



REPORT No.: SZ25040156W01

TEST REPORT

MANUFACTURER : Shenzhen Hohem Technology Co., Ltd.

PRODUCT NAME : iSteady V3 Ultra AI Tracking
Smartphone Gimbal

MODEL NAME : HPG-V3U

BRAND NAME : hohem

STANDARD(S) : ETSI EN 300 328 V2.2.2 (2019-07)

RECEIPT DATE : 2025-04-18

TEST DATE : 2025-04-29 to 2025-06-06

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Edited by: Peng Mi
Peng Mi (Rapporteur)

Approved by: Shen Junsheng
Shen Junsheng (Supervisor)

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MORLAB

Shenzhen Morlab Communications Technology Co., Ltd.
FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road,
Block67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

Tel: 86-755-36698555

Http://www.morlab.cn

Fax: 86-755-36698525

E-mail: service@morlab.cn





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Change History		
Version	Date	Reason for change
1.0	2025-07-02	First edition

1. Summary of Test Results

No.	Test Items	Test Engineer	Result	Remark
1	RF output power	Li Xinpeng	PASS	/
2	Power Spectral Density	Li Xinpeng	PASS	/
3	Duty cycle, Tx-sequence, Tx-gap	N/A	N/A _{Note1}	/
4	Medium Utilization (MU) factor	N/A	N/A _{Note1}	/
5	Occupied Channel Bandwidth	Li Xinpeng	PASS	/
6	Transmitter unwanted emissions in the out-of-band domain	Li Xinpeng	PASS	/
7	Transmitter unwanted emissions in the spurious domain	Li Xinpeng Gao Jianrou	PASS	/
8	Receiver spurious emissions	Li Xinpeng Gao Jianrou	PASS	/
9	Receiver Blocking	Li Xinpeng	PASS	/
10	Geo-location capability	N/A	N/A	/

Note 1: This requirement does not apply for equipment with a maximum declared RF Output power level of less than 10dBm e.i.r.p. or for equipment when operating in a mode where the RF Output power is less than 10dBm e.i.r.p.

Note 2: Any additions, deviation, or exclusions from the method shall be noted in the "Remark".

1.1. Applicable Standards

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

- ETSI EN 300 328 V2.2.2 (2019-07)

1.2. Applicable Test Methods

- ETSI EN 300 328 V2.2.2 (2019-07)



1.3. Test Equipment List

1.3.1. Conducted

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
Radio Communication Tester	R&S	CMW500	108950	2025.01.06	2026.01.05
Temperature Chamber	YOMA	DTL-003S/01	12108015	2024.09.11	2025.09.10
MXG Vector Signal Generator	Agilent	N5182B	MY53050961	2025.01.15	2026.01.14
EXG Analog Signal Generator	Agilent	N5171B	MY53050558	2025.01.15	2026.01.14
EXA Signal Analyzer	Agilent	N9010A	MY53470836	2025.01.15	2026.01.14
USB Power Sensor	Agilent	U2021XA	MY54180008	2024.09.11	2025.09.10

**1.3.2.Radiated**

Equipment	Serial No.	Model No.	Manufacturer	Cal. Date	Due Date
Signal Analyzer	MY56060145	N9020A	Agilent	2024.05.30	2025.05.29
				2025.05.13	2026.05.12
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2024.06.22	2025.06.21
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2024.06.22	2025.06.21
Test Antenna -Horn	9120D-963	BBHA 9120D	Schwarzbeck	2024.06.03	2025.06.02
				2025.05.16	2026.05.15
Test Antenna - Bi-Log	9163-274	VULB 9163	Schwarzbeck	2024.06.29	2025.06.28
Signal Generator	203403	MG3692C	anritsu	2024.09.11	2025.09.10
Preamplifier (10MHz-6GHz)	46732	S10M100L3802	LUCIX CORP.	2024.05.30	2025.05.29
				2025.05.13	2026.05.12
Preamplifier (2GHz-18GHz)	61171/61172	S020180L3203	LUCIX CORP.	2024.05.30	2025.05.29
				2025.05.13	2026.05.12
Preamplifier (18GHz-40GHz)	DS77209	DCLNA0118-40C-S	Decentest	2024.05.30	2025.05.29
				2025.05.13	2026.05.12
RF Coaxial Cable (DC-18GHz)	MRE001	PE330	Pasternack	2024.05.30	2025.05.29
				2025.05.13	2026.05.12
RF Coaxial Cable (DC-18GHz)	MRE002	CLU18	Pasternack	2024.05.30	2025.05.29
				2025.05.13	2026.05.12
RF Coaxial Cable (DC-18GHz)	MRE003	CLU18	Pasternack	2024.05.30	2025.05.29
				2025.05.13	2026.05.12
RF Coaxial Cable (DC-40GHz)	22290045	QA360-40-KK-0.5	Qualwave	N/A	N/A
RF Coaxial Cable (DC-40GHz)	22290046	QA360-40-KKF-2	Qualwave	N/A	N/A
RF Coaxial Cable (DC-18GHz)	22120181	QA500-18-NN-5	Qualwave	N/A	N/A
Anechoic Chamber	N/A	9m*6m*6m	CRT	2025.04.19	2028.04.18
Anechoic Chamber	N/A	9m*6m*6m	CRT	2022.11.30	2025.11.29



1.4. Test Software List

1.4.1. Conducted

Description	Manufacturer	Software Version
Test System	MaiWei	2.0.0.0

1.4.2. Radiated

Description	Manufacturer	Software Version
JS36-RSE	Tonscend	5.0.0



1.5. Test Uncertainty

No.	Parameter	Uncertainty
1	Occupied Channel Bandwidth	$\pm 5\%$
2	RF Output Power, Conducted	$\pm 1,5\%$
3	Power Spectral Density, Conducted	$\pm 3\text{dB}$
4	Unwanted Emissions, Conducted	$\pm 3\text{dB}$
5	All Emissions, Radiated	$\pm 6\text{dB}$
6	Temperature	$\pm 3^{\circ}\text{C}$
7	Supply Voltages	$\pm 3\%$
8	Time	$\pm 5\%$

1.6. Testing Laboratory Information

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Accredited Testing Laboratory:	CNAS No. L3572 (Shenzhen Morlab Communications Technology Co., Ltd.)
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525



2. General Description

2.1. Manufacturer and Factory Information

Manufacturer:	Shenzhen Hohem Technology Co., Ltd.
Manufacturer Address:	B106,Building 2, jiuxianglin industrial park,4227 Xili lake road, Xili street,Nanshan,Shenzhen city.
Factory:	Shenzhen Hohem Technology Co., Ltd.
Factory Address:	B106,Building 2, jiuxianglin industrial park,4227 Xili lake road, Xili street,Nanshan,Shenzhen city.

2.2. Equipment Under Test (EUT) Description

Product Name:	iSteady V3 Ultra AI Tracking Smartphone Gimbal	
Sample No.:	3#, 5#	
Hardware Version:	V1.4	
Software Version:	1.011.36	
Equipment Type:	Bluetooth LE	
Bluetooth Version:	5.2	
Modulation Type:	GFSK	
Data Rate:	1Mbps, 2Mbps	
Operating Frequency Range:	2402MHz-2480MHz	
Channel Number:	Refer 2.3	
Maximum E.I.R.P.:	8.32dBm	
Adaptive Mode:	Adaptive/Non-adaptive Equipment:	Non-adaptive Equipment
	Number of Transmit Chain:	1
	Number of Receive Chain:	1
Antenna Type:	FPC Antenna	
Antenna Gain:	2.45dBi	
Power Supply:	Battery	
Operating Voltage:	Rated	7.2V
Operating Temperature:	Normal	25°C
	Low	-10°C
	High	45°C

Note 1: The EUT description presented in the report are provided by applicant and/or manufacturer, and the test laboratory is not responsible for the accuracy of the information. For a more detailed description, please refer to Specification or User's Manual supplied by the



applicant and/or manufacturer.

2.3.The Channel Number and Frequency

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

Note 1: The black bold channels were selected for test.



2.4. Test Configuration of EUT

2.4.1. Evaluation of The Worst Case

Investigation has been done on all the possible configurations for searching the worst cases.

2.5. Test Conditions

2.5.1. Environment Condition

Temperature (°C):	5-35
Relative Humidity (%):	45-85
Atmospheric Pressure (kPa):	86-106

2.5.2. EUT Setup and Operating Conditions

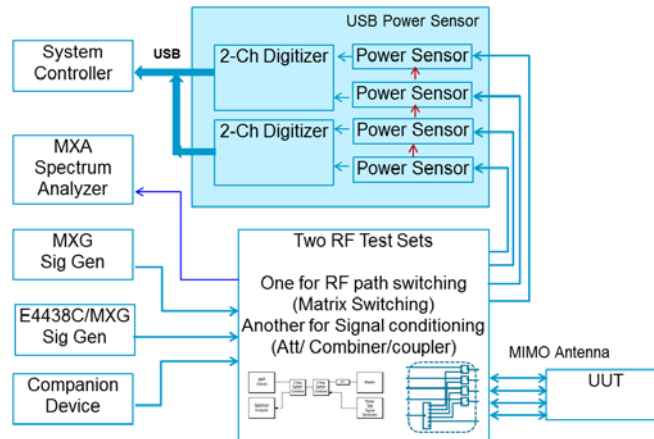
The EUT is activated and controlled by the System Simulator and software. The EUT is powered by battery.

Supply Voltage:	Conducted	Normal(NV)	7.2V
	Radiated	Normal(NV)	7.2V
Test Temperature:	Conducted	Normal(NT)	25°C
		Lowest(LT)	-10°C
		Highest(HT)	45°C
	Radiated	Normal(NT)	25°C

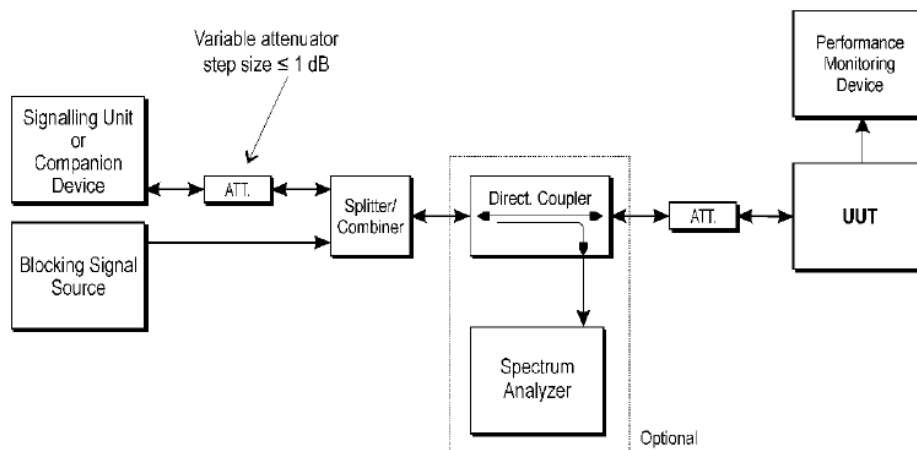
2.6. Test Setup Layout Diagram

2.6.1. Conducted

1) System Block Diagram



2) Receiver Blocking



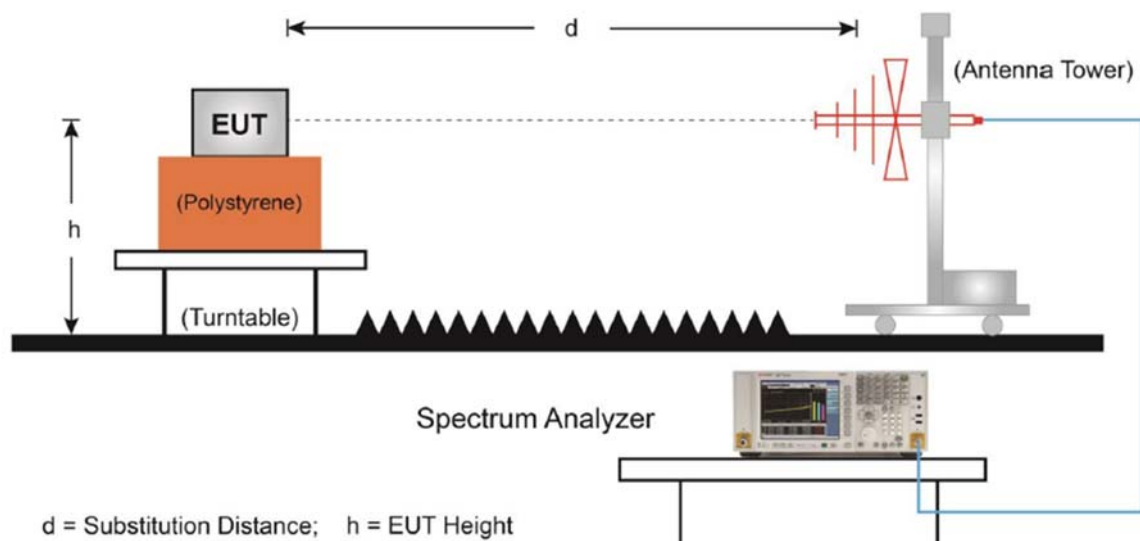
2.6.2.Radiation

Block diagram of radiated test setup:

$h=1.5\text{m}$, $d=3\text{m}$

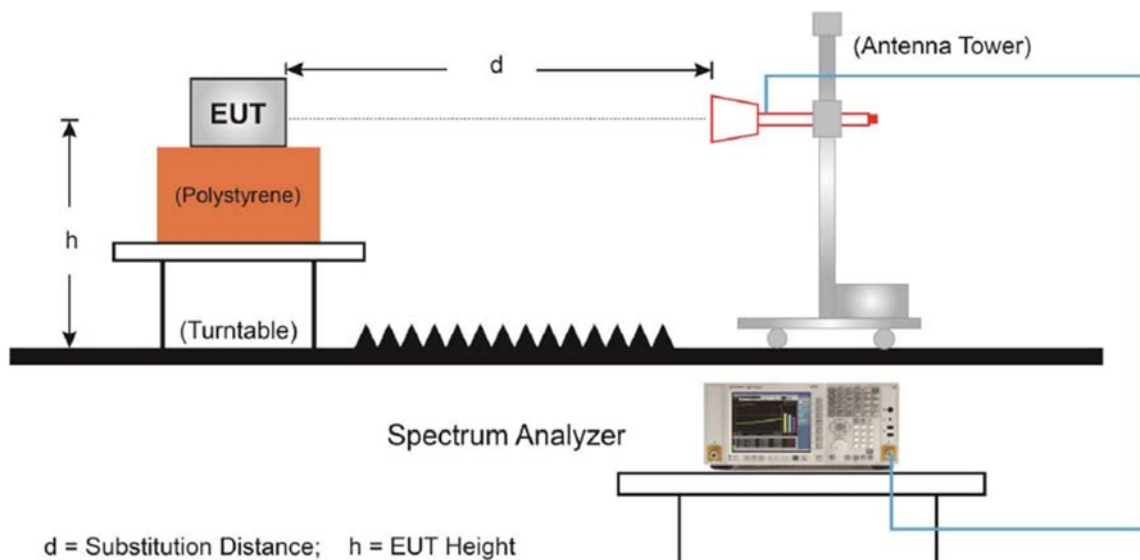
1) For radiated emissions from 30MHz to1GHz

30MHz ~ 1GHz Test Setup:



2) For radiated emissions above 1GHz

1GHz ~ 12.75GHz Test Setup:



3. Description of Test Items and Results

3.1. RF output power

3.1.1. Limit

Equipment Type	Limit
Non-Adaptivity	≤ 20 dBm
Adaptivity	≤ 20 dBm

3.1.2. Result

Refer to Annex A.1 in this report.

Note: The RF output power test conditions are considered and evaluated by performing a full test and only the worst data (normal conditions) are recorded and reported.

3.2. Power Spectral Density

3.2.1. Limit

Equipment Type	Limit
Non-FHSS	≤ 10 dBm/MHz

3.2.2. Result

Refer to Annex A.2 in this report.

3.3. Duty Cycle, Tx-sequence, Tx-gap

3.3.1. Limit

Item	Equipment Type	Limit
Tx-sequence	FHSS	≤ 5 ms
	Non-FHSS	≤ 10 ms
Tx-gap	FHSS	≥ 5 ms
	Non-FHSS	≥ 3.5 ms
Duty Cycle	FHSS	$\leq$ Maximum value declared by the manufacturer
	Non-FHSS	

3.3.2. Result

This test case does not apply this kind of EUT.

