

TEST REPORT

**REGULATIONS : FCC Part15 C §15.247
RSS-247 Issue 2 (2017-02)**

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Equipment Type	144/220/430MHz TRIBANDER
Trademark	KENWOOD
Model(s)	TH-D75A
Serial No.	FES1 K-51
Equipment Authorization	FES1 K-52 (for Antenna Port Conductive testing)
Equipment Authorization	Certification
FCC ID	K44521000
ISED CN and UPN No.	282F-521000
PMN and HVIN (ISED)	TH-D75A
Test Result	Complied
Report Number	23070289JMA-001
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SECTION 1. GENERAL INFORMATION

Test Performed

EUT Received	September 1, 2023	
Date of Test	From September 29, 2023 to October 12, 2023	
Standard Applied	FCC	IC
	FCC Part15 C §15.247	RSS-247 Issue 2 (2017-02)
Test methods	ANSI C63.10-2013	RSS-Gen Issue 5 (2021-02) ANSI C63.10-2013
Deviation from Standard(s)	None	

Qualifications of Testing Laboratory

Accreditation/Recognition	Scope	Lab. Code	Remarks
VLAC	Wireless / EMC Testing	VLAC-008-3	JAPAN
NVLAP	Wireless / EMC Testing	600234-0	USA
FCC	Wireless / EMC Testing	JP0009	USA
ISED	Wireless Testing	JP0004 (CABID)	CANADA
BSMI	EMC Testing	SL2-IN-E-6009	TAIWAN
SABS	EMC Testing	N/A	South Africa
Filing			
VCCI	EMC Testing	A-0127	JAPAN

Abbreviations

EUT	Equipment Under Test	DoC	Declaration of Conformity
AMN	Artificial Mains Network	ISN	Impedance Stabilization Network
LISN	Line Impedance Stabilization Network	Q-P	Quasi-peak
AMP	Amplifier	AVG	Average
ATT	Attenuator	PK	Peak
ANT	Antenna	Cal	Calibration
BBA	Broadband Antenna	N/A	Not applicable or Not available
DIP	Dipole Antenna	LCD	Liquid-Crystal Display
AE	Associated Equipment	HDMI	High-Definition Multimedia Interface
AFH	Adaptive Hopping Frequency		

SECTION 2. SUMMARY OF TEST RESULTS

Test Item	Specification	Results	Detail
20 dB Bandwidth and 99 % Occupied Bandwidth	FCC Part15C §15.247 (a) (1) RSS-247 5.1 (a) RSS-Gen 6.7	PASS	Section 9.1
Maximum Peak Output Power	FCC Part15C §15.247 (b) (1) RSS-247 5.4 (b)	PASS	Section 9.2
Carrier Frequency Separation	FCC Part15C §15.247 (a) (1) RSS-247 5.1 (b)	PASS	Section 9.3
Number of Hopping Frequency	FCC Part15C §15.247 (a) (1) (iii) RSS-247 5.1 (d)	PASS	Section 9.4
Time of occupancy	FCC Part15C §15.247 (a) (1) (iii) RSS-247 5.1 (d)	PASS	Section 9.5
Radiated Spurious Emissions and Restrict Band edge	FCC Part15C §15.209, §15.205 RSS-247 5.5 RSS-Gen 8.9	PASS	Section 9.6
Band Edge of Authorized Frequency Band	FCC Part15C §15.247 (d) RSS-247 5.5	PASS	Section 9.7
Spurious RF Conducted Emissions	FCC Part15C §15.247 (d) RSS-247 5.5	PASS	Section 9.8
AC Conducted Emissions	FCC Part15C §15.207 RSS-Gen 7.2, 8.8	PASS	Section 9.9
Receiver Spurious Emissions	RSS-Gen 7.3	PASS	Section 9.10

Limitation on Results

The test result of this report is effective equipment under test itself and under the test configuration described on the report.

This test report does not assure that whether the test result taken in other testing laboratory is compatible or reproducible to the test result on this report or not.

SECTION 3. EQUIPMENT UNDER TEST

The equipment under test (EUT) consisted of the following apparatus.
The information of this section is provided by the Applicant or customer. Intertek doesn't take any responsibility for the information.

3.1 System Configuration

Symbol	Item	Model No.	Serial No.	Manufacturer
A	144/220/430MHz TRIBANDER	TH-D75A	FES1 K-51	JVCKENWOOD Corporation
			FES1 K-52 (for Antenna Port Conductive testing)	
Rated Power :		DC IN Jack : DC13.8 V (DC11.7 V - 15.9 V) Battery Terminal : DC7.4 V (DC5.6 V - 10.2 V)		
Supplied Power : DC13.8 V (Supplied by DC Power Supply)				
Condition of Equipment		Prototype		
Type		Tabletop (Handheld type)		
Firmware Version		Ver: V0.01.009		
Suppression Devices		No Modifications by the laboratory were made to the device		

3.2 Over View of EUT

Access method	Bluetooth Version 3.0
Rated Output Power	2.5 mW
Antenna Type and Gain	Wire Antenna, -2.16 dBi
Frequency Range of Operating	2402 - 2480 MHz
Occupied Channel Bandwidth	79 ch, 1 MHz step
Modulation Type	FHSS (GFSK, $\pi/4$ dPSK, 8DPSK)
Operating temperature range	-10 to +50 °C (Battery), -20 to +60 °C (DC IN)

3.3 Requirements for Bluetooth transmitter (§15.247)

This Bluetooth module has been tested by a Bluetooth Qualification Lab, and we confirm the following:

- 1) This system is hopping pseudorandomly.
- 2) Each frequency is used equally on the average by each transmitter.
- 3) The receiver input bandwidths that match the hopping channel bandwidths of their corresponding transmitters
- 4) The receiver shifts frequencies in synchronization with the transmitted signals.
 - §15.247(g): The system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this Section 15.247 should the transmitter be presented with a continuous data (or information) stream.
 - §15.247(h): The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.
The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.
 - RSS-247 5.1 (a): The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.
The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

SECTION 4. SUPPORT EQUIPMENT

The EUT was supported by the following equipment during the test.

Symbol	Item	Model No.	Serial No.	Manufacturer	Remarks	FCC ID
B	WHIP Antenna	T9A-0034-00	No.04	JVCKENWOOD Corporation	-	N/A
C	Li-ion Battery	KNB-75LA	3122A	JVCKENWOOD Corporation	-	N/A
D	microSD card	SDSQXAT-032G-JN3MD	23140VT5708Y (for FES1 K-51)	SanDisk	-	N/A
			23140VT5003V (for FES1 K-52)			
E	Speaker Microphone	KMC-45D	No.001	JVCKENWOOD Corporation	-	N/A
F	DC Power Supply	PS-60	11/01 00148	JVCKENWOOD Corporation	-	N/A
Supplied Power:						
F	AC120 V, 60 Hz					

Note: These information is provided by the Applicant or customer. Intertek doesn't take any responsibility for the information.

SECTION 5. USED CABLE(S)

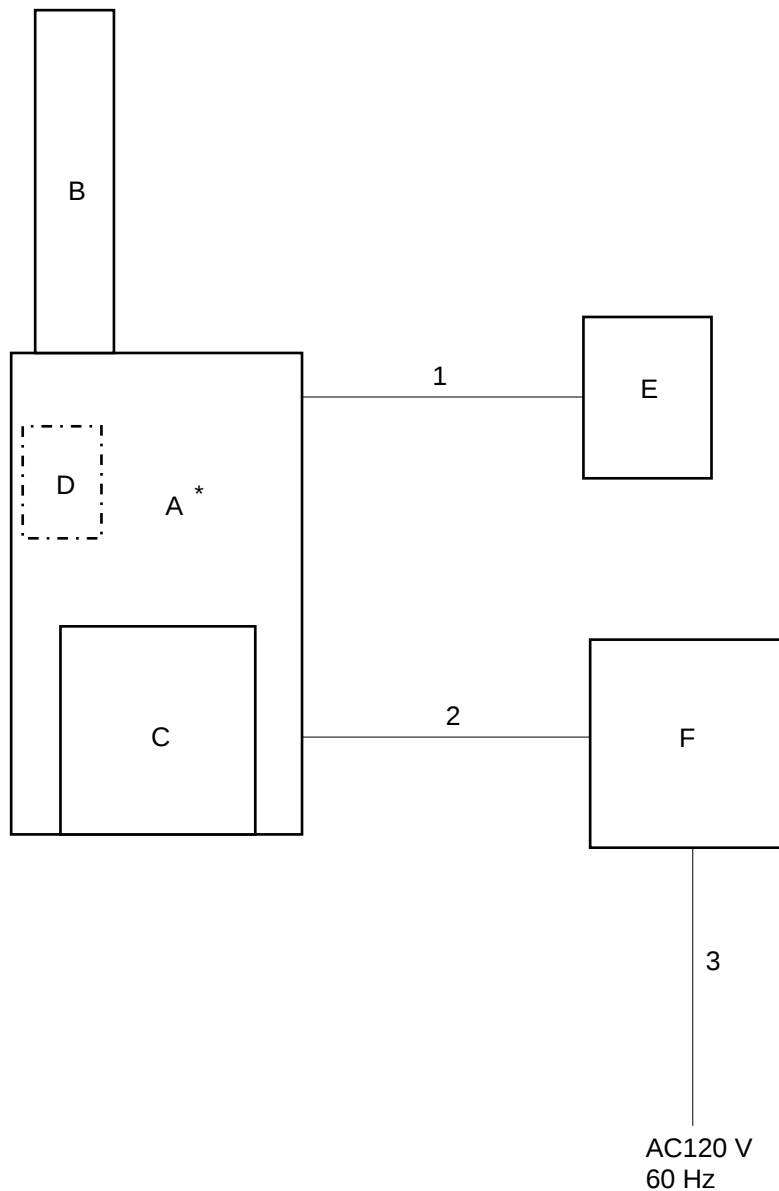
The following cable(s) was used for the test.

No.	Name	Length (m)	Shield	Metal Connector	Ferrite Core
1	Speaker Microphone Cable	0.55	No	No	-
2	Power cable for TH-D75A (DC)	1.40	No	No	-
3	Power cable for DC Power Supply (AC: 3 core)	1.75	No	No	-

Note: These information is provided by the Applicant or customer. Intertek doesn't take any responsibility for the information.

SECTION 6. TEST CONFIGURATION

* : EUT



The symbols and numbers assigned to the equipment and cables on this diagram correspond to the ones in Sections 3 to 5.

SECTION 7. OPERATING CONDITION

The test was carried out under the following mode.

Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

7.1 Test Channel

In accordance with Section 15.31 (m), all test items was conducted in the following three channels:

Test Channel	Frequency [MHz]
Low	2402
Middle	2441
High	2480

7.2 Test modes

Test Item	Operating modes
Maximum Peak Output Power	Hopping OFF DH1, DH3, DH5 2-DH1, 2-DH3, 2-DH5 3-DH1, 3-DH3, 3-DH5
Carrier Frequency Separation	Hopping ON DH5, 2-DH5, 3-DH5
Number of Hopping Frequency	Hopping ON DH5, 2-DH5, 3-DH5
Time of occupancy	Hopping OFF DH1, DH3, DH5 2-DH1, 2-DH3, 2-DH5 3-DH1, 3-DH3, 3-DH5
Radiated Spurious Emissions and Restrict Band edge	Hopping OFF DH5, 2-DH5, 3-DH5
Band Edge of Authorized Frequency Band	Hopping OFF/ON DH5, 2-DH5, 3-DH5
Spurious RF Conducted Emissions	Hopping OFF DH5, 2-DH5, 3-DH5
AC Conducted Emissions	Hopping ON DH5, 2-DH5, 3-DH5
Receiver Spurious Emissions	Transmit OFF, Receive mode

Note: The Test modes were configured in typical fashion as a customer would normally use it.

SECTION 8. UNCERTAINTY

Traceability to national standard in SI units is ensured with these values.
Compliance with the limits in this standard are determined without in consideration of the measurement uncertainty of the measurement instrumentation.

8.1 Emission tests

Test items	Expand Uncertainty [$k = 1.96$]
Radiated Spurious Emissions at 3m	
Below 30 MHz	+/- 5.15 dB
30 MHz – 1000 MHz	+/- 5.69 dB
Above 1 GHz	+/- 5.78 dB
AC Conducted Emissions	
150 kHz – 30 MHz	+/- 1.53 dB

The above expanded instrumentation uncertainty, is estimated in accordance with ANSI C63.10-2013 (ETSI TR 100 028 V1.4.1).

8.2 RF Conducted tests

Test Items	Expand Uncertainty [$k = 1.96$]
Bandwidth	+/- 1.42 %
Maximum Output Power	+/- 1.96 dB
Conducted Emissions	+/- 1.82 dB

The above expanded instrumentation uncertainty, is estimated in accordance with ANSI C63.10-2013 (ETSI TR 100 028 V1.4.1).

SECTION 9. TEST DATA

9.1 20 dB Bandwidth and 99 % Occupied Bandwidth

Regulations	FCC Part15C §15.247 (a) (1) RSS-247 5.1 (a) RSS-Gen 6.7
Test Method/Guide	ANSI C63.10-2013 clause 6.9.2

Test Procedure

- The EUT and test instrument were set up as shown on section 10.1.
- Adjust the test instrument for the following setting:

RBW	:	1 to 5 % of the 20 dB bandwidth
VBW	:	approximately 3 times RBW
Span	:	approximately 3 times the 20 dB bandwidth
Detector	:	Peak
Sweep Time	:	Auto
Trace mode	:	Max Hold
- Allow trace to fully stabilize.
- Use "Occupied Bandwidth Measurement" function to measure the 20 dB bandwidth.

Test Result

Location	Matsuda No.1 Test Site
Test date	October 2, 2023
Temperature	21.0 [degree C]
Humidity variation	59 [%]
Test Engineer	Kenji Kitta

Operating modes	Frequency [MHz]	20 dB Bandwidth [MHz]	99 % Bandwidth [MHz]
DH5	2402	0.9382	0.84930
	2441	0.9417	0.85609
	2480	0.9383	0.85225
2-DH5	2402	1.325	1.1857
	2441	1.325	1.1845
	2480	1.328	1.1878
3-DH5	2402	1.312	1.1994
	2441	1.311	1.1944
	2480	1.310	1.1929

Spectrum Plots

See ANNEX A.1.

9.2 Maximum Peak Output Power

Regulations	FCC Part15C §15.247 (b) (1) RSS-247 5.4 (b)
Test Method/Guide	ANSI C63.10-2013 clause 7.8.5

Test Procedure

1. The EUT and test instrument were set up as shown on section 10.1.
2. Adjust the test instrument for the following setting:

RBW	:	≥ the 20 dB bandwidth
VBW	:	≥ RBW
Span	:	approximately 5 times the 20 dB bandwidth
Detector	:	Peak
Sweep Time	:	Auto
Trace mode	:	Max Hold

Note: The value of the “20 dB bandwidth”, from the result of section 9.1.

3. Allow trace to fully stabilize.
4. Use the peak search function to measure the peak of the emission.
5. Measurement data correction;

Measured Value [dBm] = Reading [dBm] + Factor [dB]

*Factor = Cable Loss [dB] + Attenuator [dB]

Margin [dB] = Limit [dBm] - Measured Value [dBm]

Test Result

Location	Matsuda No.1 Test Site
Test date	October 6, 2023
Temperature	21.0 [degree C]
Humidity variation	55 [%RH]
Test Engineer	Kenji Kitta

Operating modes	Freq. [MHz]	Reading [dBm]	Factor [dB]	Measured Value [dBm]	Limit		Margin [dB]
					[mW]	[dBm]	
DH1	2402	-8.251	10.74	2.489	125	20.97	18.481
	2441	-8.743	10.75	2.007			18.963
	2480	-9.761	10.76	0.999			19.971
DH3	2402	-8.283	10.74	2.457			18.513
	2441	-8.764	10.75	1.986			18.984
	2480	-9.752	10.76	1.008			19.962
DH5	2402	-7.913	10.74	2.827			18.143
	2441	-8.770	10.75	1.980			18.990
	2480	-9.782	10.76	0.978			19.992
2-DH1	2402	-8.097	10.74	2.643			18.327
	2441	-8.483	10.75	2.267			18.703
	2480	-9.404	10.76	1.356			19.614
2-DH3	2402	-8.119	10.74	2.621			18.349
	2441	-8.512	10.75	2.238			18.732
	2480	-9.413	10.76	1.347			19.623
2-DH5	2402	-8.178	10.74	2.562			18.408
	2441	-8.521	10.75	2.229			18.741
	2480	-9.420	10.76	1.340			19.630
3-DH1	2402	-7.643	10.74	3.097			17.873
	2441	-7.937	10.75	2.813			18.157
	2480	-8.741	10.76	2.019			18.951
3-DH3	2402	-7.654	10.74	3.086			17.884
	2441	-7.962	10.75	2.788			18.182
	2480	-8.750	10.76	2.010			18.960
3-DH5	2402	-7.376	10.74	3.364			17.606
	2441	-7.972	10.75	2.778			18.192
	2480	-8.791	10.76	1.969			19.001

Spectrum Plots

See ANNEX A.2

9.3 Carrier Frequency Separation

Regulations	FCC Part15C §15.247 (a) (1) RSS-247 5.1 (b)
Test Method/Guide	ANSI C63.10-2013 clause 7.8.2

Test Procedure

- The EUT and test instrument were set up as shown on section 10.1.
- Adjust the test instrument for the following setting:

RBW	:	approximately 30% of the channel spacing
VBW	:	≥ RBW
Span	:	Wide enough to capture the peaks of two adjacent channels.
Detector	:	Peak
Sweep Time	:	Auto
Trace mode	:	Max Hold
- Allow trace to fully stabilize.
- Use delta marker function to measure the separation between the two channels.

Test Result

Location	Matsuda No.1 Test Site
Test date	October 2, 2023
Temperature	21.0 [degree C]
Humidity variation	59 [%RH]
Test Engineer	Kenji Kitta

Operating modes	Frequency [MHz]	Measured Value [MHz]	Limit [MHz]
DH5	2402	1.000	≥ 0.6255
	2441	1.000	≥ 0.6278
	2480	1.000	≥ 0.6255
2-DH5	2402	1.000	≥ 0.8833
	2441	1.000	≥ 0.8833
	2480	1.000	≥ 0.8853
3-DH5	2402	1.000	≥ 0.8747
	2441	1.000	≥ 0.8740
	2480	1.000	≥ 0.8733

Note: Limits were applied to two-thirds of 20 dB bandwidth.
The value of the “20 dB bandwidth”, from the result of section 9.1.

Spectrum Plots

See ANNEX A.3

9.4 Number of Hopping Frequency

Regulations	FCC Part15C §15.247 (a) (1) (iii) RSS-247 5.1 (d)
Test Method/Guide	ANSI C63.10-2013 clause 7.8.3

Test Procedure

1. The EUT and test instrument were set up as shown on section 10.1.
2. Adjust the test instrument for the following setting:

RBW	:	< 30% of the channel spacing
VBW	:	≥ RBW
Span	:	Including emission band
Detector	:	Peak
Sweep Time	:	Auto
Trace mode	:	Max Hold
3. Allow trace to fully stabilize.
4. Count the peaks.

Test Result

Location	Matsuda No.1 Test Site
Test date	October 2, 2023
Temperature	21.0 [degree C]
Humidity variation	59 [%RH]
Test Engineer	Kenji Kitta

Operating modes	Measured Value	Limit
DH5	79	≥ 15
2-DH5	79	
3-DH5	79	

Spectrum Plots

See ANNEX A.4

9.5 Time of Occupancy

Regulations	FCC Part15C §15.247 (a) (1) (iii) RSS-247 5.1 (d)
Test Method/Guide	ANSI C63.10-2013 clause 7.8.4

Test Procedure

1. The EUT and test instrument were set up as shown on section 10.1.
2. Adjust the test instrument for the following setting:

RBW	:	$\leq$ channel spacing
VBW	:	$\geq$ RBW
Span	:	0 Hz
Detector	:	Peak
Sweep Time	:	As necessary to capture the entire dwell time per hopping channel
Trace mode	:	Single, Use Video Trigger
3. Use delta marker function to measure the transmit time as per hop.
4. By the following method, calculated time of occupancy;

(1) Number of hops per sec
= Hopping rate / 1 time slots / 1 [sec].

* 1 time slots : 6 for DH5 packet
* Hopping rate : 1600 for Normal mode
800 for AFH mode

(2) Number of hops per sec in each channel
= Number of hops per sec / number of hopping channel.
* number of hopping channel: 79 for Normal mode
20 for AFH mode

(3) Specified periods [sec]
= 0.4 [sec] x number of hopping channels.

(4) Number of hops per specified periods in each channel
= Number of hops per sec in each channel x Specified periods [sec].

(5) Time of occupancy [ms]
= Number of hops per specified periods in each channel x the transmit time as per hop [ms].

Test Result

Location	Matsuda No.1 Test Site
Test date	October 2, 2023
Temperature	21.0 [degree C]
Humidity variation	59 [%RH]
Test Engineer	Kenji Kitta

Normal mode

Operating modes	Transmit Time per Hop [ms]	Number of hops per channel in specified period	Time of Occupancy [ms]	Limit [ms]
DH1	0.40130	320.00	128.42	400
DH3	1.83500	160.00	293.60	
DH5	2.90430	106.67	309.79	
2-DH1	0.46090	320.00	147.49	
2-DH3	1.83765	160.00	294.02	
2-DH5	2.92810	106.67	312.33	
3-DH1	0.46130	320.00	147.62	
3-DH3	1.83700	160.00	293.92	
3-DH5	2.92950	106.67	312.48	

AFH mode

Operating modes	Transmit Time per Hop [ms]	Number of hops per channel in specified period	Time of Occupancy [ms]	Limit [ms]
DH5	2.90325	53.33	154.84	400
2-DH5	2.92775	53.33	156.15	
3-DH5	2.92845	53.33	156.18	

Spectrum Chart

See ANNEX A.5

9.6 Radiated Spurious Emissions and Band Edge of Restrict Band

Regulations	FCC Part15C §15.209, §15.205 RSS-247 5.5 RSS-Gen 8.9
Test Method/Guide	ANSI C63.10-2013 clause 6.5 and 6.6

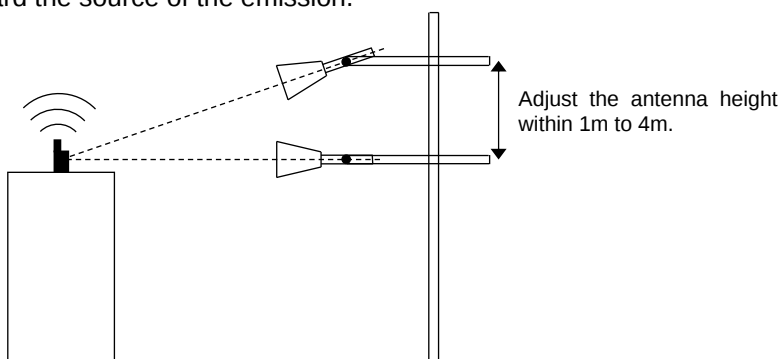
Test Procedure

1. The EUT and test instrument were set up as shown on section 10.2.
2. The measurement antenna was placed at a distance of 3 m from the EUT.
3. The turntable azimuth (EUT direction, 0 – 360 degree) and antenna height (1 – 4 m) are adjusted the position so that maximum field strength is obtained for each frequency spectrum to be measured.

The equipment and cables are arranged or manipulated within the range of the test standard in the above condition. At least six highest spectrums are measured by the test receiver (below 1 GHz) and spectrum analyzer (above 1 GHz).

For measurements above 1GHz, the emission signal shall be kept within the illumination area of the 3 dB beamwidth of the antenna so that the maximum emission from the EUT is measured.

And the antenna angle toward the source of the emission.



