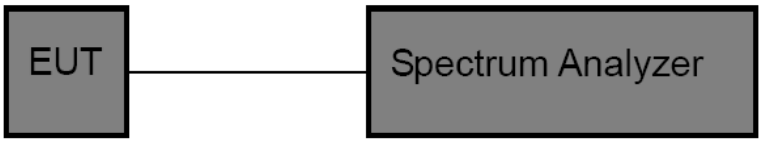
3.5. 20dB Bandwidth

Limit

N/A

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. OCB and 20dB Spectrum Setting:
   (1) Set RBW = 1% ~ 5% occupied bandwidth.
   (2) Set the video bandwidth (VBW) ≥ 3 RBW.
   (3) Detector = Peak.
   (4) Trace mode = Max hold.
   (5) Sweep = Auto couple.

Note: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

Test Mode

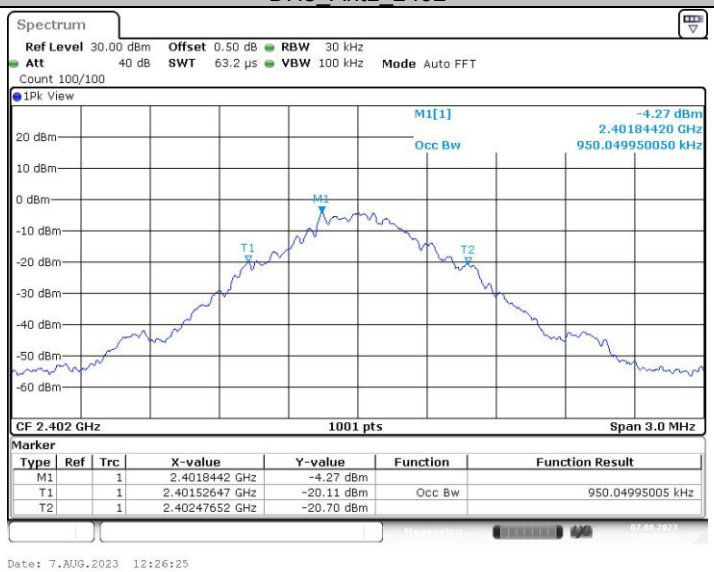
Please refer to the clause 2.4.

Test Result

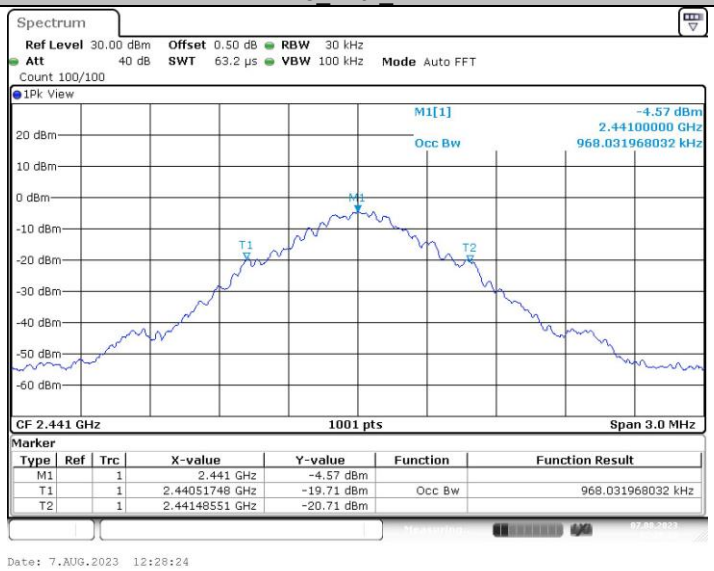
Test Mode	Frequency (MHz)	99% Bandwidth (MHz)	20 dB Bandwidth (MHz)	20dB Bandwidth *2/3 (MHz)
DH5	2402	0.950	1.041	0.694
	2441	0.968	1.074	0.716
	2480	0.971	1.047	0.698
2DH5	2402	1.214	1.335	0.890
	2441	1.223	1.338	0.892
	2480	1.238	1.341	0.894
3DH5	2402	1.211	1.302	0.868
	2441	1.214	1.296	0.864
	2480	1.220	1.287	0.858

99% Bandwidth:

