TEST REPORT

REGULATIONS : **FCC Part15 C §15.247**
RSS-247 Issue 1

Applicant	Testing Laboratory
JVC KENWOOD Corporation 1-16-2, Hakusan, Midori-ku, Yokohama-shi Kanagawa, 226-8525 Japan Tel.: +81 45 939 6254 / Fax.: +81 45 939 7097	Intertek Japan K.K. Matsuda Laboratory 1283 Yadoriki, Matsuda-machi, Ashigarakami-gun, Kanagawa-ken, 258-0001 Japan Tel.: +81 465 89 2316 / Fax.: +81 465 89 2160 URL: http://www.japan.intertek-etlsemko.com

Equipment Type	144/220/430MHz TRIBANDER with Bluetooth
Trademark	KENWOOD
Model(s)	TH-D74A
Serial No.	FES2 K-13 (for Radiated testing) FES1 K-29 (for Antenna Port Conductive testing)
FCC ID	K44440900
IC CN and UPN	282F-440900
Test Result	Complied
Report Number	16050301JMA-001
Original Issue Date	June 24, 2016
Revised Date	July 4, 2016

Approved by H. Kosemura
Hideaki Kosemura
[Reviewer]

Tested by T. Yonemura
Tomochika Yonemura
[Engineer]

VLAC-008-3

Responsible Party of Test Item (Product)

Responsible Party	:
Add.	:
Tel.	:
Fax.	:
Contact Person	:

TABLE OF CONTENTS

SECTION 1. GENERAL INFORMATION

Test Performed

EUT Received	May 26, 2016	
Date of Test	From June 6, 2016 to June 23, 2016	
	FCC	IC
Standard Applied	FCC Part15 C §15.247	RSS-247 Issue 1
Test methods	ANSI C63.10-2013	RSS-Gen Issue 4 ANSI C63.10-2013
Deviation from Standard(s)	None	

Qualifications of Testing Laboratory (Matsuda Lab.)

Accreditation	**Scope**	**Lab. Code**	**Remarks**
VLAC	EMC Testing	VLAC-008-3	JAPAN
BSMI	EMC Testing	SL2-IN-E-6009	TAIWAN
Filing			
VCCI	EMC Testing	A-0127	JAPAN
FCC	EMC Testing	Designation Number : JP0009	USA
IC	EMC Testing	2042S-1, 2042S-2, 2042S-3	Canada
CB-Scheme	EMC Testing	TL223	IECEE
SAUDI ARABIA	EMC Testing	N/A	

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		

Revision Summary

Revised Date	Section	Description of Changes
June 30, 2016	Cover	Add accreditation logo
	10	Add “All measurements equipment used for the measurement is calibrated based on standard.” Add “Each measurement result is traceable to national or international standards.”
July 4, 2016	10	Add “Antenna used in the measurement is calibrated according to ANSI C63.5.”

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 (1) RSS-Gen 6.6	N/A	Section 9.1
Maximum Peak Output Power	FCC Part15C §15.247 (b) (1) RSS-247 5.4 (2)	PASS	Section 9.2
Carrier Frequency Separation	FCC Part15C §15.247 (a) (1) RSS-247 5.1 (2)	PASS	Section 9.3
Number of Hopping Frequency	FCC Part15C §15.247 (a) (1) (iii) RSS-247 5.1 (4)	PASS	Section 9.4
Time of occupancy	FCC Part15C §15.247 (a) (1) (iii) RSS-247 5.1 (4)	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 7.2.2	PASS	Section 9.9
Receiver Spurious Emissions	RSS-Gen 7.1	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.

3.1 System Configuration

Symbol	Item	Model No.	Serial No.	Manufacturer
A	144/220/430MHz TRIBANDER with Bluetooth	TH-D74A	FES2 K-13 (for Radiated testing) FES1 K-29 (for Antenna Port Conductive testing)	JVC KENWOOD Corporation
Rated Power : DC-IN: DC 13.8 V (DC 12-16V), Battery Terminal: DC 7.4 V (DC 5.5 – 10.8 V)				
Supplied Power : DC 13.8 V				
Condition of Equipment	Prototype			
Type	Mobile type			
Suppression Devices	No Modifications by the laboratory were made to the device			

3.2 Port(s)/Connector(s)

Port Name	Connector Type	Connector Pin	Remarks
DC Jack	3.75Φ	2 pin	
External Microphone Jack	3.5Φ	3 pin	
External Speaker Jack	2.5Φ	3 pin	
USB Socket	Mini USB plug B	5 pin	
microSD Slot	microSD Slot	12 pin	
SMA Connector (Antenna)	SMA	2 pin	
Battery Terminal Connector	BZ type	3 pin	

3.3 Highest Frequency Generated / Used

Operating Frequency	Board Name	Remarks
288 MHz	Charge	-
4960 MHz	Generated, Bluetooh	-
1.6 GHz	Device Operates	-

3.4 Over View of EUT

Access method	Bluetooth Version 3.0
Rated Output Power	2.5 mW
Frequency Range of Operating	2402 – 2480 MHz
Number of Channels	Max: 79 ch, 1 MHz step (Normal mode) Min: 20 ch (AFH mode)
Modulation Method	FHSS (GFSK, π/4DQPSK, 8DPSK)
Antenna Type and Gain	Wire Antenna, -2.16 dBi See Note 1
Antenna Connector	None

Note:
1. The EUT comply with the requirement of FCC Part15C §15.203, because
(1) The Bluetooth antenna was built in the EUT and permanently attached.
(2) There were no other Bluetooth antenna connectors.

SECTION 4. SUPPORT EQUIPMENT

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

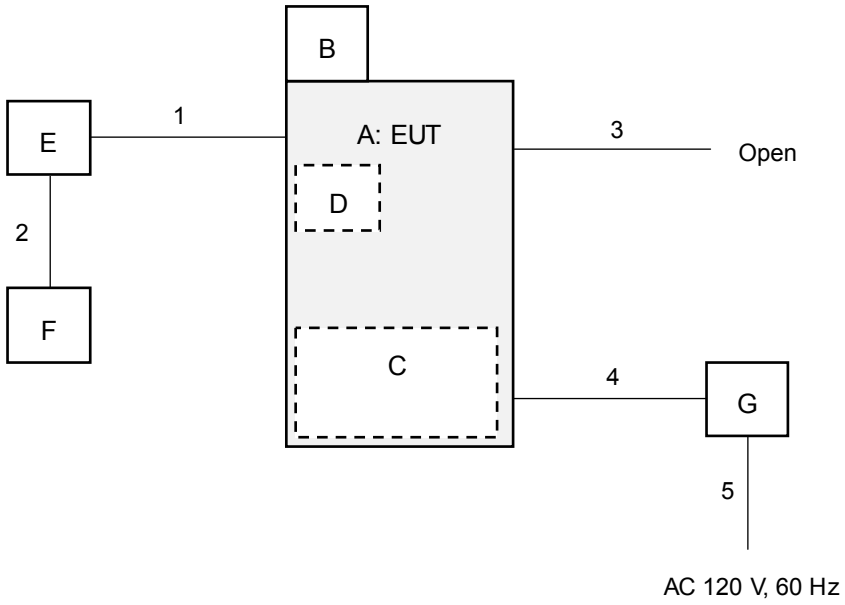
Symbol	Item	Model No.	Serial No.	Manufacturer	Remarks	FCC ID
B	WHIP Antenna	T9A-0034-00	106	JVC KENWOOD		N/A
C	Li-ion battery	KNB-75L	4	JVC KENWOOD		N/A
D	microSDHC card	Y08GI30	MDS4071062	JVC KENWOOD		DoC
E	Speaker microphone	SMC-34	1	JVC KENWOOD		N/A
F	Earphone	HS-9	1	JVC KENWOOD		N/A
G	DC Power Supply	PS-60	11/01 00142	KENWOOD		N/A
Supplied Power:						
G	AC120 V, 60 Hz					

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	0.48	No	No	
2	Earphone Cable	1.00	No	No	
3	USB Cable	1.00	Yes	Yes	
4	Power cable (DC)	1.40	No	No	
5	Power cable (AC)	1.80	No	No	

SECTION 6. TEST CONFIGURATION



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

The following uncertainty represents the expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.
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	U_{lab} [k = 2]	U_{cispr}
Radiated Spurious Emissions at 3m		
30 MHz – 1000 MHz	+/- 3.96 dB	6.3 dB
Above 1 GHz	+/- 4.91 dB	5.2 dB
AC Conducted Emissions		
150 kHz – 30 MHz	+/- 2.80 dB	3.4 dB

The above expanded instrumentation uncertainty, $U_{lab.}$, is estimated in accordance with CISPR 16-4-2:2011.

8.2 RF Conducted tests

Test Items	U_{lab} [k = 2]
Bandwidth	+/- 1.42 %
Maximum Output Power	+/- 1.96 dB
Conducted Emissions	+/- 1.82 dB

SECTION 9. TEST DATA

9.1 20 dB Bandwidth and 99 % Occupied Bandwidth

Regulations	FCC Part15C §15.247 (a) (1) RSS-247 5.1 (1) RSS-Gen 6.6
Test Method/Guide	ANSI C63.10-2013 clause 6.9.2

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	:	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

3. Allow trace to fully stabilize.
4. Use “Occupied Bandwidth Measurement” function to measure the 20 dB bandwidth.

Test Result

Location	Matsuda Laboratory No.2 Test Site
Test date	June 6, 2016
Temperature	24.0 [degree C]
Humidity variation	55.0 [%RH]
Test Engineer	Tomochika Yonemura

Operating modes	Frequency [MHz]	20 dB Bandwidth [MHz]	99 % Bandwidth [MHz]
DH5	2402	0.960	0.851
	2441	0.963	0.857
	2480	0.958	0.862
2-DH5	2402	1.335	1.193
	2441	1.331	1.194
	2480	1.334	1.197
3-DH5	2402	1.316	1.201
	2441	1.318	1.201
	2480	1.315	1.195

Spectrum Plots

See ANNEX A.1.

9.2 Maximum Peak Output Power

Regulations	FCC Part15C §15.247 (b) (1) RSS-247 5.4 (2)
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 Laboratory No.2 Test Site
Test date	June 6, 2015
Temperature	24.0 [degree C]
Humidity variation	55.0 [%]
Test Engineer	Tomochika Yonemura

Operating modes	Freq. [MHz]	Reading [dBm]	Factor [dB]	Measured Value [dBm]	Limit		Margin [dB]
					[mW]	[dBm]	
DH1	2402	-18.480	20.570	2.090	125	20.97	18.880
	2441	-18.832	20.580	1.748			19.222
	2480	-19.062	20.580	1.518			19.452
DH3	2402	-18.503	20.570	2.067			18.903
	2441	-18.862	20.580	1.718			19.252
	2480	-19.088	20.580	1.492			19.478
DH5	2402	-18.973	20.570	1.597			19.373
	2441	-19.336	20.580	1.244			19.726
	2480	-19.566	20.580	1.014			19.956
2-DH1	2402	-18.044	20.570	2.526			18.444
	2441	-18.375	20.580	2.205			18.765
	2480	-18.598	20.580	1.982			18.988
2-DH3	2402	-18.090	20.570	2.480			18.490
	2441	-18.417	20.580	2.163			18.807
	2480	-18.625	20.580	1.955			19.015
2-DH5	2402	-18.567	20.570	2.003			18.967
	2441	-18.885	20.580	1.695			19.275
	2480	-19.109	20.580	1.471			19.499
3-DH1	2402	-17.408	20.570	3.162			17.808
	2441	-17.711	20.580	2.869			18.101
	2480	-17.925	20.580	2.655			18.315
3-DH3	2402	-17.420	20.570	3.150			17.820
	2441	-17.720	20.580	2.860			18.110
	2480	-17.952	20.580	2.628			18.342
3-DH5	2402	-17.910	20.570	2.660			18.310
	2441	-18.228	20.580	2.352			18.618
	2480	-18.433	20.580	2.147			18.823

Spectrum Plots

See ANNEX A.2

9.3 Carrier Frequency Separation

Regulations	FCC Part15C §15.247 (a) (1) RSS-247 5.1 (2)
Test Method/Guide	ANSI C63.10-2013 clause 7.8.2

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	:	approximately 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. Use delta marker function to measure the separation between the two channels.

