Shenzhen Huatongwei International Inspection Co., Ltd.
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TEST REPORT

Report Reference No. ..... :	**TRE1603019106**	R/C…….: 14043
Applicant's name ..... :	**Vonino Electronics Limited**	
Address.....:	Miramar Tower 10F - no1010, 132 Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong	
Manufacturer.....:	Vonino Electronics Limited	
Address.....:	Miramar Tower 10F - no1010, 132 Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong	
Test item description ..... :	**XAVY L8 / Epic M8**	
Trade Mark .....:	vonino	
Model/Type reference.....:	T8S	
Listed Model(s) .....:	-	
Standard ..... :	**ETSI EN 300 328 V1.9.1: 2015-02**	
Date of receipt of test sample……..:	Mar 29, 2016	
Date of testing……:	Mar 30, 2016- Apr 20, 2016	
Date of issue……...:	Apr 20, 2016	
Result..... ……..:	**PASS**	

Compiled by (position+printed name+signature)..:	File administrators Shayne Zhu	Shayne Zhu
Supervised by (position+printed name+signature)..:	Project Engineer Lion Cai	Lion Cai
Approved by (position+printed name+signature)..:	RF Manager Hans Hu	Hans Hu

Testing Laboratory Name ..... :	**Shenzhen Huatongwei International Inspection Co., Ltd**
Address.....:	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1. TEST STANDARDS AND TEST DESCRIPTION

1.1. Test Standards

The tests were performed according to following standards:

ETSI EN 300 328V1.9.1(2015-02)–Electromagnetic compatibility and Radio spectrum Matters (ERM);Wideband transmission systems; Data transmission equipment operatingin the 2,4 GHz ISM band and using wide band modulation techniques; Harmonized ENcovering the essential requirementsof article 3.2 of the R&TTE Directive

1.2. Test Description

Test item	Standards requirement	Result
RF output power	ETSI EN 300 328 Sub-clause 4.3.1.2	Pass
Duty Cycle, Tx-sequence, Tx-gap	ETSI EN 300 328 Sub-clause 4.3.1.3	N/A
Accumulated Transmit Time, Minimum Frequency Occupation and Hopping Sequence	ETSI EN 300 328 Sub-clause 4.3.1.4	Pass
Hopping Frequency Separation	ETSI EN 300 328 Sub-clause 4.3.1.5	Pass
Medium Utilisation (MU) factor	ETSI EN 300 328 Sub-clause 4.3.1.6	N/A
Adaptivity	ETSI EN 300 328 Sub-clause 4.3.1.7	N/A
Occupied Channel Bandwidth	ETSI EN 300 328 Sub-clause 4.3.1.8	Pass
Transmitter unwanted emissions in the out-of-band domain	ETSI EN 300 328 Sub-clause 4.3.1.9	Pass
Transmitter unwanted emissions in the spurious domain	ETSI EN 300 328 Sub-clause 4.3.1.10	Pass
Receiver spurious emissions	ETSI EN 300 328 Sub-clause 4.3.1.11	Pass
Receiver Blocking	ETSI EN 300 328 Sub-clause 4.3.1.12	N/A
Geo-location capability	ETSI EN 300 328 Sub-clause 4.3.1.13	N/A

Remark: The measurement uncertainty is not included in the test result.
N/A is an abbreviation for Not Applicable and means this test item is not applicable for this device according to the technology characteristic of device.

2. SUMMARY

2.1. Client Information

Applicant:	Vonino Electronics Limited
Address:	Miramar Tower 10F - no1010, 132 Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong
Manufacturer:	Vonino Electronics Limited
Address:	Miramar Tower 10F - no1010, 132 Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong

2.2. Product Description

Name of EUT	XAVY L8 / Epic M8
Trade Mark:	vonino
Model No.:	T8S
Listed Model(s):	-
Power supply:	DC 3.7V From internal battery
Adapter information:	Model:FJ-SW728L0502000UE Input:AC 100-240V,50/60Hz 0.4A Max Output: 5Vd.c., 2000mA
Bluetooth	
Version:	Supported BT4.0+EDR
Modulation:	GFSK, π/4QPSK, 8DPSK
Operation frequency:	2402MHz~2480MHz
Channel number:	79
Channel separation:	1MHz
Antenna type:	Internal Antenna

Operation Frequency (bluetooth)

Channel	Frequency (MHz)
0	**2402**
1	2403
⋮	. . .
38	2440
39	**2441**
40	2442
⋮	⋮
77	2479
78	**2480**

Technical index for Bluetooth	
Supported type:	Bluetooth 4.0+EDR
Operation frequency:	2402MHz~2480MHz
Channel number:	79
Channel separation:	1MHz
Modulation:	☒ FHSS ☐ Other forms of modulation GFSK
Type of Equipment:	☒ Stand-alone ☐ Combined Equipment ☐ Plug-in radio device ☐ Other
Adaptive / non-adaptive equipment	☐ non-adaptive Equipment ☐ adaptive Equipment without the possibility to switch to a non-adaptive mode ☒ adaptive Equipment which can also operate in a non-adaptive mode
Operating mode:	☒ Single Antenna Equipment ☒ Equipment with only 1 antenna ☐ Equipment with 2 diversity antennas but only 1 antenna active at any moment in time ☐ Smart Antenna Systems with 2 or more antennas, but operating in a (legacy) mode where only 1antenna is used.
	☐ Smart Antenna Systems - Multiple Antennas without beam forming ☐ Single spatial stream / Standard throughput ☐ High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 1 ☐ High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 2
	☐ Smart Antenna Systems - Multiple Antennas with beam forming ☐ Single spatial stream / Standard throughput ☐ High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 1 ☐ High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 2
Antenna type:	☒ Integral Antenna ☐ Temporary RF connector provided ☒ No temporary RF connector provided Antenna Gain: ....1.2.... dBi Beamforming gain: ....0.....dB
	☐ Dedicated Antennas (equipment with antenna connector) ☐ Single power level with corresponding antenna(s) ☐ Multiple power settings and corresponding antenna(s) Number of different Power Levels: ..... Power Level 1: ..... dBm Power Level 2: ..... dBm Power Level 3: ..... dBm

Information is provided by the supplier	
In case of FHSS modulation:	☐ In case of non-Adaptive Frequency Hopping equipment: The number of Hopping Frequencies: ……..
	☐ In case of Adaptive Frequency Hopping Equipment: The maximum number of Hopping Frequencies: …….. The minimum number of Hopping Frequencies: ……..
	The Dwell Time: ……..
	The Minimum Channel Occupation Time: ……..
In case of adaptive equipment:	The Channel Occupancy Time implemented by the equipment: ../.. ms
	☒ The equipment has implemented an LBT based DAA mechanism In case of equipment using modulation different from FHSS: ☐ The equipment is Frame Based equipment ☒ The equipment is Load Based equipment ☐ The equipment can switch dynamically between Frame Based and Load Based equipment The CCA time implemented by the equipment: .... µs
	☐ The equipment has implemented an non-LBT based DAA mechanism
	☐ The equipment can operate in more than one adaptive mode
In case of non-adaptive Equipment	The maximum RF Output Power (e.i.r.p.): ……. dBm The maximum (corresponding) Duty Cycle: ……. %

The worst case operational mode for each of the following tests:	
RF Output Power	7.31 dBm
Occupied Channel Bandwidth	0.976MHz
Transmitter unwanted emissions in the OOB domain	Reference to section 4.5
Transmitter unwanted emissions in the spurious domain	Reference to section 4.6
Receiver spurious emissions	Reference to section 4.7
☒ FHSS	
Dwell time:	
Minimum FrequencyOccupation:	
Hopping Sequence:	
Hopping Frequency Separation	
☐ Other	
Power Spectral Density:	
☒ Adaptive equipment	
Adaptivity:	-
Receiver Blocking:	-
☐ Non-adaptiveequipment	
Duty cycle:	
Tx-Sequence:	
Tx-gap:	
Medium Utilisation:	

2.3. EUT operation mode

The EUT has been tested under typical operating condition. The Applicant provides software to control the EUT for staying in continous transmitting and receiving mode for testing.

2.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

		Length (m) :	/
		Shield :	/
		Detachable :	/
		Manufacturer :	/
		Model No. :	/

2.5. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Laboratory:Shenzhen Huatongwei International Inspection Co., Ltd.
Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China
Phone: 86-755-26748019 Fax: 86-755-26748089

3.2. Test Facility

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

CNAS-Lab Code: L1225
Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: February 28, 2015. Valid time is until February 27, 2018.

A2LA-Lab Cert. No. 3902.01
Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until December 31, 2016.

