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Acer Incorporated

TEST REPORT

REPORT NUMBER
200700111TWN-001

ISSUE DATE
Jul. 23, 2020

PAGES
55

Radio Spectrum
TEST REPORT

Applicant:	**Acer Incorporated** **8F, 88, Sec.1, Xintai 5th Rd. Xizhi, New Taipei City 221, Taiwan**
Product:	**Wireless Keyboard**
Model No.:	**DKR010**
Brand Name:	**Acer**
FCC ID:	**HLZDKR010**
Test Method/ Standard:	**47 CFR FCC Part 15.247 & ANSI C63.10 2013** **KDB 558074 D01 v05r02**
Test By:	**Intertek Testing Services Taiwan Ltd.,** **Hsinchu Laboratory** **No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,** **Shiang-Shan District, Hsinchu City, Taiwan**

Testing Laboratory
0597

Prepared and Checked by:

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Engineer

Revision History

Report No.	Issue Date	Revision Summary
200700111TWN-001	Jul. 21, 2020	Original report

Table of Contents

Summary of Test Data

Test Requirement	Applicable Rule (Section 15.247)	Result
20dB Bandwidth Test	15.247(a)(1)	Pass
Carrier Frequency Separation Test	15.247(a)(1)	Pass
Number of Hopping Frequencies Test	15.247(a)(1)	Pass
Time of Occupancy (Dwell Time) Test	15.247(a)(1)(iii)	Pass
Maximum Output Power Test	15.247(b)	Pass
RF Antenna Conducted Spurious Test	15.247(d)	Pass
Radiated Spurious Emission Test	15.205, 15.209	Pass
Emission on the Band Edge Test	15.247(d)	Pass
AC Power Line Conducted Emission Test	15.207	Pass
Antenna Requirement	15.203	Pass

Note: Please note that the test results with statement of conformity, the decision rules which are based on: Safety Testing: the specification, standard or IEC Guide 115.
Other Testing: the specification, standard and not taking into account the measurement uncertainty.

1. General Information

1.1 Identification of the EUT

Product:	Wireless Keyboard
Model No.:	DKR010
S/N Number:	GPKBD1101E921000014Z01
SW Version:	V05_Ex33EE
Test Software Version:	1.9.5.2
Power Setting:	0 dBm
Operating Frequency:	2402 MHz ~ 2480 MHz
Channel Number:	79 channels
Frequency of Each Channel:	2402+1 k, k＝0 ~ 78
Access scheme:	GFSK, π/4DQPSK, 8DPSK
Rated Power:	3.8Vdc from Battery or 5Vdc from USB
Power Cord:	N/A
Sample receiving date:	Jul. 09, 2020
Sample condition:	Workable
Test Date(s):	Jul. 14, 2020 ~ Jul. 17, 2020

1.2 Antenna description

Antenna Gain : 2.78 dBi
Antenna Type : PCB antenna
Connector Type : Fixed

1.3 Operation mode

The EUT was supplied with DC 5 V from USB port (Test voltage: 120Vac, 60Hz).

Connected to Notebook via USB To UART Cable, executing “BlueTool 1.9.5.2” and select different frequency and modulation.

1.4 Peripherals equipment

Peripherals	Brand	Model No.	Serial No.	Data cable
Notebook PC	HP	HP ProBook 440 G3	5CD8021S9H	USB To UART 1.5 meter × 1

2. 20dB Bandwidth Test

2.1 Test Setup & Procedure

The test procedure was according to FCC measurement guidelines DA 00-705.

The 20dB bandwidth per FCC §15.247(a)(1) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set≧ 1% of 20dB Bandwidth, the video bandwidth ≧ RBW, and the SPAN may equal to approximately 2 to 3 times the 20dB bandwidth. The test was performed at 3 channels (lowest, middle and highest channel). The maximum 20dB modulation bandwidth is in the following Table.

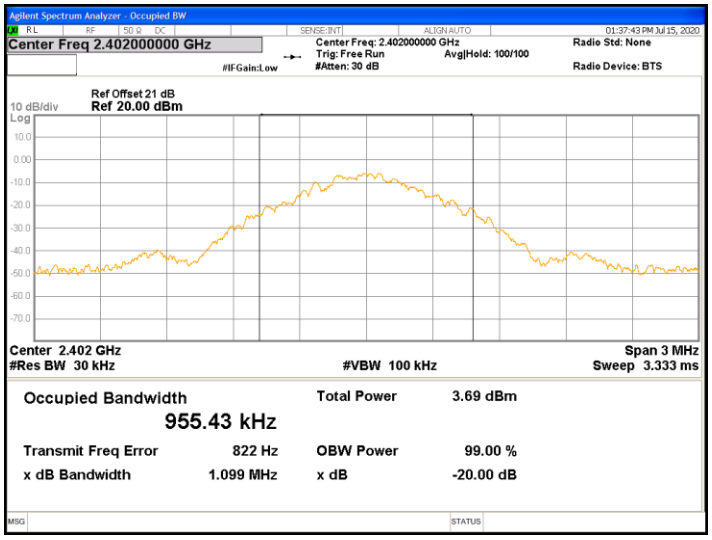
2.2 Operating Environment Condition

Temperature (℃) :	24
Relative Humidity (%) :	55

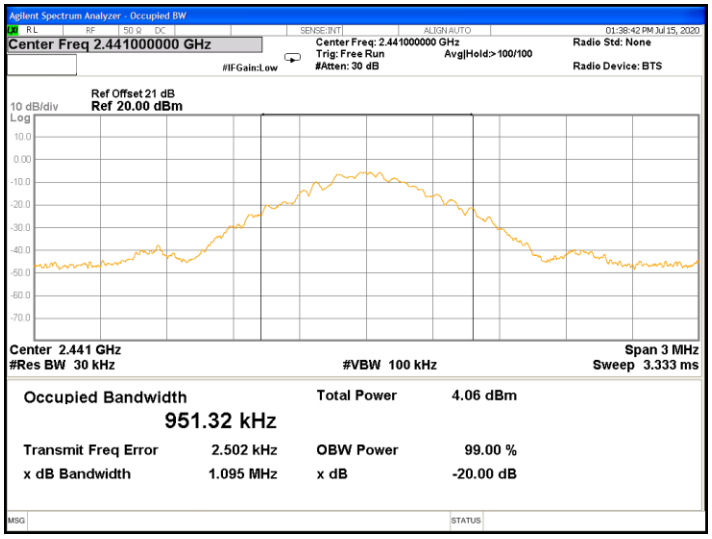
2.3 Test Results

Mode	Channel	Frequency (MHz)	20dB Bandwidth (MHz)
DH5	0	2402	1.099
	39	2441	1.095
	78	2480	1.091
2DH5	0	2402	1.099
	39	2441	1.094
	78	2480	1.097
3DH5	0	2402	1.100
	39	2441	1.094
	78	2480	1.043

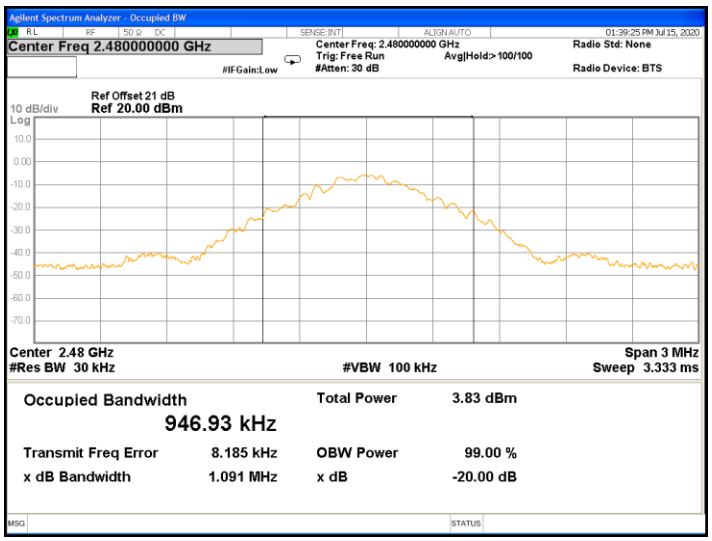
20dB Occupied Bandwidth @ DH5 Ch 0



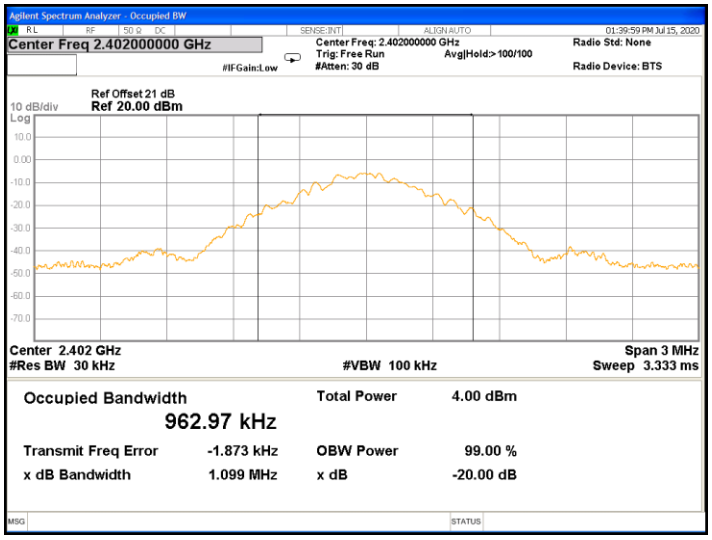
20dB Occupied Bandwidth @ DH5 Ch 39



20dB Occupied Bandwidth @ DH5 Ch 78



20dB Occupied Bandwidth @ 2DH5 Ch 0



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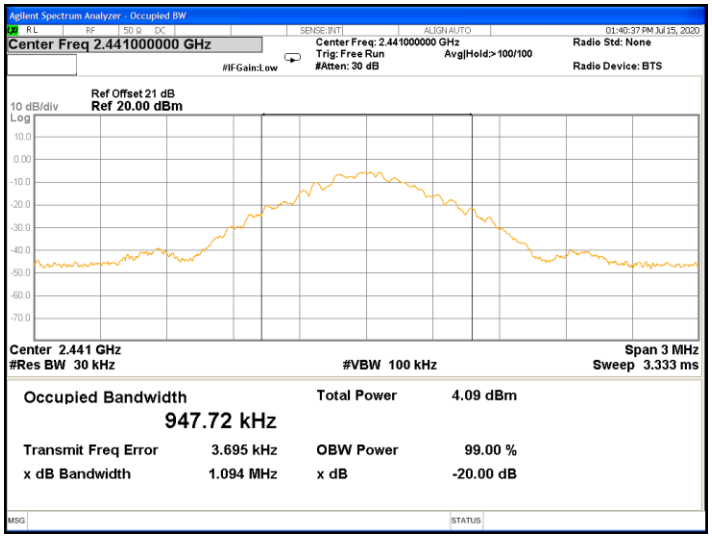
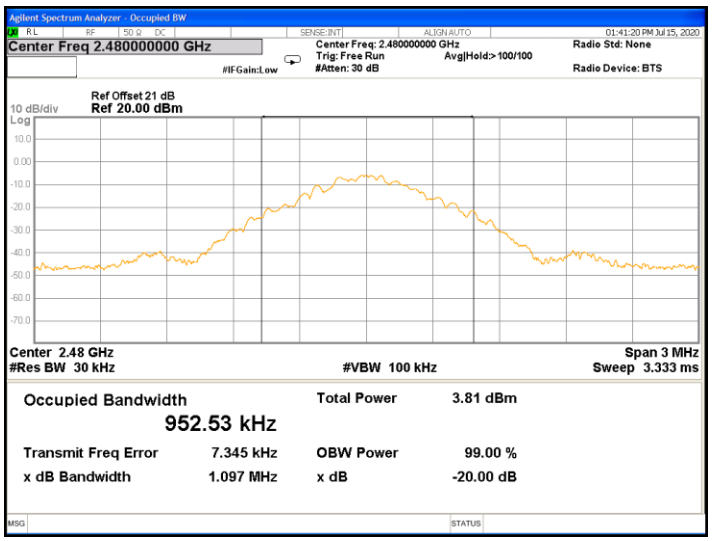
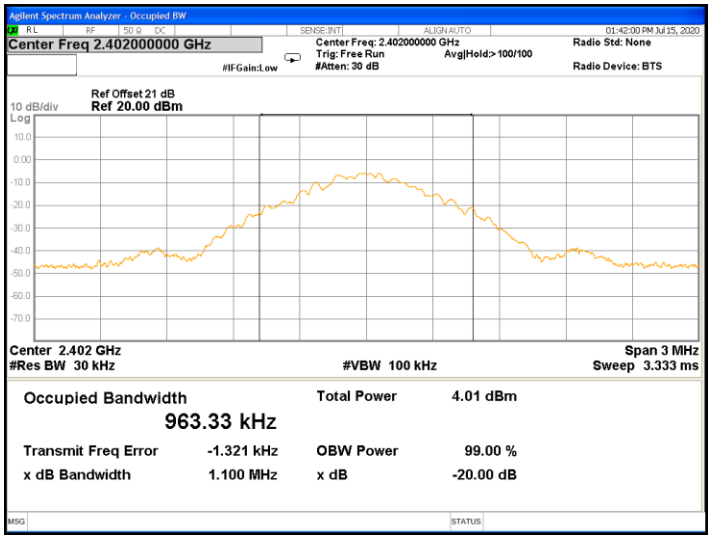


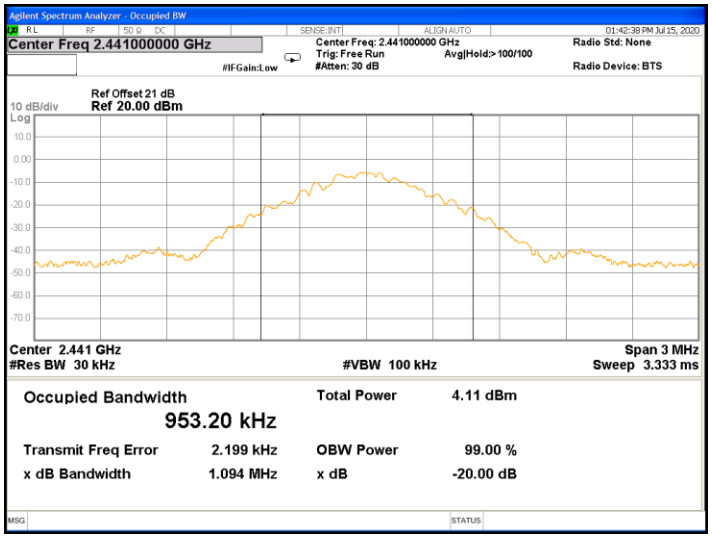
20dB Occupied Bandwidth @ 2DH5 Ch 78



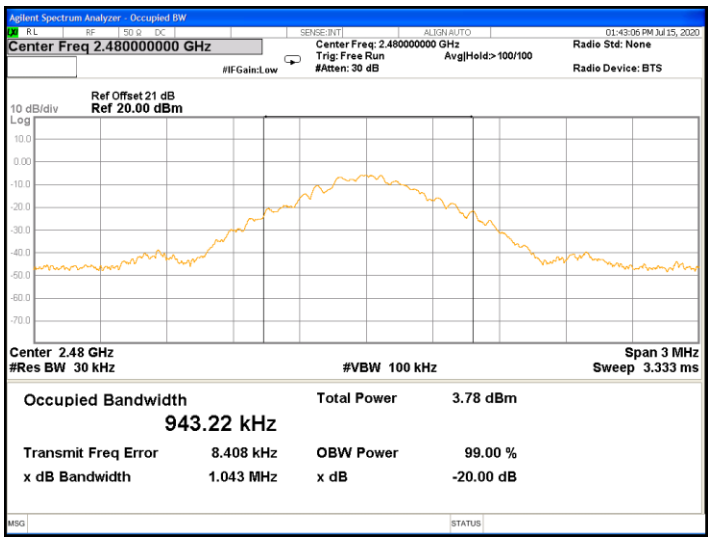
20dB Occupied Bandwidth @ 3DH5 Ch 0



20dB Occupied Bandwidth @ 3DH5 Ch 39



20dB Occupied Bandwidth @ 3DH5 Ch 78



3. Carrier Frequency Separation Test

3.1 Test Setup & Procedure

The test procedure was according to FCC measurement guidelines DA 00-705.
The carrier frequency separation per FCC §15.247(a)(1) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at ≧ 1% of the span, the video bandwidth ≧ RBW, and the SPAN was wide enough to capture the peaks of two adjacent channels. The carrier frequency separation result is in the following Table.

