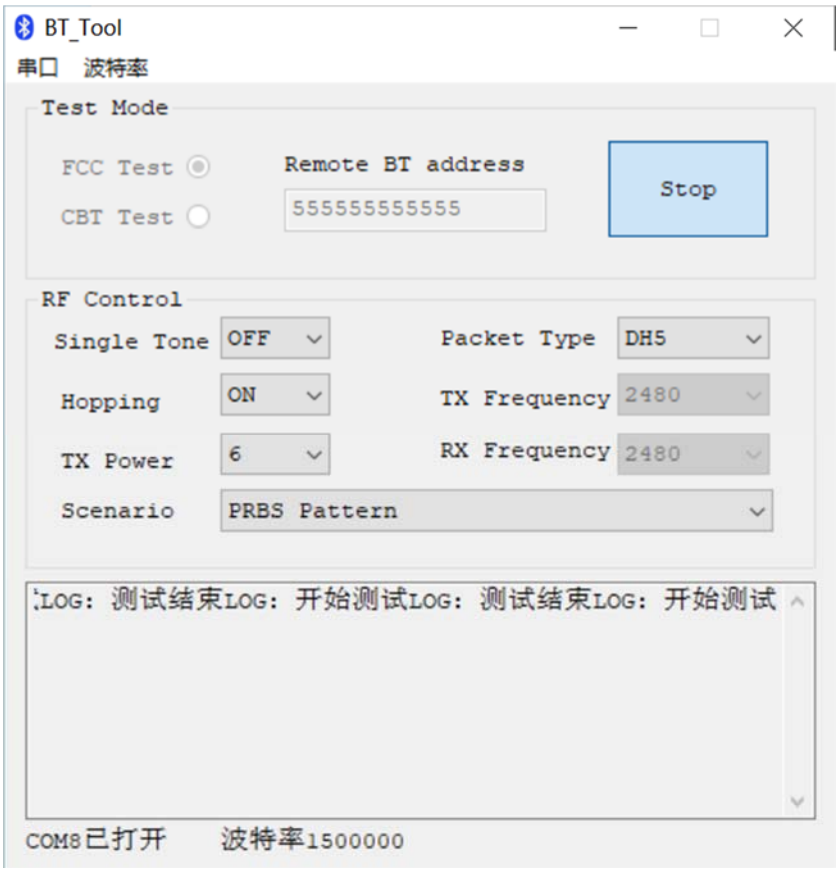
EUT Software Settings:

Mode	☒ Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

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

Power level setup in software			
Test Software Version	BT_tool		
Support Units (Software installation media)	Description	Manufacturer	Model
	Notebook	Lenovo	X220
	Notebook	HP	N/A
Mode	Channel	Frequency (MHz)	Soft Set
DH5	CH0	2402	Power parameter Settings is 6
	CH39	2441	
	CH78	2480	
2DH5	CH0	2402	
	CH39	2441	
	CH78	2480	
3DH5	CH0	2402	
	CH39	2441	
	CH78	2480	

Run Software:



3 SUMMARY OF TEST RESULTS

The EUT has been tested according to ETSI EN 300 328 V2.2.2 (2019-07).

No.	Identity	Document Title
1	ETSI EN 300 328 V2.2.2 (2019-07)	Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz band; Harmonised Standard for access to radio spectrum

Test items and the results are as follows:

Report Section	Standard Rule	Description	Channel (BT for Classic)	Test Result	Verdict	Remark
Transmitter Parameters						
5.1.1	4.3.1.2 4.3.2.2	RF output power	Hopping Mode	ANNEX A.1	Pass	--
5.1.2	4.3.2.3	Power Spectral Density	--	ANNEX A.2	N/A	Note [4]
5.1.3	4.3.1.3 4.3.2.4	Duty Cycle, Tx-sequence, Tx-gap	N/A	ANNEX A.3	N/A	Note [2], Note [7]
5.1.4	4.3.1.4	Accumulated Transmit Time, Frequency Occupation and Hopping Sequence	Hopping Mode	ANNEX A.4	Pass	Note [5]
5.1.5	4.3.1.5	Hopping Frequency Separation	Hopping Mode	ANNEX A.5	Pass	Note [5]
5.1.6	4.3.1.6 4.3.2.5	Medium Utilization (MU) factor	N/A	ANNEX A.6	N/A	Note [2], Note [7]
5.1.7	4.3.1.7 4.3.2.6	Adaptivity	N/A	ANNEX A.7	N/A	Note [2], Note [3]
5.1.8	4.3.1.8 4.3.2.7	Occupied Channel Bandwidth	Low/High	ANNEX A.8	Pass	--
5.1.9	4.3.1.9 4.3.2.8	Transmitter unwanted emissions in the out-of-band domain	Hopping Mode	ANNEX A.9	Pass	--
5.1.10	4.3.1.10 4.3.2.9	Transmitter unwanted emissions in the spurious domain	Hopping Mode	ANNEX A.10	Pass	--
Receiver Parameters						
5.2.1	4.2.3.2	Receiver categories	--	--	--	--
5.2.2	4.3.1.11 4.3.2.10	Receiver spurious emissions	Hopping Mode	ANNEX A.11	Pass	--
5.2.3	4.3.1.12 4.3.2.11	Receiver Blocking	Hopping Mode	ANNEX A.12	Pass	--
Other Parameters						
5.3.1	4.3.1.13 4.3.2.12	Geo-location capability	--	--	N/A	Note [6]

Note [1]: This requirement does not apply to adaptive equipment unless operating in a non-adaptive mode.
Note [2]: This test doesn't apply for the EUT which has the RF Output power is less than 10 dBm e.i.r.p.
Note [3]: This requirement does not apply to non-adaptive equipment or adaptive equipment operating in a non-adaptive mode.
Note [4]: This requirement apply to the equipment is using wide band modulations other than FHSS.
Note [5]: This requirement apply to the equipment is using FHSS.
Note [6]: This requirement does not apply to devices that do not support Geo-location capability.
Note [7]: These requirements apply to non-adaptive frequency hopping equipment or to adaptive frequency hopping equipment operating in a non-adaptive mode.

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

During the measurement, the normal environmental conditions were within the listed ranges:

Relative Humidity	30% to 75%	
Atmospheric Pressure	98 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+22℃ to +25℃
	LT (Low Temperature)	0℃
	HT (High Temperature)	+40℃
Working Voltage of the EUT	NV (Normal Voltage)	4 V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2021.06.01	2022.05.31
Spectrum Analyzer	KEYSIGHT	N9020A	MY56060183	2020.09.25	2021.09.24
Vector Signal Generator	ROHDE&SCHWARZ	SMBV100A	260592	2021.01.27	2022.01.26
Signal Generator	ROHDE&SCHWARZ	SMB100A	177746	2021.06.01	2022.05.31
Switch Unit with OSP-B157	ROHDE&SCHWARZ	OSP120	101270	2021.06.01	2022.05.31
Bluetooth Signaling Unit	ROHDE&SCHWARZ	CMW270	100607	2021.06.01	2022.05.31
Bluetooth Signaling Unit	ROHDE&SCHWARZ	CMW500	142028	2021.06.01	2022.05.31
Bluetooth Signaling Unit	ROHDE&SCHWARZ	CBT	101005	2021.06.01	2022.05.31
DC Power Supply	ITECH	IT6720	60010301071 7610007	2020.09.25	2021.09.24
Temperature Chamber	AHK	NTH64-40A	1310	2021.01.14	2022.01.03
EMI Receiver	KEYSIGHT	N9038A	MY53220118	2021.06.01	2022.05.31
Test Antenna-Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2019.10.29	2021.10.28
Test Antenna-Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2019.07.02	2022.07.01
Test Antenna-Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1917	2019.07.02	2022.07.01
Test Antenna-Horn (18-40 GHz)	A-INFO	LB-180400KF	J211060273	2021.01.05	2023.01.04
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2017.02.21	2022.02.20

4.3 Test Software List

Description	Manufacturer	Software Version	Serial No.
TS8997 EMC32	ROHDE&SCHWARZ	V10.00.00	N/A

4.4 Measurement Uncertainty

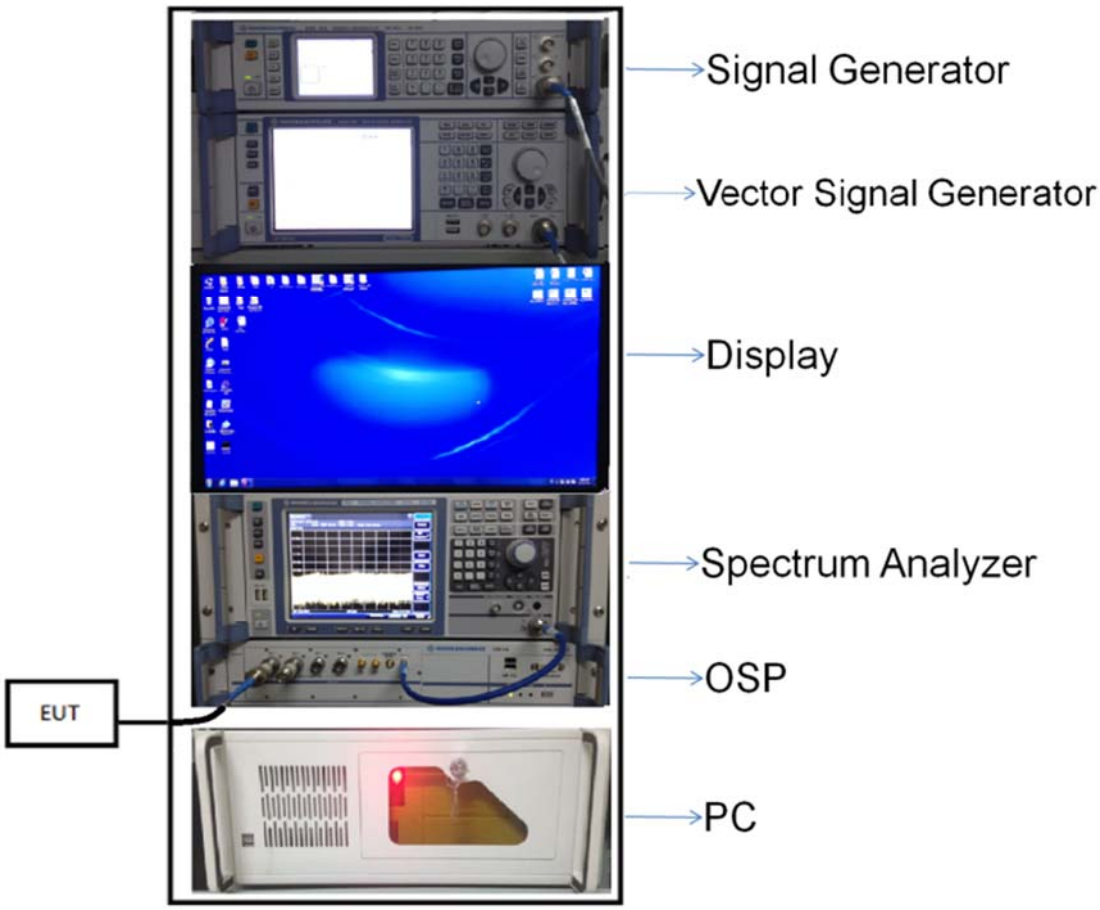
The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Parameters	Uncertainty
Occupied Channel Bandwidth	3.6 %
RF output power, conducted	0.66 dB
Power Spectral Density, conducted	0.90 dB
Unwanted Emissions, conducted	1.78 dB
All emissions, radiated	5.36 dB
Temperature	0.82 °C
Humidity	4.1 %