3.4. Medium Utilization (MU) factor

3.4.1. Limit

Equipment Type	Limit
Non-Adaptivity	≤ 10 %

3.4.2. Result

This test case does not apply this kind of EUT.

3.5. Occupied Channel Bandwidth

3.5.1. Limit

Within 2400 MHz to 2483.5 MHz.

3.5.2. Result

Refer to Annex A.3 in this report.

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

3.6.1. Limit

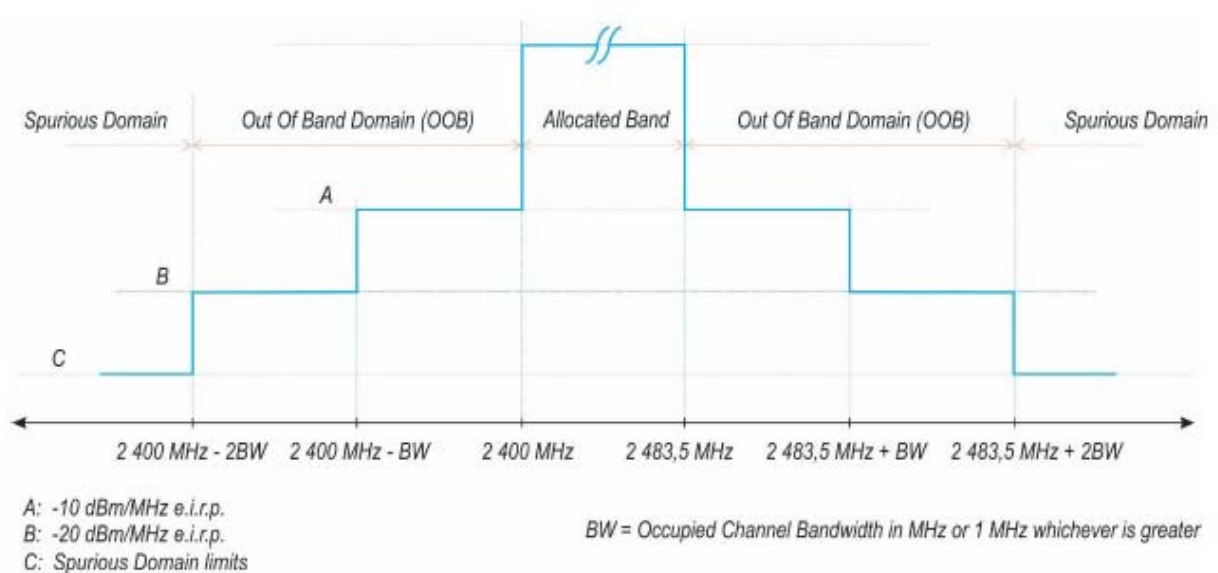


Figure 3: Transmit mask

3.6.2. Result

Refer to Annex A.4 in this report.

3.7. Transmitter unwanted emissions in the spurious domain

3.7.1. Limit

Frequency Range	Maximum Power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100kHz
47 MHz to 74 MHz	-54 dBm	100kHz
74 MHz to 87,5 MHz	-36 dBm	100kHz
87,5 MHz to 118 MHz	-54 dBm	100kHz
118 MHz to 174 MHz	-36 dBm	100kHz
174 MHz to 230 MHz	-54 dBm	100kHz
230 MHz to 470 MHz	-36 dBm	100kHz
470 MHz to 694 MHz	-54 dBm	100kHz
694 MHz to 1 GHz	-36 dBm	100kHz
1 GHz to 12,75 GHz	-30 dBm	1MHz

3.7.2. Result

Refer to Annex A.5 in this report.

3.8. Receiver spurious emissions

3.8.1. Limit

Frequency range	Maximum power	Measurement bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12,75 GHz	-47 dBm	1 MHz

3.8.2. Result

Refer to Annex A.6 in this report.

3.9.Receiver Blocking

3.9.1.Limit

Receiver Category	Wanted signal mean power from companion device (dBm) (see notes 1 and 4)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 4)	Type of blocking signal
1	(-133 dBm + 10 × log ₁₀ (OCBW)) or -68 dBm whichever is less; For radiated P _{min} + 26 dB	2380 2504	-34	CW
	(-139 dBm + 10 × log ₁₀ (OCBW)) or -74 dBm whichever is less; For radiated P _{min} + 20 dB	2 300 2 330 2 360 2 524 2 584 2 674		
2	(-139 dBm + 10 × log ₁₀ (OCBW) + 10 dB) or (-74 dBm + 10 dB) whichever is less; For radiated P _{min} + 26 dB	2380 2504 2300 2584	-34	CW
3	(-139 dBm + 10 × log ₁₀ (OCBW) + 20 dB) or (-74 dBm + 20 dB) whichever is less; For radiated P _{min} + 30 dB	2380 2504 2300 2584	-34	CW
Note: OCBW is in Hz.				

3.9.2.Result

Refer to Annex A.7 in this report.



3.10. Geo-location capability

3.10.1. Definition

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

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

3.10.2. Requirement

The geographical location determined by the equipment as defined in clause 3.3.1 shall not be accessible to the user.

3.10.3. Result

Geo-location capability	Check method	Verdict
☒ Not support	☐ Visual inspection	Pass
☐ Not be accessible to the user	☒ Declared by manufacturer	



Annex A Test Data and Result

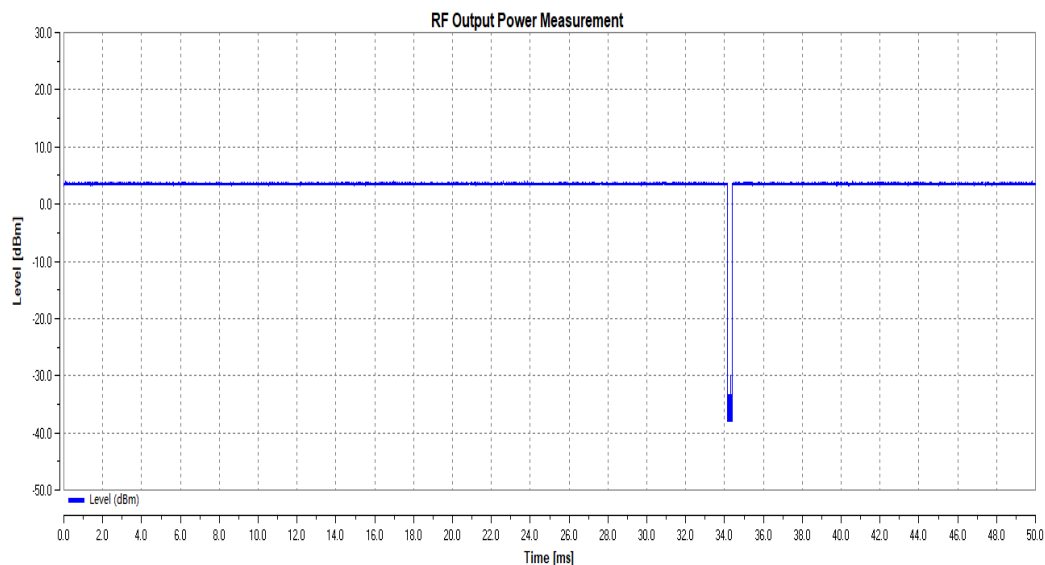
A.1. RF Output Power

Test Condition	Test Mode	Antenna	Channel	Power[dBm]	EIRP[dBm]	Limit[dBm]	Verdict
NTNV	BLE_1M	Ant1	2402	3.58	6.03	20	PASS
			2440	4.64	7.09	20	PASS
			2480	5.87	8.32	20	PASS
	BLE_2M	Ant1	2402	3.62	6.07	20	PASS
			2440	4.58	7.03	20	PASS
			2480	5.86	8.31	20	PASS

