Star Systems International Limited
Application
For
Certification

FCC ID: 2AA7KPLATINO-BT2014

RFID Handheld Reader

Model: PLATINO
Brand Name: Star Systems

Report No.: 140924018SZN-001

Prepared and Checked by:

Sign on file

Benson Wang
Assistant Engineer

Approved by:

Digitally signed by Andy Yan
Location: Intertek Testing Services

Andy Yan
Senior Project Engineer
Date: 23 June, 2015

TRF No.: FCC 15C_TX_b

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LIST OF EXHIBITS

INTERTEK TESTING SERVICES

MEASUREMENT/TECHNICAL REPORT

Star Systems International Limited
Model: PLATINO

FCC ID: 2AA7KPLATINO-BT2014

This report concerns (check one:) Original Grant ___X___ Class II Change _____

Equipment Type: DSS - Part 15 Spread Spectrum Transmitter

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes _____ No __X__

If yes, defer until: _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes _____ No __X__

If no, assumed Part 15, Subpart C for intentional radiator – the new 47 CFR [10-1-13 Edition] provision.

Report prepared by:

Benson Wang
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List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Test Report	Test Report	sar report.pdf
Operational Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
External Photos	External Photo	external photos.pdf
Internal Photos	Internal Photo	internal photos.pdf
ID Label/Location Info	Label Artwork and Location	label.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
Users Manual	User Manual	manual.pdf
Cover Letter	Letter of Agency	letter of agency.pdf

EXHIBIT 1

GENERAL DESCRIPTION

1.0 General Description

1.1 Product Description

The equipment under test (EUT) is a RFID Handheld Reader, it is able to read ID cards through 902.75-927.25MHz and transmit data through Bluetooth function operating at 2402-2480MHz. The EUT was powered by a 3.7 VDC Li-ion rechargeable battery which is charged by USB Power Adapter with AC 120V, 60Hz input. For more detail information pls. refer to the user manual.

Antenna Type: Integral antenna
Modulation Type: DSB-ASK

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

1. This is an application for certification of the RFID function operation at 902.75-927.25MHz.
2. BT Function: Refer to report 140924018SZN-002
3. Data Transfer function with PC: this function has been completed in DoC.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4: 2009 and DA 00-705. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

The Semi-Anechoic chamber and shield room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, Block D, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 242492).

EXHIBIT 2

SYSTEM TEST CONFIGURATION

2.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4: 2009.

The EUT was powered by a 3.7 VDC fully charged Li-ion rechargeable battery which is charged by USB Power Adapter with AC 120V, 60Hz input during the test.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The rear of unit shall be flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on a turn table, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

The EUT engineering mode (provided by client) used during testing as similar to a typical use.

2.3 Special Accessories

One shielded USB cable with a ferrite core attached with the EUT is used.

2.4 Equipment Modification

Any modifications installed previous to testing by Star Systems International Limited will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch.

2.5 Measurement Uncertainty

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

2.6 Support Equipment List and Description

Description	Manufacturer	Model No.
110cm shielded USB Cable with a ferrite core	Star Systems International Limited	N/A
USB Power Adapter	Juxing Electronic (Huizhou) Co.,Ltd.	JXAS0050500100VU, Input: AC 100-240V; 50/60Hz Output: DC 5V; 1000mA

EXHIBIT 3

TEST RESULTS

3.0 **Test Results**

Data is included worst-case configuration (the configuration which resulted in the highest emission levels).

3.1 **Radiated Test Results**

A sample calculation, configuration photographs and data tables of the emissions are included.

3.1.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD + AV

Where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB
AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD + AV

Assume a receiver reading of 62.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 62.0 dBµV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB

AV = -10 dB

FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 dBµV/m

Level in µV/m = Common Antilogarithm [(32 dBµV/m)/20] = 39.8 µV/m

3.1.2 Radiated Emission Data and Configuration Photograph - FCC section 15.209

Worst Case Radiated Emission
At
86.280 MHz

Judgement: Passed by 12.8 dB

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos.pdf.

TEST PERSONNEL:

Sign on file

Benson Wang, Assistant Engineer
Typed / Printed Name

January 8, 2015
Date

Applicant: Star Systems International Limited
Date of Test: January 8, 2015
Model: PLATINO
Worst Case Operating Mode: Transmit with charging

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	30.970	22.3	20.0	18.6	20.9	40.0	-19.1
Horizontal	403.440	36.7	20.0	13.5	30.2	46.0	-15.8
Horizontal	486.385	33.3	20.0	17.0	30.3	46.0	-15.7
Vertical	32.910	23.6	20.0	18.2	21.8	40.0	-18.2
Vertical	86.280	40.1	20.0	7.1	27.2	40.0	-12.8
Vertical	314.210	22.6	20.0	22.1	24.7	46.0	-21.3

NOTES:
1. Quasi-Peak detector is used except for others stated.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. All emissions are below the QP limit.

Test Engineer: Benson Wang

3.1.3 Transmitter Spurious Emissions (Radiated) - FCC section 15.209

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Worst Case Radiated Emission
at
3611 MHz

Judgement: Passed by 6.5 dB

TEST PERSONNEL:

Sign on file

Benson Wang, Assistant Engineer
Typed/Printed Name

January 8, 2015
Date

Applicant: Star Systems International Limited
Date of Test: January 8, 2015
Model: PLATINO
Mode: Transmit with charging (902.75MHz)

Table 2

Radiated Emissions

(902.75MHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*2708.250	61.2	36.8	26.5	50.9	74.0	-23.1
Horizontal	*3611.000	49.0	35.6	39.5	52.9	74.0	-21.1

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*2708.250	57.1	36.8	26.5	46.8	54.0	-7.2
Horizontal	*3611.000	43.6	35.6	39.5	47.5	54.0	-6.5

NOTES: 1. Peak detector is used except for others stated. Peak detector is used for spurious emission with RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Benson Wang

Applicant: Star Systems International Limited
Date of Test: January 8, 2015
Model: PLATINO
Mode: Transmit with charging (914.75MHz)

Table 3

Radiated Emissions
(914.75MHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*2744.250	43.5	36.2	37.9	45.2	74.0	-28.8
Horizontal	*3659.000	45.8	35.6	39.5	49.7	74.0	-24.3

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*2744.250	36.6	36.2	37.9	38.3	54.0	-15.7
Horizontal	*3659.000	36.6	35.6	39.5	40.5	54.0	-13.5

NOTES:
1. Peak detector is used except for others stated. Peak detector is used for spurious emission with RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Benson Wang

Applicant: Star Systems International Limited
Date of Test: January 8, 2015
Model: PLATINO
Mode: Transmit with charging (927.25MHz)

Table 4

Radiated Emissions

(927.25MHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*2781.750	57.2	36.8	26.5	46.9	74.0	-27.1
Horizontal	*3709.000	43.3	35.6	39.5	47.2	74.0	-26.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*2781.750	51.6	36.8	26.5	41.3	54.0	-12.7
Horizontal	*3709.000	29.3	35.6	39.5	33.2	54.0	-20.8

NOTES:
1. Peak detector is used except for others stated. Peak detector is used for spurious emission with RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Benson Wang

3.2 **Conducted Emission at Mains Terminal**

3.2.1 Conducted Emissions and Data Configuration Photograph

Worst Case Conducted Configuration
at
0.906 MHz

Judgement: Passed by 6.8 dB

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

TEST PERSONNEL:

Sign on file

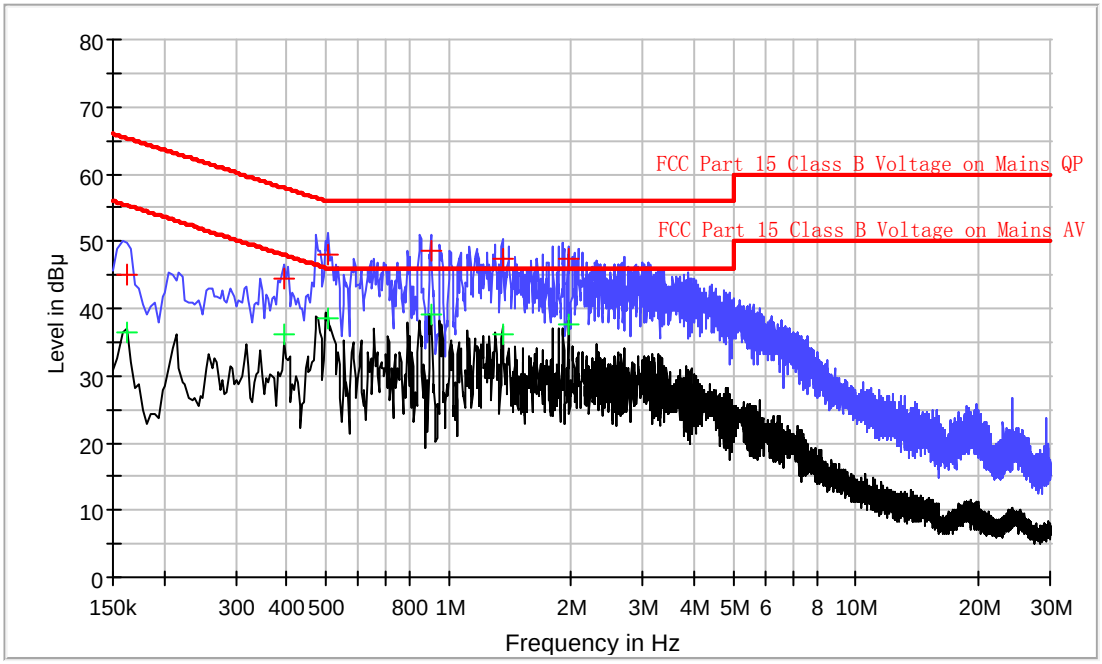
Benson Wang, Assistant Engineer
Typed/Printed Name