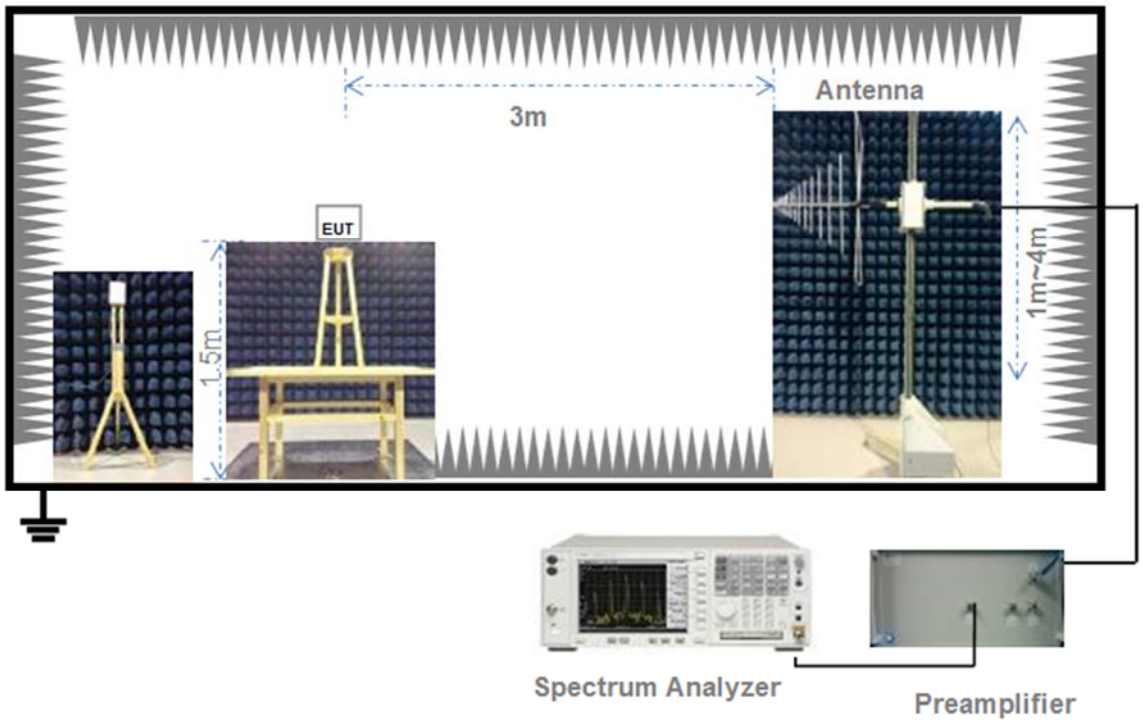
4.5 Description of Test Setup

4.5.1 For Conducted Test

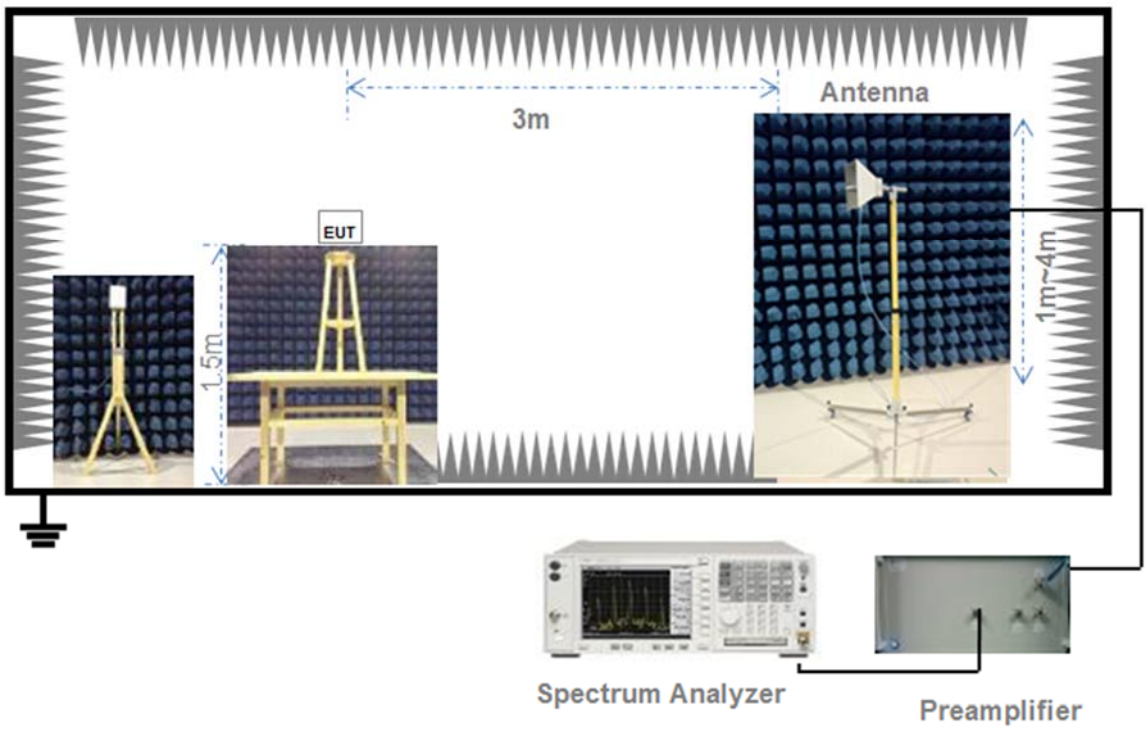


(Diagram 1)

4.5.2 For Radiated Test

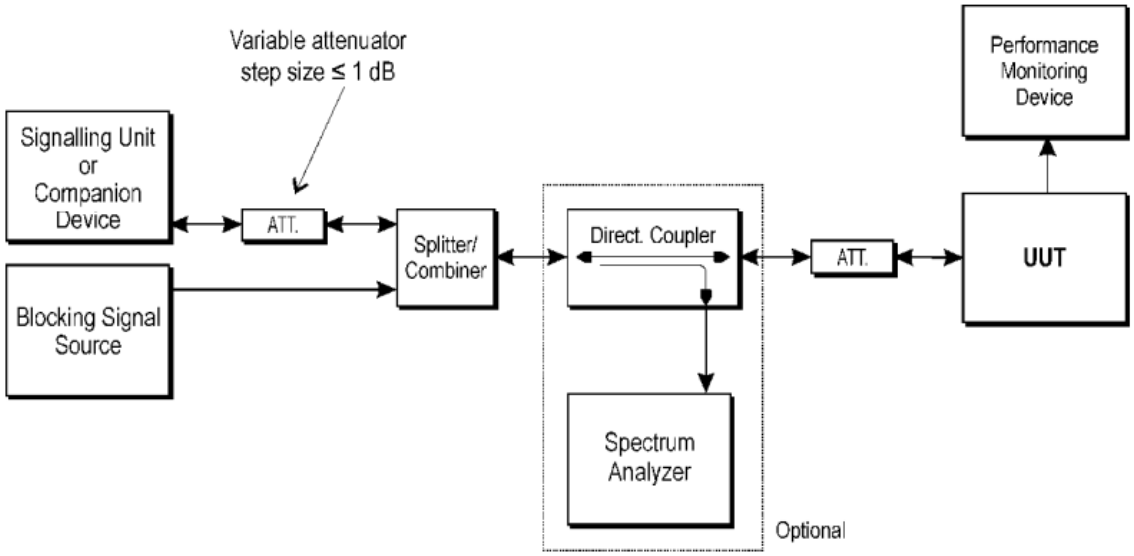


(Diagram 2)



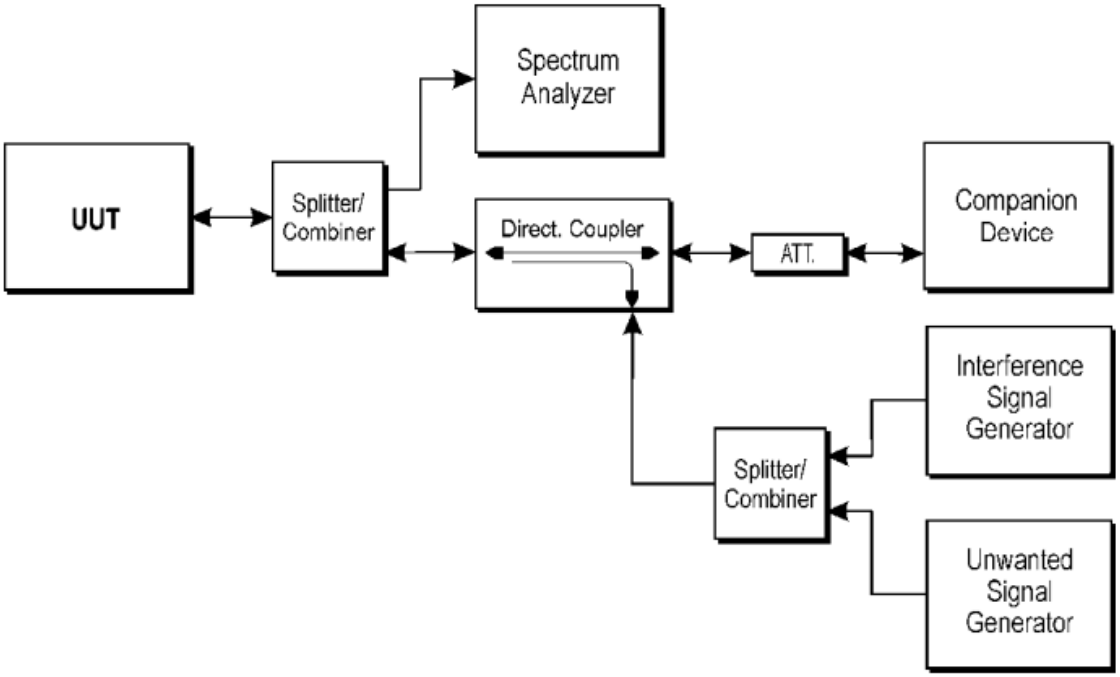
(Diagram 3)

4.5.3 For Receiver Blocking Test



(Diagram 4)

4.5.4 For Adaptivity Test



(Diagram 5)

5 Test Type and Test Results

5.1 Transmitter Parameters

5.1.1 RF output power

5.1.1.1 Limit

The maximum RF output power shall be equal to or less than 20 dBm.

5.1.1.2 Test Setup

The section 4.5.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.1.1.3 Test Procedure

Reference to ETSI EN 300 328 V2.2.2 clause 5.4.2.2.

5.1.1.4 Test Result

Please refer to ANNEX A.1.

5.1.2 Power Spectral Density

5.1.2.1 Limit

The maximum Power Spectral Density for non-FHSS equipment is 10 dBm per MHz.

5.1.2.2 Test Setup

The section 4.5.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.1.2.3 Test Procedure

Reference to ETSI EN 300 328 V2.2.2 clause 5.4.3.2.

5.1.2.4 Test Result

Please refer to ANNEX A.2.

5.1.3 Duty Cycle, Tx-sequence, Tx-gap

5.1.3.1 Limit

The Duty Cycle shall be equal to or less than the maximum value declared by the manufacturer.

The Tx-sequence time shall be equal to or less than 10 ms.

The minimum Tx-gap time following a Tx-sequence shall be equal to the duration of that proceeding Txsequence with a minimum of 3,5 ms.

5.1.3.2 Test Setup

The section 4.5.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.1.3.3 Test Procedure

Reference to ETSI EN 300 328 V2.2.2 clause 5.4.2.2.

5.1.3.4 Test Result

Please refer to ANNEX A.3.

5.1.4 Accumulated Transmit Time, Frequency Occupation and Hopping Sequence

5.1.4.1 Limit

The Accumulated Transmit Time on any hopping frequency shall not be greater than 400 ms within any observation period of 400 ms multiplied by the minimum number of hopping frequencies (N) that have to be used.

The hopping sequence(s) shall contain at least N hopping frequencies where N is 15 or 15 divided by the minimum Hopping Frequency Separation in MHz, whichever is the greater.

