China

RF - TEST REPORT

Report Number	:	**64.790.12.02025.01- FCC**	Date of Issue:	2012-10-08

Model	:	iF191BI
Product Type	:	Bluetooth Body Scale
FCC ID	:	Q22IF191BI
Applicant	:	Zhongshan Camry Electronic Co., Ltd.
Manufacturer	:	Zhongshan Camry Electronic Co., Ltd.
Address	:	Baishawan Industrial Park, Qiwan Road East, East District, 528403, Zhongshan, Guangdong, PEOPLE'S REPUBLIC OF CHINA
Test Result	:	■ **Positive** ☐ **Negative**
Total pages including Appendices	:	73

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China

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1. DETAILS ABOUT THE TEST LABORATORY

Details about the Test Laboratory

Company name:	Neutron Engineering Inc. No.3.JinShaGang 1st Road, ShiXia,DaLang Town, DongGuan, China
Telephone: Fax:	86 769 83183000 86 769 83196000
	January 24, 2005 File on Federal Communications Commission Laboratory Division 7435 Oakland Mills Road Columbia, MD 21046
Registration Number:	319330

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2. DESCRIPTION OF THE EQUIPMENT UNDER TEST

Test Standards	
FCC Part 15 Subpart C, 10-1-2011 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

Equipment	Bluetooth Body Scale
Model Name.	iF191BI
Model Difference	N/A
Product Description	The EUT is a Bluetooth Body Scale. Product Type: Bluetooth Body Scale Operation Frequency: 2402~2480 MHz Modulation Type: GFSK, (π/4)QPSK, 8DPSK Date rate: Normal: 1M bps; EDR: 3M bps Number Of Channel: 79 Antenna Designation: PCB layout antenna Antenna Gain(Peak): 0.69 dBi max. Output Power: -0.55dBm (conducted peak power) More details of EUT technical specification. Please refer to the User's Manual.
Channel List	Please refer to the Note 2.
Power Source	DC 6V (4 x size “AAA”)
Connecting I/O Port(s)	Please refer to the User's Manual
Products Covered	N/A

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

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2.

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2402	28	2429	55	2456
2	2403	29	2430	56	2457
3	2404	30	2431	57	2458
4	2405	31	2432	58	2459
5	2406	32	2433	59	2460
6	2407	33	2434	60	2461
7	2408	34	2435	61	2480
8	2409	35	2436	62	2463
9	2410	36	2437	63	2464
10	2411	37	2438	64	2465
11	2402	38	2439	65	2466
12	2413	39	2440	66	2467
13	2414	40	2441	67	2468
14	2415	41	2442	68	2469
15	2416	42	2443	69	2470
16	2417	43	2444	70	2471
17	2418	44	2445	71	2472
18	2419	45	2446	72	2473
19	2420	46	2447	73	2474
20	2421	47	2448	74	2475
21	2422	48	2449	75	2476
22	2423	49	2450	76	2477
23	2424	50	2451	77	2478
24	2425	51	2452	78	2479
25	2426	52	2453	79	2480
26	2427	53	2454		
27	2428	54	2455		

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	PCB layout Antenna	N/A	0.69

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3. SUMMARY OF TEST RESULTS

Technical Requirements			
Transmit mode			
Test Items	Test Result		
	Pass	Fail	N/A
15.247(b)(4) Antenna Requirement	☒	☐	☐
15.247 (a1) Occupied Bandwidth	☒	☐	☐
15.247(a)(1) Carrier Frequencies Separated	☒	☐	☐
15.247(a)(1)(iii) Hopping Channel Number	☒	☐	☐
15.247(a)(1)(iii) Dwell Time	☒	☐	☐
15.247(b)(1) Maximum Peak Output Power	☒	☐	☐
15.209 &15.247(d) Conducted Spurious Emission (30MHz to 25GHz)	☒	☐	☐
15.209 &15.247(d) Radiated Spurious Emission (30MHz to 25GHz)	☒	☐	☐
15.247(d) Restricted bands	☒	☐	☐
15.247 (d) &15.205 Band Edges Measurement	☒	☐	☐

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4. GENERAL REMARKS

This submittal(s) (test report) is intended for
FCC ID: Q22IF191BI
filing to comply with
- Section 15.205, 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C Rules. Tests have been carried out in accordance with FCC rules Part 15 Subpart C, ANSI C63.4 (2009), Public Notice DA 00-705.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

☐ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Testing Start Date: 2012-09-23

Testing End Date: 2012-09-24

- JIANGSU TÜV PRODUCT SERVICE LTD. GUANGZHOU BRANCH-

Reviewed by: Tony Liu

Prepared by: Celia Xiang

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5. DESCRIPTION OF TEST MODES

To investigate the maximum emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Transmitting in GFSK mode with different data package.
Mode 2	Transmitting in π/4QPSK mode with different data package.
Mode 3	Transmitting in 8DPSK mode with different data package.

Final Test Mode	Description
Mode 1	Transmitting in GFSK mode with data package DH1.
Mode 2	Transmitting in 8DPSK mode data package 3DH1.

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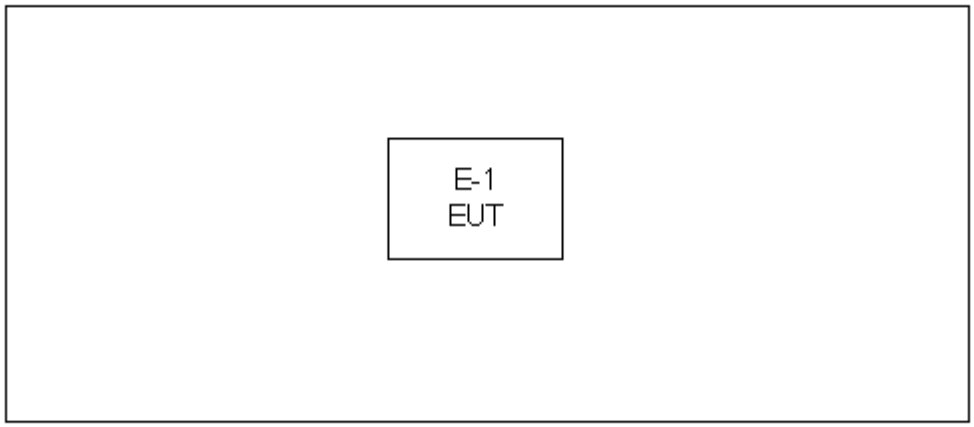
5.1 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



5.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note

Item	Shielded Type	Ferrite Core	Length	Note

Note:
(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in m in『Length』column.

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6. TEST RESULTS

6.1 MEASUREMENT UNCERTAINTY

For a 95% confidence level(k=2), the measurement expanded uncertainties for defined systems accordance with the recommendations of ISO 17025 as following:

Test item		expanded uncertainty
Conducted emission	Voltage(dBuV)	U= 0.83dB
Bandwidth	Magnitude (%)	U= 0.5%
Maximum peak power	Power (dBm)	U= 0.1dB
Power spectral density	Power (dBm)	U= 0.1dB
Conducted spurious emission and band edge	Power (dBm)	U= 0.1dB
Radiated spurious emission	Filed strength (dBuV/m)	U= 2.61dB(30MH~1GHz) U= 2.6dB(above 1GHz)

6.2 ANTENNA REQUIRMENT

6.1.1 STANDARD REQUIRMENTS

15.247(b) (4) requirement:
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

6.1.2 EUT ANTENNA

The max antenna gain of PCB layout antenna for EUT is 0.69dBi.

6.1.3 ANTENNA PHOTO

6.1.4 RESULT

Complies.

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6.3 OCCUPIED BANDWIDTH

6.3.1 APPLIED PROCEDURES / LIMIT

15.247 (a1):

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

6.3.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2012

Remark: ” N/A” denotes No Model Name. , Serial No. or No Calibration specified.

6.3.3 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 30KHz, VBW=100KHz, Sweep time = 5 ms.

6.3.4 DEVIATION FROM STANDARD

No deviation.

6.3.5 TEST SETUP

6.3.6 EUT OPERATION CONDITIONS

The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

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6.3.7 TEST RESULTS

Model:	iF191BI	Result:	PASS
Temperature：	20°C	Relative Humidity：	55 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Continuously transmitting mode.		

Normal mode:

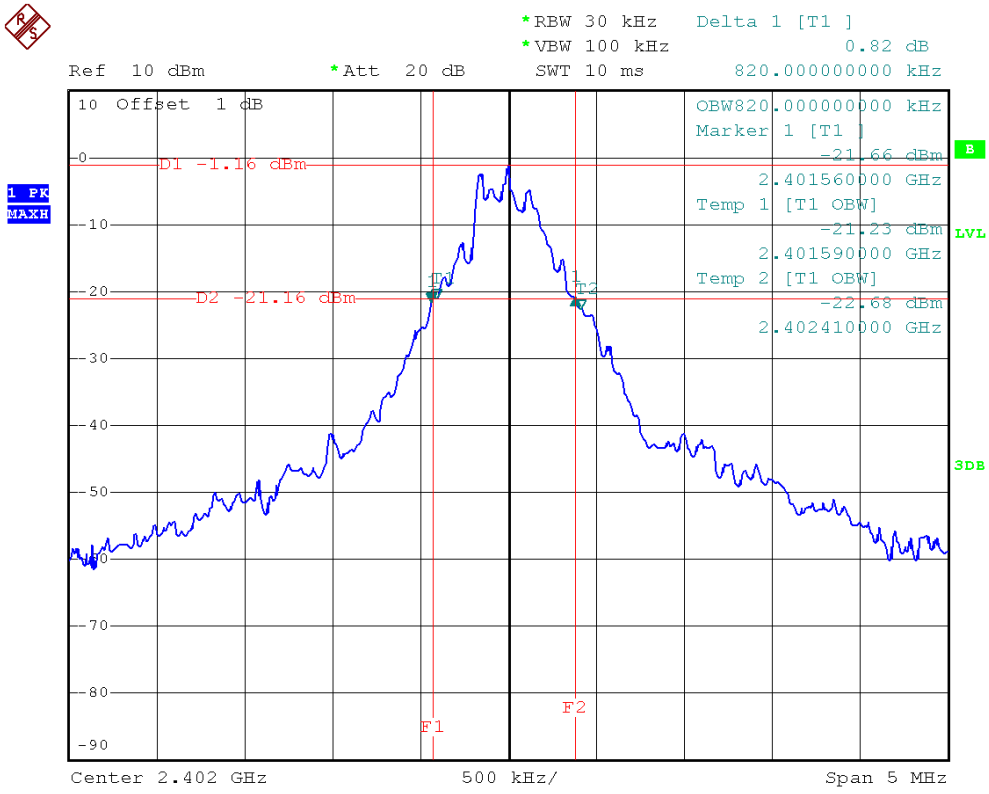
Test Channel	Bandwidth(MHz)	2/3 bandwidth(MHz)
Low	0.82	0.55
Middle	0.83	0.55
High	0.83	0.55

EDR mode:

Test Channel	Bandwidth(MHz)	2/3 bandwidth(MHz)
Low	1.14	0.76
Middle	1.15	0.77
High	1.15	0.77

Normal mode:

2402MHz



2441MHz

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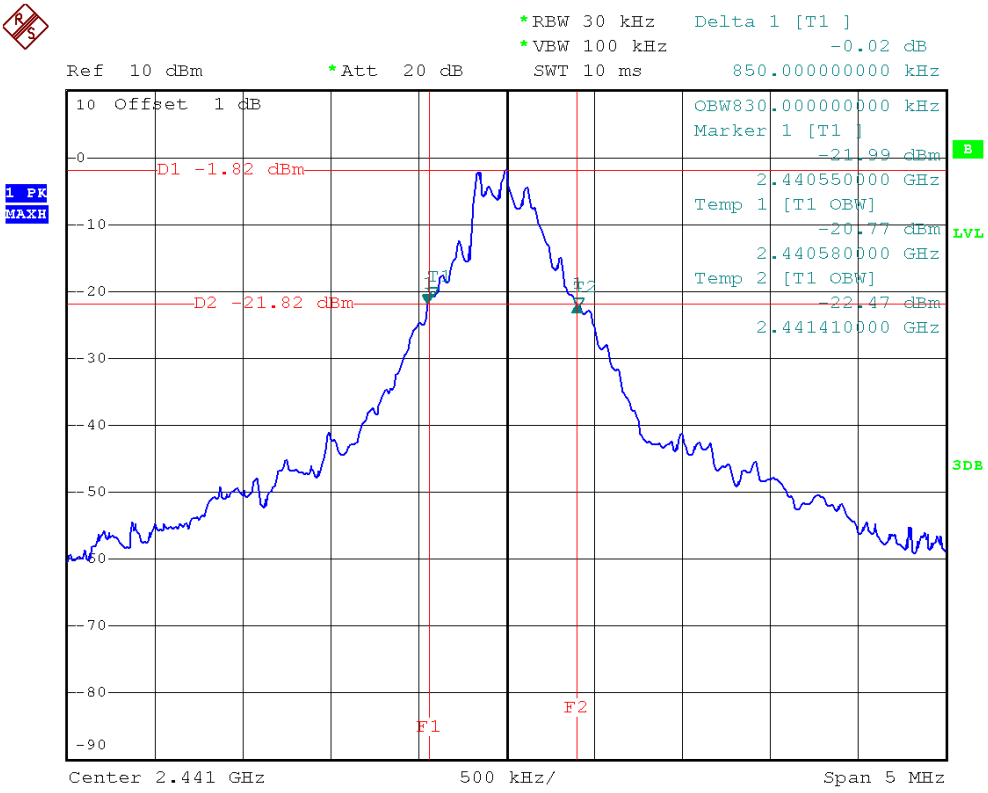
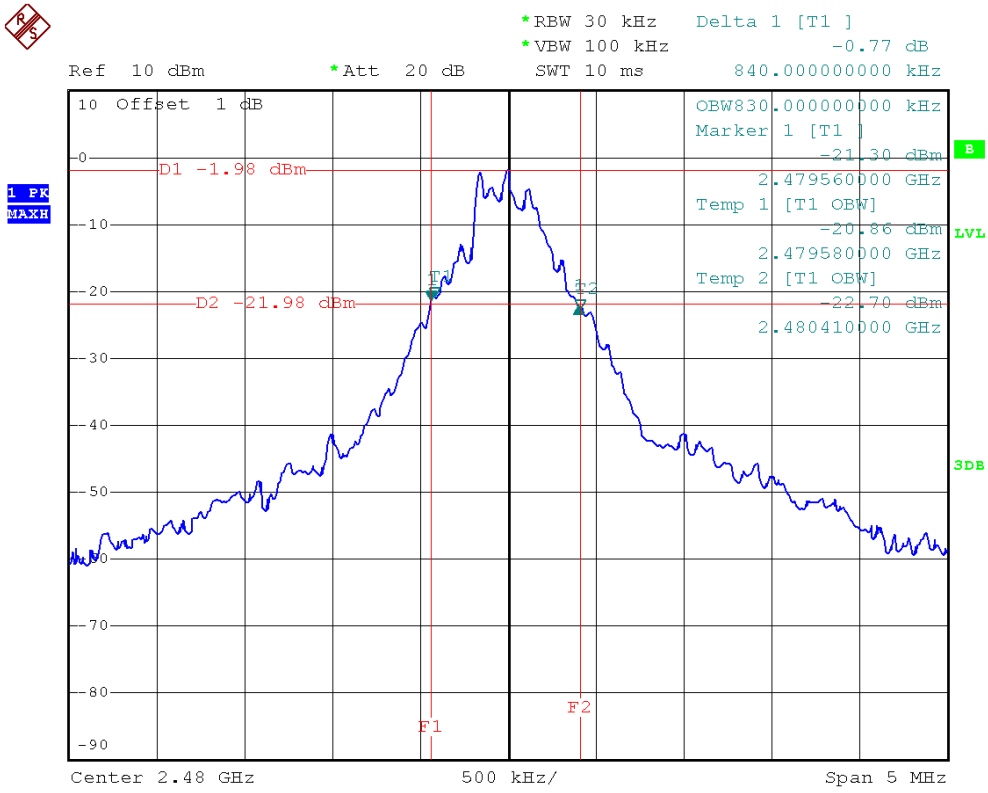


2480MHz



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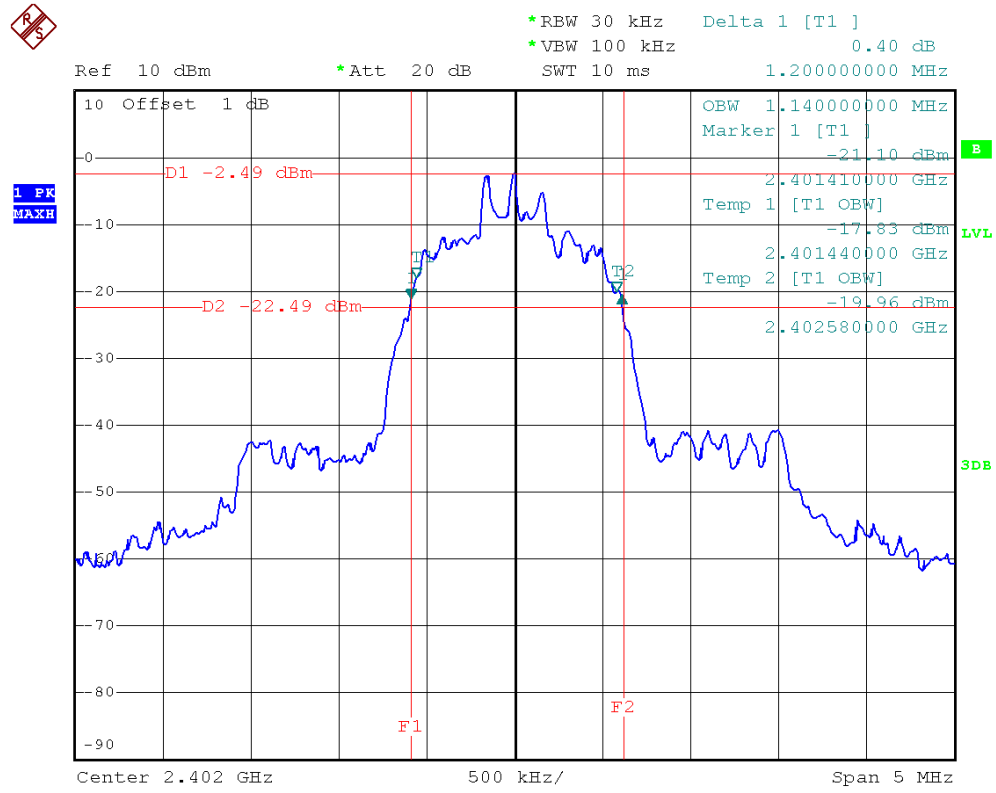
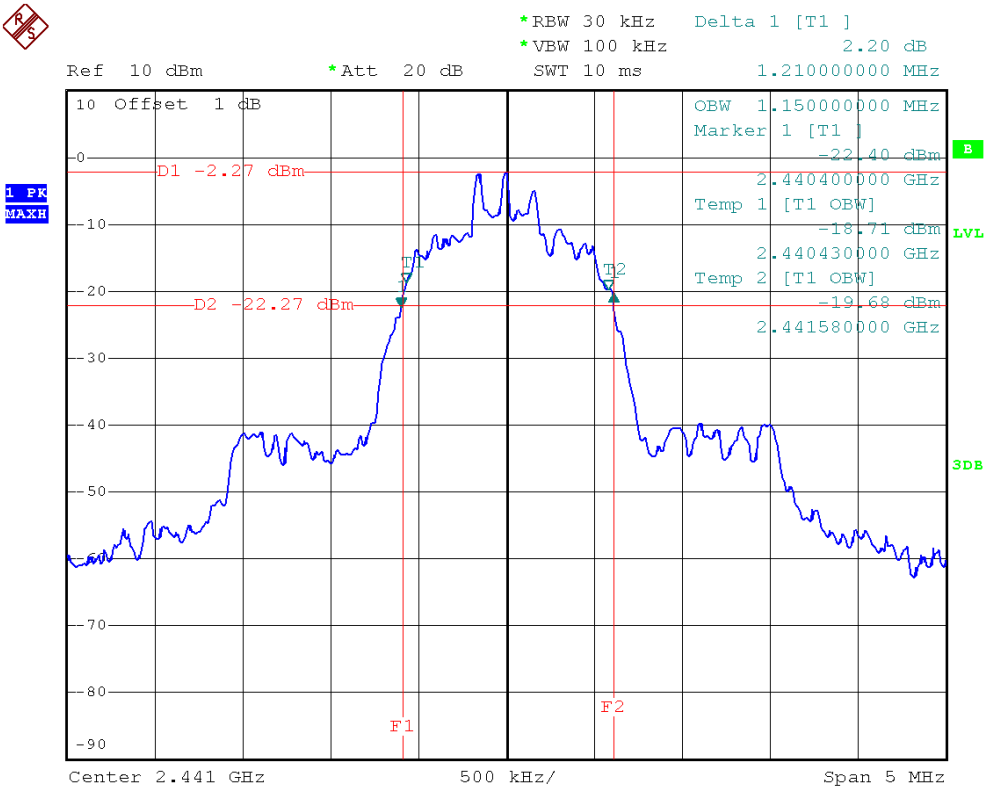
EDR mode:

2402MHz



2441MHz



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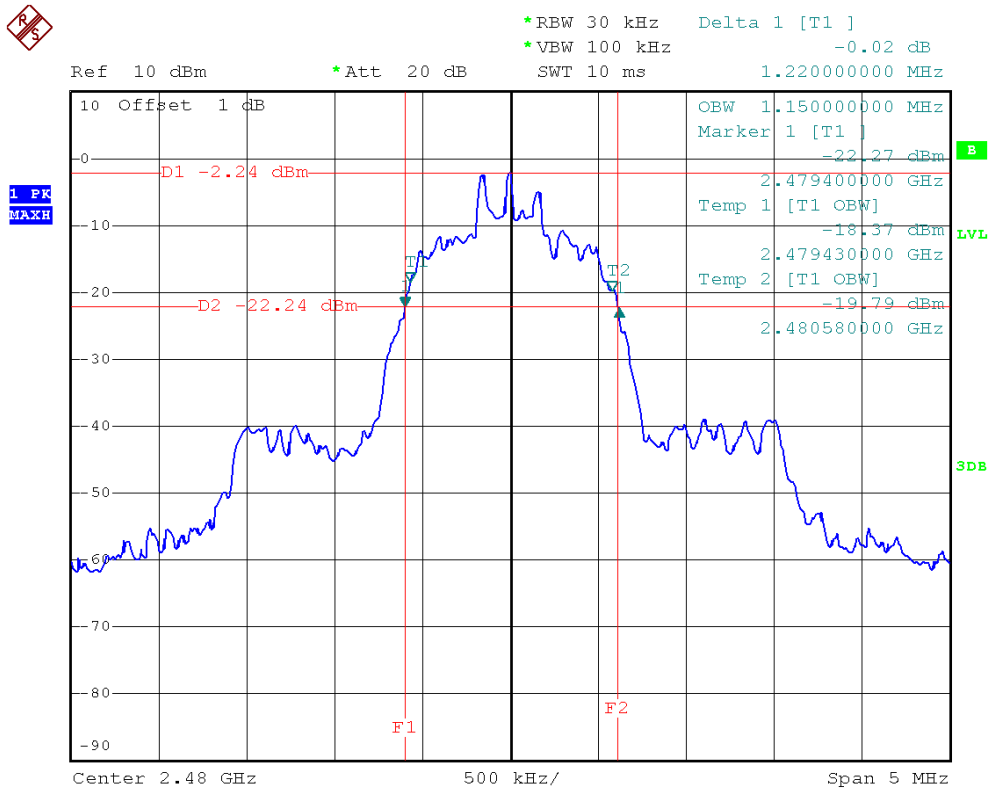
2480MHz



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6.4 CARRIER FREQUENCIES SEPARATED

6.4.1 APPLIED PROCEDURES / LIMIT

15.247(a1):

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

6.4.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2012

Remark: ” N/A” denotes No Model Name. , Serial No. or No Calibration specified.