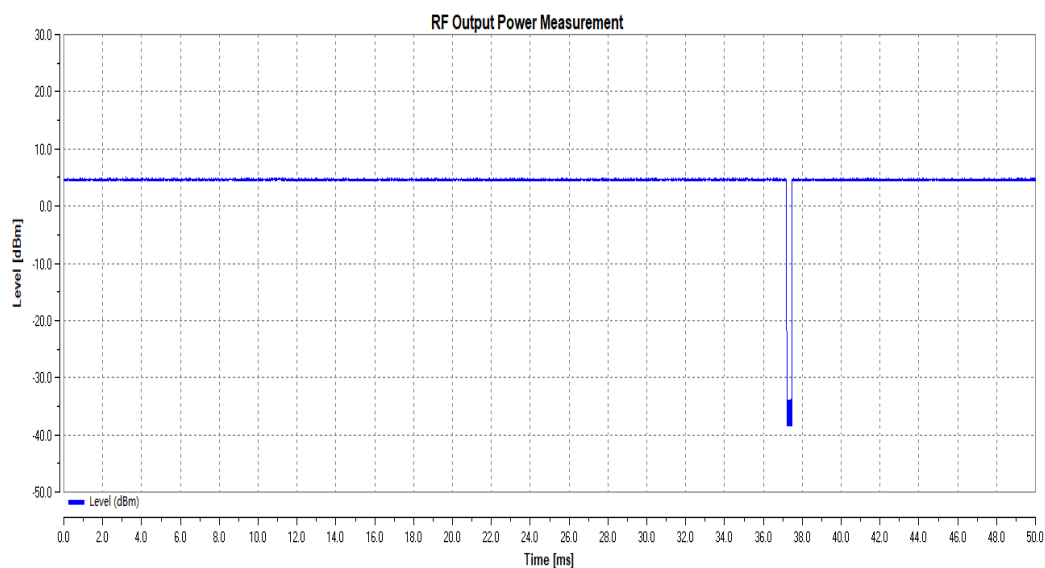


Test Graphs

Power NVNT BLE 1M 2402MHz Ant1

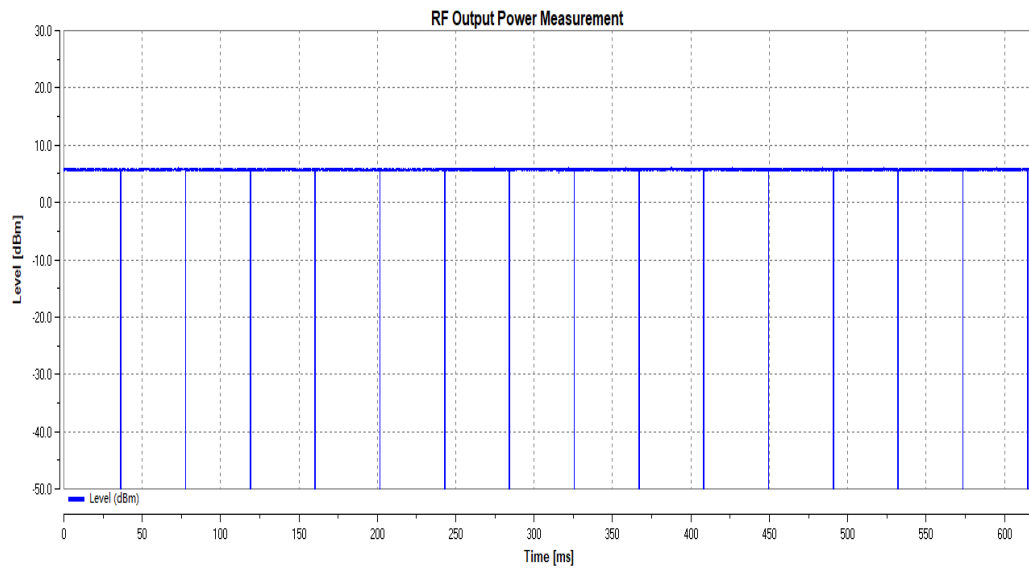


Power NVNT BLE 1M 2440MHz Ant1

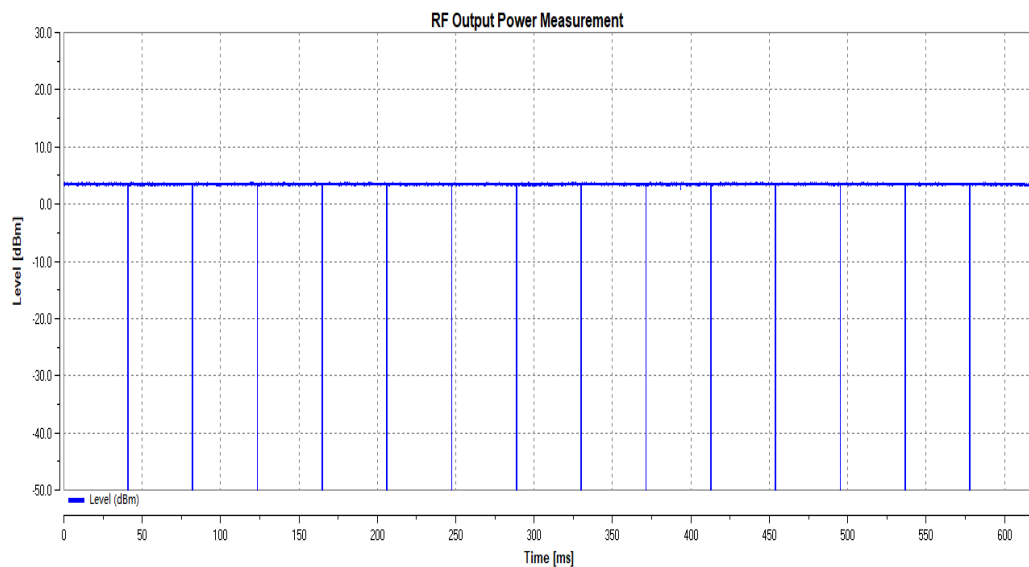




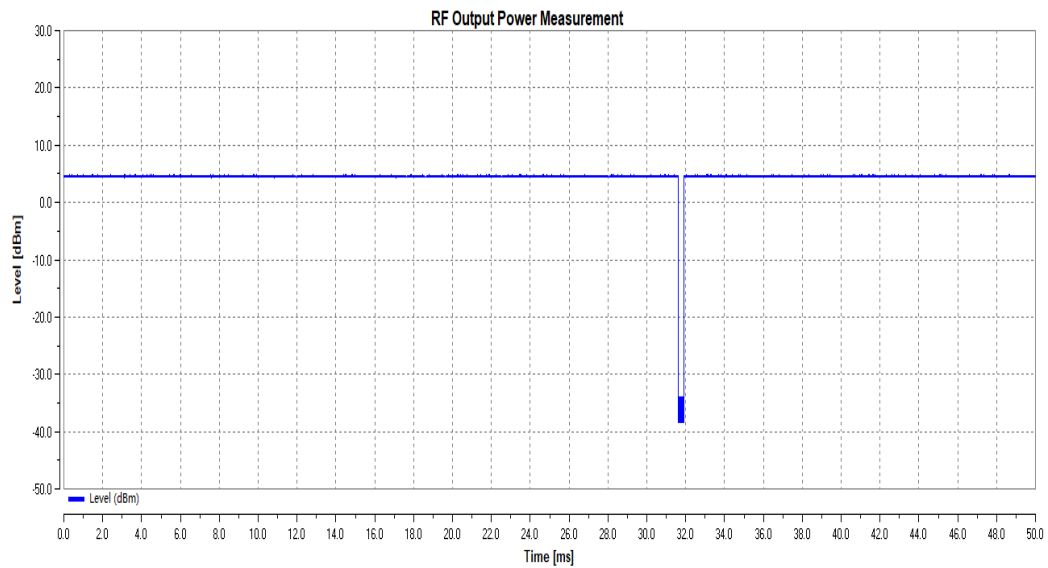
Power NVNT BLE 1M 2480MHz Ant1



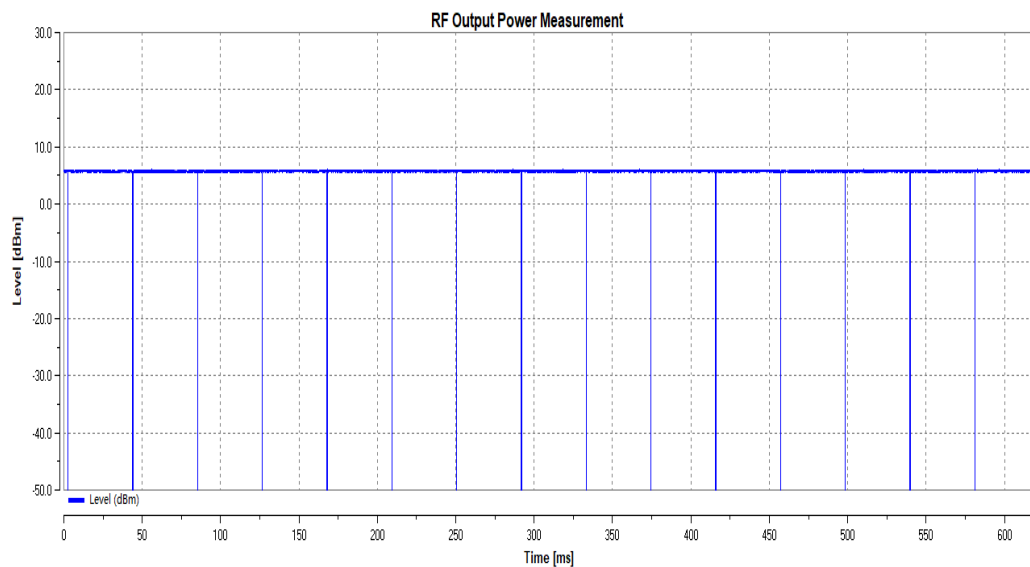
Power NVNT BLE 2M 2402MHz Ant1



Power NVNT BLE 2M 2440MHz Ant1



Power NVNT BLE 2M 2480MHz Ant1

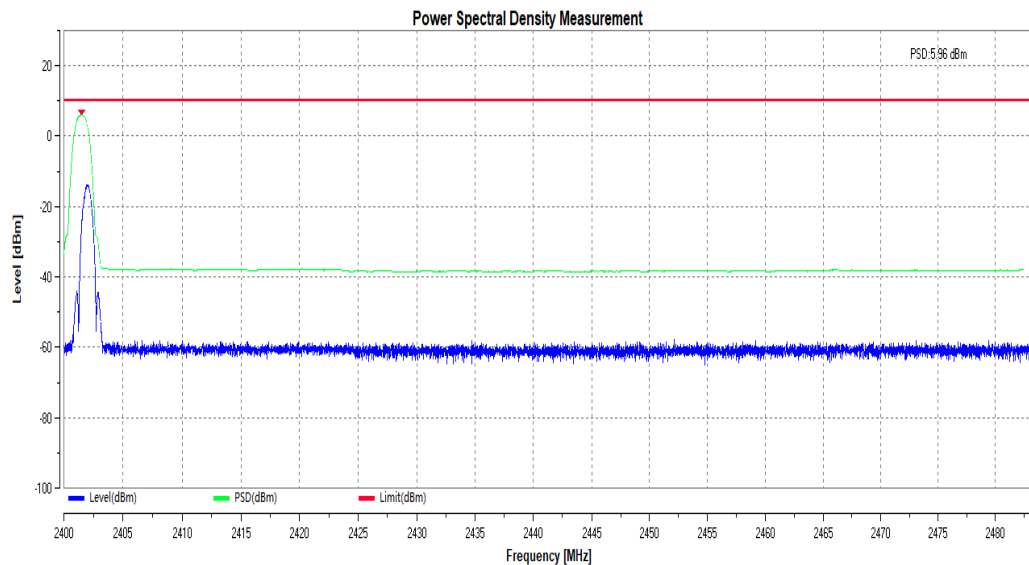


**A.2. Power Spectral Density**

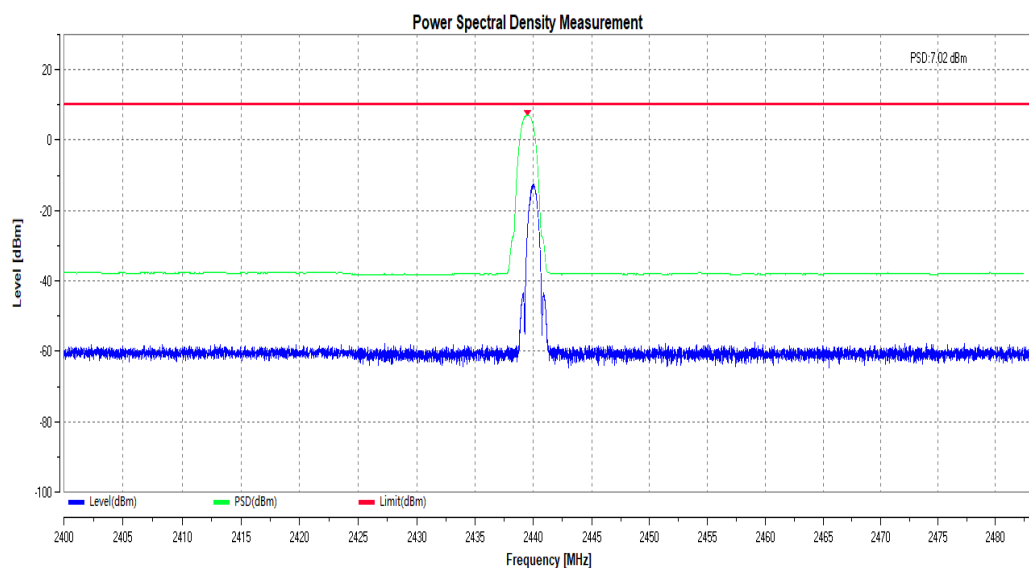
Test Mode	Antenna	Channel	PSD[dBm/MHz]	Limit[dBm/MHz]	Verdict
BLE_1M	Ant1	2402	5.96	10	PASS
		2440	7.02	10	PASS
		2480	8.26	10	PASS
BLE_2M	Ant1	2402	4.94	10	PASS
		2440	5.90	10	PASS
		2480	7.18	10	PASS

Test Graphs

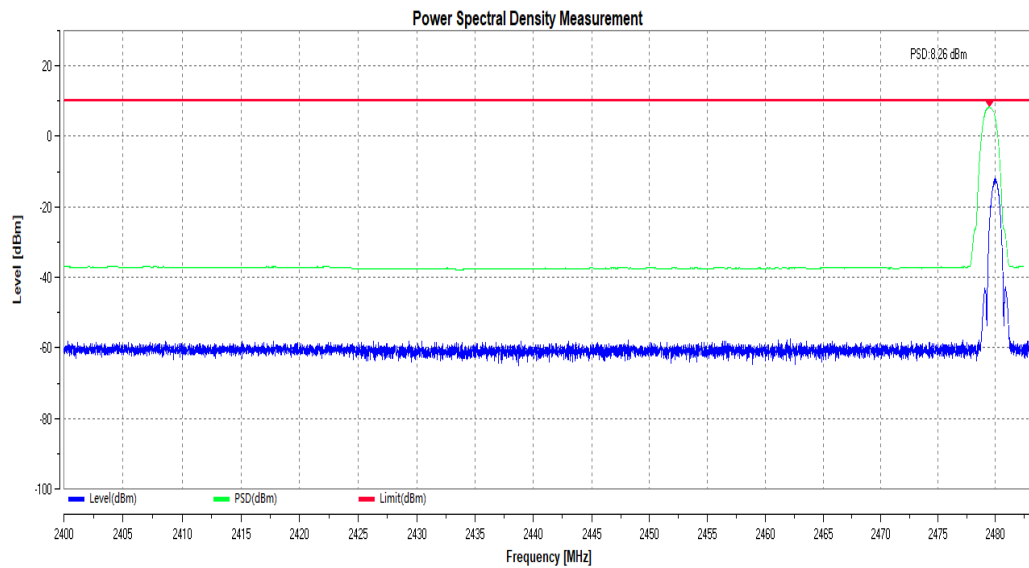
PSD NVNT BLE 1M 2402MHz Ant1



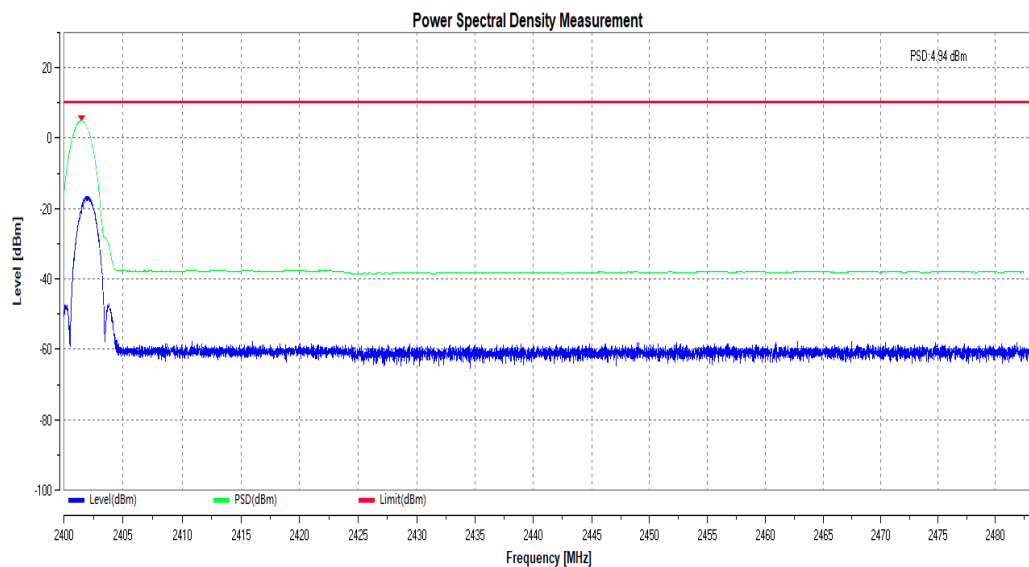
PSD NVNT BLE 1M 2440MHz Ant1



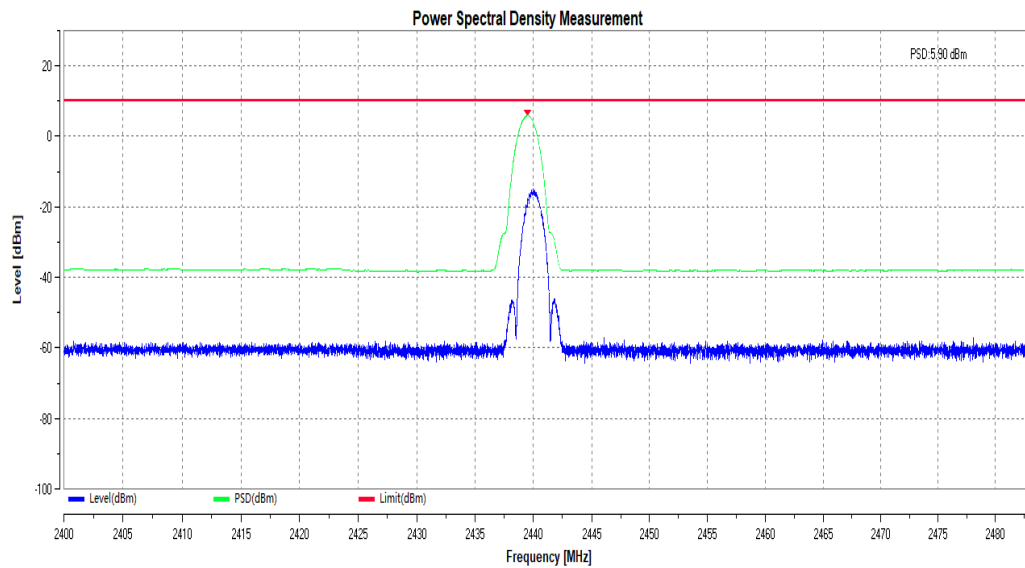
PSD NVNT BLE 1M 2480MHz Ant1



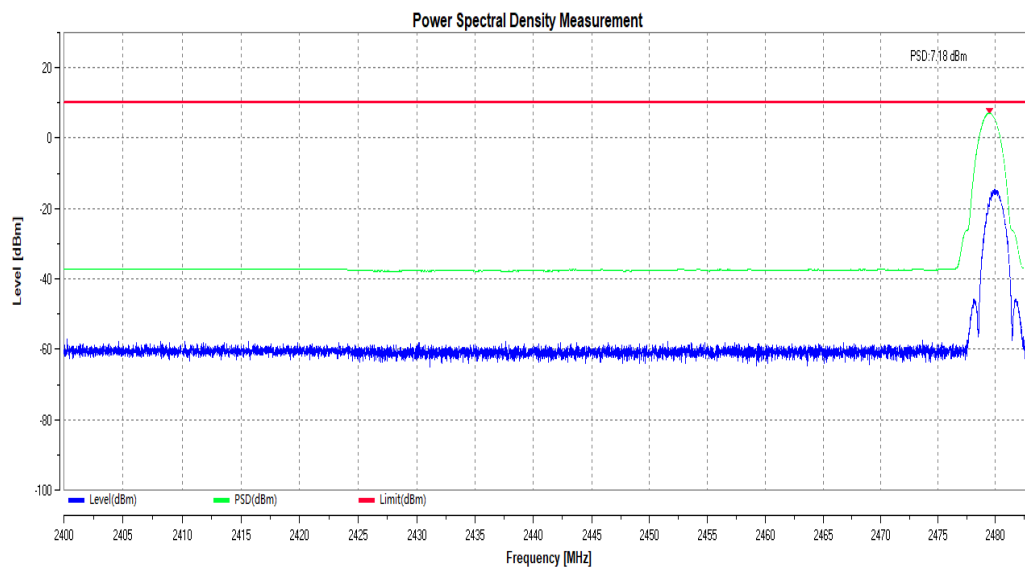
PSD NVNT BLE 2M 2402MHz Ant1



PSD NVNT BLE 2M 2440MHz Ant1



PSD NVNT BLE 2M 2480MHz Ant1



**A.3. Occupied Channel Bandwidth**

Test Mode	Antenna	Channel	OCB[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0320	2401.4734	2402.5054	2400 to 2483.5	PASS
		2480	1.0324	2479.4710	2480.5034	2400 to 2483.5	PASS
BLE_2M	Ant1	2402	2.0541	2400.9620	2403.0161	2400 to 2483.5	PASS
		2480	2.0544	2478.9596	2481.0140	2400 to 2483.5	PASS



Agilent Spectrum Analyzer - Occupied BW

Center Freq 2.402000000 GHz

Ref Offset 9.69 dB
Ref 20.00 dBm

Mkr3 2.4025054 GHz
-20.867 dBm

Center 2.402 GHz
Res BW 43 kHz

Span 4 MHz
Sweep 1 s

Occupied Bandwidth 1.0320 MHz

Total Power 3.39 dBm

Transmit Freq Error -10.578 kHz

OBW Power 99.00 %

x dB Bandwidth 1.316 MHz

x dB -26.00 dB

Agilent Spectrum Analyzer - Occupied BW

RL F0 F1 F2 F3 F4 F5 F6 F7 F8 F9

Center Freq **2.480000000 GHz** Center Freq: 2.480000000 GHz ALTN: AUTO 04-27-03 AM May 31, 2025

Trig: Free Run Avg/Hold: 10/10 Radio Std: None

#FGain: Low #Att: 20 dB Radio Device: BTS

10 dB/div Ref Offset 9.86 dB Mkr3 2.4805034 GHz
Log Ref 20.00 dBm -19.167 dBm

Center 2.48 GHz Span 4 MHz
#Res BW 43 kHz #VBW 130 kHz #Sweep 1 s

Occupied Bandwidth		Total Power	
1.0324 MHz		5.23 dBm	
Transmit Freq Error	-12.810 kHz	OBW Power	99.00 %
x dB Bandwidth	1.317 MHz	x dB	-26.00 dB