FCC-Registration No.: 317478
Shenzhen Huatongwei International Inspection 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 317478, Renewal date Jul. 18, 2014, valid time is until Jul. 18, 2017.

IC-Registration No.: 5377A&5377B
The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377A on Dec. 31, 2013, valid time is until Dec. 31, 2016.
Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377B on Dec.03, 2014, valid time is until Dec.03, 2017.

ACA
Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

VCCI
Radiated disturbance above 1GHz measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-292. Date of Registration: Dec. 24, 2013. Valid time is until Dec. 23, 2016.
Telecommunication Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-1837. Date of Registration: May 07, 2013. Valid time is until May 06, 2016.

DNV
Shenzhen Huatongwei International Inspection Co., Ltd. has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025 (2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until Aug. 24, 2016.

3.3. Environmental conditions

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

Temperature	Normal Temperature/Tnor:	25°C
	High Temperature/Thigh:	55°C
	Low Temperature/Tlow:	-20°C
Voltage	Normal Voltage	DC 3.70V
	High Voltage	DC 4.25V
	Low Voltage	DC 3.50V
Other	lative Humidity	55 %
	Air Pressure	989 hPa

3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 1" and TR-100028-02 "Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 2 " and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Frequency error	25 Hz	(1)
Frequency range	25 Hz	(1)
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Adjacent and alternate channel power Conducted	1.20 dB	(1)
Conducted spurious emission	1.60 dB	(1)
Radiated spurious emission	2.20 dB	(1)
Intermodulation attenuation	1.00 dB	(1)
Maximum useable receiver sensitivity	2.80 dB	(1)
Co-channel rejection	2.80 dB	(1)
Adjacent channel selectivity	2.80 dB	(1)
Spurious response rejection	2.80 dB	(1)
Intermodulation response rejection	2.80 dB	(1)
Blcking or desensitization	2.80 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

3.5. Equipments Used during the Test

TS8997						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	Signal generator	R&S	SMB100A	177956	11/3/2015	11/2/2016
2	Signal and spectrum analyzer	R&S	FSV40	100048	11/3/2015	11/2/2016
3	OSP	R&S	OSP120	101317	11/3/2015	11/2/2016
4	OSP	R&S	OSP-B157	100890	11/3/2015	11/2/2016
5	Climate Chamber	ESPEC	EL-10KA	05107008	11/3/2015	11/2/2016
6	POWER SUPPLY	R&S	NGMO1	1504.8420	11/3/2015	11/2/2016
7	Vector signal generator	R&S	SMBV100A	260790	11/3/2015	11/2/2016

The Cal. Interval was one year

4. TEST CONDITIONS AND RESULTS

4.1. RF output power

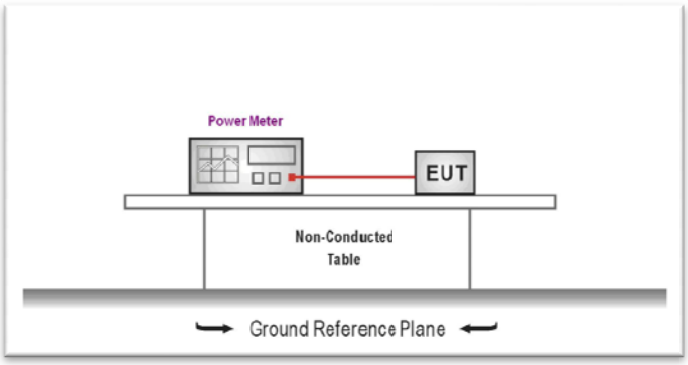
LIMIT

ETSI EN 300 328 Sub-clause 4.3.1.2.3

The maximum RF output power for adaptive Frequency Hopping equipment shall be equal to or less than 20 dBm.
The maximum RF output power for non-adaptive equipment shall be declared by the supplier and shall not exceed 20 dBm. See clause 5.3.1 m). For non-adaptive equipment using wide band modulations other than FHSS, the maximum RF output power shall be equal to or less than the value declared by the supplier.

This limit shall apply for any combination of power level and intended antenna assembly.

TEST CONFIGURATION



TEST PROCEDURE

Refer to ETSI EN 300 328 Sub-clause 5.3.2.2
Power Meter: sample speed 1MS/s
Test bursts: 600.

TEST RESULTS

Hopping Mode					
Test conditions		*Modulation*	*EIRP (dBm)*	*Limit (dBm)*	*Result*
Temperature (℃)	*Voltage (V)*				
Tnor=25	*3.70*	*GFSK*	7.17	*20.00*	*Pass*
		π/4QPSK	4.15		
		8DPSK	3.25		
Tlow=-20	*3.50*	*GFSK*	7.08		
		π/4QPSK	4.07		
		8DPSK	3.15		
	4.25	*GFSK*	7.31		
		π/4QPSK	4.23		
		8DPSK	3.34		
Thigh=+55	*3.50*	*GFSK*	7.07		
		π/4QPSK	4.07		
		8DPSK	3.13		
	4.25	*GFSK*	7.24		
		π/4QPSK	4.25		
		8DPSK	3.36		

Note :
1. Measured Power include the cable loss.

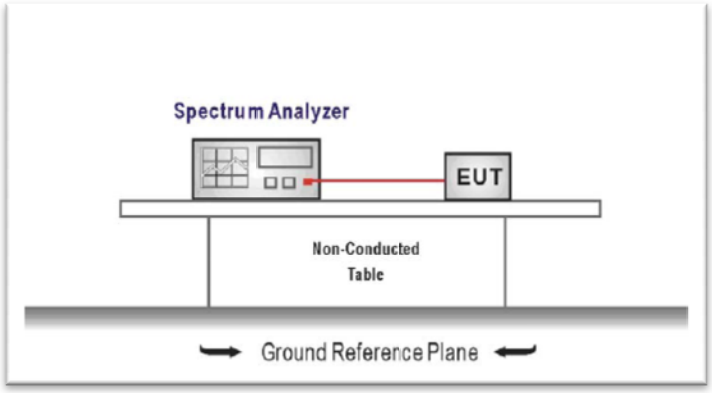
4.2. Accumulated Transmit Time, Minimum Frequency Occupation and Hopping Sequence

LIMIT

ETSI EN 300 328 Sub-clause 4.3.1.4.3

-Adaptive Frequency Hopping systems shall be capable of operating over a minimum of 70 % of the band specified in
clause 1.
-The maximum accumulated dwell time on any hopping frequency shall be 400 ms within any 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 at all times, where N is 15 or 15 divided by the
-minimum Hopping Frequency Separation in MHz, whichever is the greater.
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

TEST CONFIGURATION



TEST PROCEDURE

1.Please refer to ETSI EN 300 328 Sub-clause5.1 for the test conditions.
2.Please refer to ETSI EN 300 328 Sub-clause 5.3.4.2.1 for the measurement method.

Connect the UUT to the spectrum analyzer and use the following settings:

Centre Frequency	Equal to the hopping frequency being investigated
RBW	~ 50 % of the Occupied Channel Bandwidth (500KHz)
VBW	≥ RBW (500KHz)
Detector	RMS
sweep points	30 000
Trace	Clear / Write
Trigger	Free Run

TEST RESULTS

◆ **Accumulated Transmit Time**

Modulation	Channel	Packet	Accumulated Transmit Time (ms)	Limit (second)	Measurement Time(ms)	Result
GFSK	0	DH5	33.00	0.40	6000.00	Pass
	78		21.20		6000.00	
π/4QPSK	0	2DH5	71.20	0.40	6000.00	Pass
	78		71.80		6000.00	
8DPSK	0	3DH5	34.60	0.40	6000.00	Pass
	78		29.80		6000.00	