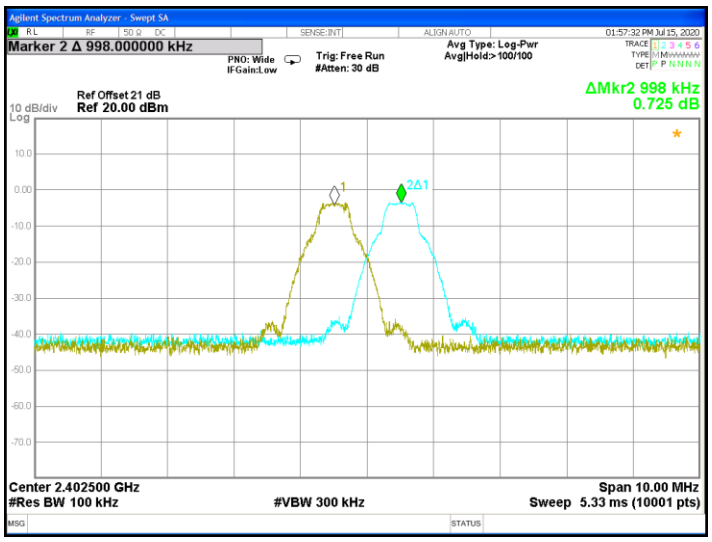
3.2 Operating Environment Condition

Temperature (℃) :	24
Relative Humidity (%) :	55

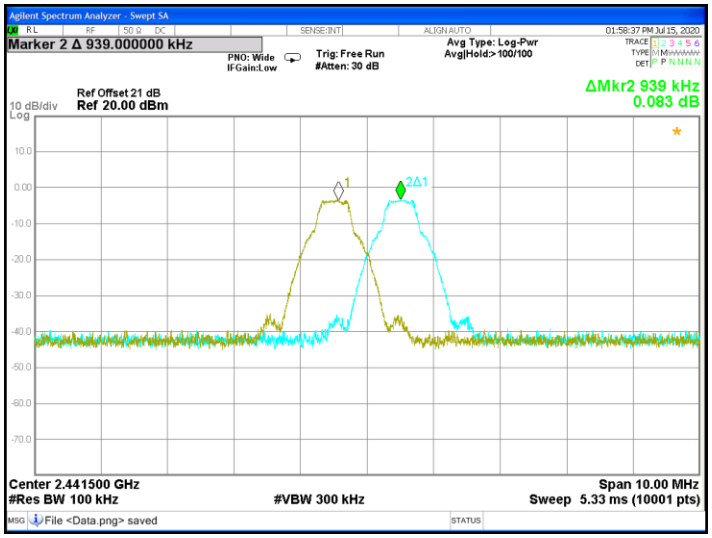
3.3 Test Results

Mode	Channel	Frequency (MHz)	Adjacent channel separation (MHz)	Limit (MHz)
DH5	0	2402	0.998	0.733
	39	2441	0.939	0.730
	78	2480	0.993	0.727
2DH5	0	2402	1.006	0.733
	39	2441	0.957	0.729
	78	2480	1.007	0.731
3DH5	0	2402	0.999	0.733
	39	2441	0.953	0.729
	78	2480	0.986	0.695

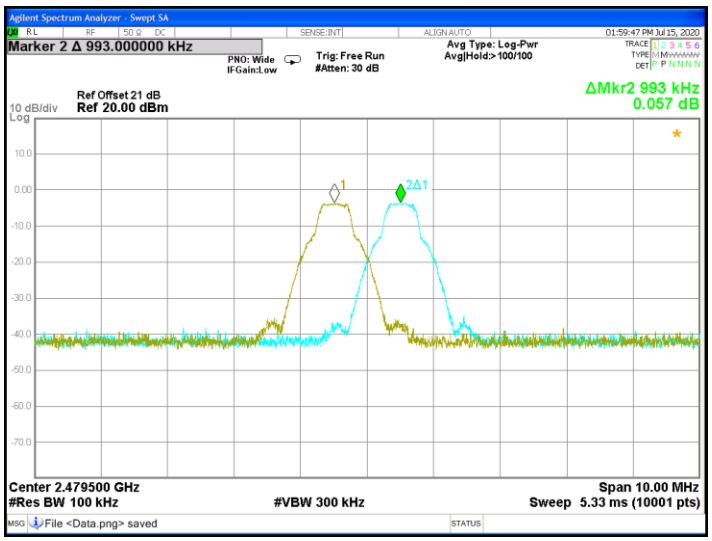
Frequency Separation @ DH5 Ch 0



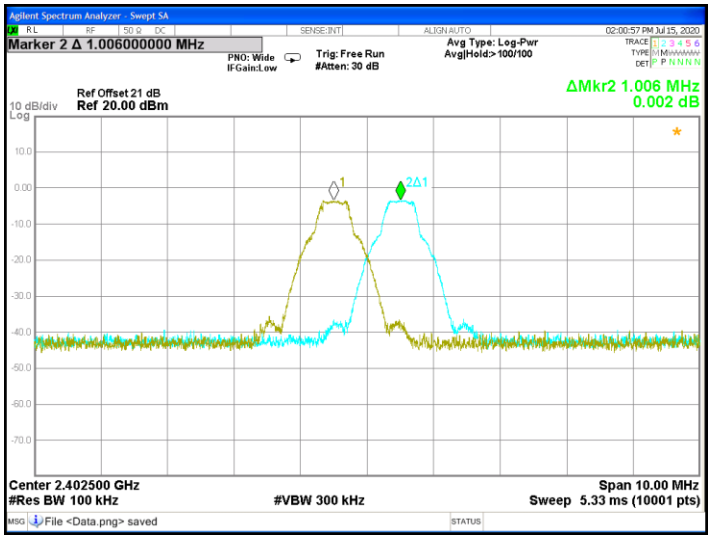
Frequency Separation @ DH5 Ch 39



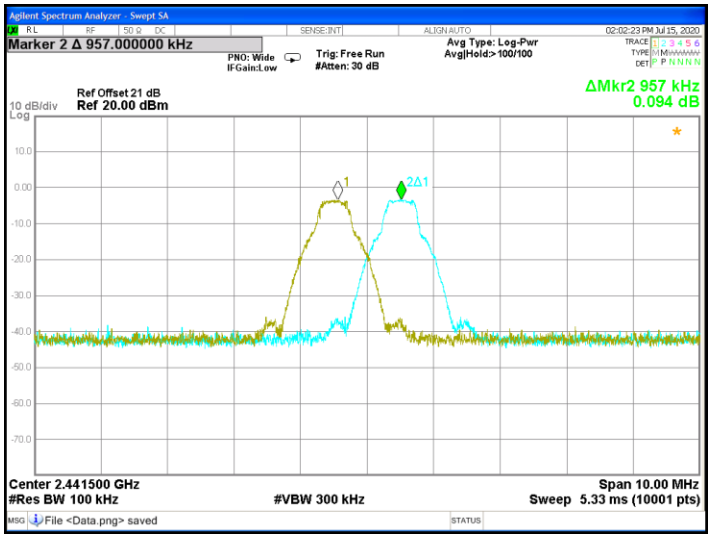
Frequency Separation @ DH5 Ch 78



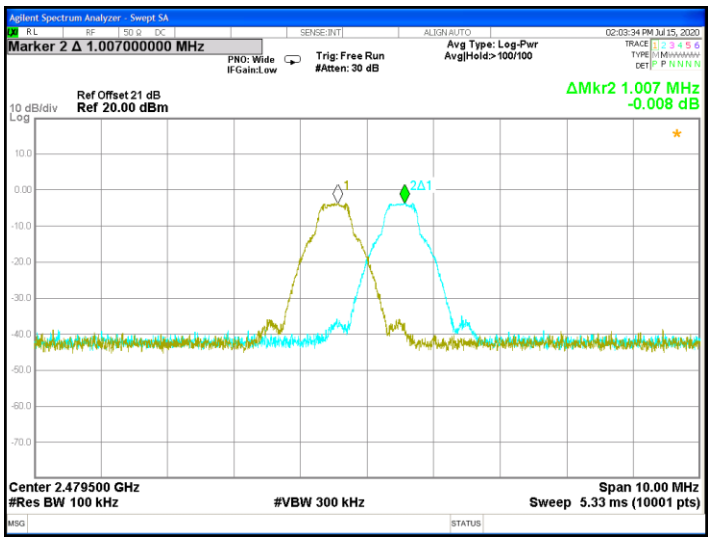
Frequency Separation @ 2DH5 Ch 0



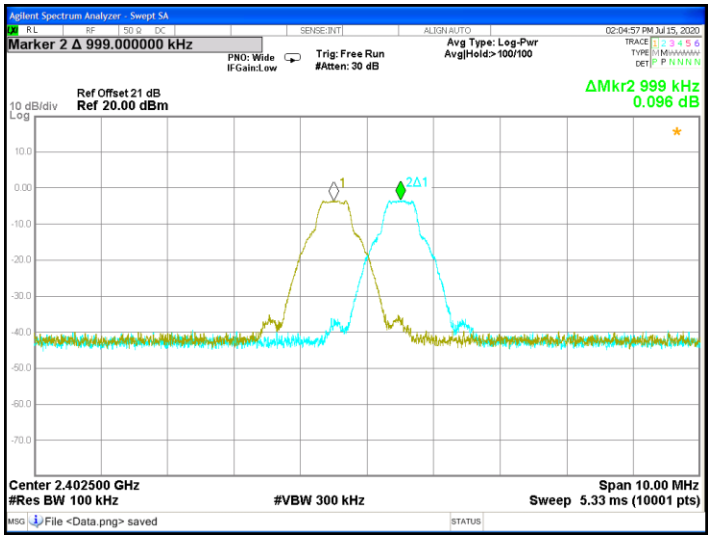
Frequency Separation @ 2DH5 Ch 39



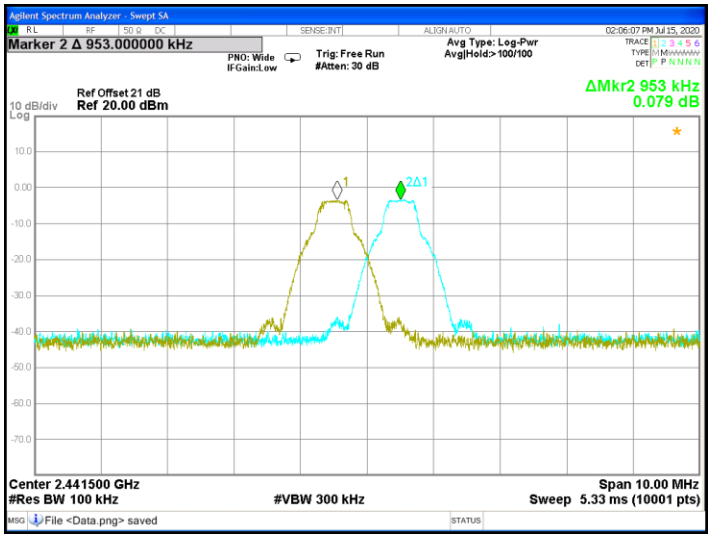
Frequency Separation @ 2DH5 Ch 78



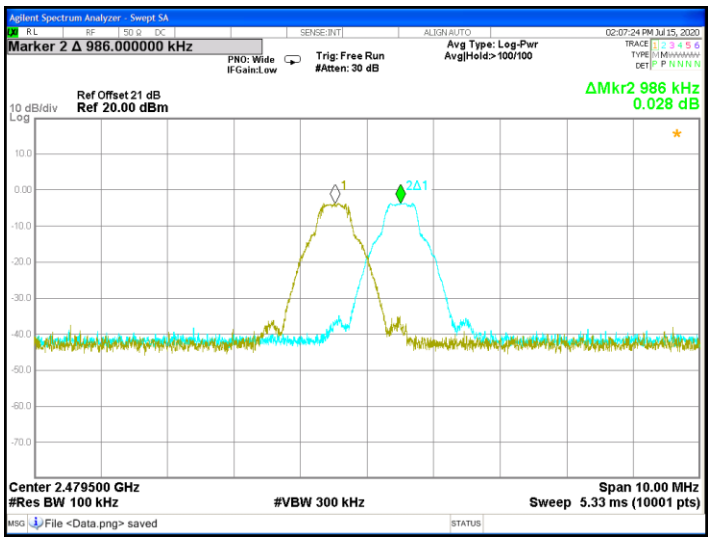
Frequency Separation @ 3DH5 Ch 0



Frequency Separation @ 3DH5 Ch 39



Frequency Separation @ 3DH5 Ch 78



4. Number of Hopping Frequencies Test

4.1 Test Setup & Procedure

The test procedure was according to FCC measurement guidelines DA 00-705.
The number of hopping frequencies per FCC §15.247(a)(1) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at ≧ 1% of the span, the video bandwidth ≧ RBW, and the SPAN was the frequency band of operation. The carrier frequency separation result is in the following Table.

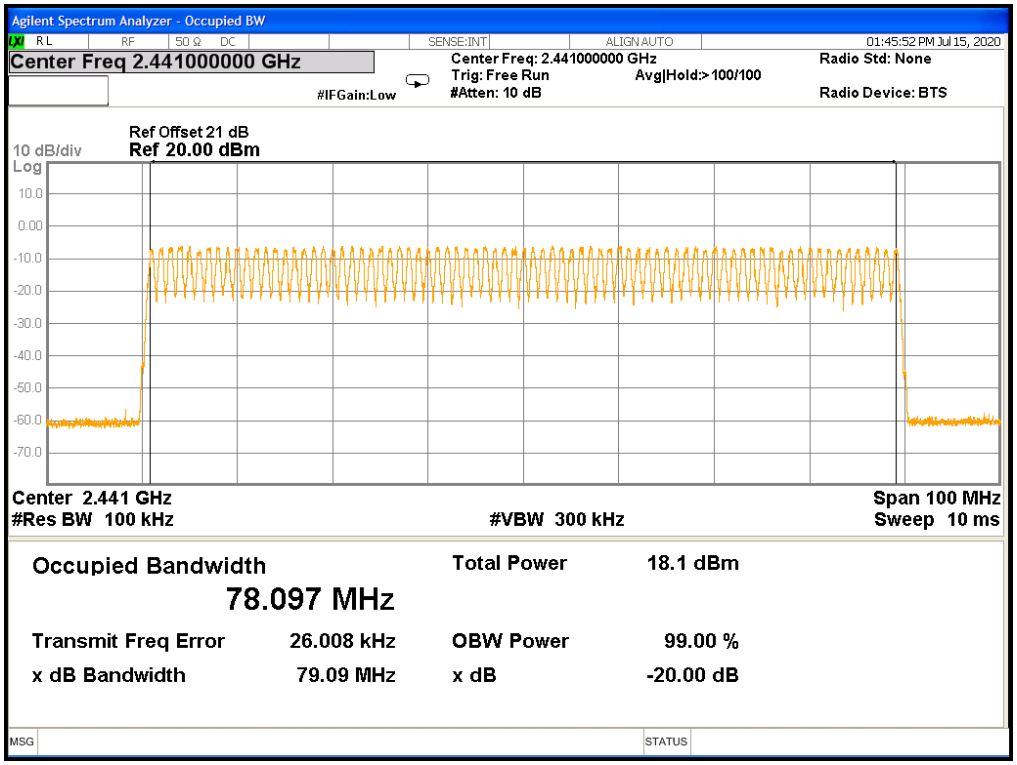
4.2 Operating Environment Condition

Temperature (℃) :	24
Relative Humidity (%) :	55

4.3 Test Results

Frequency Range (MHz)	Hopping Channels
2402~2480	79

79 Channel @ DH5 Hopping Mode



5. Time of Occupancy (Dwell Time)

5.1 Test Setup & Procedure

The test procedure was according to FCC measurement guidelines DA 00-705.
The time of occupancy (dwell time) per FCC §15.247(a)(1) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 1MHz, the video bandwidth ≧ RBW, and the zero span function of spectrum analyzer was enable. The EUT has its hopping function enable.

5.2 Operating Environment Condition

Temperature (℃) :	24
Relative Humidity (%) :	55

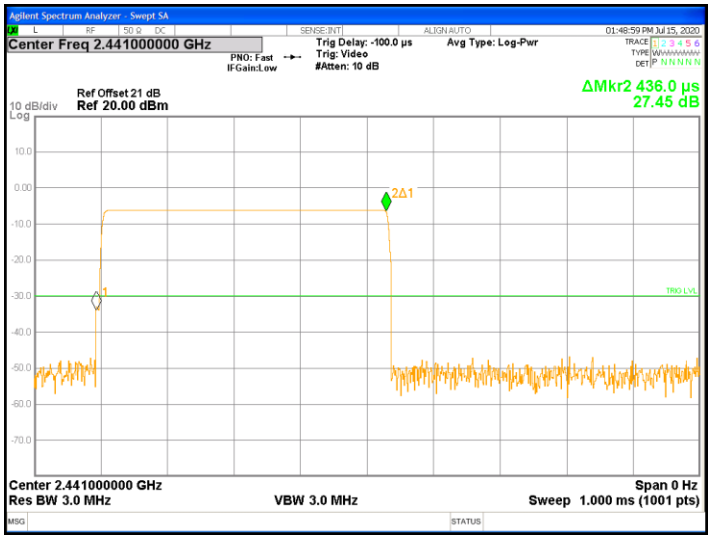
5.3 Test Results

The total sweep time is 0.4×79 Channels =31.6 seconds
Due to the number of hops in the 31.6s sweep, we determined to reduce the sweep time to 5s, count the number of hops and multiply by 6.32. The total number of hops will be multiplied by the measured time of one pulse.

Mode	Packet type	Pulse duration (ms)	Measure time (s)	Dwell time (s)	Limit (s)	Test Results
GFSK	DH1	0.436	31.6	0.140	0.4	Pass
	DH3	1.692	31.6	0.271	0.4	Pass
	DH5	2.938	31.6	0.313	0.4	Pass
π/4-DQPSK	2DH1	0.448	31.6	0.143	0.4	Pass
	2DH3	1.694	31.6	0.271	0.4	Pass
	2DH5	2.942	31.6	0.314	0.4	Pass
8-DPSK	3DH1	0.448	31.6	0.143	0.4	Pass
	3DH3	1.694	31.6	0.271	0.4	Pass
	3DH5	2.942	31.6	0.314	0.4	Pass

Note: (1) Dwell time = 1600 ÷ (79 × N) × Pulse duration × Measure time
(2) DH1, N=2
DH3, N=4
DH5, N=6

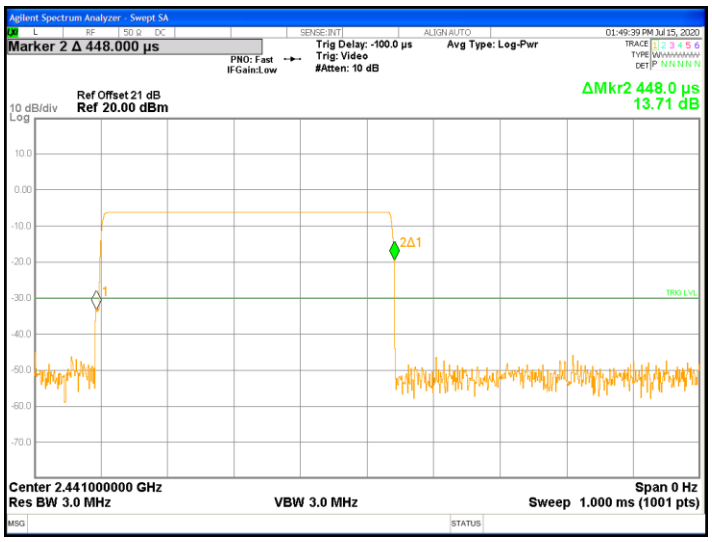
Dwell Time @ DH1 Ch 39



Dwell Time @ DH3 Ch 39

Dwell Time @ DH5 Ch 39

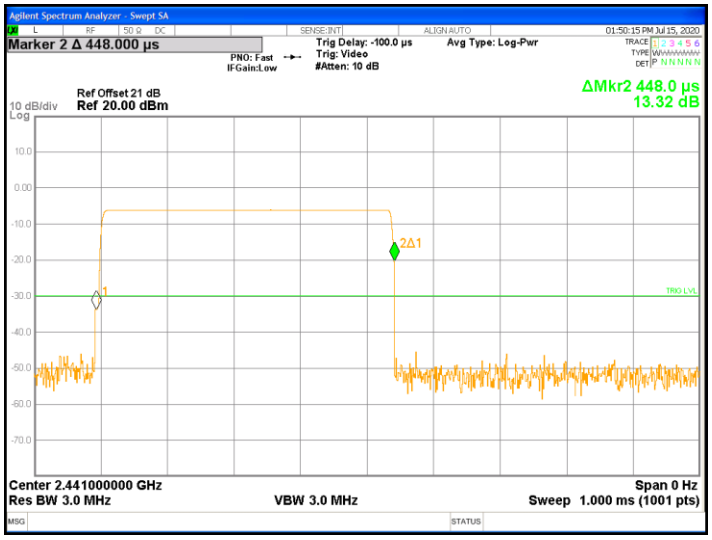
Dwell Time @ 2DH1 Ch 39



Dwell Time @ 2DH3 Ch 39

Dwell Time @ 2DH5 Ch 39

Dwell Time @ 3DH1 Ch 39



Dwell Time @ 3DH3 Ch 39

Dwell Time @ 3DH5 Ch 39

6. Maximum Output Power Test

6.1 Test Setup & Procedure

The test procedure was according to FCC measurement guidelines DA 00-705.
The power output per FCC §15.247(b) was measured on the EUT using a 50 ohm SMA cable connected to peak power meter via power sensor. Power was read directly and cable loss correction (2 dB) was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel).