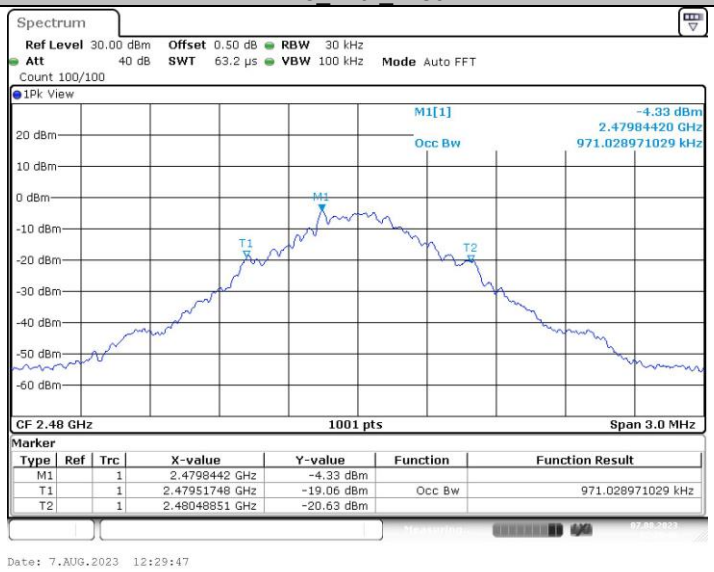
DH5_Ant1_2402



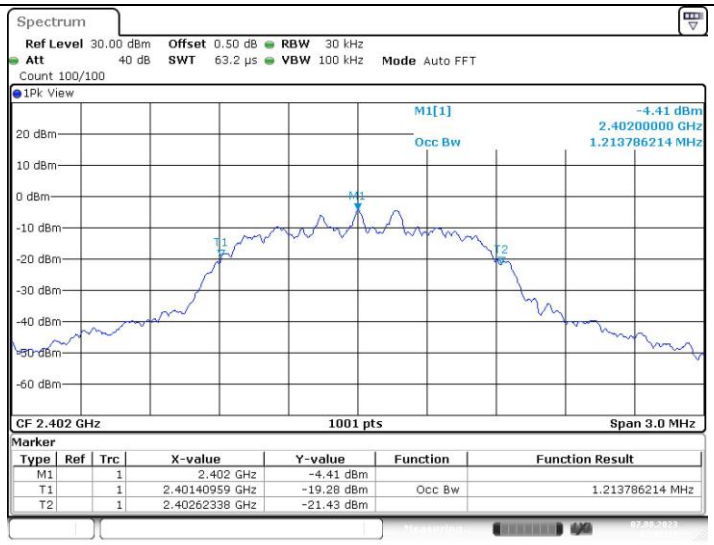
DH5_Ant1_2441



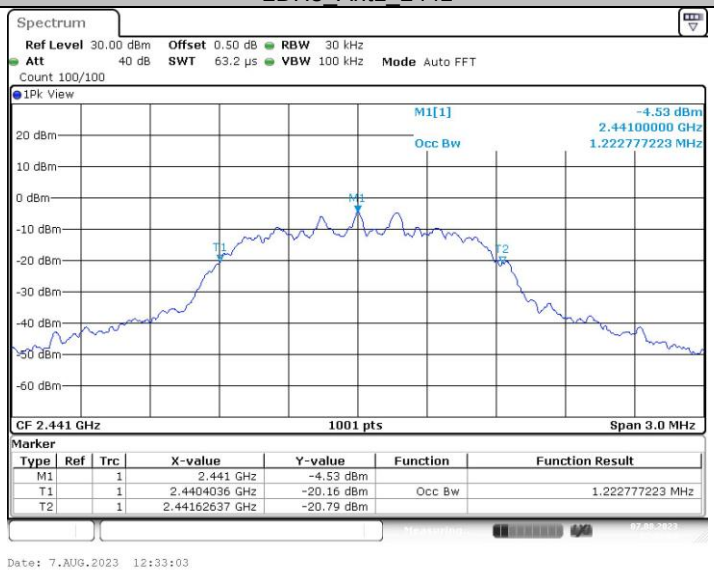
DH5_Ant1_2480



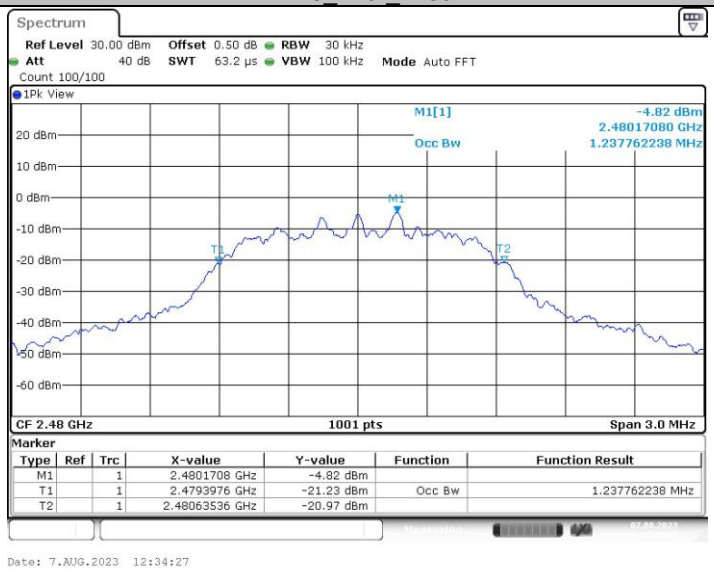
2DH5_Ant1_2402



2DH5_Ant1_2441



2DH5_Ant1_2480



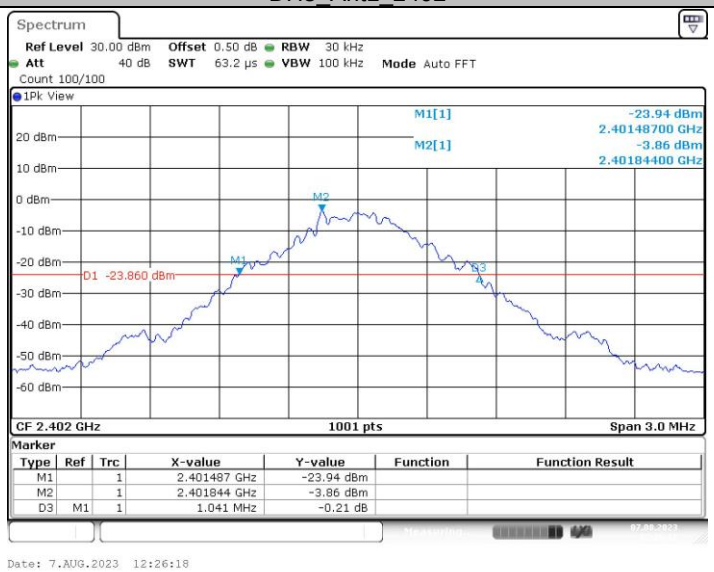
3DH5_Ant1_2402

3DH5_Ant1_2441

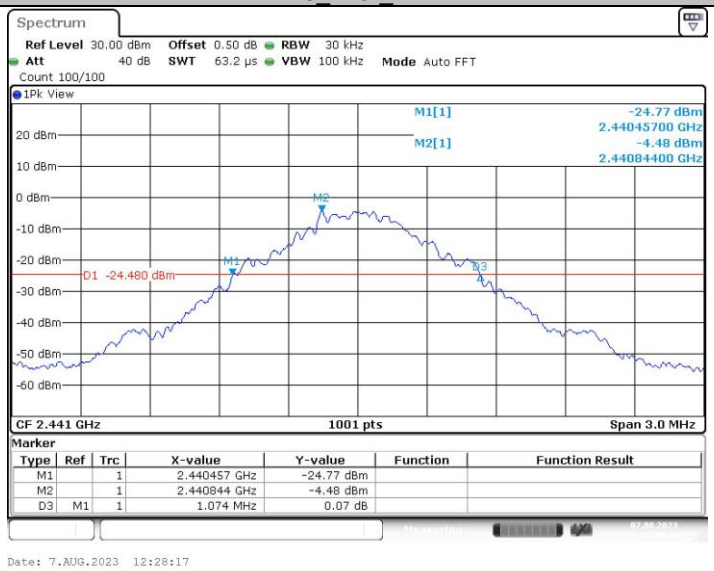
3DH5_Ant1_2480

20dB Bandwidth:

