




시험 성적서

TEST REPORT

페이지(page) : (1) / (총(Total) 84)

성적서 번호 Report No.		ICRT-TR-E220814-0A	
신청자 Client	기관명 Name	PITASOFT CO.,LTD.	
	주소 Address	A4th floor, ABN Tower, 331, Pangyo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea	
시험대상품목 Sample description		Car Dashcam	
모델명 Type designation		BlackVue 7 LTE	
정격 Ratings		DC 12.0 V / DC 24.0 V	
시험장소 Place of test		<input checked="" type="checkbox"/> 고정시험(Inside test) <input type="checkbox"/> 현장시험(Field test) 주소지(Address): 112, 113 Hwanggeum 3-ro 7beon-gil, Hagun-ri, Yangchon-eup, Gimpo-si, Gyeonggi-do, Korea	
시험기간 Date of test		01.Mar. 2022 ~ 29. Mar. 2022	
시험방법/항목 Test Method/Item		FCC Part 15 Subpart C §15.247	
시험결과 Test Results		Refer to 3. Test Summary	
확인 Affirmation	작성자 Tested by	기술책임자 Technical Manager	
	성명 Name	성명 Name	성명 Name
		Yeong-Hwan, Hong (Signature)	Min-Gi, Son (Signature)
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Revision History

Issued Report No.	Issued Date	Revisions	Effect Section
ICRT-TR-E220814-0A	06-Apr-2022	Initial Issue	All



1. Applicant & Manufacturer & Test Laboratory Information

1.1 Applicant information

Applicant	PITTASOFT CO.,LTD.
Address	A4th floor, ABN Tower, 331, Pangyo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea
Contact Person	MINHO SHIN
Telephone No.	+ 82-31-8039-7789
Fax No.	+ 82-31-8039-5260
E-mail	shinmh@pittasoft.com

1.2 Manufacturer Information

Manufacturer	PITTASOFT CO.,LTD.
Address	A4th floor, ABN Tower, 331, Pangyo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

1.3 Test Laboratory Information

Conducted tests were performed at	
Laboratory	ICR Co., Ltd.
Address	112, Hwanggeum 3-ro 7beon-gil, Hagun-ri, Yangchon-eup, Gimpo-si, Gyeonggi-do, Korea
Telephone No.	+82-2-6351-9002
Fax No.	+82-2-6351-9007
RRA No.	KR0165
KOLAS No.	KT652
Test Firm Registration Number	490614



2. Equipment under Test(EUT) Information

2.1 General Information

Product Name	Car Dashcam
Brand Name	-
Model Name	BlackVue 7 LTE
Additional Model Name	BlackVue 7-1CH LTE, BlackVue 7-2CH LTE, BlackVue 7-2CH IR LTE, BlackVue 7-2CH DMS LTE , BlackVue 7-2CH Truck LTE, BlackVue 7-2CH ELD LTE
FCC ID	YCK-BV7LTE
Power Supply	DC 12.0 V / DC 24.0 V

2.2 Additional Information

Equipment Class	DSS - Frequency Hopping Spread Spectrum systems
Device Type	Stand-alone
Operating Frequency	2 402 MHz ~ 2 480 MHz
RF Output Power	3.08 dBm
Number of Channel	79
Modulation Type	GFSK / $\pi/4$ -DQPSK / 8DPSK
Antenna Type	Chip Antenna
Antenna Gain	1.88 dBi
Antenna Operating Mode	Single Antenna Equipment with only one antenna

2.3 Test Frequency

Test mode	Test frequency (MHz)		
	Lowest frequency	Middle frequency	High frequency
GFSK	2 402	2 441	2 480
$\pi/4$ -DQPSK	2 402	2 441	2 480
8DPSK	2 402	2 441	2 480

2.4 Worst-Case

BDR	DH5(GFSK)
EDR	3-DH5(8DPSK)

Note: The power measurement has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.



2.5 Mode of operation during the test

- The EUT is continuous transmission mode during the test with set at Low Channel, Middle Channel, and High Channel. To get a maximum radiated emission levels from the EUT, the EUT was moved throughout the XY, YZ, XZ planes.

2.6 Modifications of EUT

- None



3. Test Summary

3.1 Test standards and results

FCC Part 15 Subpart C			
Clause	Test items	Applied	Results
§15.247 (a)(1)(i)	20 dB Bandwidth & 99 % Bandwidth	<input checked="" type="checkbox"/>	PASS
§15.247 (a)(1)	Carrier Frequency Separation	<input checked="" type="checkbox"/>	PASS
§15.247 (a)(1) (iii)	Number of Hopping Frequencies	<input checked="" type="checkbox"/>	PASS
§15.247 (a)(1) (iii)	Time of Occupancy (dwell Time)	<input checked="" type="checkbox"/>	PASS
§15.247 (a)(1)	Output Power	<input checked="" type="checkbox"/>	PASS
§15.247 (d)	Conducted Spurious Emission & Band edge (Non-Restricted band)	<input checked="" type="checkbox"/>	PASS
§15.209 & §15.205	Radiated Spurious Emission(Restricted band)	<input checked="" type="checkbox"/>	PASS
§15.207	Power Line Conducted Emission	<input checked="" type="checkbox"/>	PASS

3.2 Purpose of the test

- To determine whether the equipment under test fulfills the requirements of the standards stated in FCC Part 15 Subpart C Section 15.247

3.3 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10: 2013.

Radiated testing was performed at a distance of 3 m from EUT to the antenna.

3.4 Configuration of Test System

3.4.1 Radiated emission test

Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 m Semi Anechoic Chamber. The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

3.4.2 AC powerline conducted emission test

The EUT was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions.



3.5 Antenna requirement

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section.

The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

And according to §15.247(b)(4), 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.

3.5.1 Result: Pass

The transmitter has a **Chip Antenna**. The directional gain of the antenna is **1.88 dBi**.



4. Used equipment on test

	Description	Model Name	Serial Number	Manufacturer	Next Cal. (cycle)
<input checked="" type="checkbox"/>	Spectrum analyzer	FSV40	101455	R&S	2023. 03. 02 (1Y)
<input checked="" type="checkbox"/>	Signal Generator	SMB100A	180607	R&S	2023. 03. 03 (1Y)
<input checked="" type="checkbox"/>	DC Power Supply	XDL 35-5P	J00385373	Sorensen	2023. 03. 03 (1Y)
<input checked="" type="checkbox"/>	Loop Antenna	HFH2-Z2	100506	Rohde & Schwarz	2023. 07. 05 (2Y)
<input checked="" type="checkbox"/>	TRILOG BROADBAND ANTENNA	VULB9162	120	SCHWARZBECK	2022. 12. 15 (2Y)
<input checked="" type="checkbox"/>	RF Pre Amplifier	SCU08	100747	Rohde & Schwarz	2022. 04. 14 (1Y)
<input checked="" type="checkbox"/>	DOUBLE-RIDGE WAVEGUIDE HORN ANTENNA	HF907	102556	Rohde & Schwarz	2022. 08. 18 (1Y)
<input checked="" type="checkbox"/>	RF Pre Amplifier	SCU18	102342	Rohde & Schwarz	2022. 04. 14 (1Y)
<input checked="" type="checkbox"/>	Horn Antenna	LB-42-10-C-KF	J202024625	AINFO Inc.	2023. 03. 10 (1Y)
<input checked="" type="checkbox"/>	RF Pre Amplifier	AMF-4F-18265-35-8P-1	771846	MITEQ	2023 .03. 07 (1Y)
<input checked="" type="checkbox"/>	Horn Antenna	LB-28-10-C-KF	J202024627	AINFO Inc.	2023. 03. 10 (1Y)
<input checked="" type="checkbox"/>	RF Pre Amplifier	AMF-4D-260400-45-6P	779919	MITEQ	2023 .03. 07 (1Y)
<input checked="" type="checkbox"/>	EMI Test Receiver	ESR26	101461	Rohde & Schwarz	2022. 04. 14 (1Y)
<input checked="" type="checkbox"/>	EMI Test Receiver	ESR26	101462	Rohde & Schwarz	2022. 04. 14 (1Y)
<input checked="" type="checkbox"/>	LISN	ENV216	102194	Rohde & Schwarz	2022. 04. 15 (1Y)
<input checked="" type="checkbox"/>	EMI Test Receiver	ESR3	102119	Rohde & Schwarz	2022. 04. 14 (1Y)

※ All test equipment used is calibration on a regular basis.



6. 20 dB Bandwidth & 99 % Bandwidth

6.1 Operating environment

Temperature : 22 °C
Relative humidity : 46 %

6.2 Measurement method

Standard : ANSI 63.10 (6.9.2)

6.3 Limit

Standard : §15.247 (a)(1)(i)

6.4 Test data

Operating mode : Transmit mode
Test Result : Pass

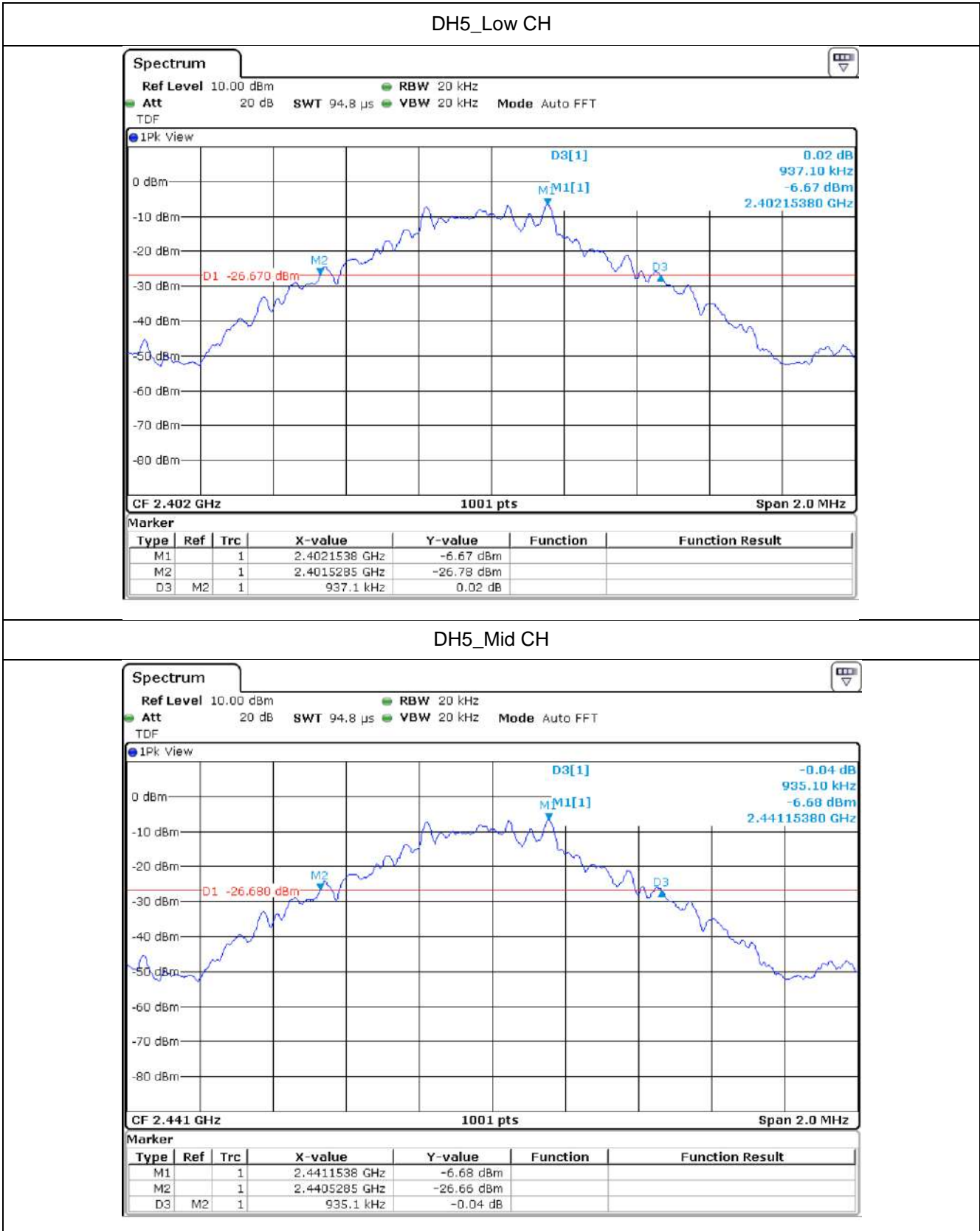
6.4.1 Measured Results for DC 12 V

Modulation Type	Channel (Frequency)	20 dB Bandwidth (kHz)	99 % Occupied Bandwidth (kHz)
DH5	0 (2 402 MHz)	937.10	857.14
	19 (2 441 MHz)	935.10	855.14
	39 (2 480 MHz)	935.10	857.14
3-DH5	0 (2 402 MHz)	1 264.70	1 180.82
	19 (2 441 MHz)	1 266.70	1 186.81
	39 (2 480 MHz)	1 268.70	1 198.80



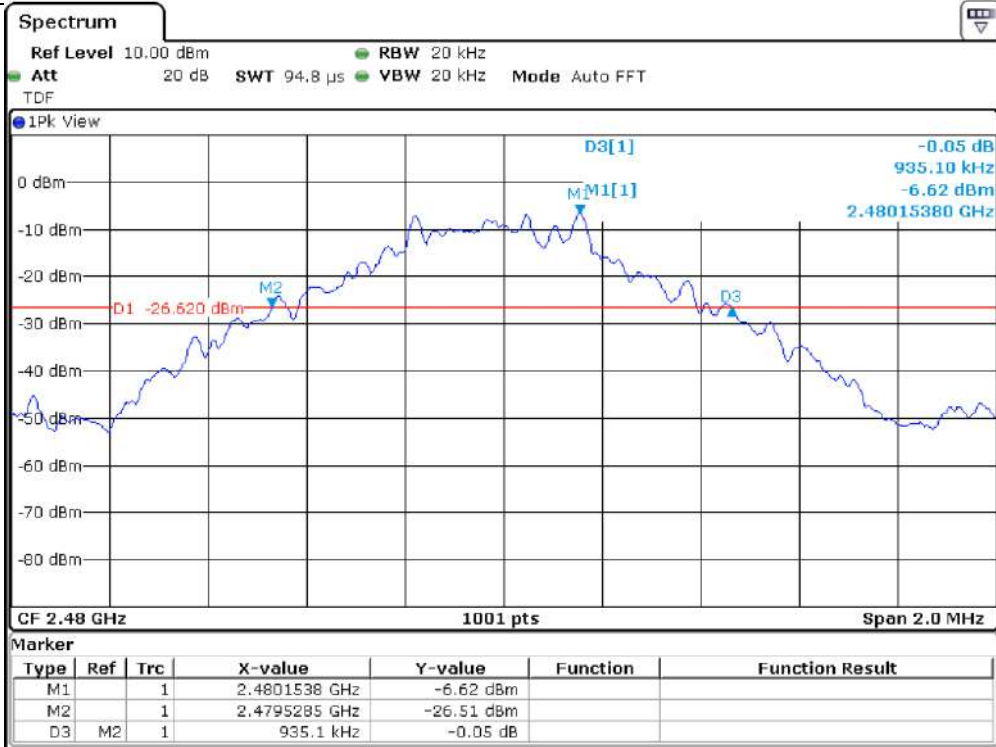
6.4.1.1 Measured Graph for DC 12 V

- 20dB Bandwidth

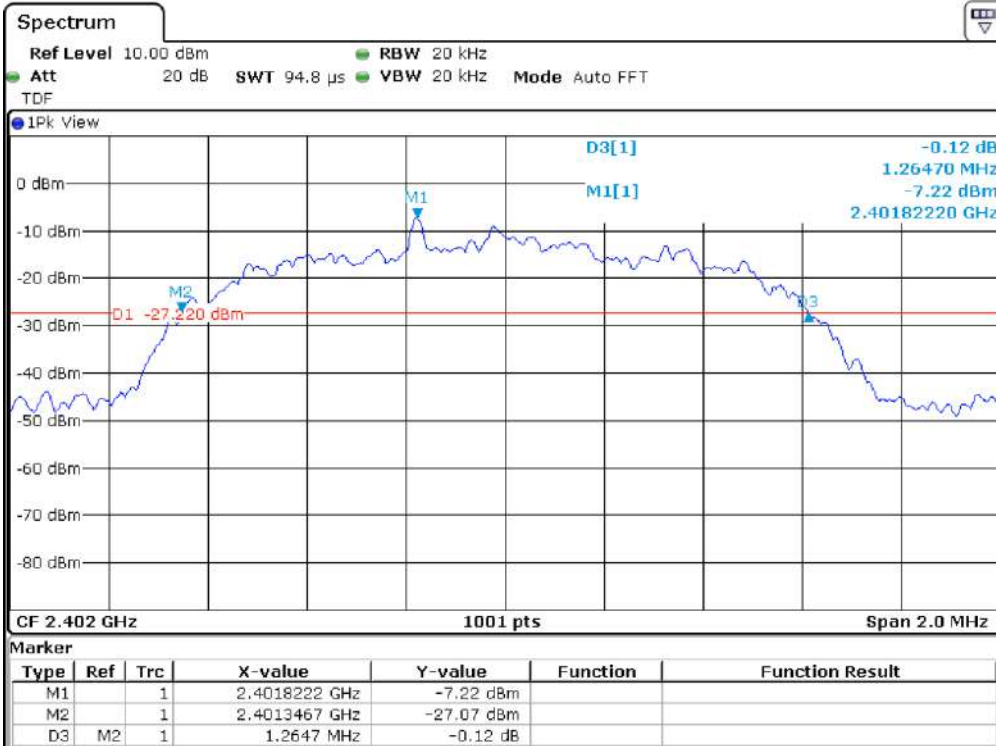

DH5_Mid CH



DH5_High CH

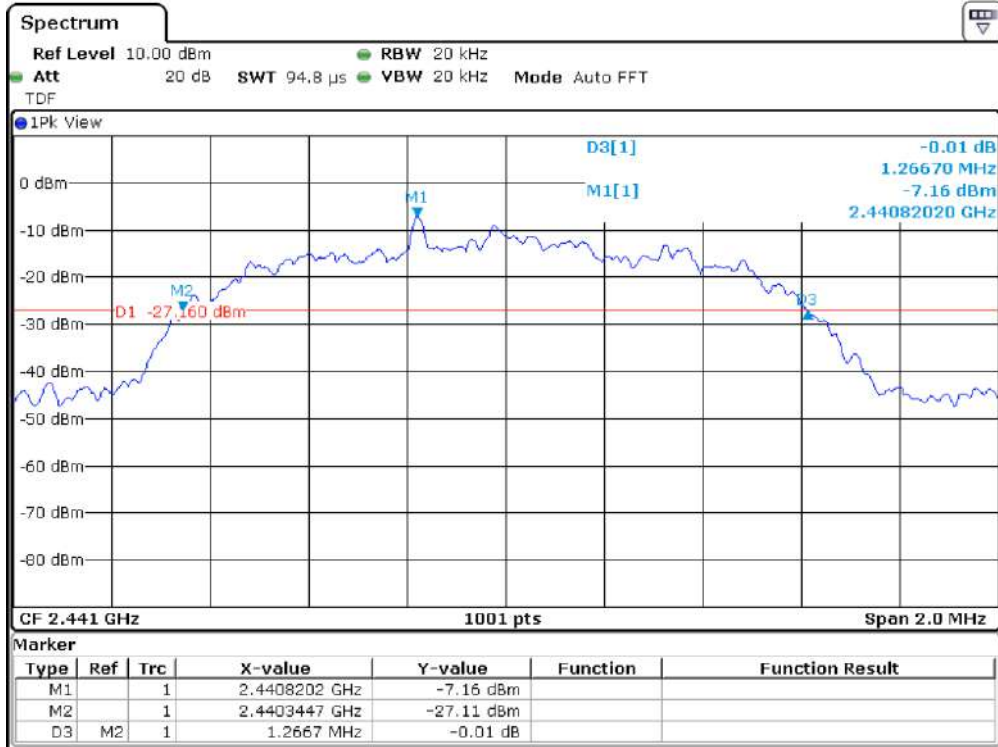


3-DH5_Low CH

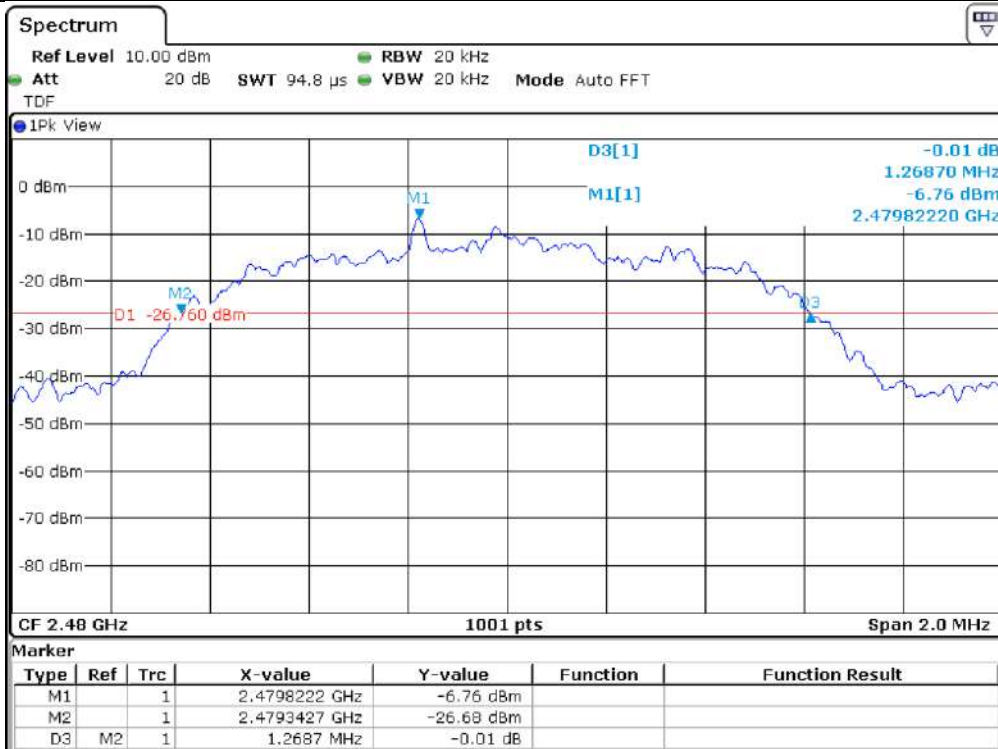




3-DH5_Mid CH

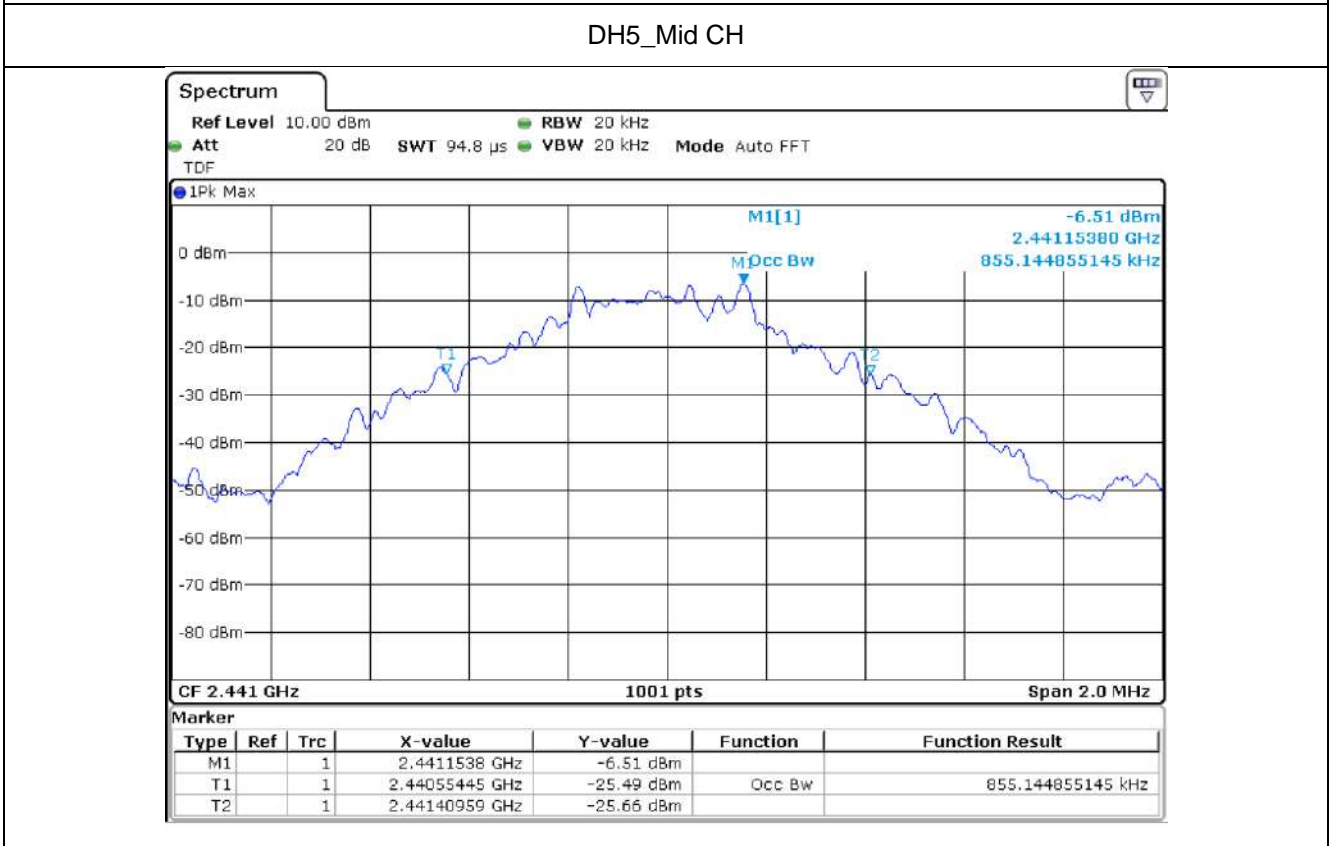
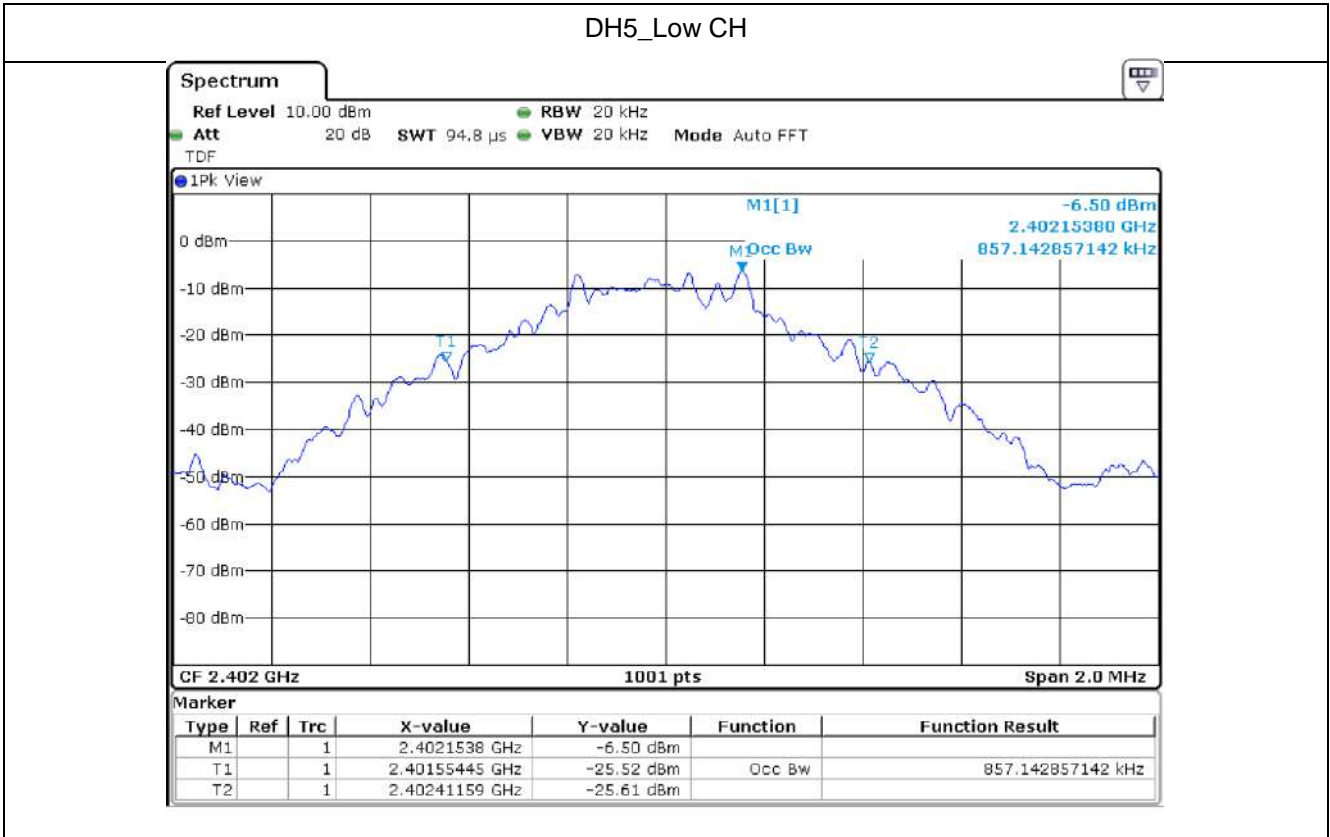