4. Adjust the test instrument for the following setting:

Frequency	Instruments	Detector	RBW	VBW	Remarks
30 – 1000 MHz	CISPR Receiver	QP	120 kHz	N/A	-
1000 MHz - 18000 MHz	CISPR Receiver	Peak	1 MHz	N/A	-
		AVG	1 MHz	N/A	-
Above 18000 MHz	Spectrum Analyzer	N/A	1 MHz	3 MHz	for Peak
		N/A	1 MHz	10 Hz	for Average

5. Measurement data correction;

Emission Level [dBuV/m] = Reading [dBuV] + Factor [dB/m]

Margin [dB] = Limit [dBuV/m] – Emission Level [dBuV/m]

* Factor = Antenna Factor + Amplifier gain + Cable loss + Attenuator (+ Filter)
(+ Distance Conversion Factor)*

* For other than Standard distance:

Distance Conversion Factor = 20 log (Measurement distance / Standard distance)

Test Result

Operating mode	DH5, 2402 MHz, EUT axis: X		
Location	Matsuda No.2 Test Site	Matsuda No.1 Test Site	
Frequency	0.009 – 30 MHz, 30 – 1000 MHz	1 - 18 GHz, 18 – 25 GHz	
Test date	Oct. 6, 2023	Oct. 5, 2023	
Temperature	27.4	19.0	[degree C]
Humidity variation	25	65	[%]
Test Engineer	Daichi Mitsunaga		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Emission Level [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hori	Vert		Hori	Vert		Hori	Vert
1	111.85	QuasiPeak	21.6	21.4	-8.0	13.6	13.4	43.5	29.9	30.1
2	695.51	QuasiPeak	21.6	21.5	7.4	29.0	28.9	46.0	17.0	17.1
3	1201.00	Peak	41.5	41.4	2.0	43.5	43.4	74.0	30.5	30.6
4	1201.00	Average	28.0	27.1	2.0	30.0	29.1	54.0	24.0	24.9
5	4804.00	Peak	41.5	41.4	13.3	54.8	54.7	74.0	19.2	19.3
6	4804.00	Average	27.6	27.5	13.3	40.9	40.8	54.0	13.1	13.2
7	7206.00	Peak	43.2	43.8	18.1	61.3	61.9	74.0	12.7	12.1
8	7206.00	Average	29.5	29.5	18.1	47.6	47.6	54.0	6.4	6.4
9	9608.00	Peak	43.6	43.4	21.4	65.0	64.8	74.0	9.0	9.2
10	9608.00	Average	30.1	30.1	21.4	51.5	51.5	54.0	2.5	2.5

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver		Hor	Ver	Hor	Ver	Hor	Ver
1*	2402.00	Peak	76.9	85.1	6.9	83.8	92.0	-	-	-	-
2*	2400.00	Peak	45.3	40.6	6.9	52.2	47.5	63.8	72.0	11.6	24.5

Note.

- * : Band Edge of Restrict Band
- : Measurement limit

Below 30 MHz: Spurious emission was not detected.

Any Spurious emissions lower than and higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	DH5, 2441 MHz, EUT axis: X		
Location	Matsuda No.2 Test Site	Matsuda No.1 Test Site	
Frequency	0.009 – 30 MHz, 30 – 1000 MHz	1 - 18 GHz, 18 – 25 GHz	
Test date	Oct. 6, 2023	Oct. 5, 2023	
Temperature	27.4	19.0	[degree C]
Humidity variation	25	65	[%]
Test Engineer	Daichi Mitsunaga		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Emission Level [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hori	Vert		Hori	Vert		Hori	Vert
1	111.85	QuasiPeak	21.3	21.3	-8.0	13.3	13.3	43.5	30.2	30.2
2	695.51	QuasiPeak	21.6	21.5	7.4	29.0	28.9	46.0	17.0	17.1
3	1220.50	Peak	46.1	41.7	2.1	48.2	43.8	74.0	25.8	30.2
4	1220.50	Average	27.2	27.1	2.1	29.3	29.2	54.0	24.7	24.8
5	4882.00	Peak	40.0	39.5	13.4	53.4	52.9	74.0	20.6	21.1
6	4882.00	Average	26.4	26.4	13.4	39.8	39.8	54.0	14.2	14.2
7	7323.00	Peak	44.3	43.2	18.5	62.8	61.7	74.0	11.2	12.3
8	7323.00	Average	29.8	29.8	18.5	48.3	48.3	54.0	5.7	5.7
9	9764.00	Peak	44.1	44.2	21.5	65.6	65.7	74.0	8.4	8.3
10	9764.00	Average	30.5	30.4	21.5	52.0	51.9	54.0	2.0	2.1

Note.

Below 30 MHz: Spurious emission was not detected.

Any Spurious emissions lower than and higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	DH5, 2480 MHz, EUT axis: X		
Location	Matsuda No.2 Test Site	Matsuda No.1 Test Site	
Frequency	0.009 – 30 MHz, 30 – 1000 MHz	1 - 18 GHz, 18 – 25 GHz	
Test date	Oct. 6, 2023	Oct. 5, 2023	
Temperature	27.4	19.0	[degree C]
Humidity variation	25	65	[%]
Test Engineer	Daichi Mitsunaga		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Emission Level [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hori	Vert		Hori	Vert		Hori	Vert
1	111.85	QuasiPeak	21.3	21.4	-8.0	13.3	13.4	43.5	30.2	30.1
2	695.51	QuasiPeak	21.4	21.5	7.4	28.8	28.9	46.0	17.2	17.1
3	1240.00	Peak	40.2	41.6	2.3	42.5	43.9	74.0	31.5	30.1
4	1240.00	Average	27.5	27.2	2.3	29.8	29.5	54.0	24.2	24.5
5	4960.00	Peak	40.5	40.4	13.6	54.1	54.0	74.0	19.9	20.0
6	4960.00	Average	26.6	26.6	13.6	40.2	40.2	54.0	13.8	13.8
7	7440.00	Peak	43.8	44.1	19.0	62.8	63.1	74.0	11.2	10.9
8	7440.00	Average	30.0	30.0	19.0	49.0	49.0	54.0	5.0	5.0
9	9920.00	Peak	43.2	44.6	21.8	65.0	66.4	74.0	9.0	7.6
10	9920.00	Average	30.5	30.5	21.8	52.3	52.3	54.0	1.7	1.7

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver		Hor	Ver	Hor	Ver	Hor	Ver
1*	2480.00	Peak	80.2	82.8	7.1	87.3	89.9	-	-	-	-
2*	2483.50	Peak	49.3	53.2	7.1	56.4	60.3	67.3	69.9	10.9	9.6

Note.

- * : Band Edge of Restrict Band
- : Measurement limit

Below 30 MHz: Spurious emission was not detected.

Any Spurious emissions lower than and higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	2-DH5, 2402 MHz, EUT axis: X		
Location	Matsuda No.2 Test Site	Matsuda No.1 Test Site	
Frequency	0.009 – 30 MHz, 30 – 1000 MHz	1 - 18 GHz, 18 – 25 GHz	
Test date	Oct. 6, 2023	Oct. 5, 2023	
Temperature	27.4	19.0	[degree C]
Humidity variation	25	65	[%]
Test Engineer	Daichi Mitsunaga		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Emission Level [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hori	Vert		Hori	Vert		Hori	Vert
1	111.85	QuasiPeak	21.4	21.4	-8.0	13.4	13.4	43.5	30.1	30.1
2	695.51	QuasiPeak	21.5	21.5	7.4	28.9	28.9	46.0	17.1	17.1
3	1201.00	Peak	41.2	42.1	2.0	43.2	44.1	74.0	30.8	29.9
4	1201.00	Average	27.3	27.6	2.0	29.3	29.6	54.0	24.7	24.4
5	4804.00	Peak	41.3	41.5	13.3	54.6	54.8	74.0	19.4	19.2
6	4804.00	Average	27.5	27.5	13.3	40.8	40.8	54.0	13.2	13.2
7	7206.00	Peak	42.4	44.0	18.1	60.5	62.1	74.0	13.5	11.9
8	7206.00	Average	29.5	29.5	18.1	47.6	47.6	54.0	6.4	6.4
9	9608.00	Peak	43.5	43.7	21.4	64.9	65.1	74.0	9.1	8.9
10	9608.00	Average	30.0	30.1	21.4	51.4	51.5	54.0	2.6	2.5

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver		Hor	Ver	Hor	Ver	Hor	Ver
1*	2402.00	Peak	76.9	83.6	6.9	83.8	90.5	-	-	-	-
2*	2400.00	Peak	40.8	41.8	6.9	47.7	48.7	63.8	70.5	16.1	21.8

Note.

- * : Band Edge of Restrict Band
- : Measurement limit

Below 30 MHz: Spurious emission was not detected.

Any Spurious emissions lower than and higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	2-DH5, 2441 MHz, EUT axis: X		
Location	Matsuda No.2 Test Site	Matsuda No.1 Test Site	
Frequency	0.009 – 30 MHz, 30 – 1000 MHz	1 - 18 GHz, 18 – 25 GHz	
Test date	Oct. 6, 2023	Oct. 5, 2023	
Temperature	27.4	19.0	[degree C]
Humidity variation	25	65	[%]
Test Engineer	Daichi Mitsunaga		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Emission Level [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hori	Vert		Hori	Vert		Hori	Vert
1	111.85	QuasiPeak	21.5	21.6	-8.0	13.5	13.6	43.5	30.0	29.9
2	695.51	QuasiPeak	21.6	21.4	7.4	29.0	28.8	46.0	17.0	17.2
3	1220.50	Peak	45.5	44.7	2.1	47.6	46.8	74.0	26.4	27.2
4	1220.50	Average	27.2	27.1	2.1	29.3	29.2	54.0	24.7	24.8
5	4882.00	Peak	40.5	40.0	13.4	53.9	53.4	74.0	20.1	20.6
6	4882.00	Average	26.5	26.5	13.4	39.9	39.9	54.0	14.1	14.1
7	7323.00	Peak	43.4	44.0	18.5	61.9	62.5	74.0	12.1	11.5
8	7323.00	Average	29.7	29.7	18.5	48.2	48.2	54.0	5.8	5.8
9	9764.00	Peak	43.9	44.4	21.5	65.4	65.9	74.0	8.6	8.1
10	9764.00	Average	30.4	30.5	21.5	51.9	52.0	54.0	2.1	2.0

Note.

Below 30 MHz: Spurious emission was not detected.

Any Spurious emissions lower than and higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	2-DH5, 2480 MHz, EUT axis: X		
Location	Matsuda No.2 Test Site	Matsuda No.1 Test Site	
Frequency	0.009 – 30 MHz, 30 – 1000 MHz	1 - 18 GHz, 18 – 25 GHz	
Test date	Oct. 6, 2023	Oct. 5, 2023	
Temperature	27.4	19.0	[degree C]
Humidity variation	25	65	[%]
Test Engineer	Daichi Mitsunaga		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Emission Level [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hori	Vert		Hori	Vert		Hori	Vert
1	111.85	QuasiPeak	21.6	21.5	-8.0	13.6	13.5	43.5	29.9	30.0
2	695.51	QuasiPeak	21.5	21.5	7.4	28.9	28.9	46.0	17.1	17.1
3	1240.00	Peak	42.0	40.4	2.3	44.3	42.7	74.0	29.7	31.3
4	1240.00	Average	27.5	27.6	2.3	29.8	29.9	54.0	24.2	24.1
5	4960.00	Peak	39.5	40.1	13.6	53.1	53.7	74.0	20.9	20.3
6	4960.00	Average	26.5	26.5	13.6	40.1	40.1	54.0	13.9	13.9
7	7440.00	Peak	44.0	44.0	19.0	63.0	63.0	74.0	11.0	11.0
8	7440.00	Average	30.1	30.1	19.0	49.1	49.1	54.0	4.9	4.9
9	9920.00	Peak	43.6	44.7	21.8	65.4	66.5	74.0	8.6	7.5
10	9920.00	Average	30.6	30.6	21.8	52.4	52.4	54.0	1.6	1.6

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver		Hor	Ver	Hor	Ver	Hor	Ver
1*	2480.00	Peak	77.9	80.1	7.1	85.0	87.2	-	-	-	-
2*	2483.50	Peak	43.3	52.8	7.1	50.4	59.9	65.0	67.2	14.6	7.3

Note.

- * : Band Edge of Restrict Band
- : Measurement limit

Below 30 MHz: Spurious emission was not detected.

Any Spurious emissions lower than and higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	3-DH5, 2402 MHz, EUT axis: X		
Location	Matsuda No.2 Test Site	Matsuda No.1 Test Site	
Frequency	0.009 – 30 MHz, 30 – 1000 MHz	1 - 18 GHz, 18 – 25 GHz	
Test date	Oct. 6, 2023	Oct. 5, 2023	
Temperature	27.4	19.0	[degree C]
Humidity variation	25	65	[%]
Test Engineer	Daichi Mitsunaga		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Emission Level [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hori	Vert		Hori	Vert		Hori	Vert
1	111.85	QuasiPeak	21.6	21.6	-8.0	13.6	13.6	43.5	29.9	29.9
2	695.51	QuasiPeak	21.5	21.4	7.4	28.9	28.8	46.0	17.1	17.2
3	1201.00	Peak	41.5	42.3	2.0	43.5	44.3	74.0	30.5	29.7
4	1201.00	Average	27.6	27.7	2.0	29.6	29.7	54.0	24.4	24.3
5	4804.00	Peak	41.4	41.6	13.3	54.7	54.9	74.0	19.3	19.1
6	4804.00	Average	27.5	27.5	13.3	40.8	40.8	54.0	13.2	13.2
7	7206.00	Peak	43.0	43.0	18.1	61.1	61.1	74.0	12.9	12.9
8	7206.00	Average	29.5	29.6	18.1	47.6	47.7	54.0	6.4	6.3
9	9608.00	Peak	43.1	43.4	21.4	64.5	64.8	74.0	9.5	9.2
10	9608.00	Average	30.7	30.0	21.4	52.1	51.4	54.0	1.9	2.6

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver		Hor	Ver	Hor	Ver	Hor	Ver
1*	2402.00	Peak	79.3	80.8	6.9	86.2	87.7	-	-	-	-
2*	2400.00	Peak	41.3	42.0	6.9	48.2	48.9	66.2	67.7	18.0	18.8

Note.

- * : Band Edge of Restrict Band
- : Measurement limit

Below 30 MHz: Spurious emission was not detected.

Any Spurious emissions lower than and higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	3-DH5, 2441 MHz, EUT axis: X		
Location	Matsuda No.2 Test Site	Matsuda No.1 Test Site	
Frequency	0.009 – 30 MHz, 30 – 1000 MHz	1 - 18 GHz, 18 – 25 GHz	
Test date	Oct. 6, 2023	Oct. 5, 2023	
Temperature	27.4	19.0	[degree C]
Humidity variation	25	65	[%]
Test Engineer	Daichi Mitsunaga		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Emission Level [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hori	Vert		Hori	Vert		Hori	Vert
1	111.85	QuasiPeak	21.6	21.6	-8.0	13.6	13.6	43.5	29.9	29.9
2	695.51	QuasiPeak	21.6	21.5	7.4	29.0	28.9	46.0	17.0	17.1
3	1220.50	Peak	45.4	44.3	2.1	47.5	46.4	74.0	26.5	27.6
4	1220.50	Average	27.2	30.9	2.1	29.3	33.0	54.0	24.7	21.0
5	4882.00	Peak	41.0	40.8	13.4	54.4	54.2	74.0	19.6	19.8
6	4882.00	Average	26.5	26.3	13.4	39.9	39.7	54.0	14.1	14.3
7	7323.00	Peak	43.3	44.3	18.5	61.8	62.8	74.0	12.2	11.2
8	7323.00	Average	29.7	29.7	18.5	48.2	48.2	54.0	5.8	5.8
9	9764.00	Peak	43.9	43.8	21.5	65.4	65.3	74.0	8.6	8.7
10	9764.00	Average	30.4	30.4	21.5	51.9	51.9	54.0	2.1	2.1

Note.

Below 30 MHz: Spurious emission was not detected.

Any Spurious emissions lower than and higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	3-DH5, 2480 MHz, EUT axis: X		
Location	Matsuda No.2 Test Site	Matsuda No.1 Test Site	
Frequency	0.009 – 30 MHz, 30 – 1000 MHz	1 - 18 GHz, 18 – 25 GHz	
Test date	Oct. 6, 2023	Oct. 5, 2023	
Temperature	27.4	19.0	[degree C]
Humidity variation	25	65	[%]
Test Engineer	Daichi Mitsunaga		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Emission Level [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hori	Vert		Hori	Vert		Hori	Vert
1	111.85	QuasiPeak	21.6	21.3	-8.0	13.6	13.3	43.5	29.9	30.2
2	695.51	QuasiPeak	21.4	21.6	7.4	28.8	29.0	46.0	17.2	17.0
3	1240.00	Peak	41.3	41.6	2.3	43.6	43.9	74.0	30.4	30.1
4	1240.00	Average	27.5	27.6	2.3	29.8	29.9	54.0	24.2	24.1
5	4960.00	Peak	40.8	40.6	13.6	54.4	54.2	74.0	19.6	19.8
6	4960.00	Average	26.5	26.5	13.6	40.1	40.1	54.0	13.9	13.9
7	7440.00	Peak	44.2	43.8	19.0	63.2	62.8	74.0	10.8	11.2
8	7440.00	Average	30.0	30.1	19.0	49.0	49.1	54.0	5.0	4.9
9	9920.00	Peak	45.0	44.2	21.8	66.8	66.0	74.0	7.2	8.0
10	9920.00	Average	30.6	30.5	21.8	52.4	52.3	54.0	1.6	1.7

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver		Hor	Ver	Hor	Ver	Hor	Ver
1*	2480.00	Peak	76.8	81.4	7.1	83.9	88.5	-	-	-	-
2*	2483.50	Peak	45.1	54.0	7.1	52.2	61.1	63.9	68.5	11.7	7.4

Note.

- * : Band Edge of Restrict Band
- : Measurement limit

Below 30 MHz: Spurious emission was not detected.

Any Spurious emissions lower than and higher than the frequency reported in the table above were not detected during the measurement.

9.7 Band Edge of Authorized Frequency Band

Regulations	FCC Part15C §15.247 (d) RSS-247 5.5
Test Method/Guide	ANSI C63.10-2013 clause 6.10.4

Test Procedure

1. The EUT and test instrument were set up as shown on section 10.1.
2. Adjust the measurement instrument for the following setting:

RBW	:	100 kHz
VBW	:	300 kHz
Span	:	10 MHz
Detector	:	Peak
Sweep Time	:	Auto
Trace mode	:	Max Hold
3. Allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within in-band emission.
5. Use the marker function to ensure that the band edge level of the authorized frequency band was attenuated by at least the minimum requirements specified.
6. Band Edge Measurement data correction;
$$\text{Limit [dBm]} = \text{Reading of Peak level within in-band emission [dBm]} + \text{Factor [dB]} - 20 \text{ [dB]}$$
$$\text{Margin [dB]} = \text{Limit [dBm]} - (\text{Reading of Band edge Level [dBm]} + \text{Factor [dB]})$$

Test Result

Location	Matsuda No.1 Test Site
Test date	October 2, 2023
Temperature	21.0 [degree C]
Humidity variation	59 [%]
Test Engineer	Kenji Kitta

Operating mode		DH5, Hopping OFF					
Freq. [MHz]	Factor [dB]	Band edge Emission		In-band Emission		Limit [dBm]	Margin [dB]
		Reading Level [dBm]	Emission Level [dBm]	Reading Level [dBm]	Emission Level [dBm]		
2400.00	10.74	-68.714	-57.974	-8.003	2.737	-17.263	40.711
2483.50	10.76	-71.650	-60.890	-9.870	0.890	-19.110	41.780

Operating mode		DH5, Hopping ON					
Freq. [MHz]	Factor [dB]	Band edge Emission		In-band Emission		Limit [dBm]	Margin [dB]
		Reading Level [dBm]	Emission Level [dBm]	Reading Level [dBm]	Emission Level [dBm]		
2400.00	10.74	-71.482	-60.742	-8.066	2.674	-17.326	43.416
2483.50	10.76	-72.864	-62.104	-10.315	0.445	-19.555	42.549

Operating mode		2-DH5, Hopping OFF					
Freq. [MHz]	Factor [dB]	Band edge Emission		In-band Emission		Limit [dBm]	Margin [dB]
		Reading Level [dBm]	Emission Level [dBm]	Reading Level [dBm]	Emission Level [dBm]		
2400.00	10.74	-59.345	-48.605	-9.749	0.991	-19.009	29.596
2483.50	10.76	-69.429	-58.669	-11.665	-0.905	-20.905	37.764

Operating mode		2-DH5, Hopping ON					
Freq. [MHz]	Factor [dB]	Band edge Emission		In-band Emission		Limit [dBm]	Margin [dB]
		Reading Level [dBm]	Emission Level [dBm]	Reading Level [dBm]	Emission Level [dBm]		
2400.00	10.74	-62.918	-52.178	-9.766	0.974	-19.026	33.152
2483.50	10.76	-70.403	-59.643	-13.842	-3.082	-23.082	36.561

Operating mode		3-DH5, Hopping OFF					
Freq. [MHz]	Factor [dB]	Band edge Emission		In-band Emission		Limit [dBm]	Margin [dB]
		Reading Level [dBm]	Emission Level [dBm]	Reading Level [dBm]	Emission Level [dBm]		
2400.00	10.74	-57.292	-46.552	-9.708	1.032	-18.968	27.584
2483.50	10.76	-67.619	-56.859	-11.735	-0.975	-20.975	35.884

Operating mode		3-DH5, Hopping ON					
Freq. [MHz]	Factor [dB]	Band edge Emission		In-band Emission		Limit [dBm]	Margin [dB]
		Reading Level [dBm]	Emission Level [dBm]	Reading Level [dBm]	Emission Level [dBm]		
2400.00	10.74	-61.209	-50.469	-10.594	0.146	-19.854	30.615
2483.50	10.76	-70.812	-60.052	-12.190	-1.430	-21.430	38.622

Spectrum Plots
See ANNEX A.6

9.8 Conducted Spurious Emissions

Regulations	FCC Part15C §15.247 (d) RSS-247 5.5
Test Method/Guide	ANSI C63.10-2013 clause 7.8.8

Test Procedure

1. The EUT and test instrument were set up as shown on section 10.1.
2. Adjust the measurement instrument for the following setting:

RBW	:	100 kHz
VBW	:	300 kHz
Span	:	Set span to encompass the spectrum to be examined
Detector	:	Peak
Sweep Time	:	Auto
Trace mode	:	Max Hold, Allow trace to fully stabilize.
3. Use the marker function to ensure that the amplitude of all unwanted emissions outside of the authorized frequency band is attenuated by at least the minimum requirements specified.

Spectrum Plots

See ANNEX A.7

Location	Matsuda No.1 Test Site
Test date	September 29, 2023
Temperature	26.0 [degree C]
Humidity variation	68 [%]
Test Engineer	Kenji Kitta

9.9 AC Conducted Emissions

Regulations	FCC Part15C §15.207 RSS-Gen 7.2, 8.8
Test Method/Guide	ANSI C63.10-2013 clause 6.2

Test Procedure

1. The EUT and test instrument were set up as shown on section 10.3.
2. The spectrum analyzer is controlled by the computer program to sweep the frequency range to be measured, then spectrum chart is plotted out to find the worst emission.

At least six highest spectrum are measured in quasi-peak and average (if necessary) using the CISPR Receiver.

