Test Report No.:
FCC2022-0014-RF1

RF Test Report

EUT	**:**	**15.6-inch Computer**
MODEL	**:**	**VT-HMI-156-TEL**
BRAND NAME	**:**	**N/A**
APPLICANT	**:**	**Chengdu Vantron Technology Co., Ltd.**
Classification Of Test	**:**	**N/A**

CVC Testing Technology Co., Ltd.

Client	**Name : Chengdu Vantron Technology Co., Ltd.** **Address : No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China**		
Manufacturer	**Name : Chengdu Vantron Technology Co., Ltd.** **Address : No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China**		
Equipment Under Test	**Name : 15.6-inch Computer** **Model/Type: VT-HMI-156-TEL** **Trade mark : N/A** **Serial NO.:N/A** **Sampe NO.:4-1**		
Date of Receipt.	**2022.03.10**	Date of Testing	**2022.03.10～2022.03.31**

Test Specification	**Test Result**
FCC Part 15, Subpart C, Section 15.247	PASS

Evaluation of Test Result	The equipment under test was found to comply with the requirements of the standards applied. **Issue Date: 2022.03.31**	
Tested by: Xu ZhenFei **Xu ZhenFei** Name Signature	Reviewed by: Liu yonghai **Liu YongHai** Name Signature	Approved by: **Chen HuaWen** Name Signature

Other Aspects: NONE.

Abbreviations:OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FCC2022-0014-RF1	Original release	2022.03.31

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
FCC STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit.
15.247(a)(1)	Number of Hopping Frequency Used	PASS	Meet the requirement of limit.
15.247(a)(1)	Hopping Channel Separation	PASS	Meet the requirement of limit.
15.247(a)(1)	Dell Time of Each Channel	PASS	Meet the requirement of limit.
15.247(a)(1)	20dB EMISSION BANDWIDTH	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output Power	PASS	Meet the requirement of limit.
15.247(d), 15.209,15.205	Radiated Emissions	PASS	Meet the requirement of limit.
15.247(d)	Out of band Emission Measurement	PASS	Meet the requirement of limit.
15.203 14.247(b)	Antenna Requirement	PASS	No antenna connector is used.

1.1 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Test Equipment	Type/Mode	SERIAL NO.	Equipment No.	Manufacturer	Cal. Due
WIFI & Bluetooth Test System 1					/
Communication Shielded Room 1	4m*3m*3m	CRTDSWKSR44301	VGDS-0699	CRT	2024/04/24
Spectrum Analyzer	FSV30	104337	DZ-000235	R&S	2022/11/03
Comprehensive Test Instrument	CMW500	137779	DZ-000220	R&S	2022/06/30
Comprehensive Test Instrument	CMW500	169888	DZ-000342	R&S	2022/12/01
LTE Comprehensive Test Instrument	E7515A	MY58010639	DZ-000173	KEYSIGHT	2022/04/14
Analog Signal Generator	SMA100B	103663	DZ-000239-2	R&S	2022/06/30
Vector Signal Generator	SMBV100B	101757	DZ-000239-1	R&S	2022/06/30
Programmable DC Power Supply	E3642A	MY59108106	DZ-000242-2	KEYSIGHT	2022/08/05
Radiation SpuriousTest System					/
3m Semi-Anechoic Chamber	FACT-4	ST08035	WKNA-0024	ETS	2024/12/12
Spectrum Analyzer	N9010B	MY57470323	DZ-000174	KEYSIGHT	2023/03/02
EMI Test Receiver	N9038A-508	MY532290079	EM-000397	Agilent	2023/03/02
Broadband Antenna	VULB 9163	9163-530	EM-000342	SCHWARZBECK	2022/06/26
Waveguide Horn Antenna	HF906	360306/008	WKNA-0024-8	R&S	2023/03/04
Waveguide Horn Antenna	BBHA9170	00949	DZ-000209-2	SCHWARZBECK	2022/08/27
Preamplifier	BBV 9721	9721-050	DZ-000209-1	SCHWARZBECK	2022/06/30
5G Bandstop Filters	WRCJV12-4900-5100-5900-6100-50EE	1	DZ-000186	WI	2022/12/20
Comprehensive tester	CMW500	159000	DZ-000240-2	R&S	2022/12/20

1.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

No.	ITEM	FREQUENCY	UNCERTAINTY
1	Conducted Emissions	9kHz~30MHz	±2.66dB
2	Radiated Spurious Emissions	9KHz ~ 30MHz	±0.769dB
		30MHz ~ 1GMHz	±0.877dB
		1GHz ~ 18GHz	±0.777dB
		18GHz ~ 40GHz	±1.315dB

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

1.3 TEST LOCATION

The tests and measurements refer to this report were performed by EMC testing Lab. of CVC Testing Technology Co., Ltd.

Address: No.3,TiantaiyiRoad,KaitaiAvenue,ScienceCity,Guangzhou,China
Post Code：510663 Tel：020-32293888
FAX：020-32293889 E-mail：office@cvc.org.cn

2 GENERAL INFORMATION

2.1 GENERAL PRODUCT INFORMATION

PRODUCT	15.6-inch Computer
BRAND	N/A
MODEL	VT-HMI-156-TEL
ADDITIONAL MODEL	N/A
FCC ID	2AAGE156TEL6256
POWER SUPPLY	DC 12V From Adapter or DC 48V from POE
MODULATION TYPE	GFSK, π/4 DQPSK, 8DPSK
OPERATING FREQUENCY	2402MHz~2480MHz
NUMBER OF CHANNEL	79
PEAK OUTPUT POWER	4.46dBm (Max. Measured)
ANTENNA TYPE	External antenna , 3dBi Gain
I/O PORTS	Refer to user’s manual
CABLE SUPPLIED	N/A

Remark:

1. For more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. EUT photo refer to the report (Report NO.: FCC2022-0014-E).
4. The EUT have SISO function, provides 1 completed transmitter and 1 receiver.

2.2 OTHER INFORMATION

Operation frequency each of channel.

Operation Frequency Each of Channel							
For BT (GFSK, π/4 DQPSK, 8 DPSK)							
CHANNEL	**FREQ. (MHz)**	**CHANNEL**	**FREQ. (MHz)**	**CHANNEL**	**FREQ. (MHz)**	**CHANNEL**	**FREQ. (MHz)**
0	**2402**	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	**78**	**2480**
19	2421	**39**	**2441**	59	2461		

1. By means of test software which provided by manufacture, the power levels during the tests were set according to the following codes:

GFSK		π/4-DQPSK		8DPSK	
CHANNEL	**POWER SETTING**	**CHANNEL**	**POWER SETTING**	**CHANNEL**	**POWER SETTING**
0	default	**0**	default	**0**	default
39	default	**39**	default	**39**	default
78	default	**78**	default	**78**	default

2.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, xyz axis and antenna ports

The worst case was found when positioned on xaxis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	APPLICABLE TEST ITEMS				DESCRIPTION
	RSE<1G	RSE≥1G	PLC	APCM	
A	√	√	√	√	BT LINK

Where **RSE<1G:** Radiated Emission below 1GHz. **RSE≥1G:** Radiated Emission above 1GHz.
PLC: Power Line Conducted Emission. **APCM:** Antenna Port Conducted Measurement.

RADIATED EMISSION TEST (BELOW 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type.

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
A	0	FHSS	GFSK	DH5

RADIATED EMISSION TEST (ABOVE 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type.

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
A	0, 39, 78	FHSS	GFSK	DH5
A	0, 39, 78	FHSS	π/4 DQPSK	2DH5
A	0, 39, 78	FHSS	8DPSK	3DH5

POWER LINE CONDUCTED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CONDITION
-	BT Link

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
A	0, 39, 78	FHSS	GFSK	DH5
A	0, 39, 78	FHSS	π/4 DQPSK	2DH5
A	0, 39, 78	FHSS	8DPSK	3DH5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE (SYSTEM)	TESTED BY
RSE<1G	25deg. C, 55%RH	DC 12V From Adapter	Liu shiwei
RSE≥1G	25deg. C, 55%RH	DC 12V From Adapter	Liu shiwei
PLC	25deg. C, 55%RH	DC 12V From Adapter	Liu shiwei
APCM	25deg. C, 60%RH	DC 12V From Adapter	Liu shiwei

2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

FCC PART 15, Subpart C. Section 15.247
KDB 558074 D01 15.247 Meas Guidance v05r02
ANSI C63.10-2020

All test items have been performed and recorded as per the above standards

2.5 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.

Support Equipment					
NO	Description	Brand	Model No.	Serial Number	Supplied by

Support Cable							
NO	Description	Quantity (Number)	Length (m)	Detachable (Yes/ No)	Shielded (Yes/ No)	Cores (Number)	Supplied by
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A

3 TEST TYPES AND RESULTS

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 Limit

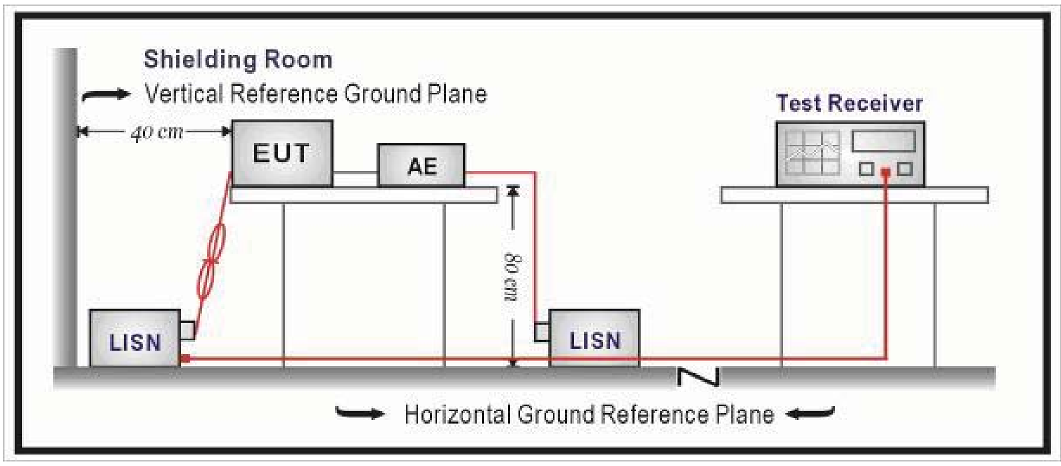
Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.
NOTE: 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

3.1.2 Measurement procedure

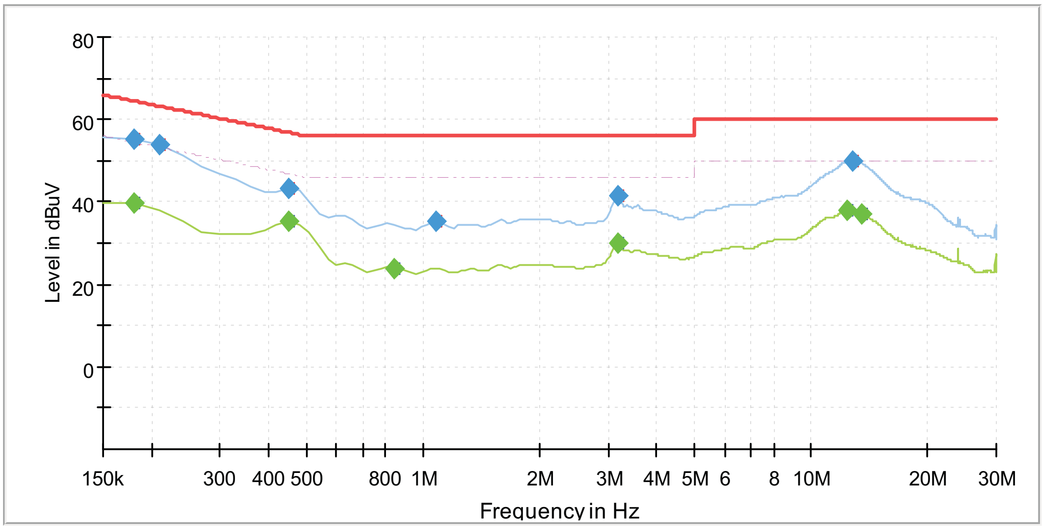
a. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the Test photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.The equipment under test shall be placed on a support of non-metallic material, the height of which shall be1.5m above the ground,
b. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
c. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

3.1.3 Test setup



3.1.4 Test results

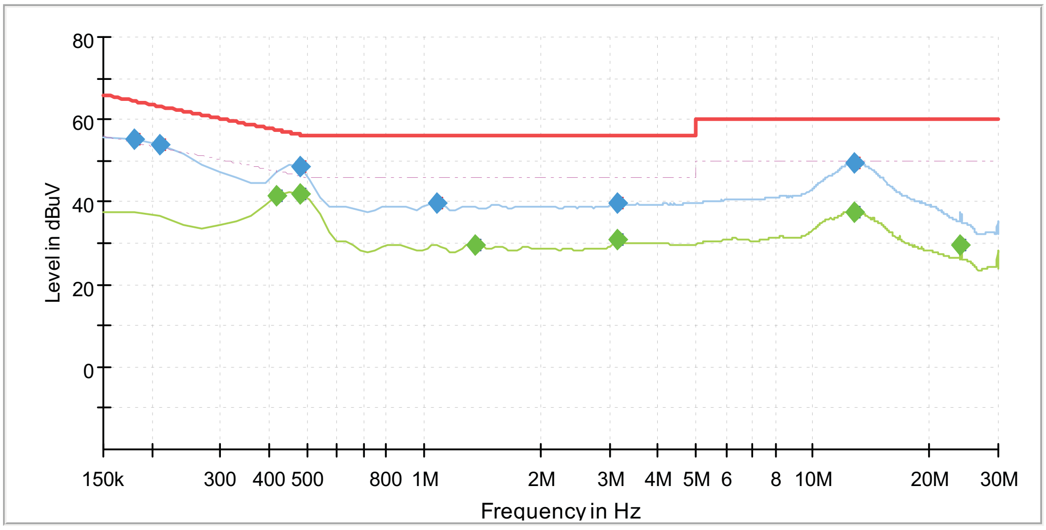
Test Mode	Charging+ WIFI (2.4G) Link + BT Link		
Frequency Range	150KHz ~ 30MHz	**PHASE**	Line (L)



NO	Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr.Factor (dB)
1	0.180	55.4	---	64.5	9.1	L1	19.5
2	0.180	---	39.8	54.5	14.7	L1	19.5
3	0.210	53.7	---	63.2	9.5	L1	19.5
4	0.450	43.3	---	56.9	13.5	L1	19.5
5	0.450	---	35.2	46.9	11.7	L1	19.5
6	0.840	---	24.0	46.0	22.0	L1	19.6
7	1.080	35.2	---	56.0	20.8	L1	19.5
8	3.180	41.4	---	56.0	14.6	L1	19.6
9	3.180	---	29.8	46.0	16.2	L1	19.6
10	12.390	---	37.9	50.0	12.1	L1	19.8
11	12.840	49.9	---	60.0	10.1	L1	19.9
12	13.560	---	37.3	50.0	12.7	L1	19.9

Remark: 1.The emission levels of other frequencies were very low against the limit.
2.Margin= Limit - Result
3. Corr.= Insertion loss + Cable loss + LISN Factor
4. Result = Corr. + Reading

Test Mode	Charging+ WIFI (2.4G) Link + BT Link		
Frequency Range	150KHz ~ 30MHz	**PHASE**	Line (N)



NO	Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr.Factor (dB)
1	0.180	55.4	---	64.5	9.1	N	19.5
2	0.210	54.0	---	63.2	9.2	N	19.5
3	0.420	---	41.6	47.4	5.9	N	19.6
4	0.480	48.5	---	56.3	7.9	N	19.6
5	0.480	---	42.1	46.3	4.2	N	19.6
6	1.080	39.6	---	56.0	16.4	N	19.6
7	1.350	---	29.7	46.0	16.3	N	19.6
8	3.150	39.9	---	56.0	16.1	N	19.6
9	3.150	---	30.9	46.0	15.1	N	19.6
10	12.810	---	37.7	50.0	12.3	N	20.1
11	12.810	49.5	---	60.0	10.5	N	20.1
12	23.880	---	29.4	50.0	20.6	N	20.2

Remark: 1.The emission levels of other frequencies were very low against the limit.
2.Margin= Limit - Result
3. Corr.= Insertion loss + Cable loss + LISN Factor
4. Result = Corr. + Reading

3.2 RADIATED EMISSIONS

3.2.1 Limits

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). Other emissions shall be at least 20dB below the highest level of the desired power.