3-DH5_High CH



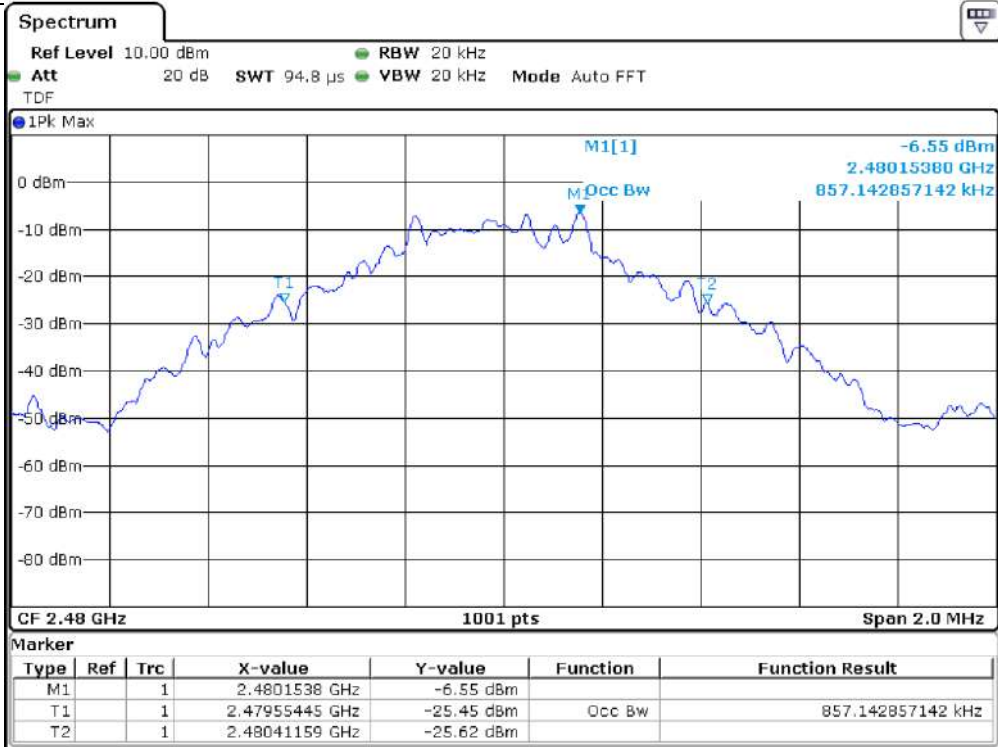


- 99% Bandwidth

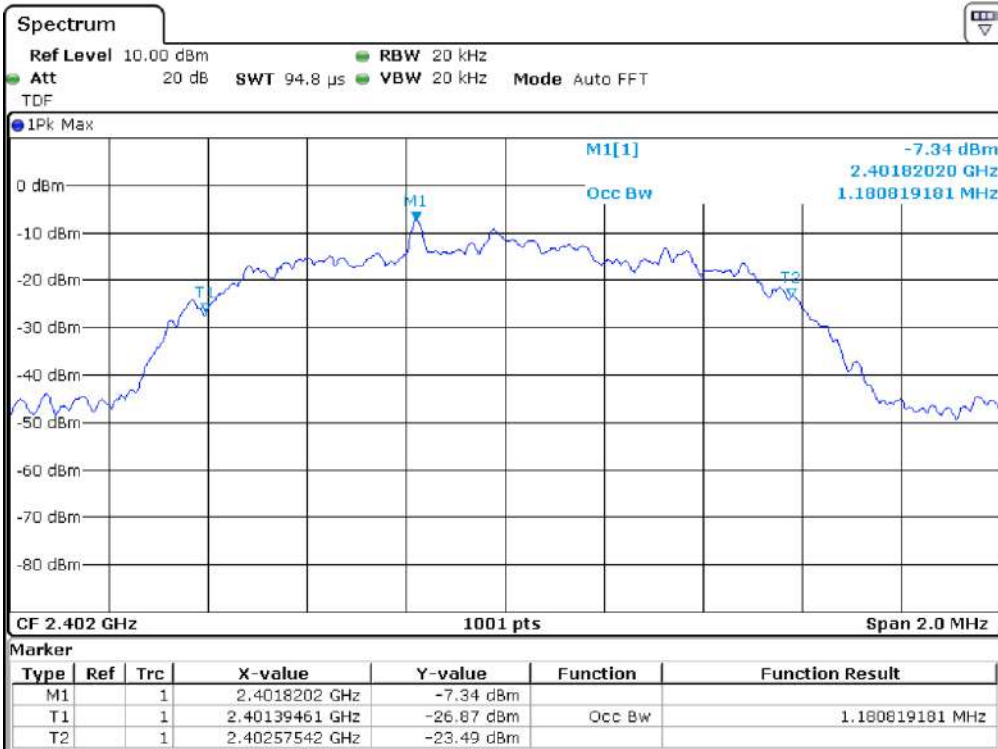




DH5_High CH

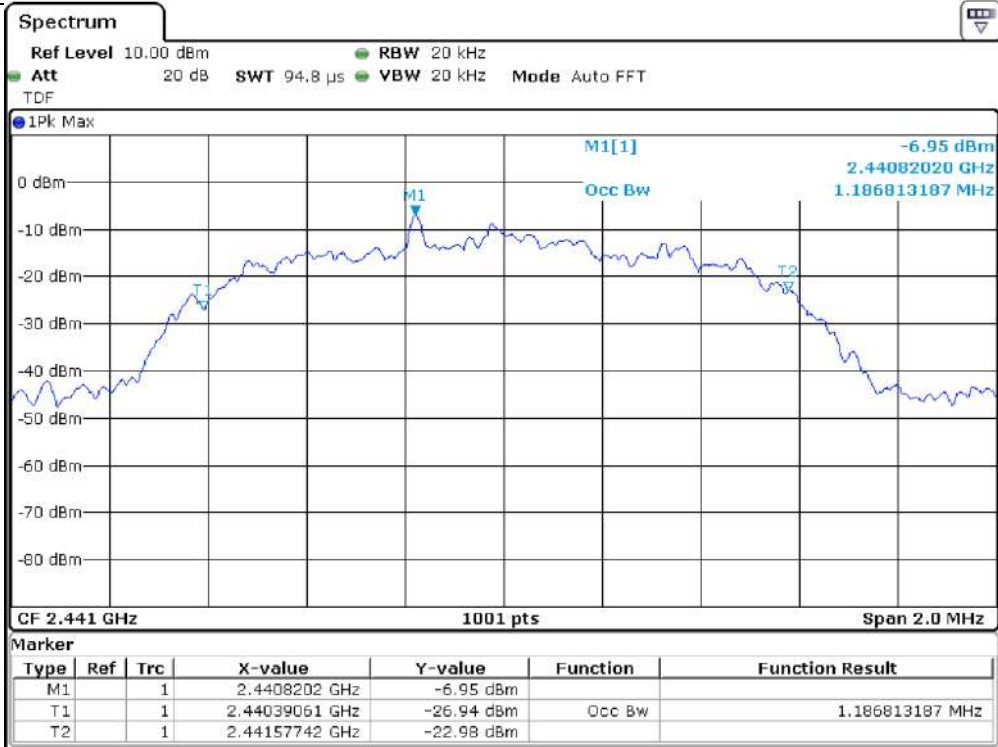


3-DH5_Low CH

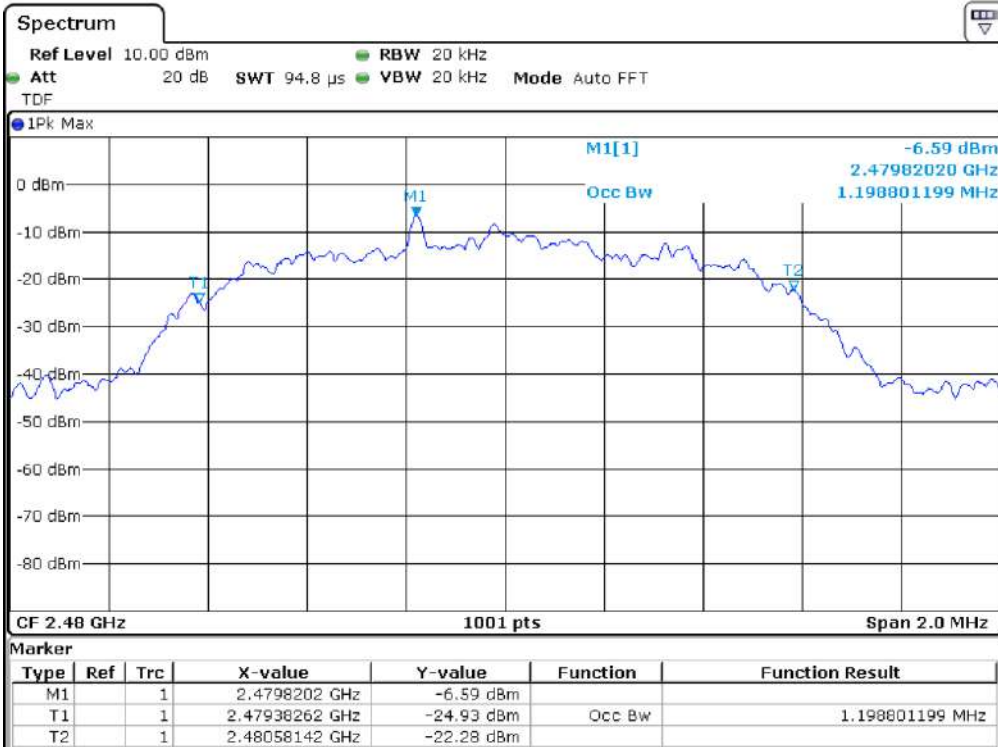




3-DH5_Mid CH



3-DH5_High CH





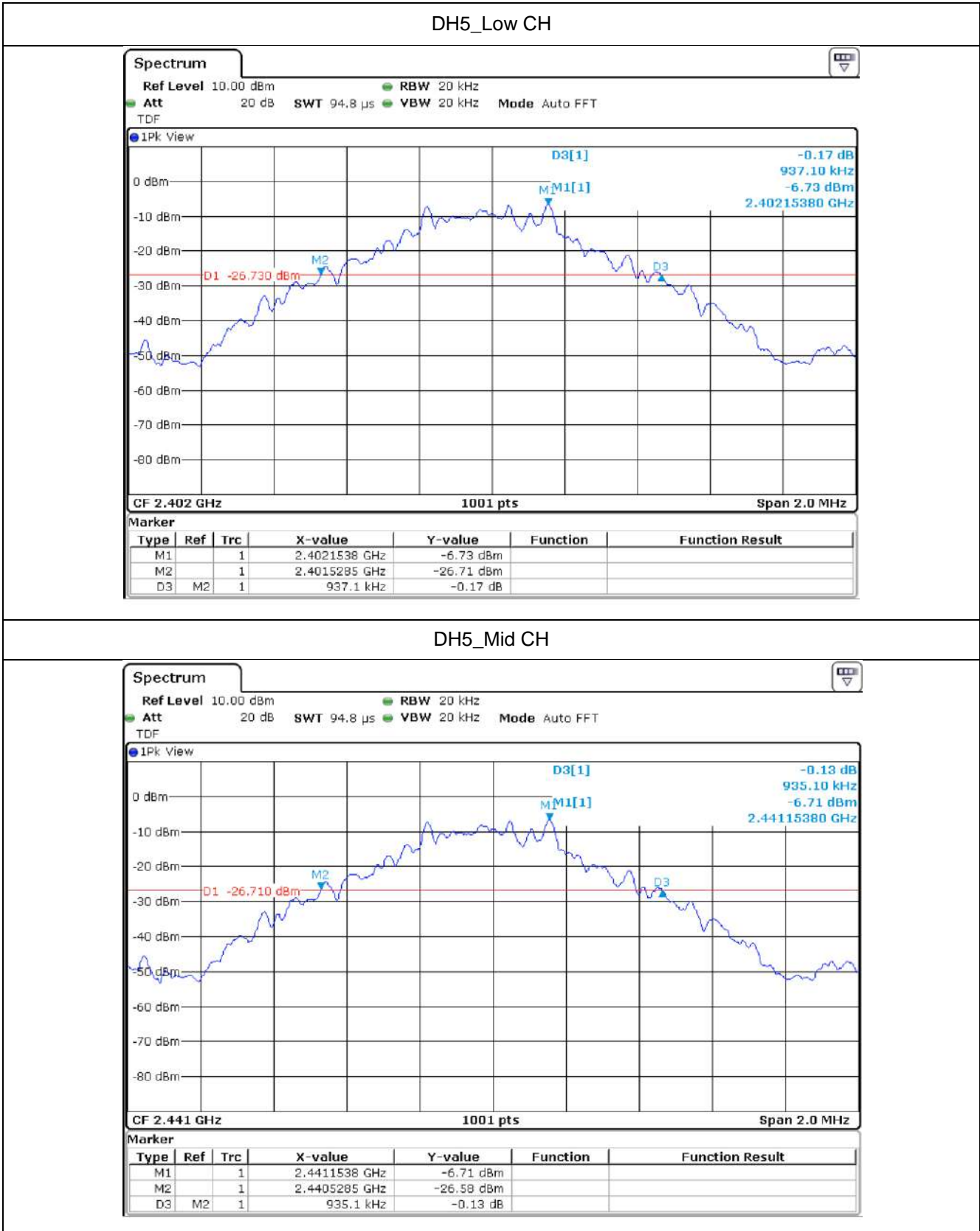
6.4.2 Measured Results for DC 24 V

Modulation Type	Channel (Frequency)	20 dB Bandwidth (kHz)	99 % Occupied Bandwidth (kHz)
DH5	0 (2 402 MHz)	937.10	855.14
	19 (2 441 MHz)	935.10	855.14
	39 (2 480 MHz)	935.10	857.14
3-DH5	0 (2 402 MHz)	1 264.70	1 180.82
	19 (2 441 MHz)	1 266.70	1 186.81
	39 (2 480 MHz)	1 268.70	1 196.80



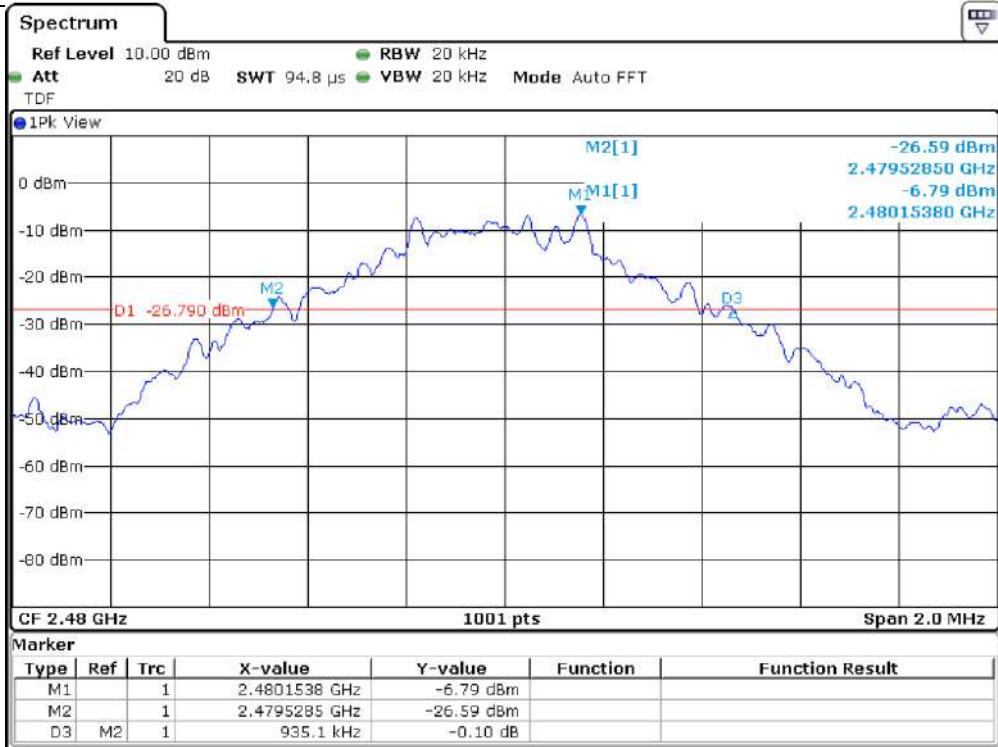
6.4.2.1 Measured Graph for DC 24 V

- 20dB Bandwidth

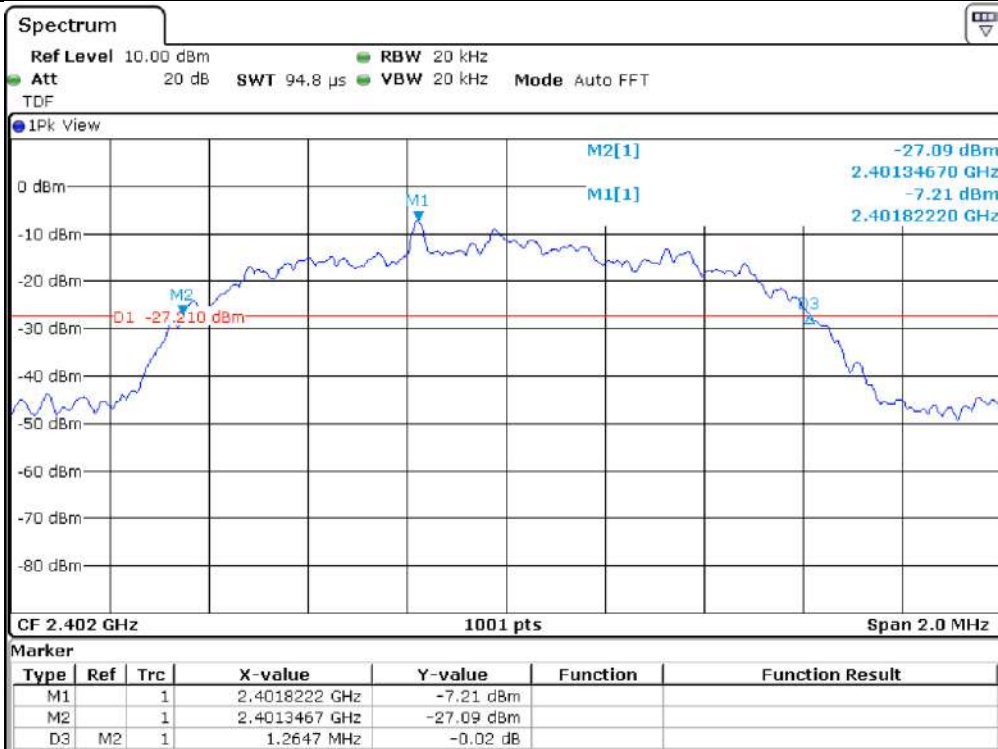

DH5_Mid CH



DH5_High CH

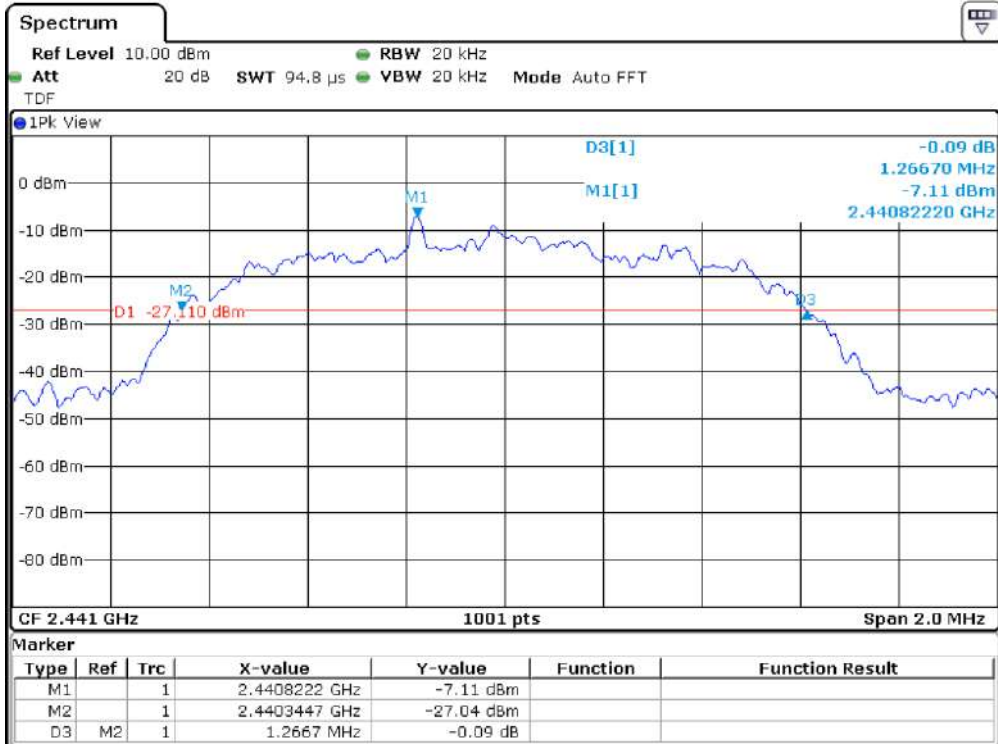


3-DH5_Low CH

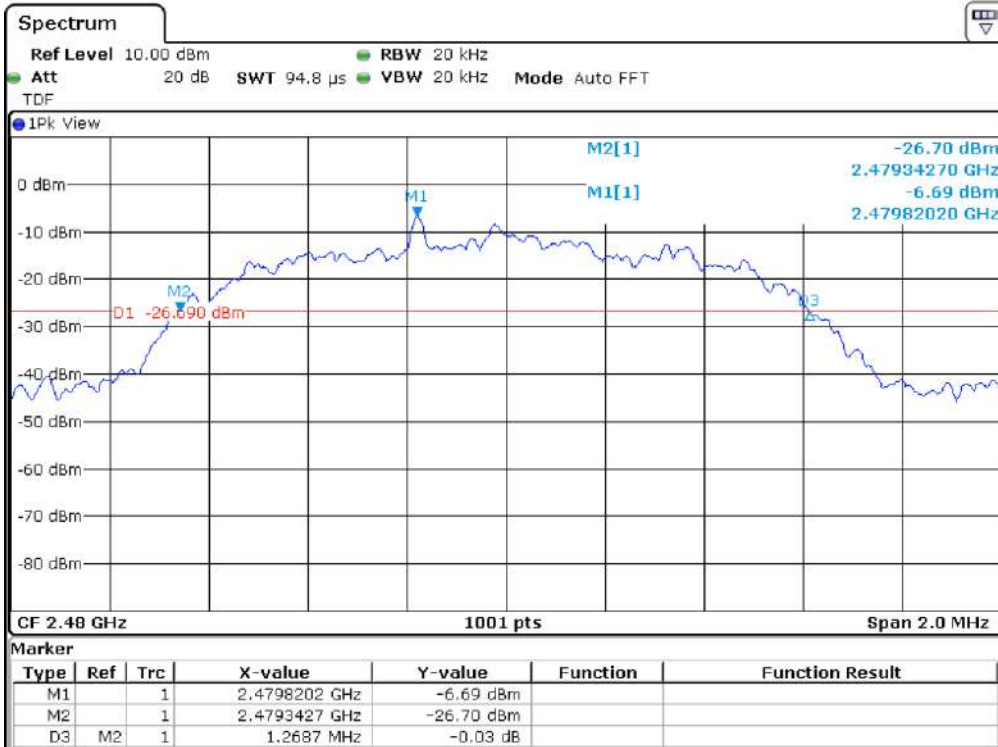




3-DH5_Mid CH

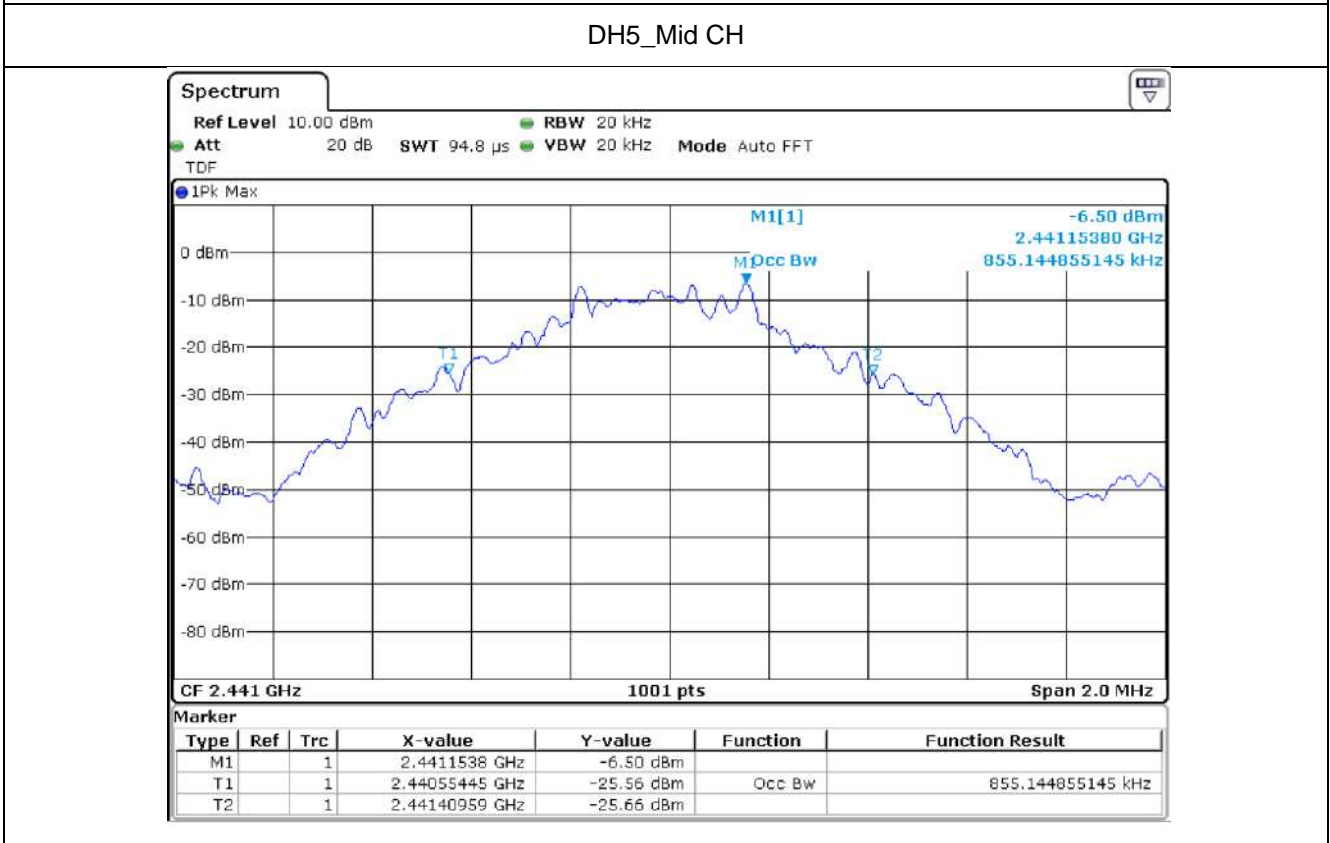
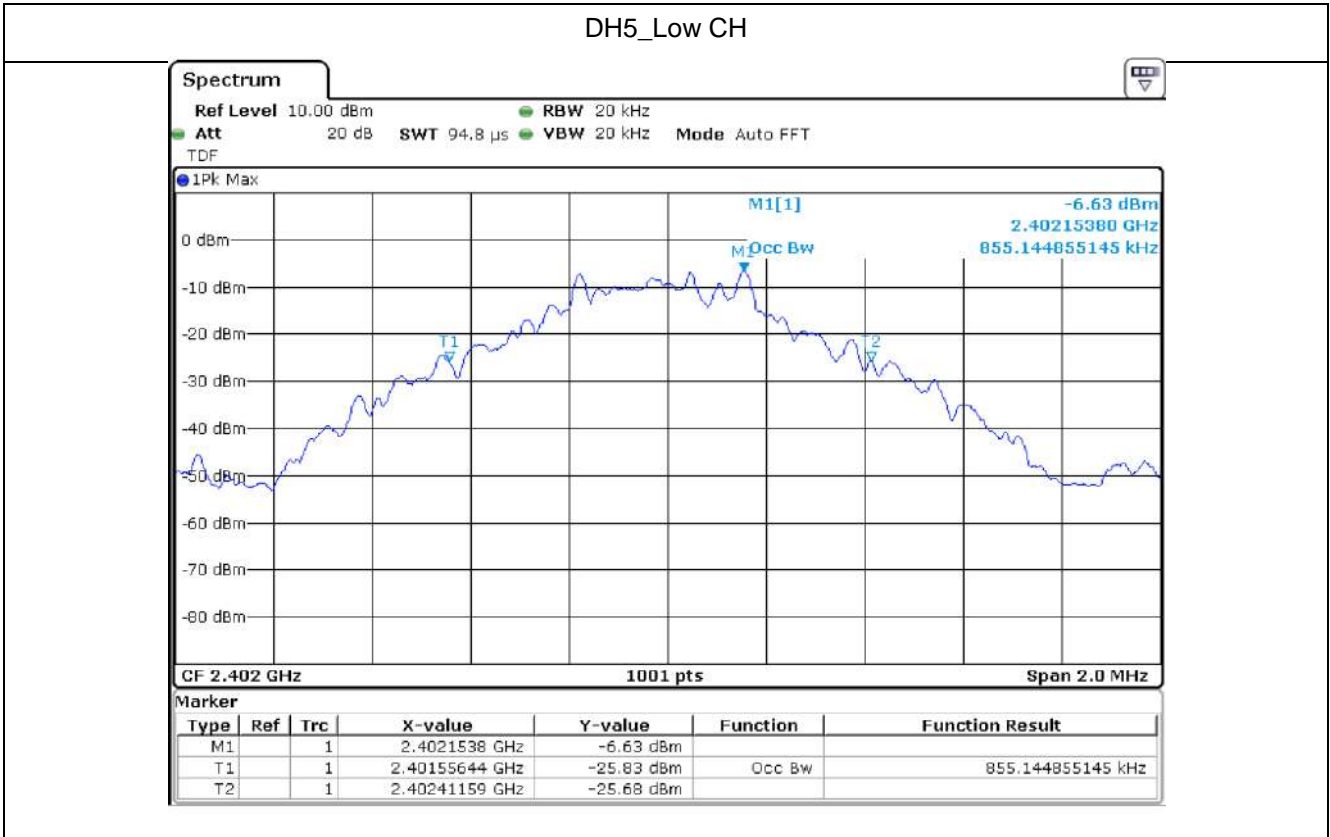


3-DH5_High CH



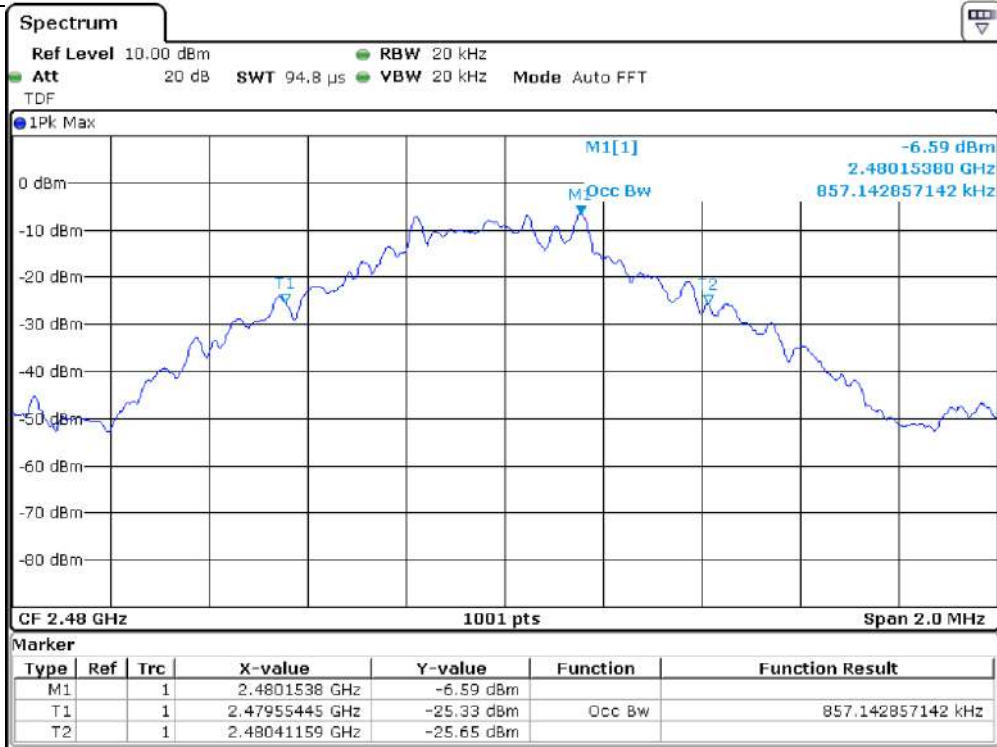


- 99% Bandwidth

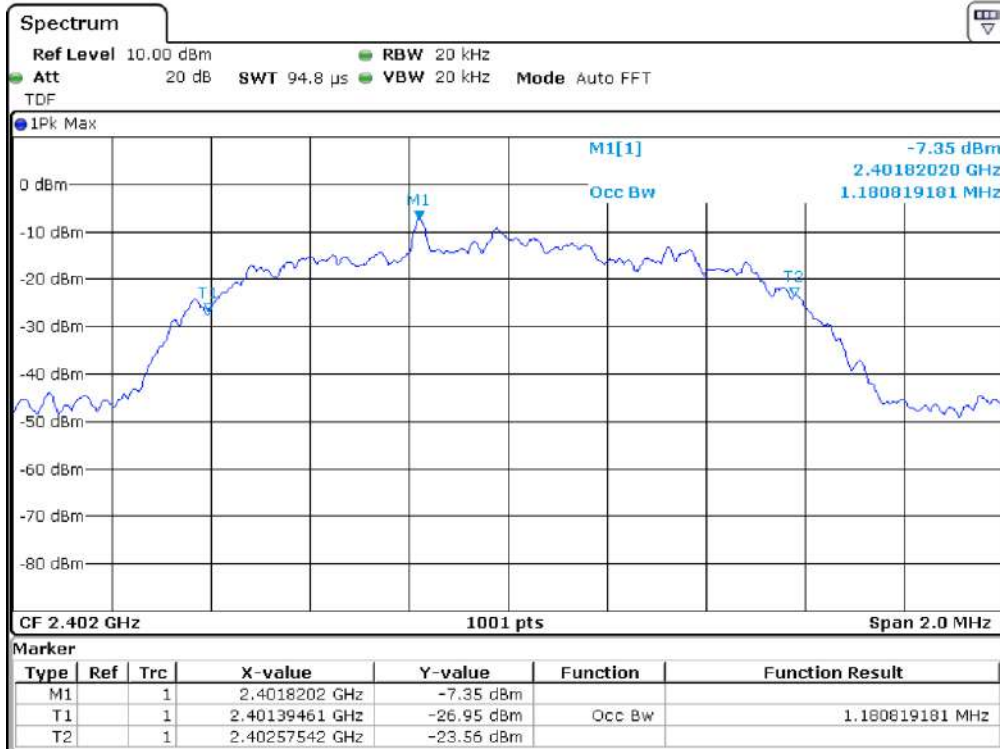




DH5_High CH

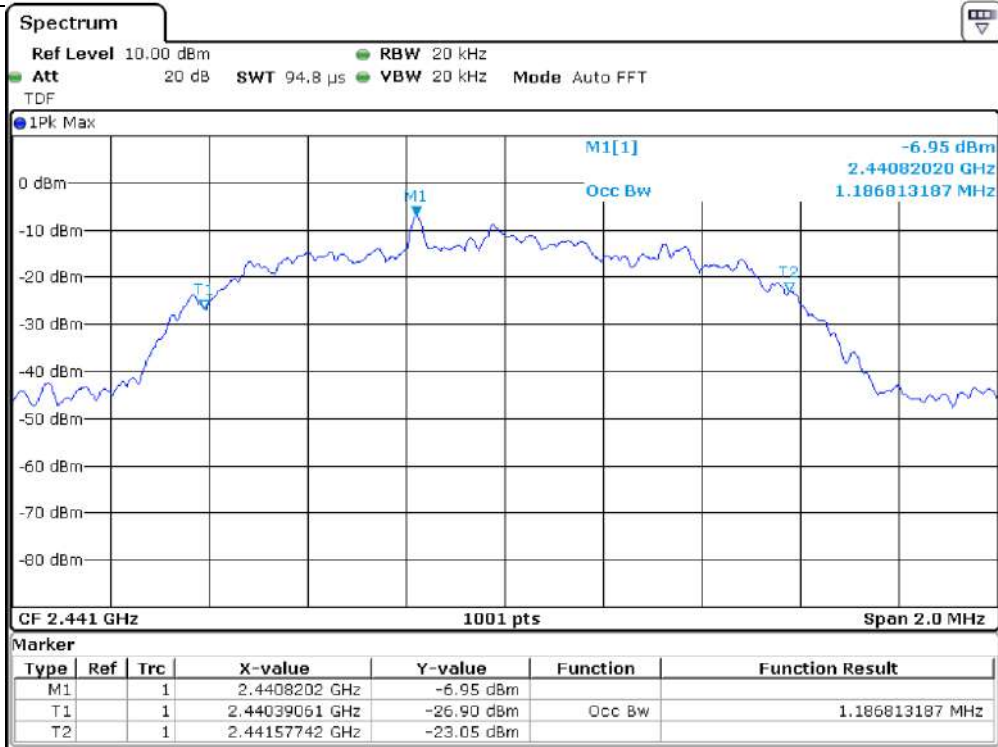


3-DH5_Low CH

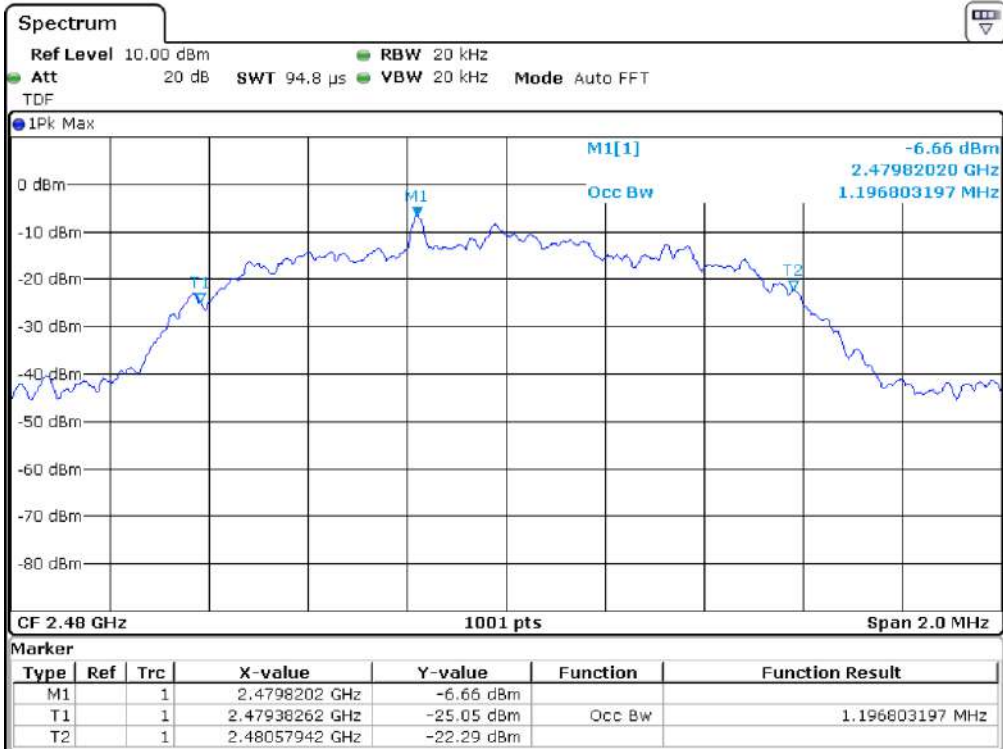




3-DH5_Mid CH



3-DH5_High CH





7. Carrier Frequency Separation

7.1 Operating environment

Temperature : 22 °C
 Relative humidity : 46 %

7.2 Measurement method

Standard : ANSI 63.10 (7.8.2)

7.3 Limit

Standard : 15.247 (a)(1)

7.4 Test data

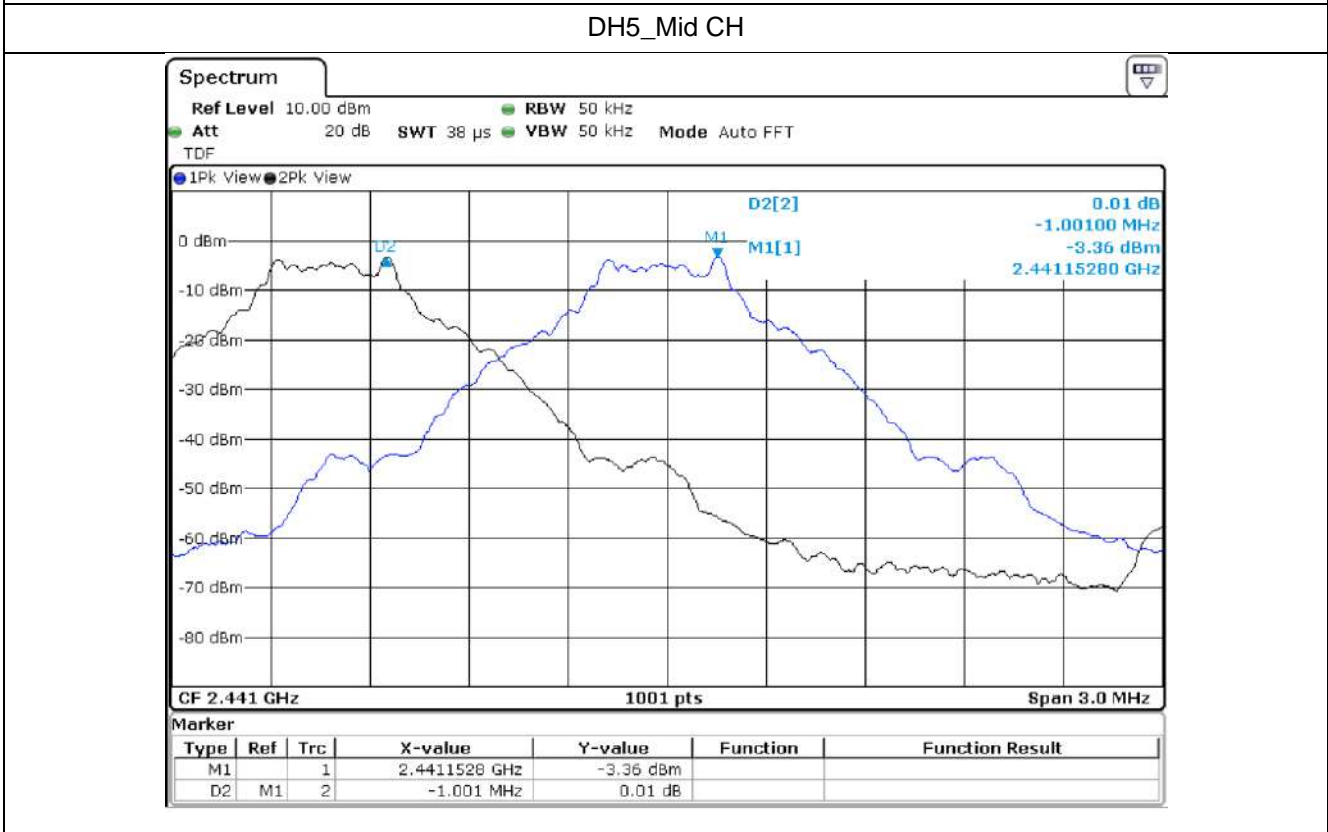
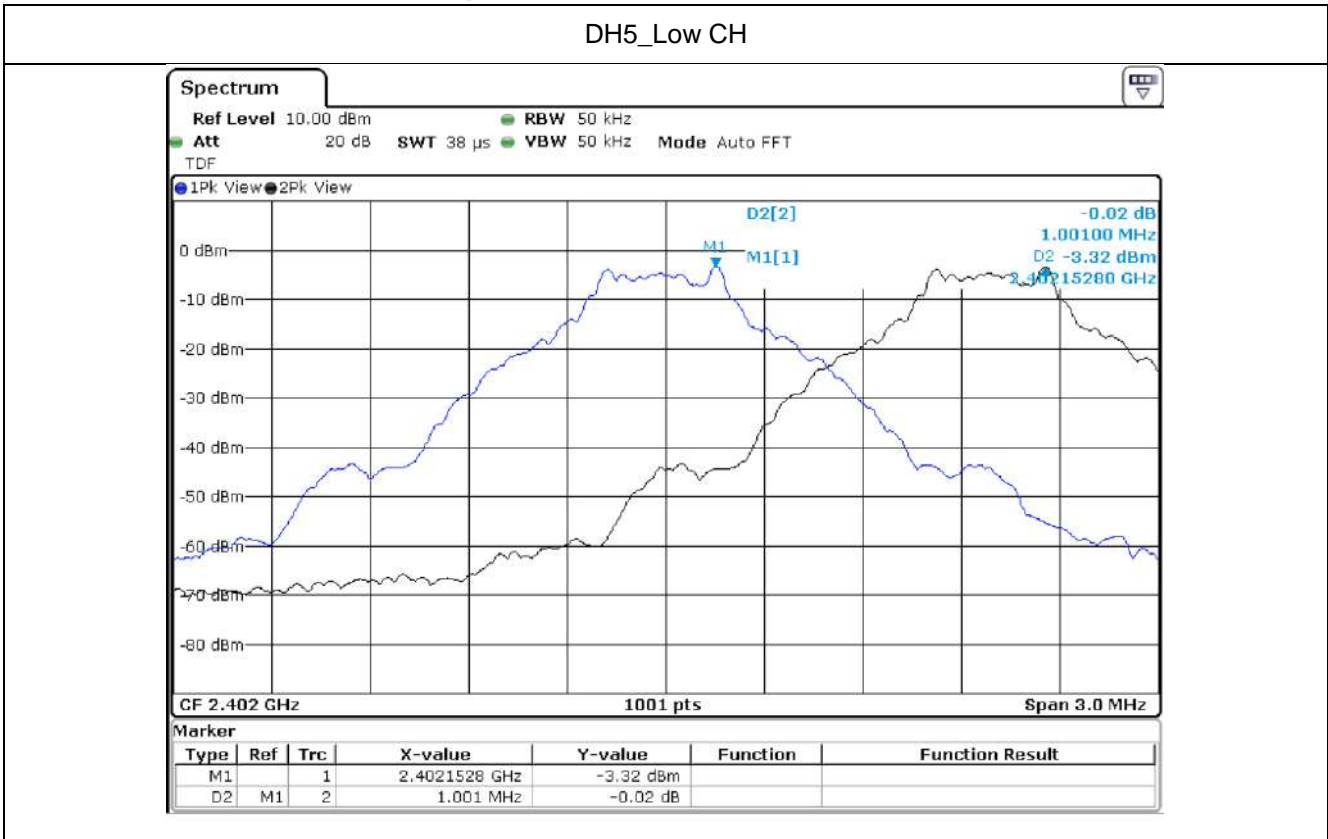
Operating mode : Transmit mode
 Test Result : Pass