◆ **Frequency occupation**

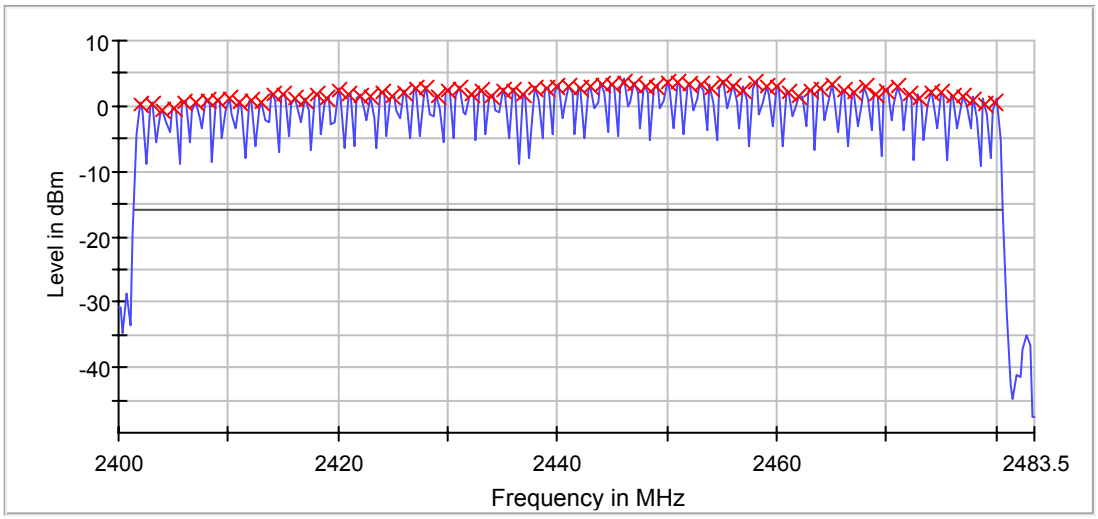
Modulation	Channel	Packet	Frequency Occupation(ms)	Limit (ms)	Measurement Time(ms)	Result
GFSK	0	DH5	27.02	>0	4740	Pass
	78		24.02		4740	
π/4QPSK	0	2DH5	46.61	>0	4740	Pass
	78		61.15		4740	
8DPSK	0	3DH5	18.17	>0	4740	Pass
	78		17.06		4740	

◆ **Hopping Sequence**

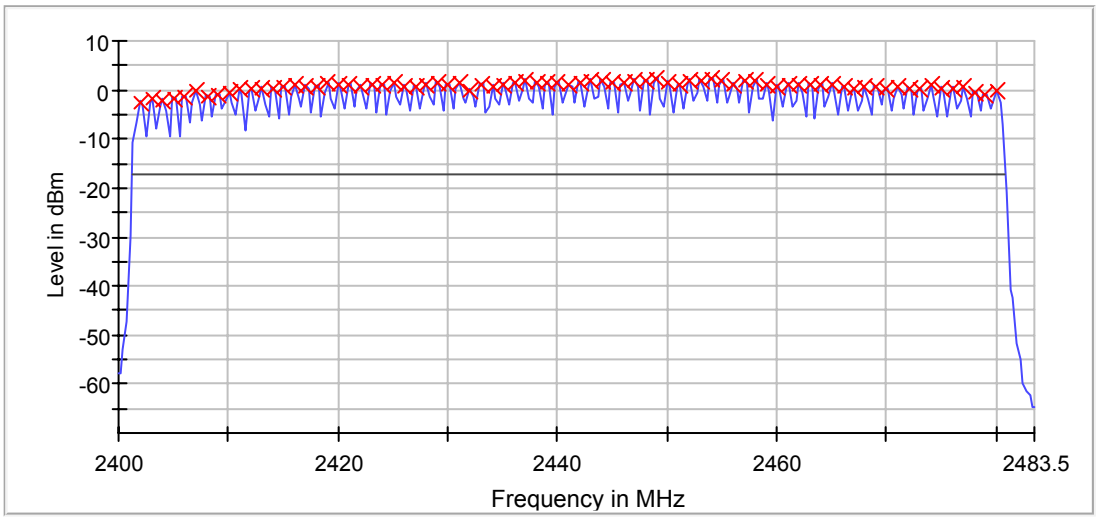
Modulation	Number of Hopping Frequencies	Limit	Band Allocation(%)	Limit Band Allocation(%)	Result
GFSK	79	≥15	94.88	≥70%	Pass
π/4QPSK	79	≥15	95.36		
8DPSK	79	≥15	95.36		

Test plot as follows:

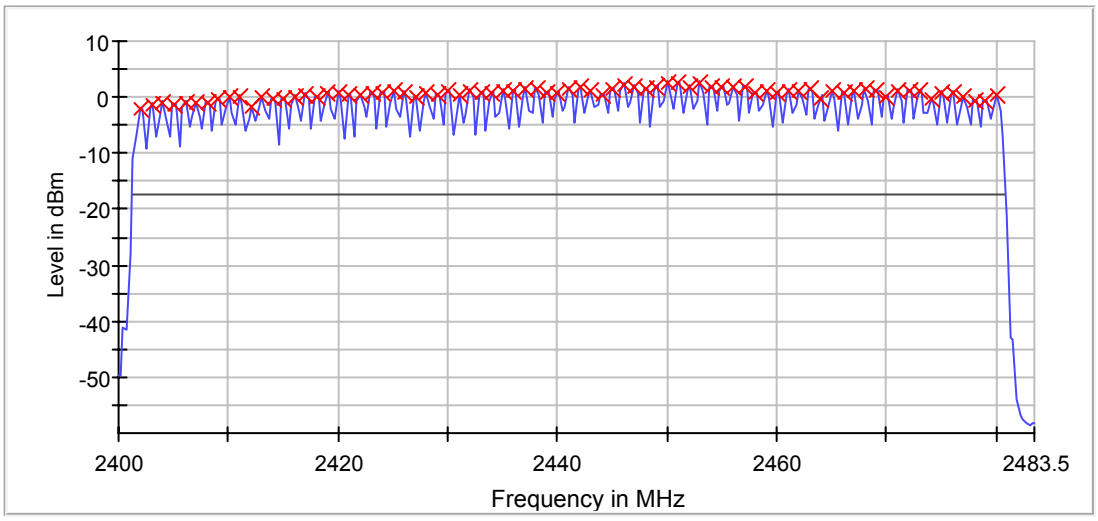
GFSK Modulation



π/4QPSK



8DPSK



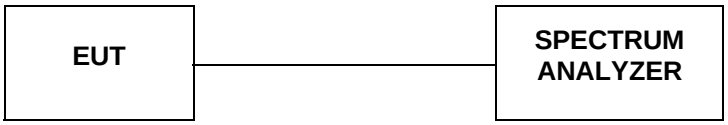
4.3. Hopping Frequency Separation

LIMIT

ETSI EN 300 328 Sub-clause 4.3.1.5.3

- The minimum Hopping Frequency Separation shall be equal to Occupied Channel Bandwidth (see clause 4.3.1.7) of a single hop, with a minimum separation of 100 kHz.

TEST CONFIGURATION



TEST PROCEDURE

1. Please refer to ETSI EN 300 328 Sub-clause 5.1 for the test conditions.
2. Please refer to ETSI EN 300 328 Sub-clause 5.3.5.2.1 for the measurement method.

Connect the UUT to the spectrum analyzer and use the following settings:

Centre Frequency	Equal to the hopping frequency being investigated
Span	Sufficient to see the complete power envelope of both hopping frequencies
RBW	1 % of the Span (30kHz)
VBW	⩾ RBW (100KHz)
Detector	RMS
Trace	Max hold
Sweep time	Auto