6.2 Operating Environment Condition

Temperature (℃) :	24
Relative Humidity (%) :	55

6.3 Test Results

Mode	Channel	Frequency (MHz)	Maximun power (PK) (dBm)	Maximun power (PK) (mW)	Limit (dBm)	Margin (dB)
DH5	0	2402	-3.53	0.444	30	-33.53
	39	2441	-3.49	0.448	30	-33.49
	78	2480	-3.30	0.468	30	-33.30
2DH5	0	2402	-3.51	0.446	30	-33.51
	39	2441	-3.50	0.447	30	-33.50
	78	2480	-3.28	0.470	30	-33.28
3DH5	0	2402	-3.52	0.445	30	-33.52
	39	2441	-3.49	0.448	30	-33.49
	78	2480	-3.31	0.467	30	-33.31

7. RF Antenna Conducted Spurious Test

7.1 Test Setup & Procedure

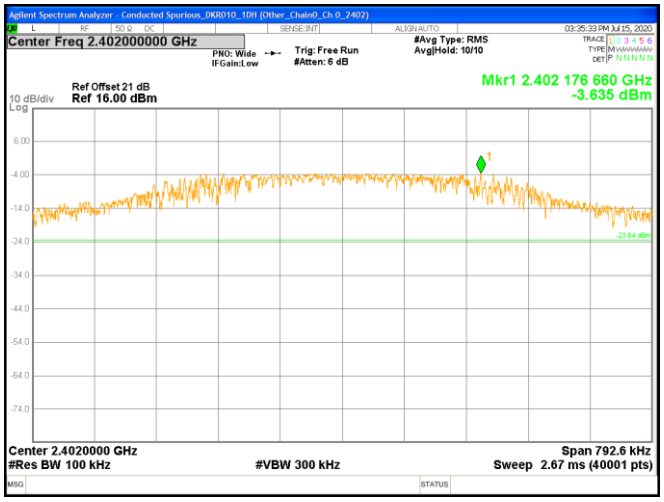
The test procedure was according to FCC measurement guidelines DA 00-705.
The measurements were performed from 30MHz to 25GHz RF antenna conducted per FCC 15.247 (c) was measured from the EUT antenna port using a 50ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 100 kHz.
Harmonics and spurious noise must be at least 20dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

7.2 Operating Environment Condition

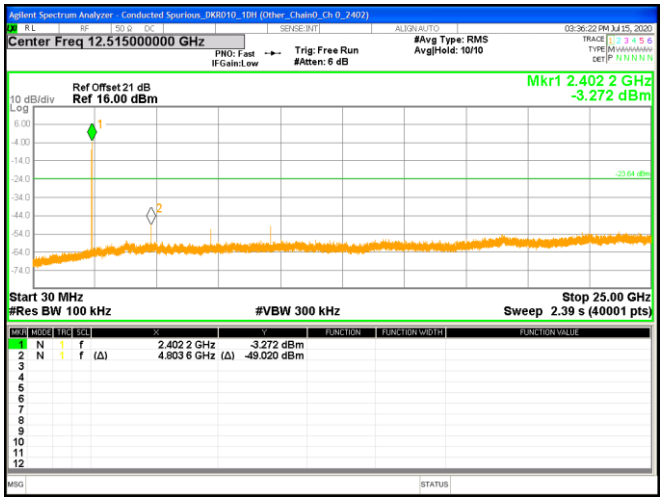
Temperature (℃) :	24
Relative Humidity (%) :	55

7.3 Test Results

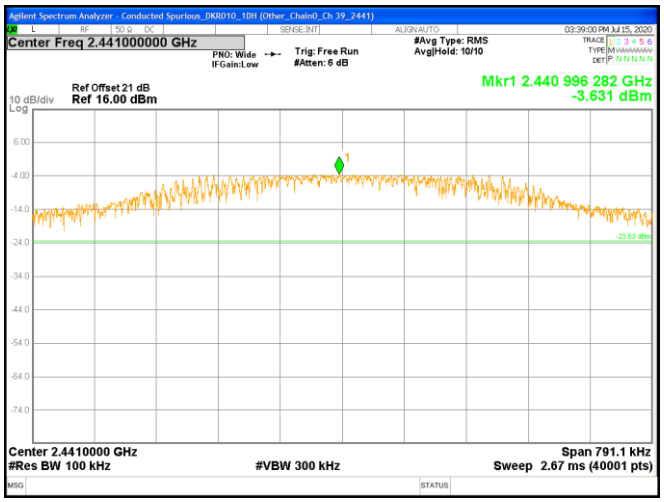
Conducted Spurious @ DH5 Ch 0



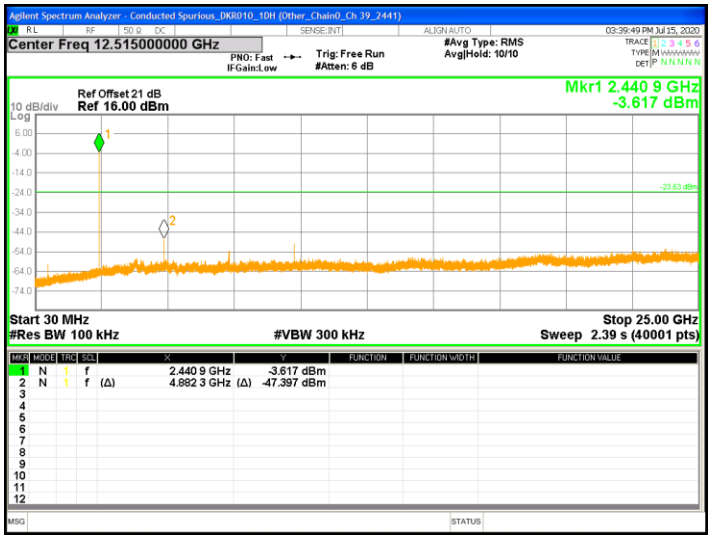
Conducted Spurious @ DH5 Ch 0



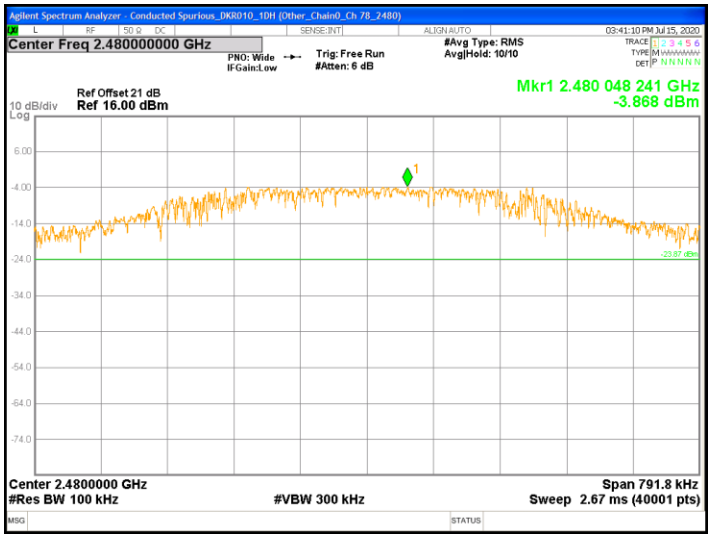
Conducted Spurious @ DH5 Ch 39



Conducted Spurious @ DH5 Ch 39



Conducted Spurious @ DH5 Ch 78



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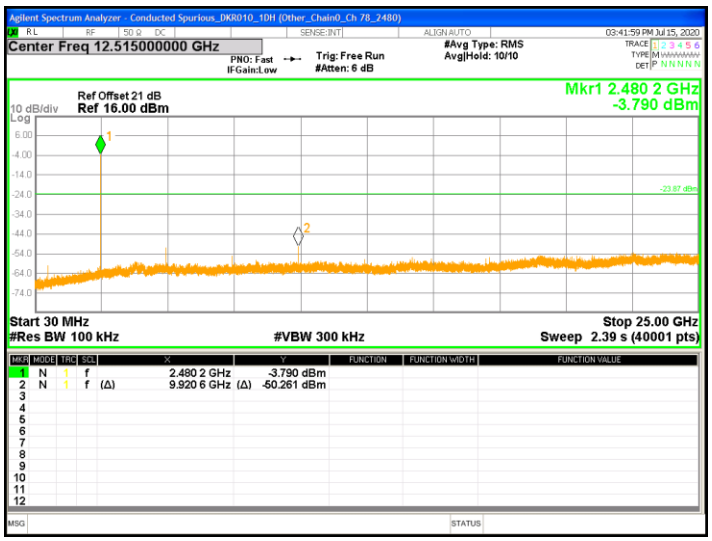

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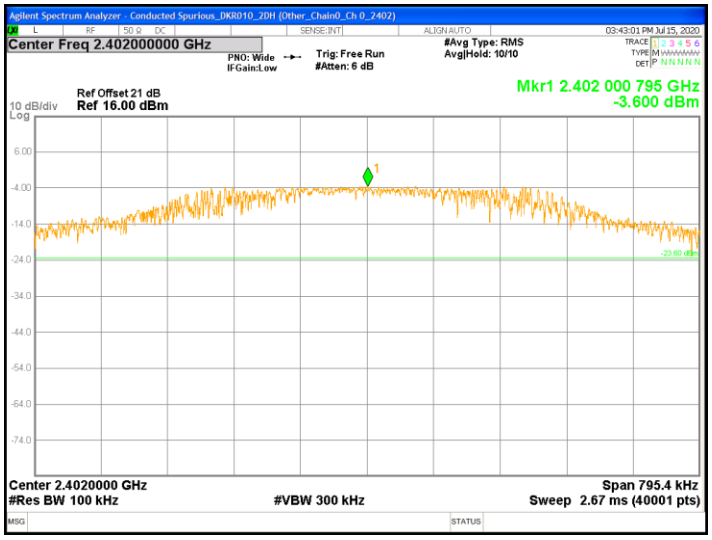

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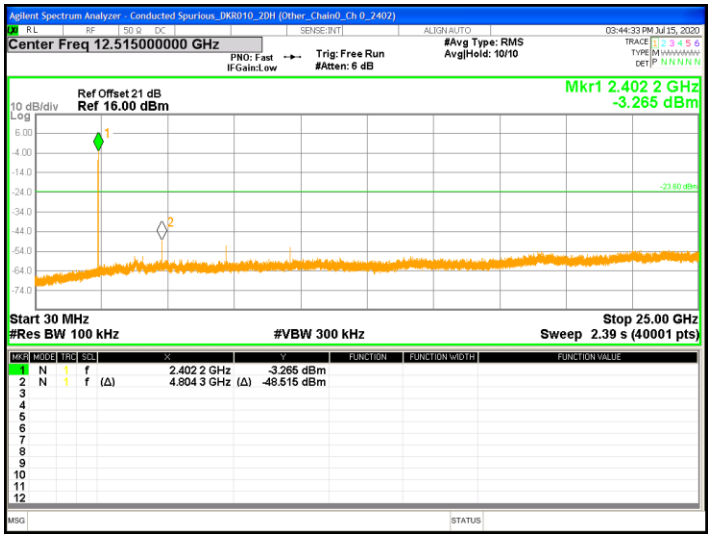

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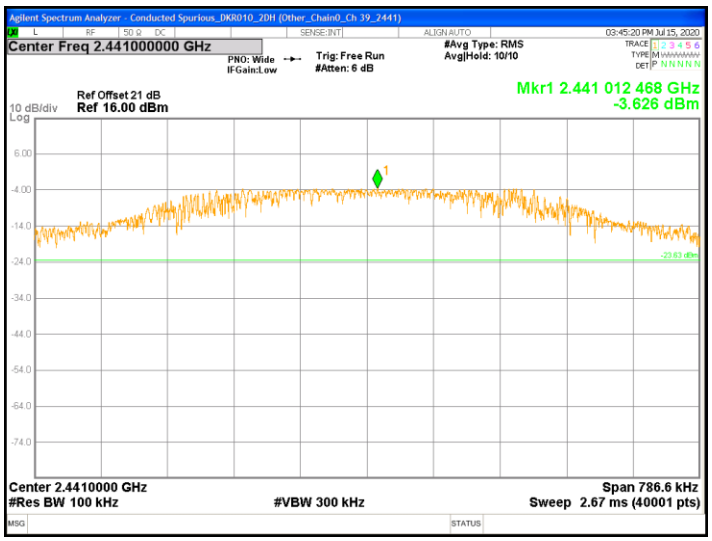

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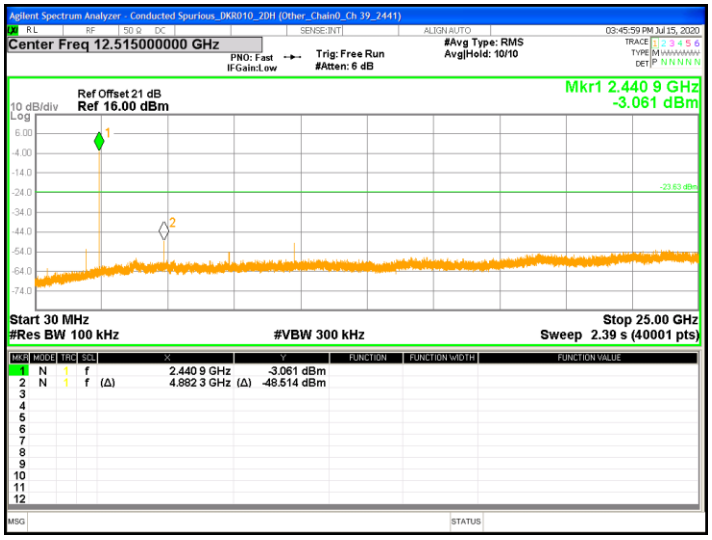

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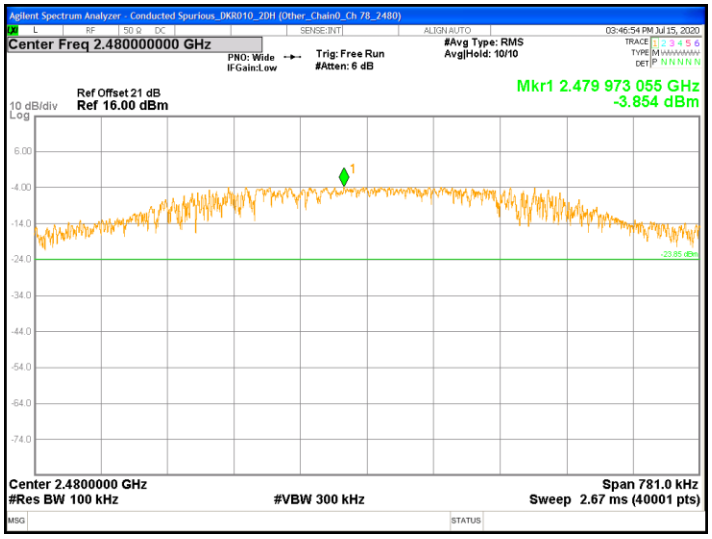
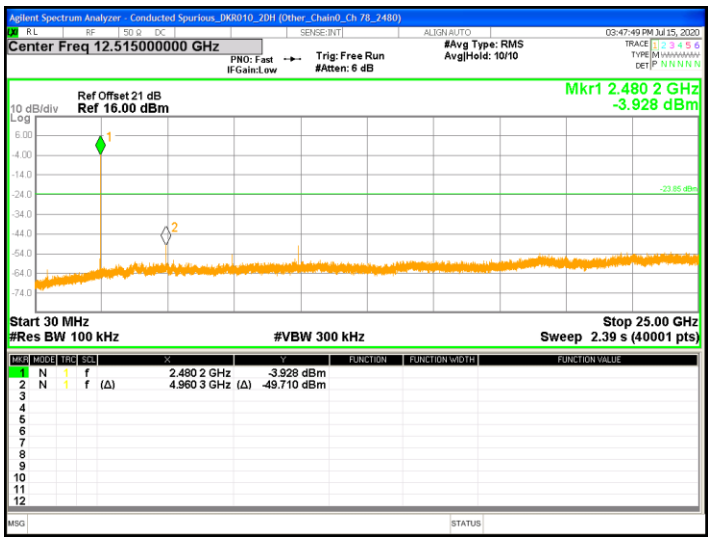
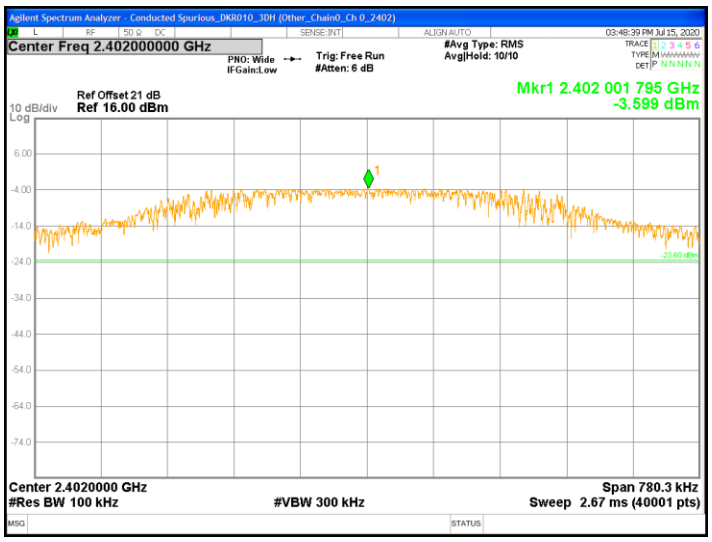