In order for the equipment to comply with the Frequency Occupation requirement, it shall meet either of the following two options:

Option 1: Each hopping frequency of the hopping sequence shall be occupied at least once within a period not exceeding four times the product of the dwell time and the number of hopping frequencies in use.

Option 2: The occupation probability for each frequency shall be between ((1 / U) × 25 %) and 77 % where U is the number of hopping frequencies in use.

5.1.4.2 Test Setup

The section 4.5.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.1.4.3 Test Procedure

Reference to ETSI EN 300 328 V2.2.2 clause 5.4.4.2.

5.1.4.4 Test Result

Please refer to ANNEX A.4.

5.1.5 Hopping Frequency Separation

5.1.5.1 Limit

For adaptive frequency hopping systems, the minimum Hopping Frequency Separation shall be 100 kHz.

5.1.5.2 Test Setup

The section 4.5.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.1.5.3 Test Procedure

Reference to ETSI EN 300 328 V2.2.2 clause 5.4.5.2.

5.1.5.4 Test Result

Please refer to ANNEX A.5.

5.1.6 Medium Utilization (MU) factor

5.1.6.1 Limit

The maximum Medium Utilization factor for non-adaptive equipment shall be 10 %.

5.1.6.2 Test Setup

The section 4.5.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.1.6.3 Test Procedure

Reference to ETSI EN 300 328 V2.2.2 clause 5.4.2.2.

5.1.6.4 Test Result

Please refer to ANNEX A.6.

5.1.7 Adaptivity

5.1.7.1 Limit

Adaptive Frequency Hopping

Requirement	Operational Mode	
	Non-LBT based Detect and Avoid	LBT based Detect and Avoid
Minimum Clear Channel Assessment (CCA) Time	NA	18 us (see Note [1])
Maximum Channel Occupancy (COT) Time	40 ms	60 ms
Minimum Idle Period	5% of COT	5% of COT
Extended CCA check	NA	NA
Short Control Signalling Transmissions	Maximum duty cycle of 10 % within an observation period of 50 ms (see Note [2])	
Note [1]: The CCA time used by the equipment shall be declared by the supplier. Note [2]: Adaptive equipment may or may not have Short Control Signalling Transmissions. Note [3]: The Idle Period is considered to be equal to the CCA or Extended CCA time defined in clause 4.3.2.6.3.2.3, step 1 and step 2. Note [4]: The Idle Period in between transmissions is considered to be the CCA or the Extended CCA check as there are no transmissions during this period.		

Interference threshold level:

Maximum transmit power (P_H) EIRP dBm	Threshold level (TL) (see notes 1 and 2)
20	-70 dBm / MHz
Note [1]: TL = -70 dBm/MHz + 10 × log10 (100 mW / Pout) (Pout in mW e.i.r.p.). Note [2]: transmitter the CCA threshold level (TL) shall be equal or lower than -70 dBm/MHz at the input to the receiver (assuming a 0 dBi receive antenna).	

Unwanted Signal parameters

Wanted signal mean power from companion device	Unwanted signal frequency (MHz)	Unwanted CW signal power (dBm)
sufficient to maintain the link (see Note [2])	2 395 or 2 488,5 (see Note [1])	-35 (see Note [3])
Note [1]: The highest frequency shall be used for testing operating channels within the range 2400 MHz to 2 442 MHz, while the lowest frequency shall be used for testing operating channels within the range 2 442 MHz to 2 483.5 MHz. See clause 5.4.6.1. Note [2]: A typical value which can be used in most cases is -50 dBm/MHz. Note [3]: The level specified is the level in front of the UUT antenna. In case of conducted measurements, this level has to be corrected by the actual antenna assembly gain.		

Adaptive equipment using modulations other than FHSS

Requirement	Operational Mode			
	Non-LBT based Detect and Avoid	LBT based Detect and Avoid		
		Frame Based Equipment	Load Based Equipment (CCA using 'energy detect')	Load Based Equipment (CCA not using any of the mechanisms referenced as Note[2])
Minimum Clear Channel Assessment (CCA) Time	NA	18 us (see Note [1])	(see Note [2])	18 us (see Note [1])
Maximum Channel Occupancy (COT) Time	40 ms	1 ms to 10 ms	(see Note [2])	13 ms
Minimum Idle Period	5% of COT	5% of COT	(see Note [2])	NA
Extended CCA check	NA	NA	(see Note [2])	a random duration in the range between 18 µs and at least 160 µs
Short Control Signalling Transmissions	Maximum duty cycle of 10 % within an observation period of 50 ms (see Note [3])			

Note [1]: The CCA time used by the equipment shall be declared by the supplier.
Note [2]: Load Based Equipment may implement an LBT based spectrum sharing mechanism based on the Clear Channel Assessment (CCA) mode using energy detect, as described in IEEE 802.11™-2012 [i.3] clause 9, clause 10, clause 16, clause 17, clause 19 and clause 20, or in IEEE 802.15.4™-2011 [i.4], clause 4, clause 5 and clause 8
Note [3]: Adaptive equipment may or may not have Short Control Signalling Transmissions.
Note [4]: The Idle Period is considered to be equal to the CCA or Extended CCA time defined in clause 4.3.2.6.3.2.3, step 1 and step 2.
Note [5]: The Idle Period in between transmissions is considered to be the CCA or the Extended CCA check as there are no transmissions during this period.

Interference threshold level:

Maximum transmit power (P_H) EIRP dBm	Threshold level (TL) (see notes 1 and 2)
20	-70 dBm / MHz
Note 1: TL = -70 dBm/MHz + 10 × log10 (100 mW / Pout) (Pout in mW e.i.r.p.). Note 2: transmitter the CCA threshold level (TL) shall be equal or lower than -70 dBm/MHz at the input to the receiver (assuming a 0 dBi receive antenna).	

Unwanted Signal parameters

Wanted signal mean power from companion device	Unwanted signal frequency (MHz)	Unwanted CW signal power (dBm)
sufficient to maintain the link (see note 2)	2 395 or 2 488,5 (see note 1)	-35 (see note 3)
Note [1]: The highest frequency shall be used for testing operating channels within the range 2400 MHz to 2 442 MHz, while the lowest frequency shall be used for testing operating channels within the range 2 442 MHz to 2 483.5 MHz. See clause 5.4.6.1. Note [2]: A typical value which can be used in most cases is -50 dBm/MHz. Note [3]: The level specified is the level in front of the UUT antenna. In case of conducted measurements, this level has to be corrected by the actual antenna assembly gain.		

5.1.7.2 Test Setup

The section 4.5.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.1.7.3 Test Procedure

Reference to ETSI EN 300 328 V2.2.2 clause 5.4.6.2.

5.1.7.4 Test Result

Please refer to ANNEX A.7.

5.1.8 Occupied Channel Bandwidth

5.1.8.1 Limit

The Occupied Channel Bandwidth for each hopping frequency shall fall completely within the band 2400 MHz to 2483.5 MHz.

In addition, for non-adaptive FHSS equipment with e.i.r.p. greater than 10 dBm, the Occupied Channel Bandwidth for every occupied hopping frequency shall be equal to or less than 5 MHz..

In addition, for non-adaptive non-FHSS equipment with e.i.r.p. greater than 10 dBm, the Occupied Channel Bandwidth shall be equal to or less than 20 MHz.

5.1.8.2 Test Setup

The section 4.5.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.1.8.3 Test Procedure

Reference to ETSI EN 300 328 V2.2.2 clause 5.4.7.2.

5.1.8.4 Test Result

Please refer to ANNEX A.8.

5.1.9 Transmitter unwanted emissions in the out-of-band domain

5.1.9.1 Limit

The transmitter unwanted emissions in the out-of-band domain but outside the allocated band, shall not exceed the values provided by the mask in figure 1.

NOTE: Within the 2400 M Hz to 2483,5 MHz band, the Out-of-band emissions are fulfilled by compliance with the Occupied Channel Bandwidth requirement in clause 4.3.1.8.

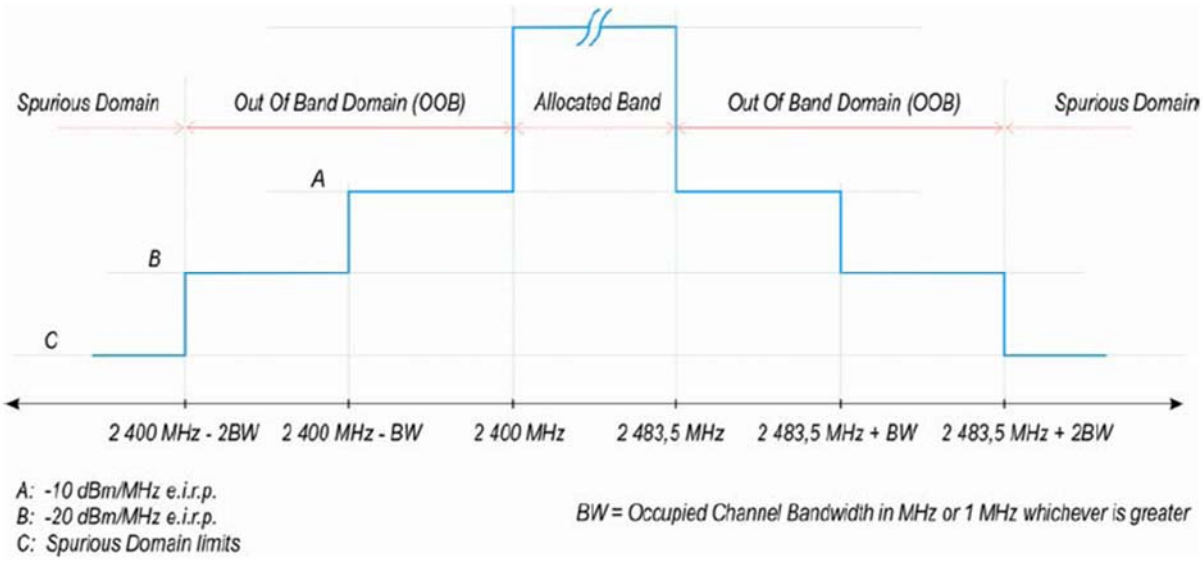


Figure 1: Transmit mask

5.1.9.2 Test Setup

The section 4.5.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.1.9.3 Test Procedure

Reference to ETSI EN 300 328 V2.2.2 clause 5.4.8.2.

5.1.9.4 Test Result

Please refer to ANNEX A.9.

5.1.10 Transmitter unwanted emissions in the spurious domain

5.1.10.1 Limit

The transmitter unwanted emissions in the spurious domain shall not exceed the values in following tables:

Frequency range	Maximum power (dBm)	Bandwidth
30 MHz to 47 MHz	-36	100 kHz
47 MHz to 74 MHz	-54	100 kHz
74 MHz to 87.5 MHz	-36	100 kHz
87.5 MHz to 118 MHz	-54	100 kHz
118 MHz to 174 MHz	-36	100 kHz
174 MHz to 230 MHz	-54	100 kHz
230 MHz to 470 MHz	-36	100 kHz
470 MHz to 694 MHz	-54	100 kHz
694 MHz to 1 GHz	-36	100 kHz
1 GHz to 12.75 GHz	-30	1 MHz

5.1.10.2 Test Setup

The section 4.5.1 and 4.5.2 (Diagram 1, 2, 3) for test setup description. The photo of test setup please refer to ANNEX B.

5.1.10.3 Test Procedure

Reference to ETSI EN 300 328 V2.2.2 clause 5.4.9.2.

5.1.10.4 Test Result

Please refer to ANNEX A.10.

5.2 Receiver Parameters

5.2.1 Receiver categories

There have three different receiver categories for which different receiver requirements and/or corresponding limits apply.

Receiver Category

Receiver Category	Definition
Category 1	Adaptive equipment with a maximum RF output power greater than 10 dBm e.i.r.p.
Category 2	Non-adaptive equipment with a Medium Utilization (MU) factor greater than 1 % and less than or equal to 10 % or adaptive equipment and non-adaptive with a maximum RF output power of 10 dBm e.i.r.p.
Category 3	Non-adaptive equipment with a maximum Medium Utilization (MU) factor of 1 % or adaptive equipment and non-adaptive with a maximum RF output power of 0 dBm e.i.r.p.