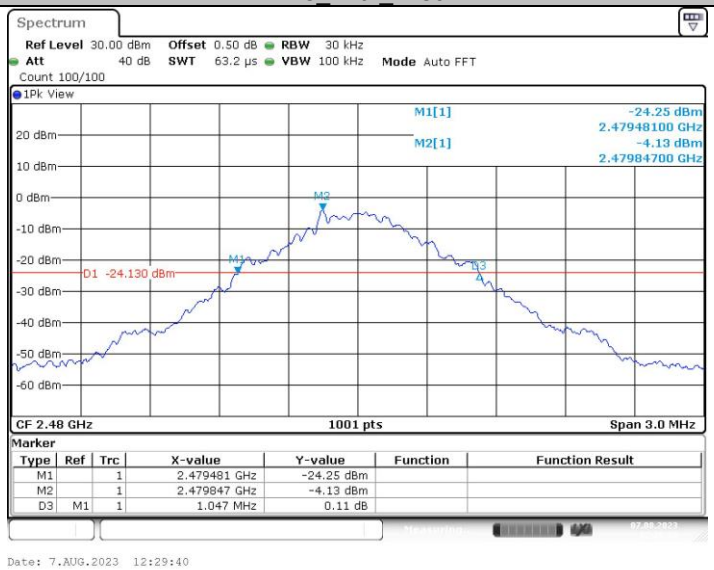
DH5_Ant1_2402



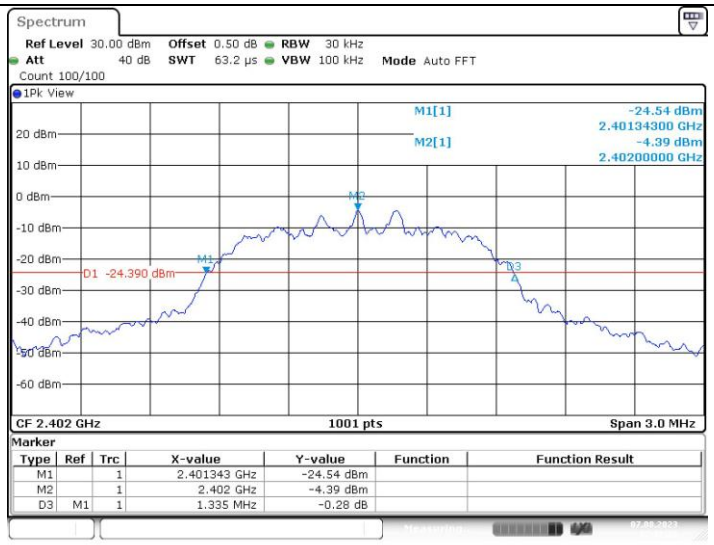
DH5_Ant1_2441



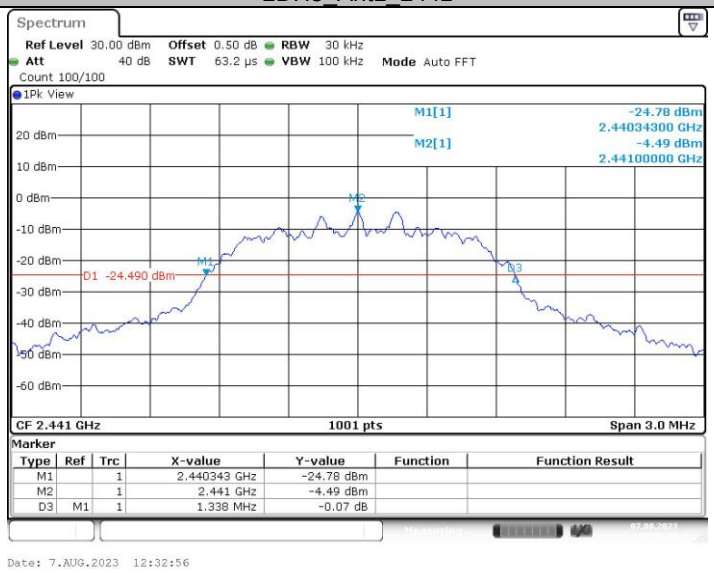
DH5_Ant1_2480



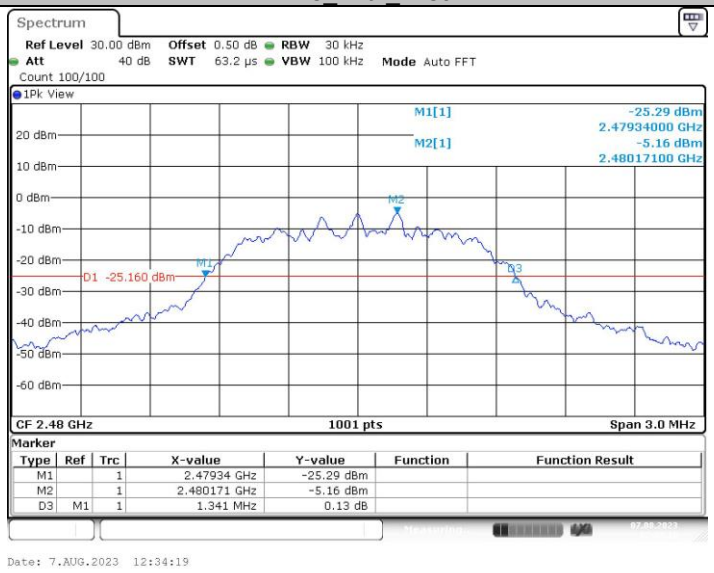
2DH5_Ant1_2402



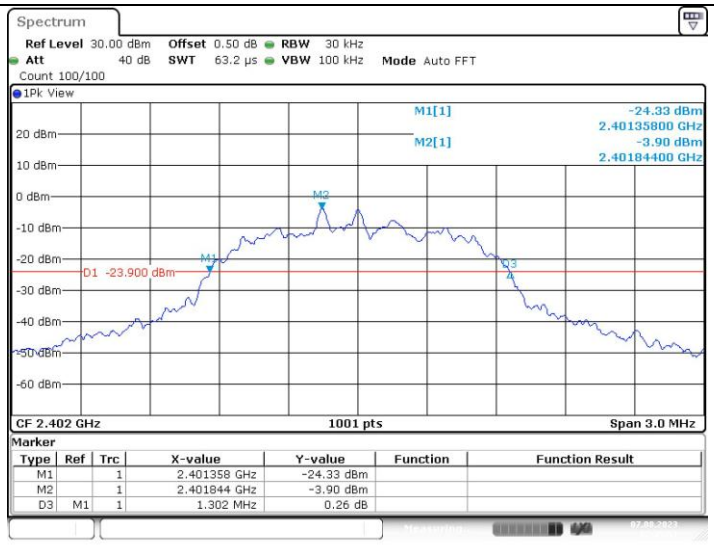
2DH5_Ant1_2441



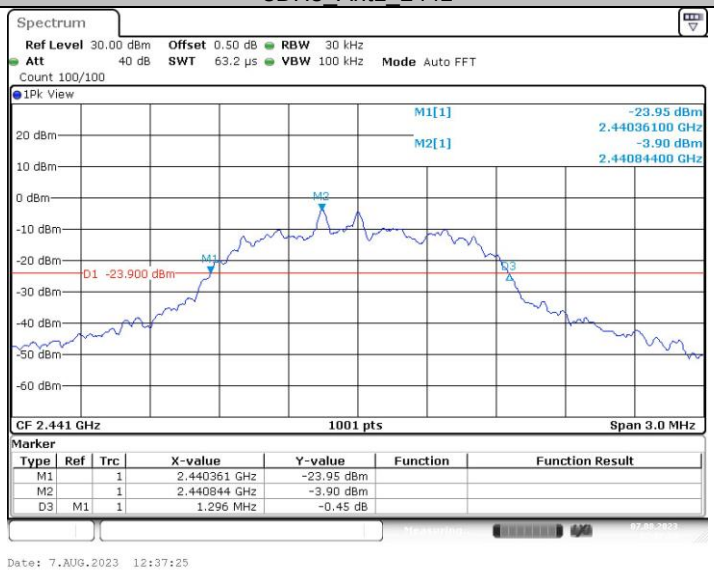
2DH5_Ant1_2480



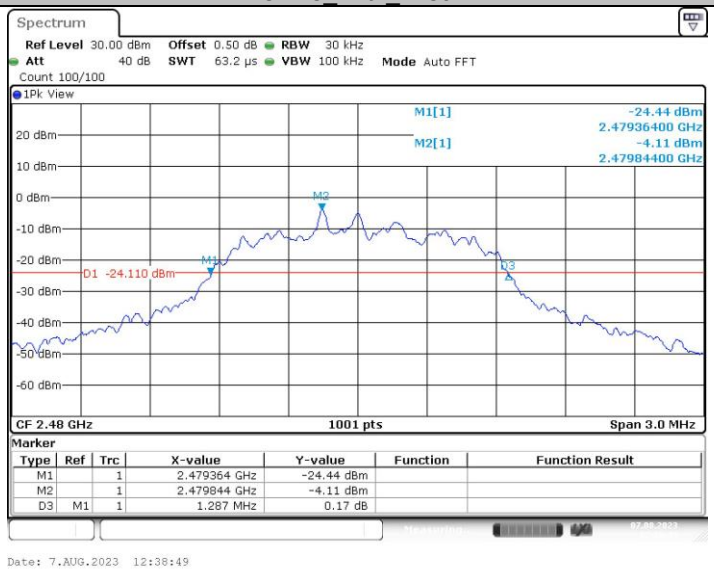
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



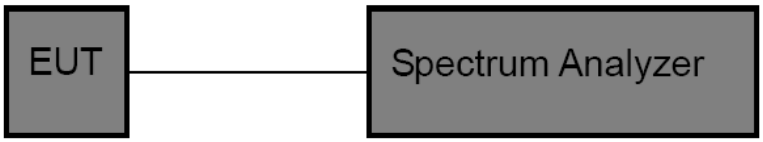
3.6. Channel Separation

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1) / RSS-247 5.1 b

Test Item	Limit	Frequency Range (MHz)
Channel Separation	>25kHz or >two-thirds of the 20 dB bandwidth Which is greater	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
   (1) Set RBW = 100 kHz.
   (2) Set the video bandwidth (VBW) ≥ 3 RBW.
   (3) Detector = Peak.