Conducted Spurious @ 2DH5 Ch 78



Conducted Spurious @ 3DH5 Ch 0



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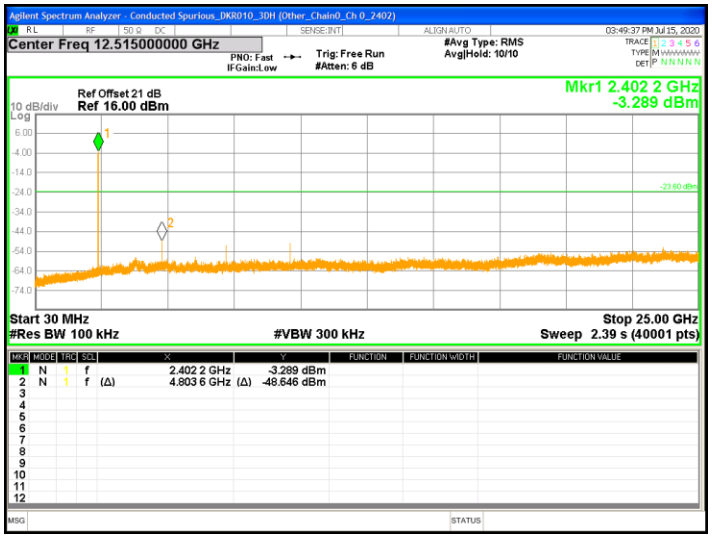
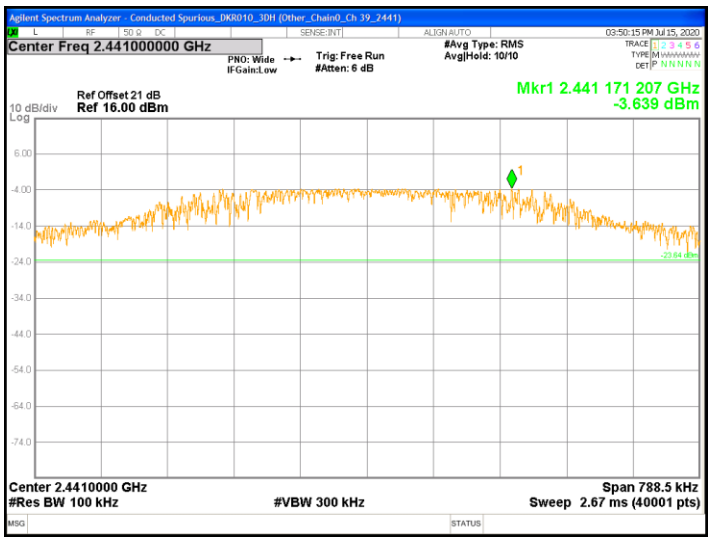


Conducted Spurious @ 3DH5 Ch 39



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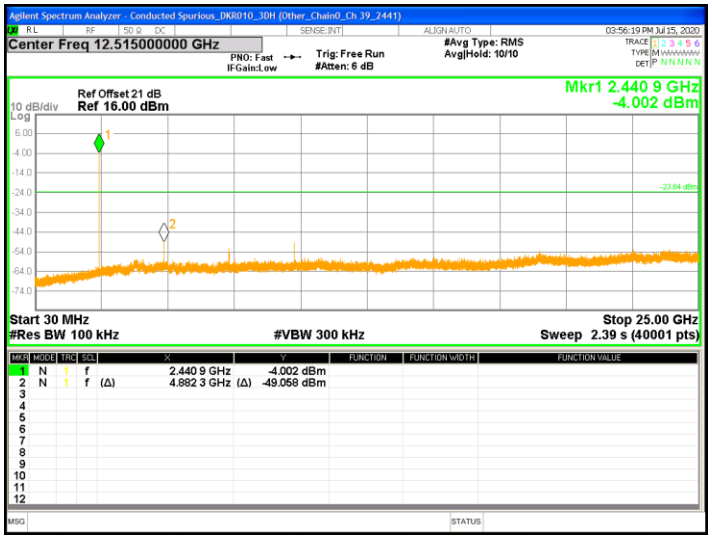

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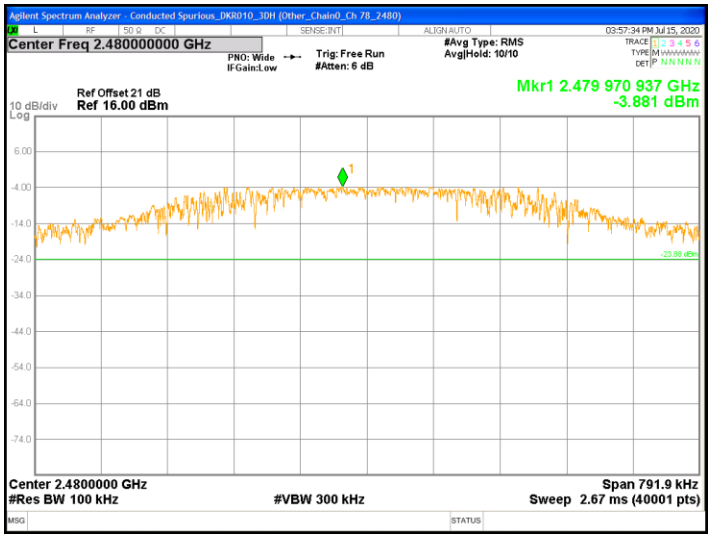

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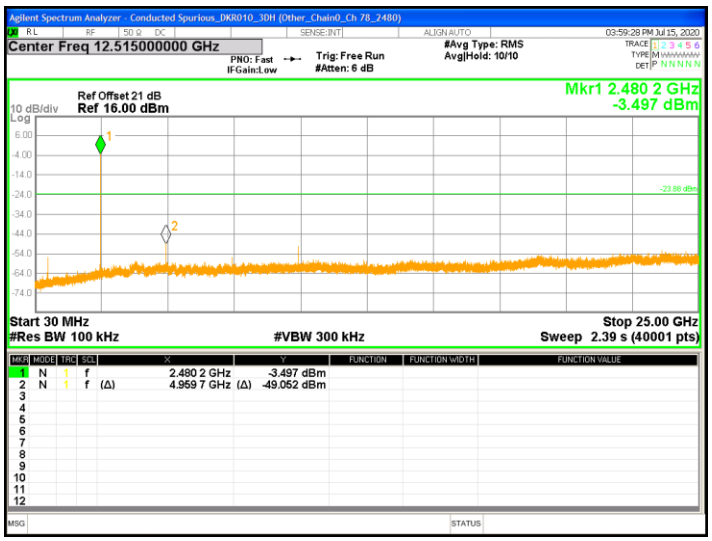
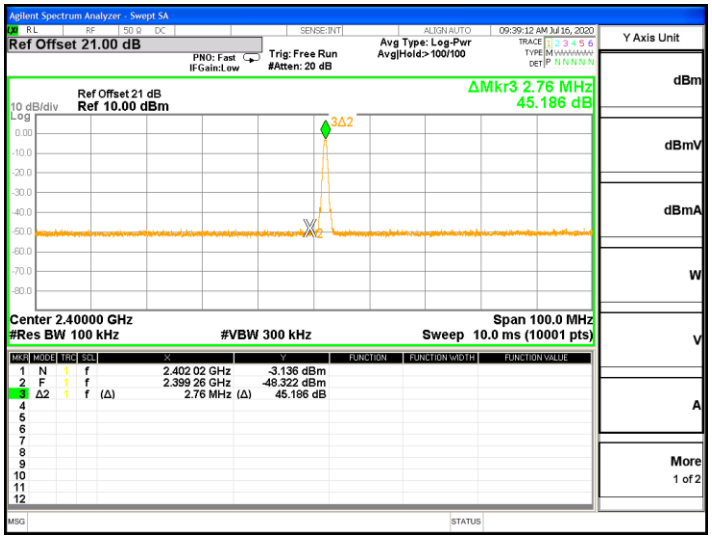


Authorized Bandedge @ DH5 Ch 0



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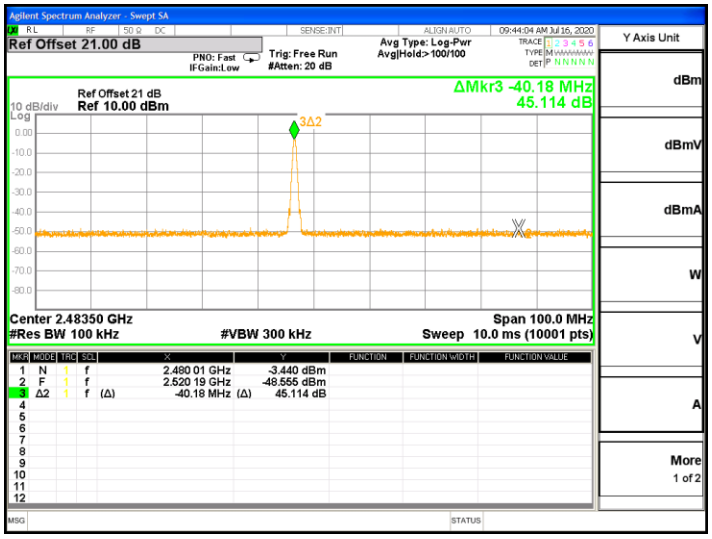

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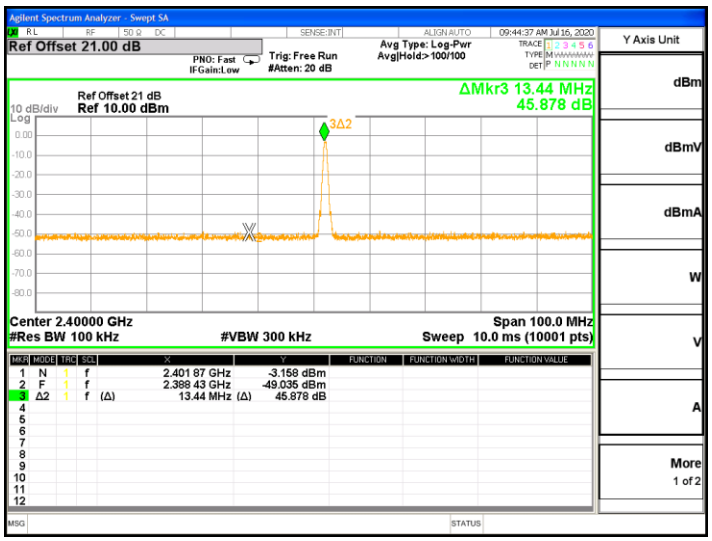

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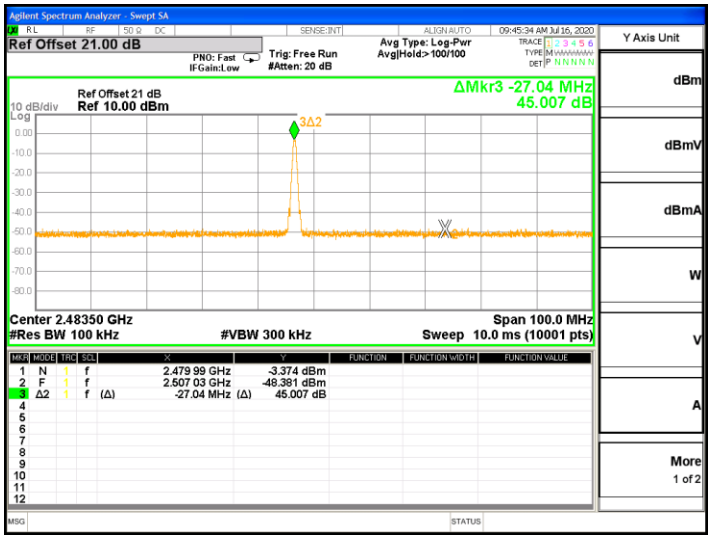
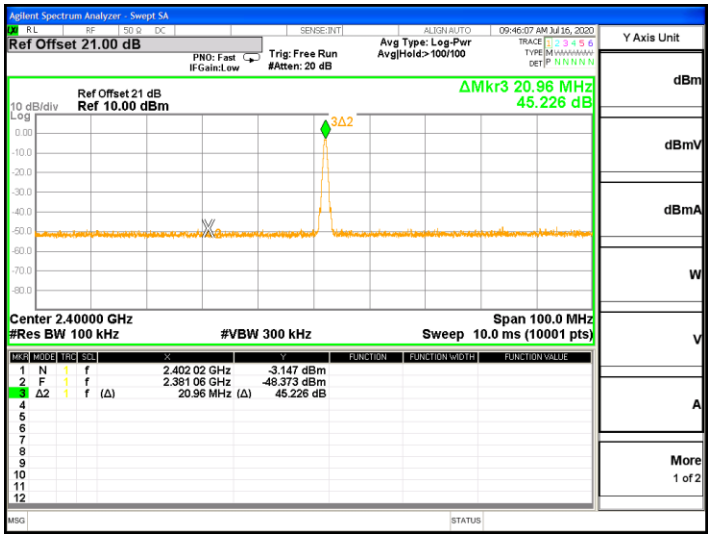
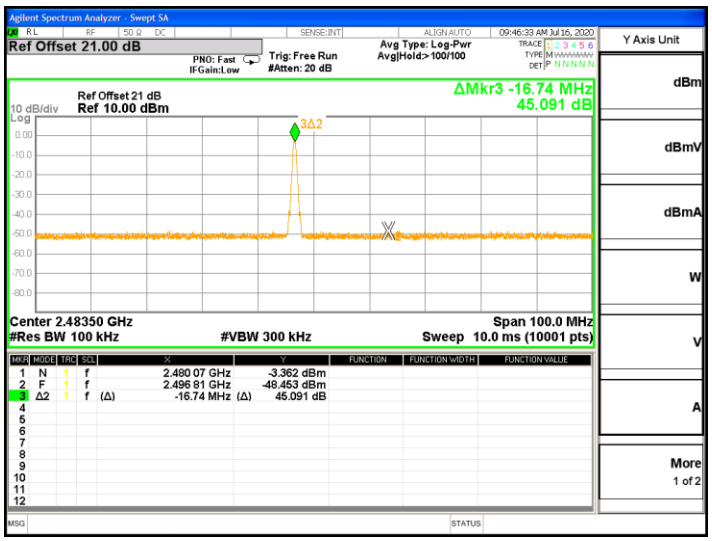


Authorized Bandedge @ 3DH5 Ch 0



Authorized Bandedge @ 3DH5 Ch 78



8. Emissions in Restricted Frequency Bands (Radiated emission measurements)

8.1 Instrument Setting

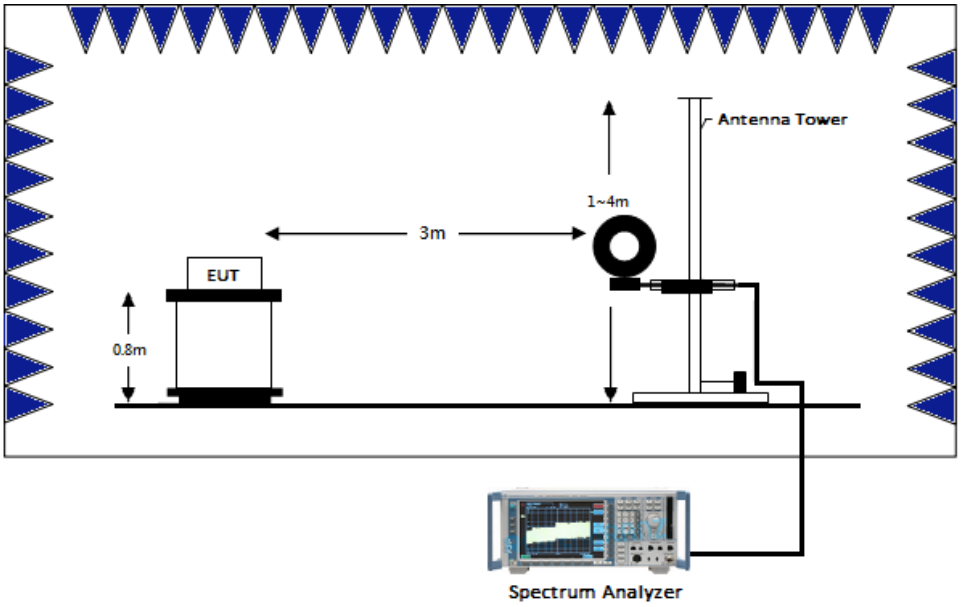
Receiver Function	Setting (Below 1GHz)	Setting (Above 1GHz)
Detector	QP	Peak and Average
RBW	9-150 kHz ; 200-300 Hz 0.15-30 MHz; 9-10 kHz 30-1000 MHz; 100-120 kHz	1MHz
VBW	≧3 x RBW	3MHz
Sweep	Auto couple	Auto couple
Start Frequency	9 kHz	1GHz
Stop Frequency	1 GHz	Tenth harmonic
Attenuation	Auto	Auto

