
RF Test Report

Report No.: AGC03739230301EE24

PRODUCT DESIGNATION : Dual Band Digital Two Way Radio

BRAND NAME : VITAI, JUENTAI, ZASTONE

MODEL NAME : VDG-UV008, JD-UV008, ZT-UV008

APPLICANT : VITAI ELECTRONICS CO., LIMITED

DATE OF ISSUE : Apr. 13, 2023

STANDARD(S) : ETSI EN 300 113 V3.1.1 (2020-06)

REPORT VERSION : V1.0

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr. 13, 2023	Valid	Initial release

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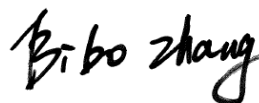
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1.TEST RESULT CERTIFICATION

Applicant	VITAI ELECTRONICS CO., LIMITED
Address	Room 1901 Buiding 1, Zhongjun Tianfeng,Jiangbinbei Road,Quanzhou,Fujian Province ,China
Manufacturer	VITAI ELECTRONICS CO., LIMITED
Address	Room 1901 Buiding 1, Zhongjun Tianfeng,Jiangbinbei Road,Quanzhou,Fujian Province ,China
Factory	VITAI ELECTRONICS CO., LIMITED
Address	Room 1901 Buiding 1, Zhongjun Tianfeng,Jiangbinbei Road,Quanzhou,Fujian Province ,China
Product Designation	Dual Band Digital Two Way Radio
Brand Name	VITAI, JUENTAI, ZASTONE
Test Model	VDG-UV008
Series Model	JD-UV008, ZT-UV008
Difference Description	Only the model name & brand name are different.
Date of receipt of test item	Mar. 24, 2023
Date of Test	Mar. 24, 2023~Apr. 13, 2023
Test Result	Pass

The above equipment was tested by Attestation of Global Compliance Co., Ltd. for compliance with the requirements set forth in the European Standard ETSI EN 300 113. The results of testing in this report apply to the product /system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Prepared By

Bibo Zhang
(Project Engineer)

Apr. 13, 2023

Reviewed By

Calvin Liu
(Reviewer)

Apr. 13, 2023

Approved By

Max Zhang
Authorized Officer

Apr. 13, 2023

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2. EUT DESCRIPTION

Product Designation	Dual Band Digital Two Way Radio
Brand Name	VITAI, JUENTAI, ZASTONE
Model Name	VDG-UV008
Hardware Version	LD8800DF697
Software Version	V1.02.03.1007
Operation Frequency	From 136MHz to 174MHz VHF From 400MHz to 480MHz UHF
Modulation	4FSK
Operation Mode	Push to talk
Channel Separation	12.5KHz
Rated Output Power	5W (It was fixed by the manufacturer, any individual can't arbitrarily change it.)
Antenna Designation	Detachable
Antenna Gain	1.5dBi
Power Supply	DC 7.4V, 2500mAh by battery, Charger for 8.4V
Test Frequencies	136.025MHz, 155.025MH, 173.975MHz 400.025MHz, 430.025MHz, 440.025MHz, 450.025MHz, 479.975MHz (Near lowest, near middle& near highest frequencies in the frequency range of operation)

Note: For more details, refer to the user's manual of the EUT.

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3. TEST METHODOLOGY

3.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:

ETSI EN 300 113 V3.1.1 (2020-06) Land Mobile Service; Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU

3.2 DESCRIPTION OF TEST MODES

The EUT has been tested under typical operating condition. No software used to control the EUT for staying in transmitting and receiving mode for testing.

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4. FACILITIES AND ACCREDITATIONS

4.1 FACILITIES

Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao 'an District, Shenzhen, Guangdong, China

4.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

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5. SETUP OF EQUIPMENT UNDER TEST

5.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

5.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
1	Battery	N/A	VTB-UV008	--	--	--
2	Adapter	N/A	NLA050120W1U6	--	--	1.0m Unshielded
3	Charger	N/A	VTC-UV008		--	--
4	Lanyard	N/A	--	--	--	--

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

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6. ETSI EN 300 113 REQUIREMENTS FOR TRANSMITTER

6.1 FREQUENCY ERROR

LIMIT

ETSI EN 300 113 (V3.1.1) Sub-clause 7.1

The frequency error, as defined in EN 300 113 sub-clause 7.1.1, shall not exceed the limits in EN 300 113 sub-clause 7.1.3, table 2.

Table 2: Frequency error

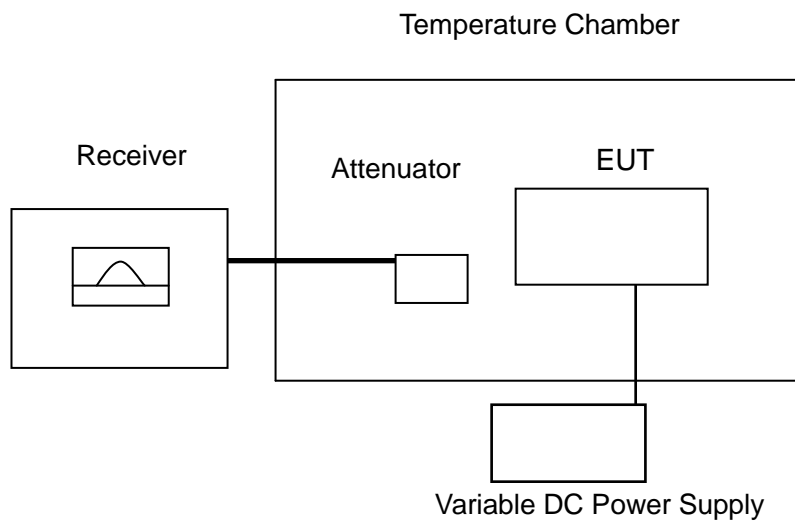
Channel separation (kHz)	Frequency error limit (kHz)				
	below 47 MHz	47 MHz to 137 MHz	above 137 MHz to 300 MHz	above 300 MHz to 500 MHz	above 500 MHz to 1 000 MHz
20 and 25	±0,60	±1,35	±2,00	±2,00 (see note 2)	±2,50 (see note 2)
12,5	±0,60	±1,00	±1,00 (B) ±1,50 (M)	±1,00 (B) ±1,50 (M) (see note 2)	No value specified
NOTE 1: For handportable stations having integral power supplies, these limits only apply to the reduced extreme temperature range 0 °C to +40 °C.					
NOTE 2: However for the full extreme temperature conditions (see clause 5.4.1), exceeding the reduced extreme temperature range above, the following frequency error limits apply: ±2,50 kHz between 300 MHz and 500 MHz; ±3,00 kHz between 500 MHz and 1 000 MHz.					
NOTE 3: (B) base station.					
NOTE 4: (M) mobile station.					

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
SPECTRUM ANALYZER	AGILENT	N9010A	MY53470504	Aug. 04, 2022	Aug. 03, 2023
POWER ATTENUATOR	WEINSCHEL CORP	58-30-33	ML030	Jun. 06, 2022	Jun. 05, 2023
H & T CHAMBER	EXPERY	TN-400	TN2007SR038	Jun. 06, 2022	Jun. 05, 2023

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST CONFIGURATION



TEST PROCEDURE

1. Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 5.3 and Sub-clause 5.4 for the test conditions.
2. Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 7.1.2 for the measurement method.

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TEST RESULTS

The Bottom Channel (400.025MHz) of 12.5 KHz Channel Separation-5W

Test Condition		Frequency Measured (MHz)	Frequency Error (KHz)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	400.025458	0.458
T min (-10°C)	DC 6.29V	400.025361	0.361
	DC 7.40V	400.025359	0.359
T Max (40°C)	DC 6.29V	400.025345	0.345
	DC 7.40V	400.025416	0.416
Limit		Normal temperature: $\pm 1.50\text{KHz}$ @ 400.025MHz	
		Extreme temperature: $\pm 2.50\text{KHz}$ @ 400.025MHz	
Result		Pass	

The Middle Channel (430.025MHz) of 12.5 KHz Channel Separation-5W

Test Condition		Frequency Measured (MHz)	Frequency Error (KHz)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	430.025453	0.453
T min (0°C)	DC 6.29V	430.025316	0.316
	DC 7.40V	430.025449	0.449
T Max (40°C)	DC 6.29V	430.025645	0.645
	DC 7.40V	430.025632	0.632
Limit		Normal temperature: $\pm 1.5\text{KHz}$ @ 430.025MHz	
		Extreme temperature: $\pm 2.5\text{KHz}$ @ 430.025MHz	
Result		Pass	

The Middle Channel (440.025MHz) of 12.5 KHz Channel Separation-5W

Test Condition		Frequency Measured (MHz)	Frequency Error (KHz)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	440.025374	0.374
T min (-10°C)	DC 6.29V	440.025463	0.463
	DC 7.40V	440.025502	0.502
T Max (40°C)	DC 6.29V	440.025396	0.396
	DC 7.40V	440.025574	0.574
Limit		Normal temperature: $\pm 1.50\text{KHz}$ @ 440.025MHz	
		Extreme temperature: $\pm 2.50\text{KHz}$ @ 440.025MHz	
Result		Pass	

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The Middle Channel (450.025MHz) of 12.5 KHz Channel Separation-5W

Test Condition		Frequency Measured (MHz)	Frequency Error (KHz)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	450.025485	0.485
T min (-10°C)	DC 6.29V	450.025384	0.384
	DC 7.40V	450.025412	0.412
T Max (40°C)	DC 6.29V	450.025363	0.363
	DC 7.40V	450.025469	0.469
Limit		Normal temperature: $\pm 1.50\text{KHz}$ @ 450.025MHz	
		Extreme temperature: $\pm 2.50\text{KHz}$ @ 450.025MHz	
Result		Pass	

The Top Channel (479.975MHz) of 12.5 KHz Channel Separation-5W

Test Condition		Frequency Measured (MHz)	Frequency Error (KHz)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	479.975521	0.521
T min (-10°C)	DC 6.29V	479.975399	0.399
	DC 7.40V	479.975514	0.514
T Max (40°C)	DC 6.29V	479.975496	0.496
	DC 7.40V	479.975388	0.388
Limit		Normal temperature: $\pm 1.50\text{KHz}$ @ 479.975MHz	
		Extreme temperature: $\pm 2.50\text{KHz}$ @ 479.975MHz	
Result		Pass	

The Bottom Channel (400.025MHz) of 12.5 KHz Channel Separation-0.5W

Test Condition		Frequency Measured (MHz)	Frequency Error (KHz)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	400.025415	0.415
T min (-10°C)	DC 6.29V	400.025499	0.499
	DC 7.40V	400.025315	0.315
T Max (40°C)	DC 6.29V	400.025552	0.552
	DC 7.40V	400.025674	0.674
Limit		Normal temperature: $\pm 1.50\text{KHz}$ @ 400.025MHz	
		Extreme temperature: $\pm 2.50\text{KHz}$ @ 400.025MHz	
Result		Pass	

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The Middle Channel (430.025MHz) of 12.5 KHz Channel Separation-0.5W

Test Condition		Frequency Measured (MHz)	Frequency Error (KHz)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	430.025359	0.359
T min (0°C)	DC 6.29V	430.025358	0.358
	DC 7.40V	430.025361	0.361
T Max (40°C)	DC 6.29V	430.025485	0.485
	DC 7.40V	430.025355	0.355
Limit		Normal temperature: $\pm 1.5\text{KHz}$ @ 430.025MHz	
		Extreme temperature: $\pm 2.5\text{KHz}$ @ 430.025MHz	
Result		Pass	

The Middle Channel (440.025MHz) of 12.5 KHz Channel Separation-0.5W

Test Condition		Frequency Measured (MHz)	Frequency Error (KHz)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	440.025411	0.411
T min (-10°C)	DC 6.29V	440.025606	0.606
	DC 7.40V	440.025582	0.582
T Max (40°C)	DC 6.29V	440.025391	0.391
	DC 7.40V	440.025374	0.374
Limit		Normal temperature: $\pm 1.50\text{KHz}$ @ 440.025MHz	
		Extreme temperature: $\pm 2.50\text{KHz}$ @ 440.025MHz	
Result		Pass	

The Middle Channel (450.025MHz) of 12.5 KHz Channel Separation-0.5W

Test Condition		Frequency Measured (MHz)	Frequency Error (KHz)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	450.025412	0.412
T min (-10°C)	DC 6.29V	450.025569	0.569
	DC 7.40V	450.025452	0.452
T Max (40°C)	DC 6.29V	450.025366	0.366
	DC 7.40V	450.025345	0.345
Limit		Normal temperature: $\pm 1.50\text{KHz}$ @ 450.025MHz	
		Extreme temperature: $\pm 2.50\text{KHz}$ @ 450.025MHz	
Result		Pass	

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The Top Channel (479.975MHz) of 12.5 KHz Channel Separation-0.5W

Test Condition		Frequency Measured	Frequency Error
Temperature (°C)	Voltage (V)	(MHz)	(KHz)
T Nor (25°C)	DC 7.40V	479.975582	0.582
T min (-10°C)	DC 6.29V	479.975411	0.411
	DC 7.40V	479.975505	0.505
T Max (40°C)	DC 6.29V	479.975469	0.469
	DC 7.40V	479.975583	0.583
Limit		Normal temperature: $\pm 1.50\text{KHz}$ @ 479.975MHz	
		Extreme temperature: $\pm 2.50\text{KHz}$ @ 479.975MHz	
Result		Pass	

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6.2 TRANSMITTER POWER (CONDUCTED)

LIMIT

ETSI EN 300 113 (V3.1.1) Sub-clause 7.2

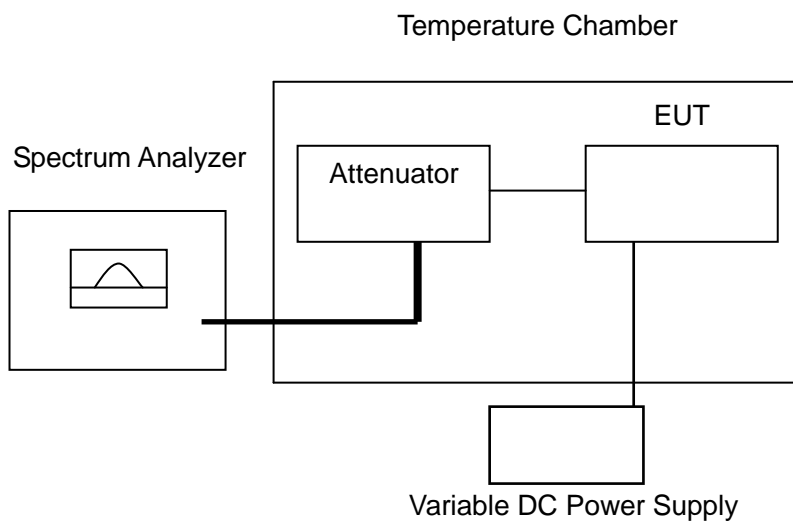
The transmitter power (conducted) under the specified conditions of measurement (see clause 7.2.2) and at normal test conditions (see clause 5.3), shall be within $\pm 1,5$ dB of the rated output power (conducted).
The transmitter power (conducted) under extreme test conditions shall be within +2,0 dB and -3,0 dB of the rated output power.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
SPECTRUM ANALYZER	AGILENT	N9010A	MY53470504	Aug. 04, 2022	Aug. 03, 2023
POWER ATTENUATOR	WEINSCHEL CORP	58-30-33	ML030	Jun. 06, 2022	Jun. 05, 2023
H & T CHAMBER	EXPERY	TN-400	TN2007SR038	Jun. 06, 2022	Jun. 05, 2023

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST CONFIGURATION



TEST PROCEDURE

1. Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 5.3 and 5.4 for the test conditions.
2. Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 7.2.2 for the measurement method.