January 8, 2015
Date

Company: Star Systems International Limited
Date of Test: January 8, 2015
Model: PLATINO
Worst Case Operating Mode: Transmit with charging

Conducted Emission Test – FCC

Pursuant to 15.207 Emissions Requirement



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.162000	45.0	L1	9.8	20.4	65.4
0.394000	44.5	L1	9.8	13.5	58.0
0.506000	48.1	L1	9.8	7.9	56.0
0.906000	48.7	L1	9.9	7.3	56.0
1.354000	47.4	L1	9.9	8.6	56.0
1.966000	47.3	L1	9.9	8.7	56.0

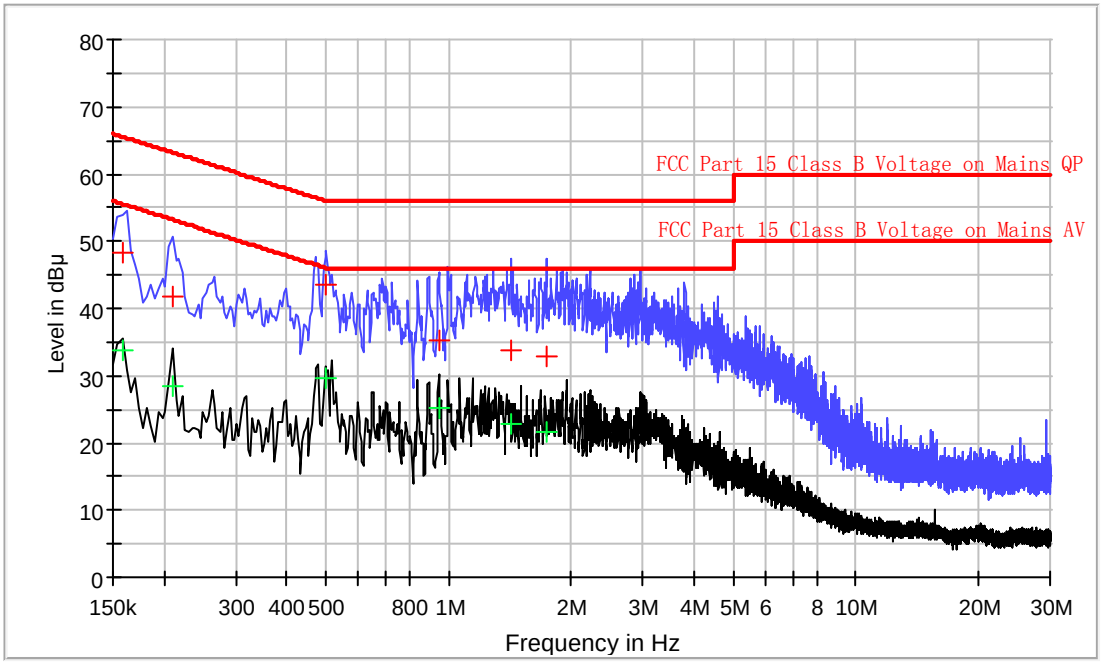
Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.162000	36.5	L1	9.8	18.9	55.4
0.394000	36.2	L1	9.8	11.8	48.0
0.506000	38.6	L1	9.8	7.4	46.0
0.906000	39.2	L1	9.9	6.8	46.0
1.354000	36.3	L1	9.9	9.7	46.0
1.966000	37.5	L1	9.9	8.5	46.0

Company: Star Systems International Limited
Date of Test: January 8, 2015
Model: PLATINO
Worst Case Operating Mode: Transmit with charging

Conducted Emission Test – FCC

Pursuant to 15.207 Emissions Requirement



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.158000	48.2	N	10.0	17.4	65.6
0.210000	41.7	N	10.1	21.5	63.2
0.502000	43.4	N	10.1	12.6	56.0
0.946000	35.2	N	10.2	20.8	56.0
1.426000	33.9	N	10.3	22.1	56.0
1.738000	32.9	N	10.3	23.1	56.0

Result Table AV

Frequency (MHz)	CAverage (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.158000	33.8	N	10.0	21.8	55.6
0.210000	28.4	N	10.1	24.8	53.2
0.502000	29.6	N	10.1	16.4	46.0
0.946000	25.3	N	10.2	20.7	46.0
1.426000	22.9	N	10.3	23.1	46.0
1.738000	21.5	N	10.3	24.5	46.0

3.3 **Peak Power**

Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(1)

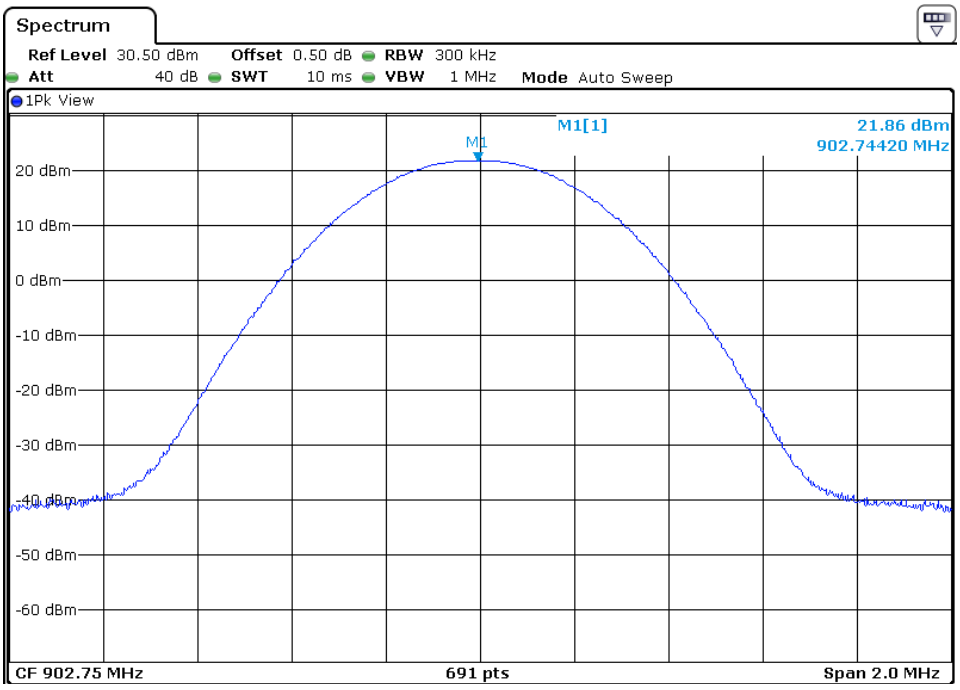
The antenna port of the EUT was connected to the input of a spectrum analyzer. The analyzer was set for RBW > 20dB bandwidth and power was read directly in dBm.

For frequency hopping systems operating in the 902–928 MHz band: 1 watt for systems employing at least 50 hopping channels.