FREQUENCIES (MHz)	FIELD STRENGTH (Microvolts/Meter)	MEASUREMENT DISTANCE (Meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE: 1. The lower limit shall apply at the transition frequencies.
NOTE: 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
NOTE: 3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

3.2.2 Measurement procedure

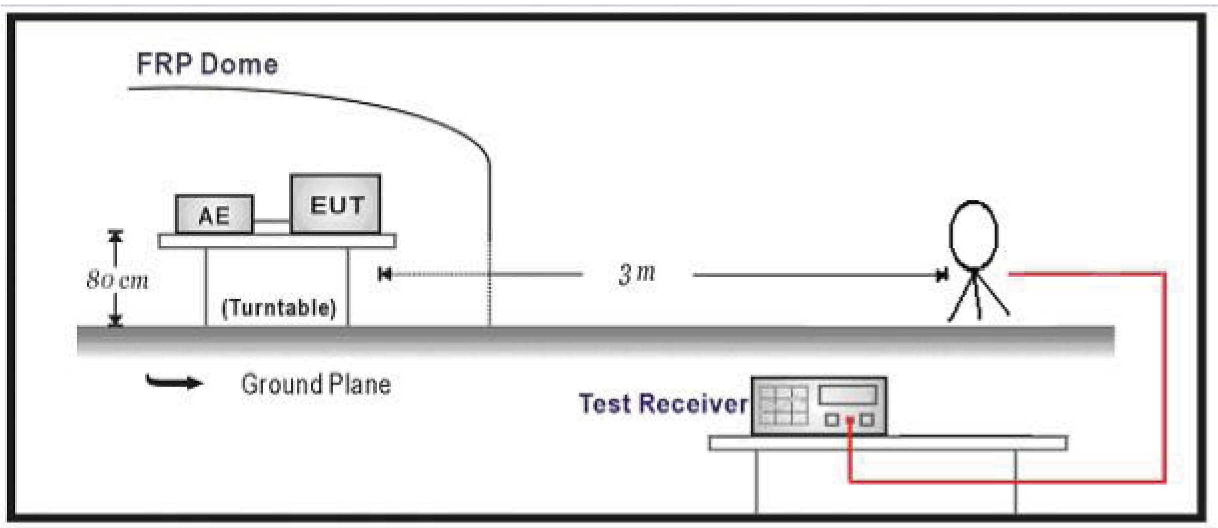
a. The EUT was placed on the top of a rotating table 1.5 meters(above 1GHz) and 0.8 meters(below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. For below 1GHz was used bilog antenna, and above 1GHz was used horn antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
g. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

NOTE:

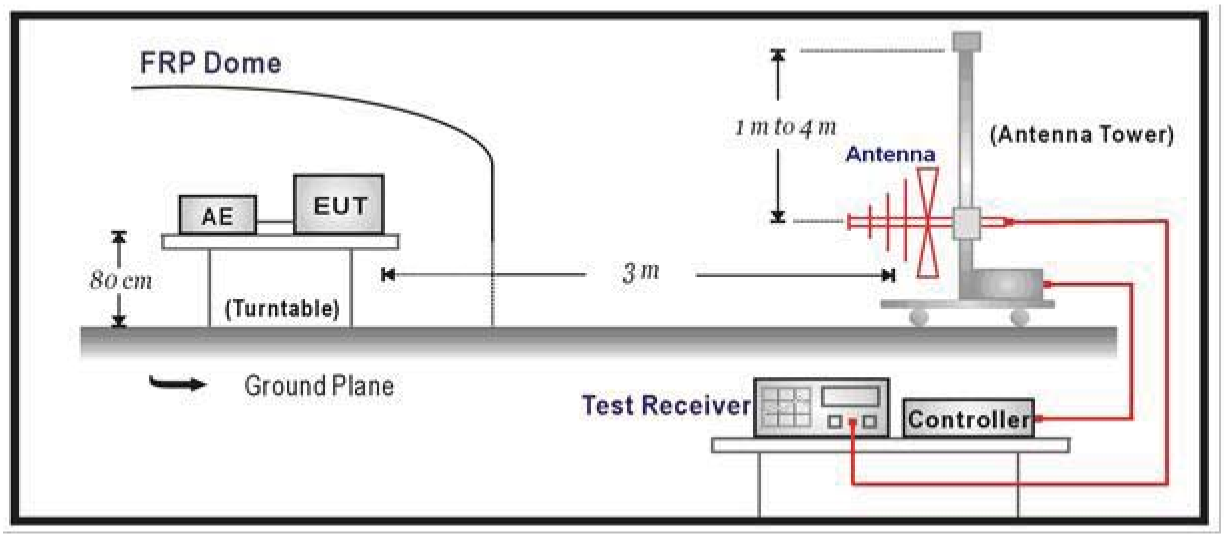
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

3.2.3 Test setup

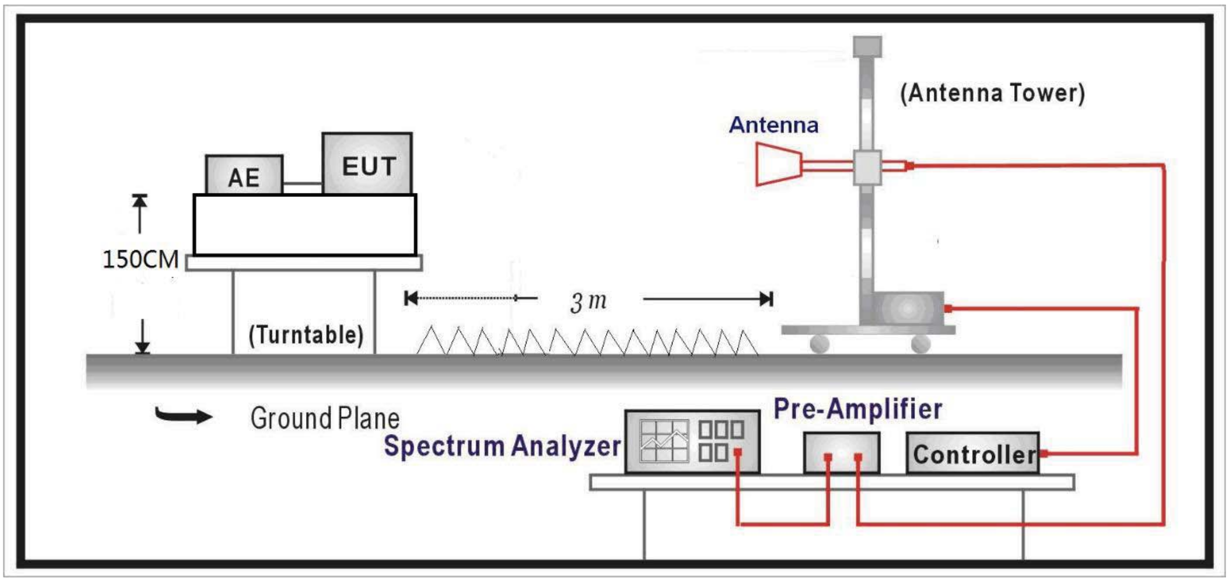
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:

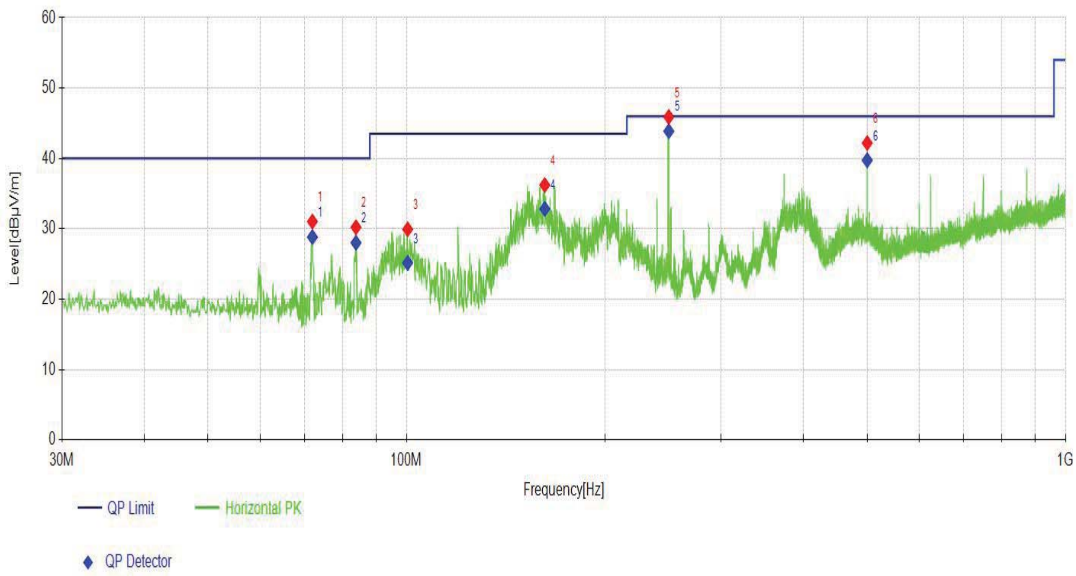


3.2.4 Test results

BELOW 1GHz WORST-CASE DATA:

Worst Test Mode	DR0	**Channel**	CH 0
Frequency Range	9KHz ~ 1GHz	**Detector Function**	Quasi-Peak (QP)

Horizontal

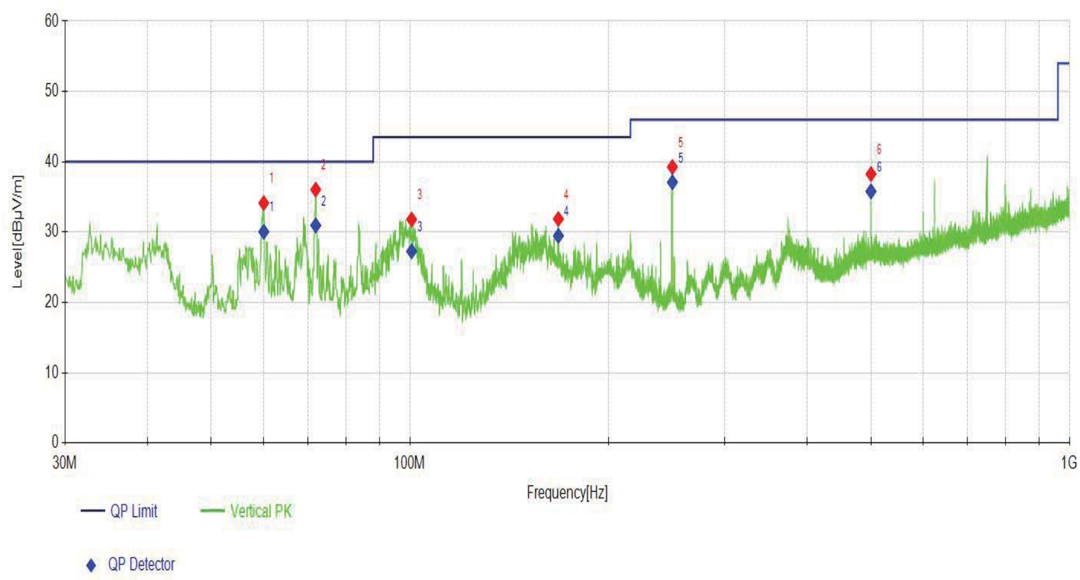


NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]
1	72.0052	12.31	28.82	16.51	40.00	11.18	200	1
2	83.8404	12.62	28.01	15.39	40.00	11.99	200	357
3	100.4290	8.83	25.16	16.33	43.50	18.34	200	155
4	162.1272	12.12	32.83	20.71	43.50	10.67	200	4
5	**250.0180**	**25.81**	**43.88**	**18.07**	**46.00**	**2.12**	**100**	**16**
6	500.0120	15.93	39.75	23.82	46.00	6.25	200	155

Remark: 1. 9KHz~30MHz have been test and test data more than 20dB margin.
2. The emission levels of other frequencies were greater than 20dB margin.
3. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
4. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
5. Margin(dB) = Limit[dBµV/m] - Level [dBµV/m]

Worst Test Mode	DR0	**Channel**	CH 0
Frequency Range	9KHz ~ 1GHz	**Detector Function**	Quasi-Peak (QP)

Vertical



NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]
1	60.0730	11.02	30.05	19.03	**40.00**	9.95	100	328
2	72.0052	14.45	30.96	16.51	40.00	9.04	100	215
3	100.6231	10.92	27.26	16.34	43.50	16.24	100	108
4	167.9478	9.24	29.47	20.23	43.50	14.03	100	277
5	250.0180	19.02	37.09	18.07	46.00	8.91	200	26
6	500.0120	11.97	35.79	23.82	46.00	10.21	100	125

Remark: 1. 9KHz~30MHz have been test and test data more than 20dB margin.
2. The emission levels of other frequencies were greater than 20dB margin.
3. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
4. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
5. Margin(dB) = Limit[dBµV/m] - Level [dBµV/m]

ABOVE 1GHz DATA

DH5-CH 0

Channel	CH 0	**Frequency**	2402MHz
Frequency Range	Above 1G	**Detector Function**	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2390	36.67	-0.15	36.52	54.00	17.48	134	291	AV
2	2390	43.90	-0.15	43.75	74.00	30.25	134	138	PK
3	2402	76.05	-0.03	76.02			134	65	PK
4	2402	75.90	-0.03	75.87			134	65	AV
5	4804	35.06	9.29	44.35	54.00	9.65	221	348	AV
6	4804	44.75	9.29	54.04	74.00	19.96	221	348	PK
7	7206	28.61	12.81	41.42	74.00	32.58	221	211	PK
8	7206	21.84	12.81	34.65	54.00	19.35	221	39	AV
9	9608	21.15	13.32	34.47	54.00	19.53	221	319	AV
10	9608	27.13	13.32	40.45	74.00	33.55	221	325	PK

Vertical

NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2390	44.85	-0.15	44.70	74.00	29.30	164	194	PK
2	2390	36.93	-0.15	36.78	54.00	17.22	164	22	AV
3	2402	87.57	-0.03	87.54			164	261	PK
4	2402	87.57	-0.03	87.54			164	261	PK
5	4804	43.63	9.29	52.92	74.00	21.08	163	66	PK
6	4804	37.85	9.29	47.14	54.00	6.86	163	220	AV
7	7206	21.33	12.81	34.14	54.00	19.86	163	248	AV
8	7206	27.76	12.81	40.57	74.00	33.43	163	107	PK
9	9608	26.97	13.32	40.29	74.00	33.71	163	26	PK
10	9608	21.25	13.32	34.57	54.00	19.43	163	26	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBµV/m] - Level [dBµV/m]

DH5-CH 39

Channel	CH 0	**Frequency**	2441MHz
Frequency Range	Above 1G	**Detector Function**	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	4882	34.75	9.84	44.59	54.00	9.41	245	94	AV
2	4882	42.68	9.84	52.52	74.00	21.48	245	261	PK
3	7323	28.19	10.96	39.15	74.00	34.85	245	240	PK
4	7323	22.57	10.96	33.53	54.00	20.47	245	3	AV
5	9764	20.64	13.23	33.87	54.00	20.13	245	160	AV
6	9764	26.31	13.23	39.54	74.00	34.46	245	140	PK

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	4882	43.00	9.84	52.84	74.00	21.16	299	206	PK
2	4882	35.43	9.84	45.27	54.00	8.73	299	79	AV
3	7323	21.92	10.96	32.88	54.00	21.12	299	12	AV
4	7323	29.78	10.96	40.74	74.00	33.26	299	335	PK
5	9764	26.98	13.23	40.21	74.00	33.79	299	335	PK
6	9764	20.05	13.23	33.28	54.00	20.72	299	335	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