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TEST RESULTS

VHF:

The Bottom Channel (137.025MHz) of 12.5 KHz Channel Separation-5W

Test Condition		Power Measured	Power Error
Temperature (°C)	Voltage (V)	(dBm)	(dB)
T Nor (25°C)	DC 3.70V	36.91	-0.08
T min (-10°C)	DC 3.15V	36.88	-0.11
	DC 3.70V	36.85	-0.14
T Max (40°C)	DC 3.15V	36.82	-0.17
	DC 3.70V	36.87	-0.12
Nominal Power=36.99dBm; Limit n=±1.5 dB and Limit e=2 dB & -3 dB			
Result		Pass	

The Middle Channel (155.025MHz) of 12.5 KHz Channel Separation-5W

Test Condition		Power Measured	Power Error
Temperature (°C)	Voltage (V)	(dBm)	(dB)
T Nor (25°C)	DC 3.70V	36.95	-0.04
T min (-10°C)	DC 3.15V	36.89	-0.10
	DC 3.70V	36.91	-0.08
T Max (40°C)	DC 3.15V	36.88	-0.11
	DC 3.70V	36.89	-0.10
Nominal Power= 36.99dBm; Limit n=±1.5 dB and Limit e=2 dB & -3 dB			
Result		Pass	

The Middle Channel (173.975MHz) of 12.5 KHz Channel Separation-5W

Test Condition		Power Measured	Power Error
Temperature (°C)	Voltage (V)	(dBm)	(dB)
T Nor (25°C)	DC 3.70V	36.92	-0.07
T min (-10°C)	DC 3.15V	36.85	-0.14
	DC 3.70V	36.89	-0.10
T Max (40°C)	DC 3.15V	36.87	-0.12
	DC 3.70V	36.85	-0.14
Nominal Power= 36.99dBm; Limit n=±1.5 dB and Limit e=2 dB & -3dB			
Result		Pass	

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UHF:

The Bottom Channel (400.025MHz) of 12.5 KHz Channel Separation-5W

Test Condition		Power Measured	Power Error
Temperature (°C)	Voltage (V)	(dBm)	(dB)
T Nor (25°C)	DC 7.40V	36.83	-0.16
T min (-10°C)	DC 6.29V	36.82	-0.17
	DC 7.40V	36.74	-0.25
T Max (40°C)	DC 6.29V	36.75	-0.24
	DC 7.40V	36.77	-0.22
Nominal Power= 36.99dBm; Limit n=±1.5 dB and Limit e=2 dB & -3 dB			
Result		Pass	

The Middle Channel (430.025MHz) of 12.5 KHz Channel Separation-5W

Test Condition		Power Measured	Power Error
Temperature (°C)	Voltage (V)	(dBm)	(dB)
T Nor (25°C)	DC 7.40V	36.88	-0.11
T min (-10°C)	DC 6.29V	36.77	-0.22
	DC 7.40V	36.78	-0.21
T Max (40°C)	DC 6.29V	36.79	-0.20
	DC 7.40V	36.85	-0.14
Nominal Power= 36.99dBm; Limit n=±1.5 dB and Limit e=2 dB & -3 dB			
Result		Pass	

The Middle Channel (440.025MHz) of 12.5 KHz Channel Separation-5W

Test Condition		Power Measured	Power Error
Temperature (°C)	Voltage (V)	(dBm)	(dB)
T Nor (25°C)	DC 7.40V	36.93	-0.06
T min (-10°C)	DC 6.29V	36.89	-0.10
	DC 7.40V	36.88	-0.11
T Max (40°C)	DC 6.29V	36.91	-0.08
	DC 7.40V	36.87	-0.12
Nominal Power= 36.99 dBm; Limit n=±1.5 dB and Limit e=2 dB & -3 dB			
Result		Pass	

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The Middle Channel (450.025MHz) of 12.5 KHz Channel Separation-5W

Test Condition		Power Measured	Power Error
Temperature (°C)	Voltage (V)	(dBm)	(dB)
T Nor (25°C)	DC 7.40V	36.95	-0.04
T min (-10°C)	DC 6.29V	36.85	-0.14
	DC 7.40V	36.91	-0.08
T Max (40°C)	DC 6.29V	36.90	-0.09
	DC 7.40V	36.85	-0.14
Nominal Power=36.99 dBm; Limit n=±1.5 dB and Limit e=2 dB & -3 dB			
Result		Pass	

The Top Channel (479.975MHz) of 12.5 KHz Channel Separation-5W

Test Condition		Power Measured	Power Error
Temperature (°C)	Voltage (V)	(dBm)	(dB)
T Nor (25°C)	DC 7.40V	36.92	-0.07
T min (-10°C)	DC 6.29V	36.81	-0.18
	DC 7.40V	36.88	-0.11
T Max (40°C)	DC 6.29V	36.78	-0.21
	DC 7.40V	36.83	-0.16
Nominal Power=36.99 dBm; Limit n=±1.5 dB and Limit e=2 dB & -3 dB			
Result		Pass	

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

6.3 MAXIMUM EFFECTIVE RADIATED POWER (NOT APPLICABLE TO DEVICE WITH EXTERNAL RF PORT)

LIMIT

N/A

MEASUREMENT EQUIPMENT USED

N/A

TEST PROCEDURE

N/A

TEST CONFIGURATION

N/A

TEST RESULTS

N/A

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6.4 ADJACENT AND ALTERNATE CHANNEL POWER

LIMIT

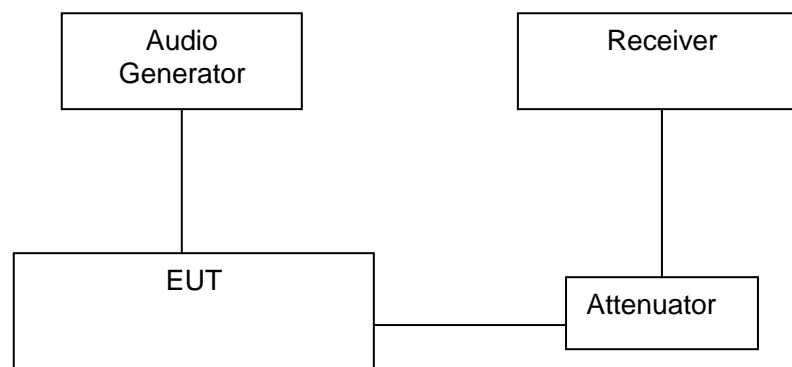
ETSI EN 300 113(V 3.1.1) Sub-clause 7.4

For a channel separation of 12,5 kHz, 20 kHz and 25 kHz, the adjacent and alternate channel power shall not exceed a value of 60,0 dB below the transmitter power (conducted) without the need to be below 0,2 μ W (-37 dBm).

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
SPECTRUM ANALYZER	AGILENT	N9010A	MY53470504	Aug. 04, 2022	Aug. 03, 2023
POWER ATTENUATOR	WEINSCHEL CORP	58-30-33	ML030	Jun. 06, 2022	Jun. 05, 2023
SIGNAL GENERATOR	Aglient	E4421B	MY43351603	Feb. 17, 2023	Feb. 16, 2024

TEST CONFIGURATION



TEST PROCEDURE

1. Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 5.3 for the test conditions.
2. Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 7.4.2 for the measurement method.

TEST RESULTS

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

Test Result of Adjacent Channel Power:

VHF:

The Top Channel of (173.975MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Adjacent Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	V Nor (7.40)	+8.25 KHz	62.1
		-8.25 KHz	63.3
Applicable Limit		60 dBc	
Result		Pass	

The Middle Channel of (155.025MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Adjacent Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25℃)	V Nor (7.40)	+8.25 KHz	65.0
		-8.25 KHz	66.7
Applicable Limit		60 dBc	
Result		Pass	

The Bottom Channel of (137.025MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Adjacent Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	V Nor (7.40)	+8.25 KHz	64.2
		-8.25 KHz	65.4
Applicable Limit		60 dBc	
Result		Pass	

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UHF:
The Top Channel of (479.975MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Adjacent Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	V Nor (7.40)	+8.25 KHz	62.8
		-8.25 KHz	64.9
Applicable Limit		60 dBc	
Result		Pass	

The Middle Channel of (450.025MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Adjacent Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25℃)	V Nor (7.40)	+8.25 KHz	64.4
		-8.25 KHz	66.1
Applicable Limit		60 dBc	
Result		Pass	

The Middle Channel of (440.025MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Adjacent Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25℃)	V Nor (7.40)	+8.25 KHz	61.9
		-8.25 KHz	62.5
Applicable Limit		60 dBc	
Result		Pass	

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The Middle Channel of (430.025MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Adjacent Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25℃)	V Nor (7.40)	+8.25 KHz	64.1
		-8.25 KHz	65.6
Applicable Limit		60 dBc	
Result		Pass	

The Bottom Channel of (400.025MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Adjacent Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25℃)	V Nor (7.40)	+8.25 KHz	63.3
		-8.25 KHz	64.5
Applicable Limit		60 dBc	
Result		Pass	

Test Result of Alternate Channel Power:

VHF:

The Top Channel of (173.975MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Alternate Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	V Nor (7.40)	+20.75 KHz	72.8
		-20.75 KHz	73.4
Applicable Limit		60 dBc	
Result		Pass	

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The Middle Channel of (155.025MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Alternate Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	V Nor (7.40)	+20.75 KHz	73.3
		-20.75 KHz	74.1
Applicable Limit		60 dBc	
Result		Pass	

The Bottom Channel of (137.025MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Alternate Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	V Nor (7.40)	+20.75 KHz	75.0
		-20.75 KHz	76.9
Applicable Limit		60 dBc	
Result		Pass	

UHF:

The Top Channel of (479.975MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Alternate Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	V Nor (7.40)	+20.75 KHz	75.8
		-20.75 KHz	76.7
Applicable Limit		60 dBc	
Result		Pass	

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The Middle Channel of (450.025MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Alternate Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	V Nor (7.40)	+20.75 KHz	73.9
		-20.75 KHz	74.5
Applicable Limit		60 dBc	
Result		Pass	

The Middle Channel of (440.025MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Alternate Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	V Nor (7.40)	+20.75 KHz	73.7
		-20.75 KHz	75.1
Applicable Limit		60 dBc	
Result		Pass	

The Middle Channel of (430.025MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Alternate Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	V Nor (7.40)	+20.75 KHz	71.7
		-20.75 KHz	72.2
Applicable Limit		60 dBc	
Result		Pass	

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The Bottom Channel of (400.025MHz) 12.5 KHz Channel Separation-5W

Test Condition		Measurement Offset	Alternate Channel Power (dBc)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	V Nor (7.40)	+20.75 KHz	72.9
		-20.75 KHz	73.2
Applicable Limit		60 dBc	
Result		Pass	

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6.5 UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

LIMIT

ETSI EN 300 113 (V3.1.1) Sub-clause 7.5

The power of any spurious emission shall not exceed the values given in tables 4 and 5.

Table 4: Conducted emissions

Frequency Range	Tx Operation	Tx Standby
9 KHz to 1GHz	0.25 μ W (-36 dBm)	2.0nW (-57 dBm)
Above 1GHz to 12.75GHz, or above 1GHz to 12.75GHz	1.00uW (-30 dBm)	20nW (-47.0 dBm)

Table 5: Radiated emissions

Frequency Range	Tx Operation	Tx Standby
9 KHz to 1GHz	0.25 μ W (-36 dBm)	2.0nW (-57 dBm)
Above 1GHz to 12.75GHz, or above 1GHz to 12.75GHz	1.00uW (-30 dBm)	20nW (-47.0 dBm)

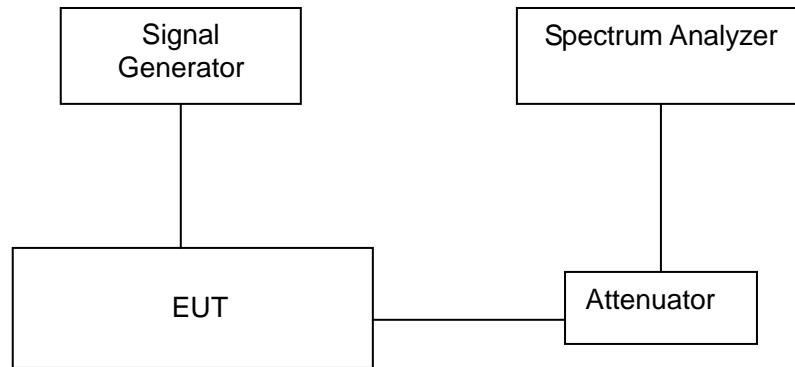
MEASUREMENT EQUIPMENT USED

Radiated Emission Test Site # 4					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EMI TEST RECEIVER	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024
AMPLIFIER	Schwarzbeck	BBV 9718	9718-162	Jun. 06, 2022	Jun. 05, 2023
SPECTRUM ANALYZER	AGILENT	N9010A	MY53470504	Aug. 04, 2022	Aug. 03, 2023
ATTENUATOR	WEINSCHTEL CORP	58-30-33	ML030	Jun. 06, 2022	Jun. 05, 2023
ANTENNA	R&S	VULB9168	D69250	Apr. 28, 2021	Apr. 27, 2023
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023

Remark: Each piece of equipment is scheduled for calibration once a year. Expect for the antenna was once two years.

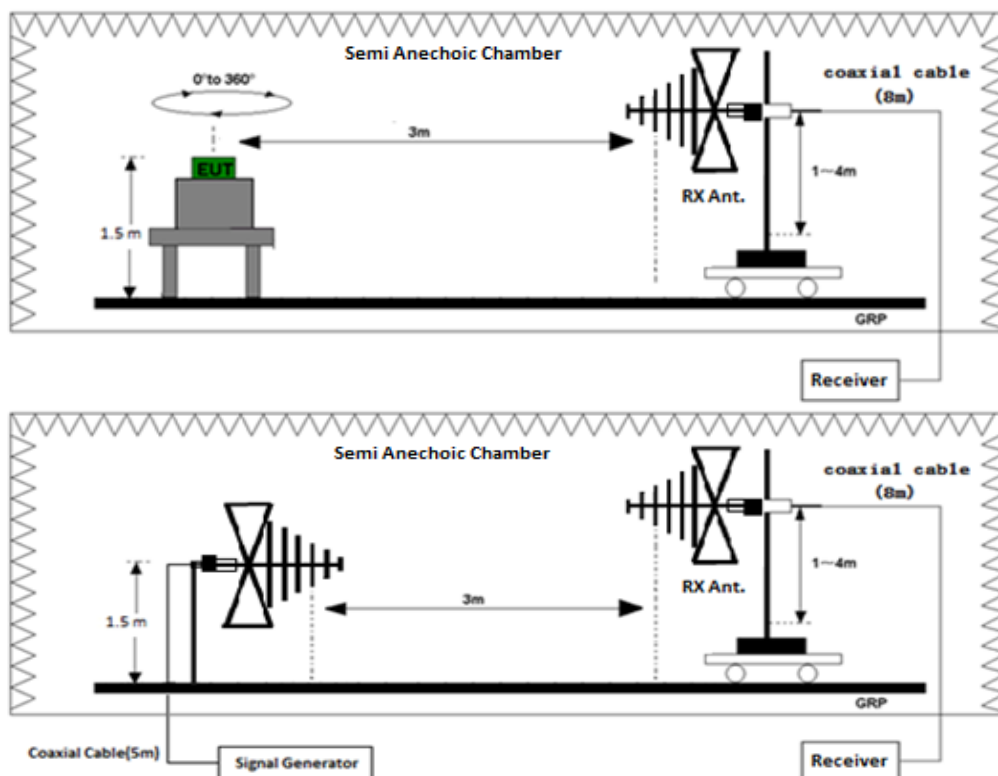
TEST CONFIGURATION

Conducted Measurement (9 KHz to 12.75GHz)



Effective Radiated Power measurement (30MHz to 12.75GHz)

☒ Effective Radiated Method:



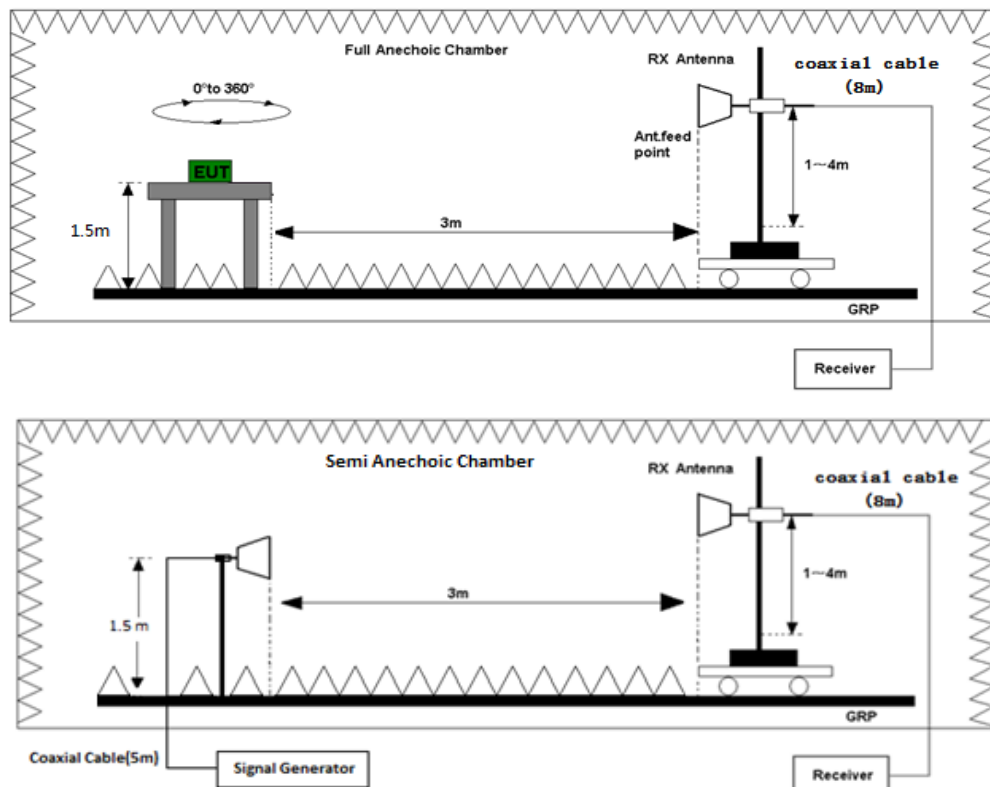
Test set-up of radiated disturbance (30MHz-1GHz)

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Attestation of Global Compliance(Shenzhen)Co., Ltd

Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd

Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: <http://www.agccert.com/>



Test set-up of radiated disturbance (above 1GHz)

TEST PROCEDURE

1. Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 5.3 for the test conditions.
2. Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 7.5.2. and 7.5.3 for the measurement method.