7.4.1 Measured Results for DC 12 V

Modulation type	Channel (Frequency)	Separation (kHz)	Two-third 20 dB bandwidth of the hopping channel (kHz)	Limit
DH5	0 (2 402 MHz)	1 001.00	624.73	25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater
	39 (2 441 MHz)	1 001.00	623.40	
	78 (2 480 MHz)	1 010.00	623.40	
3-DH5	0 (2 402 MHz)	998.00	843.13	
	39 (2 441 MHz)	1 001.00	844.47	
	78 (2 480 MHz)	1 001.00	845.80	

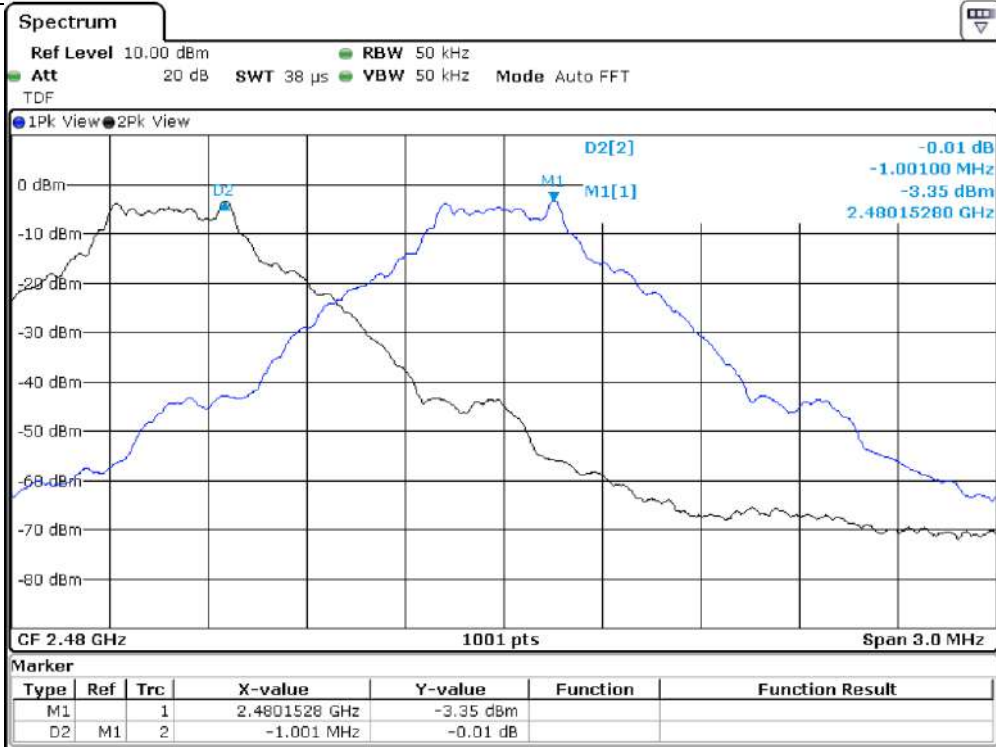


7.4.1.1 Measured Graph for DC 12 V

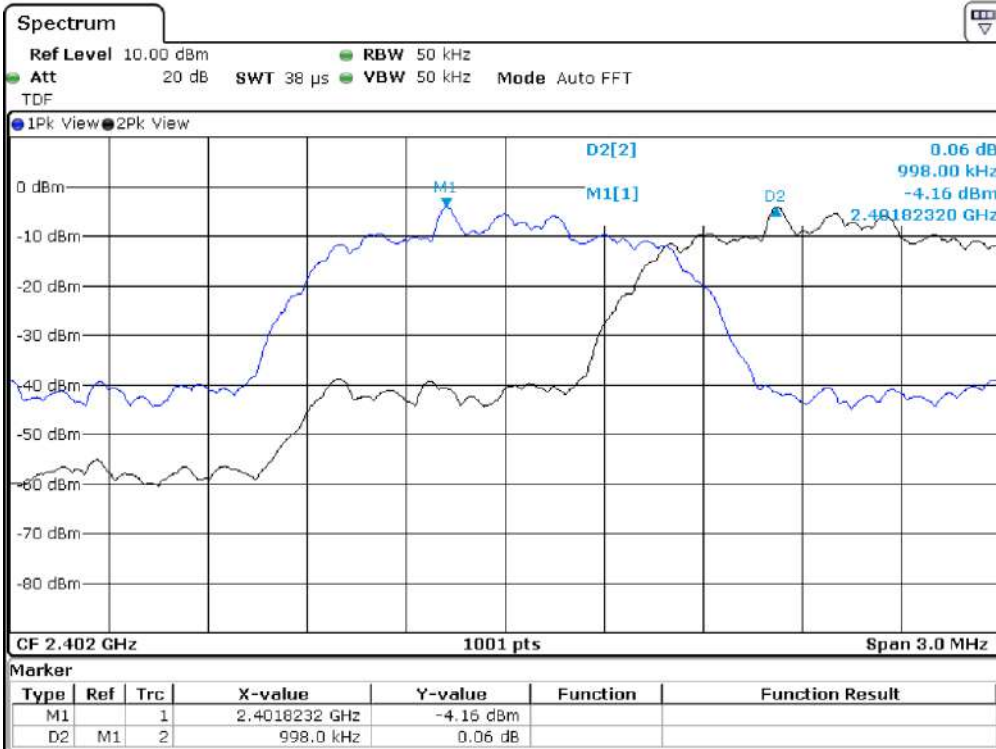




DH5_High CH

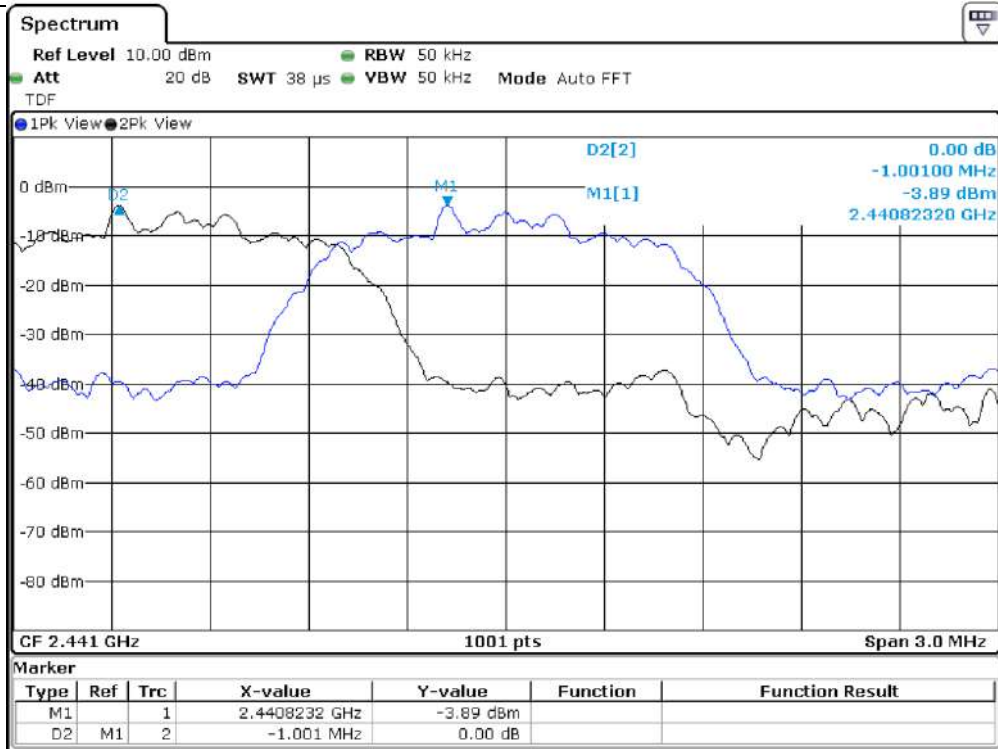


3-DH5_Low CH

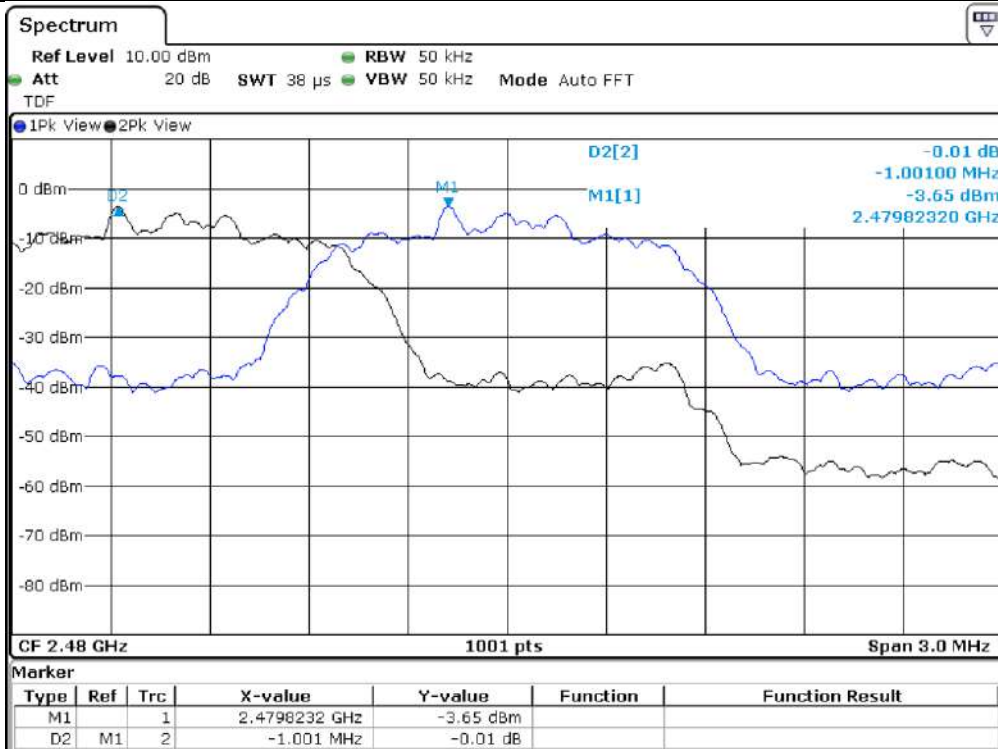




3-DH5_Mid CH



3-DH5_High CH

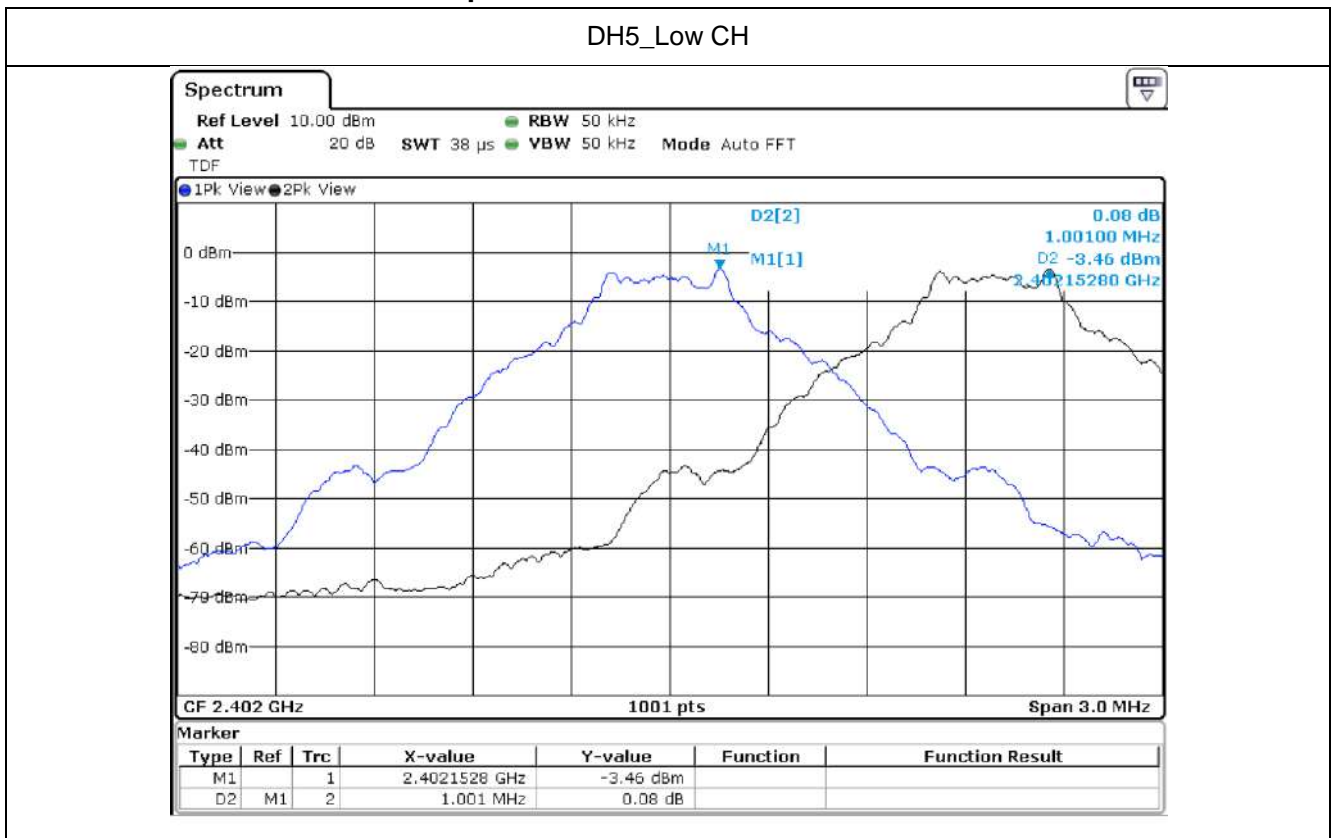




7.4.2 Measured Results for DC 24 V

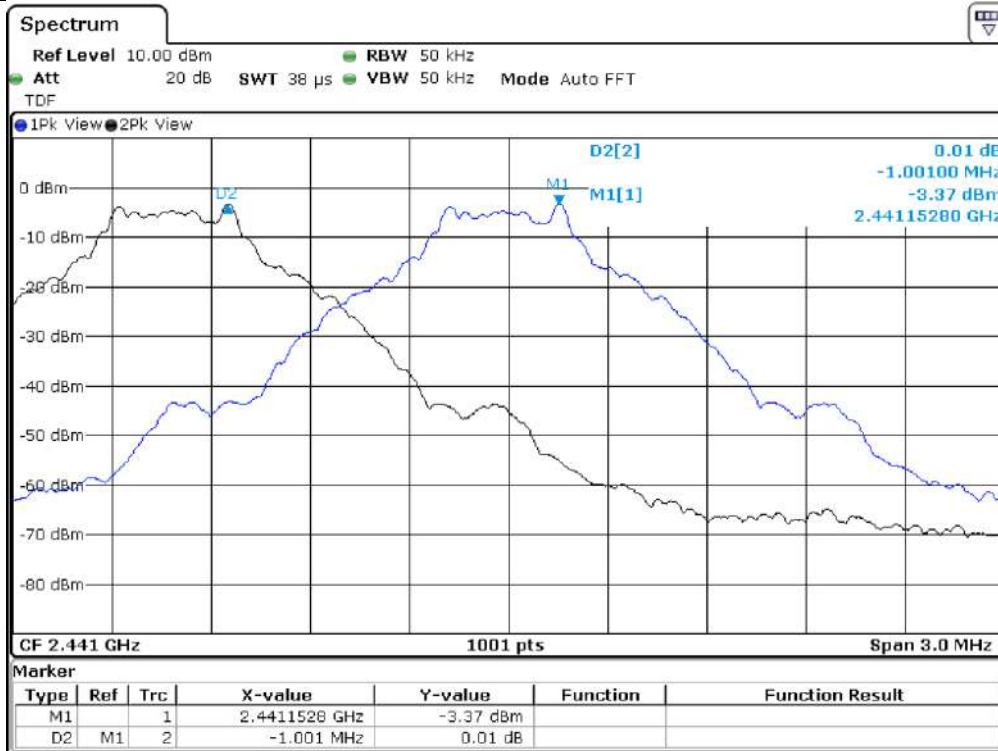
Modulation type	Channel (Frequency)	Separation (kHz)	Two-third 20 dB bandwidth of the hopping channel (kHz)	Limit
DH5	0 (2 402 MHz)	1 001.00	624.73	25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater
	39 (2 441 MHz)	1 001.00	623.40	
	78 (2 480 MHz)	1 010.00	623.40	
3-DH5	0 (2 402 MHz)	998.00	843.13	
	39 (2 441 MHz)	1 001.00	844.47	
	78 (2 480 MHz)	1 001.00	845.80	

7.4.2.1 Measured Graph for DC 24 V

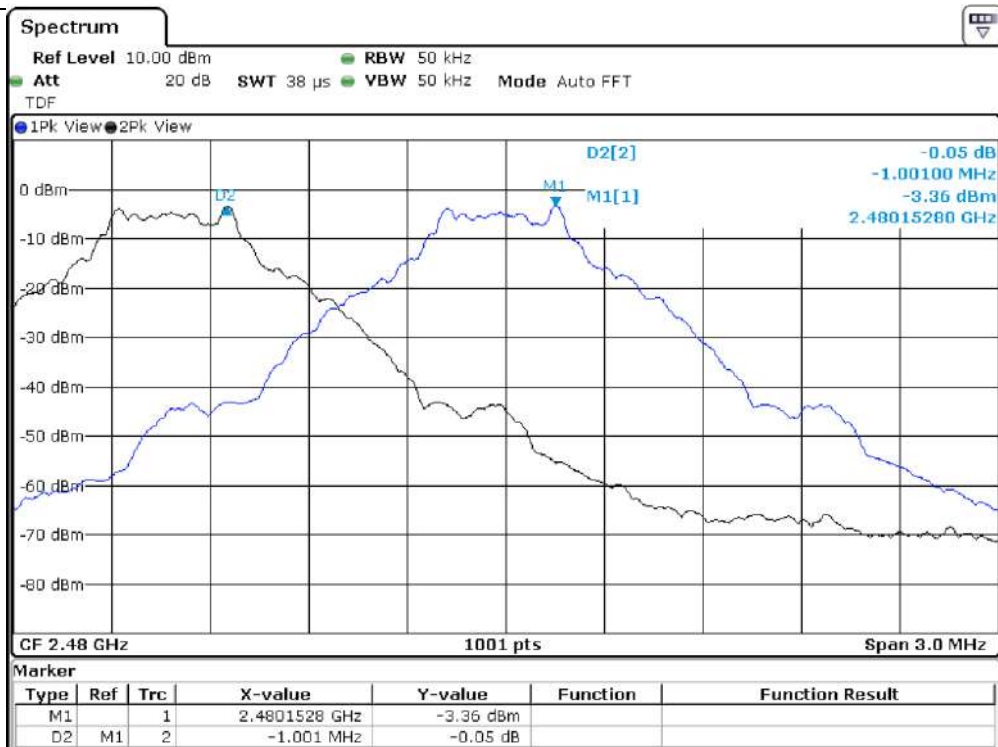




DH5_Mid CH

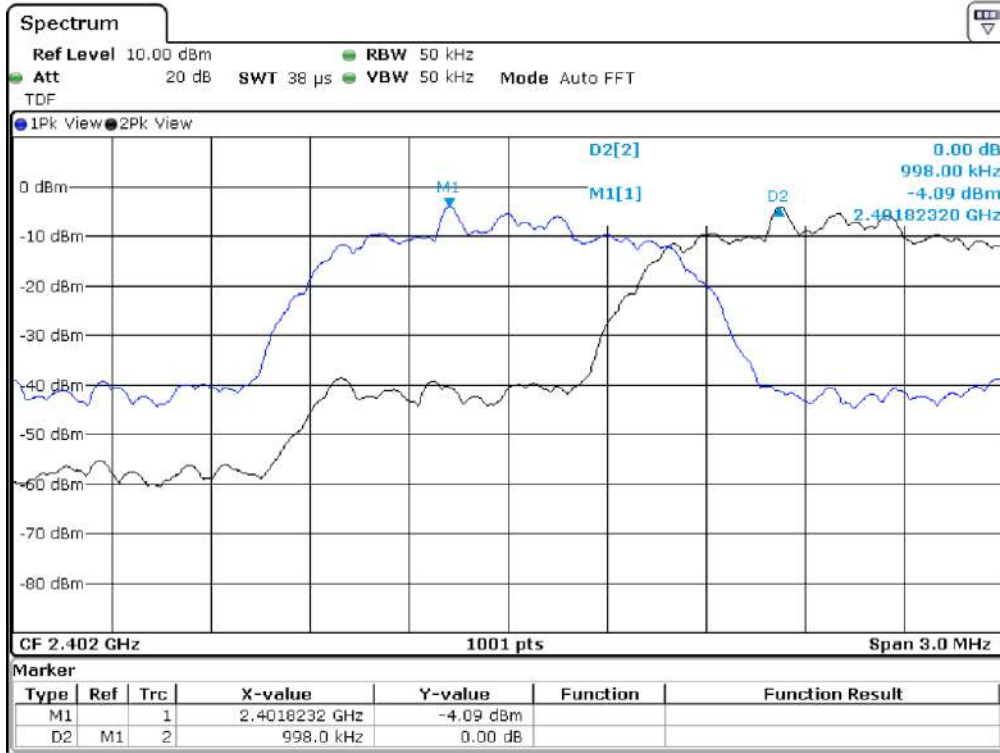


DH5_High CH

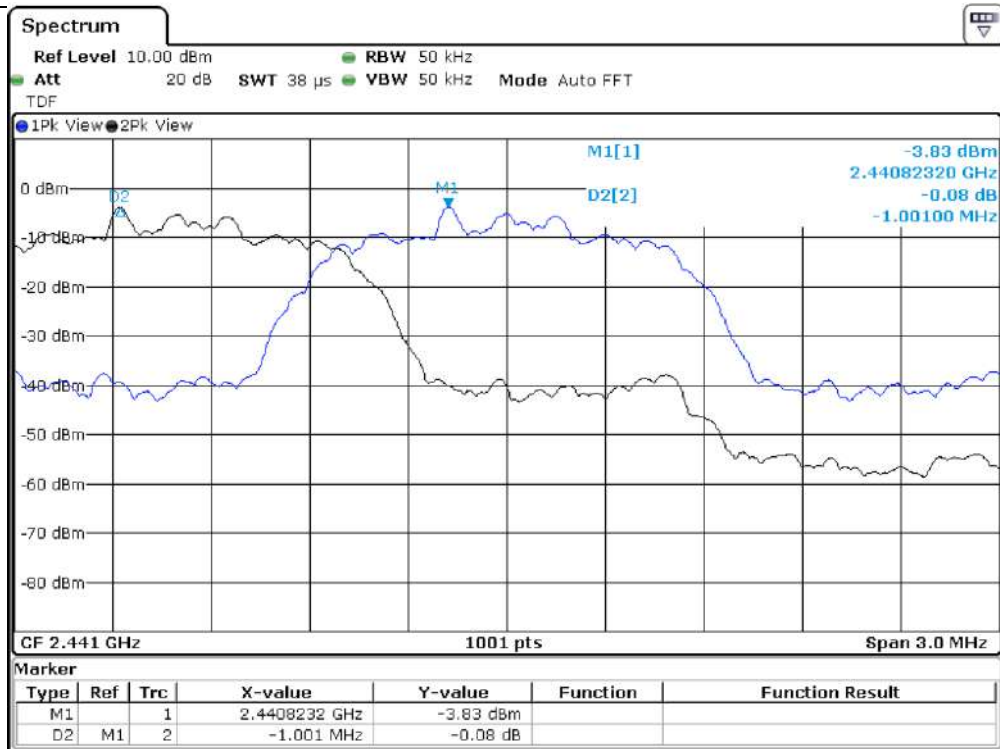


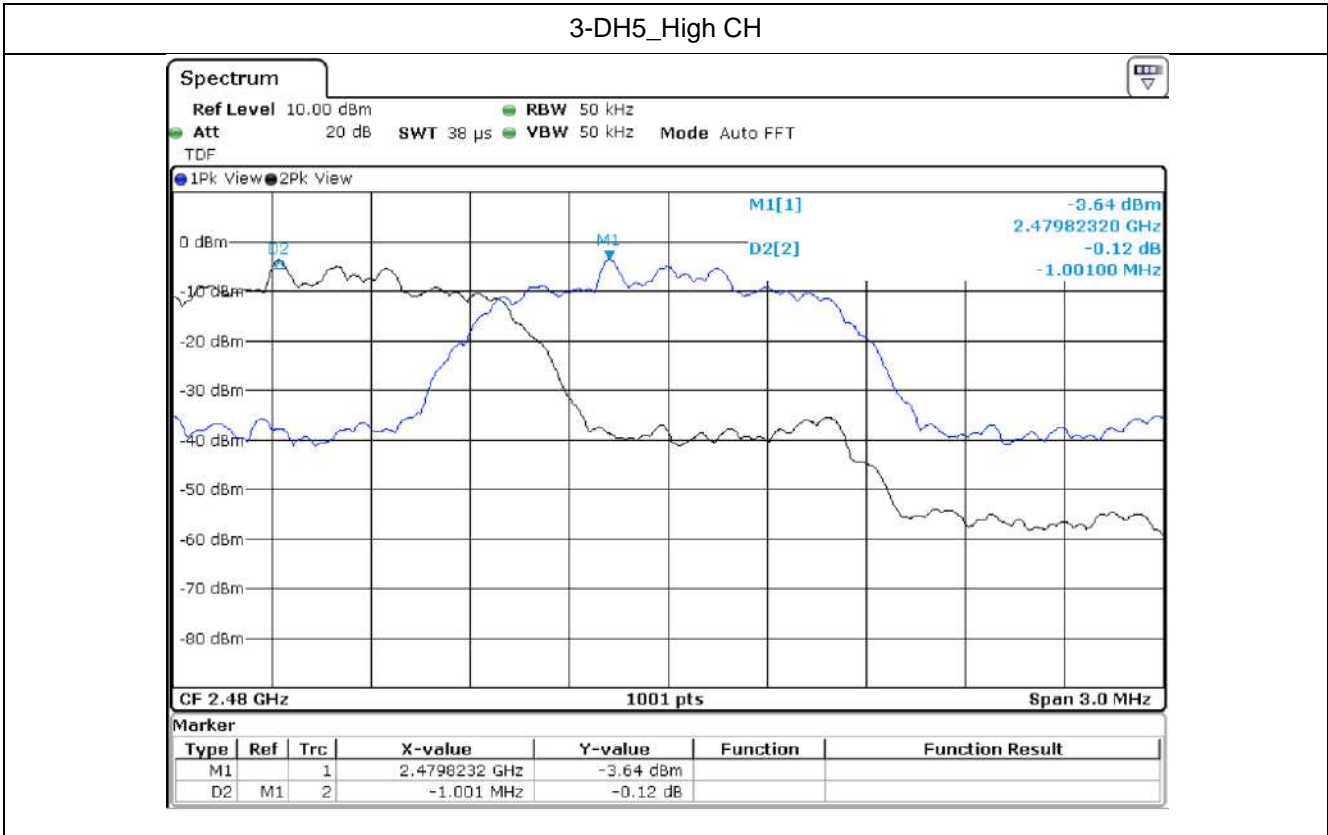


3-DH5_Low CH



3-DH5_Mid CH







8. Number of Hopping Frequency

8.1 Operating environment

Temperature : 22 °C
Relative humidity : 46 %

8.2 Measurement method

Standard : ANSI 63.10 (7.8.3)

8.3 Limit

Standard : 15.247 (a)(1)(iii)

8.4 Test data

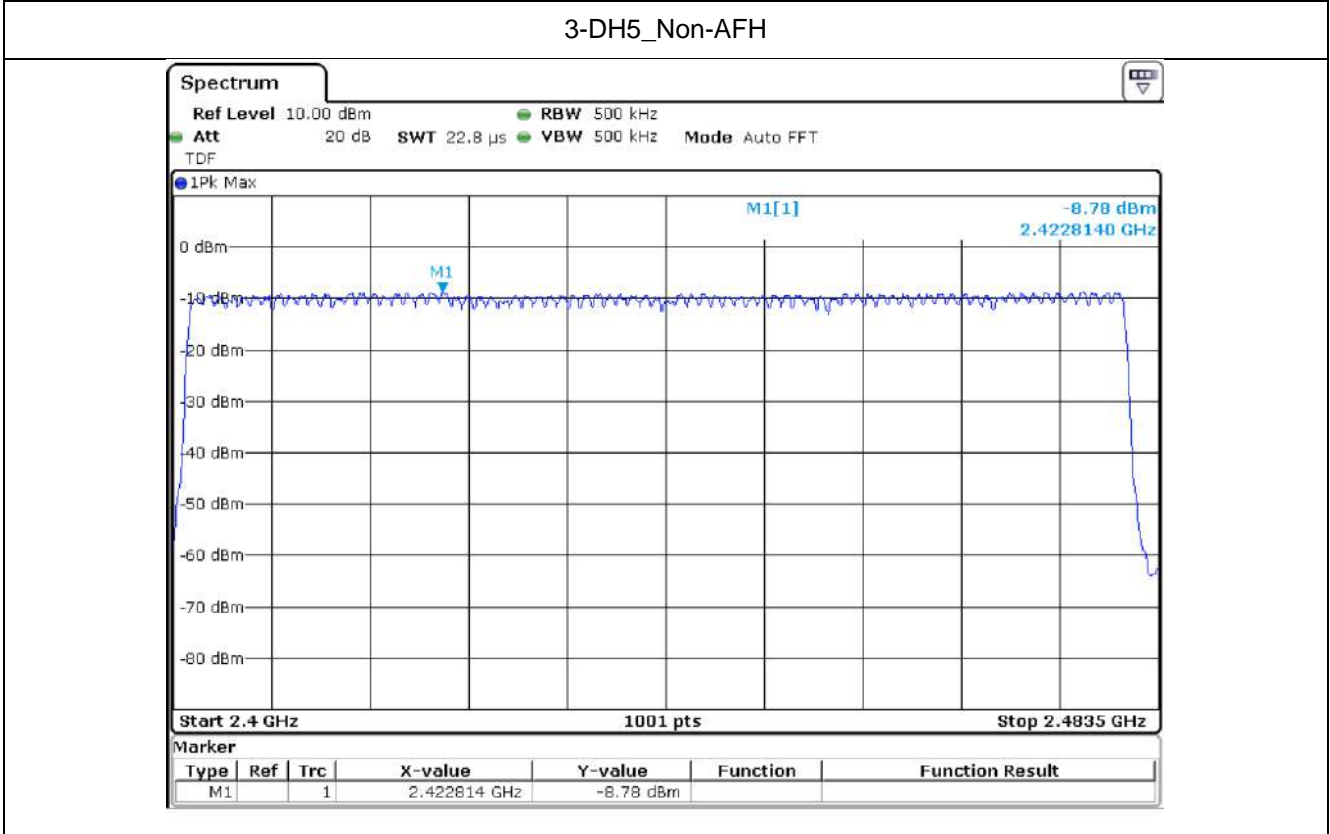
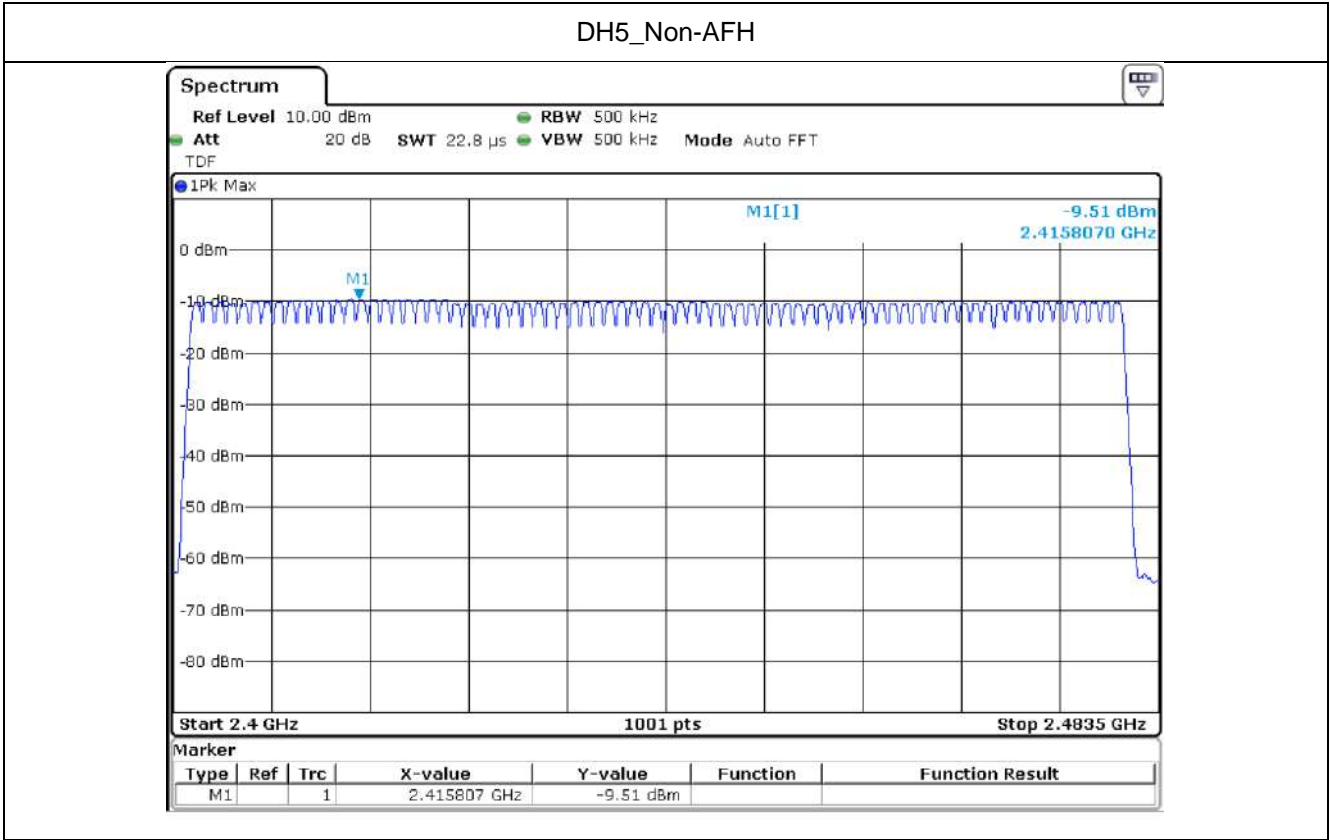
Operating mode : Hopping mode
Test Result : Pass

