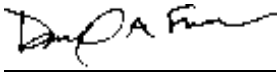
Certification Application Report
FCC Part 15.247 & ISED RSS-247

Test Lab:		Applicant:	
Rhein Tech Laboratories, Inc. Phone: 703-689 0368 360 Herndon Parkway Fax: 703-689-2056 Suite 1400 www.rheintech.com Herndon, VA 20170 E-Mail: atcbinfo@rheintech.com		Honeywell International Inc. 9680 Old Bailes Road Fort Mill, SC 29707	
FCC ID/ IC	HD5-TAP1000-01/ 1693B-TAP100001	**Test Report Date**	June 15, 2018
Platform	N/A	**RTL Work Order #**	2018064
Model Model #/HVINs	A700x TAP1010-01, TAP1020-01, TAP1030-01	**RTL Quote Number**	QRTL18-064A

American National Standard Institute:	ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
FCC Classification:	DSS – Part 15 Spread Spectrum Transmitter
FCC Rule Part(s)	FCC Rules Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz (10-01-17)
ISED Standards	RSS-247 Issue 2: Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices RSS-Gen Issue 5: General Requirements for Compliance of Radio Apparatus
Digital Interface Information	Digital Interface was found to be compliant

Frequency Range (MHz)	Output Power (W) Peak Conducted	Frequency Tolerance	Emission Designator
2402-2480	0.005	N/A	1M49FXD

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards. Furthermore, there was no deviation from, additions to, or exclusions from, the applicable parts of FCC Part 2, FCC Part 15, ANSI C63.10, and ISED RSS-247 and RSS-Gen.

Signature:  Date: June 15, 2018

Typed/Printed Name: Desmond A. Fraser Position: President

These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by ANAB. Refer to certificate and scope of accreditation AT-1445.

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1 General Information

1.1 Scope

Applicable Standards:

- FCC Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz.
- ISED RSS-247: Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices
- ISED RSS-Gen Issue 5: General Requirements for Compliance of Radio Apparatus

1.2 Description of EUT

Equipment Under Test	Body-worn transmitter
Model	A700x
Power Supply	Internal rechargeable 3.7VDC Li-Ion Battery
Modulation Type	FHSS
Frequency Range	2402–2480 MHz
Antenna	Internal -0.26 dBi

1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.10-2013).

1.4 Related Submittal(s)/Grant(s)

This is an original certification application for Honeywell International Inc. Model A700x, FCC ID: HD5-TAP1000-01, IC: 1693B-TAP100001. The ISED application includes a family certification for three HVINs: TAP1010-01, TAP1020-01, and TAP1030-01. These 3 HVINs are electrically identical.

1.5 Modifications

No modifications were required for compliance.

2 Test Information

2.1 Description of Test Modes

In accordance with FCC 15.31(m), and because the EUT utilizes an operating band greater than 10 MHz, the following frequencies were tested:

Table 2-1: Test Frequencies

Channel	FHSS Frequency (MHz)
0	2402
39	2441
78	2480

2.2 Exercising the EUT

The EUT was tested in all three orthogonal planes in order to determine worst-case emissions. The EUT was provided with software to continuously transmit during testing. The carrier was also checked to verify that information was being transmitted; all modes were investigated and the worst-case mode was used for final testing. There were no deviations from the test standard(s) and/or methods. The test results reported relate only to the item tested.

2.3 Test Result Summary

Table 2-2: Test Result Summary – FCC Part 15, Subpart C (Section 15.247); ISED RSS-247, RSS-Gen

Test	FCC Reference	ISED Reference	Result
AC Power Conducted Emissions	15.207	RSS-Gen 8.8	N/A
Radiated Emissions	15.209	RSS-247 5.5; RSS-Gen 8.9, 8.10	Pass
Maximum Peak Power Output	15.247(b)(1)	RSS-247 5.4(b), RSS-Gen 6.12	Pass
Antenna Conducted Spurious Emissions	15.247(d)	RSS-247 5.5, RSS-Gen 6.13	Pass
Carrier Frequency Separation	15.247(a)(1)	RSS-247 5.1(b)	Pass
Band Edge Measurement	15.247(d)	RSS-247 5.5	Pass
20 dB Bandwidth	15.247(a)(1)	RSS-247 5.1(a)	Pass
Hopping Characteristics	15.247(a)(1)(iii)	RSS-247 5.1(d)	Pass
Average Time of Occupancy	15.247(a)(1)(iii)	RSS-247 5.1(d)	Pass
99% Bandwidth	N/A	RSS-Gen 6.7/ TRC-43	N/A

2.4 Test System Details

The test samples were received on June 5, 2018. The FCC identifiers for all applicable equipment, plus descriptions of all cables used in the tested system, are identified in the following tables. The BT transceiver models are electrically identical.

Table 2-3: Equipment Under Test (EUT)

Part	Manufacturer	Model #/ HVIN	Serial Number	FCC ID	Cable Description	RTL Bar Code
BT Transceiver (conducted)	Honeywell International Inc.	TAP1020-01	7518200122	HD5-TAP1000-01	N/A	22944
BT Transceiver	Honeywell International Inc.	TAP1020-01	7518200106	HD5-TAP1000-01	N/A	22942
BT Transceiver	Honeywell International Inc.	TAP1010-01	7418200070	HD5-TAP1000-01	N/A	22940
3.7V Lithium Ion Battery	Honeywell International Inc.	BT-901	351747034705	N/A	N/A	22950
3.7V Lithium Ion Battery	Honeywell International Inc.	TBA901-01	351747030105	N/A	N/A	22955
3.7V Lithium Ion Battery	Honeywell International Inc.	BT-902	351741029405	N/A	N/A	22952

Table 2-4: Support Equipment

Part	Manufacturer	Model #	Serial Number	FCC ID	Cable Description	RTL Bar Code
Laptop	Samsung	NP300E5A-A01UB	HJVF93EB903201D	N/A	N/A	901550

2.5 Configuration of Tested System

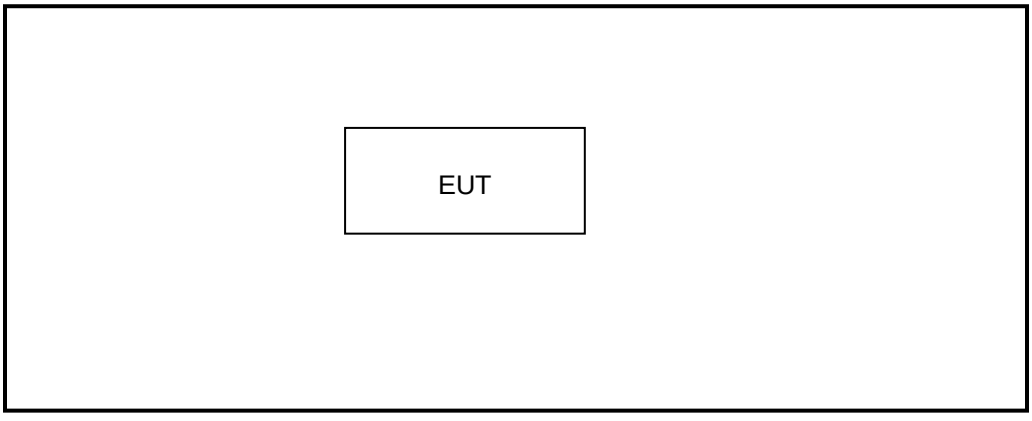


Figure 2-1: Configuration of System Under Test

3 Peak Output Power – FCC 15.247(b)(1); ISED RSS-247 5.4(b), RSS-Gen 6.12

3.1 Power Output Test Procedure

A conducted power measurement of the EUT was taken using a Rhode & Schwarz Analyzer. The following settings were used:

1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel (5 MHz used)
2) RBW >20 dB bandwidth of the emission being measured (2 MHz used)
3) VBW ≥RBW (3 MHz used)
4) Sweep: Auto
5) Detector function: Peak
6) Trace: Max hold. The trace was allowed to stabilize, and the marker-to-peak function was used to set the marker to the peak of the emission.

Table 3-1: Power Output Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19

3.2 Power Output Test Data

Table 3-2: Power Output Test Data

Modulation Type	Level Measured 2402 MHz (dBm)	Level Measured 2441 MHz (dBm)	Level Measured 2480 MHz (dBm)
DM1	4.0	3.8	3.7
DH1	3.9	3.8	3.7
DM3	4.0	3.8	3.7
DH3	3.9	3.8	3.7
DM5	3.8	3.8	3.7
DH5	3.8	3.8	3.7
2-DH1	6.4	6.2	5.9
3-DH1	6.3	6.1	5.8
2-DH3	6.6	6.4	6.1
3-DH3	6.4	6.2	5.9
2-DH5	6.2	6.0	5.7
3-DH5	6.3	6.1	5.8

Measurement uncertainty: ±0.8 dB. This measurement uncertainty is an expanded uncertainty for 95% confidence level received with a coverage factor k=2.

Test Personnel:

Khue Do		June 6, 2018
Test Engineer	Signature	Date of Test

4 Compliance with the Band Edge – FCC 15.247(d); ISED RSS-247 5.5

4.1 Band Edge Test Procedure

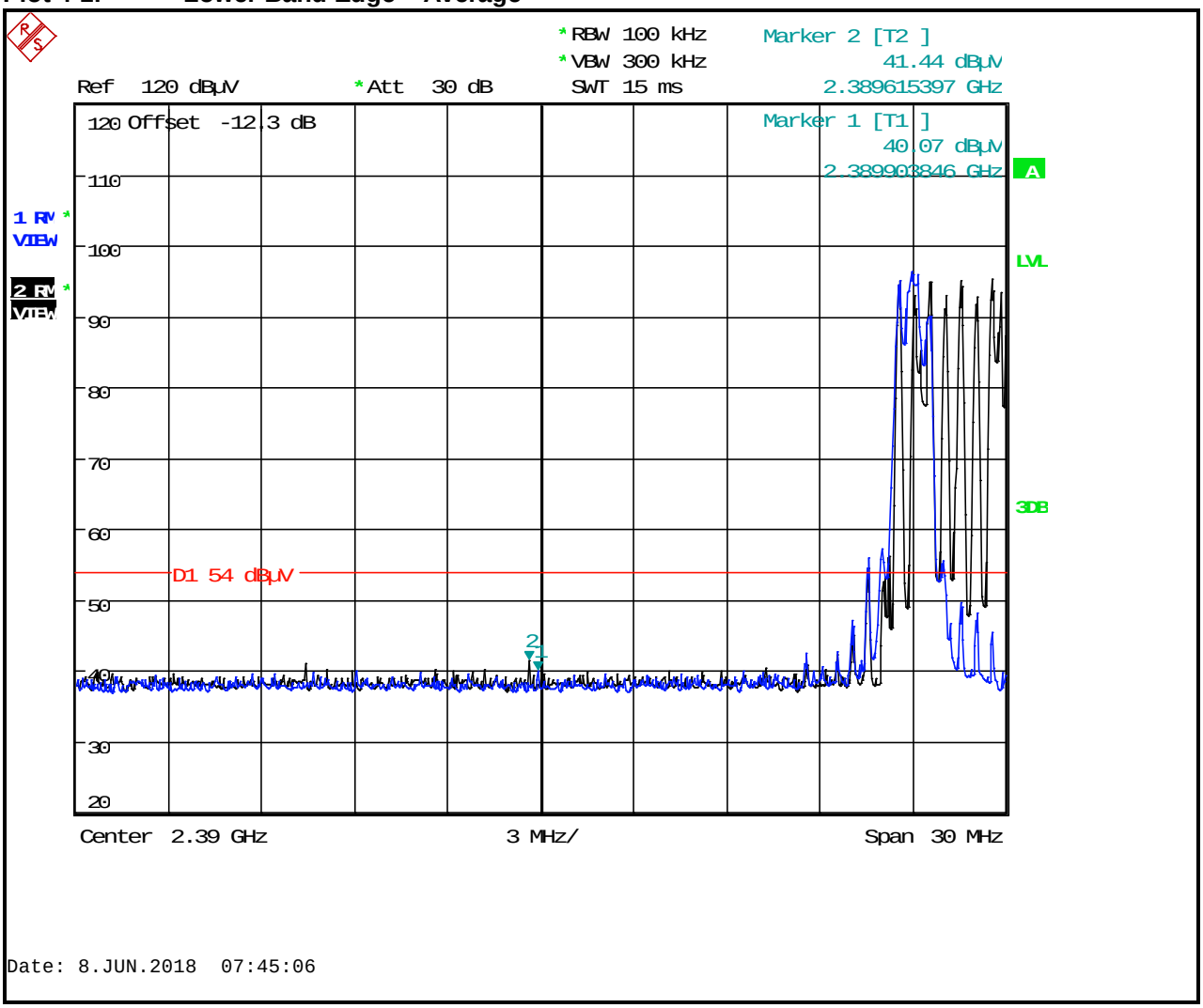
The transmitter output was connected to the spectrum analyzer. Peak and average detector conducted plots were taken with a suitable span to encompass the peak of the fundamental, and traces to stop hopping and non-hopping modes. The measurement was performed from the highest peak in the restricted band (within 2 MHz), and the result was compared to the restricted band limit (54 dBuV/m). An offset was used to reference the fundamental power to a radiated field strength measurement.