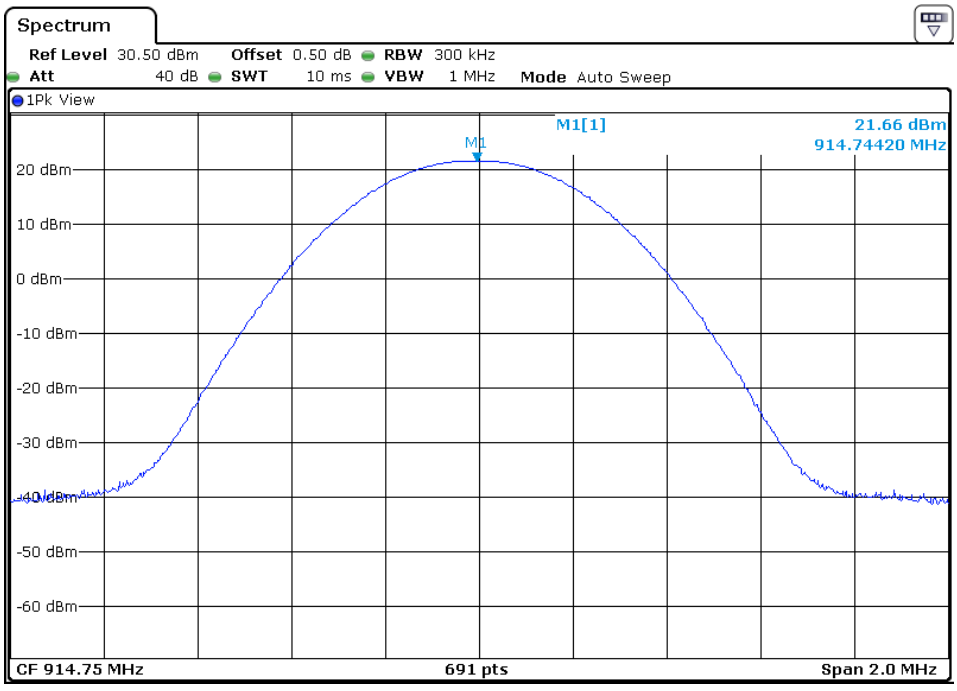
Antenna Gain = 2.0dBi			
Modulation Type	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
DSB-ASK	902.75	21.86	153.46
	914.75	21.66	146.55
	927.25	21.38	137.40

Modulation Type: DSB-ASK

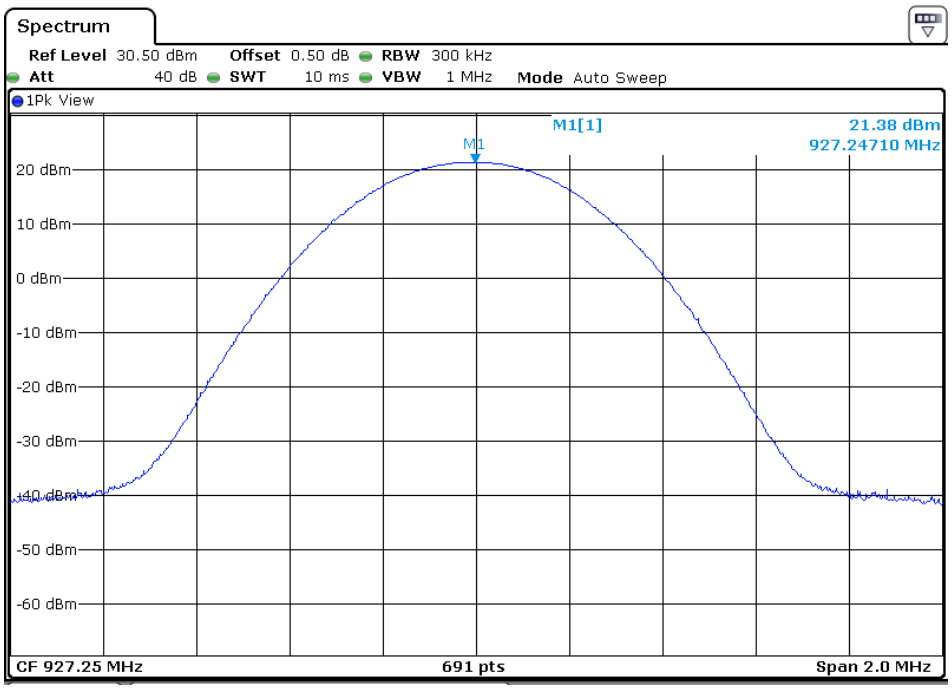
902.75 MHz



914.75 MHz



927.25 MHz


Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 300 kHz
Att 40 dB SWT 10 ms VBW 1 MHz Mode Auto Sweep
1Pk View
M1[1] 21.38 dBm
927.24710 MHz
M1
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 927.25 MHz
691 pts
Span 2.0 MHz

3.4 20dB Bandwidth

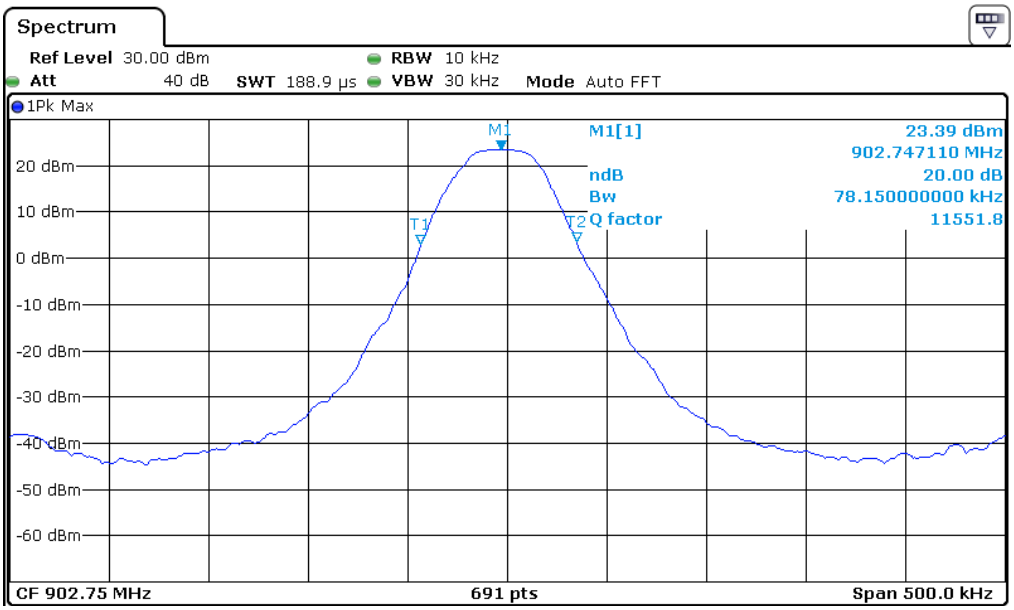
Maximum 20dB RF Bandwidth, FCC Rule 15.247(a) (1):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW was chosen so that the display was a result of the hopping channel modulation. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. Use the spectrum 20dB down delta function to measure the bandwidth.

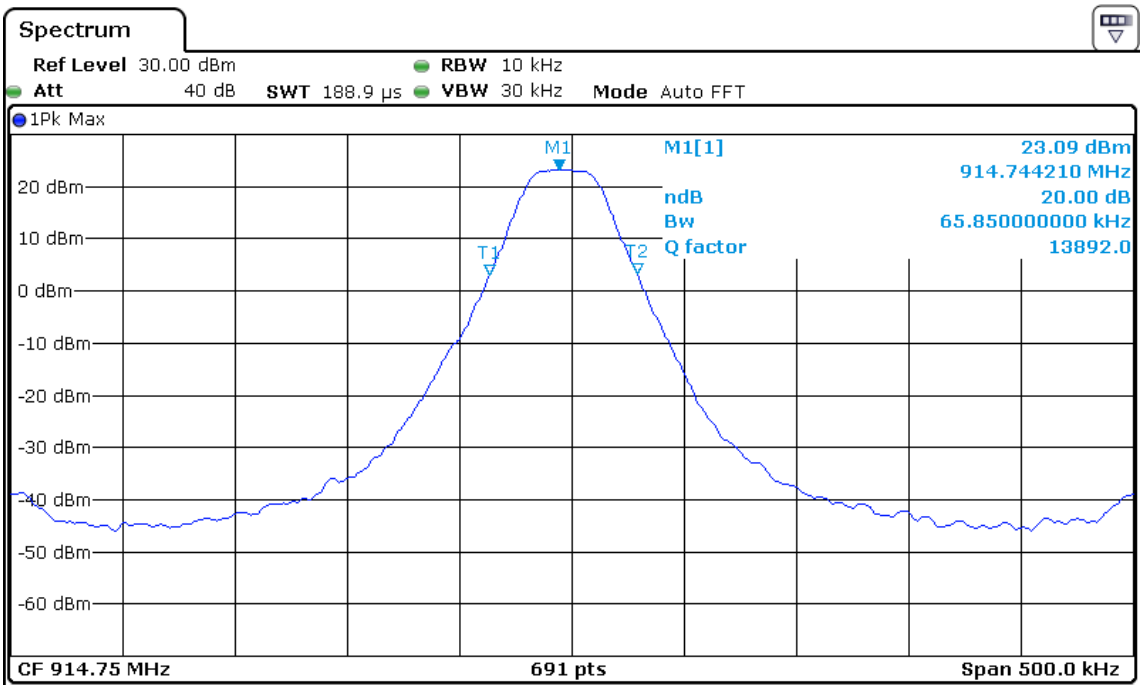
Frequency (MHz)	20 dB Bandwidth (KHz)	Limit (KHz)
902.75	78.150	500
914.75	65.850	500
927.25	57.890	500