5.2.2 Receiver Spurious Emissions

5.2.2.1 Limit

Receiver spurious emissions are emissions at any frequency when the equipment is in receive mode.

The spurious emissions of the transmitter shall not exceed the values in following tables for the EUT in this report.

Frequency range	Maximum power (dBm)	Bandwidth
30 MHz to 1 GHz	-57	100 KHz
1 GHz to 12.75 GHz	-47	1 MHz

5.2.2.2 Test Setup

The section 4.5.1 (Diagram 1) for test setup description. The photo of test setup please refer to ANNEX B.

5.2.2.3 Test Procedure

Reference to ETSI EN 300 328 V2.2.2 clause 5.4.10.2.

5.2.2.4 Test Result

Please refer to ANNEX A.11.

5.2.3 Receiver Blocking

5.2.3.1 Limit

While maintaining the minimum performance criteria as defined in clause 4.3.1.12.3, the blocking levels at specified frequency offsets shall be equal to or greater than the limits defined for the applicable receiver category provided in next table.

Receiver Category 1 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 4)	Blocking signal frequency(MHz)	Blocking signal power (dBm) (see note 4)	Type of blocking signal
(-133 dBm + 10 × $\log_{10}$(OCBW)) or -68 dBm whichever is less (see note 2)	2 380	-34	CW
	2 504	-34	CW
(-139 dBm + 10 × $\log_{10}$(OCBW)) or -74 dBm whichever is less (see note 3)	2 300	-34	CW
	2 330	-34	CW
	2 360	-34	CW
	2 524	-34	CW
	2 584	-34	CW
	2 674	-34	CW

Note [1]: OCBW is in Hz.

Note [2]: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. P_{min} is the minimum level of wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

Note [3]: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 20 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

Note [4]: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

Receiver Category 2 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 10 × $\log_{10}$(OCBW) + 10 dB) or (-74 dBm + 10 dB) whichever is less (see note 2)	2 380	-34	CW
	2 504	-34	CW
	2 300	-34	CW
	2 584	-34	CW

NOTE [1]: OCBW is in Hz.

NOTE [2]: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Pmin + 26 dB where Pmin is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE [3]: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

Receiver Category 3 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency(MHz)	Blocking signal power (dBm) (see note 2)	Type of blocking signal
(-139 dBm + 10 × $\log_{10}$(OCBW) + 20 dB) or (-74 dBm + 20 dB) whichever is less (see note 2)	2 380	-34	CW
	2 504	-34	CW
	2 300	-34	CW
	2 584	-34	CW

NOTE [1]: OCBW is in Hz.

NOTE [2]: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Pmin + 30 dB where Pmin is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE [3]: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

Categorization

Receiver category	Definition
1	Adaptive equipment with a maximum RF output power greater than 10 dBm e.i.r.p. shall be considered as receiver category 1 equipment.
2	Non-adaptive equipment with a Medium Utilization (MU) factor greater than 1 % and less than or equal to 10 % or adaptive equipment with a maximum RF output power of 10 dBm e.i.r.p. shall be considered as receiver category 2 equipment.
3	Non-adaptive equipment with a maximum Medium Utilization (MU) factor of 1 % or adaptive equipment with a maximum RF output power of 0 dBm e.i.r.p. shall be considered as receiver category 3 equipment

5.2.3.2 Test Setup

See the section 4.5.3 (Diagram 4) for test setup description. The photo of test setup please refer to ANNEX B.

5.2.3.3 Test Procedure

Reference to ETSI EN 300 328 V2.2.2 clause 5.4.11.2.

5.2.3.4 Test Result

Please refer to ANNEX A.12.

5.3 Other Parameters

5.3.1 Geo-location capability

5.3.1.1 Requirements

The geographical location determined by the equipment as defined in following section (5.3.1.2) shall not be accessible to the user.

5.3.1.2 Definition

Geo-location capability is a feature of the equipment to determine its geographical location with the purpose to configure itself according to the regulatory requirements applicable at the geographical location where it operates.

The geo-location capability may be present in the equipment or in an external device (temporary) associated with the equipment operating at the same geographical location during the initial power up of the equipment. The geographical location may also be available in equipment already installed and operating at the same geographical location.

5.3.1.3 Test Result

Note: Not applicable.

ANNEX A TEST RESULT

A.1 RF output power

Test Data

Note: EIRP Power = Conducted Power + Antenna Gain

Modulation Mode			GFSK	π/4-DQPSK	8-DPSK
Limit			20 dBm		
Test Result					
Test Method	Test Conditions		Transmitter Power Level (dBm)	Transmitter Power Level (dBm)	Transmitter Power Level (dBm)
	Voltage	Temperature	EIRP	EIRP	EIRP
☐ Radiated ☒ Conducted	NV	NT	3.0	3.0	2.9
		LT	2.9	3.0	2.6
		HT	2.6	2.6	2.5
Test Verdict			Pass		

Bursts Power List

GFSK MODE

Burst RMS Power	Start Time	Stop Time	Tx_on	Tx_off
dBm	ms	ms	ms	ms
0.5	0.000	2.903	2.903	0.847
3.0	3.750	6.653	2.903	0.847
0.7	7.500	10.403	2.903	0.847
2.2	11.250	14.153	2.903	0.847
1.7	15.000	17.903	2.903	0.846
2.4	18.749	21.652	2.903	0.847
1.4	22.499	25.402	2.903	0.847
2.1	26.249	29.152	2.903	0.847
0.8	29.999	32.902	2.903	0.846
2.3	33.748	36.652	2.904	0.846
1.4	37.498	40.401	2.903	0.847
2.0	41.248	44.151	2.903	0.847
1.1	44.998	47.901	2.903	0.847
2.8	48.748	51.651	2.903	0.846
1.2	52.497	55.400	2.903	0.847
1.8	56.247	59.150	2.903	0.847
2.5	59.997	62.900	2.903	0.847
1.4	63.747	66.650	2.903	0.847
0.5	67.497	70.400	2.903	0.846
0.8	71.246	74.149	2.903	0.847
2.4	74.996	77.899	2.903	0.847
1.4	78.746	81.649	2.903	0.847
0.6	82.496	85.399	2.903	0.847
1.1	86.246	89.149	2.903	0.846
2.2	89.995	92.898	2.903	0.847
1.2	93.745	96.648	2.903	0.847
1.5	97.495	100.398	2.903	0.847
2.8	101.245	104.148	2.903	0.847
1.8	104.995	107.898	2.903	0.846
0.6	108.744	111.647	2.903	0.847
1.4	112.494	115.397	2.903	0.847
2.4	116.244	119.147	2.903	0.847
1.7	119.994	122.897	2.903	0.847
0.6	123.744	126.646	2.902	0.847

π/4-DQPSK MODE

Burst RMS Power	Start Time	Stop Time	Tx_on	Tx_off
dBm	ms	ms	ms	ms
0.6	0.000	2.909	2.909	0.841
3.0	3.750	6.659	2.909	0.841
0.8	7.500	10.408	2.908	0.056
2.8	11.249	14.158	2.909	0.841
1.7	14.999	17.908	2.909	0.841
2.3	18.749	21.658	2.909	0.841
2.4	22.499	25.408	2.909	0.841
1.2	26.249	29.157	2.908	0.842
1.9	29.999	32.907	2.908	0.841
1.4	33.748	36.657	2.909	0.841
2.1	37.498	40.407	2.909	0.841
2.2	41.248	44.157	2.909	0.841
0.7	44.998	47.906	2.908	0.842
1.6	48.748	51.656	2.908	0.829
1.1	52.497	55.406	2.909	0.841
0.7	56.247	59.156	2.909	0.841
1.7	59.997	62.906	2.909	0.841
1.8	63.747	66.655	2.908	0.842
0.5	67.497	70.405	2.908	0.841
0.0	71.246	74.155	2.909	0.841
0.6	74.996	77.905	2.909	0.841
1.6	78.746	81.655	2.909	0.841
1.6	82.496	85.404	2.908	0.841
2.7	86.245	89.154	2.909	0.841
0.5	89.995	92.904	2.909	0.841
1.5	93.745	96.654	2.909	0.841
0.6	97.495	100.404	2.909	0.841
0.4	101.245	104.153	2.908	0.842
0.9	104.995	107.903	2.908	0.555
1.5	108.744	111.653	2.909	0.841
1.9	112.494	115.403	2.909	0.841
2.8	116.244	119.153	2.909	0.841
1.0	119.994	122.902	2.908	0.842
0.5	123.744	126.652	2.908	0.841

8-DPSK MODE

Burst RMS Power	Start Time	Stop Time	Tx_on	Tx_off
dBm	ms	ms	ms	ms
1.3	0.000	2.911	2.911	0.839
2.9	3.750	6.661	2.911	0.838
0.9	7.499	10.411	2.912	0.838
2.1	11.249	14.161	2.912	0.838
0.5	14.999	17.911	2.912	0.838
1.7	18.749	21.660	2.911	0.838
2.5	22.498	25.410	2.912	0.838
0.6	26.248	29.160	2.912	0.838
2.4	29.998	32.910	2.912	0.838
0.7	33.748	36.660	2.912	0.838
2.6	37.498	40.410	2.912	0.838
0.9	41.248	44.159	2.911	0.838
-0.1	44.997	47.909	2.912	0.838
1.0	48.747	51.659	2.912	0.838
1.9	52.497	55.409	2.912	0.284
-22.4	55.693	55.695	0.002	0.552
0.7	56.247	59.158	2.911	0.838
1.0	59.996	62.908	2.912	0.838
2.1	63.746	66.658	2.912	0.838
1.1	67.496	70.408	2.912	0.838
2.8	71.246	74.158	2.912	0.838
1.4	74.996	77.907	2.911	0.838
2.2	78.745	81.657	2.912	0.838
1.2	82.495	85.407	2.912	0.838
0.1	86.245	89.157	2.912	0.838
1.9	89.995	92.907	2.912	0.838
2.1	93.745	96.656	2.911	0.838
0.8	97.494	100.406	2.912	0.838
1.2	101.244	104.156	2.912	0.838
0.1	104.994	107.906	2.912	0.838
1.6	108.744	111.656	2.912	0.838
2.7	112.494	115.405	2.911	0.838
0.6	116.243	119.155	2.912	0.838
0.8	119.993	122.905	2.912	0.838

A.2 Power spectral density

Note: Not applicable.

A.3 Duty Cycle, Tx-sequence, Tx-gap

Note [1]: The maximum value of Duty Cycle declared by the supplier.

Test Data

Duty Cycle (%)	Limit Duty Cycle (%)Note1	Number of Bursts	Minimum Tx-On (ms)	Maximum Tx-On (ms)	Minimum Tx-Off (ms)	Maximum Tx-Off (ms)	Measurement Time (ms)	Comment
--	--	--	--	--	--	--	--	--

Note [2]: Not applicable.