TEST RESULTS

Conducted Measurement (9 KHz to 12.75GHz) --- PASS

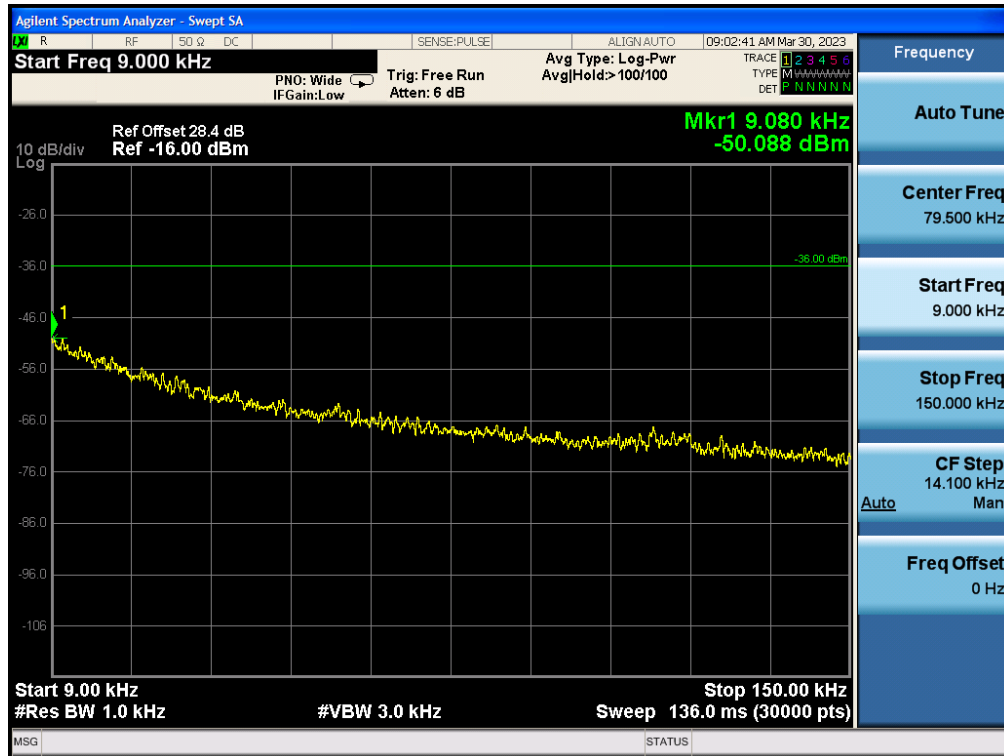
Note: only result the worst case in this part.

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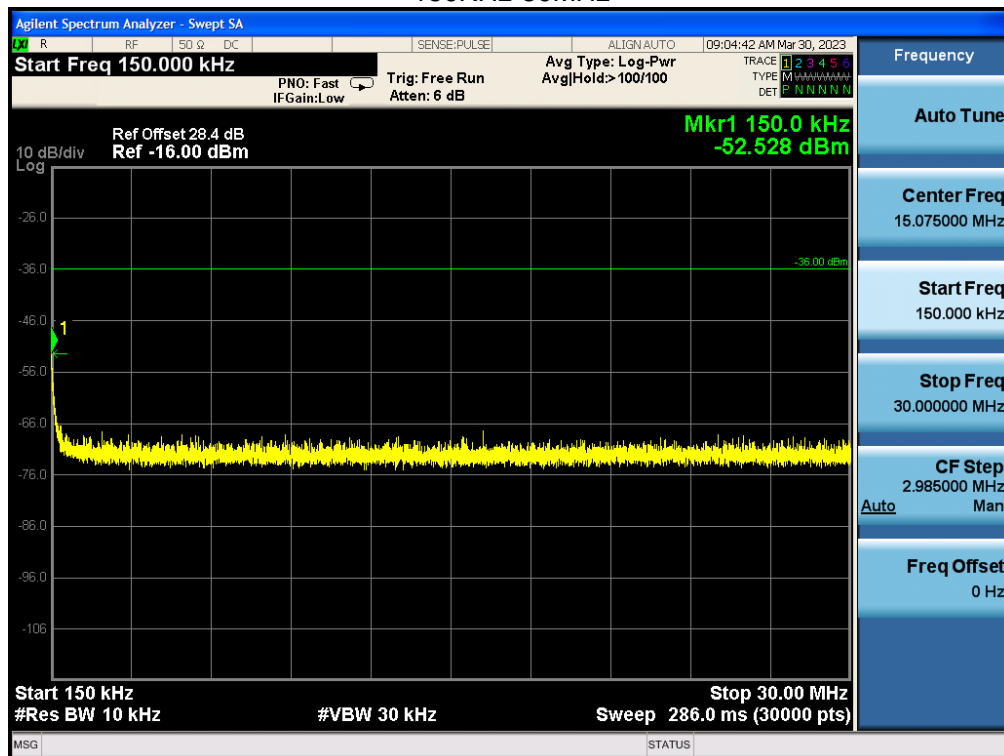
Attestation of Global Compliance(Shenzhen)Co., Ltd
Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd
Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: <http://www.agccert.com/>

UNWANTED EMISSIONS AT BOTTOM CHANNEL
(137.025MHz with 12.5 KHz channel separation)-5W

9KHz-150 KHz

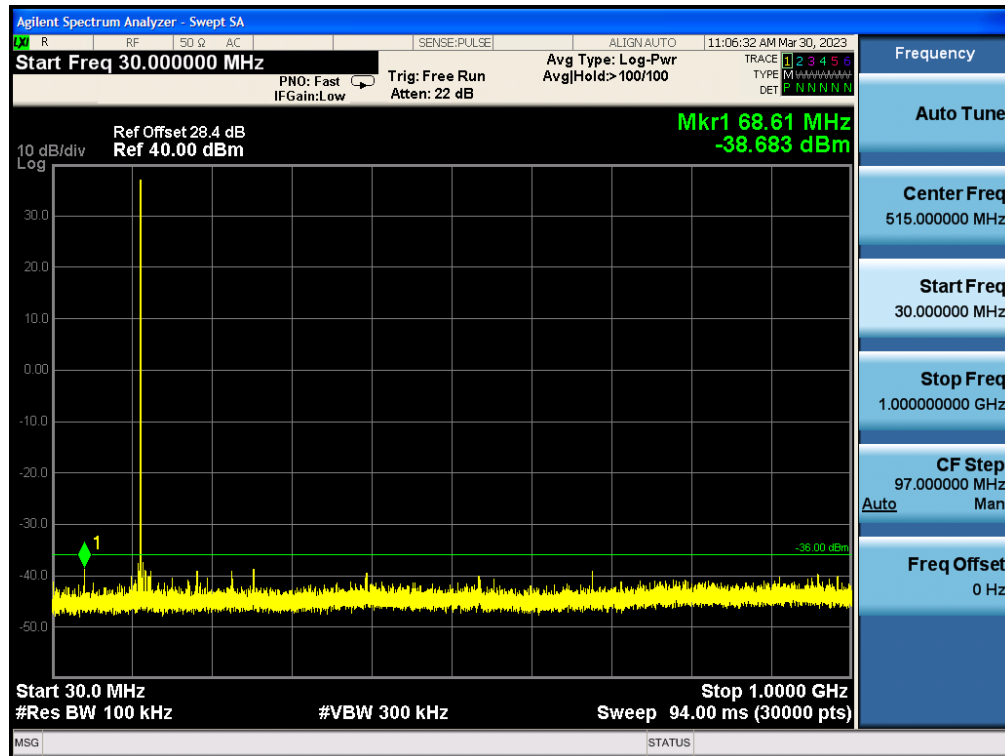


150KHz-30MHz

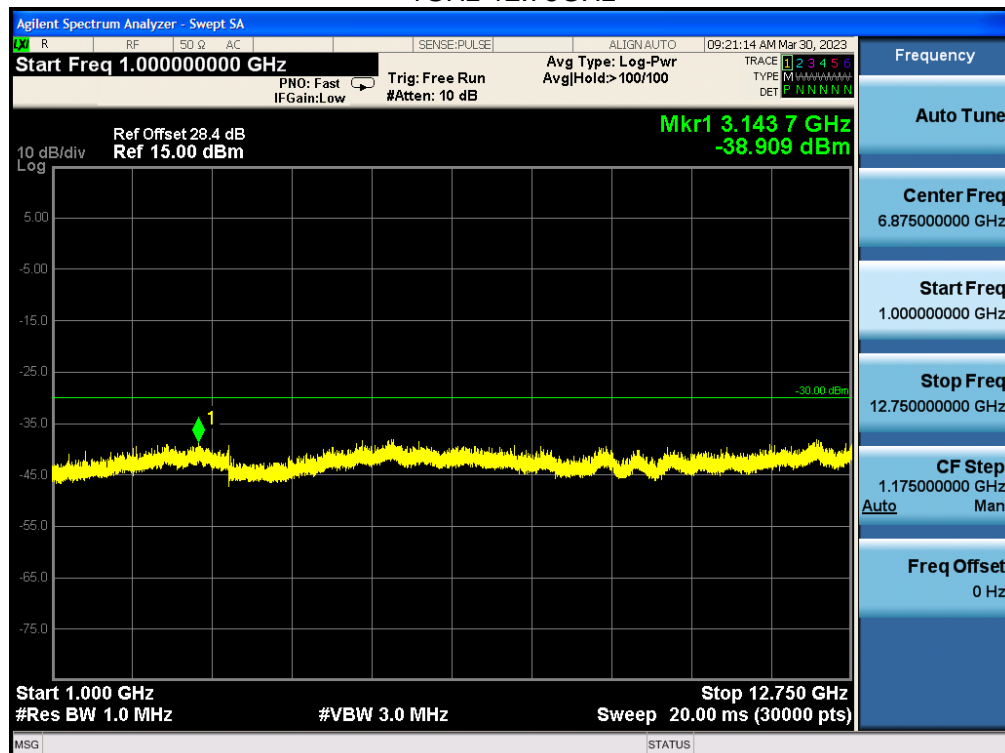


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30MHz-1GHz



1GHz-12.75GHz



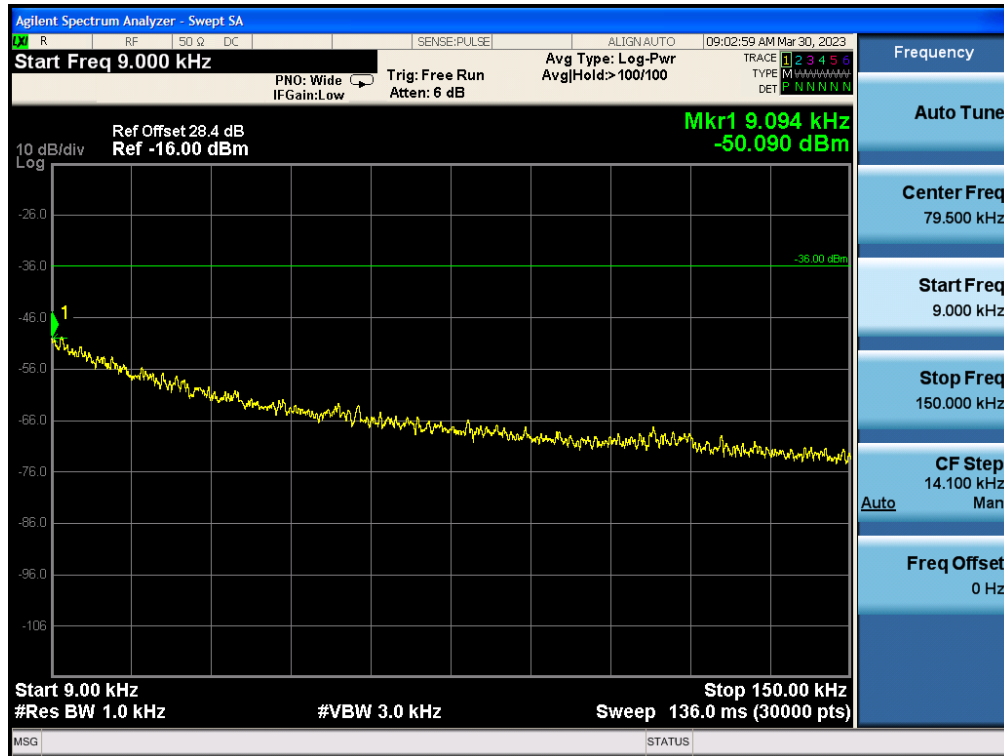
Note: All the test frequencies was tested, but only the worst data be recorded in this part.

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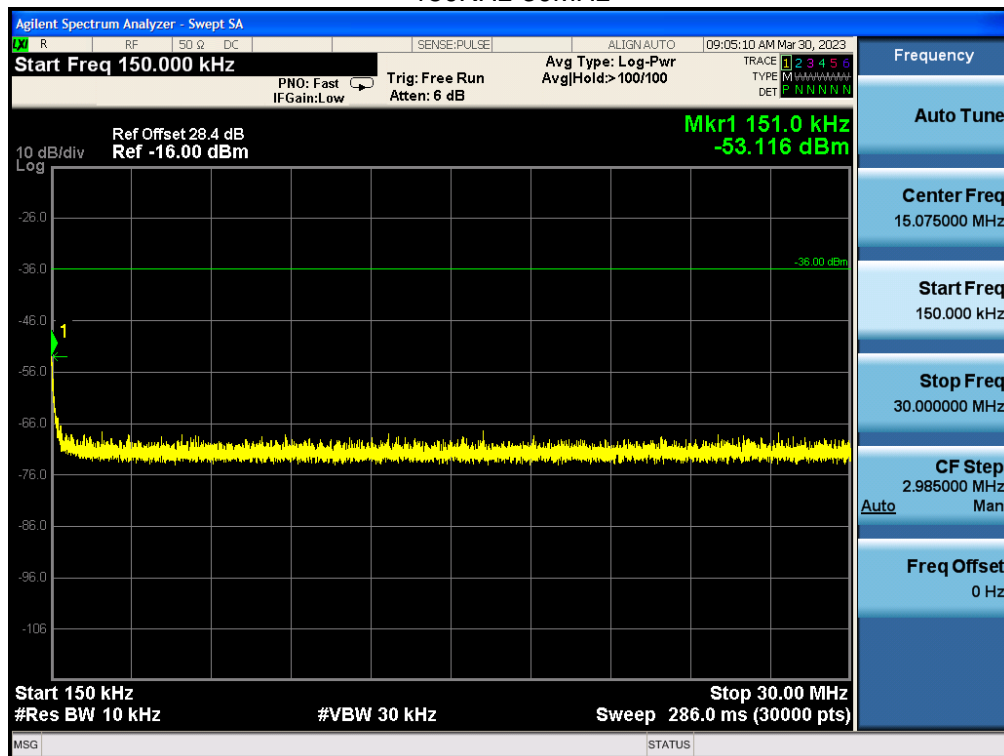
Attestation of Global Compliance(Shenzhen)Co., Ltd
Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd
Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/

UNWANTED EMISSIONS AT BOTTOM CHANNEL
(400.025MHz with 12.5 KHz channel separation)-5 W

9KHz-150 KHz

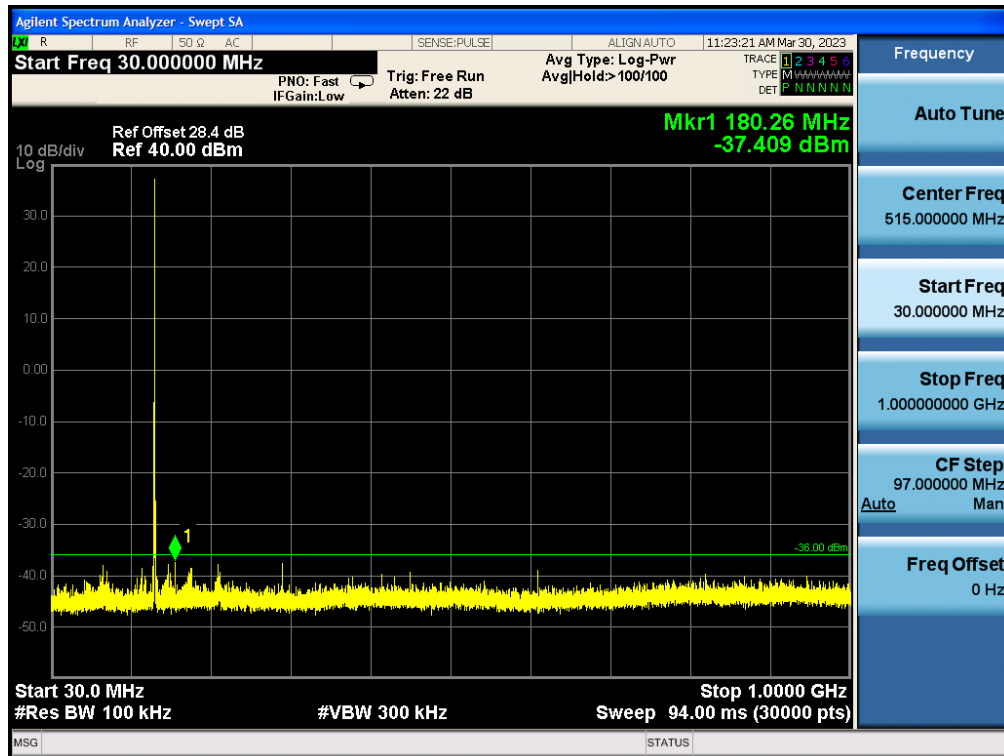


150KHz-30MHz

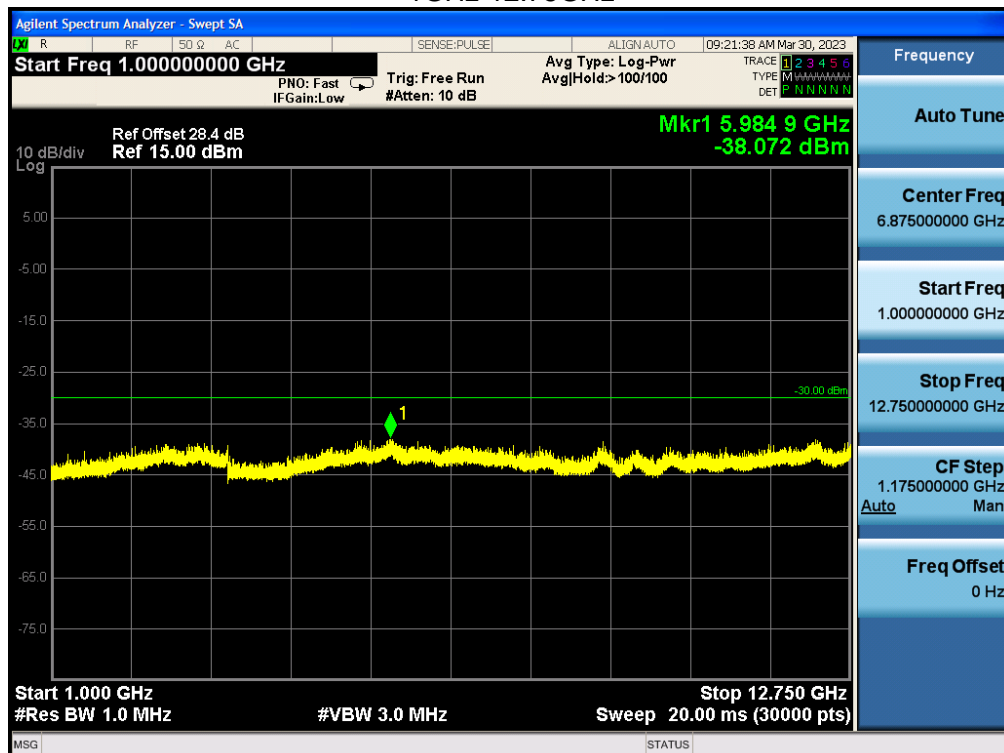


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30MHz-1GHz



1GHz-12.75GHz



Note: All the test frequencies was tested, but only the worst data be recorded in this part.