DH5-CH 78

Channel	CH 78	**Frequency**	2480MHz
Frequency Range	Above 1G	**Detector Function**	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2480	89.89	0.32	90.21			142	319	PK
2	2480	89.85	0.32	90.17			142	319	AV
3	2483.5	36.73	0.46	37.19	54.00	16.81	142	73	AV
4	2483.5	44.15	0.46	44.61	74.00	29.39	142	26	PK
5	4960	42.53	10.69	53.22	74.00	20.78	206	334	PK
6	4960	34.81	10.69	45.50	54.00	8.50	206	334	AV
7	7440	22.35	9.75	32.10	54.00	21.90	206	319	AV
8	7440	28.89	9.75	38.64	74.00	35.36	206	179	PK
9	9920	25.44	13.83	39.27	74.00	34.73	206	279	PK
10	9920	18.90	13.83	32.73	54.00	21.27	206	165	AV

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2480	102.49	0.32	102.81			295	3	PK
2	2480	102.46	0.32	102.78			295	3	AV
3	2483.5	39.41	0.46	39.87	54.00	14.13	295	359	AV
4	2483.5	52.46	0.46	52.92	74.00	21.08	295	359	PK
5	4960	42.84	10.69	53.53	74.00	20.47	280	312	PK
6	4960	34.79	10.69	45.48	54.00	8.52	280	312	AV
7	7440	22.72	9.75	32.47	54.00	21.53	280	87	AV
8	7440	29.14	9.75	38.89	74.00	35.11	280	80	PK
9	9920	25.47	13.83	39.30	74.00	34.70	280	328	PK
10	9920	19.62	13.83	33.45	54.00	20.55	280	328	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

2DH5-CH 0

Channel	CH 0	Frequency	2402MHz
Frequency Range	Above 1G	Detector Function	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2390	36.41	-0.15	36.26	54.00	17.74	122	178	AV
2	2390	44.42	-0.15	44.27	74.00	29.73	122	85	PK
3	2402	73.37	-0.03	73.34			122	165	PK
4	2402	73.11	-0.03	73.08			122	165	AV
5	4804	43.22	9.29	52.51	74.00	21.49	224	281	PK
6	4804	34.36	9.29	43.65	54.00	10.35	224	340	AV
7	7206	22.22	12.81	35.03	54.00	18.97	224	119	AV
8	7206	27.94	12.81	40.75	74.00	33.25	224	360	PK
9	9608	27.33	13.32	40.65	74.00	33.35	224	279	PK
10	9608	20.83	13.32	34.15	54.00	19.85	224	66	AV

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2390	36.15	-0.15	36.00	54.00	18.00	154	214	AV
2	2390	44.35	-0.15	44.20	74.00	29.80	154	120	PK
3	2402	86.36	-0.03	86.33			154	357	PK
4	2402	85.40	-0.03	85.37			154	0	AV
5	4804	42.90	9.29	52.19	74.00	21.81	281	287	PK
6	4804	35.56	9.29	44.85	54.00	9.15	281	287	AV
7	7206	21.71	12.81	34.52	54.00	19.48	281	107	AV
8	7206	28.84	12.81	41.65	74.00	32.35	281	254	PK
9	9608	26.89	13.32	40.21	74.00	33.79	281	359	PK
10	9608	21.25	13.32	34.57	54.00	19.43	281	20	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

2DH5-CH 39

Channel	CH 0	**Frequency**	2441MHz
Frequency Range	Above 1G	**Detector Function**	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	4882	34.91	9.84	44.75	54.00	9.25	203	341	AV
2	4882	42.26	9.84	52.10	74.00	21.90	203	202	PK
3	7323	29.45	10.96	40.41	74.00	33.59	203	98	PK
4	7323	22.93	10.96	33.89	54.00	20.11	203	98	AV
5	9764	19.52	13.23	32.75	54.00	21.25	203	138	AV
6	9764	26.97	13.23	40.20	74.00	33.80	203	145	PK

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	4882	44.23	9.84	54.07	74.00	19.93	246	214	PK
2	4882	34.47	9.84	44.31	54.00	9.69	246	253	AV
3	7323	22.10	10.96	33.06	54.00	20.94	246	268	AV
4	7323	28.56	10.96	39.52	74.00	34.48	246	328	PK
5	9764	26.66	13.23	39.89	74.00	34.11	246	255	PK
6	9764	19.80	13.23	33.03	54.00	20.97	246	1	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

2DH5-CH 78

Channel	CH 78	**Frequency**	2480MHz
Frequency Range	Above 1G	**Detector Function**	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2480	88.03	0.31	88.34			134	318	PK
2	2480	87.24	0.32	87.56			134	311	AV
3	2483.5	37.29	0.46	37.75	54.00	16.25	134	311	AV
4	2483.5	44.86	0.46	45.32	74.00	28.68	134	311	PK
5	4960	42.93	10.69	53.62	74.00	20.38	118	181	PK
6	4960	34.99	10.69	45.68	54.00	8.32	118	162	AV
7	7440	23.37	9.75	33.12	54.00	20.88	118	6	AV
8	7440	29.89	9.75	39.64	74.00	34.36	118	312	PK
9	9920	24.25	13.83	38.08	74.00	35.92	118	266	PK
10	9920	18.77	13.83	32.60	54.00	21.40	118	1	AV

Vertical

NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2480	100.16	0.31	100.47			258	359	PK
2	2480	99.35	0.32	99.67			258	357	AV
3	2483.5	38.39	0.46	38.85	54.00	15.15	258	20	AV
4	2483.5	48.27	0.46	48.73	74.00	25.27	258	334	PK
5	4960	42.57	10.69	53.26	74.00	20.74	259	236	PK
6	4960	34.45	10.69	45.14	54.00	8.86	259	87	AV
7	7440	22.38	9.75	32.13	54.00	21.87	259	43	AV
8	7440	29.33	9.75	39.08	74.00	34.92	259	70	PK
9	9920	25.38	13.83	39.21	74.00	34.79	259	199	PK
10	9920	18.79	13.83	32.62	54.00	21.38	259	70	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBµV/m] - Level [dBµV/m]

3DH5-CH 0

Channel	CH 0	Frequency	2402MHz
Frequency Range	Above 1G	Detector Function	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2390	35.96	-0.15	35.81	54.00	18.19	209	79	AV
2	2390	43.52	-0.15	43.37	74.00	30.63	209	152	PK
3	2402	72.84	-0.03	72.81			209	290	AV
4	2402	75.41	-0.03	75.38			209	304	PK
5	4804	43.69	9.29	52.98	74.00	21.02	201	308	PK
6	4804	34.71	9.29	44.00	54.00	10.00	201	1	AV
7	7206	21.43	12.81	34.24	54.00	19.76	201	176	AV
8	7206	27.26	12.81	40.07	74.00	33.93	201	176	PK
9	9608	27.20	13.32	40.52	74.00	33.48	201	216	PK
10	9608	19.86	13.32	33.18	54.00	20.82	201	229	AV

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2390	36.03	-0.15	35.88	54.00	18.12	203	108	AV
2	2390	43.99	-0.15	43.84	74.00	30.16	203	181	PK
3	2402	83.29	-0.03	83.26			203	35	AV
4	2402	85.67	-0.03	85.64			203	8	PK
5	4804	42.99	9.29	52.28	74.00	21.72	139	281	PK
6	4804	34.75	9.29	44.04	54.00	9.96	139	314	AV
7	7206	21.30	12.81	34.11	54.00	19.89	139	322	AV
8	7206	29.13	12.81	41.94	74.00	32.06	139	322	PK
9	9608	27.30	13.32	40.62	74.00	33.38	139	44	PK
10	9608	20.30	13.32	33.62	54.00	20.38	139	315	AV

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

3DH5-CH 39

Channel	CH 0	**Frequency**	2441MHz
Frequency Range	Above 1G	**Detector Function**	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	4882	42.40	9.84	52.24	74.00	21.76	246	20	PK
2	4882	34.92	9.84	44.76	54.00	9.24	246	54	AV
3	7323	21.49	10.96	32.45	54.00	21.55	246	339	AV
4	7323	28.71	10.96	39.67	74.00	34.33	246	106	PK
5	9764	26.08	13.23	39.31	74.00	34.69	246	180	PK
6	9764	19.98	13.23	33.21	54.00	20.79	246	152	AV

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	4882	34.69	9.84	44.53	54.00	9.47	235	53	AV
2	4882	43.16	9.84	53.00	74.00	21.00	235	260	PK
3	7323	29.48	10.96	40.44	74.00	33.56	235	160	PK
4	7323	21.76	10.96	32.72	54.00	21.28	235	160	AV
5	9764	20.37	13.23	33.60	54.00	20.40	235	320	AV
6	9764	26.62	13.23	39.85	74.00	34.15	235	320	PK

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

3DH5-CH 78

Channel	CH 78	Frequency	2480MHz
Frequency Range	Above 1G	Detector Function	PK/AV

Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2480	88.92	0.33	89.25			239	318	PK
2	2480	87.80	0.32	88.12			239	325	AV
3	2483.5	36.70	0.46	37.16	54.00	16.84	239	332	AV
4	2483.5	44.41	0.46	44.87	74.00	29.13	239	278	PK
5	4960	34.39	10.69	45.08	54.00	8.92	131	22	AV
6	4960	42.76	10.69	53.45	74.00	20.55	131	274	PK
7	7440	29.79	9.75	39.54	74.00	34.46	131	1	PK
8	7440	22.92	9.75	32.67	54.00	21.33	131	219	AV
9	9920	18.46	13.83	32.29	54.00	21.71	131	199	AV
10	9920	26.13	13.83	39.96	74.00	34.04	131	99	PK

Vertical

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	2480	98.46	0.31	98.77			140	359	AV
2	2480	100.03	0.32	100.35			140	357	PK
3	2483.5	38.26	0.46	38.72	54.00	15.28	140	359	AV
4	2483.5	50.36	0.46	50.82	74.00	23.18	140	0	PK
5	4960	34.49	10.69	45.18	54.00	8.82	119	139	AV
6	4960	42.83	10.69	53.52	74.00	20.48	119	52	PK
7	7440	29.19	9.75	38.94	74.00	35.06	119	60	PK
8	7440	23.39	9.75	33.14	54.00	20.86	119	73	AV
9	9920	18.27	13.83	32.10	54.00	21.90	119	33	AV
10	9920	25.68	13.83	39.51	74.00	34.49	119	280	PK

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

3.3 NUMBER OF HOPPING FREQUENCY USED

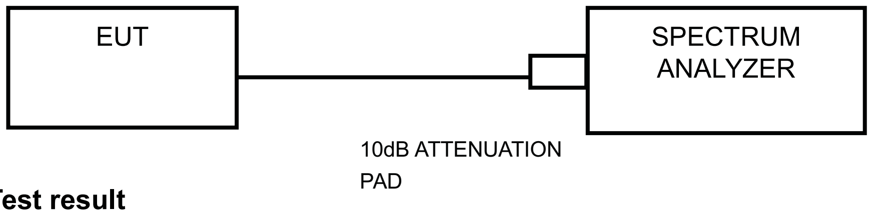
3.3.1 Limits

At least 15 channels frequencies, and should be equally spaced.

3.3.2 Measurement procedure

a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
c. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
d. Set the SA on View mode and then plot the result on SA screen.
e. Repeat above procedures until all frequencies measured were completed.

3.3.3 Test setup



3.3.4 Test result

Refer to Appendix A.

3.4 DWELL TIME ON EACH CHANNEL

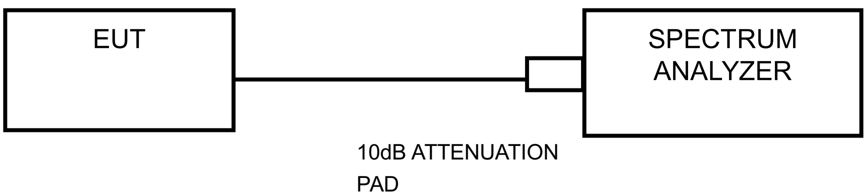
3.4.1 Limits

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.

3.4.2 Measurement procedure

a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
c. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
d. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
e. Repeat above procedures until all different time-slot modes have been completed.

3.4.3 Test setup



3.4.4 Test result

Refer to Appendix A.

3.5 20dB EMISSION BANDWIDTH

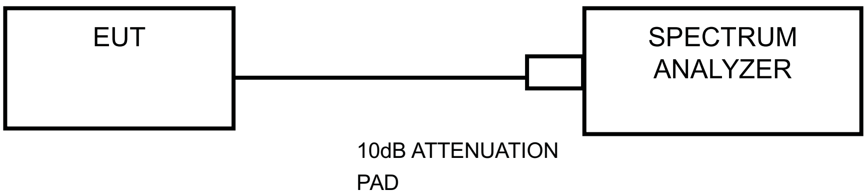
3.5.1 Limits

For frequency hopping system operating in the 2400-2483.5MHz, If the 20dB bandwidth of hopping channel is greater than 25kHz, two-thirds 20dBbandwidth of hopping channel shell be a minimum limit for the hopping channel separation

3.5.2 Measurement procedure

a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
d. Repeat above procedures until all frequencies measured were complete.

3.5.3 Test setup



3.5.4 Test result

Refer to Appendix A.

3.6 HOPPING CHANNEL SEPARATION

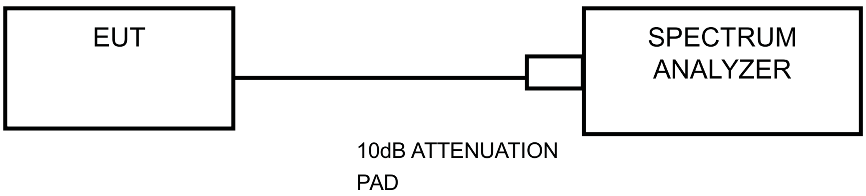
3.6.1 Limits

At least 25kHz or two-third of 20dB hopping channel bandwidth (whichever is greater).

3.6.2 Measurement procedure

a. Span: Wide enough to capture the peaks of two adjacent channels.
b. RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
c. Video (or average) bandwidth (VBW) ⩾ RBW.
d. Sweep: Auto.
e. Detector function: Peak.
f. Trace: Max hold.
g. Allow the trace to stabilize.

3.6.3 Test setup



3.6.4 Test result

Refer to Appendix A.

3.7 CONDUCTED OUTPUT POWER

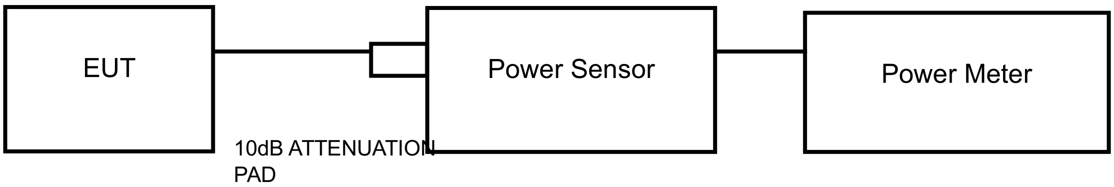
3.7.1 Limits

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.

3.7.2 Measurement procedure

a. A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor and set the detector to PEAK. Record the power level.
b. Anaverage power sensor was used on the output port of the EUT. A power meter was used to read the response of the average power senso and set the detector to AVERAGE. Record the power level.

3.7.3 Test setup



3.7.4 Test result

Refer to Appendix A.

3.8 OUT OF BAND EMISSION MEASUREMENT

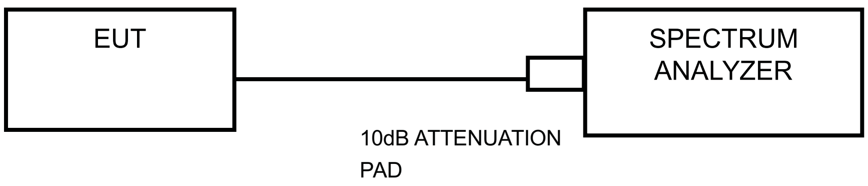
3.8.1 Limits

Below –20dB of the highest emission level of operating band (in 100KHz RBW).

3.8.2 Measurement procedure

The transmitter output was connected to the spectrum analyzer via a low loss cable. of Spectrum Analyzer was set RBW to 100 kHz and VBW to 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. Detector = PEAK and Trace mode = Max Hold. The band edges was measured and recorded.

3.8.3 Test setup



3.8.4 Test result

Refer to Appendix A.

4 PHOTOGRAPHS OF TEST SETUP

Please refer to the attached file (Test Photos).

5 PHOTOGRAPHS OF THE EUT

Please refer to the attached file (External Photos report and Internal Photos).