A.4 Accumulated Transmit Time, Frequency Occupation and Hopping Sequence

Test Data (Dwell Time)

Test Condition			Temperature NT, Voltage NV		
Test Method	Modulation Mode	Channel	Total of Dwell (ms)	Measurement Time (s)	Limit (ms)
☐ Radiated ☒ Conducted	GFSK	Low Channel	309.5664	31.6	400
		High Channel	309.5664	31.6	400
	8-DPSK	Low Channel	310.4192	31.6	400
		High Channel	310.4192	31.6	400
Test Verdict			Pass		

Test Data (Minimum Frequency Occupation)

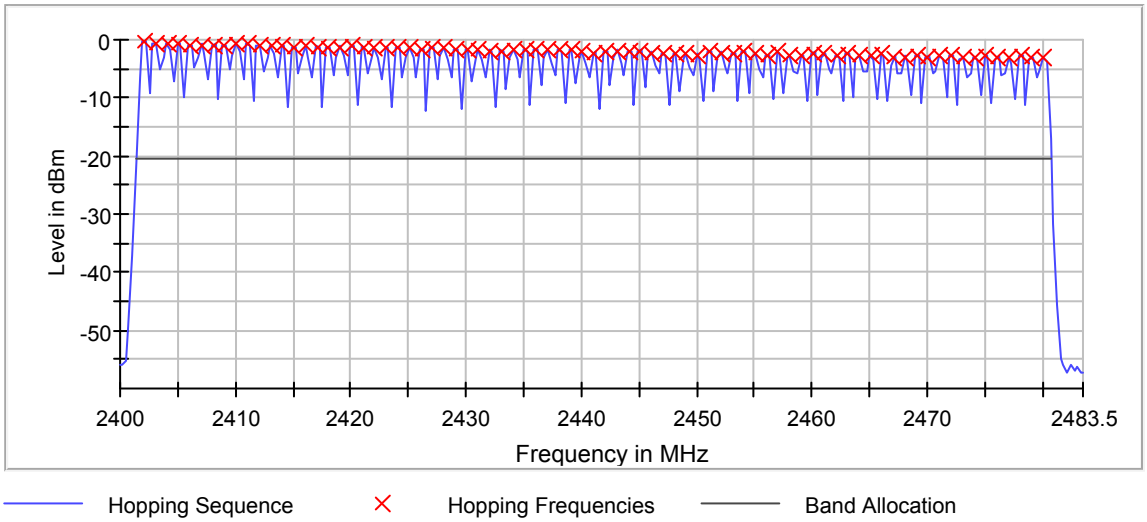
Test Condition			Temperature NT, Voltage NV		
Test Method	Modulation Mode	Channel	Minimum Frequency Occupation (ms)	Measurement Time (ms)	Limit (ms)
☐ Radiated ☒ Conducted	GFSK	Low Channel	7.556	917.664	≥ 2.904
		High Channel	9.911	917.664	≥ 2.904
	8-DPSK	Low Channel	11.288	920.192	≥ 2.912
		High Channel	8.926	920.192	≥ 2.912
Test Verdict			Pass		
Note: The Minimum Frequency Occupation Time shall be equal to one dwell time within a period not exceeding four times the product of the dwell time per hop and the number of hopping frequencies in use. And the minimum of one dwell time have showed out at the ANNEX A.1 Test Bursts Power List.					

Test Data (Hopping Sequence)

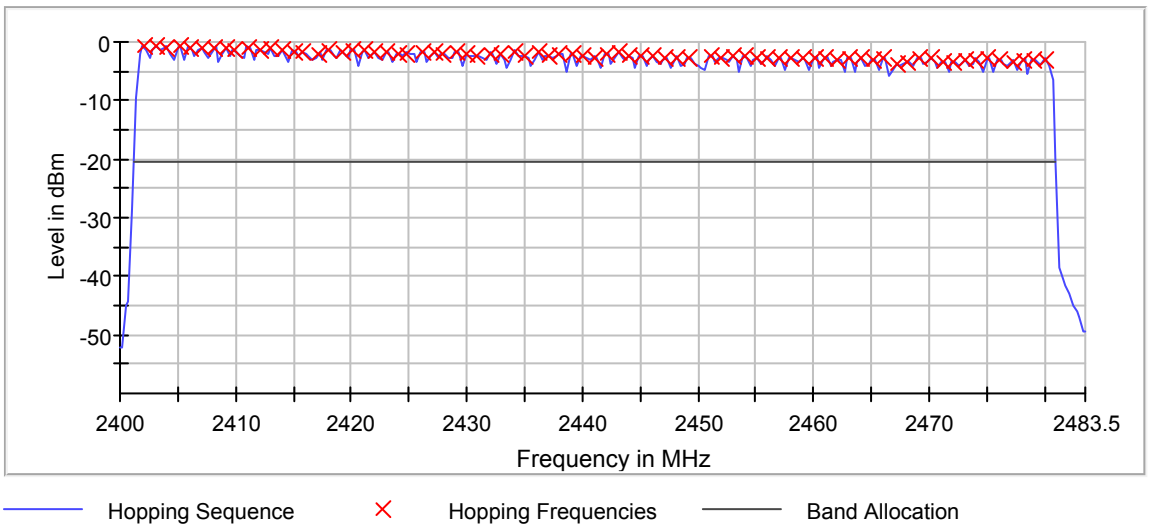
Test Condition		Temperature NT, Voltage NV				
Test Method	Test Mode	Number of Hopping Frequencies	Limit of the Min. channel	Band Allocation (%)	Limit Band Allocation (%)	Verdict
☐ Radiated	GFSK	79	≥ 15	95.0	≥ 70	Pass
☒ Conducted	8-DPSK	79	≥ 15	95.5	≥ 70	Pass

Test plots

Hopping Sequence: GFSK



Hopping Sequence:8-DPSK



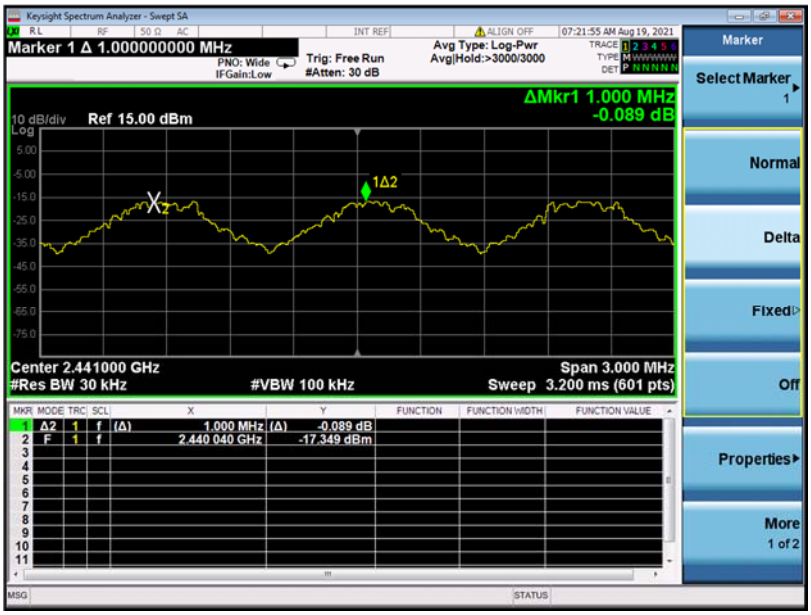
A.5 Hopping Frequency Separation

Test Data

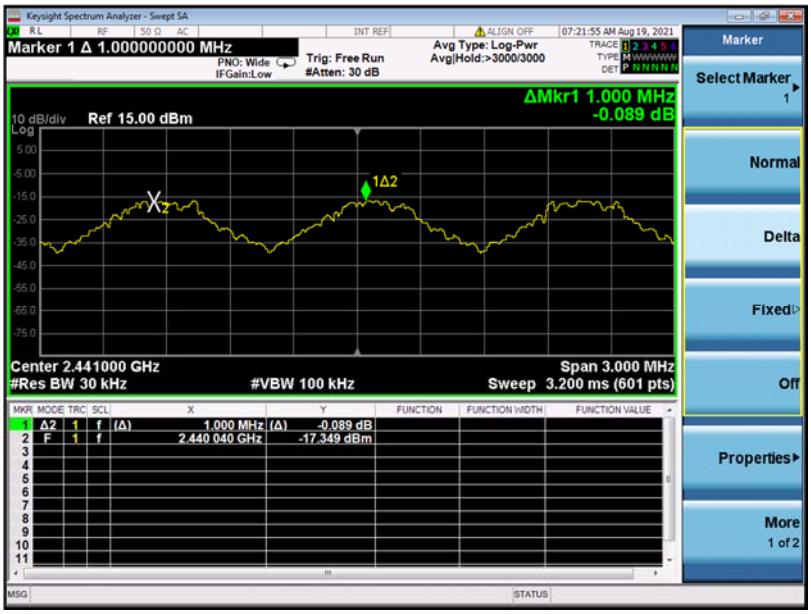
Test Method	Test Conditions		Test Result		
☐ Radiated ☒ Conducted	Temperature	Voltage	Modulation Mode	Channel Separation (MHz)	Limit (MHz)
	NT	NV	GFSK	1.000	≧0.1
			8-DPSK	1.000	≧0.1
Test Verdict			Pass		

Test plots

GFSK



8-DPSK



A.6 Medium Utilization (MU) factor

Medium Utilization (MU) (%)	Limit Medium Utilization (MU) (%)	Verdict
--	10	--

Note: Not applicable.

A.7 Adaptivity

Note: Not applicable.

A.8 Occupied Channel Bandwidth

Measuring Parameter

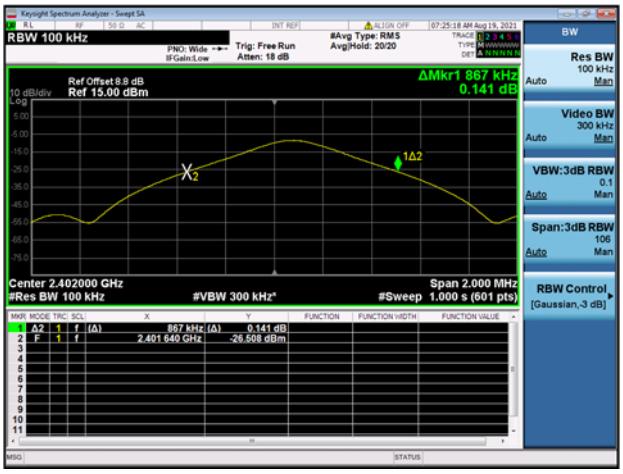
Centre Frequency	The centre frequency of the channel under test
RBW	~ 1 % of the span without going below 1 %
VBW	3 × RBW
Span	2 × Nominal Channel Bandwidth
Detector mode	RMS
Trace mode	Max Hold
Sweep time	Auto
Test Method	☐ Radiated ☒ Conducted

Test Data

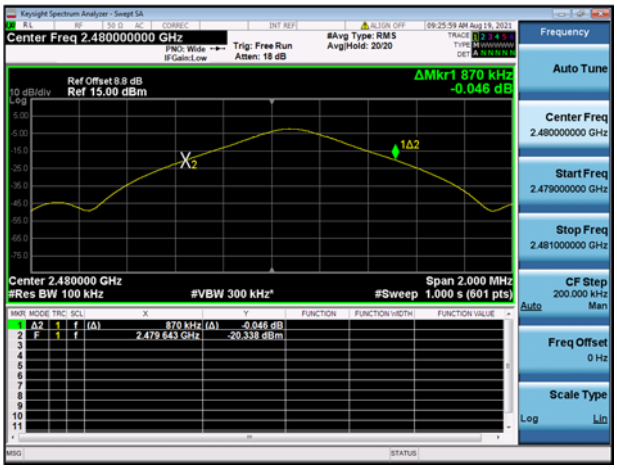
Test Conditions		Test Mode	DUT Frequency (MHz)	Occupied Channel Bandwidth (MHz)	Lower Band Edge (MHz)	Upper Band Edge (MHz)	Limit (MHz)
Temperature	Voltage						
NT	NV	GFSK	2402	0.867	2401.639893	2402.506893	Within The Band 2400 MHz to 2483.5 MHz
			2480	0.870	2479.643311	2480.513311	
		8-DPSK	2402	1.200	2401.476562	2402.676562	
			2480	1.230	2479.463379	2480.693379	
Test Verdict		Pass					