Test Result

Location	Matsuda Laboratory No.2 Test Site
Test date	June 6, 2016
Temperature	24.0 [degree C]
Humidity variation	55.0 [%]
Test Engineer	Tomochika Yonemura

Operating modes	Frequency [MHz]	Measured Value [MHz]	Limit [MHz]
DH5	2402	1.000	≥ 0.640
	2441	1.000	≥ 0.642
	2480	1.000	≥ 0.639
2-DH5	2402	1.000	≥ 0.890
	2441	1.000	≥ 0.887
	2480	1.000	≥ 0.889
3-DH5	2402	1.000	≥ 0.890
	2441	1.000	≥ 0.878
	2480	1.000	≥ 0.877

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 (4)
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 Laboratory No.2 Test Site
Test date	June 6, 2016
Temperature	24.0 [degree C]
Humidity variation	55.0 [%]
Test Engineer	Tomochika Yonemura

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 (4)
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	:	≤ channel spacing
VBW	:	≥ 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 : 2 for DH1 packet
4 for DH3 packet
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

Test date	June 6, 2016
Location	Matsuda Laboratory No.2 Test Site
Temperature	24.0 [degree C]
Humidity variation	55.0 [%]
Test Engineer	Tomochika Yonemura

Normal mode

Operating modes	Transmit Time per Hop [ms]	Number of hops per channel in specified period	Time of Occupancy [ms]	Limit [ms]
DH1	0.3999	320.00	127.98	400
DH3	1.6560	160.00	264.96	
DH5	2.9036	106.67	309.72	
2-DH1	0.4265	320.00	90.99	
2-DH3	1.6794	160.00	268.70	
2-DH5	2.9270	106.67	312.21	
3-DH1	0.4262	320.00	136.37	
3-DH3	1.6780	160.00	268.48	
3-DH5	2.9303	106.67	312.56	

AFH mode

Operating modes	Transmit Time per Hop [ms]	Number of hops per channel in specified period	Time of Occupancy [ms]	Limit [ms]
DH1	0.3999	160.00	63.99	400
DH3	1.6560	80.00	132.48	
DH5	2.9036	53.33	154.86	
2-DH1	0.4265	160.00	68.24	
2-DH3	1.6794	80.00	134.35	
2-DH5	2.9270	53.33	156.11	
3-DH1	0.4262	160.00	68.18	
3-DH3	1.6780	80.00	134.24	
3-DH5	2.9303	53.33	156.28	

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.
4. The turntable azimuth (EUT direction) and antenna height 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).
5. Adjust the test instrument for the following setting:

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

6. 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)

Note: Did not carried out the fainal measurement about frequency range of 9 kHz to 30 MHz, because result of pre-check in shield room, spurious emissions was not detected.

Test Result

Operating mode	DH5, 2402 MHz, EUT axis: X			
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site		
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz	
Test date	June 8, 2016,	June 20, 2016	June 20, 2016	
Temperature	21.5	24.0	24.0	[degree C]
Humidity variation	66.0	55.0	55.0	[%]
Test Engineer	Tomochika Yonemura			

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	59.210	QuasiPeak	28.20	28.90	-7.1	0.0	21.1	21.8	40.0	18.9	18.2
2	520.540	QuasiPeak	27.00	26.80	3.3	0.0	30.3	30.1	46.0	15.7	15.9
3	1256.762	Peak	43.84	42.70	-1.4	3.3	45.8	44.6	74.0	28.2	29.4
4	1256.762	Average	27.87	27.56	-1.4	3.3	29.8	29.5	54.0	24.2	24.5
5	4804.000	Peak	40.84	40.77	9.6	3.3	53.7	53.7	74.0	20.3	20.3
6	4804.000	Average	27.32	27.65	9.6	3.3	40.2	40.5	54.0	13.8	13.5
7	7206.000	Peak	39.92	40.00	15.0	3.3	58.2	58.3	74.0	15.8	15.7
8	7206.000	Average	25.78	25.55	15.0	3.3	44.0	43.8	54.0	10.0	10.2
9	9608.000	Peak	39.83	39.54	17.3	3.3	60.4	60.2	74.0	13.6	13.8
10	9608.000	Average	26.65	26.76	17.3	3.3	47.3	47.4	54.0	6.7	6.6
11	12010.000	Peak	39.41	39.11	21.7	3.3	64.4	64.1	74.0	9.6	9.9
12	12010.000	Average	23.66	23.21	21.7	3.3	48.7	48.2	54.0	5.3	5.8

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver	Hor	Ver	Hor	Ver
1*	2402	Peak	88.97	92.11	3.8	3.3	96.1	99.2	-	-	-	-
2*	2400	Peak	29.99	30.16	3.8	3.3	37.1	37.3	76.1	79.2	39.0	42.0

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

Any Spurious emissions 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 Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site		
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz	
Test date	June 8, 2016,	June 20, 2016	June 20, 2016	
Temperature	21.5	24.0	24.0	[degree C]
Humidity variation	66.0	55.0	55.0	[%]
Test Engineer	Tomochika Yonemura			

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	59.250	QuasiPeak	28.00	28.70	-7.1	0.0	20.9	21.6	40.0	19.1	18.4
2	520.480	QuasiPeak	27.40	26.70	3.3	0.0	30.7	30.0	46.0	15.3	16.0
3	1256.888	Peak	43.79	42.71	-1.4	3.3	45.7	44.6	74.0	28.3	29.4
4	1256.888	Average	27.66	27.48	-1.4	3.3	29.6	29.4	54.0	24.4	24.6
5	4882.000	Peak	40.91	39.77	9.8	3.3	54.0	52.9	74.0	20.0	21.1
6	4882.000	Average	27.00	27.27	9.8	3.3	40.1	40.4	54.0	13.9	13.6
7	7323.000	Peak	38.00	38.99	15.4	3.3	56.7	57.7	74.0	17.3	16.3
8	7323.000	Average	25.60	25.21	15.4	3.3	44.3	43.9	54.0	9.7	10.1
9	9764.000	Peak	40.23	40.64	17.7	3.3	61.3	61.7	74.0	12.7	12.3
10	9764.000	Average	27.11	26.88	17.7	3.3	48.1	47.9	54.0	5.9	6.1
11	12205.000	Peak	40.4	39.27	21.7	3.3	65.4	64.2	74.0	8.6	9.8
12	12205.000	Average	23.25	23.34	21.7	3.3	48.2	48.3	54.0	5.8	5.7

Note.

Any Spurious emissions 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 Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site		
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz	
Test date	June 8, 2016,	June 20, 2016	June 20, 2016	
Temperature	21.5	24.0	24.0	[degree C]
Humidity variation	66.0	55.0	55.0	[%]
Test Engineer	Tomochika Yonemura			

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	59.230	QuasiPeak	27.80	28.20	-7.1	0.0	20.7	21.1	40.0	19.3	18.9
2	520.500	QuasiPeak	27.10	26.90	3.3	0.0	30.4	30.2	46.0	15.6	15.8
3	1256.881	Peak	42.11	42.34	-1.4	3.3	44.0	44.3	74.0	30.0	29.7
4	1256.881	Average	28.00	27.78	-1.4	3.3	29.9	29.7	54.0	24.1	24.3
5	4960.000	Peak	40.24	39.78	9.9	3.3	53.4	53.0	74.0	20.6	21.0
6	4960.000	Average	26.87	27.99	9.9	3.3	40.0	41.2	54.0	14.0	12.8
7	7440.000	Peak	40.20	40.51	15.7	3.3	59.2	59.5	74.0	14.8	14.5
8	7440.000	Average	26.16	25.70	15.7	3.3	45.1	44.7	54.0	8.9	9.3
9	9920.000	Peak	40.03	39.92	18.4	3.3	61.8	61.6	74.0	12.2	12.4
10	9920.000	Average	26.2	26.19	18.4	3.3	47.9	47.9	54.0	6.1	6.1
11	12400.000	Peak	39.92	39.77	21.6	3.3	64.8	64.7	74.0	9.2	9.3
12	12400.000	Average	23.13	22.98	21.6	3.3	48.0	47.9	54.0	6.0	6.1

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver	Hor	Ver	Hor	Ver
1*	2480	Peak	89.22	91.87	3.7	3.3	96.2	98.8	-	-	-	-
2*	2483.5	Peak	28.97	29.88	3.6	3.3	35.9	36.8	76.2	78.8	40.3	42.0

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

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

Operating mode	2DH5, 2402 MHz, EUT axis: X			
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site		
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz	
Test date	June 8, 2016,	June 20, 2016	June 20, 2016	
Temperature	21.5	24.0	24.0	[degree C]
Humidity variation	66.0	55.0	55.0	[%]
Test Engineer	Tomochika Yonemura			

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	59.250	QuasiPeak	28.10	27.90	-7.1	0.0	21.0	20.8	40.0	19.0	19.2
2	520.390	QuasiPeak	27.40	27.50	3.3	0.0	30.7	30.8	46.0	15.3	15.2
3	1256.654	Peak	43.28	42.34	-1.4	3.3	45.2	44.3	74.0	28.8	29.7
4	1256.654	Average	28.01	27.97	-1.4	3.3	29.9	29.9	54.0	24.1	24.1
5	4804.000	Peak	40.23	40.42	9.6	3.3	53.1	53.3	74.0	20.9	20.7
6	4804.000	Average	26.22	26.72	9.6	3.3	39.1	39.6	54.0	14.9	14.4
7	7206.000	Peak	40.00	39.87	15.0	3.3	58.3	58.1	74.0	15.7	15.9
8	7206.000	Average	25.91	26.65	15.0	3.3	44.2	44.9	54.0	9.8	9.1
9	9608.000	Peak	40.27	40.52	17.3	3.3	60.9	61.1	74.0	13.1	12.9
10	9608.000	Average	27.00	26.89	17.3	3.3	47.6	47.5	54.0	6.4	6.5
11	12010.000	Peak	39.22	39.45	21.7	3.3	64.3	64.5	74.0	9.7	9.5
12	12010.000	Average	23.23	23.68	21.7	3.3	48.3	48.7	54.0	5.7	5.3

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver	Hor	Ver	Hor	Ver
1*	2402	Peak	87.78	92.18	3.8	3.3	94.9	99.3	-	-	-	-
2*	2400	Peak	28.85	30	3.8	3.3	36.0	37.1	74.9	79.3	38.9	42.2

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

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

Operating mode	2DH5, 2441 MHz, EUT axis: X			
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site		
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz	
Test date	June 8, 2016,	June 20, 2016	June 20, 2016	
Temperature	21.5	24.0	24.0	[degree C]
Humidity variation	66.0	55.0	55.0	[%]
Test Engineer	Tomochika Yonemura			

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	59.290	QuasiPeak	26.90	27.40	-7.1	0.0	19.8	20.3	40.0	20.2	19.7
2	520.270	QuasiPeak	26.70	27.10	3.3	0.0	30.0	30.4	46.0	16.0	15.6
3	1256.745	Peak	43.72	42.81	-1.4	3.3	45.7	44.7	74.0	28.3	29.3
4	1256.745	Average	26.89	27.22	-1.4	3.3	28.8	29.2	54.0	25.2	24.8
5	4882.000	Peak	38.99	39.25	9.8	3.3	52.1	52.4	74.0	21.9	21.6
6	4882.000	Average	27.26	27.01	9.8	3.3	40.4	40.1	54.0	13.6	13.9
7	7323.000	Peak	39.55	39.38	15.4	3.3	58.3	58.1	74.0	15.7	15.9
8	7323.000	Average	25.75	25.45	15.4	3.3	44.5	44.2	54.0	9.5	9.8
9	9764.000	Peak	40.50	40.82	17.7	3.3	61.5	61.8	74.0	12.5	12.2
10	9764.000	Average	27.14	26.27	17.7	3.3	48.2	47.3	54.0	5.8	6.7
11	12205.000	Peak	39.42	39.85	21.7	3.3	64.4	64.8	74.0	9.6	9.2
12	12205.000	Average	22.99	22.20	21.7	3.3	47.9	47.2	54.0	6.1	6.8

Note.

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

Operating mode	2DH5, 2480 MHz, EUT axis: X			
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site		
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz	
Test date	June 8, 2016,	June 20, 2016	June 20, 2016	
Temperature	21.5	24.0	24.0	[degree C]
Humidity variation	66.0	55.0	55.0	[%]
Test Engineer	Tomochika Yonemura			

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	59.340	QuasiPeak	27.40	27.80	-7.1	0.0	20.3	20.7	40.0	19.7	19.3
2	520.350	QuasiPeak	26.90	27.20	3.3	0.0	30.2	30.5	46.0	15.8	15.5
3	1256.889	Peak	41.88	41.73	-1.4	3.3	43.8	43.7	74.0	30.2	30.3
4	1256.889	Average	27.88	28.02	-1.4	3.3	29.8	30.0	54.0	24.2	24.0
5	4960.000	Peak	41.82	40.23	9.9	3.3	55.0	53.4	74.0	19.0	20.6
6	4960.000	Average	27.11	27.27	9.9	3.3	40.3	40.4	54.0	13.7	13.6
7	7440.000	Peak	39.87	40.10	15.7	3.3	58.9	59.1	74.0	15.1	14.9
8	7440.000	Average	26.99	26.28	15.7	3.3	46.0	45.3	54.0	8.0	8.7
9	9920.000	Peak	40.11	39.63	18.4	3.3	61.8	61.4	74.0	12.2	12.6
10	9920.000	Average	24.98	25.50	18.4	3.3	46.7	47.2	54.0	7.3	6.8
11	12400.000	Peak	40.2	40.66	21.6	3.3	65.1	65.6	74.0	8.9	8.4
12	12400.000	Average	22	23.68	21.6	3.3	46.9	48.6	54.0	7.1	5.4

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver	Hor	Ver	Hor	Ver
1*	2480	Peak	88.65	92.41	3.7	3.3	95.6	99.4	-	-	-	-
2*	2483.5	Peak	29.24	30.2	3.6	3.3	36.2	37.1	75.6	79.4	39.4	42.2

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

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

Operating mode	3DH5, 2402 MHz, EUT axis: X			
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site		
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz	
Test date	June 8, 2016,	June 20, 2016	June 20, 2016	
Temperature	21.5	24.0	24.0	[degree C]
Humidity variation	66.0	55.0	55.0	[%]
Test Engineer	Tomochika Yonemura			