6 Appendix A

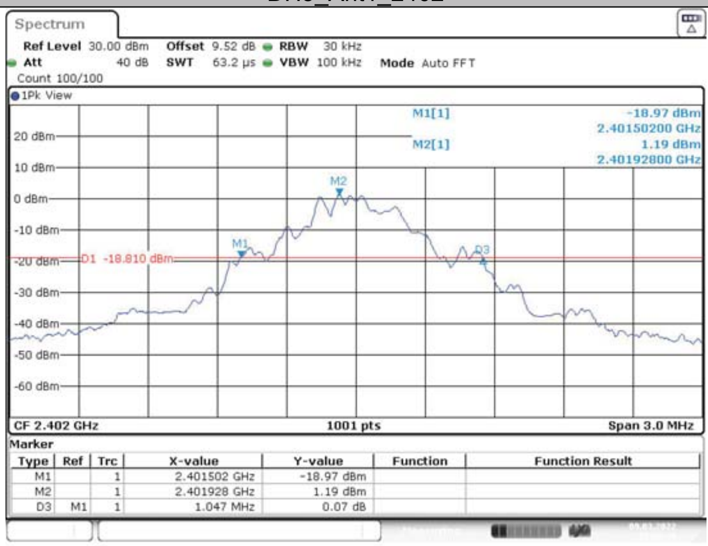
6.1 20dB Emission Bandwidth

6.1.1 Test Result

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	1.05	2401.50	2402.55	---	---
		2441	1.05	2440.51	2441.56	---	---
		2480	1.04	2479.51	2480.56	---	---
2DH5	Ant1	2402	1.36	2401.33	2402.69	---	---
		2441	1.36	2440.33	2441.69	---	---
		2480	1.37	2479.33	2480.70	---	---
3DH5	Ant1	2402	1.31	2401.35	2402.66	---	---
		2441	1.31	2440.36	2441.67	---	---
		2480	1.31	2479.36	2480.68	---	---

6.1.2 Test Graphs

DH5_Ant1_2402

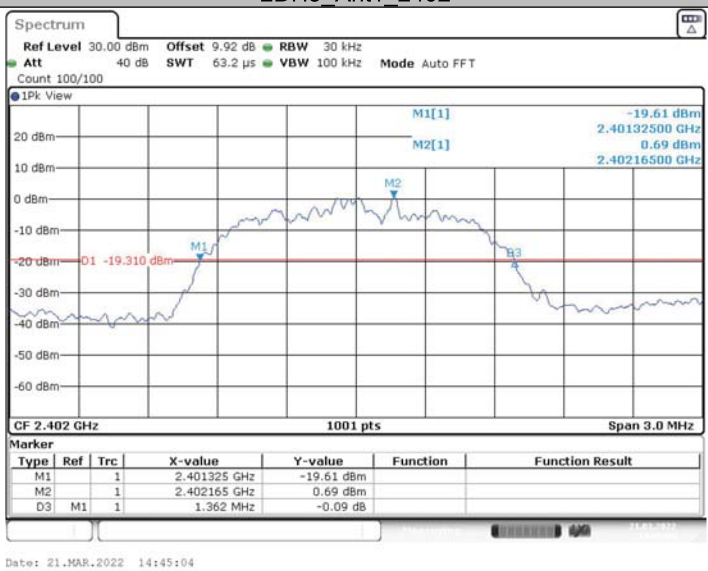


Date: 9.MAR.2022 12:53:18

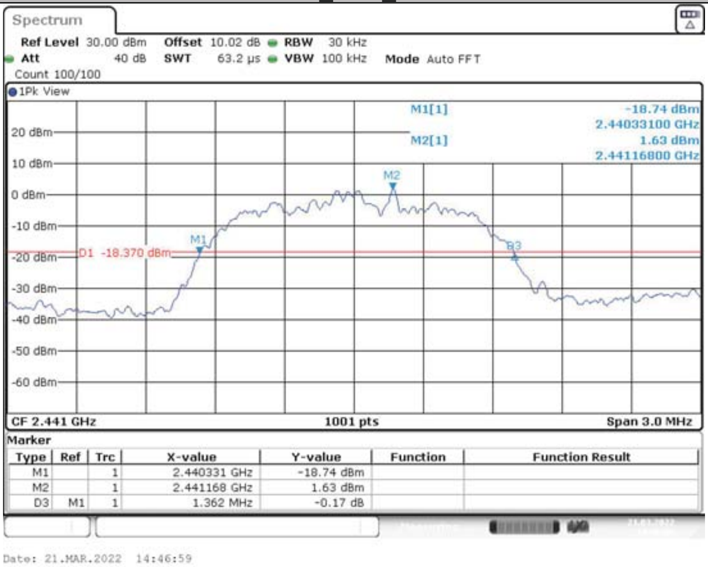
DH5_Ant1_2441

DH5_Ant1_2480

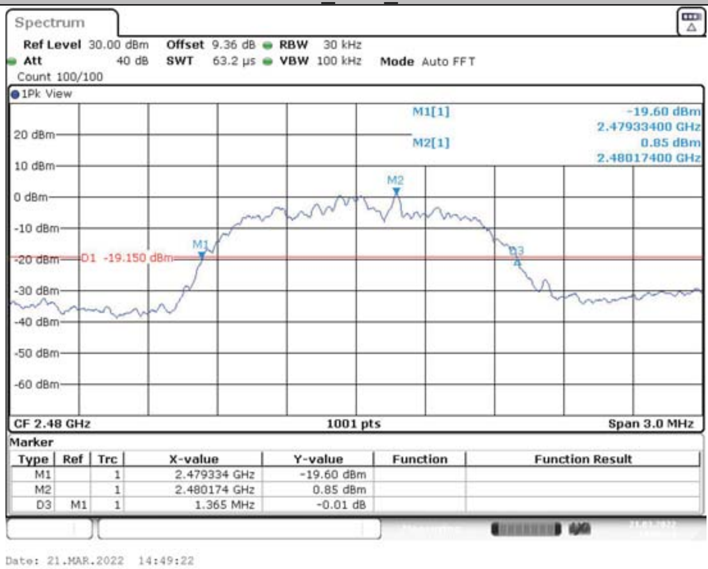
2DH5_Ant1_2402



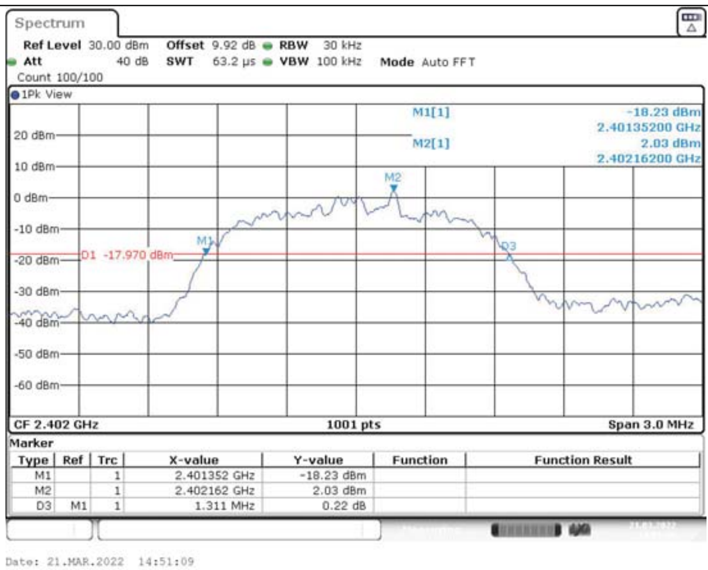
2DH5_Ant1_2441



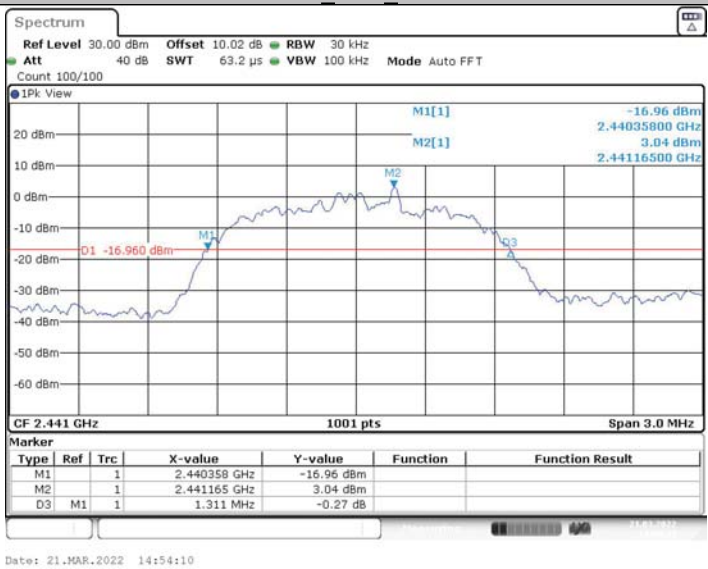
2DH5_Ant1_2480



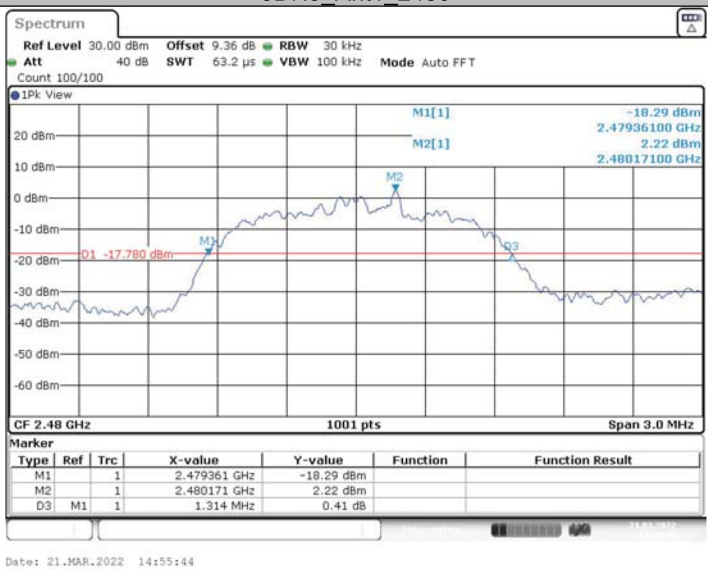
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



6.2 Occupied Channel Bandwidth

6.2.1 Test Result

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.956	2401.538	2402.495	---	---
		2441	0.956	2440.544	2441.500	---	---
		2480	0.956	2479.547	2480.503	---	---
2DH5	Ant1	2402	1.22	2401.401	2402.620	---	---
		2441	1.22	2440.407	2441.626	---	---
		2480	1.232	2479.410	2480.641	---	---
3DH5	Ant1	2402	1.211	2401.401	2402.611	---	---
		2441	1.214	2440.404	2441.617	---	---
		2480	1.226	2479.404	2480.629	---	---

6.2.2 Test Graphs

DH5_Ant1_2402

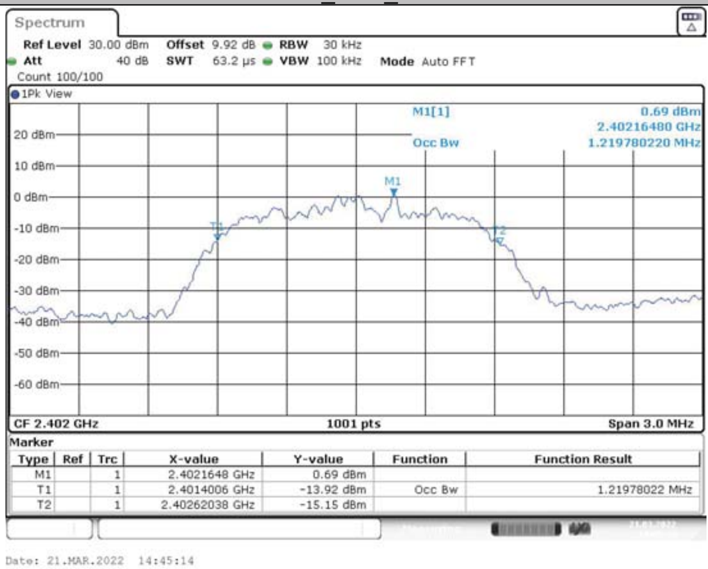
Date: 9.MAR.2022 12:53:31

DH5_Ant1_2441

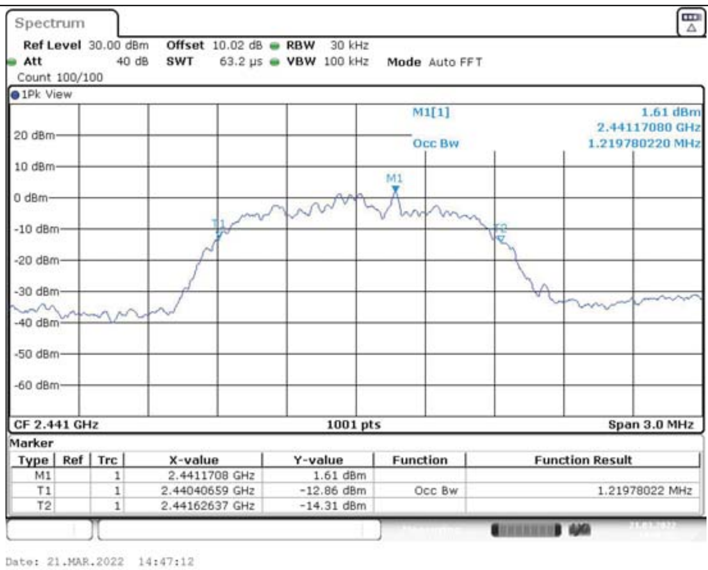
Date: 9.MAR.2022 12:56:07

DH5_Ant1_2480

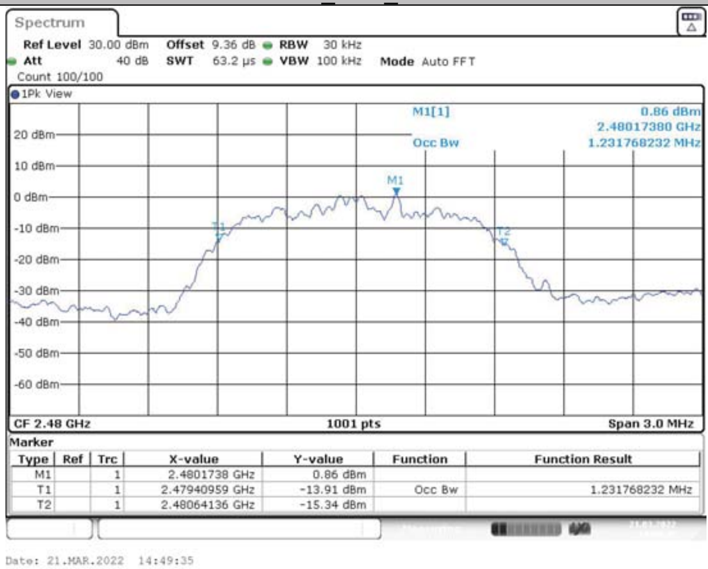
2DH5_Ant1_2402



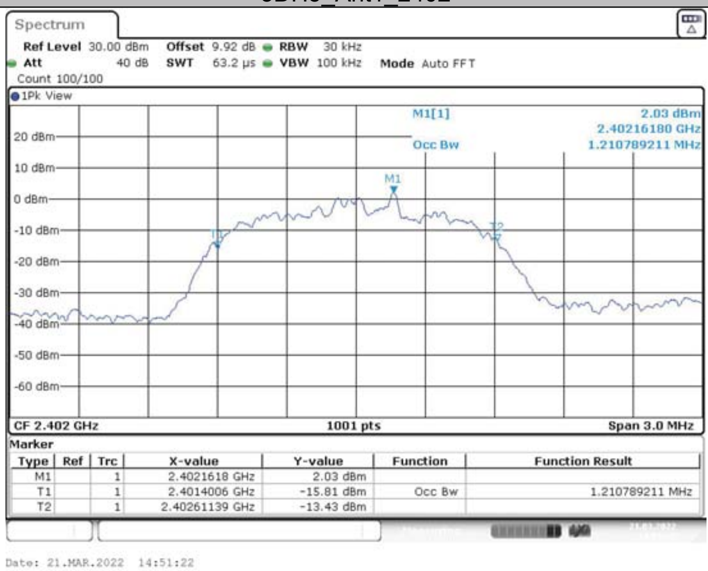
2DH5_Ant1_2441



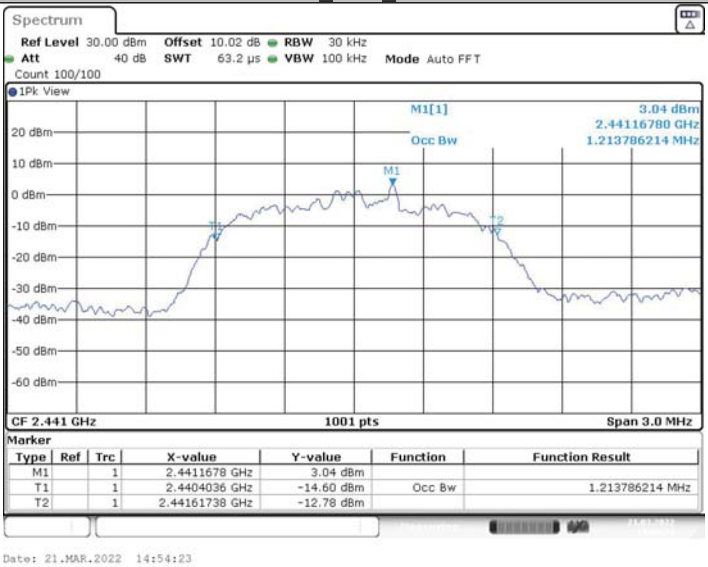
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