Test Plots

GFSK: Low Channel

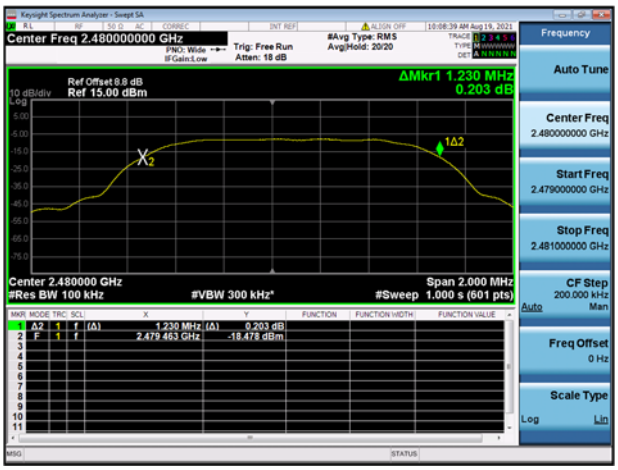


GFSK: High Channel



8-DPSK: Low Channel

8-DPSK: High Channel



A.9 Transmitter unwanted emissions in the out-of-band domain

Test Data

GFSK

DUT Frequency (MHz)	Nominal Bandwidth (MHz)	Frequency (MHz)	Level (dBm)	Limit (dBm)	Result
2402	1	2398.5	-35.692	-20	Pass
2402	1	2399.5	-33.945	-10	Pass
2480	1	2484.0	-35.083	-10	Pass
2480	1	2485.0	-35.504	-20	Pass

8-DPSK

DUT Frequency (MHz)	Nominal Bandwidth (MHz)	Frequency (MHz)	Level (dBm)	Limit (dBm)	Result
2402	1	2398.5	-35.920	-20	PASS
2402	1	2399.5	-34.778	-10	PASS
2480	1	2484.0	-34.342	-10	PASS
2480	1	2485.0	-35.374	-20	PASS

A.10 Transmitter unwanted emissions in the spurious domain

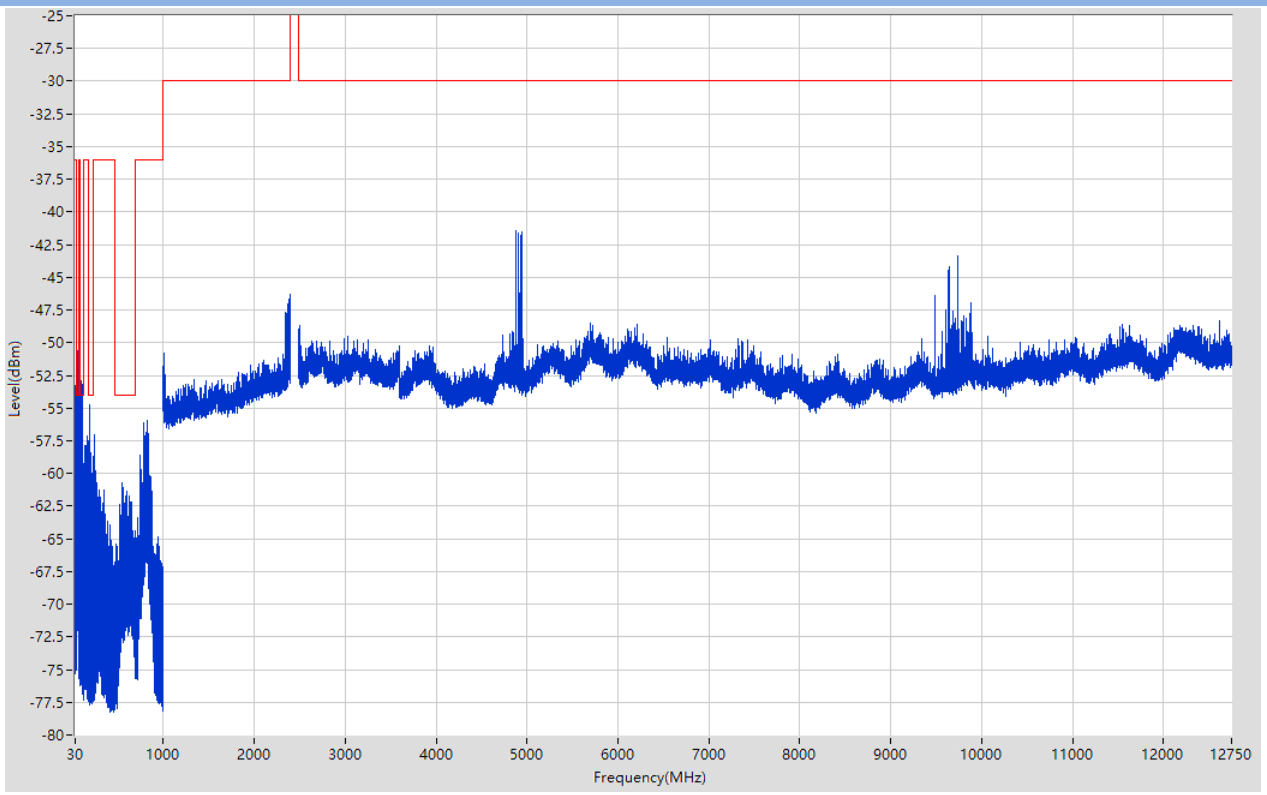
Note [1]: The test method choose the conducted method. Which power in a specified load (conducted spurious emissions) and their effective radiated power when radiated by the cabinet or structure of the equipment (cabinet radiation).
Note [2]: The Frequency band was pre-scanned, the harmonic and other spurious which worst frequency are recorded in the report.
Note [3]: The cabinet radiated test data is tested in the normal working mode of the product.

Measuring Parameter

Frequency Range		
30 MHz to 1 000 MHz	RBW (MHz)	100 kHz
	VBW (MHz)	300 kHz
	Sweep points	19400
	Detector mode	Peak
	Trace mode	Max Hold
1 GHz to 12,75 GHz	RBW (MHz)	1 MHz
	VBW (MHz)	3 MHz
	Sweep points	23500
	Detector mode	Peak
	Trace mode	Max Hold

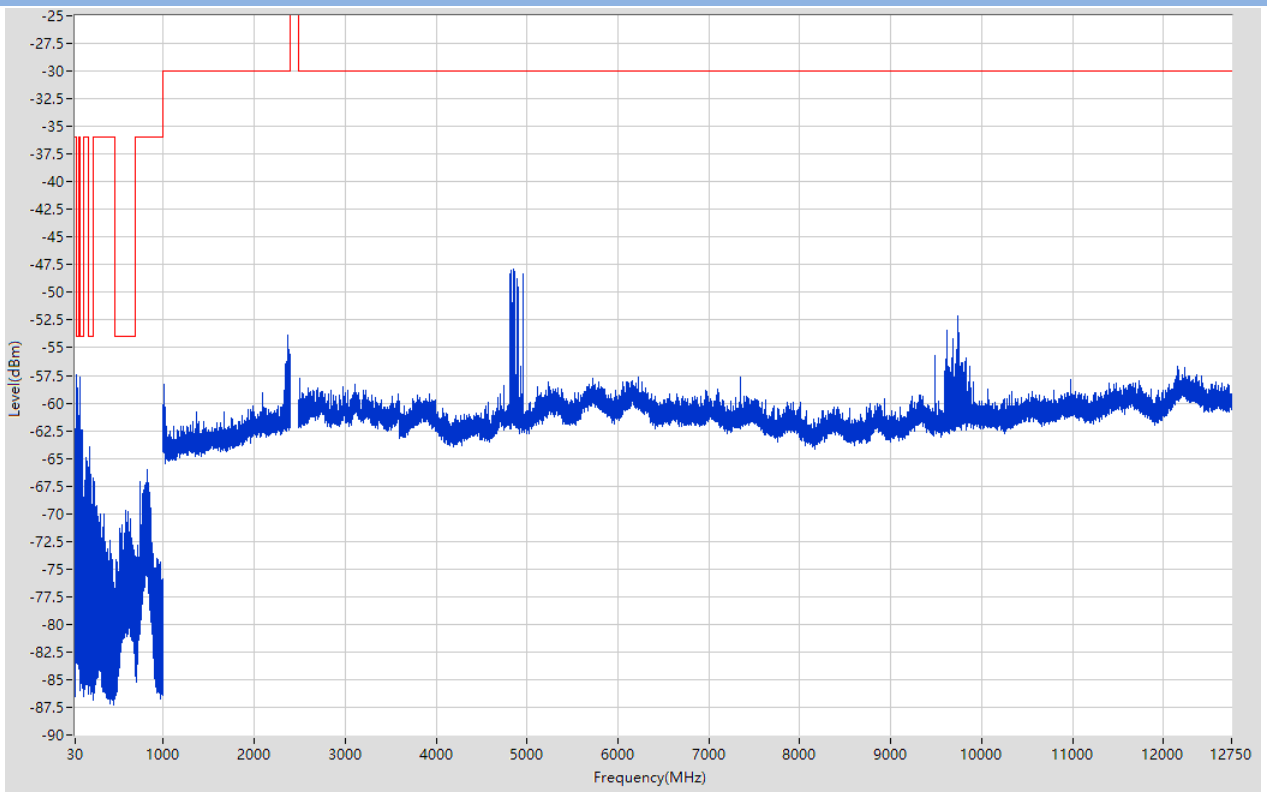
Conducted Test Data

GFSK 30 MHz to 12.75 GHz



Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	45.768	-51.18	-36	Pass	401
47	74	0.1	Peak	47.95	-48.91	-54	N/A	541
			RMS		-65.79		Pass	30000
74	87.5	0.1	Peak	78.016	-50.72	-36	Pass	401
87.5	118	0.1	Peak	96	-52.95	-54	N/A	611
			RMS		-62.60		Pass	30000
118	174	0.1	Peak	156.05	-57.17	-36	Pass	1121
174	230	0.1	Peak	192	-54.73	-54	N/A	1121
			RMS		-62.64		Pass	30000
230	470	0.1	Peak	240	-57.09	-36	Pass	4801
470	694	0.1	Peak	547.3	-60.71	-54	Pass	4481
694	1000	0.1	Peak	827.2	-55.9	-36	Pass	6121
1000	2398	1	Peak	2394.5	-46.33	-30	Pass	2797
2485.5	12750	1	Peak	4878.5	-41.47	-30	Pass	20530