6.4.3 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 30KHz, VBW=100KHz, Sweep time = 5 ms.

6.4.4 DEVIATION FROM STANDARD

No deviation.

6.4.5 TEST SETUP

6.4.6 EUT OPERATION CONDITIONS

The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

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6.4.7 TEST RESULTS

Model:	iF191BI	Result:	PASS
Temperature：	20°C	Relative Humidity：	55 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Hopping mode.		

Normal mode:

Test Channel	Carrier Frequencies Separated	PASS/FAIL
Lower Channels (channel 1 and channel 2)	0.992	Pass
Middle Channels (channel 39 and channel 40)	1.002	Pass
Upper Channels (channel 78 and channel 79)	0.984	Pass
Remark: The limit is maximum two-thirds of the 20 dB bandwidth: 550KHz.		

EDR mode:

Test Channel	Carrier Frequencies Separated	PASS/FAIL
Lower Channels (channel 1 and channel 2)	1.032	Pass
Middle Channels (channel 39 and channel 40)	1.002	Pass
Upper Channels (channel 78 and channel 79)	1.002	Pass
Remark: The limit is maximum two-thirds of the 20 dB bandwidth: 770KHz.		

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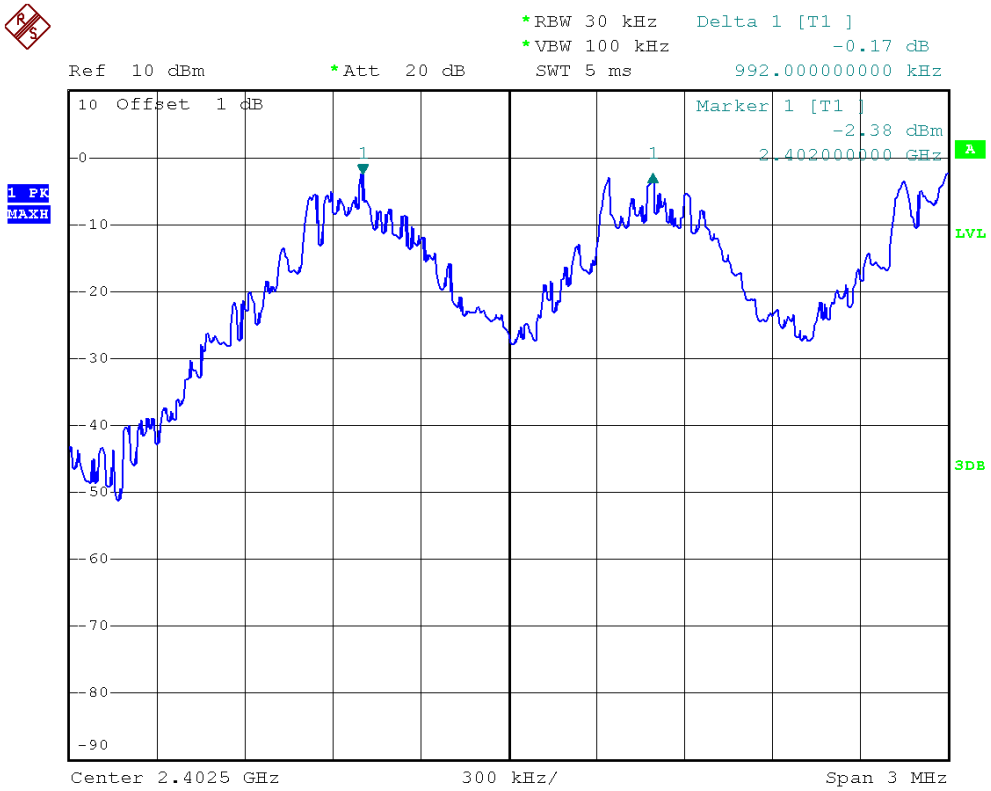
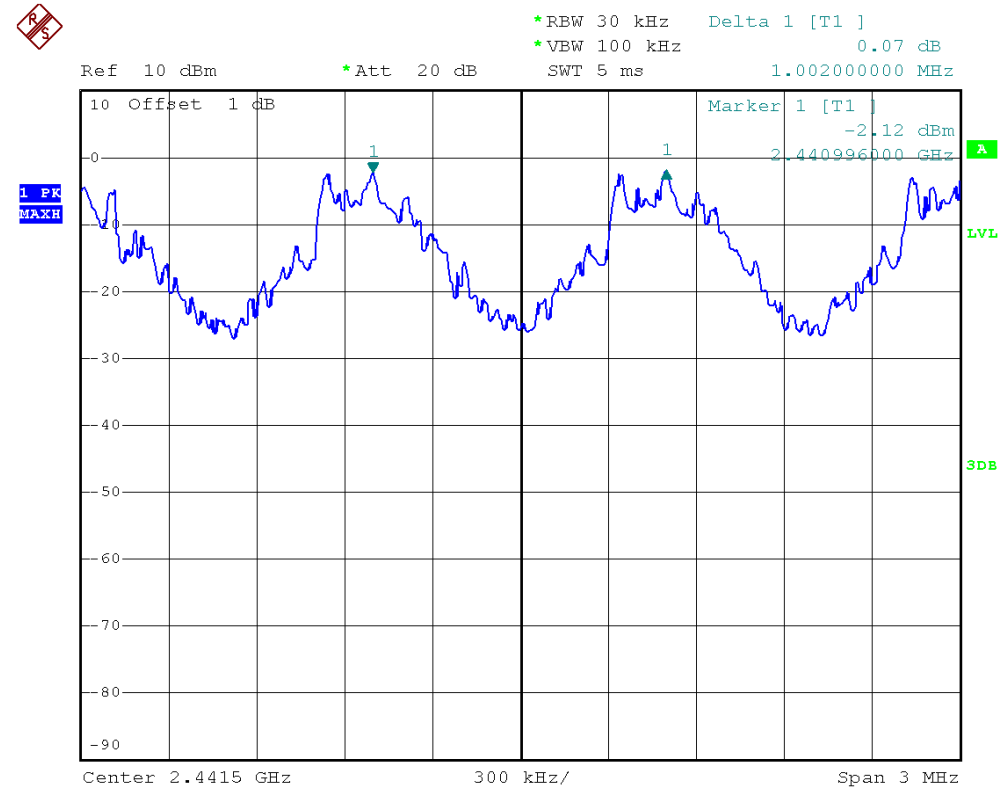
Normal mode:

2402MHz



2441MHz



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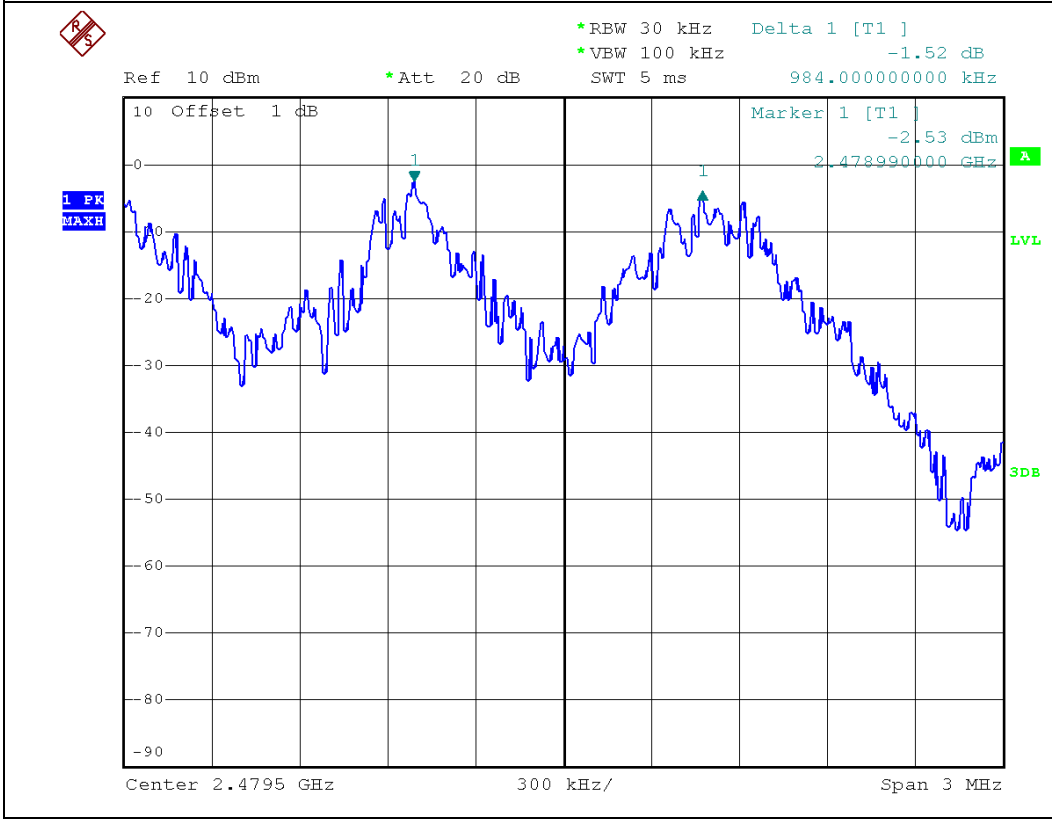
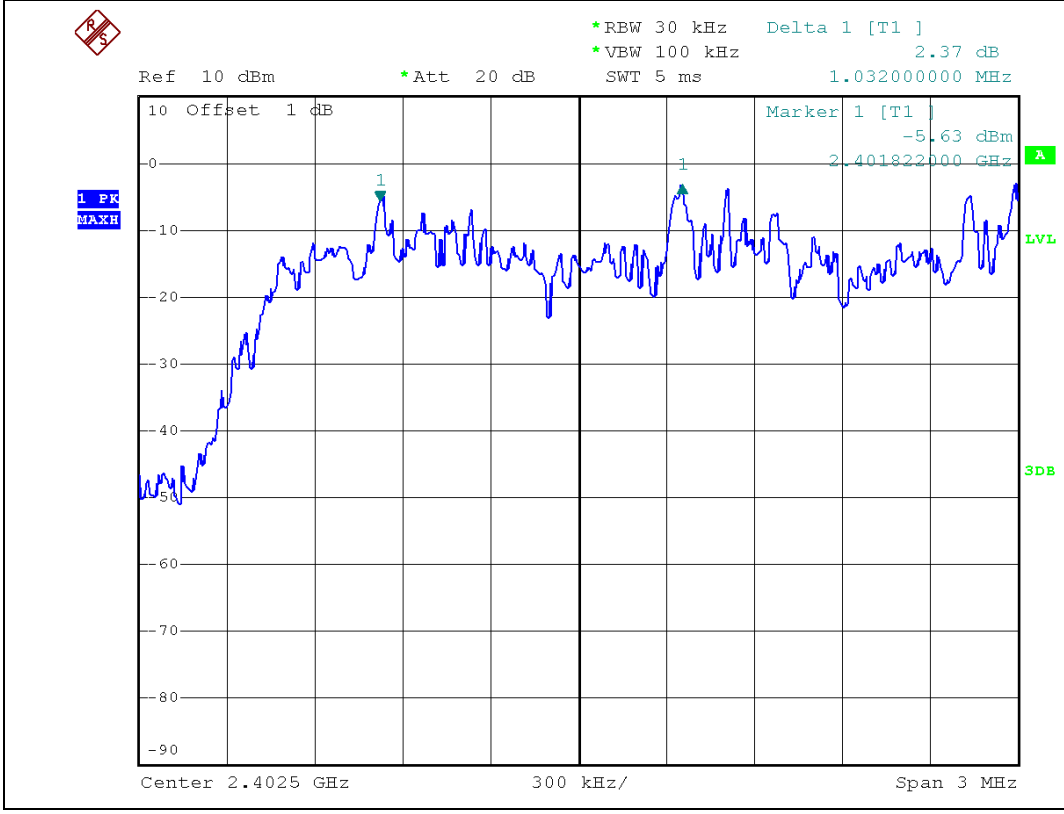
2480MHz



EDR mode:

2402MHz



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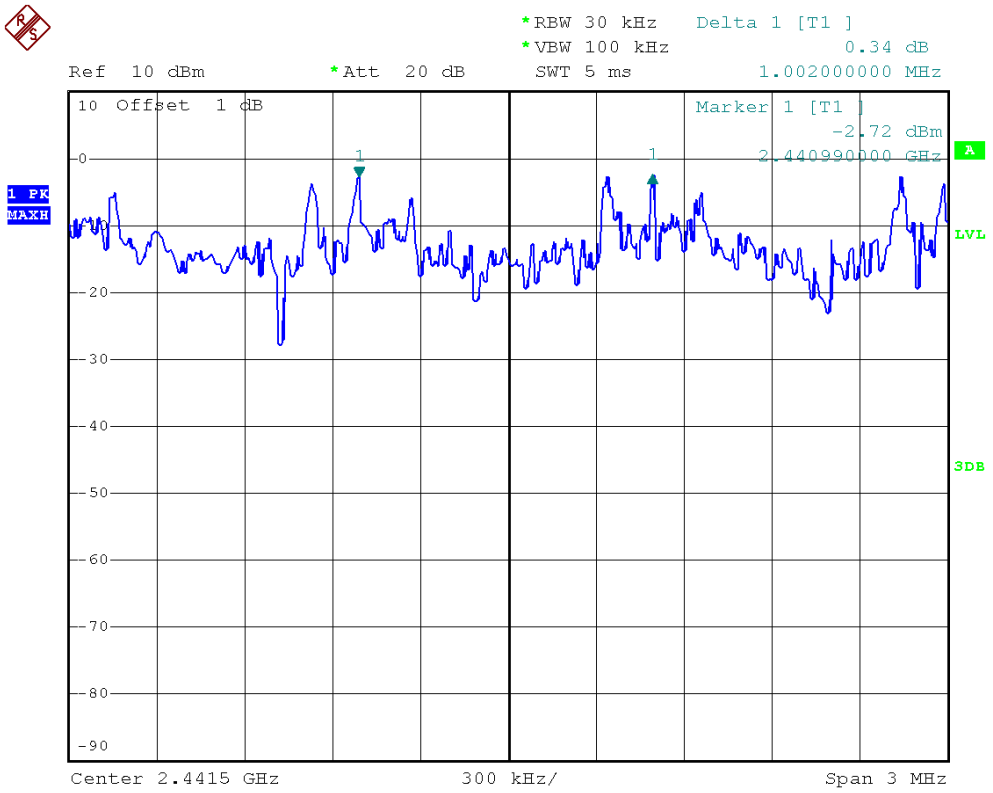
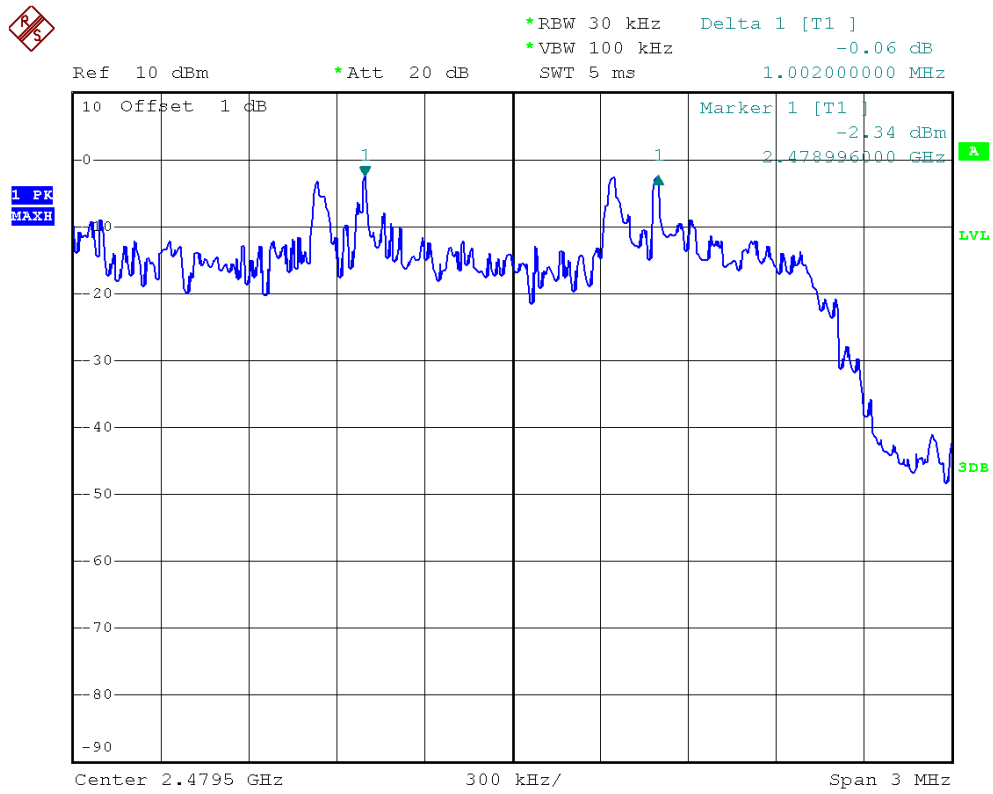
2441MHz



2480MHz



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6.5 HOPPING CHANNEL NUMBER

6.5.1 APPLIED PROCEDURES / LIMIT

15.247 (a) (1)(iii):

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

6.5.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2012

Remark: ” N/A” denotes No Model Name. , Serial No. or No Calibration specified.

6.5.3 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = 10 ms.

6.5.4 DEVIATION FROM STANDARD

No deviation.

6.5.5 TEST SETUP

6.5.6 EUT OPERATION CONDITIONS

The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

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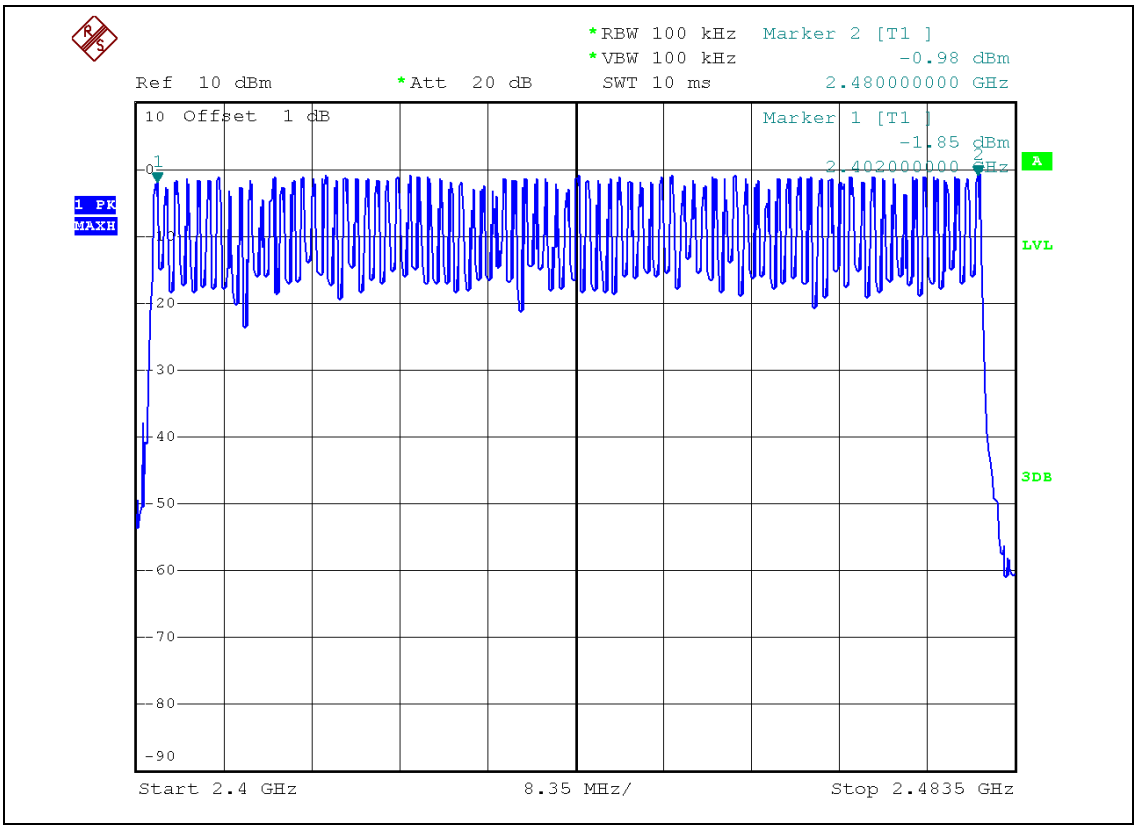
6.5.7 TEST RESULTS

Model:	iF191BI	Result:	PASS
Temperature：	20°C	Relative Humidity：	55 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Hopping mode.		

Result: total channel number is 79.

Normal mode:



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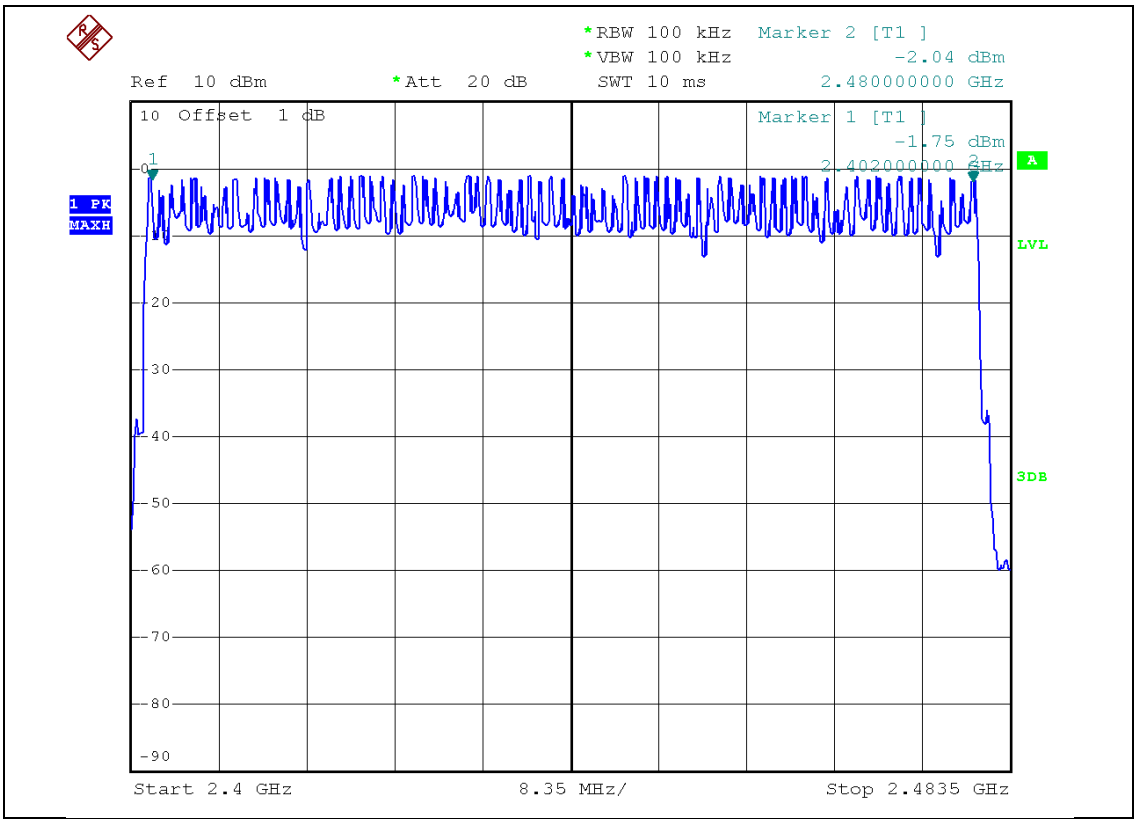
EDR mode:



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6.6 DWELL TIME

6.6.1 APPLIED PROCEDURES / LIMIT

15.247(a)(1)(iii):

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

6.6.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2012

Remark: ” N/A” denotes No Model Name. , Serial No. or No Calibration specified.