8.2 Test Procedure

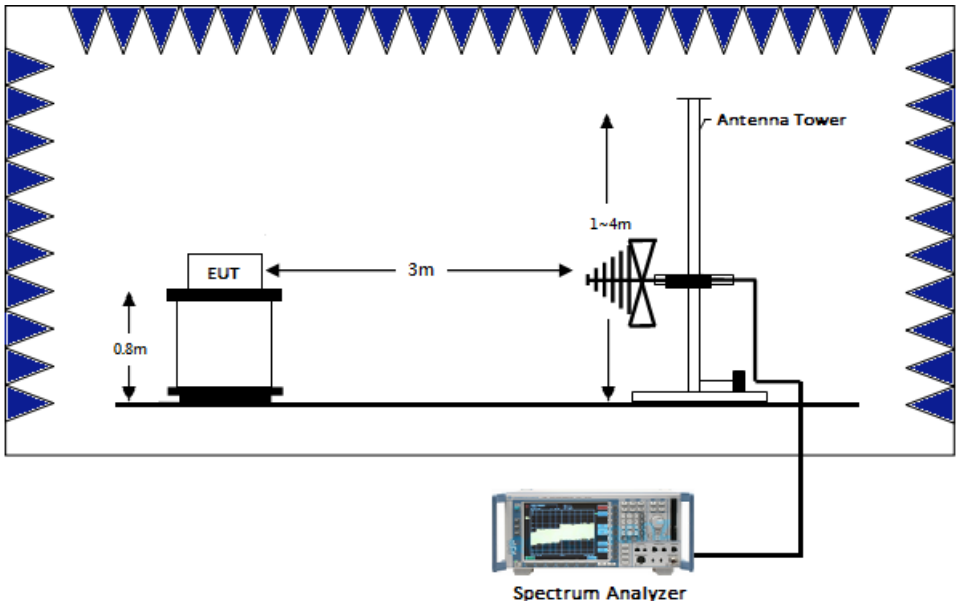
Step 1	Configure the EUT according to ANSI C63.10:2013. The EUT was placed on the top of the turntable 0.8 meter (below 1GHz) and 1.5 meter (above 1GHz) above ground. The center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
Step 2	Power on the EUT and all the companion devices. The turntable was rotated by 360 degree to find the position of the maximum emission level.
Step 3	The height of the receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of the both horizontal and vertical polarization.
Step 4	If find the frequencies above the limit or below within 3dB, the antenna tower was scan (from 1m to 4m) and then the turntable was rotated to find the maximum reading.
Step 5	Set the test-receiver system to peak or CISPR quasi-peak detector with specified bandwidth under maximum hold mode.
Step 6	For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for reading in spectrum analyzer. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.
Step 7	If the emissions level of the EUT in peak mode was 3dB lower than the average limit specified then testing will be stopped and peak values of the EUT will be reported. Otherwise, the emissions which do not have 3dB margin will be measured using the quasi-peak method for below 1GHz.
Step 8	For testing above 1GHz, The emissions level of the EUT in peak mode was lower than average limit, then testing will be stopped and peak values of the EUT will be reported, otherwise, the emission will be measured in average mode again and reported.
Step 9	In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be quasi-peak measured by receiver.

8.3 Test Diagram

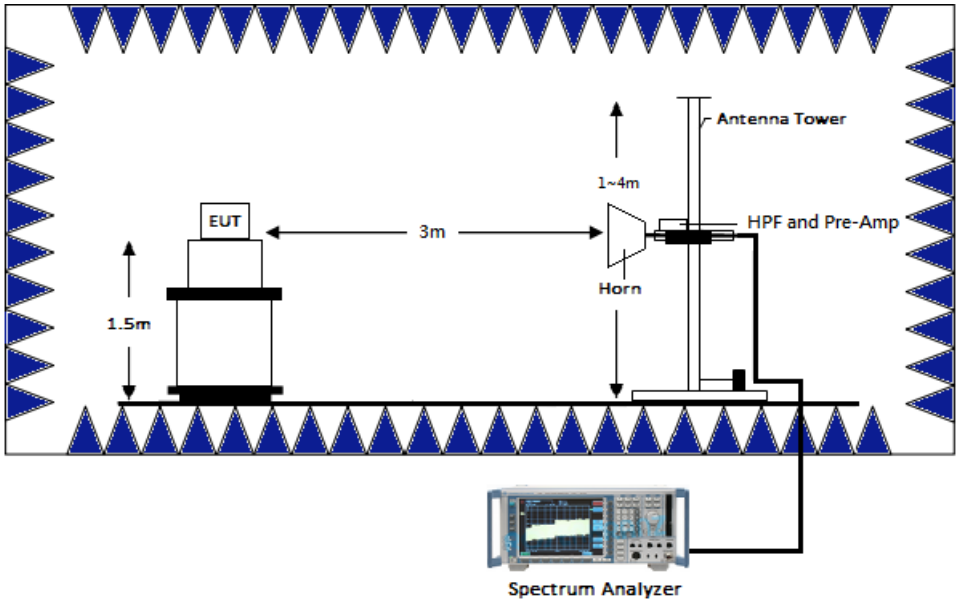
8.3.1 Radiated emission from 9kHz to 30MHz uses Loop Antenna:



8.3.2 Radiated emission below 1GHz using Bilog Antenna



8.3.3 Radiated emission above 1GHz using Horn Antenna



8.4 Limit

Frequency(MHz)	Field Strength(uV/m)	Measurement distance(m)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

8.5 Operating Environment Condition

Temperature (℃) :	27
Relative Humidity (%) :	57

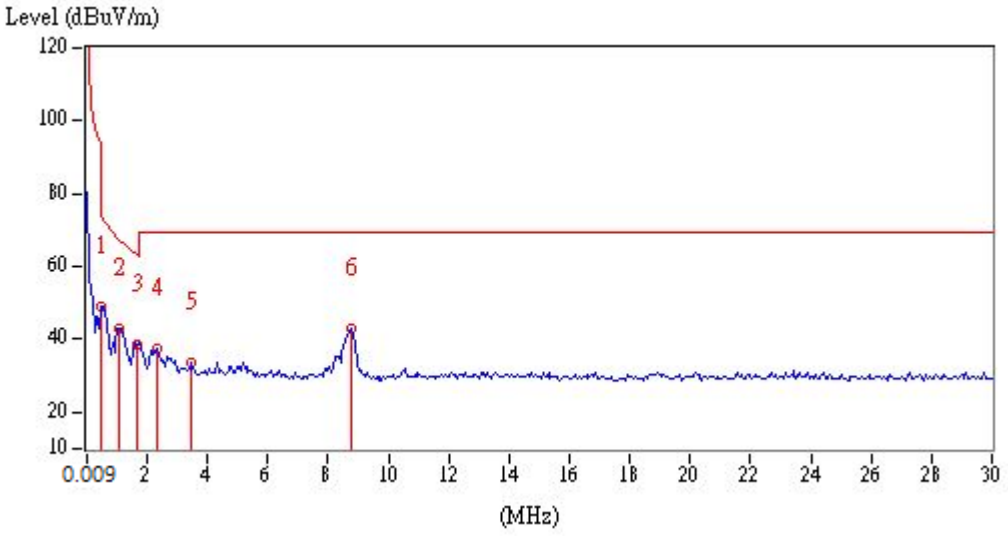
8.6 Test Result

8.6.1 Measurement results: frequencies 9kHz to 30MHz

The test was performed on EUT under continuously transmitting mode. The worst case occurred at 2DH5 Ch 78.

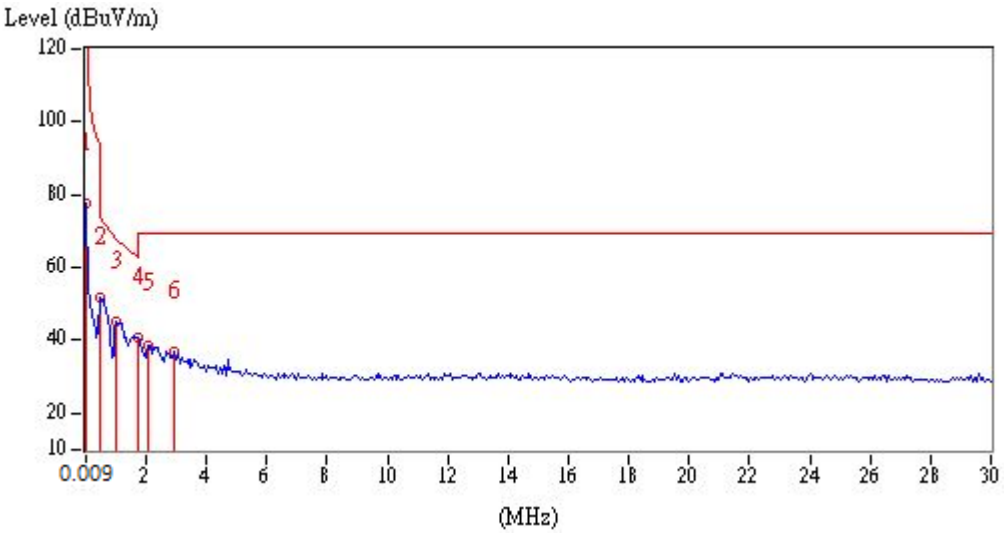
Ant Polarity	Frequency (MHz)	Detector	Factor (dB/m)	Reading (dBµV)	Corrected Reading (dBµV/m)	Limit @ 3m (dBµV/m)	Margin (dB)
Perpendicular	0.49	AV	18.44	30.75	49.19	93.80	-44.61
Perpendicular	1.09	QP	18.46	24.46	42.92	66.86	-23.94
Perpendicular	1.69	QP	18.47	20.28	38.75	63.05	-24.30
Perpendicular	2.35	QP	18.48	18.90	37.38	69.54	-32.16
Perpendicular	3.49	QP	18.67	15.18	33.85	69.54	-35.69
Perpendicular	8.77	QP	20.08	22.77	42.85	69.54	-26.69

Remark: Corr. Factor = Antenna Factor + Cable Loss



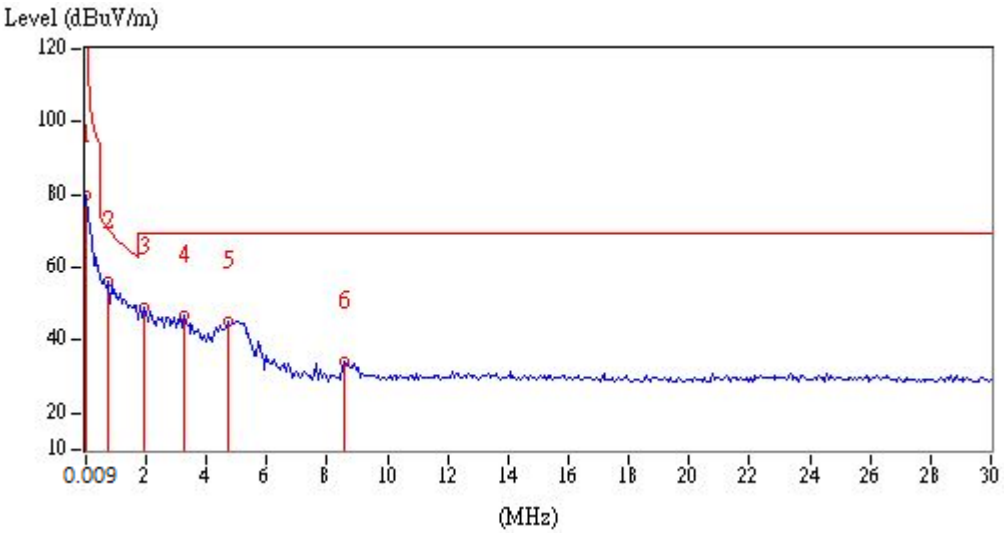
Ant Polarity	Frequency (MHz)	Detector	Factor (dB/m)	Reading (dBµV)	Corrected Reading (dBµV/m)	Limit @ 3m (dBµV/m)	Margin (dB)
Parallel	0.01	AV	18.28	59.57	77.85	127.60	-49.75
Parallel	0.49	AV	18.44	33.20	51.64	93.80	-42.16
Parallel	1.03	QP	18.46	26.75	45.21	67.35	-22.14
Parallel	1.75	QP	18.47	22.46	40.93	69.54	-28.61
Parallel	2.05	QP	18.47	20.36	38.83	69.54	-30.71
Parallel	2.95	QP	18.49	18.45	36.94	69.54	-32.60

Remark: Corr. Factor = Antenna Factor + Cable Loss



Ant Polarity	Frequency (MHz)	Detector	Factor (dB/m)	Reading (dBµV)	Corrected Reading (dBµV/m)	Limit @ 3m (dBµV/m)	Margin (dB)
Ground-parallel	0.01	AV	18.28	61.31	79.59	127.60	-48.01
Ground-parallel	0.73	QP	18.45	37.53	55.98	70.34	-14.36
Ground-parallel	1.93	QP	18.47	30.39	48.86	69.54	-20.68
Ground-parallel	3.25	QP	18.58	28.04	46.62	69.54	-22.92
Ground-parallel	4.75	QP	19.12	25.92	45.04	69.54	-24.50
Ground-parallel	8.59	QP	20.03	13.98	34.01	69.54	-35.53

Remark: Corr. Factor = Antenna Factor + Cable Loss

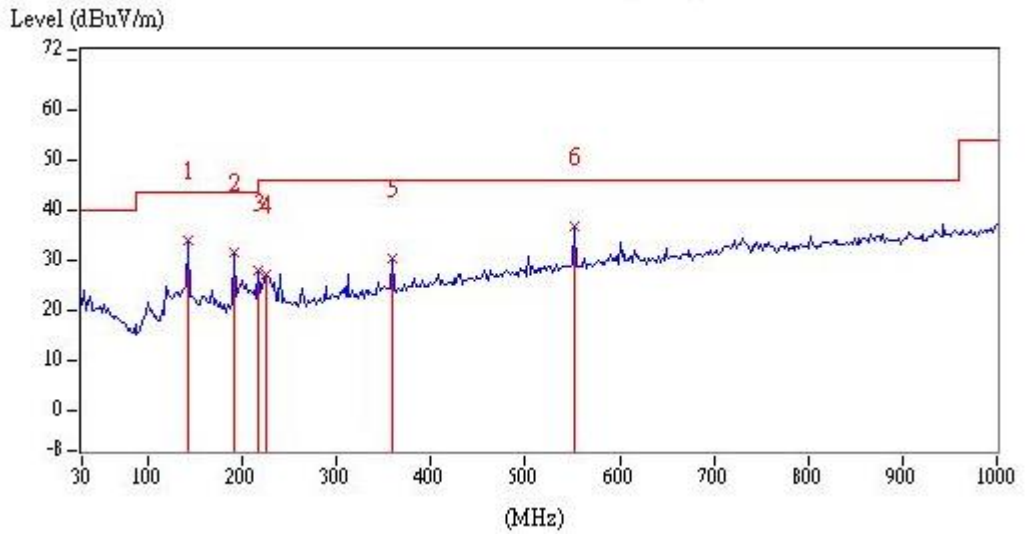


8.6.2 Measurement results: frequencies below 1 GHz

The test was performed on EUT under continuously transmitting mode. The worst case occurred at 2DH5 Ch 78.

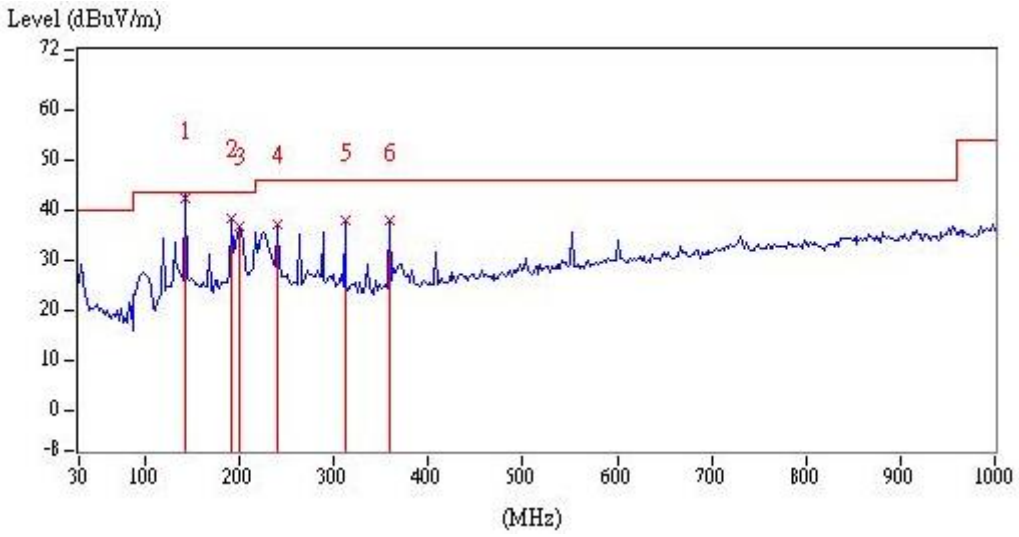
EUT: DKR010

Ant Polarity	Frequency (MHz)	Detector	Factor (dB/m)	Reading (dBµV)	Corrected Reading (dBµV/m)	Limit @ 3m (dBµV/m)	Margin (dB)
Vertical	142.52	QP	21.05	13.05	34.10	43.50	-9.40
Vertical	191.02	QP	18.81	12.83	31.64	43.50	-11.86
Vertical	216.24	QP	19.39	8.59	27.98	46.00	-18.02
Vertical	225.94	QP	19.95	7.42	27.37	46.00	-18.63
Vertical	359.80	QP	24.00	6.56	30.56	46.00	-15.44
Vertical	551.86	QP	28.33	8.57	36.90	46.00	-9.10



Ant Polarity	Frequency (MHz)	Detector	Factor (dB/m)	Reading (dBµV)	Corrected Reading (dBµV/m)	Limit @ 3m (dBµV/m)	Margin (dB)
Horizontal	142.52	QP	21.05	21.20	42.25	43.50	-1.25
Horizontal	191.02	QP	18.81	19.62	38.43	43.50	-5.07
Horizontal	200.72	QP	18.80	18.18	36.98	43.50	-6.52
Horizontal	239.52	QP	20.63	16.67	37.30	46.00	-8.70
Horizontal	311.30	QP	22.72	15.25	37.97	46.00	-8.03
Horizontal	359.80	QP	24.00	13.85	37.85	46.00	-8.15