6.3 Conducted Output Power

6.3.1 Test Result

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Powert[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	2.82	≤20.97	PASS
		2441	4.41	≤20.97	PASS
		2480	3.06	≤20.97	PASS
2DH5	Ant1	2402	2.79	≤20.97	PASS
		2441	4.46	≤20.97	PASS
		2480	3.06	≤20.97	PASS
3DH5	Ant1	2402	2.8	≤20.97	PASS
		2441	4.44	≤20.97	PASS
		2480	3.01	≤20.97	PASS

Test Mode	Antenna	Frequency[MHz]	AV Powert[dBm]
DH5	Ant1	2402	2.11
		2441	3.01
		2480	2.33
2DH5	Ant1	2402	1.53
		2441	1.71
		2480	1.52
3DH5	Ant1	2402	1.44
		2441	1.65
		2480	1.34

6.4 Hopping Channel Separation

6.4.1 Test Result

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.013	≥0.940	PASS
2DH5	Ant1	Hop	1.001	≥0.900	PASS
3DH5	Ant1	Hop	1.013	≥0.900	PASS

6.4.2 Test Graphs

DH5_Ant1_Hop

2DH5_Ant1_Hop

3DH5_Ant1_Hop

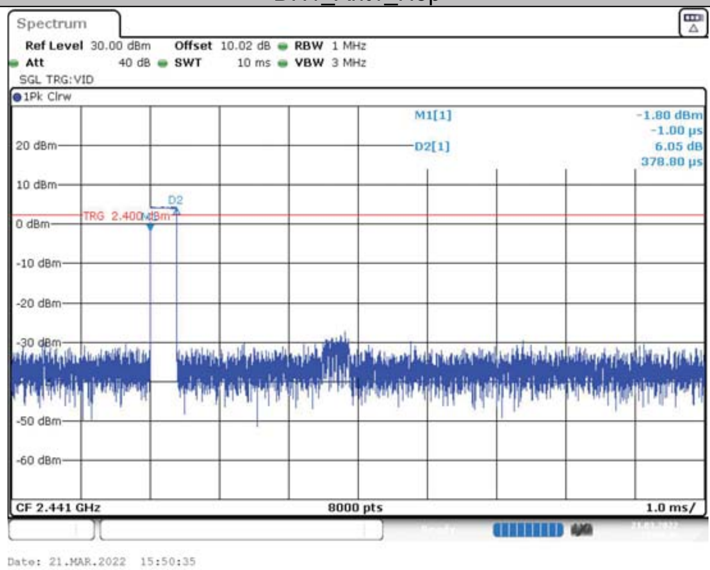
6.5 Dell Time of Each Channel

6.5.1 Test Result

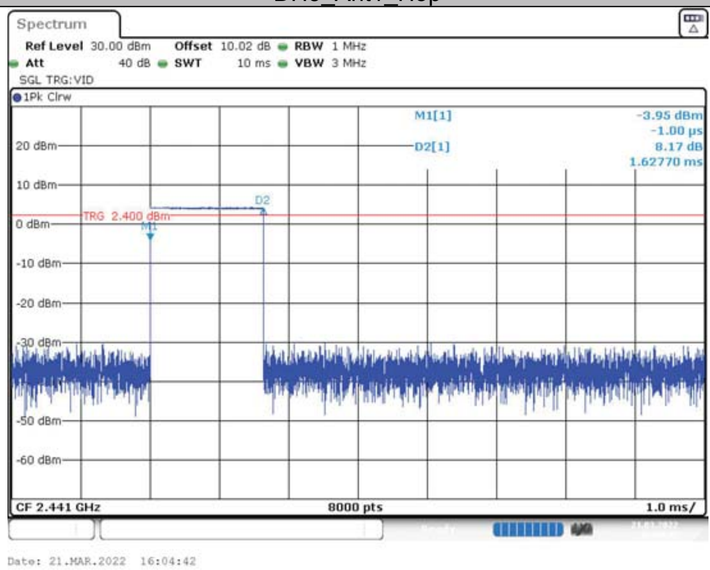
TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.38	320	0.121	≤0.4	PASS
DH3	Ant1	Hop	1.63	160	0.26	≤0.4	PASS
DH5	Ant1	Hop	2.87	106.67	0.306	≤0.4	PASS
2DH1	Ant1	Hop	0.38	320	0.122	≤0.4	PASS
2DH3	Ant1	Hop	1.63	160	0.261	≤0.4	PASS
2DH5	Ant1	Hop	2.87	106.67	0.306	≤0.4	PASS
3DH1	Ant1	Hop	0.39	320	0.124	≤0.4	PASS
3DH3	Ant1	Hop	1.63	160	0.261	≤0.4	PASS
3DH5	Ant1	Hop	2.87	106.67	0.306	≤0.4	PASS

6.5.2 Test Graphs

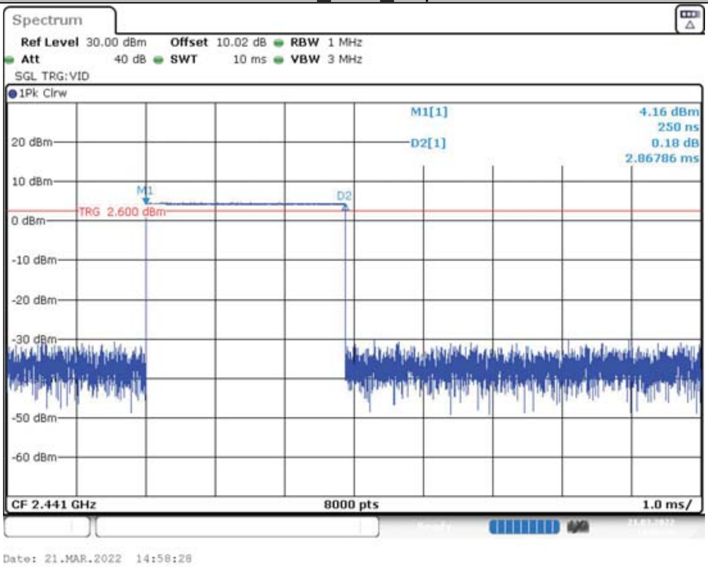
DH1_Ant1_Hop



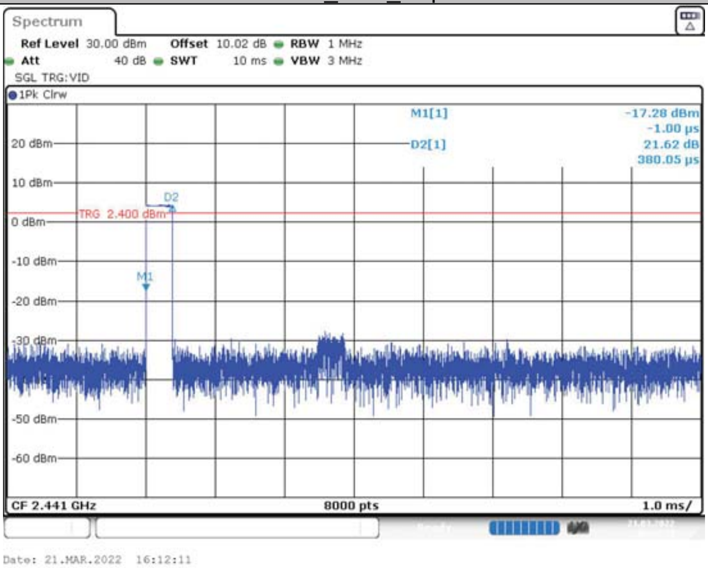
DH3_Ant1_Hop



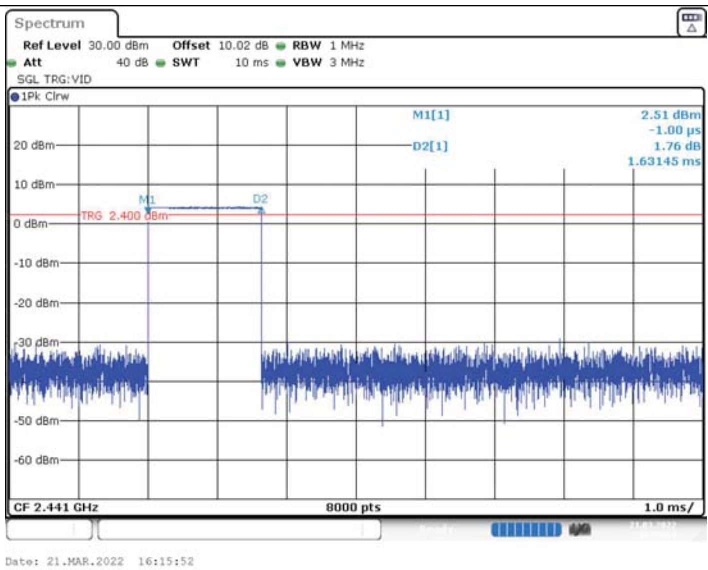
DH5_Ant1_Hop



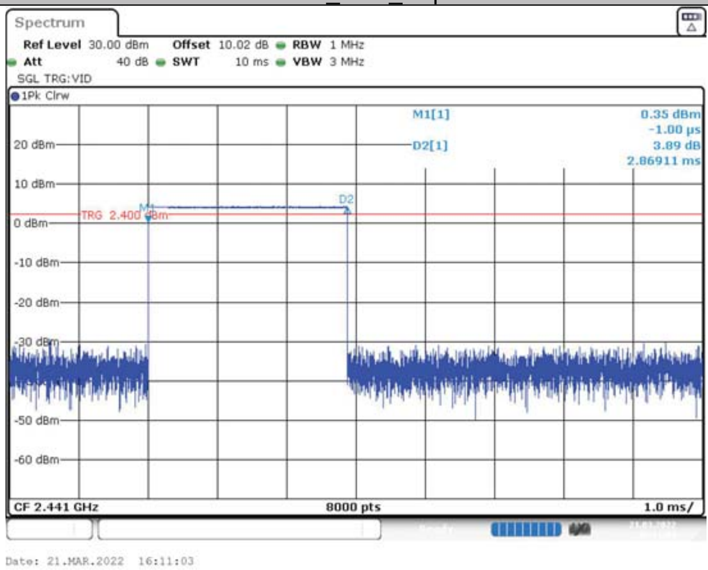
2DH1_Ant1_Hop



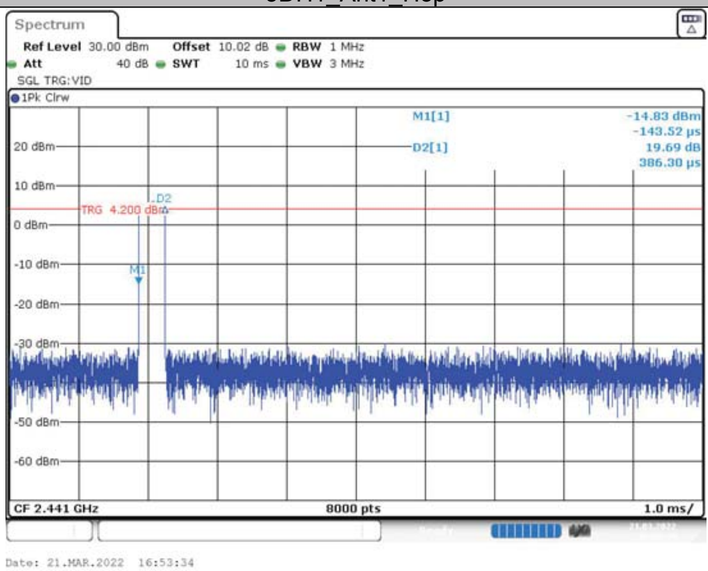
2DH3_Ant1_Hop



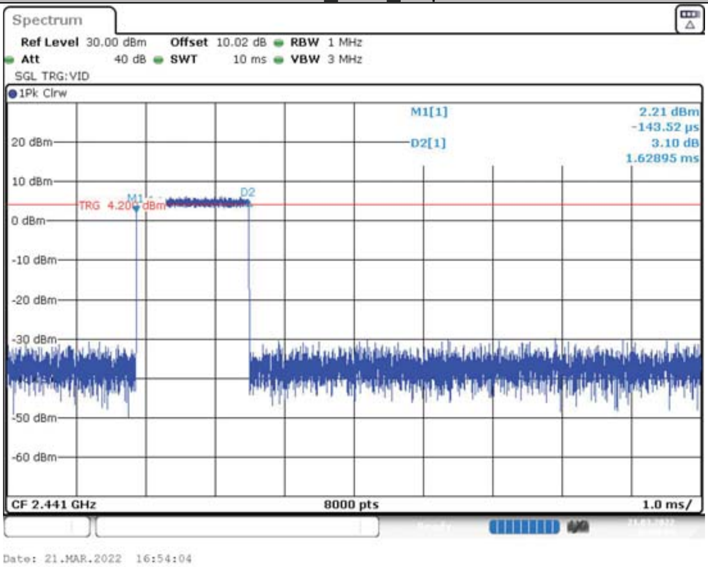
2DH5_Ant1_Hop



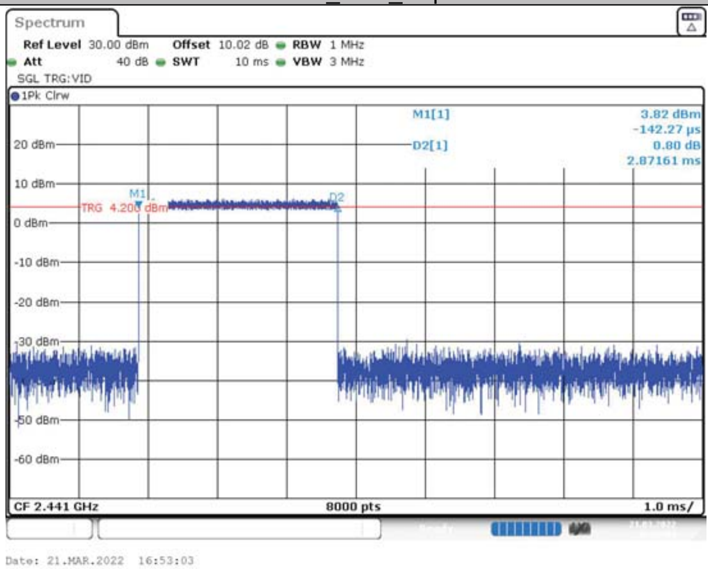
3DH1_Ant1_Hop



3DH3_Ant1_Hop



3DH5_Ant1_Hop



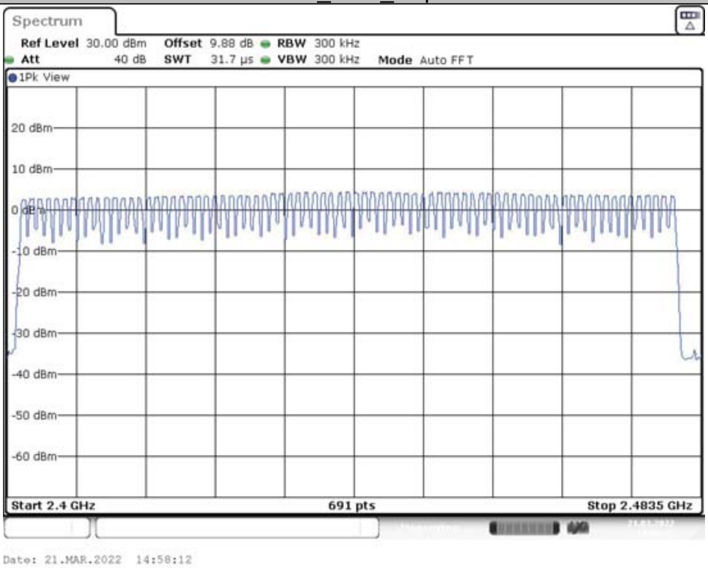
6.6 Number of hopping channels

6.6.1 Test Result

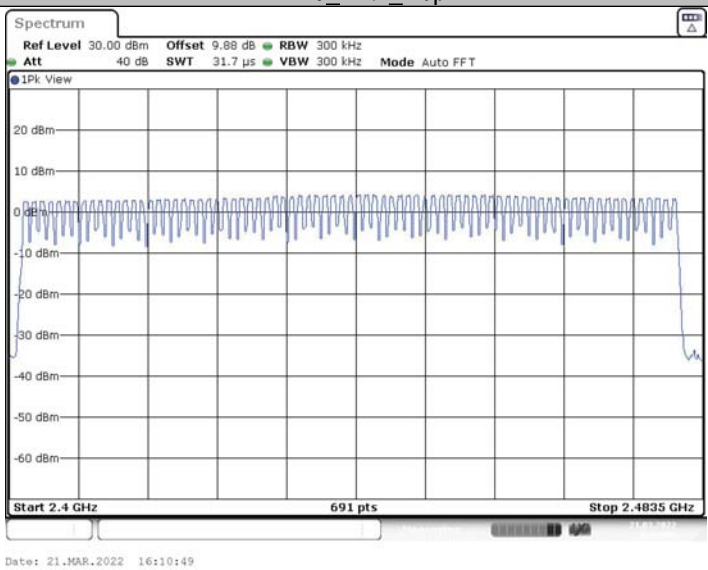
TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