   (4) Trace mode = Max hold.
   (5) Sweep = Auto couple.

Test Mode

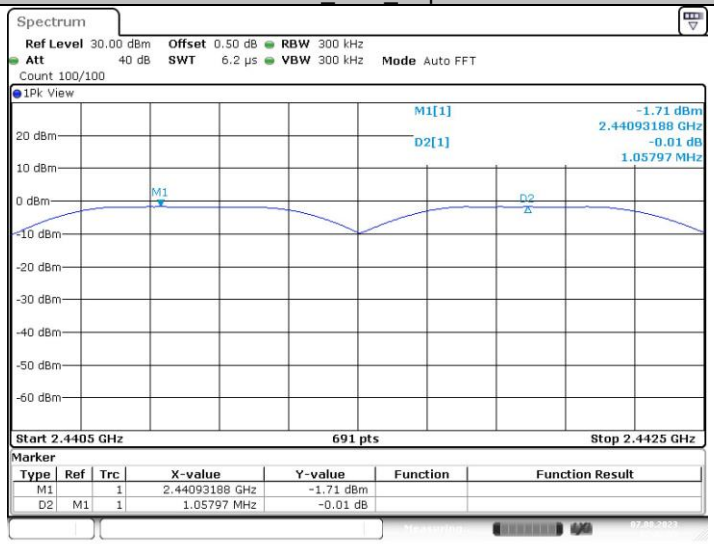
Please refer to the clause 2.4.

Test Result

Test Mode	Frequency (MHz)	Result (MHz)	Limit (MHz)	Verdict
DH5	Hop	1.058	≥0.716	PASS
2DH5	Hop	1.070	≥0.892	PASS
3DH5	Hop	0.974	≥0.864	PASS

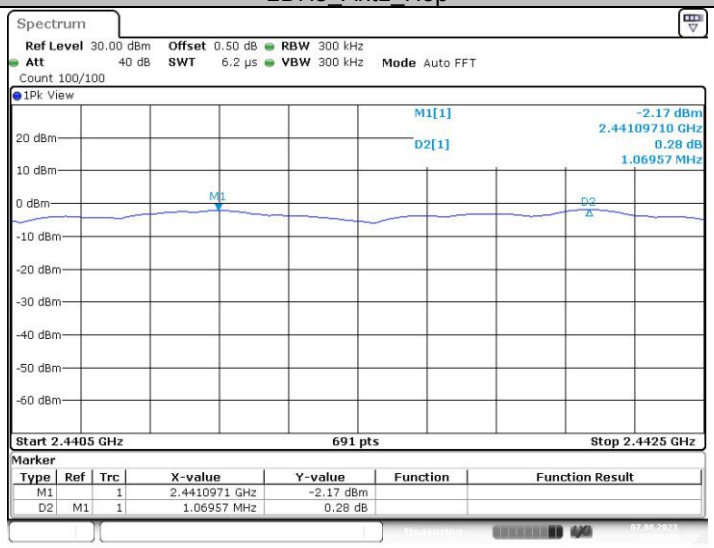
Test Graphs:

DH5_Ant1_Hop



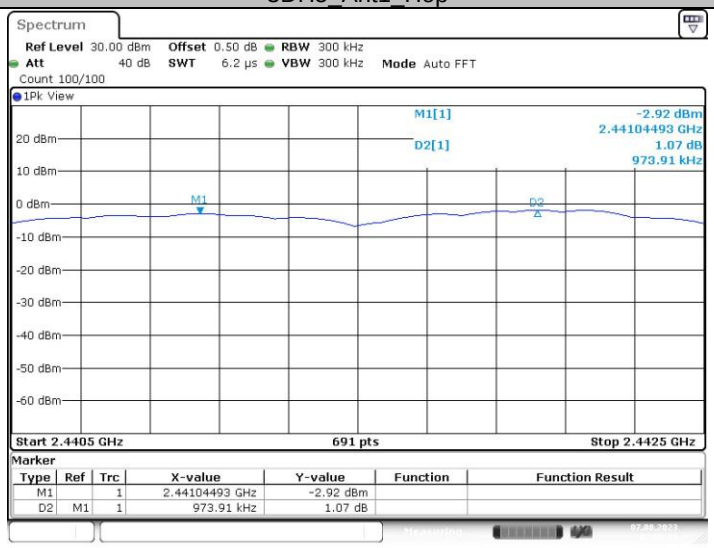
Date: 7.AUG.2023 12:42:55

2DH5_Ant1_Hop



Date: 7.AUG.2023 12:55:50

3DH5_Ant1_Hop



Date: 7.AUG.2023 12:58:33

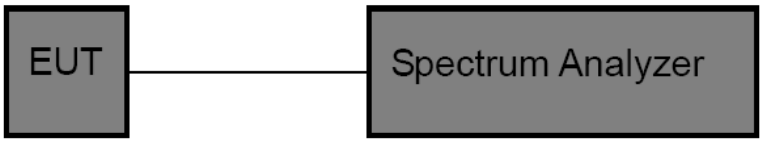
3.7. Number of Hopping Channel

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(iii) / RSS-247 5.1 d

Section	Test Item	Limit
15.247 (a)(iii) RSS-247 5.1 d	Number of Hopping Channel	⩾15

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
   (1) Peak Detector: RBW=100 kHz, VBW⩾RBW, Sweep time= Auto.