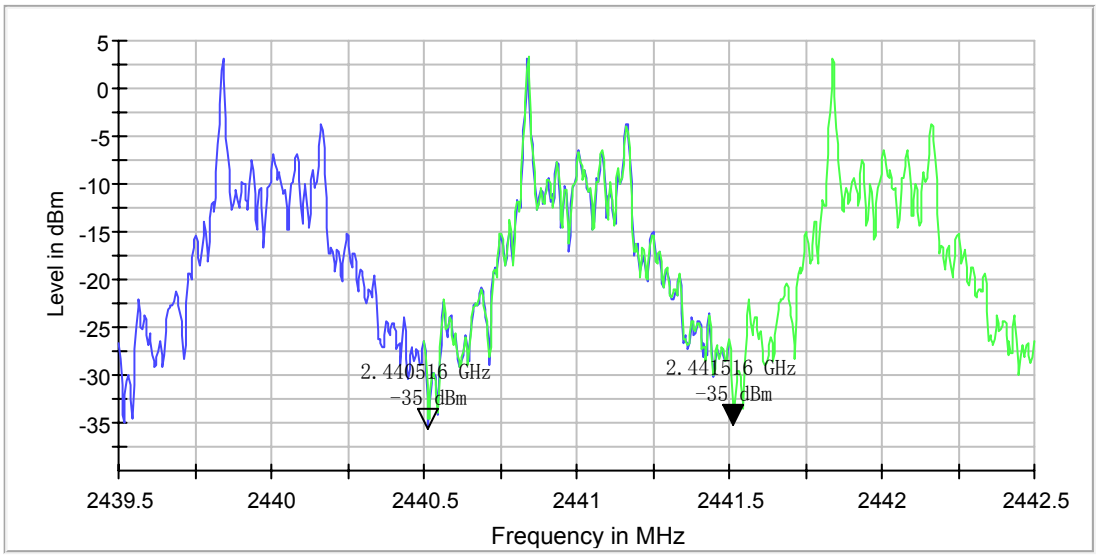
TEST RESULT

◆ **Channel separation**

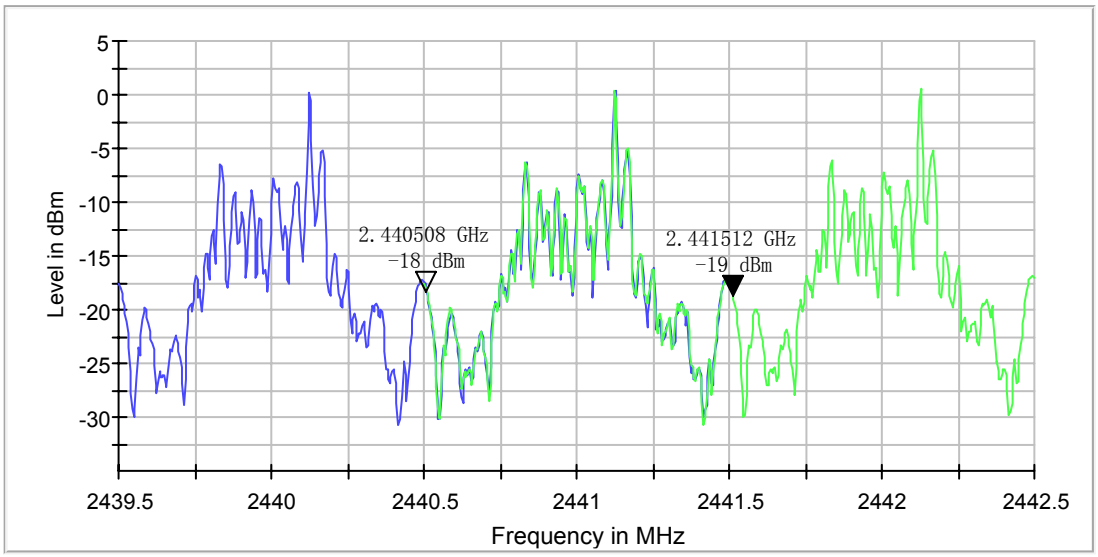
Modulation	Hopping Frequency Separation(MHz)	Limit(MHz)	Result
GFSK	1.000	>= 0.10	Pass
π/4QPSK	1.000	>= 0.10	Pass
8DPSK	1.000	>= 0.10	Pass

Test plot as follows:

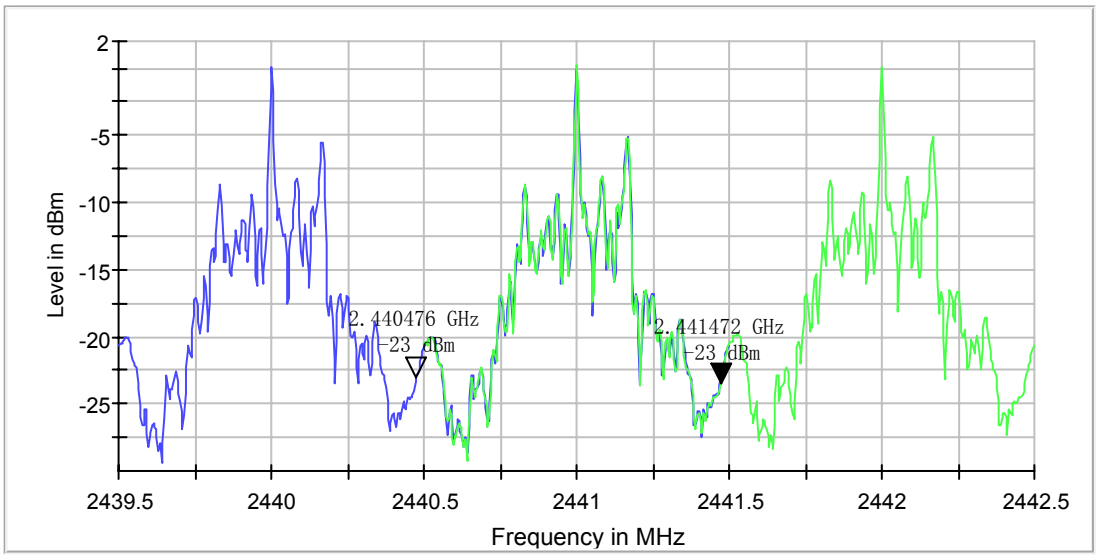
GFSK Modulation



π/4QPSK



8DPSK



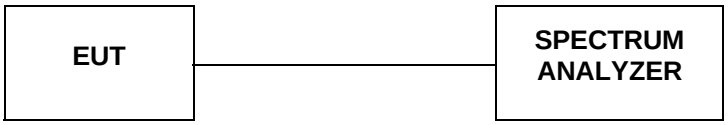
4.4. Occupied Channel Bandwidth

LIMIT

ETSI EN 300 328 Sub-clause 4.3.1.8.3

- The Occupied Channel Bandwidth for each hopping frequency shall fall completely within the band given in clause 1. For non-adaptive Frequency Hopping 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 the value declared by the supplier. This declared value shall not be greater than 5 MHz.

TEST CONFIGURATION



TEST PROCEDURE

1. Please refer to ETSI EN 300 328 Sub-clause 5.1 for the test conditions.
2. Please refer to ETSI EN 300 328 Sub-clause 5.3.8.2.1 for the measurement method.

Connect the UUT to the spectrum analyzer and use the following settings:

Centre Frequency	The centre frequency of the channel under test
Span	2× Occupied Channel Bandwidth
RBW	~1 % of the Span (30kHz)
VBW	⩾ RBW (100KHz)
Detector	RMS
Trace	Max hold