Remark: Corr. Factor = Antenna Factor + Cable Loss



8.6.3 Measurement results: frequency above 1GHz to 25GHz

EUT: DKR010

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBµV)	Corrected Reading (dBµV/m)	Limit @ 3 m (dBµV/m)	Margin (dB)
DH5_Ch0	4804	PK	V	6.92	41.47	48.39	74	-25.61
	7206	PK	V	13.64	41.63	55.27	74	-18.73
	7206	AV	V	13.64	37.53	51.17	54	-2.83
	4804	PK	H	6.92	39.6	46.52	74	-27.48
	7206	PK	H	13.64	38.99	52.63	74	-21.37
DH5_Ch39	4882	PK	V	7.13	39.95	47.08	74	-26.92
	7323	PK	V	14.07	40.43	54.50	74	-19.50
	7323	AV	V	14.07	36.03	50.10	54	-3.90
	4882	PK	H	7.13	37.8	44.93	74	-29.07
	7323	PK	H	14.07	37.72	51.79	74	-22.21
DH5_Ch78	4960	PK	V	7.33	40.05	47.38	74	-26.62
	7440	PK	V	14.51	38.49	53.00	74	-21.00
	4960	PK	H	7.33	38.69	46.02	74	-27.98
	7440	PK	H	14.51	37.28	51.79	74	-22.21
2DH5_Ch0	4804	PK	V	6.92	38.65	45.57	74	-28.43
	7206	PK	V	13.64	42.25	55.89	74	-18.11
	7206	AV	V	13.64	37.96	51.60	54	-2.40
	4804	PK	H	6.92	39.71	46.63	74	-27.37
	7206	PK	H	13.64	38.91	52.55	74	-21.45
2DH5_Ch39	4882	PK	V	7.13	40.46	47.59	74	-26.41
	7323	PK	V	14.07	39.77	53.84	74	-20.16
	7323	AV	V	14.07	35.73	49.80	54	-4.20
	4882	PK	H	7.13	38.7	45.83	74	-28.17
	7323	PK	H	14.07	38.66	52.73	74	-21.27
2DH5_Ch78	4960	PK	V	7.33	41.38	48.71	74	-25.29
	7440	PK	V	14.51	38.48	52.99	74	-21.01
	4960	PK	H	7.33	38.62	45.95	74	-28.05
	7440	PK	H	14.51	36.3	50.81	74	-23.19

Remark: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBµV)	Corrected Reading (dBµV/m)	Limit @ 3 m (dBµV/m)	Margin (dB)
3DH5_Ch0	4804	PK	V	6.92	41.79	48.71	74	-25.29
	7206	PK	V	13.64	41.77	55.41	74	-18.59
	7206	AV	V	13.64	37.68	51.32	54	-2.68
	4804	PK	H	6.92	39.06	45.98	74	-28.02
	7206	PK	H	13.64	38.55	52.19	74	-21.81
3DH5_Ch39	4882	PK	V	7.13	40.85	47.98	74	-26.02
	7323	PK	V	14.07	39.88	53.95	74	-20.05
	7323	AV	V	14.07	35.43	49.50	54	-4.50
	4882	PK	H	7.13	38.36	45.49	74	-28.51
	7323	PK	H	14.07	38.53	52.60	74	-21.40
3DH5_Ch78	4960	PK	V	7.33	41.51	48.84	74	-25.16
	7440	PK	V	14.51	38.52	53.03	74	-20.97
	4960	PK	H	7.33	39.46	46.79	74	-27.21
	7440	PK	H	14.51	35.17	49.68	74	-24.32

Remark: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

9. Emission on Band Edge

9.1 Instrument Setting

Spectrum Function	Setting
Detector	Peak and Average
RBW	1MHz
VBW	3MHz
Sweep	Auto couple
Restrict bands	2310 MHz ~ 2390 MHz 2483.5 MHz ~ 2500 MHz
Attenuation	Auto

9.2 Test Procedure

The test procedure is the same as Emissions in Restricted Frequency Bands (Radiated emission measurements).

9.3 Operating Environment Condition

Temperature (℃) :	27
Relative Humidity (%) :	57

9.4 Test Results

EUT: DKR010

Non-Hopping

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)	Restricted band (MHz)
DH5	2361.87	PK	V	34.40	21.05	55.45	74	-18.55	2310~2390
	2388.75	AV	V	34.51	7.59	42.10	54	-11.90	
	2496.80	PK	V	34.98	20.02	55.00	74	-19.00	2483.5~2500
	2496.85	AV	V	34.98	7.77	42.75	54	-11.25	
2DH5	2344.23	PK	V	34.32	21.11	55.43	74	-18.57	2310~2390
	2388.96	AV	V	34.51	7.60	42.11	54	-11.89	
	2497.80	PK	V	34.98	20.54	55.52	74	-18.48	2483.5~2500
	2497.15	AV	V	34.98	7.75	42.73	54	-11.27	
3DH5	2331.84	PK	V	34.27	21.05	55.32	74	-18.68	2310~2390
	2388.33	AV	V	34.51	7.61	42.12	54	-11.88	
	2493.60	PK	V	34.96	20.83	55.79	74	-18.21	2483.5~2500
	2497.15	AV	V	34.98	7.74	42.72	54	-11.28	

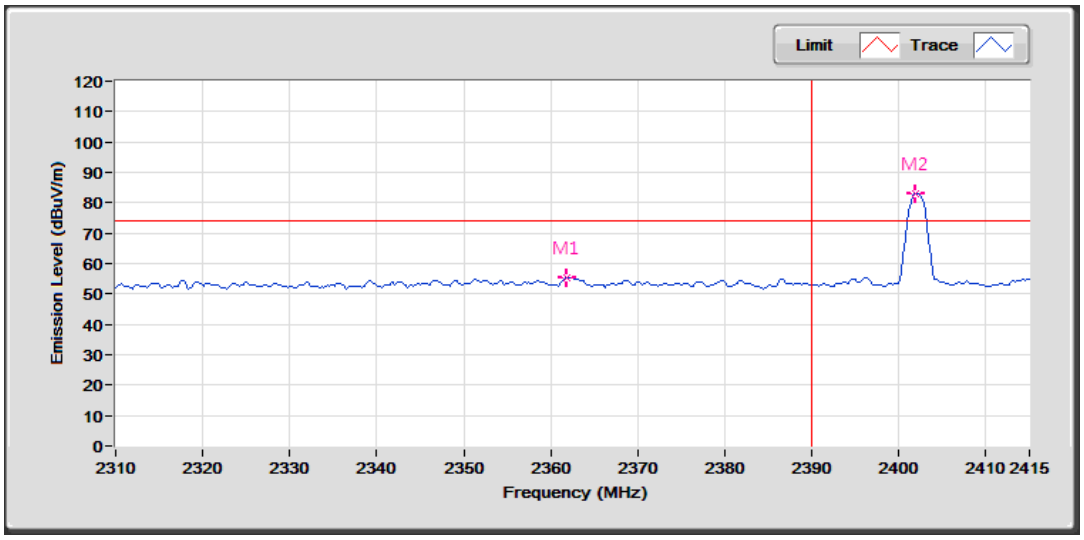
Remark: Correction Factor = Antenna Factor + Cable Loss

Hopping

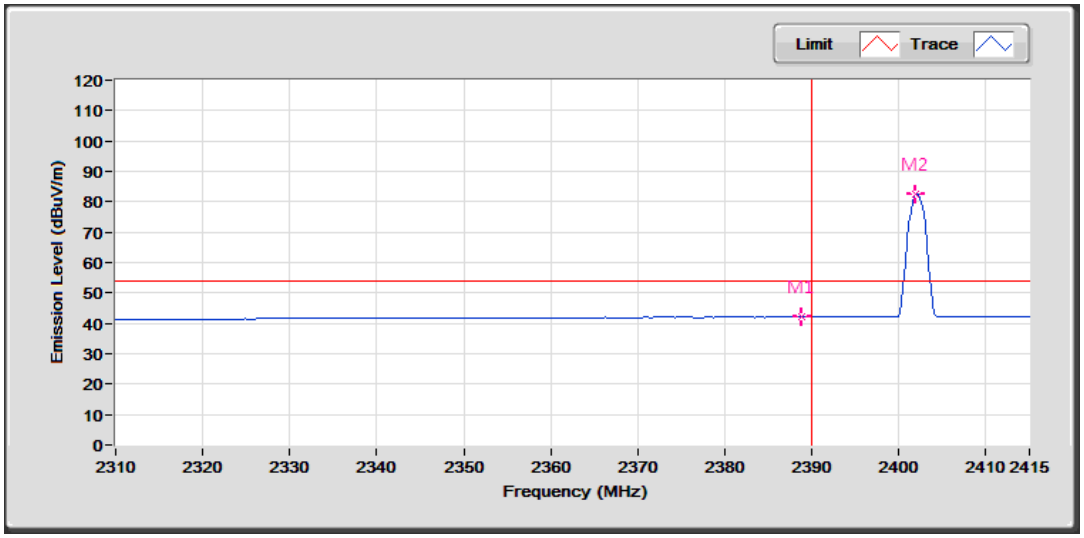
Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)	Restricted band (MHz)
DH5	2387.40	PK	V	34.51	21.17	55.68	74	-18.32	2310~2390
	2387.40	AV	V	34.51	8.48	42.99	54	-11.01	
	2491.40	PK	V	34.95	20.79	55.74	74	-18.26	2483.5~2500
	2499.00	AV	V	34.99	8.62	43.61	54	-10.39	
2DH5	2385.00	PK	V	34.50	21.71	56.21	74	-17.79	2310~2390
	2389.00	AV	V	34.51	8.47	42.98	54	-11.02	
	2485.80	PK	V	34.93	20.28	55.21	74	-18.79	2483.5~2500
	2499.80	AV	V	34.99	8.58	43.57	54	-10.43	
3DH5	2311.40	PK	V	34.18	20.84	55.02	74	-18.98	2310~2390
	2383.80	AV	V	34.49	8.51	43.00	54	-11.00	
	2483.50	PK	V	34.92	20.49	55.41	74	-18.59	2483.5~2500
	2496.20	AV	V	34.97	8.47	43.44	54	-10.56	

Remark: Correction Factor = Antenna Factor + Cable Loss

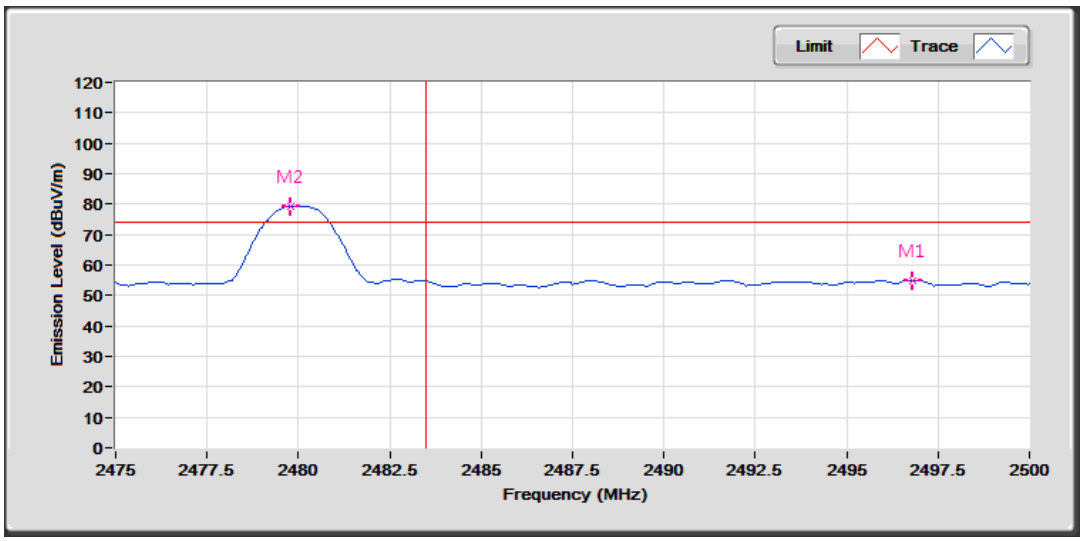
Restricted Band Bandedge @ DH5 Mode Ch0 PK



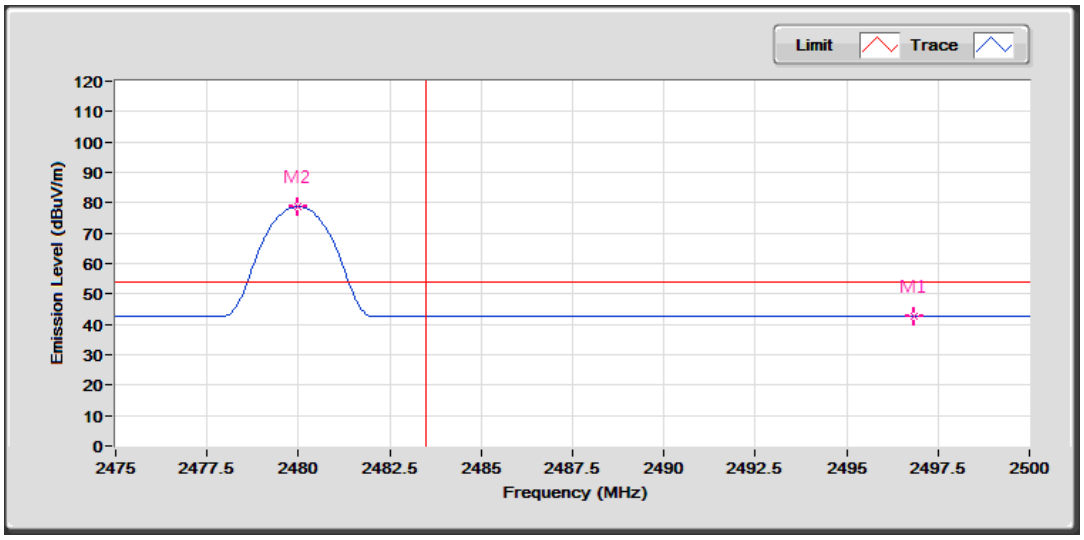
Restricted Band Bandedge @ DH5 Mode Ch0 AV



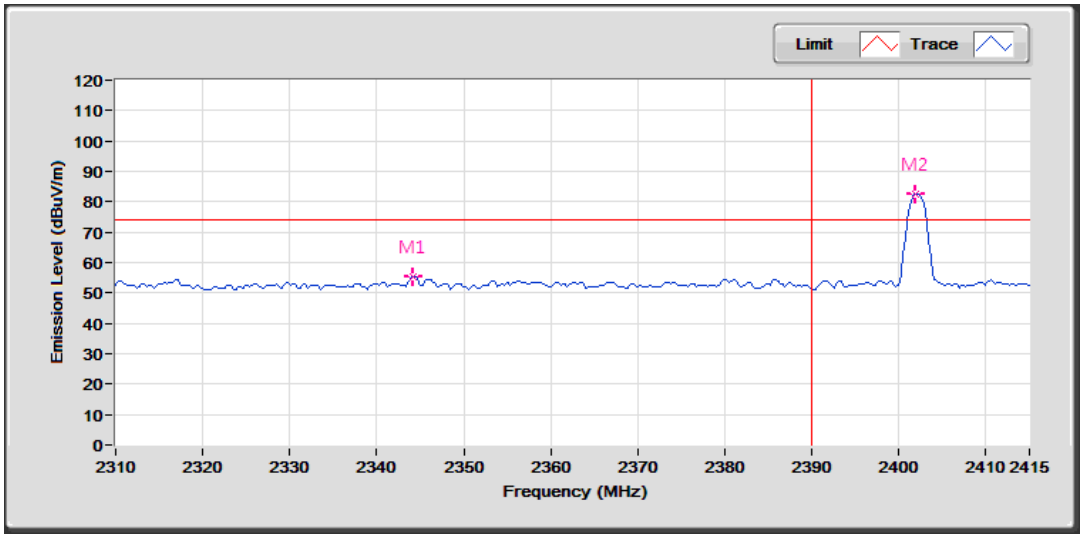
Restricted Band Bandedge @ DH5 Mode Ch78 PK



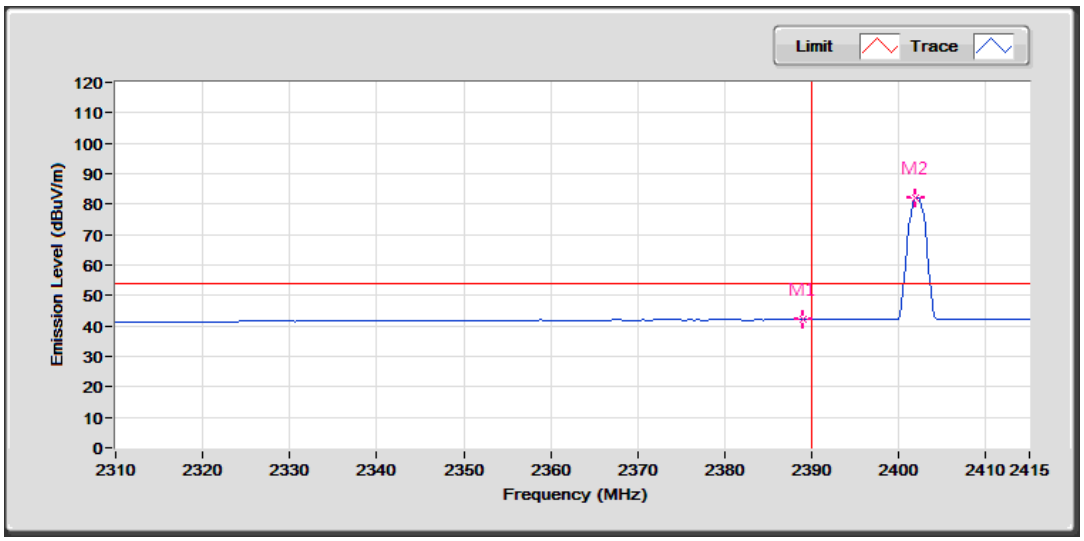
Restricted Band Bandedge @ DH5 Mode Ch78 AV