Test Mode

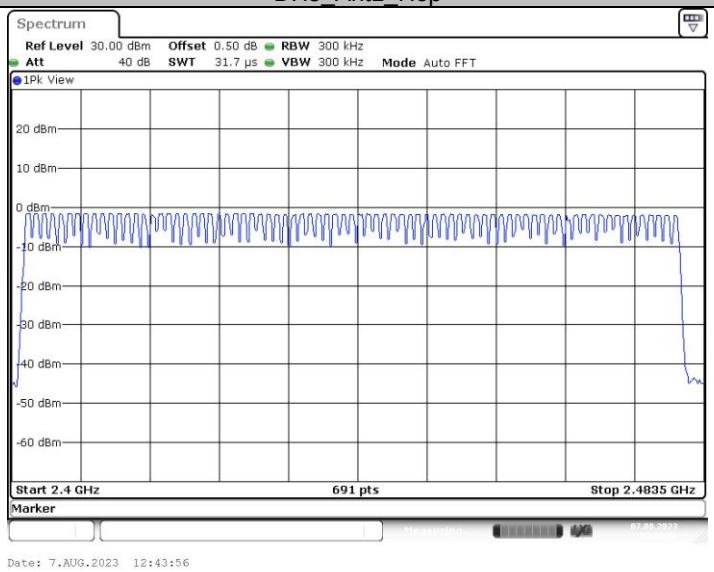
Please refer to the clause 2.4.

Test Result

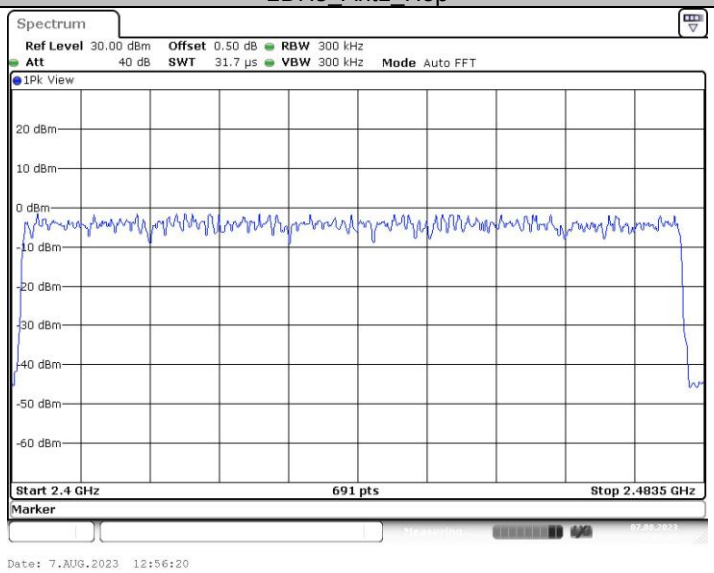
Test Mode	Frequency (MHz)	Result [Num]	Limit [Num]	Verdict
DH5	Hop	79	≥15	PASS
2DH5	Hop	79	≥15	PASS
3DH5	Hop	79	≥15	PASS

Test Graphs:

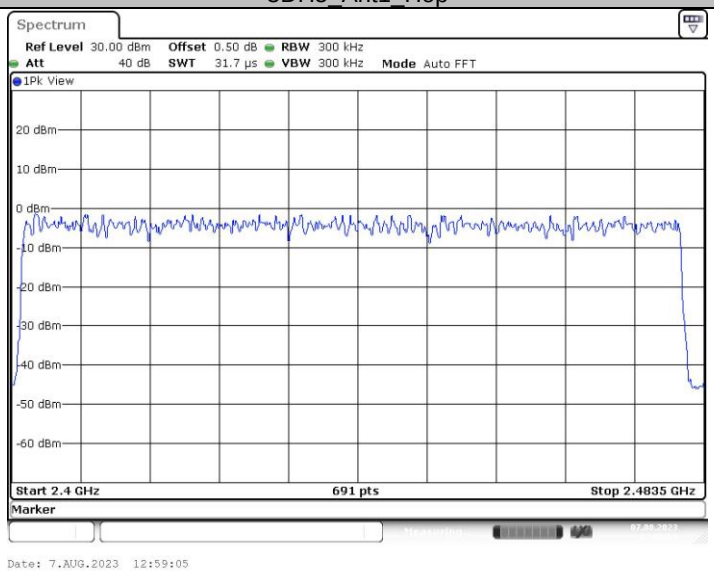
DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop



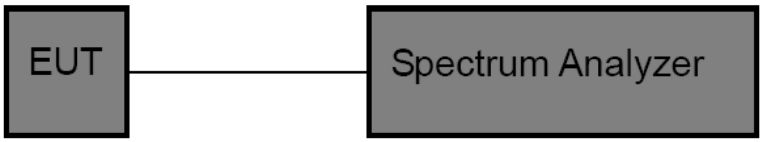
3.8. Dwell Time

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(iii) / RSS-247 5.1 d

Section	Test Item	Limit
15.247 (a)(iii) RSS-247 5.1 d	Average Time of Occupancy	0.4 sec

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
   (1) Spectrum Setting: RBW=1MHz, VBW≥RBW.
   (2) Use video trigger with the trigger level set to enable triggering only on full pulses.
   (3) Sweep Time is more than once pulse time.
   (4) Set the center frequency on any frequency would be measure and set the frequency span to zero.
   (5) Measure the maximum time duration of one single pulse.
   (6) Set the EUT for packet transmitting.

Test Mode

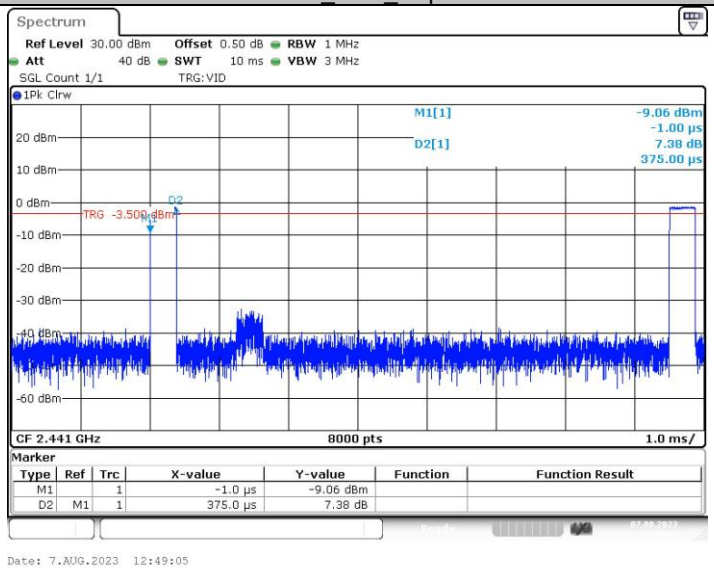
Please refer to the clause 2.4.

Test Result

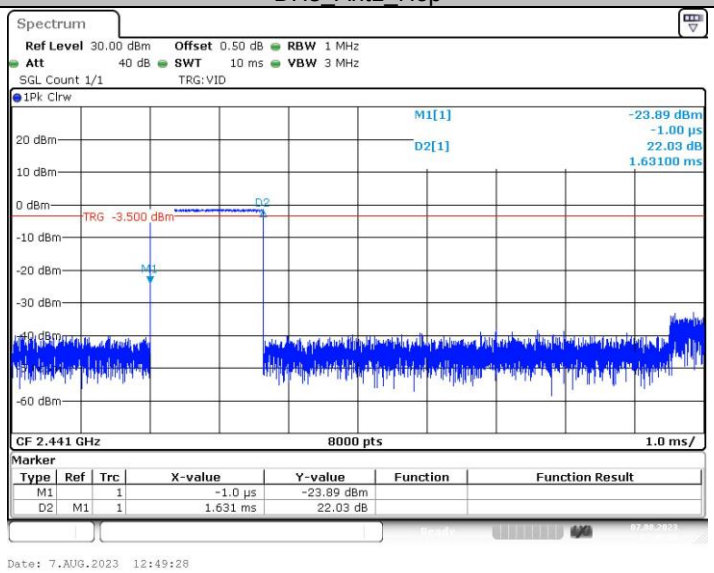
Test Mode	Freq(MHz)	Burst Width [ms]	Total Hops [Num]	Result[ms]	Limit[s]	Verdict
DH1	Hop	0.375	320	120.00	≤0.4	PASS
DH3	Hop	1.631	160	260.96	≤0.4	PASS
DH5	Hop	2.879	106.67	307.09	≤0.4	PASS
2DH1	Hop	0.385	320	123.20	≤0.4	PASS
2DH3	Hop	1.636	160	261.76	≤0.4	PASS
2DH5	Hop	2.884	106.67	307.63	≤0.4	PASS
3DH1	Hop	0.386	320	123.52	≤0.4	PASS
3DH3	Hop	1.636	160	261.76	≤0.4	PASS
3DH5	Hop	2.887	106.67	307.95	≤0.4	PASS