3. Adjust the test instrument for the following setting:

Frequency	Instruments	Detector	RBW	VBW
0.15 – 30 MHz	CISPR Receiver	QP	9 kHz	N/A
		AVG		

6. Measurement data correction;

Emission Level [dBuV] = Reading [dBuV] + Factor [dB]

Margin [dB] = Limit [dBuV] – Emission Level [dBuV]

* Factor = LISN Factor + Cable loss + Attenuator

Test Result

Test date	Matsuda No.2 Test Site
Location	Oct. 12, 2023
Temperature	23.3 [degree C]
Humidity variation	51 [%]
Test Engineer	Daichi Mitsunaga

Operating mode			DH5, 2402 MHz, Hopping ON								
No.	Freq [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.2264	QuasiPeak	11.6	16.7	10.1	10.2	21.7	26.9	62.6	40.9	35.7
2	0.2264	Average	10.0	11.6	10.1	10.2	20.1	21.8	52.6	32.5	30.8
3	0.3395	QuasiPeak	14.6	15.3	10.2	10.3	24.8	25.6	59.2	34.4	33.6
4	0.3395	Average	14.4	15.2	10.2	10.3	24.6	25.5	49.2	24.6	23.7
5	0.3585	QuasiPeak	13.9	15.1	10.2	10.3	24.1	25.4	58.8	34.7	33.4
6	0.3585	Average	10.5	11.7	10.2	10.3	20.7	22.0	48.8	28.1	26.8
7	0.5672	QuasiPeak	6.3	8.1	10.2	10.3	16.5	18.4	56.0	39.5	37.6
8	0.5672	Average	5.8	7.7	10.2	10.3	16.0	18.0	46.0	30.0	28.0
9	14.1817	QuasiPeak	16.8	16.7	11.2	11.4	28.0	28.1	60.0	32.0	31.9
10	14.1817	Average	3.7	3.8	11.2	11.4	14.9	15.2	50.0	35.1	34.8
11	15.9869	QuasiPeak	16.0	16.3	11.2	11.4	27.2	27.7	60.0	32.8	32.3
12	15.9869	Average	4.1	3.8	11.2	11.4	15.3	15.2	50.0	34.7	34.8

Test date	Matsuda No.2 Test Site
Location	Oct. 12, 2023
Temperature	23.3 [degree C]
Humidity variation	51 [%]
Test Engineer	Daichi Mitsunaga

Operating mode			DH5, 2441 MHz, Hopping ON								
No.	Freq [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.2264	QuasiPeak	12.5	16.1	10.1	10.2	22.6	26.3	62.6	40.0	36.3
2	0.2264	Average	11.9	11.0	10.1	10.2	22.0	21.2	52.6	30.6	31.4
3	0.3395	QuasiPeak	13.1	13.9	10.2	10.3	23.3	24.2	59.2	35.9	35.0
4	0.3395	Average	12.0	12.8	10.2	10.3	22.2	23.1	49.2	27.0	26.1
5	0.3585	QuasiPeak	13.7	14.7	10.2	10.3	23.9	25.0	58.8	34.9	33.8
6	0.3585	Average	10.1	11.1	10.2	10.3	20.3	21.4	48.8	28.5	27.4
7	0.5672	QuasiPeak	4.2	6.2	10.2	10.3	14.4	16.5	56.0	41.6	39.5
8	0.5672	Average	1.3	3.3	10.2	10.3	11.5	13.6	46.0	34.5	32.4
9	14.1817	QuasiPeak	13.8	13.2	11.2	11.4	25.0	24.6	60.0	35.0	35.4
10	14.1817	Average	3.8	2.9	11.2	11.4	15.0	14.3	50.0	35.0	35.7
11	15.9869	QuasiPeak	15.7	15.5	11.2	11.4	26.9	26.9	60.0	33.1	33.1
12	15.9869	Average	3.7	4.2	11.2	11.4	14.9	15.6	50.0	35.1	34.4

Test date	Matsuda No.2 Test Site
Location	Oct. 12, 2023
Temperature	23.3 [degree C]
Humidity variation	51 [%]
Test Engineer	Daichi Mitsunaga

Operating mode			DH5, 2480 MHz, Hopping ON								
No.	Freq [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.2264	QuasiPeak	11.7	16.2	10.1	10.2	21.8	26.4	62.6	40.8	36.2
2	0.2264	Average	9.9	10.0	10.1	10.2	20.0	20.2	52.6	32.6	32.4
3	0.3395	QuasiPeak	14.4	15.1	10.2	10.3	24.6	25.4	59.2	34.6	33.8
4	0.3395	Average	14.1	14.1	10.2	10.3	24.3	24.4	49.2	24.9	24.8
5	0.3585	QuasiPeak	13.9	14.9	10.2	10.3	24.1	25.2	58.8	34.7	33.6
6	0.3585	Average	10.6	10.6	10.2	10.3	20.8	20.9	48.8	28.0	27.9
7	0.5672	QuasiPeak	6.2	8.1	10.2	10.3	16.4	18.4	56.0	39.6	37.6
8	0.5672	Average	5.7	5.7	10.2	10.3	15.9	16.0	46.0	30.1	30.0
9	14.1817	QuasiPeak	17.1	17.0	11.2	11.4	28.3	28.4	60.0	31.7	31.6
10	14.1817	Average	3.4	3.5	11.2	11.4	14.6	14.9	50.0	35.4	35.1
11	15.9869	QuasiPeak	15.5	15.9	11.2	11.4	26.7	27.3	60.0	33.3	32.7
12	15.9869	Average	3.8	2.8	11.2	11.4	15.0	14.2	50.0	35.0	35.8

Test date	Matsuda No.2 Test Site
Location	Oct. 12, 2023
Temperature	23.3 [degree C]
Humidity variation	51 [%]
Test Engineer	Daichi Mitsunaga

Operating mode			2-DH5, 2402 MHz, Hopping ON								
No.	Freq [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.2264	QuasiPeak	17.0	16.5	10.1	10.2	27.1	26.7	62.6	35.5	35.9
2	0.2264	Average	10.0	11.6	10.1	10.2	20.1	21.8	52.6	32.5	30.8
3	0.3395	QuasiPeak	14.6	15.3	10.2	10.3	24.8	25.6	59.2	34.4	33.6
4	0.3395	Average	14.4	15.1	10.2	10.3	24.6	25.4	49.2	24.6	23.8
5	0.3585	QuasiPeak	14.0	15.2	10.2	10.3	24.2	25.5	58.8	34.6	33.3
6	0.3585	Average	10.8	11.9	10.2	10.3	21.0	22.2	48.8	27.8	26.6
7	0.5672	QuasiPeak	6.2	7.9	10.2	10.3	16.4	18.2	56.0	39.6	37.8
8	0.5672	Average	5.6	7.3	10.2	10.3	15.8	17.6	46.0	30.2	28.4
9	14.1817	QuasiPeak	16.1	15.3	11.2	11.4	27.3	26.7	60.0	32.7	33.3
10	14.1817	Average	3.8	1.0	11.2	11.4	15.0	12.4	50.0	35.0	37.6
11	15.9869	QuasiPeak	15.9	14.7	11.2	11.4	27.1	26.1	60.0	32.9	33.9
12	15.9869	Average	4.3	4.1	11.2	11.4	15.5	15.5	50.0	34.5	34.5

Test date	Matsuda No.2 Test Site
Location	Oct. 12, 2023
Temperature	23.3 [degree C]
Humidity variation	51 [%]
Test Engineer	Daichi Mitsunaga

Operating mode			2-DH5, 2441 MHz, Hopping ON								
No.	Freq [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.2264	QuasiPeak	11.3	16.2	10.1	10.2	21.4	26.4	62.6	41.2	36.2
2	0.2264	Average	10.0	11.5	10.1	10.2	20.1	21.7	52.6	32.5	30.9
3	0.3395	QuasiPeak	14.5	15.3	10.2	10.3	24.7	25.6	59.2	34.5	33.6
4	0.3395	Average	14.3	15.1	10.2	10.3	24.5	25.4	49.2	24.7	23.8
5	0.3585	QuasiPeak	14.0	15.1	10.2	10.3	24.2	25.4	58.8	34.6	33.4
6	0.3585	Average	10.8	11.9	10.2	10.3	21.0	22.2	48.8	27.8	26.6
7	0.5672	QuasiPeak	6.1	8.1	10.2	10.3	16.3	18.4	56.0	39.7	37.6
8	0.5672	Average	5.6	7.7	10.2	10.3	15.8	18.0	46.0	30.2	28.0
9	14.1817	QuasiPeak	16.6	16.5	11.2	11.4	27.8	27.9	60.0	32.2	32.1
10	14.1817	Average	4.6	3.5	11.2	11.4	15.8	14.9	50.0	34.2	35.1
11	15.9869	QuasiPeak	16.0	16.2	11.2	11.4	27.2	27.6	60.0	32.8	32.4
12	15.9869	Average	3.8	5.0	11.2	11.4	15.0	16.4	50.0	35.0	33.6

Test date	Matsuda No.2 Test Site
Location	Oct. 12, 2023
Temperature	23.3 [degree C]
Humidity variation	51 [%]
Test Engineer	Daichi Mitsunaga

Operating mode			2-DH5, 2480 MHz, Hopping ON								
No.	Freq [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.2264	QuasiPeak	11.4	16.2	10.1	10.2	21.5	26.4	62.6	41.1	36.2
2	0.2264	Average	9.8	11.5	10.1	10.2	19.9	21.7	52.6	32.7	30.9
3	0.3395	QuasiPeak	14.4	15.2	10.2	10.3	24.6	25.5	59.2	34.6	33.7
4	0.3395	Average	10.7	15.0	10.2	10.3	20.9	25.3	49.2	28.3	23.9
5	0.3585	QuasiPeak	13.9	15.0	10.2	10.3	24.1	25.3	58.8	34.7	33.5
6	0.3585	Average	10.7	11.7	10.2	10.3	20.9	22.0	48.8	27.9	26.8
7	0.5672	QuasiPeak	6.1	8.0	10.2	10.3	16.3	18.3	56.0	39.7	37.7
8	0.5672	Average	5.5	7.6	10.2	10.3	15.7	17.9	46.0	30.3	28.1
9	14.1817	QuasiPeak	16.7	16.4	11.2	11.4	27.9	27.8	60.0	32.1	32.2
10	14.1817	Average	5.1	3.6	11.2	11.4	16.3	15.0	50.0	33.7	35.0
11	15.9869	QuasiPeak	16.1	16.2	11.2	11.4	27.3	27.6	60.0	32.7	32.4
12	15.9869	Average	4.2	3.8	11.2	11.4	15.4	15.2	50.0	34.6	34.8

Test date	Matsuda No.2 Test Site
Location	Oct. 12, 2023
Temperature	23.3 [degree C]
Humidity variation	51 [%]
Test Engineer	Daichi Mitsunaga

Operating mode			3-DH5, 2402 MHz, Hopping ON								
No.	Freq [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.2264	QuasiPeak	11.4	16.3	10.1	10.2	21.5	26.5	62.6	41.1	36.1
2	0.2264	Average	10.0	11.6	10.1	10.2	20.1	21.8	52.6	32.5	30.8
3	0.3395	QuasiPeak	14.5	15.3	10.2	10.3	24.7	25.6	59.2	34.5	33.6
4	0.3395	Average	14.3	15.1	10.2	10.3	24.5	25.4	49.2	24.7	23.8
5	0.3585	QuasiPeak	14.0	15.2	10.2	10.3	24.2	25.5	58.8	34.6	33.3
6	0.3585	Average	10.8	11.9	10.2	10.3	21.0	22.2	48.8	27.8	26.6
7	0.5672	QuasiPeak	6.2	8.0	10.2	10.3	16.4	18.3	56.0	39.6	37.7
8	0.5672	Average	5.7	7.5	10.2	10.3	15.9	17.8	46.0	30.1	28.2
9	14.1817	QuasiPeak	16.3	15.9	11.2	11.4	27.5	27.3	60.0	32.5	32.7
10	14.1817	Average	4.0	3.8	11.2	11.4	15.2	15.2	50.0	34.8	34.8
11	15.9869	QuasiPeak	15.6	15.7	11.2	11.4	26.8	27.1	60.0	33.2	32.9
12	15.9869	Average	5.6	4.8	11.2	11.4	16.8	16.2	50.0	33.2	33.8

Test date	Matsuda No.2 Test Site
Location	Oct. 12, 2023
Temperature	23.3 [degree C]
Humidity variation	51 [%]
Test Engineer	Daichi Mitsunaga

Operating mode			3-DH5, 2441 MHz, Hopping ON								
No.	Freq [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.2264	QuasiPeak	11.4	16.3	10.1	10.2	21.5	26.5	62.6	41.1	36.1
2	0.2264	Average	10.0	11.5	10.1	10.2	20.1	21.7	52.6	32.5	30.9
3	0.3395	QuasiPeak	14.5	15.3	10.2	10.3	24.7	25.6	59.2	34.5	33.6
4	0.3395	Average	14.4	15.1	10.2	10.3	24.6	25.4	49.2	24.6	23.8
5	0.3585	QuasiPeak	14.1	15.2	10.2	10.3	24.3	25.5	58.8	34.5	33.3
6	0.3585	Average	10.8	11.9	10.2	10.3	21.0	22.2	48.8	27.8	26.6
7	0.5672	QuasiPeak	6.2	8.1	10.2	10.3	16.4	18.4	56.0	39.6	37.6
8	0.5672	Average	5.6	7.6	10.2	10.3	15.8	17.9	46.0	30.2	28.1
9	14.1817	QuasiPeak	16.2	15.9	11.2	11.4	27.4	27.3	60.0	32.6	32.7
10	14.1817	Average	4.8	3.9	11.2	11.4	16.0	15.3	50.0	34.0	34.7
11	15.9869	QuasiPeak	15.5	15.8	11.2	11.4	26.7	27.2	60.0	33.3	32.8
12	15.9869	Average	4.8	4.2	11.2	11.4	16.0	15.6	50.0	34.0	34.4

Test date	Matsuda No.2 Test Site
Location	Oct. 12, 2023
Temperature	23.3 [degree C]
Humidity variation	51 [%]
Test Engineer	Daichi Mitsunaga

Operating mode			3-DH5, 2480 MHz, Hopping ON								
No.	Freq [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.2264	QuasiPeak	11.2	16.0	10.1	10.2	21.3	26.2	62.6	41.3	36.4
2	0.2264	Average	9.8	11.4	10.1	10.2	19.9	21.6	52.6	32.7	31.0
3	0.3395	QuasiPeak	14.3	15.1	10.2	10.3	24.5	25.4	59.2	34.7	33.8
4	0.3395	Average	14.2	15.0	10.2	10.3	24.4	25.3	49.2	24.8	23.9
5	0.3585	QuasiPeak	13.8	14.9	10.2	10.3	24.0	25.2	58.8	34.8	33.6
6	0.3585	Average	10.6	11.7	10.2	10.3	20.8	22.0	48.8	28.0	26.8
7	0.5672	QuasiPeak	6.0	7.9	10.2	10.3	16.2	18.2	56.0	39.8	37.8
8	0.5672	Average	5.5	7.5	10.2	10.3	15.7	17.8	46.0	30.3	28.2
9	14.1817	QuasiPeak	16.3	16.2	11.2	11.4	27.5	27.6	60.0	32.5	32.4
10	14.1817	Average	3.6	3.8	11.2	11.4	14.8	15.2	50.0	35.2	34.8
11	15.9869	QuasiPeak	15.9	16.2	11.2	11.4	27.1	27.6	60.0	32.9	32.4
12	15.9869	Average	4.0	4.1	11.2	11.4	15.2	15.5	50.0	34.8	34.5

Test date	Matsuda No.2 Test Site
Location	Oct. 12, 2023
Temperature	23.3 [degree C]
Humidity variation	51 [%]
Test Engineer	Daichi Mitsunaga

Operating mode			Reception , 2402 MHz								
No.	Freq [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.2264	QuasiPeak	11.4	16.2	10.1	10.2	21.5	26.4	62.6	41.1	36.2
2	0.2264	Average	9.8	11.5	10.1	10.2	19.9	21.7	52.6	32.7	30.9
3	0.3395	QuasiPeak	14.3	15.1	10.2	10.3	24.5	25.4	59.2	34.7	33.8
4	0.3395	Average	14.2	15.0	10.2	10.3	24.4	25.3	49.2	24.8	23.9
5	0.3585	QuasiPeak	13.6	14.8	10.2	10.3	23.8	25.1	58.8	35.0	33.7
6	0.3585	Average	10.5	11.6	10.2	10.3	20.7	21.9	48.8	28.1	26.9
7	0.5672	QuasiPeak	6.0	8.1	10.2	10.3	16.2	18.4	56.0	39.8	37.6
8	0.5672	Average	5.7	7.8	10.2	10.3	15.9	18.1	46.0	30.1	27.9
9	14.1817	QuasiPeak	17.5	17.4	11.2	11.4	28.7	28.8	60.0	31.3	31.2
10	14.1817	Average	6.1	5.6	11.2	11.4	17.3	17.0	50.0	32.7	33.0
11	15.9869	QuasiPeak	16.3	16.5	11.2	11.4	27.5	27.9	60.0	32.5	32.1
12	15.9869	Average	2.8	3.2	11.2	11.4	14.0	14.6	50.0	36.0	35.4

Test date	Matsuda No.2 Test Site
Location	Oct. 12, 2023
Temperature	23.3 [degree C]
Humidity variation	51 [%]
Test Engineer	Daichi Mitsunaga

Operating mode			Reception , 2441 MHz								
No.	Freq [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.2264	QuasiPeak	11.6	16.2	10.1	10.2	21.7	26.4	62.6	40.9	36.2
2	0.2264	Average	9.8	11.5	10.1	10.2	19.9	21.7	52.6	32.7	30.9
3	0.3395	QuasiPeak	14.4	15.2	10.2	10.3	24.6	25.5	59.2	34.6	33.7
4	0.3395	Average	14.2	15.0	10.2	10.3	24.4	25.3	49.2	24.8	23.9
5	0.3585	QuasiPeak	13.8	14.8	10.2	10.3	24.0	25.1	58.8	34.8	33.7
6	0.3585	Average	10.4	11.5	10.2	10.3	20.6	21.8	48.8	28.2	27.0
7	0.5672	QuasiPeak	6.2	8.1	10.2	10.3	16.4	18.4	56.0	39.6	37.6
8	0.5672	Average	5.7	7.8	10.2	10.3	15.9	18.1	46.0	30.1	27.9
9	14.1817	QuasiPeak	17.4	17.3	11.2	11.4	28.6	28.7	60.0	31.4	31.3
10	14.1817	Average	6.1	5.8	11.2	11.4	17.3	17.2	50.0	32.7	32.8
11	15.9869	QuasiPeak	16.3	16.4	11.2	11.4	27.5	27.8	60.0	32.5	32.2
12	15.9869	Average	3.1	3.7	11.2	11.4	14.3	15.1	50.0	35.7	34.9

Test date	Matsuda No.2 Test Site
Location	Oct. 12, 2023
Temperature	23.3 [degree C]
Humidity variation	51 [%]
Test Engineer	Daichi Mitsunaga

Operating mode			Reception , 2480 MHz								
No.	Freq [MHz]	Detector	Reading [dBuV]		Factor [dB]		Emission Level [dBuV]		Limit [dBuV]	Margin [dB]	
			L1	L2	L1	L2	L1	L2		L1	L2
1	0.2264	QuasiPeak	11.4	16.3	10.1	10.2	21.5	26.5	62.6	41.1	36.1
2	0.2264	Average	9.9	11.5	10.1	10.2	20.0	21.7	52.6	32.6	30.9
3	0.3395	QuasiPeak	14.4	15.1	10.2	10.3	24.6	25.4	59.2	34.6	33.8
4	0.3395	Average	14.2	15.0	10.2	10.3	24.4	25.3	49.2	24.8	23.9
5	0.3585	QuasiPeak	13.7	14.9	10.2	10.3	23.9	25.2	58.8	34.9	33.6
6	0.3585	Average	10.4	11.6	10.2	10.3	20.6	21.9	48.8	28.2	26.9
7	0.5672	QuasiPeak	6.2	7.9	10.2	10.3	16.4	18.2	56.0	39.6	37.8
8	0.5672	Average	5.8	7.7	10.2	10.3	16.0	18.0	46.0	30.0	28.0
9	14.1817	QuasiPeak	17.6	17.4	11.2	11.4	28.8	28.8	60.0	31.2	31.2
10	14.1817	Average	6.6	6.5	11.2	11.4	17.8	17.9	50.0	32.2	32.1
11	15.9869	QuasiPeak	16.3	16.5	11.2	11.4	27.5	27.9	60.0	32.5	32.1
12	15.9869	Average	4.2	4.1	11.2	11.4	15.4	15.5	50.0	34.6	34.5

9.10 Receiver Spurious Emissions

Regulations	RSS-Gen 7.3
Test Method/Guide	ANSI C63.10-2013 clause 6.5 and 6.6

Test Procedure

See section 9.6

Test Result

Operating mode	Receive mode, 2402 MHz, EUT axis: X	
Location	Matsuda No.2 Test Site	Matsuda No.1 Test Site
Frequency	30 – 1000 MHz,	1-18 GHz, 18 – 25 GHz
Test date	Oct. 6, 2023	Oct. 5, 2023
Temperature	27.4	19.0 [degree C]
Humidity variation	25	65 [%]
Test Engineer	Daichi Mitsunaga	

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Emission Level [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hori	Vert		Hori	Vert		Hori	Vert
1	111.85	QuasiPeak	21.4	21.6	-8.0	13.4	13.6	43.5	30.1	29.9
2	695.51	QuasiPeak	21.5	21.6	7.4	28.9	29.0	46.0	17.1	17.0
3	1201.00	Peak	40.9	41.0	2.0	42.9	43.0	74.0	31.1	31.0
4	1201.00	Average	27.3	27.4	2.0	29.3	29.4	54.0	24.7	24.6
5	4801.07	Peak	41.2	41.1	13.3	54.5	54.4	74.0	19.5	19.6
6	4801.07	Average	27.2	27.3	13.3	40.5	40.6	54.0	13.5	13.4
7	7206.00	Peak	43.2	43.4	18.1	61.3	61.5	74.0	12.7	12.5
8	7206.00	Average	29.5	29.5	18.1	47.6	47.6	54.0	6.4	6.4
9	9608.00	Peak	43.6	43.5	21.4	65.0	64.9	74.0	9.0	9.1
10	9608.00	Average	30.1	30.0	21.4	51.5	51.4	54.0	2.5	2.6

Any Spurious emissions lower than and higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	Receive mode, 2441 MHz, EUT axis: X		
Location	Matsuda No.2 Test Site	Matsuda No.1 Test Site	
Frequency	30 – 1000 MHz,	1-18 GHz, 18 – 25 GHz	
Test date	Oct. 6, 2023	Oct. 5, 2023	
Temperature	27.4	19.0	[degree C]
Humidity variation	25	65	[%]
Test Engineer	Daichi Mitsunaga		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Emission Level [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hori	Vert		Hori	Vert		Hori	Vert
1	111.85	QuasiPeak	21.5	21.5	-8.0	13.5	13.5	43.5	30.0	30.0
2	695.51	QuasiPeak	21.6	21.6	7.4	29.0	29.0	46.0	17.0	17.0
3	1220.50	Peak	40.3	40.4	2.1	42.4	42.5	74.0	31.6	31.5
4	1220.50	Average	26.8	26.9	2.1	28.9	29.0	54.0	25.1	25.0
5	4878.77	Peak	39.6	40.0	13.4	53.0	53.4	74.0	21.0	20.6
6	4878.77	Average	26.0	26.0	13.4	39.4	39.4	54.0	14.6	14.6
7	7323.00	Peak	43.4	43.7	18.5	61.9	62.2	74.0	12.1	11.8
8	7323.00	Average	29.7	29.7	18.5	48.2	48.2	54.0	5.8	5.8
9	9764.00	Peak	44.3	43.8	21.5	65.8	65.3	74.0	8.2	8.7
10	9764.00	Average	30.3	30.3	21.5	51.8	51.8	54.0	2.2	2.2

Any Spurious emissions lower than and higher than the frequency reported in the table above were not detected during the measurement.

Operating mode	Receive mode, 2480 MHz, EUT axis: X		
Location	Matsuda No.2 Test Site	Matsuda No.1 Test Site	
Frequency	30 – 1000 MHz,	1-18 GHz, 18 – 25 GHz	
Test date	Oct. 6, 2023	Oct. 5, 2023	
Temperature	27.4	19.0	[degree C]
Humidity variation	25	65	[%]
Test Engineer	Daichi Mitsunaga		

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB/m]	Emission Level [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hori	Vert		Hori	Vert		Hori	Vert
1	111.85	QuasiPeak	21.6	21.5	-8.0	13.6	13.5	43.5	29.9	30.0
2	695.51	QuasiPeak	21.5	21.3	7.4	28.9	28.7	46.0	17.1	17.3
3	1240.00	Peak	40.8	40.5	2.3	43.1	42.8	74.0	30.9	31.2
4	1240.00	Average	27.0	27.0	2.3	29.3	29.3	54.0	24.7	24.7
5	4956.88	Peak	39.1	40.0	13.6	52.7	53.6	74.0	21.3	20.4
6	4956.88	Average	25.8	25.8	13.6	39.4	39.4	54.0	14.6	14.6
7	7440.00	Peak	43.7	43.3	19.0	62.7	62.3	74.0	11.3	11.7
8	7440.00	Average	29.9	29.9	19.0	48.9	48.9	54.0	5.1	5.1
9	9920.00	Peak	44.6	44.4	21.8	66.4	66.2	74.0	7.6	7.8
10	9920.00	Average	30.5	30.5	21.8	52.3	52.3	54.0	1.7	1.7

Any Spurious emissions lower than and higher than the frequency reported in the table above were not detected during the measurement.

SECTION 10. LIST AND DIAGRAM OF MEASURING INSTRUMENTS

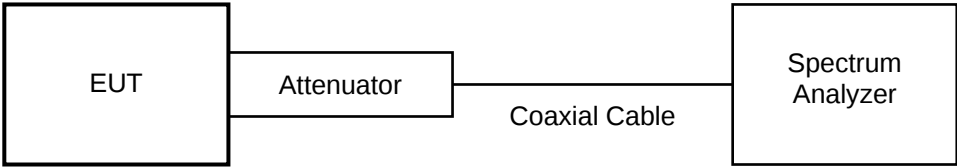
Test instruments are calibrated according to Quality Manual and Calibration Rules of Intertek Japan K.K.