Modulation Type: DSB-ASK

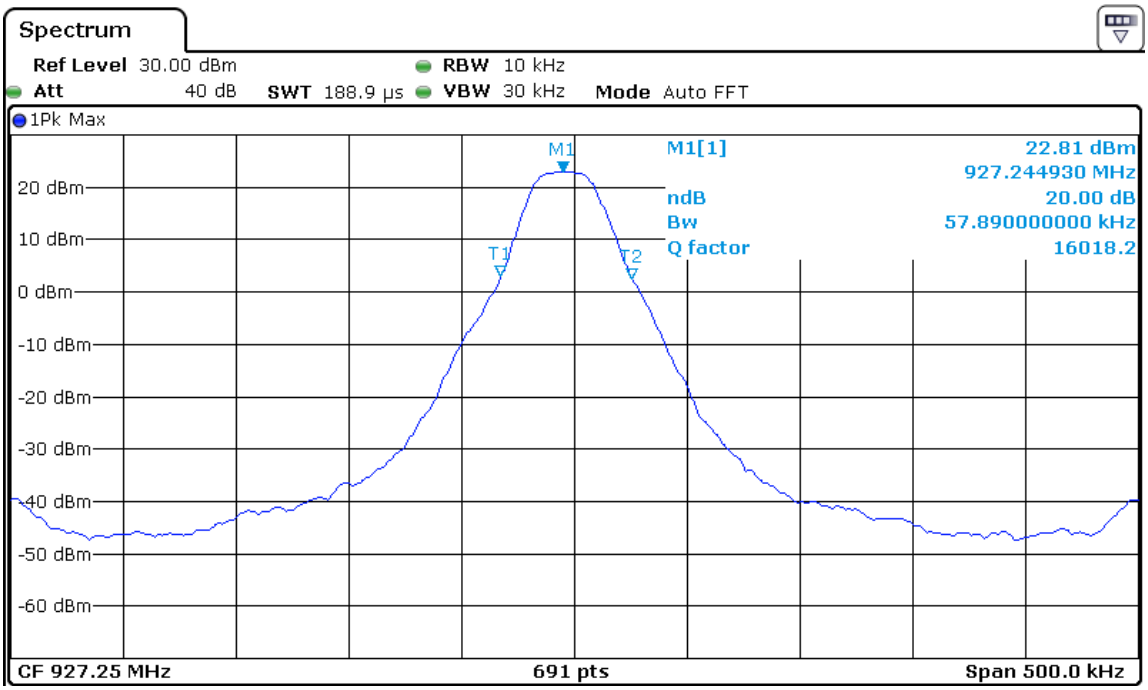
902.75MHz



914.75MHz



927.25MHz



3.5 Channel Number (Number of Hopping Frequencies)

Minimum Number of Hopping Frequencies, FCC Rule 15.247(a) (1) (iii):

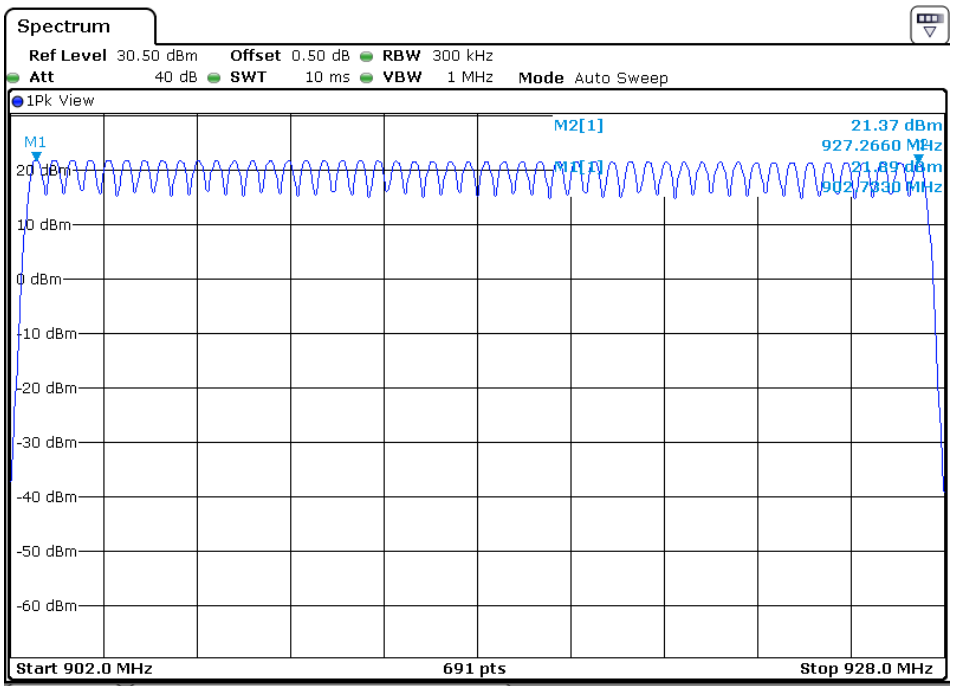
The RF passband of the EUT was divided into 3 approximately equal bands. With the analyzer set to MAX HOLD readings were taken for 2-3 minutes. The channel peaks so recorded were added together, and the total number compared to the minimum number of channels required in the regulation.

Note: For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies

Number of hopping channels =	50

Modulation Type: DSB-ASK

CH00-CH49



3.6 Channel Separation (Carrier Frequency Separation)

Minimum Hopping Channel Carrier Frequency Separation, FCC Ref: 15.247(a)(1):

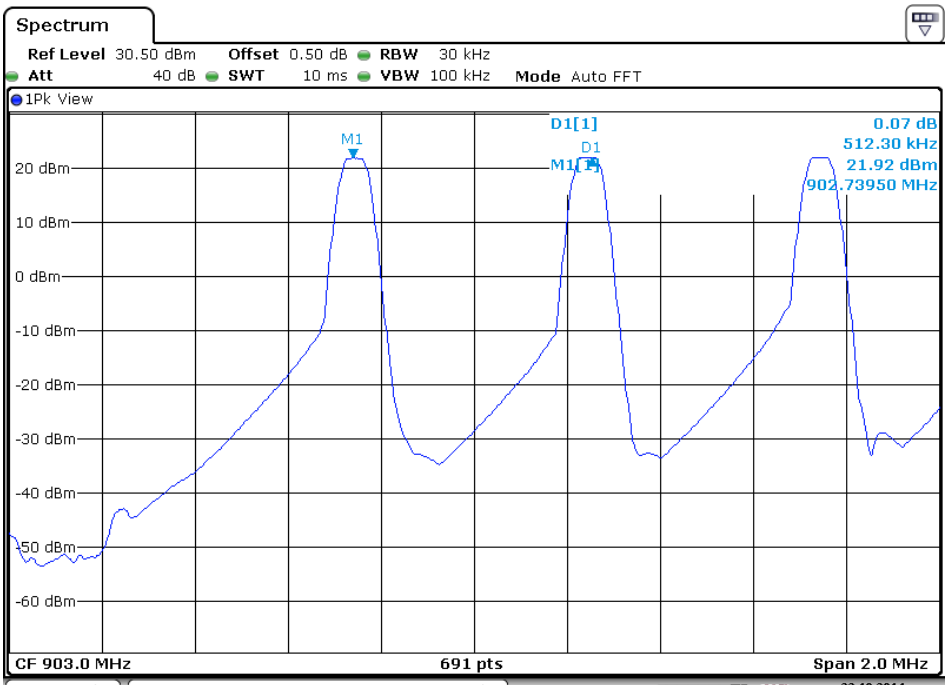
Using the DELTA MARKER function of the analyzer, the frequency separation between two adjacent channels was measured and compared against the limit:

Limit: Not less than 20dB bandwidth: 78KHz

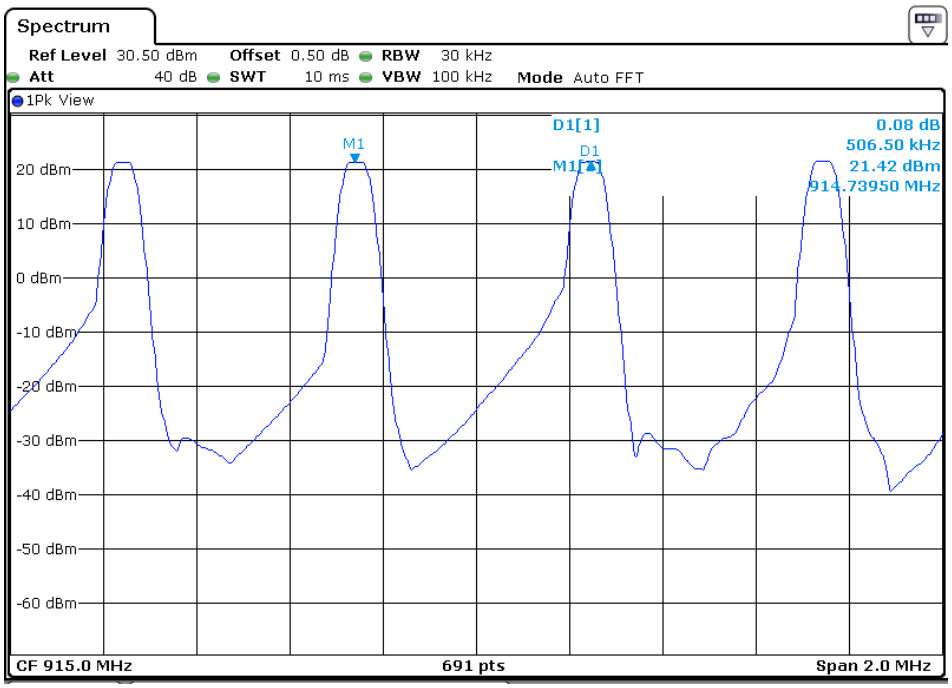
Channel	Channel Separation (KHz)	Limit (KHz)
Low	512.3	78
Mid	506.5	78
High	506.5	78