MSG STATUS



BLE_2M_Ant1_2402



BLE_2M_Ant1_2480



**A.4. Transmitter unwanted emissions in the Out-Of-Band Domain**

Test Mode	Antenna	Channel	Freq. [MHz]	Level[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	2398.436	-41.55	-20.00	PASS
			2398.468	-42.64	-20.00	PASS
			2399.468	-40.60	-10.00	PASS
			2399.5	-39.52	-10.00	PASS
			2484	-45.96	-10.00	PASS
			2484.032	-46.09	-10.00	PASS
			2485.032	-46.62	-20.00	PASS
			2485.064	-46.29	-20.00	PASS
		2480	2398.4352	-47.12	-20.00	PASS
			2398.4676	-46.43	-20.00	PASS
			2399.4676	-46.51	-10.00	PASS
			2399.5	-45.57	-10.00	PASS
			2484	-39.94	-10.00	PASS
			2484.0324	-40.41	-10.00	PASS
			2485.0324	-41.38	-20.00	PASS
			2485.0648	-40.63	-20.00	PASS
BLE_2M	Ant1	2402	2396.3918	-42.58	-20.00	PASS
			2396.4459	-43.49	-20.00	PASS
			2397.4459	-42.53	-20.00	PASS
			2398.4459	-41.70	-10.00	PASS
			2398.5	-41.16	-10.00	PASS
			2399.5	-28.07	-10.00	PASS
			2484	-46.67	-10.00	PASS
			2485	-46.44	-10.00	PASS
			2485.0541	-46.23	-10.00	PASS
			2486.0541	-45.74	-20.00	PASS
			2487.0541	-45.83	-20.00	PASS
			2487.1082	-46.30	-20.00	PASS
		2480	2396.3912	-46.33	-20.00	PASS
			2396.4456	-47.09	-20.00	PASS
			2397.4456	-46.32	-20.00	PASS
			2398.4456	-47.12	-10.00	PASS
			2398.5	-46.39	-10.00	PASS
			2399.5	-46.74	-10.00	PASS
			2484	-40.75	-10.00	PASS

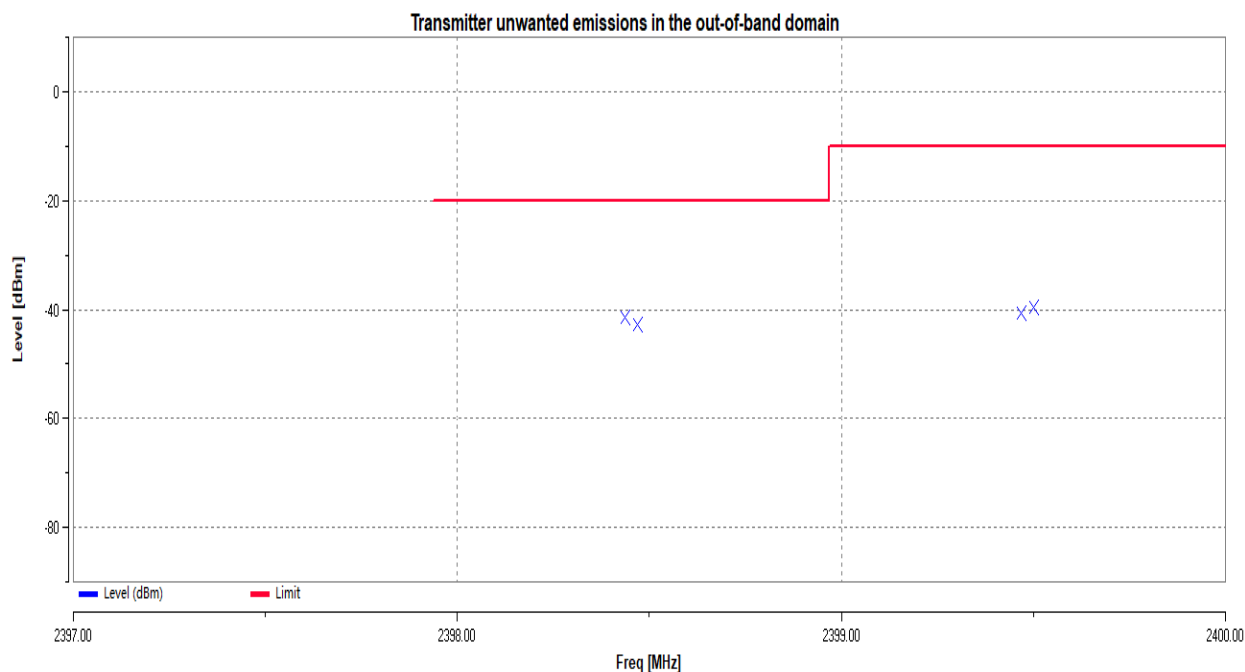


REPORT No.: SZ25040156W01

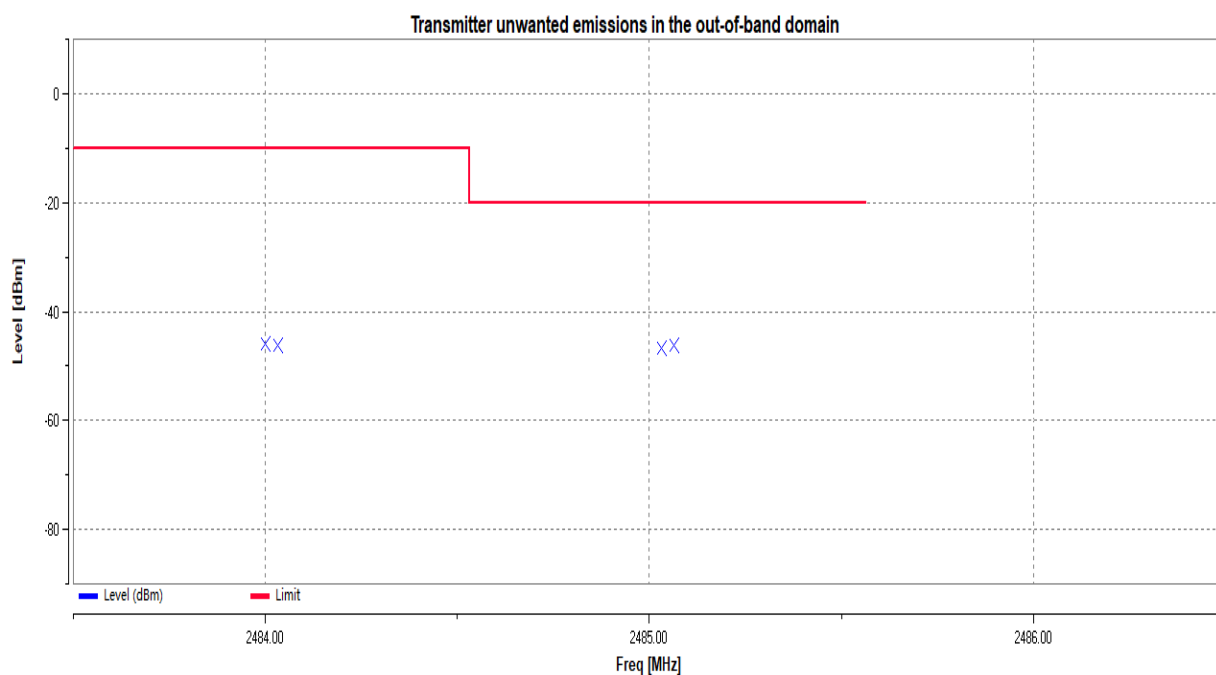
			2485	-41.47	-10.00	PASS
			2485.0544	-41.16	-10.00	PASS
			2486.0544	-41.35	-20.00	PASS
			2487.0544	-41.87	-20.00	PASS
			2487.1088	-41.91	-20.00	PASS