Table 4-1: Band Edge Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19
900878	Rhein Tech Laboratories, Inc.	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901592	Insulated Wire Inc.	KPS-1503-3600-KPR	SMK RF Cables 20'	NA	8/18/18
901242	Rhein Tech Laboratories, Inc.	WRT-000-0003	Wood rotating table	N/A	Not Required
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	4/9/19

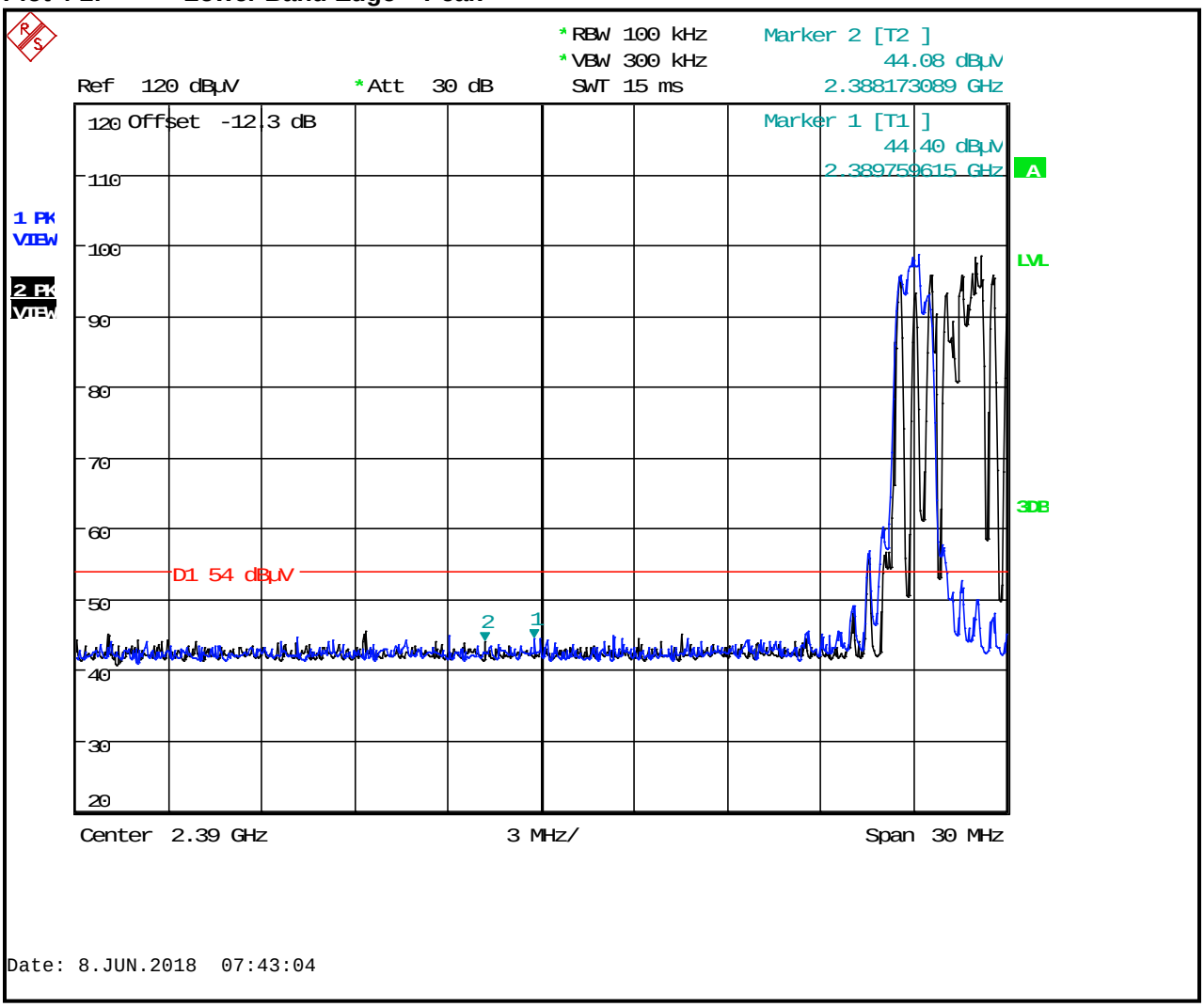
4.2 Restricted Band Edge Test Results

Plot 4-1: Lower Band Edge – Average



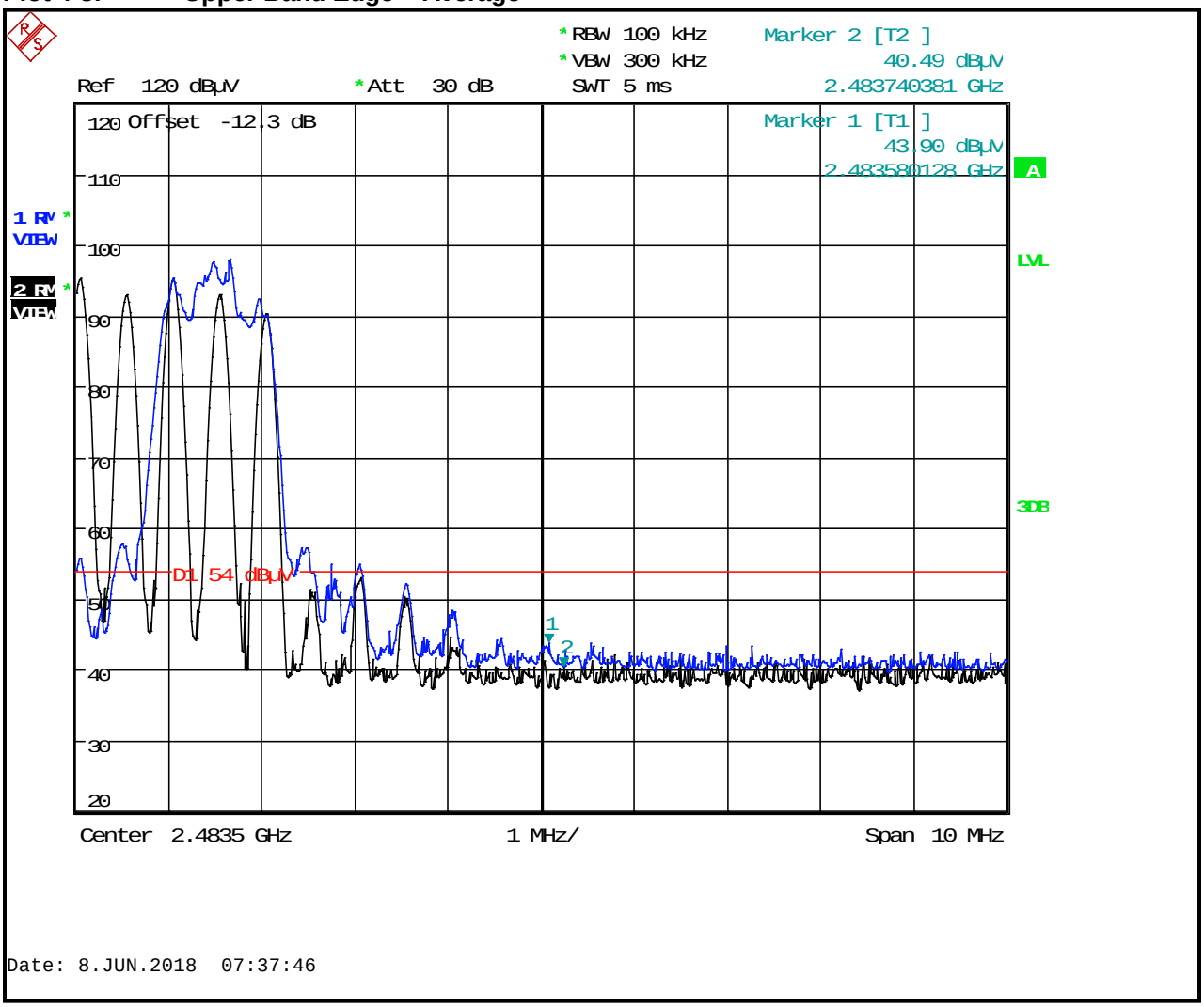
Measured = 41.4 dBµV/m Limit = 54.0 dBµV/m Margin = -12.6 dB Result: Pass

Plot 4-2: Lower Band Edge – Peak



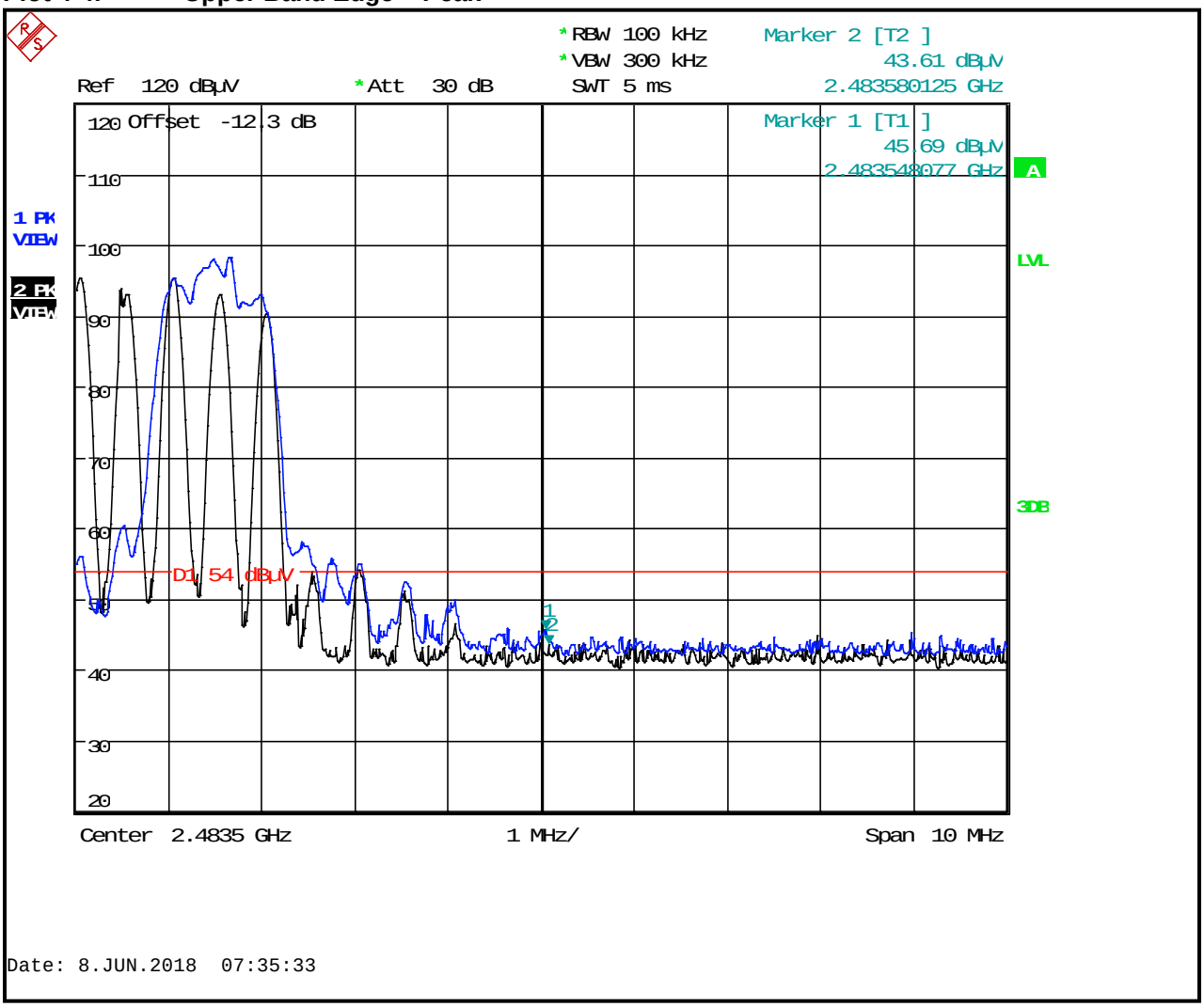
Measured = 44.4 dBµV/m Limit = 54.0 dBµV/m Margin = -9.6 dB Result: Pass

Plot 4-3: Upper Band Edge – Average



Measured = 43.9 dBµV/m Limit = 54.0 dBµV/m Margin = -10.1 dB Result: Pass

Plot 4-4: Upper Band Edge – Peak



Measured = 45.7 dBµV/m Limit = 54.0 dBµV/m Margin = -8.3 dB Result: Pass

Measurement uncertainty: ±0.8 dB. This measurement uncertainty is an expanded uncertainty for 95% confidence level received with a coverage factor k=2.

Test Personnel:

Khue Do		June 8, 2018
Test Engineer	Signature	Date of Test

5 Antenna Conducted Spurious Emissions – FCC 15.247(d); ISED RSS-247 5.5, RSS-Gen 6.13

5.1 Antenna Conducted Spurious Emissions Test Procedures

Antenna spurious emissions per FCC 15.247(d) were measured from the EUT antenna port using a 50-ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 100 kHz. The modulated carrier was identified at the following frequencies: 2402 MHz, 2441 MHz and 2480 MHz.

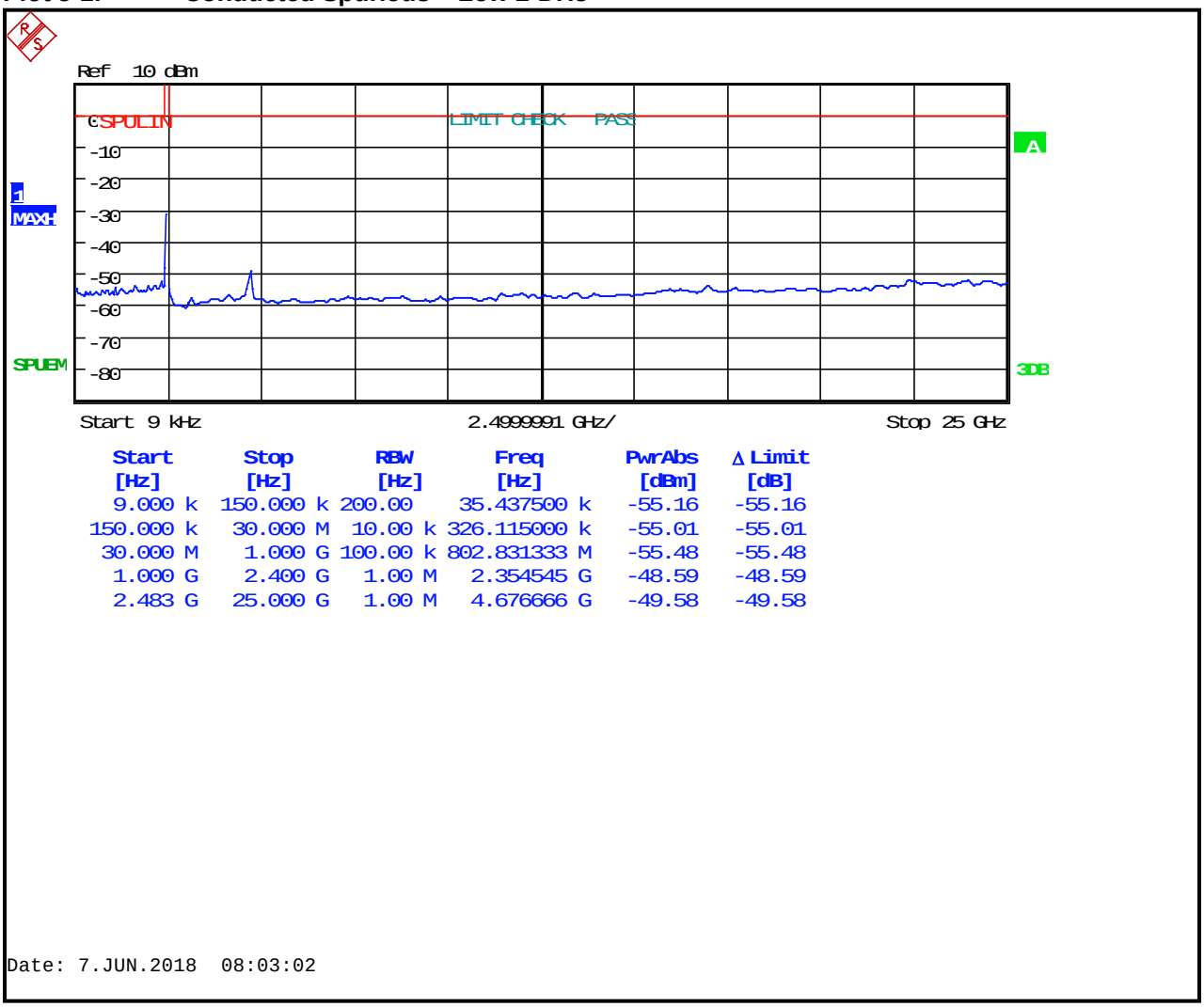
5.2 Antenna Conducted Spurious Emissions Test Results

No harmonics or spurs were found within 20 dB (note that we are reporting power as peak) of the carrier level from the carrier to the 10th harmonic of the carrier frequency.