Modulation Type: DSB-ASK

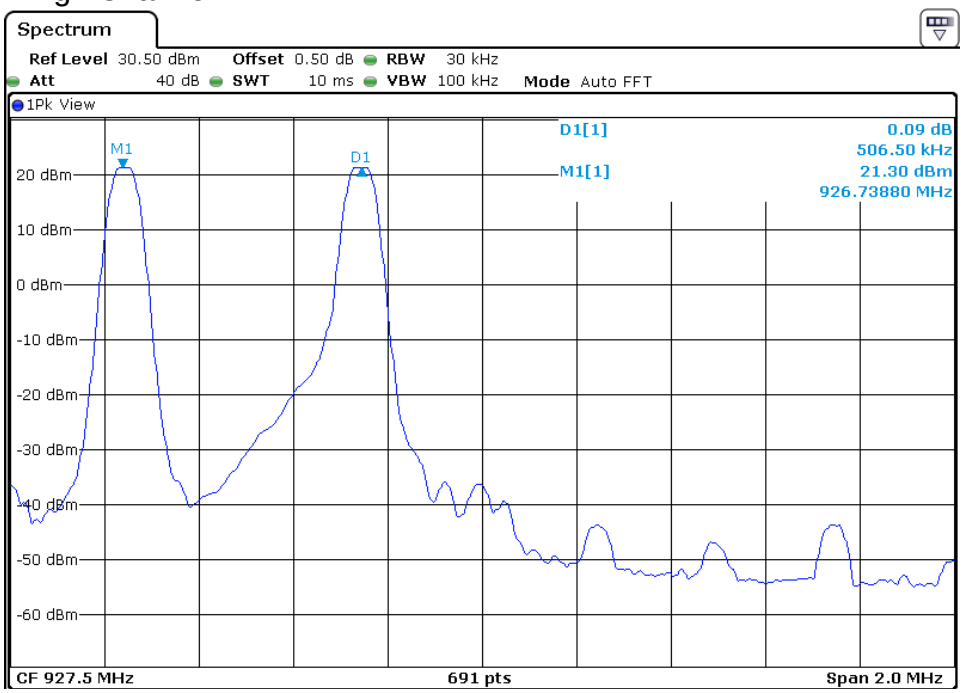
Low Channel



Middle Channel



High Channel



3.7 Dwell Time (Time of Occupancy)

Average Channel Occupancy Time, FCC Ref: 15.247(a)(1)(iii):

The spectrum analyzer center frequency was set to one of the known hopping channels. The SWEEP was set to 20s, the SPAN was set to ZERO SPAN, and the TRGGER was set to VIDEO. The time duration of the transmissions so captured was measured with the MARKER DELTA function.

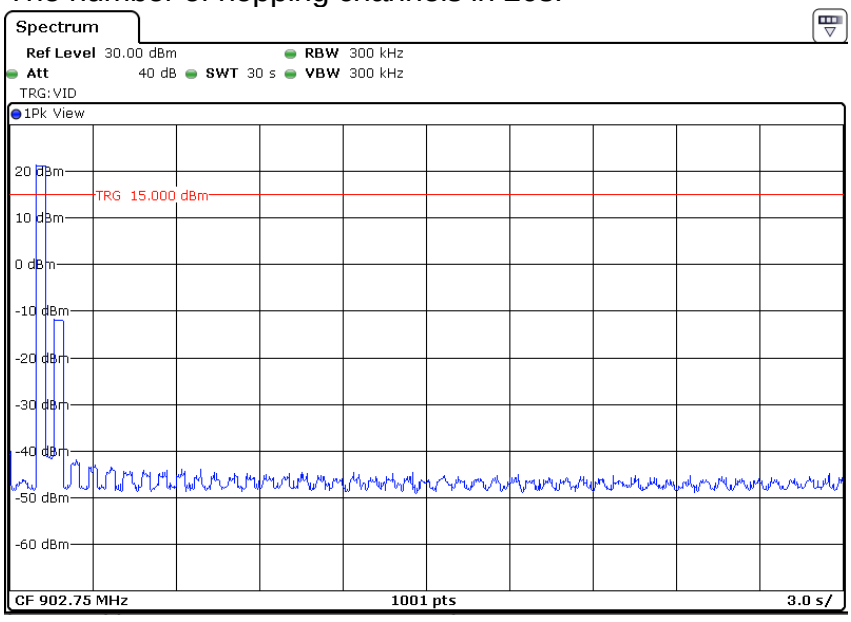
Note: For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

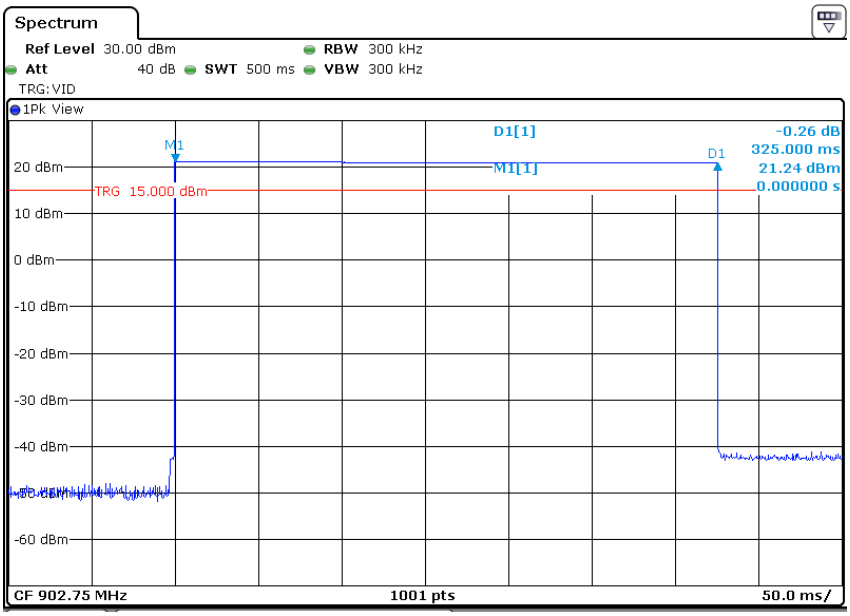
The maximum number of hopping channels in 20s:

Frequency (MHz)	Dwell time Per Hop(s)	Number of hopping channels in 20s	Dwell time (s)	Limit (s)
902.75	0.33	1	0.33	0.4
914.75	0.33	1	0.33	0.4
927.25	0.33	1	0.33	0.4