10.1 RF Conducted

Measurement Instruments

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective period
Spectrum Analyzer	N9030A	US51350220	Agilent	1 Y	2023-11-03
10 dB Attenuator	8493C	02627	Agilent	1 Y	2024-07-10
Coaxial Cable	5B-048-98-98-1000	None(ECE0081)	CANDOX Systems	1 Y	2024-07-10

Measurement Equipment Configuration



10.2 Radiated Emission

Measurement Instruments

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective period
Radiated disturbance :Below 30 MHz					
Spectrum Analyzer	N9030A	US51350220	Agilent	1 Y	2023-11-03
Test Receiver	ESR26 (Firmware Ver. 3.46 SP1)	101629	Rohde & Schwarz	1 Y	2024-03-21
Loop Antenna	HFH2-Z2	882964/28	Rohde & Schwarz	1 Y	2023-10-20
Coaxial Cable (M1)	5D-2W(8.0m)	EM0CS012	SUHNER	1 Y	2024-02-13
Radiated disturbance :30 MHz – 1000 MHz					
Broad Band Antenna	VULB9168	111	Schwarzbeck	1 Y	2024-02-16
Amplifier	8447D	2727A05809	Hewlett Packard	1 Y	2024-01-08
Step Attenuator	8494B	2805A14576	Hewlett Packard	1 Y	2024-01-08
6dB Attenuator	MP721B	M54588	ANRITSU	1 Y	2024-02-17
Coaxial Cable (R1)	RG214HF(8.0m)	MTS02R3-1	SUHNER	1 Y	2024-01-08
Coaxial Cable (R2)	12D-SFA(28.0m)	MTS02R3-2	Intertek	1 Y	2024-01-08
Coaxial Cable (R3)	RG214HF(2.0m)	MTS02R3-3	SUHNER	1 Y	2024-01-08
Coaxial Cable (R4)	RG214HF(0.4m)	MTS02R3-4	SUHNER	1 Y	2024-01-08
Coaxial Cable (R5)	RG214HF(0.4m)	MTS02R3-5	SUHNER	1 Y	2024-01-08
Coaxial Cable (R6)	RG214HF(1.5m)	MTS02R3-6	SUHNER	1 Y	2024-01-08
Coaxial Cable (R7)	RG214HF(1.5m)	MTS02R3-7	SUHNER	1 Y	2024-01-08
Coaxial Cable (R8)	RG214HF(1.5m)	MTS02R3-8	SUHNER	1 Y	2024-01-08
Coaxial Cable (R9)	5D-2W(8.0m)	MTS02R3-9	SUHNER	1 Y	2024-01-08
Test Receiver	ESS (Firmware Version 1.08)	844861/008	Rohde & Schwarz	1 Y	2023-11-14
RF Switch(1)	MP59B	M7736	ANRITSU	1 Y	2024-01-08
RF Switch(2)	ACX-150-1	E02301501	Intertek	1 Y	2024-01-08
Site Attenuation	2site	-	-	1 Y	2024-05-07

Radiated disturbance :Above 1000 MHz					
Double Ridged Antenna	3115	2568	EMCO	1 Y	2024-04-16
Amplifier	TPA0118-30	950186	TOYO	1 Y	2024-04-06
6dB Attenuator	6806.17.B	EM0G003	HUBER+SUHNER	1 Y	2024-01-19
Coaxial Cable (R11)	SUCOFLEX 104	808144/4	HUBER+SUHNER	1 Y	2023-11-21
Coaxial Cable (R12)	S04272B/11N/11SMA	38242_1	HUBER+SUHNER	1 Y	2023-11-21
Coaxial Cable (R13)	MWX342	2305H016	Junkosha	1 Y	2024-06-19
Horn Antenna	MLA-18265-J02	16248-01	TSJ	1 Y	2024-03-30
Test Receiver	ESR26 (Firmware Ver. 3.46 SP1)	101629	Rohde & Schwarz	1 Y	2024-03-21
Spectrum Analyzer	N9030A	US51350220	Agilent	1 Y	2023-11-03
SVSWR(1 – 18GHz)	-	-	-	1 Y	2024-09-09
Common					
Testing Software	emiT (Version 3,0,0,0)			N/A	N/A

Measurement Instruments Configurations

Diagram of the measuring instruments (Below 30MHz)



Diagram of the measurement instruments (30-1000 MHz)

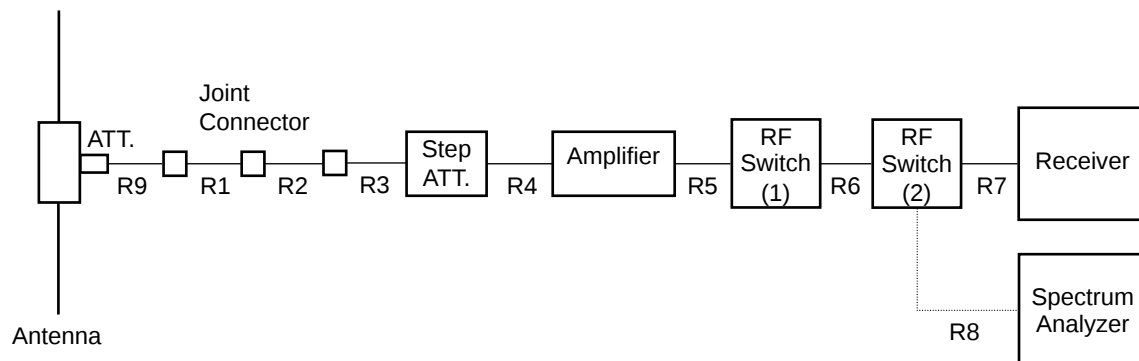


Diagram of the measurement instruments (2000 - 3000 MHz)

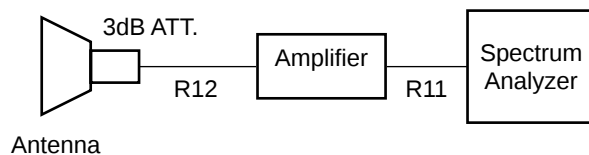


Diagram of the measurement instruments (1000- 2000 and 3000 – 18000 MHz)

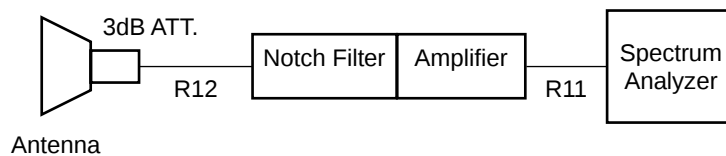
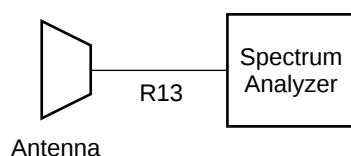
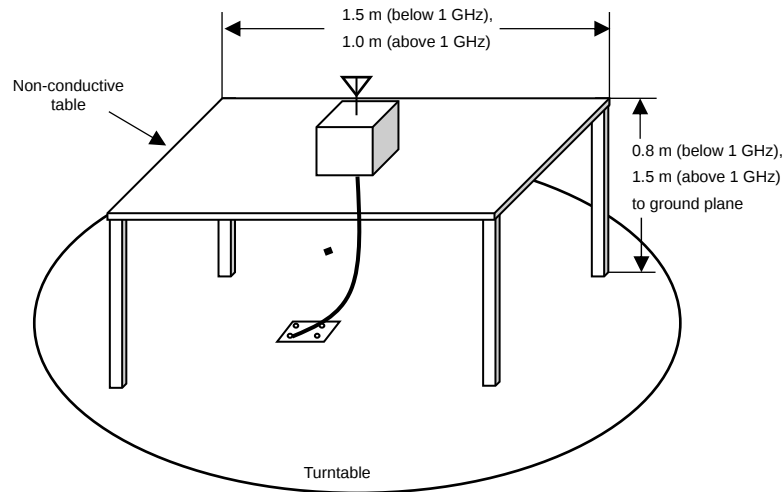


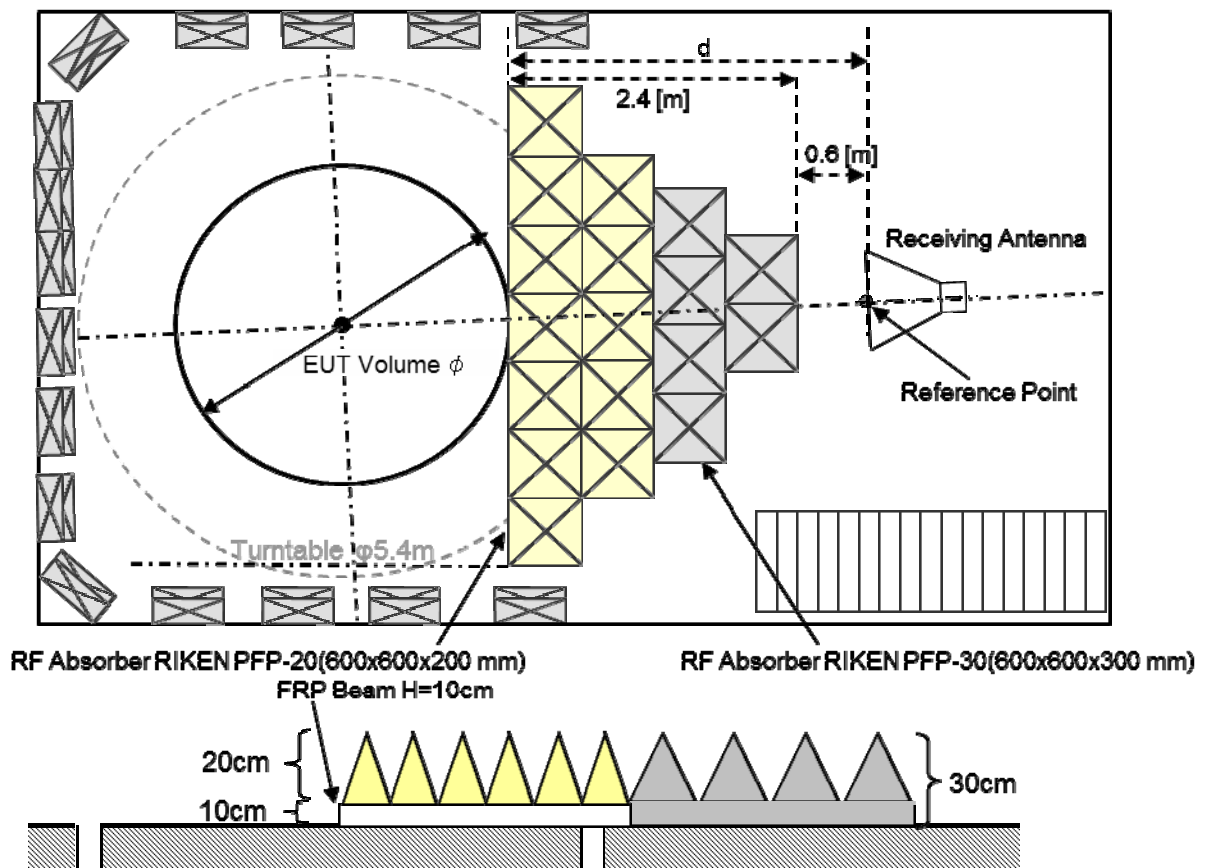
Diagram of the measurement instruments (18000 - 25000 MHz)



EUT set-up as per standard



Absorber placement and Receive Antenna location in Radiated disturbance above 1 GHz

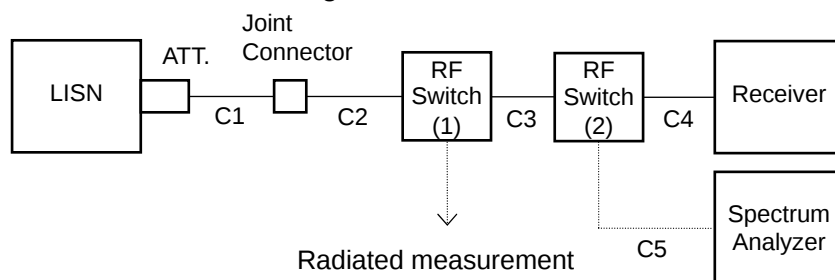


10.3 AC Line Conducted Emission

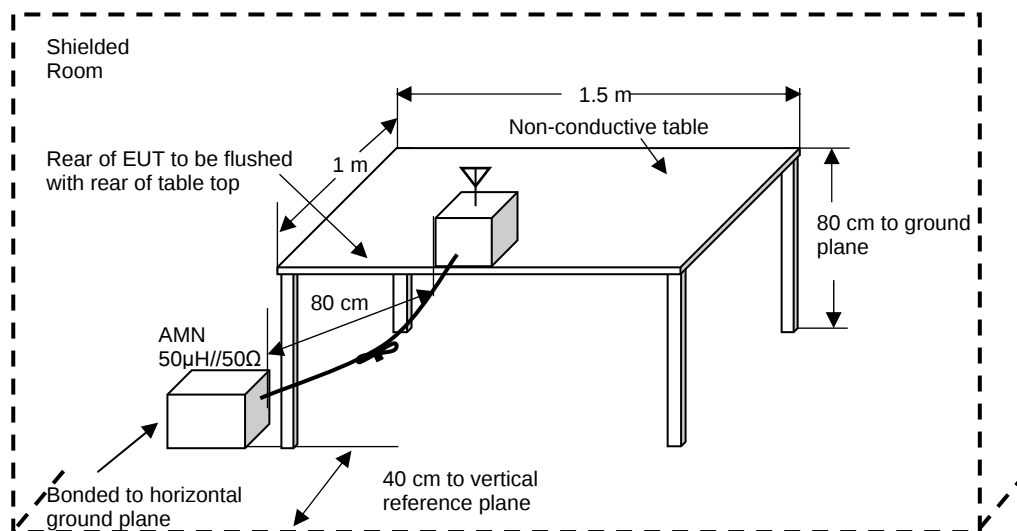
Measurement Instrument

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective period
LISN(EUT)	ESH2-Z5	882395/019	Rohde & Schwarz	1 Y	2024-07-23
10dB LISN Pad	CFA-01	E04AT10B	TAMAGAWA	1 Y	2024-07-23
Coaxial Cable (C1)	3D-2W(7.8m)	MTS02CSR-1	Intertek	1 Y	2024-01-08
Coaxial Cable (C2)	RG-5A/U(12.0m)	MTS02CSR-2	Intertek	1 Y	2024-01-08
Coaxial Cable (C3)	RG214HF(1.5m)	MTS02CSR-3	SUHNER	1 Y	2024-01-08
Coaxial Cable (C4)	RG214HF(1.5m)	MTS02CSR-4	SUHNER	1 Y	2024-01-08
Coaxial Cable (C5)	RG214HF(1.5m)	MTS02CSR-5	SUHNER	1 Y	2024-01-08
Test Receiver	ESR26 (Firmware Ver. 3.46 SP1)	101629	Rohde & Schwarz	1 Y	2024-03-21
Testing Software	emiT (Version 3,0,0,0)			N/A	N/A

Measurement Instruments Configurations



Test setup as per standard



* Reference Ground plane : greater than 2 x 2m

ANNEX

A. HARD COPY OF SPECTRUM PLOTS

A.1 20 dB Bandwidth and 99 % Occupied Bandwidth

DH5

2402 MHz



2-DH5

2402 MHz



2441 MHz



2441 MHz



2480 MHz



2480 MHz

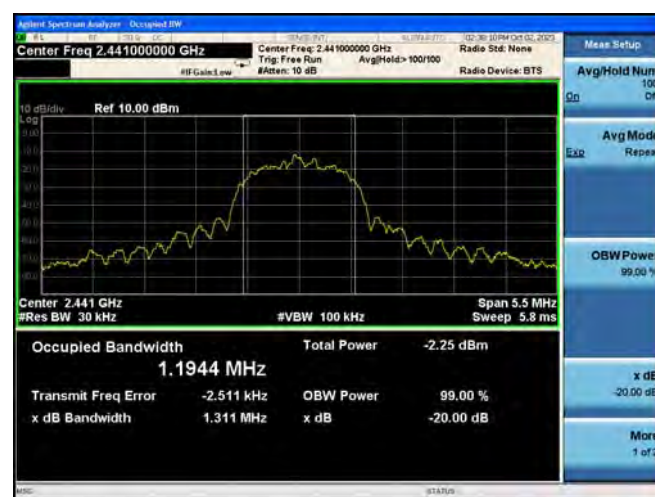


3-DH5

2402 MHz



2441 MHz



2480 MHz



A.2 Maximum Peak Output Power

DH5

2402 MHz



2-DH5

2402 MHz



2441 MHz



2441 MHz



2480 MHz



2480 MHz



3-DH5

2402 MHz



2441 MHz



2480 MHz



A.3 Carrier Frequency Separation

DH5

2402 MHz



2-DH5

2402 MHz



2441 MHz



2441 MHz



2480 MHz



2480 MHz



3-DH5

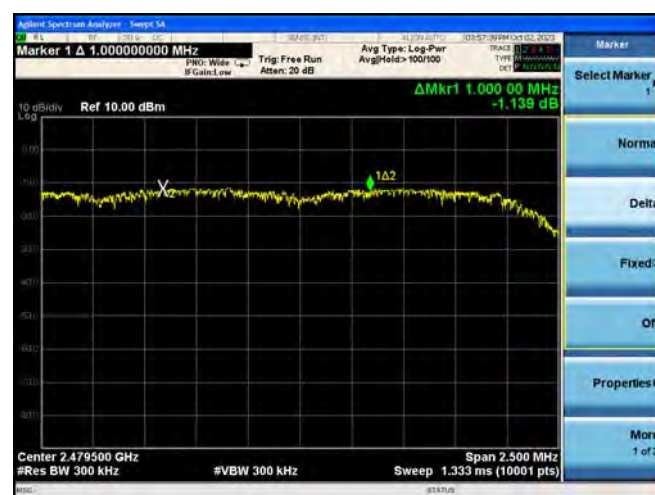
2402 MHz



2441 MHz



2480 MHz



A.4 Number of Hopping Frequency

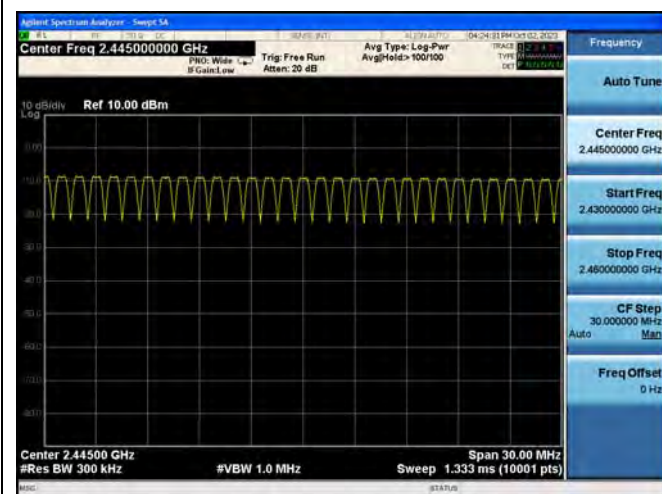
DH5_(2400 MHz – 2430 MHz)



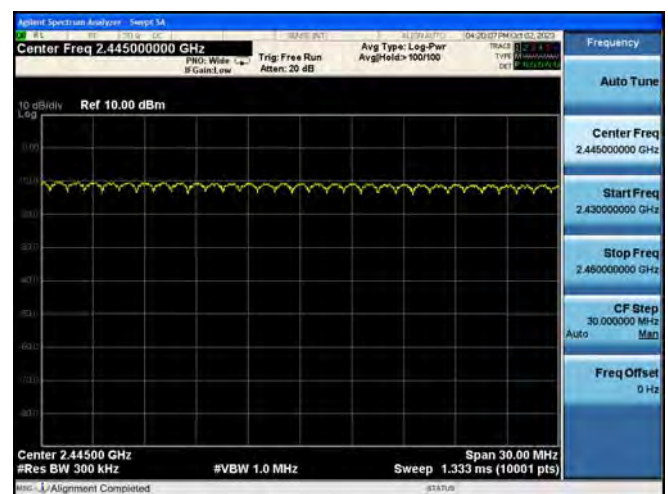
2-DH5_(2400 MHz – 2430 MHz)



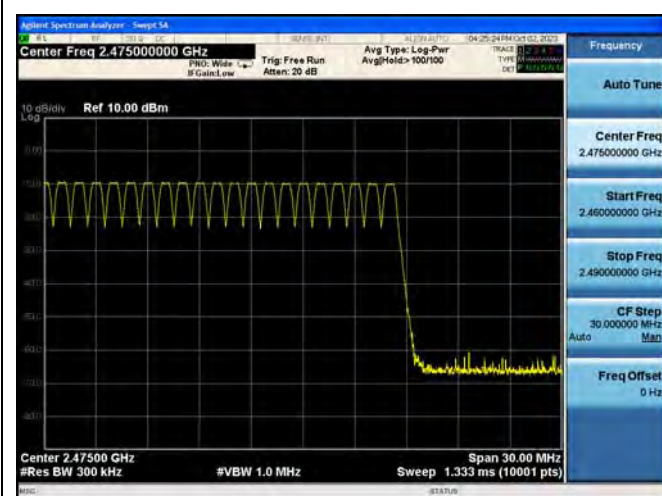
DH5_(2430 MHz – 2460 MHz)



2-DH5_(2430 MHz – 2460 MHz)



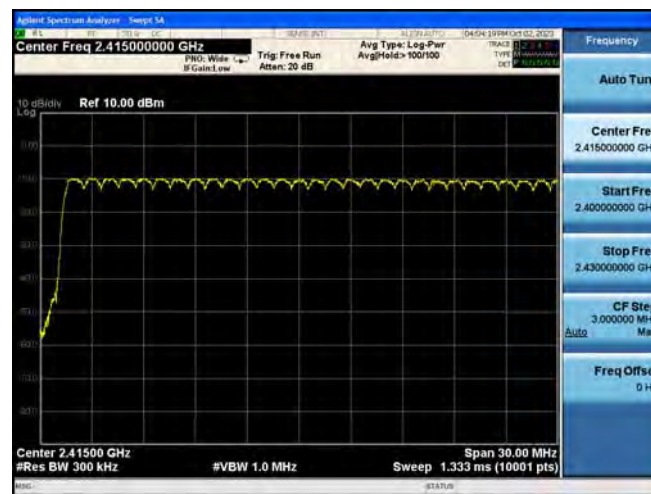
DH5_(2460 MHz – 2490 MHz)



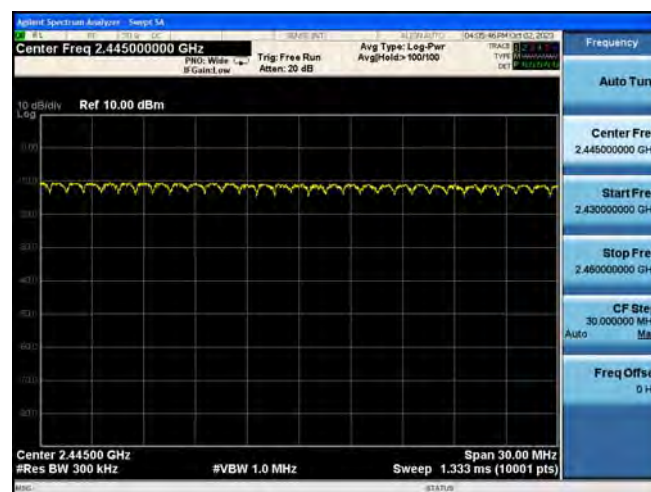
2-DH5_(2460 MHz – 2490 MHz)



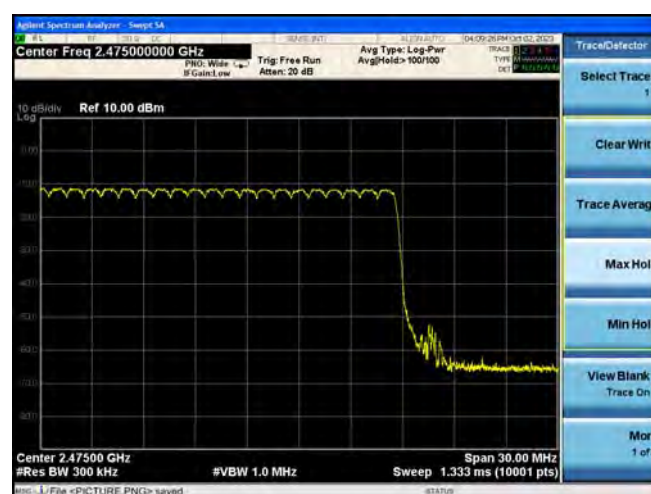
3-DH5_(2400 MHz – 2430 MHz)



3-DH5_(2430 MHz – 2460 MHz)

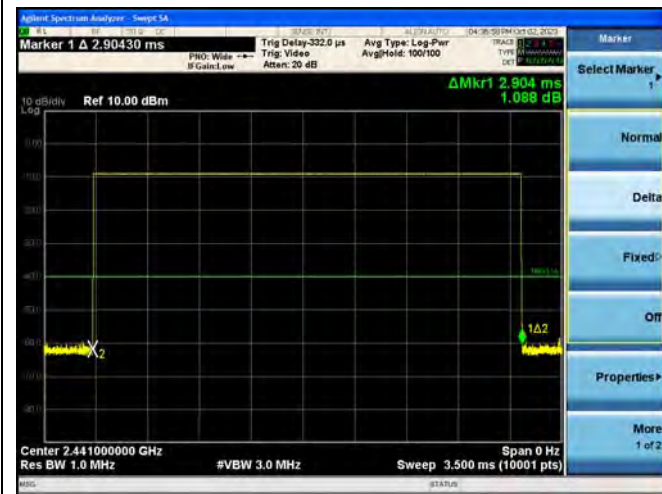


3-DH5_(2460 MHz – 2490 MHz)