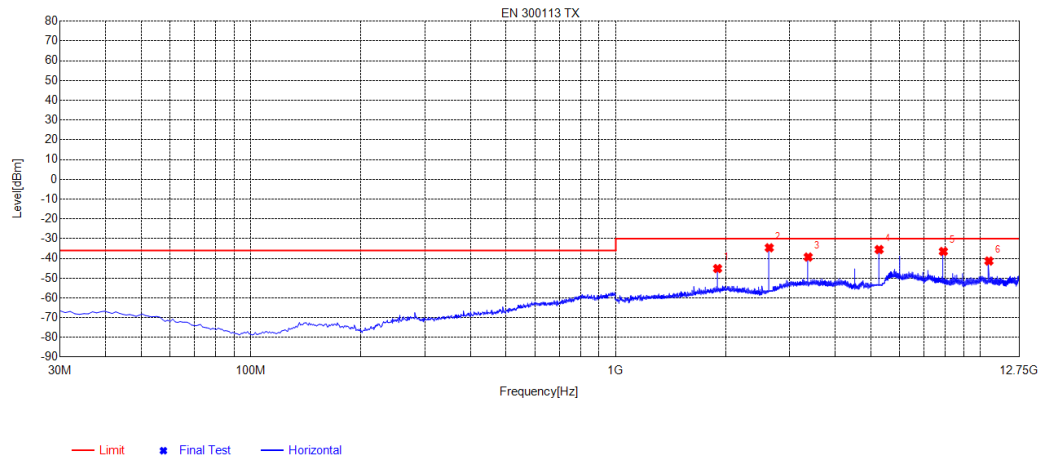
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Effective Radiated Power measurement (30 MHz to 12.75GHz) --- PASS

VHF:

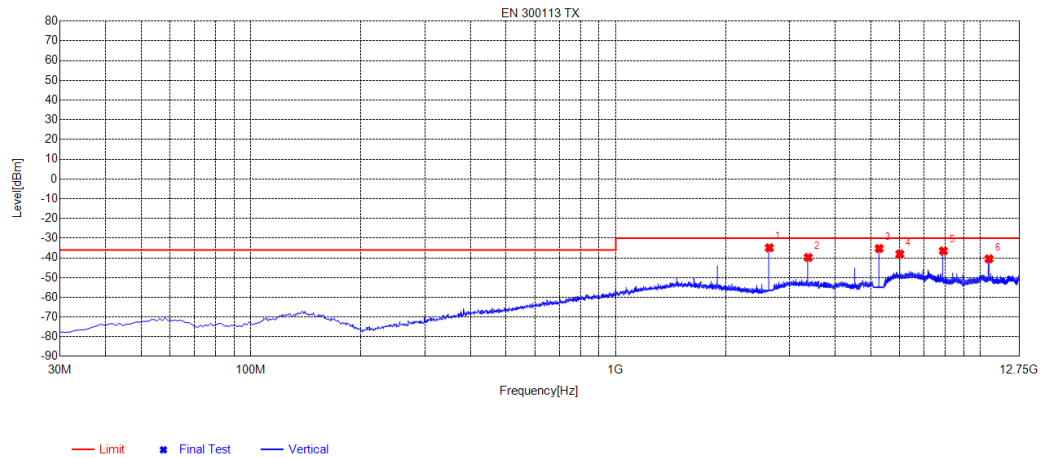
The Bottom channel for 12.5 KHz Channel Separation @Transmitting Mode-Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	1901.3151	-44.94	-45.15	-30.00	15.15	-0.21	212	Horizontal
2	2634.5885	-34.47	-34.64	-30.00	4.64	-0.17	184	Horizontal
3	3369.0369	-43.29	-39.34	-30.00	9.34	3.95	9	Horizontal
4	5270.377	-42.07	-35.53	-30.00	5.53	6.54	82	Horizontal
5	7904.9905	-49.50	-36.51	-30.00	6.51	12.99	304	Horizontal
6	10539.604	-56.96	-41.35	-30.00	11.35	15.61	82	Horizontal

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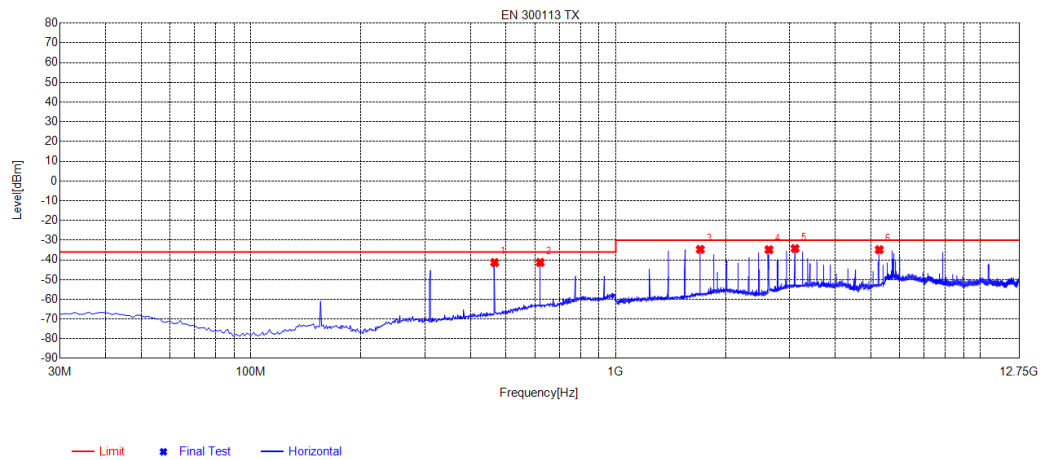
The Bottom channel for 12.5 KHz Channel Separation @Transmitting Mode- Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	2635.7636	-34.99	-34.91	-30.00	4.91	0.08	175	Vertical
2	3369.0369	-42.92	-39.82	-30.00	9.82	3.10	351	Vertical
3	5271.5522	-40.35	-35.27	-30.00	5.27	5.08	82	Vertical
4	6004.8255	-49.04	-38.10	-30.00	8.10	10.94	258	Vertical
5	7906.1656	-49.45	-36.48	-30.00	6.48	12.97	294	Vertical
6	10541.9542	-56.72	-40.46	-30.00	10.46	16.26	82	Vertical

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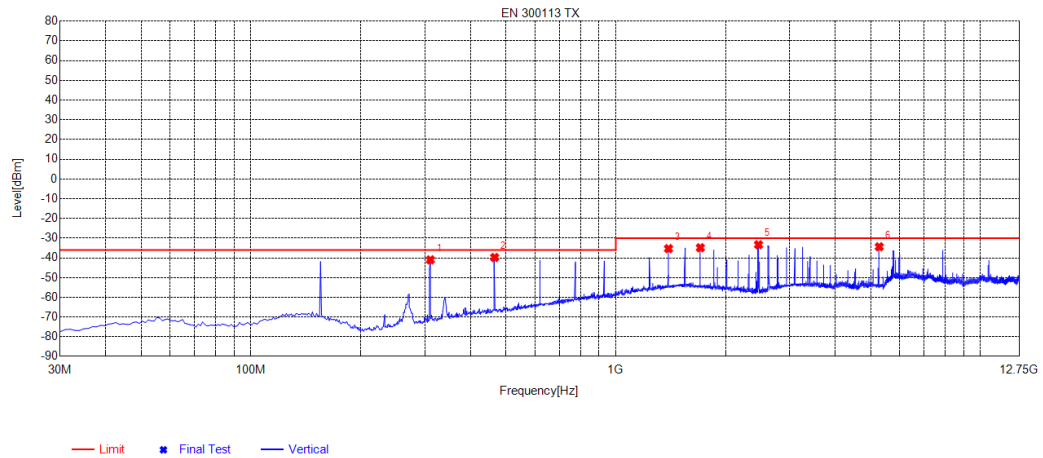
The Middle channel for 12.5 KHz Channel Separation @Transmitting Mode-Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	465.53	-77.03	-41.36	-36.00	5.36	35.67	9	Horizontal
2	620.73	-81.22	-41.31	-36.00	5.31	39.91	154	Horizontal
3	1705.0705	-33.04	-34.72	-30.00	4.72	-1.68	183	Horizontal
4	2629.888	-34.64	-34.85	-30.00	4.85	-0.21	360	Horizontal
5	3101.1101	-37.74	-34.27	-30.00	4.27	3.47	9	Horizontal
6	5275.0775	-41.44	-34.85	-30.00	4.85	6.59	71	Horizontal

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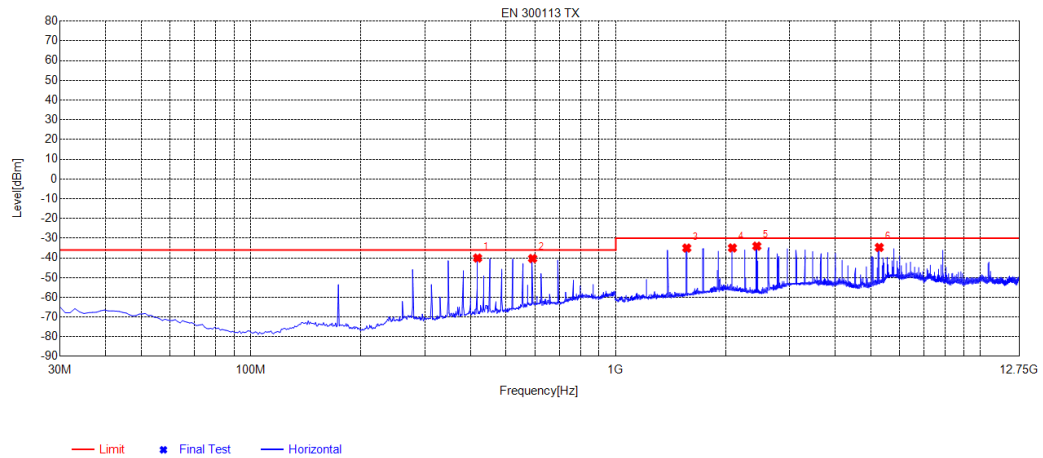
The Middle channel for 12.5 KHz Channel Separation @Transmitting Mode- Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	310.33	-72.36	-41.01	-36.00	5.01	31.35	28	Vertical
2	465.53	-75.70	-39.79	-36.00	3.79	35.91	359	Vertical
3	1394.8395	-36.78	-35.32	-30.00	5.32	1.46	269	Vertical
4	1705.0705	-36.31	-34.87	-30.00	4.87	1.44	195	Vertical
5	2461.8462	-32.36	-33.34	-30.00	3.34	-0.98	359	Vertical
6	5275.0775	-39.49	-34.39	-30.00	4.39	5.10	64	Vertical

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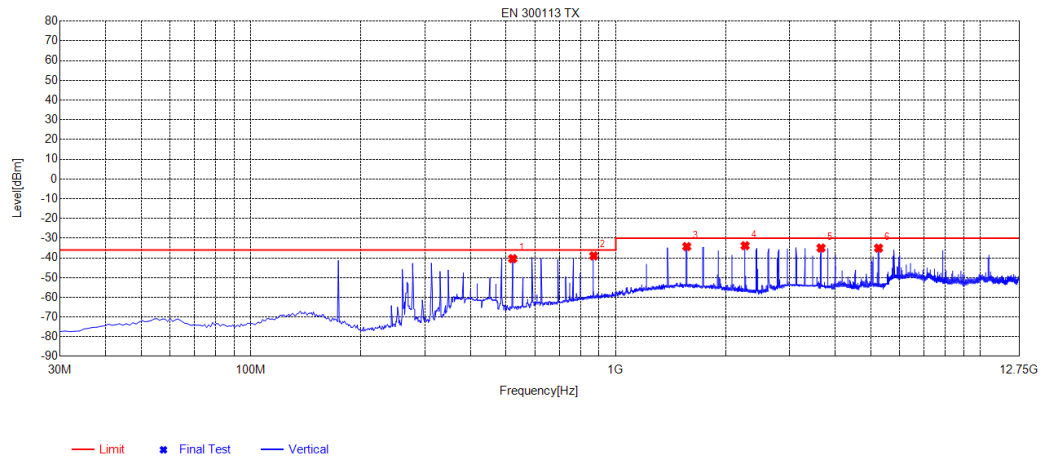
The Top channel for 12.5 KHz Channel Separation @Transmitting Mode-Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	418	-74.87	-40.11	-36.00	4.11	34.76	44	Horizontal
2	591.63	-79.90	-40.34	-36.00	4.34	39.56	340	Horizontal
3	1565.2315	-32.31	-35.03	-30.00	5.03	-2.72	174	Horizontal
4	2088.1588	-35.17	-34.99	-30.00	4.99	0.18	184	Horizontal
5	2435.9936	-32.87	-34.06	-30.00	4.06	-1.19	184	Horizontal
6	5275.0775	-41.30	-34.71	-30.00	4.71	6.59	82	Horizontal

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The Top channel for 12.5 KHz Channel Separation @Transmitting Mode- Vertical

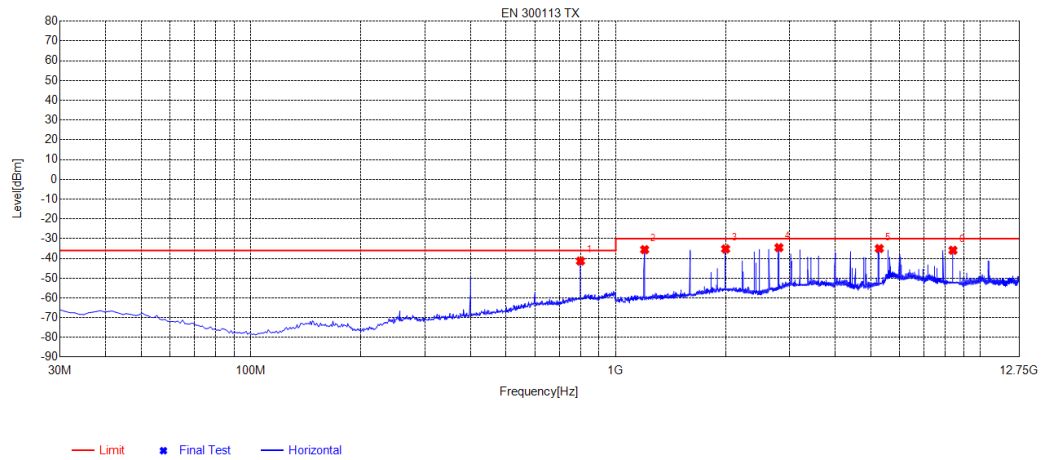


NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	521.79	-77.31	-40.41	-36.00	4.41	36.90	164	Vertical
2	870.02	-82.04	-39.01	-36.00	3.01	43.03	351	Vertical
3	1565.2315	-36.20	-34.27	-30.00	4.27	1.93	80	Vertical
4	2262.0762	-33.46	-33.84	-30.00	3.84	-0.38	351	Vertical
5	3653.4153	-38.14	-35.01	-30.00	5.01	3.13	116	Vertical
6	5251.5752	-40.09	-35.09	-30.00	5.09	5.00	144	Vertical

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UHF:

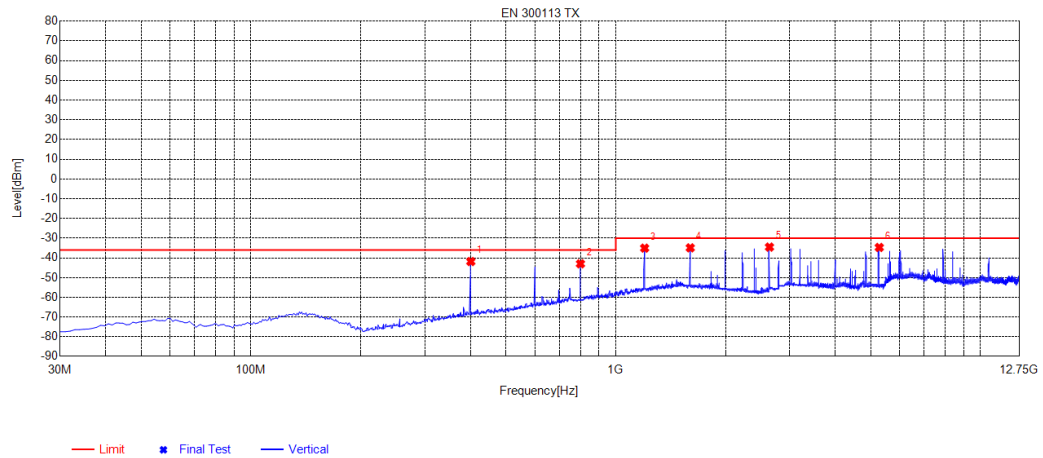
The Bottom channel for 12.5 KHz Channel Separation @Transmitting Mode-Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	800.18	-84.78	-41.36	-36.00	5.36	43.42	281	Horizontal
2	1199.77	-31.73	-35.57	-30.00	5.57	-3.84	353	Horizontal
3	2000.025	-35.75	-35.22	-30.00	5.22	0.53	353	Horizontal
4	2800.28	-35.96	-34.56	-30.00	4.56	1.40	345	Horizontal
5	5276.2526	-41.63	-35.03	-30.00	5.03	6.60	77	Horizontal
6	8400.8901	-48.81	-35.90	-30.00	5.90	12.91	345	Horizontal