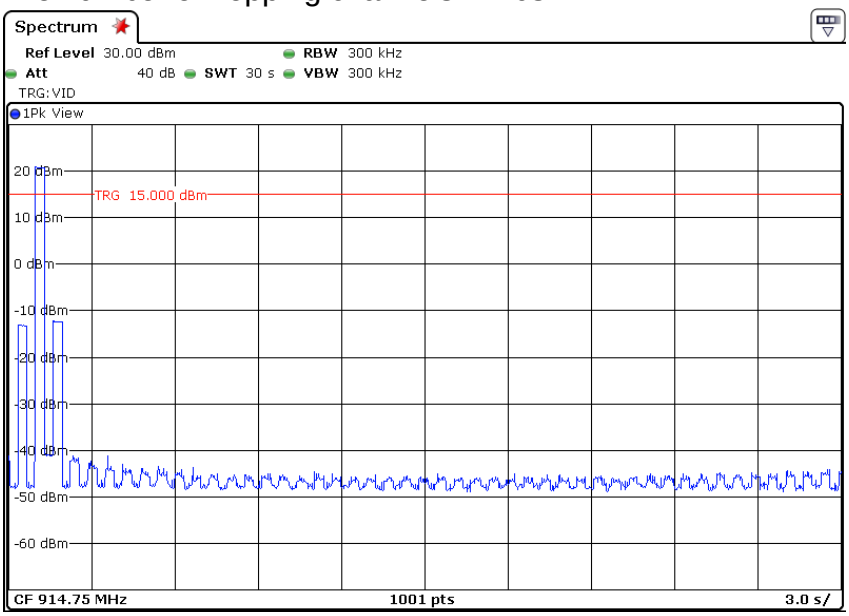
Modulation Type: DSB-ASK

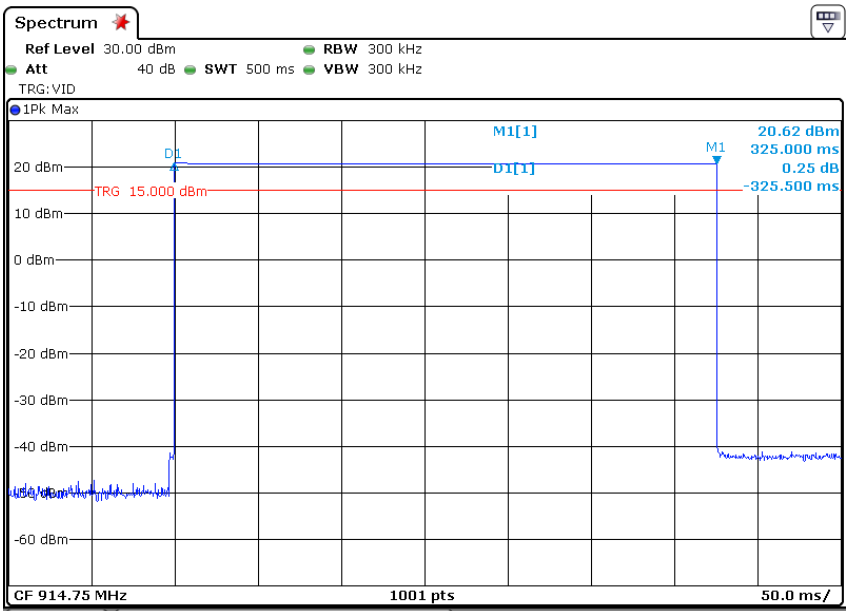
902.75MHz
The number of hopping channels in 20s:



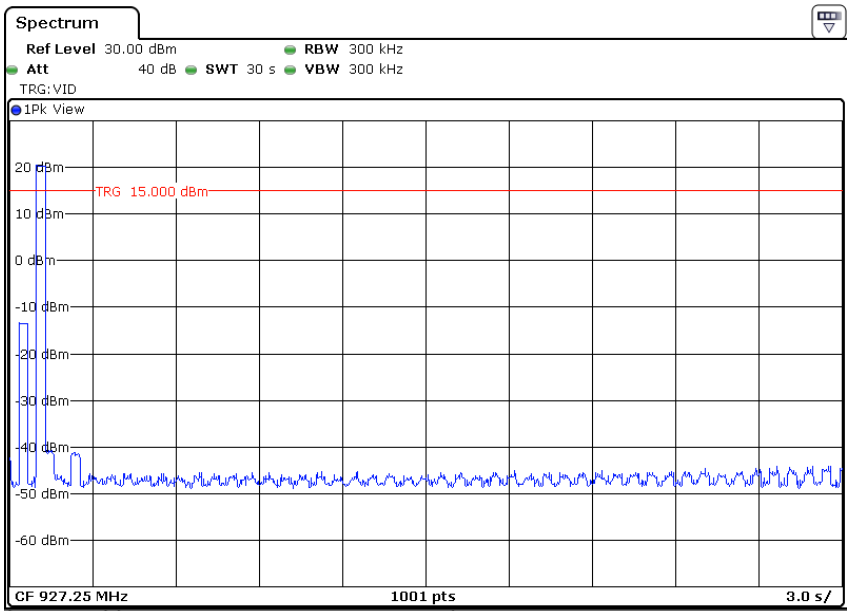


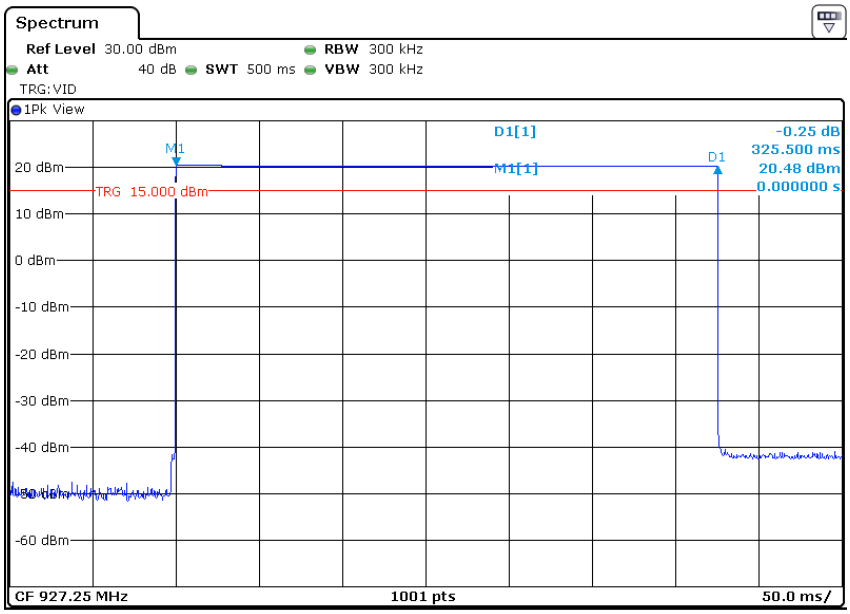
914.75MHz
The number of hopping channels in 20s:




Spectrum
Ref Level 30.00 dBm
RBW 300 kHz
Att 40 dB SWT 500 ms VBW 300 kHz
TRG:VID
1Pk Max
M1[1] 20.62 dBm
325.000 ms
D1[1] 0.25 dB
-325.500 ms
D1
M1
TRG 15.000 dBm
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-60 dBm
CF 914.75 MHz
1001 pts
50.0 ms/

927.25MHz


Spectrum
Ref Level 30.00 dBm
RBW 300 kHz
Att 40 dB SWT 30 s VBW 300 kHz
TRG:VID
1Pk View
TRG 15.000 dBm
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 927.25 MHz
1001 pts
3.0 s/

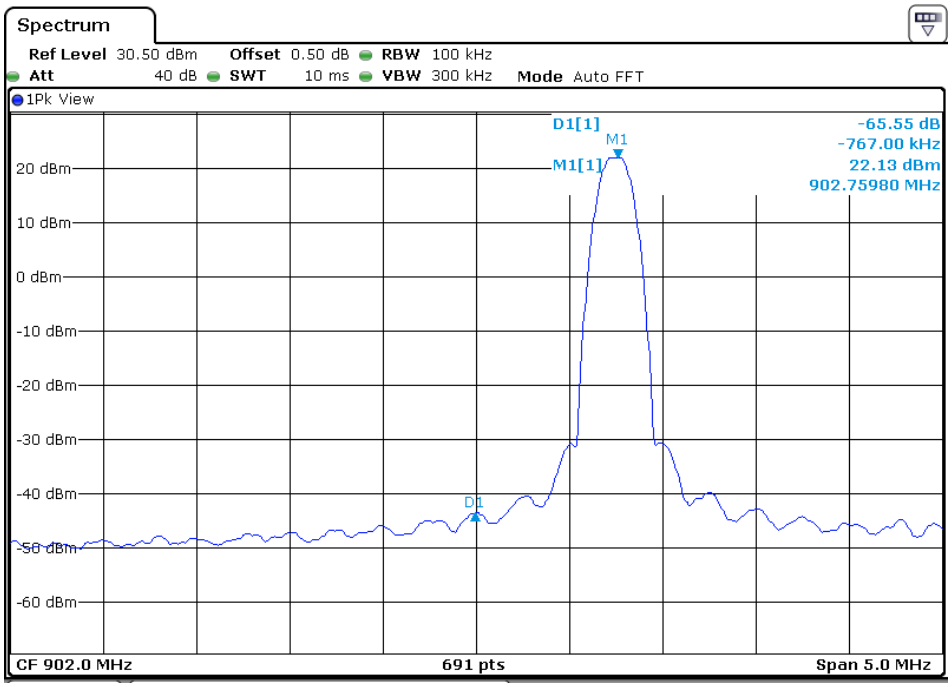

Spectrum
Ref Level 30.00 dBm
RBW 300 kHz
Att 40 dB SWT 500 ms VBW 300 kHz
TRG:VID
1Pk View
D1[1]
-0.25 dB
325.500 ms
M1[1]
20.48 dBm
0.000000 s
M1
D1
TRG 15.000 dBm
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-60 dBm
CF 927.25 MHz
1001 pts
50.0 ms/