Test plot as follows:

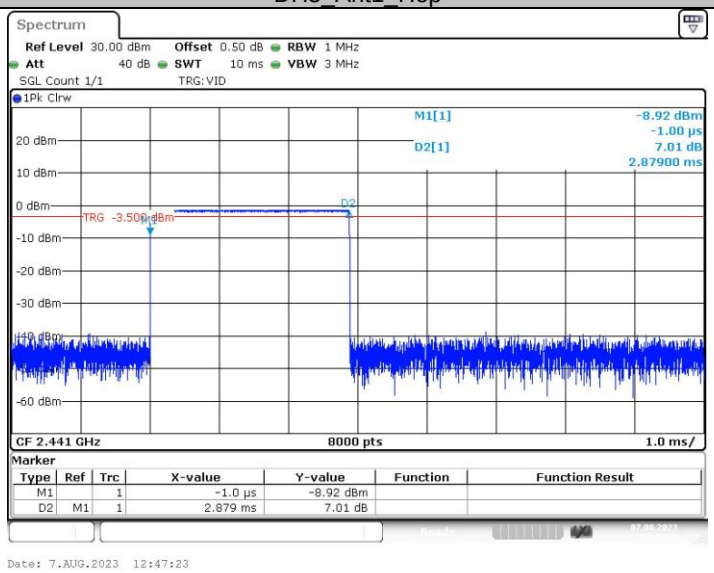
DH1_Ant1_Hop



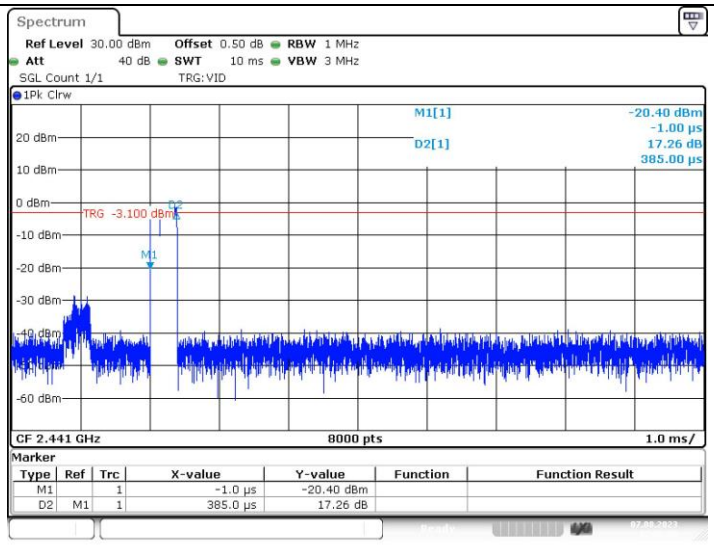
DH3_Ant1_Hop



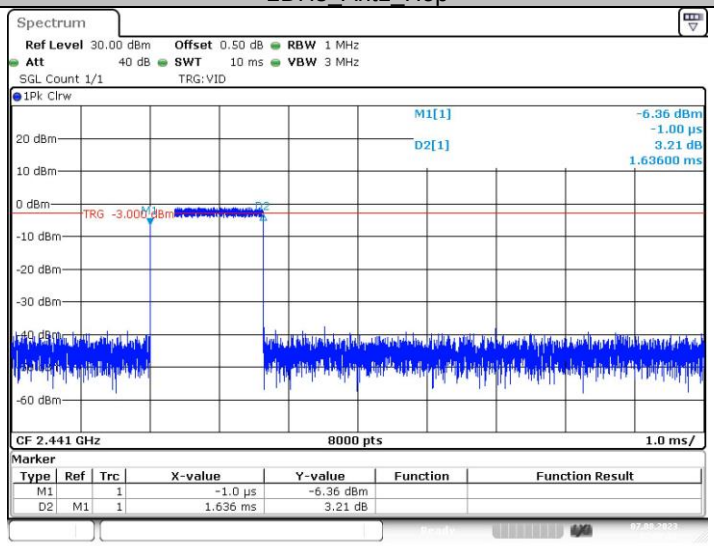
DH5_Ant1_Hop



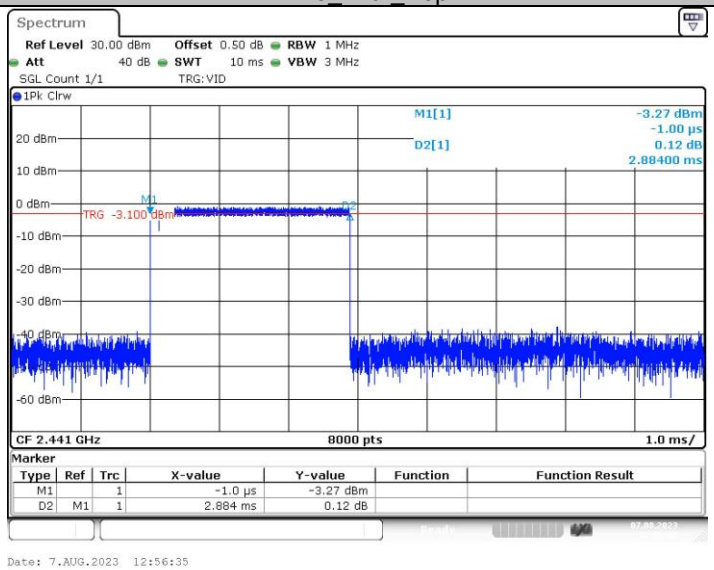
2DH1_Ant1_Hop



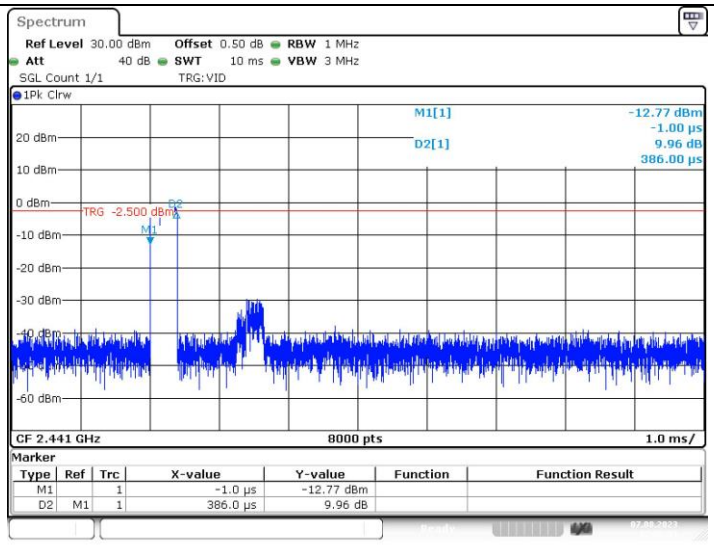
2DH3_Ant1_Hop



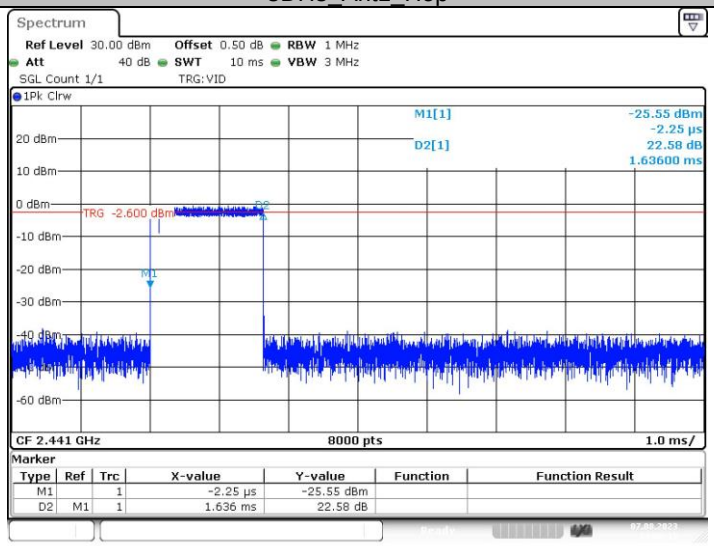
2DH5_Ant1_Hop



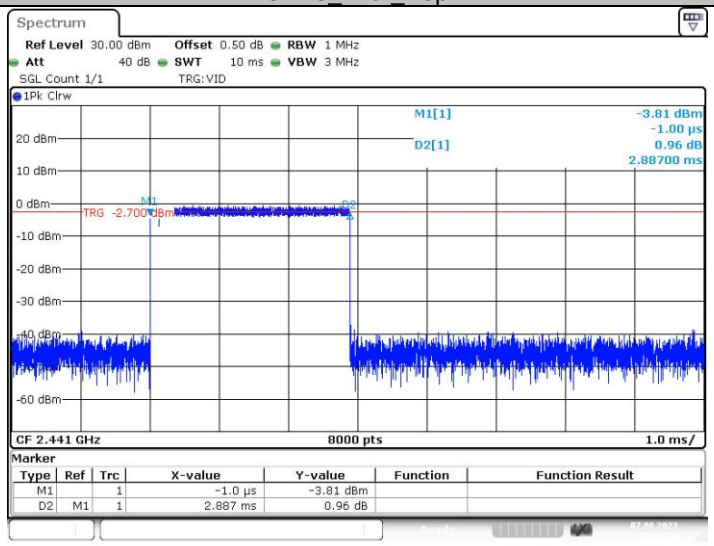
3DH1_Ant1_Hop



3DH3_Ant1_Hop



3DH5_Ant1_Hop



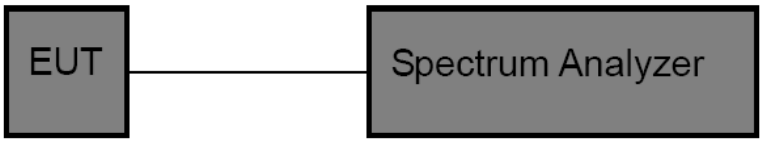
3.9. Peak Output Power

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(1) / RSS-247 5.4 b

Section	Test Item	Limit	Frequency Range (MHz)
FCC CFR 47 Part15.247 (b)(1)	Maximum Conducted Output Power	Hopping Channels≥75, Power <1W(30dBm); Others <125mW(21dBm)	2400~2483.5
ISED RSS-247 5.4 b	EIRP	4 Watt or 36dBm	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
   (1) Set RBW > 20dB Bandwidth.
   (2) Set VBW ≥ RBW.
   (3) Detector = Peak.
   (4) Trace mode = Max hold.
   (5) Sweep = Auto couple.
   (6) Span = Approximately five times the 20dB bandwidth, centered on a hopping channel.

Test Mode

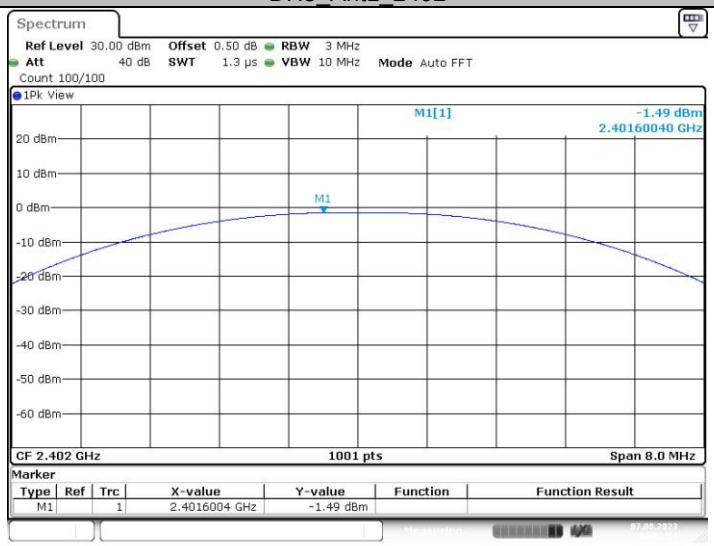
Please refer to the clause 2.4.

Test Result

Test Mode	Frequency(MHz)	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
DH5	2402	-1.49	≤30	PASS
	2441	-1.47	≤30	PASS
	2480	-1.79	≤30	PASS
2DH5	2402	-0.78	≤30	PASS
	2441	-0.94	≤30	PASS
	2480	-1.25	≤30	PASS
3DH5	2402	-0.58	≤30	PASS
	2441	-0.59	≤30	PASS
	2480	-0.69	≤30	PASS

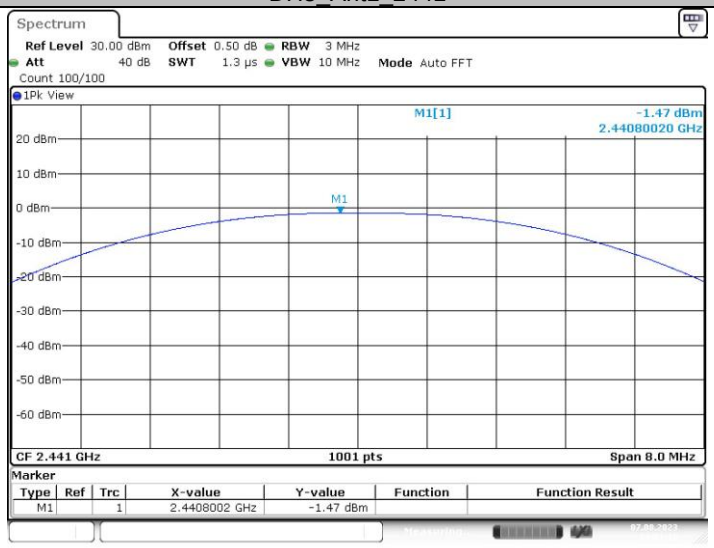
Test Graphs:

DH5_Ant1_2402



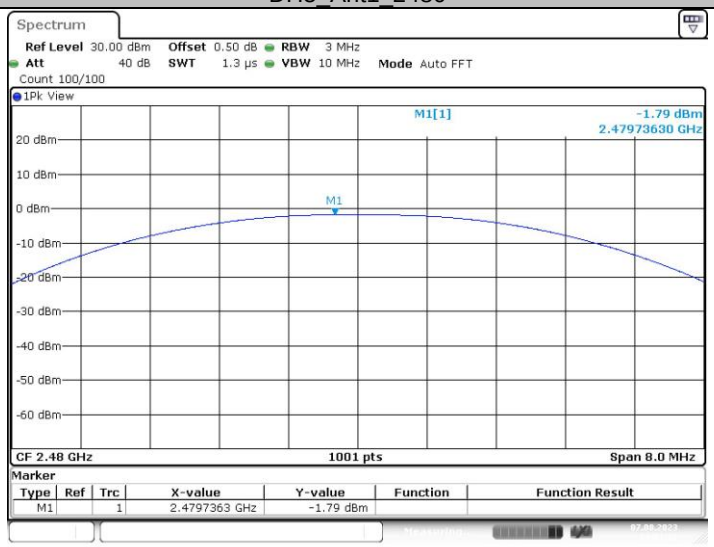
Date: 7.AUG.2023 13:01:01

DH5_Ant1_2441



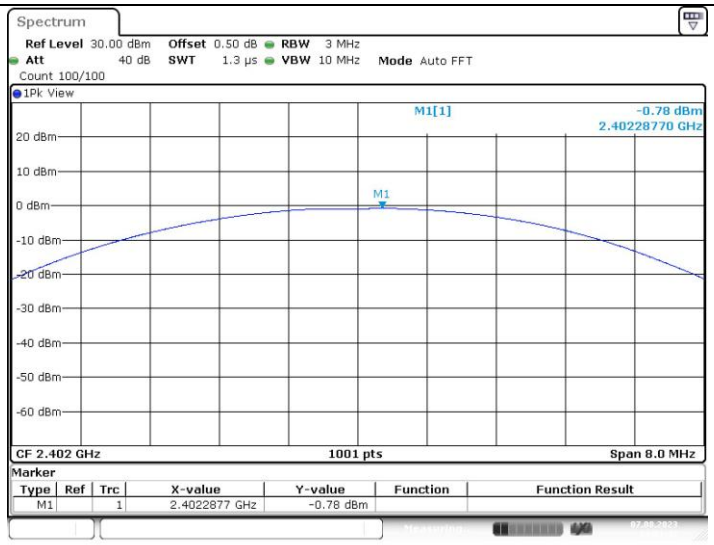
Date: 7.AUG.2023 13:01:19

DH5_Ant1_2480

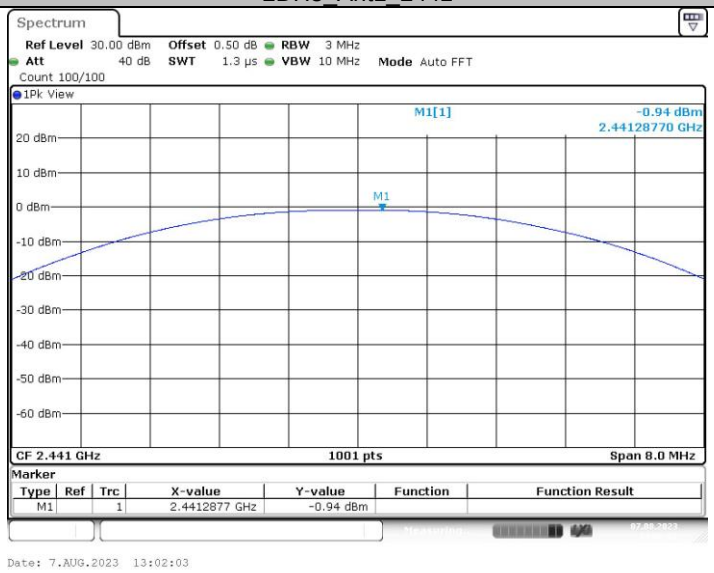


Date: 7.AUG.2023 13:01:32

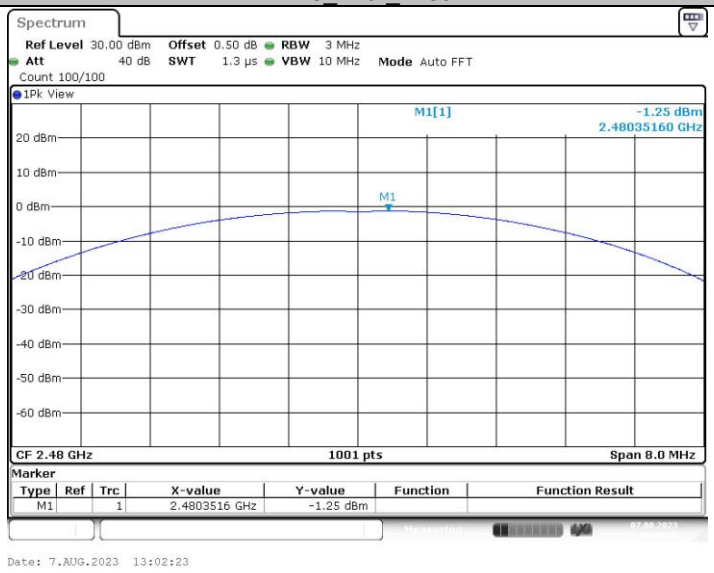
2DH5_Ant1_2402



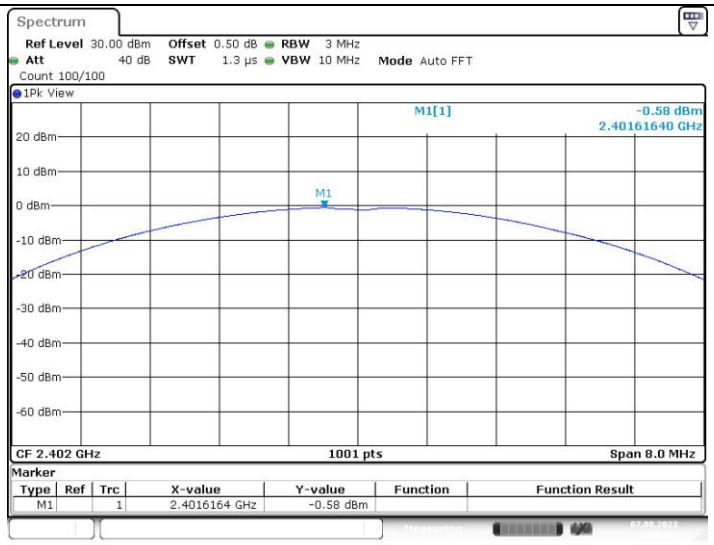
2DH5_Ant1_2441



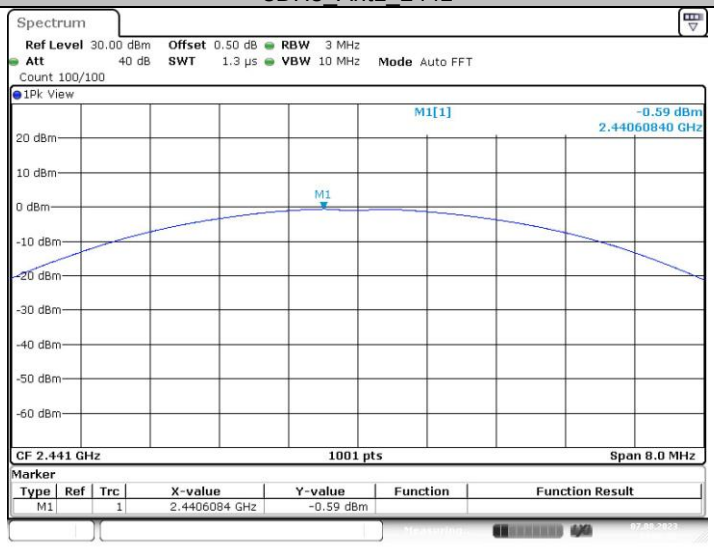
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



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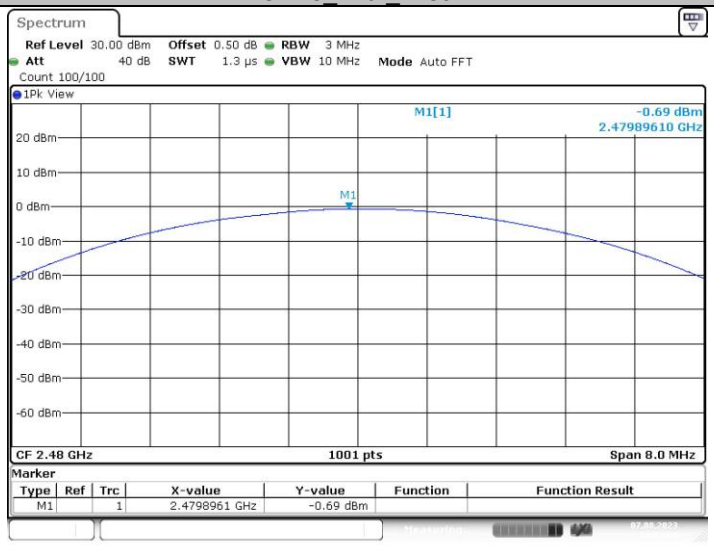
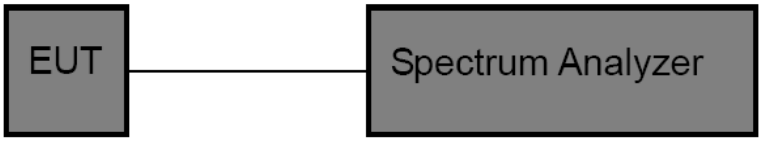


3.10. Duty Cycle

Limit

None, for report purposes only.

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:

Set analyzer center frequency to test channel center frequency.
Set the span to 0Hz.
Set the RBW to 10MHz.
Set the VBW to 10MHz.
Detector: Peak.
Sweep time: Auto.
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

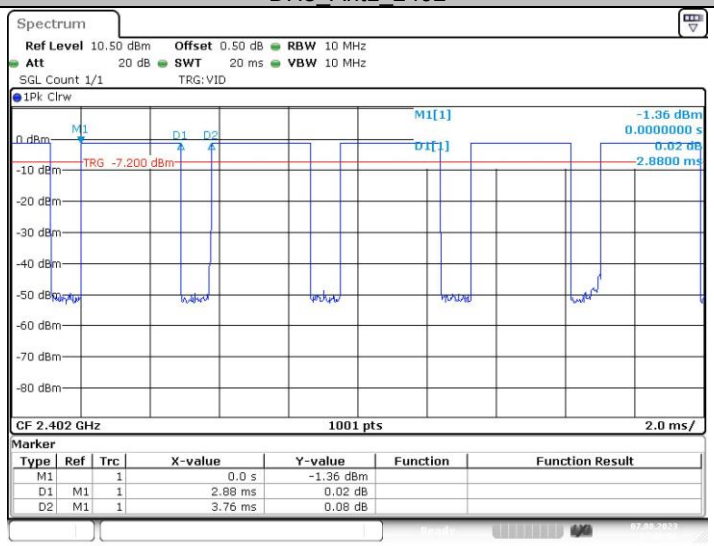
Please refer to the clause 2.4.

Test Result

Test Mode	Freq(MHz)	ON Time [ms]	Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final Setting for VBW (kHz)
DH5	2402	2.88	3.76	76.60	0.35	1
	2441	2.88	3.76	76.60	0.35	1
	2480	2.88	3.76	76.60	0.35	1
2DH5	2402	2.88	3.76	76.60	0.35	1
	2441	2.88	3.76	76.60	0.35	1
	2480	2.88	3.76	76.60	0.35	1
3DH5	2402	2.88	3.74	77.01	0.35	1
	2441	2.88	3.74	77.01	0.35	1
	2480	2.88	3.74	77.01	0.35	1

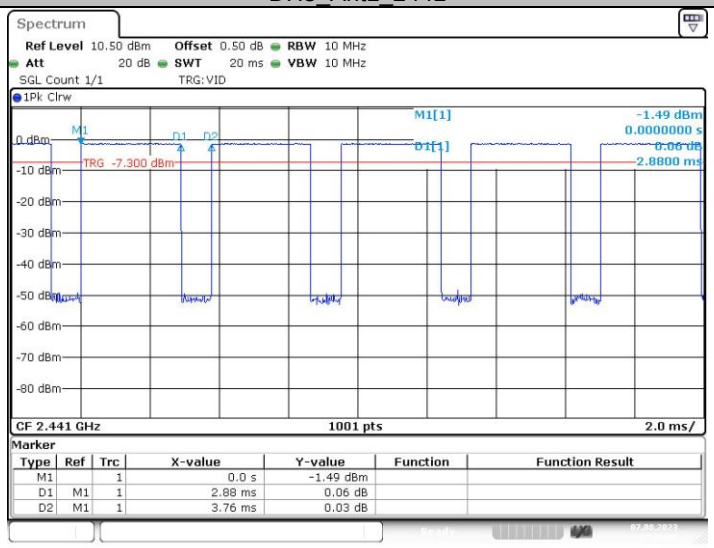
Test Graphs:

DH5_Ant1_2402



Date: 7.AUG.2023 12:26:08

DH5_Ant1_2441



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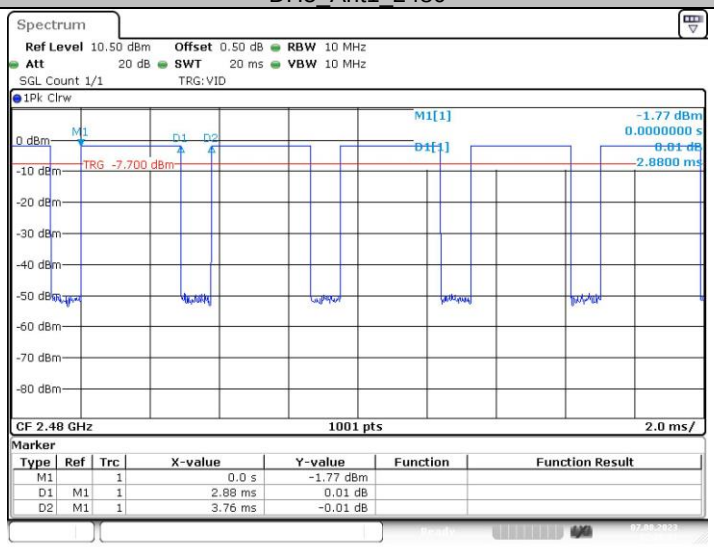
DH5_Ant1_2480



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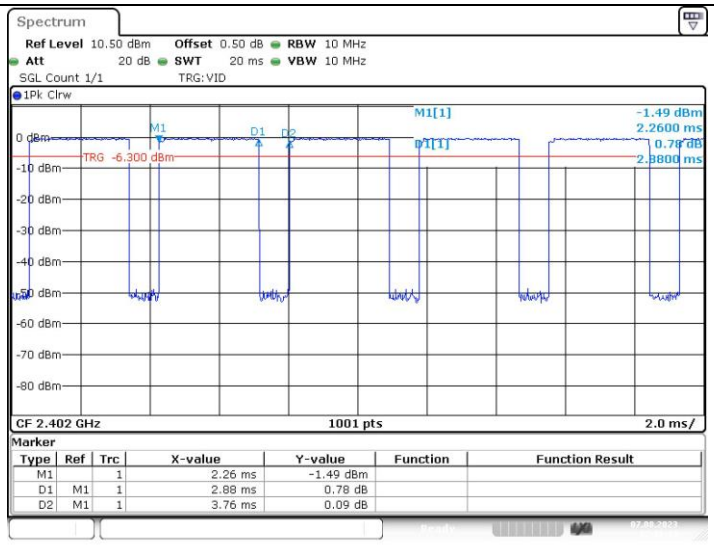
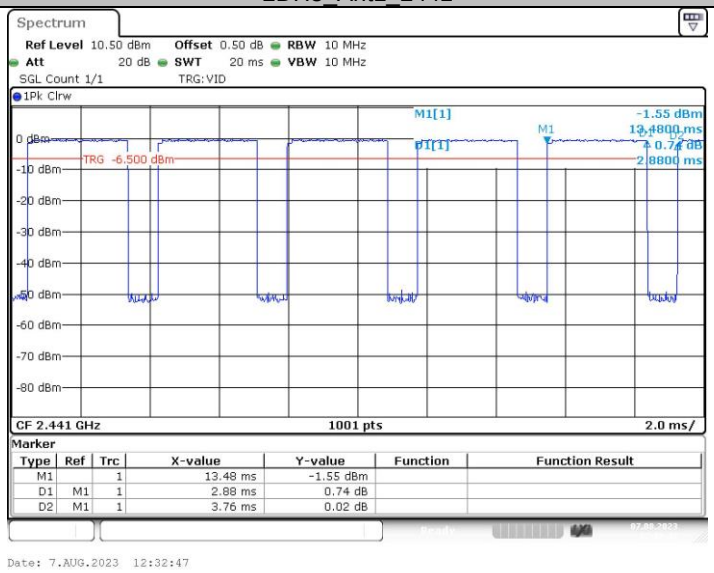
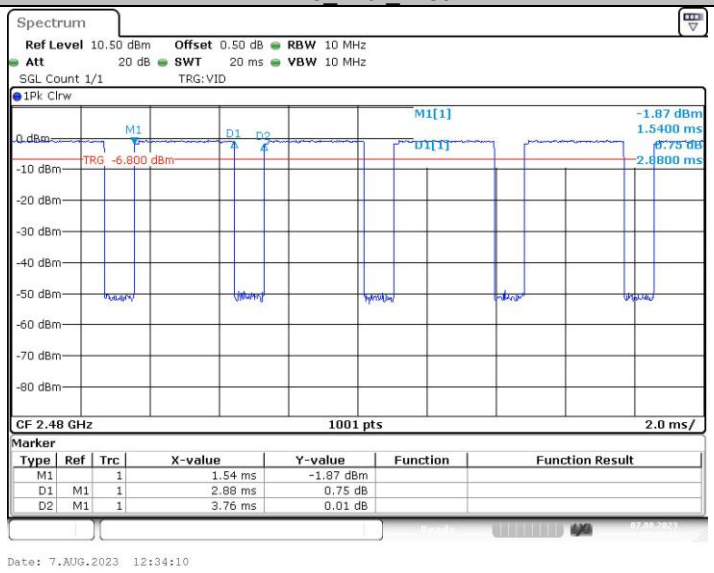
2DH5_Ant1_2402



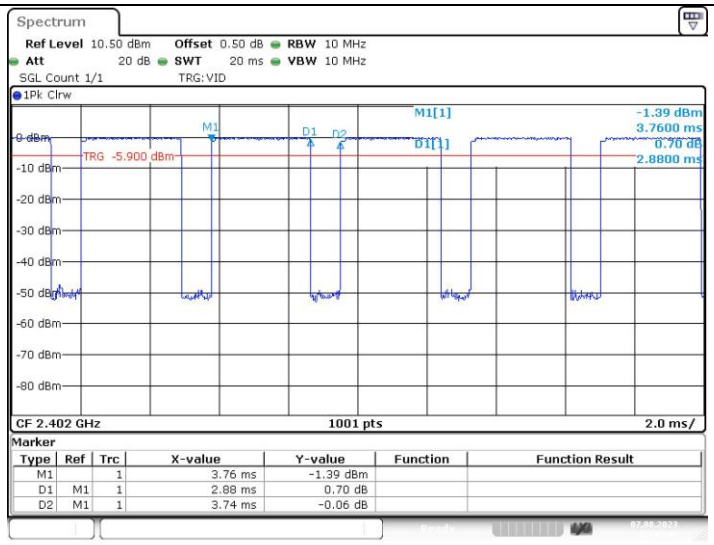
2DH5_Ant1_2441



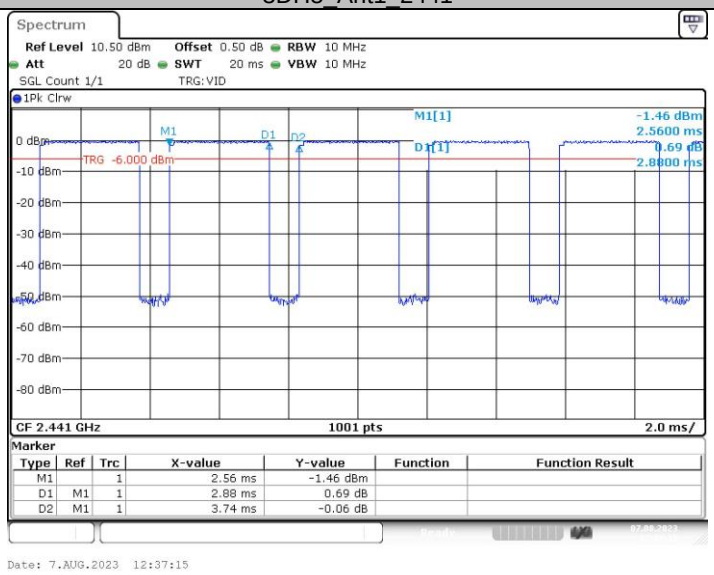
2DH5_Ant1_2480



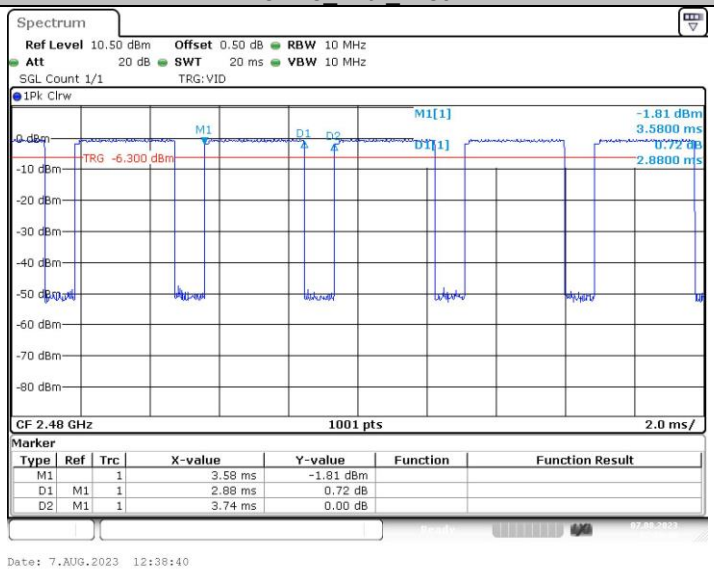
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



3.11. Antenna Requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 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 antenna that uses a unique coupling to the intentional radiator, 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.
FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i)
(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result

The directional gain of the antenna is less than 6dBi, please refer to the EUT internal photographs antenna photo.

**********THE END**********