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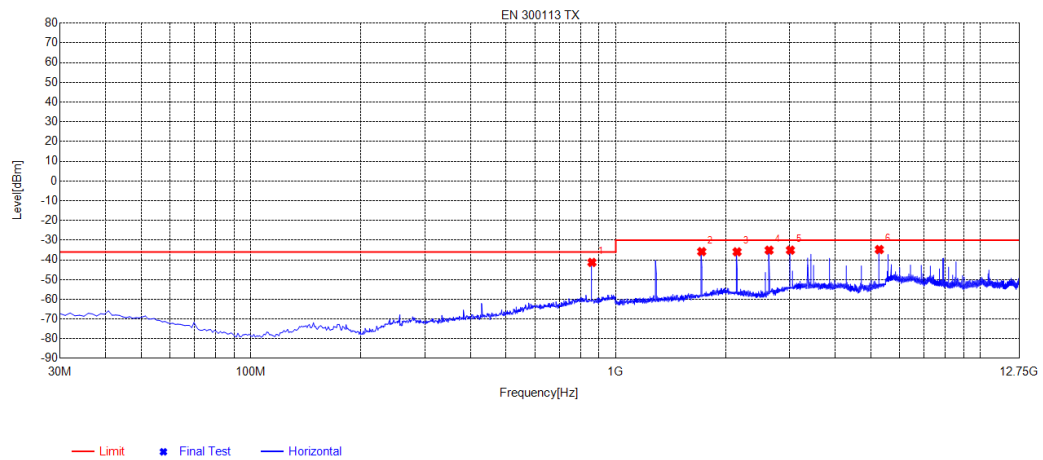
The Bottom channel for 12.5 KHz Channel Separation @Transmitting Mode- Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	400.54	-76.86	-41.86	-36.00	5.86	35.00	359	Vertical
2	800.18	-85.37	-43.00	-36.00	7.00	42.37	3	Vertical
3	1199.77	-35.24	-35.07	-30.00	5.07	0.17	359	Vertical
4	1600.485	-36.73	-34.92	-30.00	4.92	1.81	359	Vertical
5	2638.1138	-34.65	-34.55	-30.00	4.55	0.10	3	Vertical
6	5276.2526	-39.82	-34.72	-30.00	4.72	5.10	138	Vertical

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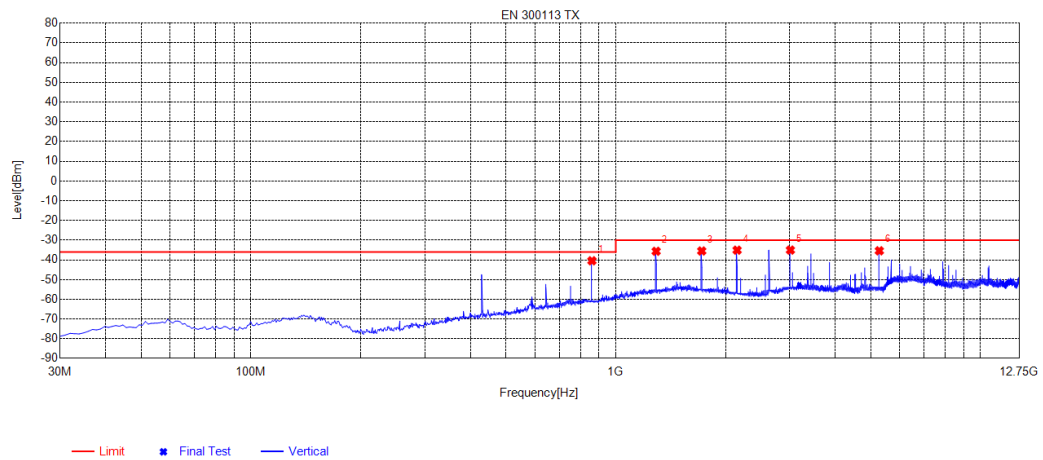
The Middle channel for 12.5 KHz Channel Separation @Transmitting Mode-Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	860.32	-84.44	-41.31	-36.00	5.31	43.13	300	Horizontal
2	1720.347	-34.27	-35.83	-30.00	5.83	-1.56	30	Horizontal
3	2150.44	-35.88	-35.94	-30.00	5.94	-0.06	200	Horizontal
4	2632.2382	-34.92	-35.11	-30.00	5.11	-0.19	230	Horizontal
5	3010.6261	-38.39	-35.08	-30.00	5.08	3.31	120	Horizontal
6	5277.4277	-41.39	-34.78	-30.00	4.78	6.61	30	Horizontal

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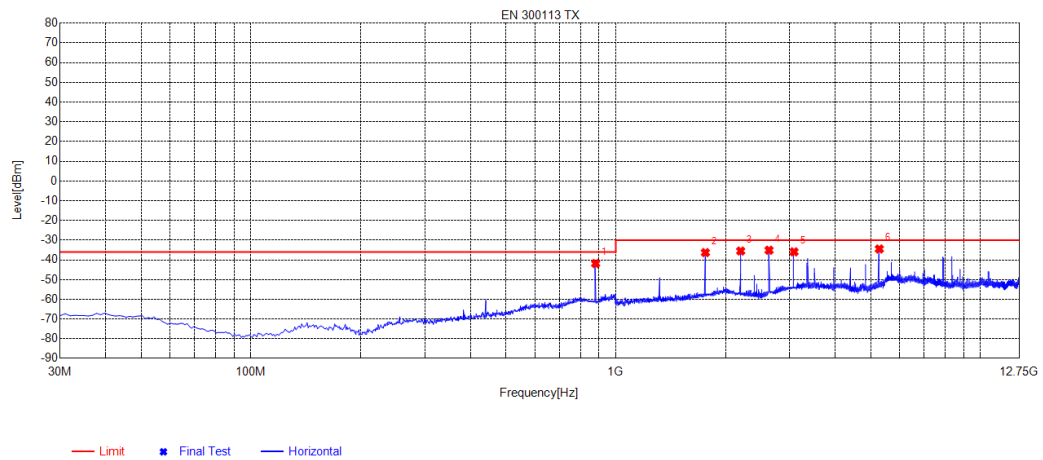
The Middle channel for 12.5 KHz Channel Separation @Transmitting Mode- Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	860.32	-83.40	-40.46	-36.00	4.46	42.94	60	Vertical
2	1290.254	-36.42	-35.65	-30.00	5.65	0.77	0	Vertical
3	1720.347	-36.89	-35.50	-30.00	5.50	1.39	170	Vertical
4	2150.44	-35.04	-35.08	-30.00	5.08	-0.04	230	Vertical
5	3010.6261	-38.25	-35.04	-30.00	5.04	3.21	250	Vertical
6	5277.4277	-40.51	-35.40	-30.00	5.40	5.11	30	Vertical

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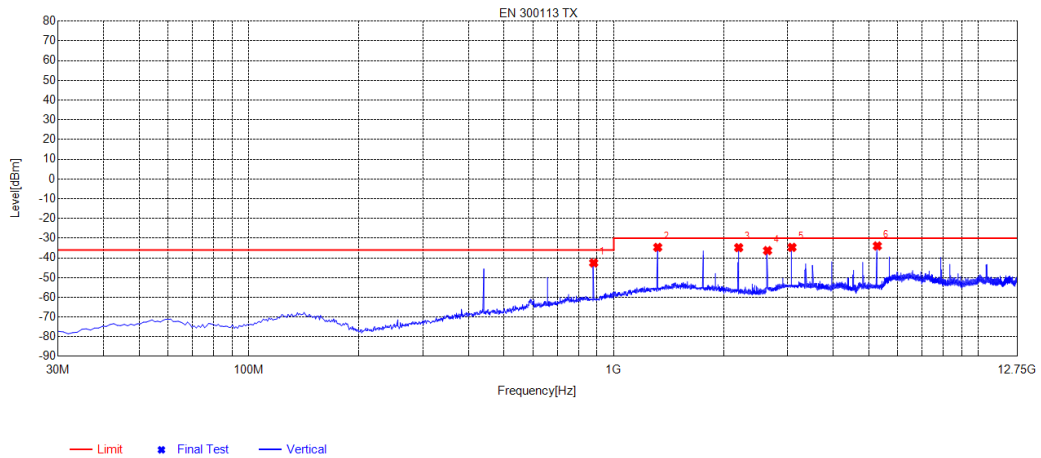
The Middle channel for 12.5 KHz Channel Separation @Transmitting Mode-Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	880.69	-84.87	-41.84	-36.00	5.84	43.03	60	Horizontal
2	1760.301	-35.05	-36.31	-30.00	6.31	-1.26	50	Horizontal
3	2199.795	-35.25	-35.51	-30.00	5.51	-0.26	20	Horizontal
4	2631.0631	-34.91	-35.11	-30.00	5.11	-0.20	360	Horizontal
5	3079.958	-39.37	-35.94	-30.00	5.94	3.43	330	Horizontal
6	5277.4277	-41.09	-34.48	-30.00	4.48	6.61	120	Horizontal

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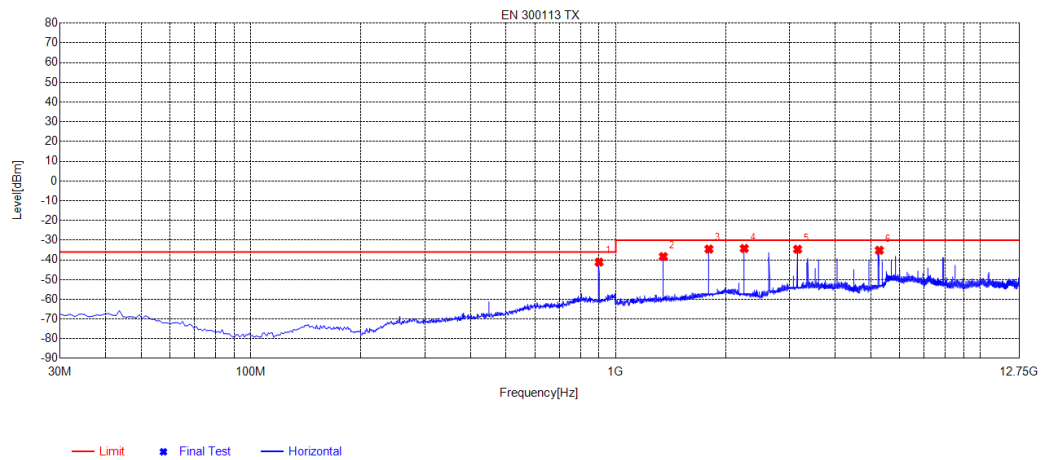
The Middle channel for 12.5 KHz Channel Separation @Transmitting Mode- Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	880.69	-85.70	-42.57	-36.00	6.57	43.13	200	Vertical
2	1319.632	-35.64	-34.68	-30.00	4.68	0.96	80	Vertical
3	2199.795	-34.64	-34.83	-30.00	4.83	-0.19	150	Vertical
4	2639.2889	-36.43	-36.32	-30.00	6.32	0.11	80	Vertical
5	3079.958	-37.87	-34.68	-30.00	4.68	3.19	50	Vertical
6	5277.4277	-39.07	-33.96	-30.00	3.96	5.11	320	Vertical

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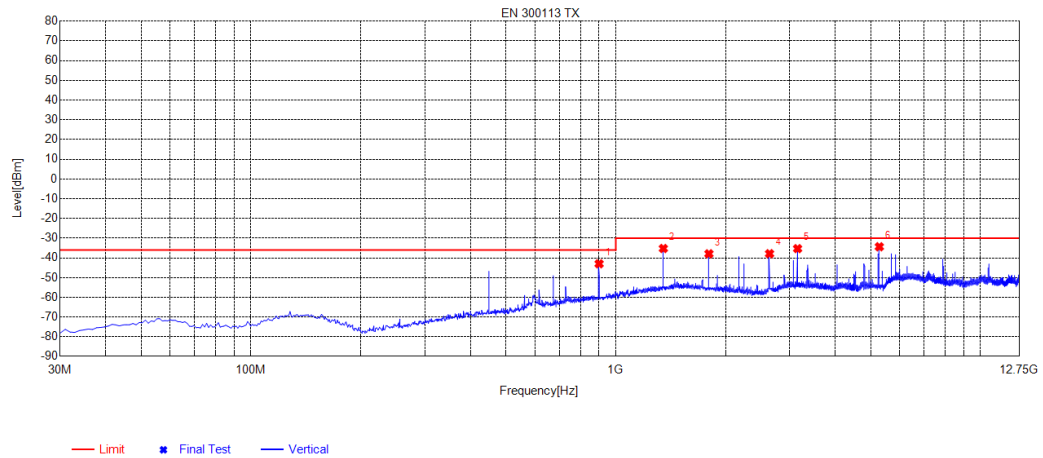
The Middle channel for 12.5 KHz Channel Separation @Transmitting Mode-Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	900.09	-84.12	-41.18	-36.00	5.18	42.94	210	Horizontal
2	1350.185	-34.79	-38.31	-30.00	8.31	-3.52	250	Horizontal
3	1800.255	-33.58	-34.54	-30.00	4.54	-0.96	210	Horizontal
4	2250.325	-33.79	-34.25	-30.00	4.25	-0.46	190	Horizontal
5	3150.465	-38.19	-34.63	-30.00	4.63	3.56	210	Horizontal
6	5277.4277	-41.77	-35.16	-30.00	5.16	6.61	70	Horizontal

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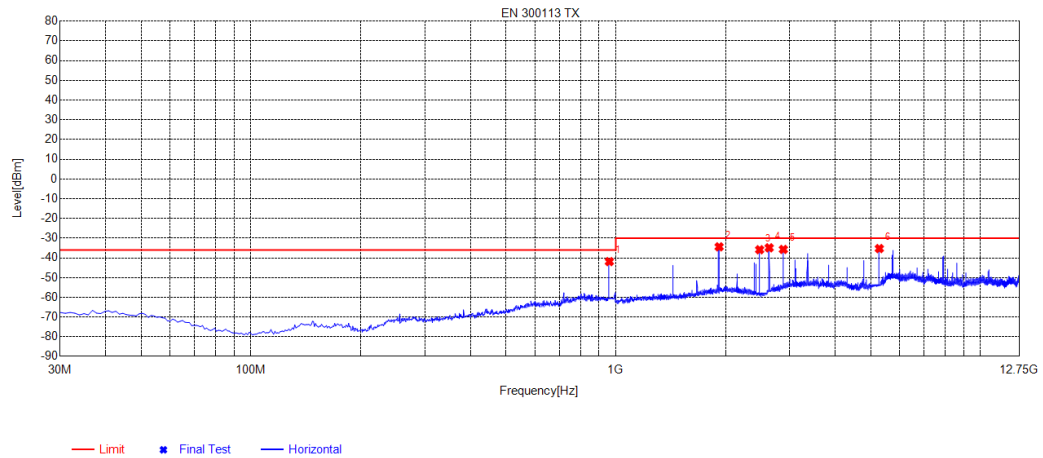
The Middle channel for 12.5 KHz Channel Separation @Transmitting Mode- Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	900.09	-86.31	-43.00	-36.00	7.00	43.31	0	Vertical
2	1350.185	-36.42	-35.25	-30.00	5.25	1.17	180	Vertical
3	1800.255	-39.05	-37.94	-30.00	7.94	1.11	240	Vertical
4	2639.2889	-38.00	-37.89	-30.00	7.89	0.11	250	Vertical
5	3150.465	-38.49	-35.33	-30.00	5.33	3.16	170	Vertical
6	5277.4277	-39.48	-34.37	-30.00	4.37	5.11	100	Vertical

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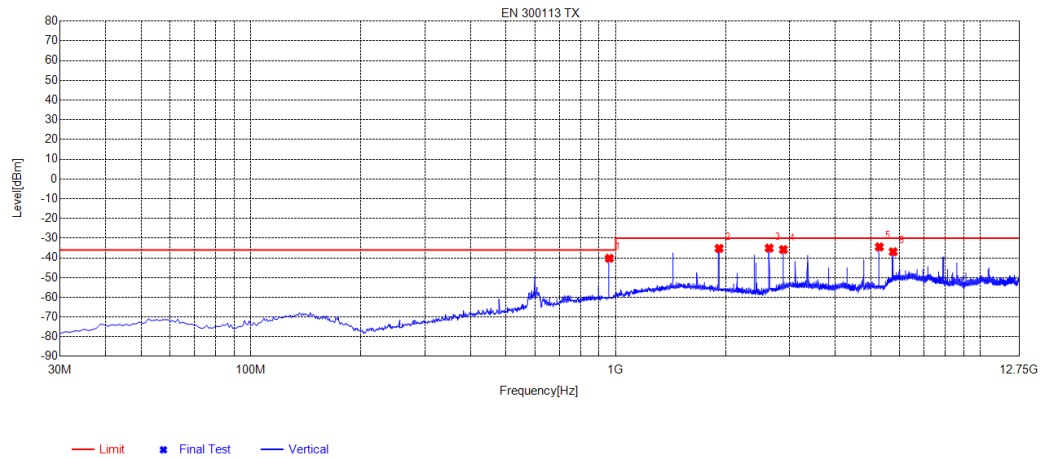
The Top channel for 12.5 KHz Channel Separation @Transmitting Mode-Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	960.23	-86.15	-41.90	-36.00	5.90	44.25	120	Horizontal
2	1920.117	-34.33	-34.40	-30.00	4.40	-0.07	360	Horizontal
3	2479.4729	-34.52	-35.88	-30.00	5.88	-1.36	130	Horizontal
4	2633.4133	-34.73	-34.91	-30.00	4.91	-0.18	190	Horizontal
5	2880.188	-37.88	-35.72	-30.00	5.72	2.16	130	Horizontal
6	5277.4277	-41.89	-35.28	-30.00	5.28	6.61	50	Horizontal

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The Top channel for 12.5 KHz Channel Separation @Transmitting Mode- Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	960.23	-84.17	-40.25	-36.00	4.25	43.92	100	Vertical
2	1920.117	-35.91	-35.22	-30.00	5.22	0.69	340	Vertical
3	2633.4133	-35.14	-35.08	-30.00	5.08	0.06	140	Vertical
4	2880.188	-37.98	-35.80	-30.00	5.80	2.18	120	Vertical
5	5277.4277	-39.58	-34.47	-30.00	4.47	5.11	250	Vertical
6	5759.2259	-45.52	-36.93	-30.00	6.93	8.59	0	Vertical

Remark: 1) Measuring frequencies from 30MHz to the 12.75GHz.
2) The emission more than 30dB below the limit is not measured.