6.6.2 Test Graphs

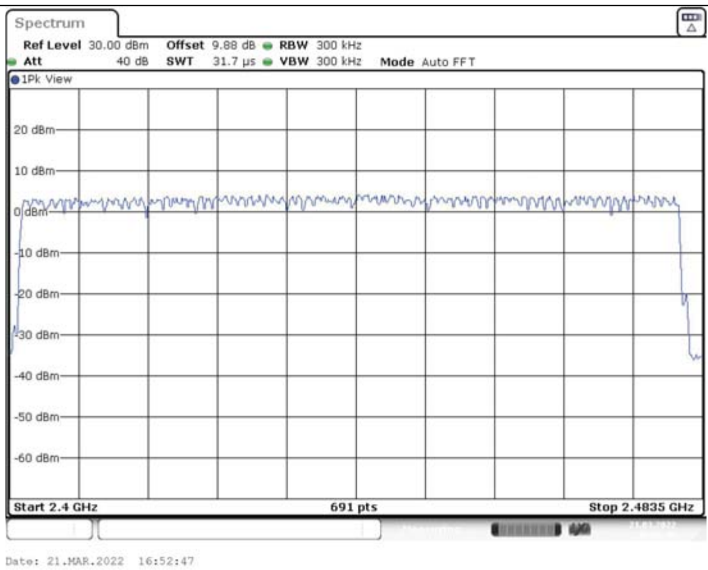
DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop


Spectrum
Ref Level 30.00 dBm Offset 9.88 dB RBW 300 kHz
Att 40 dB SWT 31.7 µs VBW 300 kHz Mode Auto FFT
1Pk View
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
Start 2.4 GHz
691 pts
Stop 2.4835 GHz
Date: 21.MAR.2022 16:52:47

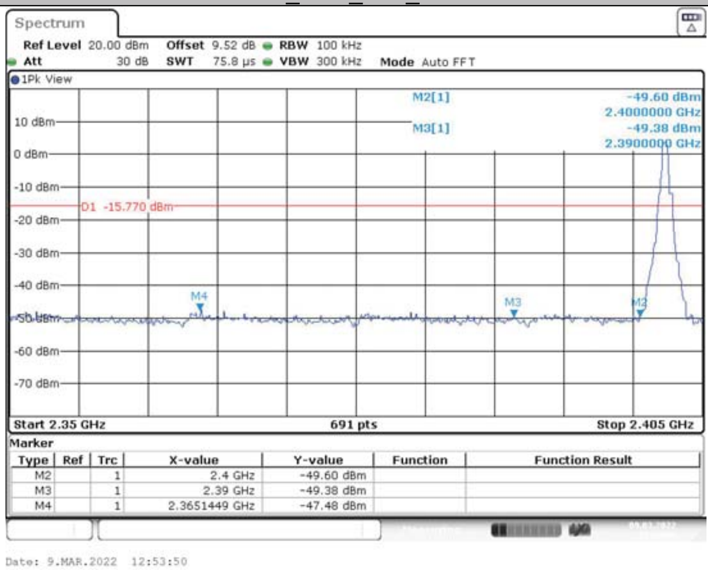
6.7 Band edge measurements

6.7.1 Test Result

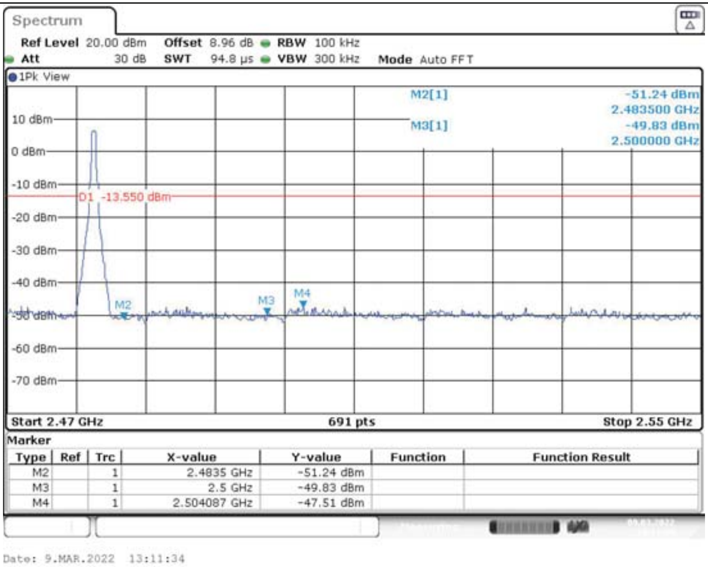
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	4.23	-47.48	≤-15.77	PASS
		High	2480	6.45	-47.51	≤-13.55	PASS
		Low	Hop_2402	2.21	-47.76	≤-17.79	PASS
		High	Hop_2480	2.24	-47.44	≤-17.76	PASS
2DH5	Ant1	Low	2402	3.30	-45.99	≤-16.70	PASS
		High	2480	3.41	-47.60	≤-16.59	PASS
		Low	Hop_2402	1.84	-48.62	≤-18.16	PASS
		High	Hop_2480	3.03	-46.73	≤-16.97	PASS
3DH5	Ant1	Low	2402	3.39	-47.16	≤-16.61	PASS
		High	2480	3.54	-46.39	≤-16.46	PASS
		Low	Hop_2402	1.41	-47.78	≤-18.59	PASS
		High	Hop_2480	3.06	-47.55	≤-16.94	PASS

6.7.2 Test Graphs

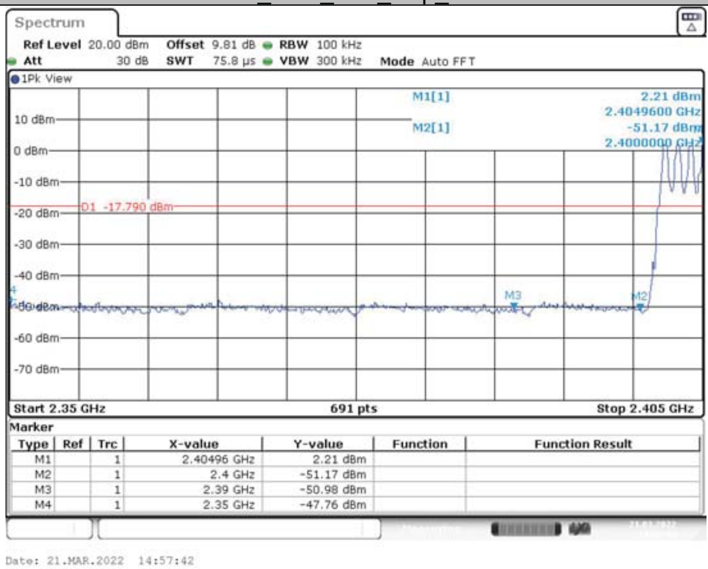
DH5_Ant1_Low_2402



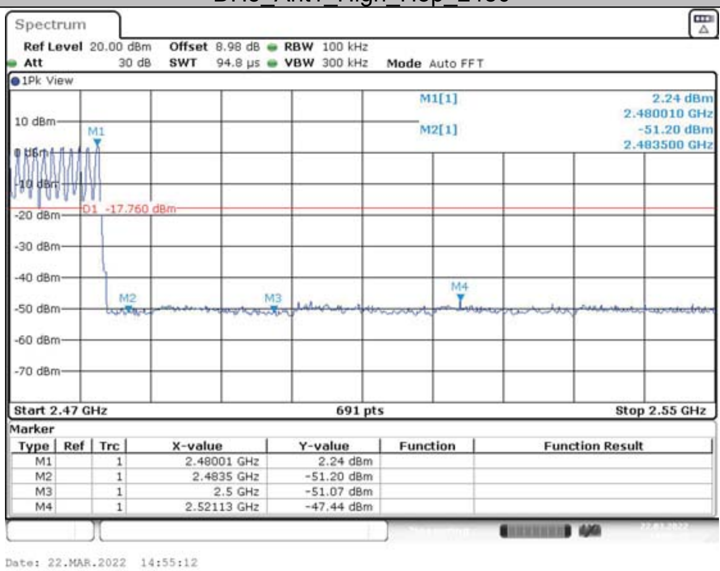
DH5_Ant1_High_2480

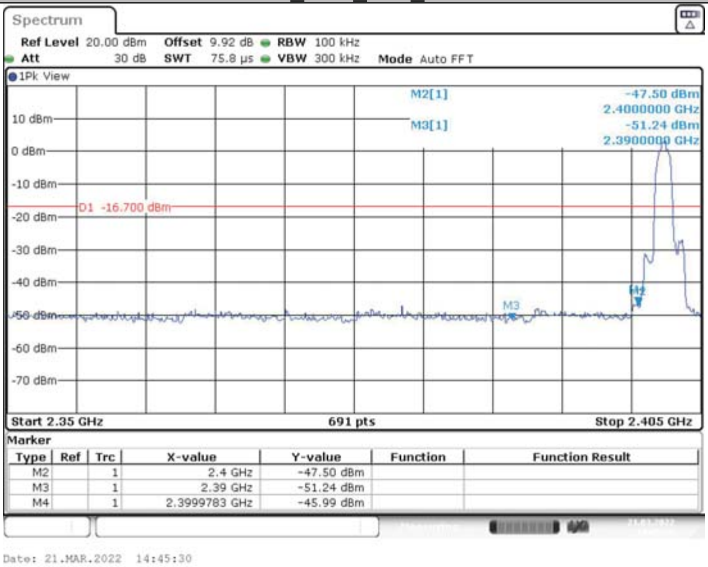
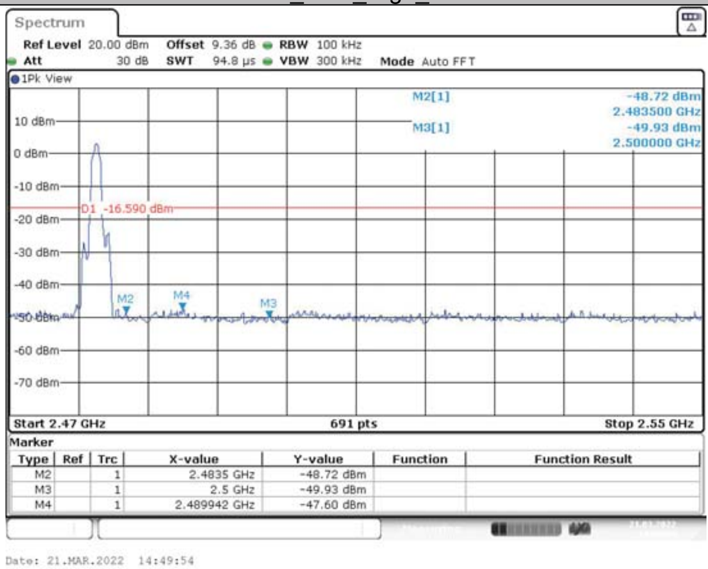