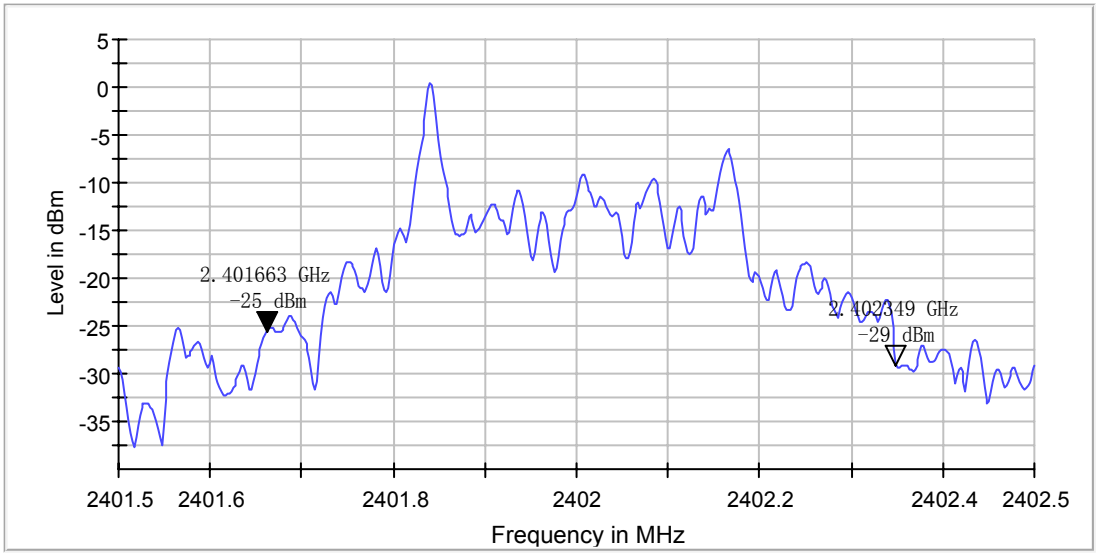
TEST RESULT

◆ Occupied Channel Bandwidth

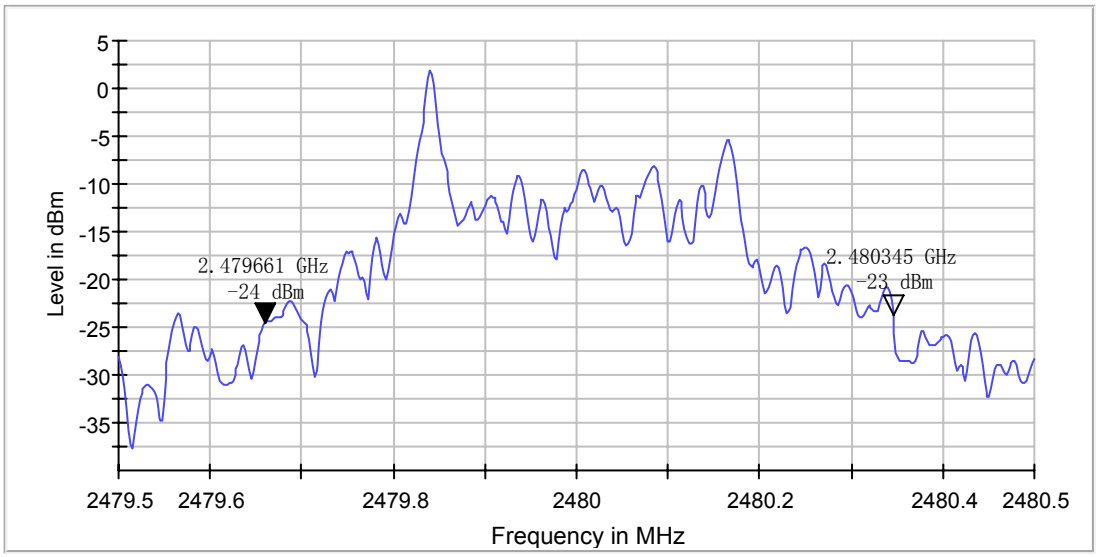
Modulation	Channel	Occupied Channel Bandwidth (MHz)	Result
GFSK	CH0	0.686	Pass
	CH78	0.684	
π/4QPSK	CH0	0.974	
	CH78	0.976	
8DPSK	CH0	0.944	
	CH78	0.942	

Test plot as follows:

GFSK Modulation



CH0



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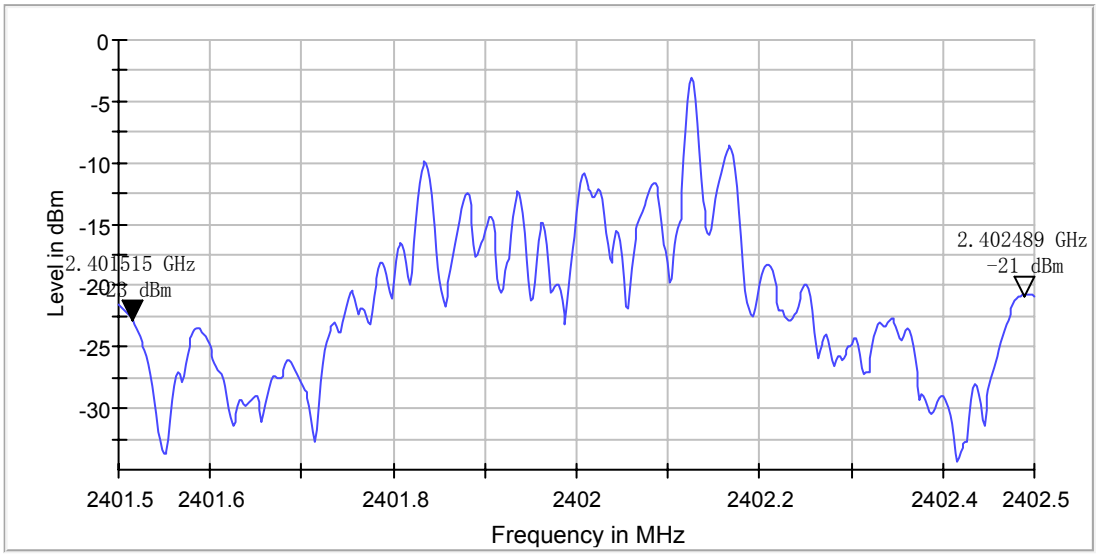
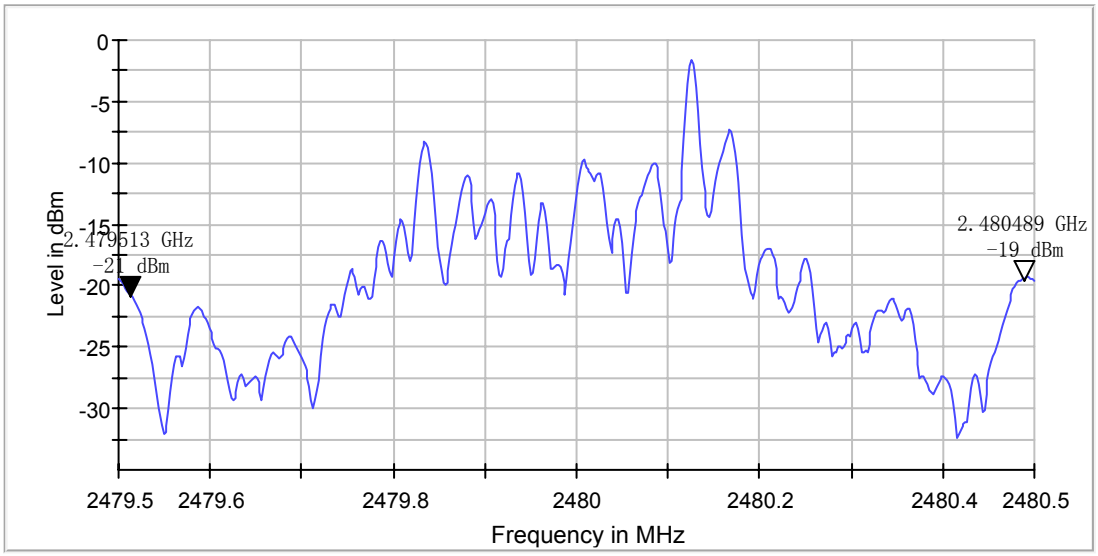
π/4QPSK Modulation