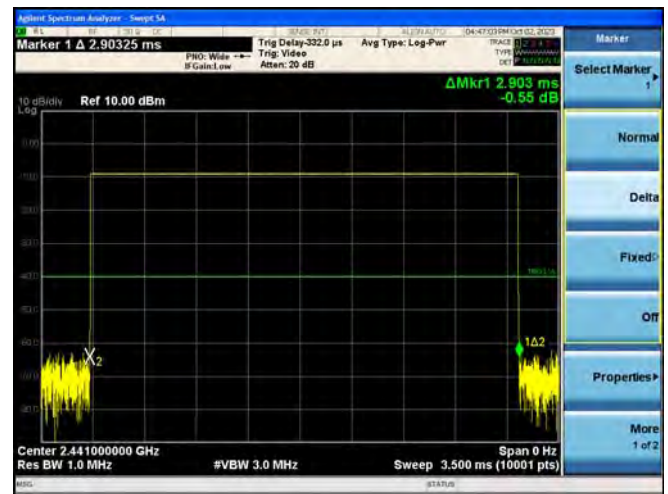


A.5 Time of Occupancy

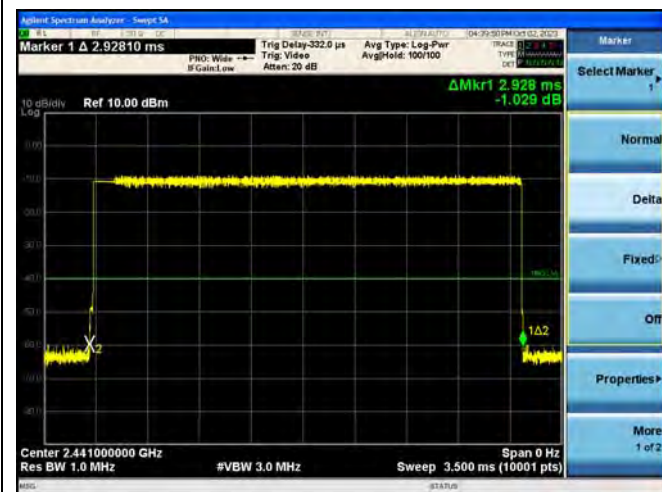
DH5_Normal



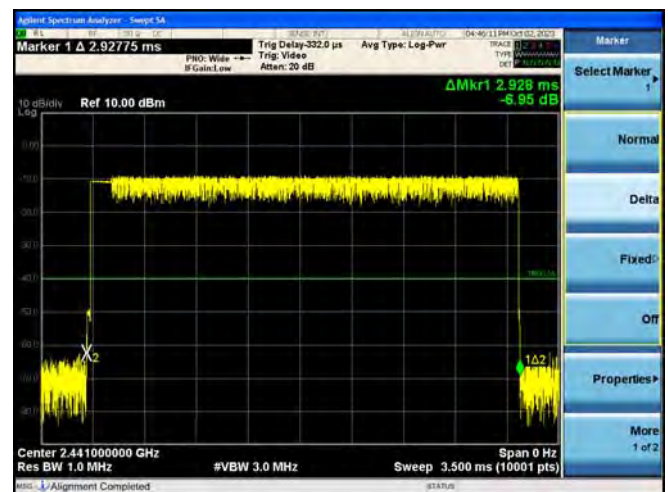
DH5_AFH



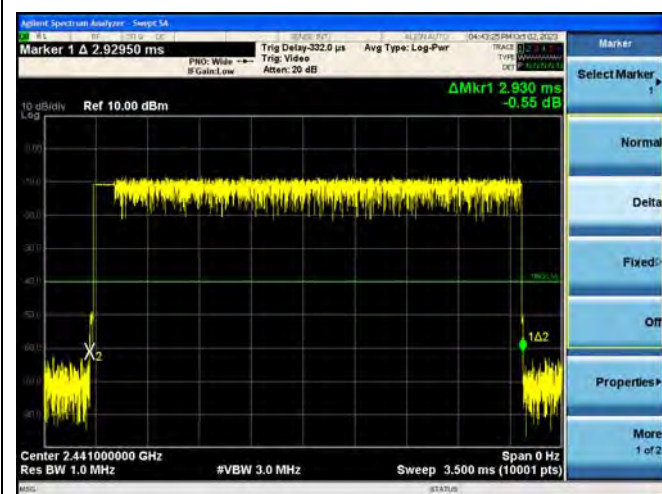
2-DH5_Normal



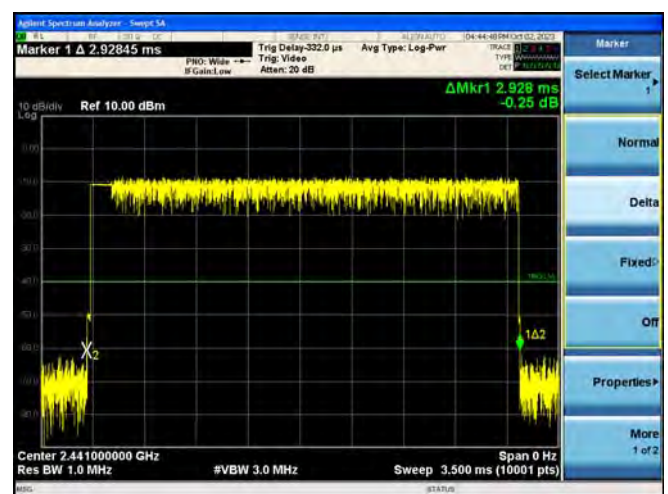
2-DH5_AFH



3-DH5_Normal



3-DH5_AFH



A.6 Band Edge of Authorized Frequency Band

DH5, Hopping OFF

2400 MHz

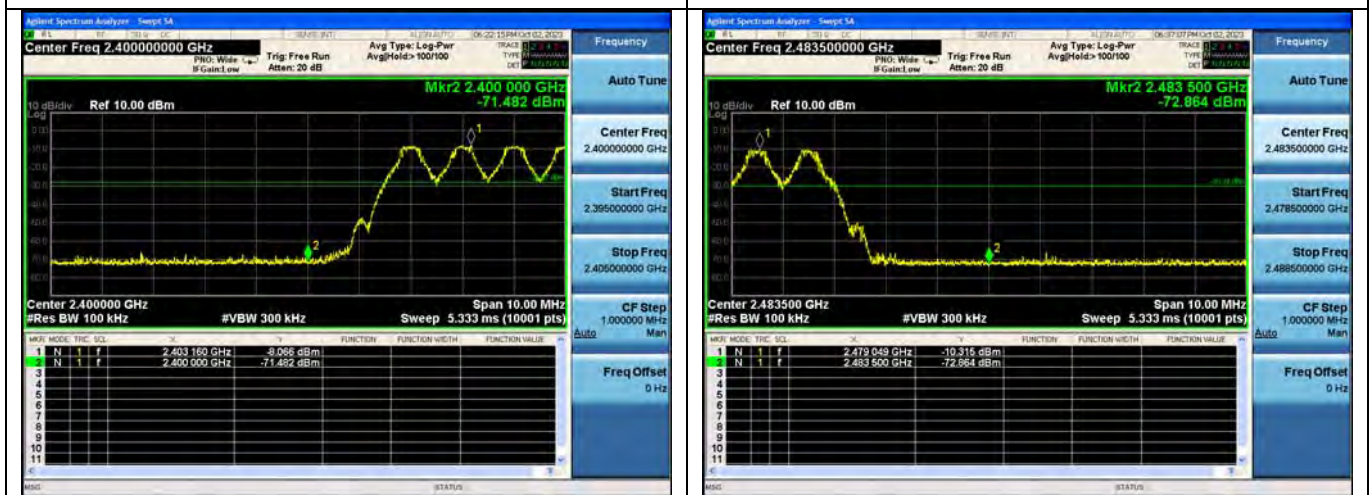
2483.5 MHz



DH5, Hopping ON

2400 MHz

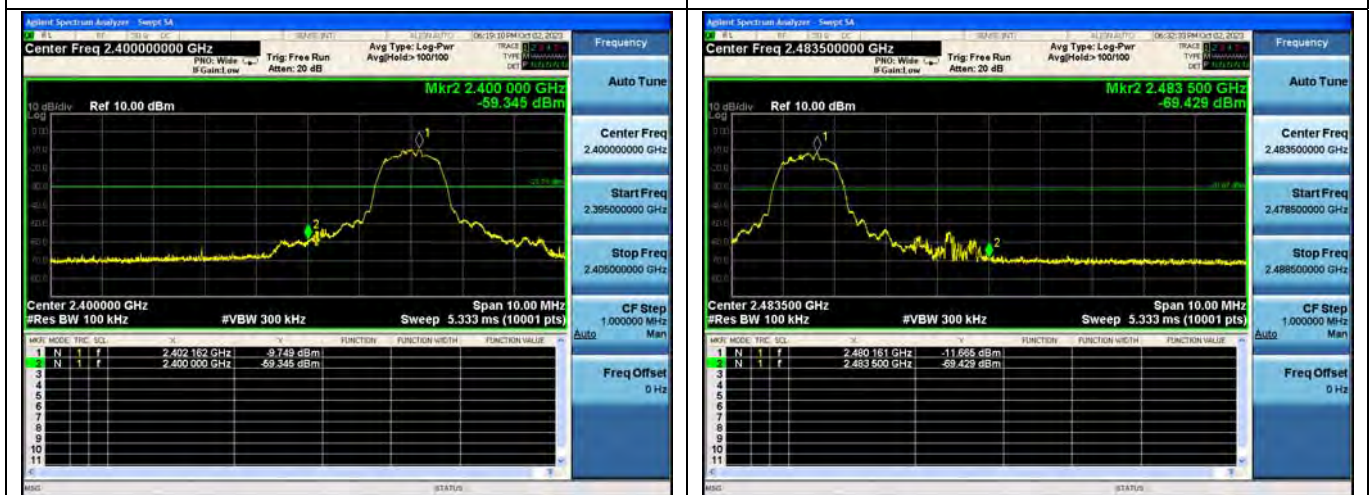
2483.5 MHz



2-DH5, Hopping OFF

2400 MHz

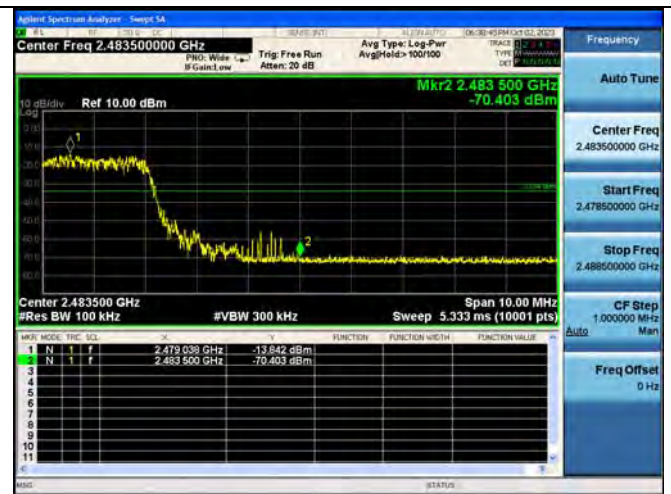
2483.5 MHz



2-DH5, Hopping ON

2400 MHz

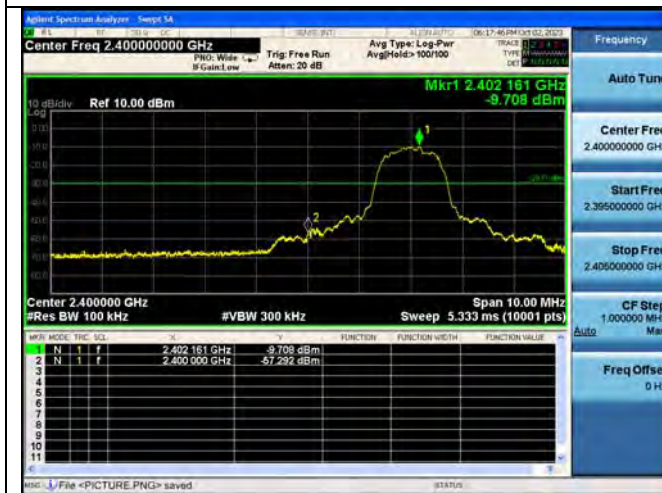
2483.5 MHz



3-DH5, Hopping OFF

2400 MHz

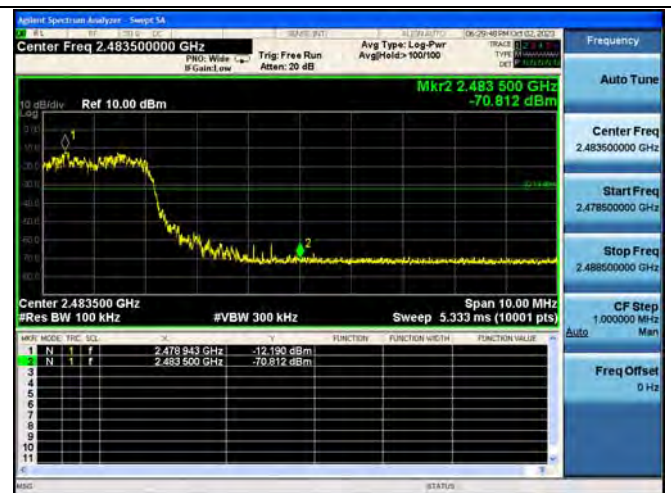
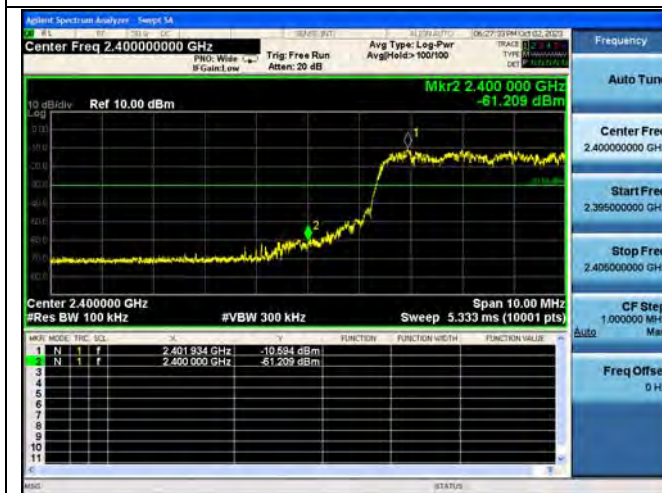
2483.5 MHz