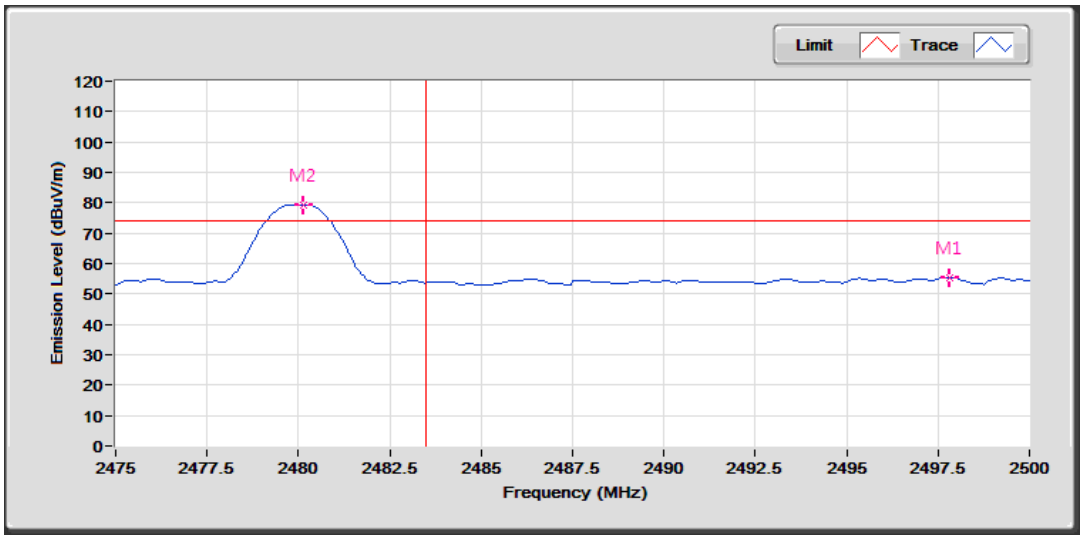
Restricted Band Bandedge @ 2DH5 Mode Ch0 PK



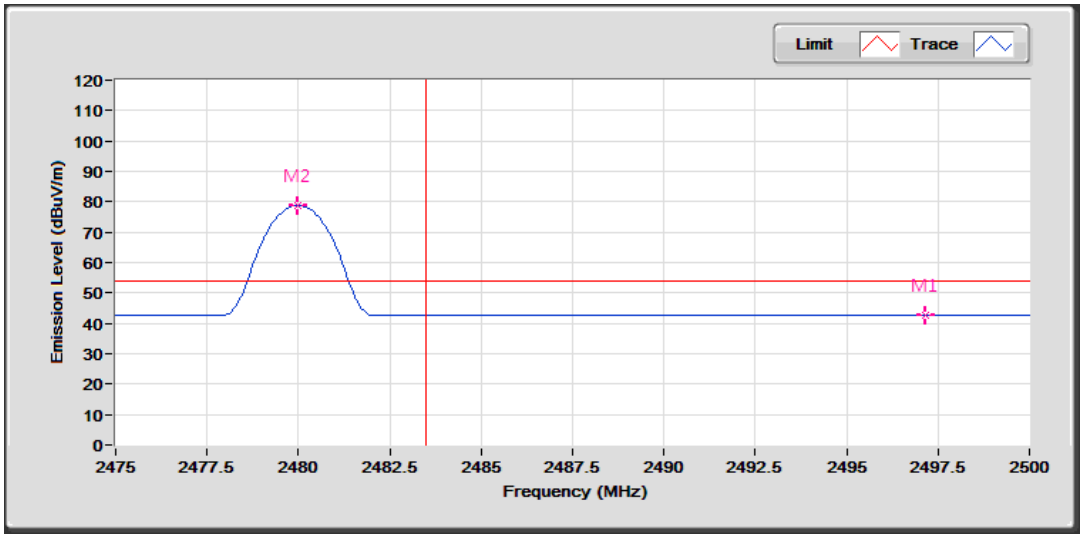
Restricted Band Bandedge @ 2DH5 Mode Ch0 AV



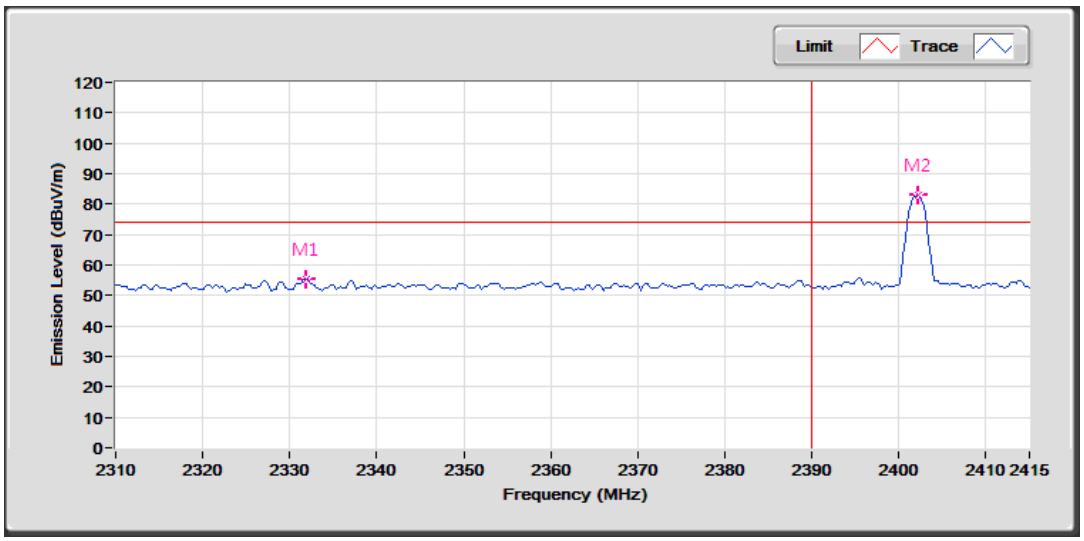
Restricted Band Bandedge @ 2DH5 Mode Ch78 PK



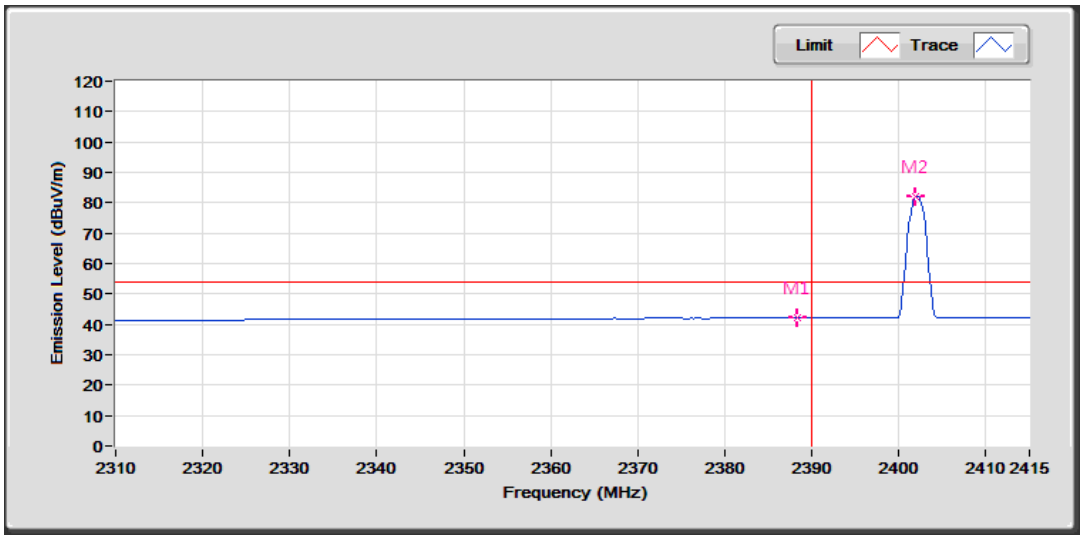
Restricted Band Bandedge @ 2DH5 Mode Ch78 AV



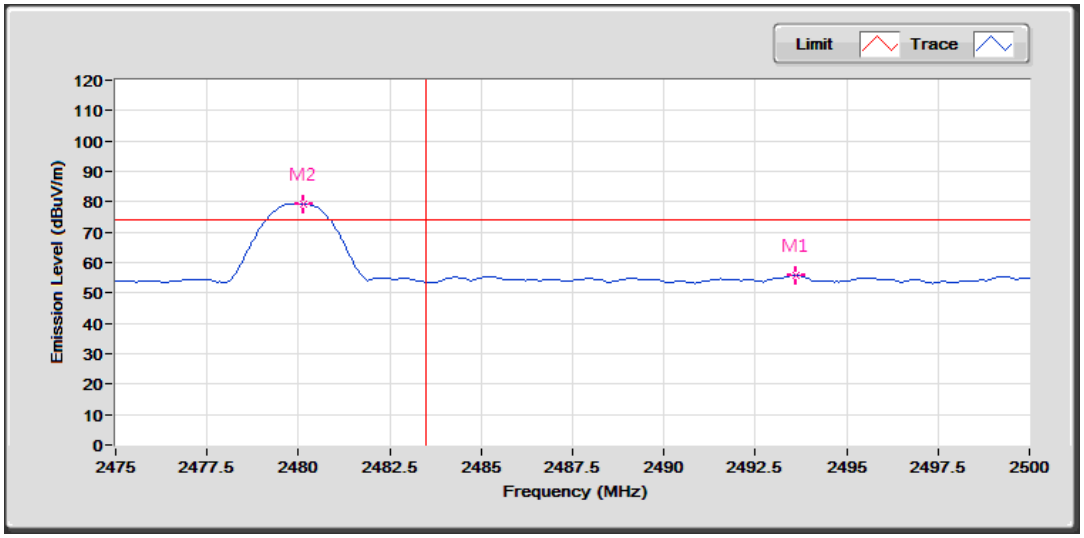
Restricted Band Bandedge @ 3DH5 Mode Ch0 PK



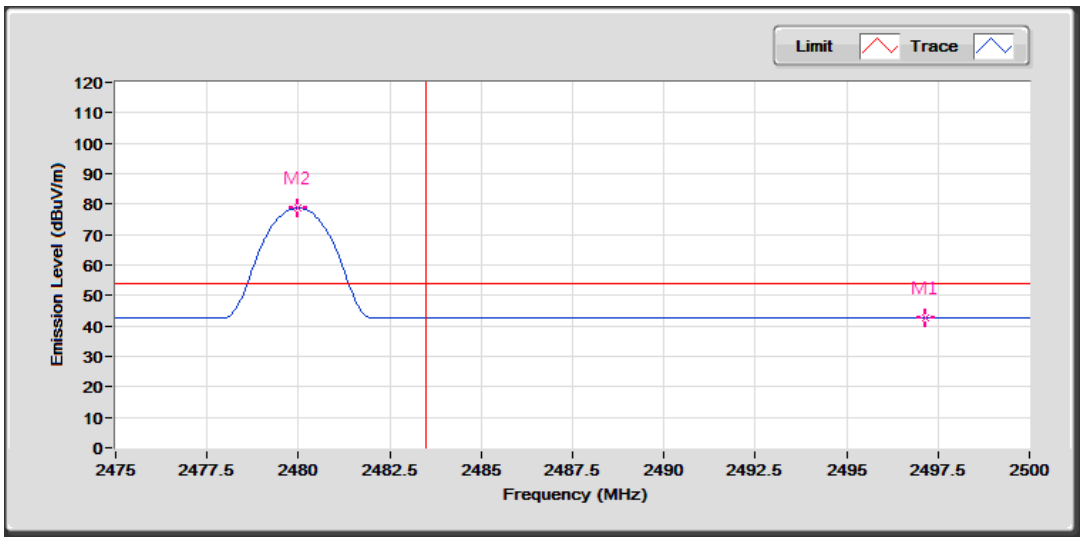
Restricted Band Bandedge @ 3DH5 Mode Ch0 AV



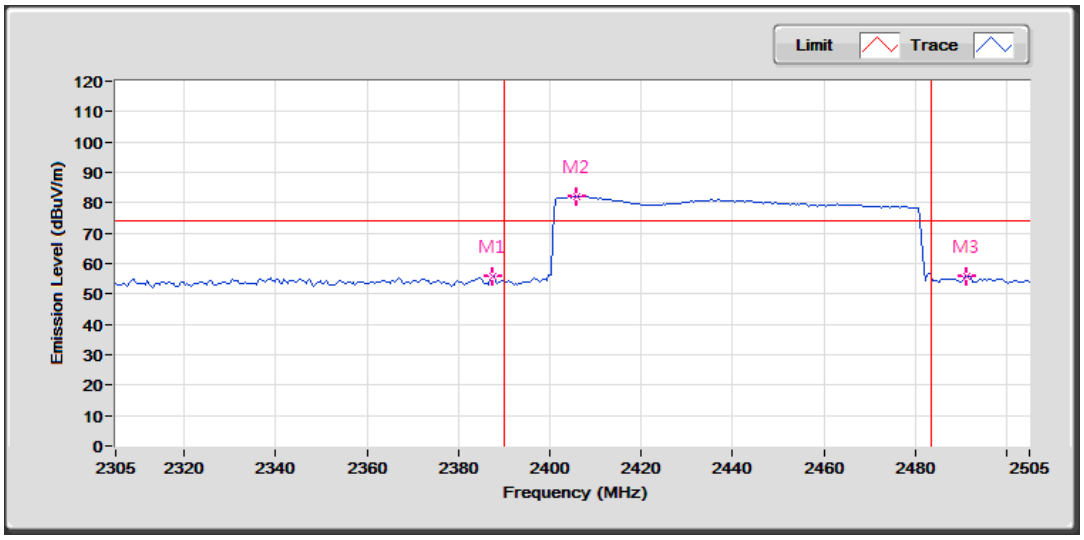
Restricted Band Bandedge @ 3DH5 Mode Ch78 PK



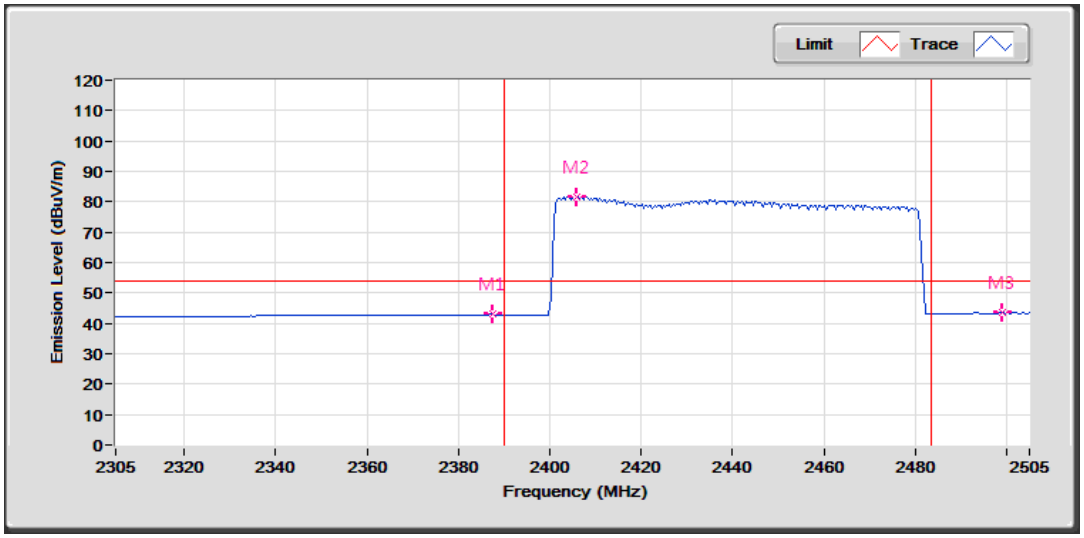
Restricted Band Bandedge @ 3DH5 Mode Ch78 AV



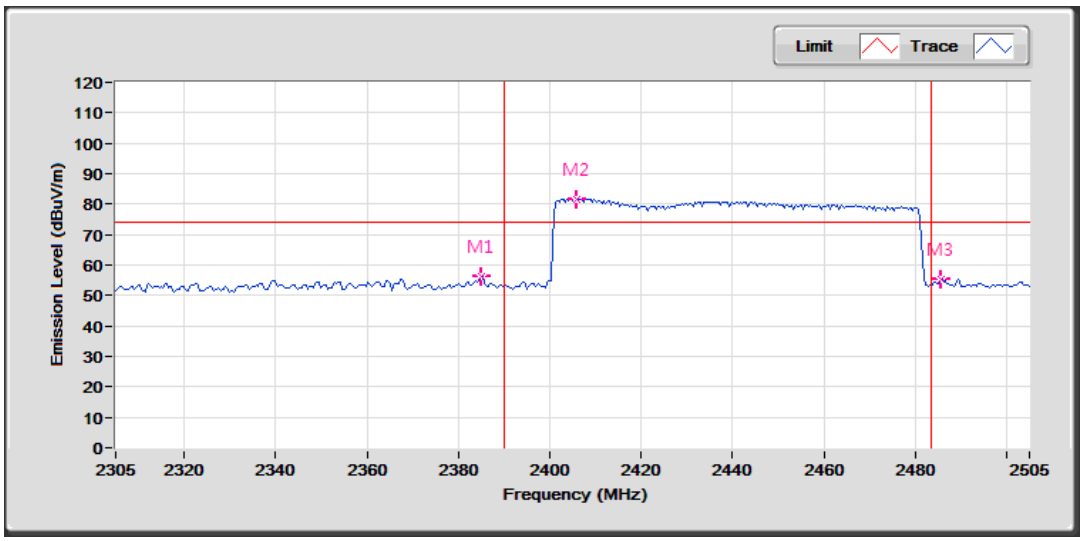
Restricted Band Bandedge @ DH5 Hopping Mode PK