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	59.400	QuasiPeak	27.60	28.00	-7.1	0.0	20.5	20.9	40.0	19.5	19.1
2	520.340	QuasiPeak	27.10	27.00	3.3	0.0	30.4	30.3	46.0	15.6	15.7
3	1256.699	Peak	44.10	43.33	-1.4	3.3	46.0	45.3	74.0	28.0	28.7
4	1256.699	Average	27.64	27.17	-1.4	3.3	29.6	29.1	54.0	24.4	24.9
5	4804.000	Peak	39.73	40.23	9.6	3.3	52.6	53.1	74.0	21.4	20.9
6	4804.000	Average	27.41	27.81	9.6	3.3	40.3	40.7	54.0	13.7	13.3
7	7206.000	Peak	39.87	40.37	15.0	3.3	58.1	58.6	74.0	15.9	15.4
8	7206.000	Average	26.71	27.05	15.0	3.3	45.0	45.3	54.0	9.0	8.7
9	9608.000	Peak	40.11	39.41	17.3	3.3	60.7	60.0	74.0	13.3	14.0
10	9608.000	Average	27.60	27.04	17.3	3.3	48.2	47.7	54.0	5.8	6.3
11	12010.000	Peak	40.92	40.65	21.7	3.3	66.0	65.7	74.0	8.0	8.3
12	12010.000	Average	23.1	23.35	21.7	3.3	48.1	48.4	54.0	5.9	5.6

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver	Hor	Ver	Hor	Ver
1*	2402	Peak	88.38	93	3.8	3.3	95.5	100.1	-	-	-	-
2*	2400	Peak	29.7	29.26	3.8	3.3	36.8	36.4	75.5	80.1	38.7	43.7

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

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

Operating mode	3DH5, 2441 MHz, EUT axis: X			
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site		
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz	
Test date	June 8, 2016,	June 20, 2016	June 20, 2016	
Temperature	21.5	24.0	24.0	[degree C]
Humidity variation	66.0	55.0	55.0	[%]
Test Engineer	Tomochika Yonemura			

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	59.410	QuasiPeak	27.30	27.40	-7.1	0.0	20.2	20.3	40.0	19.8	19.7
2	520.360	QuasiPeak	27.20	27.10	3.3	0.0	30.5	30.4	46.0	15.5	15.6
3	1256.720	Peak	43.03	41.91	-1.4	3.3	45.0	43.8	74.0	29.0	30.2
4	1256.720	Average	27.25	28.19	-1.4	3.3	29.2	30.1	54.0	24.8	23.9
5	4882.000	Peak	40.82	40.75	9.8	3.3	53.9	53.9	74.0	20.1	20.1
6	4882.000	Average	27.99	27.66	9.8	3.3	41.1	40.8	54.0	12.9	13.2
7	7323.000	Peak	40.50	39.84	15.4	3.3	59.2	58.6	74.0	14.8	15.4
8	7323.000	Average	26.94	26.88	15.4	3.3	45.7	45.6	54.0	8.3	8.4
9	9764.000	Peak	40.00	38.70	17.7	3.3	61.0	59.7	74.0	13.0	14.3
10	9764.000	Average	25.99	26.40	17.7	3.3	47.0	47.4	54.0	7.0	6.6
11	12205.000	Peak	39.28	40.82	21.7	3.3	64.2	65.8	74.0	9.8	8.2
12	12205.000	Average	22.6	23.10	21.7	3.3	47.6	48.1	54.0	6.4	5.9

Note.

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

Operating mode	3DH5, 2480 MHz, EUT axis: X			
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site		
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz	
Test date	June 8, 2016,	June 20, 2016	June 20, 2016	
Temperature	21.5	24.0	24.0	[degree C]
Humidity variation	66.0	55.0	55.0	[%]
Test Engineer	Tomochika Yonemura			

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	59.400	QuasiPeak	26.70	27.30	-7.1	0.0	19.6	20.2	40.0	20.4	19.8
2	520.340	QuasiPeak	26.90	27.00	3.3	0.0	30.2	30.3	46.0	15.8	15.7
3	1256.671	Peak	40.29	40.86	-1.4	3.3	42.2	42.8	74.0	31.8	31.2
4	1256.671	Average	26.89	27.00	-1.4	3.3	28.8	28.9	54.0	25.2	25.1
5	4960.000	Peak	40.37	39.77	9.9	3.3	53.5	52.9	74.0	20.5	21.1
6	4960.000	Average	26.73	26.97	9.9	3.3	39.9	40.1	54.0	14.1	13.9
7	7440.000	Peak	39.40	39.00	15.7	3.3	58.4	58.0	74.0	15.6	16.0
8	7440.000	Average	27.33	27.00	15.7	3.3	46.3	46.0	54.0	7.7	8.0
9	9920.000	Peak	41.58	40.80	18.4	3.3	63.3	62.5	74.0	10.7	11.5
10	9920.000	Average	26.2	26.50	18.4	3.3	47.9	48.2	54.0	6.1	5.8
11	12400.000	Peak	40.87	39.66	21.6	3.3	65.8	64.6	74.0	8.2	9.4
12	12400.000	Average	22.8	23.10	21.6	3.3	47.7	48.0	54.0	6.3	6.0

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]		Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver	Hor	Ver	Hor	Ver
1*	2480	Peak	87.99	92.45	3.7	3.3	95.0	99.4	-	-	-	-
2*	2483.5	Peak	28.98	30.16	3.6	3.3	35.9	37.1	75.0	79.4	39.0	42.3

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

Any Spurious emissions 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	:	20 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;

   Limit [dBm] = Peak level within in-band emission [dBm] + Factor [dB] - 20 [dB]

   Margin [dB] = Limit [dBm] – (Band edge Level [dBm] + Factor [dB])

Test Result

Location	Matsuda Laboratory No.2 Test Site
Test date	June 6, 2016
Temperature	24.0 [degree C]
Humidity variation	55.0 [%RH]
Test Engineer	Tomochika Yonemura

Operating mode	**DH5, Hopping OFF**			
Freq. [MHz]	**Peak level within in-band emission [dBm]**	**Limit [dBm]**	**Band edge level [dBm]**	**Margin [dB]**
2400	-1.166	-21.166	-53.315	32.149
2483.5	-0.607	-20.607	-52.427	31.820

Operating mode	**DH5, Hopping ON**			
Freq. [MHz]	**Peak level within in-band emission [dBm]**	**Limit [dBm]**	**Band edge level [dBm]**	**Margin [dB]**
2400	-1.800	-21.800	-52.427	30.627
2483.5	-1.100	-21.100	-51.487	30.387

Operating mode	**2-DH5, Hopping OFF**			
Freq. [MHz]	**Peak level within in-band emission [dBm]**	**Limit [dBm]**	**Band edge level [dBm]**	**Margin [dB]**
2400	-2.753	-22.753	-51.278	28.525
2483.5	-2.132	-22.132	-51.144	29.012

Operating mode	**2-DH5, Hopping ON**			
Freq. [MHz]	**Peak level within in-band emission [dBm]**	**Limit [dBm]**	**Band edge level [dBm]**	**Margin [dB]**
2400	-2.731	-22.731	-51.882	29.151
2483.5	-2.160	-22.160	-50.866	28.706

Operating mode	3-DH5, Hopping OFF			
Freq. [MHz]	Peak level within in-band emission [dBm]	Limit [dBm]	Band edge level [dBm]	Margin [dB]
2400	-2.773	-22.773	-51.709	28.936
2483.5	-2.138	-22.138	-52.393	30.255

Operating mode	3-DH5, Hopping ON			
Freq. [MHz]	Peak level within in-band emission [dBm]	Limit [dBm]	Band edge level [dBm]	Margin [dB]
2400	-2.856	-22.856	-50.091	27.235
2483.5	-2.149	-22.149	-50.593	28.444

Spectrum Plots

See ANNEX A.6

9.8 Spurious RF Conducted 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
Correction Factor	:	Input Cable loss and Attenuator
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 Laboratory No.2 Test Site
Test date	June 7, 2016
Temperature	24.0 [degree C]
Humidity variation	55.0 [%]
Test Engineer	Tomochika Yonemura

9.9 AC Conducted Emissions

Regulations	FCC Part15C §15.207 RSS-Gen 7.2.2
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	June 23, 2016
Location	Matsuda Laboratory No.1 Test Site
Temperature	26.0 [degree C]
Humidity variation	71.0 [%]
Test Engineer	Tomochika Yonemura

Operating mode			**DH5, 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	0.2256	QuasiPeak	23.60	26.60	10.4	10.4	34.0	37.0	62.6	28.6	25.6
2	0.2256	Average	16.40	20.00	10.4	10.4	26.8	30.4	52.6	25.8	22.2
3	0.3437	QuasiPeak	17.90	22.30	10.4	10.4	28.3	32.7	59.1	30.8	26.4
4	0.3437	Average	12.40	16.50	10.4	10.4	22.8	26.9	49.1	26.3	22.2
5	0.5660	QuasiPeak	11.40	12.10	10.5	10.5	21.9	22.6	56.0	34.1	33.4
6	0.5660	Average	9.70	10.10	10.5	10.5	20.2	20.6	46.0	25.8	25.4
7	13.9784	QuasiPeak	19.80	19.60	11.3	11.3	31.1	30.9	60.0	28.9	29.1
8	13.9784	Average	7.40	7.10	11.3	11.3	18.7	18.4	50.0	31.3	31.6
9	14.4890	QuasiPeak	24.60	24.30	11.3	11.3	35.9	35.6	60.0	24.1	24.4
10	14.4890	Average	10.00	9.80	11.3	11.3	21.3	21.1	50.0	28.7	28.9
11	15.5780	QuasiPeak	21.70	21.00	11.3	11.3	33.0	32.3	60.0	27.0	27.7
12	15.5780	Average	8.10	7.90	11.3	11.3	19.4	19.2	50.0	30.6	30.8

Operating mode	2DH5, 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	0.2294	QuasiPeak	24.80	25.90	10.4	10.4	35.2	36.3	62.5	27.3	26.2
2	0.2294	Average	17.60	19.80	10.4	10.4	28.0	30.2	52.5	24.5	22.3
3	0.3488	QuasiPeak	21.70	23.30	10.4	10.4	32.1	33.7	59.0	26.9	25.3
4	0.3488	Average	15.90	17.80	10.4	10.4	26.3	28.2	49.0	22.7	20.8
5	0.5750	QuasiPeak	11.70	11.90	10.5	10.5	22.2	22.4	56.0	33.8	33.6
6	0.5750	Average	10.20	10.40	10.5	10.5	20.7	20.9	46.0	25.3	25.1
7	13.9780	QuasiPeak	22.70	22.00	11.3	11.3	34.0	33.3	60.0	26.0	26.7
8	13.9780	Average	7.40	7.80	11.3	11.3	18.7	19.1	50.0	31.3	30.9
9	14.4993	QuasiPeak	25.40	25.90	11.3	11.3	36.7	37.2	60.0	23.3	22.8
10	14.4993	Average	10.10	10.60	11.3	11.3	21.4	21.9	50.0	28.6	28.1
11	15.5780	QuasiPeak	20.40	21.30	11.3	11.3	31.7	32.6	60.0	28.3	27.4
12	15.5780	Average	8.40	9.00	11.3	11.3	19.7	20.3	50.0	30.3	29.7

Operating mode	3DH5, 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	0.2319	QuasiPeak	24.10	26.50	10.4	10.4	34.5	36.9	62.4	27.9	25.5
2	0.2319	Average	16.70	19.80	10.4	10.4	27.1	30.2	52.4	25.3	22.2
3	0.3522	QuasiPeak	18.50	22.70	10.5	10.5	29.0	33.2	58.9	29.9	25.7
4	0.3522	Average	13.10	16.80	10.5	10.5	23.6	27.3	48.9	25.3	21.6
5	0.5787	QuasiPeak	7.30	9.70	10.5	10.5	17.8	20.2	56.0	38.2	35.8
6	0.5787	Average	5.80	6.00	10.5	10.5	16.3	16.5	46.0	29.7	29.5
7	13.9874	QuasiPeak	22.00	22.10	11.3	11.3	33.3	33.4	60.0	26.7	26.6
8	13.9874	Average	8.70	9.00	11.3	11.3	20.0	20.3	50.0	30.0	29.7
9	14.9900	QuasiPeak	20.90	21.50	11.3	11.3	32.2	32.8	60.0	27.8	27.2
10	14.9900	Average	8.90	9.20	11.3	11.3	20.2	20.5	50.0	29.8	29.5
11	15.5815	QuasiPeak	24.70	24.40	11.3	11.3	36.0	35.7	60.0	24.0	24.3
12	15.5815	Average	10.10	10.40	11.3	11.3	21.4	21.7	50.0	28.6	28.3

9.10 Receiver Spurious Emissions

Regulations	RSS-Gen 7.1
Test Method/Guide	ANSI C63.10-2013 clause 6.5 and 6.6

Test Procedure

See section 9.6

Test Result

Operating mode	Receiving mode, EUT Axis: X			
Location	Matsuda Laboratory No.2 Test Site	Matsuda Laboratory No.1 Test Site		
Frequency	30 - 1000 MHz,	1 - 18 GHz,	18 - 25 GHz	
Test date	June 8, 2016,	June 20, 2016	June 20, 2016	
Temperature	21.5	24.0	24.0	[degree C]
Humidity variation	66.0	55.0	55.0	[%]
Test Engineer	Tomochika Yonemura			

No.	Freq. [MHz]	Detector	Reading [dBuV]		Factor [dB]		Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]	
			Hor	Ver	Loss, Gain	Dist. Factor	Hor	Ver		Hor	Ver
1	59.420	QuasiPeak	26.90	27.40	-7.1	0.0	19.8	20.3	40.0	20.2	19.7
2	520.370	QuasiPeak	26.70	27.00	3.3	0.0	30.0	30.3	46.0	16.0	15.7
3	1256.880	Peak	42.99	42.31	-1.4	3.3	44.9	44.2	74.0	29.1	29.8
4	1256.880	Average	27.37	27.78	-1.4	3.3	29.3	29.7	54.0	24.7	24.3
5	4882.000	Peak	40.32	40.05	9.8	3.3	53.4	53.2	74.0	20.6	20.8
6	4882.000	Average	26.71	26.55	9.8	3.3	39.8	39.7	54.0	14.2	14.3
7	7323.000	Peak	39.81	39.40	15.4	3.3	58.5	58.1	74.0	15.5	15.9
8	7323.000	Average	26.41	26.91	15.4	3.3	45.1	45.6	54.0	8.9	8.4
9	9764.000	Peak	39.00	38.20	17.7	3.3	60.0	59.2	74.0	14.0	14.8
10	9764.000	Average	25.7	26.00	17.7	3.3	46.7	47.0	54.0	7.3	7.0
11	12205.000	Peak	38.33	39.70	21.7	3.3	63.3	64.7	74.0	10.7	9.3
12	12205.000	Average	22.99	23.20	21.7	3.3	47.9	48.2	54.0	6.1	5.8

Note.