Table 5-1: Antenna Conducted Spurious Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19

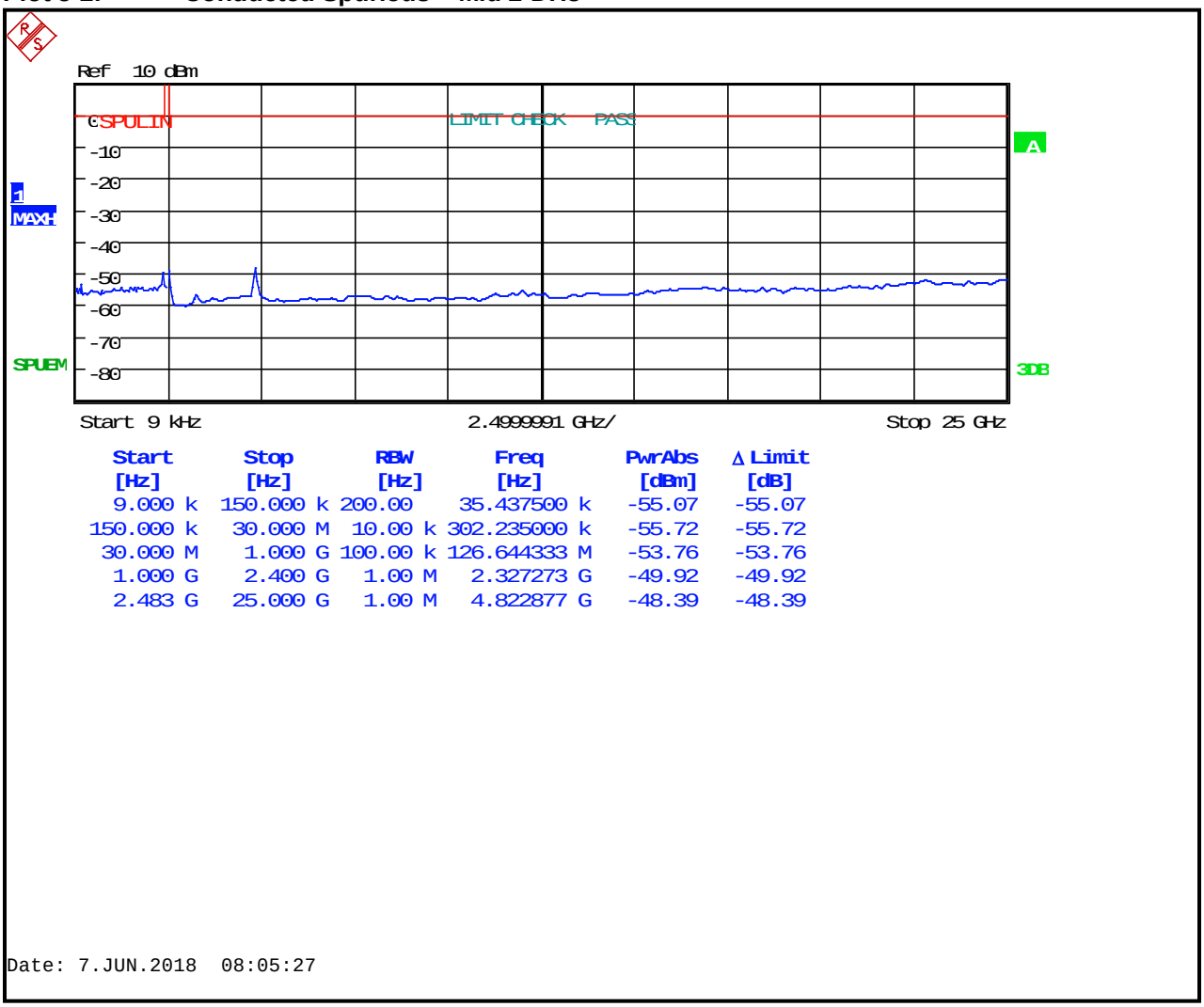
Plot 5-1: Conducted Spurious – Low 2-DH3



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
9.000 k	150.000 k	200.00	35.437500 k	-55.16	-55.16
150.000 k	30.000 M	10.00 k	326.115000 k	-55.01	-55.01
30.000 M	1.000 G	100.00 k	802.831333 M	-55.48	-55.48
1.000 G	2.400 G	1.00 M	2.354545 G	-48.59	-48.59
2.483 G	25.000 G	1.00 M	4.676666 G	-49.58	-49.58

Date: 7.JUN.2018 08:03:02

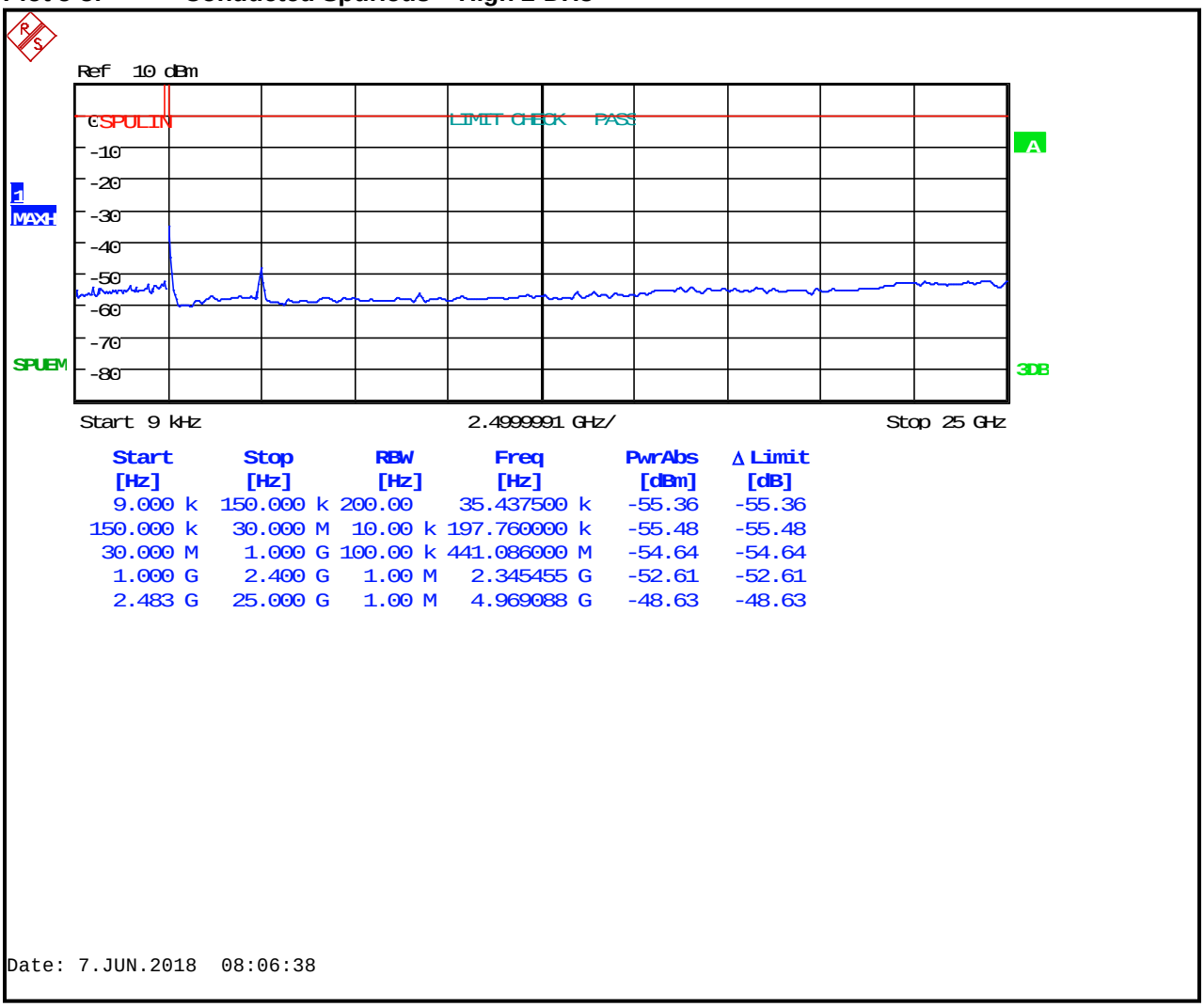
Plot 5-2: Conducted Spurious – Mid 2-DH3



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
9.000 k	150.000 k	200.00	35.437500 k	-55.07	-55.07
150.000 k	30.000 M	10.00 k	302.235000 k	-55.72	-55.72
30.000 M	1.000 G	100.00 k	126.644333 M	-53.76	-53.76
1.000 G	2.400 G	1.00 M	2.327273 G	-49.92	-49.92
2.483 G	25.000 G	1.00 M	4.822877 G	-48.39	-48.39

Date: 7.JUN.2018 08:05:27

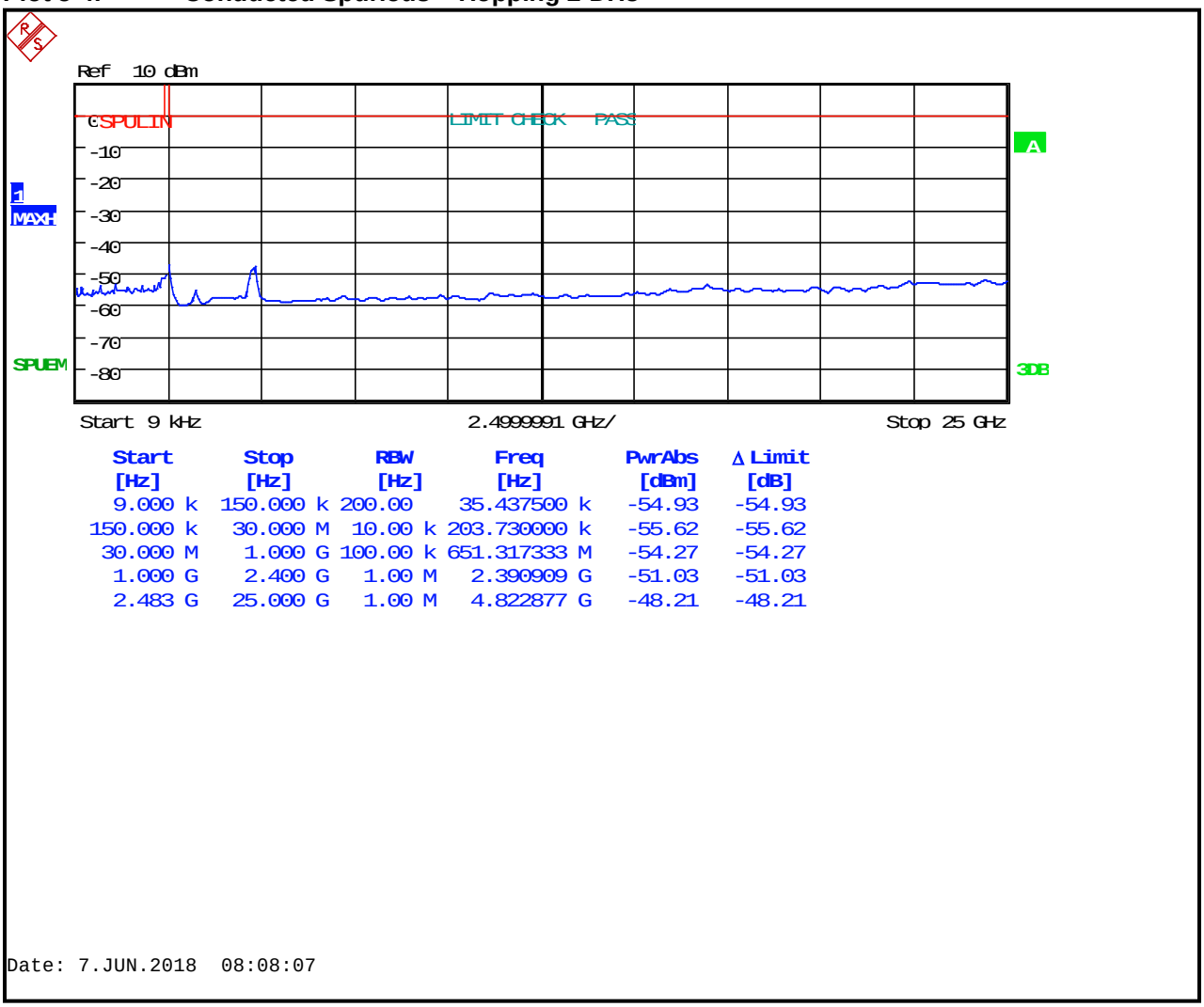
Plot 5-3: Conducted Spurious – High 2-DH3



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
9.000 k	150.000 k	200.00	35.437500 k	-55.36	-55.36
150.000 k	30.000 M	10.00 k	197.760000 k	-55.48	-55.48
30.000 M	1.000 G	100.00 k	441.086000 M	-54.64	-54.64
1.000 G	2.400 G	1.00 M	2.345455 G	-52.61	-52.61
2.483 G	25.000 G	1.00 M	4.969088 G	-48.63	-48.63

Date: 7.JUN.2018 08:06:38

Plot 5-4: Conducted Spurious – Hopping 2-DH3



Measurement uncertainty: ±0.8 dB. This measurement uncertainty is an expanded uncertainty for 95% confidence level received with a coverage factor k=2.