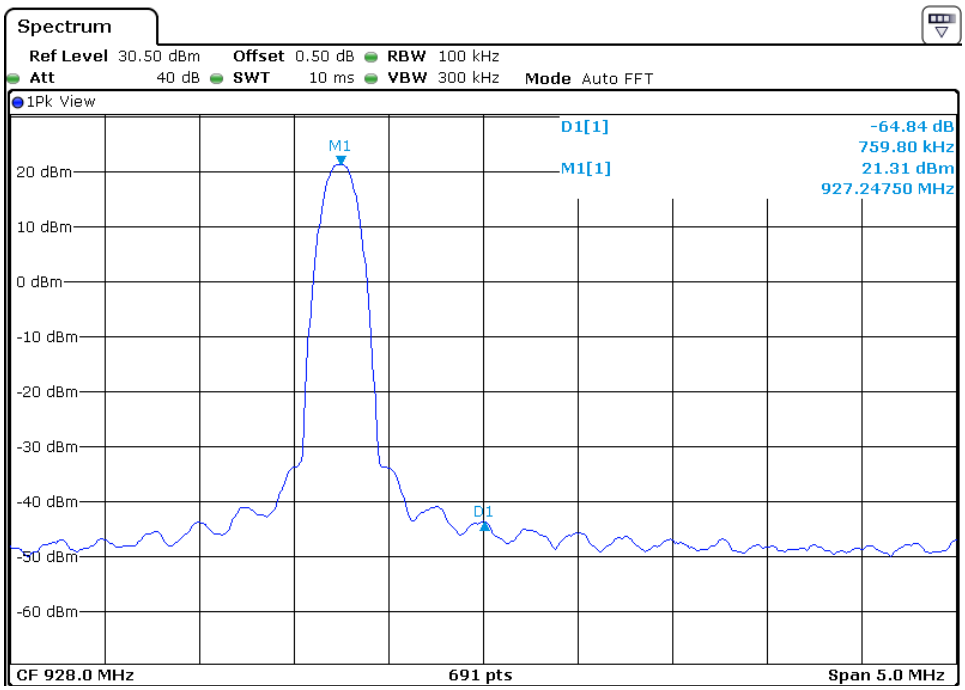
3.8 Band Edge

Out of Band Conducted Emissions, FCC Rule 15.247(d):

In any 100 KHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission.

Modulation Type: DSB-ASK




Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 10 ms VBW 300 kHz Mode Auto FFT
1Pk View
D1[1] -64.84 dB
759.80 kHz
M1[1] 21.31 dBm
927.24750 MHz
M1
D1
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 928.0 MHz
691 pts
Span 5.0 MHz

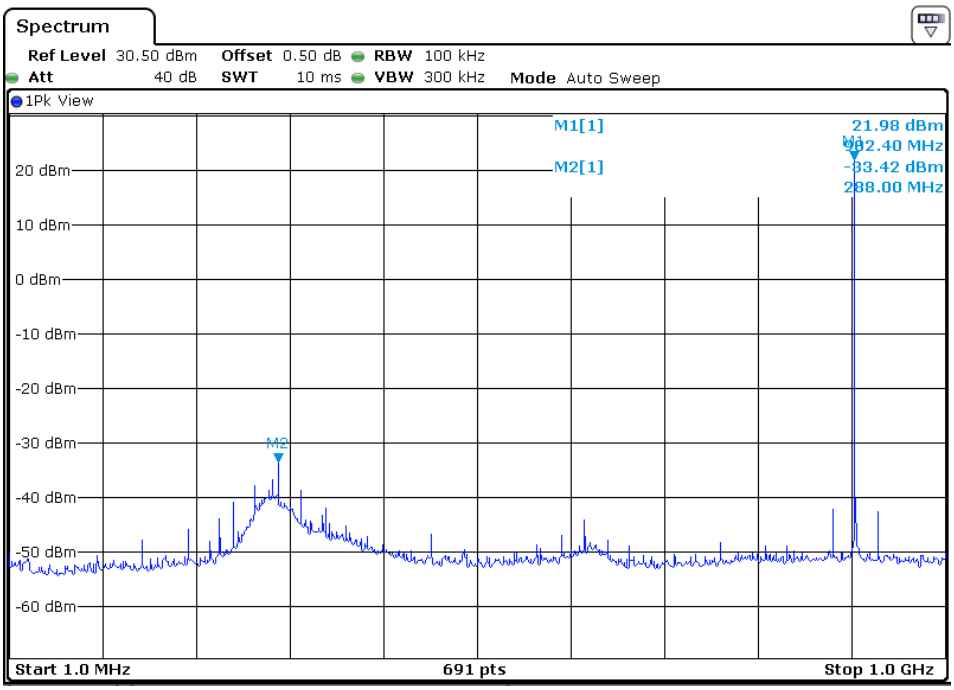
3.9 Transmitter Spurious Emissions (Conducted)

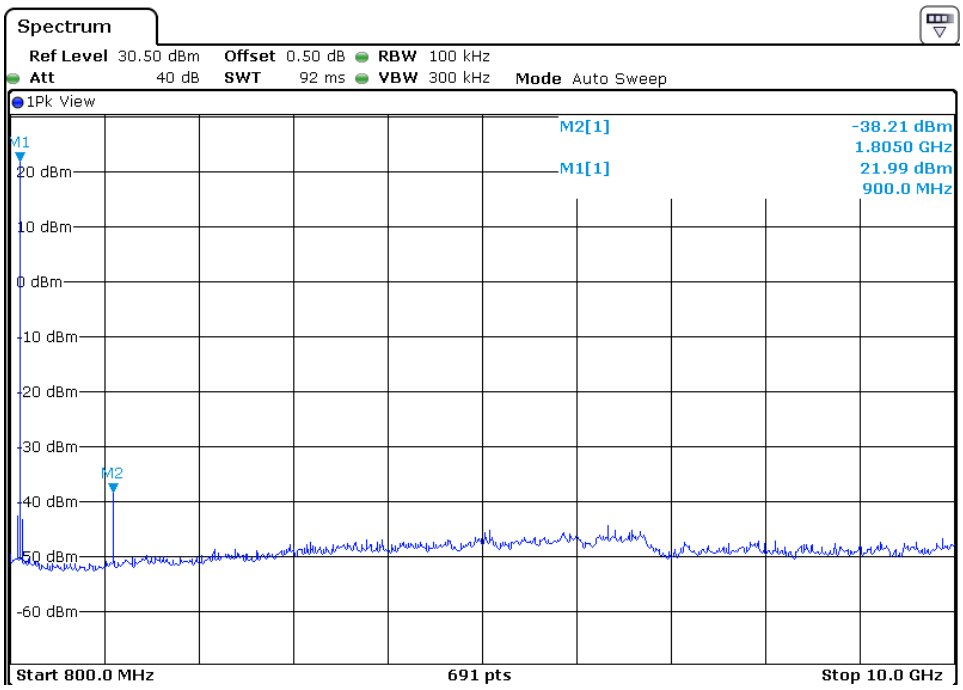
Out of Band Conducted Spurious Emissions, FCC Rule 15.247(d):

All spurious emission and up to the tenth harmonic was measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