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6.6 INTERMODULATION ATTENUATION

This requirement applies only to transmitters to be used in base stations (fixed).

LIMIT

ETSI EN 300 113(V 3.1.1) Sub-clause 7.6

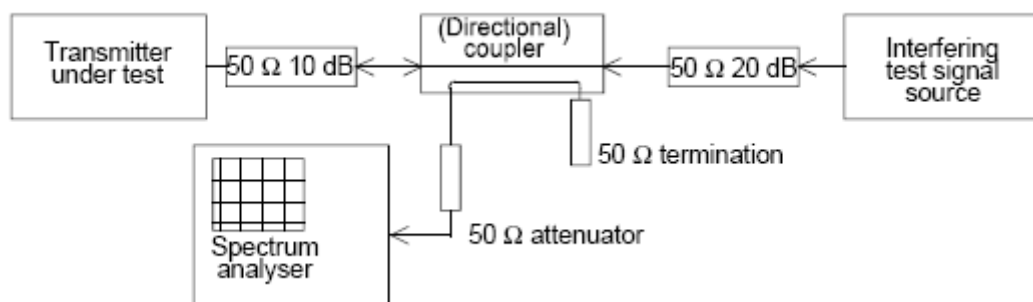
Two classes of transmitter intermodulation attenuation are defined, the equipment shall fulfil one of the requirements:

In general the intermodulation attenuation ratio shall be at least 40,0 dB for any intermodulation component; for base station equipment to be used in special service conditions (e.g. at sites where more than one transmitter will be in service) or when the regulatory authority makes it a condition of the licence, the intermodulation attenuation ratio shall be at least 70,0 dB for any intermodulation component. In the case where the performance is achieved by additional internal or external isolating devices (such as circulators) these are expected to be available at the time the measurements are made and shall be used for the measurements.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum Analyser	AGILENT	N9010A	MY53470504	Aug. 04, 2022	Aug. 03, 2023
SIGNAL GENERATOR	Aglient	E4421B	MY43351603	Feb. 17, 2023	Feb. 16, 2024
Directional Coupler	Werlatone	C5571-10	99463	Mar. 30, 2022	Mar. 29, 2024
RF Amplifier	OPHIR	5127	--	Aug. 15, 2022	Aug. 14, 2023

TEST CONFIGURATION



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TEST PROCEDUR

3. Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 5.3 for the test conditions.
4. Please refer to ETSI EN 300 113 (V2.2.1)) Sub-clause 7.6.2 for the measurement method.

TEST RESULTS

N/A

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6.7 TRANSMITTER ATTACK TIME

LIMIT

ETSI EN 300 113(V 3.1.1) Sub-clause 7.7

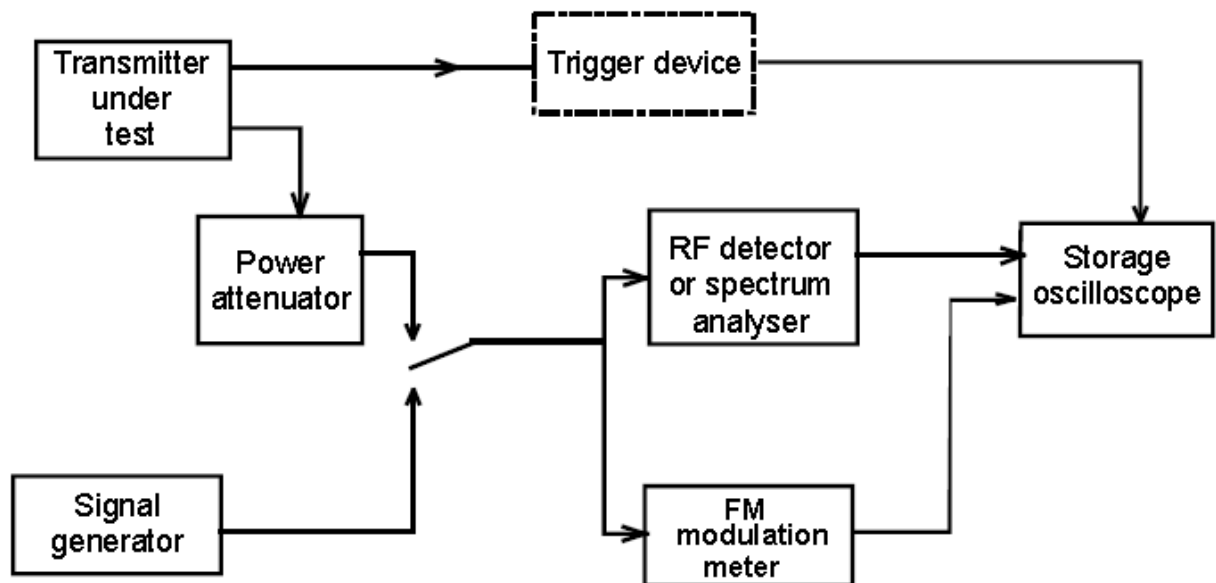
The transmitter attack time for constant envelope transmissions shall not exceed 25 ms ($t_{am} \leq t_{al}$).

For constant envelope transmissions a limit at +4 dB above the steady state power shall not be exceeded during the transmitter attack time.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum Analyser	AGILENT	E4440A	MY44303916	Mar. 28, 2022	Mar. 27, 2023
Signal Generator	AGILENT	N5182A	MY50140530	Aug. 03, 2022	Aug. 02, 2023
Directional Coupler	Werlatone	C5571-10	99463	Mar. 30, 2022	Mar. 29, 2024
RF Amplifier	OPHIR	5127	--	Aug. 15, 2022	Aug. 14, 2023

TEST CONFIGURATION



TEST PROCEDUR

Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 5.3 for the test conditions.

Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 7.7.2 for the measurement method.

TEST RESULTS

Test result of 12.5 KHz Channel Separation-5W-VHF

Test Channel	T _{am} (ms)	T _{al} (ms)	P _c (dBm)	P _o (dBm)	Conclusion
Low Channel	17	25	32.85	26.99	Pass
Middle Channel	18	25	32.82	26.99	Pass
High Channel	19	25	32.86	26.99	Pass

Test result of 12.5 KHz Channel Separation-5W-UHF

Test Channel	T _{am} (ms)	T _{al} (ms)	P _c (dBm)	P _o (dBm)	Conclusion
Low Channel	15	25	26.85	26.99	Pass
Middle Channel	16	25	26.79	26.99	Pass
High Channel	18	25	26.82	26.99	Pass

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6.8 TRANSMITTER RELEASE TIME

LIMIT

ETSI EN 300 113(V 3.1.1) Sub-clause 7.8

For constant envelope transmissions the transmitter release time shall not exceed 20 ms ($t_{rm} \leq t_{rl}$).

For constant envelope transmissions a limit at +4 dB above the steady state power shall not be exceeded during the transmitter attack time.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Generator	AGILENT	N5182A	MY50140530	Aug. 03, 2022	Aug. 02 2023
Oscilloscope	TEKTRONIX	TDS2022B	C056355	Jun. 06, 2022	Jun. 05, 2023
FM Modulation Meter	EMG	EMG-1652	E02547833	Jun. 06, 2022	Jun. 05, 2023

TEST CONFIGURATION

The same as described in section 6.8

TEST PROCEDUR

Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 5.3 for the test conditions.

Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 7.8.2 for the measurement method.

TEST RESULTS

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Test result of 12.5 KHz Channel Separation-5W-VHF

Test Channel	$T_{rm}(ms)$	$T_{rl}(ms)$	Conclusion
Low Channel	15	20	Pass
Middle Channel	17	20	Pass
High Channel	16	20	Pass

Test result of 12.5 KHz Channel Separation-5W-UHF

Test Channel	$T_{rm}(ms)$	$T_{rl}(ms)$	Conclusion
Low Channel	14	20	Pass
Middle Channel	16	20	Pass
High Channel	18	20	Pass

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6.9 TRANSIENT BEHAVIOUR OF THE TRANSMITTER

6.9.1 TIME DOMAIN MEASUREMENTS OF POWER AND FREQUENCY

LIMIT

ETSI EN 300 113(V 3.1.1) Sub-clause 7.9.4.1

At any time when the carrier power is above $P_c - 30$ dB, the carrier frequency shall remain within half a channel separation (dfc) from the steady carrier frequency (F_c).

In case of equipment operating with channel separation of 12,5 kHz, the slopes of the plots "power as a function of time" corresponding to both attack and release times, shall be such that:

$t_p \geq 0,10$ ms and $t_d \geq 0,10$ ms, for attack and release time;

between the $P_c - 30$ dB point and the $P_c - 6$ dB point, both in the case of attack and release time, the sign of the slope shall not change.

In case of equipment operating with channel separation of 20 kHz or 25 kHz, the slopes of the plots "power as a function of time" corresponding to both attack and release times, shall be such that:

$t_p \geq 0,05$ ms and $t_d \geq 0,05$ ms, for attack and release time;

between the $P_c - 30$ dB point and the $P_c - 6$ dB point, both in the case of attack and release time, the sign of the slope shall not change.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum Analyser	AGILENT	N9010A	MY53470504	Aug. 04, 2022	Aug. 03, 2023
SIGNAL GENERATOR	Aglient	E4421B	MY43351603	Feb. 17, 2023	Feb. 16, 2024
Directional Coupler	Werlatone	C5571-10	99463	Mar. 30, 2022	Mar. 29, 2024
FM Modulation Meter	EMG	EMG-1652	E02547833	Jun. 06, 2022	Jun. 05, 2023

TEST CONFIGURATION

The same as described in section 6.8

TEST PROCEDUR

Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 5.3 for the test conditions.

Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 7.9.3.2 for the measurement method.

THE RESULTS: PASS

VHF:

Test Channel	T_p (ms)	T_d (ms)	The sign of the slope between the P_c - 30 dB point and the P_c - 6 dB point	Conclusion:
Low Channel	0.17	0.17	Not Change	Pass
Middle Channel	0.16	0.18	Not Change	Pass
High Channel	0.18	0.16	Not Change	Pass

UHF:

Test Channel	T_p (ms)	T_d (ms)	The sign of the slope between the P_c - 30 dB point and the P_c - 6 dB point	Conclusion:
Low Channel	0.16	0.18	Not Change	Pass
Middle Channel	0.14	0.17	Not Change	Pass
High Channel	0.19	0.15	Not Change	Pass

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6.9.2 ADJACENT CHANNEL TRANSIENT POWER MEASUREMENTS

LIMIT

ETSI EN 300 113(V 3.1.1) Sub-clause 7.9.4.2

The transient power, in the adjacent channels shall not exceed a value of:

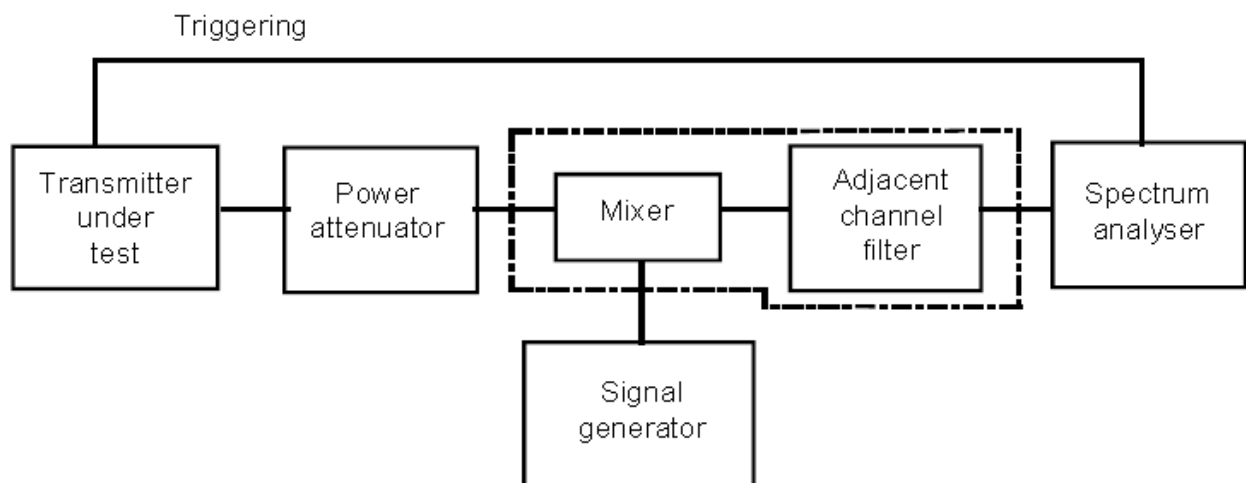
60,0 dB below the transmitter power (conducted) without the need to be below 2 μ W (-27,0 dBm), for a channel separations of 20 kHz and 25 kHz;

50,0 dB below the transmitter power (conducted) without the need to be below 2 μ W (-27,0 dBm), for a channel separation of 12,5 kHz.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
SIGNAL GENERATOR	Aglient	E4421B	MY43351603	Feb. 17, 2023	Feb. 16, 2024
Directional Coupler	Werlatone	C5571-10	99463	Mar. 30, 2022	Mar. 29, 2024
FM Modulation Meter	EMG	EMG-1652	E02547833	Jun. 06, 2022	Jun. 05, 2023

TEST CONFIGURATION



TEST PROCEDUR

Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 5.3 for the test conditions.

Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 7.9.3.3.2 for the measurement method.

TEST RESULTS

VHF:

The Bottom Channel of 12.5 KHz Channel Separation-5W

Test Condition		Adjacent Channel Power (dBc)
Temperature (°C)	Voltage (V)	
25°C	DC 7.40V	73
-10°C	DC 6.29V	68
	DC 7.40V	65
40°C	DC 6.29V	63
	DC 7.40V	64
Applicable Limit:		50dBc
Result		Pass

The Middle Channel of 12.5 KHz Channel Separation-5W

Test Condition		Adjacent Channel Power (dBc)
Temperature (°C)	Voltage (V)	
25°C	DC 7.40V	75
-10°C	DC 6.29V	62
	DC 7.40V	66
40°C	DC 6.29V	63
	DC 7.40V	67
Applicable Limit:		50dBc
Result		Pass

The Top Channel of 12.5 KHz Channel Separation-5W

Test Condition		Adjacent Channel Power (dBc)
Temperature (°C)	Voltage (V)	
25°C	DC 7.40V	72
-10°C	DC 6.29V	66
	DC 7.40V	69
40°C	DC 6.29V	65
	DC 7.40V	67
Applicable Limit:		50dBc
Result		Pass

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UHF:
The Bottom Channel of 12.5 KHz Channel Separation-5W

Test Condition		Adjacent Channel Power (dBc)
Temperature (°C)	Voltage (V)	
25°C	DC 7.40V	72
-10°C	DC 6.29V	65
	DC 7.40V	67
40°C	DC 6.29V	68
	DC 7.40V	69
Applicable Limit:		50dBc
Result		Pass

The Middle Channel of 12.5 KHz Channel Separation-5W

Test Condition		Adjacent Channel Power (dBc)
Temperature (°C)	Voltage (V)	
25°C	DC 7.40V	74
-10°C	DC 6.29V	63
	DC 7.40V	65
40°C	DC 6.29V	66
	DC 7.40V	68
Applicable Limit:		50dBc
Result		Pass

The Top Channel of 12.5 KHz Channel Separation-5W

Test Condition		Adjacent Channel Power (dBc)
Temperature (°C)	Voltage (V)	
25°C	DC 7.40V	74
-10°C	DC 6.29V	65
	DC 7.40V	68
40°C	DC 6.29V	62
	DC 7.40V	66
Applicable Limit:		50dBc
Result		Pass

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7. ETSI EN 300 113 REQUIREMENTS FOR RECEIVER

7.1 MAXIMUM USABLE SENSITIVITY (CONDUCTED)

LIMIT

ETSI EN 300 113(V 3.1.1) Sub-clause 8.1

The maximum usable sensitivity shall not exceed the values given in table 9 under normal test conditions, and the values in table 9 plus 6 dB under extreme test conditions.