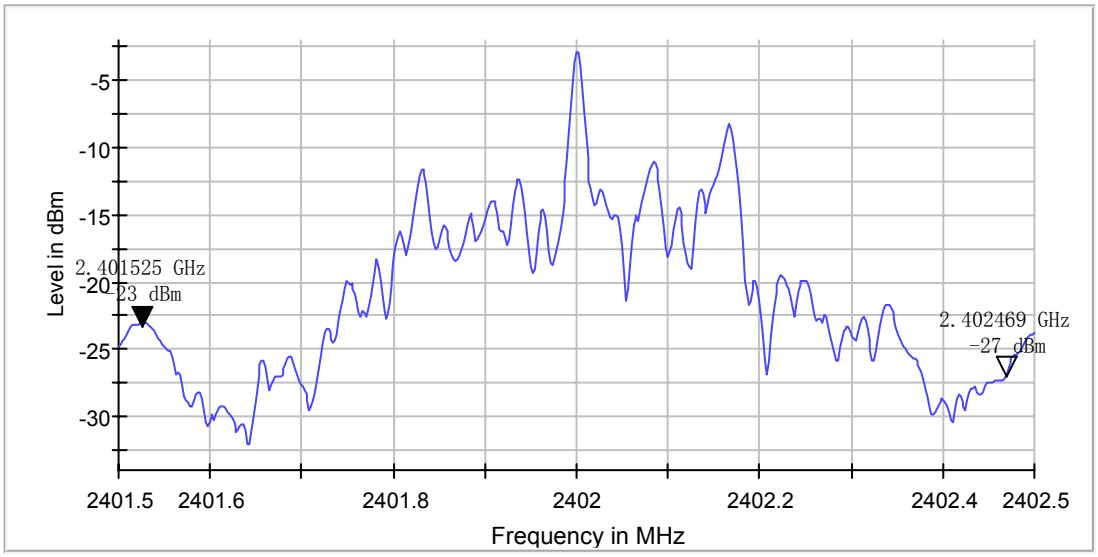


CH0

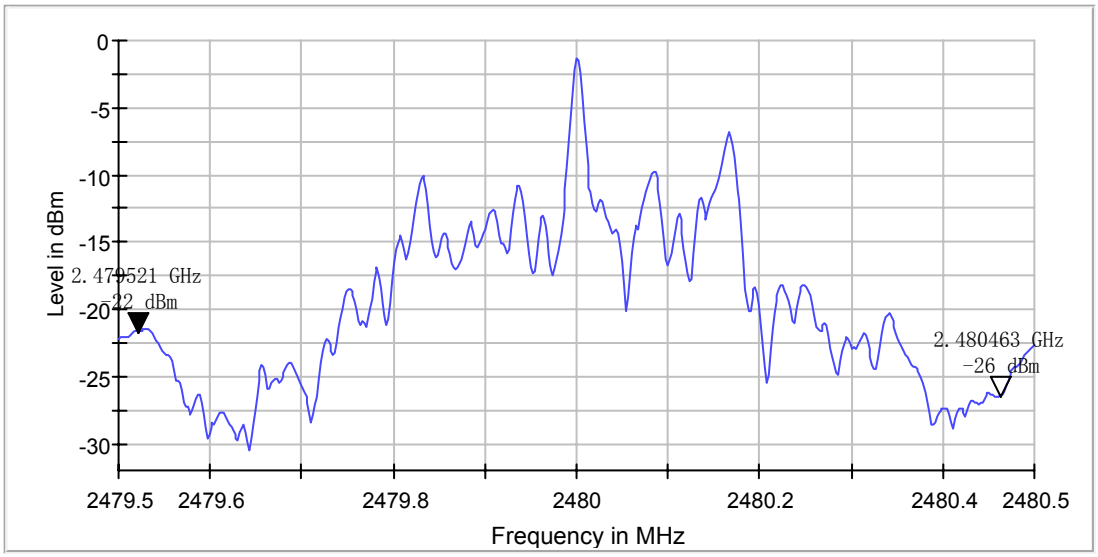


CH78

8DPSK Modulation



CH0



CH78

4.5. Transmitter unwanted emissions in the out-of-band domain

LIMIT

ETSI EN 300 328 Sub-clause 4.3.1.9.3

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

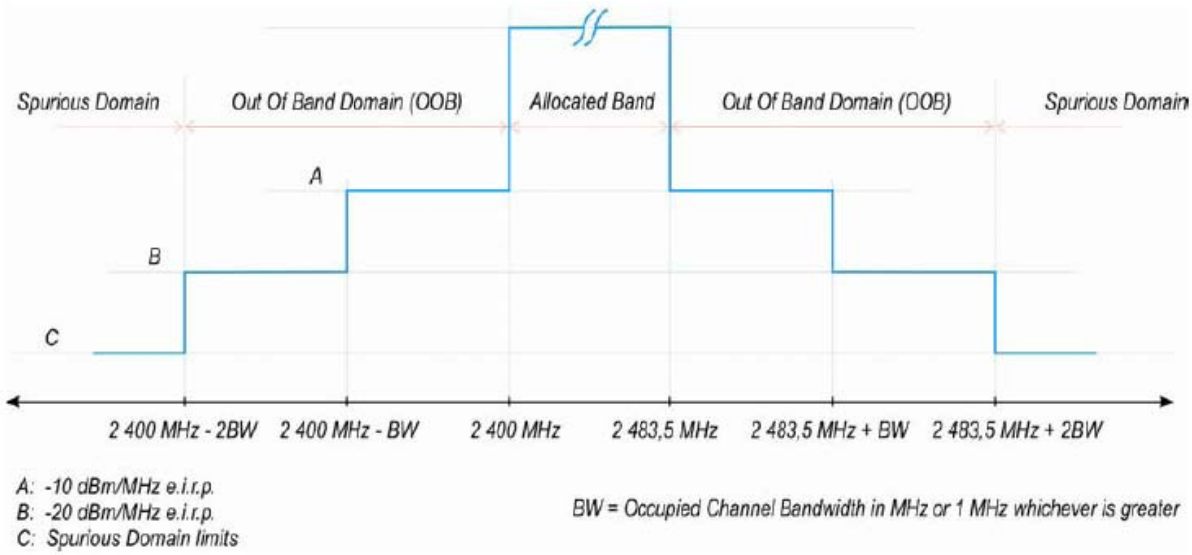
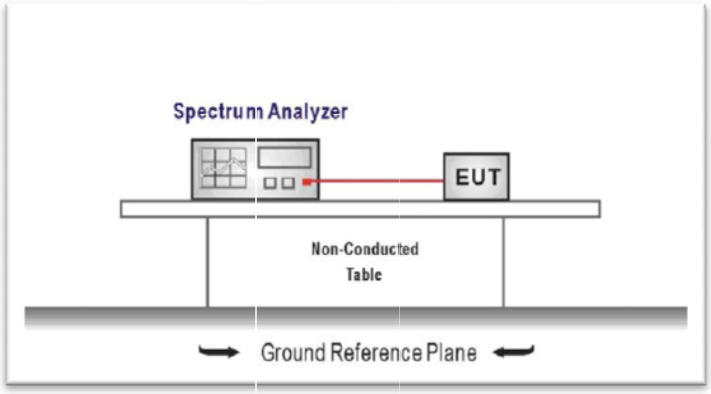


Figure 1: Transmit mask

TEST CONFIGURATION



TEST PROCEDURE

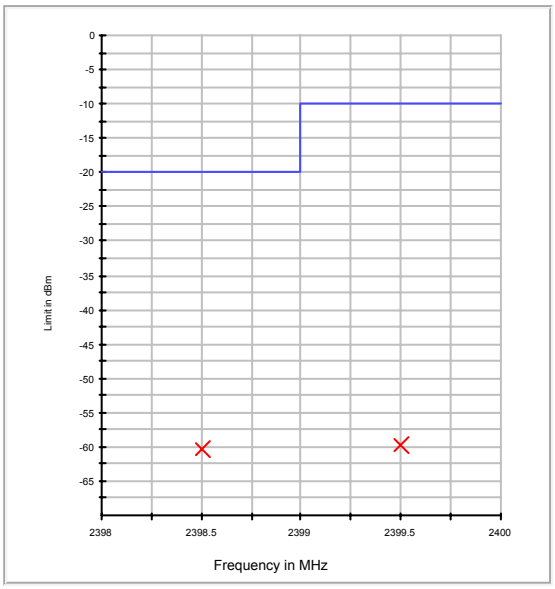
1. Please refer to ETSI EN 300 328 Sub-clause 5.1 for the test conditions.
2. Please refer to ETSI EN 300 328 Sub-clause 5.3.9.2 for the measurement method.

Connect the UUT to the spectrum analyzer and use the following settings:

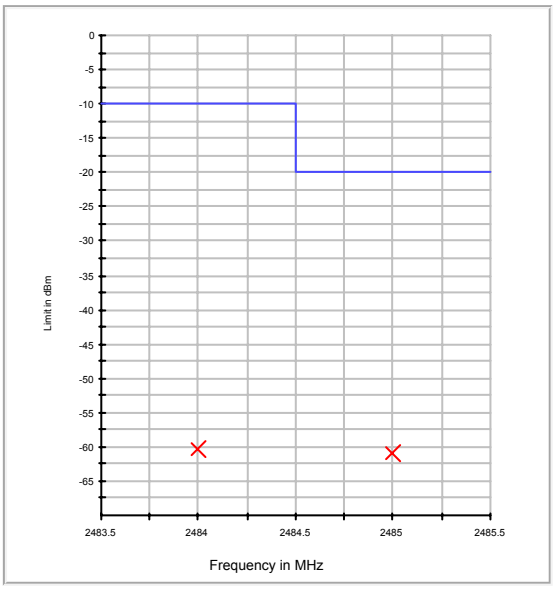
Centre Frequency	Equal to the frequency being investigated
Span	0Hz
RBW	1MHz
VBW	3MHz
Detector	RMS
Trace	Clear / Write
Trigger Mode	Video trigger

TEST RESULT

GFSK Modulation						
Test conditions		Frequency range (MHz)		Level (dBm)	Limit (dBm)	Result
Temperature (℃)	Voltage (V)	Start	Stop			
Tnor=25	3.70	2400-2OBW	2400-OBW	-60.02	<-20	Pass
		2400-OBW	2400	-59.87	<-10	Pass
		2484	2484+OBW	-60.12	<-10	Pass
		2484+OBW	2484+2OBW	-61.25	<-20	Pass
Tlow=-20	3.50	2400-2OBW	2400-OBW	-60.31	<-20	Pass
		2400-OBW	2400	-59.13	<-10	Pass
		2484	2484+OBW	-60.95	<-10	Pass
		2484+OBW	2484+2OBW	-62.08	<-20	Pass
	4.25	2400-2OBW	2400-OBW	-61.40	<-20	Pass
		2400-OBW	2400	-60.13	<-10	Pass
		2484	2484+OBW	-60.15	<-10	Pass
		2484+OBW	2484+2OBW	-61.34	<-20	Pass
Thigh=+55	3.50	2400-2OBW	2400-OBW	-61.57	<-20	Pass
		2400-OBW	2400	-60.61	<-10	Pass
		2484	2484+OBW	-59.60	<-10	Pass
		2484+OBW	2484+2OBW	-62.05	<-20	Pass
	4.25	2400-2OBW	2400-OBW	-60.72	<-20	Pass
		2400-OBW	2400	-61.24	<-10	Pass
		2484	2484+OBW	-62.51	<-10	Pass
		2484+OBW	2484+2OBW	-60.63	<-20	Pass



