849 NW STATE ROAD 45
NEWBERRY, FL 32669 USA

PHONE: 352.472.5500
EMAIL: INFO@TIMCOENGR.COM
WEB: HTTP://WWW.TIMCOENGR.COM

TIMCO ENGINEERING, Inc.

An IIA Company

FCC PART 15.247 & IC RSS-247 900MHz FHSS Test Report

APPLICANT	ADEMCO INC.
ADDRESS	2 CORPORATE CENTER DRIVE SUITE 1009040, MELVILLE NY 11747
FCC ID	CFS8DLPROINDMV
IC	573F-PROINDMV
MODEL NUMBER	PROINDMV
PRODUCT DESCRIPTION	INDOOR MOTION VIEWER
DATE SAMPLE RECEIVED	8/1/2019
FINAL TEST DATE	8/22/2019
TESTED BY	Tim Royer
TEST RESULTS	☒ PASS ☐ FAIL

Report Number	Report Version	Description	Issue Date
2068UT19_TestReport_	Rev1	Initial Issue	11/12/2019

TIMCO ENGINEERING, Inc.

TABLE OF CONTENTS

GENERAL REMARKS **3**

GENERAL INFORMATION **4**

EUT INFORMATION 4
PERIPHERALS USED IN TESTING 4

RESULTS SUMMARY **5**

FREQUENCY RANGE(S) OF EUT 5

OCCUPIED BANDWIDTH **6**

TEST DATA: 20 DB OCCUPIED BANDWIDTH MEASUREMENT TABLE 6
RESULTS: PASS 6
TEST DATA: 99% OCCUPIED BANDWIDTH MEASUREMENT TABLE 6
TEST DATA: 20 DB OBW LOW END OF BAND PLOT 7
TEST DATA: 20 DB OBW MIDDLE OF BAND PLOT 8
TEST DATA: 20 DB OBW HIGH END OF BAND PLOT 9
TEST DATA: 99% OBW LOW END OF BAND PLOT 10
TEST DATA: 99% OBW MIDDLE OF BAND PLOT 11
TEST DATA: 99% OBW HIGH END OF BAND PLOT 12

FHSS REQUIREMENTS **13**

TEST DATA: FHSS CHANNEL SEPARATION MEASUREMENT TABLE 14
TEST DATA: NUMBER OF HOPPING CHANNELS MEASUREMENT TABLE 14
TEST DATA: HOPPING CHANNEL OCCUPANCY TIME MEASUREMENT TABLE 14
TEST DATA: CHANNEL SEPARATION PLOT 15
TEST DATA: NUMBER OF HOPPING CHANNELS PLOT 17
TEST DATA: CHANNEL OCCUPANCY TIME PLOT 18

PEAK POWER OUTPUT **19**

TEST DATA: PEAK POWER OUTPUT MEASUREMENT TABLE 20
TEST DATA: LOW END OF BAND PEAK CONDUCTED POWER PLOT 21
TEST DATA: MIDDLE OF BAND PEAK CONDUCTED POWER PLOT 22
TEST DATA: HIGH END OF BAND PEAK CONDUCTED POWER PLOT 23

BANDEDGE **24**

TEST DATA: BANDEDGE MEASUREMENT TABLE 25
TEST DATA: LOW END OF BAND LOWER BAND EDGE PLOT 25
TEST DATA: HOPPING LOWER BAND EDGE PLOT 26
TEST DATA: HIGH END OF BAND UPPER BAND EDGE PLOT 27
TEST DATA: HOPPING UPPER BAND EDGE PLOT 28

RADIATED SPURIOUS EMISSIONS **29**

AC POWER LINE CONDUCTED EMISSIONS **38**

EMC EQUIPMENT LIST **39**

STATE OF THE MEASUREMENT UNCERTAINTY **40**

GENERAL REMARKS

Summary

The device under test does:

☒ Fulfill the general approval requirements as identified in this test report and was selected by the customer.