6.6.3 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting: RBW= 1MHz, VBW=1MHz, Sweep time = AUTO.

6.6.4 DEVIATION FROM STANDARD

No deviation.

6.6.5 TEST SETUP

6.6.6 EUT OPERATION CONDITIONS

The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

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6.6.7 TEST RESULTS

Model:	iF191BI	Result:	PASS
Temperature：	20°C	Relative Humidity：	55 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Hopping mode.		

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

Normal mode:

1. **Channel 1:** 2.402GHz

DH5 time slot = 3.1200 (ms) * (1600/(6*79)) * 31.6= 0.3328 (s)

DH3 time slot = 1.7400 (ms) * (1600/(4*79)) * 31.6= 0.2784 (s)

DH1 time slot = 0.4250 (ms) * (1600/(2*79)) * 31.6= 0.1360 (s)

2. **Channel 40:** 2.441GHz

DH5 time slot = 3.0800 (ms) * (1600/(6*79)) * 31.6= 0.3285 (s)

DH3 time slot = 1.7200 (ms) * (1600/(4*79)) * 31.6= 0.2752 (s)

DH1 time slot = 0.4350 (ms) * (1600/(2*79)) * 31.6= 0.1392 (s)

3. **Channel 79:** 2.480GHz

DH5 time slot = 3.0800 (ms) * (1600/(6*79)) * 31.6= 0.3285 (s)

DH3 time slot = 1.7800 (ms) * (1600/(4*79)) * 31.6= 0.2848 (s)

DH1 time slot = 0.4300 (ms) * (1600/(2*79)) * 31.6= 0.1376 (s)

EDR mode:

1. **Channel 1:** 2.402GHz

DH5 time slot = 3.0000 (ms) * (1600/(6*79)) * 31.6= 0.3200 (s)

DH3 time slot = 1.7400 (ms) * (1600/(4*79)) * 31.6= 0.2784 (s)

DH1 time slot = 0.4200 (ms) * (1600/(2*79)) * 31.6= 0.1344 (s)

2. **Channel 40:** 2.441GHz

DH5 time slot = 3.1200 (ms) * (1600/(6*79)) * 31.6= 0.3328 (s)

DH3 time slot = 1.7800 (ms) * (1600/(4*79)) * 31.6= 0.2848 (s)

DH1 time slot = 0.4400 (ms) * (1600/(2*79)) * 31.6= 0.1408 (s)

3. **Channel 79:** 2.480GHz

DH5 time slot = 3.0000 (ms) * (1600/(6*79)) * 31.6= 0.3200 (s)

DH3 time slot = 1.7600 (ms) * (1600/(4*79)) * 31.6= 0.2816 (s)

DH1 time slot = 0.4350 (ms) * (1600/(2*79)) * 31.6= 0.1392 (s)

The results are not greater than 0.4 seconds.

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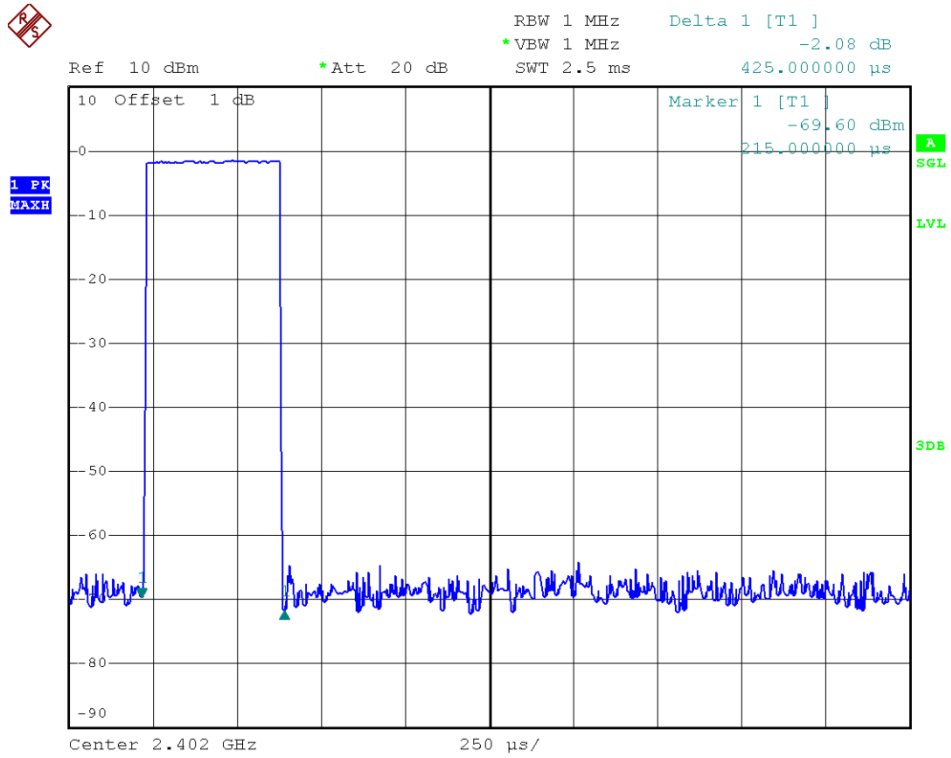
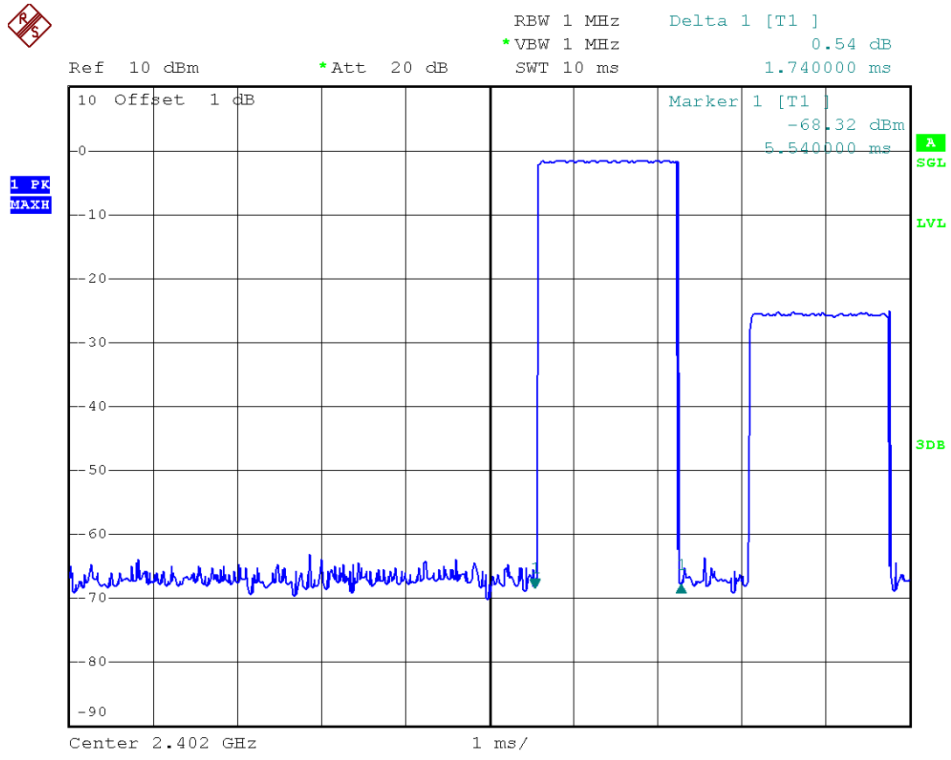
Normal mode:

2402MHz

DH1



DH3



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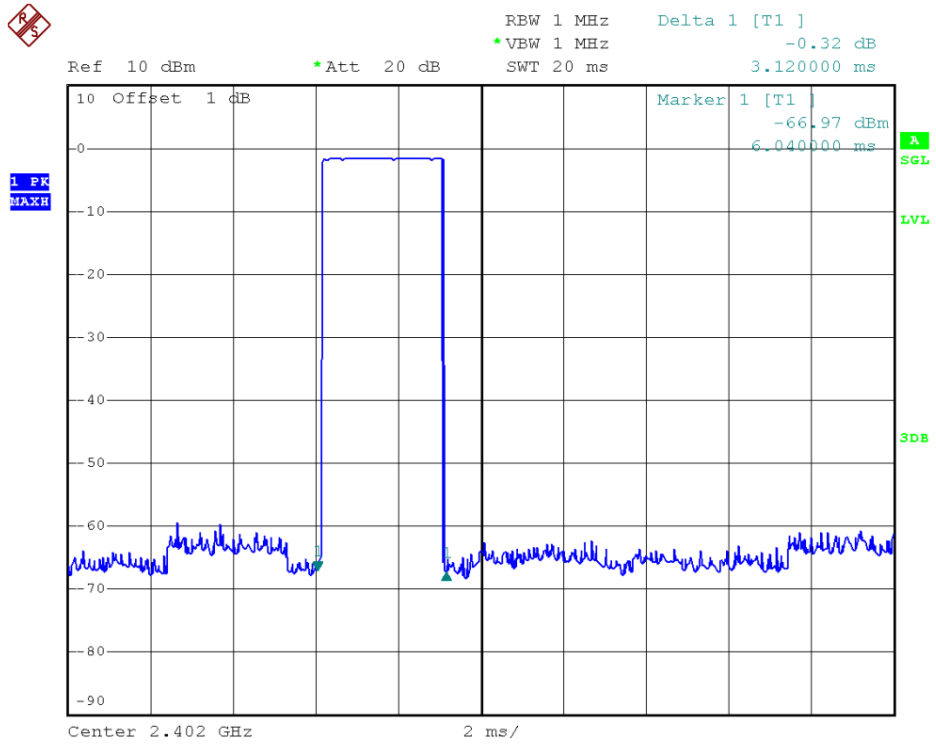
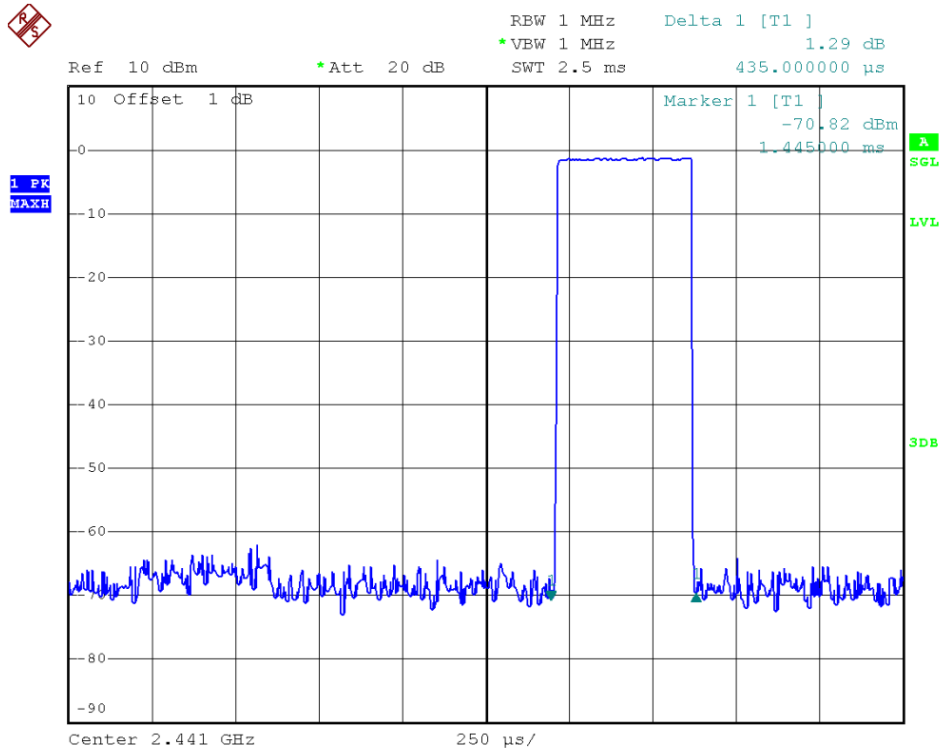
DH5



2441MHz

DH1



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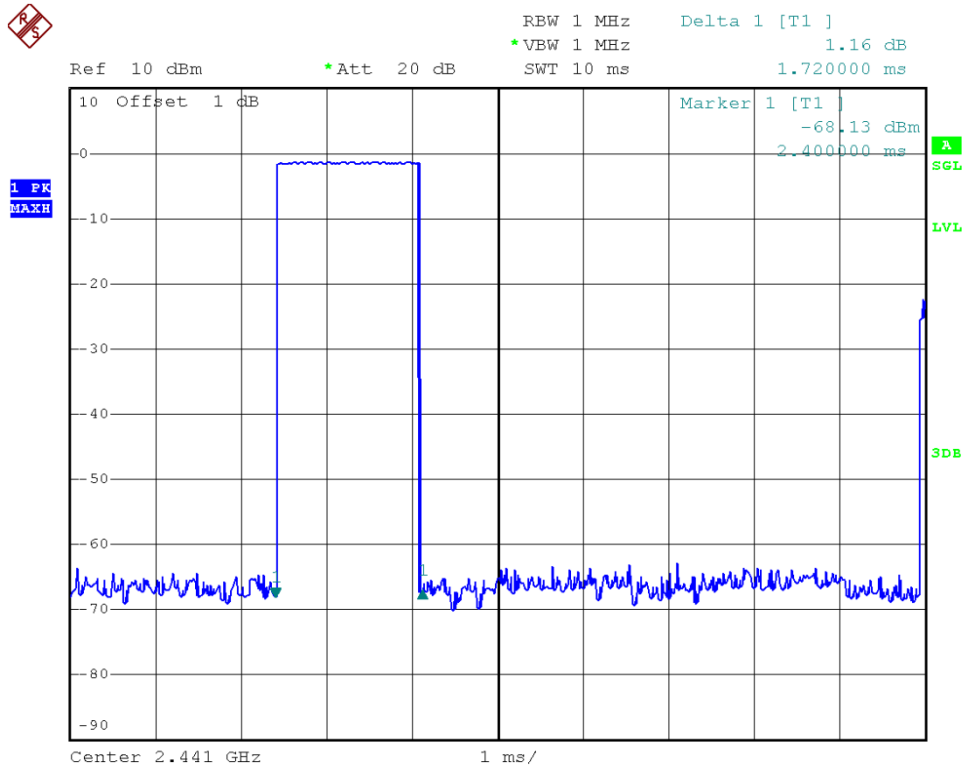
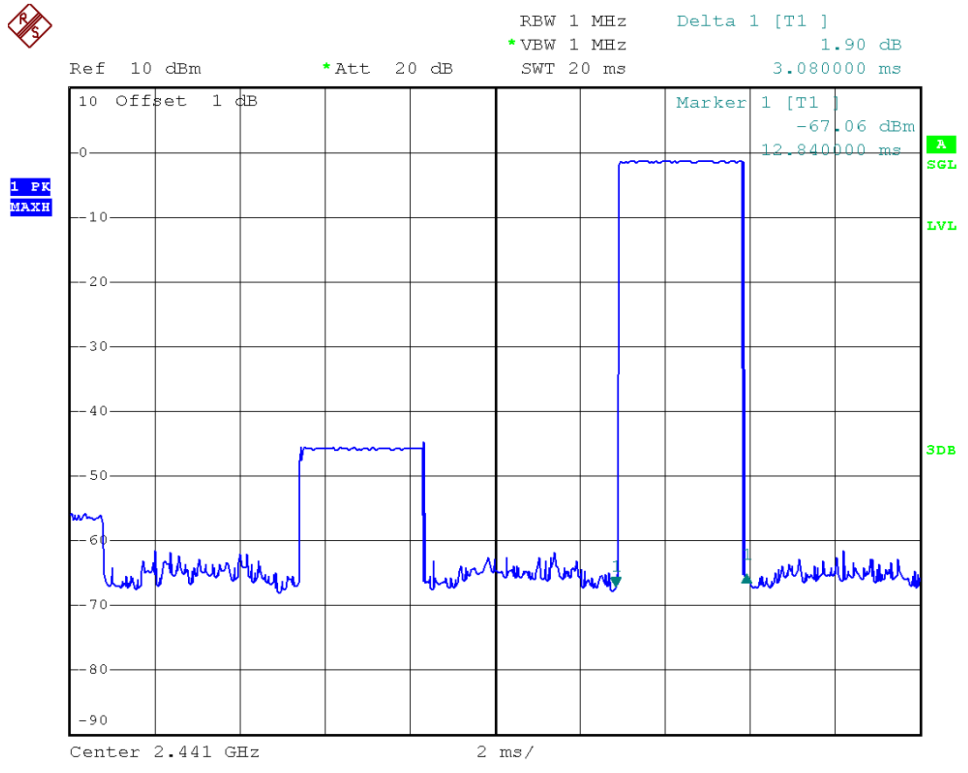
DH3



DH5



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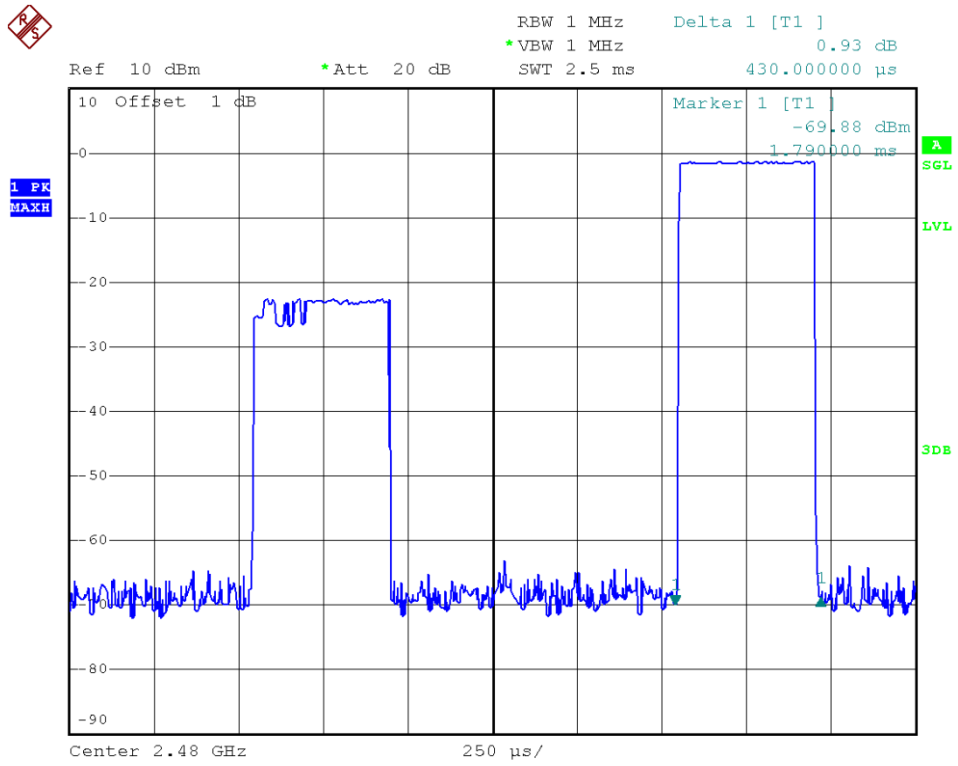
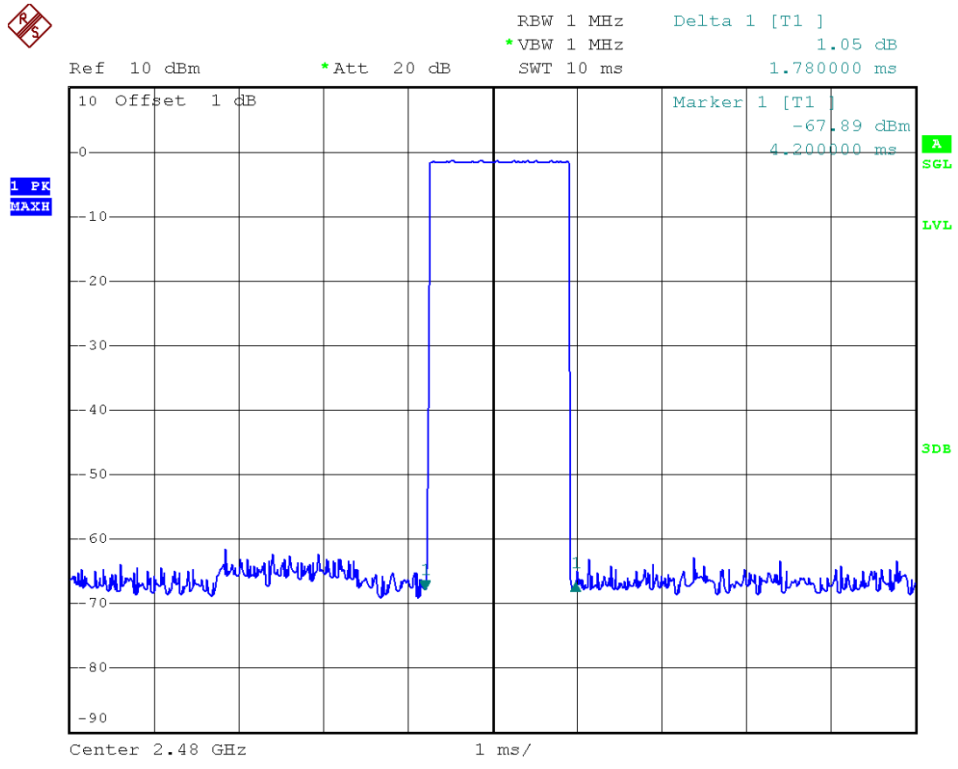
2480MHz