Left Side

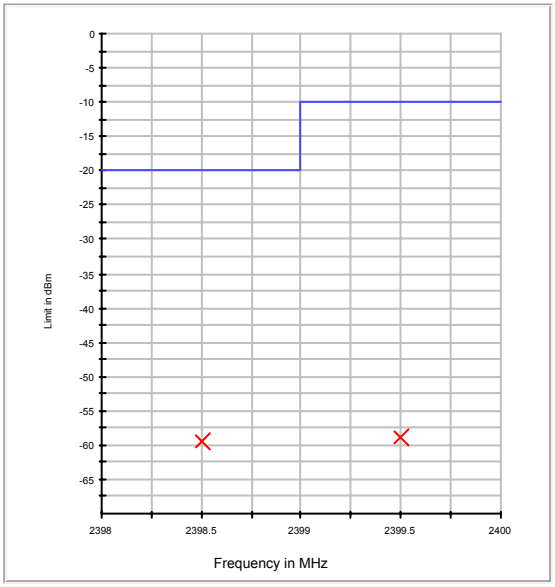


Right Side

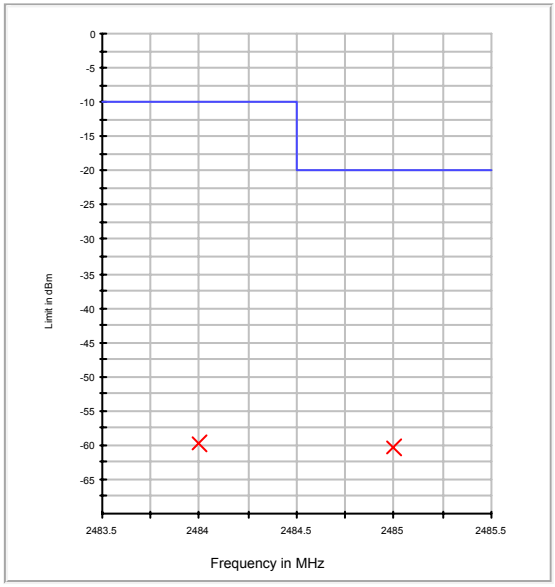
Note:

1. *Radiant level is far less than the limit, Only show the worst test result.*
2. *Only show the test plot on normal condition*

π/4QPSK Modulation						
Test conditions		Frequency range (MHz)		Level (dBm)	Limit (dBm)	Result
Temperature (℃)	Voltage (V)	Start	Stop			
Tnor=25	3.70	2400-2OBW	2400-OBW	-59.89	<-20	Pass
		2400-OBW	2400	-58.97	<-10	Pass
		2484	2484+OBW	-60.02	<-10	Pass
		2484+OBW	2484+2OBW	-60.05	<-20	Pass
Tlow=-20	3.50	2400-2OBW	2400-OBW	-60.18	<-20	Pass
		2400-OBW	2400	-58.23	<-10	Pass
		2484	2484+OBW	-60.85	<-10	Pass
		2484+OBW	2484+2OBW	-60.88	<-20	Pass
	4.25	2400-2OBW	2400-OBW	-61.27	<-20	Pass
		2400-OBW	2400	-59.23	<-10	Pass
		2484	2484+OBW	-60.05	<-10	Pass
		2484+OBW	2484+2OBW	-60.14	<-20	Pass
Thigh=+55	3.50	2400-2OBW	2400-OBW	-61.44	<-20	Pass
		2400-OBW	2400	-59.71	<-10	Pass
		2484	2484+OBW	-59.50	<-10	Pass
		2484+OBW	2484+2OBW	-60.85	<-20	Pass
	4.25	2400-2OBW	2400-OBW	-60.59	<-20	Pass
		2400-OBW	2400	-60.34	<-10	Pass
		2484	2484+OBW	-61.31	<-10	Pass
		2484+OBW	2484+2OBW	-60.50	<-20	Pass



Left Side

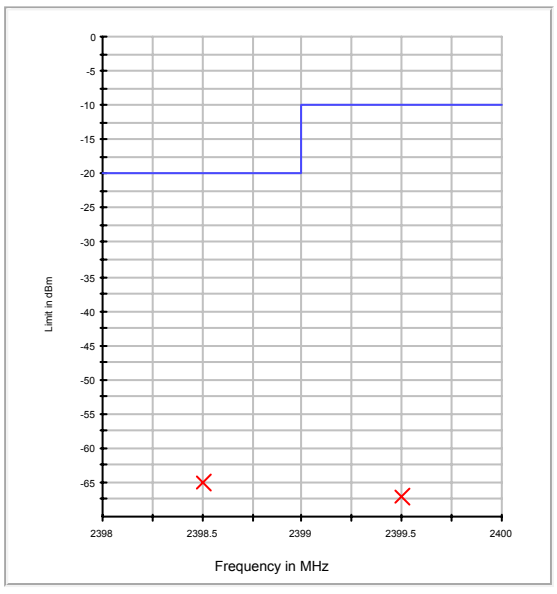


Right Side

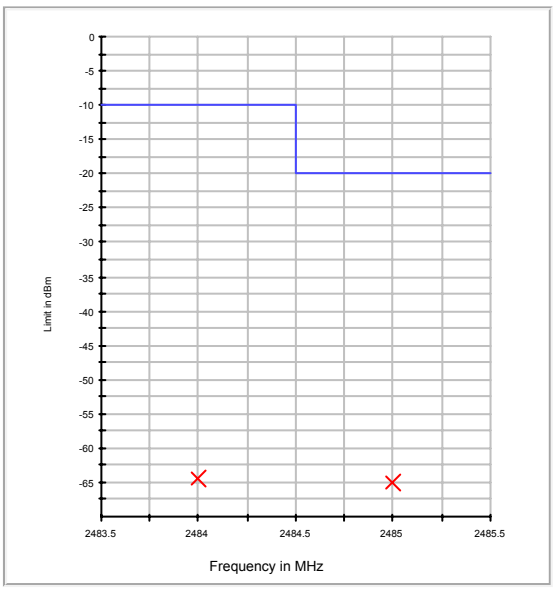
Note:

1. *Radiant level is far less than the limit, Only show the worst test result.*
2. *Only show the test plot on normal condition*

8DPSK Modulation						
Test conditions		Frequency range (MHz)		Level (dBm)	Limit (dBm)	Result
Temperature (℃)	Voltage (V)	Start	Stop			
Tnor=25	3.70	2400-2OBW	2400-OBW	-65.50	<-20	Pass
		2400-OBW	2400	-67.50	<-10	Pass
		2484	2484+OBW	-64.95	<-10	Pass
		2484+OBW	2484+2OBW	-65.00	<-20	Pass
Tlow=-20	3.50	2400-2OBW	2400-OBW	-65.95	<-20	Pass
		2400-OBW	2400	-67.26	<-10	Pass
		2484	2484+OBW	-64.50	<-10	Pass
		2484+OBW	2484+2OBW	-64.29	<-20	Pass
	4.25	2400-2OBW	2400-OBW	-66.61	<-20	Pass
		2400-OBW	2400	-66.76	<-10	Pass
		2484	2484+OBW	-64.10	<-10	Pass
		2484+OBW	2484+2OBW	-64.60	<-20	Pass
Thigh=+55	3.50	2400-2OBW	2400-OBW	-66.18	<-20	Pass
		2400-OBW	2400	-66.65	<-10	Pass
		2484	2484+OBW	-63.76	<-10	Pass
		2484+OBW	2484+2OBW	-64.11	<-20	Pass
	4.25	2400-2OBW	2400-OBW	-66.53	<-20	Pass
		2400-OBW	2400	-66.44	<-10	Pass
		2484	2484+OBW	-64.92	<-10	Pass
		2484+OBW	2484+2OBW	-66.39	<-20	Pass



Left Side



Right Side

Note:

1. *Radiant level is far less than the limit, Only show the worst test result.*
2. *Only show the test plot on normal condition*

4.6. Transmitter unwanted emissions in the spurious domain

LIMIT

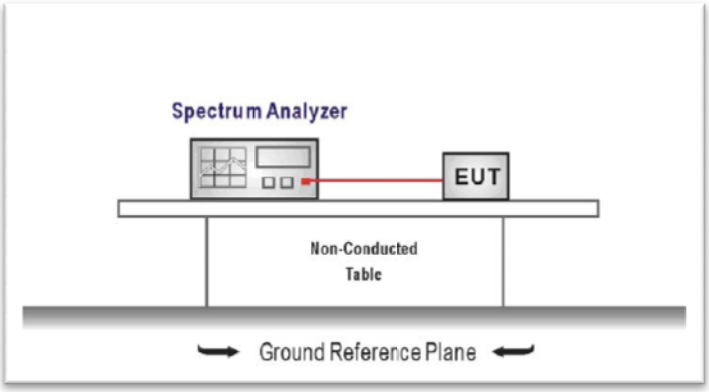
ETSI EN 300 328 Sub-clause 4.3.1.10.3

- The transmitter unwanted emissions in the spurious domain shall not exceed the values given in table 1.