8.4.1 Measured Results

Modulation type	Hopping Channel Number	Limit
DH5(non-AFH)	79	> 15
3-DH5(non-AFH)	79	

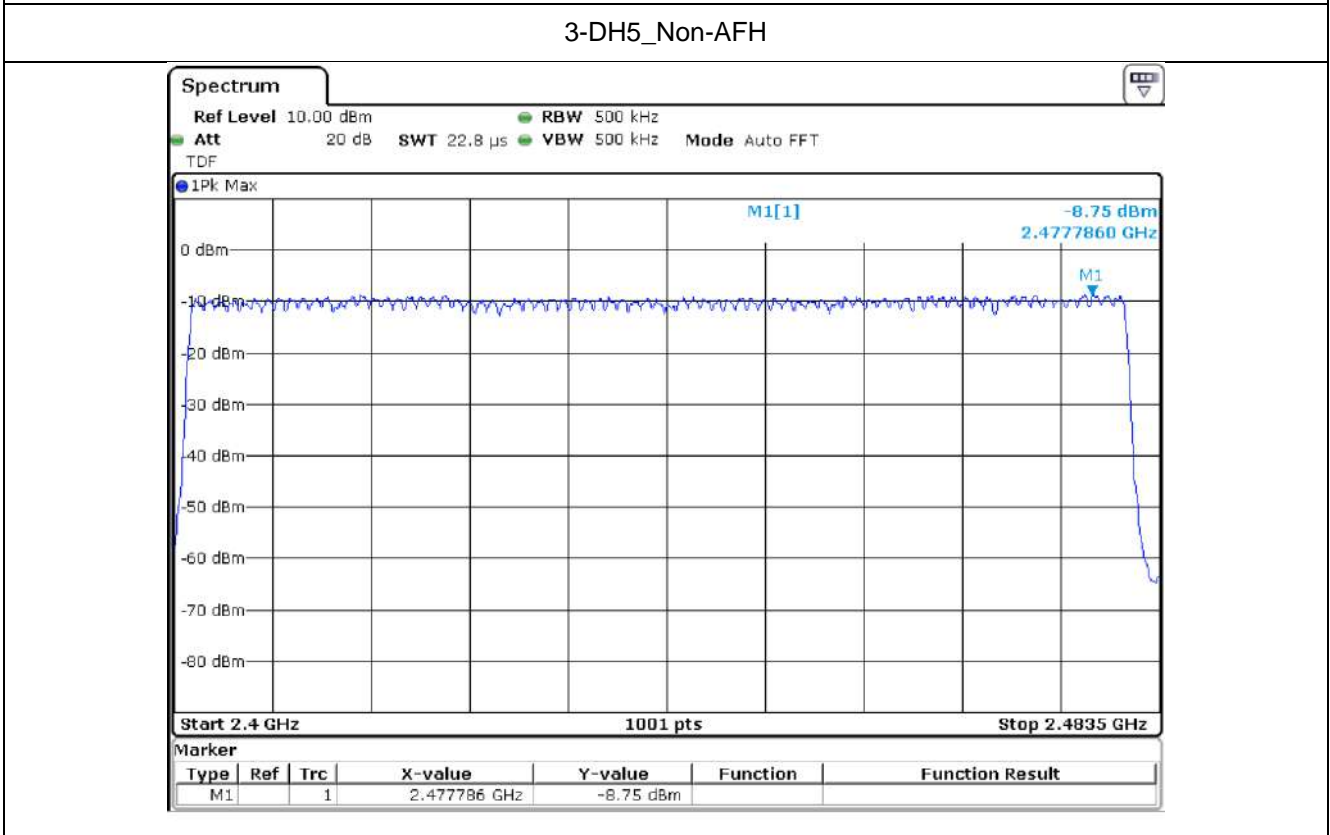
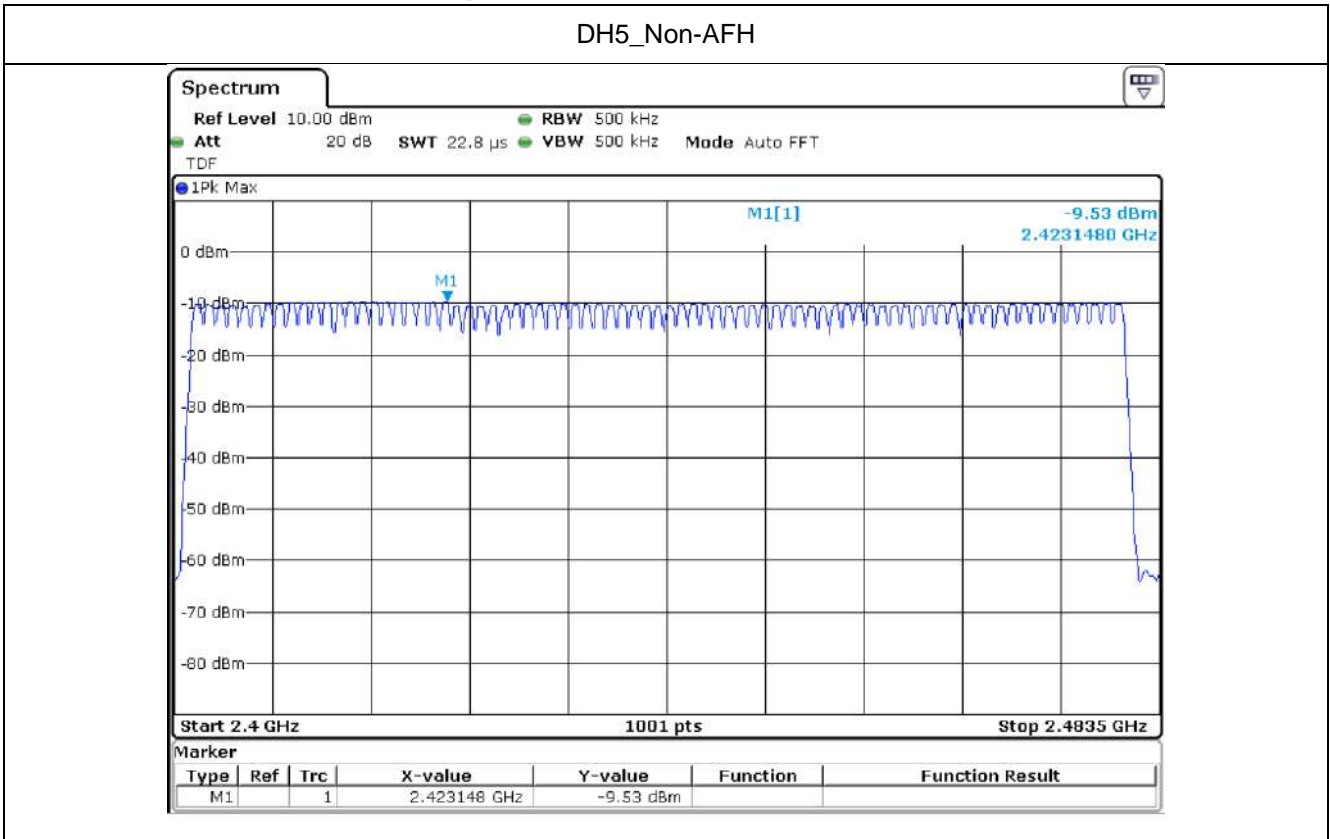


8.4.1.1 Measured Graph for DC 12 V





8.4.1.2 Measured Graph for DC 24 V





9. Time of Occupancy (dwell Time)

9.1 Operating environment

Temperature : 22 °C
Relative humidity : 46 %

9.2 Measurement method

Standard : ANSI 63.10 (7.8.4)

9.3 Limit

Standard : §15.247 (a)(1)(iii)

9.4 Test data

Test Result : Pass

In Theory,

- non-AFH mode: hopping rate is 1 600 hops/s with 6 slots in 79 hopping channels. With channel hopping rate (1600 / 6 / 79) in Occupancy Time Limit (0.4 x 79) (s).
Hops Over Occupancy Time comes to (1 600 / 6 / 79) x (0.4 x 79) = 106.67 hops.

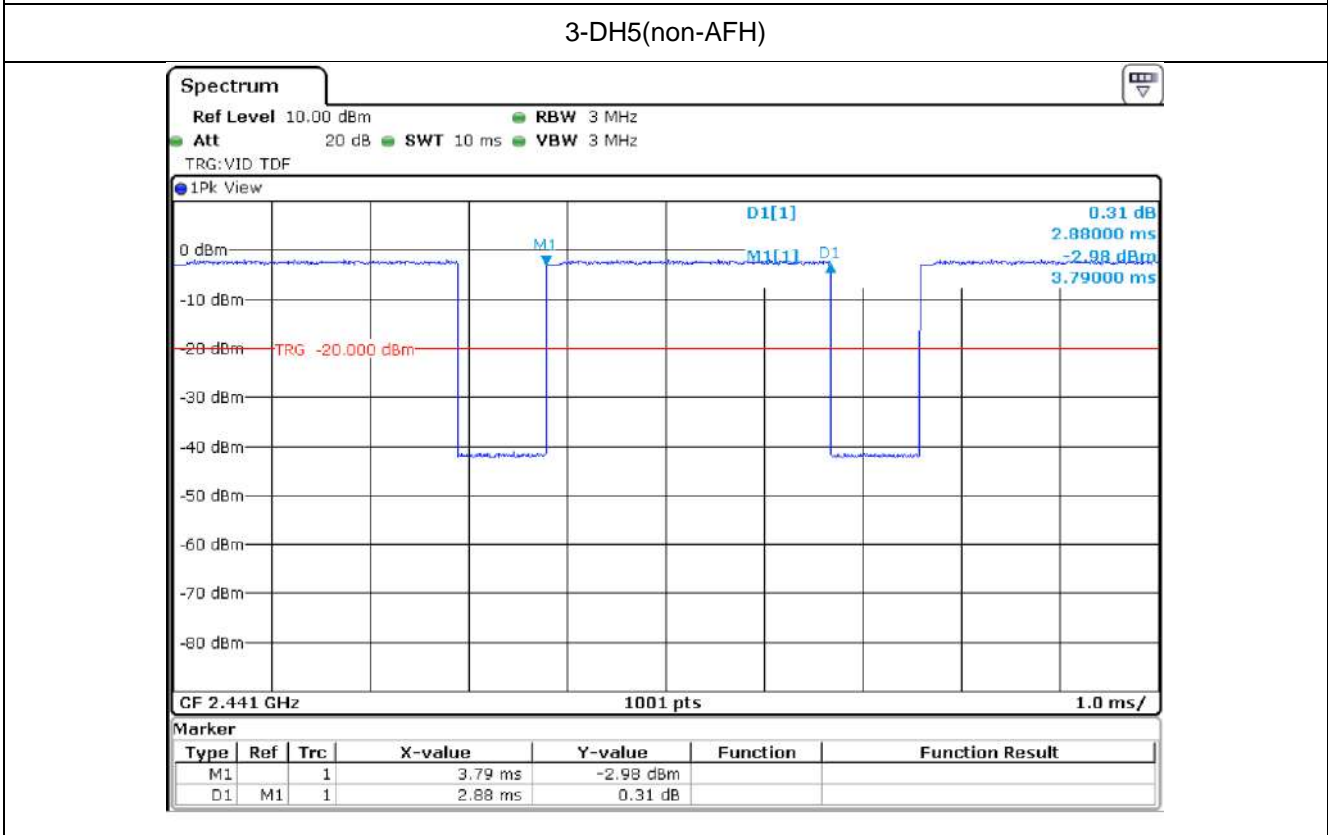
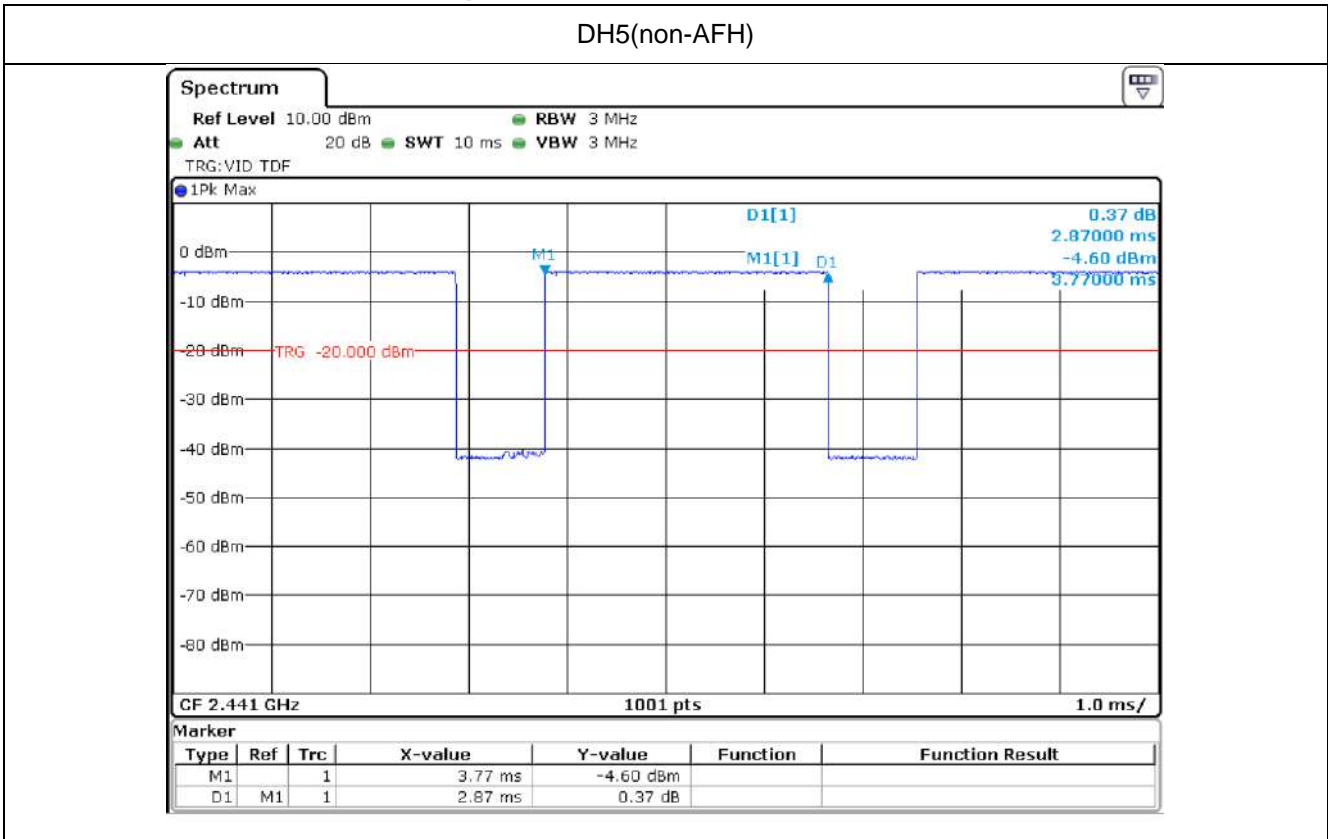
9.4.1 Measured Results for DC 12 V

Operating Mode	Mode	Hopping Channel Number	Hops Over Occupancy Time (ms/hops)	Package Transfer Time (ms)	Occupancy Time (s)	Limit (s)
Hopping	DH5(non-AFH)	79	106.67	2.87	0.31	0.4
	3-DH5(non-AFH)	79	106.67	2.88	0.31	

※ Occupancy Time (s) = Hops Over Occupancy Time (hops) x Package Transfer Time (ms)



9.4.1.1 Measured Graph for DC 12 V



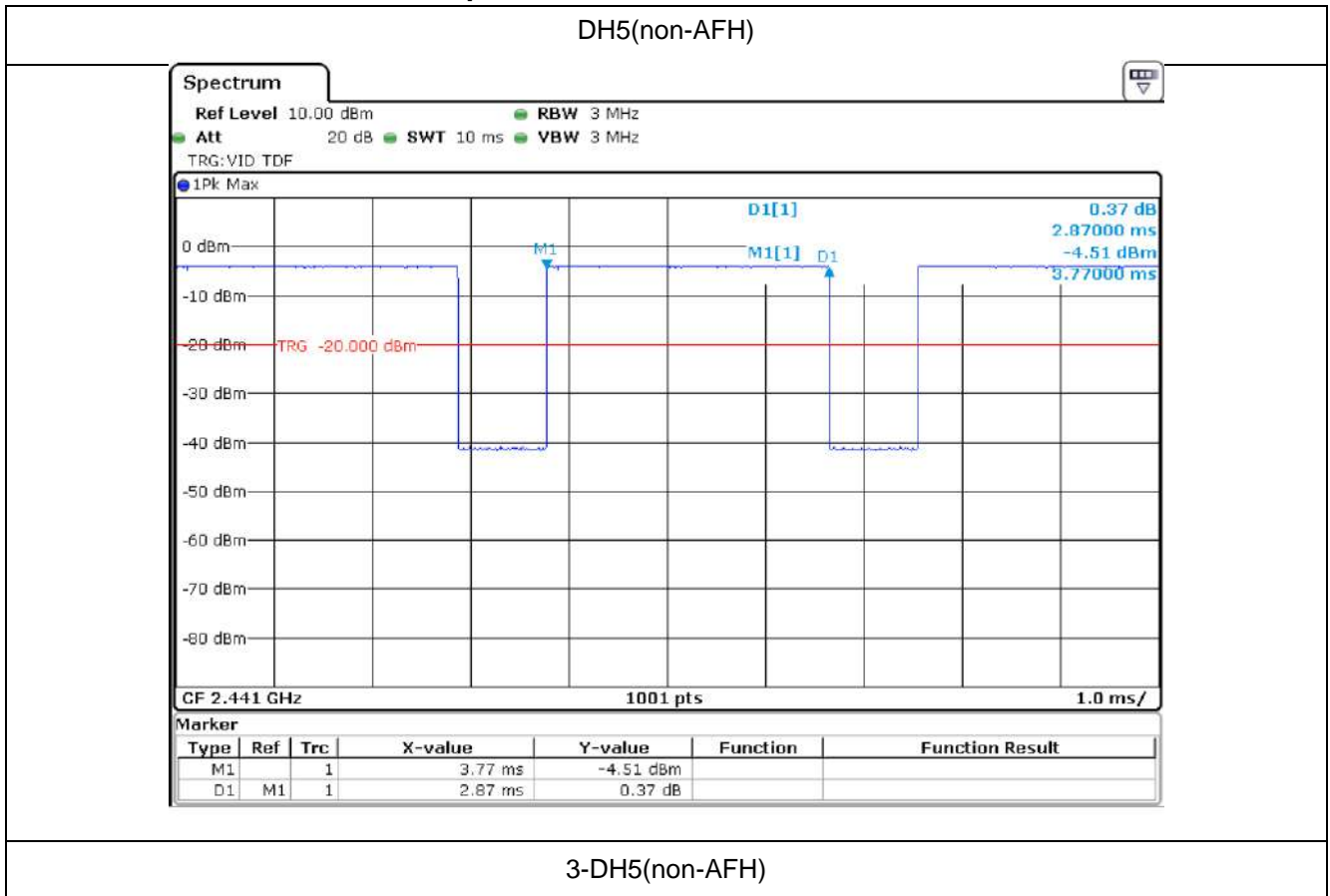


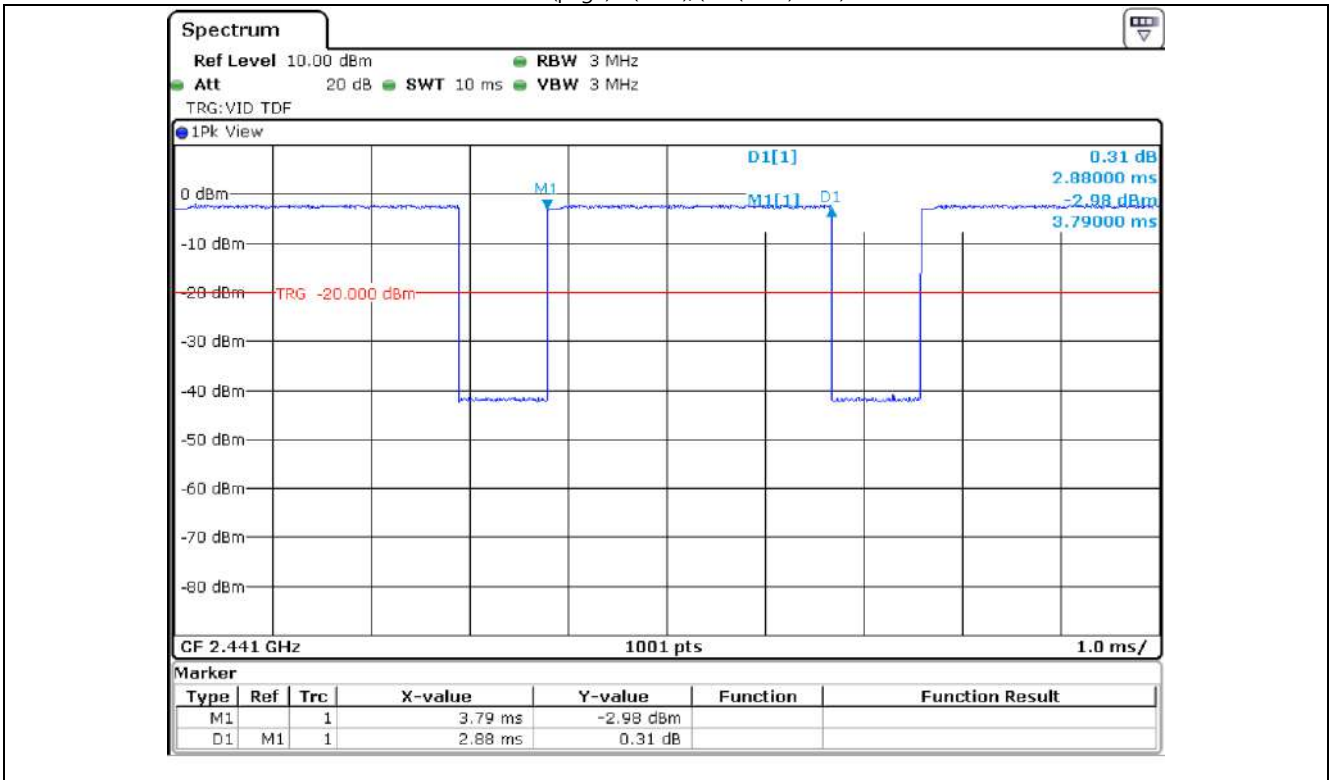
9.4.2 Measured Results for DC 24 V

Operating Mode	Mode	Hopping Channel Number	Hops Over Occupancy Time (ms/hops)	Package Transfer Time (ms)	Occupancy Time (s)	Limit (s)
Hopping	DH5(non-AFH)	79	106.67	2.87	0.31	0.4
	3-DH5(non-AFH)	79	106.67	2.88	0.31	

※ Occupancy Time (s) = Hops Over Occupancy Time (hops) x Package Transfer Time (ms)

9.4.2.1 Measured Graph for DC 24 V







10. Output Power

10.1 Operating environment

Temperature : 22 °C
 Relative humidity : 46 %

10.2 Measurement method

Standard : ANSI 63.10 (7.8.5)

10.3 Limit

Standard : §15.247 (a)(1)

10.4 Test data

Operating mode : Transmit mode
 Test Result : Pass

10.4.1 Measured Results for DC 12 V

Modulation Type	Channel (Frequency)	Maximum Conducted Output Power			e.i.r.p.	
		Measured value (dBm)	Average Power(dBm)	Limit	Measured value (dBm)	Limit
DH5	0 (2 402 MHz)	-1.12	-1.53	21 (dBm) (0.125 Watt)	2.93	36 (dBm) (4 Watt)
	39 (2 441 MHz)	-0.16	-0.62		3.37	
	78 (2 480 MHz)	0.50	0.21		3.77	
3-DH5	0 (2 402 MHz)	0.01	-2.42		2.20	
	39 (2 441 MHz)	0.56	-1.60		3.01	
	78 (2 480 MHz)	1.20	-0.70		3.51	

※ Antenna Gain : 1.88 dBi

10.4.2 Measured Results for DC 24 V

Modulation Type	Channel (Frequency)	Maximum Conducted Output Power			e.i.r.p.	
		Measured value (dBm)	Average Power(dBm)	Limit	Measured value (dBm)	Limit
DH5	0 (2 402 MHz)	-1.15	-1.55	21 (dBm) (0.125 Watt)	2.93	36 (dBm) (4 Watt)
	39 (2 441 MHz)	-0.29	-0.63		3.37	
	78 (2 480 MHz)	0.49	0.19		3.77	
3-DH5	0 (2 402 MHz)	-0.05	-2.47		2.20	
	39 (2 441 MHz)	0.49	-1.67		3.01	
	78 (2 480 MHz)	1.20	-0.71		3.51	

※ Antenna Gain : 1.88 dBi



11. Conducted Spurious Emission & Band edge (Non-Restricted band)

11.1 Operating environment

Temperature : 22 °C
Relative humidity : 46 %

11.2 Measurement method

Standard : ANSI 63.10 (7.8.8) / ANSI 63.(10 6.10.4)

11.3 Limit

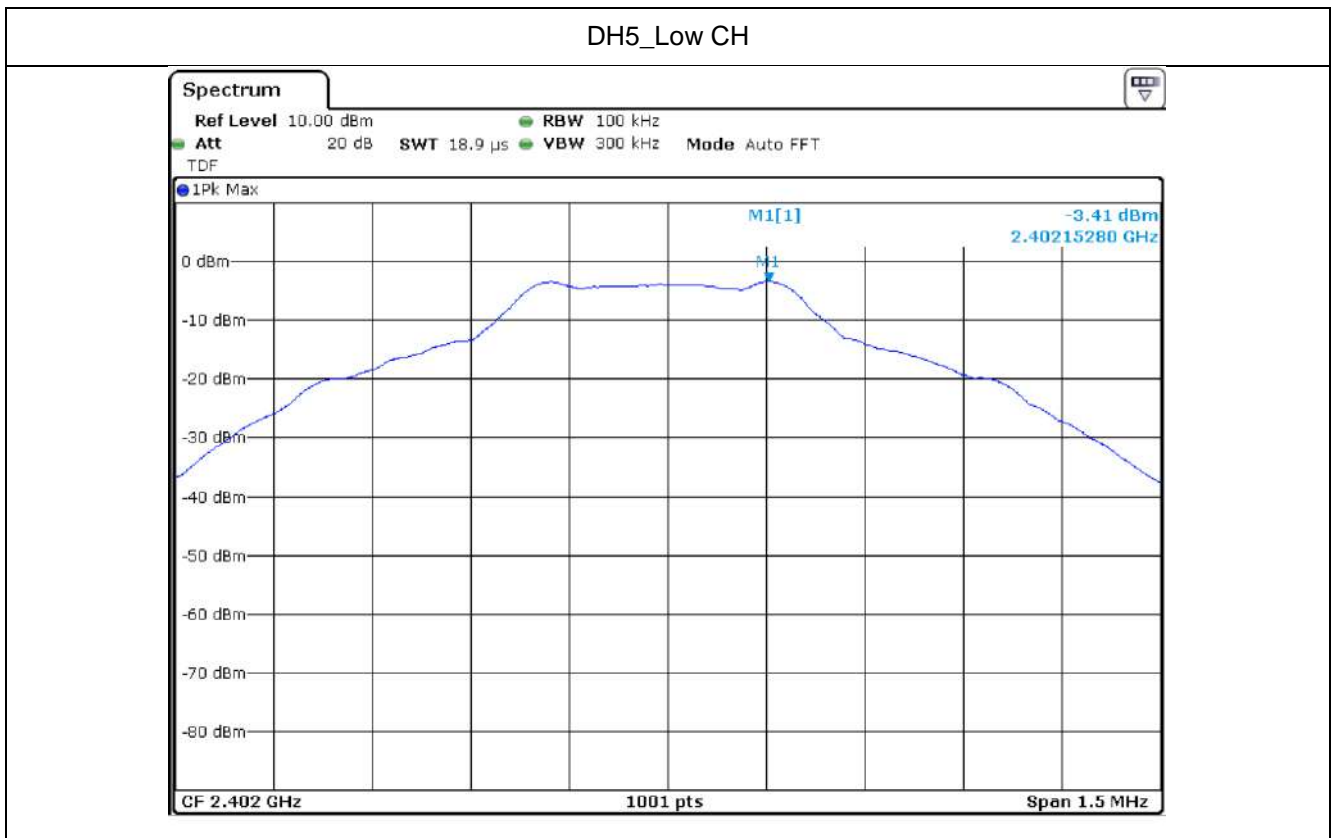
Standard : §15.247 (d)