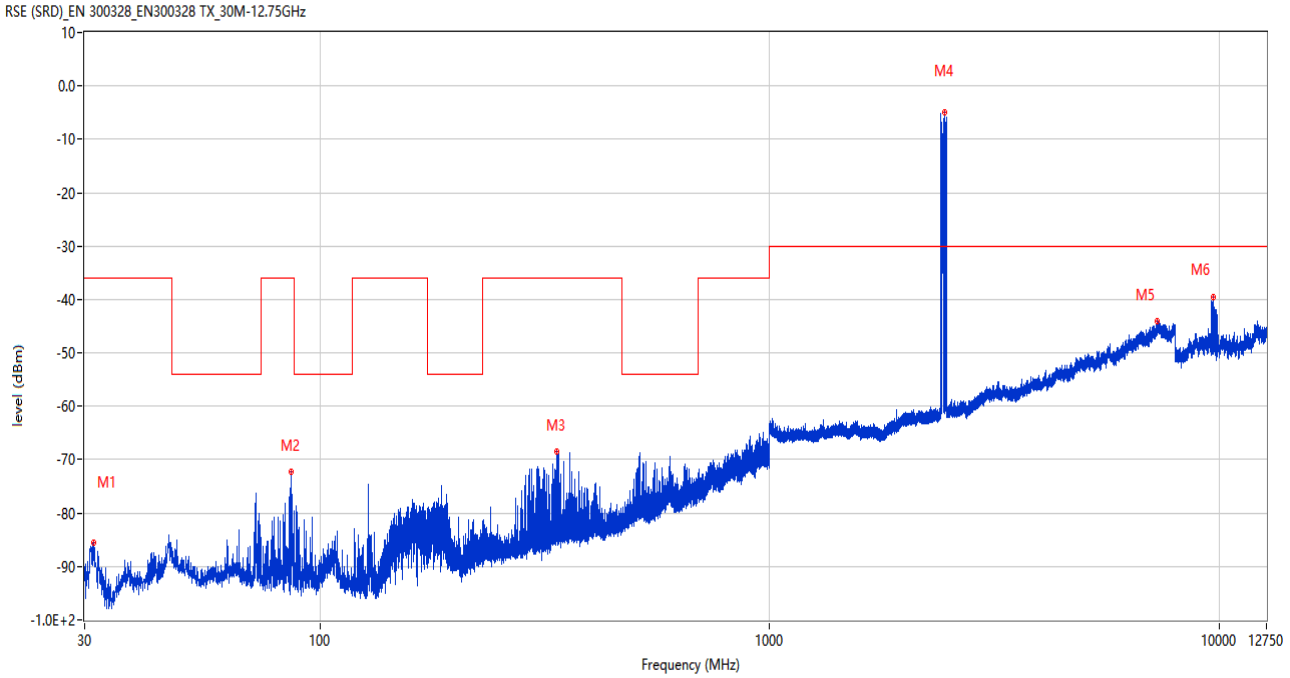
8-DPSK 30 MHz to 12.75 GHz



Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	45.173	-58.32	-36	Pass	401
47	74	0.1	Peak	48	-57.44	-54	Pass	541
74	87.5	0.1	Peak	77.983	-57.61	-36	Pass	401
87.5	118	0.1	Peak	104	-62.39	-54	Pass	611
118	174	0.1	Peak	144	-64.98	-36	Pass	1121
174	230	0.1	Peak	192	-64	-54	Pass	1121
230	470	0.1	Peak	234	-66.74	-36	Pass	4801
470	694	0.1	Peak	587.05	-69.74	-54	Pass	4481
694	1000	0.1	Peak	826.35	-66.06	-36	Pass	6121
1000	2398	1	Peak	2368.5	-53.91	-30	Pass	2797
2485.5	12750	1	Peak	4850	-47.87	-30	Pass	20530

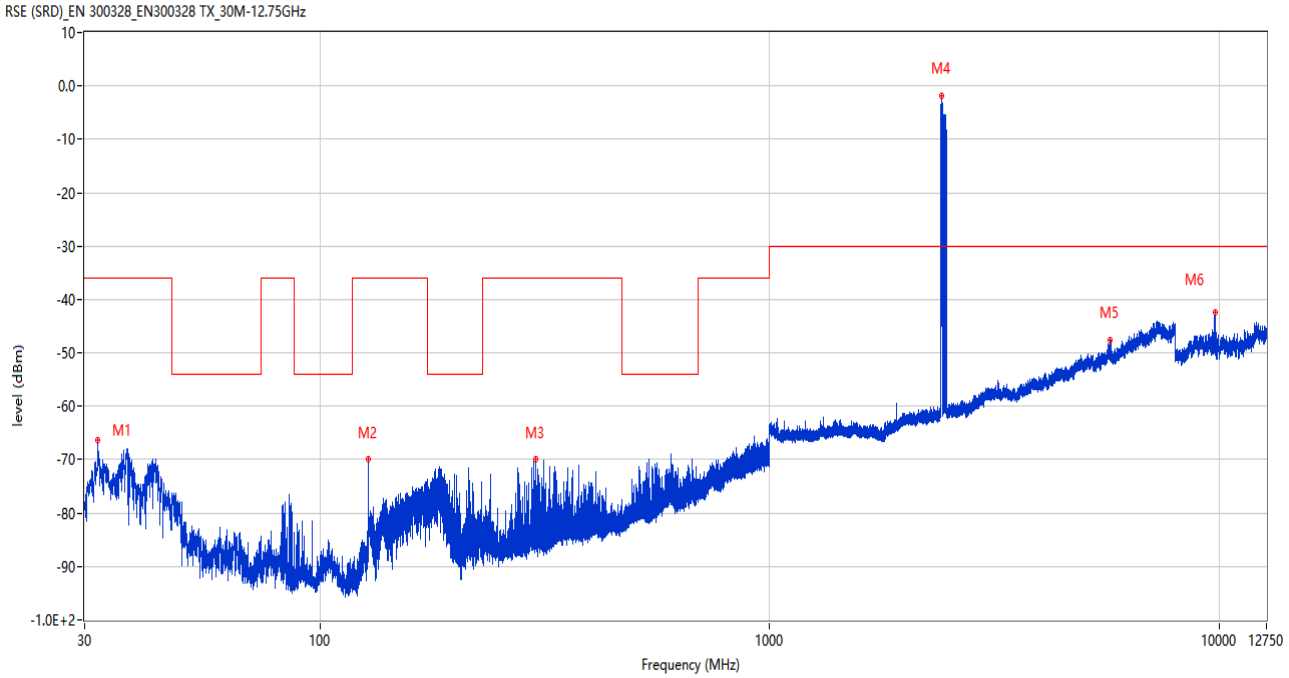
Cabinet Radiated Test Data

30 MHz to 12.75 GHz, ANT H



Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
31.455	-85.49	-21.50	-36.0	-49.49	271.00	Horizontal	Horizontal	Pass
86.163	-72.37	-21.39	-36.0	-36.37	212.00	Horizontal	Horizontal	Pass
336.132	-68.50	-11.35	-36.0	-32.50	41.00	Horizontal	Horizontal	Pass
2452.000	-4.95	2.02	-30.0	25.05	244.00	Horizontal	Horizontal	N/A
7303.250	-44.05	18.03	-30.0	-14.05	285.00	Horizontal	Horizontal	Pass
9704.300	-39.66	14.95	-30.0	-9.66	333.00	Horizontal	Horizontal	Pass

30 MHz to 12.75 GHz, ANT V



Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
32.085	-66.34	-22.31	-36.0	-30.34	170.00	Vertical	Vertical	Pass
128.406	-69.99	-22.32	-36.0	-33.99	87.00	Vertical	Vertical	Pass
302.328	-69.85	-12.94	-36.0	-33.85	216.00	Vertical	Vertical	Pass
2416.100	-1.96	0.85	-30.0	28.04	235.00	Vertical	Vertical	N/A
5738.250	-47.54	13.16	-30.0	-17.54	197.00	Vertical	Vertical	Pass
9788.375	-42.49	16.33	-30.0	-12.49	57.00	Vertical	Vertical	Pass

A.11 Receiver Spurious Emissions

Note [1]: The test method choose the conducted method. Which power in a specified load (conducted spurious emissions) and their effective radiated power when radiated by the cabinet or structure of the equipment (cabinet radiation).

Note [2]: The Frequency band was pre-scanned, the harmonic and other spurious which worst frequency are recorded in the report.

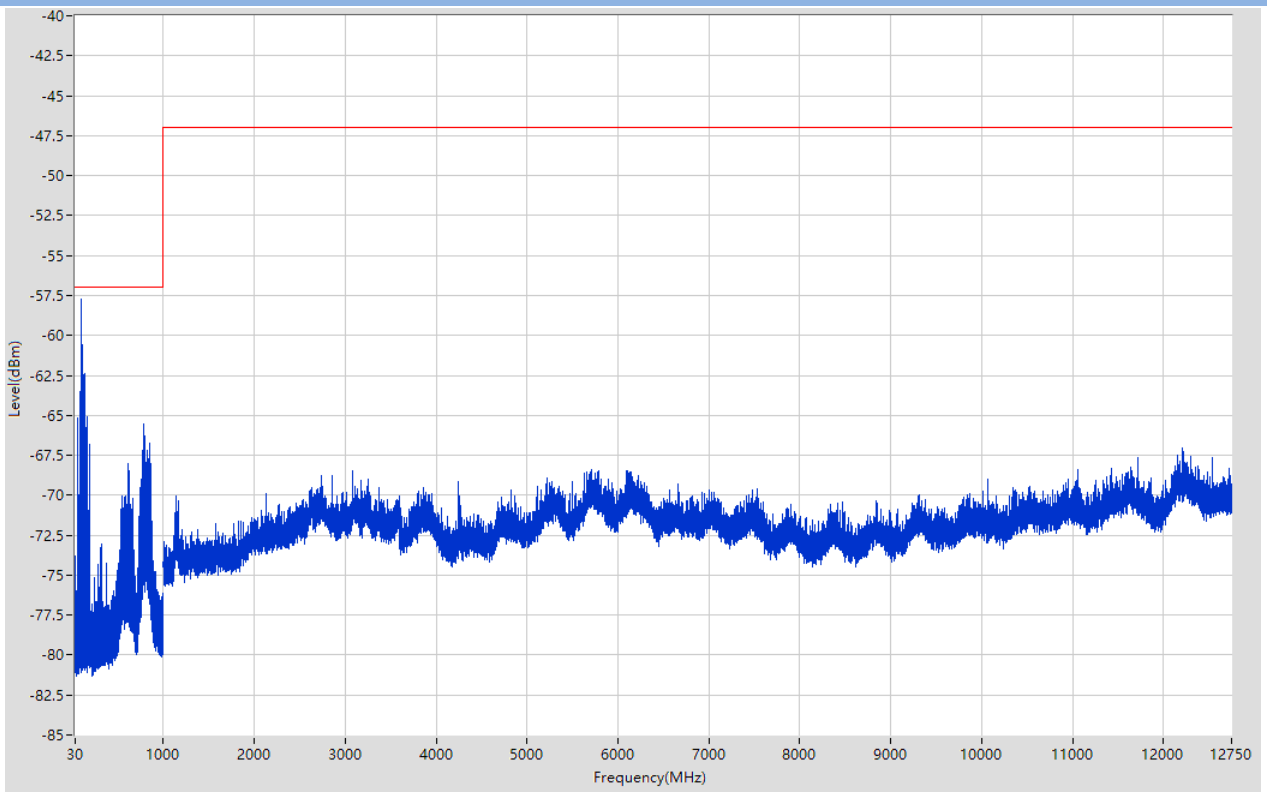
Note [3]: The cabinet radiated test data is tested in the normal working mode of the product.

Measuring Parameter

Frequency Range		
30 MHz to 1 000 MHz	RBW (MHz)	100 kHz
	VBW (MHz)	300 kHz
	Sweep points	19400
	Detector mode	Peak
	Trace mode	Max Hold
1 GHz to 12,75 GHz	RBW (MHz)	1 MHz
	VBW (MHz)	3 MHz
	Sweep points	23500
	Detector mode	Peak
	Trace mode	Max Hold