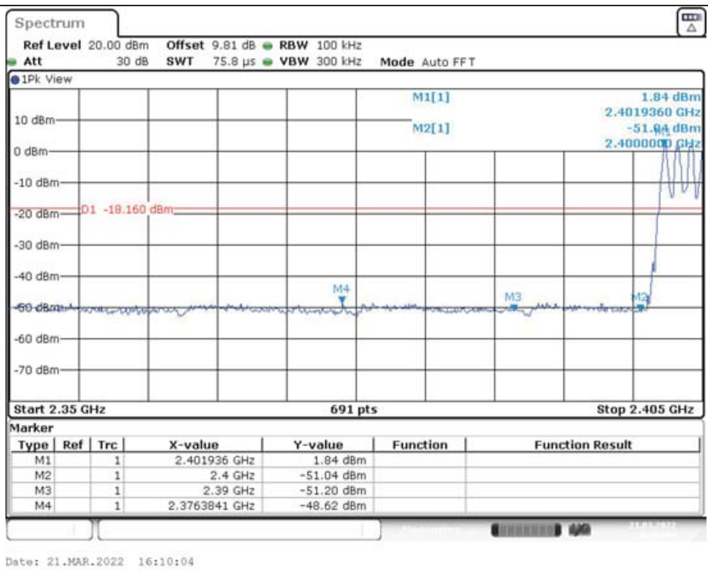
DH5_Ant1_Low_Hop_2402



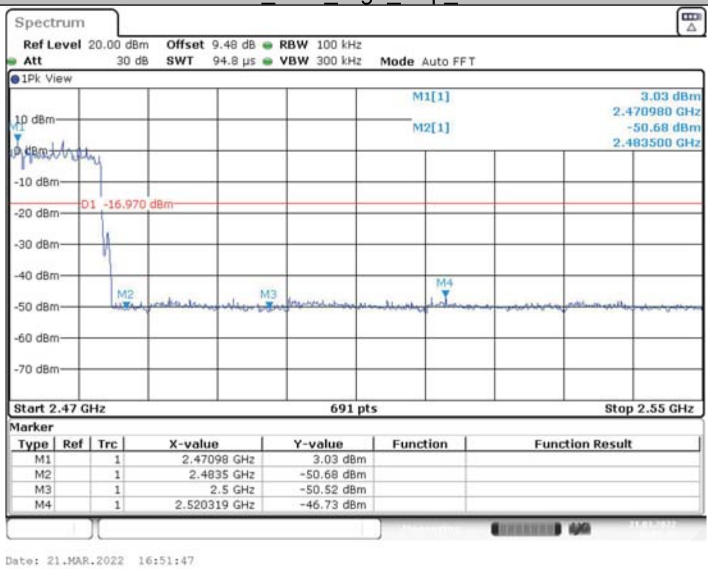
DH5_Ant1_High_Hop_2480



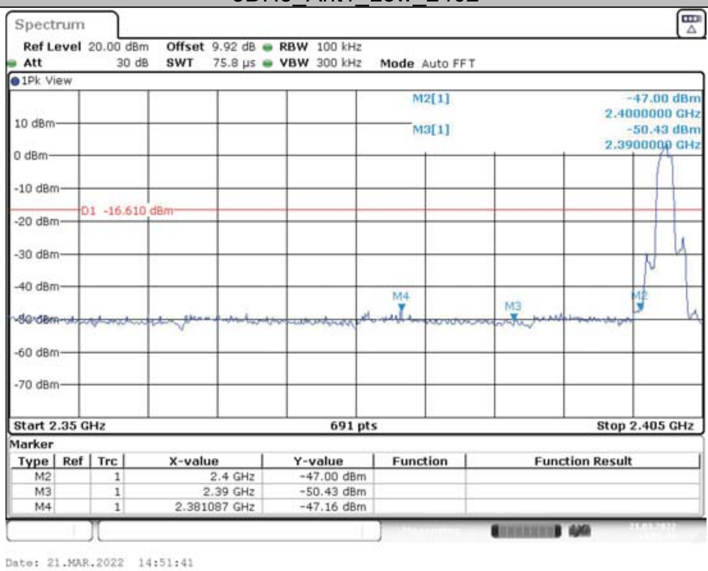
2DH5_Ant1_Low_2402

2DH5_Ant1_High_2480

2DH5_Ant1_Low_Hop_2402



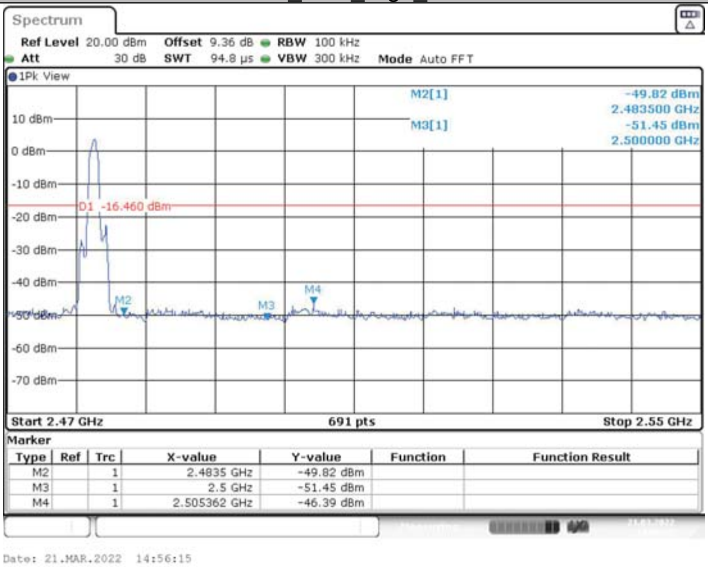
2DH5_Ant1_High_Hop_2480



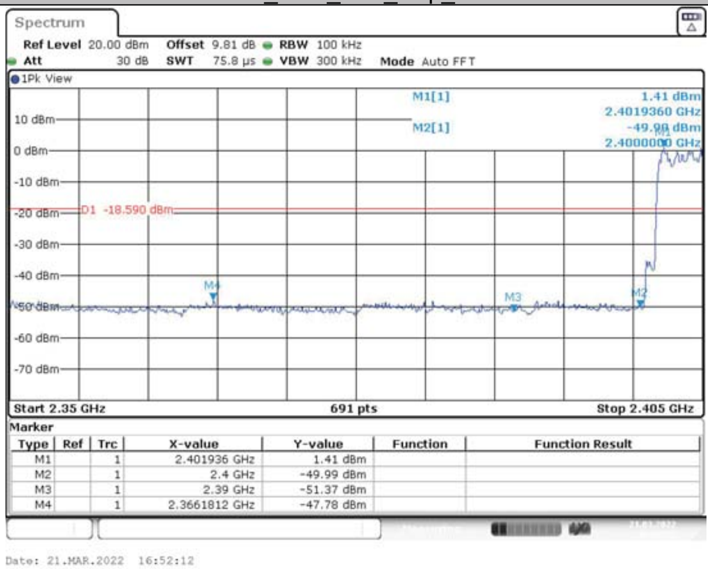
3DH5_Ant1_Low_2402



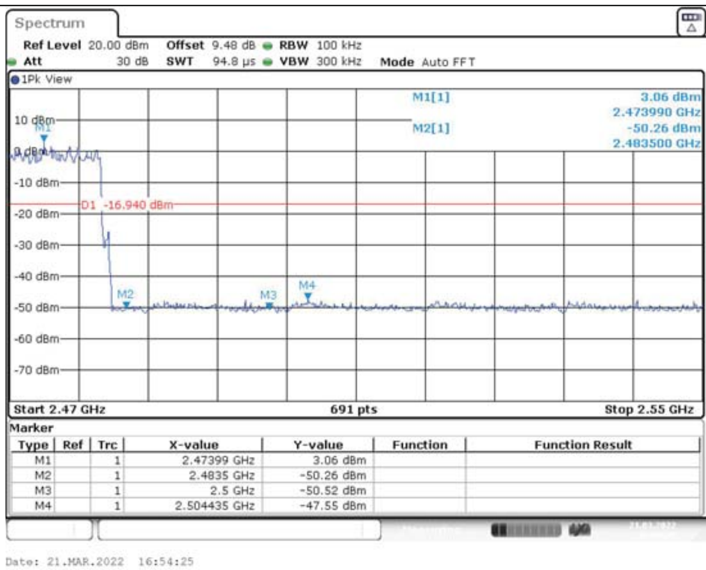
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



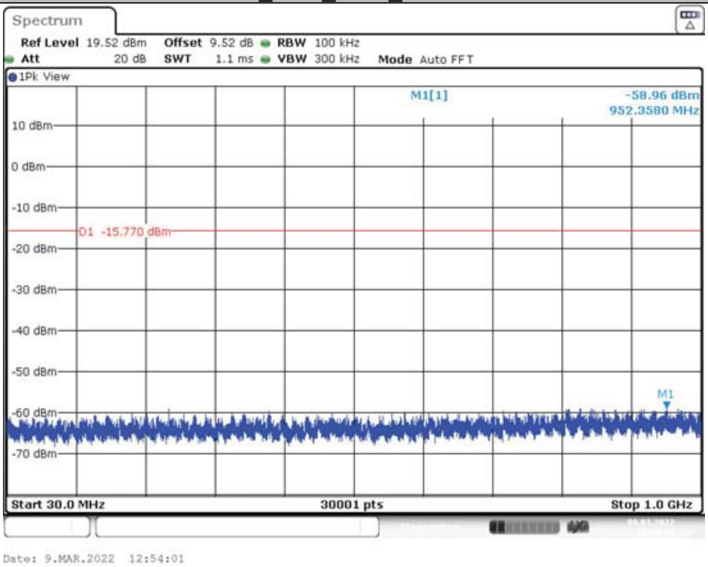
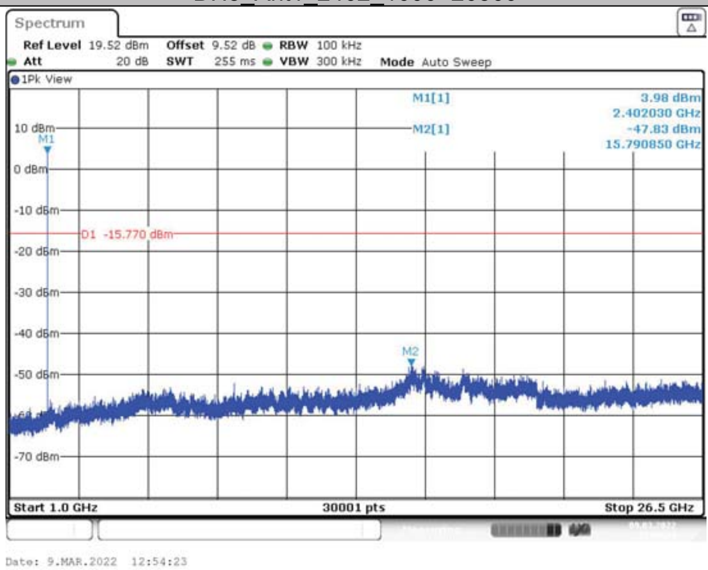
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47399 GHz	3.06 dBm		
M2		1	2.4835 GHz	-50.26 dBm		
M3		1	2.5 GHz	-50.52 dBm		
M4		1	2.504435 GHz	-47.55 dBm		

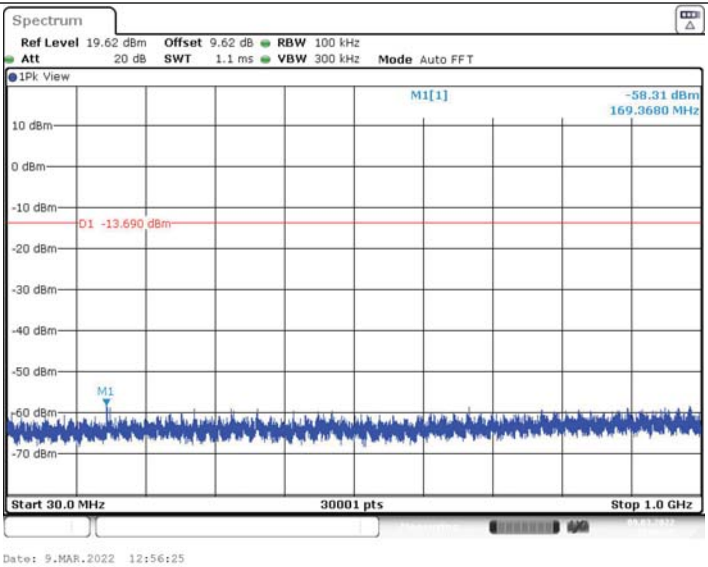
6.8 Out of band Emission Measurement

6.8.1 Test Result

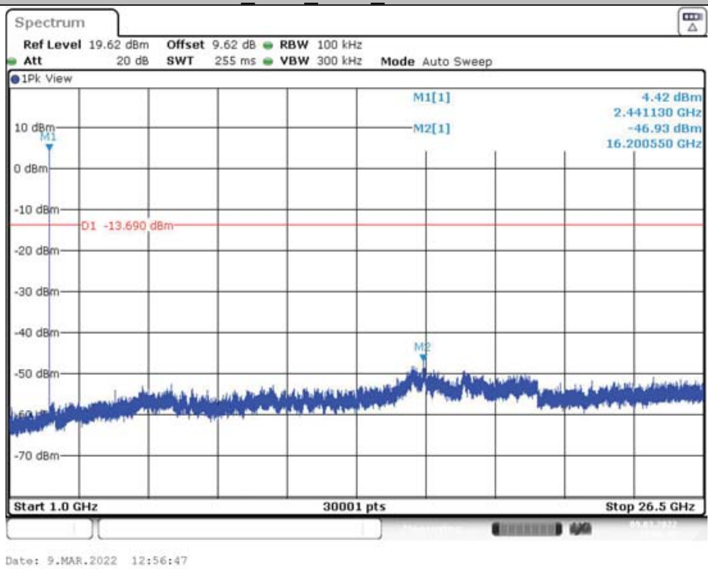
TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	30~1000	4.23	-58.96	≤-15.77	PASS
			1000~26500	4.23	-47.83	≤-15.77	PASS
		2441	30~1000	6.31	-58.31	≤-13.69	PASS
			1000~26500	6.31	-46.93	≤-13.69	PASS
		2480	30~1000	6.45	-58.67	≤-13.55	PASS
			1000~26500	6.45	-48.32	≤-13.55	PASS
2DH5	Ant1	2402	30~1000	3.30	-57.57	≤-16.7	PASS
			1000~26500	3.30	-48.2	≤-16.7	PASS
		2441	30~1000	4.23	-57.71	≤-15.77	PASS
			1000~26500	4.23	-46.91	≤-15.77	PASS
		2480	30~1000	3.41	-58.4	≤-16.59	PASS
			1000~26500	3.41	-48.06	≤-16.59	PASS
3DH5	Ant1	2402	30~1000	3.39	-58.21	≤-16.61	PASS
			1000~26500	3.39	-46.98	≤-16.61	PASS
		2441	30~1000	4.39	-57.93	≤-15.61	PASS
			1000~26500	4.39	-47.3	≤-15.61	PASS
		2480	30~1000	3.54	-58.2	≤-16.46	PASS
			1000~26500	3.54	-48.49	≤-16.46	PASS