* : Band Edge of Restrict Band

\- : Measurement limit

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

SECTION 10. LIST AND DIAGRUM OF MEASURING INSTRUMENTS

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

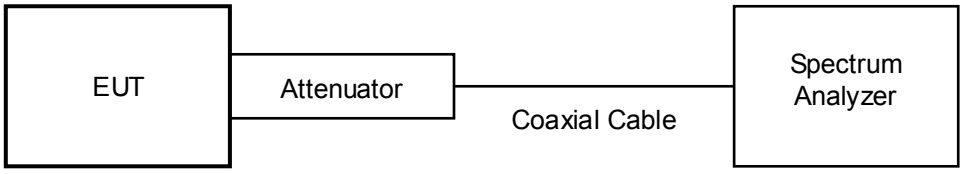
All measurements equipment used for the measurement is calibrated based on standard.
Each measurement result is traceable to national or international standards.
Antenna used in the measurement is calibrated according to ANSI C63.5.

10.1 RF Conducted

Measurement Instruments

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective period
Spectrum Analyzer	N9030A	MY52350520	Agilent	1 Y	Feb.28, 2017
20 dB Attenuator	8493C	78585	Agilent	1 Y	Jul.31, 2016
Coaxial Cable	SUCOFLEX 104PE	94703/4PE	SUHNER	1 Y	Jul.31, 2016

Measurement Equipment Configuration



10.2 Radiated Emission

Measurement Instruments

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective period
30 – 1000 MHz					
Tri-log Antenna	VULB9168WP	331	Schwarzbeck	1 Y	Jan. 2017
Amplifier	8447F	2805A02505	Hewlett Packard	1 Y	Feb. 2017
Attenuator	6806.17.AC	-	HUBER+SUHNER	1 Y	Apr. 2017
Coaxial Cable(R1)	EM0NSA3	MTD02325	Fujikura	1 Y	Jan. 2017
Coaxial Cable(R2)	SUCOFLEX 106	12718/6	HUBER+SUHNER	1 Y	Aug. 2016
Spectrum Analyzer	8567A	2841A00571	Hewlett Packard	1 Y	Jan. 2017
Test Receiver	ESS	842886/010	Rohde&Schwarz	1 Y	Jan. 2017
Site Attenuation (No.2 Test Site)	-	-	-	1 Y	May. 2017
Above 1000 MHz					
Double Ridged Antenna	3115	2568	EMCO	1 Y	Dec. 2016
Horn Antenna with Preamplifier	MLA-18265-B03-30	1694440	TSJ	1 Y	Sep. 2016
Amplifier	TPA0118-30	950186	TOYO	1 Y	Apr. 2017
Attenuator	6806.17.B	-	HUBER+SUHNER	1 Y	Apr. 2017
Notch Filter	BRM50702	111	Micro-Tronics	1 Y	Jul. 2016
Coaxial Cable(R3)	SUCOFLEX 104PE(6m)	64611/4PE	HUBER+SUHNER	1 Y	Apr. 2017
Coaxial Cable(R4)	SUCOFLEX 104PE(1m)	64587/4PE	HUBER+SUHNER	1 Y	Apr. 2017
Test Receiver	ESU26	100006	Rohde&Schwarz	1 Y	Jan. 2017
Coaxial Cable (R5)	5B-048-98-98-6000	120315	Candox	1 Y	Sep. 2015
SVSWR (No.1 Test Site)	-	-	-	1 Y	Sep. 2016
Common					
Testing Software	emiT (Version 3,0,0,0)	-	-	--	-

Measurement Instruments Configurations

Diagram of the measurement instruments (30-1000 MHz)

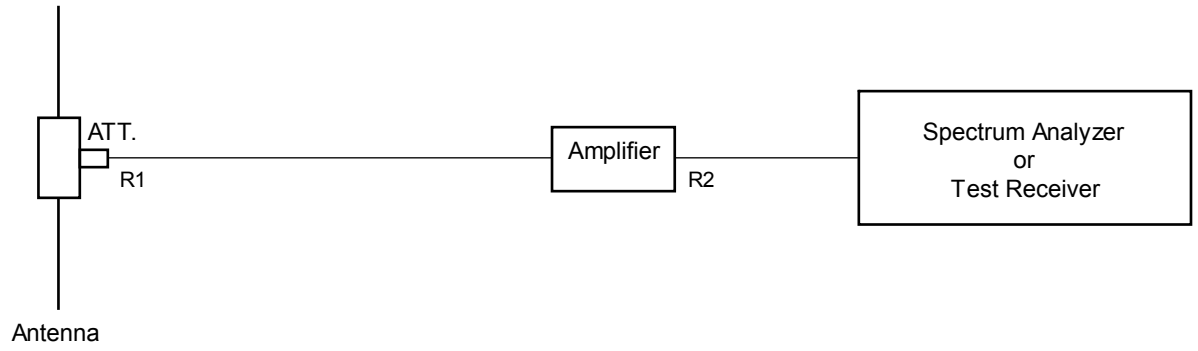


Diagram of the measurement instruments (2000 - 3000 MHz)

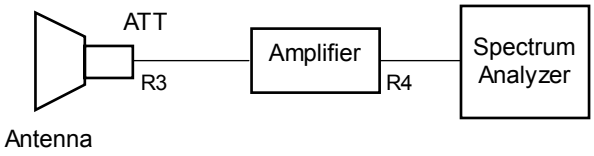


Diagram of the measurement instruments (1000- 2000 and 3000 – 18000 MHz)

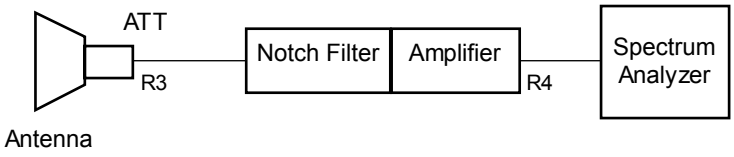
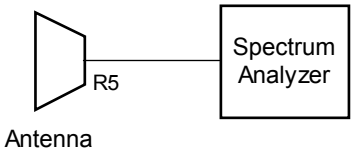
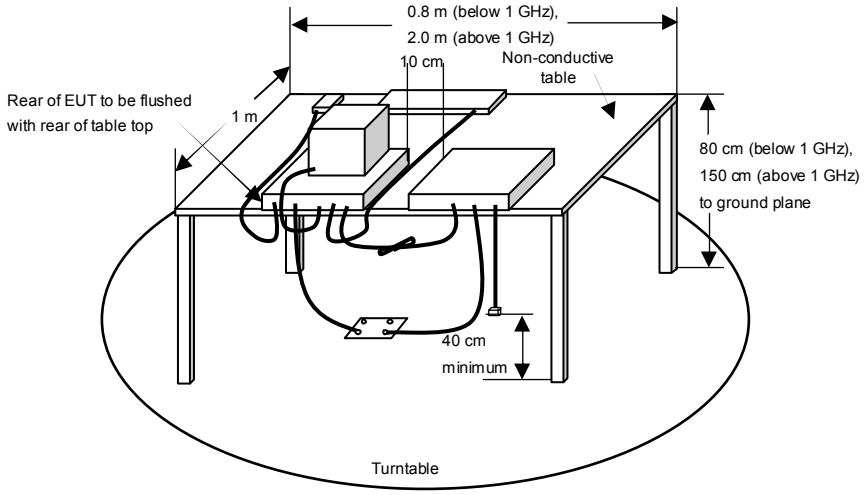


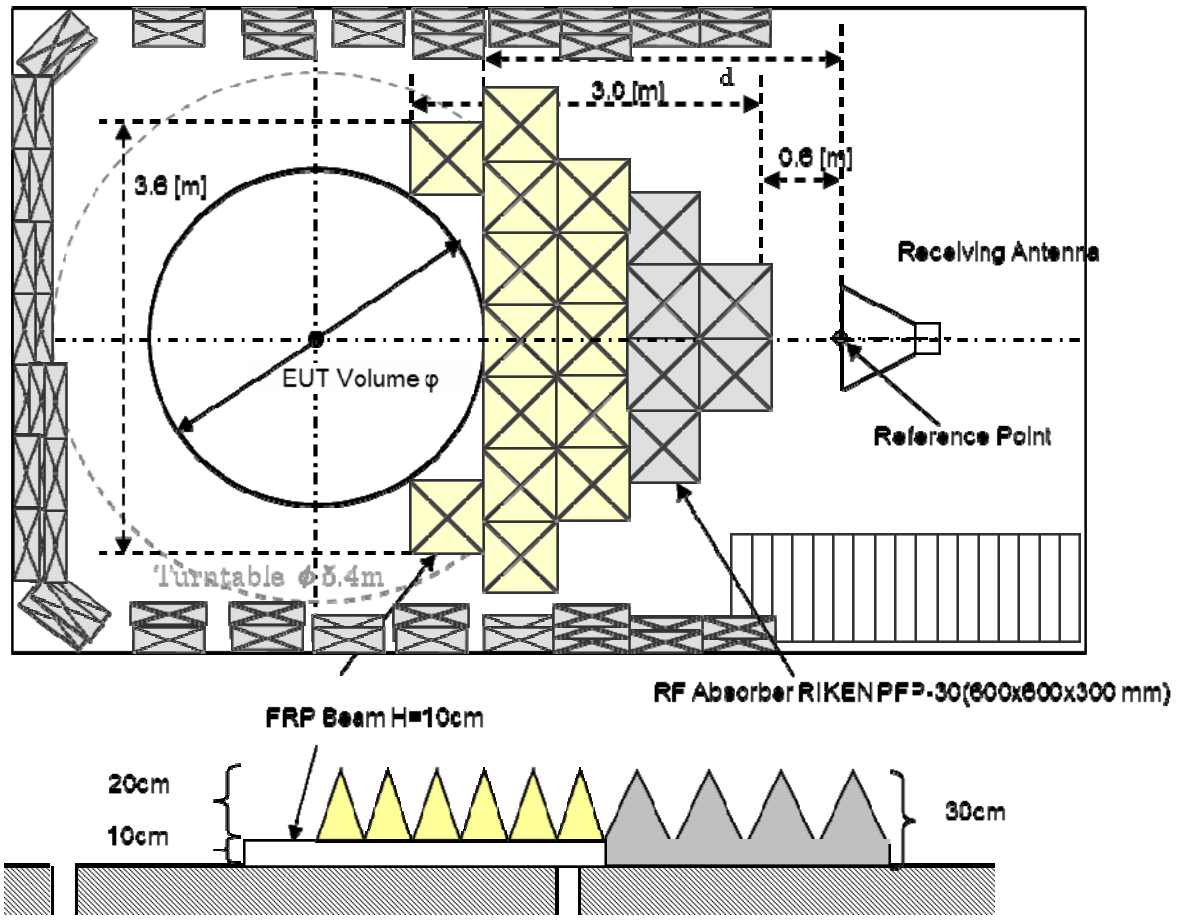
Diagram of the measurement instruments (18000 - 25000 MHz)