Test Personnel:

Khue Do		June 7, 2018
Test Engineer	Signature	Date of Test

6 20 dB Bandwidth – FCC 15.247(a)(1)); ISED RSS-247 5.1(a)

6.1 20 dB Bandwidth Test Procedure

The minimum 20 dB bandwidths per FCC 15.247 were measured using a 50-ohm spectrum analyzer. The carrier was adjusted on the analyzer so that it was displayed entirely on the spectrum analyzer. The sweep time was set to auto and allowed through several sweeps with the max hold function used in peak detector mode. The resolution bandwidth was set to 100 kHz, and the video bandwidth set at 300 kHz. The minimum 20 dB bandwidths were measured using the spectrum analyzer delta marker set 20 dB down from the peak of the carrier. The table below contains the bandwidth measurement results. DH5 and 3-DH5 are shown as representative worst case for basic and EDR modulations.

Table 6-1: 20 dB Bandwidth Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19

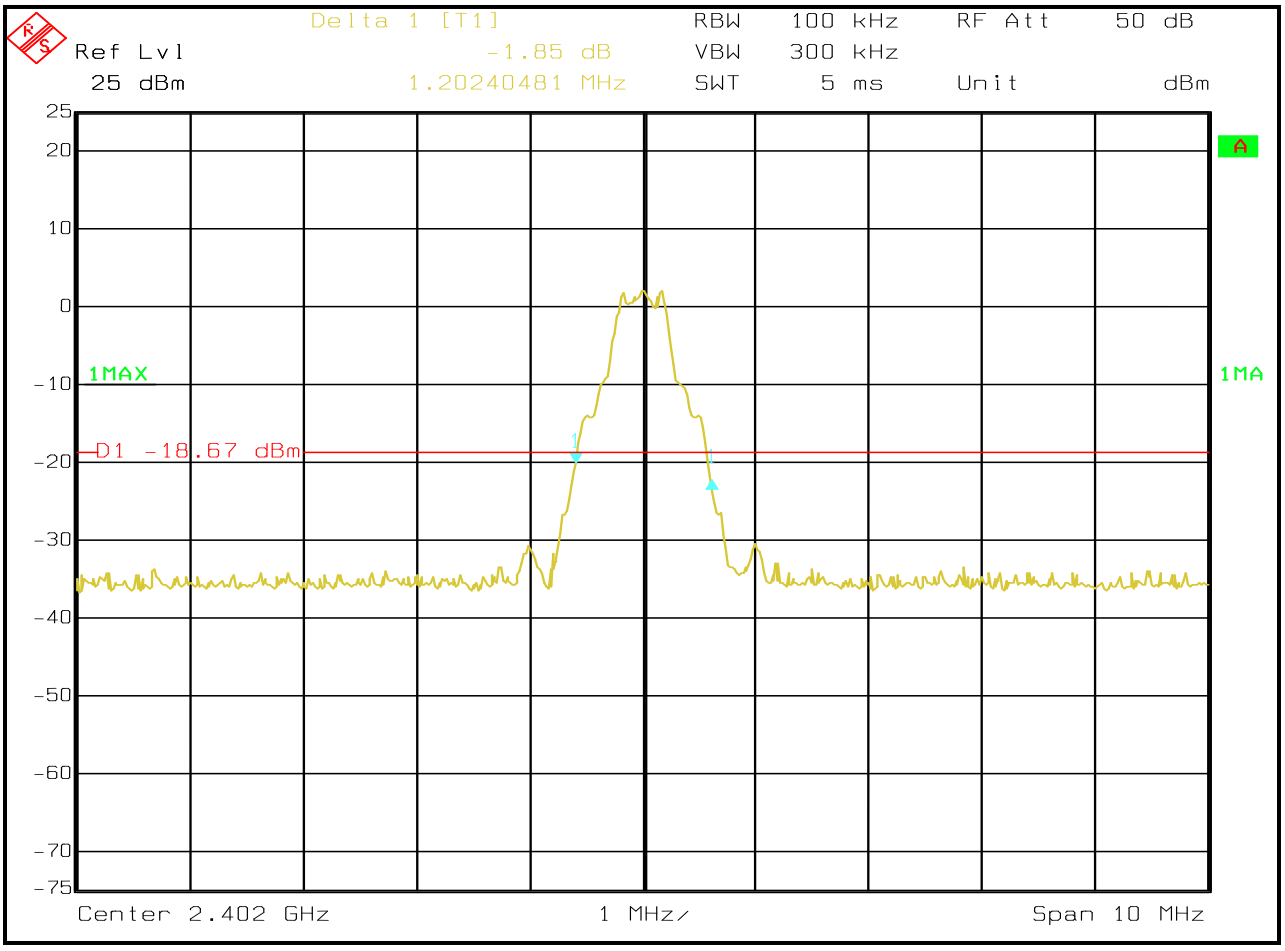
6.2 20 dB Modulated Bandwidth Test Data

Table 6-2: 20 dB Modulated Bandwidth Test Data

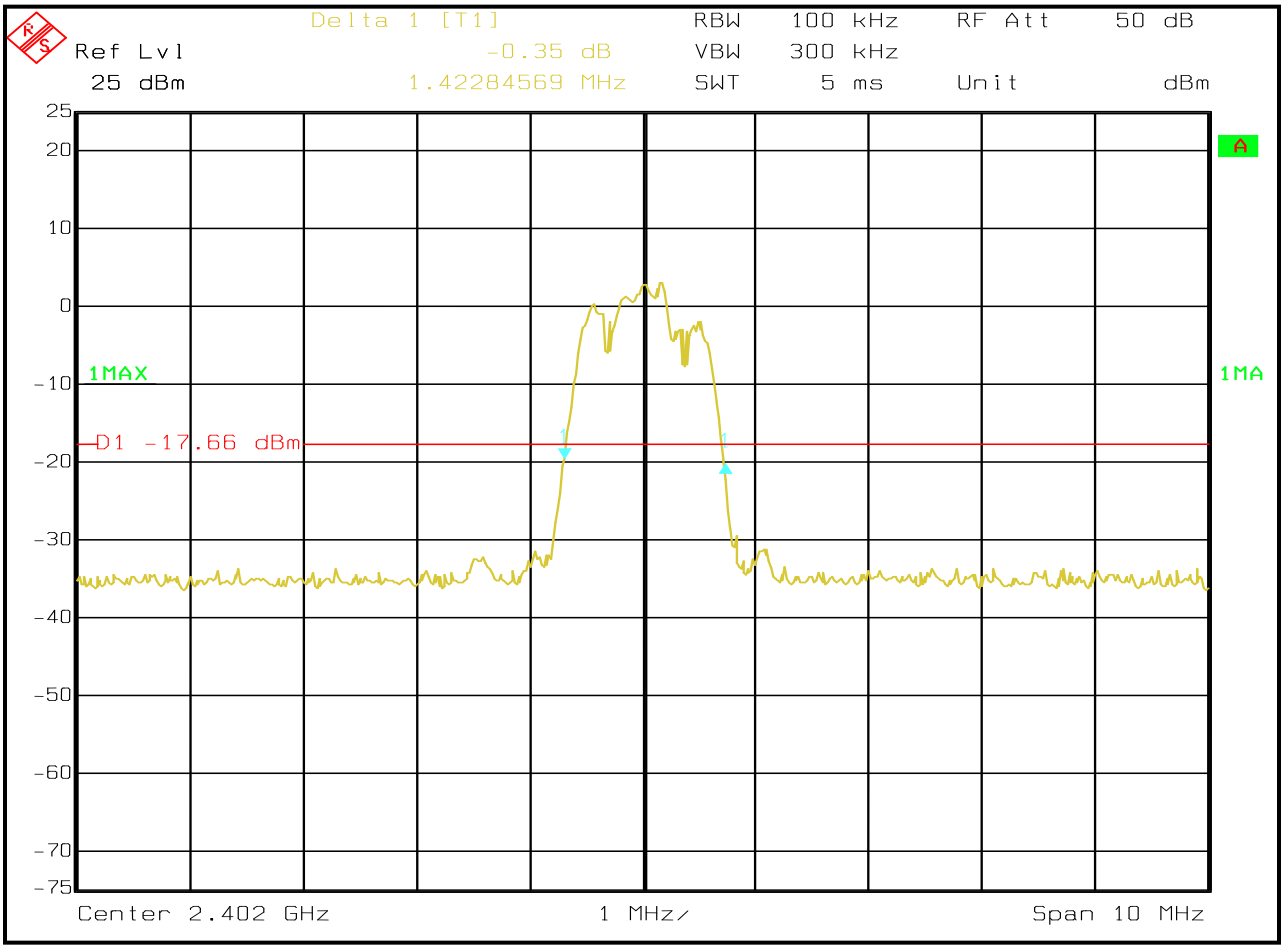
Frequency	20 dB Bandwidth (MHz)
2402 – DH5	1.2
2402 – 3-DH5	1.4
2441– DH5	1.2
2441 – 3-DH5	1.4
2480– DH5	1.2
2480 – 3-DH5	1.4

6.3 20 dB Bandwidth Plots

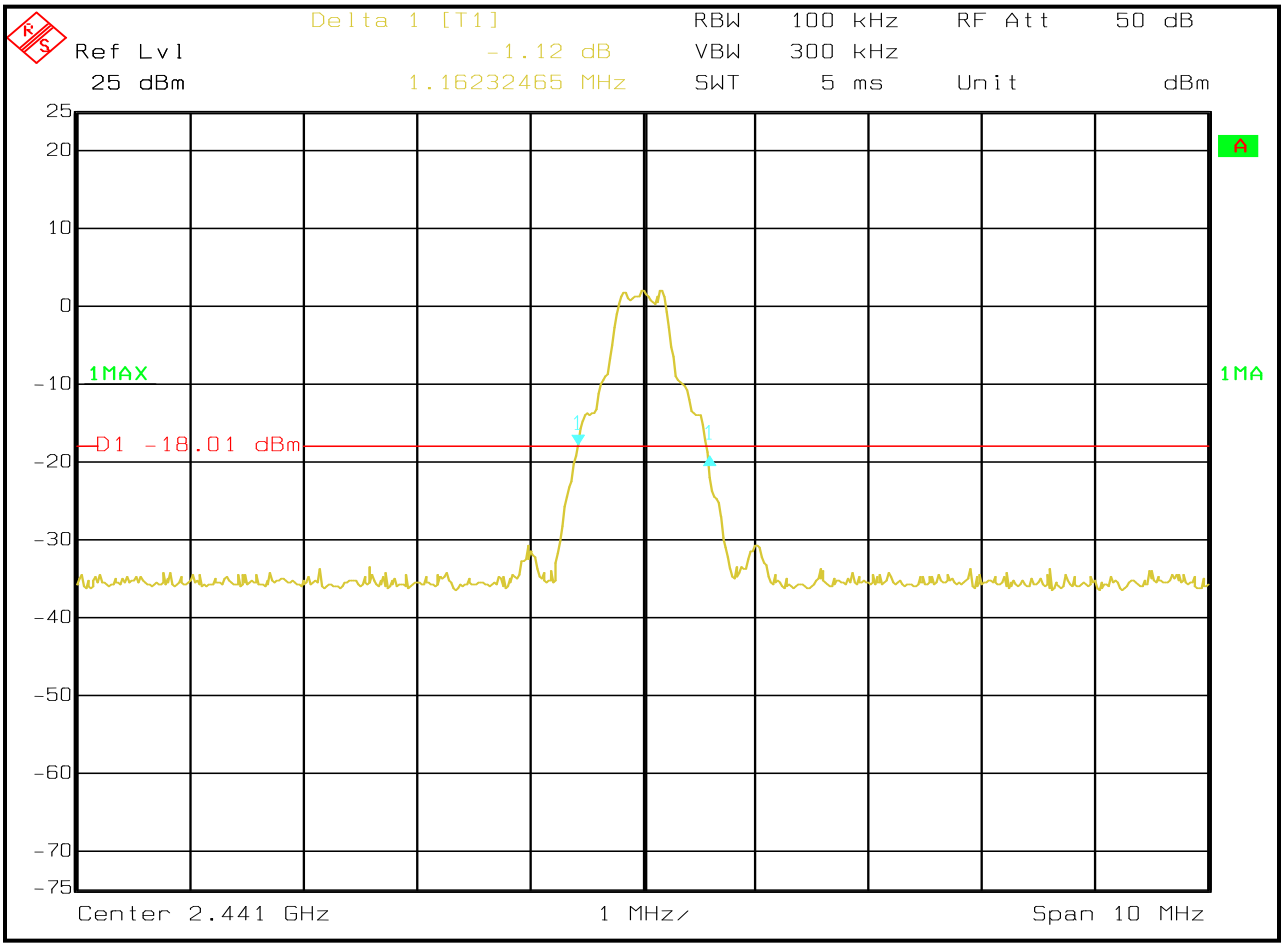
Plot 6-1: 20 dB Bandwidth – 2402 MHz - DH5



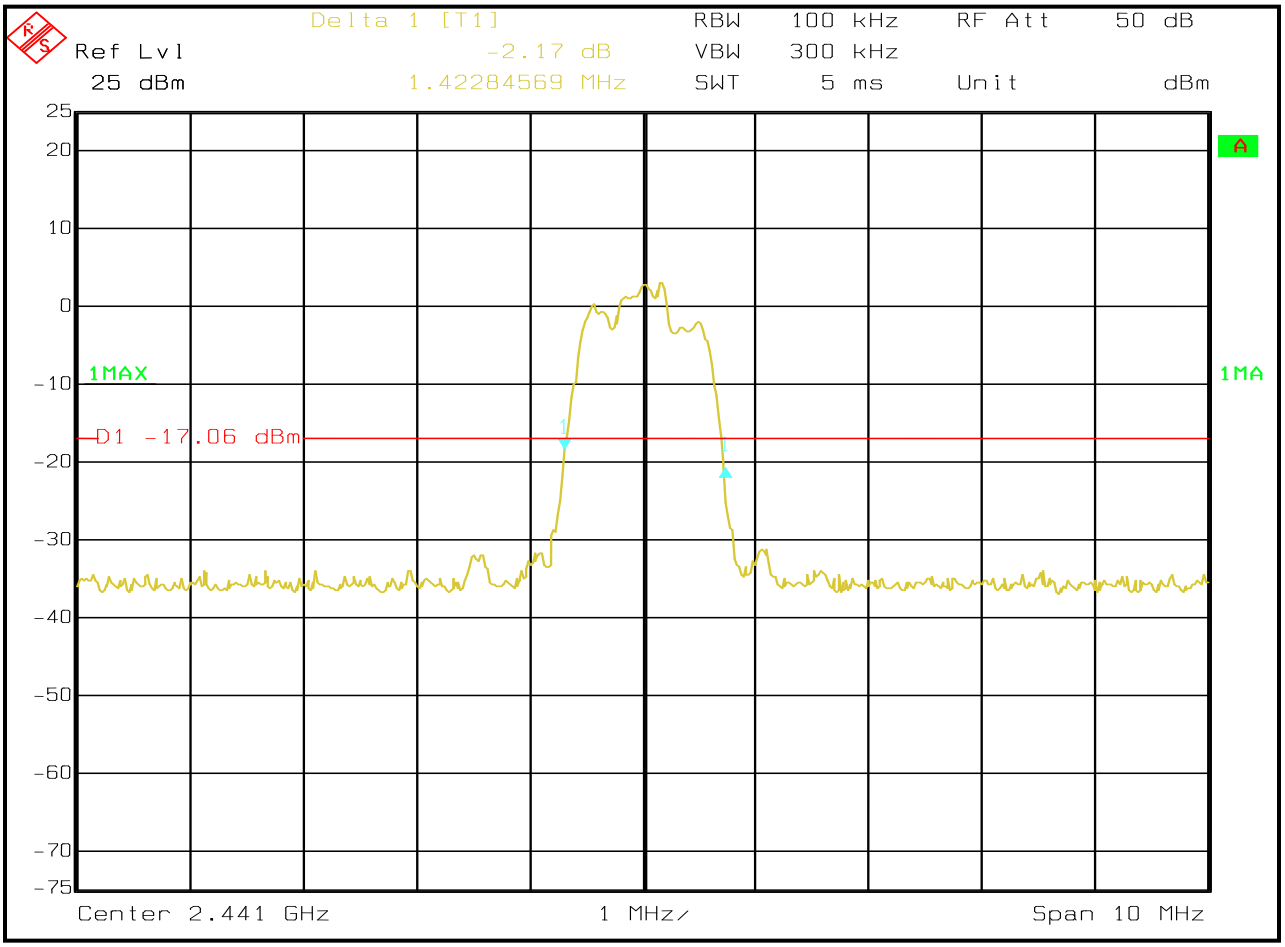
Plot 6-2: 20 dB Bandwidth – 2402 MHz - 3-DH5