6.8.2 Test Graphs

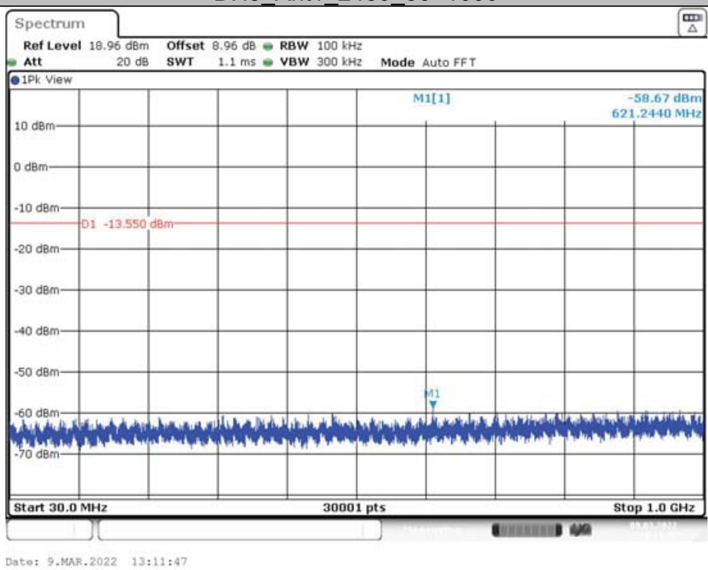
DH5_Ant1_2402_30~1000

DH5_Ant1_2402_1000~26500

DH5_Ant1_2441_30~1000



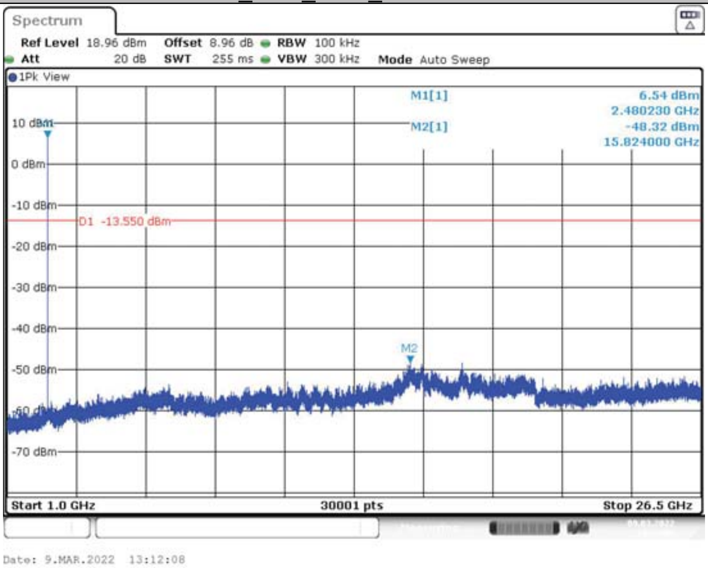
DH5_Ant1_2441_1000~26500



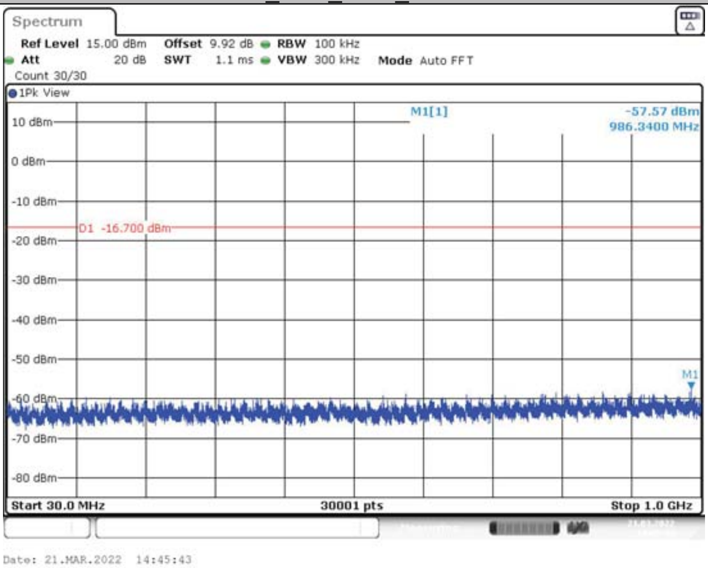
DH5_Ant1_2480_30~1000



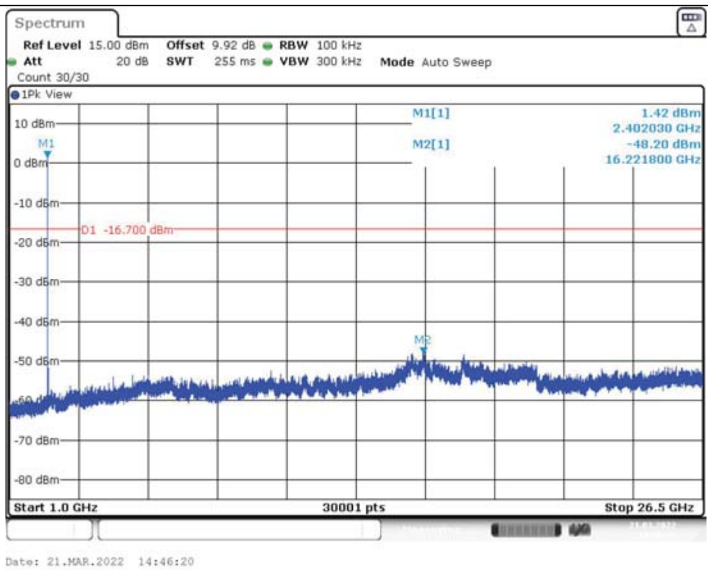
DH5_Ant1_2480_1000~26500



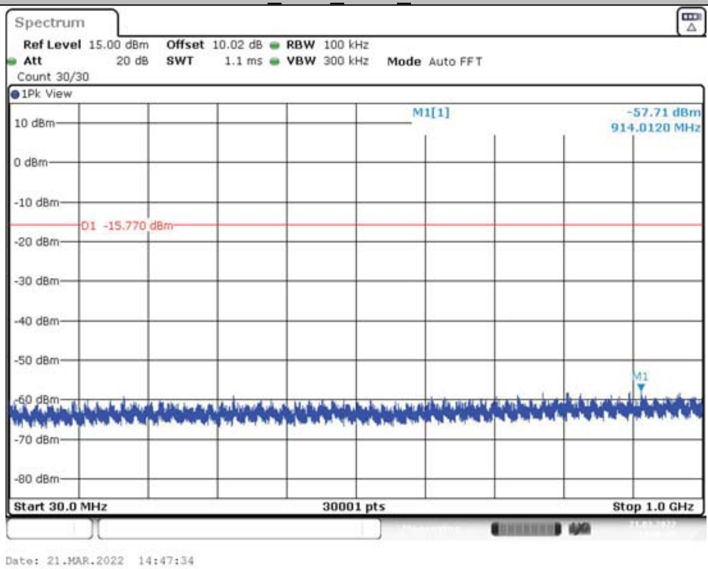
2DH5_Ant1_2402_30~1000



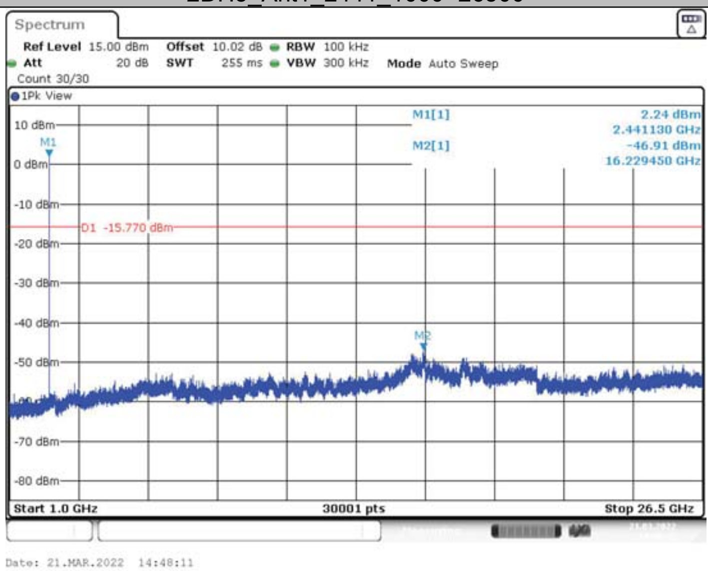
2DH5_Ant1_2402_1000~26500



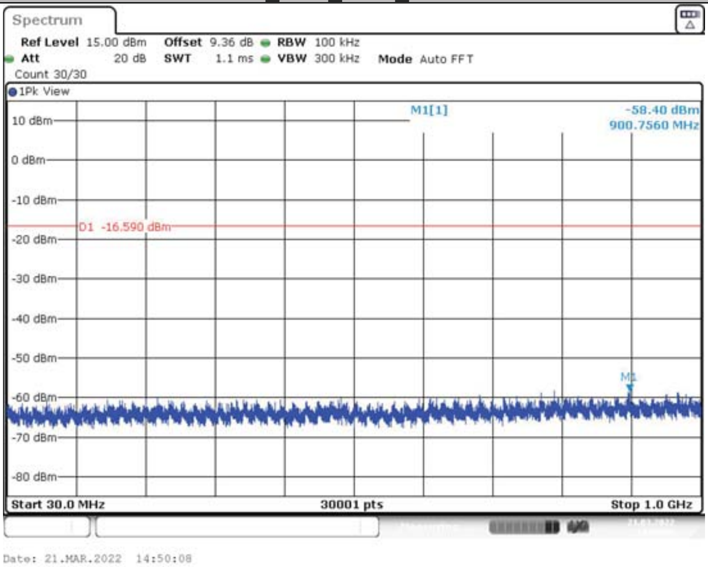
2DH5_Ant1_2441_30~1000



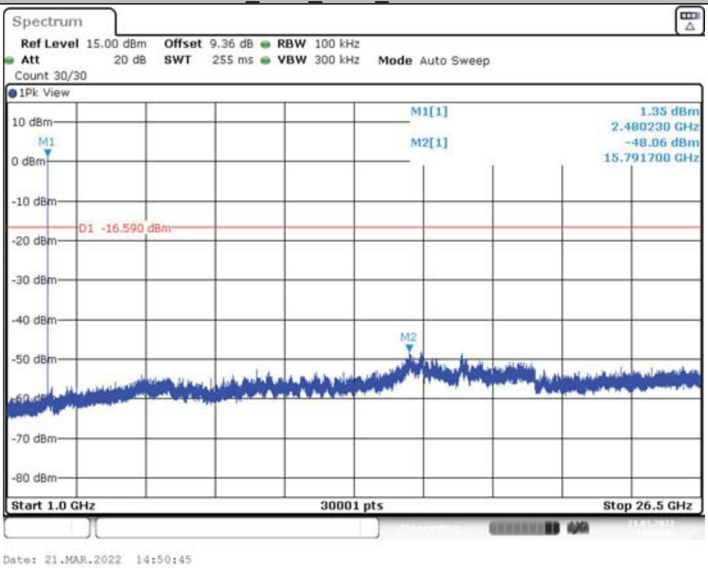
2DH5_Ant1_2441_1000~26500



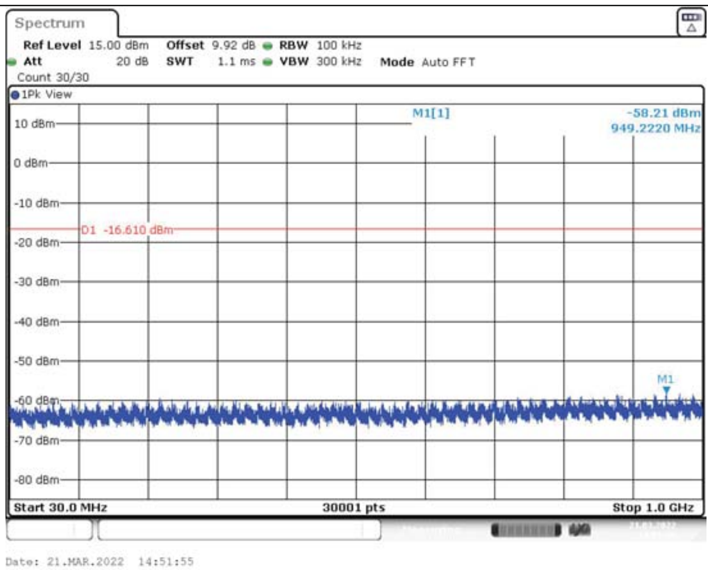
2DH5_Ant1_2480_30~1000



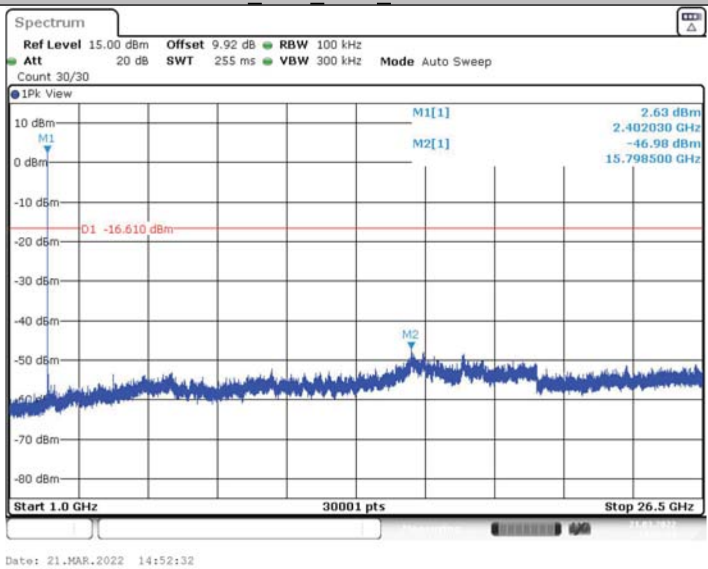
2DH5_Ant1_2480_1000~26500



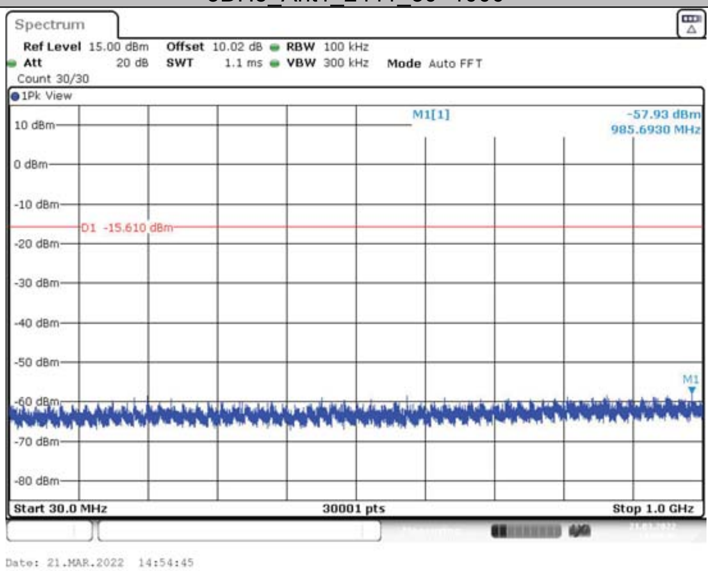
3DH5_Ant1_2402_30~1000



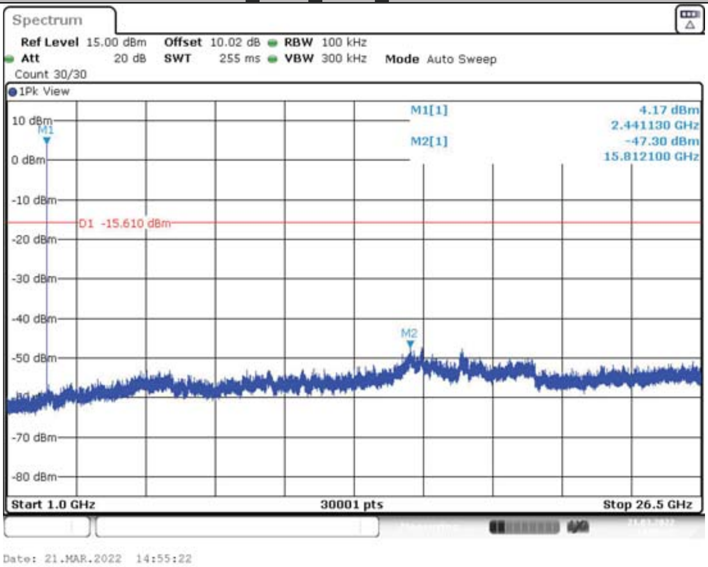
3DH5_Ant1_2402_1000~26500



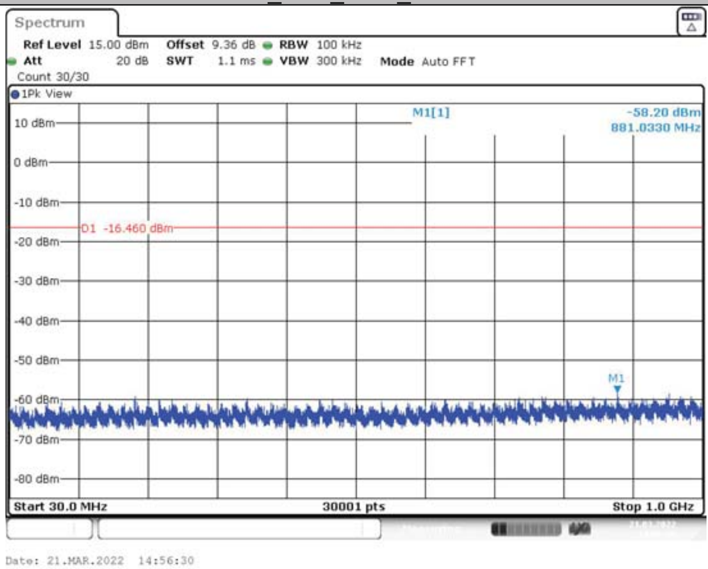
3DH5_Ant1_2441_30~1000



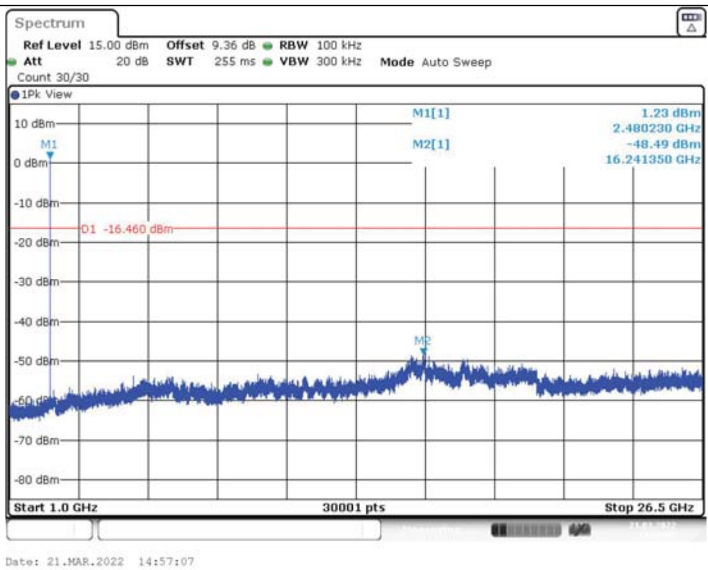
3DH5_Ant1_2441_1000~26500



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500


Spectrum
Ref Level 15.00 dBm Offset 9.36 dB RBW 100 kHz
Att 20 dB SWT 255 ms VBW 300 kHz Mode Auto Sweep
Count 30/30
1Pk View
M1[1] 1.23 dBm
2.480230 GHz
M2[1] -48.49 dBm
16.241350 GHz
10 dBm
0 dBm
-10 dBm
D1 -16.460 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
M2
Start 1.0 GHz
30001 pts
Stop 26.5 GHz
Date: 21.MAR.2022 14:57:07

Important

(1) The test report is valid with the official seal of the laboratory and the signatures of Test engineer, Author and Reviewer simultaneously.

(2) The test report is invalid if altered.

(3) Any photocopies or part photocopies in the test report are forbidden without the written permission from the laboratory.

(4) Objections to the test report must be submitted to the laboratory within 15 days.

(5) Generally, commission test is responsible for the tested samples only.

Address of the laboratory:
CVC Testing Technology Co., Ltd.
Address: No.3,TiantaiyiRoad,KaitaiAvenue,ScienceCity,Guangzhou,China
Post Code：510663 Tel：020-32293888
FAX：020-32293889 E-mail：office@cvc.org.cn