EUT set-up as per standard



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

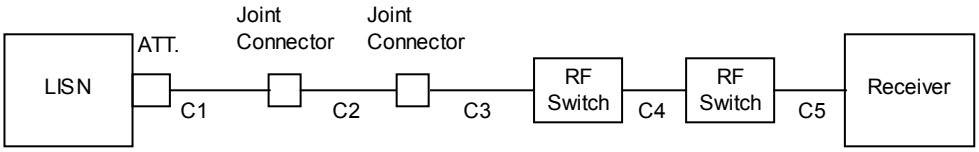


10.3 AC Line Conducted Emission

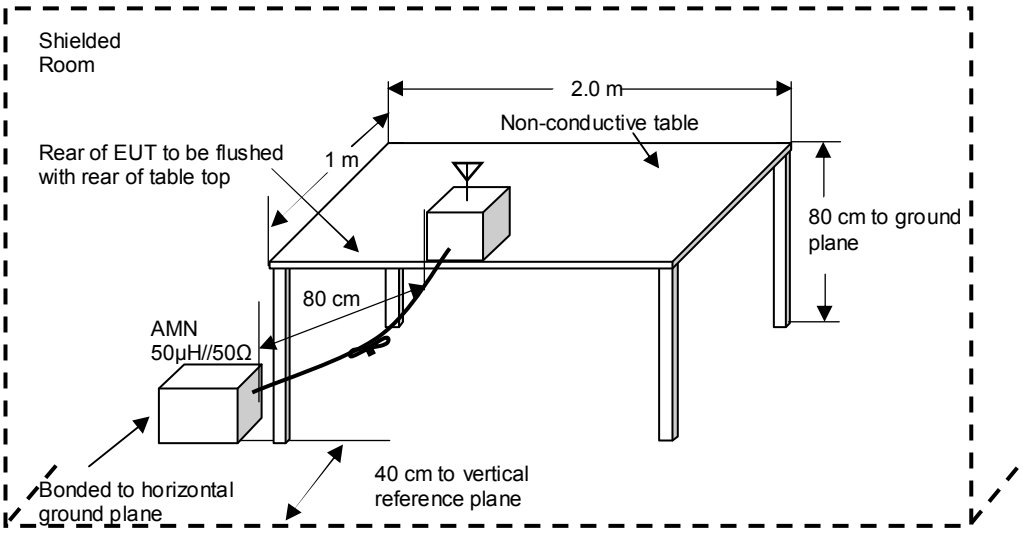
Measurement Instrument

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective period
LISN (EUT)	ESH2-Z5	879675/014	ROHDE & SCHWARZ	1 Y	Apr. 2017
10 dB Attenuator	CFA-01	KSR00251	TAMAGAWA	1 Y	Apr. 2017
Coaxial Cable(C1)	3D-2W	-	FUJIKURA	1 Y	Apr. 2017
Coaxial Cable(C2)	RG-5A/U	-	FUJIKURA	1 Y	Apr. 2017
Coaxial Cable(C3)	RG214HF	-	FUJIKURA	1 Y	Apr. 2017
Coaxial Cable(C4)	RG214HF	-	FUJIKURA	1 Y	Apr. 2017
Coaxial Cable(C5)	RG214HF	-	FUJIKURA	1 Y	Apr. 2017
RF Switch	MP59B	M28542	Anritsu	1 Y	Feb. 2017
RF Switch	ACX-150-1	-	Intertek	1 Y	Feb. 2017
Test Receiver	ESS (Firmware Version 1.21)	842123/010	Rohde & Schwarz	1 Y	Feb. 2017
Testing Software	emiT (Version 3,0,0,0)	-	-	-	-

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

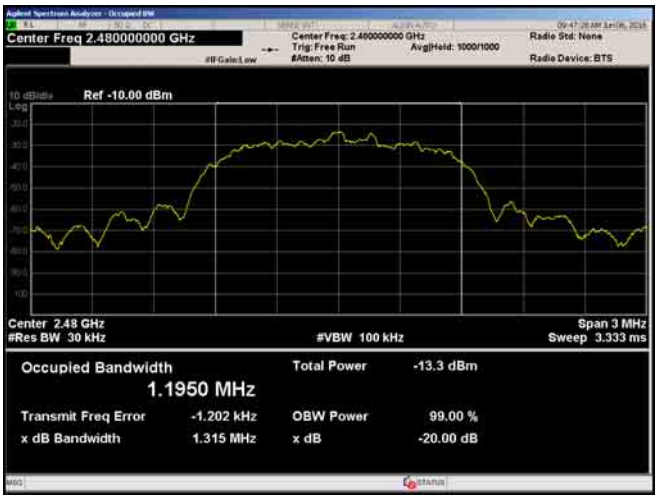
DH5	2-DH5
2402 MHz	**2402 MHz**
	
2441 MHz	**2441 MHz**
	
2480 MHz	**2480 MHz**
	

3-DH5

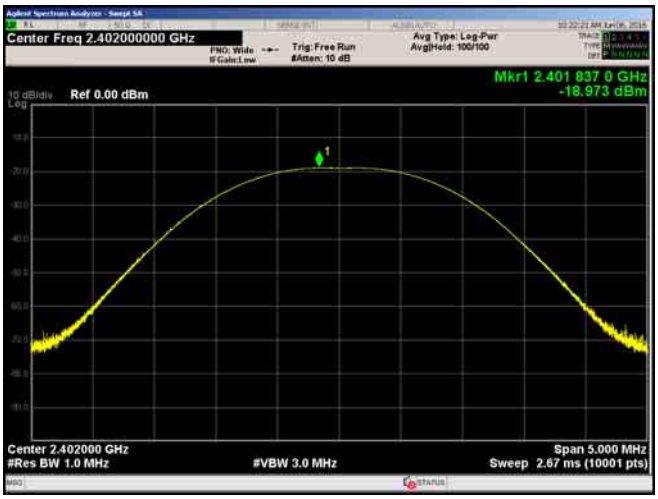
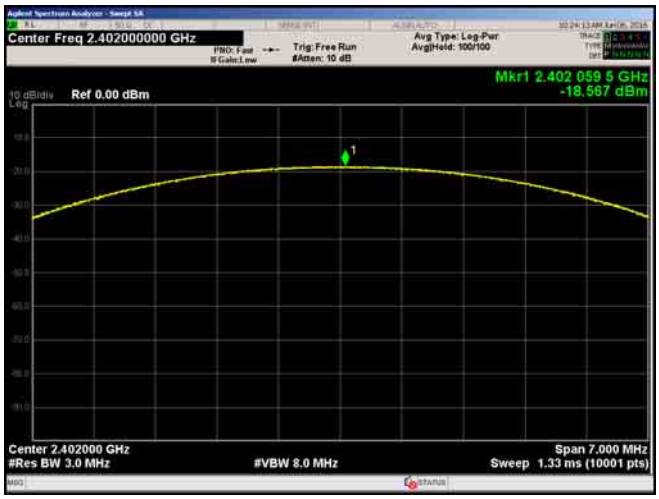
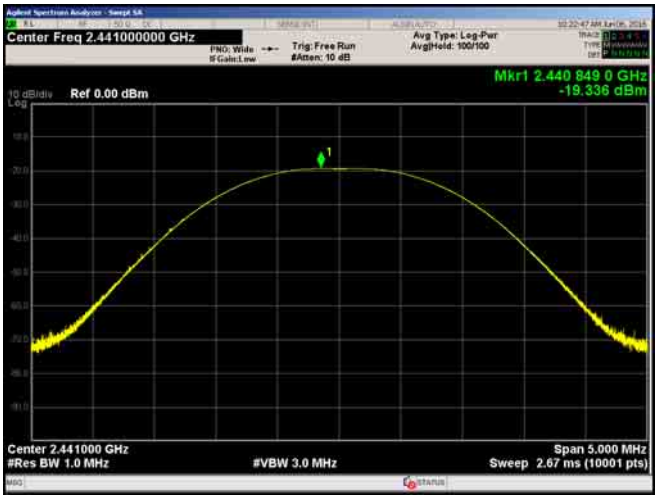
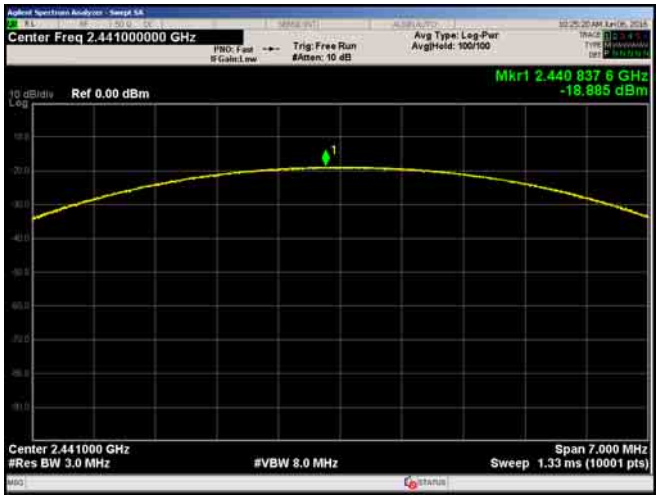
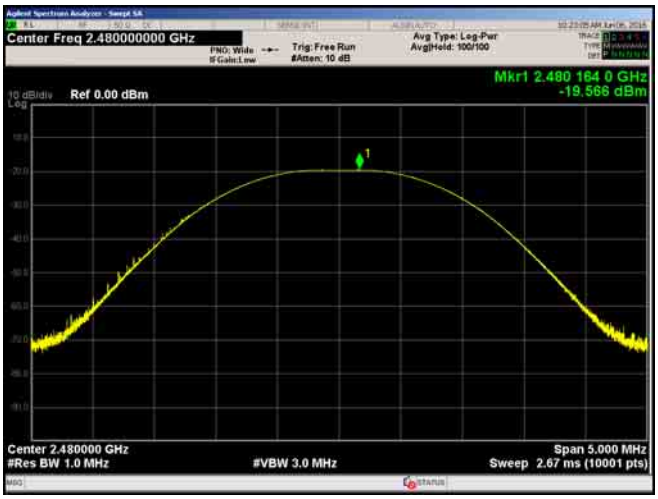
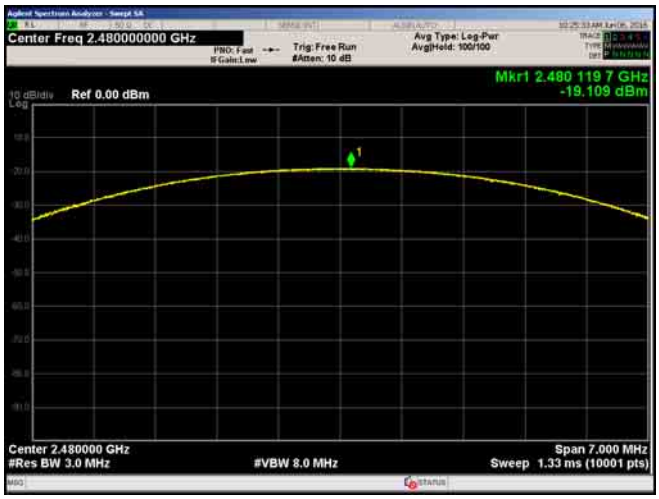
2402 MHz

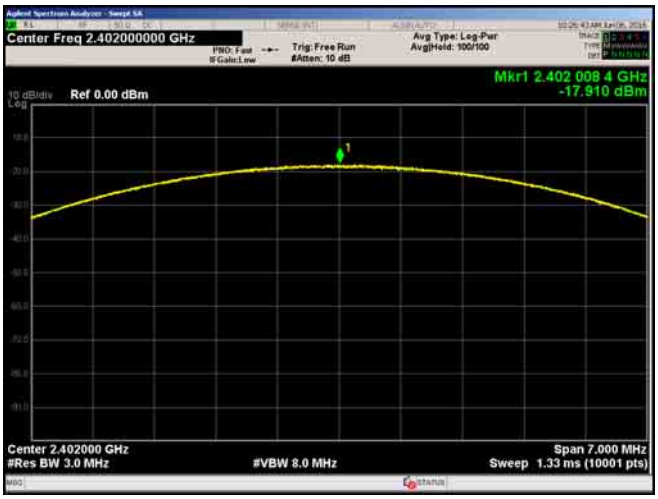
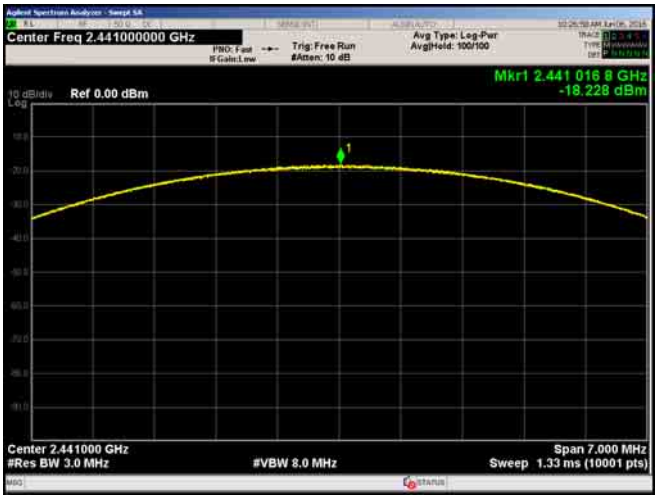
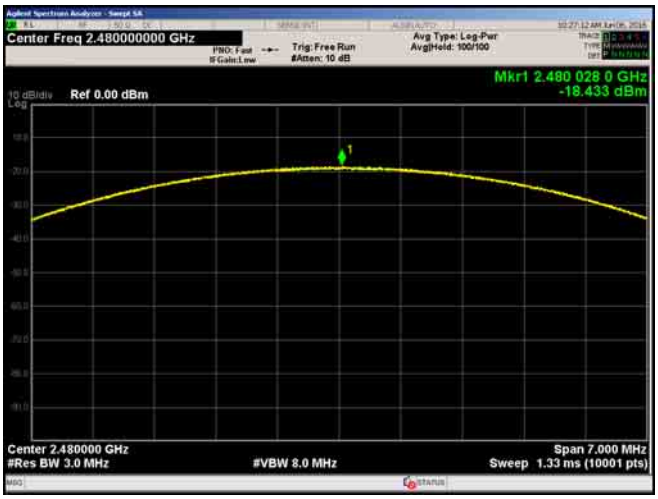
2441 MHz