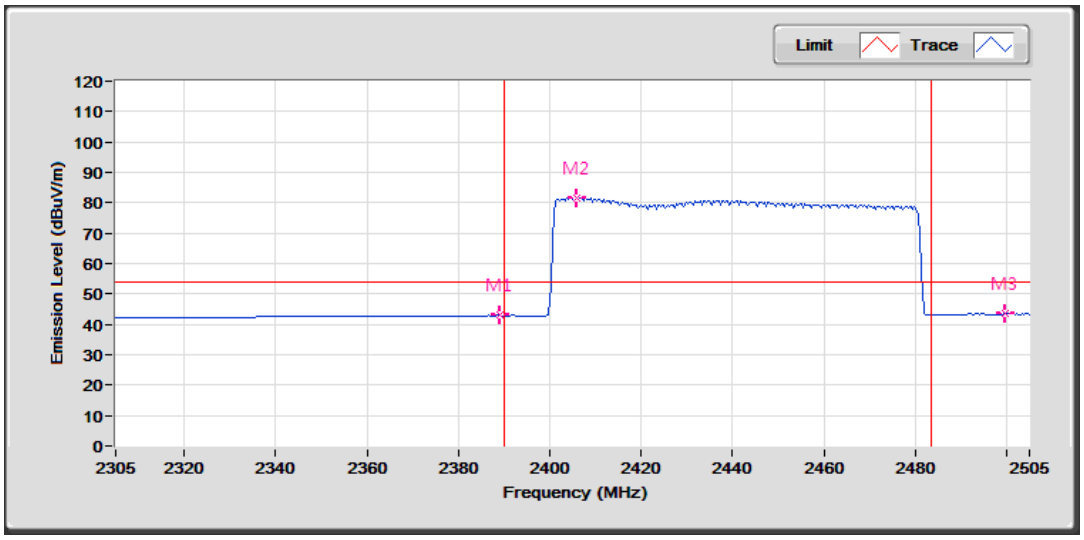
Restricted Band Bandedge @ DH5 Hopping Mode AV



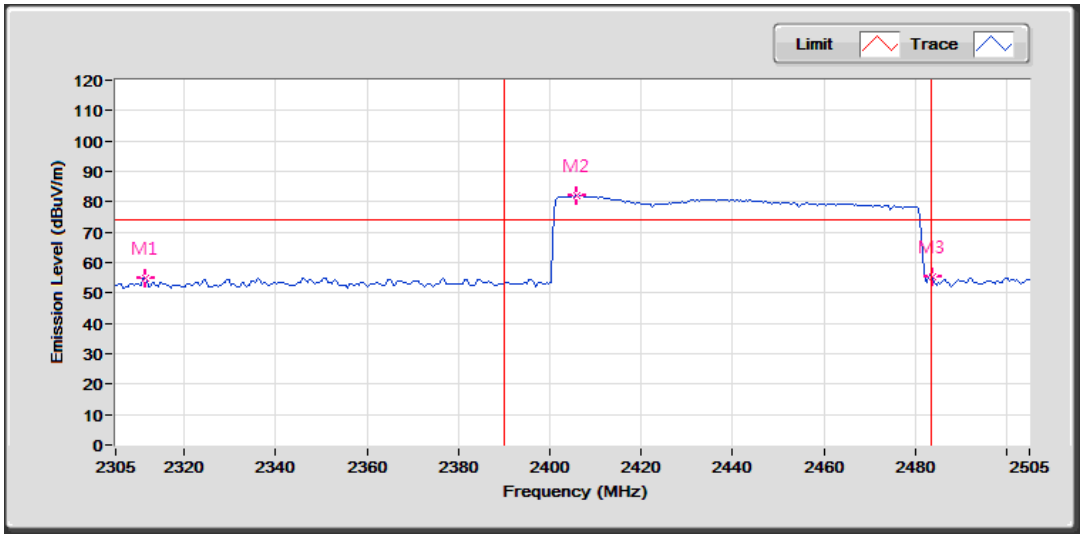
Restricted Band Bandedge @ 2DH5 Hopping Mode PK



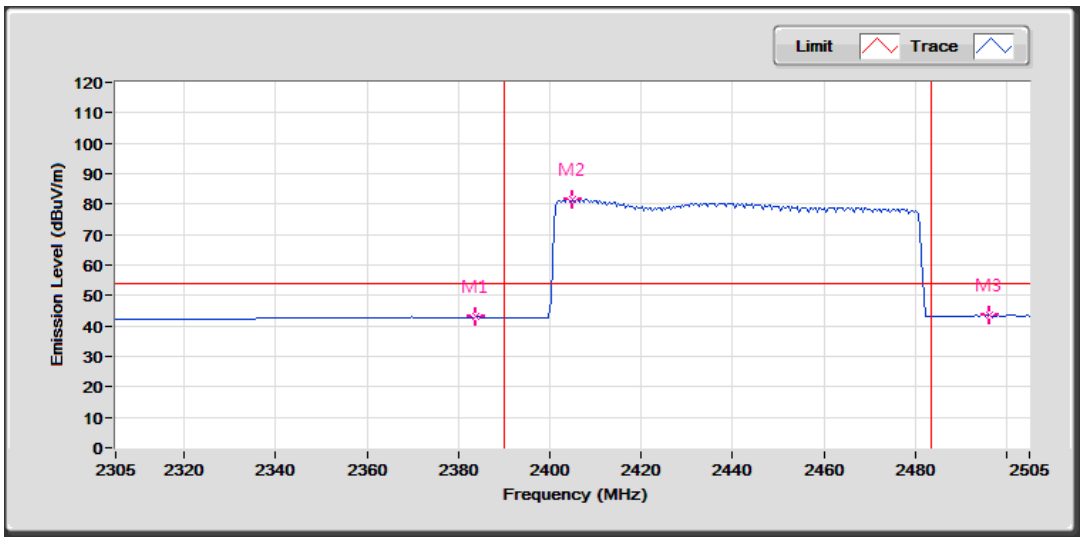
Restricted Band Bandedge @ 2DH5 Hopping Mode AV



Restricted Band Bandedge @ 3DH5 Hopping Mode PK



Restricted Band Bandedge @ 3DH5 Hopping Mode AV



10. AC Power Line Conducted Emission

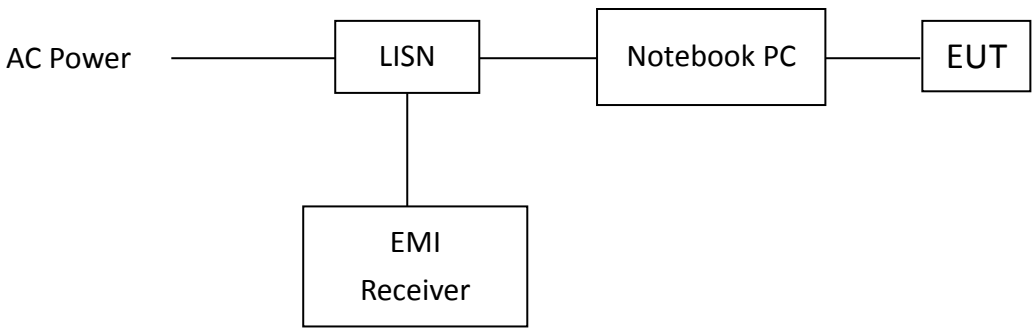
10.1 Measuring instrument setting

Receiver Function	Setting
Detector	QP
Start frequency	0.15MHz
Stop frequency	30MHz
IF bandwidth	9 kHz
Attenuation	10dB

10.2 Test Procedure

Step 1	Configure the EUT according to ANSI C63.10:2013. The EUT or host of EHT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
Step 2	Connect EUT or host of EUT to the power mains through a line impedance stabilization network.
Step 3	All the companion devices are connected to the other LISN. The LISN should provide 50Uh/50ohms coupling impedance.
Step 4	The frequency range from 150 kHz to 30MHz was searched.
Step 5	Set the test-receiver system to peak detector and specified bandwidth with maximum hold mode.
Step 6	The measurement has to be done between each power line and ground at the power terminal.

10.3 Test Diagram



10.4 Limit

Frequency (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56	56 – 46
0.50~5.00	56	46
5.00~30.0	60	50

10.5 Operating Environment Condition

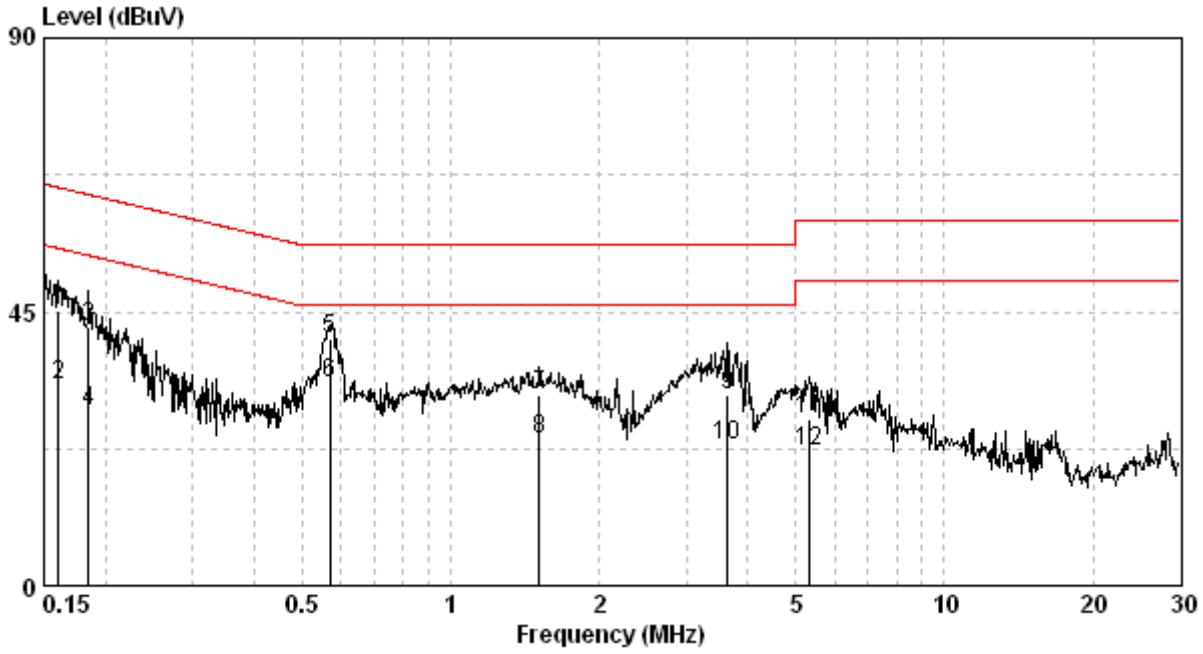
Temperature (℃) :	26
Relative Humidity (%) :	58
Atmospheric Pressure (hPa) :	1007

10.6 Test Results

Phase: Live Line
Model No.: DKR010
Test Condition: Tx mode

Frequency (MHz)	Corr. Factor (dB)	Reading QP (dBuV)	Level QP (dBuV)	Limit QP (dBuV)	Reading AV (dBuV)	Level AV (dBuV)	Limit AV (dBuV)	Margin (dB) QP	Margin (dB) AV
0.161	9.67	35.49	45.16	65.43	23.45	33.12	55.43	-20.27	-22.31
0.184	9.67	32.91	42.58	64.28	18.99	28.66	54.28	-21.70	-25.63
0.570	9.69	30.94	40.63	56.00	23.51	33.20	46.00	-15.37	-12.80
1.511	9.75	21.60	31.35	56.00	14.27	24.02	46.00	-24.65	-21.98
3.642	9.80	21.44	31.24	56.00	13.14	22.93	46.00	-24.76	-23.07
5.333	9.81	17.67	27.48	60.00	12.11	21.93	50.00	-32.52	-28.07

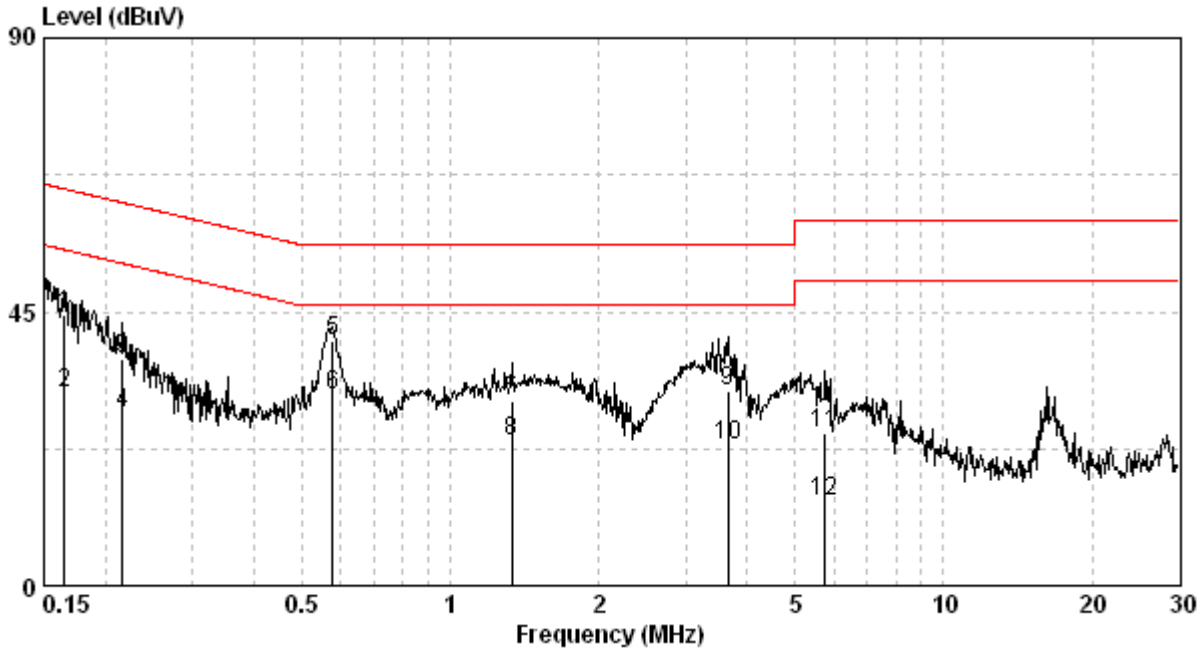
Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Level (dBuV) = Corr. Factor (dB) + Reading (dBuV)
3. Margin (dB) = Level (dBuV) – Limit (dBuV)



Phase: Neutral Line
Model No.: DKR010
Test Condition: Tx mode

Frequency (MHz)	Corr. Factor (dB)	Reading QP (dBuV)	Level QP (dBuV)	Limit QP (dBuV)	Reading AV (dBuV)	Level AV (dBuV)	Limit AV (dBuV)	Margin (dB) QP	Margin (dB) AV
0.165	9.66	34.97	44.63	65.21	22.13	31.79	55.21	-20.58	-23.42
0.216	9.66	27.72	37.38	62.96	18.69	28.35	52.96	-25.58	-24.61
0.576	9.68	30.56	40.24	56.00	21.67	31.35	46.00	-15.76	-14.65
1.331	9.73	20.60	30.33	56.00	13.93	23.67	46.00	-25.67	-22.33
3.661	9.80	22.24	32.04	56.00	13.20	23.00	46.00	-23.96	-23.00
5.744	9.83	15.32	25.14	60.00	3.91	13.73	50.00	-34.86	-36.27

Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Level (dBuV) = Corr. Factor (dB) + Reading (dBuV)
3. Margin (dB) = Level (dBuV) – Limit (dBuV)



Appendix A: Test equipment list

Test Equipment/ Test site	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
ESCI EMI Test Receiver	Rohde & Schwarz	ESCI	100018	2019/11/12	2020/11/10
Signal Analyzer	Agilent	N9030A	MY51380492	2019/08/21	2020/08/19
Active Loop Antenna	SCHWARZBECK MESS-ELEKTRONIC	FMZB1519	1519-067	2020/04/13	2021/04/12
Broadband Antenna	SHWARZBECK	VULB 9168	9168-172	2020/06/02	2021/06/01
Horn Antenna	SHWARZBECK	BBHA 9120 D	9120D-456	2020/01/20	2021/01/18
Pre-Amplifier	SCHWARZBECK	BBV9718	9718-004	2019/10/16	2020/10/14
Power Meter	Anritsu	ML2495A	0844001	2019/10/23	2020/10/21
Power Sensor	Anritsu	MA2411B	0738452	2019/10/23	2020/10/21
966-2(A) Cable	SUHNER	SMA / EX 100	N/A	2019/08/19	2020/08/17
966-2(B) Cable	SUHNER	SUCOFLEX 104P	CB0005	2019/08/19	2020/08/17
RF Cable	SUHNER	SUCOFLEX 102	CB0006	2020/04/30	2021/04/29
Hight Pass Filter	Reactel	7HS-3G/18G-S11	N/A	2020/05/27	2021/05/26
Horn Antenna (14-42G)	SCHWARZBECK	BBHA 9170	BBHA9170159	2017/09/04	2020/09/02
Pre-amplifier	EMCI	EMC184045SE	980512	2020/06/01	2021/5/31
966-2_3m Semi-Anechoic Chamber	966_2	CEM-966_2	N/A	2020/02/22	2021/02/20
EMI Test Receiver	R&S	ESCI	100059	2019/11/05	2020/11/03
LISN	R&S	ENV216	101159	2020/06/08	2021/06/07
CON-1 Cable	SUHNER	SUCOFLEX-104	26438414	2020/04/30	2021/04/29
Test software	Audix	e3	V4.20040112L	NCR	NCR

Note: No Calibration Required (NCR)

Appendix B: Measurement Uncertainty

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.

Item	Uncertainty
Vertically polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	4.90 dB
Horizontally polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	4.89 dB
Vertically polarized Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m	4.29 dB
Horizontally polarized Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m	4.29 dB
Vertically polarized Radiated disturbances from 18GHz~26.5GHz in a semi-anechoic chamber at a distance of 1m	2.45 dB
Horizontally polarized Radiated disturbances from 18GHz~26.5GHz in a semi-anechoic chamber at a distance of 1m	2.45 dB
Radiated disturbances from 9kHz~30MHz in a semi-anechoic chamber at a distance of 3m	3.32 dB
Emission on the Band Edge Test	4.29 dB
Minimum 6 dB Bandwidth	7.69 %
Maximum Peak Conducted Output Power	0.37 dB
Power Spectral Density	1.15 dB
Emissions In Non-Restricted Frequency Bands	1.15 dB
AC Power Line Conducted Emission	2.52 dB