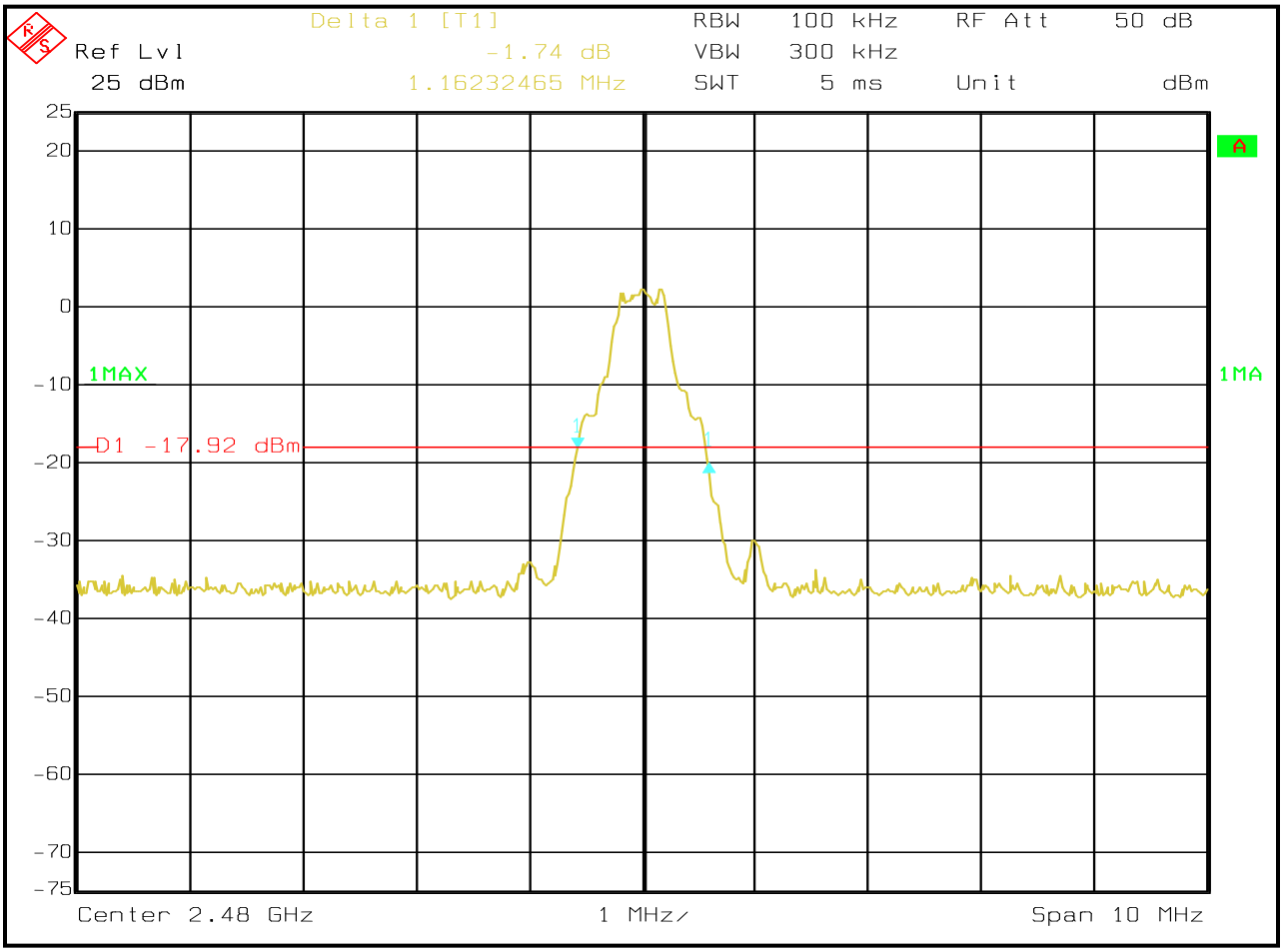
Plot 6-3: 20 dB Bandwidth – 2441 MHz - DH5



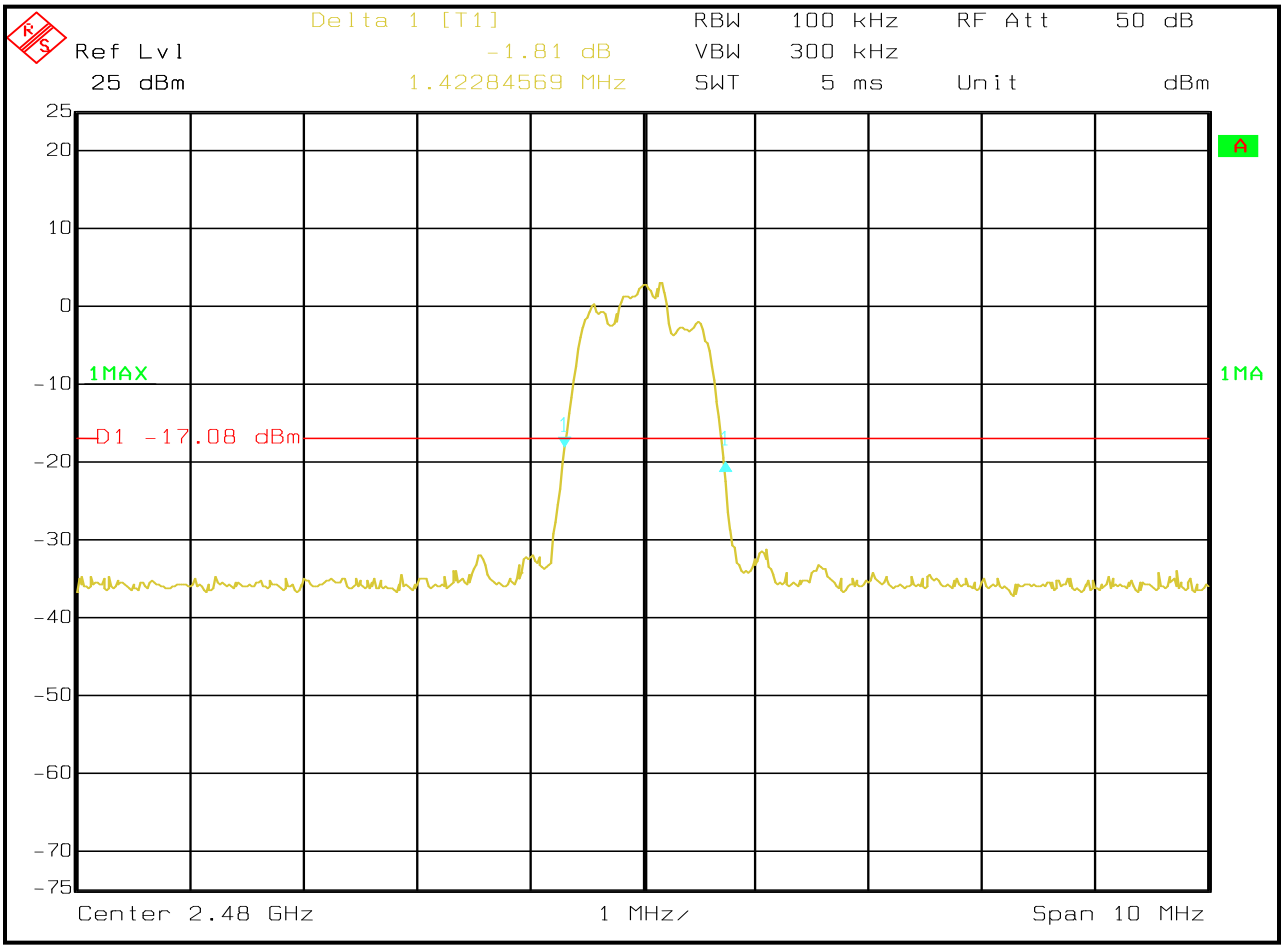
Plot 6-4: 20 dB Bandwidth – 2441 MHz - 3-DH5



Plot 6-5: 20 dB Bandwidth – 2480 MHz - DH5

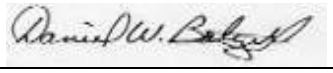


Plot 6-6: 20 dB Bandwidth – 2480 MHz - 3-DH5



Frequency uncertainty: ±1 x 10^{-6} Hz. This measurement uncertainty is an expanded uncertainty for 95% confidence level received with a coverage factor k=2.

Test Personnel:

Dan Baltzell		June 12, 2016
Test Engineer	Signature	Date of Test

7 Occupied Bandwidth – ISED RSS-Gen 6.7

7.1 99% Bandwidth Test Procedure

The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth:

• The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

• The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

• The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.