11.4 Test data

Operating mode : Transmit mode
Test Result : Pass

11.4.1 Measured Results for DC 12 V

11.4.1.1 Signal level (dB m)_DC 12 V

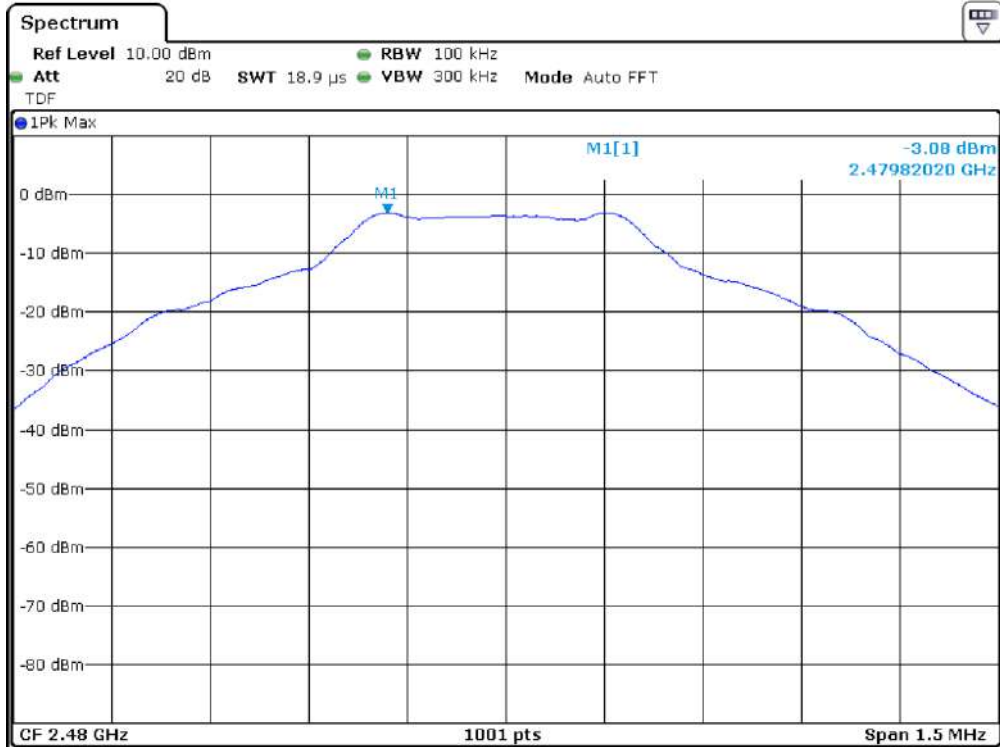




DH5_Mid CH

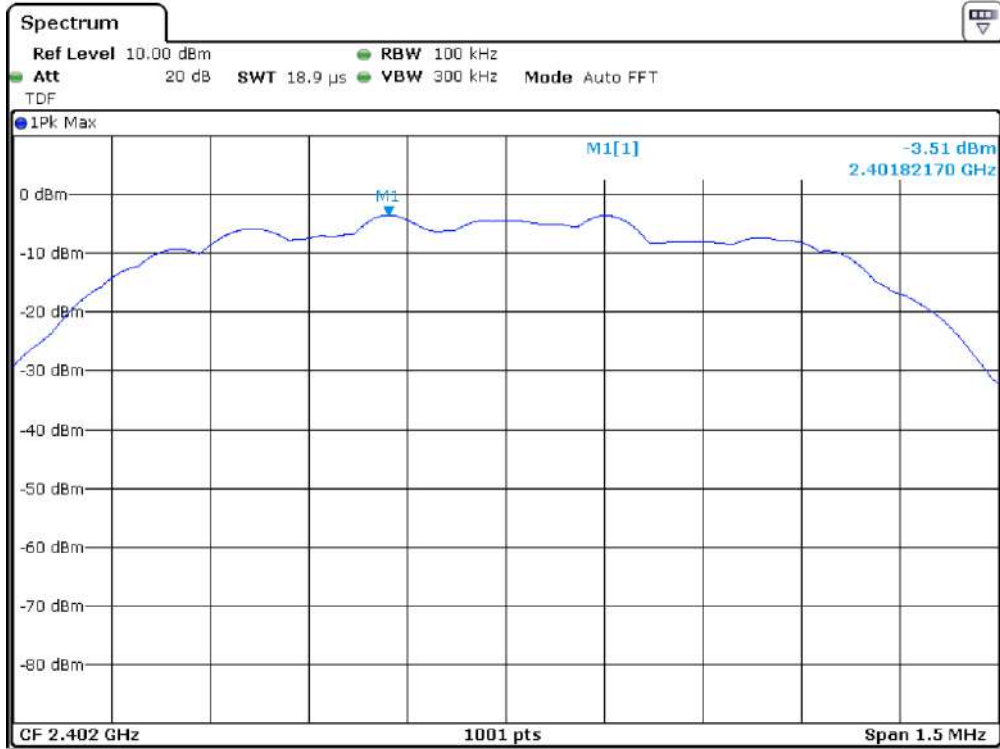


DH5_High CH

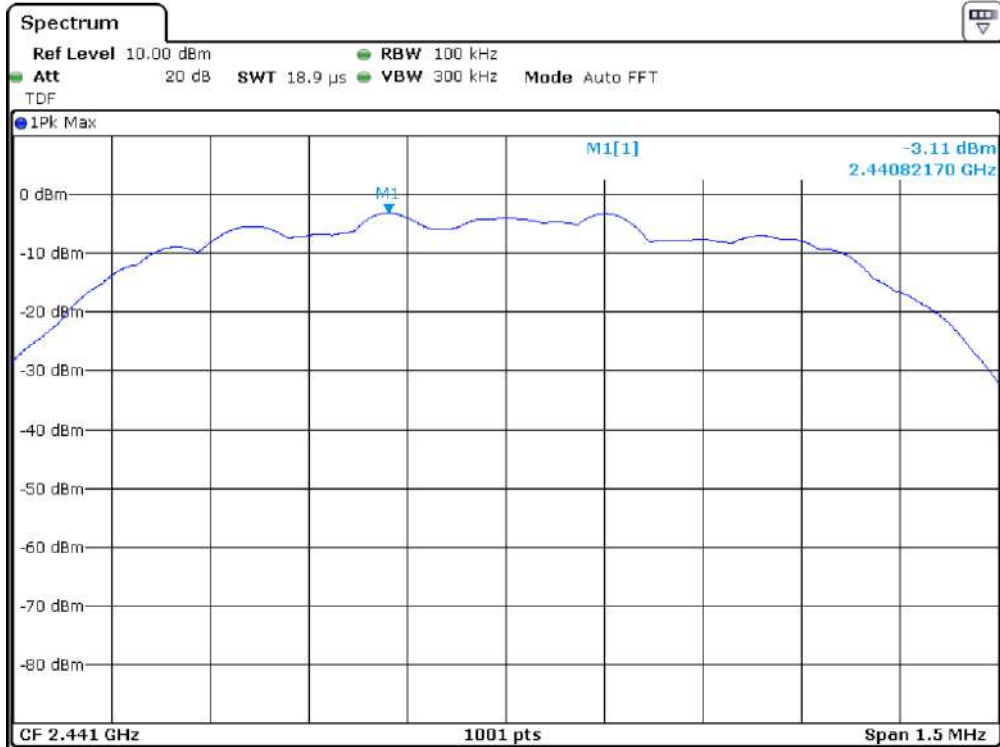


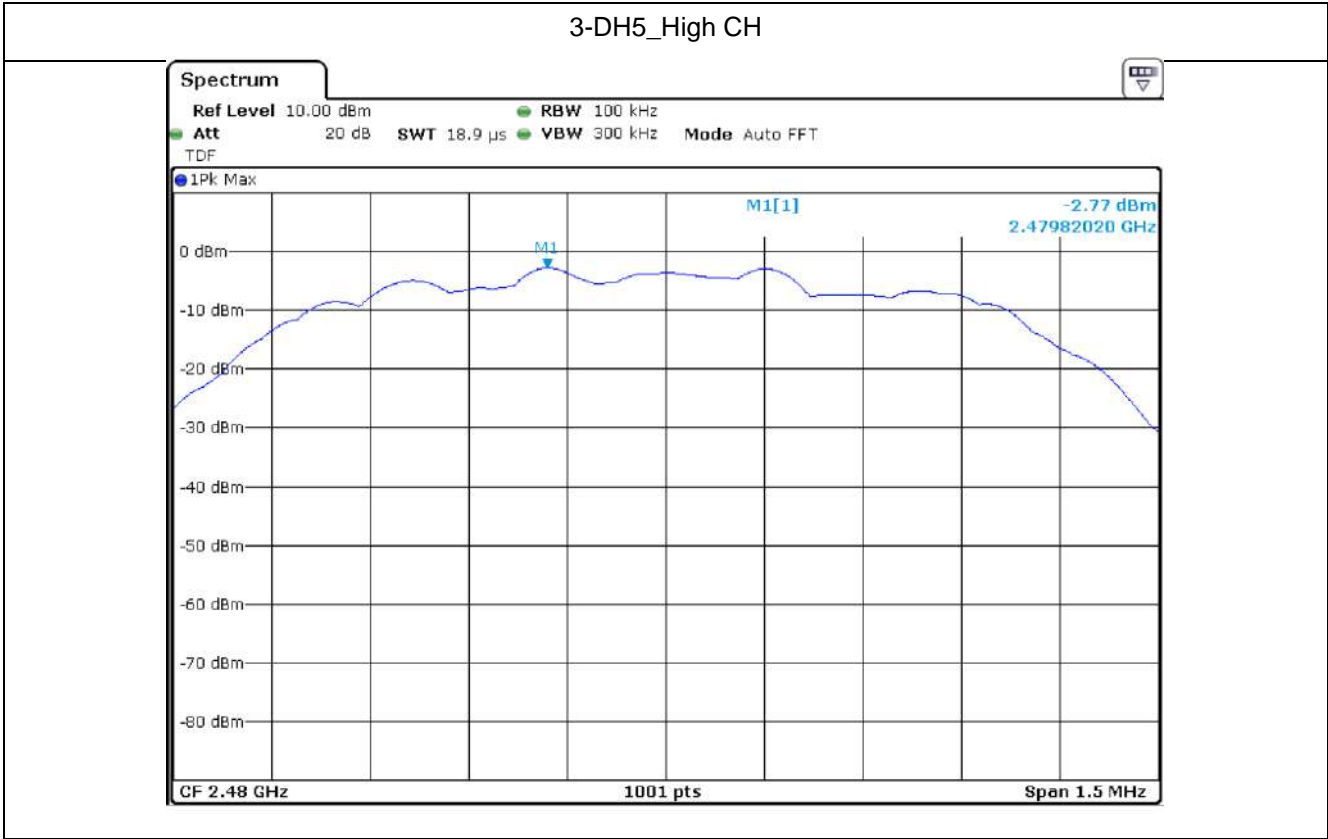


3-DH5_Low CH



3-DH5_Mid CH

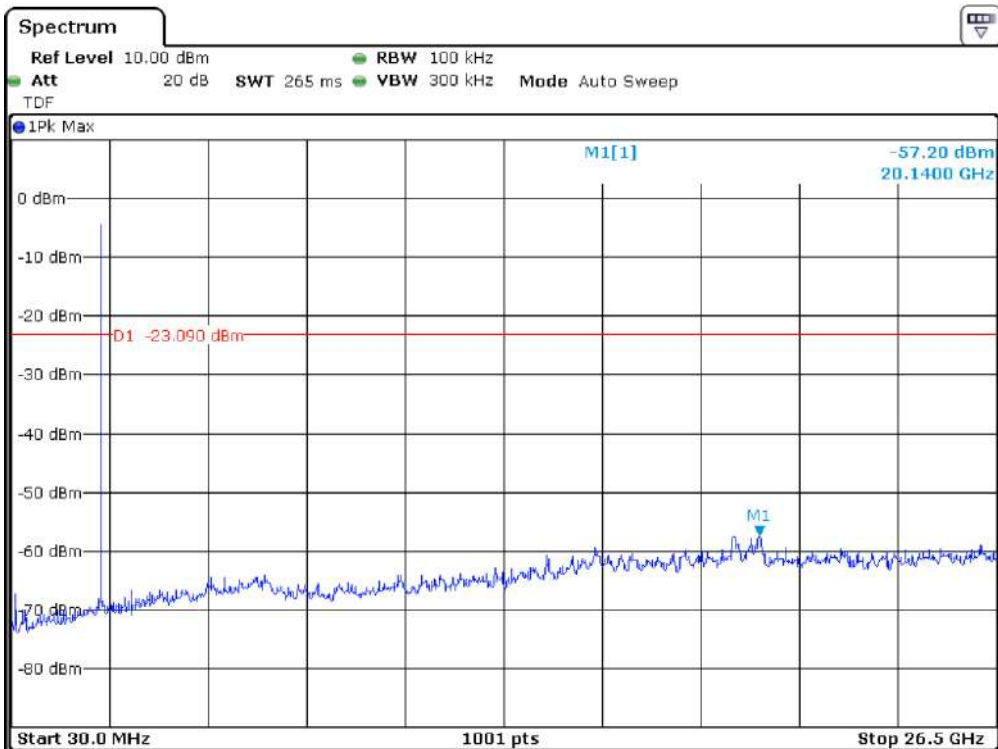
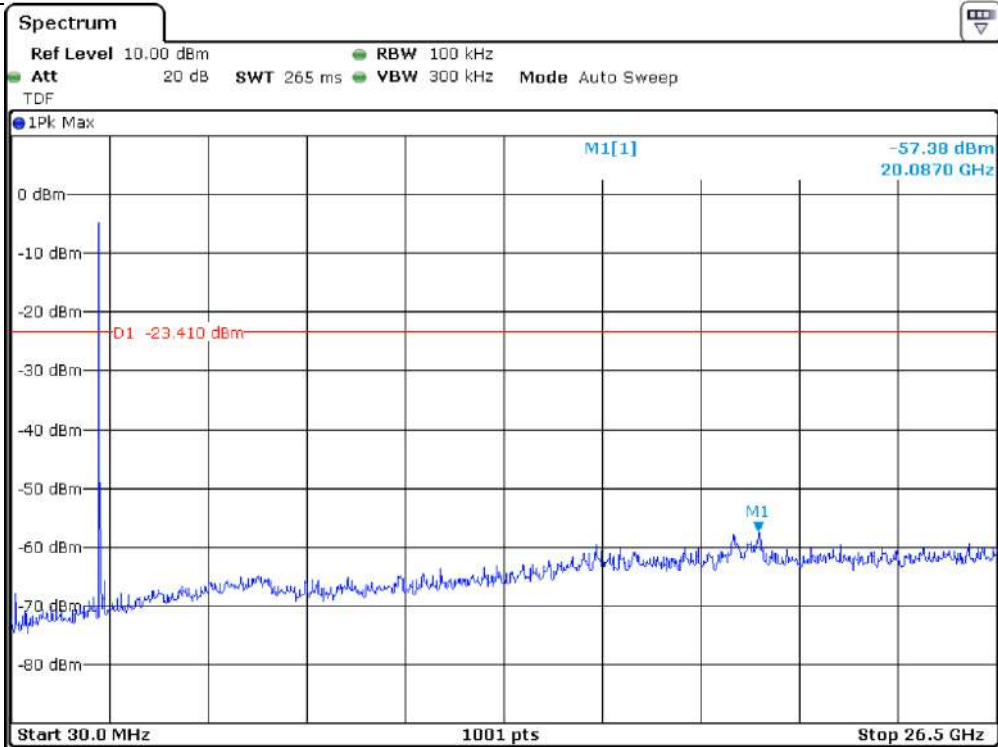






11.4.1.2 Unwanted Emissions In Non-Restricted Frequency Bands_DC 12 V

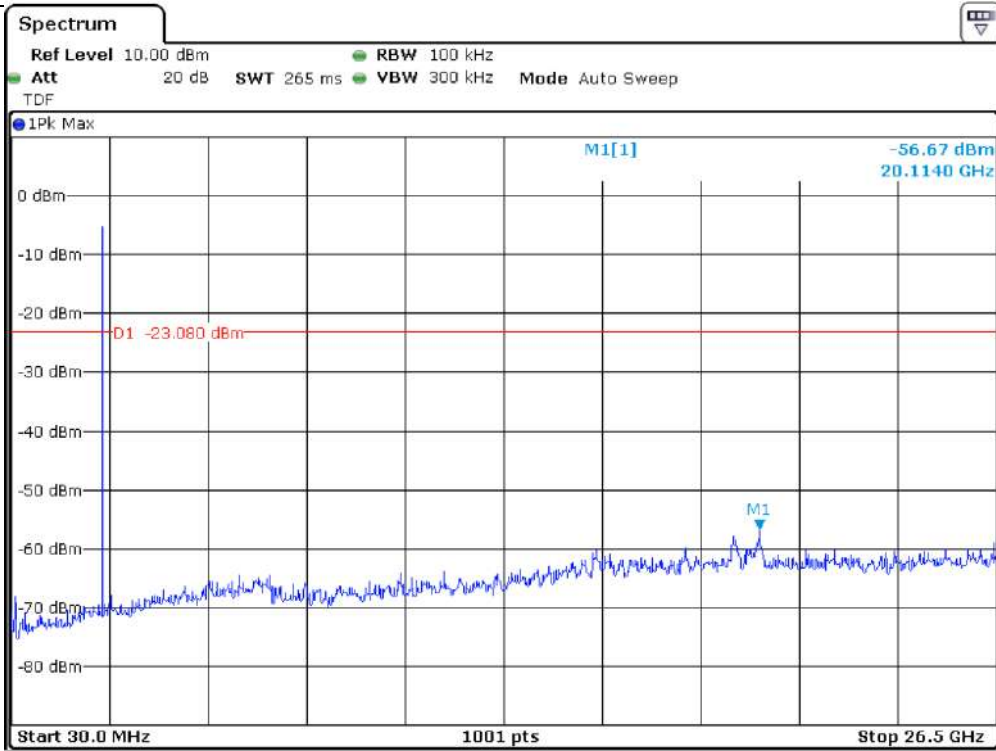
DH5_Low CH



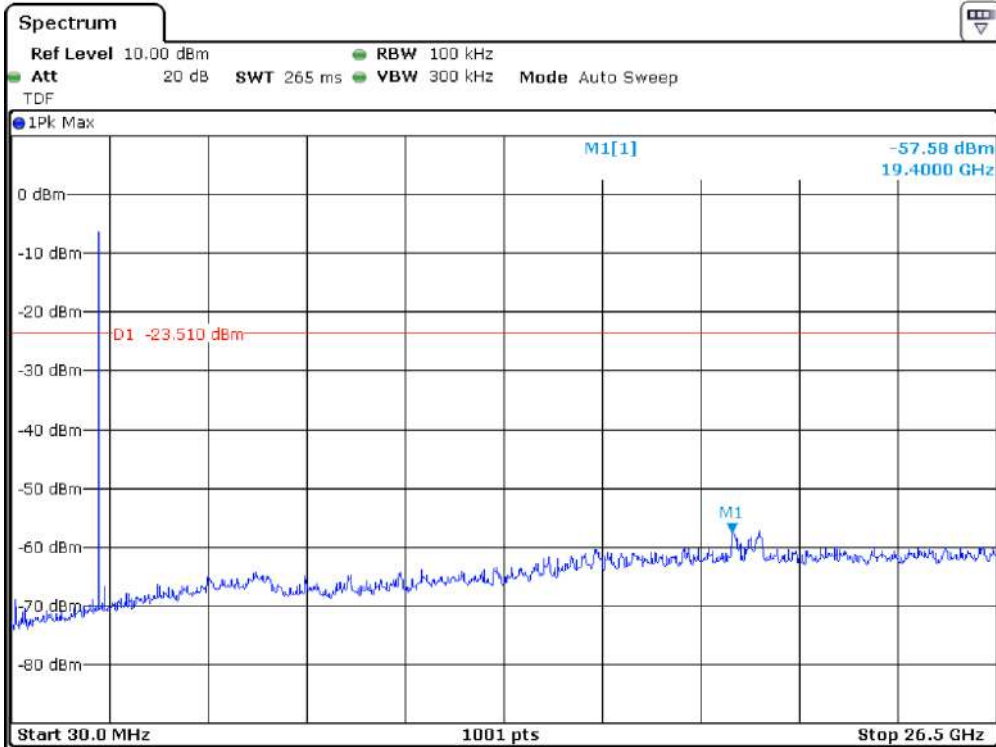
DH5_Mid CH



DH5_High CH

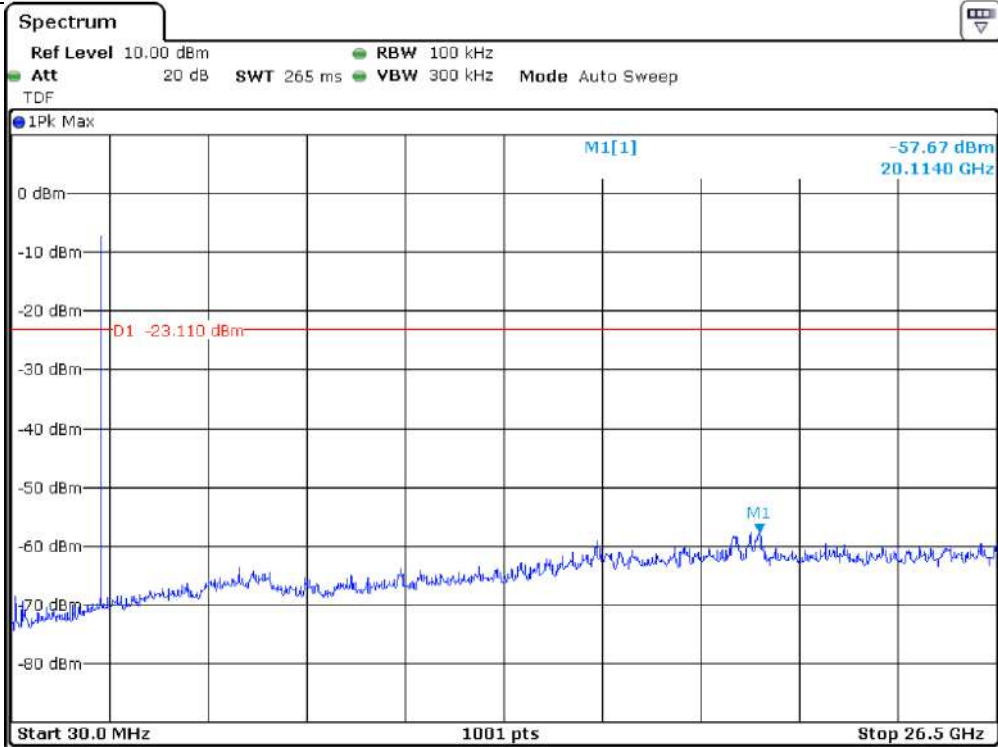


3-DH5_Low CH

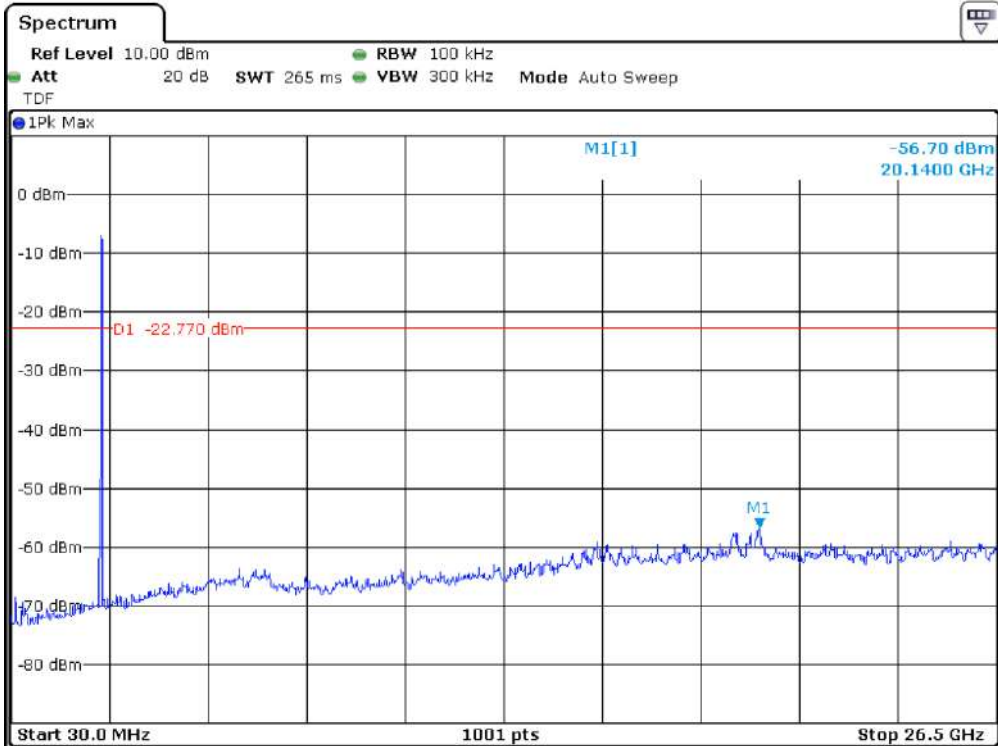




3-DH5_Mid CH

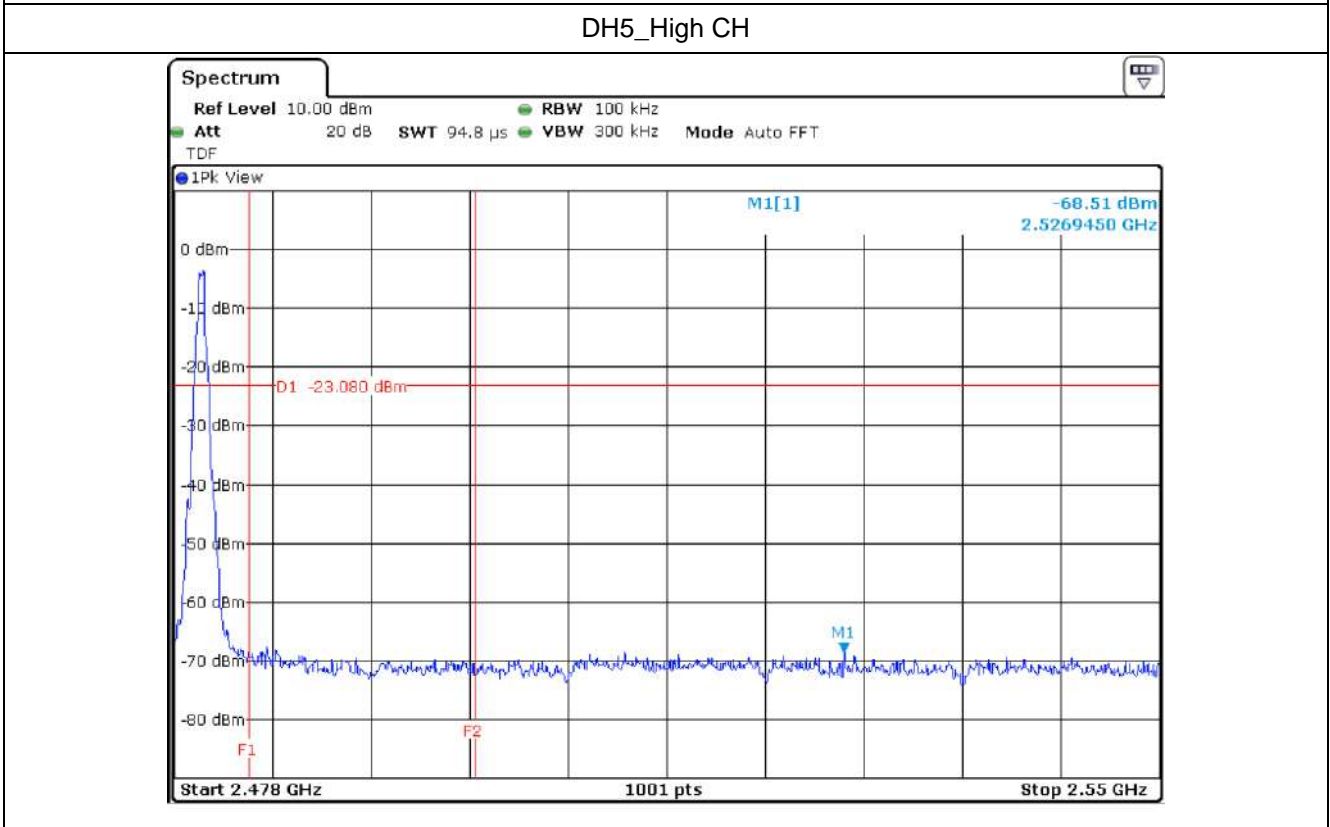
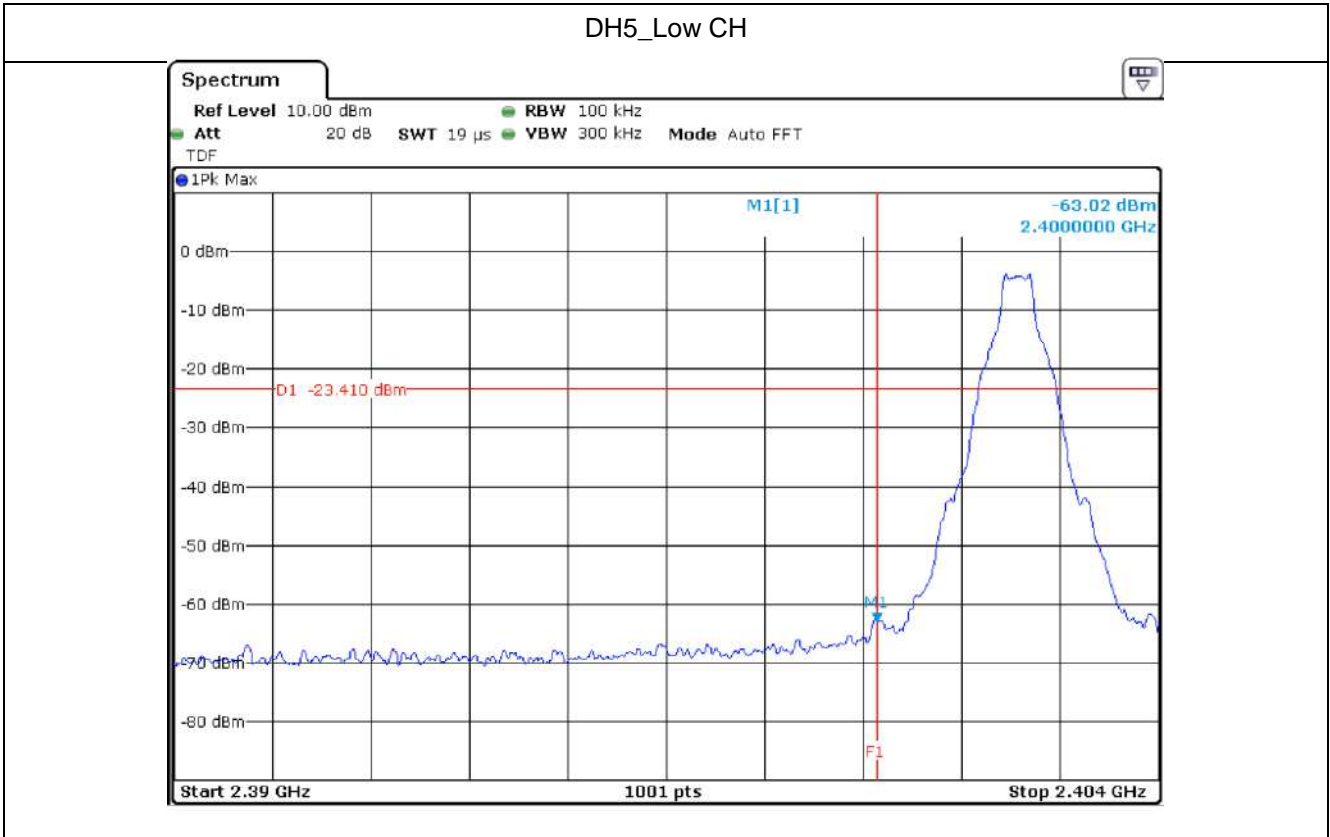