3-DH5, Hopping ON

2400 MHz

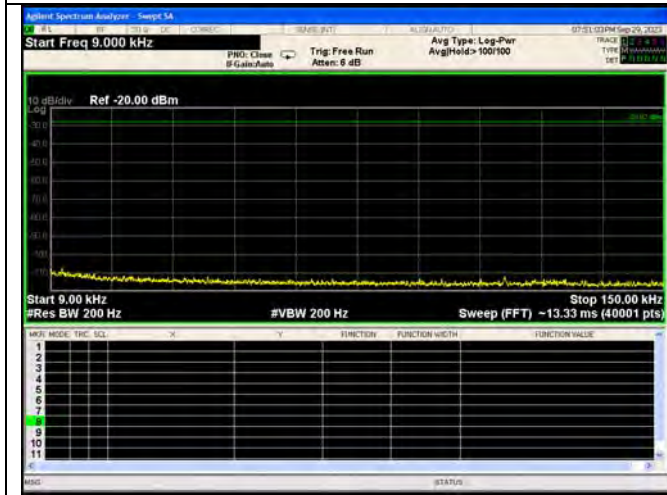
2483.5 MHz



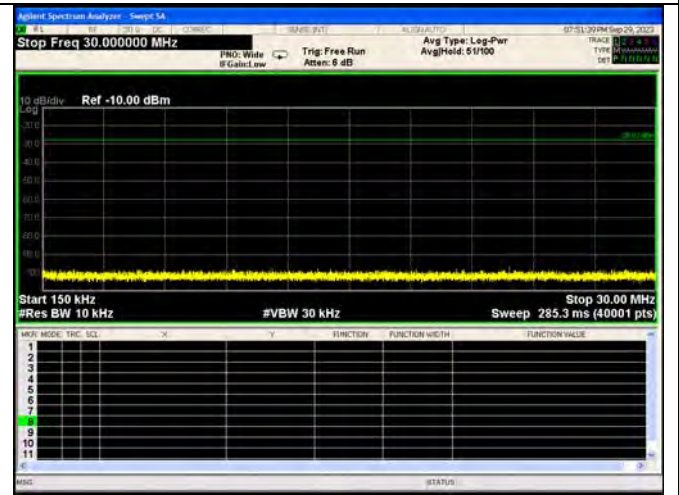
A.7 Spurious RF Conducted Emissions

DH5, Hopping OFF, 2402MHz

0.009 – 0.15 MHz



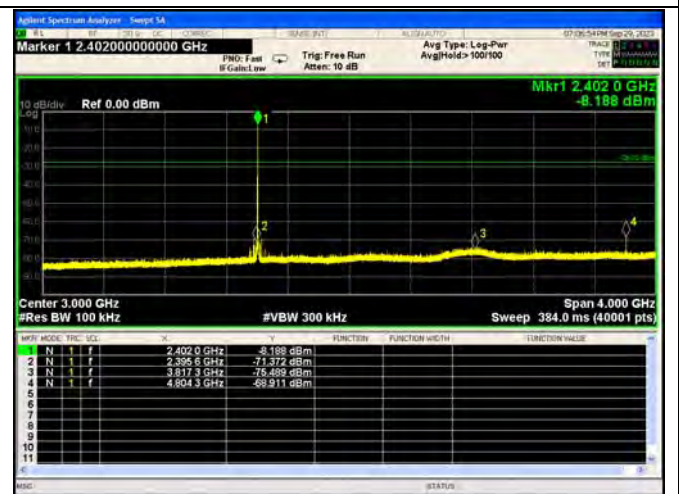
0.15 – 30 MHz



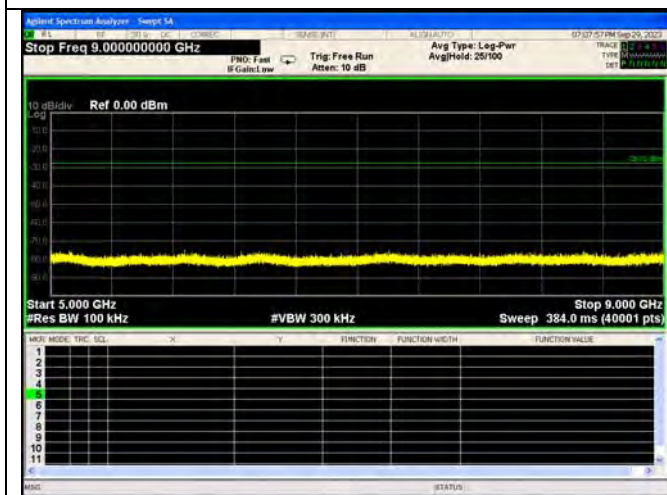
30 – 1000 MHz



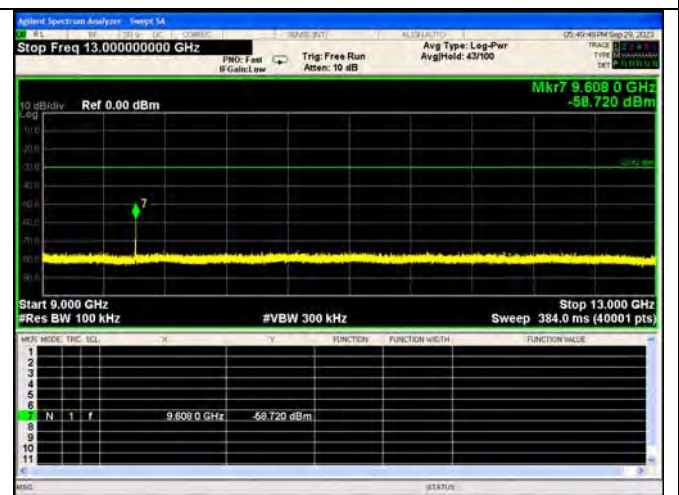
1 – 5 GHz

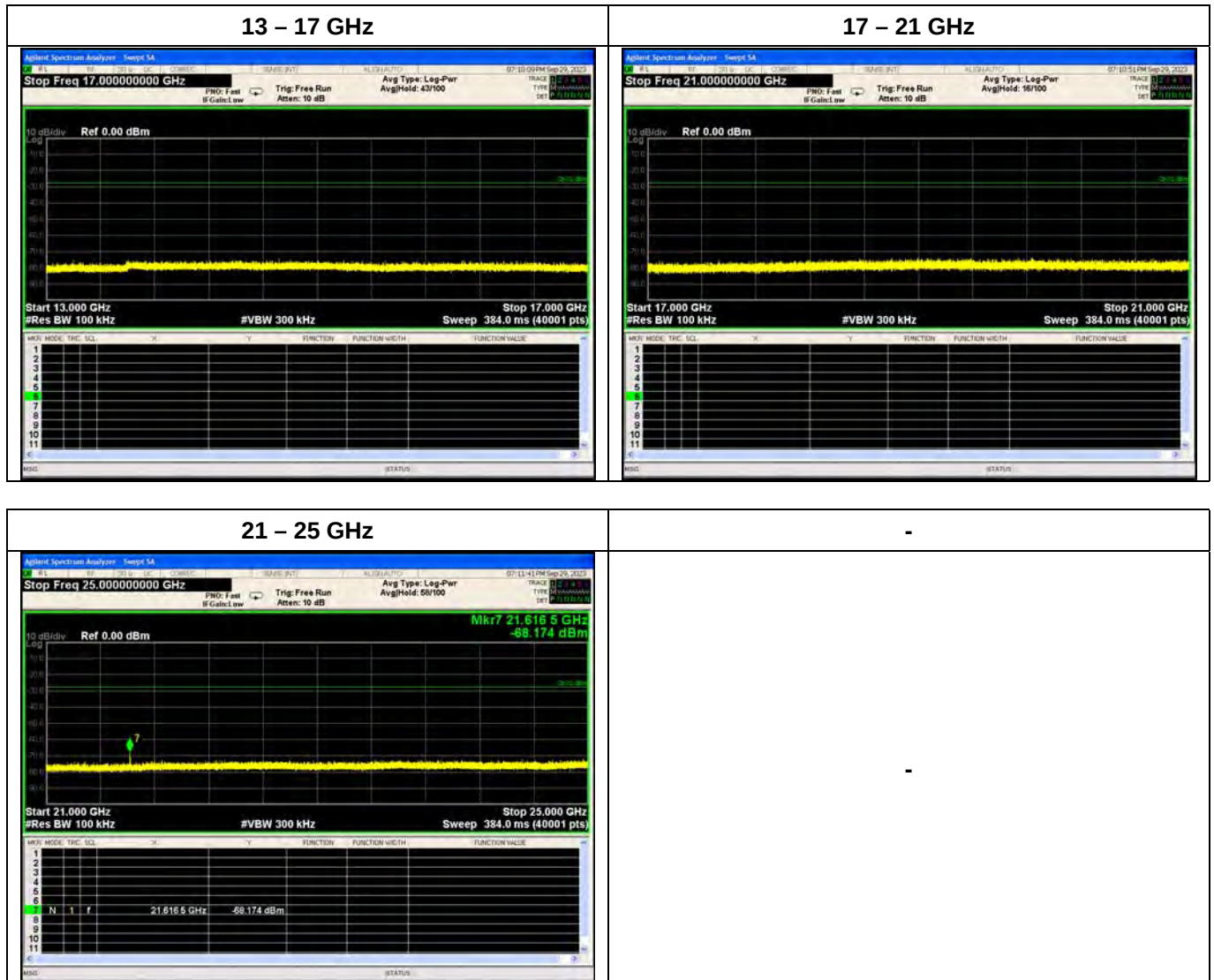


5 – 9 GHz



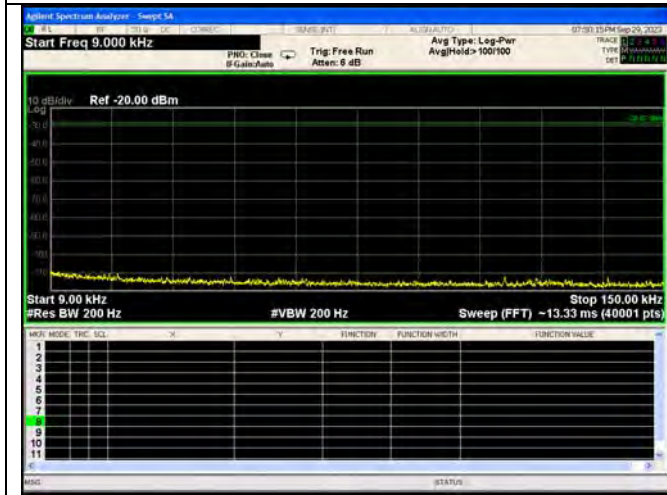
9 – 13 GHz



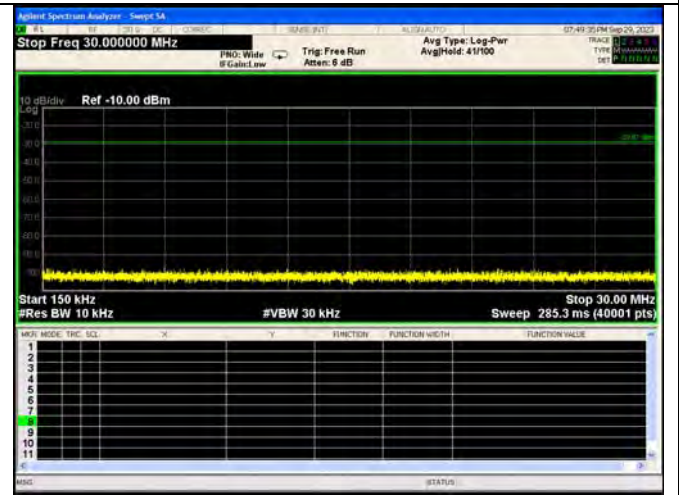


DH5, Hopping OFF, 2441MHz

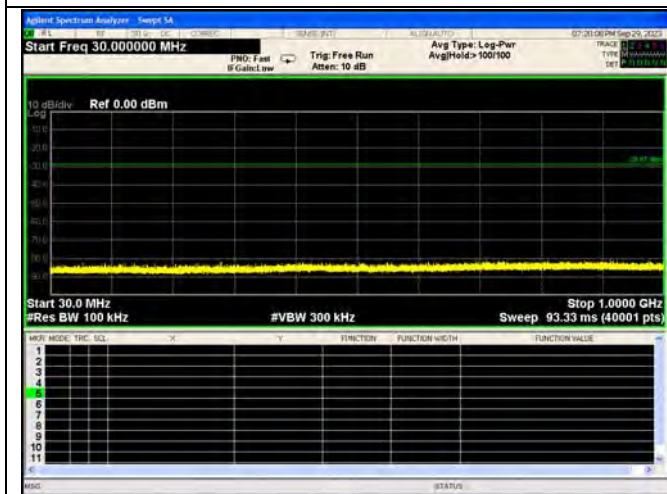
0.009 – 0.15 MHz



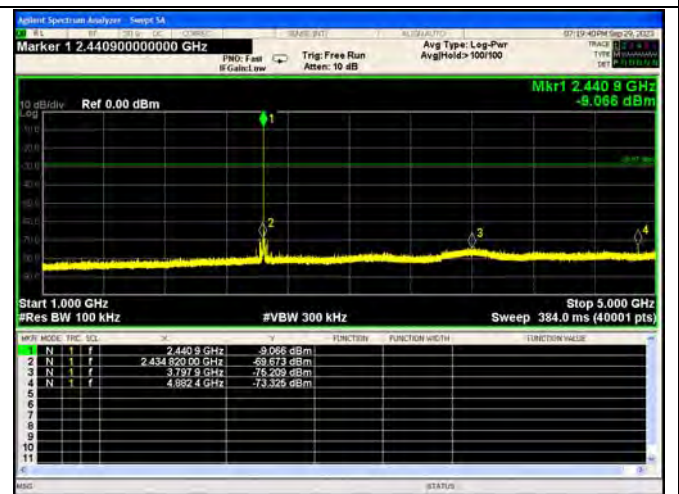
0.15 – 30 MHz



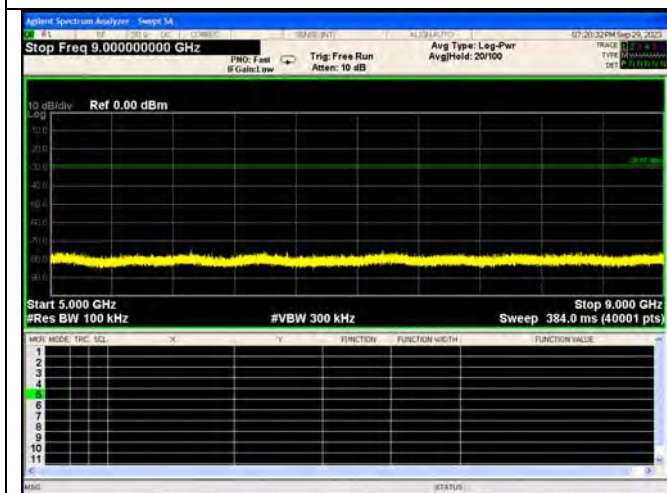
30 – 1000 MHz



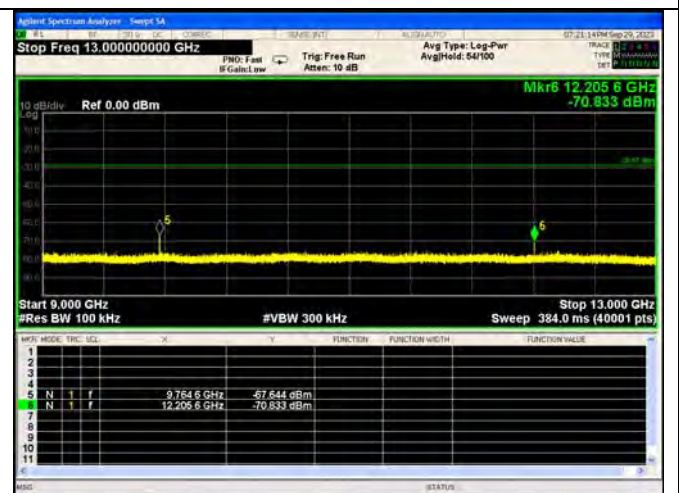
1 – 5 GHz

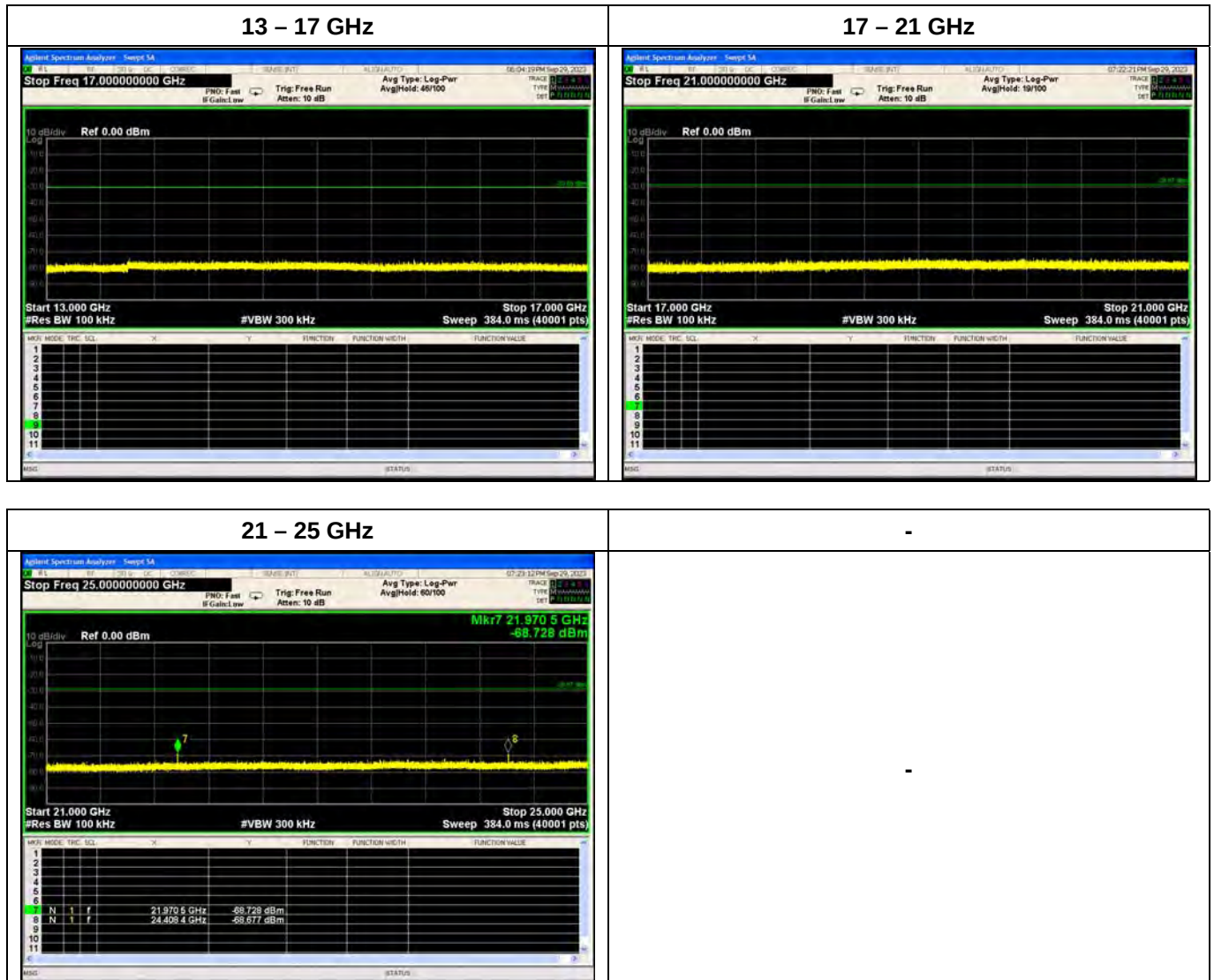


5 – 9 GHz



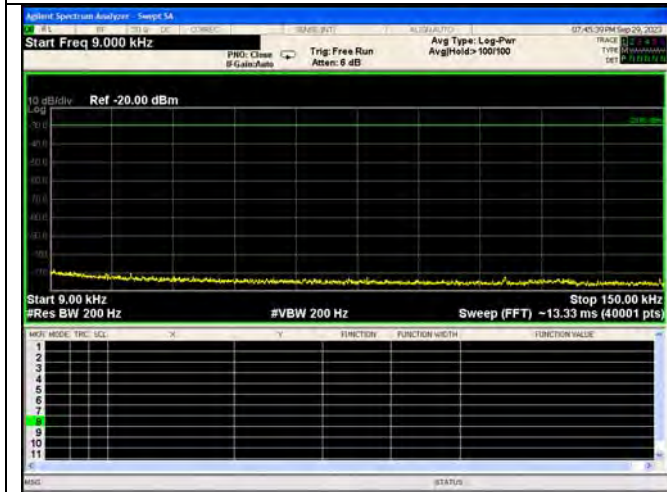
9 – 13 GHz



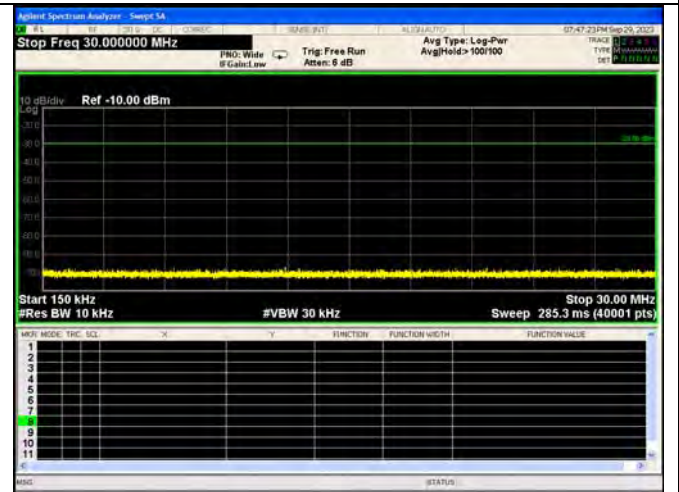


DH5, Hopping OFF, 2480MHz

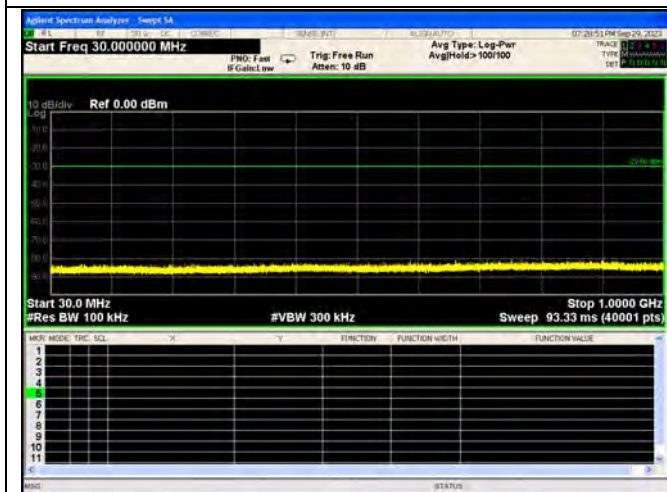
0.009 – 0.15 MHz



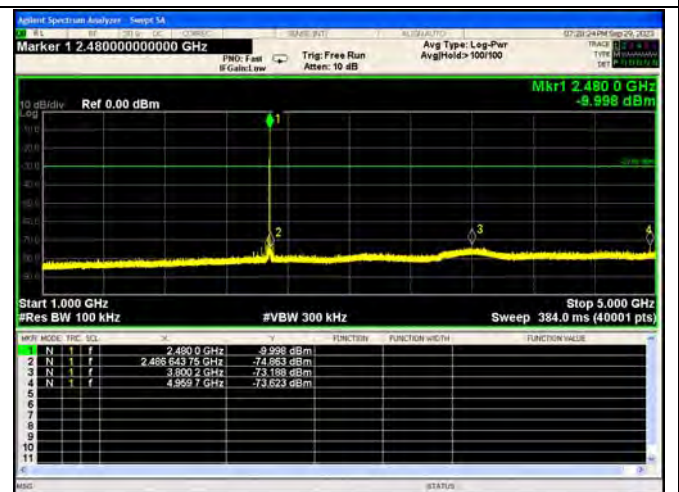
0.15 – 30 MHz



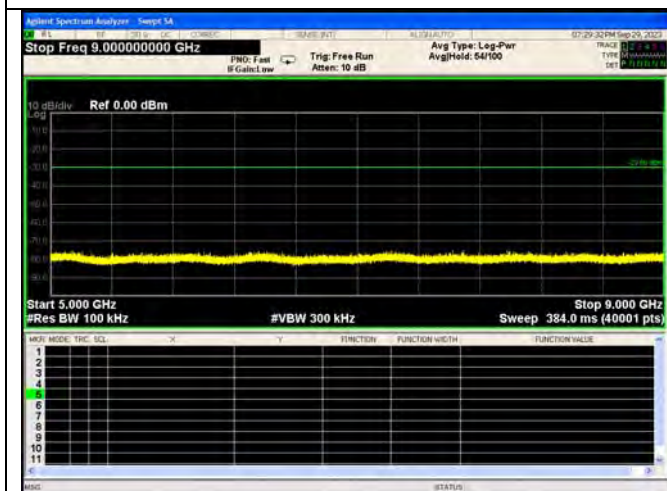
30 – 1000 MHz



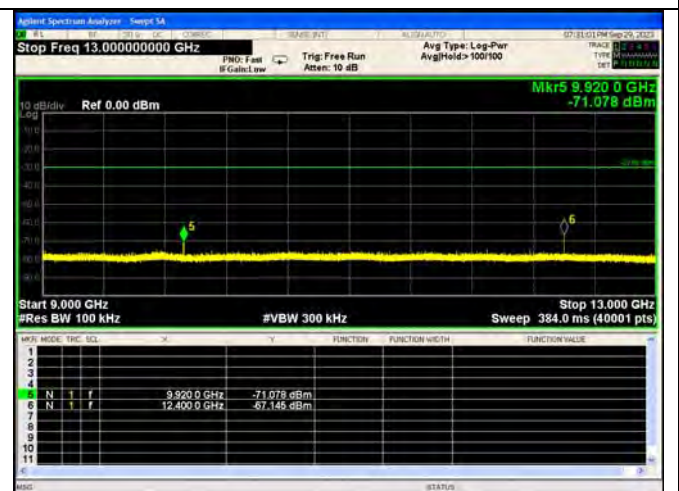