• The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

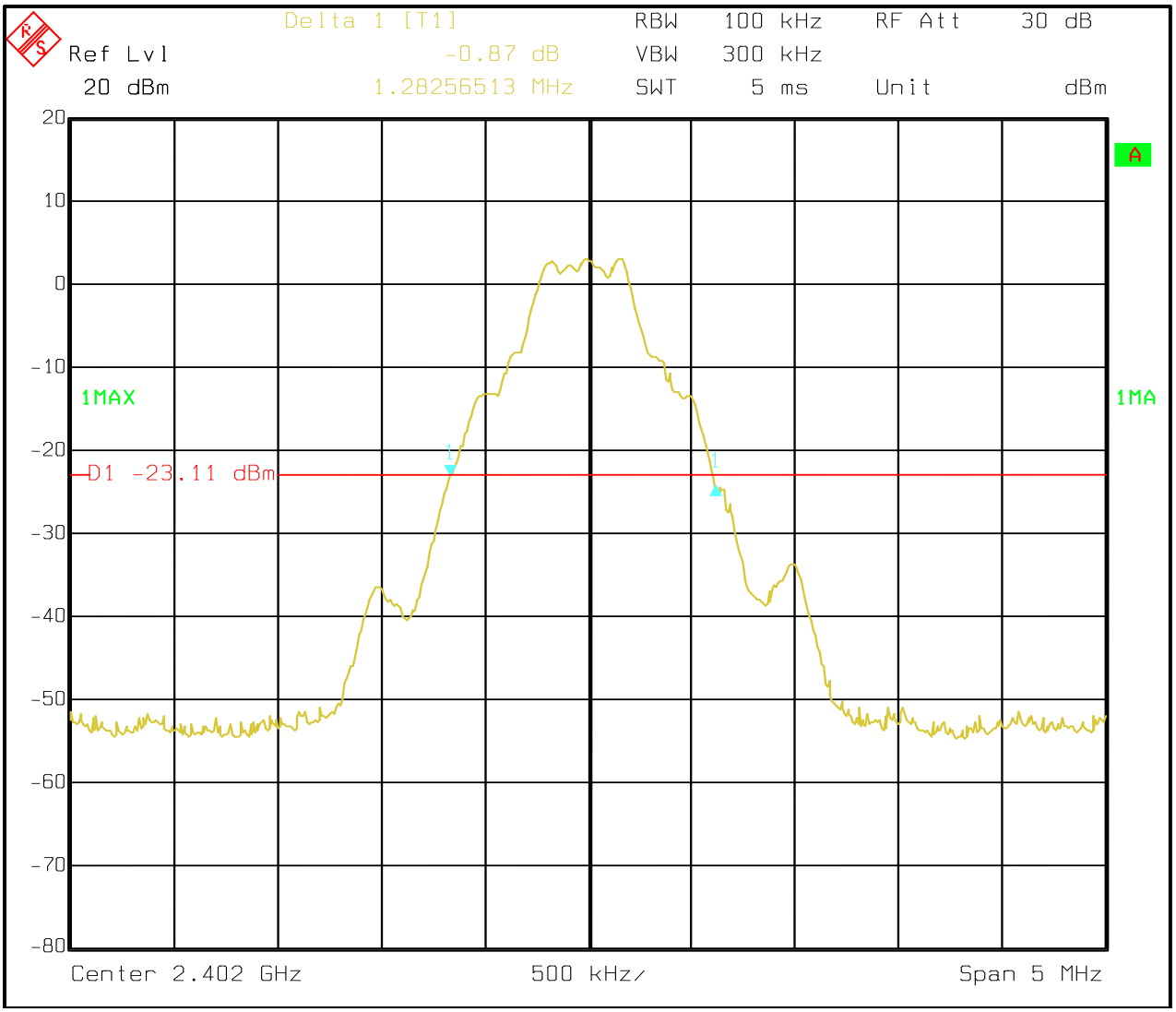
7.2 99% Bandwidth Test Data

Table 7-1: 99% Bandwidth Test Data

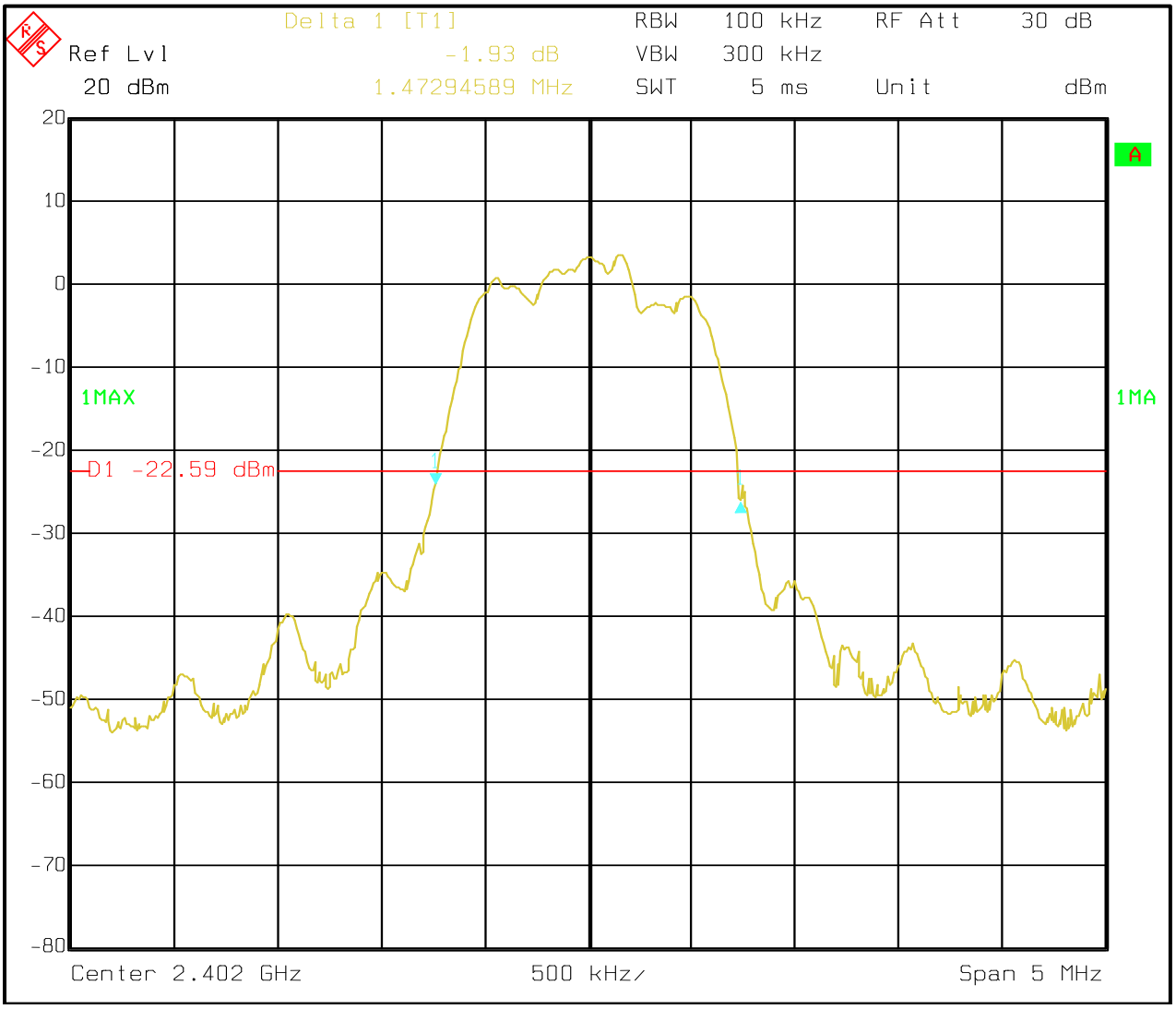
Mode	99% Bandwidth (MHz)
2402 MHz DH5	1.28
2402 MHz 3-DH5	1.47
2441 MHz DH5	1.29
2441 MHz 3-DH5	1.49
2480 MHz DH5	1.28
2480 MHz 3-DH5	1.48

7.3 99% Bandwidth Plots

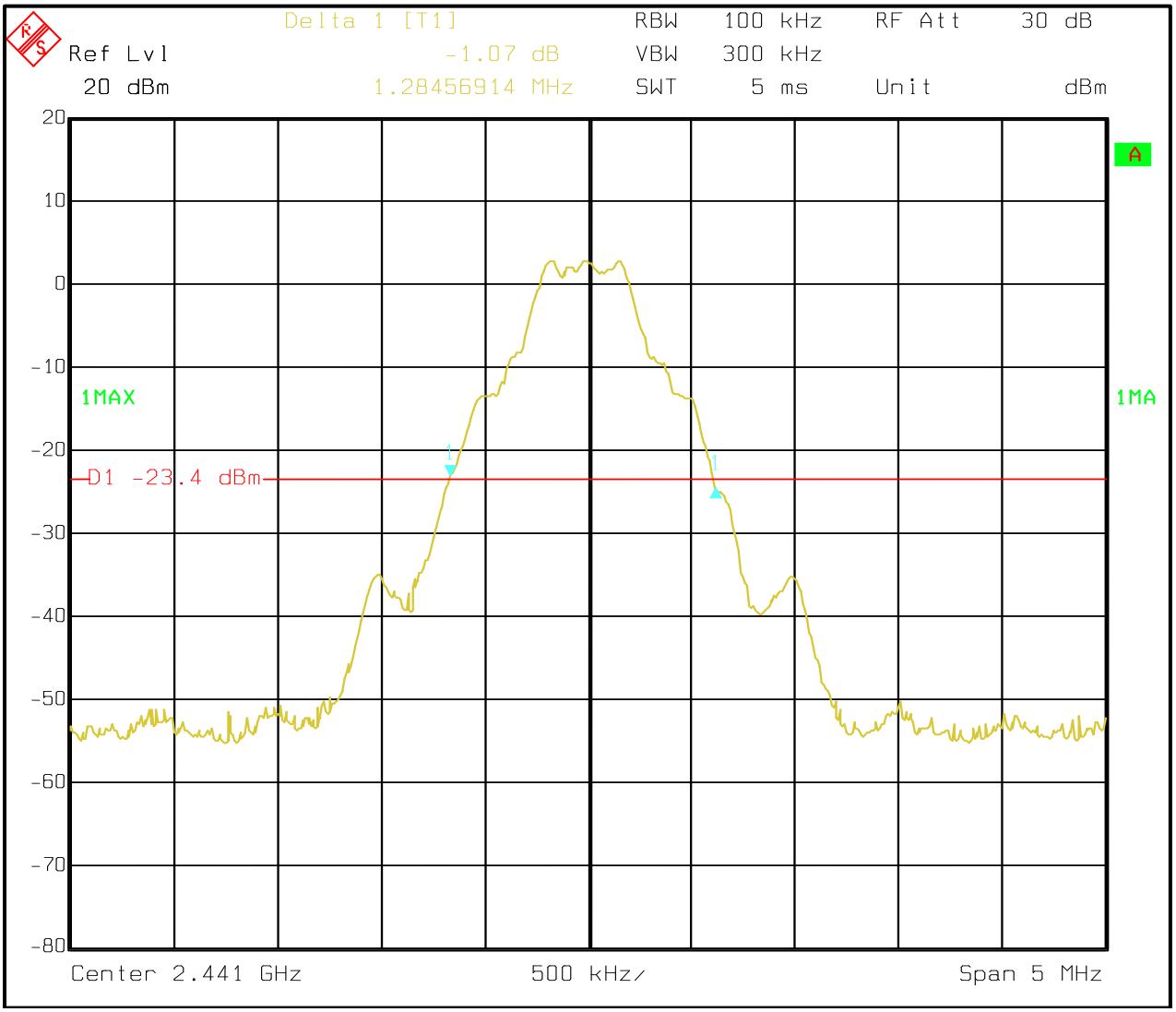
Plot 7-1: 99% Bandwidth – 2402 MHz - DH5



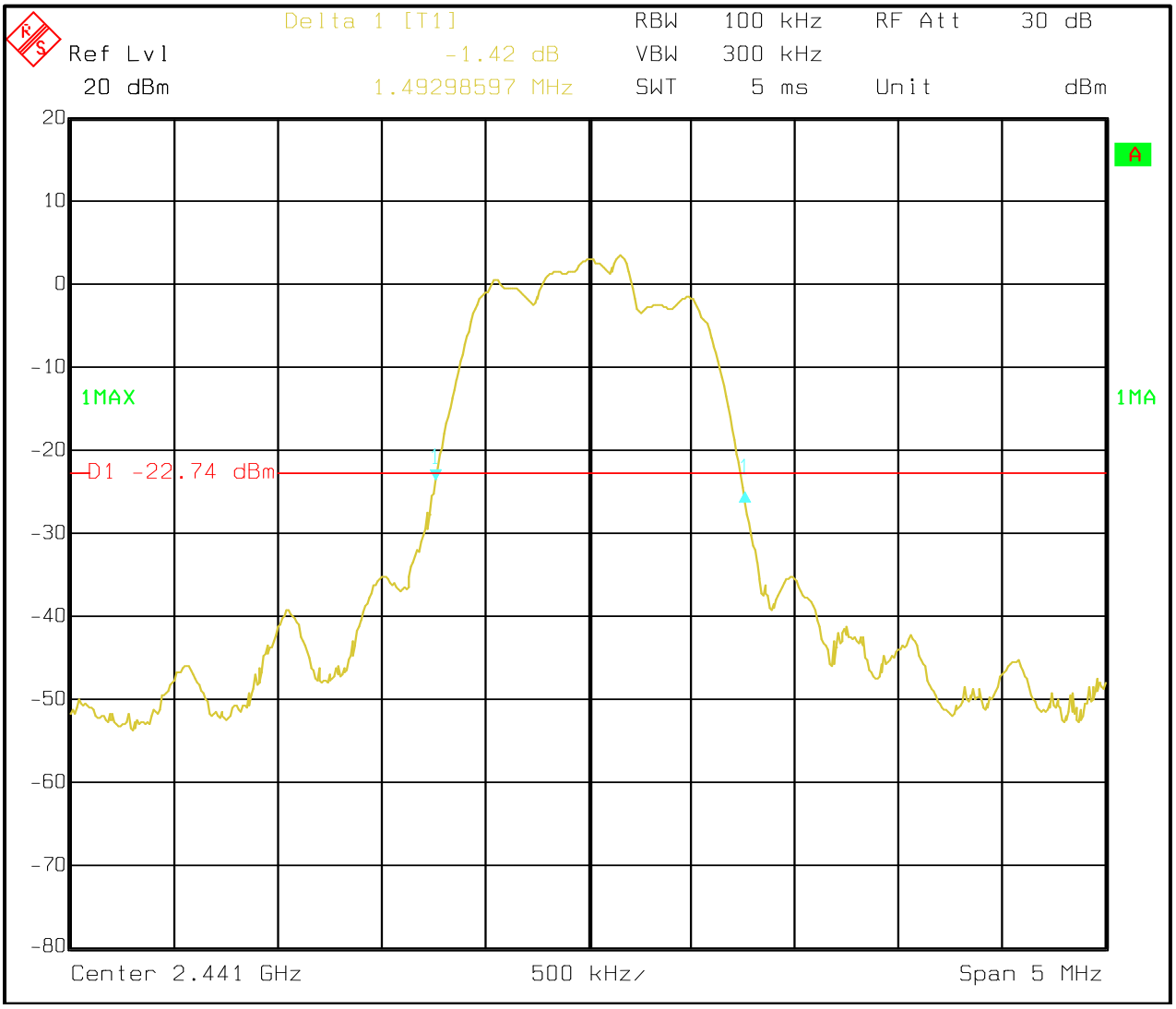
Plot 7-2: 99% Bandwidth – 2402 MHz - 3-DH5



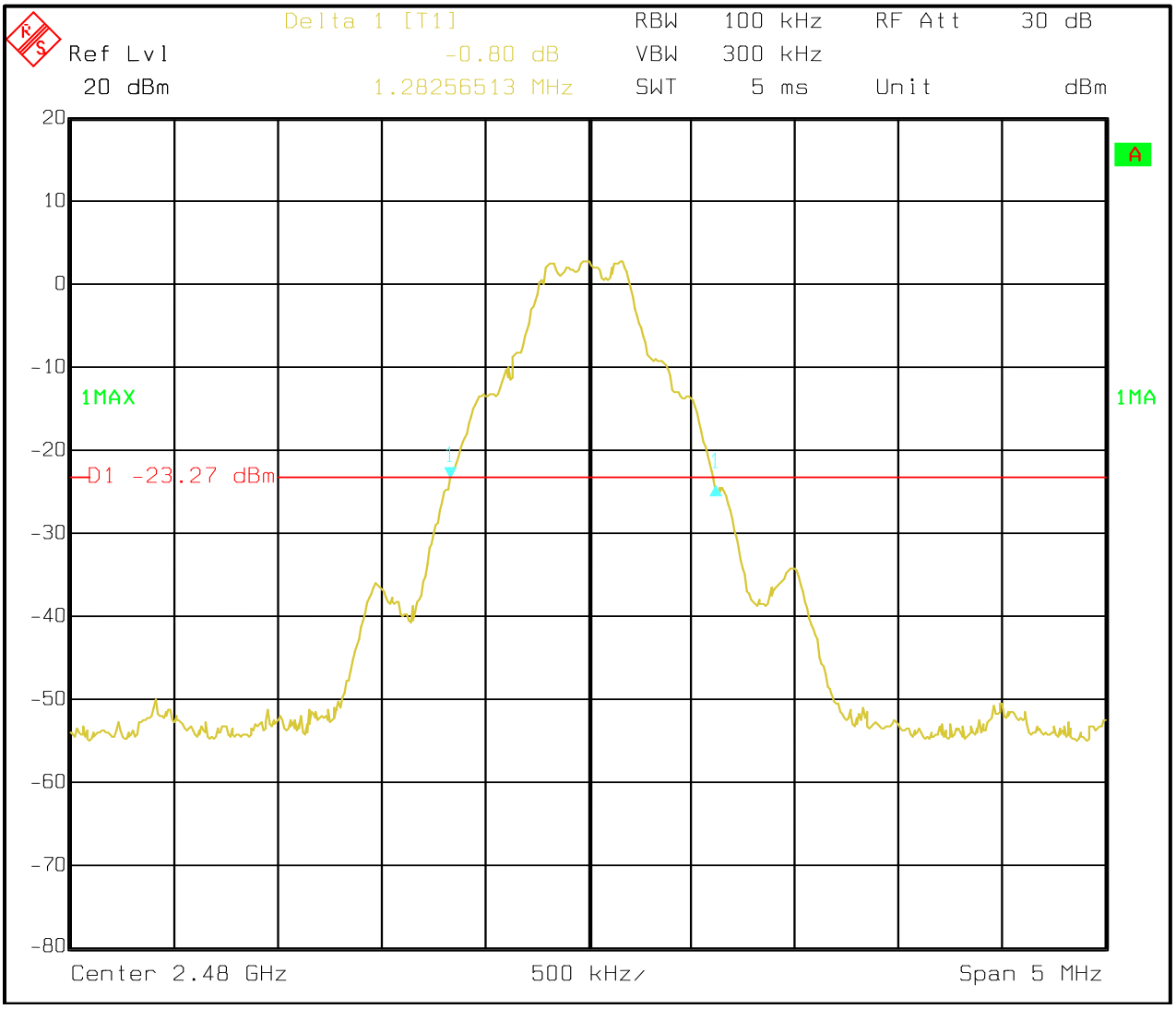
Plot 7-3: 99% Bandwidth – 2441 MHz - DH5