2480 MHz

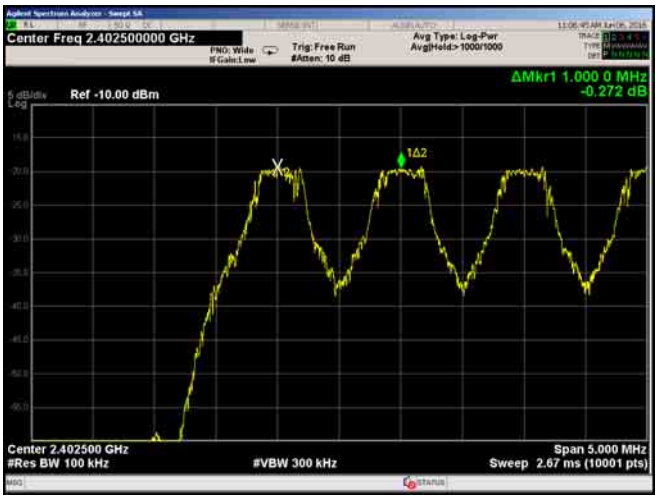
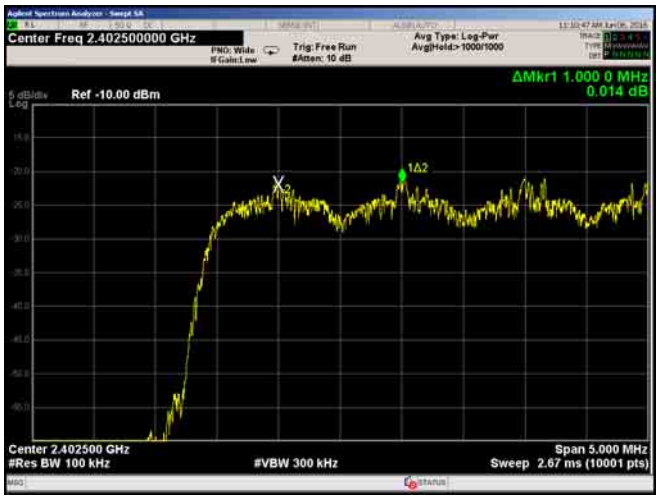
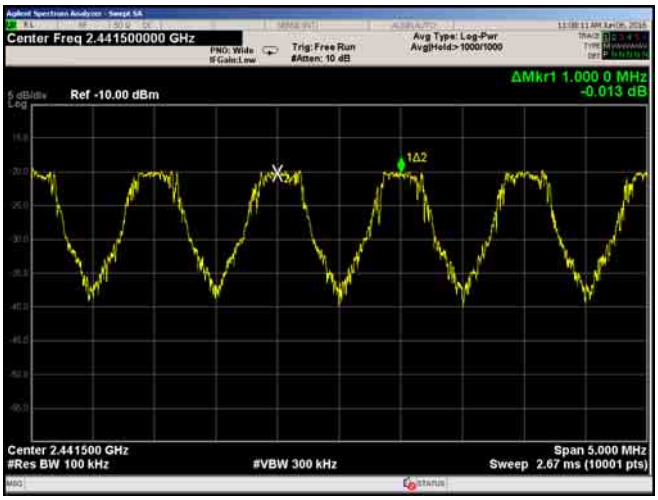
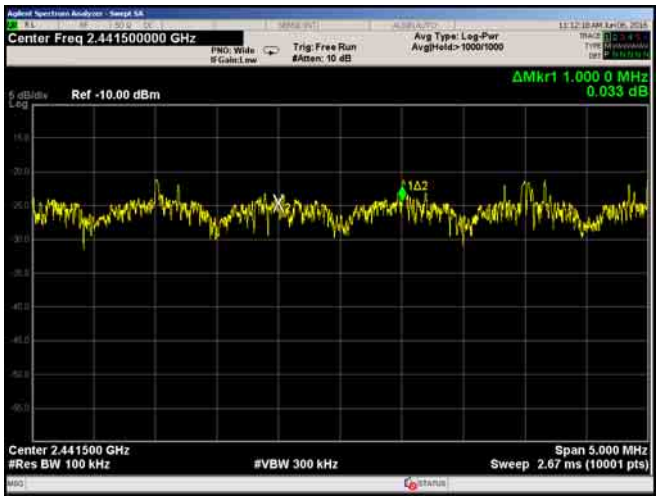
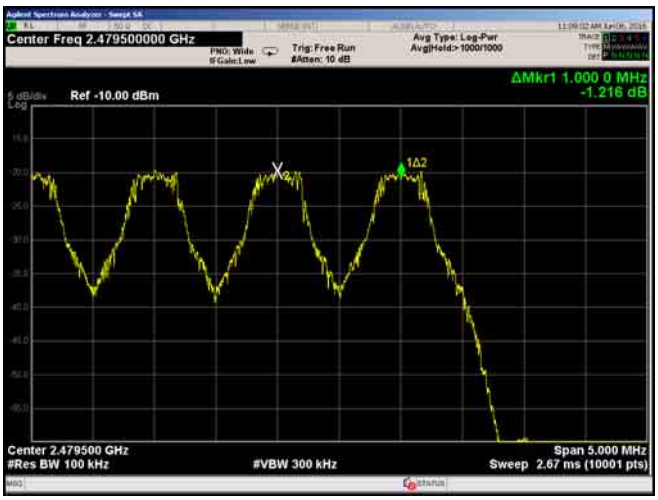
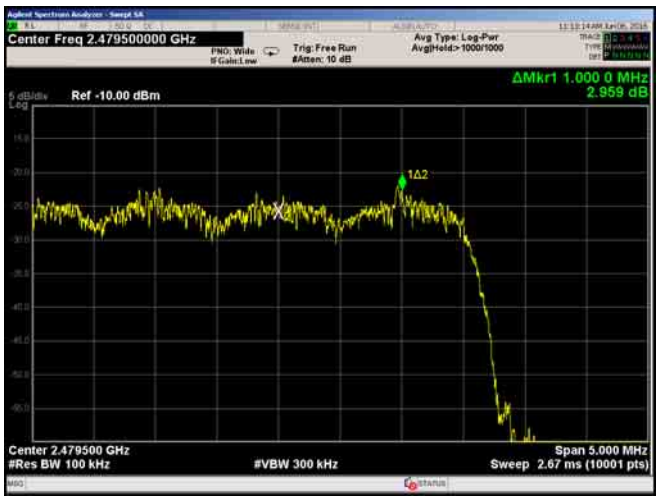


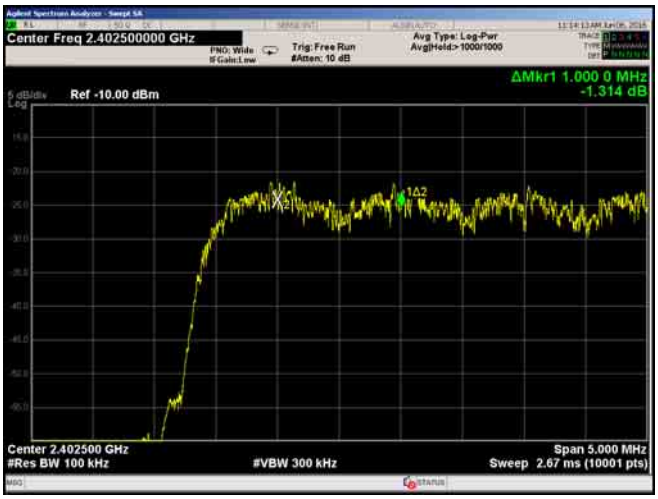
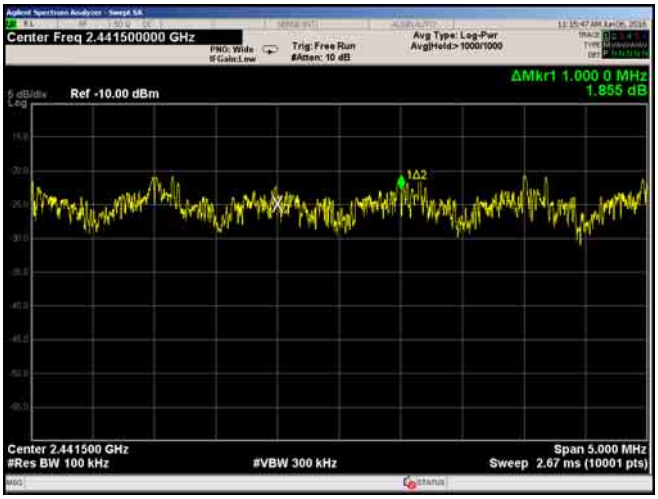
A.2 Maximum Peak Output Power