3-DH5_High CH



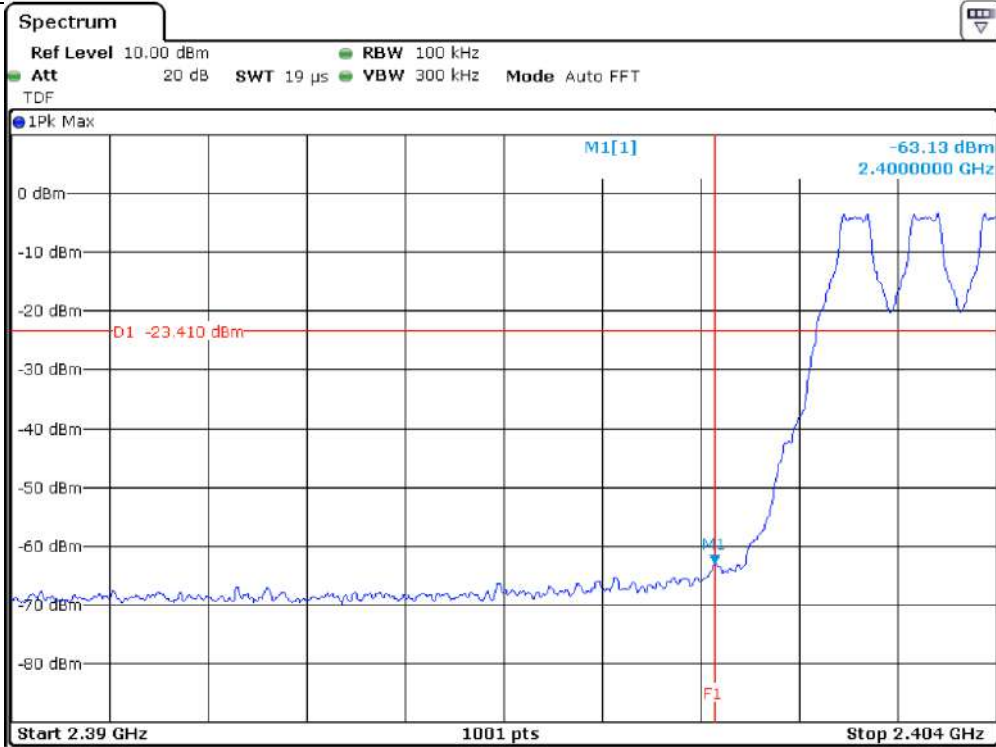


11.4.1.3 Band Edge_DC 12 V

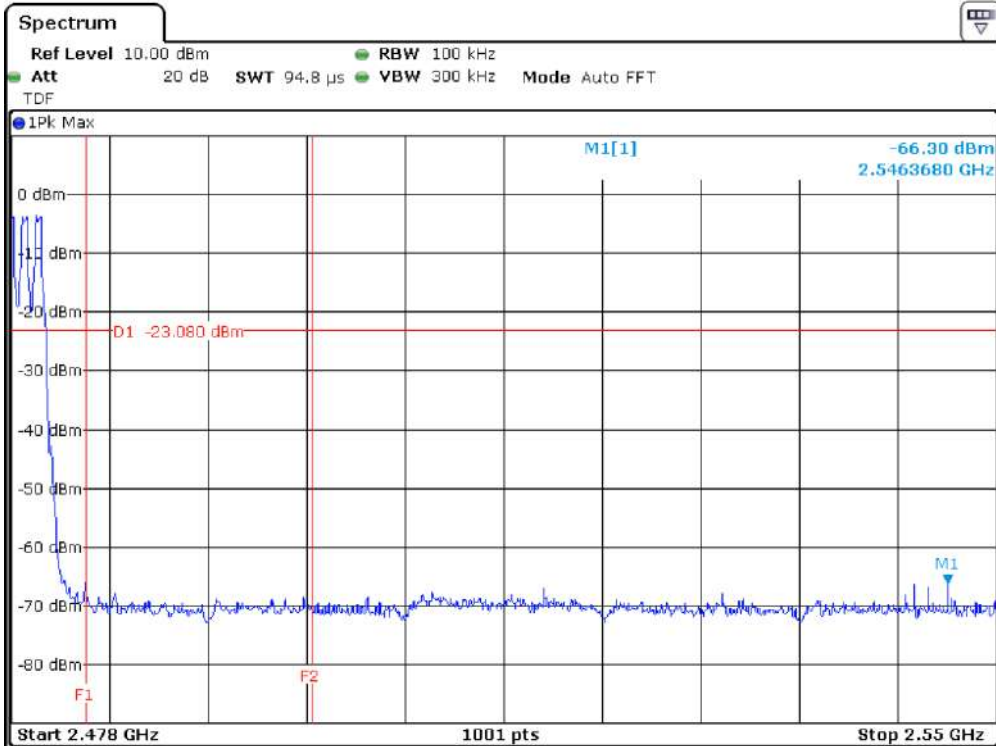




DH5_Hopping_Low CH

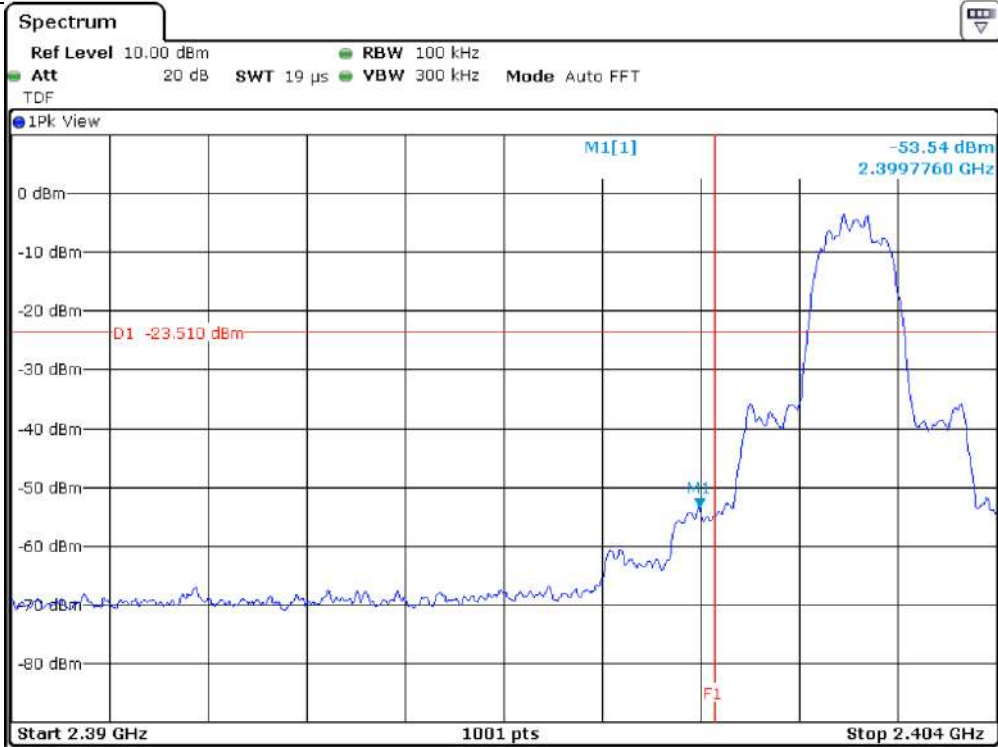


DH5_Hopping_High CH

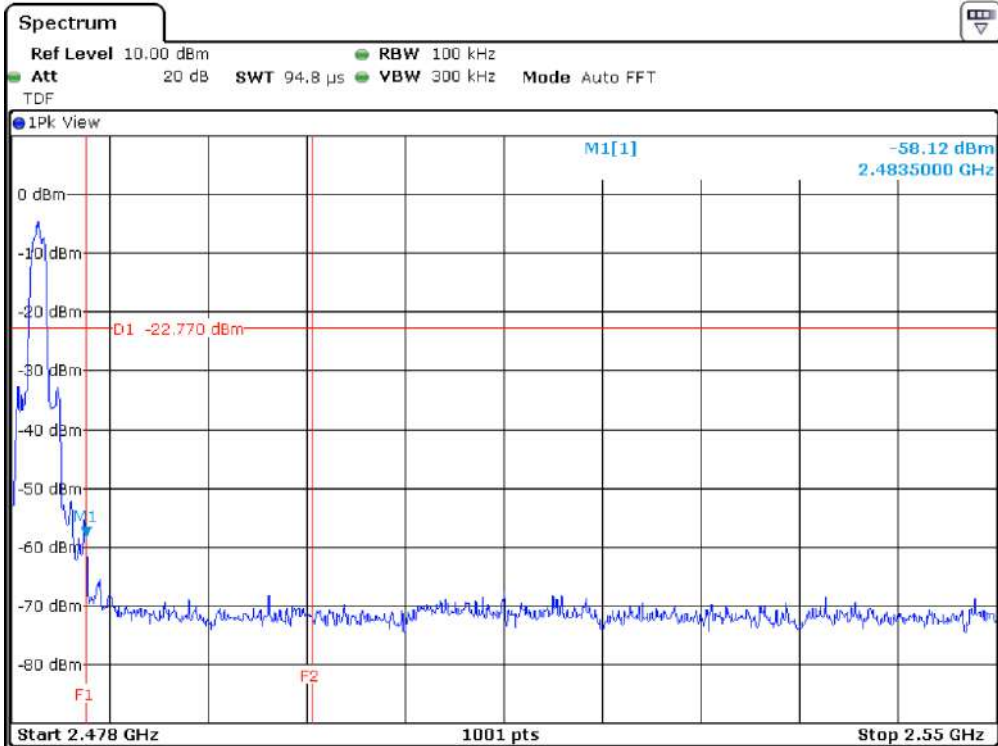




3-DH5_Low CH

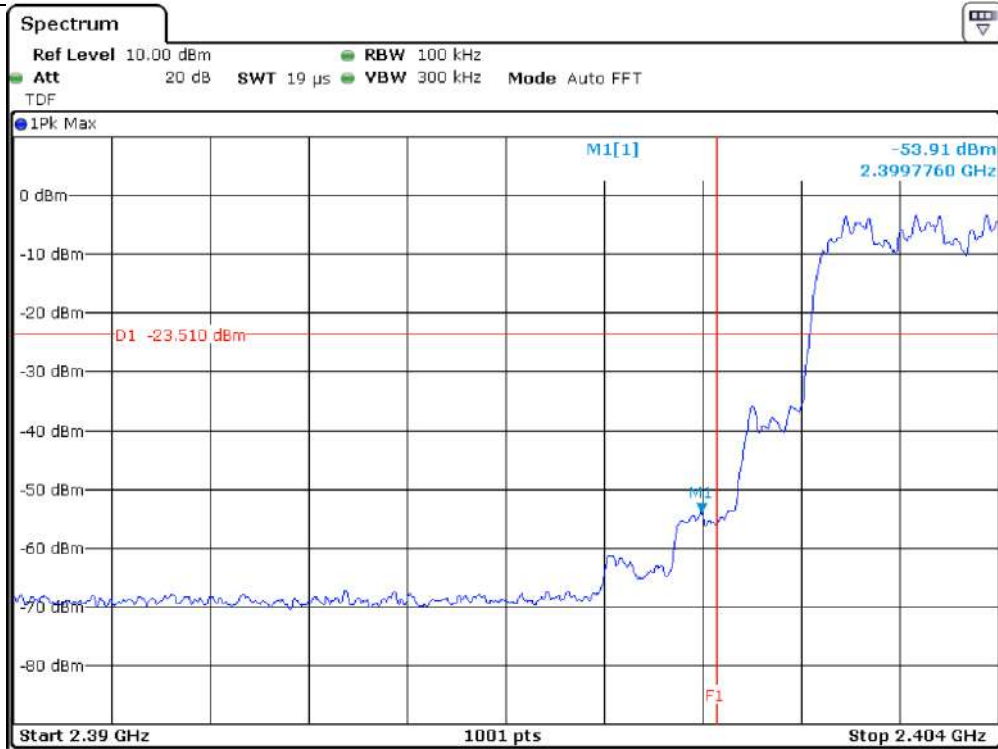


3-DH5_High CH

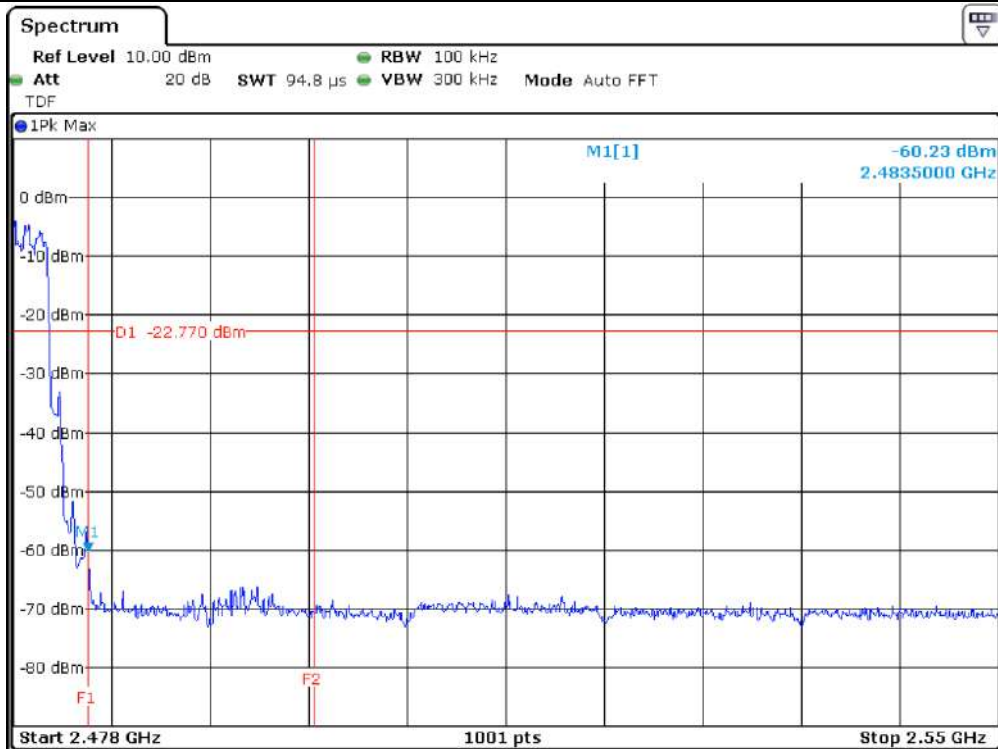




3-DH5_Hopping_Low CH



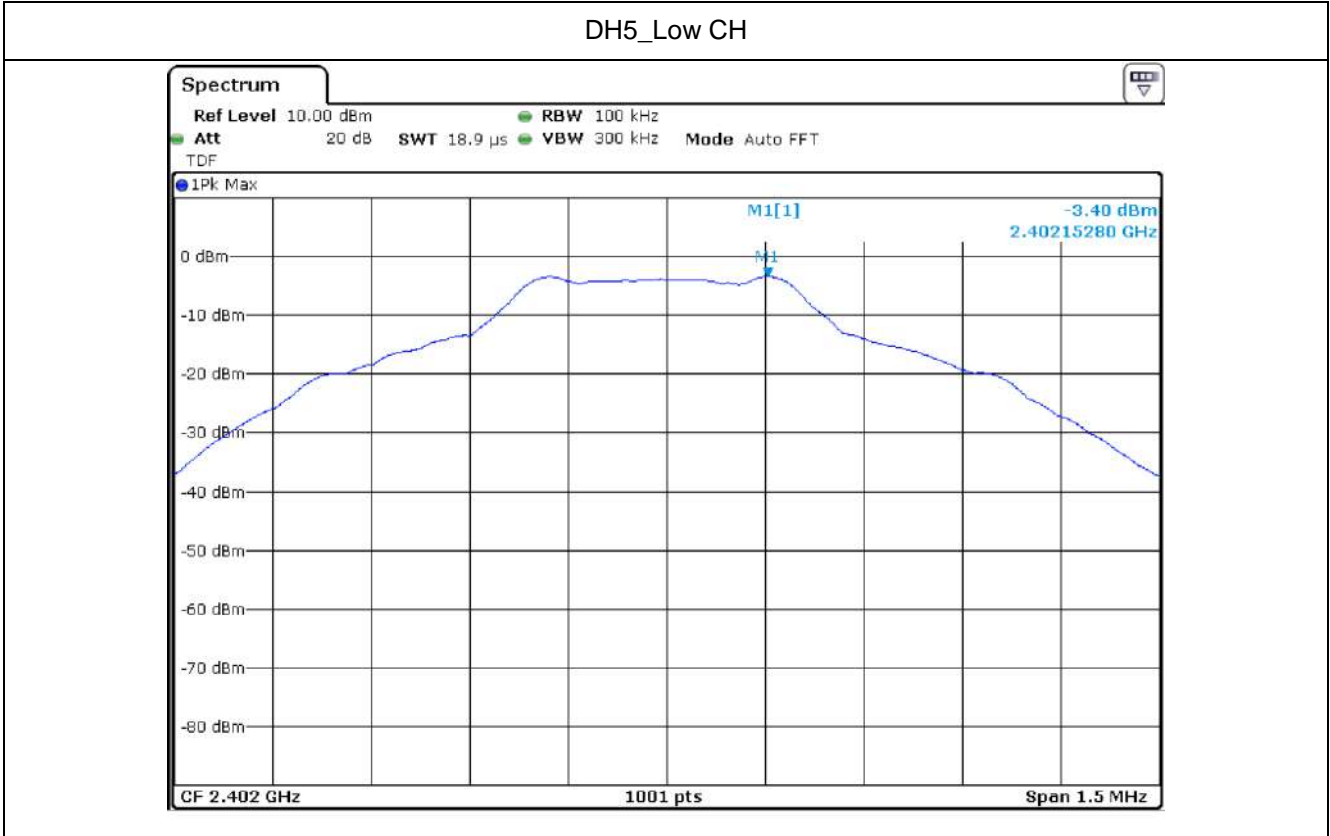
3-DH5_Hopping_High CH





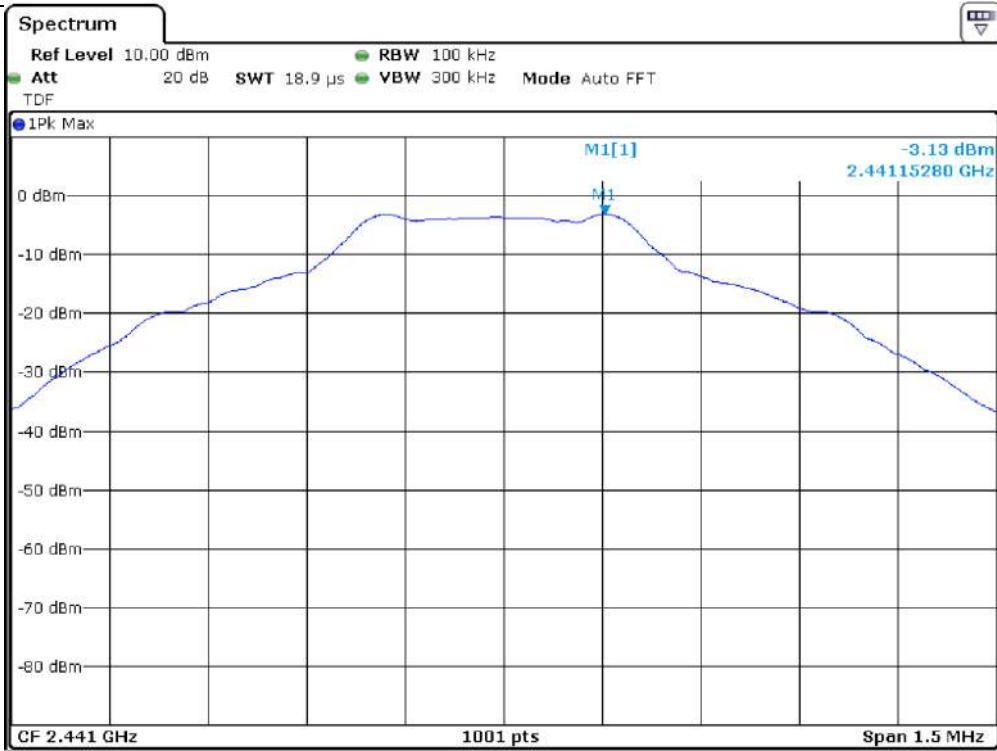
11.4.2 Measured Results for DC 24 V

11.4.2.1 Signal level (dB m)_DC 24 V





DH5_Mid CH

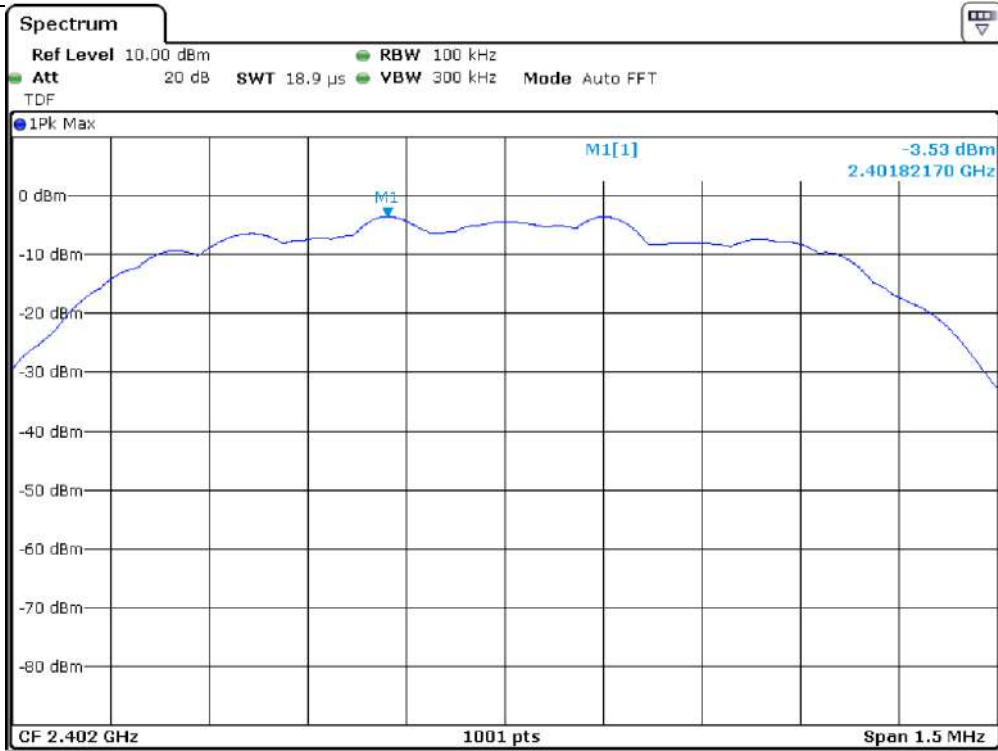


DH5_High CH

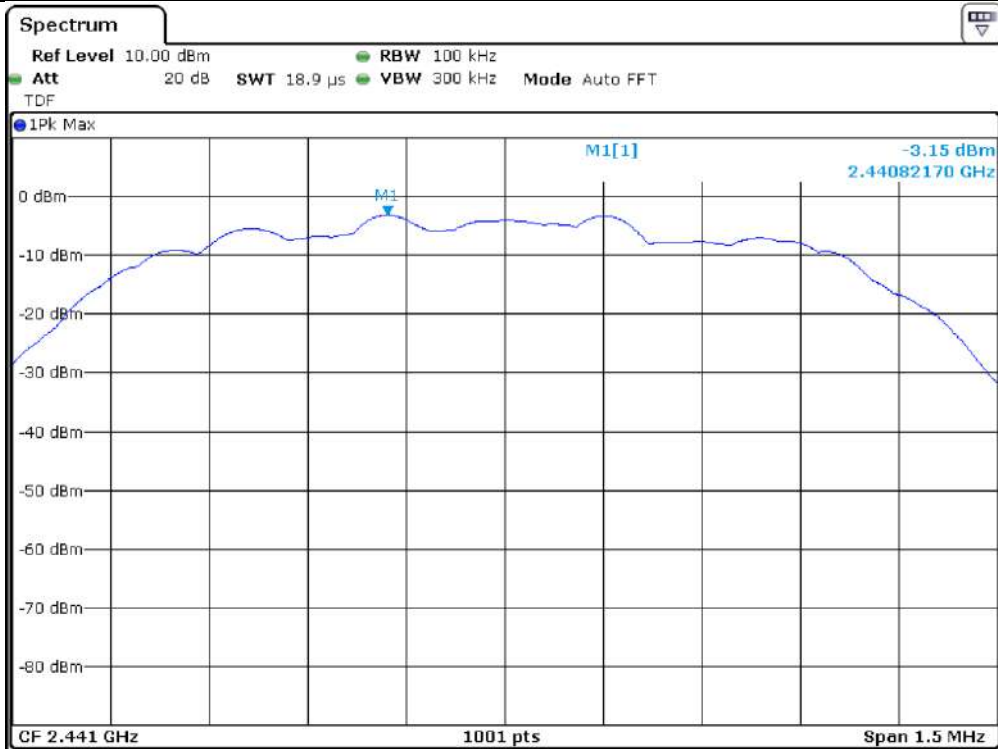


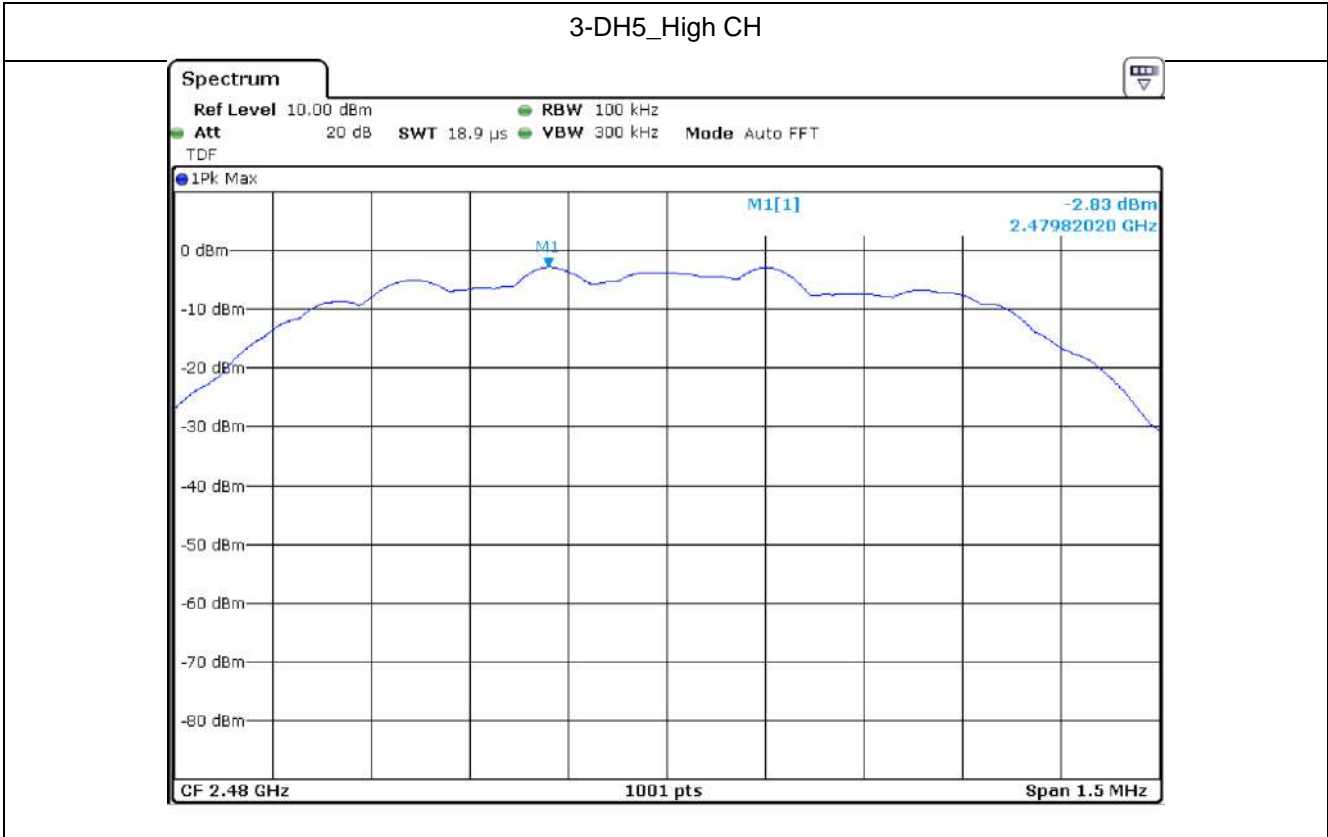


3-DH5_Low CH



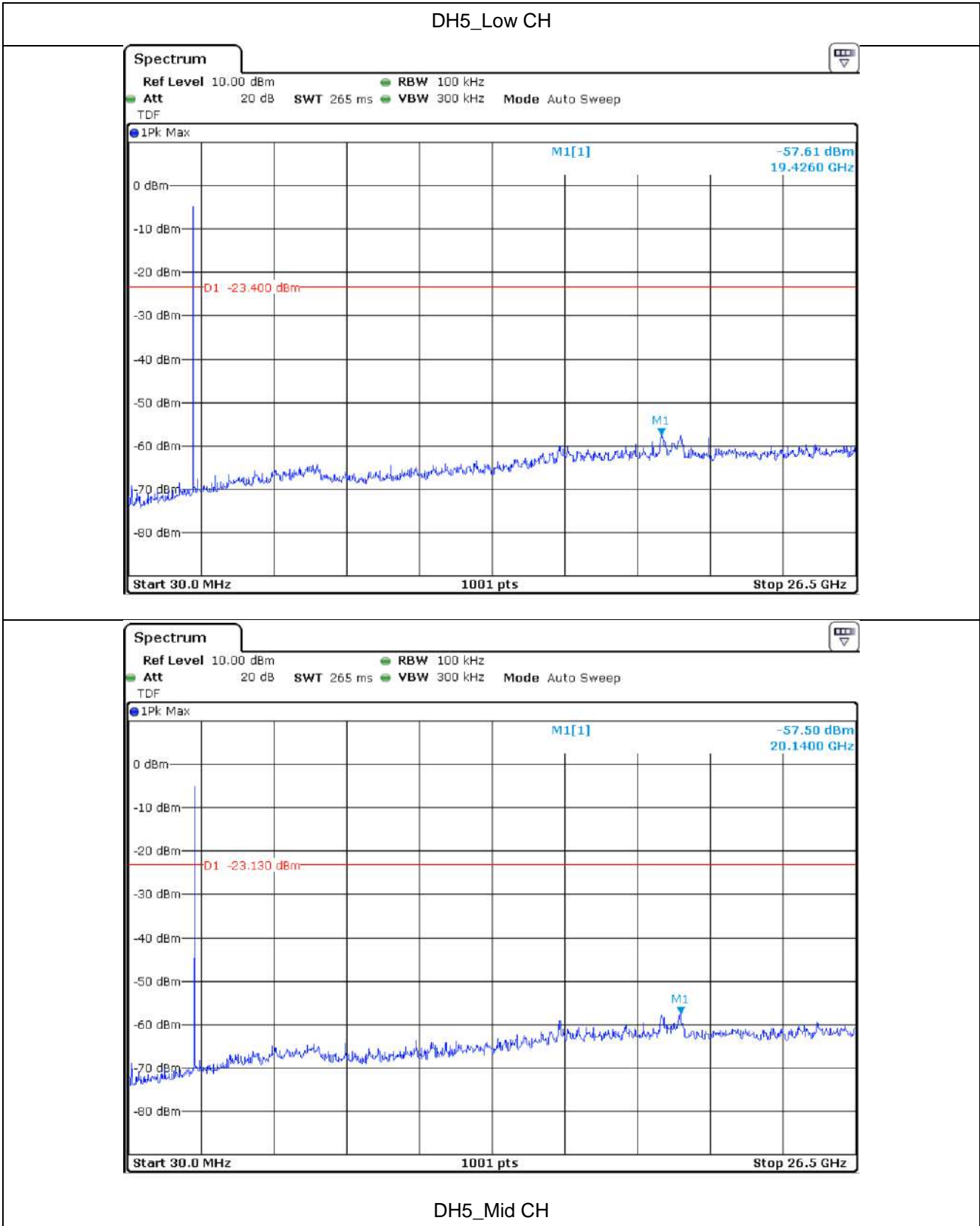
3-DH5_Mid CH





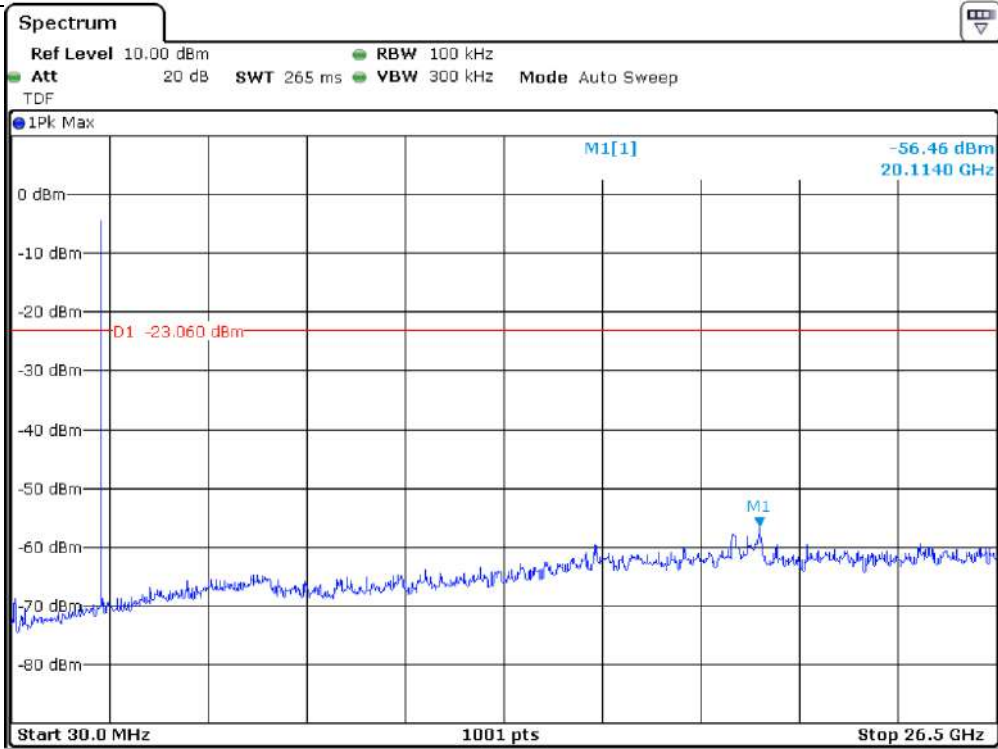


11.4.2.2 Unwanted Emissions In Non-Restricted Frequency Bands_DC 24 V

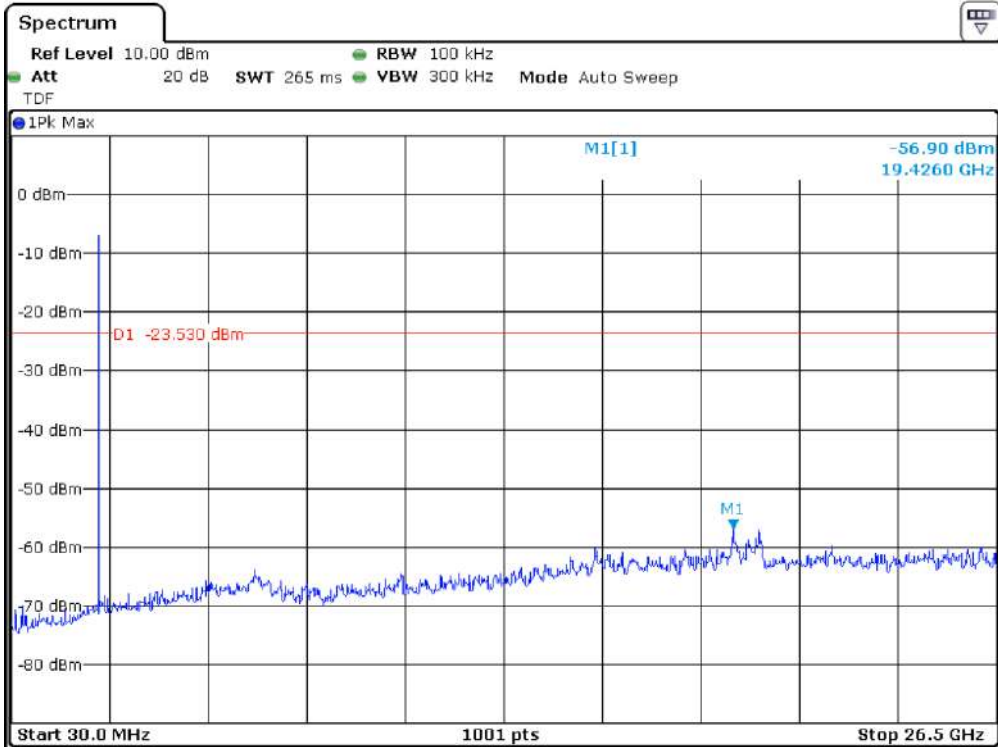




DH5_High CH

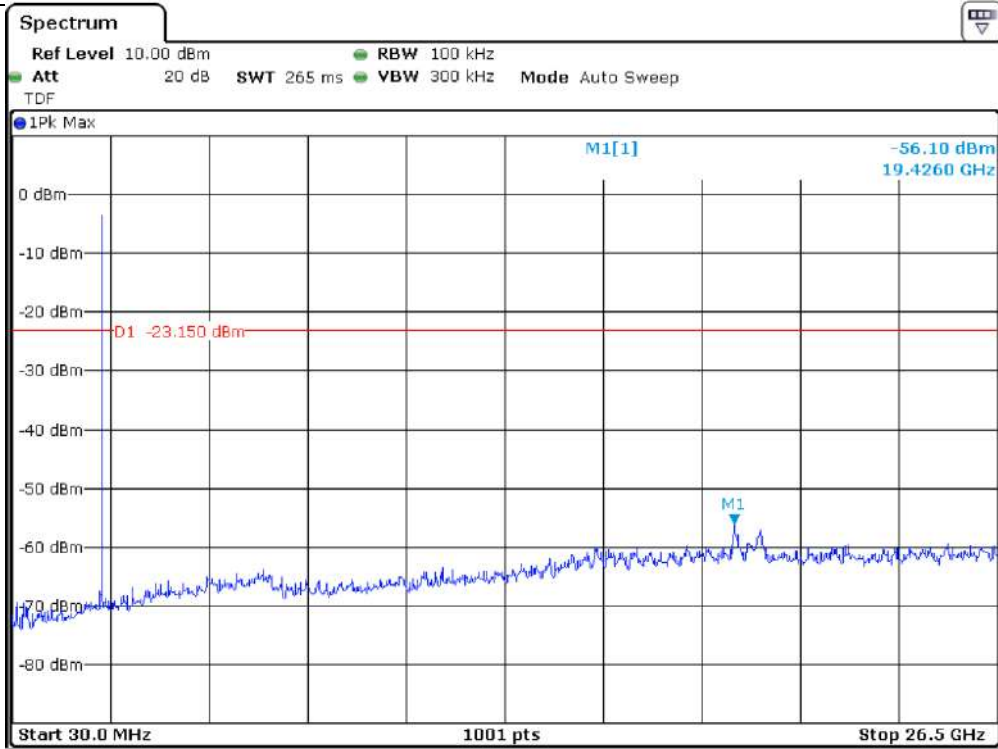


3-DH5_Low CH

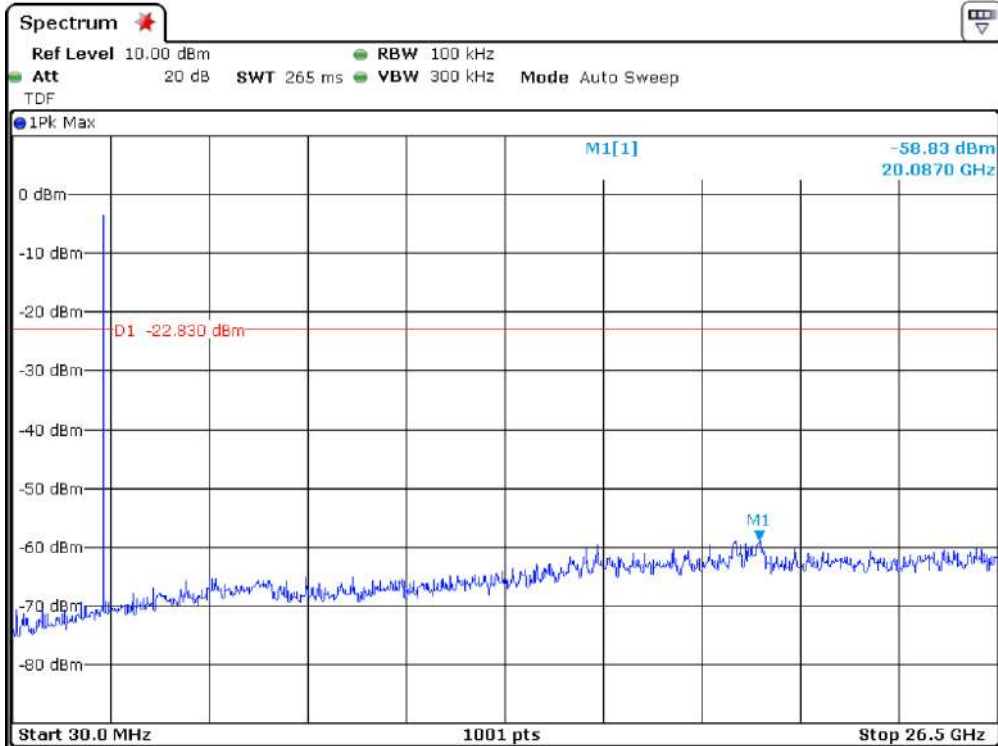




3-DH5_Mid CH

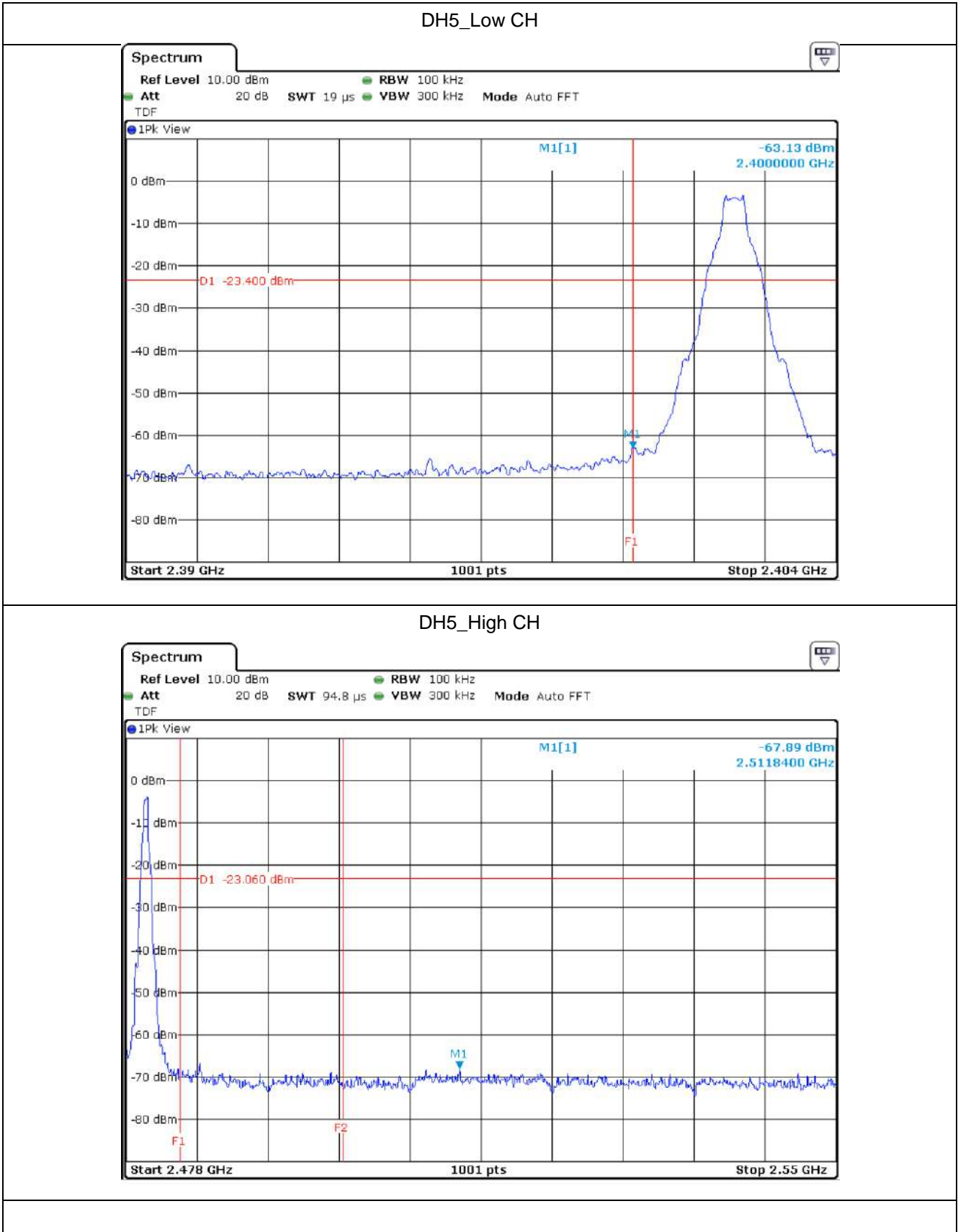


3-DH5_High CH



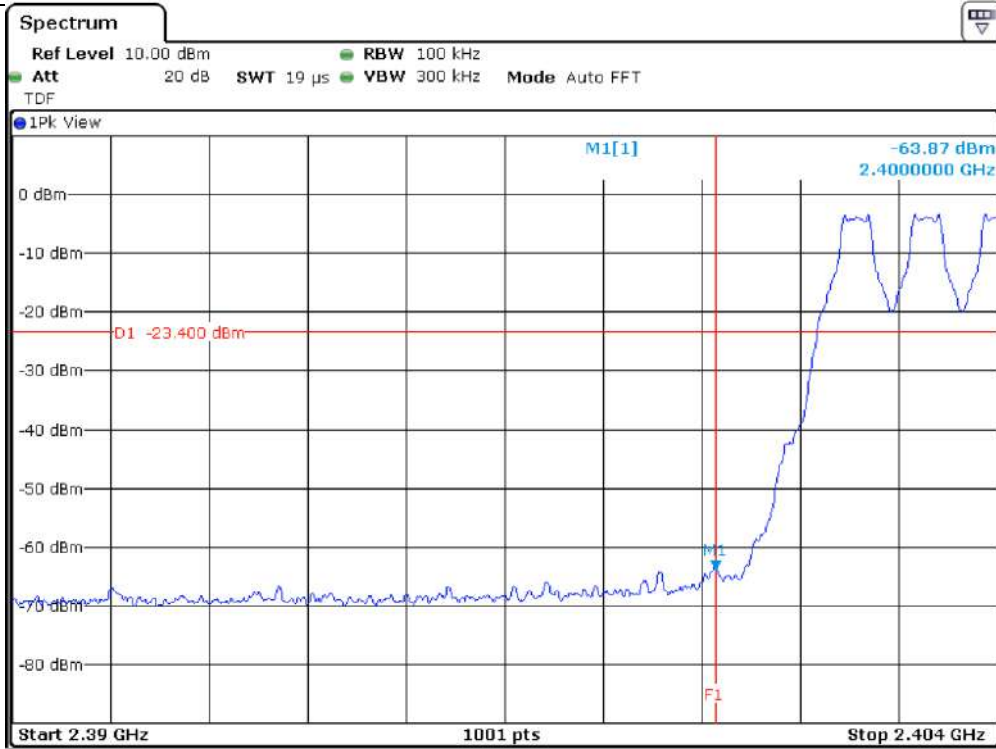


11.4.2.3 Band Edge_DC 24 V

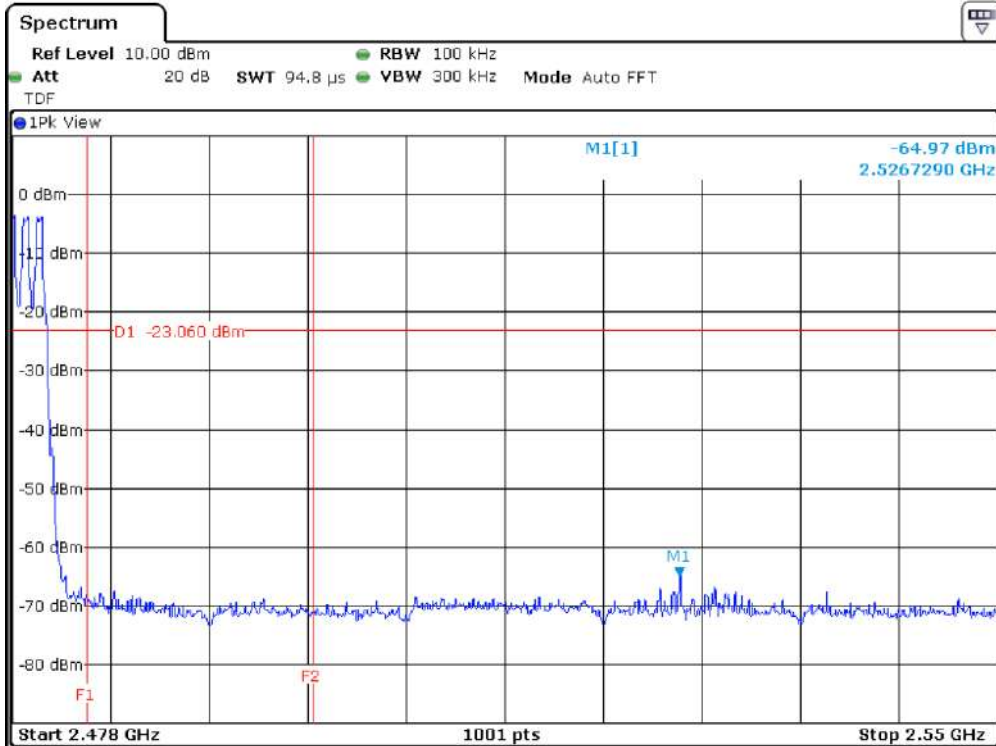




DH5_Hopping_Low CH

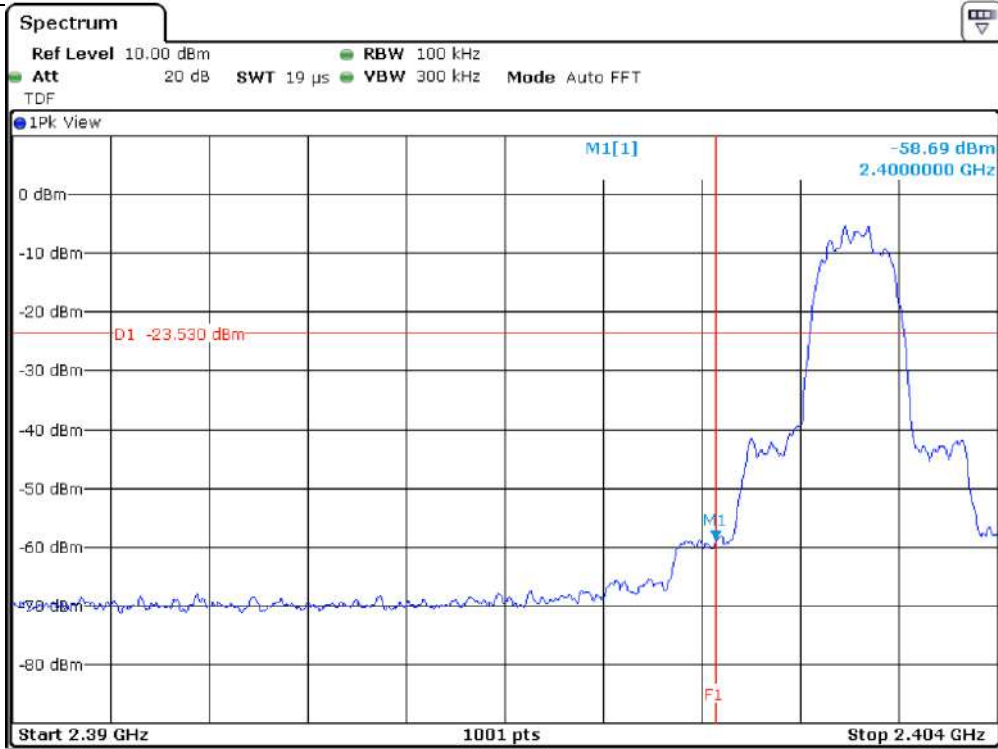


DH5_Hopping_High CH

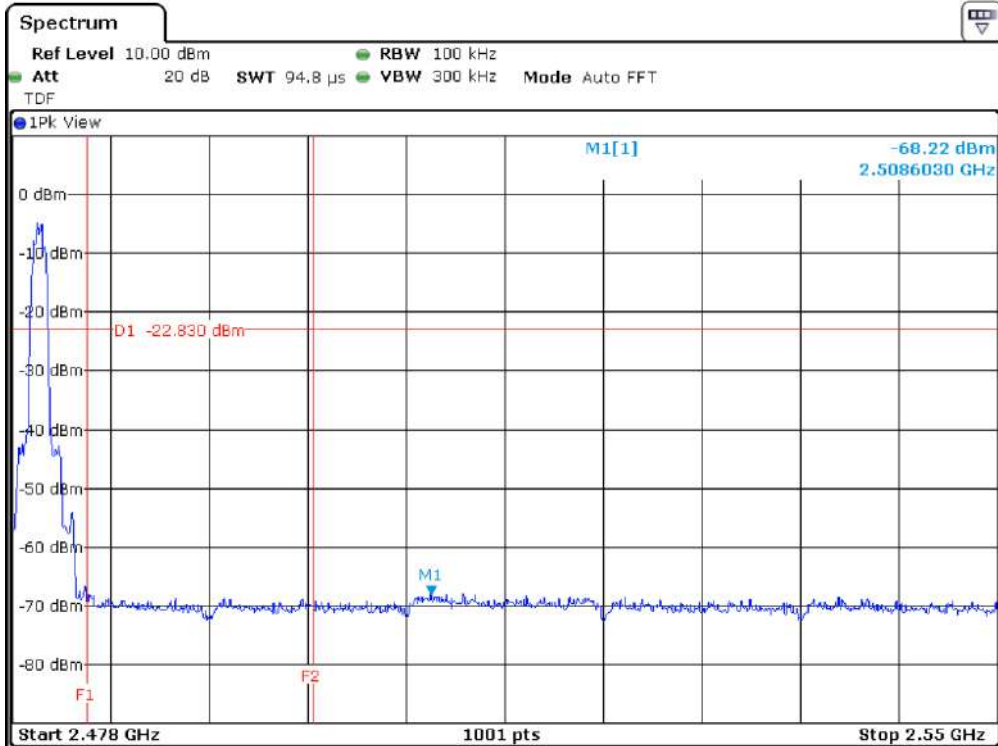




3-DH5_Low CH

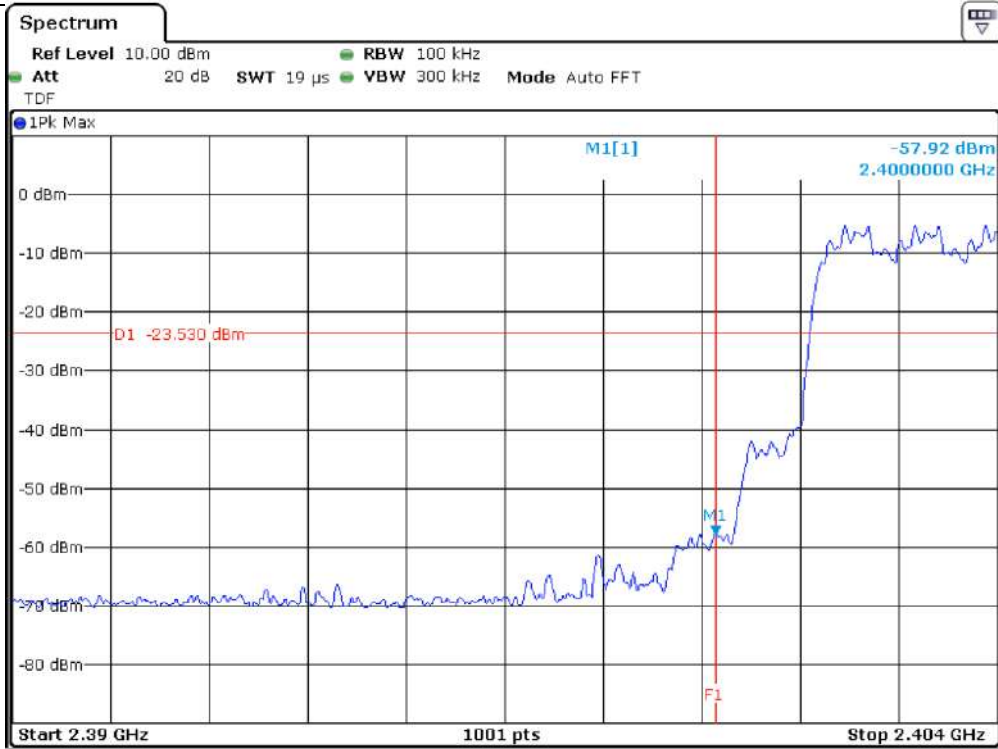


3-DH5_High CH

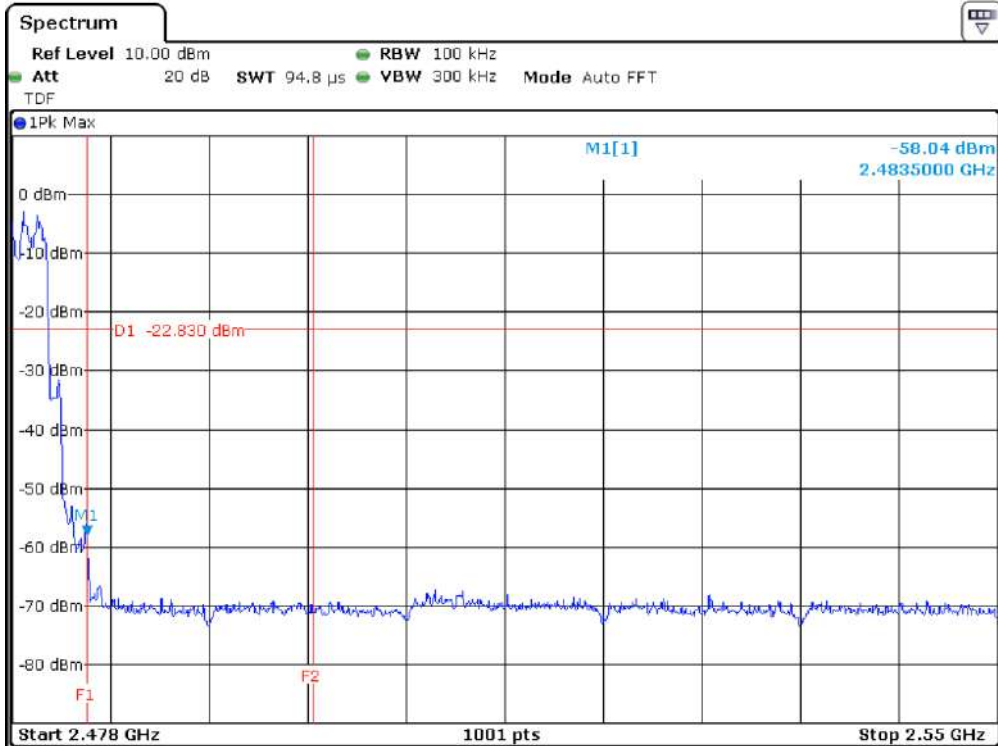




3-DH5_Hopping_Low CH



3-DH5_Hopping_High CH





12. Radiated Spurious Emission(Restricted band)

12.1 Operating environment

Temperature : (22 ~ 24) °C
 Relative humidity : (47 ~ 49) %

12.2 Measurement method

Standard : ANSI 63.10 (6.4/6.5/6.6)

12.3 Limit

Standard : §15.205, §15.209

12.4 Test data

Operating mode : Transmit mode
 Test Result : Pass

12.4.1 Test data for Restricted band for DC 12 V

12.4.1.1 Measured Results for DH5

Frequency (MHz)	Detector	Ant. Pol. (H/V)	Reading (dBμV)	Corr. Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low CH							
2 389.29	Peak	V	36.93	-13.10	50.03	73.98	23.95
	Average	V	13.74		26.84	53.98	27.14
High CH							
2 490.35	Peak	H	26.62	-12.70	39.32	73.98	34.66
	Average	H	9.41		22.11	53.98	31.87

- ※ Ant. Pol. : Antenna Polarization
- ※ Corr Factor. : Antenna Factor + Cable Loss - Amplifier Gain
- ※ Result = Reading + Corr Factor
- ※ Margin = Limit - Result



12.4.1.2 Measured Results for 3-DH5

Frequency (MHz)	Detector	Ant. Pol. (H/V)	Reading (dBμV)	Corr. Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low CH							
2 367.01	Peak	V	25.43	-13.10	38.53	73.98	35.45
	Average	V	10.41		23.51	53.98	30.47
High CH							
2 489.26	Peak	H	27.11	-12.70	39.81	73.98	34.17
	Average	H	9.14		21.84	53.98	32.14

- ※ Ant. Pol. : Antenna Polarization
- ※ Corr Factor. : Antenna Factor + Cable Loss - Amplifier Gain
- ※ Result = Reading + Corr Factor+ DCCF
- ※ Margin = Limit - Result



12.4.2 Test data for Restricted band for DC 24 V

12.4.2.1 Measured Results for DH5

Frequency (MHz)	Detector	Ant. Pol. (H/V)	Reading (dBμV)	Corr. Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low CH							
2 383.46	Peak	H	27.10	-13.10	40.20	73.98	33.78
	Average	H	14.22		27.32	53.98	26.66
High CH							
2 494.17	Peak	H	30.68	-12.70	43.38	73.98	30.60
	Average	H	9.39		22.09	53.98	31.89

- ※ Ant. Pol. : Antenna Polarization
- ※ Corr Factor. : Antenna Factor + Cable Loss - Amplifier Gain
- ※ Result = Reading + Corr Factor
- ※ Margin = Limit - Result

12.4.2.2 Measured Results for 3-DH5

Frequency (MHz)	Detector	Ant. Pol. (H/V)	Reading (dBμV)	Corr. Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low CH							
2 378.53	Peak	V	29.45	-13.10	42.55	73.98	31.43
	Average	V	12.28		25.38	53.98	28.60
High CH							
2 484.06	Peak	H	26.46	-12.80	39.26	73.98	34.72
	Average	H	9.45		22.25	53.98	31.73

- ※ Ant. Pol. : Antenna Polarization
- ※ Corr Factor. : Antenna Factor + Cable Loss - Amplifier Gain
- ※ Result = Reading + Corr Factor+ DCCF
- ※ Margin = Limit - Result



12.4.3 Test data for Spurious & Harmonic for DC 12 V

12.4.3.1 Measurement Results for Below 30 MHz

12.4.3.1.1 DH5