DH1



DH3



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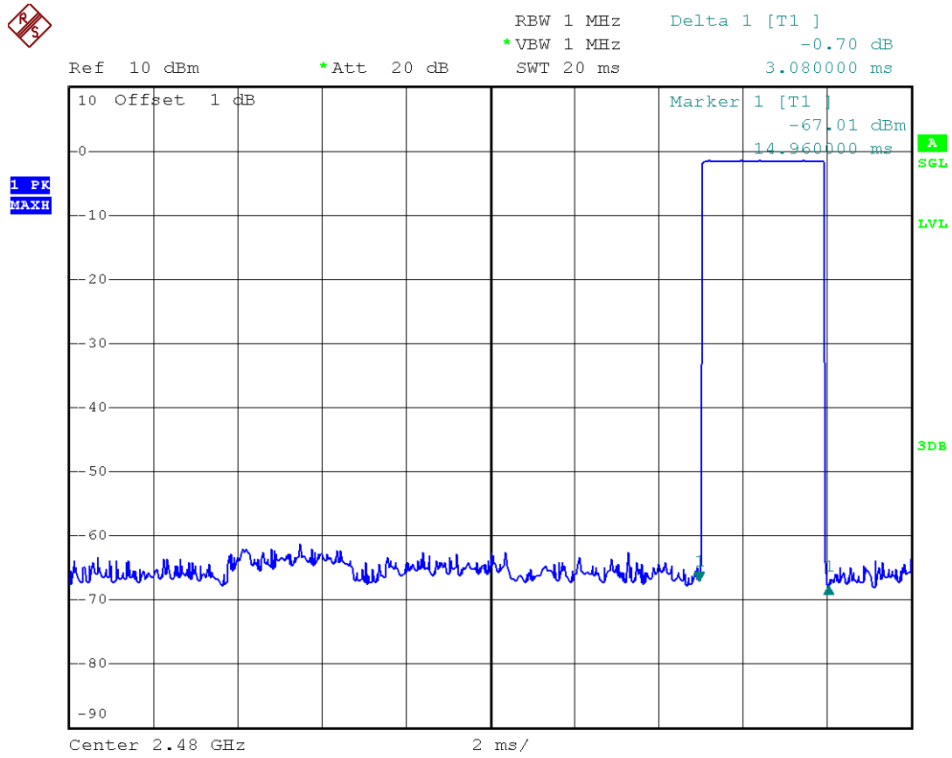
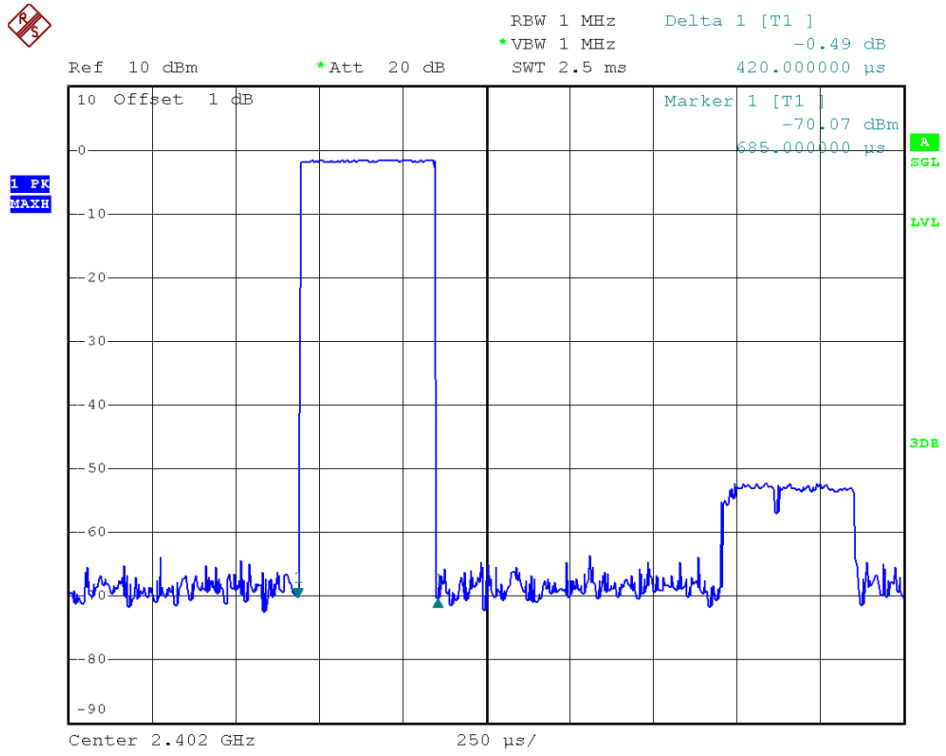
DH5



EDR mode:
2402MHz
3DH1



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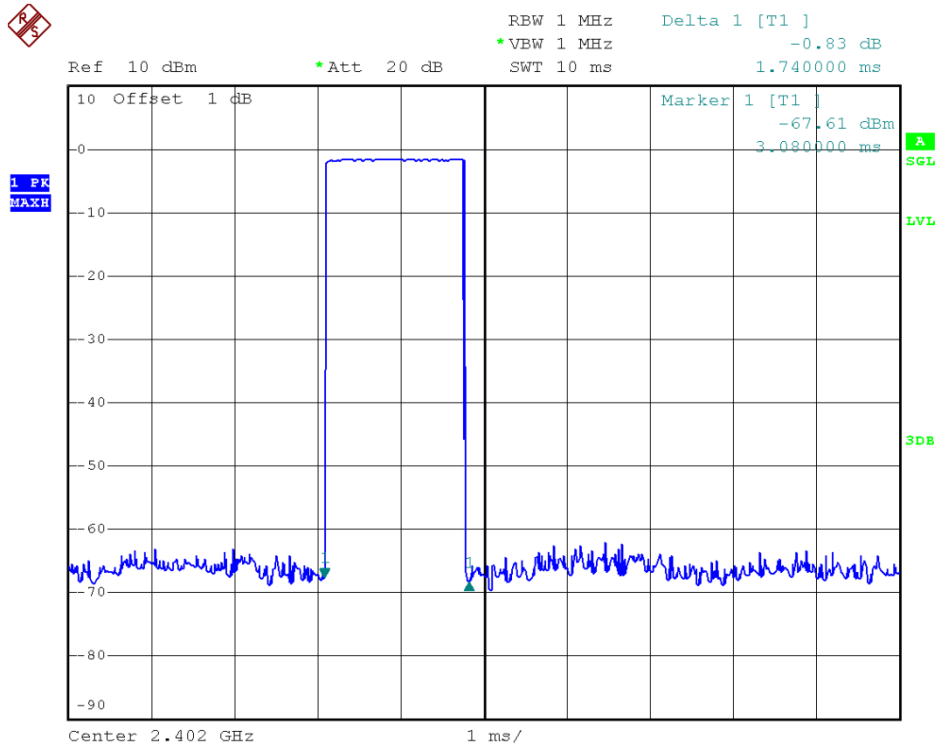
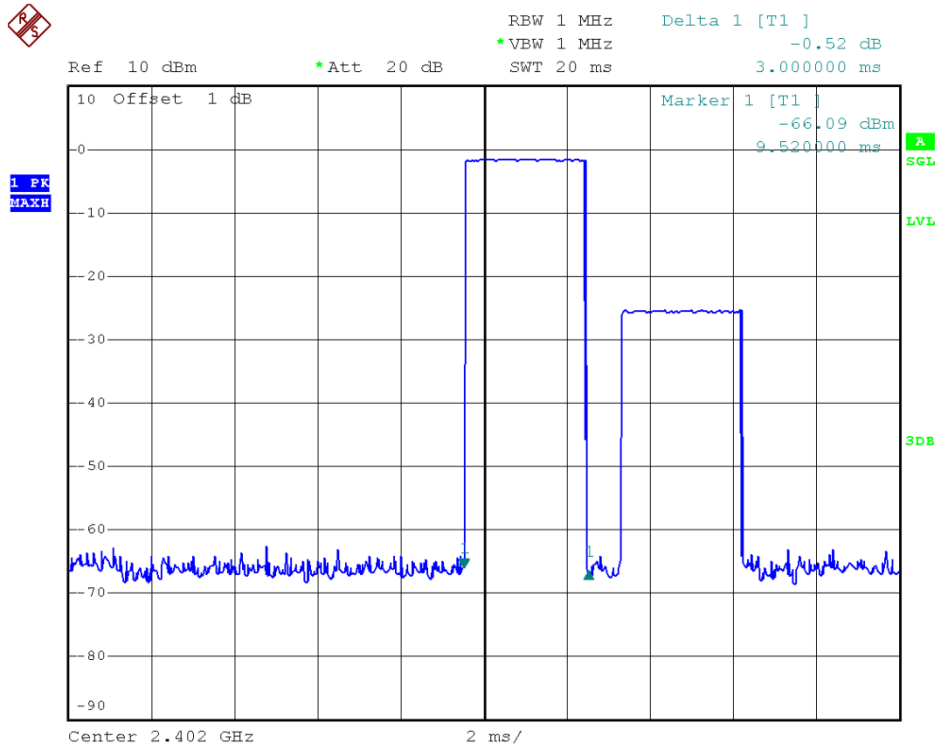
3DH3



3DH5



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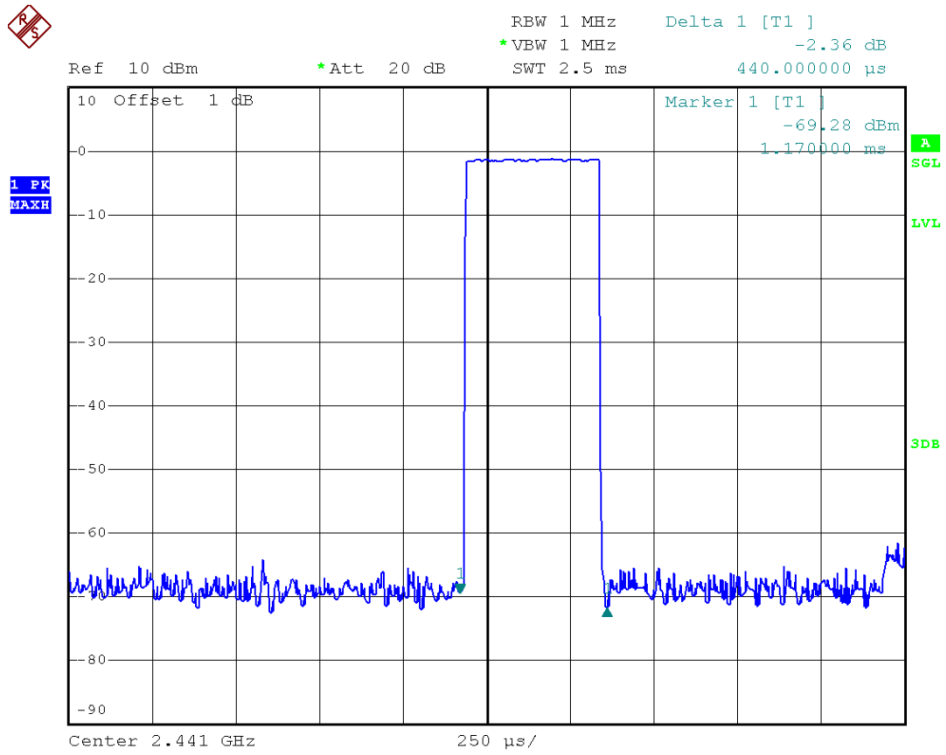
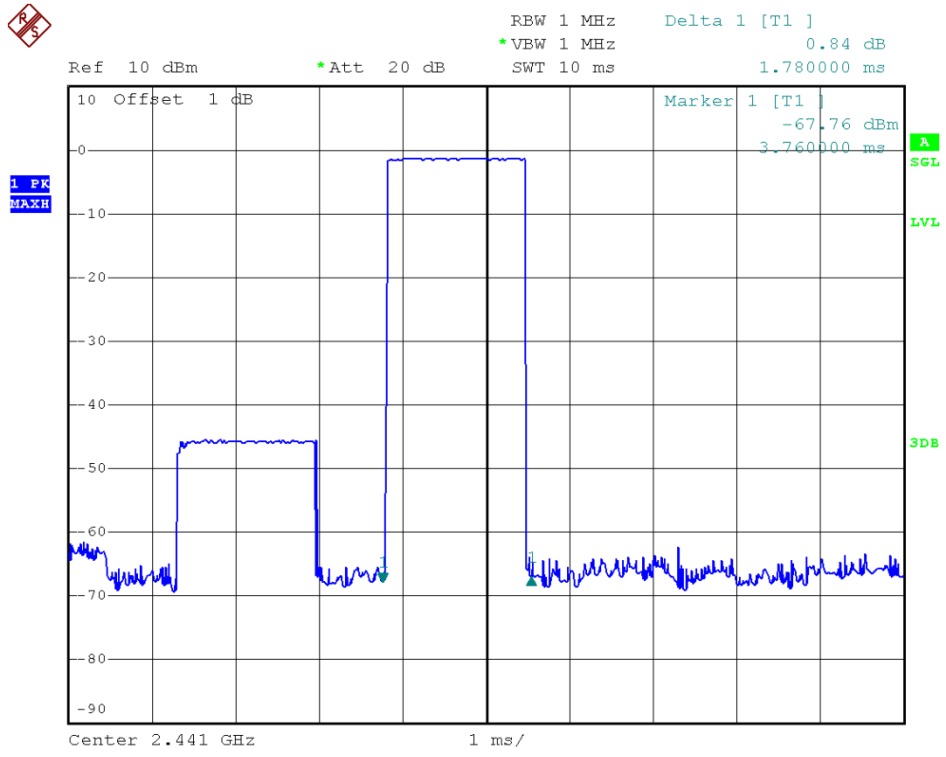
2441MHz

3DH1



3DH3



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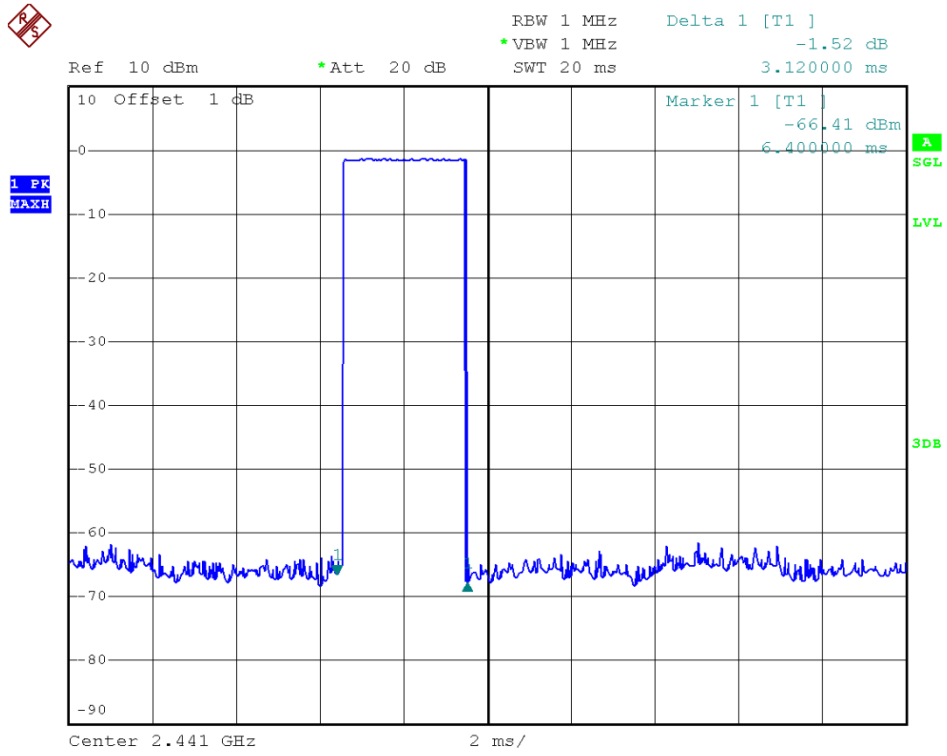
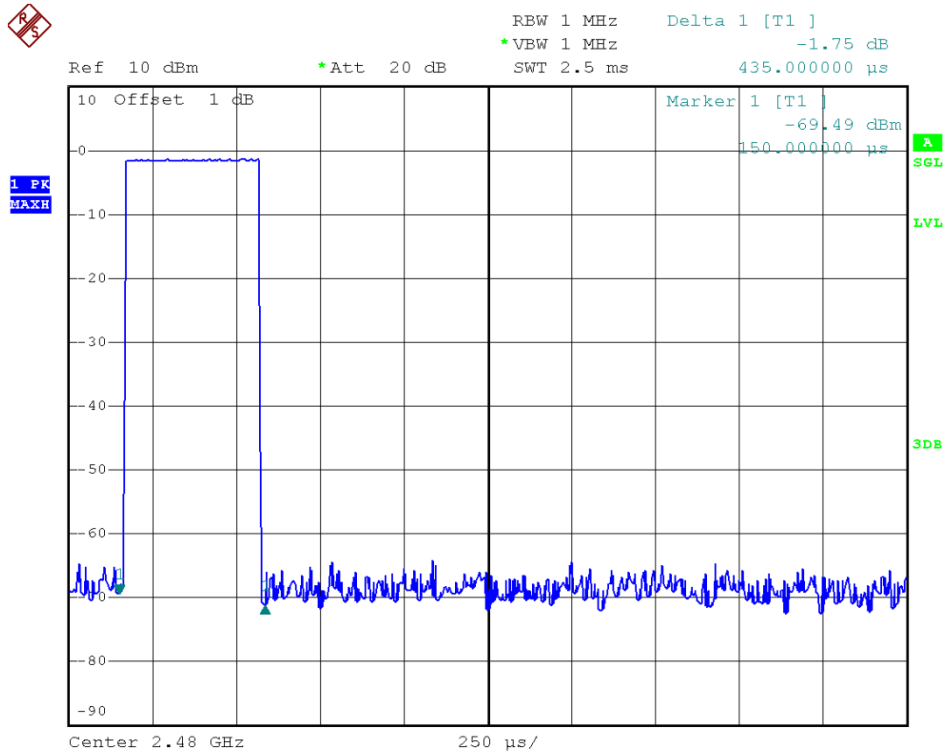
3DH5



2480MHz

3DH1



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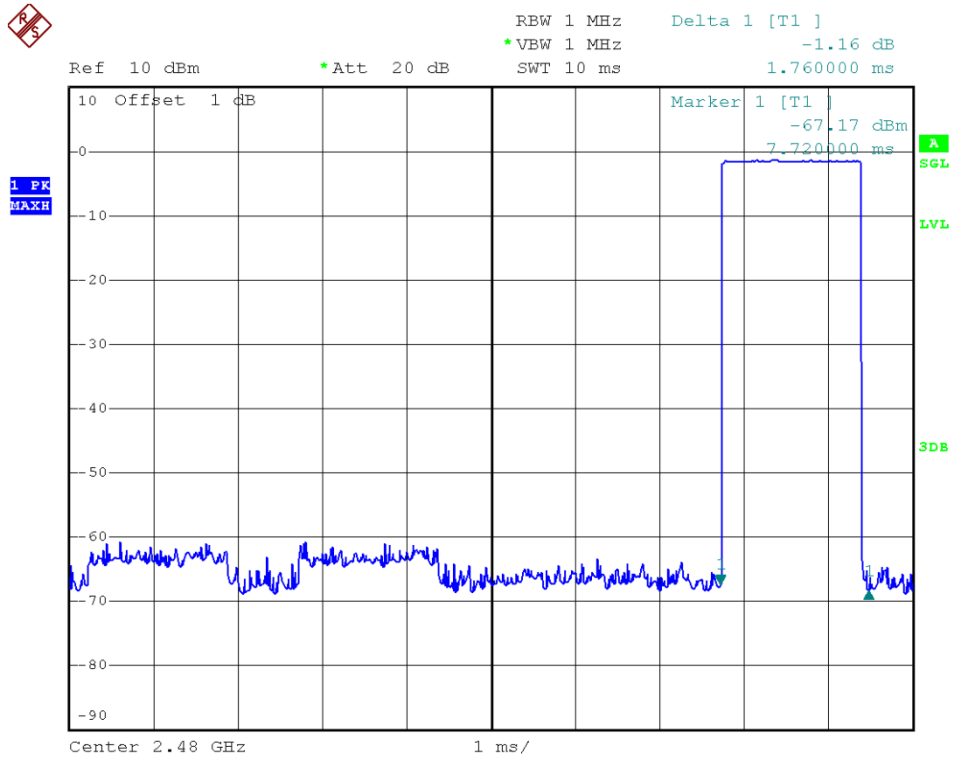
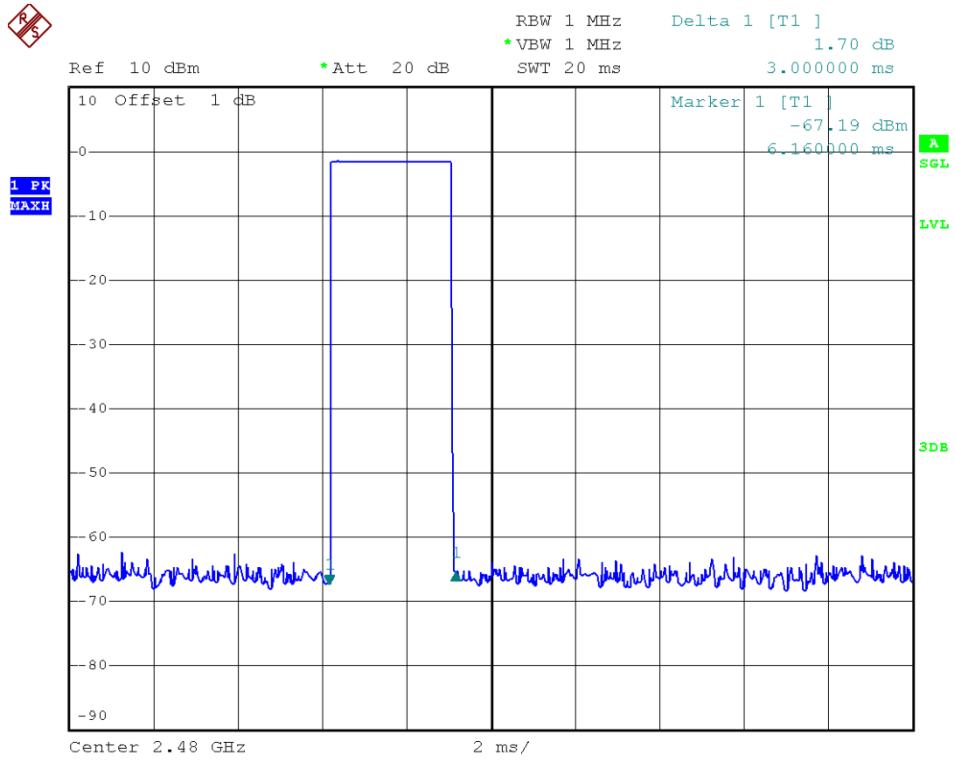
3DH3



3DH5



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6.7 MAXIMUN PEAK OUTPUT POWER

6.7.1 APPLIED PROCEDURES / LIMIT

15.247 (b)(1):
For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.
Refer to the result “Hopping channel number” of this document. The 1 watt (30.0dBm) limit applies.

6.7.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2012

6.7.3 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting :
Normal mode: RBW= 1MHz, VBW=1MHz, Sweep time = 2.5 ms.
EDR mode: RBW= 3MHz, VBW=3MHz, Sweep time = 2.5 ms.

6.7.4 DEVIATION FROM STANDARD

No deviation.

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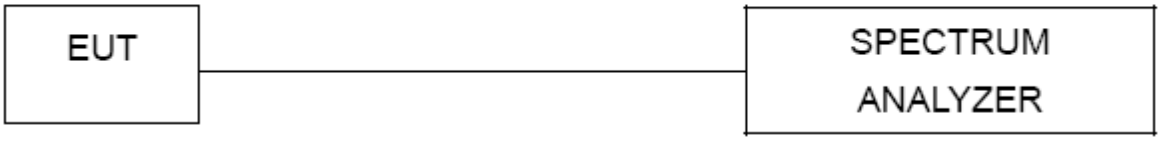
6.7.5 TEST SETUP



6.7.6 EUT OPERATION CONDITIONS

The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

6.7.7 TEST RESULTS

Model:	iF191BI	Result:	PASS
Temperature：	20°C	Relative Humidity：	55 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Continuously transmitting mode.		