☐ Not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669
Designation #: US1070

Tested by:

Name and Title	Tim Royer, Project Manager / EMC Testing Engineer
Date	12/2/2019

GENERAL INFORMATION

EUT Information

EUT Description	INDOOR MOTION VIEWER		
FCC ID	CFS8DLPROINDMV		
IC	573F-PROINDMV		
Model Number	PROINDMV		
EUT Power Source	☐110–120Vac, 50–60Hz	☐ DC Power	☒ Battery Operated
Test Item	☐ Prototype	☒ Pre-Production	☐ Production
Type of Equipment	☐ Fixed	☒ Mobile	☐ Portable
Antenna Connector	None		
Test Conditions	The temperature was 26ºC Relative humidity of 50%.		
Test Configuration	Normal operation		
Modification to the EUT	No Modification to EUT.		
Applicable Standards	FCC CFR 47 Part 2, Part 15, RSS-GEN Issue 5, RSS-247, Issue 2, Referring to ANSI C63.10-2013 for Test Procedures		
Test Facility	Timco Engineering Inc. at 849 NW State Road 45 Newberry, FL 32669 USA. Designation #: US1070 ISED Test Site Registration: 2056A		

Peripherals Used in Testing

Description	Type	Connector	Length
n/a	n/a	n/a	n/a

RESULTS SUMMARY

FCC Rule Part No.	IC Standard Ref.	Requirement	Test Item	Result
15.215 (c)	RSS-GEN 6.6	Occupied Bandwidth	99% Bandwidth	Reporting only
			20 dB Bandwidth	Pass
15.247(a,1)	RSS-247 § 5.1	FHSS Requirements	Channel Separation	Pass
			Hopping Sequence	Pass
			System Receiver Bandwidth	Pass
			Number of Hopping Channels	Pass
			Hopping Channel Occupancy Time	Pass
15.247(b,1) & (b,4)	RSS-247 § 5.4.2	Peak Power Output	Peak Power Output (ERP)	Pass
			Antenna Gain (EIRP)	Pass
15.247(d)	RSS-247 § 5.5	Unwanted Emissions	Bandedge	Pass
			Radiated Spurious	Pass

Frequency Range(s) of EUT

Operating Frequency Band 1	902 - 928 MHz

Test Frequencies	904.5, 915.3, 926 MHz

Notes:

OCCUPIED BANDWIDTH

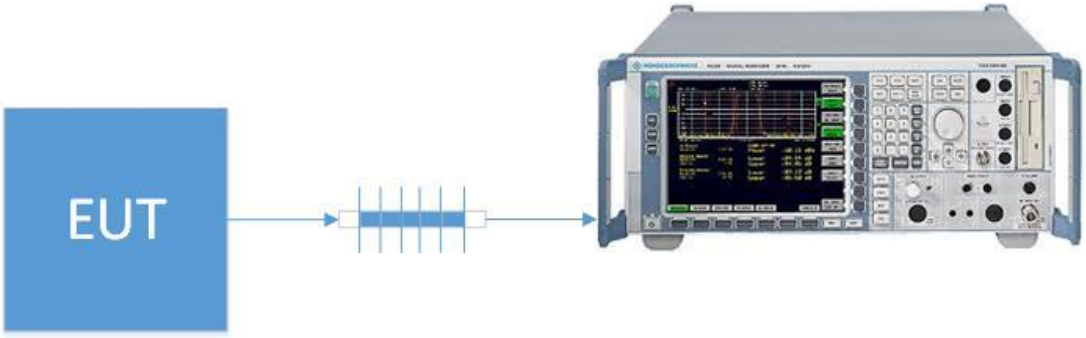
Rules Part No.: FCC 15.215(C), IC RSS 247 § 5.1.1, 5.1.1.3

FCC Requirements: The 20 dB bandwidth of the emission shall be contained within the frequency band designated in the rule section under which the equipment is operated.