DH5	2-DH5
2402 MHz	**2402 MHz**
	
2441 MHz	**2441 MHz**
	
2480 MHz	**2480 MHz**
	

3-DH5
2402 MHz

2441 MHz

2480 MHz


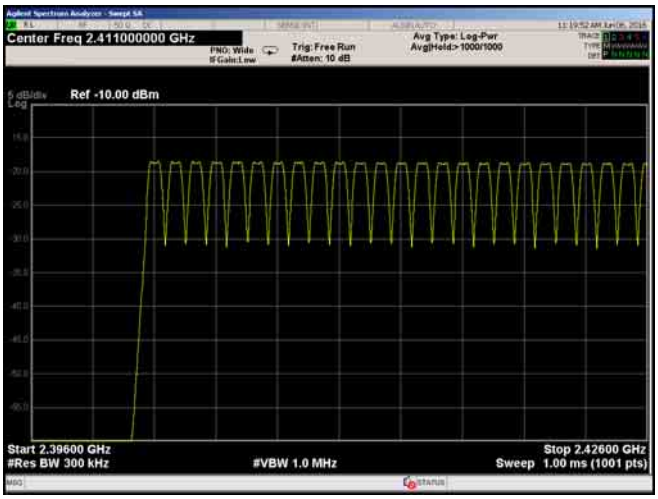
A.3 Carrier Frequency Separation

DH5	2-DH5
2402 MHz	**2402 MHz**
	
2441 MHz	**2441 MHz**
	
2480 MHz	**2480 MHz**
	

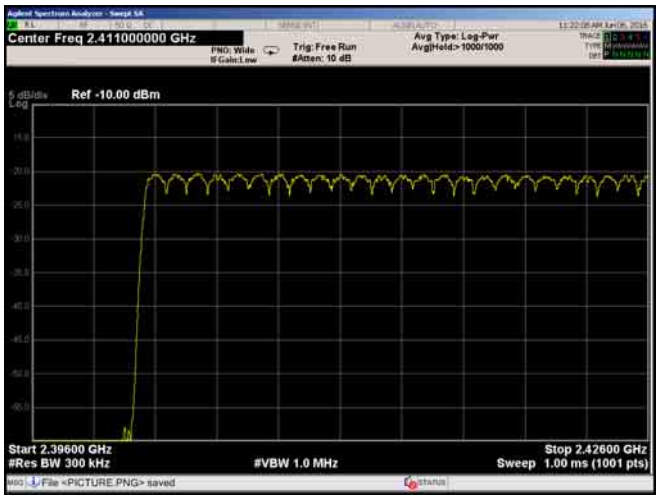
3-DH5
2402 MHz

2441 MHz

2480 MHz


A.4 Number of Hopping Frequency

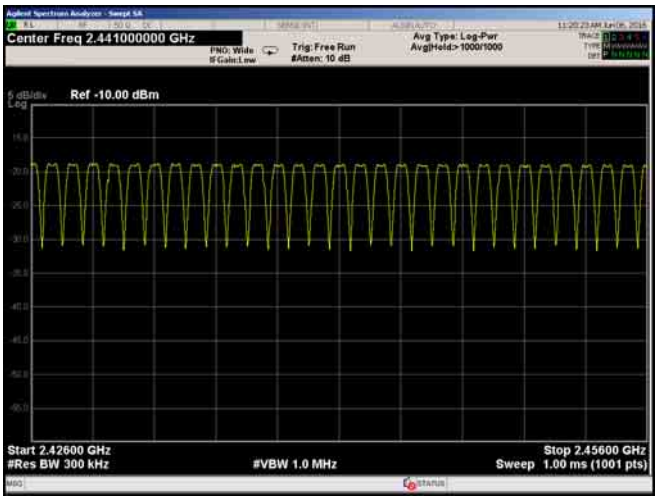
DH5_1



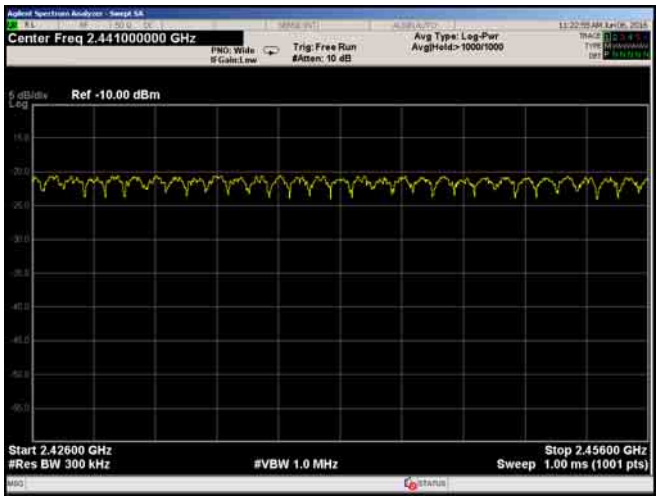
2-DH5_1



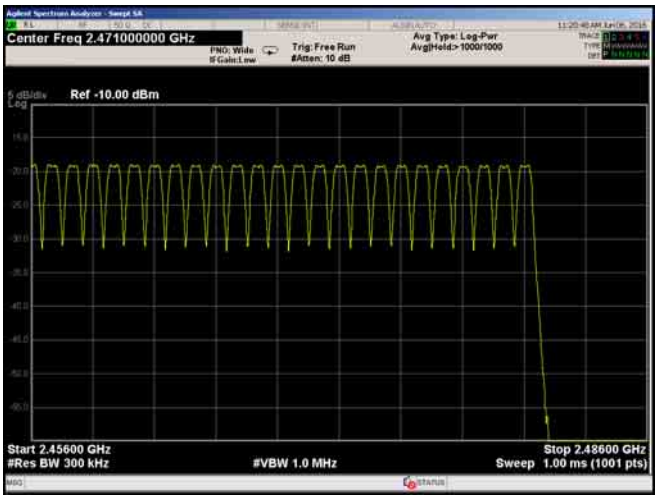
DH5_2



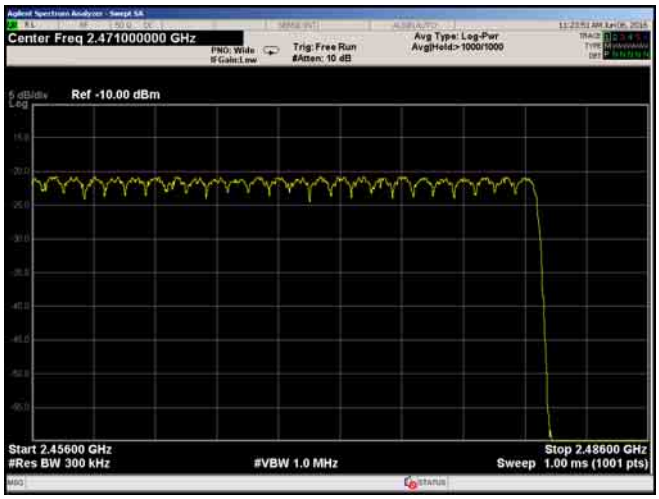
2-DH5_2



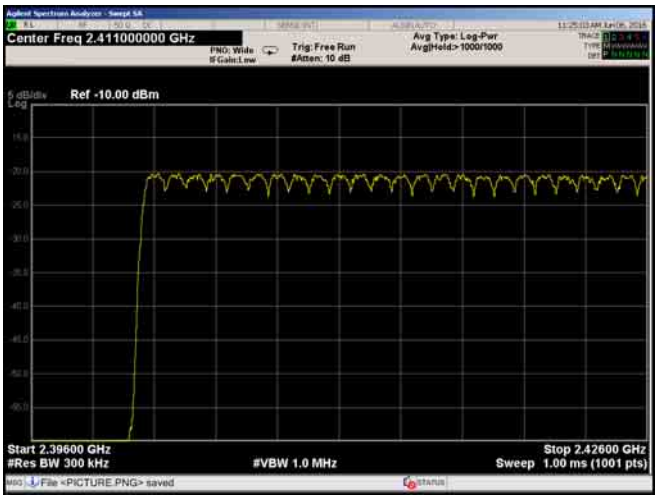
DH5_3



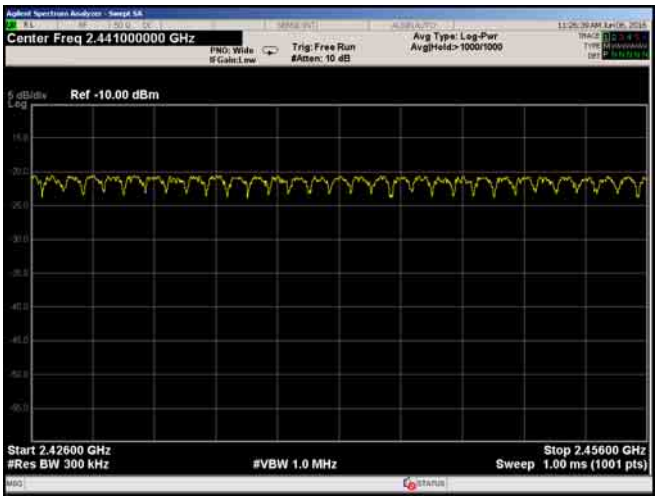
2-DH5_3



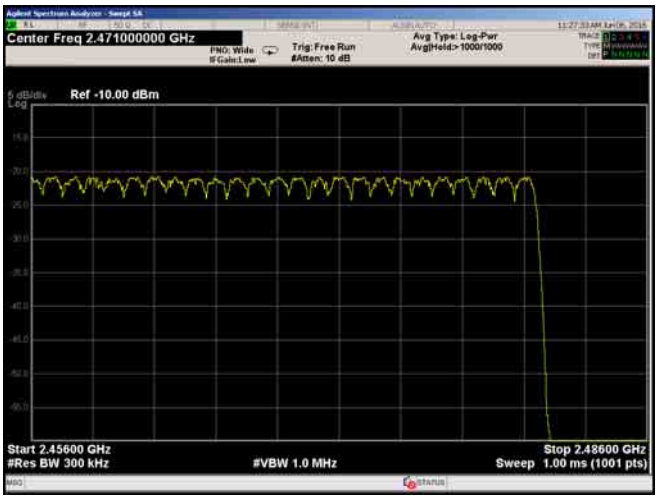
3-DH5_1



3-DH5_2

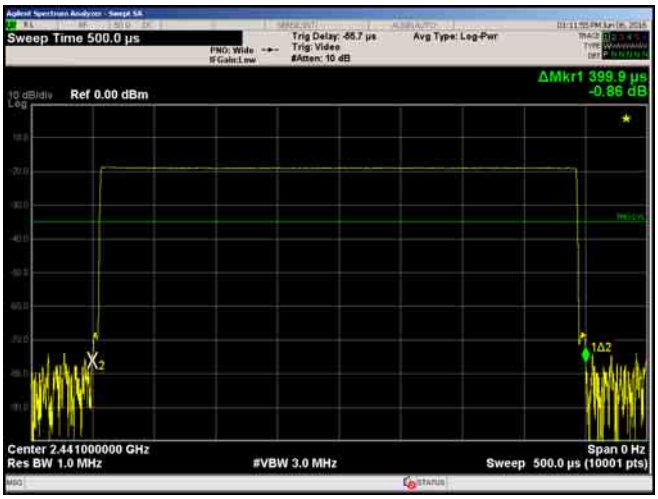


3-DH5_3

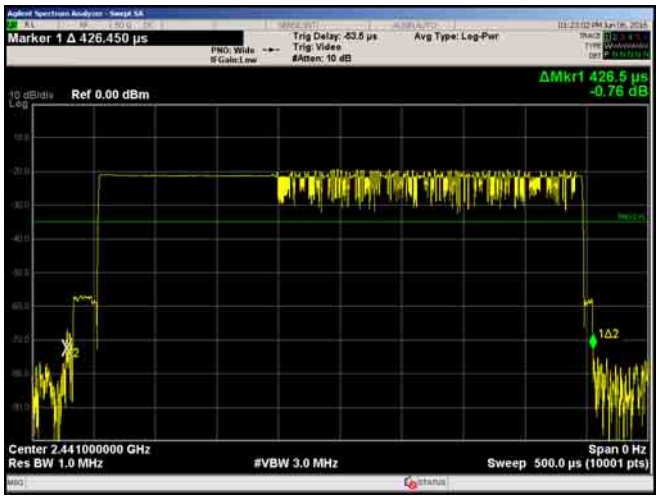


A.5 Time of Occupancy