Frequency (MHz)	Mode	Measurement (MHz)	Limit	Result
2402	Normal	-1.00	≤ 30dBm	Pass
2441		-0.68		Pass
2480		-0.92		Pass
2402	EDR	-0.74		Pass
2441		-0.55		Pass
2480		-0.78		Pass

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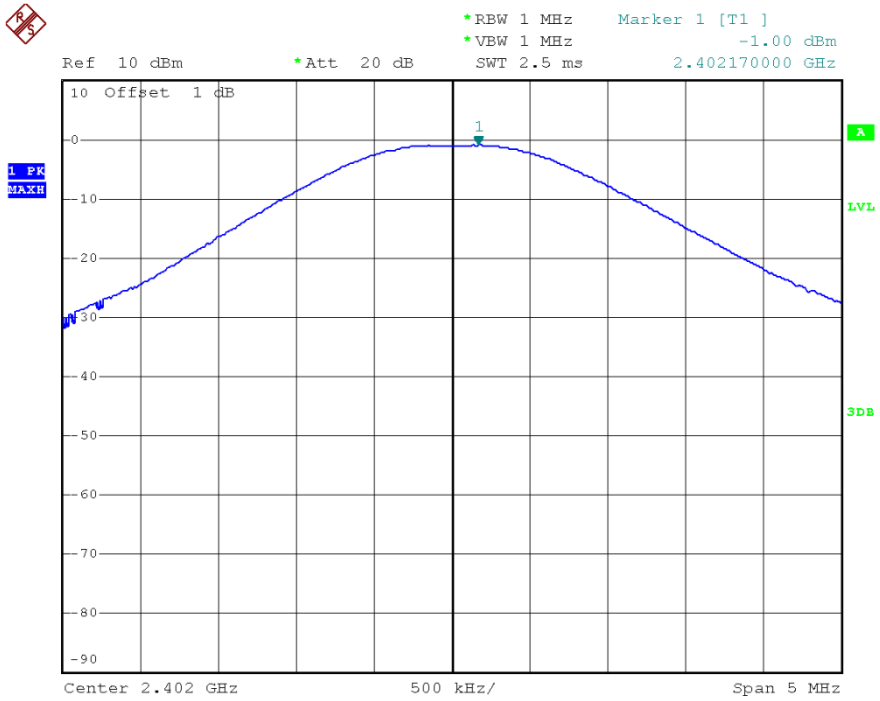
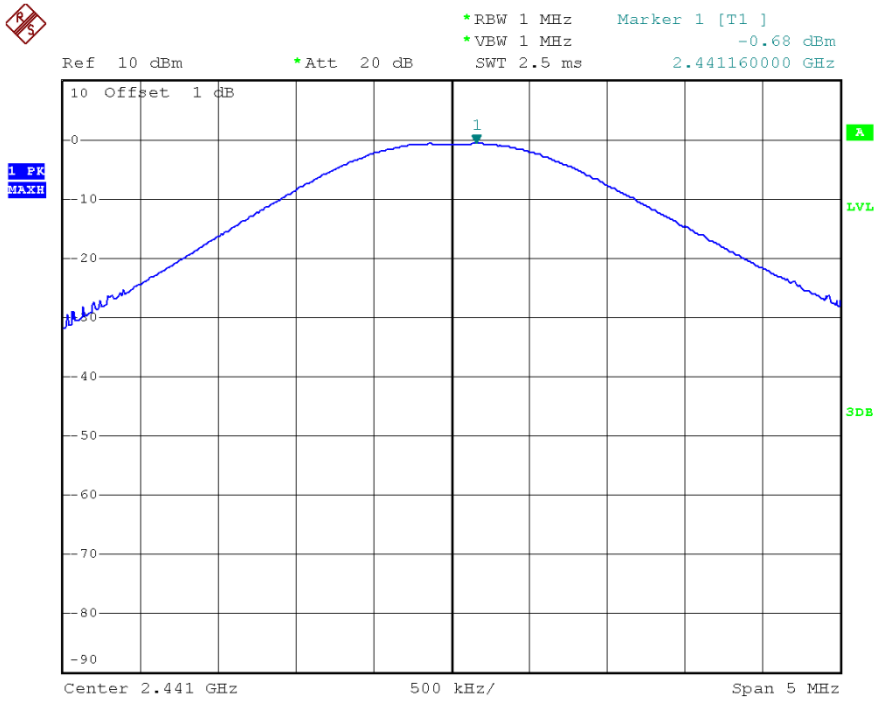
Normal mode
2402MHz



2441MHz



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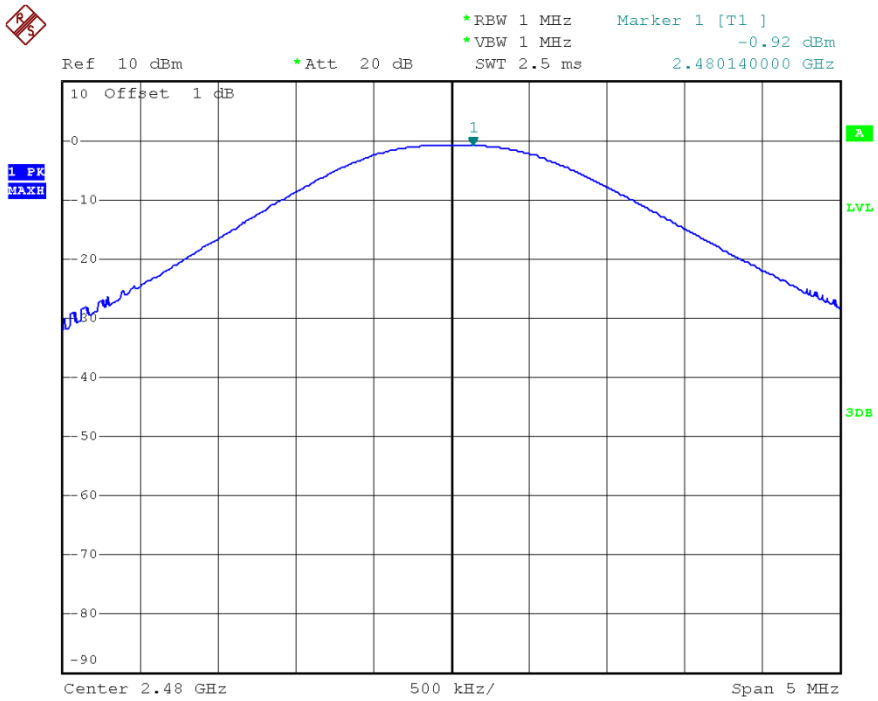
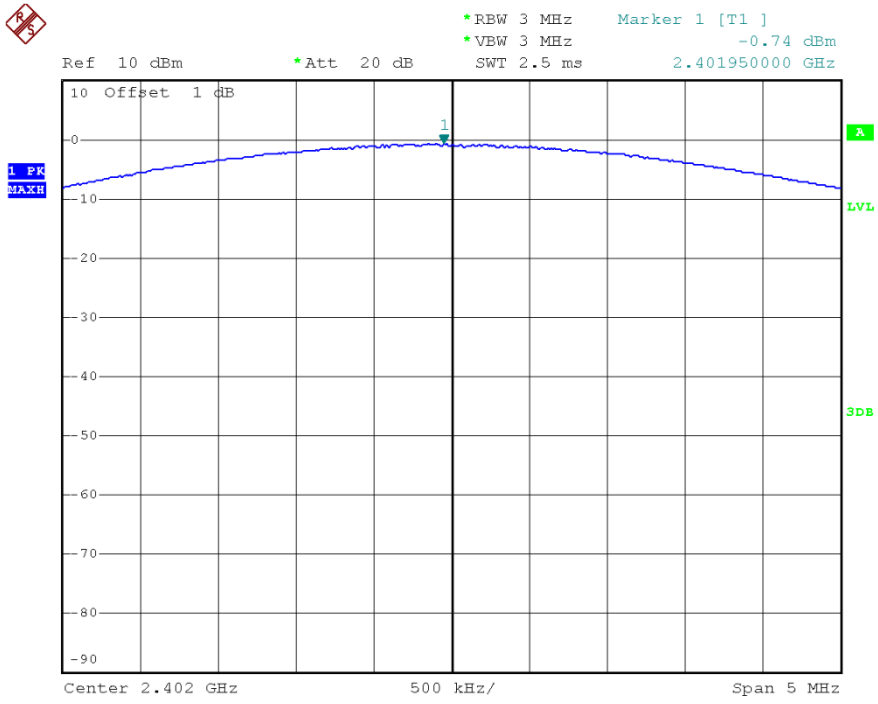
2480MHz



EDR mode
2402MHz



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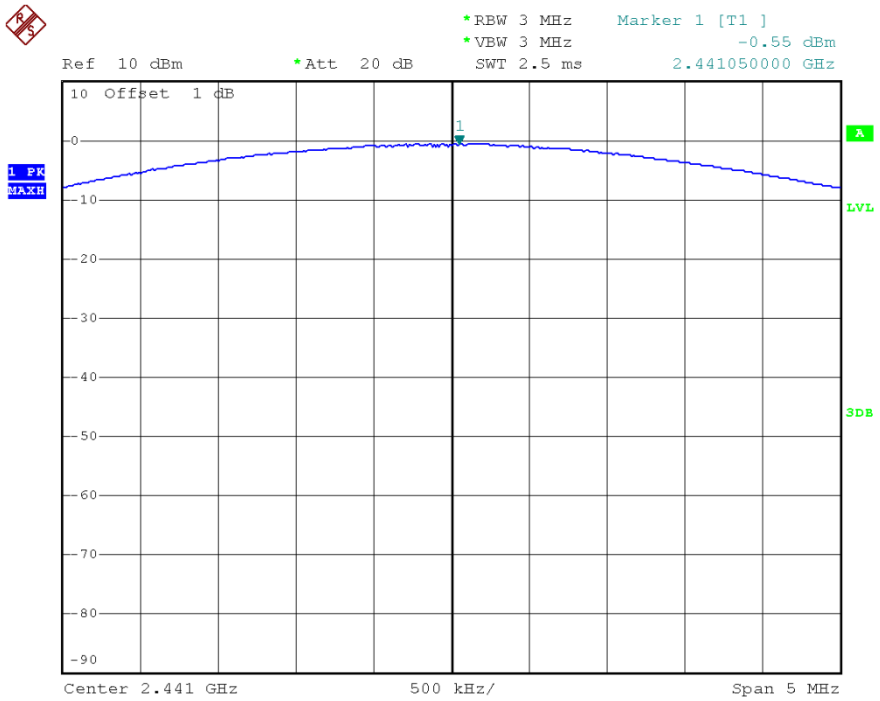
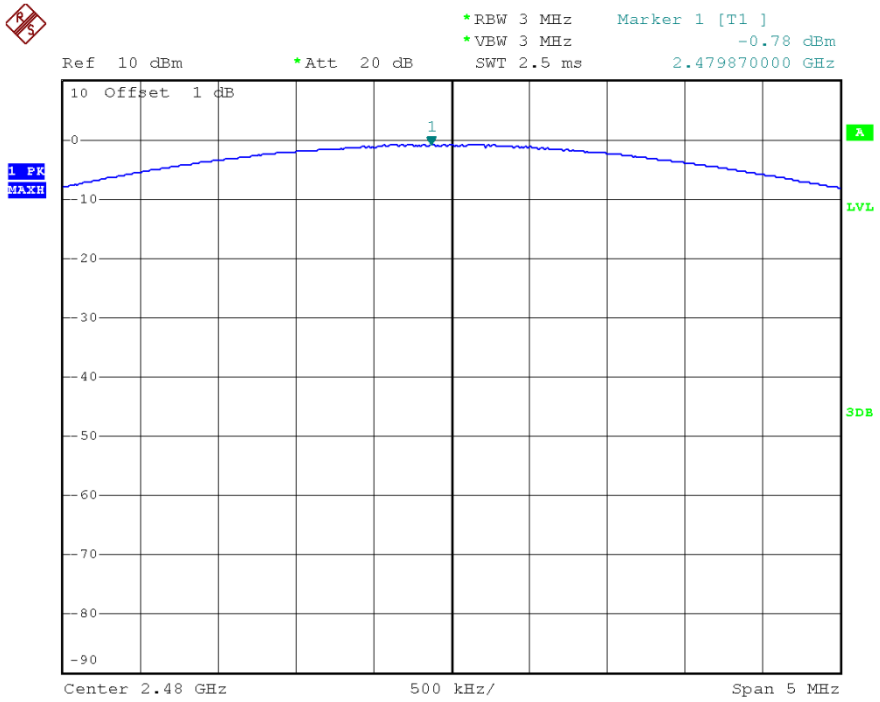
2441MHz



2480MHz



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6.8 CONDUCTED SPURIOUS EMISSIONS

6.8.1 APPLIED PROCEDURES / LIMIT

15.247(d):
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

6.8.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2012

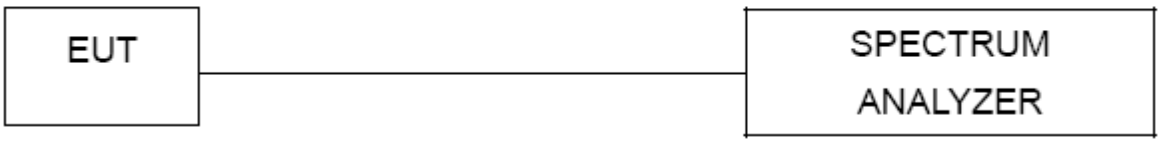
6.8.3 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum analyzer setting: RBW = 100KHz. VBW >= RBW. Sweep = auto; Detector Function = Peak (Max. hold).

6.8.4 DEVIATION FROM STANDARD

No deviation.

6.8.5 TEST SETUP



6.8.6 EUT OPERATION CONDITIONS

Test the EUT in normal mode and EDR mode, found the worst case is in normal mode and report it.

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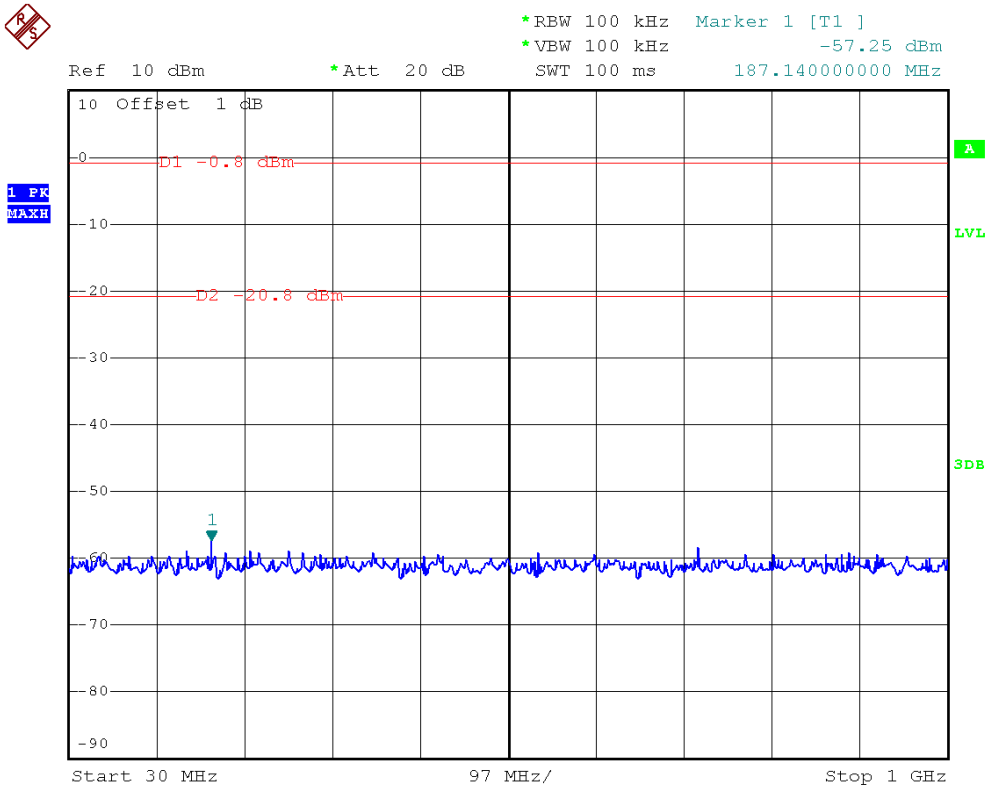
6.8.7 TEST RESULTS

Model:	iF191BI	Result:	PASS
Temperature：	20°C	Relative Humidity：	55 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode.		

2402MHz



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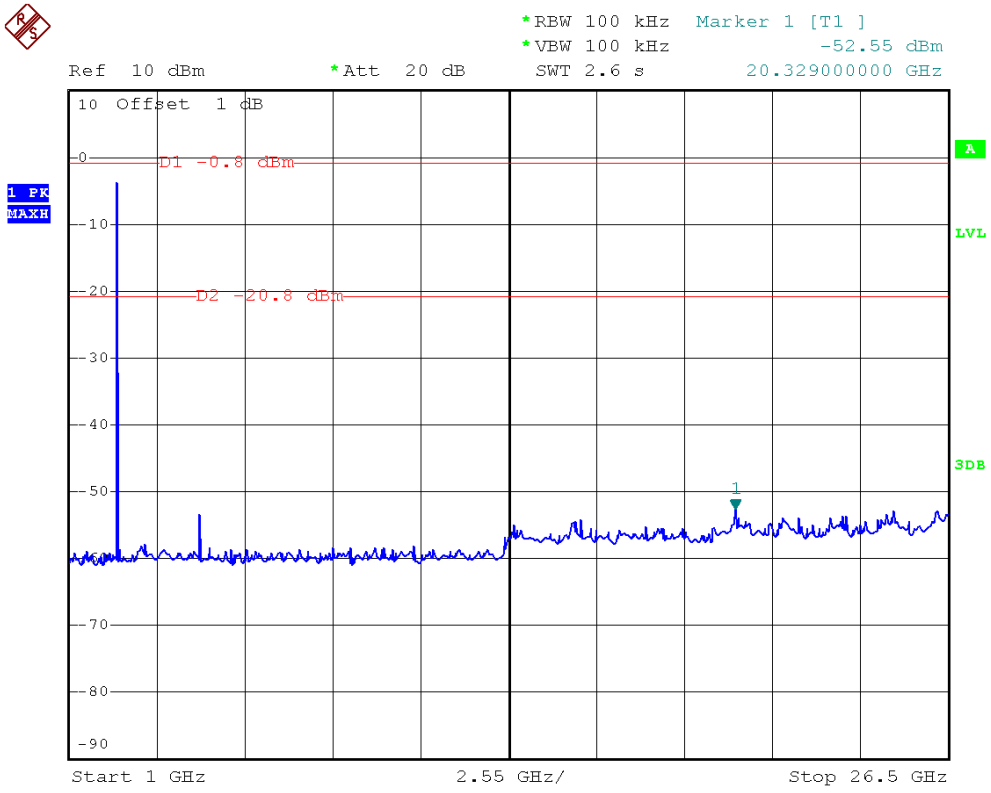
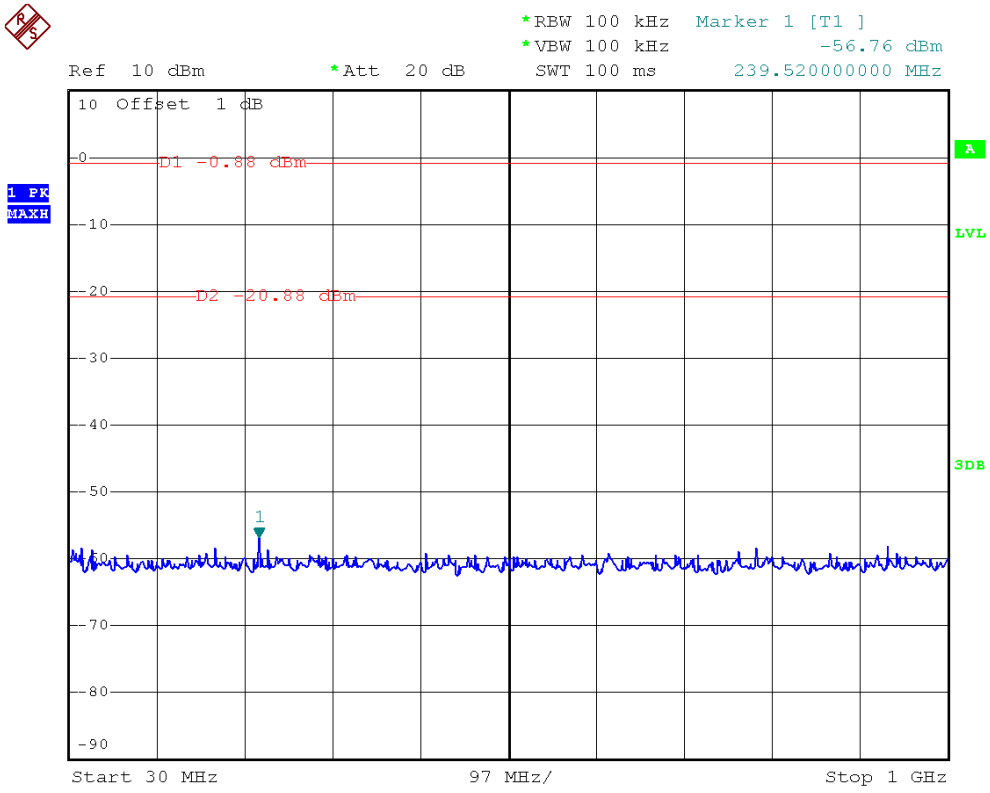


2441MHz



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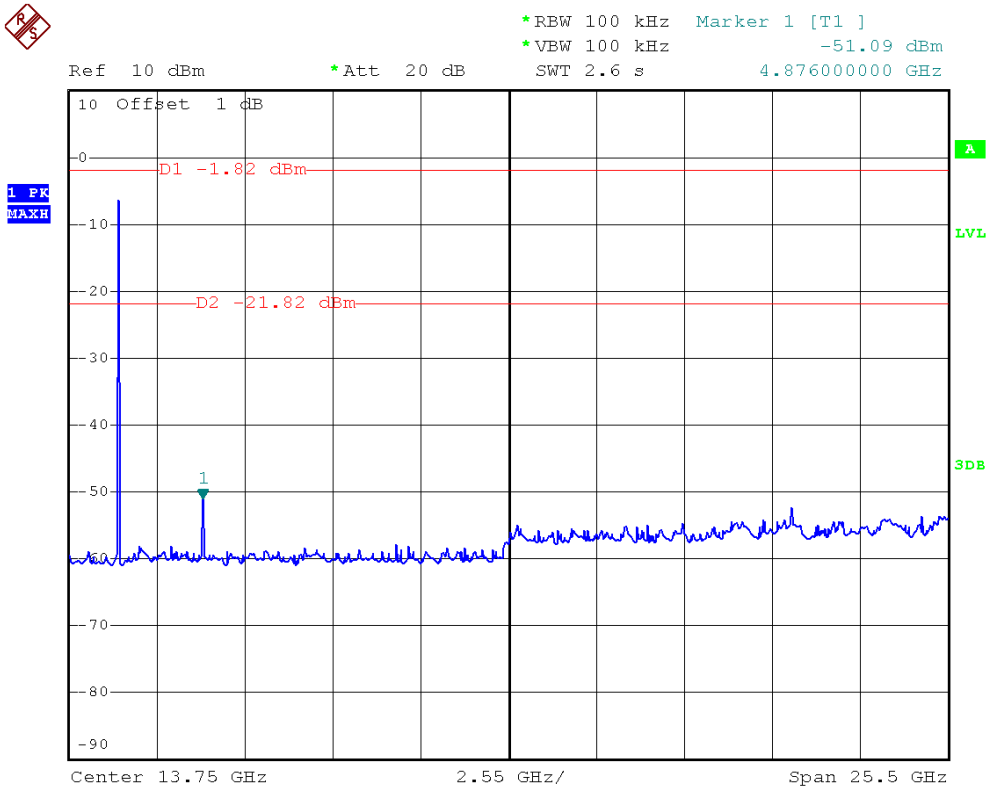
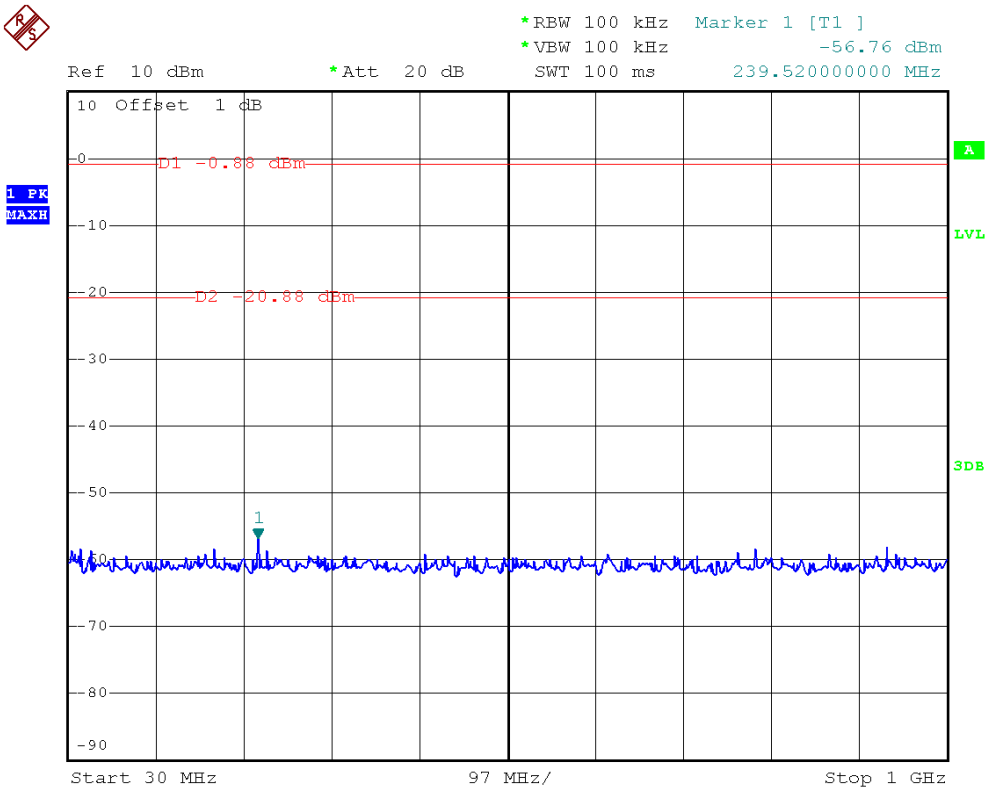