Test Graphs

BLE_1M_Ant1_2402_2400MHz-2BW to 2400MHz

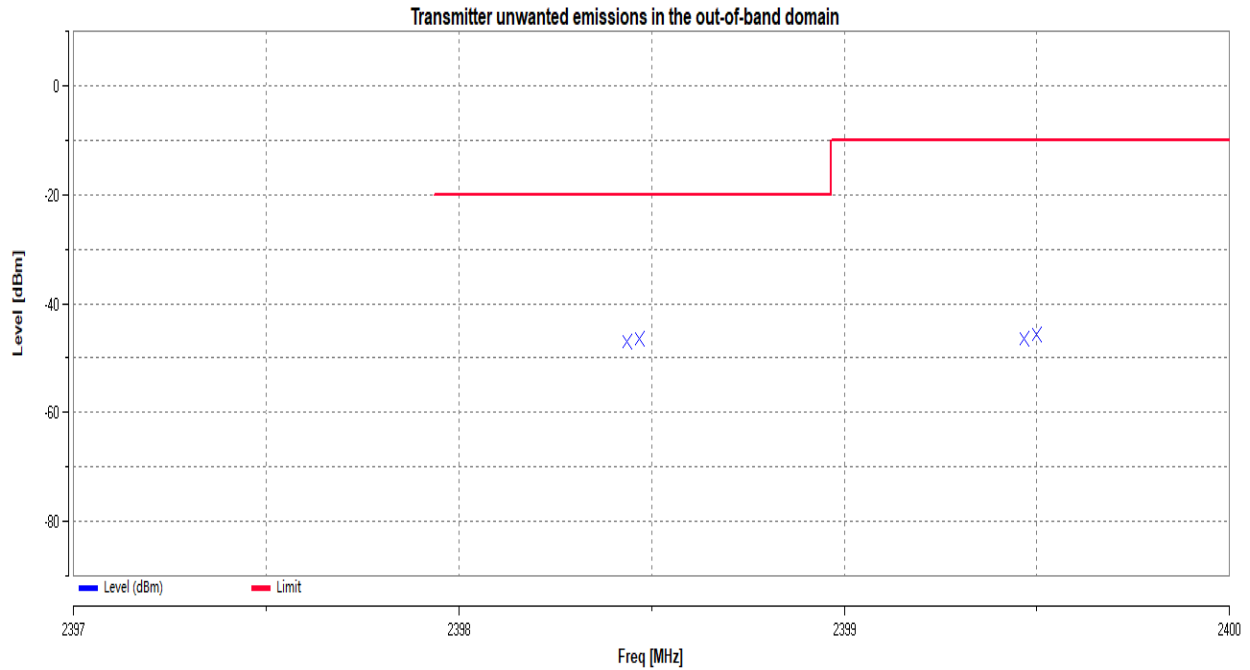


BLE_1M_Ant1_2402_2483.5MHz to 2483.5MHz+2BW

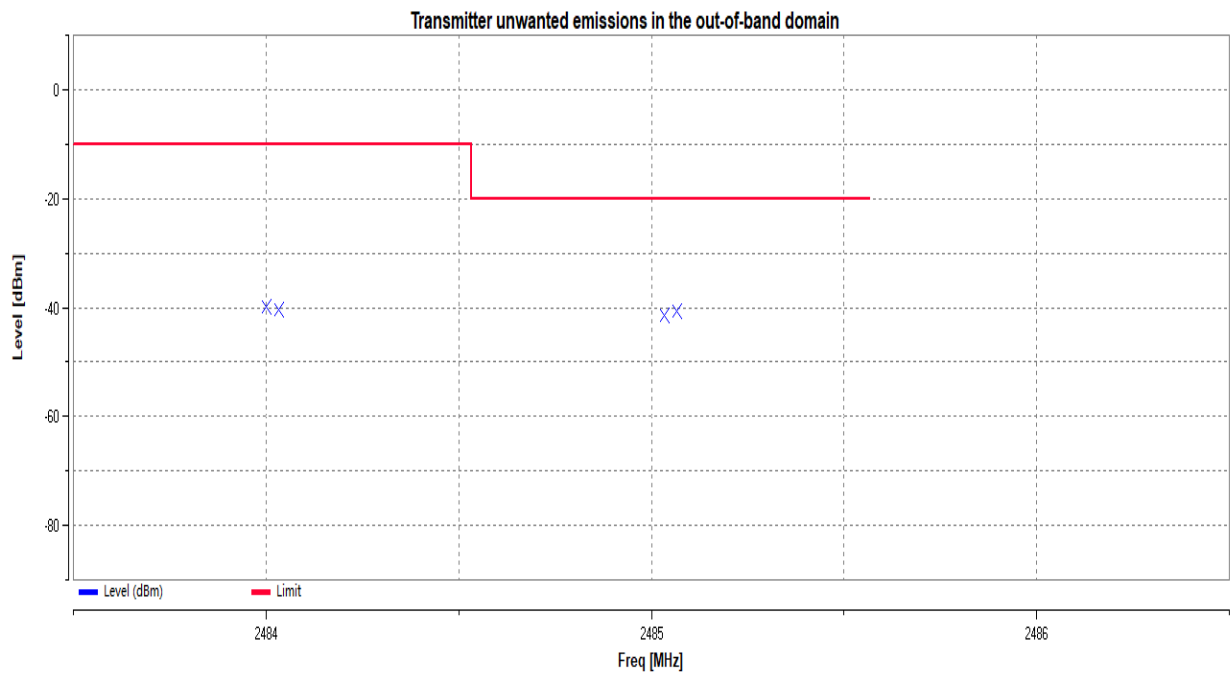




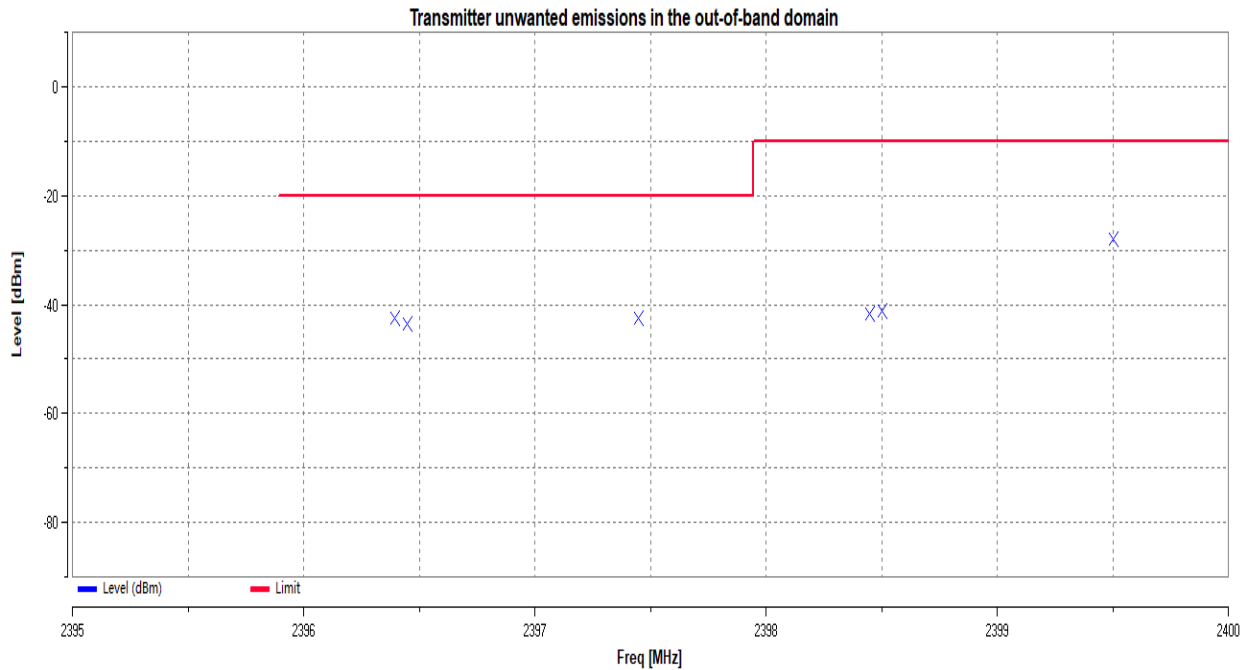
BLE_1M_Ant1_2480_2400MHz-2BW to 2400MHz



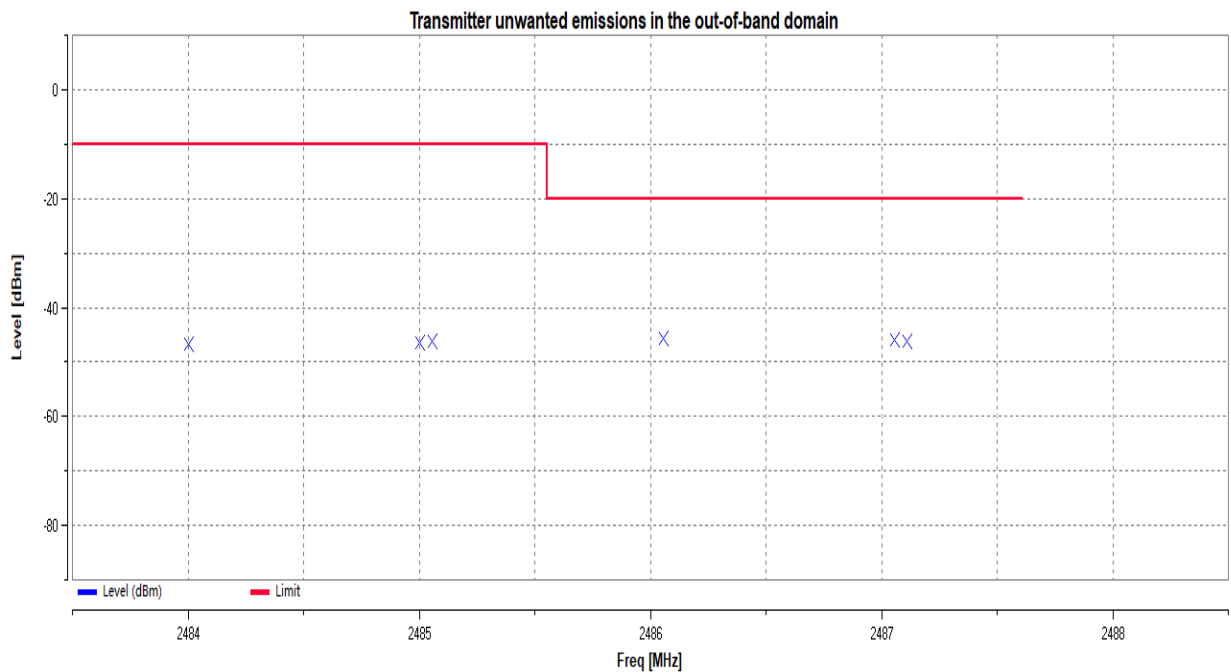
BLE_1M_Ant1_2480_2400MHz-2BW to 2400MHz



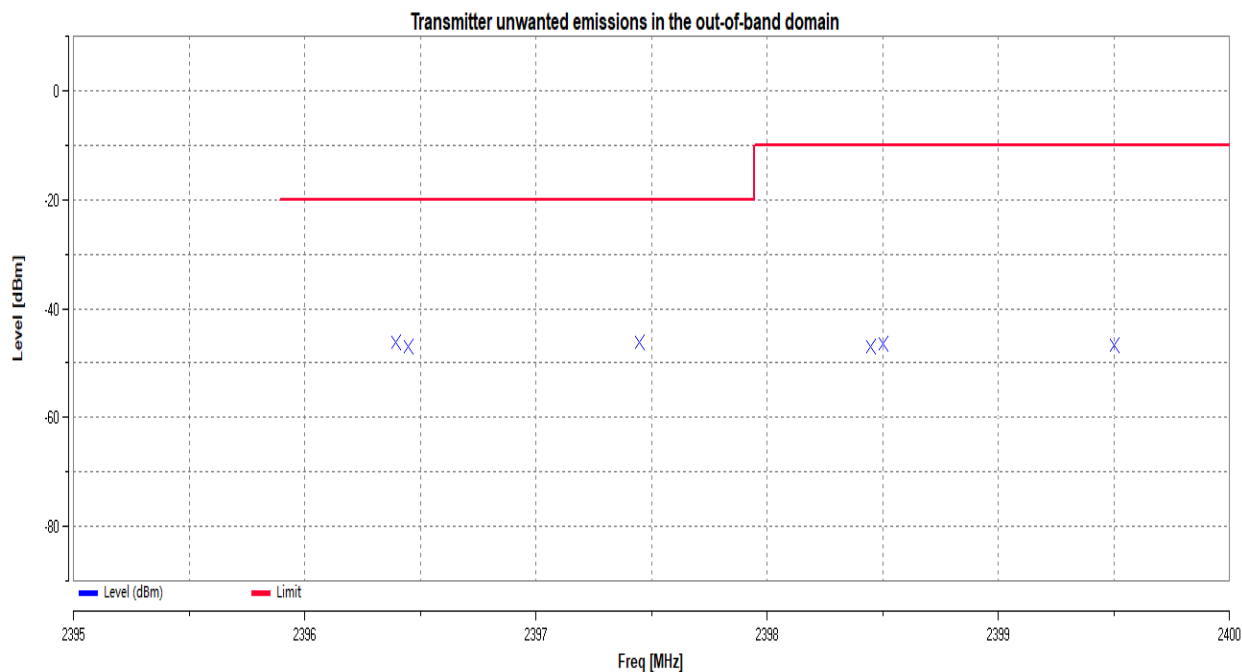
BLE_2M_Ant1_2402_2400MHz-2BW to 2400MHz



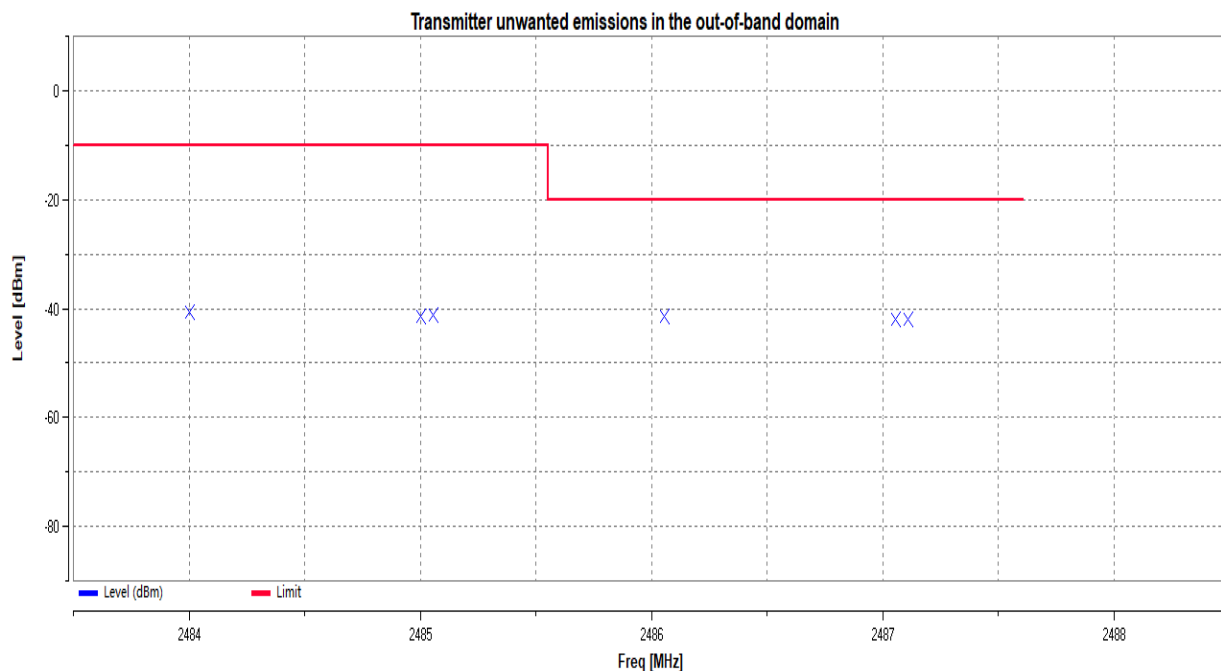
BLE_2M_Ant1_2402_2483.5MHz to 2483.5MHz+2BW



BLE_2M_Ant1_2480_2400MHz-2BW to 2400MHz



BLE_2M_Ant1_2480_2483.5MHz to 2483.5MHz+2BW

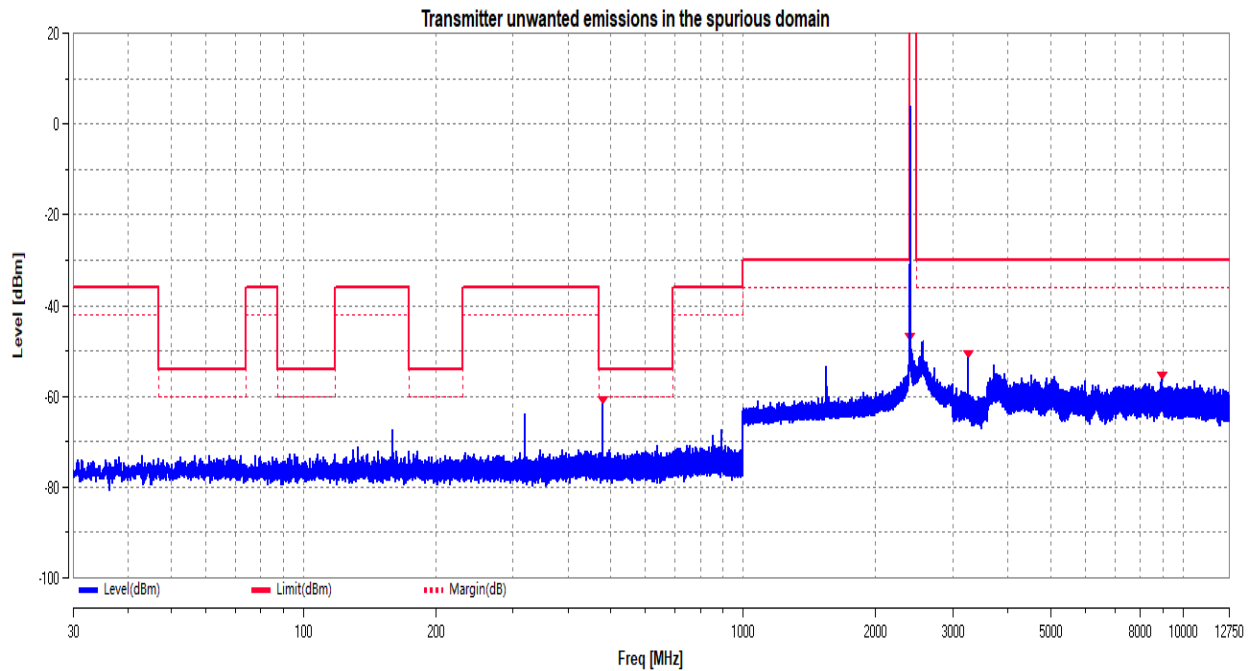


**A.5. Transmitter unwanted emissions in the spurious domain****a) Conducted measurement**

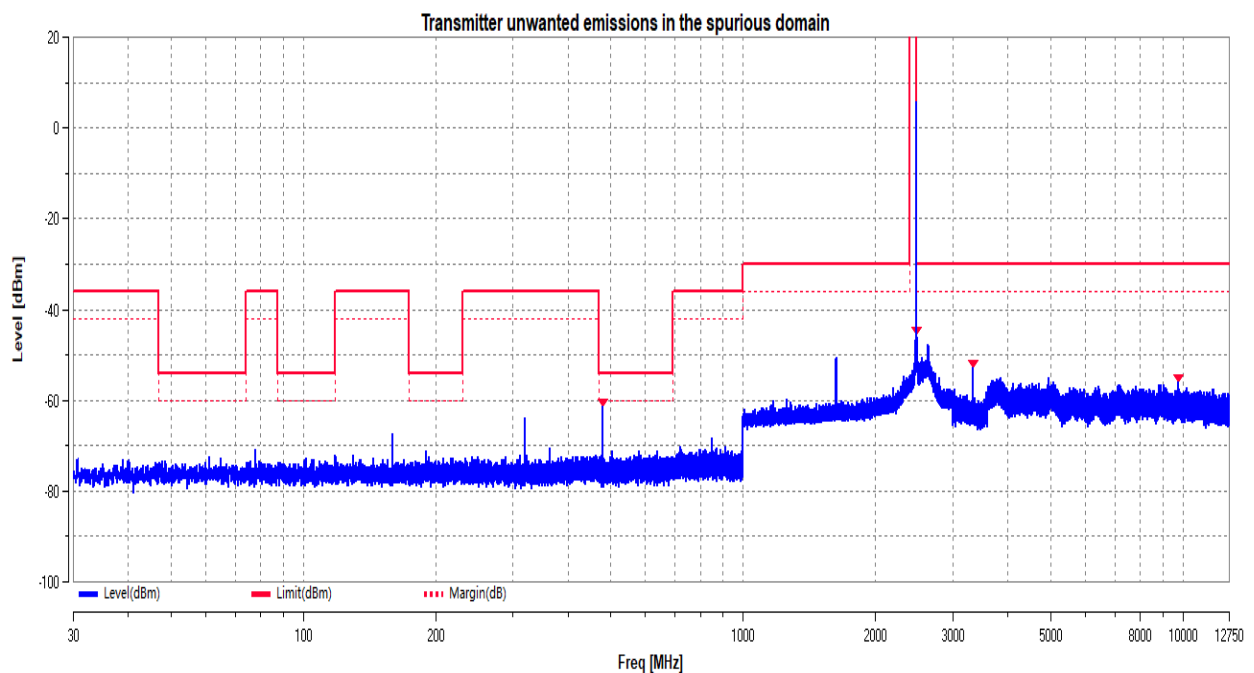
Test Mode	Antenna	Channel	Freq. [MHz]	Level[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	480	-61.57	-54	PASS
			2396.58	-47.65	-30	PASS
			3255.81	-51.5	-30	PASS
			8955.47	-56.38	-30	PASS
		2480	480	-61.22	-54	PASS
			2485.92	-45.61	-30	PASS
			3330.21	-52.73	-30	PASS
			9751.1	-56.14	-30	PASS
BLE_2M	Ant1	2402	480	-61.99	-54	PASS
			2562.39	-48.42	-30	PASS
			3253.21	-51.52	-30	PASS
			8907.1	-56.2	-30	PASS
		2480	480	-61.74	-54	PASS
			2487.85	-47.09	-30	PASS
			3330.91	-52.68	-30	PASS
			10964.12	-55.98	-30	PASS