1 – 5 GHz

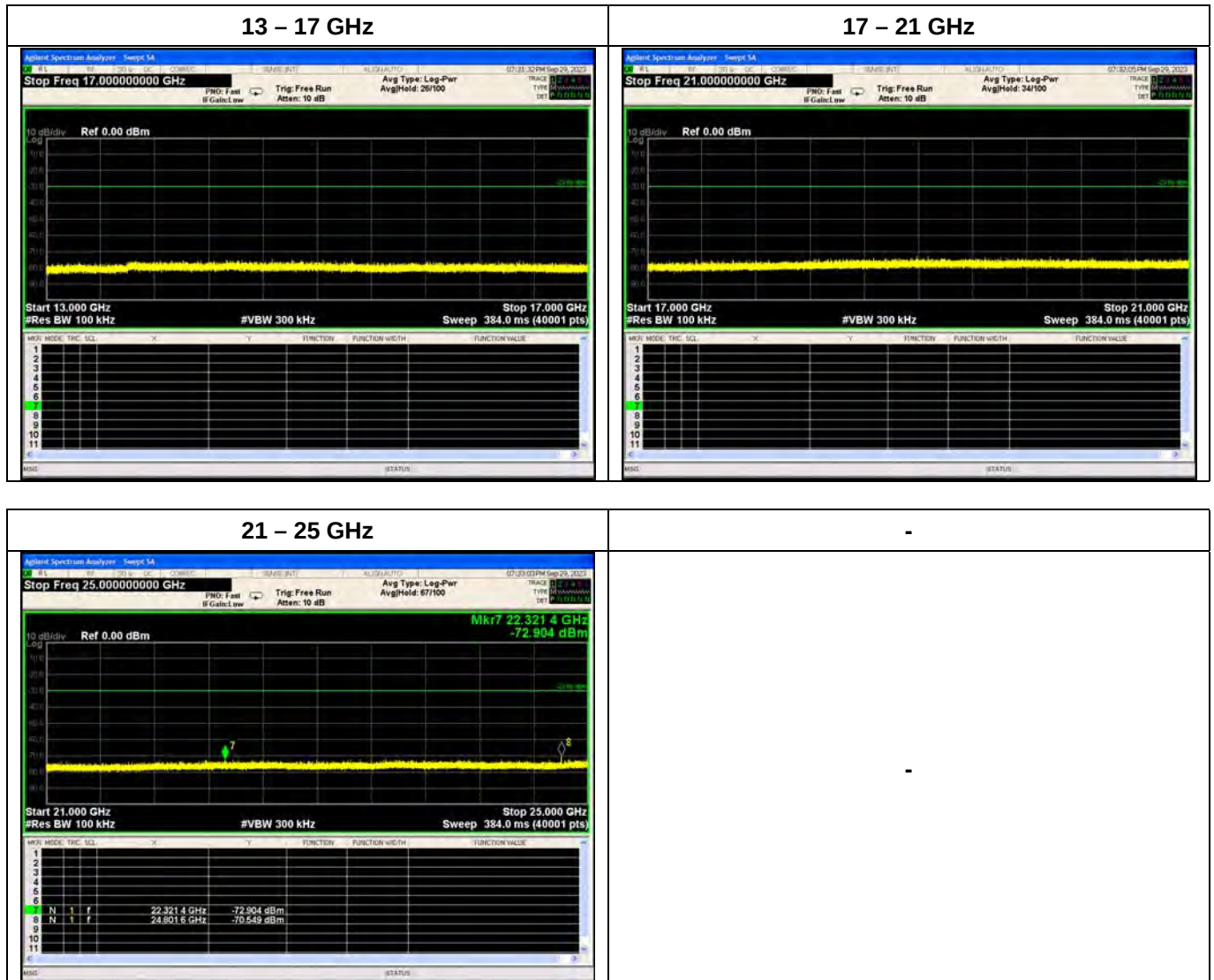


5 – 9 GHz



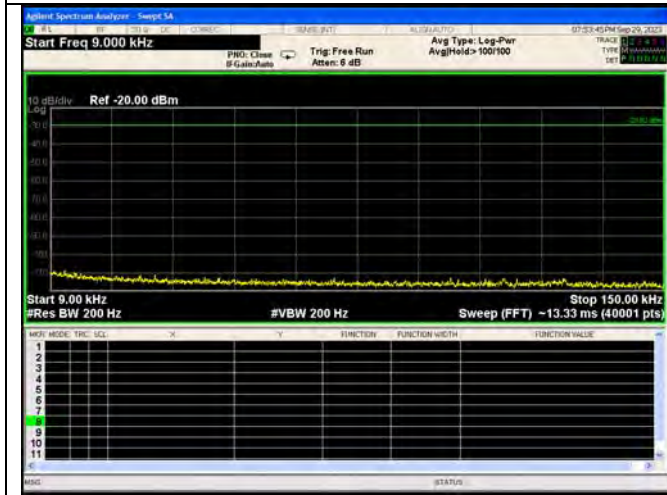
9 – 13 GHz



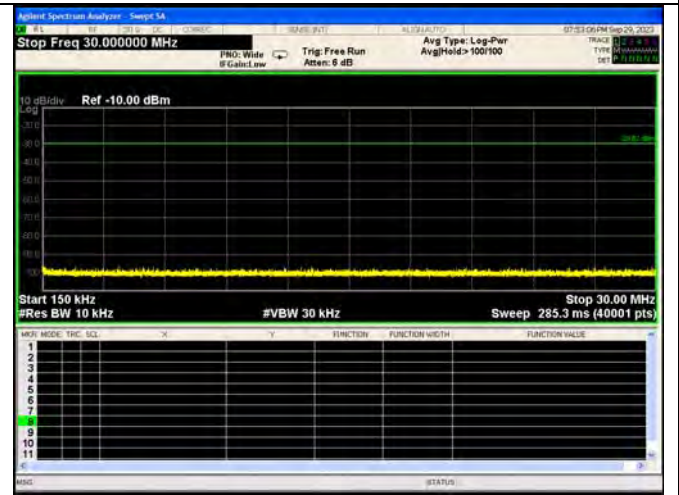


2-DH5, Hopping OFF, 2402MHz

0.009 – 0.15 MHz



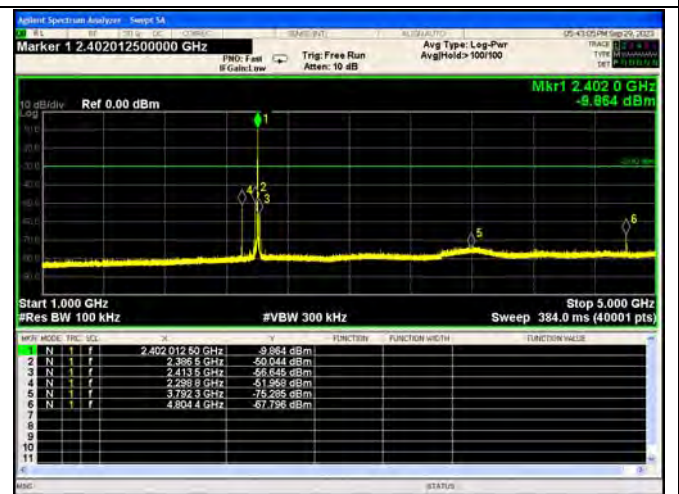
0.15 – 30 MHz



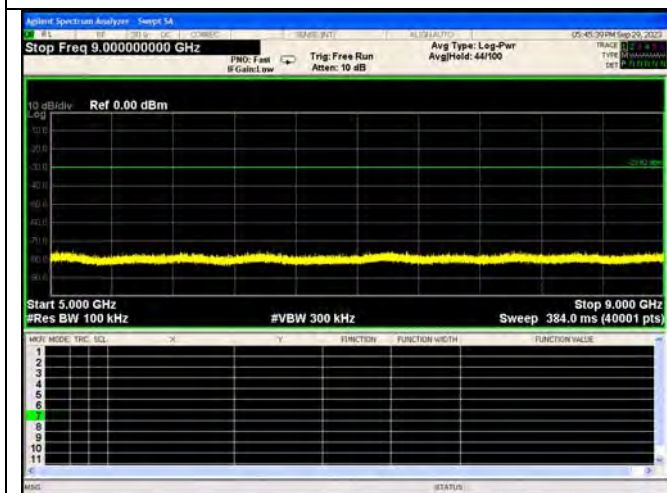
30 – 1000 MHz



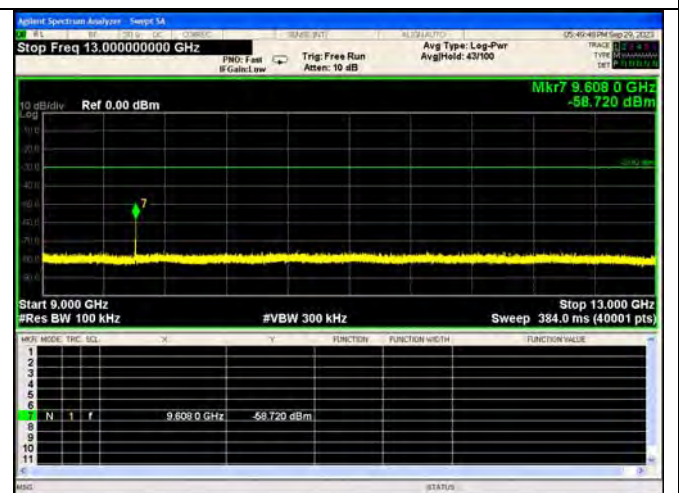
1 – 5 GHz

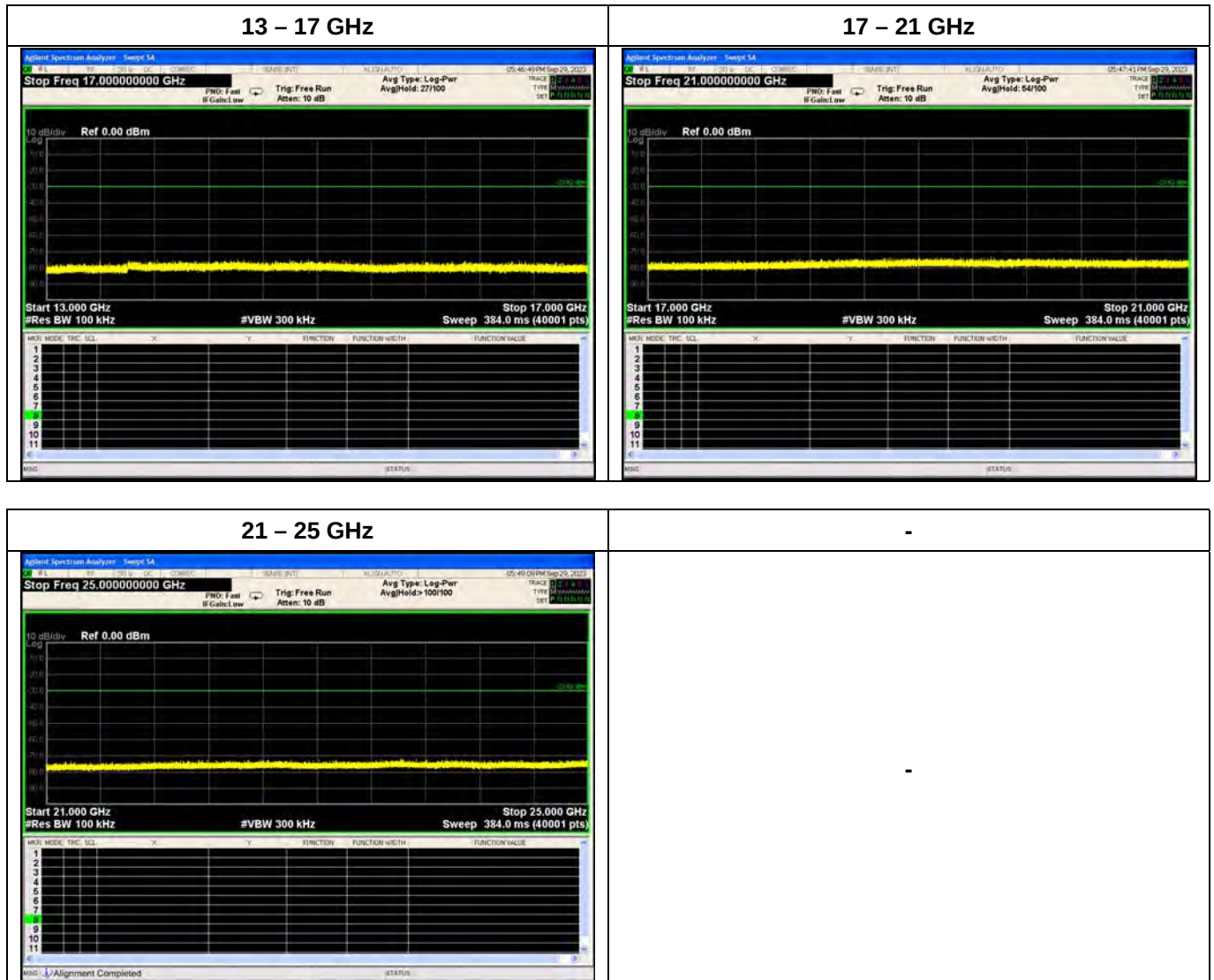


5 – 9 GHz



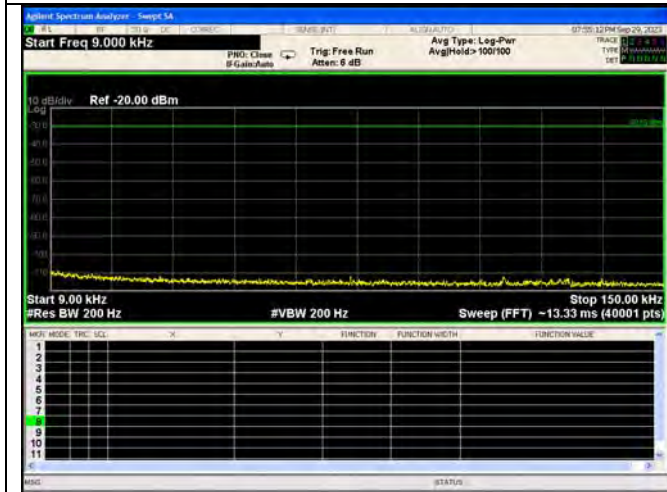
9 – 13 GHz



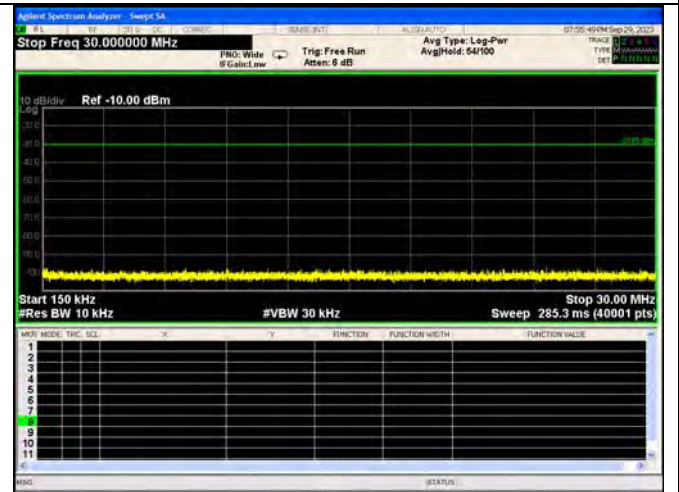


2-DH5, Hopping OFF, 2441MHz

0.009 – 0.15 MHz



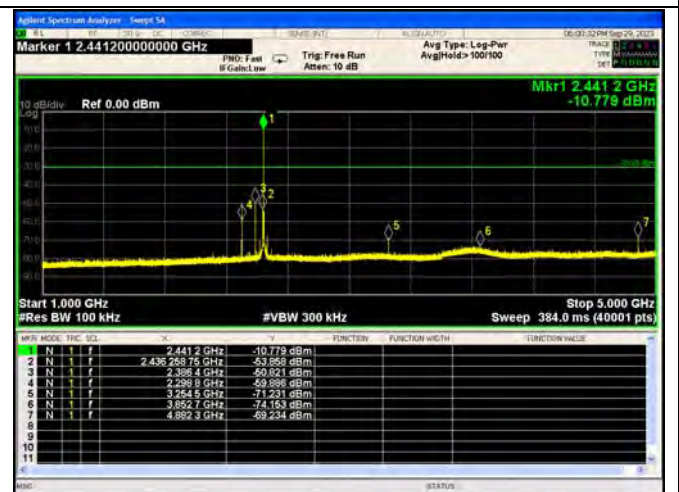
0.15 – 30 MHz



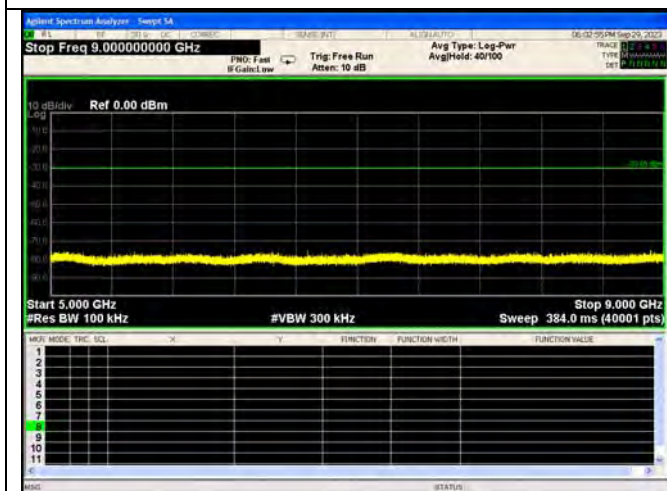
30 – 1000 MHz



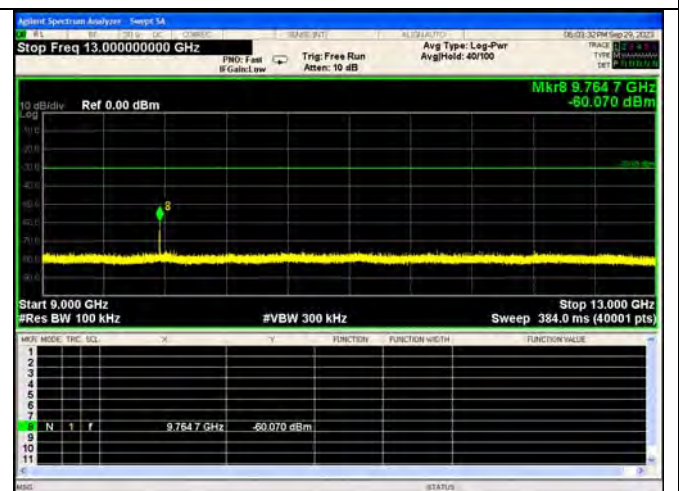
1 – 5 GHz

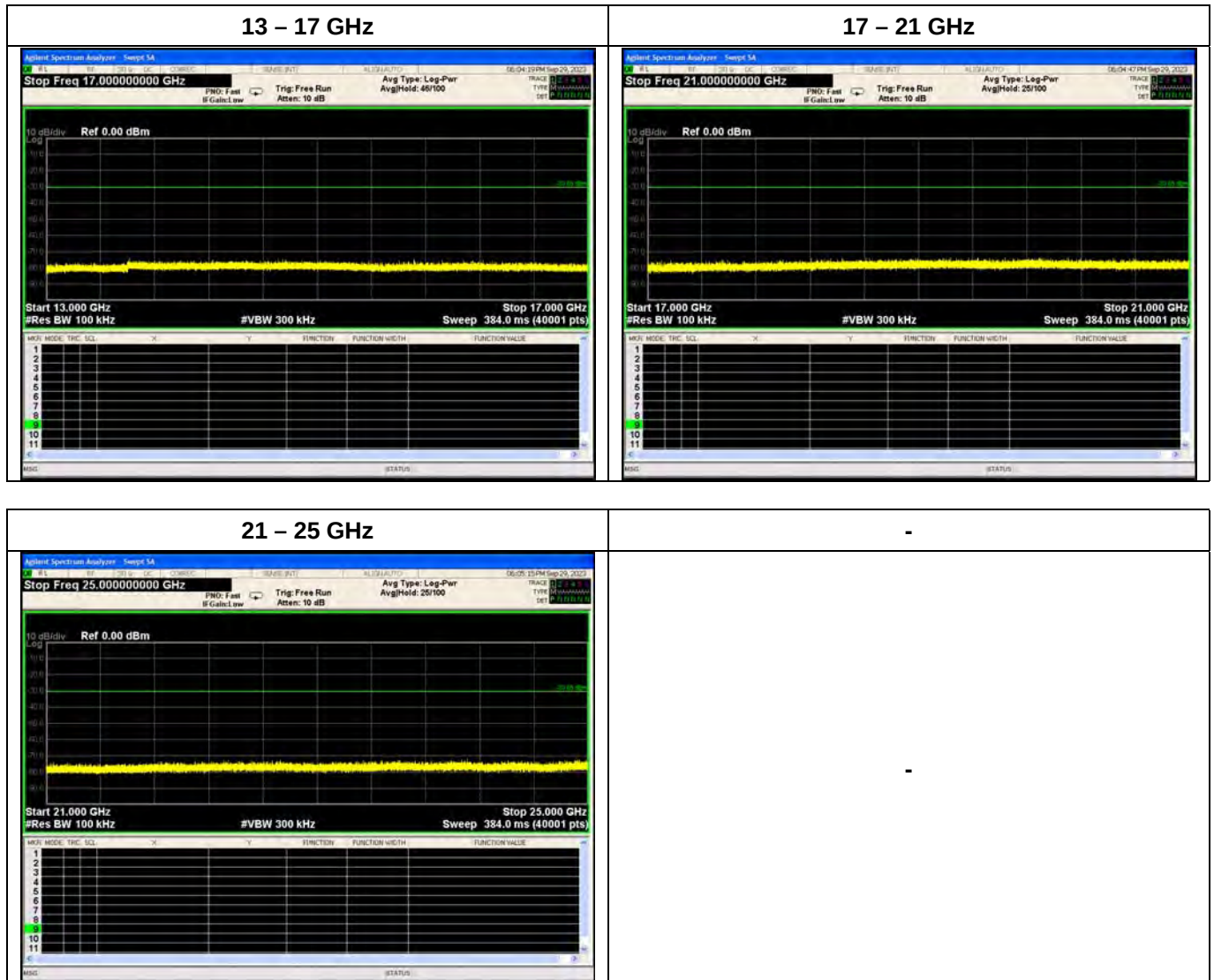


5 – 9 GHz



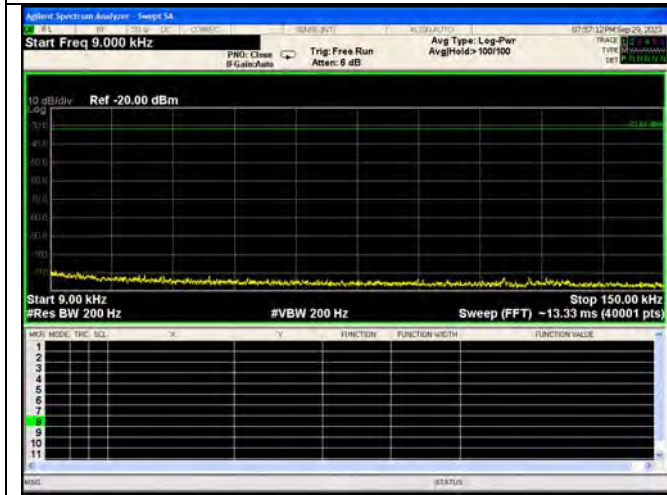
9 – 13 GHz



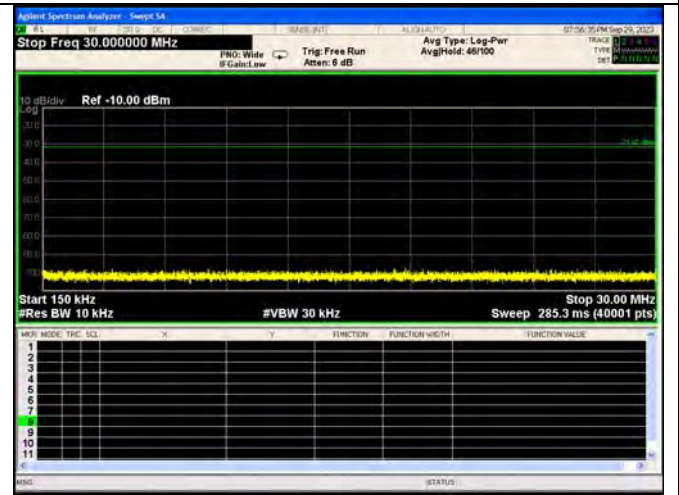


2-DH5, Hopping OFF, 2480MHz

0.009 – 0.15 MHz



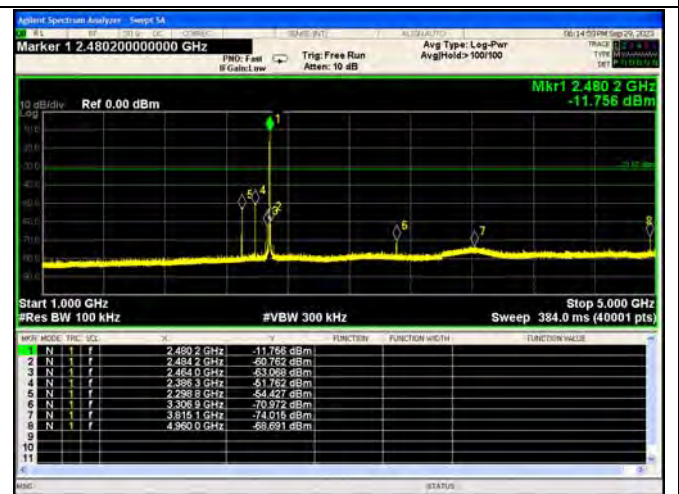
0.15 – 30 MHz



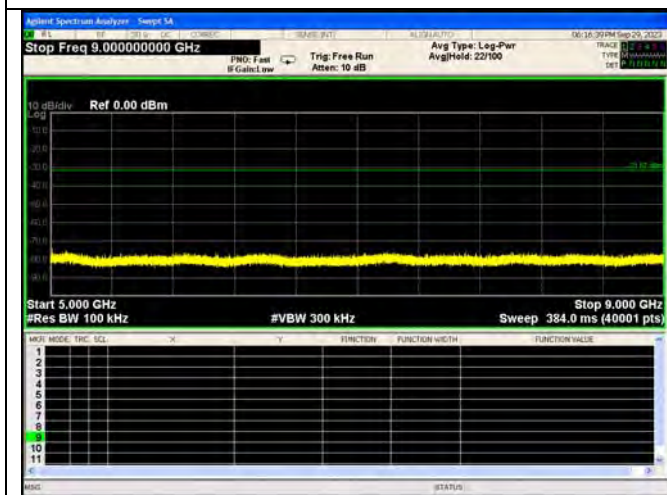
30 – 1000 MHz



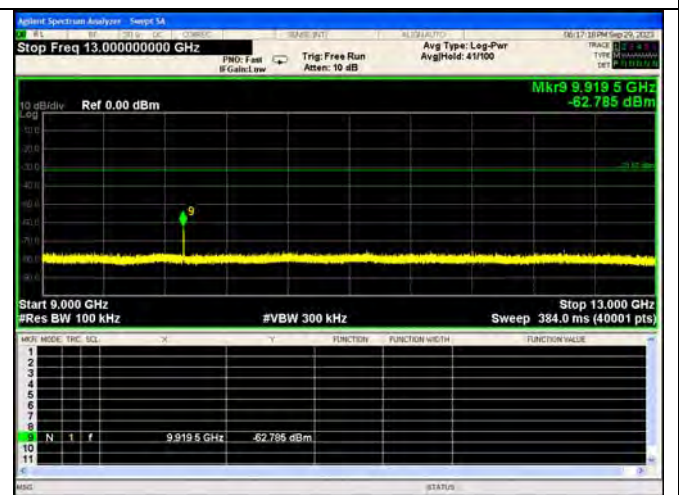
1 – 5 GHz

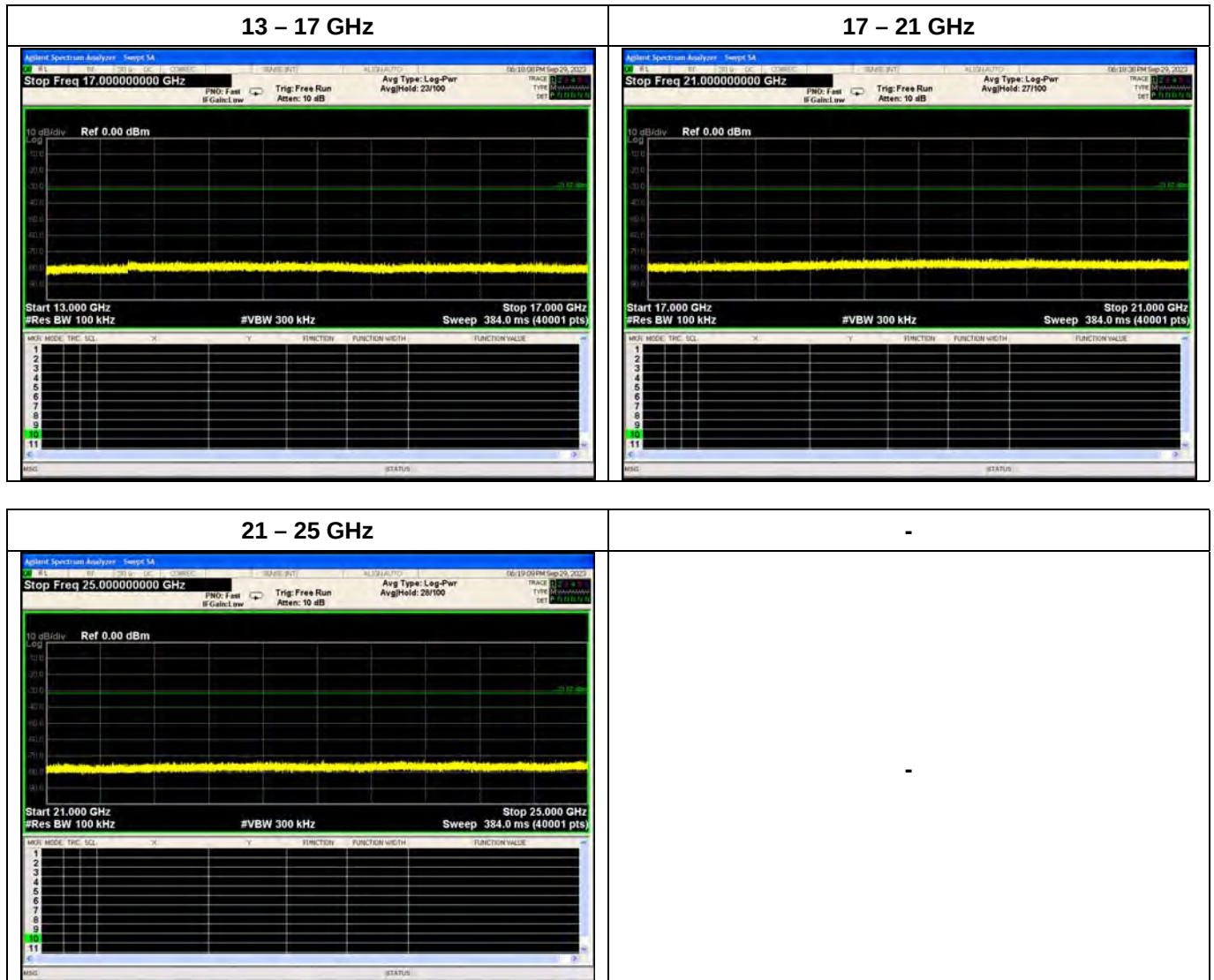