2480MHz



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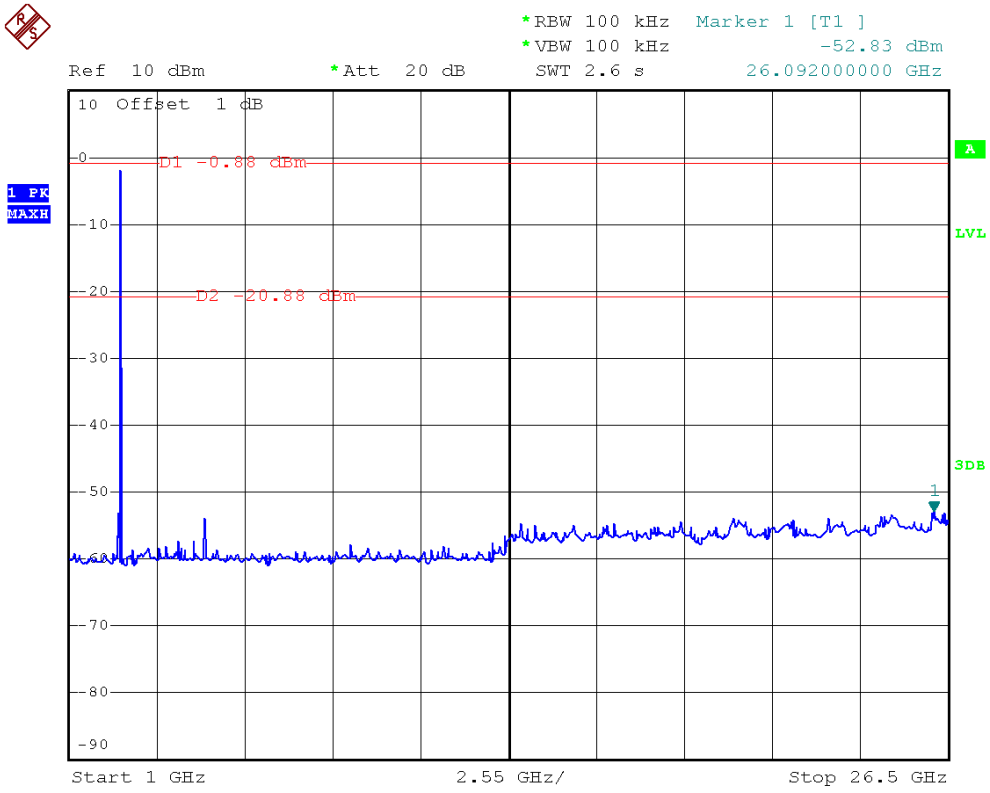

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6.9 RADIATED SPURIOUS EMISSIONS

6.9.1 STANDARD REQUIRMENTS

FCC 15.247 (d):

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. The radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, and provided the transmitter demonstrates compliance with the peak conducted power limits.

6.9.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Jun.04.2013
2	Amplifier	HP	8447D	2944A09673	May.26.2013
3	Test Receiver	R&S	ESCI	100382	May.26.2013
4	Test Cable	N/A	C-01_CB03	N/A	Jul.06.2013
5	Controller	CT	SC100	N/A	N/A
6	Antenna	ETS	3115	00075789	May.26.2013
7	Amplifier	Agilent	8449B	3008A02274	May.26.2013
8	Spectrum	Agilent	E4408B	US39240143	Nov.26.2012
9	Test Cable	HUBER+SUHNER	C-45	N/A	May.04.2013

Remark: ” N/A” denotes No Model Name. / Serial No. and No Calibration specified.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1GHz
Stop Frequency	10th carrier harmonic
RBW / VBW (emission in restricted band)	1 MHz / 1 MHz for Peak, 1MHz/10Hz for average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

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6.9.3 TEST PROCEDURE

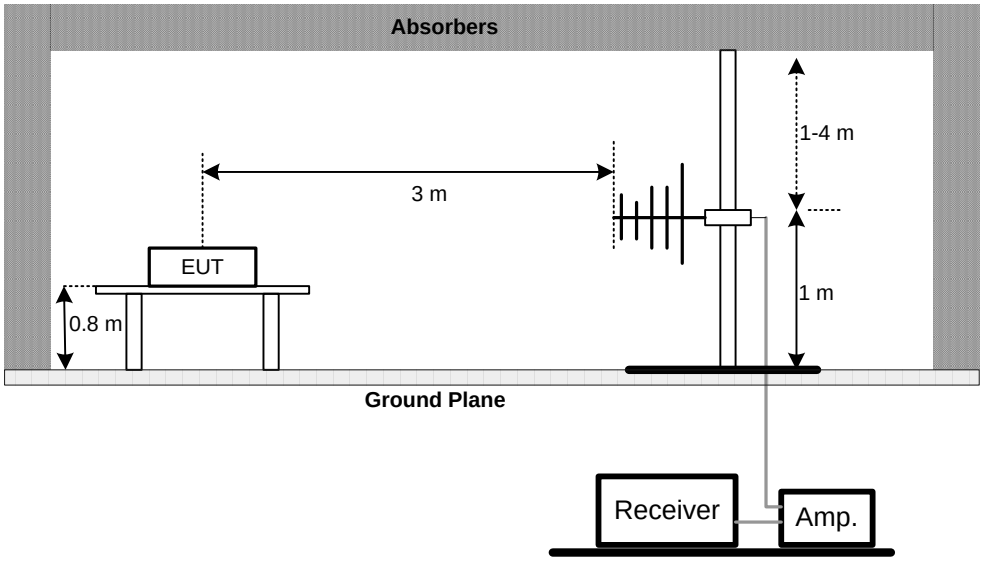
a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item – EUT Test Photos.

6.9.4 DEVIATION FROM TEST STANDARD

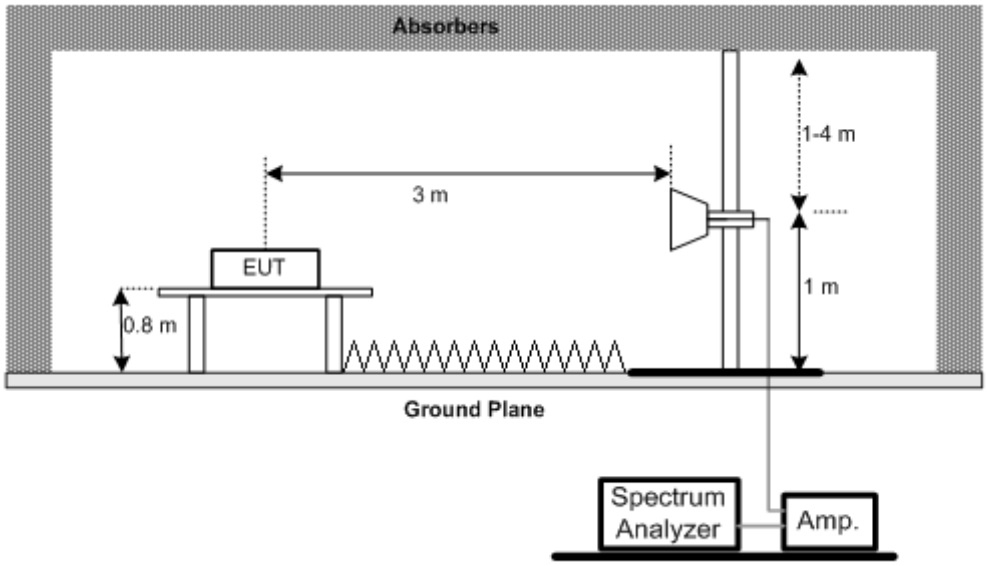
No deviation

6.9.5 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



6.9.6 EUT OPERATING CONDITIONS

The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

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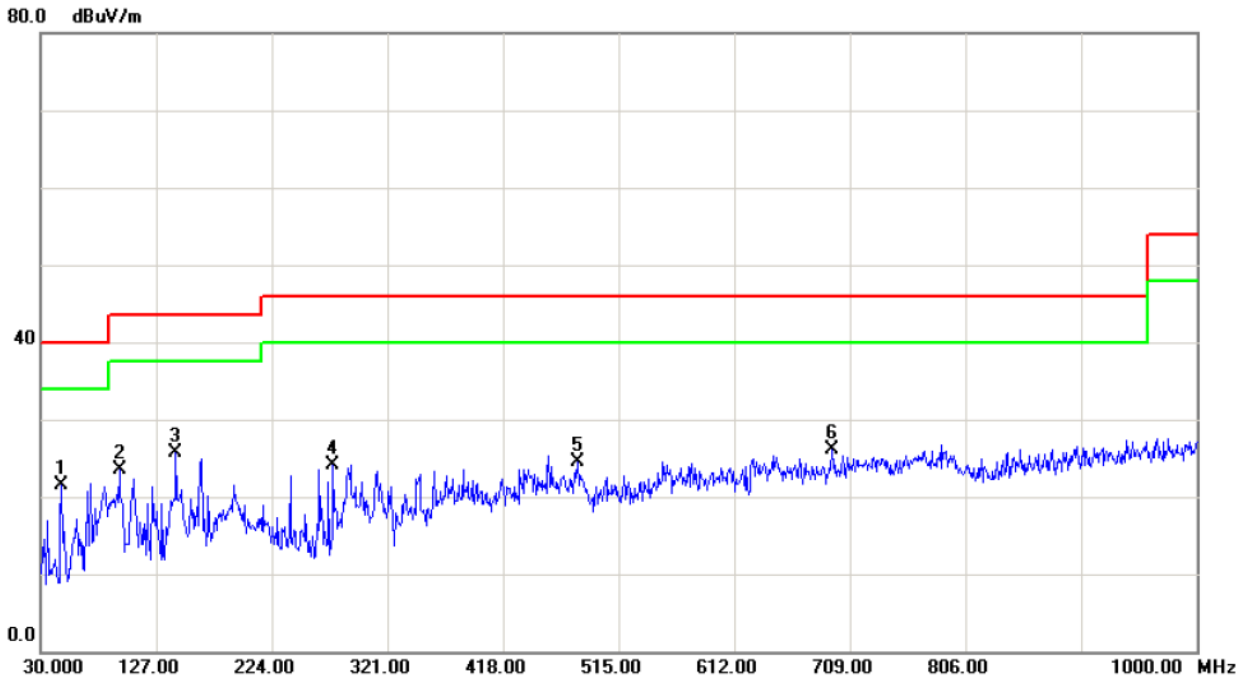
6.9.7 TEST RESULTS

Below 1GHz:

Model:	iF191BI	Result:	PASS
Temperature：	23° C	Relative Humidity：	51 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2402MHz)	Antenna polarity:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		47.4774	38.72	-17.20	21.52	40.00	-18.48	peak
2		96.0260	42.26	-18.70	23.56	43.50	-19.94	peak
3	*	143.6036	43.56	-17.94	25.62	43.50	-17.88	peak
4		275.6557	37.57	-13.45	24.12	46.00	-21.88	peak
5		480.5305	33.18	-8.63	24.55	46.00	-21.45	peak
6		694.1440	30.82	-4.66	26.16	46.00	-19.84	peak

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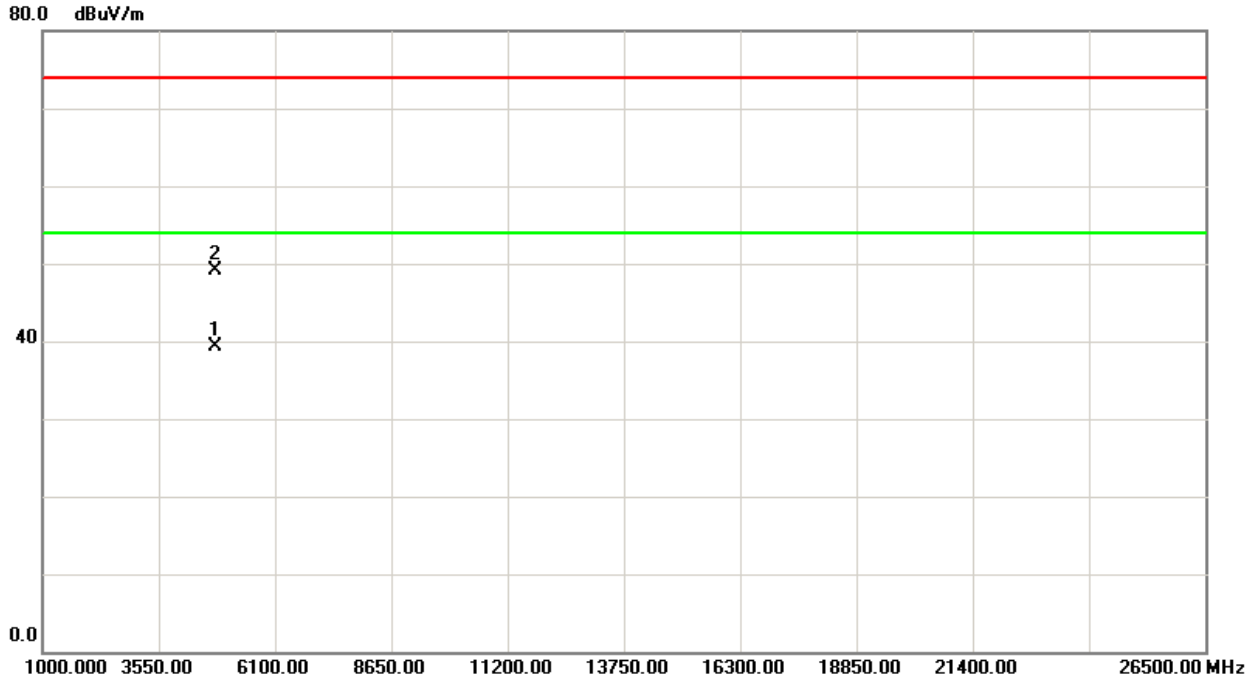
Above 1GHz:

Model:	iF191BI	Result:	PASS
Temperature：	25° C	Relative Humidity：	58 %
Pressure：	1009 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2402MHz)	Antenna polarity:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	4804.160	33.12	6.11	39.23	54.00	-14.77	AVG
2		4804.210	43.01	6.11	49.12	74.00	-24.88	peak

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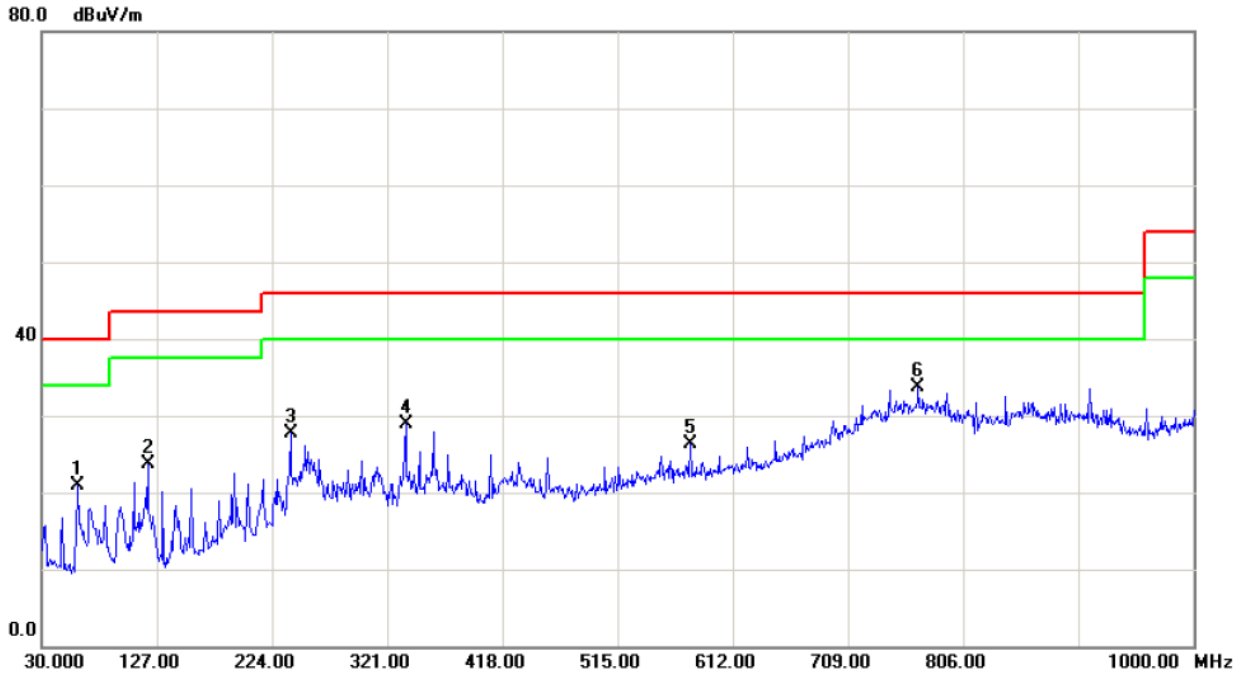
Below 1GHz:

Model:	iF191BI	Result:	PASS
Temperature：	23° C	Relative Humidity：	51 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2402MHz)	Antenna polarity:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		60.0700	38.44	-17.58	20.86	40.00	-19.14	peak
2		119.2400	42.14	-18.53	23.61	43.50	-19.89	peak
3		239.5200	43.34	-15.71	27.63	46.00	-18.37	peak
4		336.5200	40.73	-11.83	28.90	46.00	-17.10	peak
5		576.1100	32.37	-6.02	26.35	46.00	-19.65	peak
6	*	768.1700	37.73	-4.02	33.71	46.00	-12.29	peak

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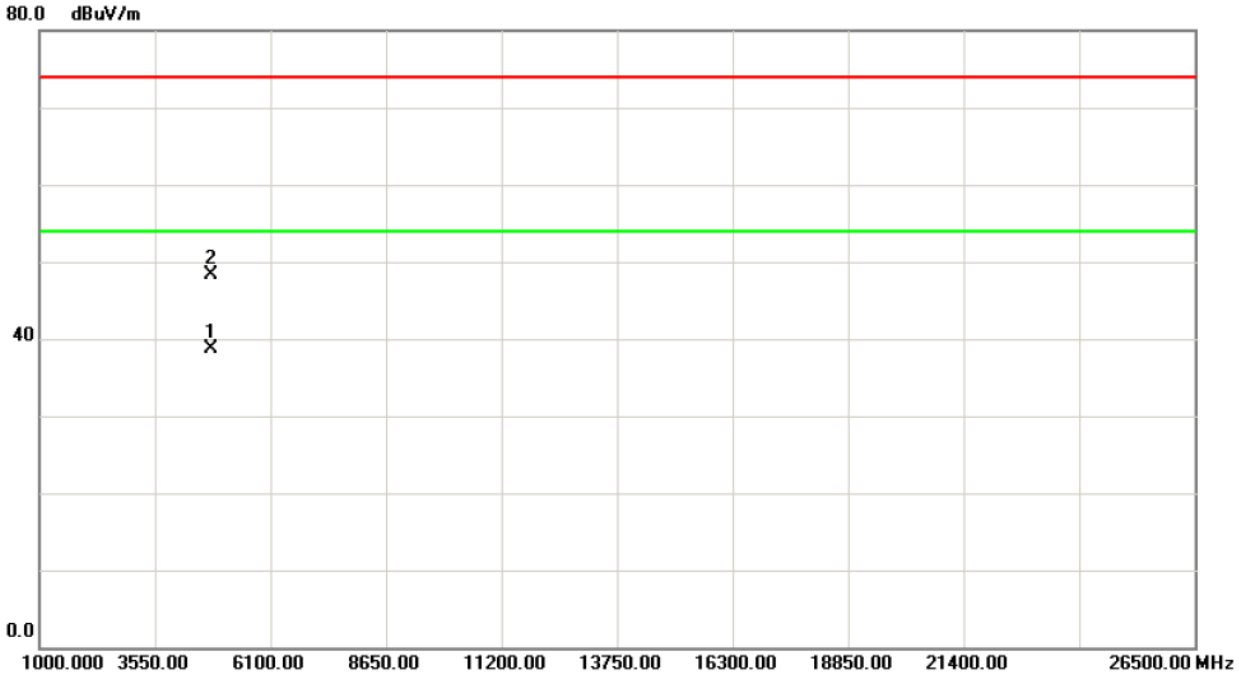
Above 1GHz:

Model:	iF191BI	Result:	PASS
Temperature：	23° C	Relative Humidity：	51 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2402MHz)	Antenna polarity:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	4804.130	32.63	6.11	38.74	54.00	-15.26	AVG
2		4804.140	42.11	6.11	48.22	74.00	-25.78	peak

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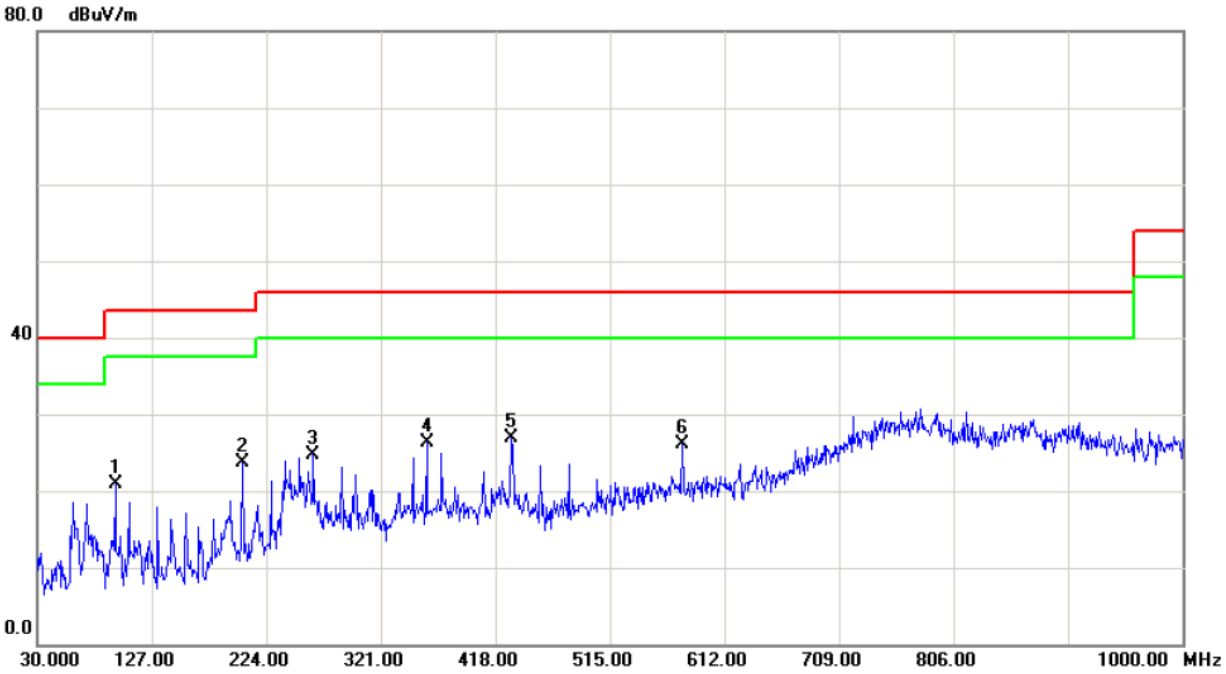
Below 1GHz:

Model:	iF191BI	Result:	PASS
Temperature：	23° C	Relative Humidity：	51 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2441MHz)	Antenna polarity:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		95.9600	39.53	-18.70	20.83	43.50	-22.67	peak
2		203.6300	40.52	-16.87	23.65	43.50	-19.85	peak
3		263.7700	38.96	-14.16	24.80	46.00	-21.20	peak
4		359.8000	37.56	-11.19	26.37	46.00	-19.63	peak
5	*	431.5800	36.30	-9.31	26.99	46.00	-19.01	peak
6		576.1100	32.09	-6.02	26.07	46.00	-19.93	peak

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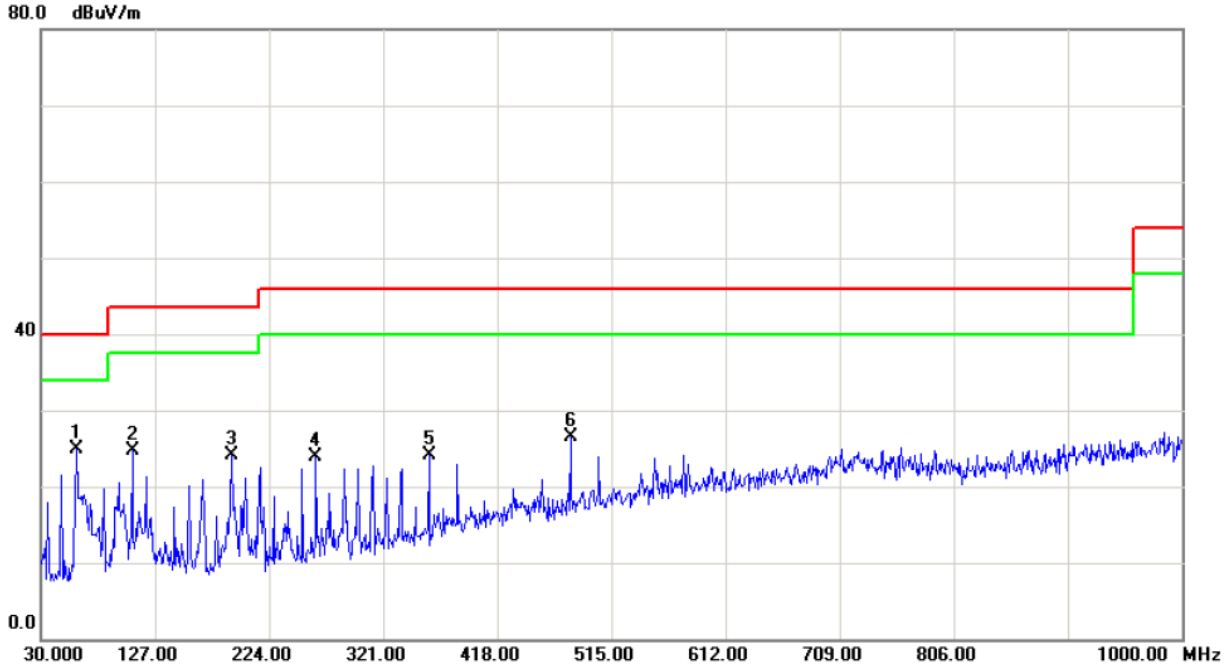
Below 1GHz:

Model:	iF191BI	Result:	PASS
Temperature：	23° C	Relative Humidity：	51 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2441MHz)	Antenna polarity:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	60.0700	42.41	-17.58	24.83	40.00	-15.17	peak
2		107.6000	43.37	-18.61	24.76	43.50	-18.74	peak
3		191.9900	41.10	-17.07	24.03	43.50	-19.47	peak
4		263.7700	38.04	-14.16	23.88	46.00	-22.12	peak
5		359.8000	35.24	-11.19	24.05	46.00	-21.95	peak
6		480.0800	35.15	-8.64	26.51	46.00	-19.49	peak

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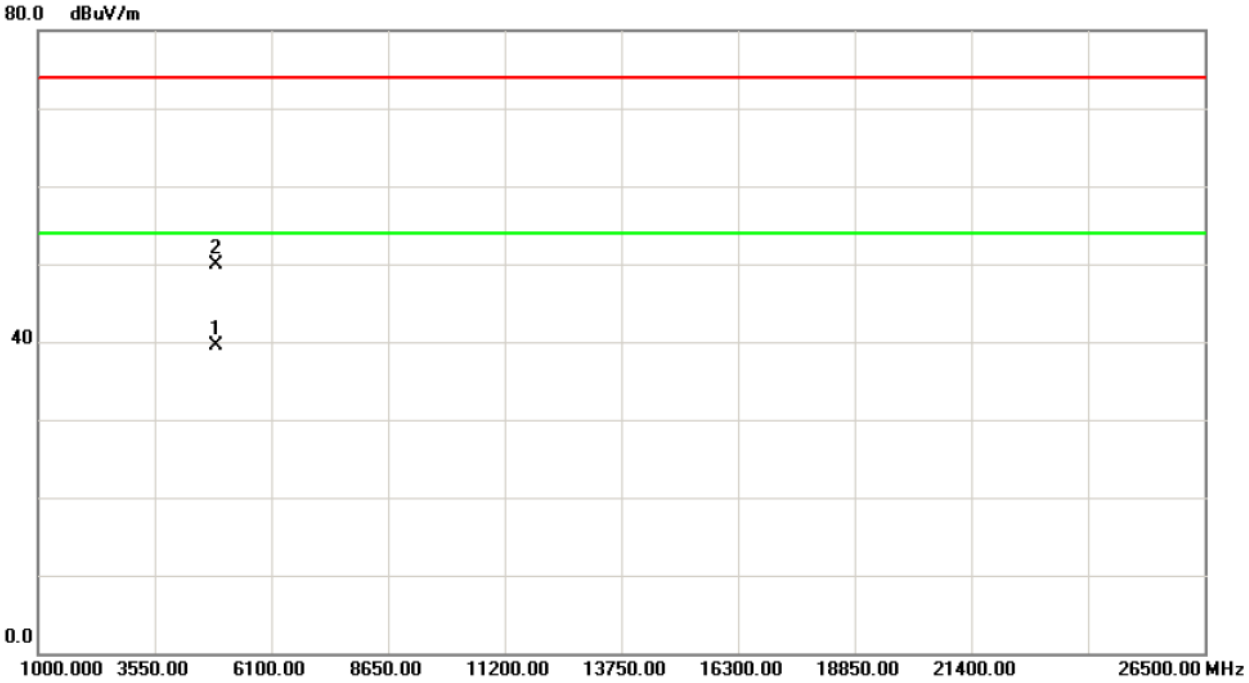
Above 1GHz:

Model:	iF191BI	Result:	PASS
Temperature：	25° C	Relative Humidity：	58 %
Pressure：	1009 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2441MHz)	Antenna polarity:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	4882.000	33.01	6.43	39.44	54.00	-14.56	AVG
2		4882.030	43.45	6.43	49.88	74.00	-24.12	peak

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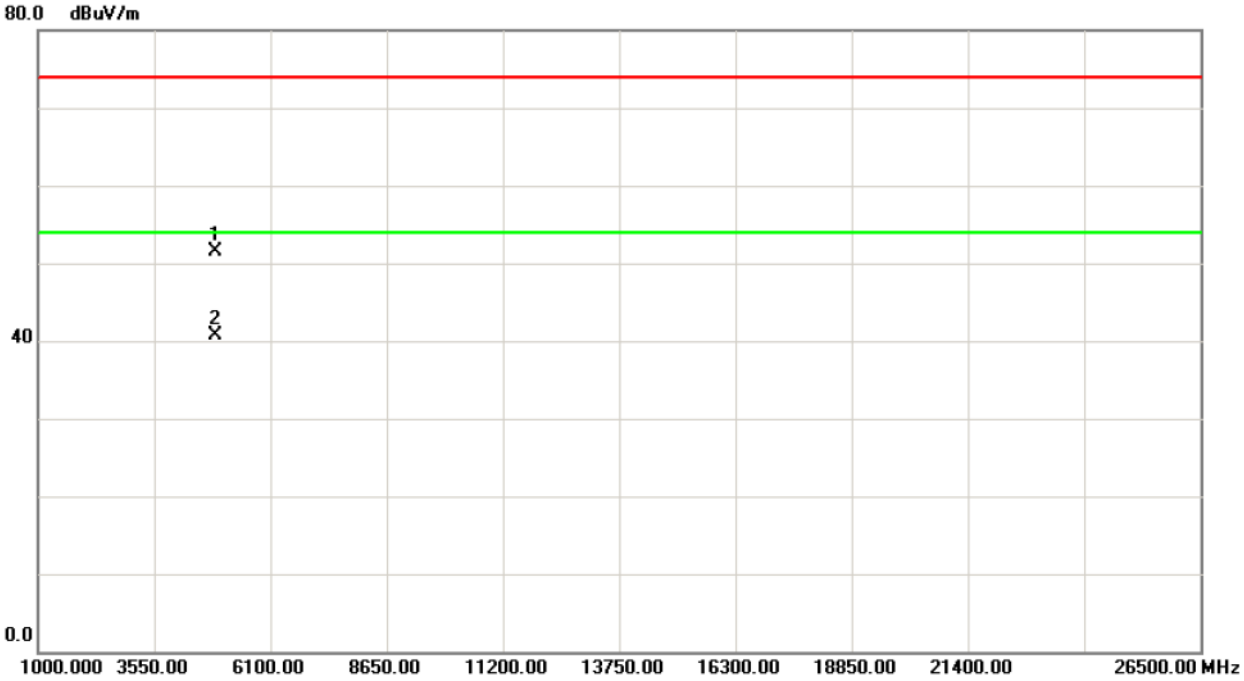
Above 1GHz:

Model:	iF191BI	Result:	PASS
Temperature：	25° C	Relative Humidity：	58 %
Pressure：	1009 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2441MHz)	Antenna polarity:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4882.010	45.13	6.43	51.56	74.00	-22.44	peak
2	*	4882.120	34.23	6.43	40.66	54.00	-13.34	AVG

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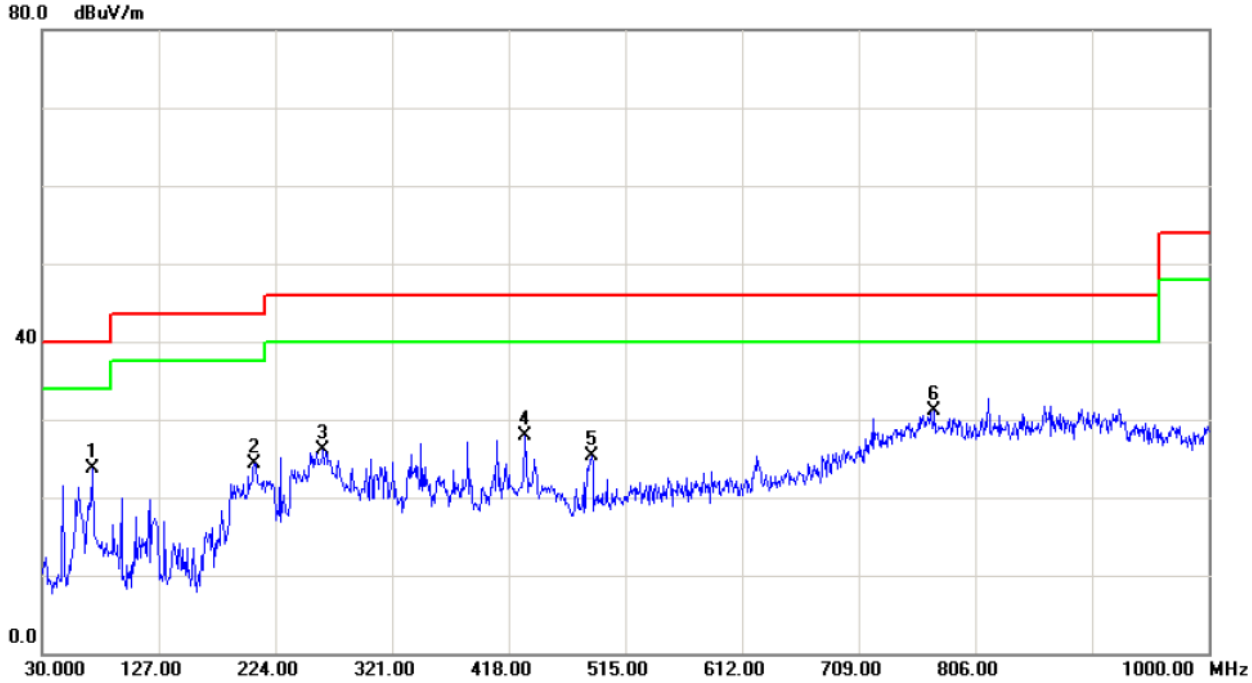
Below 1GHz:

Model:	iF191BI	Result:	PASS
Temperature：	23° C	Relative Humidity：	51 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2480MHz)	Antenna polarity:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		71.7100	42.38	-18.65	23.73	40.00	-16.27	peak
2		206.5400	41.11	-16.82	24.29	43.50	-19.21	peak
3		263.7700	40.33	-14.16	26.17	46.00	-19.83	peak
4		431.5800	37.18	-9.31	27.87	46.00	-18.13	peak
5		486.8700	33.91	-8.55	25.36	46.00	-20.64	peak
6	*	772.0500	35.14	-3.98	31.16	46.00	-14.84	peak

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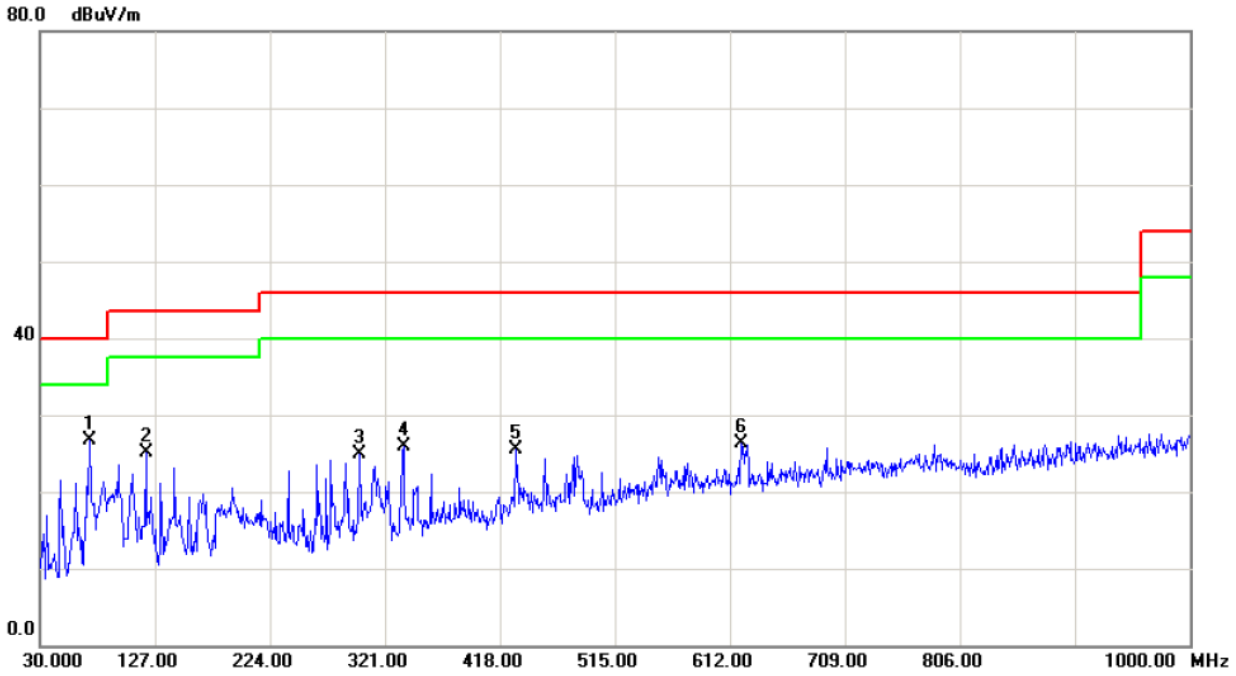
Below 1GHz:

Model:	iF191BI	Result:	PASS
Temperature：	23° C	Relative Humidity：	51 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2480MHz)	Antenna polarity:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	71.7100	45.33	-18.65	26.68	40.00	-13.32	peak
2		119.2400	43.56	-18.53	25.03	43.50	-18.47	peak
3		299.6600	37.63	-12.65	24.98	46.00	-21.02	peak
4		336.5200	37.64	-11.83	25.81	46.00	-20.19	peak
5		431.5800	34.80	-9.31	25.49	46.00	-20.51	peak
6		621.7000	31.48	-5.13	26.35	46.00	-19.65	peak

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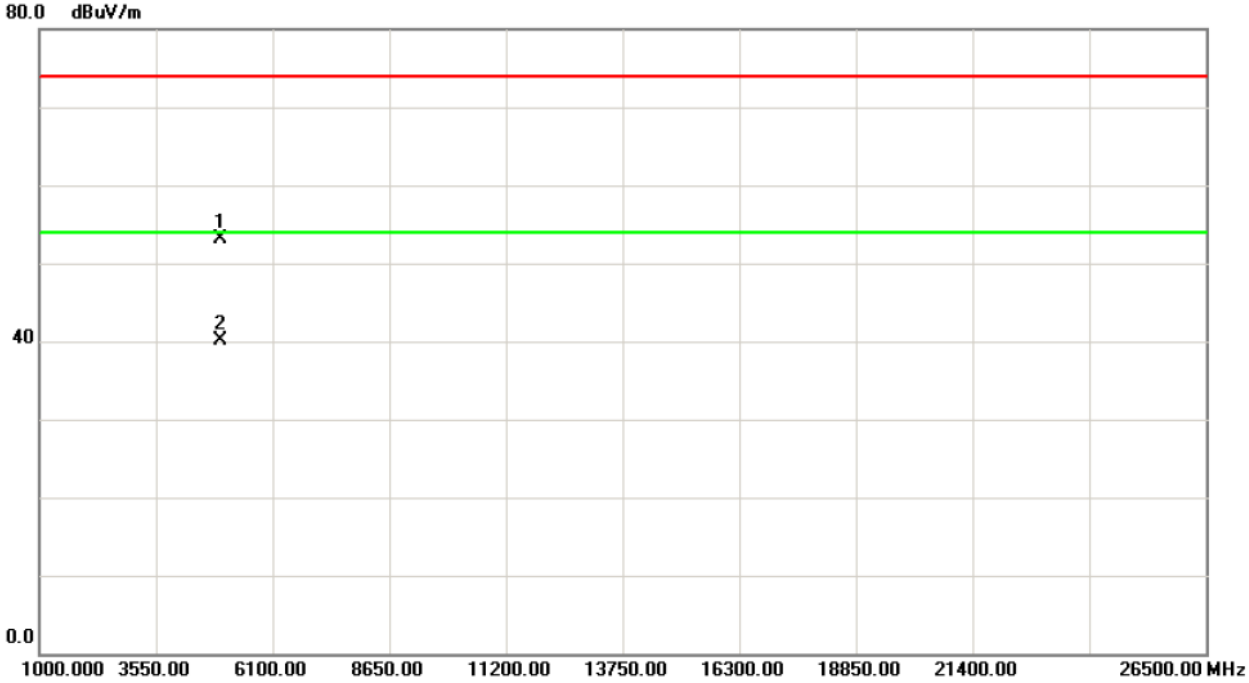
Above 1GHz:

Model:	iF191BI	Result:	PASS
Temperature：	25° C	Relative Humidity：	58 %
Pressure：	1009 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2480MHz)	Antenna polarity:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4960.030	46.42	6.74	53.16	74.00	-20.84	peak
2	*	4960.130	33.42	6.74	40.16	54.00	-13.84	AVG

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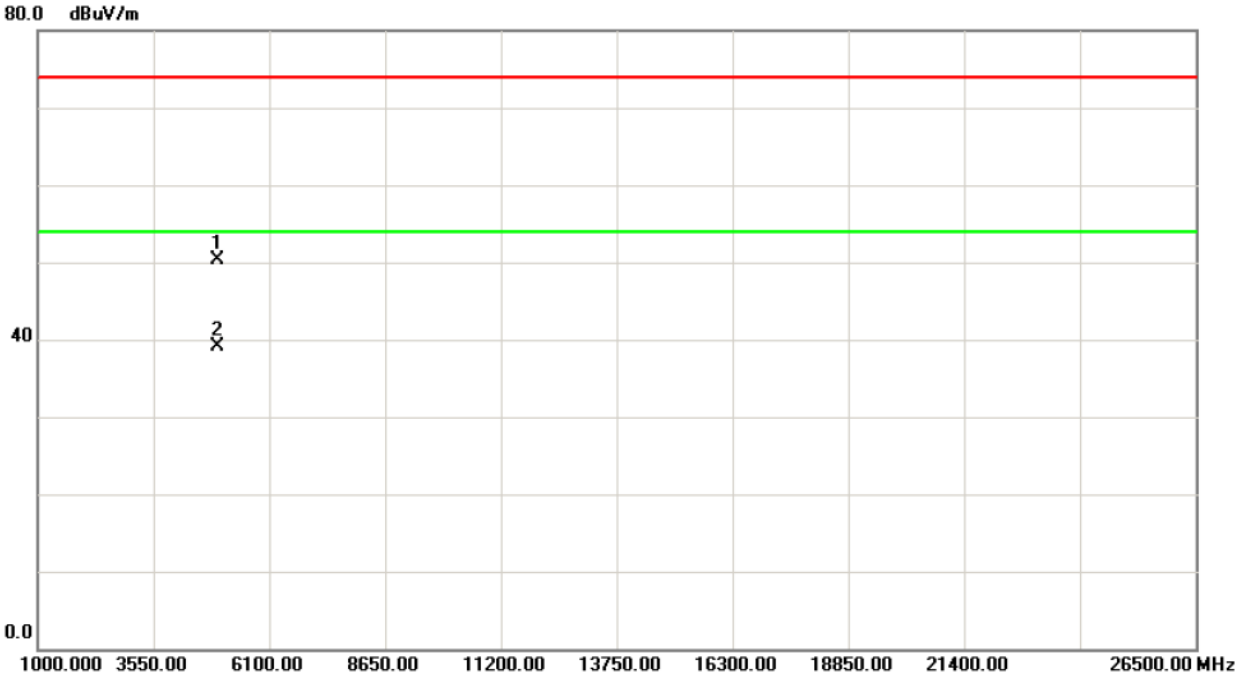
Above 1GHz:

Model:	iF191BI	Result:	PASS
Temperature：	25° C	Relative Humidity：	58 %
Pressure：	1009 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2480MHz)	Antenna polarity:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4959.980	43.56	6.74	50.30	74.00	-23.70	peak
2	*	4960.020	32.36	6.74	39.10	54.00	-14.90	AVG

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Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

From 30MHz to 1GHz, read the field strength of the emissions with RBW=120KHz.