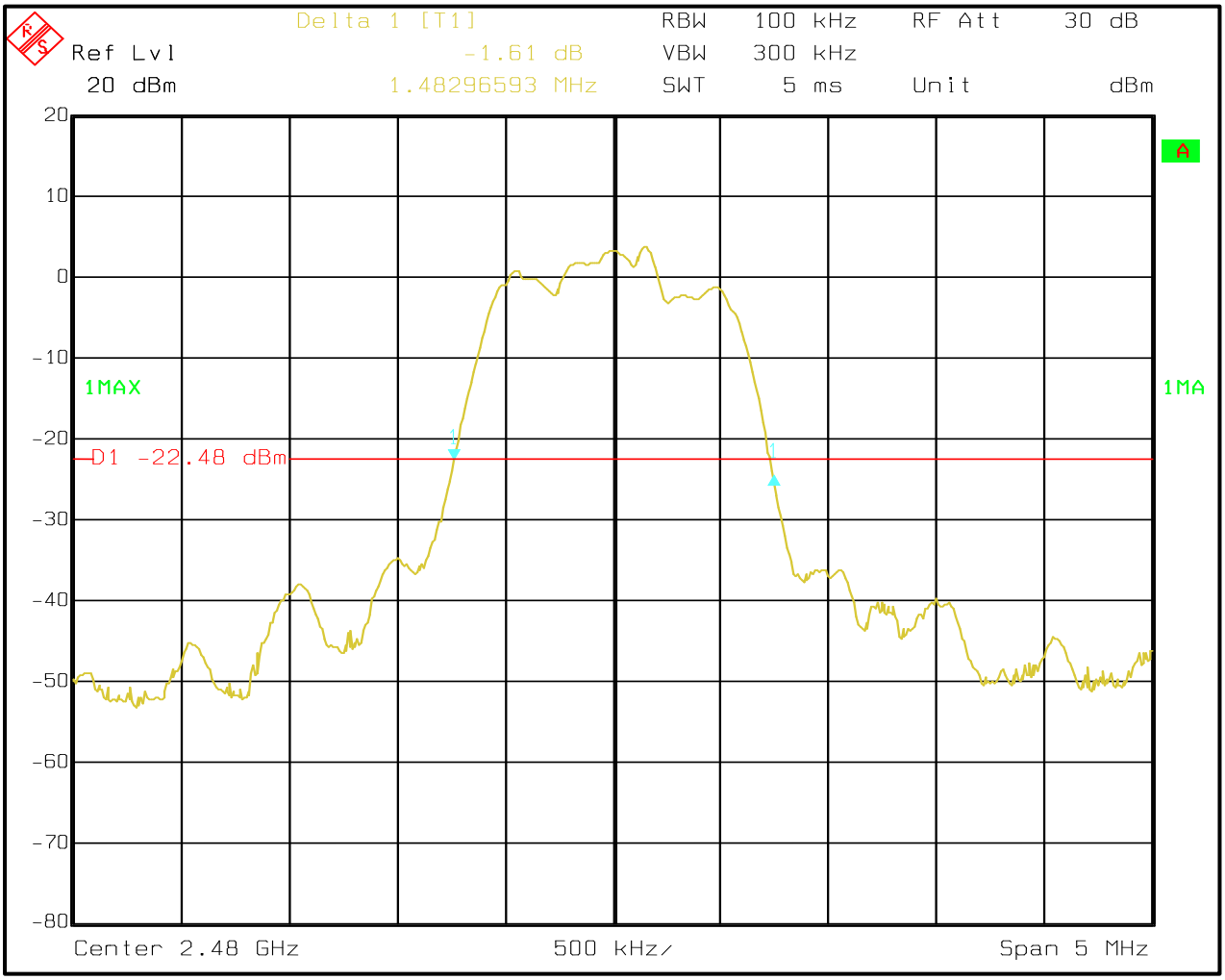
Plot 7-4: 99% Bandwidth – 2441 MHz - 3-DH5



Plot 7-5: 99% Bandwidth – 2480 MHz - DH5



Plot 7-6: 99% Bandwidth – 2480 MHz - 3-DH5



Measurement uncertainty: Measurement uncertainties shown for these tests are expanded uncertainties expressed at 95% confidence level using a coverage factor k = 2. Measurement uncertainty = ±2 dB.

Table 7-2: 99% Bandwidth Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901672	Rhode & Schwarz	FSEM 30: 1079.8500	Spectrum Analyzer (20 Hz – 26.5 GHz)	833063/13	4/17/19

Test Personnel:

Dan Baltzell		June 14, 2018
Test Engineer	Signature	Date of Test

8 Carrier Frequency Separation – FCC 15.247(a)(1); ISED RSS-247 5.1(b)

8.1 Carrier Frequency Separation Test Procedure

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

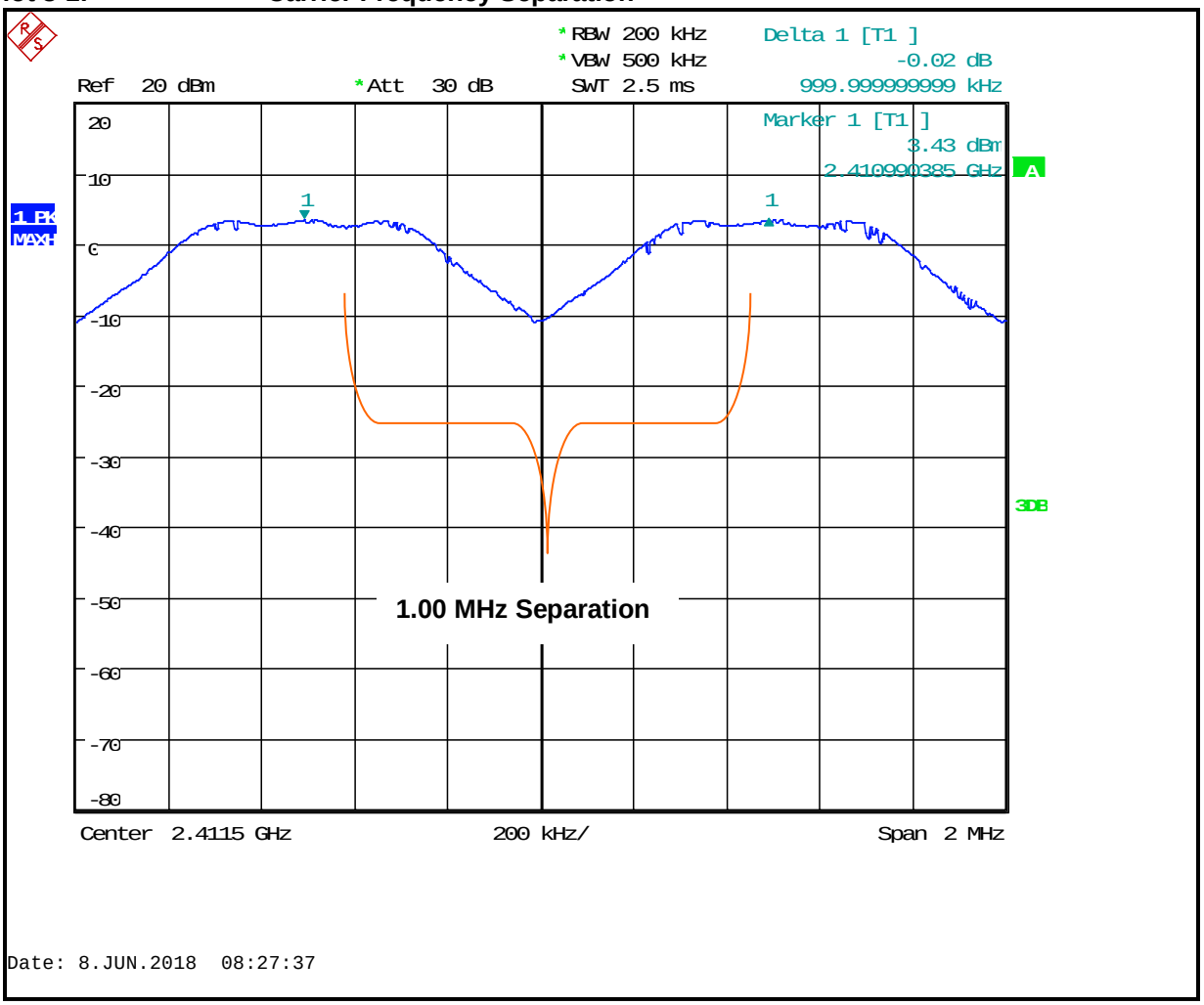
Measured frequency separation = 1.00 MHz

Table 8-1: Carrier Frequency Separation Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19

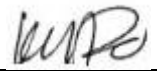
8.2 Carrier Frequency Separation Test Data

Plot 8-1: Carrier Frequency Separation



Frequency uncertainty: ±1 x 10^{-6} Hz. This measurement uncertainty is an expanded uncertainty for 95% confidence level received with a coverage factor k=2.

Test Personnel:

Khue Do		June 8, 2018
Test Engineer	Signature	Date of Test

9 Hopping Characteristics – FCC 15.247(a)(1)(iii); ISED RSS-247 5.1(d)

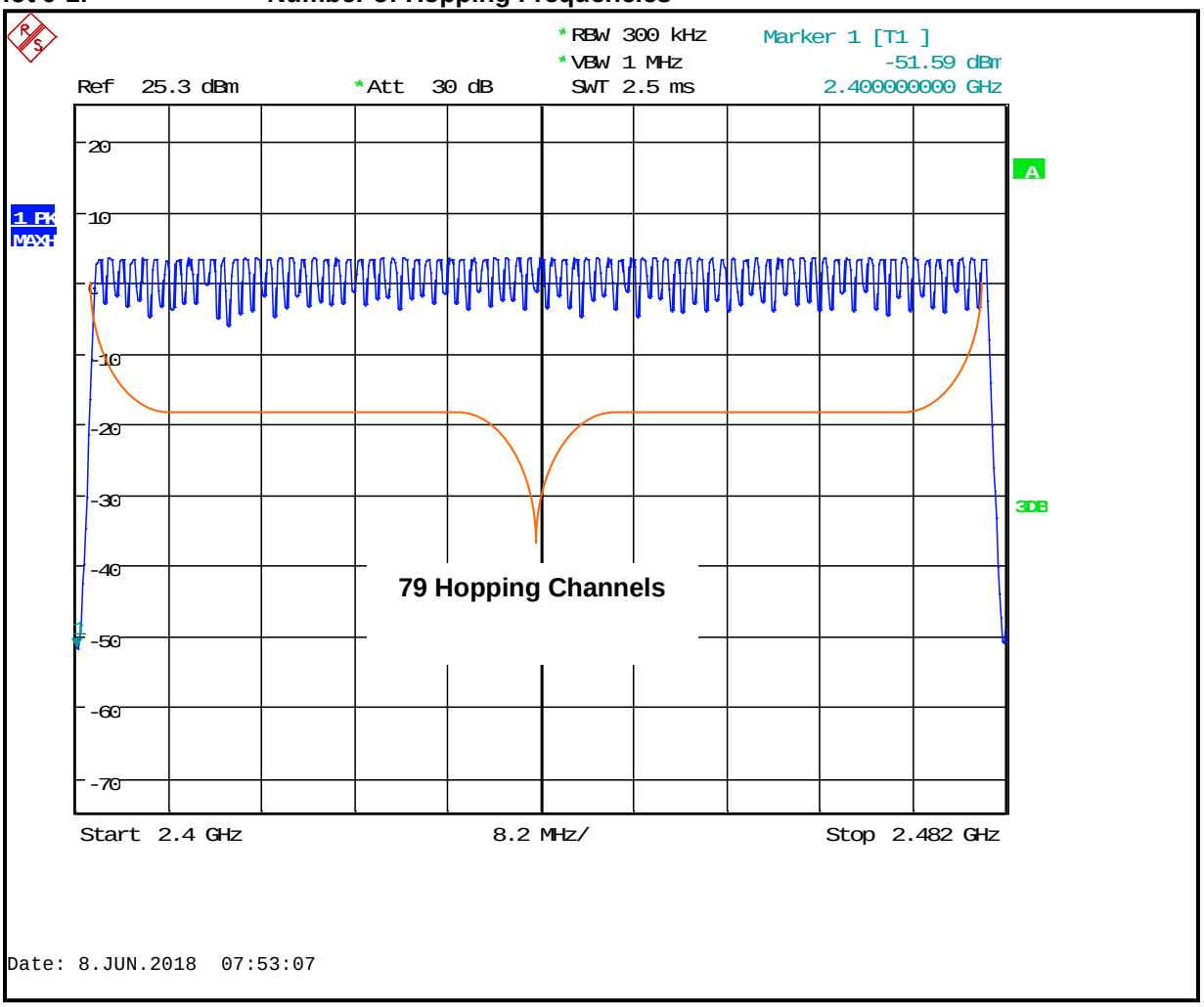
9.1 Hopping Characteristics Test Procedure

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels is used.

Table 9-1: Hopping Characteristics Test Equipment

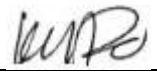
RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19

Plot 9-1: Number of Hopping Frequencies



Frequency uncertainty: ±1 x 10^{-6} Hz. This measurement uncertainty is an expanded uncertainty for 95% confidence level received with a coverage factor k=2.

Test Personnel:

Khue Do		June 8, 2018
Test Engineer	Signature	Date of Test

9.2 Average Time of Occupancy

The spectrum analyzer gate function was used to determine the pulse width using the gate start and stop times, with a zero span to capture a pulse from the device under test. The delta response was used to measure the dwell time for this pulse. The sweep was then set to single sweep for 31.6 s.