Frequency (MHz)	Reading (dB μ V)	Detector	Ant. Pol. (H/V)	Corr. Factor (dB)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Low CH							
It was not found any emissions peaks found from the EUT.							
Mid CH							
It was not found any emissions peaks found from the EUT.							
High CH							
It was not found any emissions peaks found from the EUT.							

12.4.3.1.2 3-DH5

Frequency (MHz)	Reading (dB μ V)	Detector	Ant. Pol. (H/V)	Corr. Factor (dB)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Low CH							
It was not found any emissions peaks found from the EUT.							
Mid CH							
It was not found any emissions peaks found from the EUT.							
High CH							
It was not found any emissions peaks found from the EUT.							



12.4.4 Test data for Spurious & Harmonic for DC 24 V

12.4.4.1 Measurement Results for Below 30 MHz for DC 24 V

12.4.4.1.1 DH5

Frequency (MHz)	Reading (dB μ V)	Detector	Ant. Pol. (H/V)	Corr. Factor (dB)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Low CH							
It was not found any emissions peaks found from the EUT.							
Mid CH							
It was not found any emissions peaks found from the EUT.							
High CH							
It was not found any emissions peaks found from the EUT.							

12.4.4.1.2 3-DH5

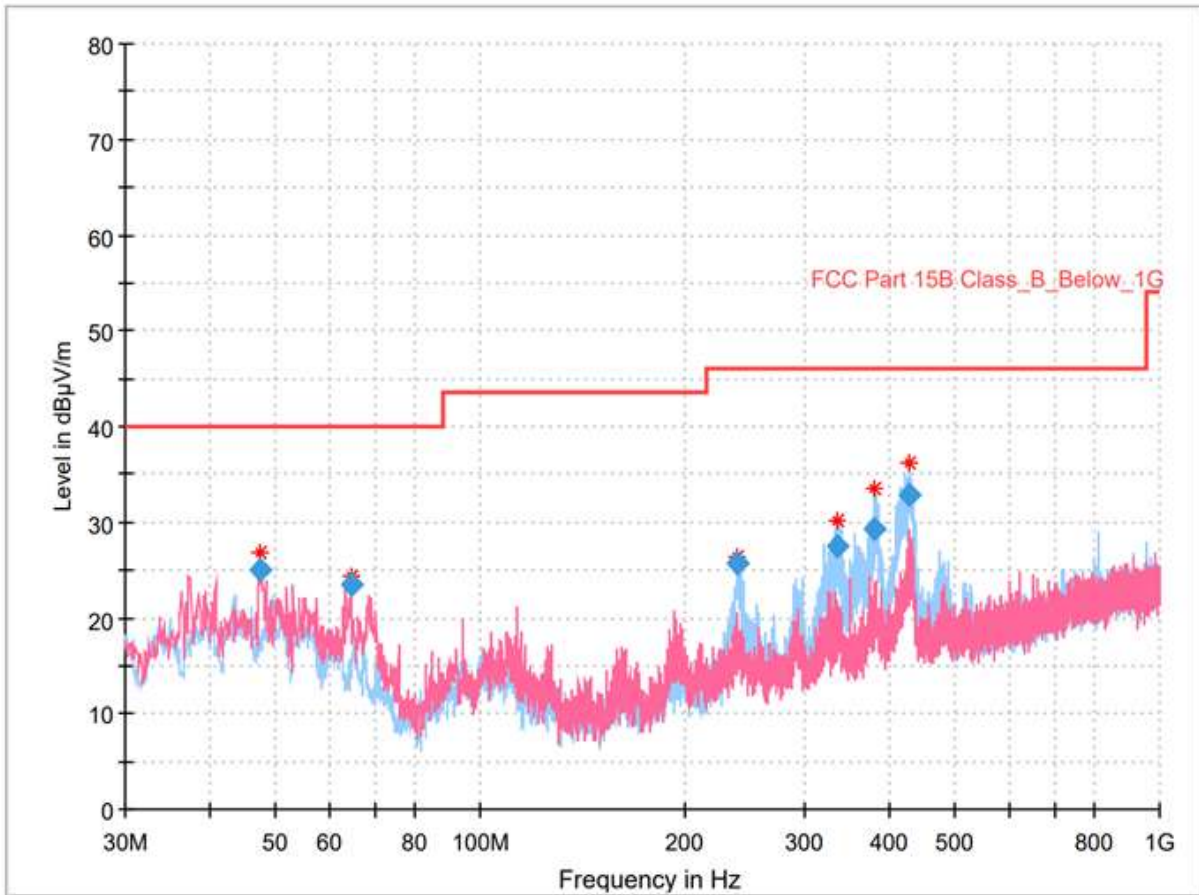
Frequency (MHz)	Reading (dB μ V)	Detector	Ant. Pol. (H/V)	Corr. Factor (dB)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Low CH							
It was not found any emissions peaks found from the EUT.							
Mid CH							
It was not found any emissions peaks found from the EUT.							
High CH							
It was not found any emissions peaks found from the EUT.							



12.4.5 Measurement Results for 30 MHz to 1 GHz for DC 12 V

12.4.5.1 DH5_DC 12 V

Low CH

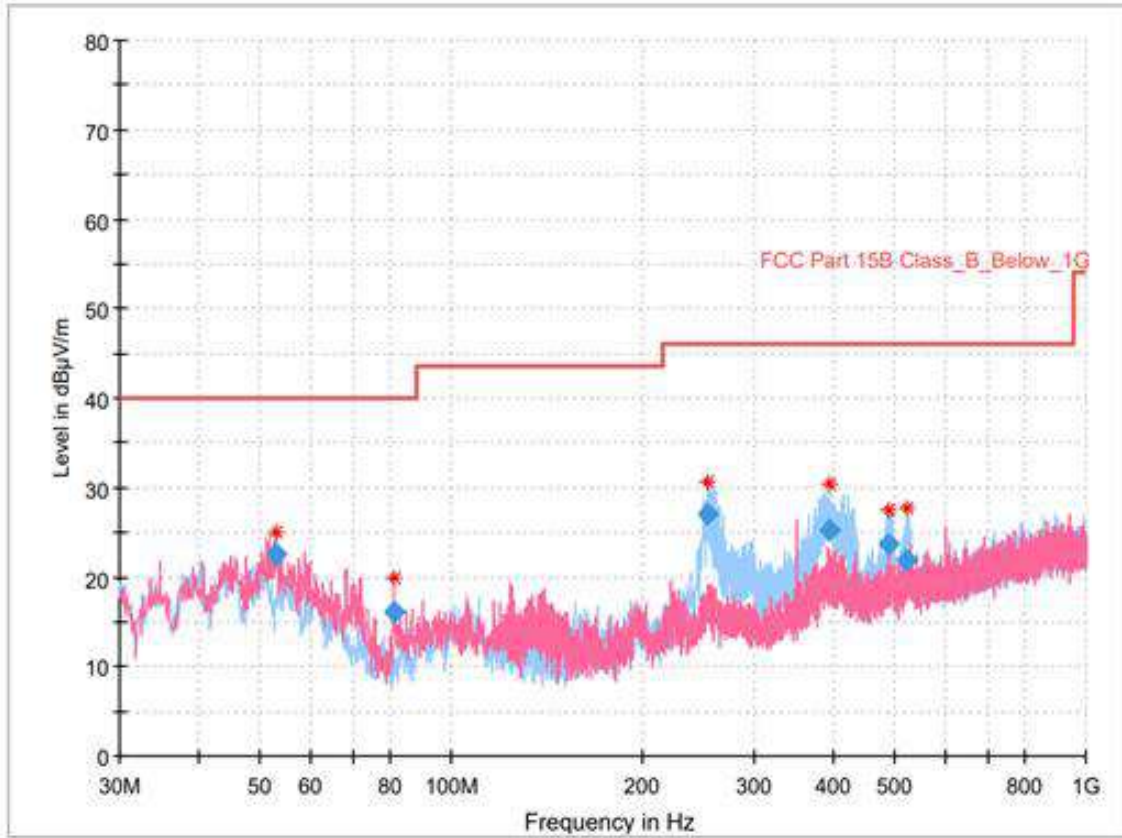


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
47.266000	24.92	40.00	15.08	1000.0	120.000	100.1	V	0.0	-19.0
64.532000	23.49	40.00	16.51	1000.0	120.000	100.1	V	103.0	-21.2
238.356000	25.62	46.00	20.38	1000.0	120.000	100.1	H	167.0	-19.9
336.423000	27.41	46.00	18.59	1000.0	120.000	100.1	H	47.0	-16.8
380.946000	29.28	46.00	16.72	1000.0	120.000	100.1	H	74.0	-15.7
426.924000	32.88	46.00	13.12	1000.0	120.000	100.1	H	193.0	-15.0



Mid CH

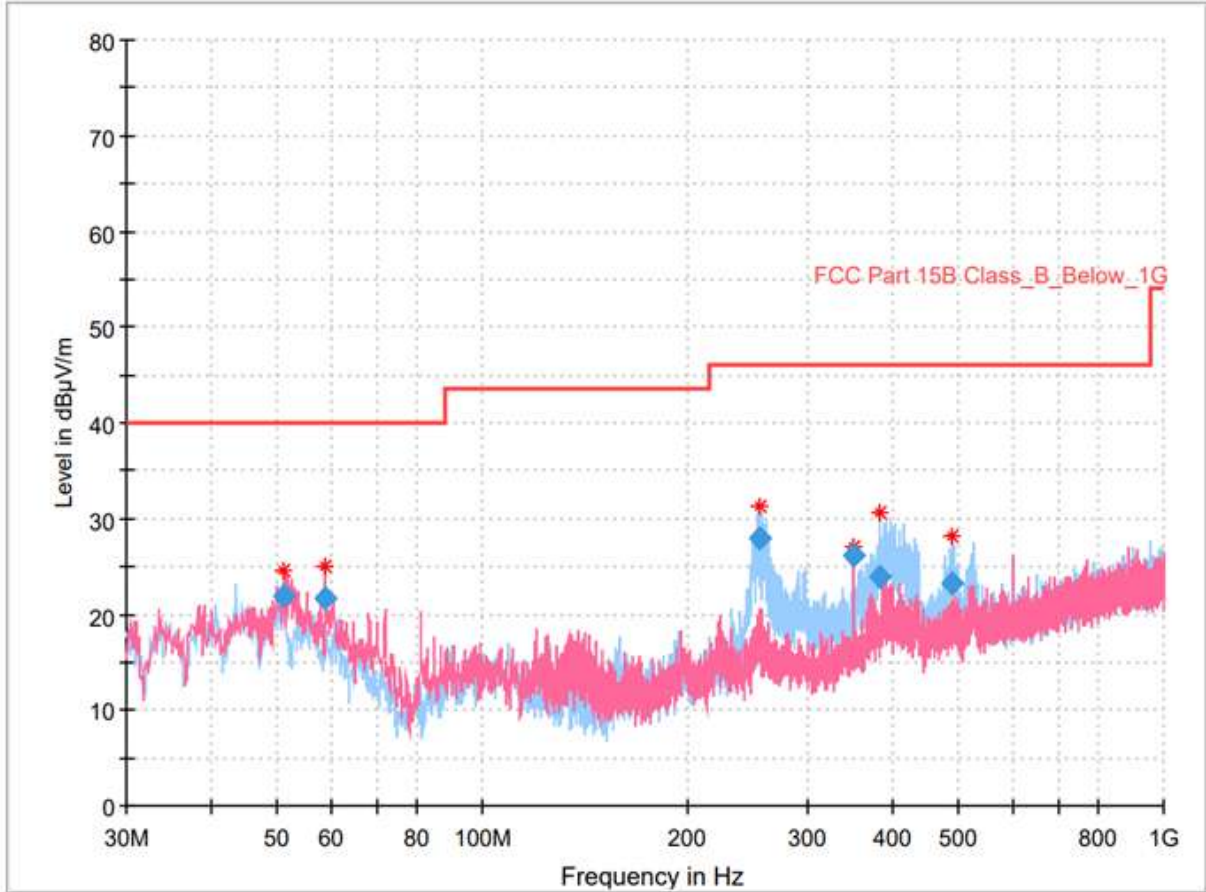


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
52.989000	22.59	40.00	17.41	1000.0	120.000	99.9	V	320.0	-19.2
81.119000	15.99	40.00	24.01	1000.0	120.000	99.9	V	296.0	-25.6
252.906000	27.11	46.00	18.89	1000.0	120.000	99.9	H	342.0	-18.8
393.168000	25.16	46.00	20.84	1000.0	120.000	99.9	H	119.0	-15.3
487.452000	23.80	46.00	22.20	1000.0	120.000	99.9	H	224.0	-13.7
520.529000	21.80	46.00	24.20	1000.0	120.000	99.9	H	119.0	-13.4



High CH



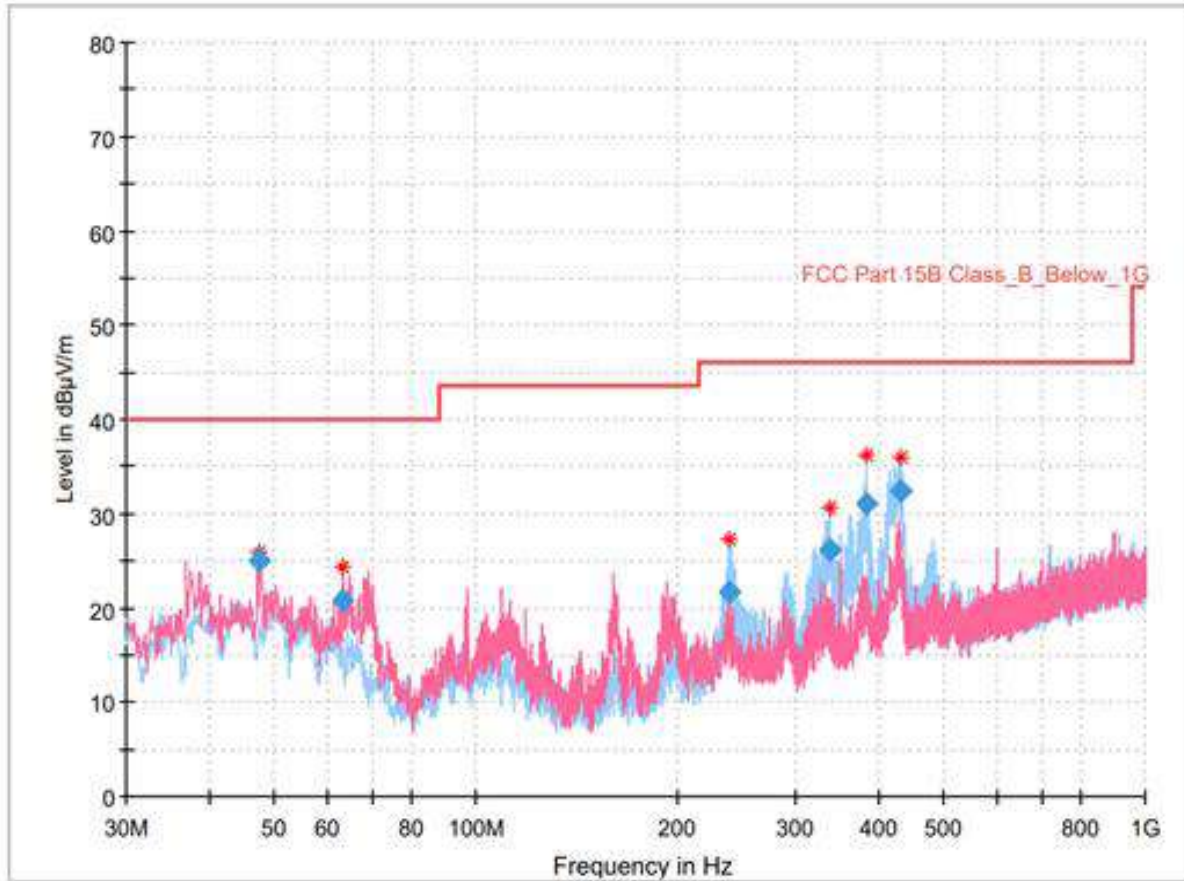
Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
51.146000	21.98	40.00	18.02	1000.0	120.000	99.9	V	74.0	-18.7
58.809000	21.69	40.00	18.31	1000.0	120.000	99.9	V	8.0	-20.2
254.749000	27.97	46.00	18.03	1000.0	120.000	99.9	H	187.0	-18.7
350.003000	26.20	46.00	19.80	1000.0	120.000	99.9	V	233.0	-16.3
382.401000	23.91	46.00	22.09	1000.0	120.000	99.9	H	278.0	-15.6
490.459000	23.35	46.00	22.65	1000.0	120.000	99.9	H	226.0	-13.7



12.4.5.2 3- DH5_DC 12 V

Low CH

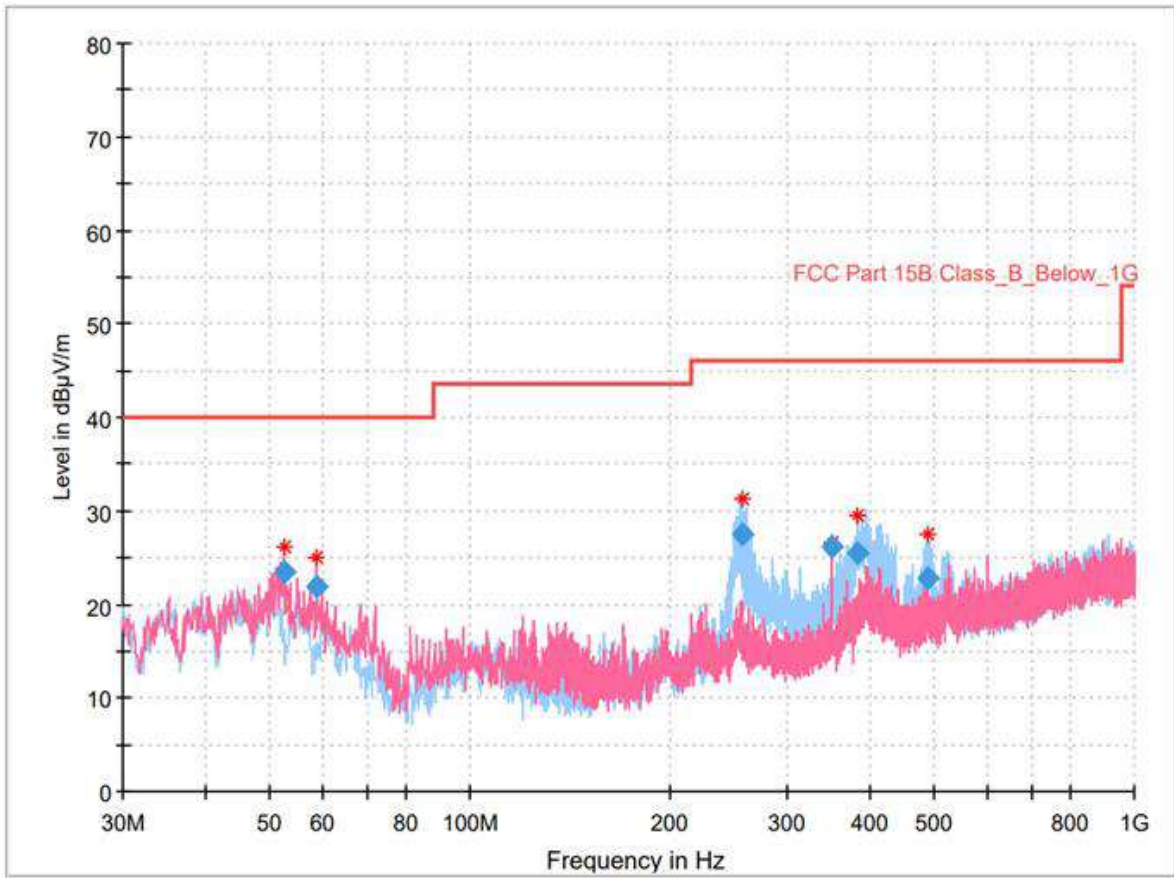


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Poi	Azimuth (deg)	Corr. (dB)
47.266000	24.99	40.00	15.01	1000.0	120.000	100.1	V	0.0	-19.0
63.465000	20.83	40.00	19.17	1000.0	120.000	100.1	V	140.0	-21.0
238.647000	21.74	46.00	24.26	1000.0	120.000	100.1	H	0.0	-19.9
337.975000	26.24	46.00	19.76	1000.0	120.000	100.1	H	246.0	-16.7
382.692000	31.00	46.00	15.00	1000.0	120.000	100.1	H	124.0	-15.6
430.901000	32.31	46.00	13.69	1000.0	120.000	100.1	H	178.0	-14.9



Mid CH

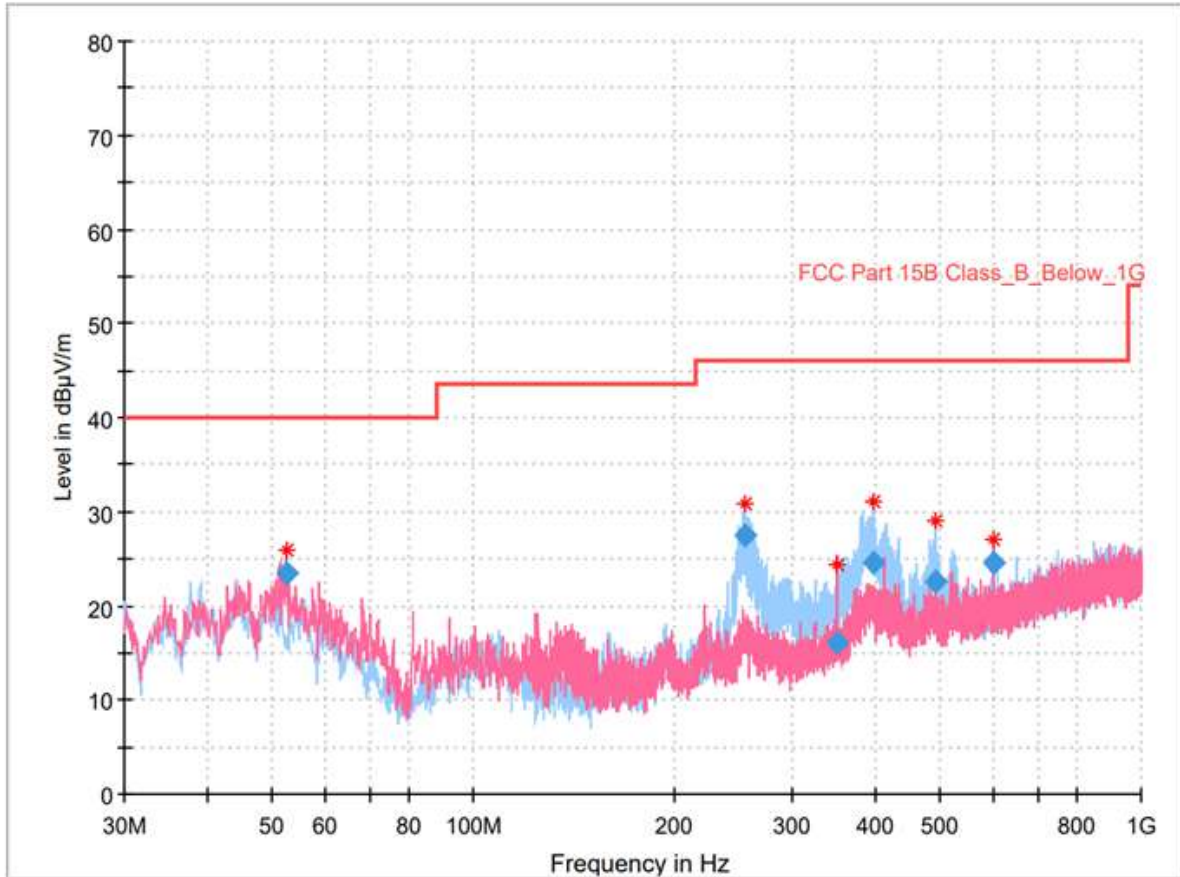


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
52.407000	23.46	40.00	16.54	1000.0	120.000	99.9	V	68.0	-19.0
58.809000	21.82	40.00	18.18	1000.0	120.000	99.9	V	1.0	-20.2
256.592000	27.54	46.00	18.46	1000.0	120.000	99.9	H	0.0	-18.6
350.003000	26.25	46.00	19.75	1000.0	120.000	99.9	V	223.0	-16.3
383.856000	25.41	46.00	20.59	1000.0	120.000	99.9	H	288.0	-15.6
487.937000	22.70	46.00	23.30	1000.0	120.000	99.9	H	217.0	-13.7