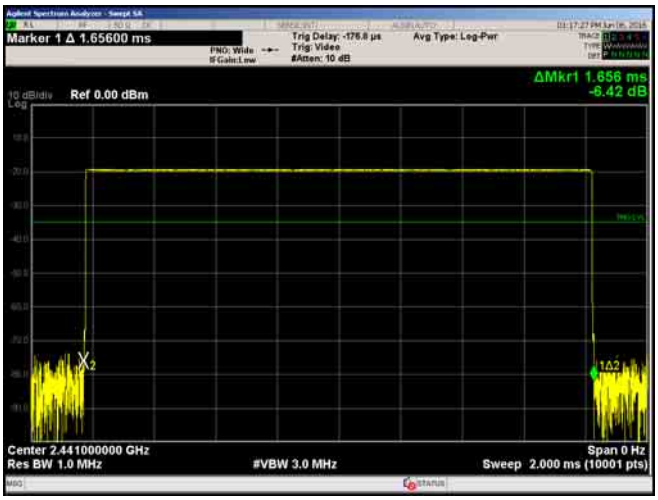
DH1



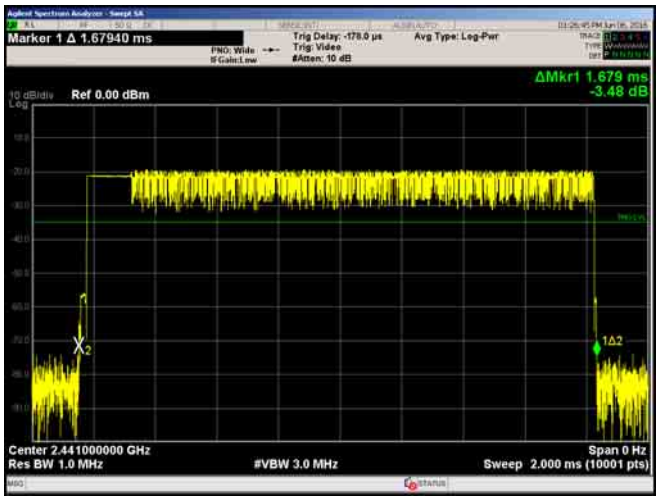
2-DH1



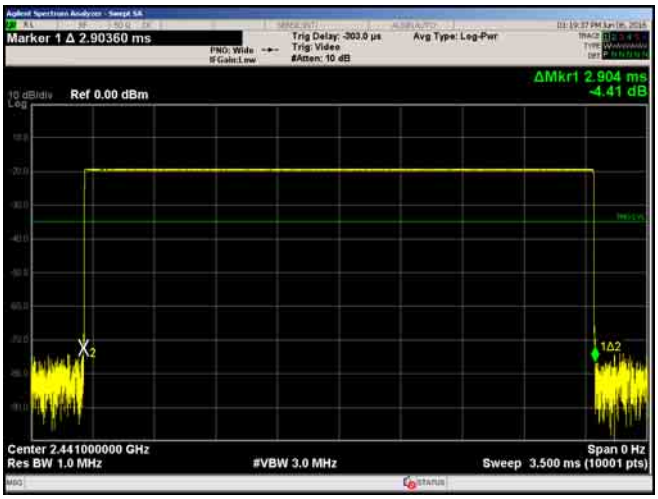
DH3



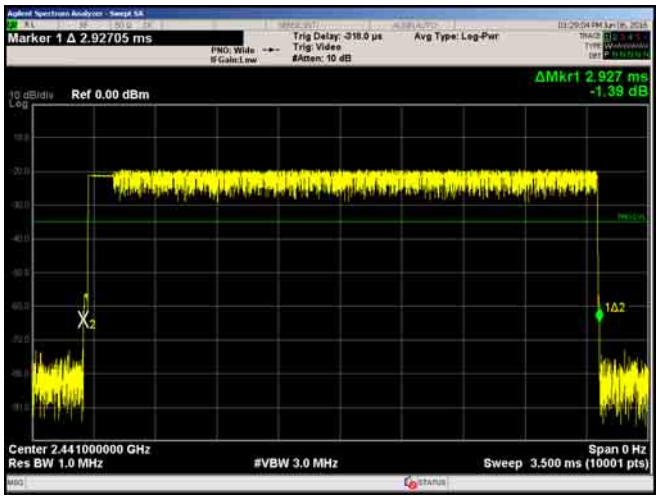
2-DH3



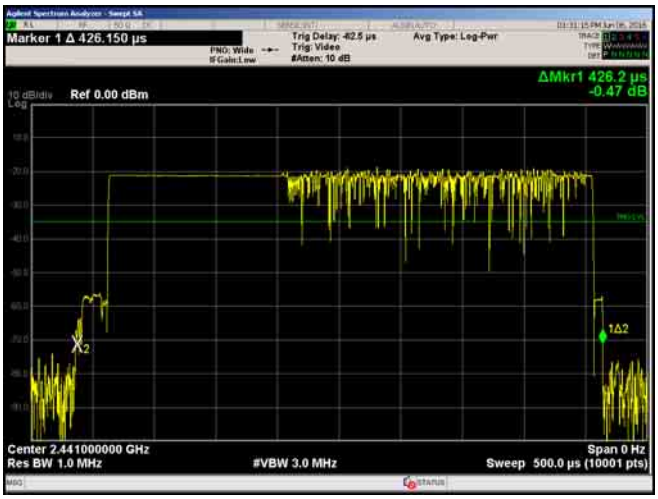
DH5



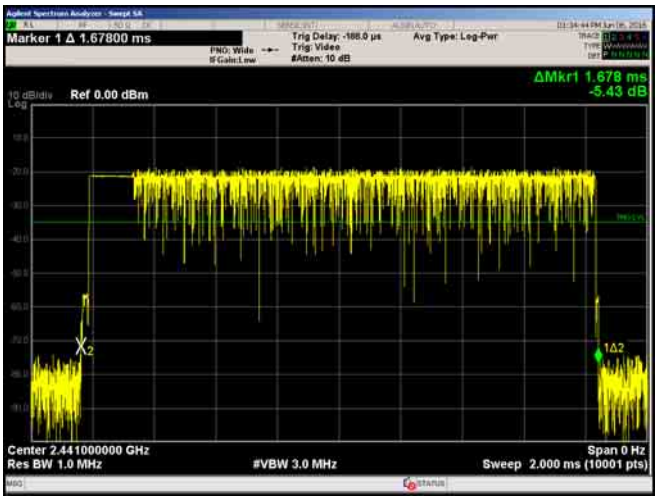
2-DH5



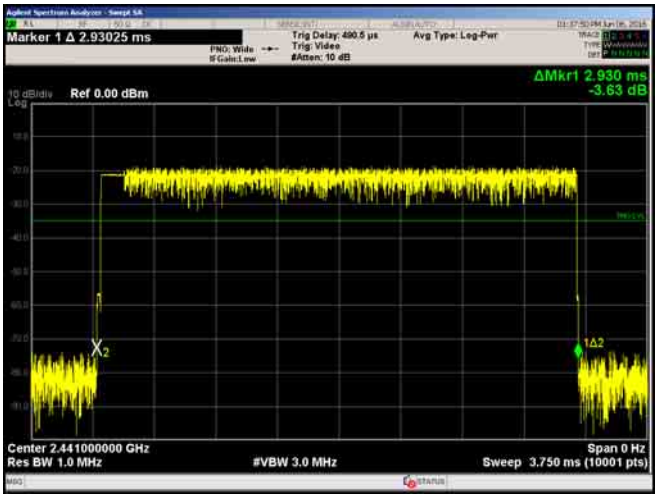
3-DH1



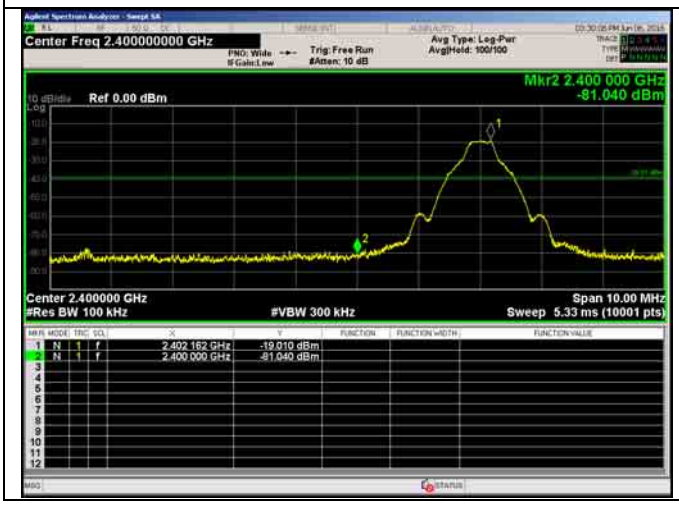
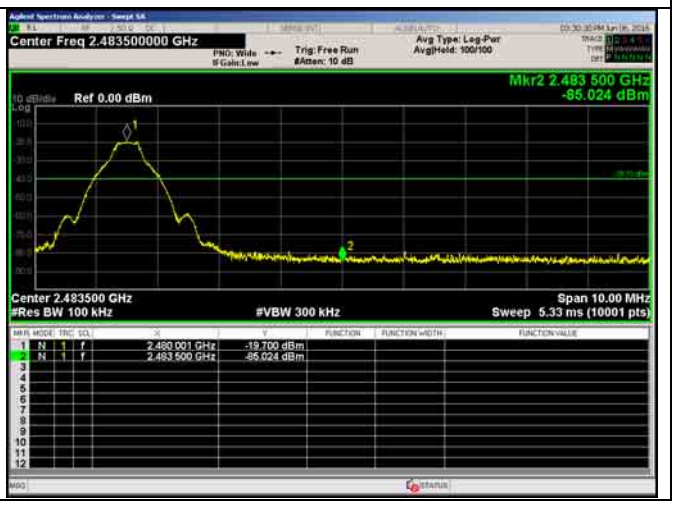
3-DH3

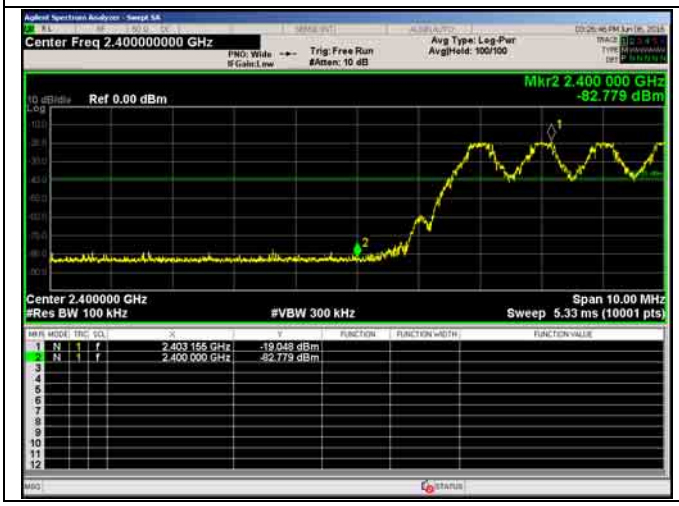
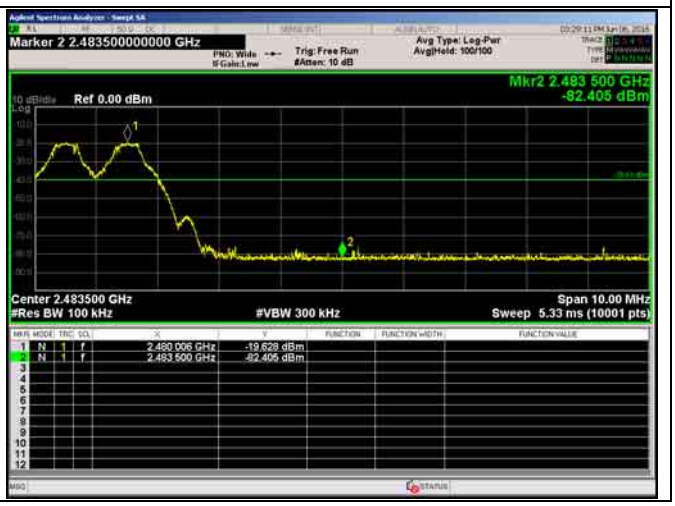


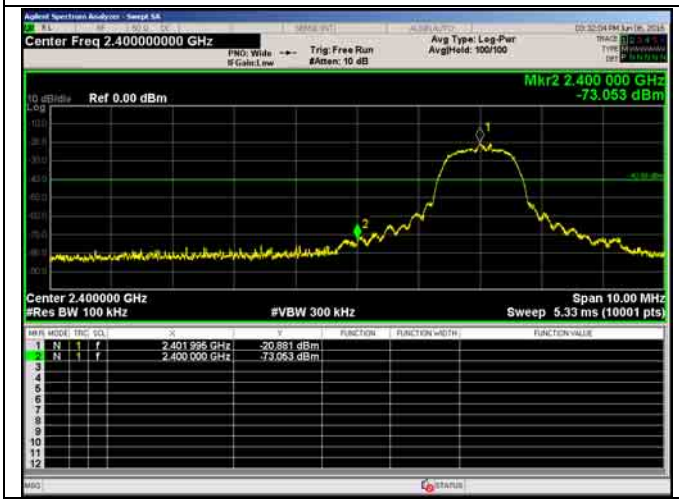
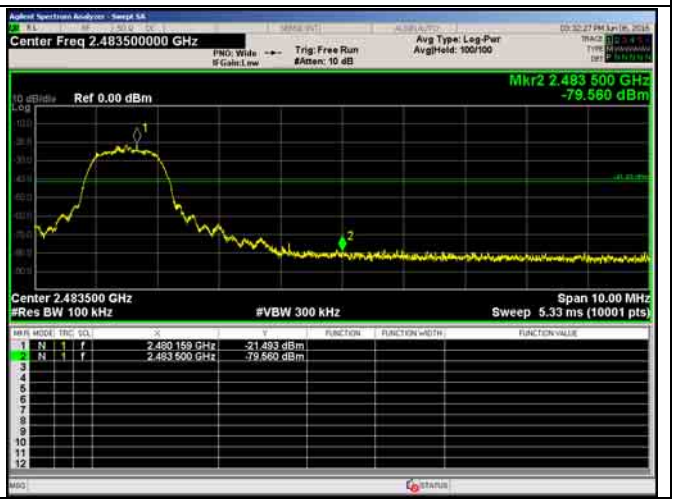
3-DH5

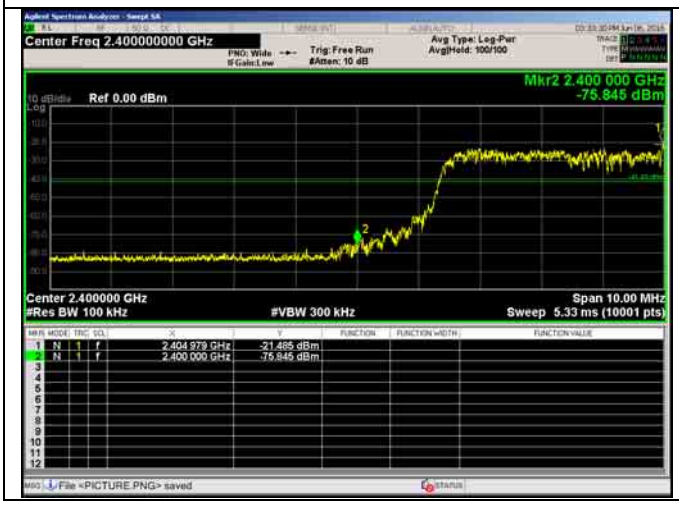
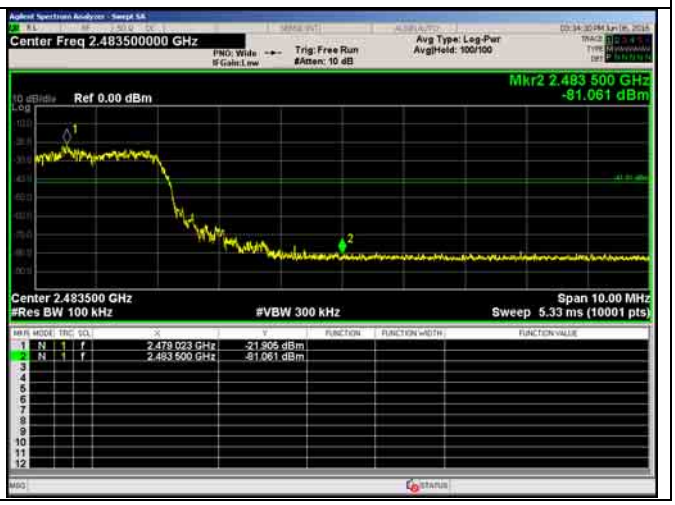


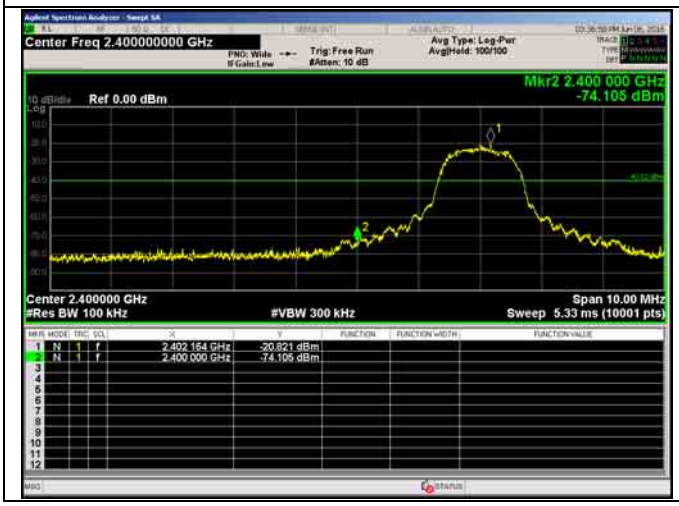
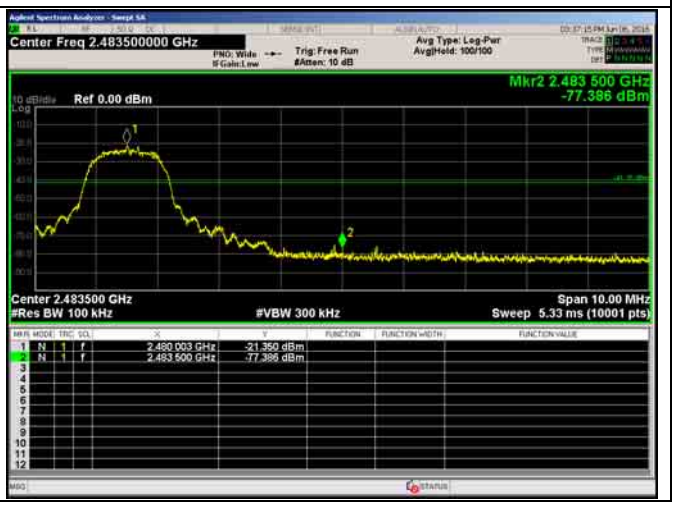
A.6 Band Edge of Authorized Frequency Band

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**