5 – 9 GHz



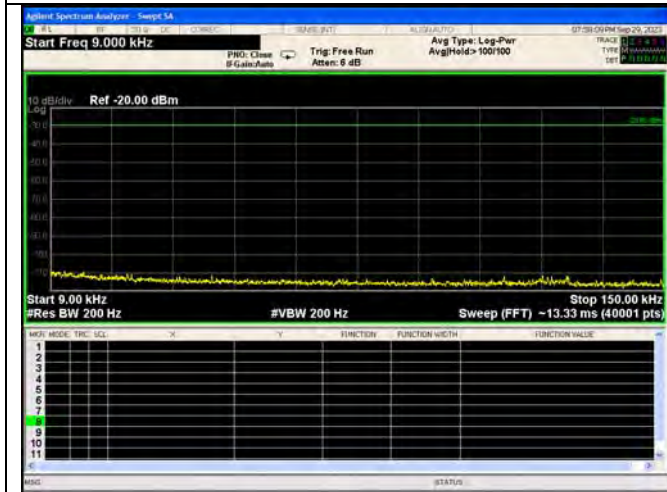
9 – 13 GHz



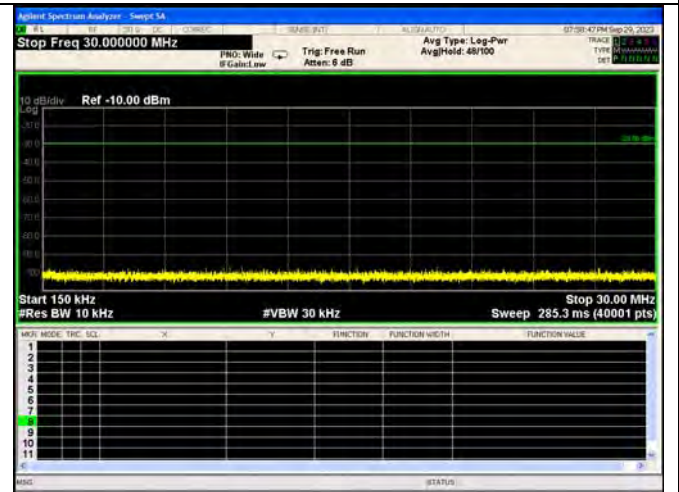


3-DH5, Hopping OFF, 2402MHz

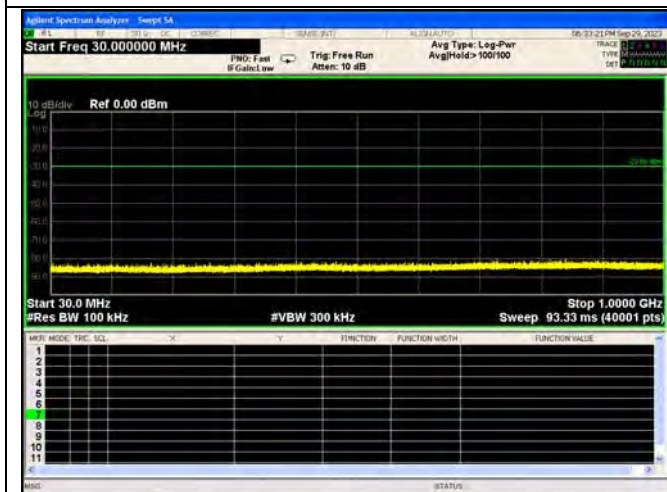
0.009 – 0.15 MHz



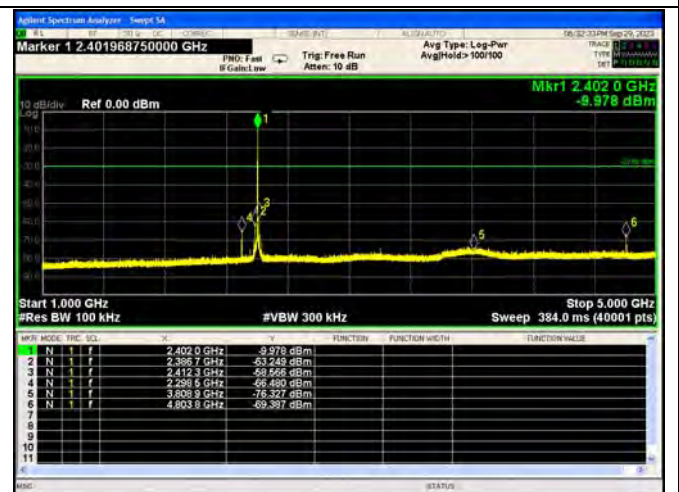
0.15 – 30 MHz



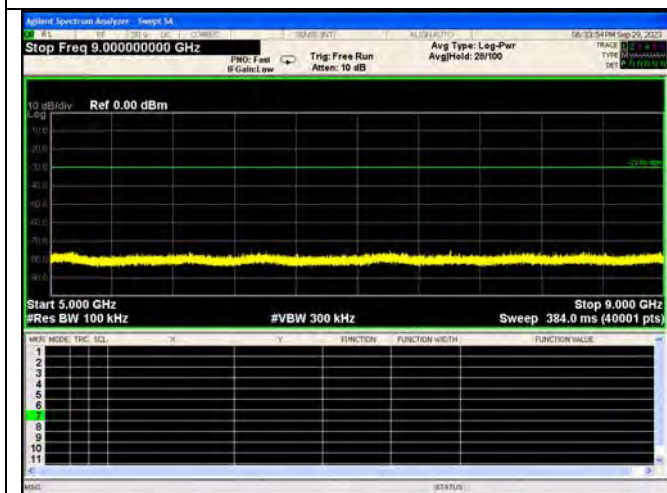
30 – 1000 MHz



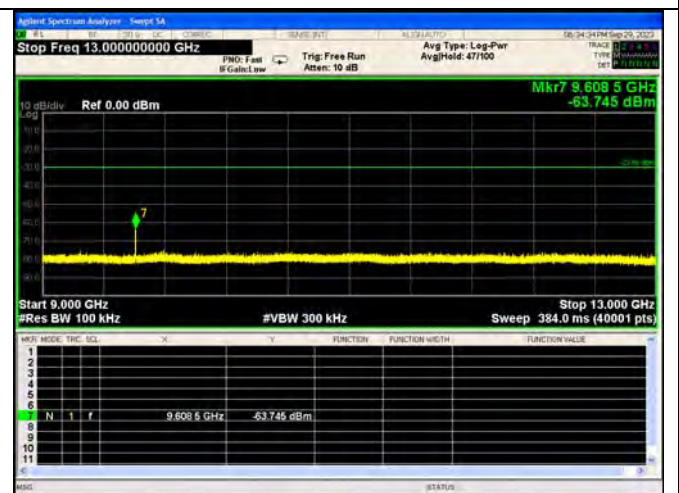
1 – 5 GHz

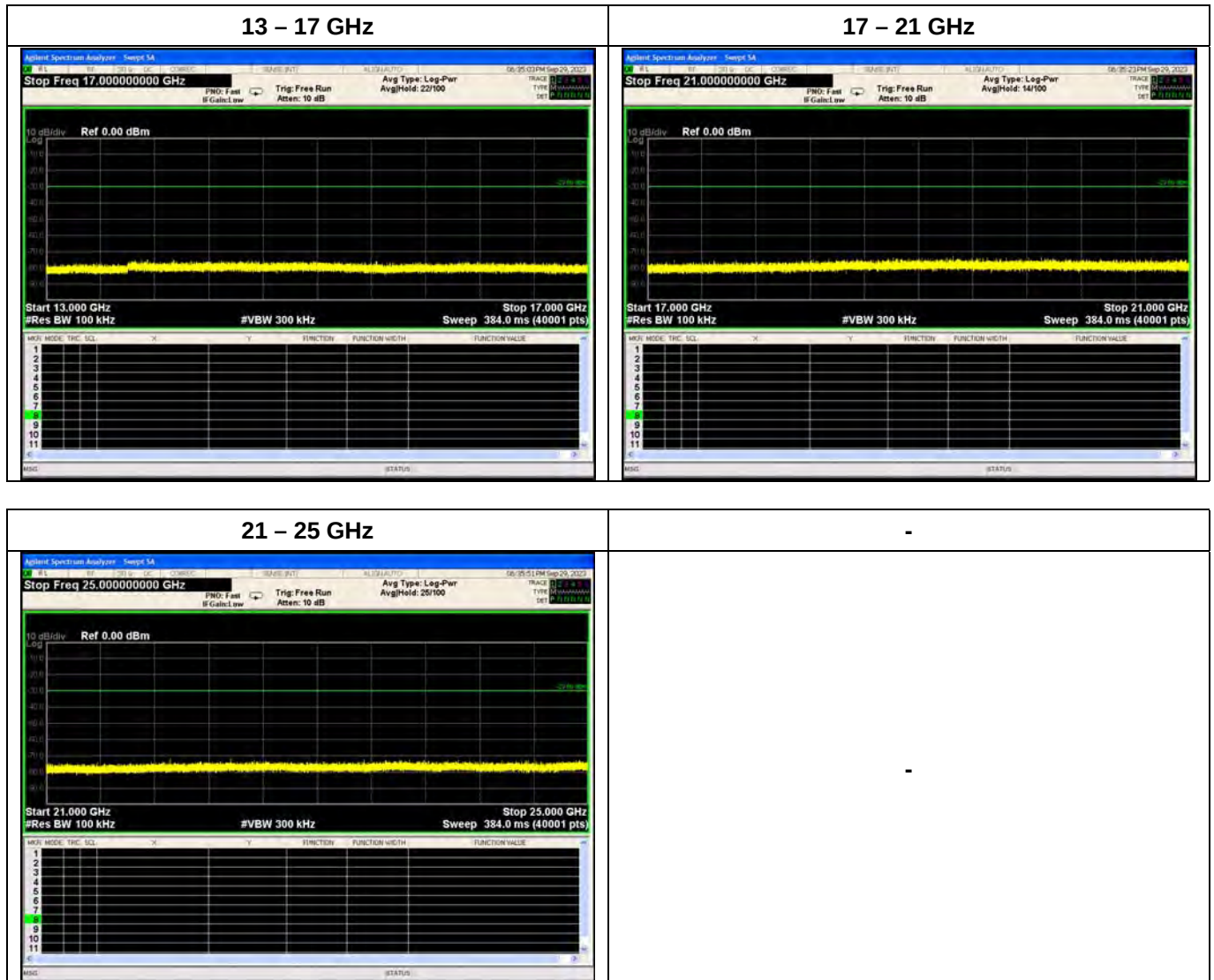


5 – 9 GHz



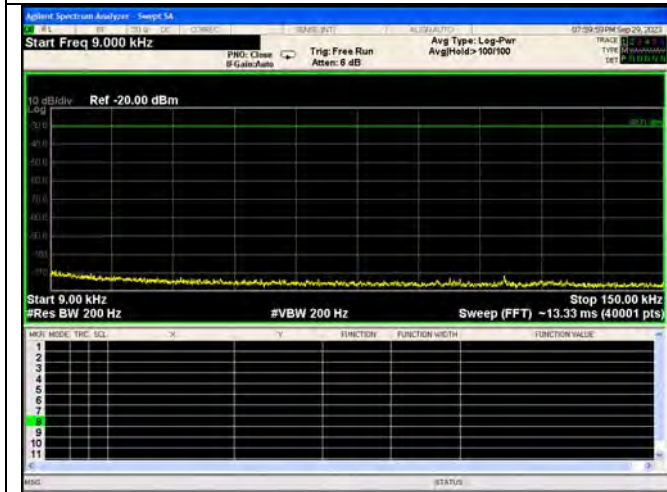
9 – 13 GHz



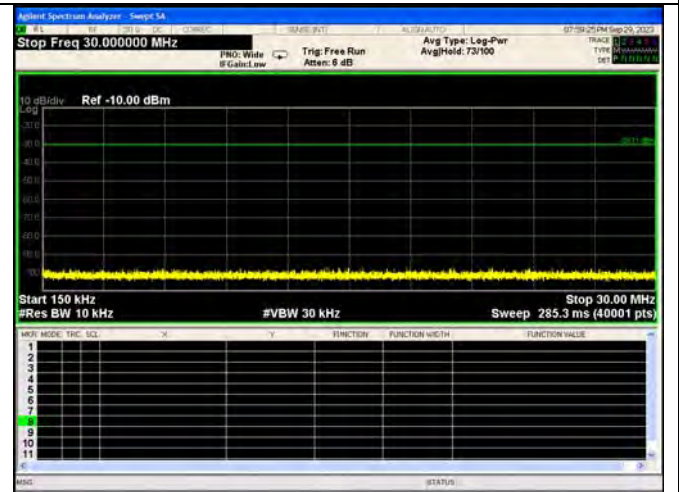


3-DH5, Hopping OFF, 2441MHz

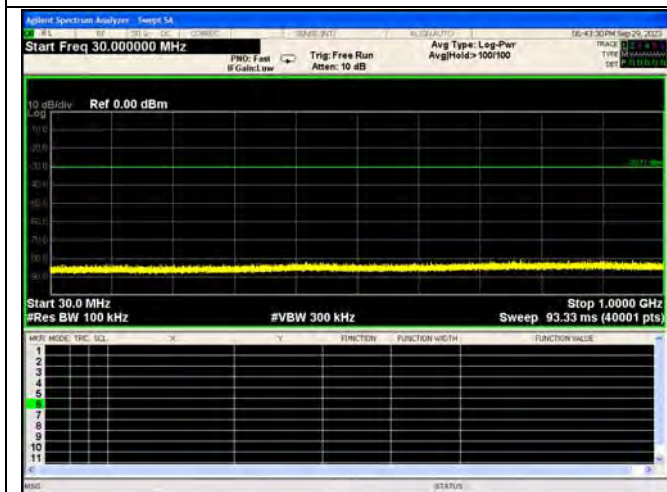
0.009 – 0.15 MHz



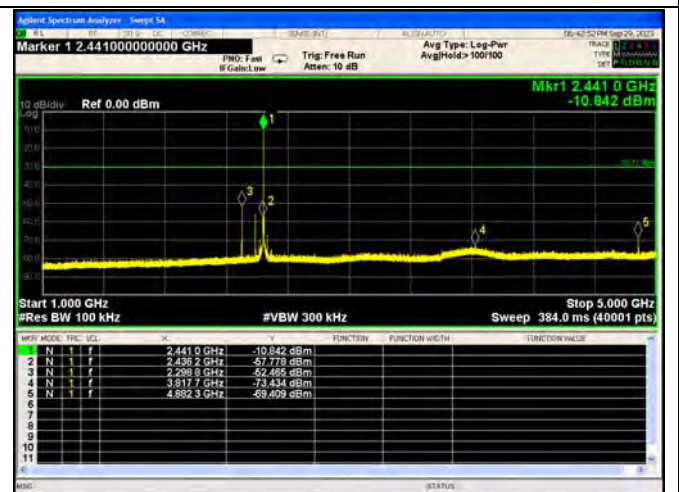
0.15 – 30 MHz



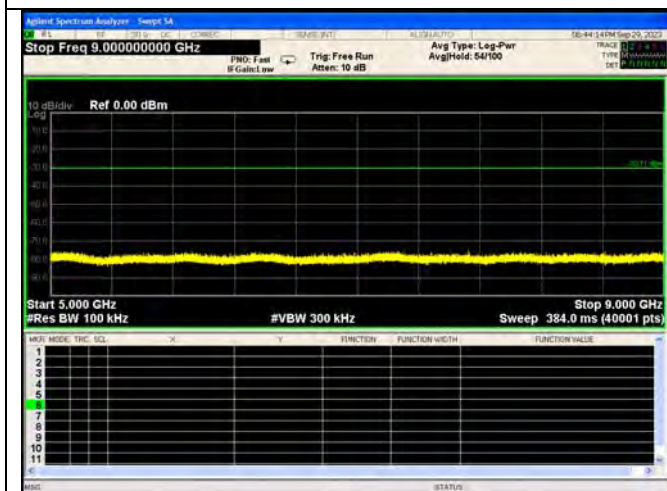
30 – 1000 MHz



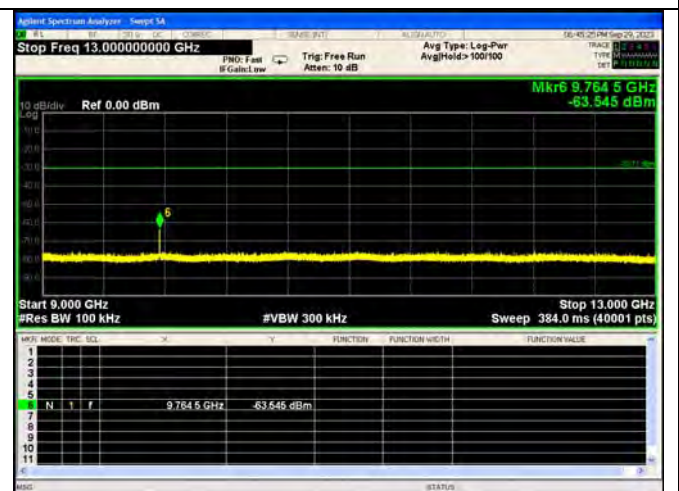
1 – 5 GHz

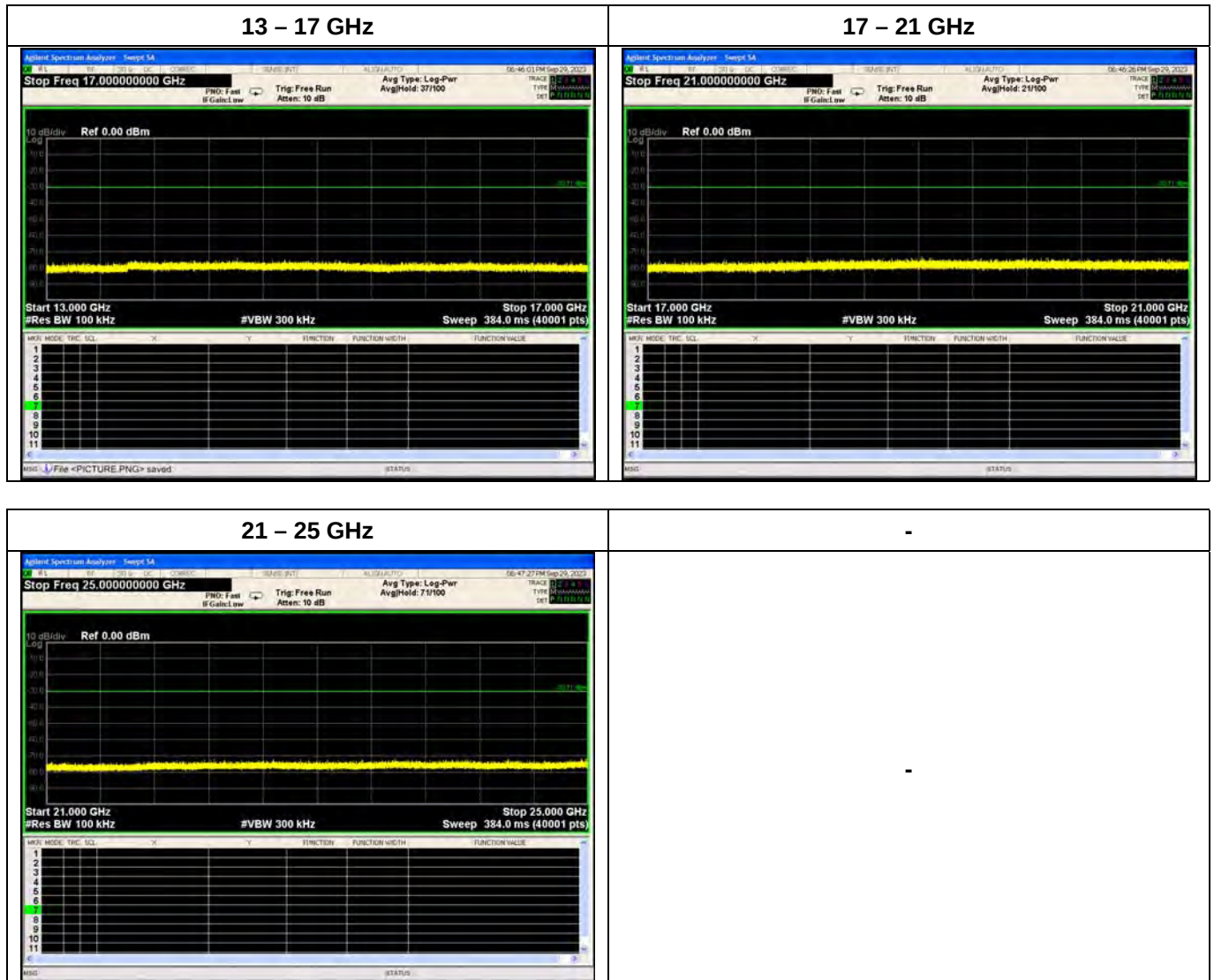


5 – 9 GHz



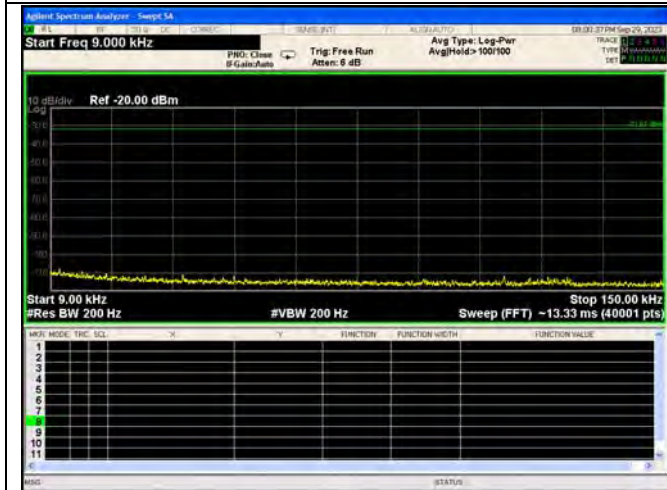
9 – 13 GHz



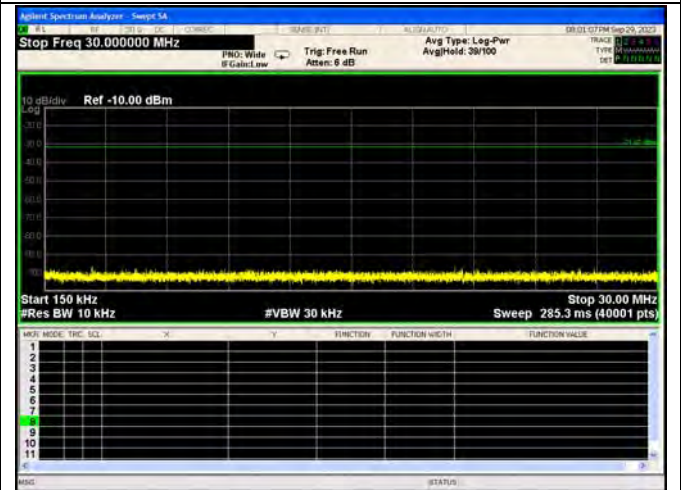


3-DH5, Hopping OFF, 2480MHz

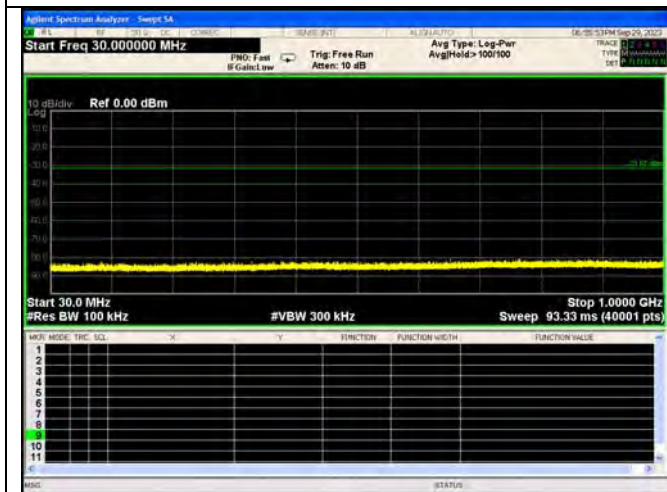
0.009 – 0.15 MHz



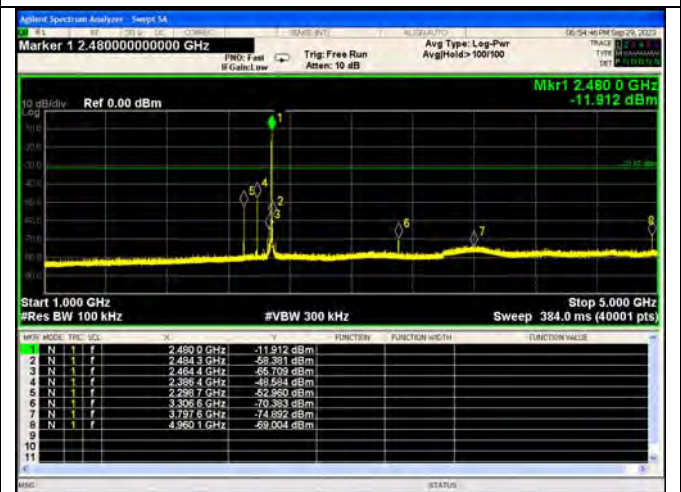
0.15 – 30 MHz



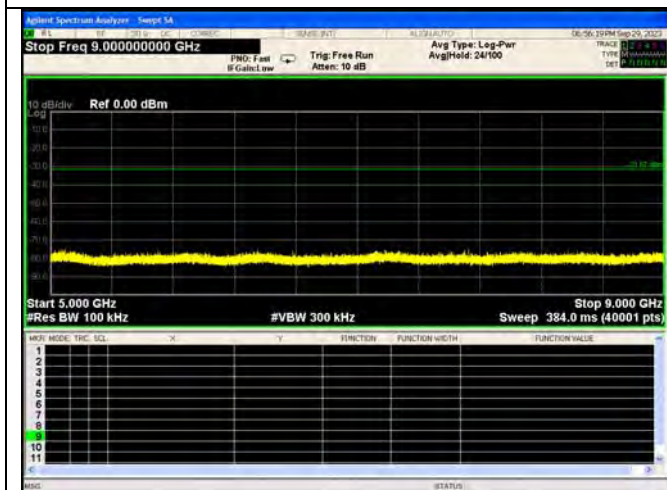
30 – 1000 MHz



1 – 5 GHz



5 – 9 GHz



9 – 13 GHz