Table 1: Transmitter limits for spurious emissions

Frequency Range	Maximum power e.r.p.(.≤1 GHz) e.i.r.p.(＞1 GHz)	Limit when Standby
30 MHz to 47 MHz	-36 dBm	100 KHz
47 MHz to 74 MHz	-54 dBm	100 KHz
74MHz to 87.5 MHz	-36 dBm	100 KHz
87.5 MHz to 118 MHz	-54 dBm	100 KHz
118 MHz to 174 MHz	-36 dBm	100 KHz
174 MHz to 230 MHz	-54 dBm	100 KHz
230 MHz to 470 MHz	-36 dBm	100 KHz
470 MHz to 862 MHz	-54 dBm	100 KHz
862 MHz to 1 GHz	-36 dBm	100 KHz
1 GHz to 12.75 GHz	-30 dBm	1 MHz

TEST CONFIGURATION



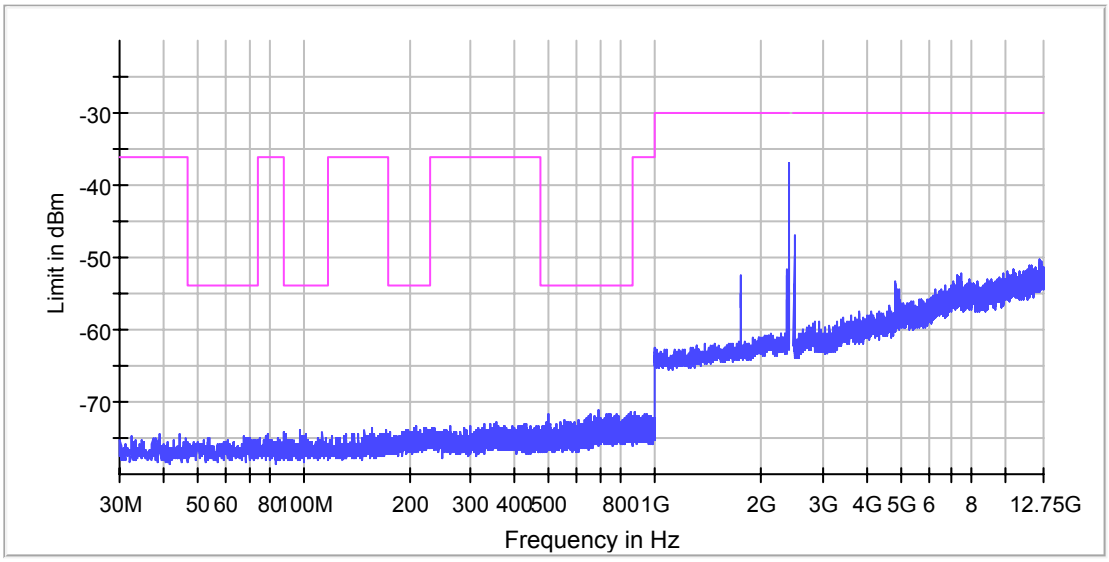
TEST PROCEDURE

1. Please refer to ETSI EN 300 328 Sub-clause 5.1 for the test conditions.
2. Please refer to ETSI EN 300 328 Sub-clause 5.3.10.2 for the measurement method.
   Resolution Bandwidth: 100 kHz (< 1 GHz) / 1 MHz (> 1 GHz)
   Video Bandwidth: 300 kHz (< 1 GHz) / 3 MHz (> 1 GHz)
   Detector: Peak for prescan/RMS for emission retest

TEST RESULTS

Test Mode	Continue Transmit

GFSK Modulation



Note: The radiated spurious are performed the each test Modulation mode, the datum recorded is the worst case for all the mode at GFSK Modulation

4.7. Receiver spurious emissions

LIMIT

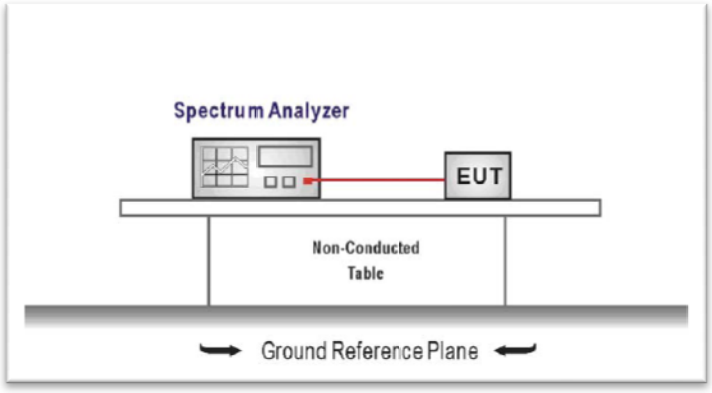
ETSI EN 300 328 Sub-clause 4.3.1.11.3

The spurious emissions of the receiver shall not exceed the values given in table 2

Table 2: spurious emission limits for receivers

Frequency	Maximum power, e.r.p.	Measurement bandwidth
30 MHz to 1 GHz	-57 dBm	100 KHz
1 GHz to 12.75 GHz	-47 dBm	1 MHz

TEST CONFIGURATION



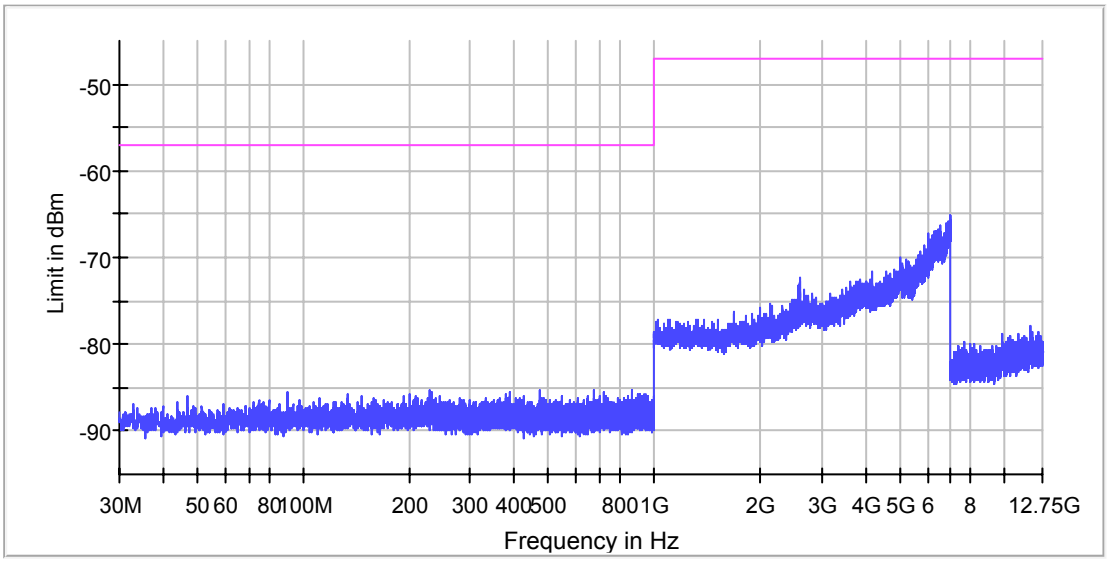
TEST PROCEDURE

1. Please refer to ETSI EN 300 328 Sub-clause 5.1 for the test conditions.
2. Refer to ETSI EN 300 328 Sub-clause 5.3.11.2 for the measurement method.
   Resolution Bandwidth: 100 kHz (< 1 GHz) / 1 MHz (> 1 GHz)
   Video Bandwidth: 300 kHz (< 1 GHz) / 3 MHz (> 1 GHz)
   Detector: Peak for prescan/RMS for emission retest

TEST RESULTS

Test mode	Receive/idle

GFSK Modulation



Note: The radiated spurious are performed the each test Modulation mode, the datum recorded is the worst case for all the mode at GFSK Modulation

5. Test Setup Photos of the EUT

6. External and Internal Photos of the EUT

Reference to the test report No. TRE1603019101

.....End of Report.....