High CH



Final Result

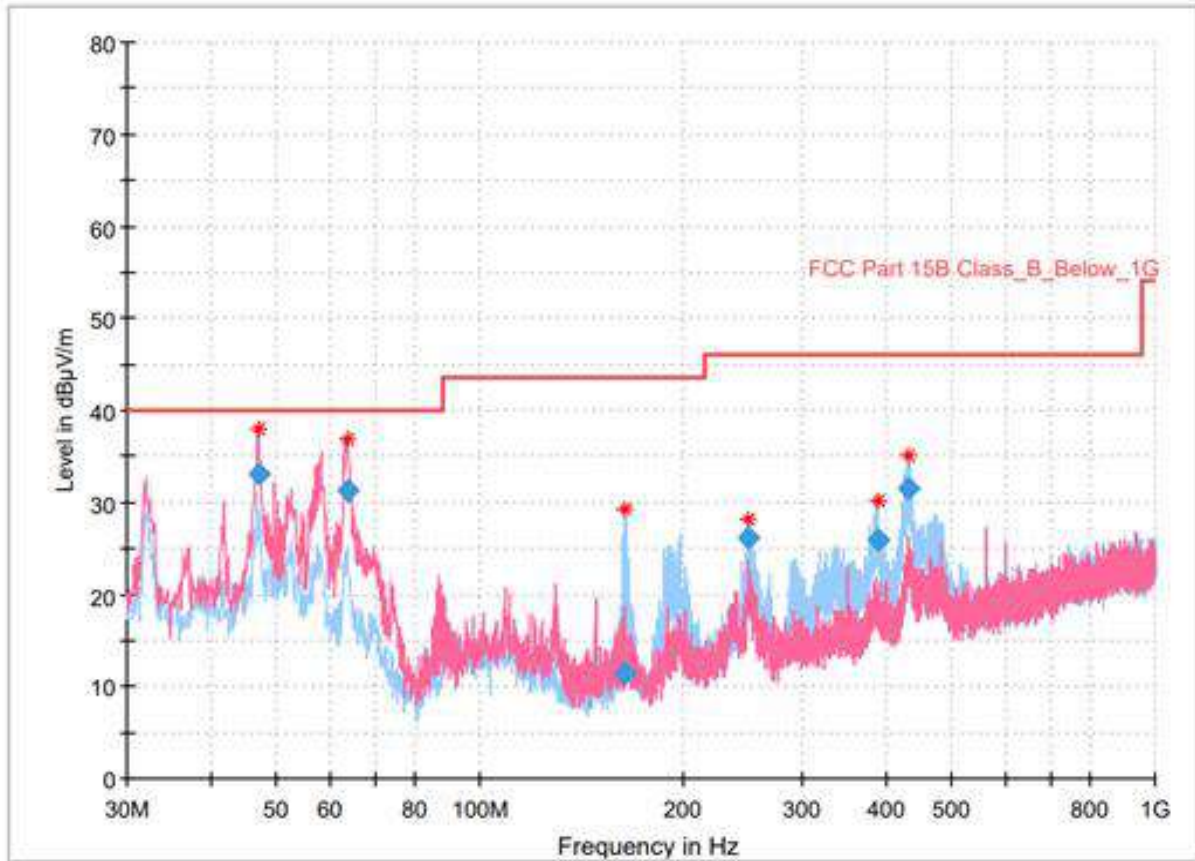
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
52.407000	23.45	40.00	16.55	1000.0	120.000	99.9	V	247.0	-19.0
255.040000	27.58	46.00	18.42	1000.0	120.000	99.9	H	0.0	-18.6
349.906000	16.17	46.00	29.83	1000.0	120.000	99.9	V	234.0	-16.3
396.757000	24.60	46.00	21.40	1000.0	120.000	99.9	H	177.0	-15.2
491.041000	22.61	46.00	23.39	1000.0	120.000	99.9	H	122.0	-13.7
599.972000	24.48	46.00	21.52	1000.0	120.000	99.9	V	181.0	-11.5



12.4.6 Measurement Results for 30 MHz to 1 GHz for DC 24 V

12.4.6.1 DH5_DC 24 V

Low CH

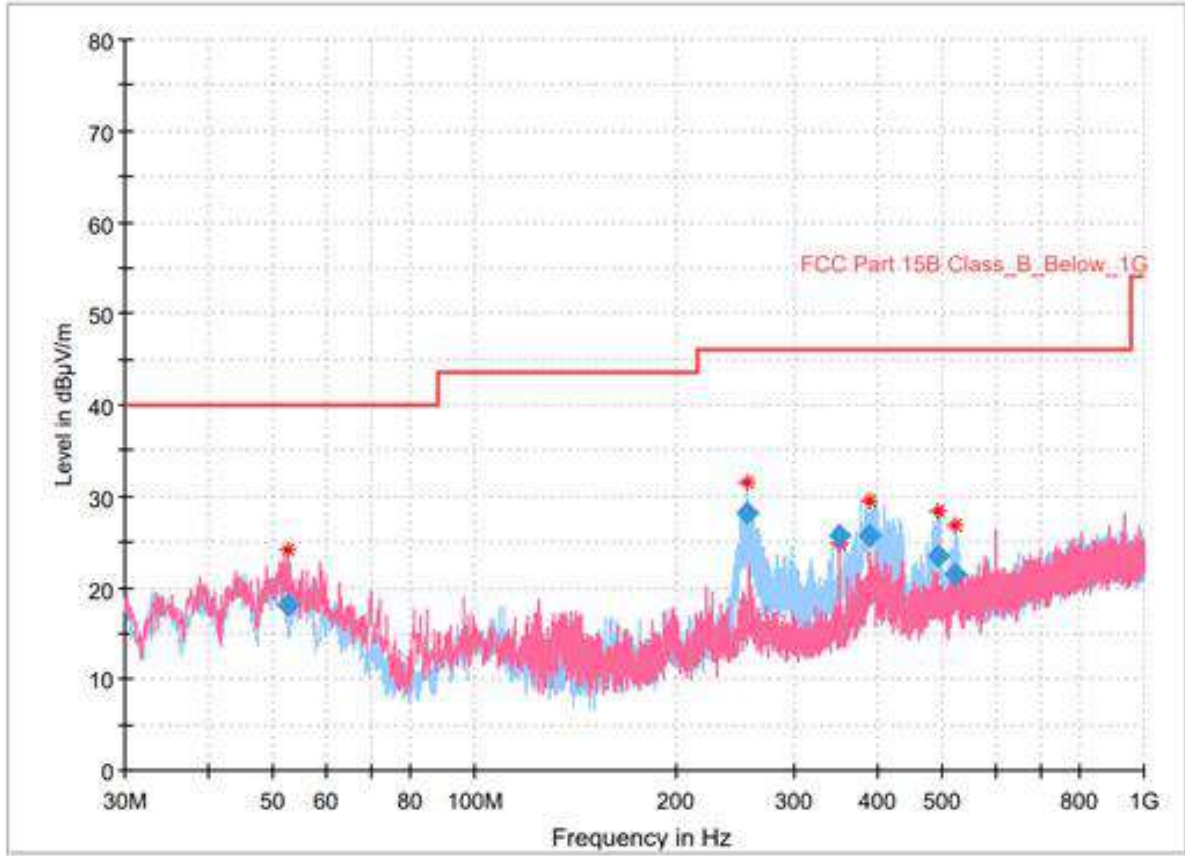


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
46.975000	33.16	40.00	6.84	1000.0	120.000	100.0	V	355.0	-19.0
63.659000	31.28	40.00	8.72	1000.0	120.000	100.0	V	168.0	-21.1
163.472000	11.41	43.50	32.09	1000.0	120.000	100.0	H	332.0	-23.6
249.511000	26.24	46.00	19.76	1000.0	120.000	100.0	H	65.0	-19.1
388.318000	25.99	46.00	20.01	1000.0	120.000	100.0	H	20.0	-15.4
430.804000	31.61	46.00	14.39	1000.0	120.000	100.0	H	0.0	-14.9



Mid CH

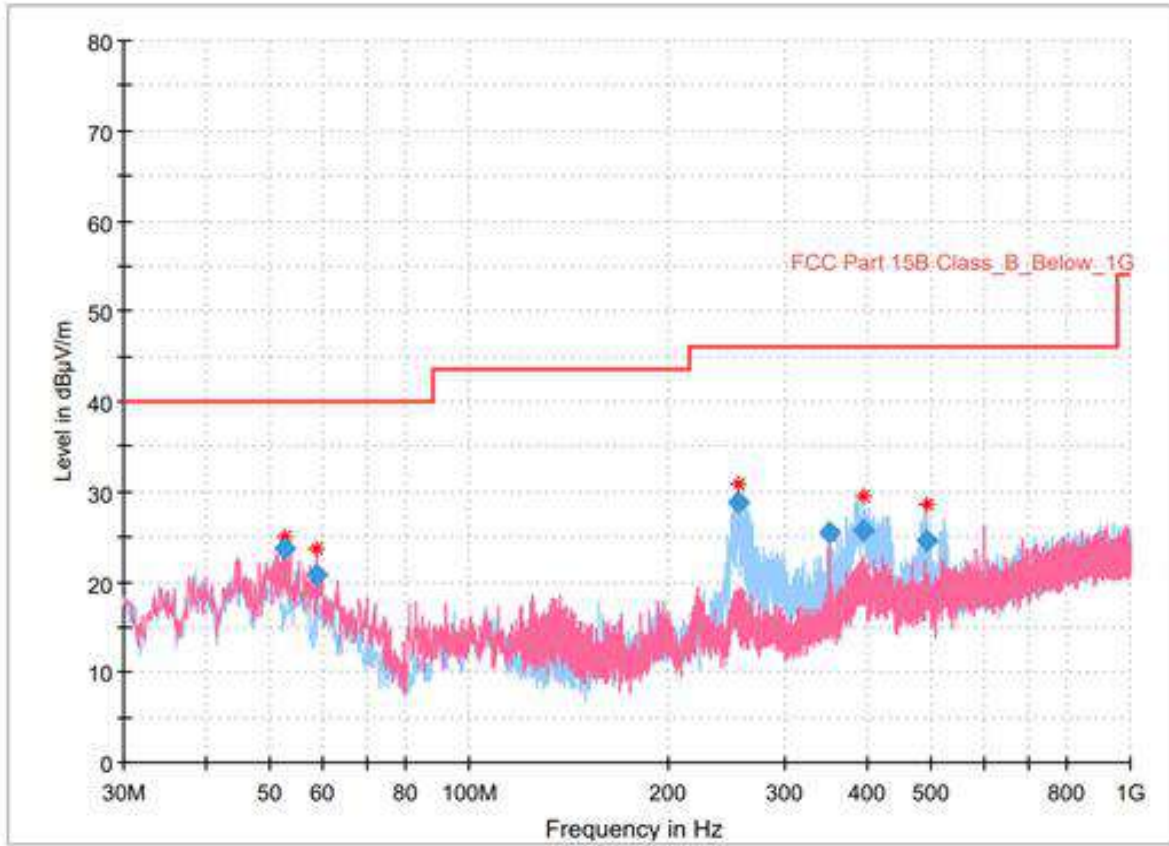


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
52.504000	18.09	40.00	21.91	1000.0	120.000	99.9	V	291.0	-19.0
254.846000	28.06	46.00	17.94	1000.0	120.000	99.9	H	341.0	-18.7
350.003000	25.77	46.00	20.23	1000.0	120.000	99.9	V	223.0	-16.3
389.579000	25.73	46.00	20.27	1000.0	120.000	99.9	H	289.0	-15.3
493.175000	23.48	46.00	22.52	1000.0	120.000	99.9	H	223.0	-13.7
522.275000	21.50	46.00	24.50	1000.0	120.000	99.9	H	117.0	-13.4



High CH



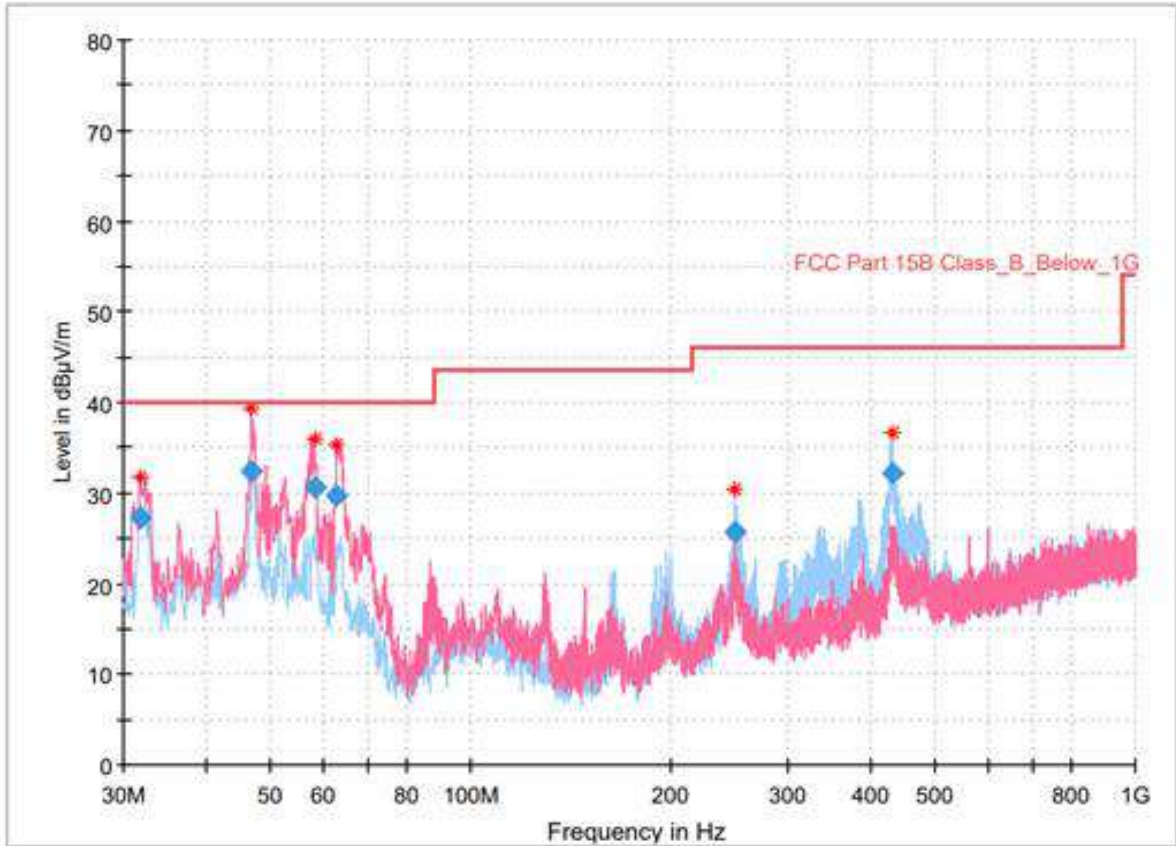
Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
52.407000	23.79	40.00	16.21	1000.0	120.000	99.9	V	282.0	-19.0
58.809000	20.73	40.00	19.27	1000.0	120.000	99.9	V	92.0	-20.2
254.943000	28.85	46.00	17.15	1000.0	120.000	99.9	H	358.0	-18.6
350.003000	25.45	46.00	20.55	1000.0	120.000	99.9	V	241.0	-16.3
395.205000	25.76	46.00	20.24	1000.0	120.000	99.9	H	288.0	-15.2
492.787000	24.61	46.00	21.39	1000.0	120.000	99.9	H	235.0	-13.7



12.4.6.2 3-DH5_DC 24 V

Low CH

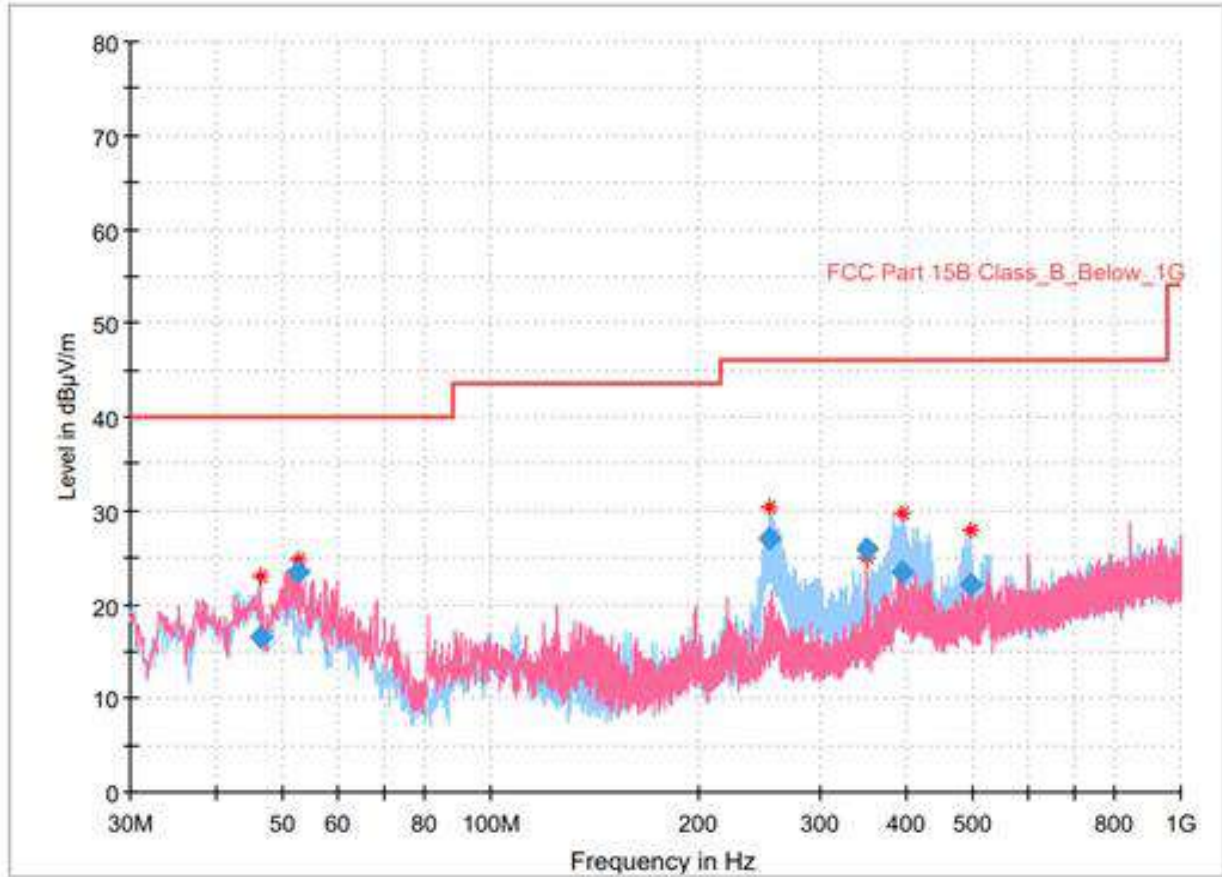


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
31.746000	27.16	40.00	12.84	1000.0	120.000	100.0	V	43.0	-23.3
46.781000	32.42	40.00	7.58	1000.0	120.000	100.0	V	1.0	-19.0
58.130000	30.57	40.00	9.43	1000.0	120.000	100.0	V	332.0	-19.9
62.883000	29.74	40.00	10.26	1000.0	120.000	100.0	V	262.0	-20.9
249.414000	25.78	46.00	20.22	1000.0	120.000	100.0	H	247.0	-19.1
432.162000	32.23	46.00	13.77	1000.0	120.000	100.0	H	0.0	-14.9



Mid CH

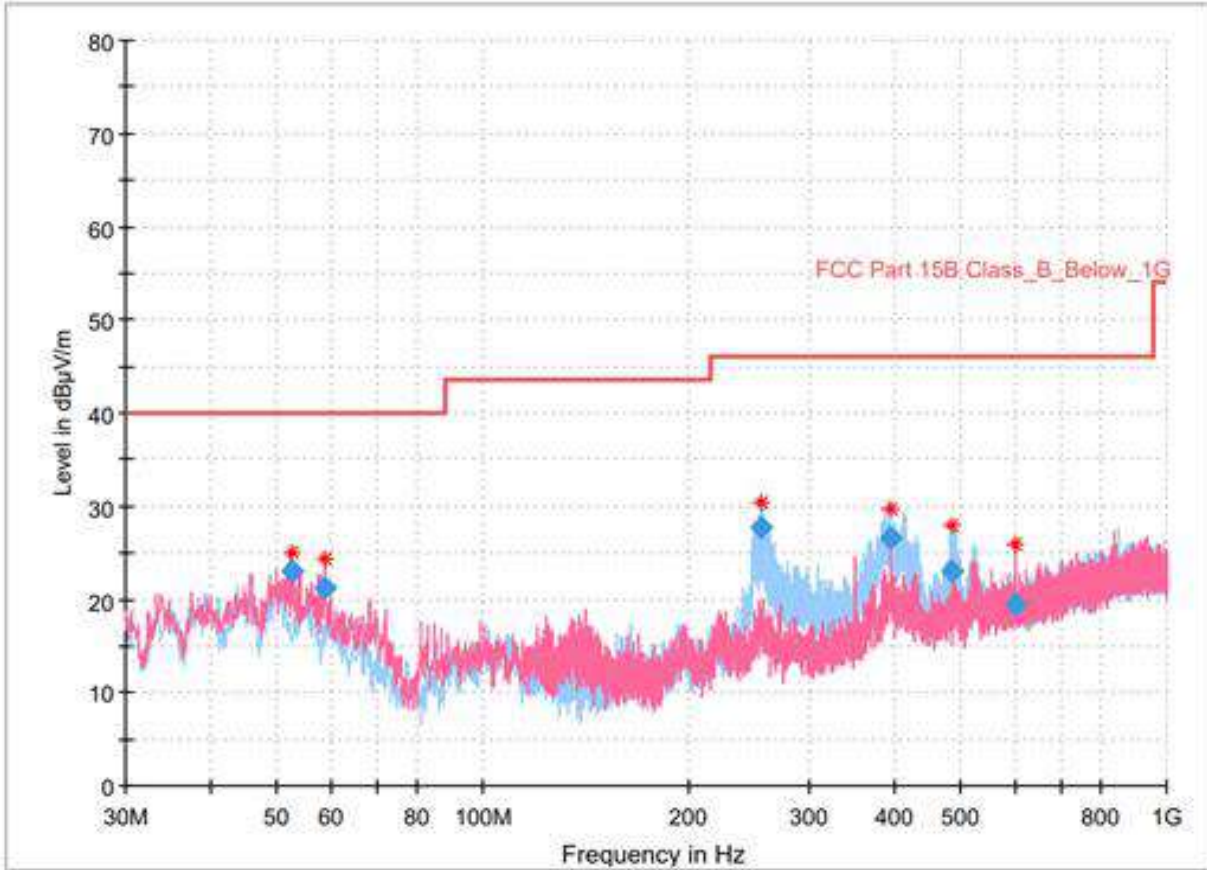


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
46.296000	16.46	40.00	23.54	1000.0	120.000	99.9	V	43.0	-19.0
52.407000	23.40	40.00	16.60	1000.0	120.000	99.9	V	241.0	-19.0
253.197000	27.09	46.00	18.91	1000.0	120.000	99.9	H	0.0	-18.8
350.003000	25.94	46.00	20.06	1000.0	120.000	99.9	V	228.0	-16.3
393.750000	23.55	46.00	22.45	1000.0	120.000	99.9	H	273.0	-15.3
497.249000	22.18	46.00	23.82	1000.0	120.000	99.9	H	232.0	-13.7



High CH



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
52.407000	23.07	40.00	16.93	1000.0	120.000	99.9	V	70.0	-19.0
58.809000	21.28	40.00	18.72	1000.0	120.000	99.9	V	304.0	-20.2
255.040000	27.62	46.00	18.38	1000.0	120.000	99.9	H	180.0	-18.6
393.071000	26.60	46.00	19.40	1000.0	120.000	99.9	H	297.0	-15.3
484.542000	22.97	46.00	23.03	1000.0	120.000	99.9	H	231.0	-13.7
600.069000	19.50	46.00	26.50	1000.0	120.000	99.9	V	56.0	-11.5



12.4.7 Measurement Results for Above 1 GHz for DC 12 V

12.4.7.1 DH5_DC 12 V

Frequency (MHz)	Detector	Ant. Pol. (H/V)	Reading (dBμV)	Corr. Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low CH							
4 804.60	Peak	V	36.88	-5.00	41.88	73.98	32.10
	Average	V	26.19		31.19	53.98	22.79
Mid CH							
4 881.10	Peak	V	34.43	-4.60	39.03	73.98	34.95
	Average	V	20.88		25.48	53.98	28.50
High CH							
4 959.30	Peak	H	34.97	-4.50	39.47	73.98	34.51
	Average	H	21.65		26.15	53.98	27.83

12.4.7.2 3-DH5_DC 12 V

Frequency (MHz)	Detector	Ant. Pol. (H/V)	Reading (dBμV)	Corr. Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low CH							
3 731.90	Peak	V	41.96	-7.30	49.26	73.98	24.72
	Average	V	18.88		26.18	53.98	27.80
4 802.90	Peak	V	38.19	-5.00	43.19	73.98	30.79
	Average	V	29.60		34.60	53.98	19.38
Mid CH							
4 881.10	Peak	V	35.87	-4.60	40.47	73.98	33.51
	Average	V	25.06		29.66	53.98	24.32
High CH							
4 959.30	Peak	V	38.99	-4.50	43.49	73.98	30.49
	Average	V	31.55		36.05	53.98	17.93

- ※ Ant. Pol. : Antenna Polarization
- ※ Corr. Factor. : Antenna Factor + Cable Loss - Amplifier Gain
- ※ Result = Reading + Corr. Factor+ DCCF
- ※ Margin = Limit – Result



12.4.8 Measurement Results for Above 1 GHz for DC 12 V

12.4.8.1 DH5_DC 12 V

Frequency (MHz)	Detector	Ant. Pol. (H/V)	Reading (dBμV)	Corr. Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low CH							
4 802.90	Peak	H	34.43	-5.00	39.43	73.98	34.55
	Average	H	21.28		26.28	53.98	27.70
5 979.30	Peak	V	44.77	-2.60	47.37	73.98	26.61
	Average	V	25.06		27.66	53.98	26.32
Mid CH							
4 881.10	Peak	V	34.81	-4.60	39.41	73.98	34.57
	Average	V	21.28		25.88	53.98	28.10
High CH							
4 959.30	Peak	V	37.52	-4.50	42.02	73.98	31.96
	Average	V	24.09		28.59	53.98	25.39
5 312.90	Peak	V	42.06	-4.10	46.16	73.98	27.82
	Average	V	23.05		27.15	53.98	26.83



12.4.8.2 3-DH5_DC 12 V

Frequency (MHz)	Detector	Ant. Pol. (H/V)	Reading (dBμV)	Corr. Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low CH							
4 804.60	Peak	V	37.25	-5.00	42.25	73.98	31.73
	Average	V	23.98		28.98	53.98	25.00
5 321.40	Peak	V	43.31	-4.00	47.31	73.98	26.67
	Average	V	22.67		26.67	53.98	27.31
Mid CH							
4 881.10	Peak	V	34.78	-4.60	39.38	73.98	34.60
	Average	V	21.32		25.92	53.98	28.06
5 982.70	Peak	H	39.06	-2.60	41.66	73.98	32.32
	Average	H	25.03		27.63	53.98	26.35
High CH							
4 959.30	Peak	V	36.03	-4.50	40.53	73.98	33.45
	Average	V	22.68		27.18	53.98	26.80
5 992.90	Peak	H	41.17	-2.60	43.77	73.98	30.21
	Average	H	25.19		27.79	53.98	26.19

- ※ Ant. Pol. : Antenna Polarization
- ※ Corr. Factor. : Antenna Factor + Cable Loss - Amplifier Gain
- ※ Result = Reading + Corr. Factor+ DCCF
- ※ Margin = Limit - Result



13. Power Line Conducted Emission

13.1 Operating environment

Temperature : 22 °C

Relative humidity : 44 %

13.2 Measurement method

Standard : §15.207

13.3 Limit

Standard : §15.207



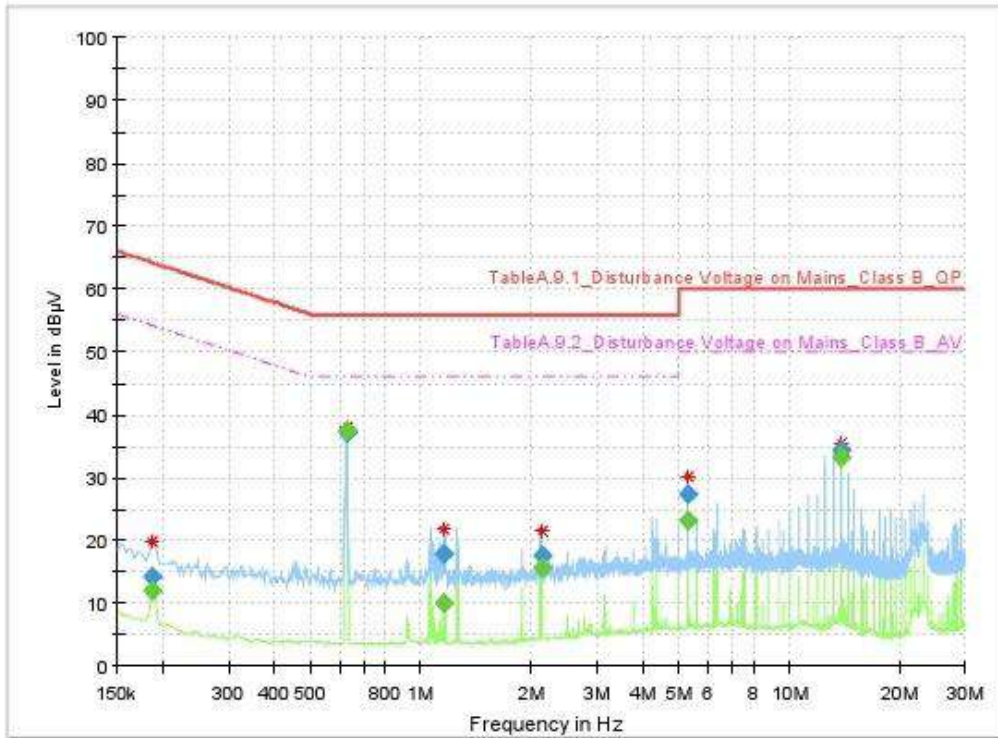
13.4 Test data

Operating mode : Transmit mode

Test Result : Pass

13.4.1 Measured Results & Graph

DH5_Live line

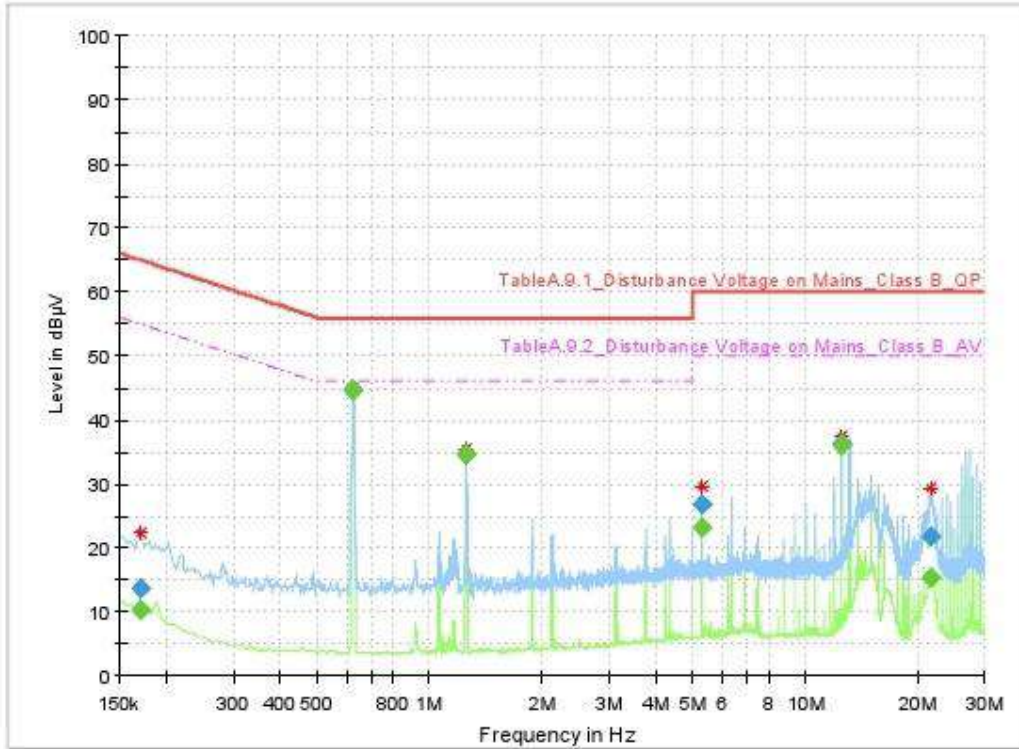


Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.186	---	12.11	54.21	42.11	1000.0	9.000	N	FLO	10.51
0.186	14.19	---	64.21	50.03	1000.0	9.000	N	FLO	10.51
0.627	---	37.32	46.00	8.68	1000.0	9.000	N	FLO	10.39
0.627	37.23	---	56.00	18.77	1000.0	9.000	N	FLO	10.39
1.158	---	9.99	46.00	36.01	1000.0	9.000	N	FLO	10.38
1.158	17.75	---	56.00	38.25	1000.0	9.000	N	FLO	10.38
2.123	---	15.76	46.00	30.24	1000.0	9.000	N	FLO	10.37
2.123	17.67	---	56.00	38.33	1000.0	9.000	N	FLO	10.37
5.307	---	23.31	50.00	26.69	1000.0	9.000	N	FLO	10.42
5.307	27.24	---	60.00	32.76	1000.0	9.000	N	FLO	10.42
13.776	---	33.35	50.00	16.65	1000.0	9.000	N	FLO	10.47
13.776	34.34	---	60.00	25.66	1000.0	9.000	N	FLO	10.47



DH5_Neutral line



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.170	---	10.41	54.95	44.54	1000.0	9.000	N	FLO	10.54
0.170	13.79	---	64.95	51.16	1000.0	9.000	N	FLO	10.54
0.625	---	44.69	46.00	1.31	1000.0	9.000	N	FLO	10.39
0.625	44.62	---	56.00	11.38	1000.0	9.000	N	FLO	10.39
1.253	---	34.54	46.00	11.46	1000.0	9.000	N	FLO	10.38
1.253	34.53	---	56.00	21.47	1000.0	9.000	N	FLO	10.38
5.307	---	23.14	50.00	26.86	1000.0	9.000	N	FLO	10.42
5.307	26.92	---	60.00	33.08	1000.0	9.000	N	FLO	10.42
12.514	---	35.90	50.00	14.10	1000.0	9.000	N	FLO	10.50
12.514	36.34	---	60.00	23.66	1000.0	9.000	N	FLO	10.50
21.437	---	15.46	50.00	34.54	1000.0	9.000	N	FLO	10.66
21.437	21.92	---	60.00	38.08	1000.0	9.000	N	FLO	10.66

- END OF REPORT.