Test Graphs

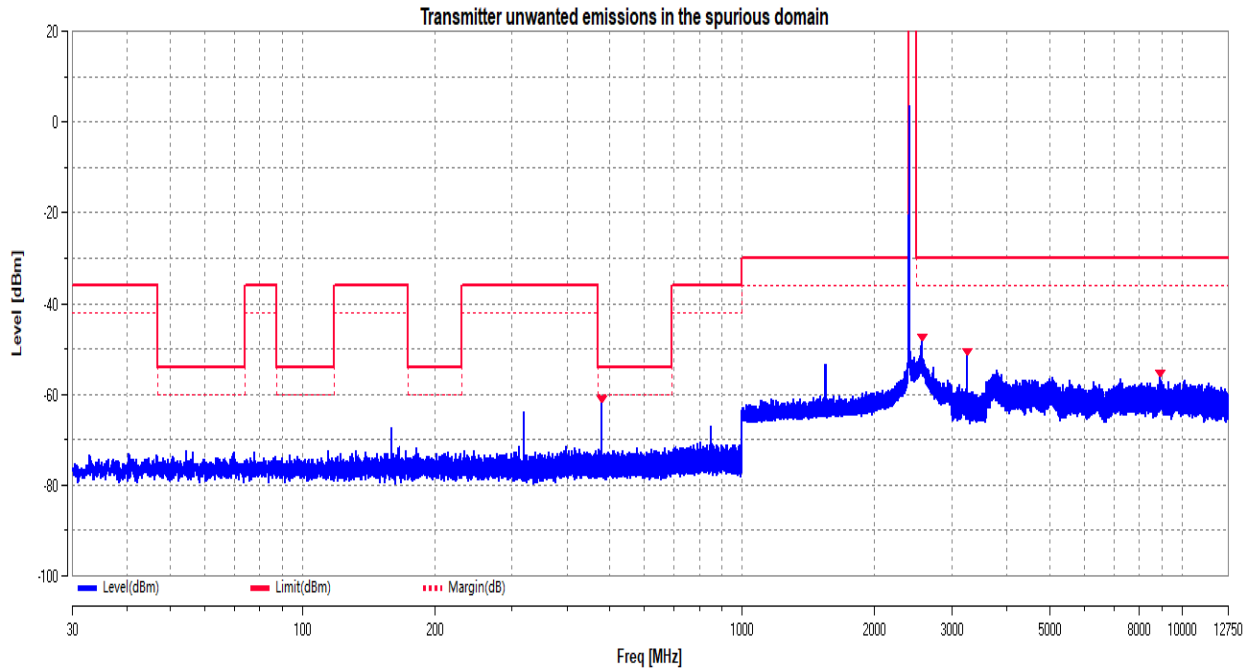
Tx. Spurious NVNT BLE 1M 2402MHz Ant1



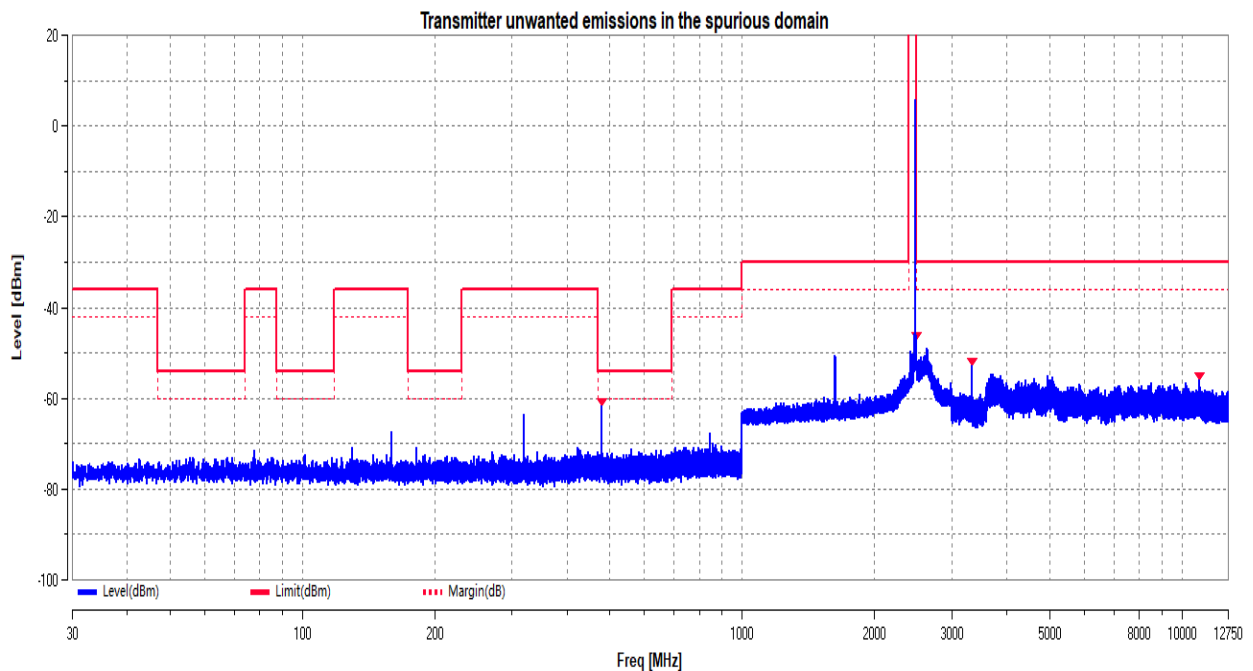
Tx. Spurious NVNT BLE 1M 2480MHz Ant1



Tx. Spurious NVNT BLE 2M 2402MHz Ant1



Tx. Spurious NVNT BLE 2M 2480MHz Ant1

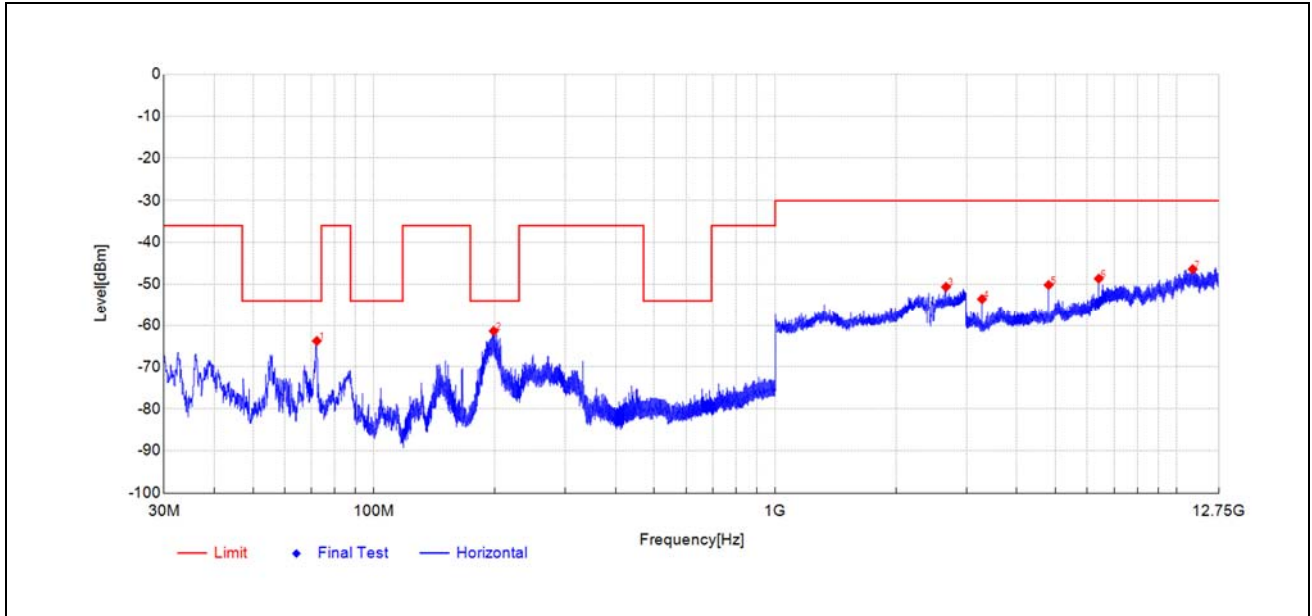


b) Radiated measurement

Below is the worst case situation test data:

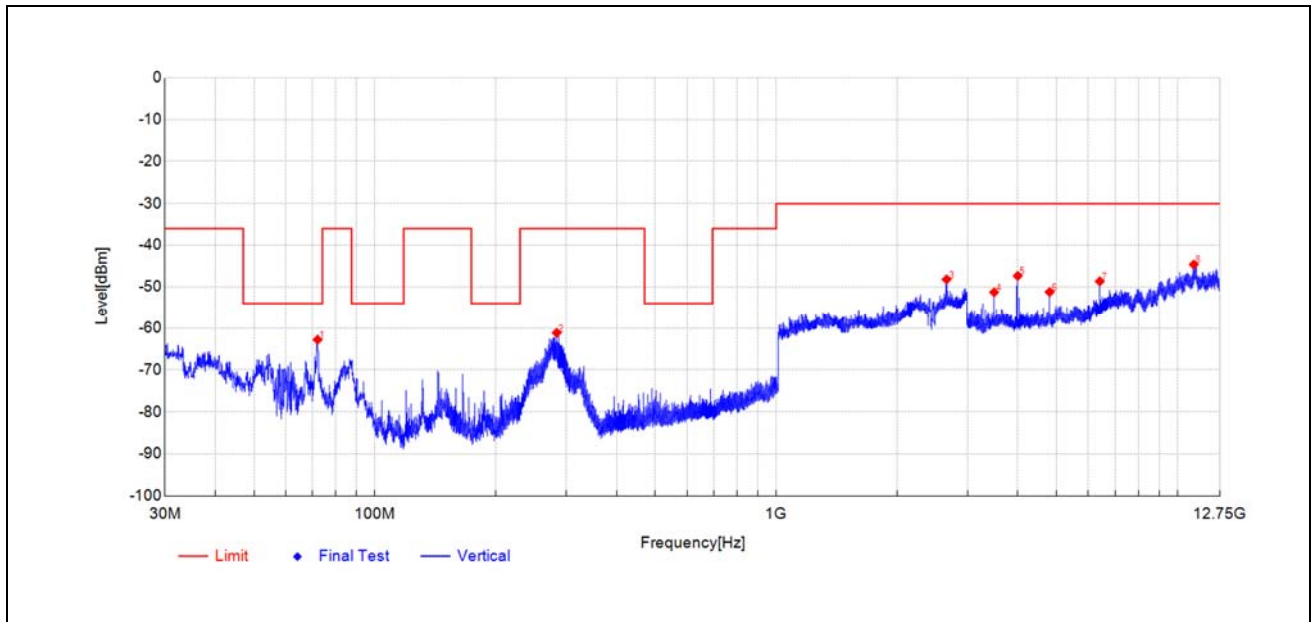
1Mbps

Plot for Channel 0



(Antenna Horizontal, 30MHz to 12.75GHz)

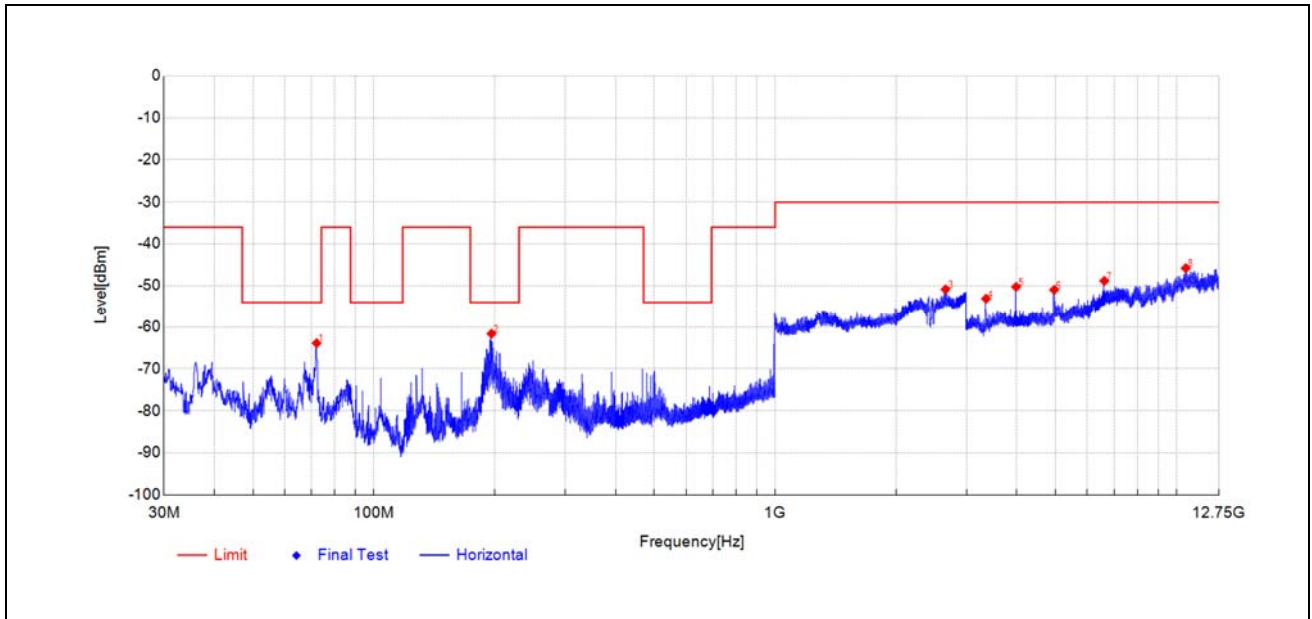
Frequency [MHz]	Reading [dBm]	Level [dBm]	Factor [dB]	Limit [dBm]	Margin [dB]	Polarity	Detector	Verdict
72.1001	-42.53	-63.78	-21.3	-54.0	9.8	Horizontal	PK	PASS
198.9824	-43.60	-61.41	-17.8	-54.0	7.4	Horizontal	PK	PASS
2665.133	-66.13	-50.64	15.5	-30.0	20.6	Horizontal	PK	PASS
3277.8889	-52.51	-53.56	-1.1	-30.0	23.6	Horizontal	PK	PASS
4803.8402	-54.41	-50.17	4.2	-30.0	20.2	Horizontal	PK	PASS
6404.8702	-58.48	-48.66	9.8	-30.0	18.7	Horizontal	PK	PASS
10980.286	-67.37	-46.40	21.0	-30.0	16.4	Horizontal	PK	PASS



(Antenna Vertical, 30MHz to 12.75GHz)

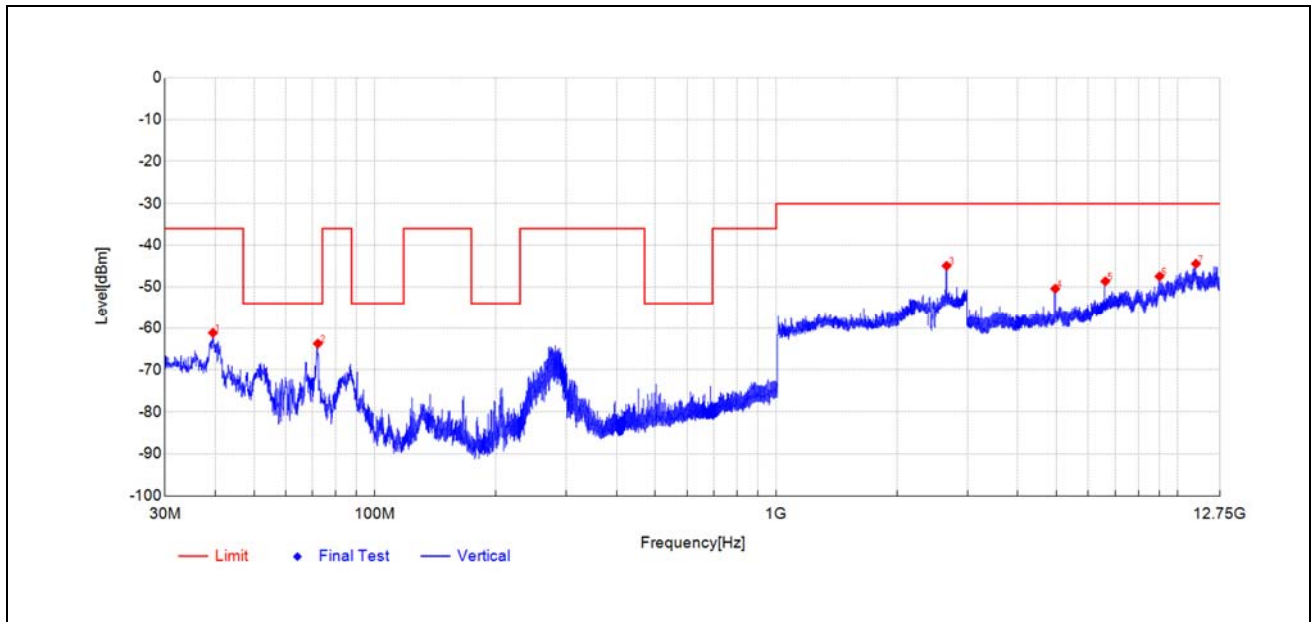
Frequency [MHz]	Reading [dBm]	Level [dBm]	Factor [dB]	Limit [dBm]	Margin [dB]	Polarity	Detector	Verdict
72.0031	-41.57	-62.81	-21.2	-54.0	8.8	Vertical	PK	PASS
283.8132	-44.14	-61.18	-17.0	-36.0	25.2	Vertical	PK	PASS
2659.5319	-64.04	-48.18	15.9	-30.0	18.2	Vertical	PK	PASS
3494.3497	-52.51	-51.27	1.2	-30.0	21.3	Vertical	PK	PASS
3999.9125	-48.43	-47.34	1.1	-30.0	17.3	Vertical	PK	PASS
4803.8402	-55.68	-51.21	4.5	-30.0	21.2	Vertical	PK	PASS
6405.3578	-57.60	-48.63	9.0	-30.0	18.6	Vertical	PK	PASS
10982.236	-66.36	-44.61	21.8	-30.0	14.6	Vertical	PK	PASS

Plot for Channel 39



(Antenna Horizontal, 30MHz to 12.75GHz)

Frequency [MHz]	Reading [dBm]	Level [dBm]	Factor [dB]	Limit [dBm]	Margin [dB]	Polarity	Detector	Verdict
72.0031	-42.66	-63.88	-21.2	-54.0	9.9	Horizontal	PK	PASS
196.4118	-43.38	-61.63	-18.3	-54.0	7.6	Horizontal	PK	PASS
2659.5319	-66.26	-50.84	15.4	-30.0	20.8	Horizontal	PK	PASS
3354.4302	-52.61	-53.10	-0.5	-30.0	23.1	Horizontal	PK	PASS
3987.2369	-51.67	-50.24	1.4	-30.0	20.2	Horizontal	PK	PASS
4959.3605	-56.20	-50.95	5.3	-30.0	21.0	Horizontal	PK	PASS
6613.5307	-60.07	-48.81	11.3	-30.0	18.8	Horizontal	PK	PASS
10552.240	-65.45	-45.78	19.7	-30.0	15.8	Horizontal	PK	PASS