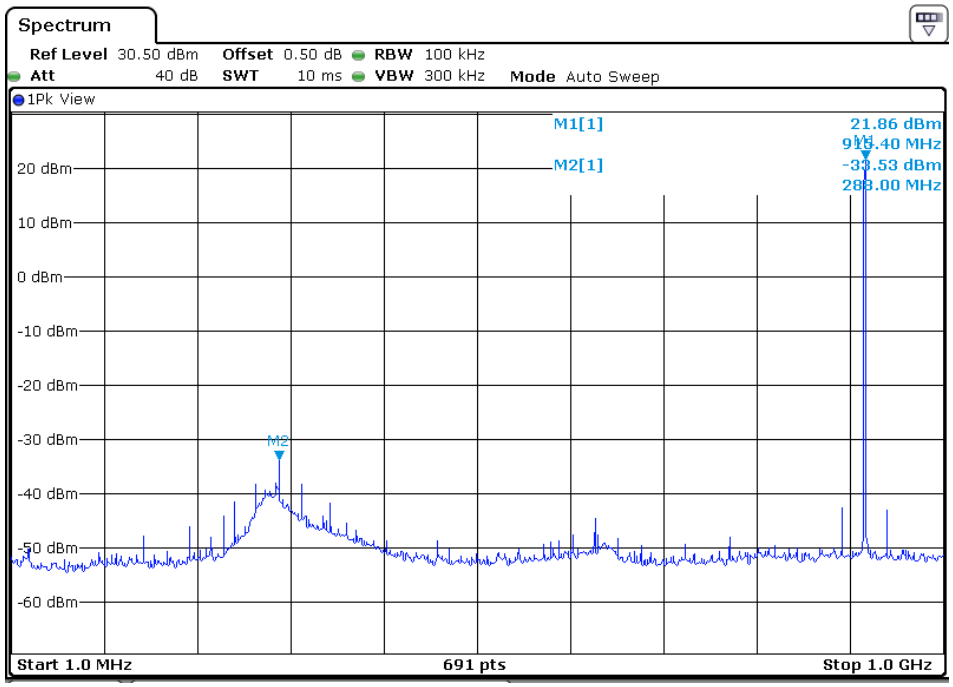
Modulation Type: DSB-ASK

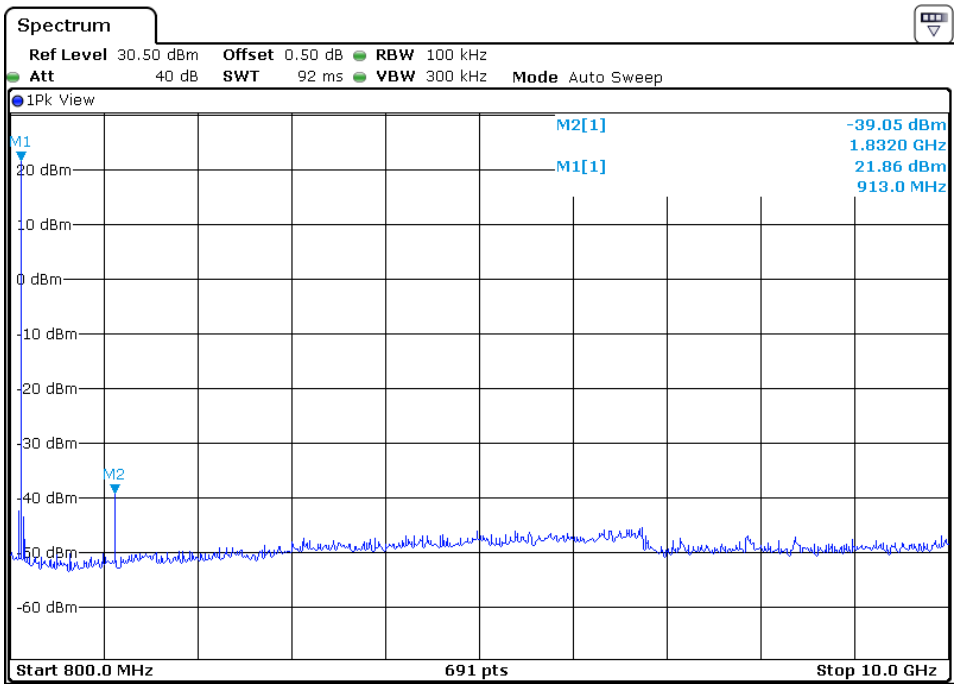
Low Channel:



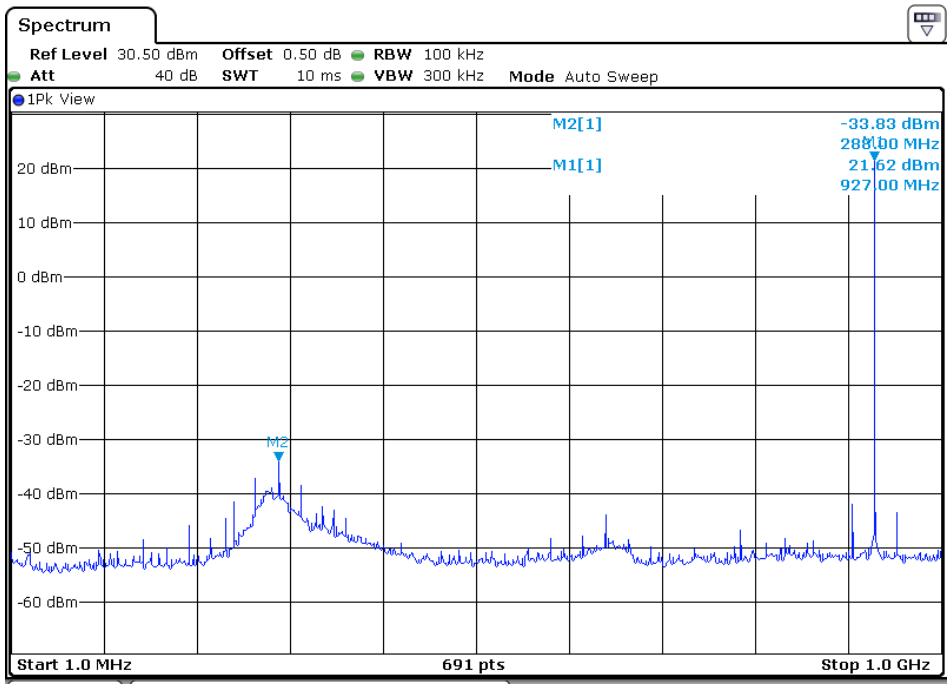


Middle Channel:





High Channel:



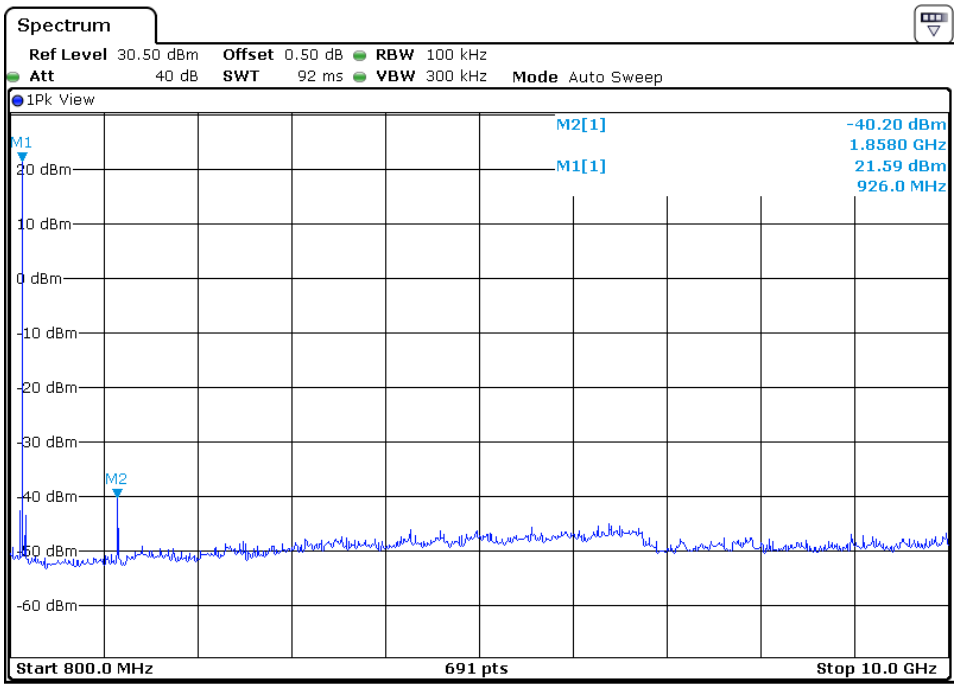


EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

4.0 **Equipment Photographs**

For electronic filing, the photographs of the tested EUT are saved with filename: external photos.pdf & internal photos.pdf.

EXHIBIT 5

PRODUCT LABELLING

5.0 **Product Labelling**

For electronic filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

EXHIBIT 6

TECHNICAL SPECIFICATIONS

6.0 Technical Specifications

For electronic filing, the block diagram and schematics of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

EXHIBIT 7

INSTRUCTION MANUAL

7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

EXHIBIT 8

MISCELLANEOUS INFORMATION

8.0 Miscellaneous Information

This miscellaneous information includes details of the test procedure and calculation of factor such as pulse desensitization.

8.1 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device.

8.2 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4: 2009.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjust through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels.

Detector function for radiated emissions is in peak mode.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.

Detector function for conducted emissions is in QP & AV mode and IFBW setting is 9 kHz from the frequency band 150 kHz to 30MHz.

8.3 **Emissions Test Procedures (cont'd)**

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.4: 2009.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, but those measurements taken at a closer distance are so marked.

EXHIBIT 9

TEST EQUIPMENT LIST

9.0 Test Equipment List

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Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	28-Jun-14	28-Jun-15
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	3-Sep-14	3-Sep-15
SZ061-08	Horn Antenna	ETS	3115	00092346	19-Oct-14	19-Oct-15
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	29-Apr-14	29-Apr-15
EM031-03	Spectrum Analyzer	R&S	FSV40	101148	9-Jun-14	9-Jun-15
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	10-Mar-14	10-Mar-15
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	19-Apr-14	19-Apr-15
SZ062-02	RF Cable	RADIALL	RG 213U	--	8-Jan-15	8-Jul-15
SZ062-06	RF Cable	RADIALL	0.04-26.5GHz	--	8-Jan-15	8-Jul-15
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	17-Oct-14	17-Apr-15
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	21-May-14	21-May-15
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	1-Nov-14	1-Nov-15
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	1-Nov-14	1-Nov-15
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	1-Nov-14	1-Nov-15
SZ188-03	Shielding Room	ETS	RFD-100	4100	23-Aug-14	23-Aug-15