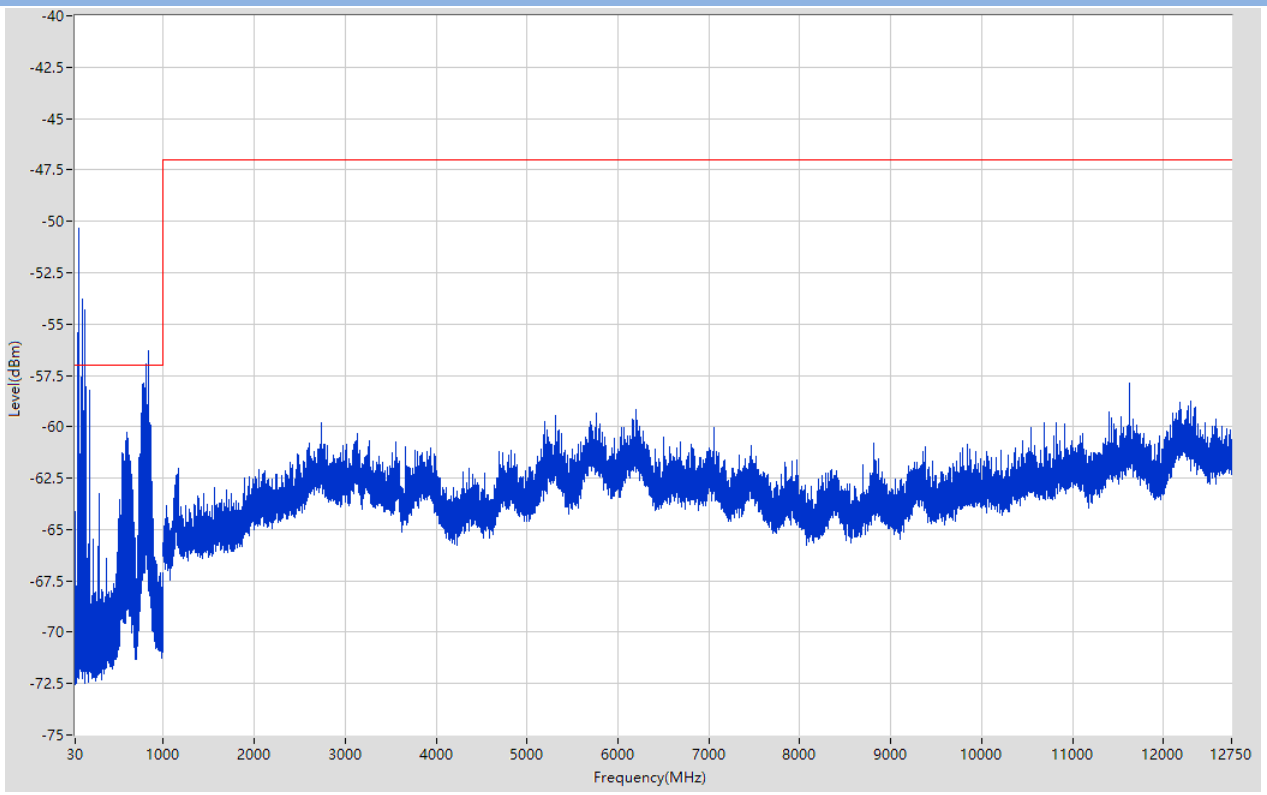
Conducted Test Data

GFSK 30 MHz to 12.75 GHz



Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	1000	0.1	Peak	96.05	-57.71	-57	N/A	19401
			RMS		-63.58		Pass	30000
1000	12750	1	Peak	12207.5	-67.04	-47	Pass	23501

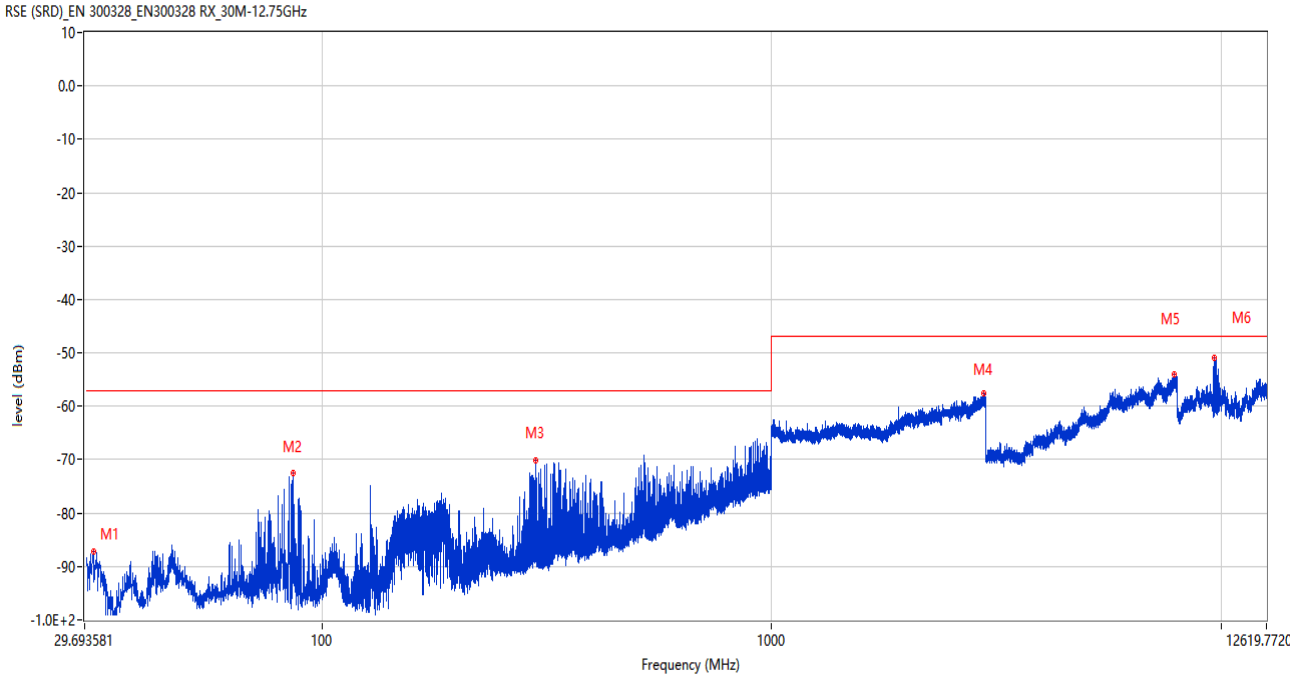
8-DPSK 30 MHz to 12.75 GHz



Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	1000	0.1	Peak	71.95	-50.35	-57	N/A	19401
			RMS		-70.29		Pass	30000
1000	12750	1	Peak	11633.5	-57.88	-47	Pass	23501

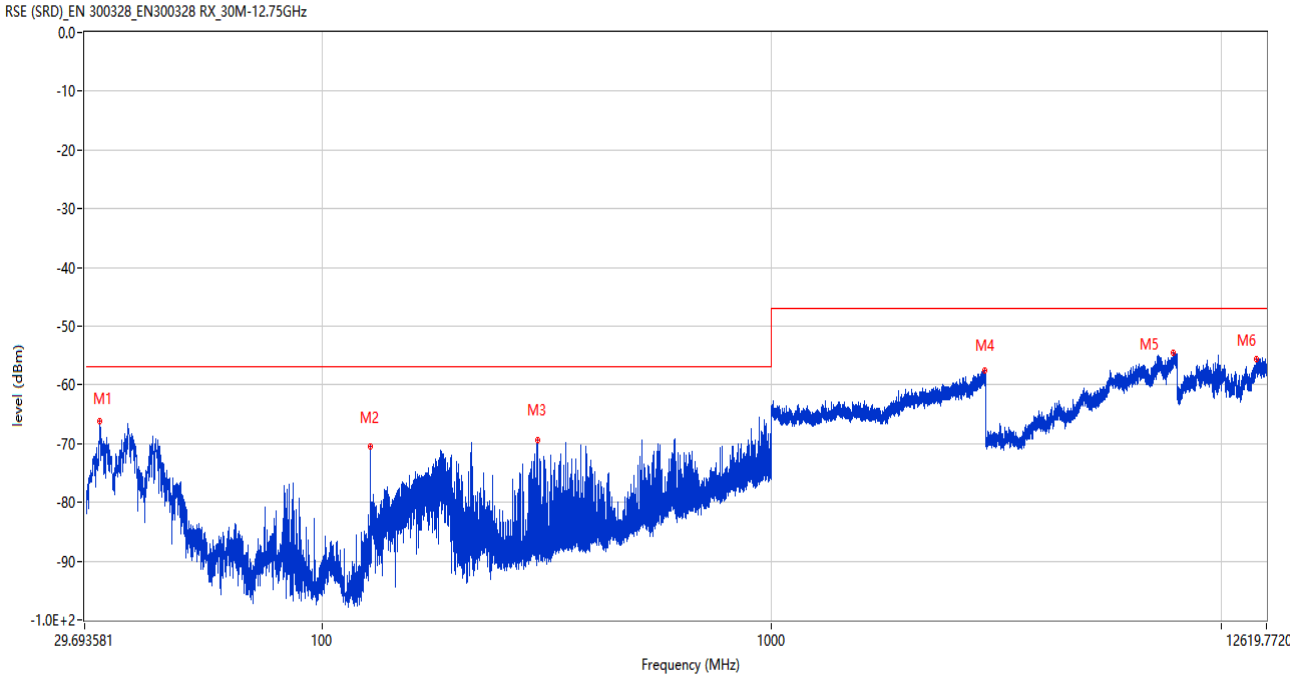
Cabinet Radiated Test Data

30 MHz to 12.75 GHz, ANT H



Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
31.116	-87.29	-21.06	-57.0	-30.29	314.00	Horizontal	Horizontal	Pass
86.163	-72.54	-21.39	-57.0	-15.54	359.00	Horizontal	Horizontal	Pass
299.272	-70.18	-12.92	-57.0	-13.18	190.00	Horizontal	Horizontal	Pass
2968.600	-57.64	5.36	-47.0	-10.64	218.00	Horizontal	Horizontal	Pass
7856.000	-54.06	8.88	-47.0	-7.06	51.00	Horizontal	Horizontal	Pass
9672.237	-51.04	3.72	-47.0	-4.04	258.00	Horizontal	Horizontal	Pass

30 MHz to 12.75 GHz, ANT V



Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
32.134	-66.11	-22.37	-57.0	-9.11	260.00	Vertical	Vertical	Pass
128.455	-70.48	-22.32	-57.0	-13.48	92.00	Vertical	Vertical	Pass
301.552	-69.30	-12.93	-57.0	-12.30	245.00	Vertical	Vertical	Pass
2986.300	-57.54	4.94	-47.0	-10.54	17.00	Vertical	Vertical	Pass
7830.750	-54.43	8.17	-47.0	-7.43	97.00	Vertical	Vertical	Pass
11977.175	-55.64	6.42	-47.0	-8.64	360.00	Vertical	Vertical	Pass

A.12 Receiver Blocking

For Bluetooth (For Classic)

Note 1: Blocking signal levels specified are levels in front of the UUT antenna. In case of conducted measurements, the levels corrected by the actual antenna assembly gain.

Note 2: During the Blocking test, the number of packets sent by the system is 1000.

Test Data:

Receiver Category 2 equipment

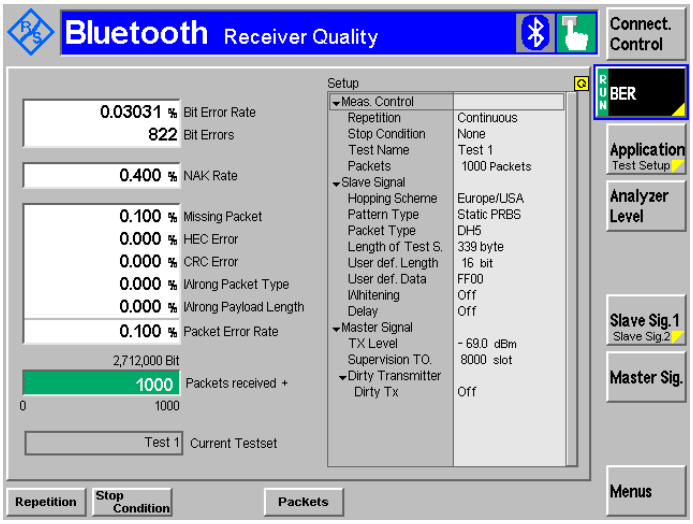
Wanted signal mean power from companion device (dBm)	Blocking signal Frequency (MHz)	Blocking signal power (dBm)	PER Result	Limit	Verdict
			Hopping channel		
-139 dBm + 10 × $\log_{10}$(OCBW) + 10 dB	2 380	-34	0.00%	≦10%	Pass
	2 504	-34	0.00%		
	2 300	-34	0.10%		
	2 584	-34	0.00%		

Test Plot (PER)

Note: All the configuration were tested, but only the worst PER Plot were reported in this report.

For Bluetooth (For Classic)

Hopping Mode



ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ2170989-AR.pdf”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ2170989-AW.pdf”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ2170989-AI.pdf”.

ANNEX E INFORMATIVE

Application form for testing please refer to the document “BL-SZ2170989-AM.pdf”.

--END OF REPORT--