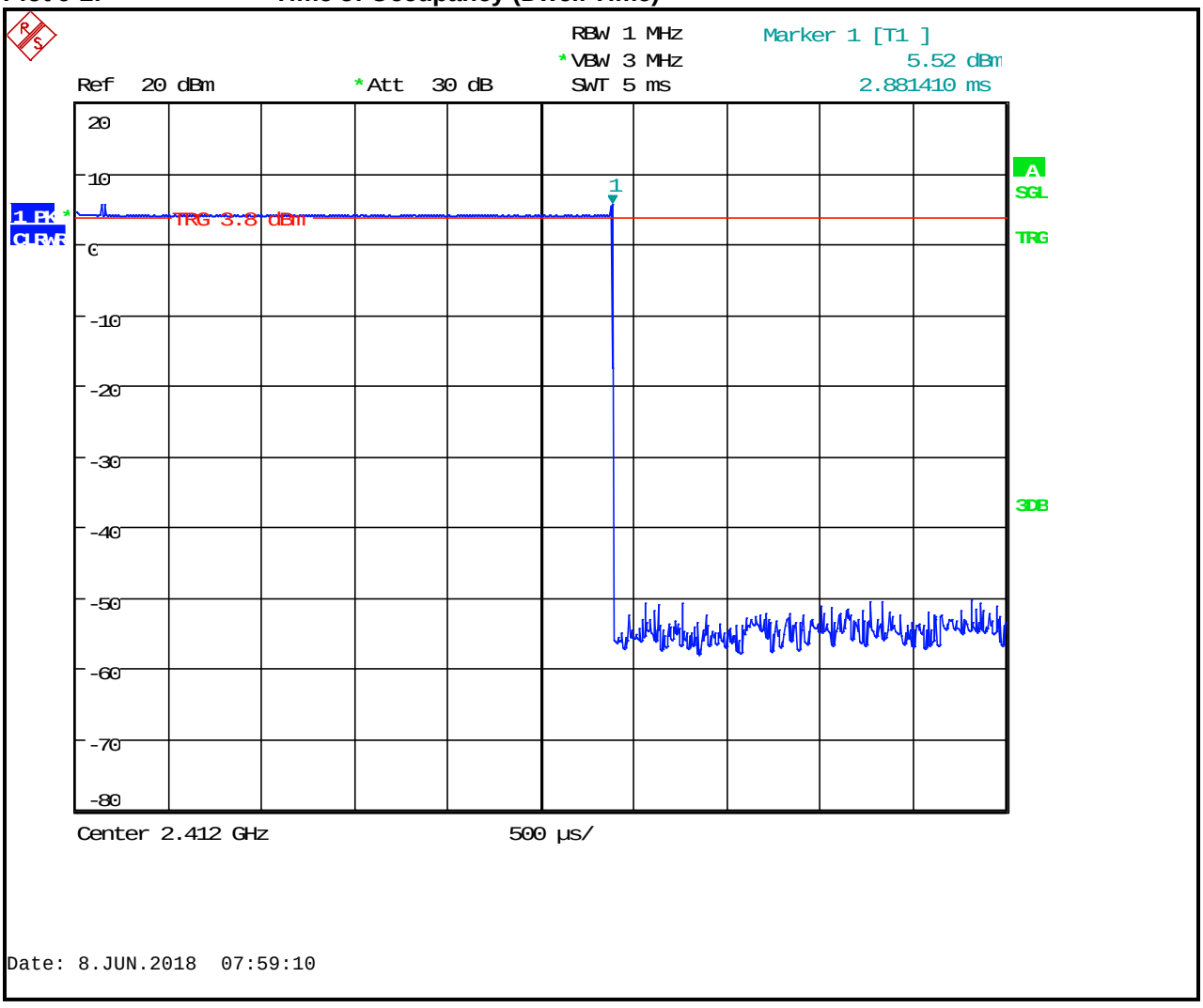
The number of pulses in 31.6 s was 109.

The average time of occupancy in the above period (31.6 s) is equal to 109 pulses x 2.88 ms = 314 ms, which meets the limit as defined by 15.247(a)(1)(iii) of 0.4 seconds.

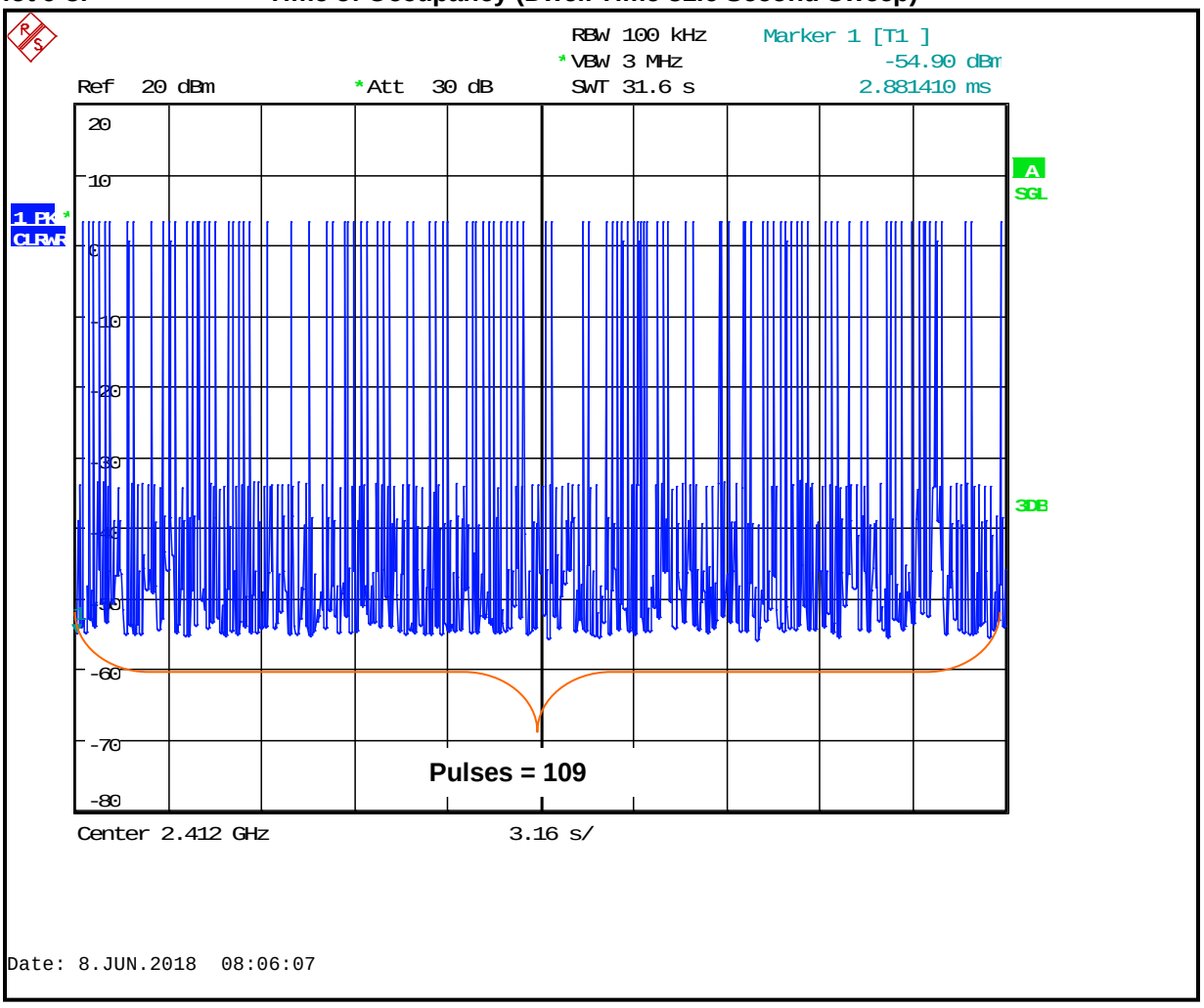
Table 9-2: Average Time of Occupancy Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19

Plot 9-2: Time of Occupancy (Dwell Time)



Plot 9-3: Time of Occupancy (Dwell Time 31.6 Second Sweep)



Number of pulses in 31.6 seconds: 109

The pulse width of 2.88 ms x 109 = 314 ms less than the limit of 400 ms.

RESULT: Passing

Frequency uncertainty: ±1 x 10^{-6} Hz. This measurement uncertainty is an expanded uncertainty for 95% confidence level received with a coverage factor k=2.

Test Personnel:

Khue Do		June 8, 2018
Test Engineer	Signature	Date of Test

10 AC Conducted Emissions – FCC 15.207; ISED RSS-Gen 8.8: AC Power-line Conducted Emissions Limits

Device is battery operated. AC line conducted emissions measurements are not required.

11 Radiated Emissions – FCC 15.209; ISED RSS-247 5.5; RSS-Gen 8.9, 8.10

11.1 Limits of Radiated Emissions Measurement

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009-0.490	2400/f (kHz)	300
0.490-1.705	2400/f (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

As shown in 15.35(b), for frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any circumstances of modulation.

11.2 Radiated Emissions Measurement Test Procedure

Before final measurements of radiated emissions were made on the open-field three/ten meter range, the EUT was scanned indoors at one and three meter distances. This was done in order to determine its emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to ensure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three/ten-meter, open-field test site. The EUT was placed on a nonconductive turntable 0.8 meters above the ground plane. The spectrum was examined from 9 kHz to the 10^{th} harmonic of the highest fundamental transmitter frequency (24.8 GHz).

At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations. For frequencies between 30 and 1000 MHz, the spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the CISPR quasi-peak detection mode. For emissions above 1000 MHz, emissions are measured using the average detector function with a minimum resolution bandwidth of 1 MHz. No video filter less than 10 times the resolution bandwidth was used. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

Table 11-1: Radiated Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901663	Rohde and Schwarz	HFH2-Z2	Loop Antenna (9 kHz - 30 MHz)	881056/062	4/3/21
900878	Rhein Tech Laboratories, Inc.	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901592	Insulated Wire, Inc.	KPS-1503-2400-KPS-09302008	RF cable, 20'	NA	8/18/18
901242	Rhein Tech Laboratories, Inc.	WRT-000-0003	Wood rotating table	N/A	Not Required
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	4/9/19
900321	EMCO	3161-03	Horn Antennas (4 - 8,2 GHz)	9508-1020	4/9/19
900323	EMCO	3160-7	Horn Antennas (8,2 - 12,4 GHz)	9605-1054	4/9/19
900356	EMCO	3160-08	Horn Antenna (12.4 - 18 GHz)	9607-1044	4/9/19
901218	EMCO	3160-09	Horn Antenna (18 - 26.5 GHz)	960281-003	4/14/19
900791	Chase	CBL6111B	Bilog Antenna (30 MHz – 2000 MHz)	N/A	10/4/20
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19

11.3 Radiated Emissions Test Results

11.3.1 Radiated Emissions Harmonics/Spurious Test Data – Fixed Frequency

Table 11-2: Radiated Emissions Harmonics/Spurious - 2402 MHz, Peak Detector

Frequency (MHz)	Peak Analyzer (dBuV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)
4804	20.7	33.4	54.1	74.0	-19.9
12010	4.1	43.6	47.7	74.0	-26.3
19216	-0.2	52.9	52.7	74.0	-21.3

Table 11-3: Radiated Emissions Harmonics/Spurious - 2402 MHz, Average Detector

Frequency (MHz)	Average Analyzer (dBuV/m)	Site Correction Factor (dB/m)	Average Corrected (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
4804	12.8	33.4	46.2	54.0	-7.8
12010	-6.3	43.6	37.3	54.0	-16.7
19216	-11.3	52.9	41.6	54.0	-12.4

Table 11-4: Radiated Emissions Harmonics/Spurious - 2440 MHz, Peak Detector

Frequency (MHz)	Peak Analyzer (dBuV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)
4882	15.8	33.4	49.2	74.0	-24.8
7323	13.8	35.7	49.5	74.0	-24.5
12205	-1.8	43.6	41.8	74.0	-32.2
19528	-1.3	53.0	51.7	74.0	-22.3

Table 11-5: Radiated Emissions Harmonics/Spurious - 2440 MHz, Average Detector

Frequency (MHz)	Average Analyzer (dBuV/m)	Site Correction Factor (dB/m)	Average Corrected (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
4882	8.2	33.4	41.6	54.0	-12.4
7323	2.2	35.7	37.9	54.0	-16.1
12205	-11.7	43.6	31.9	54.0	-22.1
19528	-10.1	53.0	42.9	54.0	-11.1

Table 11-6: Radiated Emissions Harmonics/Spurious - 2480 MHz, Peak Detector

Frequency (MHz)	Peak Analyzer (dBuV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)
4960	15.7	33.6	49.3	74.0	-24.7
7440	13.4	35.8	49.2	74.0	-24.8
12400	-0.5	43.7	43.2	74.0	-30.8
19840	-1.1	53.2	52.1	74.0	-21.9
22320	-0.2	54.2	54.0	74.0	-20.0

Table 11-7: Radiated Emissions Harmonics/Spurious - 2480 MHz, Average Detector

Frequency (MHz)	Average Analyzer (dBuV/m)	Site Correction Factor (dB/m)	Average Corrected (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
4960	7.9	33.6	41.5	54.0	-12.5
7440	2.1	35.8	37.9	54.0	-16.1
12400	-11.2	43.7	32.5	54.0	-21.5
19840	-11.5	53.2	41.7	54.0	-12.3
22320	-10.4	54.2	43.8	54.0	-10.2

Table 11-8: Unintentional Emissions Test Data

Temperature: 72.4°F Humidity: 55%										
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (°)	Antenna Height (m)	Analyzer Reading (dBµV)	Site Correction Factor (dB/m)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pass/ Fail
51.04	QP	H	90	1.0	11.8	9.0	20.8	40.0	-19.2	PASS
150.50	QP	H	90	1.0	3.1	11.5	14.6	43.5	-28.9	PASS
192.39	QP	H	90	1.0	-0.4	10.3	9.9	43.5	-33.6	PASS
207.42	QP	H	90	1.0	16.9	10.5	27.4	43.5	-16.1	PASS
556.91	QP	H	90	1.0	4.3	21.0	25.3	46.0	-20.7	PASS
767.94	QP	H	90	1.0	3.8	22.5	26.3	46.0	-19.7	PASS

Measurement uncertainty: ±4.7 dB. This measurement uncertainty is an expanded uncertainty for 95% confidence level received with a coverage factor k=2.

Test Personnel:

Khue N. Do		June 11-12, 2018
Test Engineer	Signature	Dates of Test

12 Conclusion

The data in this measurement report shows that the EUT as tested, Honeywell International Inc. Model A700x, FCC ID: HD5-TAP1000-01, IC: 1693B-TAP100001, complies with all the applicable requirements of FCC Parts 2 and 15 and ISED RSS-247 and RSS-Gen.