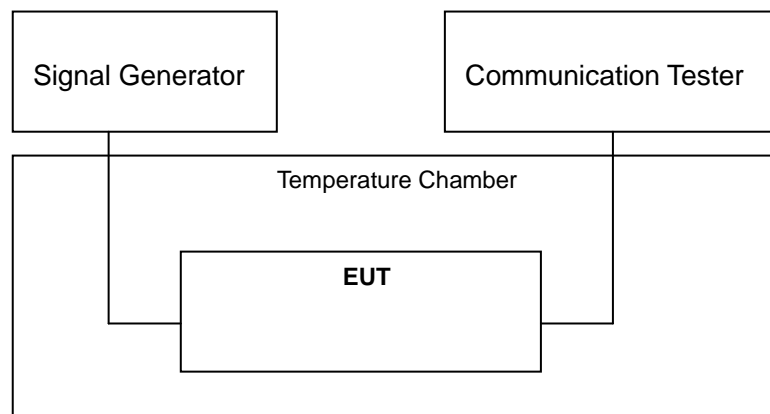
Table 9: Sensitivity levels (mean power) for different channel bandwidths and gross (on-air) bit rates

Channel BW	Data Rate	Sensitivity
12,5 kHz	9,6 kbit/s or less	-110 dBm
	more than 9,6 kbits to 16 kbit/s	-105 dBm
	more than 16 kbits to 38,4 kbit/s	-98 dBm
	greater than 38,4 kbit/s	-93 dBm
20 kHz and 25 kHz	9,6 kbit/s or less	-110 dBm
	more than 9,6 kbit/s to 38,4 kbit/s	-105 dBm
	more than 38,4 kbits to 76,8 kbit/s	-98 dBm
	greater than 76,8 kbit/s	-93 dBm

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Communication Test Set	HP	8920B	US35010161	Aug. 03, 2022	Aug. 02, 2023
H&T Chamber	EXPERY	TN-400	TN2007SR038	Jun. 06, 2022	Jun. 05, 2023
SIGNAL GENERATOR	Aglient	E4421B	MY43351603	Feb. 17, 2023	Feb. 16, 2024

TEST CONFIGURATION



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TEST PROCEDURE

Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 5.3 and 5.4 for the test conditions.

According to the ETSI EN 300 113 (V3.1.1) Sub-clause 8.1.2.1. The measurement procedure shall be as follows:

- a) an input signal with a frequency equal to the nominal frequency of the receiver, modulated by the normal test signal D-M2 (consisting of a pseudo-random bit sequence of at least 511 bits
- b) the bit pattern of the modulating signal shall be compared to the bit pattern obtained from the receiver after demodulation;
- c) the level of the input signal to the receiver is adjusted until the bit error ratio is 10^{-2} or better.
- d) the maximum usable sensitivity is the level in dBm of the input signal to the receiver; this value shall be recorded;
- e) the measurement shall be repeated under extreme test conditions

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15 days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

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TEST RESULTS

Test Result of 12.5 KHz Channel Separation for Bottom Channel (137.025 MHz) Data Rate: 9600 bits per second or less			
Test Condition		Result Measured (dBm)	Limit (dBm)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	-118	-110
T min (-10°C)	DC 7.40V	-120	-104
	DC 6.29V	-119	-104
T Max (+40°C)	DC 7.40V	-117	-104
	DC 6.29V	-116	-104
Result		Pass	

Test Result of 12.5 KHz Channel Separation for Middle Channel (155.025 MHz) Data Rate: 9600 bits per second or less			
Test Condition		Result Measured (dBm)	Limit (dBm)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	-117	-110
T min (-10°C)	DC 7.40V	-121	-104
	DC 6.29V	-119	-104
T Max (+40°C)	DC 7.40V	-115	-104
	DC 6.29V	-118	-104
Result		Pass	

Test Result of 12.5 KHz Channel Separation for High Channel (173.975MHz) Data Rate: 9600 bits per second or less			
Test Condition		Result Measured (dBm)	Limit (dBm)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	-119	-110
T min (-10°C)	DC 7.40V	-118	-104
	DC 6.29V	-116	-104
T Max (+40°C)	DC 7.40V	-115	-104
	DC 6.29V	-117	-104
Result		Pass	

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Test Result of 12.5 KHz Channel Separation for Bottom Channel (400.025 MHz)			
Data Rate: 9600 bits per second or less			
Test Condition		Result Measured (dBm)	Limit (dBm)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	-115	-110
T min (-10°C)	DC 7.40V	-120	-104
	DC 6.29V	-118	-104
T Max (+40°C)	DC 7.40V	-114	-104
	DC 6.29V	-116	-104
Result		Pass	

Test Result of 12.5 KHz Channel Separation for Middle Channel (440.025MHz)			
Data Rate: 9600 bits per second or less			
Test Condition		Result Measured (dBm)	Limit (dBm)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	-117	-110
T min (-10°C)	DC 7.40V	-118	-104
	DC 6.29V	-116	-104
T Max (+40°C)	DC 7.40V	-115	-104
	DC 6.29V	-116	-104
Result		Pass	

Test Result of 12.5 KHz Channel Separation for High Channel (479.975MHz)			
Data Rate: 9600 bits per second or less			
Test Condition		Result Measured (dBm)	Limit (dBm)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	-114	-110
T min (-10°C)	DC 7.40V	-115	-104
	DC 6.29V	-116	-104
T Max (+40°C)	DC 7.40V	-118	-104
	DC 6.29V	-117	-104
Result		Pass	

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7.2 AVERAGE USABLE SENSITIVITY (FIELD STRENGTH) (NOT APPLICABLE TO DEVICE WITH EXTERNAL RF PORT)

LIMIT

N/A

MEASUREMENT EQUIPMENT USED

N/A

TEST CONFIGURATION

N/A

TEST PROCEDURE

N/A

TEST RESULTS

N/A

7.3 LEVEL OF THE WANTED SIGNAL FOR THE DEGRADATION MEASUREMENTS

LIMIT

N/A

MEASUREMENT EQUIPMENT USED

N/A

TEST CONFIGURATION

N/A

TEST PROCEDURE

N/A

TEST RESULTS

N/A

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

7.4 ERROR BEHAVIOUR AT HIGH INPUT LEVELS

LIMIT

ETSI EN 300 113(V 3.1.1) Sub-clause 8.4

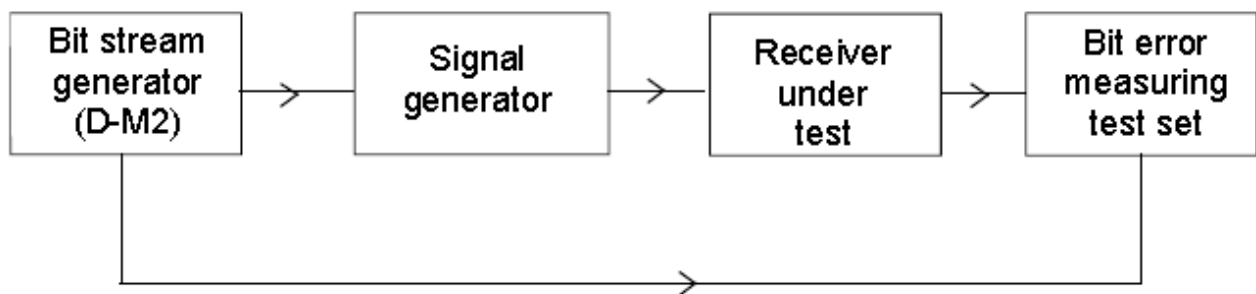
The bit error ratio (continuous bit streams) shall not exceed 10^{-4} .

The number of messages or packets not correctly received (lost or corrupted) shall not exceed 1.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Bit Error Measuring Test Set	Tektronix	PED3000	PE5263214	Jun. 06, 2022	Jun. 05, 2023
Bit Stream Generator	Agilent	33521A	258142	Jun. 06, 2022	Jun. 05, 2023
Signal Generator	AGILENT	N5182A	MY50140530	Aug. 04, 2022	Aug. 03, 2023

TEST CONFIGURATION



TEST PROCEDURE

5. Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 5.3 for the test conditions.
6. Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 8.4.2 for the measurement method.

TEST RESULTS

Test Result of 12.5 Channel Separation-5W					
Wanted Signal Channel (MHz)	Modulation	The level of the input signal	Test Result (bit error ratio)	Limit (bit error ratio)	Result
155.025	D-M2	30 dB above the level of the wanted signal for the degradation measurements	10^{-5}	10^{-4}	Pass
155.025	D-M2	-10 dBm	10^{-5}	10^{-4}	Pass

Test Result of 12.5 Channel Separation-5W					
Wanted Signal Channel (MHz)	Modulation	The level of the input signal	Test Result (bit error ratio)	Limit (bit error ratio)	Result
440.025	D-M2	30 dB above the level of the wanted signal for the degradation measurements	10^{-5}	10^{-4}	Pass
440.025	D-M2	-10 dBm	10^{-5}	10^{-4}	Pass

Note: Above is worst condition.

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7.5 CO-CHANNEL REJECTION

LIMIT

ETSI EN 300 113(V 3.1.1) Sub-clause 8.5

The value of the co-channel rejection ratio, expressed in dB, at the signal displacements given in the method of measurement, shall be between the values given in table 11.

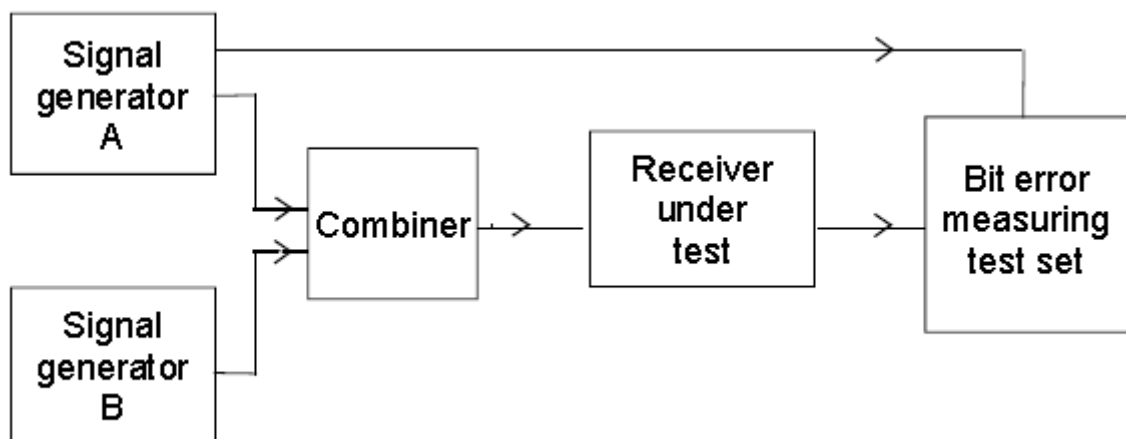
Table 11: Co-channel limits (mean power) for different channel bandwidths and gross (on-air) bit rates

Channel BW	Data Rate	Sensitivity
12,5 kHz	9,6 kbit/s or less	between 12,0 dB and 0 dB
	more than 9,6 kbits to 16 kbit/s	between 17,0 dB and 0 dB
	more than 16 kbits to 38,4 kbit/s	between 24,0 dB and 0 dB
	greater than 38,4 kbit/s	between 29,0 dB and 0 dB
20 kHz and 25 kHz	9,6 kbit/s or less	between 8,0 dB and 0 dB
	more than 9,6 kbit/s to 38,4 kbit/s	between 12,0 dB and 0 dB
	more than 38,4 kbits to 76,8 kbit/s	between 19,0 dB and 0 dB
	greater than 76,8 kbit/s	between 24,0 dB and 0 dB

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Communication Test Set	HP	8920B	US35010161	Aug. 03, 2022	Aug. 02, 2023
Signal Generator	Aglient	N5182B	MY53050647	Aug. 03, 2022	Aug. 02, 2023
Signal Generator	Aglient	N5171B	MY53050474	Aug. 03, 2022	Aug. 02, 2023

TEST CONFIGURATION



Signal generator B, generating an RF signal, modulated by an audio frequency signal of 400 Hz with a deviation of 12 % of the channel separation. This signal is used as an unwanted signal.

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TEST PROCEDURE

7. Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 5.3 for the test conditions.
8. Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 8.5.2 for the measurement method.

TEST RESULTS

Test Result of 12.5 KHz Channel Separation				
Wanted Signal Channel (MHz)	Unwanted Signal Frequency (MHz)	Test Result (dBm)	Limit (dBm)	Result
137.025	137.025+0	8.0	between 12.0 dB and 0 dB	Pass
137.025	137.025+0.0015	8.1	between 12.0 dB and 0 dB	Pass
137.025	137.025-0.0015	8.3	between 12.0 dB and 0 dB	Pass

Test Result of 12.5 KHz Channel Separation				
Wanted Signal Channel (MHz)	Unwanted Signal Frequency (MHz)	Test Result (dBm)	Limit (dBm)	Result
137.025	137.025.975+0	8.5	between 12.0 dB and 0 dB	Pass
137.025	137.025+0.0015	8.2	between 12.0 dB and 0 dB	Pass
137.025	137.025-0.0015	8.4	between 12.0 dB and 0 dB	Pass

Test Result of 12.5 KHz Channel Separation				
Wanted Signal Channel (MHz)	Unwanted Signal Frequency (MHz)	Test Result (dBm)	Limit (dBm)	Result
400.025	400.025+0	8.2	between 12.0 dB and 0 dB	Pass
400.025	400.025+0.0015	8.3	between 12.0 dB and 0 dB	Pass
400.025	400.025-0.0015	8.8	between 12.0 dB and 0 dB	Pass

Test Result of 12.5 KHz Channel Separation				
Wanted Signal Channel (MHz)	Unwanted Signal Frequency (MHz)	Test Result (dBm)	Limit (dBm)	Result
479.975	479.975+0	8.4	between 12.0 dB and 0 dB	Pass
479.975	479.975+0.0015	8.2	between 12.0 dB and 0 dB	Pass
479.975	479.975-0.0015	8.5	between 12.0 dB and 0 dB	Pass

Note: 1. The test signal is D-M2. Data Rate is 9600 bits per second
2. Above is worst condition.

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7.6 ADJACENT CHANNEL SELECTIVITY

LIMIT

ETSI EN 300 113(V 3.1.1) Sub-clause 8.6

The adjacent channel selectivity for different channel separations shall not be less than the values given in table 12.

Table 12: Adjacent channel selectivity

	Channel separation	
	12,5 kHz	20/25 kHz
normal test conditions	60,0 dB	70,0 dB
extreme test conditions	50,0 dB	60,0 dB

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Communication Test Set	HP	8920B	US35010161	Aug. 03, 2022	Aug. 02, 2023
Signal Generator	Aglient	N5182B	MY53050647	Aug. 03, 2022	Aug. 02, 2023
Signal Generator	Aglient	N5171B	MY53050474	Aug. 03, 2022	Aug. 02, 2023

TEST CONFIGURATION

The same as described in section 7.5

TEST PROCEDURE

Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 5.3 and 5.4 for the test conditions.
Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 8.6.2.1 for the measurement method.