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

Read the Peak field strength through RBW=1MHz, VBW=3MHz in spectrum analyzer setting.

Read the Average field strength through RBW=1MHz, VBW=10Hz in spectrum analyzer setting.

(4) 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.

(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

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6.10 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

6.10.1 STANDARD REQUIRMENTS

Section 15.247(d) :

In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Section 15.205 Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] Above 38.6

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6.10.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Jun.04.2013
2	Amplifier	HP	8447D	2944A09673	May.26.2013
3	Test Receiver	R&S	ESCI	100382	May.26.2013
4	Test Cable	N/A	C-01_CB03	N/A	Jul.06.2013
5	Controller	CT	SC100	N/A	N/A
6	Antenna	ETS	3115	00075789	May.26.2013
7	Amplifier	Agilent	8449B	3008A02274	May.26.2013
8	Spectrum	Agilent	E4408B	US39240143	Nov.26.2012
9	Test Cable	HUBER+SUHNER	C-45	N/A	May.04.2013

Remark: ” N/A” denotes No Model Name. / Serial No. and No Calibration specified.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1GHz
Stop Frequency	10th carrier harmonic
RBW / VBW (emission in restricted band)	1 MHz / 1 MHz for Peak, 1MHz/10Hz for average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

6.10.3 TEST PROCEDURE

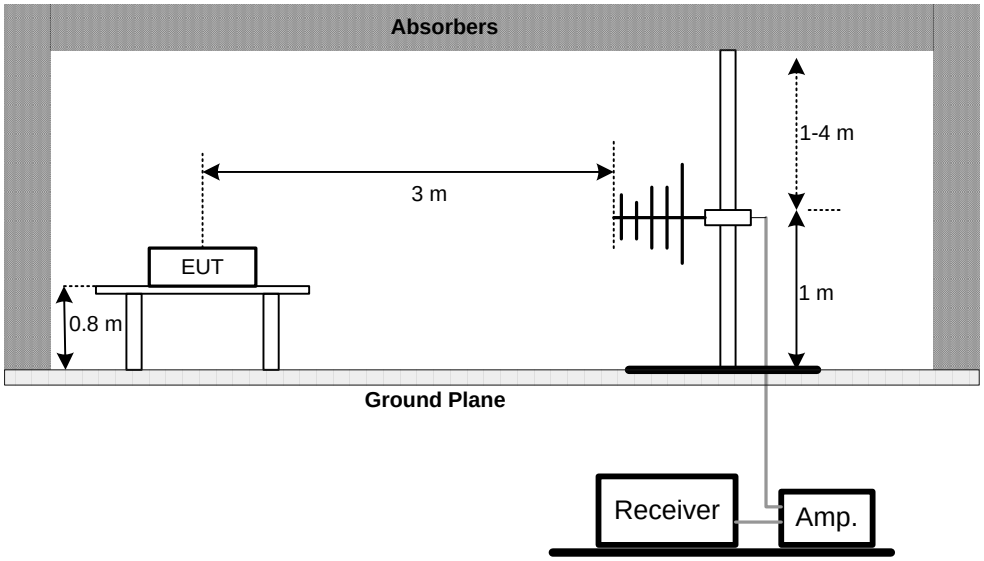
a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item – EUT Test Photos.

6.10.4 DEVIATION FROM TEST STANDARD

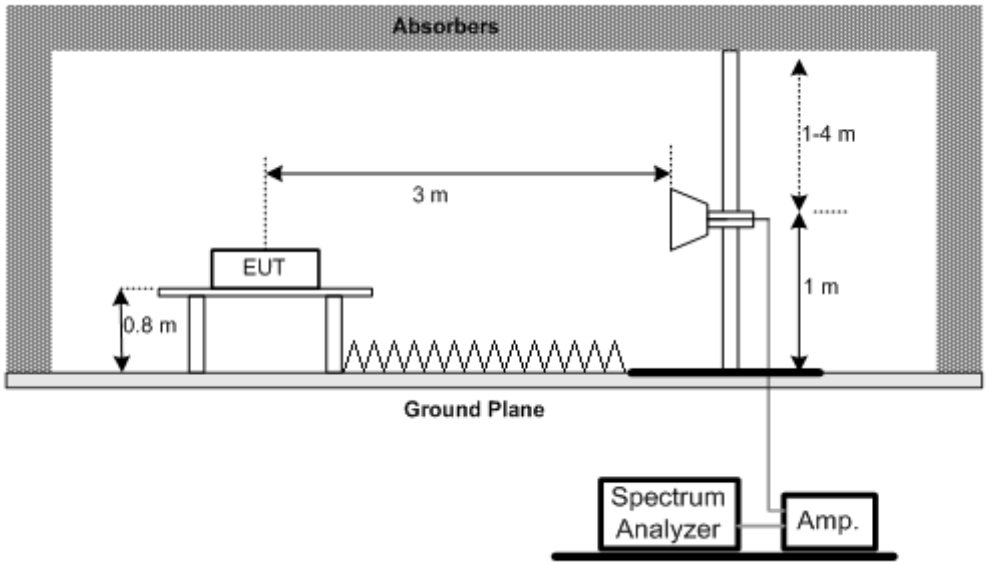
No deviation

6.10.5 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



6.10.6 EUT OPERATING CONDITIONS

The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

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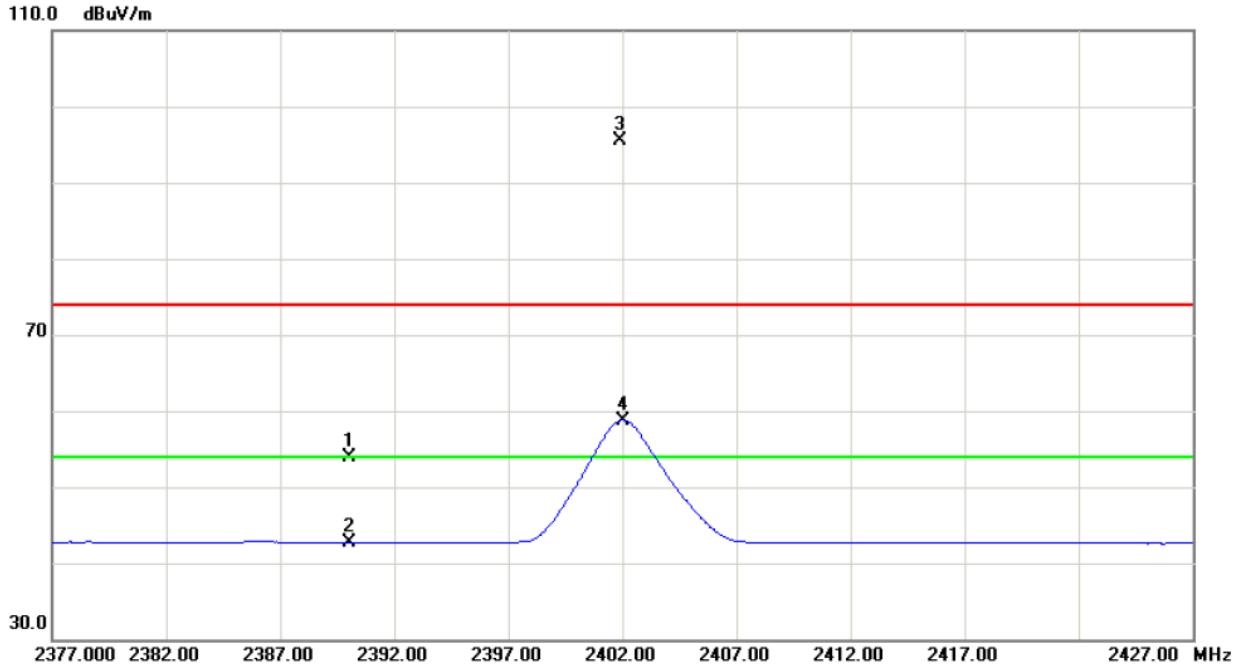
6.10.7 TEST RESULTS

Model:	iF191BI	Result:	PASS
Temperature：	23° C	Relative Humidity：	51 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2402MHz)	Antenna polarity:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2390.000	21.71	32.28	53.99	74.00	-20.01	peak
2		2390.000	10.47	32.28	42.75	54.00	-11.25	AVG

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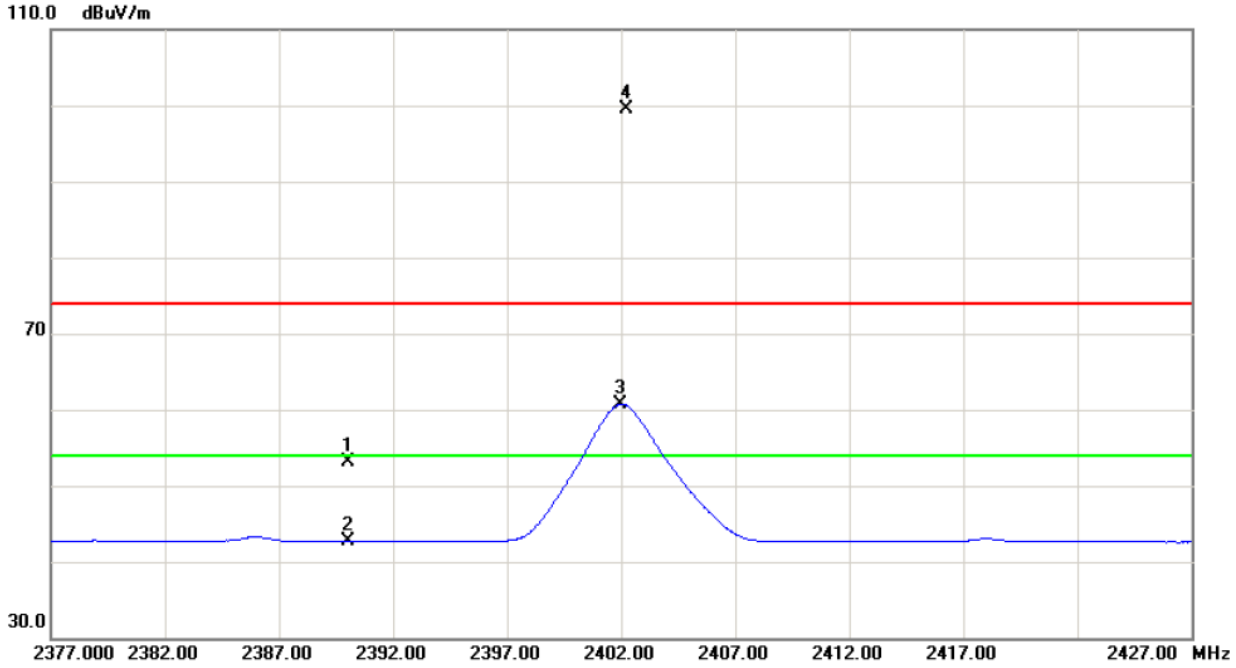
Model:	iF191BI	Result:	PASS
Temperature：	23° C	Relative Humidity：	51 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2402MHz)	Antenna polarity:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2390.000	20.89	32.28	53.17	74.00	-20.83	peak
2		2390.000	10.45	32.28	42.73	54.00	-11.27	AVG

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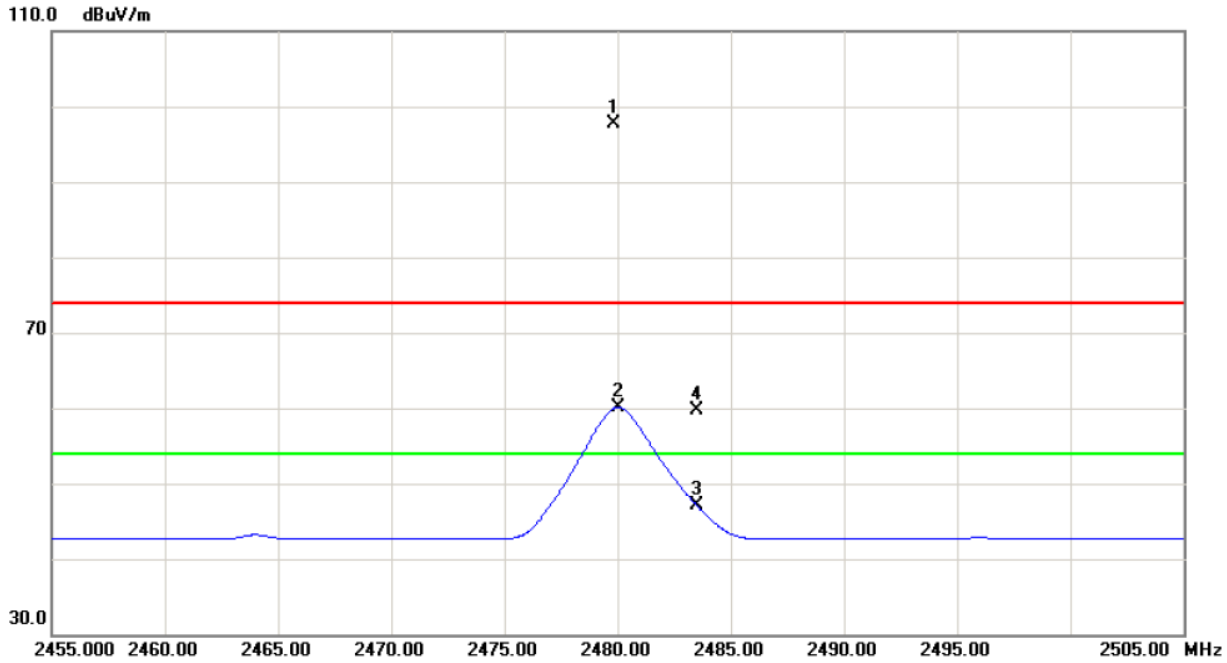
Model:	iF191BI	Result:	PASS
Temperature：	23° C	Relative Humidity：	51 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2480MHz)	Antenna polarity:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
3		2483.500	14.96	32.17	47.13	74.00	-26.87	peak
4	X	2483.500	27.45	32.17	59.62	54.00	5.62	AVG

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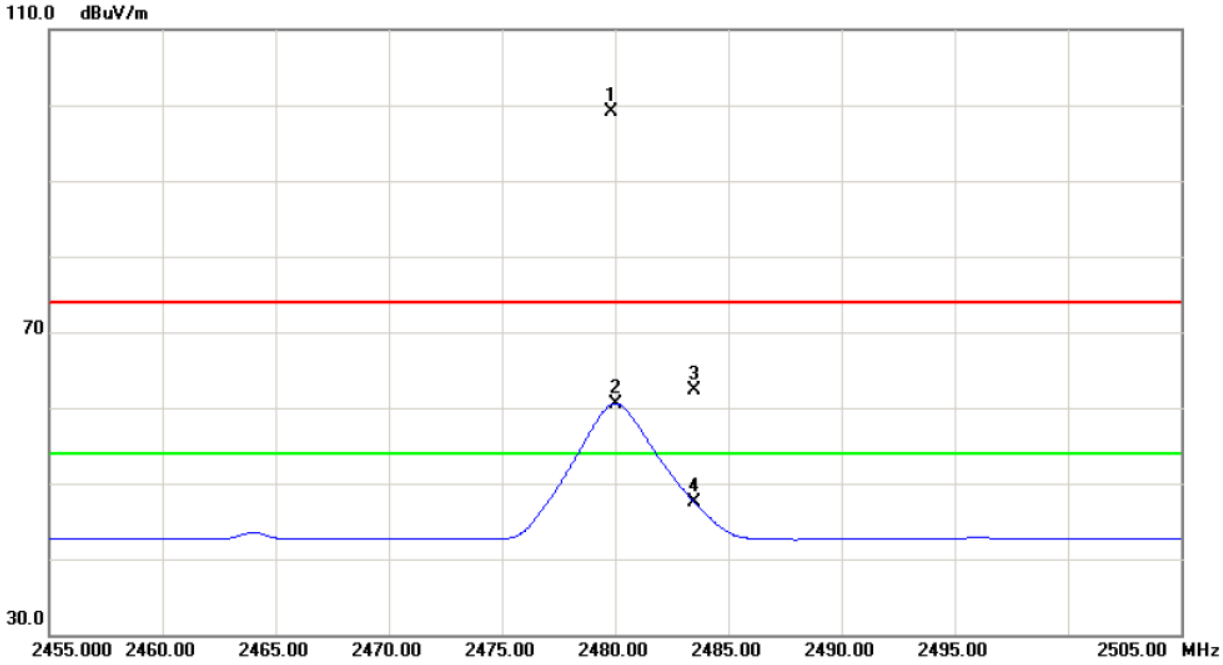
Model:	iF191BI	Result:	PASS
Temperature：	25° C	Relative Humidity：	58 %
Pressure：	1009 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode (2480MHz)	Antenna polarity:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
3		2483.500	30.09	32.17	62.26	74.00	-11.74	peak
4		2483.500	15.36	32.17	47.53	54.00	-6.47	AVG

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Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

From 30MHz to 1GHz, read the field strength of the emissions with RBW=120KHz.

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

Read the Peak field strength through RBW=1MHz, VBW=3MHz in spectrum analyzer setting.

Read the Average field strength through RBW=1MHz, VBW=10Hz in spectrum analyzer setting.

(4) 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.

(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

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6.11 BAND EDGES REQUIREMENT

6.11.1 APPLIED PROCEDURES / LIMIT

15.247(d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

6.11.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2012

Remark: ” N/A” denotes No Model Name. , Serial No. or No Calibration specified.

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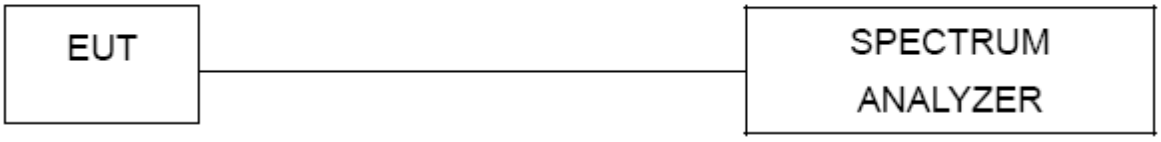
6.11.3 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = auto.

6.11.4 DEVIATION FROM STANDARD

No deviation.

6.11.5 TEST SETUP



6.11.6 EUT OPERATION CONDITIONS

Test the EUT in normal mode and EDR mode, found the worst case is in normal mode and report it.

6.11.7 TEST RESULTS

Model:	iF191BI	Result:	PASS
Temperature：	20°C	Relative Humidity：	55 %
Pressure：	1001 hPa	Test voltage：	DC 6V
Test Mode ：	Transmitting mode.		

The band edges were measured and recorded Result:

The Lower Edges attenuated more than 20dB.

The Upper Edges attenuated more than 20dB.

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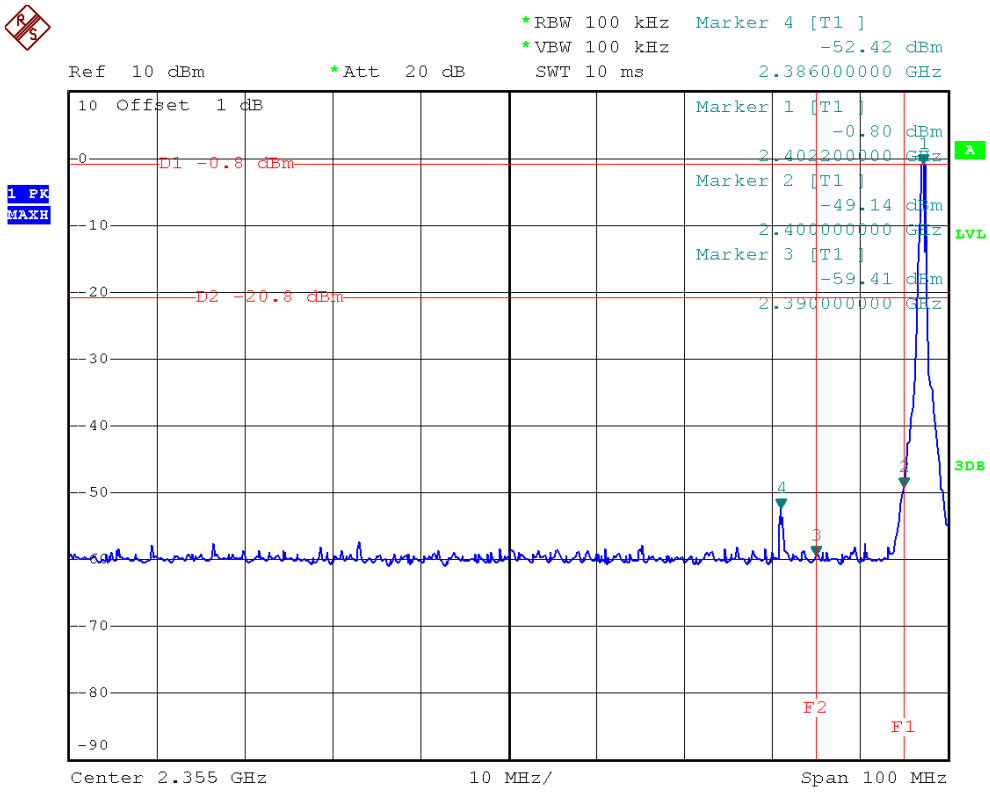
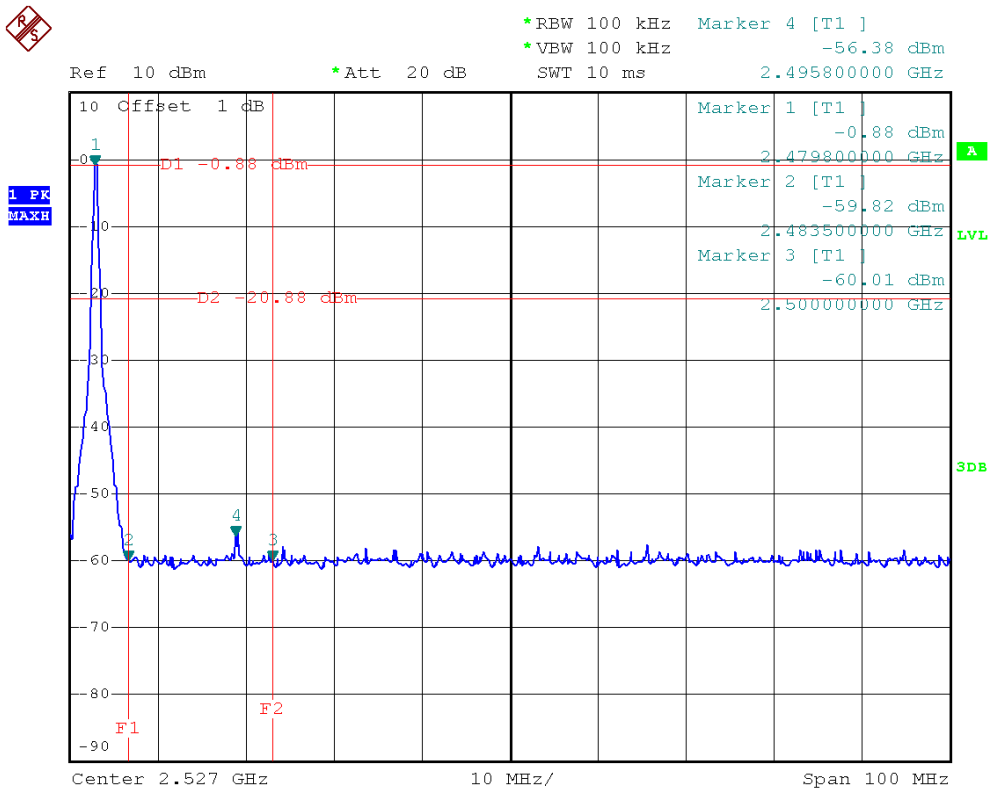
2402MHz



2480MHz



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