(Antenna Vertical, 30MHz to 12.75GHz)

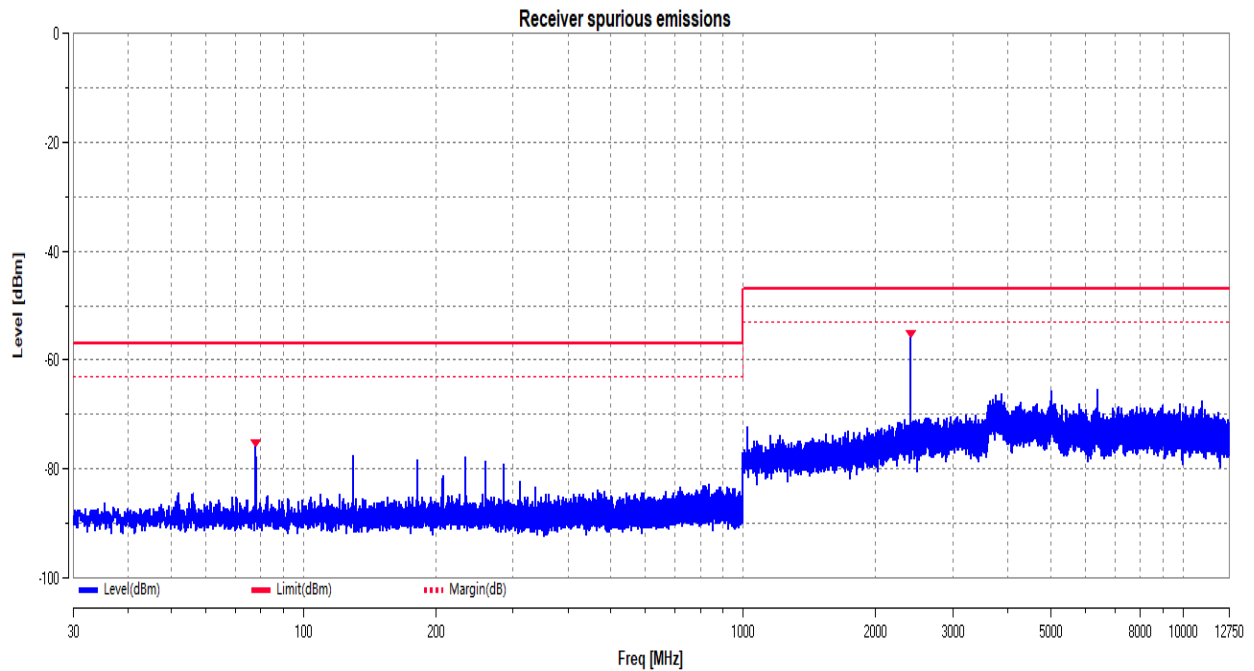
Frequency [MHz]	Reading [dBm]	Level [dBm]	Factor [dB]	Limit [dBm]	Margin [dB]	Polarity	Detector	Verdict
39.5065	-39.18	-61.19	-22.0	-36.0	25.2	Vertical	PK	PASS
72.1001	-42.47	-63.74	-21.3	-54.0	9.7	Vertical	PK	PASS
2659.5319	-60.78	-44.92	15.9	-30.0	14.9	Vertical	PK	PASS
4960.3355	-55.35	-50.43	4.9	-30.0	20.4	Vertical	PK	PASS
6613.0432	-58.73	-48.64	10.1	-30.0	18.6	Vertical	PK	PASS
9023.8512	-63.26	-47.45	15.8	-30.0	17.5	Vertical	PK	PASS
11122.643	-66.51	-44.42	22.1	-30.0	14.4	Vertical	PK	PASS

**A.6. Receiver spurious emissions****a) Conducted measurement**

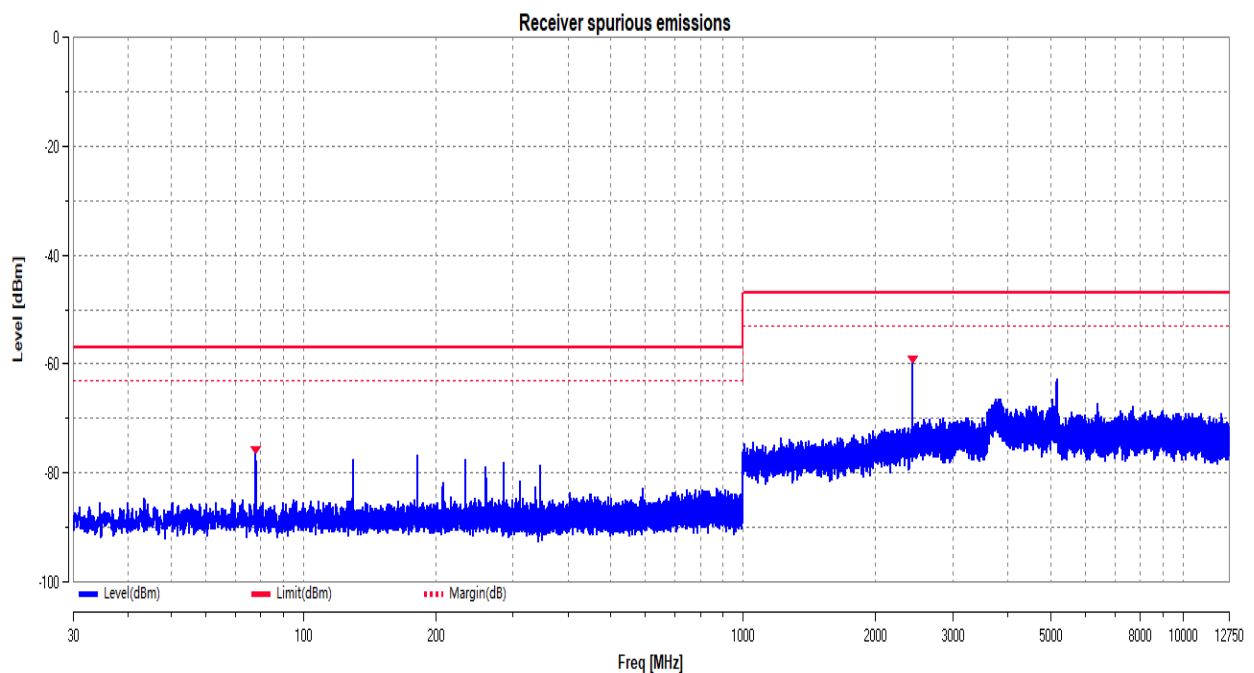
Test Mode	Antenna	Channel	Freq. [MHz]	Level[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	77.97	-76.05	-57.00	PASS
			2402.17	-55.96	-47.00	PASS
		2480	78.02	-76.63	-57.00	PASS
			2426.06	-59.87	-47.00	PASS

Test Graphs

Rx. Spurious NVNT BLE 1M 2402MHz Ant1



Rx. Spurious NVNT BLE 1M 2480MHz Ant1

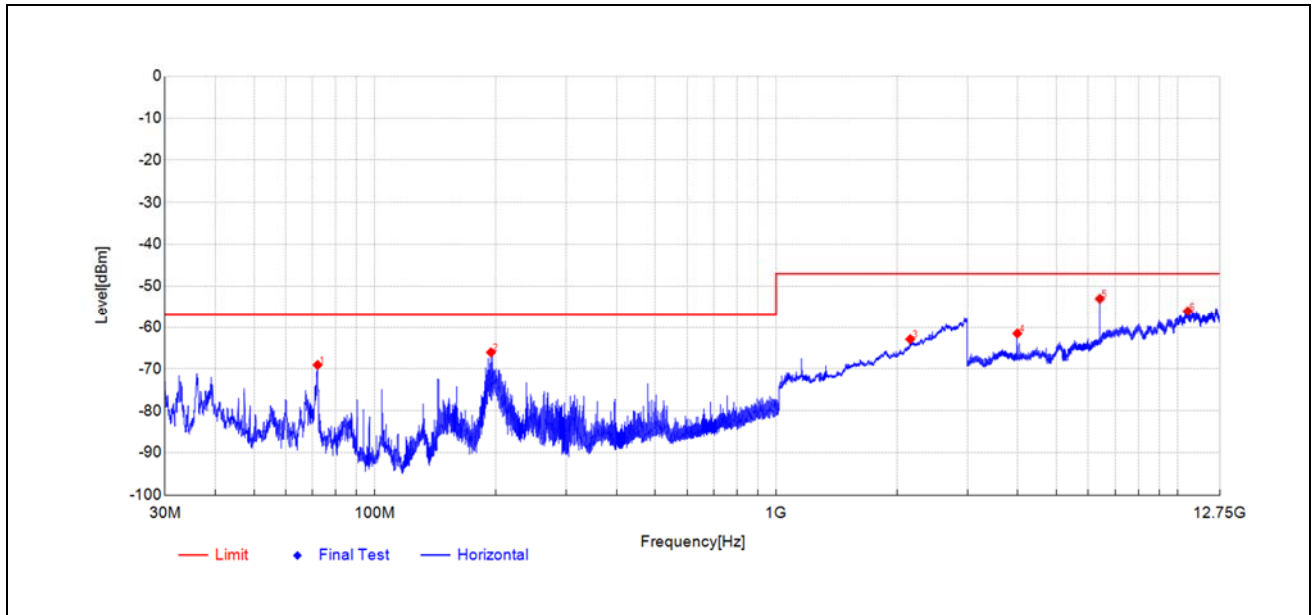


**b) Radiated measurement**

Below is the worst case situation test data:

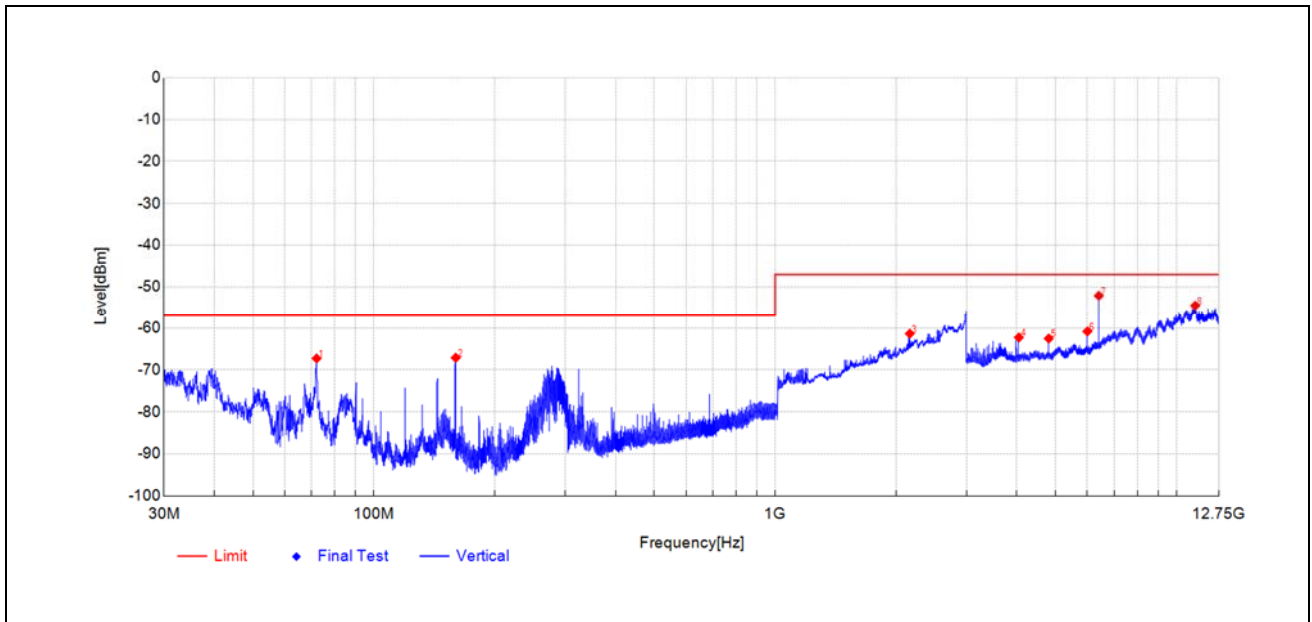
1Mbps

Plot for Channel 0



(Antenna Horizontal, 30MHz to 12.75GHz)

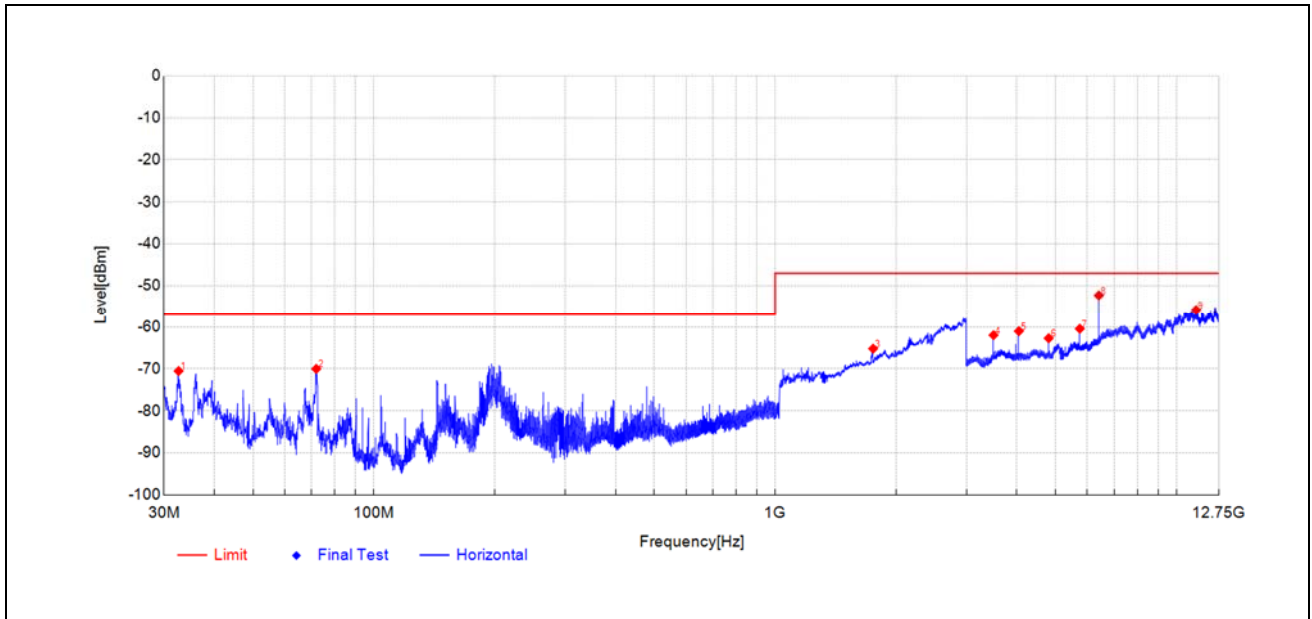
Frequency [MHz]	Reading [dBm]	Level [dBm]	Factor [dB]	Limit [dBm]	Margin [dB]	Polarity	Detector	Verdict
72.0031	-47.82	-69.04	-21.2	-57.0	12.0	Horizontal	RMS	PASS
194.6657	-47.47	-66.02	-18.6	-57.0	9.0	Horizontal	RMS	PASS
2158.2896	-67.71	-62.88	4.8	-47.0	15.9	Horizontal	RMS	PASS
3992.1121	-62.60	-61.51	1.1	-47.0	14.5	Horizontal	RMS	PASS
6407.7954	-62.05	-53.01	9.0	-47.0	6.0	Horizontal	RMS	PASS
10611.230	-75.18	-56.04	19.1	-47.0	9.0	Horizontal	RMS	PASS



(Antenna Vertical, 30MHz to 12.75GHz)