TEST RESULTS

Test Result of 12.5 KHz Channel Separation for bottom channel (137.025 MHz) at unwanted signal frequency above wanted signal frequency			
Test Condition		Result Measured (dB)	Limit (dB)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	74	60
T min (-10°C)	DC 7.40V	62	50
	DC 6.29V	66	50
T Max (+40°C)	DC 7.40V	65	50
	DC 6.29V	68	50
Result		Pass	

Test Result of 12.5 KHz Channel Separation for bottom channel (137.025MHz) at unwanted signal frequency below wanted signal frequency			
Test Condition		Result Measured (dB)	Limit (dB)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	75	60
T min (-10°C)	DC 7.40V	69	50
	DC 6.29V	64	50
T Max (+40°C)	DC 7.40V	68	50
	DC 6.29V	66	50
Result		Pass	

Test Result of 12.5 KHz Channel Separation for middle channel (155.025MHz) at unwanted signal frequency above wanted signal frequency			
Test Condition		Result Measured (dB)	Limit (dB)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	74	60
T min (-10°C)	DC 7.40V	62	50
	DC 6.29V	66	50
T Max (+40°C)	DC 7.40V	65	50
	DC 6.29V	64	50
Result		Pass	

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

Test Result of 12.5 KHz Channel Separation for middle channel (155.025MHz) at unwanted signal frequency below wanted signal frequency			
Test Condition		Result Measured (dB)	Limit (dB)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	75	60
T min (-10°C)	DC 7.40V	69	50
	DC 6.29V	66	50
T Max (+40°C)	DC 7.40V	64	50
	DC 6.29V	65	50
Result		Pass	

Test Result of 12.5 KHz Channel Separation for High channel (173.975MHz) at unwanted signal frequency above wanted signal frequency			
Test Condition		Result Measured (dB)	Limit (dB)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	72	60
T min (-10°C)	DC 7.40V	65	50
	DC 6.29V	64	50
T Max (+40°C)	DC 7.40V	62	50
	DC 6.29V	63	50
Result		Pass	

Test Result of 12.5 KHz Channel Separation for High channel (173.975MHz) at unwanted signal frequency below wanted signal frequency			
Test Condition		Result Measured (dB)	Limit (dB)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	75	60
T min (-10°C)	DC 7.40V	64	50
	DC 6.29V	66	50
T Max (+40°C)	DC 7.40V	68	50
	DC 6.29V	69	50
Result		Pass	

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Test Result of 12.5 KHz Channel Separation for bottom channel (400.025 MHz) at unwanted signal frequency above wanted signal frequency			
Test Condition		Result Measured (dB)	Limit (dB)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	72	60
T min (-10°C)	DC 7.40V	66	50
	DC 6.29V	67	50
T Max (+40°C)	DC 7.40V	65	50
	DC 6.29V	68	50
Result		Pass	

Test Result of 12.5 KHz Channel Separation for bottom channel (400.025 MHz) at unwanted signal frequency below wanted signal frequency			
Test Condition		Result Measured (dB)	Limit (dB)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	75	60
T min (-10°C)	DC 7.40V	62	50
	DC 6.29V	64	50
T Max (+40°C)	DC 7.40V	63	50
	DC 6.29V	62	50
Result		Pass	

Test Result of 12.5 KHz Channel Separation for middle channel (440.025MHz) at unwanted signal frequency above wanted signal frequency			
Test Condition		Result Measured (dB)	Limit (dB)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	72	60
T min (-10°C)	DC 7.40V	65	50
	DC 6.29V	64	50
T Max (+40°C)	DC 7.40V	66	50
	DC 6.29V	68	50
Result		Pass	

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

Test Result of 12.5 KHz Channel Separation for middle channel (440.025MHz) at unwanted signal frequency below wanted signal frequency			
Test Condition		Result Measured (dB)	Limit (dB)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	73	60
T min (-10°C)	DC 7.40V	64	50
	DC 6.29V	66	50
T Max (+40°C)	DC 7.40V	69	50
	DC 6.29V	65	50
Result		Pass	

Test Result of 12.5 KHz Channel Separation for High channel (479.975MHz) at unwanted signal frequency above wanted signal frequency			
Test Condition		Result Measured (dB)	Limit (dB)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	72	60
T min (-10°C)	DC 7.40V	65	50
	DC 6.29V	67	50
T Max (+40°C)	DC 7.40V	66	50
	DC 6.29V	68	50
Result		Pass	

Test Result of 12.5 KHz Channel Separation for High channel (479.975MHz) at unwanted signal frequency below wanted signal frequency			
Test Condition		Result Measured (dB)	Limit (dB)
Temperature (°C)	Voltage (V)		
T Nor (25°C)	DC 7.40V	73	60
T min (-10°C)	DC 7.40V	64	50
	DC 6.29V	68	50
T Max (+40°C)	DC 7.40V	66	50
	DC 6.29V	65	50
Result		Pass	

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

7.7 SPURIOUS RESPONSE REJECTION

LIMIT

ETSI EN 300 113(V 3.1.1) Sub-clause 8.7

At any frequency separated from the nominal frequency of the receiver by two channels or more, the spurious response rejection shall be such that under the specified test conditions, the given degradation shall not be exceeded for levels of the unwanted signal up to -37 dBm.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Communication Test Set	HP	8920B	US35010161	Aug. 03, 2022	Aug. 02, 2023
Signal Generator	Aglient	N5182B	MY53050647	Aug. 03, 2022	Aug. 02, 2023
Signal Generator	Aglient	N5171B	MY53050474	Aug. 03, 2022	Aug. 02, 2023

TEST CONFIGURATION

The same as described in section 7.5

TEST PROCEDURE

9. Please refer to ETSI EN 300 113(V 3.1.1) Sub-clause 5.3 for the test conditions.
10. Please refer to ETSI EN 300 113(V 3.1.1) Sub-clause 8.7.4 for the measurement method.

TEST CONFIGURATION

The same as described in section 7.5

TEST RESULTS

VHF:

Test Result of 12.5 KHz Channel Separation for low channel	
Test Result (dBm)	Limit (dBm)
-47	-37
Result	Pass

UHF:

Test Result of 12.5 KHz Channel Separation for low channel	
Test Result (dBm)	Limit (dBm)
-47	-37
Result	Pass

Note: above is worst mode data.

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

7.8 INTER MODULATION RESPONSE REJECTION

LIMIT

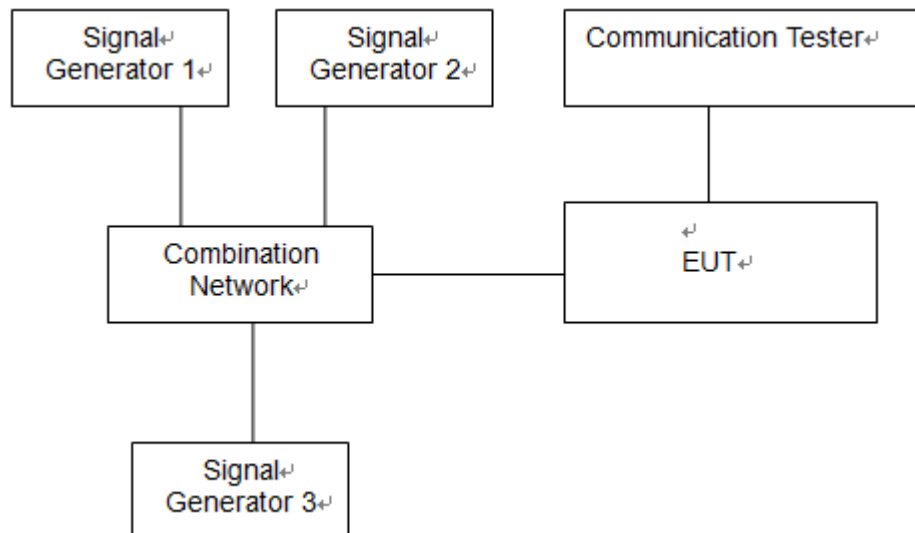
ETSI EN 300 113(V 3.1.1) Sub-clause 8.8

The intermodulation response rejection of the equipment shall be such that under the specified test conditions, the given degradation shall not be exceeded for levels of the unwanted signal up to -37dBm for base stations and -42dBm for mobile and hand portable stations.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Communication Test Set	HP	8920B	US35010161	Aug. 03, 2022	Aug. 02, 2023
Signal Generator	Aglient	N5182B	MY53050647	Aug. 03, 2022	Aug. 02, 2023
Signal Generator	Aglient	N5171B	MY53050474	Aug. 03, 2022	Aug. 02, 2023
SIGNAL GENERATOR	Aglient	E4421B	MY43351603	Feb. 17, 2023	Feb, 16, 2024

TEST CONFIGURATION



TEST PROCEDURE

- Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 5.3 for the test conditions.
- Please refer to ETSI EN 300 113 (V3.1.1) Sub-clause 8.8.2.1 for the measurement method.

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

TEST RESULTS

Test Result of 12.5 KHz Channel Separation At Above Wanted Signal Channel					
Wanted Signal Channel (MHz)	Unmodulated Unwanted Signal Frequency (MHz)	Modulated Unwanted Signal Frequency (MHz)	Test Result (dBm)	Limit (dBm)	Result
155.025	155.025+0.050	440.025+0.100	-38	-42	Pass

Test Result of 12.5 KHz Channel Separation At Below Wanted Signal Channel					
Wanted Signal Channel (MHz)	Unmodulated Unwanted Signal Frequency (MHz)	Modulated Unwanted Signal Frequency (MHz)	Test Result (dBm)	Limit (dBm)	Result
155.025	155.025-0.050	440.025-0.100	-36	-42	Pass

Test Result of 12.5 KHz Channel Separation At Above Wanted Signal Channel					
Wanted Signal Channel (MHz)	Unmodulated Unwanted Signal Frequency (MHz)	Modulated Unwanted Signal Frequency (MHz)	Test Result (dBm)	Limit (dBm)	Result
440.025	440.025+0.050	440.025+0.100	-38	-42	Pass

Test Result of 12.5 KHz Channel Separation At Below Wanted Signal Channel					
Wanted Signal Channel (MHz)	Unmodulated Unwanted Signal Frequency (MHz)	Modulated Unwanted Signal Frequency (MHz)	Test Result (dBm)	Limit (dBm)	Result
440.025	440.025-0.050	440.025-0.100	-37	-42	Pass

Note: above is worst mode data.

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

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7.9 BLOCKING OR DESENSITIZATION

LIMIT

ETSI EN 300 113(V 3.1.1) Sub-clause 8.9

The blocking level, for any frequency within the specified ranges, shall not be less than -23 dBm except at frequencies on which spurious responses are found, clause 8.6.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Communication Test Set	HP	8920B	US35010161	Aug. 03, 2022	Aug. 02, 2023
Signal Generator	Aglient	N5182B	MY53050647	Aug. 03, 2022	Aug. 02, 2023
Signal Generator	Aglient	N5171B	MY53050474	Aug. 03, 2022	Aug. 02, 2023

TEST CONFIGURATION

The same as described in section 7.5

TEST PROCEDURE

13. Please refer to ETSI EN 300 113(V 3.1.1) Sub-clause 5.3 for the test conditions.
14. Please refer to ETSI EN 300 113(V 3.1.1) Sub-clause 8.9.2.1 for the measurement method.

TEST RESULTS

Test Result of 12.5 KHz Channel Separation At Above Wanted Signal Channel				
Wanted Signal Channel (MHz)	Unwanted Signal Frequency (MHz)	Test Result (dBm)	Limit (dBm)	Result
155.025	155.025+1.000	-18	At least -23	Pass
155.025	155.025+2.000	-16	At least -23	Pass
155.025	155.025+5.000	-17	At least -23	Pass
155.025	155.025+10.000	-15	At least -23	Pass

Test Result of 12.5 KHz Channel Separation At Below Wanted Signal Channel				
Wanted Signal Channel (MHz)	Unwanted Signal Frequency (MHz)	Test Result (dB)	Limit (dBm)	Result
155.025	155.025-1.000	-17	At least -23	Pass
155.025	155.025-2.000	-16	At least -23	Pass
155.025	155.025-5.000	-15	At least -23	Pass
155.025	155.025-10.000	-16	At least -23	Pass

Test Result of 12.5 KHz Channel Separation At Above Wanted Signal Channel				
Wanted Signal Channel (MHz)	Unwanted Signal Frequency (MHz)	Test Result (dBm)	Limit (dBm)	Result
440.025	440.025+1.000	-15	At least -23	Pass
440.025	440.025+2.000	-14	At least -23	Pass
440.025	440.025+5.000	-13	At least -23	Pass
440.025	440.025+10.000	-19	At least -23	Pass

Test Result of 12.5 KHz Channel Separation At Below Wanted Signal Channel				
Wanted Signal Channel (MHz)	Unwanted Signal Frequency (MHz)	Test Result (dB)	Limit (dBm)	Result
440.025	440.025-1.000	-15	At least -23	Pass
440.025	440.025-2.000	-18	At least -23	Pass
440.025	440.025-5.000	-14	At least -23	Pass
440.025	440.025-10.000	-12	At least -23	Pass

Note: above is worst mode data.

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7.10 SPURIOUS RADIATIONS

LIMIT

ETSI EN 300 113(V 3.1.1) Sub-clause 8.10

The power of any spurious radiation shall not exceed the values given in tables 8 and 9.

Table 8: Conducted emissions

Frequency Range	9 KHz to 1GHz	Above 1GHz to 4GHz, or above 1GHz to 12.75GHz
Limit	2.0 nW (-57 dBm)	20 nW (-47 dBm)

Table 9: Radiated emissions

Frequency Range	30 MHz to 1GHz	Above 1GHz to 12.75GHz
Limit	2.0 nW (-57 dBm)	20 nW (-47 dBm)

MEASUREMENT EQUIPMENT USED

Radiated Emission Test Site # 4					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EMI TEST RECEIVER	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024
Preamplifier Assembly	ETS	3117PA	00225134	Sep. 01, 2022	Aug. 31, 2023
SPECTRUM ANALYZER	AGILENT	N9010A	MY53470504	Aug. 04, 2022	Aug. 03, 2023
ANTENNA	R&S	VULB9168	D69250	Apr. 28, 2021	Apr. 27, 2023
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023

Remark: Each piece of equipment is scheduled for calibration once a year. Expect for the antenna was once two years.

TEST CONFIGURATION

The same as described in section 6.6

TEST PROCEDURE

15. Please refer to ETSI EN 300 113(V 3.1.1) Sub-clause 5.3 for the test conditions.
16. Please refer to ETSI EN 300 113(V 3.1.1) Sub-clause 8.10.3 for the measurement method.

TEST RESULTS

Conducted Measurement (9 KHz to 12.75GHz) --- PASS

The Conducted Measurement are performed to the three channels (the bottom channel, the middle channel and the top channel) at each channel separation (12.5 KHz)

The bottom/middle/top Channel of 12.5 KHz Channel Separation

Frequency (MHz)	Reading level (dBUV)	Antenna Polarization	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
Below 1 GHz	--	V	--				-57	At least 20 dB down than the limit
Above 1 GHz	--	V	--				-47	
Below 1 GHz	--	H	--				-57	
Above 1 GHz	--	H	--				-47	

Remark:

- (1) Emission Level (dBm) = SG O/P-Cable + Ant Gain
- (2) Measuring frequencies from 9 KHz to the 12.75GHz.
- (3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measurement.

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The Radiated Measurement are performed to the three channels (the bottom channel, the middle channel and the top channel) at each channel separation (12.5 KHz)

The bottom/middle/top Channel of 12.5 KHz Channel Separation

Frequency (MHz)	Reading level (dBUV)	Antenna Polarization	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
Below 1 GHz	--	V	--				-57	At least 20 dB down than the limit
Above 1 GHz	--	V	--				-47	
Below 1 GHz	--	H	--				-57	
Above 1 GHz	--	H	--				-47	

Remark:

- (1) Emission Level (dBm) = SG O/P-Cable + Ant Gain
- (2) Measuring frequencies from 30 MHz to the 12.75GHz.
- (3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured

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8. DUPLEX OPERATION

8.1 RECEIVER DESENSITIZATION (WITH SIMULTANEOUS TRANSMISSION AND RECEPTION)

LIMIT

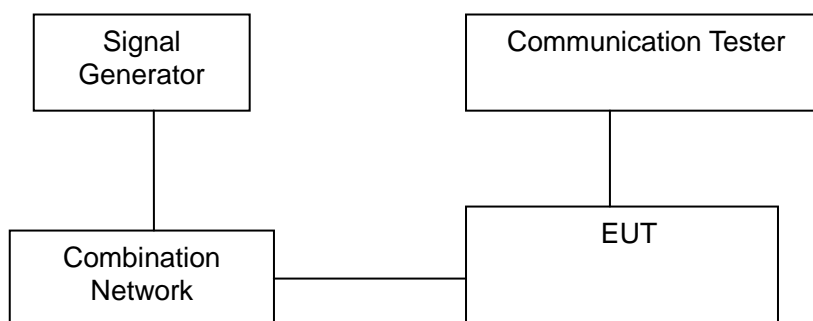
ETSI EN 300 113(V 3.1.1) Sub-clause 9

The desensitization shall not exceed 3,0 dB and the limit of maximum usable sensitivity under normal test conditions shall be met.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Communication Test Set	HP	8920B	US35010161	Aug. 03, 2022	Aug. 02, 2023
Signal Generator	AGILENT	N5182A	MY50140530	Aug. 03, 2022	Aug. 02, 2023

TEST CONFIGURATION



TEST PROCEDURE

17. Please refer to ETSI EN 300 113(V 3.1.1) Sub-clause 5.3 for the test conditions.
18. Please refer to ETSI EN 300 113(V 3.1.1) Sub-clause 9.1.2 for the measurement method.

TEST RESULTS

N/A

8.2 RECEIVER SPURIOUS RESPONSE REJECTION (WITH SIMULTANEOUS TRANSMISSION AND RECEPTION)

LIMIT

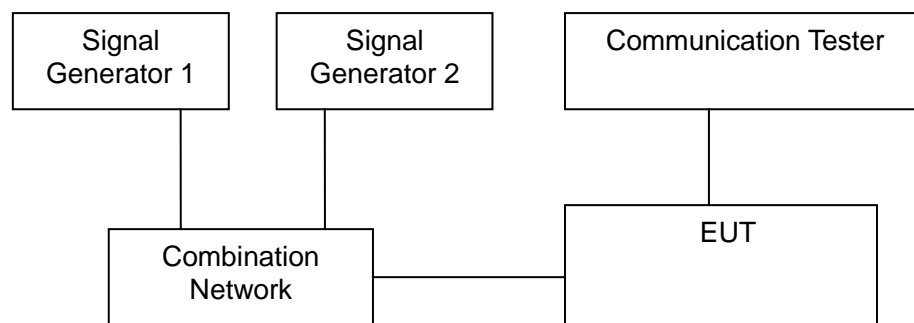
ETSI EN 300 113(V 3.1.1) Sub-clause 9.2.3

At any frequency separated from the nominal frequency of the receiver by two channels or more, the spurious response rejection ratio shall be greater than 67,0 dB.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Communication Test Set	HP	8920B	US35010161	Aug. 03, 2022	Aug. 02, 2023
Signal Generator	Aglient	N5182B	MY53050647	Aug. 03, 2022	Aug. 02, 2023
Signal Generator	Aglient	N5171B	MY53050474	Aug. 03, 2022	Aug. 02, 2023

TEST CONFIGURATION



TEST PROCEDURE

19. Please refer to ETSI EN 300 113(V 3.1.1) Sub-clause 5.3 for the test conditions.
20. Please refer to ETSI EN 300 113(V 3.1.1) Sub-clause 9.2.2 for the measurement method.

TEST RESULTS

N/A

APPENDIX I: PHOTOGRPHS OF TEST SETUP**RADIATED SPURIOUS EMISSION TEST SETUP****RADIATED SPURIOUS EMISSION ABOVE 1G TEST SETUP****----END OF REPORT----**

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3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
7. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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