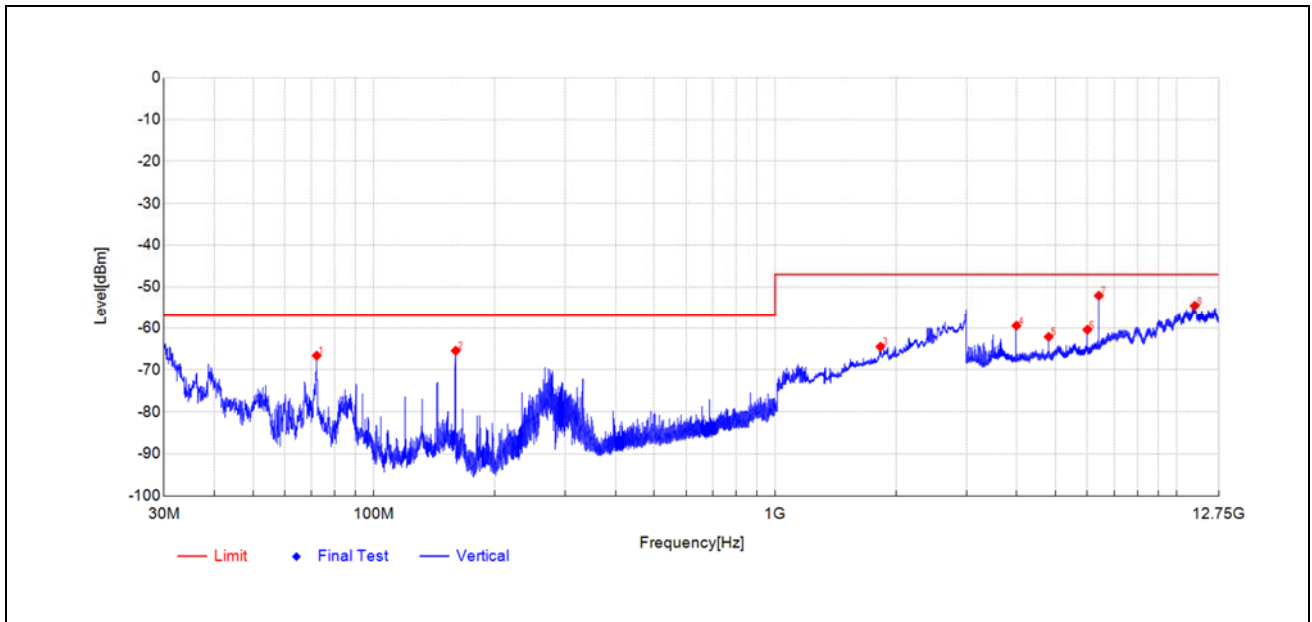
Frequency [MHz]	Reading [dBm]	Level [dBm]	Factor [dB]	Limit [dBm]	Margin [dB]	Polarity	Detector	Verdict
72.0031	-46.04	-67.28	-21.2	-57.0	10.3	Vertical	RMS	PASS
159.9865	-44.34	-67.11	-22.8	-57.0	10.1	Vertical	RMS	PASS
2165.7914	-66.14	-61.38	4.8	-47.0	14.4	Vertical	RMS	PASS
4049.64	-63.52	-62.29	1.2	-47.0	15.3	Vertical	RMS	PASS
4806.2778	-66.27	-62.53	3.7	-47.0	15.5	Vertical	RMS	PASS
6000.225	-67.92	-60.85	7.1	-47.0	13.9	Vertical	RMS	PASS
6407.7954	-60.29	-52.11	8.2	-47.0	5.1	Vertical	RMS	PASS
11140.194	-75.93	-54.51	21.4	-47.0	7.5	Vertical	RMS	PASS

Plot for Channel 39



(Antenna Horizontal, 30MHz to 12.75GHz)

Frequency [MHz]	Reading [dBm]	Level [dBm]	Factor [dB]	Limit [dBm]	Margin [dB]	Polarity	Detector	Verdict
32.6191	-55.34	-70.52	-15.2	-57.0	13.5	Horizontal	RMS	PASS
71.8576	-48.84	-70.01	-21.2	-57.0	13.0	Horizontal	RMS	PASS
1754.6887	-66.08	-65.21	0.9	-47.0	18.2	Horizontal	RMS	PASS
3501.6626	-62.57	-61.99	0.6	-47.0	15.0	Horizontal	RMS	PASS
4049.64	-62.43	-61.03	1.4	-47.0	14.0	Horizontal	RMS	PASS
4805.7903	-66.23	-62.71	3.5	-47.0	15.7	Horizontal	RMS	PASS
5746.2248	-67.48	-60.45	7.0	-47.0	13.5	Horizontal	RMS	PASS
6407.7954	-61.36	-52.32	9.0	-47.0	5.3	Horizontal	RMS	PASS
11197.234	-75.95	-55.84	20.1	-47.0	8.8	Horizontal	RMS	PASS



(Antenna Vertical, 30MHz to 12.75GHz)

Frequency [MHz]	Reading [dBm]	Level [dBm]	Factor [dB]	Limit [dBm]	Margin [dB]	Polarity	Detector	Verdict
72.0516	-45.35	-66.61	-21.3	-57.0	9.6	Vertical	RMS	PASS
159.9865	-42.69	-65.46	-22.8	-57.0	8.5	Vertical	RMS	PASS
1829.7074	-67.97	-64.49	3.5	-47.0	17.5	Vertical	RMS	PASS
3994.5497	-60.24	-59.49	0.8	-47.0	12.5	Vertical	RMS	PASS
4805.7903	-65.88	-62.14	3.7	-47.0	15.1	Vertical	RMS	PASS
6000.225	-67.52	-60.45	7.1	-47.0	13.5	Vertical	RMS	PASS
6407.7954	-60.26	-52.08	8.2	-47.0	5.1	Vertical	RMS	PASS
11108.993	-76.08	-54.52	21.6	-47.0	7.5	Vertical	RMS	PASS

A.7. Receiver Blocking

Test Result

Note: The EUT operate in normal link mode.

Channel 1, 2402MHz						
Receiver Blocking parameters for Receiver Category 2 equipment						
Wanted Signal Mean Power from Companion Device (dBm) (see Note 1)	Blocking signal frequency (MHz)	Type of blocking signal	Performance Criteria	Blocking signal power(dBm) (see note 2)		Verdict
				Test Value	Limit	
-68.86	2380	CW	PER≤10%	-4	≥-34	PASS
	2504			-1		PASS
	2300			-5		PASS
	2584			-3		PASS
Note 1: The wanted signal mean power from companion device is equal to "-139dBm+10log ₁₀ (OCBW)+10dB" or "-74dBm+10dB", whichever is less, OCBW is in Hz. Note 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the levels have to be corrected by the actual antenna assembly gain.						

Channel 39, 2480MHz						
Receiver Blocking parameters for Receiver Category 2 equipment						
Wanted Signal Mean Power from Companion Device (dBm) (see Note 1)	Blocking signal frequency (MHz)	Type of blocking signal	Performance Criteria	Blocking signal power(dBm) (see note 2)		Verdict
				Test Value	Limit	
-68.86	2380	CW	PER≤10%	-5	≥-34	PASS
	2504			-1		PASS
	2300			-3		PASS
	2584			-2		PASS
Note 1: The wanted signal mean power from companion device is equal to "-139dBm+10log ₁₀ (OCBW)+10dB" or "-74dBm+10dB", whichever is less, OCBW is in Hz. Note 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the levels have to be corrected by the actual antenna assembly gain.						

Annex B Photographs of Test Setup

B.1. Conducted



B.2. Radiated



Annex C Application Form for Testing

C.1. Introduction

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the application form pro forma in this annex so that it can be used for its intended purposes and may further publish the completed application form.

The form contained in this annex may be used by the manufacturer to comply with the requirement contained in clause 5.4.1 to provide the necessary information about the equipment to the test laboratory prior to the testing. It contains product information as well as other information which might be required to define which configurations are to be tested, which tests are to be performed as well the test conditions.

This application form should form an integral part of the test report.

C.2. Information as required by ETSI EN 300 328 V2.2.2, clause 5.4.1

In accordance with ETSI EN 300 328, clause 5.4.1, the following information is provided by the manufacturer.

a) The type of modulation used by the equipment:

☐ FHSS

☒ Other forms of modulation

b) 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 (average) Dwell Time:

c) 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

d) In case of adaptive equipment:

The maximum Channel Occupancy Time implemented by the equipment: N/A 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: N/A μ s

☐ The equipment has implemented a non-LBT based DAA mechanism

☐ The equipment can operate in more than one adaptive mode

e) In case of non-adaptive Equipment:

The maximum RF Output Power (e.i.r.p.): 8.32 dBm

The maximum (corresponding) Duty Cycle: N/A %

Equipment with dynamic behaviour, that behaviour is described here. (e.g. the different combinations of duty cycle and corresponding power levels to be declared): N/A

f) The worst case operational mode for each of the following tests:

- RF Output Power: GFSK
- Power Spectral Density: GFSK
- Duty cycle, Tx-Sequence, Tx-gap: N/A
- Dwell time, Minimum Frequency Occupation & Hopping Sequence (only for FHSS equipment): N/A
- Hopping Frequency Separation (only for FHSS equipment) : N/A
- Medium Utilisation: N/A
- Adaptivity & Receiver Blocking: N/A
- Occupied Channel Bandwidth: GFSK
- Transmitter unwanted emissions in the OOB domain: GFSK
- Transmitter unwanted emissions in the spurious domain: GFSK
- Receiver spurious emissions: GFSK

g) The different transmit operating modes (tick all that apply):

- ☒ Operating mode 1: Single Antenna Equipment
- ☒ Equipment with only one antenna
- ☐ Equipment with two diversity antennas but only one antenna active at any moment in time
- ☐ Smart Antenna Systems with two or more antennas, but operating in a (legacy) mode where only one antenna is used (e.g. IEEE 802.11TM [i.3] legacy mode in smart antenna systems)
- ☐ Operating mode 2: Smart Antenna Systems - Multiple Antennas without beam forming
- ☐ Single spatial stream / Standard throughput / (e.g. IEEE 802.11TM [i.3] legacy mode)
- ☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 1
- ☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 2

NOTE 1: Add more lines if more channel bandwidths are supported.

- ☐ Operating mode 3: Smart Antenna Systems - Multiple Antennas with beam forming
- ☐ Single spatial stream / Standard throughput (e.g. IEEE 802.11TM [i.3] legacy mode)
- ☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 1
- ☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 2

NOTE 2: Add more lines if more channel bandwidths are supported.

h) In case of Smart Antenna Systems:

- The number of Receive chains:



- The number of Transmit chains:

- ☐ symmetrical power distribution
- ☐ asymmetrical power distribution

In case of beam forming, the maximum (additional) beam forming gain: dB

NOTE: The additional beam forming gain does not include the basic gain of a single antenna.

i) Operating Frequency Range(s) of the equipment:

- Operating Frequency Range 1: 2402 MHz to 2480 MHz

NOTE: Add more lines if more Frequency Ranges are supported.

j) Nominal Channel Bandwidth(s):

- ☒ Occupied Channel Bandwidth 1: 1 MHz
- ☒ Occupied Channel Bandwidth 2: 2 MHz

NOTE: Add more lines if more channel bandwidths are supported.

k) Type of Equipment (stand-alone, combined, plug-in radio device, etc.):

- ☐ Stand-alone
- ☐ Combined Equipment (Equipment where the radio part is fully integrated within another type of equipment)
- ☐ Plug-in radio device (Equipment intended for a variety of host systems)
- ☐ Other

l) The normal and the extreme operating conditions that apply to the equipment:

Normal operating conditions (if applicable):

Operating temperature: 25°C

Extreme operating conditions:

Operating temperature range: Minimum: -10°C Maximum 45°C

Details provided are for the:

- ☒ stand-alone equipment
- ☐ combined (or host) equipment
- ☐ test jig

m) The intended combination(s) of the radio equipment power settings and one or more antenna assemblies and their corresponding e.i.r.p. levels:

- Antenna Type:

- ☒ Integral Antenna (information to be provided in case of conducted measurements)

Antenna Gain: 2.45 dBi

If applicable, additional beamforming gain (excluding basic antenna gain): dB

- ☐ Temporary RF connector provided
- ☐ No temporary RF connector provided
- ☐ 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

NOTE 1: Add more lines in case the equipment has more power levels.

NOTE 2: These power levels are conducted power levels (at antenna connector).

• For each of the Power Levels, provide the intended antenna assemblies, their corresponding gains (G) and the resulting e.i.r.p. levels also taking into account the beamforming gain (Y) if applicable

Power Level 1: dBmNumber of antenna assemblies provided for this power level: N/A

Assembly #	Gain (dBi)	e.i.r.p. (dBm)	Part number or model name
1			
2			
3			
4			

NOTE3: Add more rows in case more antenna assemblies are supported for this power level.

Power Level 2: dBm

Number of antenna assemblies provided for this power level:

Assembly #	Gain (dBi)	e.i.r.p. (dBm)	Part number or model name
1			
2			
3			
4			

NOTE4: Add more rows in case more antenna assemblies are supported for this power level.

Power Level 3: dBm

Number of antenna assemblies provided for this power level:

Assembly #	Gain (dBi)	e.i.r.p. (dBm)	Part number or model name
1			
2			
3			
4			

NOTE5: Add more rows in case more antenna assemblies are supported for this power level.

n) The nominal voltages of the stand-alone radio equipment or the nominal voltages of the combined (host) equipment or test jig in case of plug-in devices:

Details provided are for the:

☒ stand-alone equipment☐ combined (or host) equipment☐ test jig

Supply Voltage:



☐ AC mains State AC voltage N/A V

☒ DC State DC voltage 7.2V

In case of DC, indicate the type of power source:

☐ Internal Power Supply

☐ External Power Supply or AC/DC adapter

☒ Battery

☐ Other:

o) Describe the test modes available which can facilitate testing:

Use special software to control the EUT transmit or receiver.

p) The equipment type (e.g. Bluetooth®, IEEE 802.11™ [i.3], IEEE 802.15.4™ [i.4], proprietary, etc.): Bluetooth

q) If applicable, the statistical analysis referred to in clause 5.4.1 q)

(to be provided as separate attachment)

r) If applicable, the statistical analysis referred to in clause 5.4.1 r)

(to be provided as separate attachment)

s) Geo-location capability supported by the equipment:

☐ Yes

☐ The geographical location determined by the equipment as defined in clause 4.3.1.13.2 or clause 4.3.2.12.2 is not accessible to the user

☒ No

C.3: Configuration for testing (see clause 5.3.2.3 of ETSI EN 300 328 V2.2.2)

From all combinations of conducted power settings and intended antenna assembly(ies) specified in clause 5.4.1 m), specify the combination resulting in the highest e.i.r.p. for the radio equipment. Unless otherwise specified in ETSI EN 300 328, this power setting is to be used for testing against the requirements of ETSI EN 300 328. In case there is more than one such conducted power setting resulting in the same (highest) e.i.r.p. level, the highest power setting is to be used for testing. See also ETSI EN 300 328, clause 5.3.2.3.

Highest overall e.i.r.p. value: <u>8.32dBm</u>	
Corresponding Antenna assembly gain: <u>2.45dBi</u>	Antenna Assembly #: <u>N/A</u>
Corresponding conducted power setting: <u>N/A</u> dBm (also the power level to be used for testing)	Listed as Power Setting #: <u>Max</u> <u>Power Setting</u>

C.4 Additional information provided by the applicant

C.4.1 Modulation

ITU Class(es) of emission:

Can the transmitter operate unmodulated? ☐yes ☒no

C.4.2 Duty Cycle

The transmitter is intended for:

☒ Continuous duty

☐ Intermittent duty



☐ Continuous operation possible for testing purposes

C.4.3 About the UUT

☒ The equipment submitted are representative production models

☐ If not, the equipment submitted are pre-production models?

☐ If pre-production equipment are submitted, the final production equipment will be identical in all respects with the equipment tested

☐ If not, supply full details

C.4.4 Additional items and/or supporting equipment provided

☐ Spare batteries (e.g. for portable equipment)

☒ Battery charging device

☐ External Power Supply or AC/DC adapter

☐ Test jig or interface box

☐ RF test fixture (for equipment with integrated antennas)

☒ Host System Manufacturer: Shenzhen Hohem Technology Co.,Ltd.

Model #: N/A

Model name: HPG-V3U

☐ Combined equipment Manufacturer:

Model #:

Model name:

☒ User Manual

☒ Technical documentation (Handbook and circuit diagrams)

_____ END OF REPORT _____