IC Requirements: The maximum 20 dB bandwidth shall be 500 KHz

Test Method: ANSI C63.10 § 6.9.2 Occupied bandwidth-20dB Relative procedure

Setup:



Test Data: **20 dB Occupied Bandwidth Measurement Table**

Tuned Frequency (MHz)	20 dB BW (KHz)	Limit (KHz)	Margin (KHz)
904.5	292.58	≤ 500	207.42
915.3	310.62	≤ 500	189.38
926.1	292.58	≤ 500	207.42

RESULTS: Pass

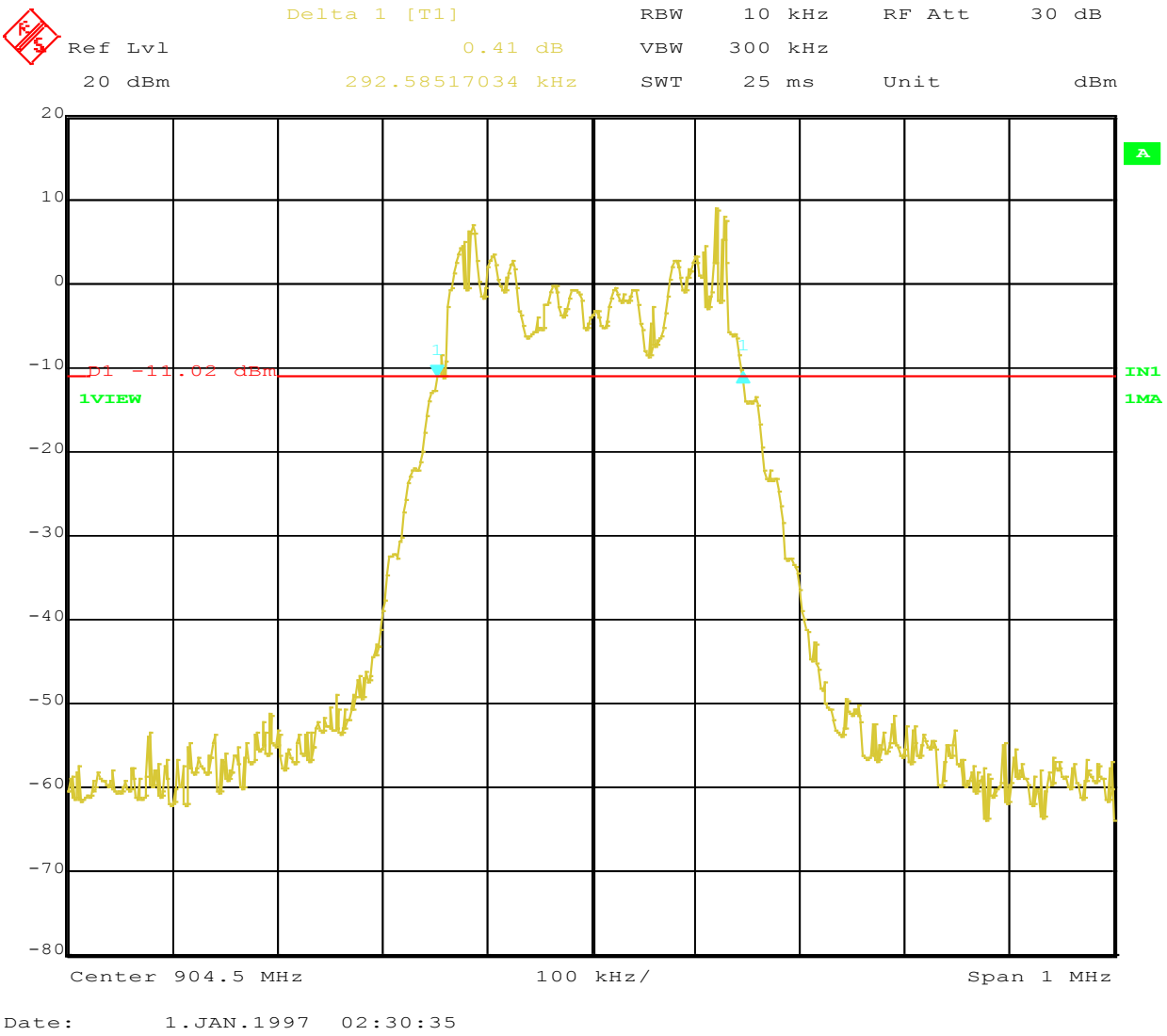
Test Data: **99% Occupied Bandwidth Measurement Table**

Tuned Frequency (MHz)	99% BW (KHz)
904.5	340.68
915.3	340.68
926.1	338.67

RESULTS: Reporting Only

OCCUPIED BANDWIDTH

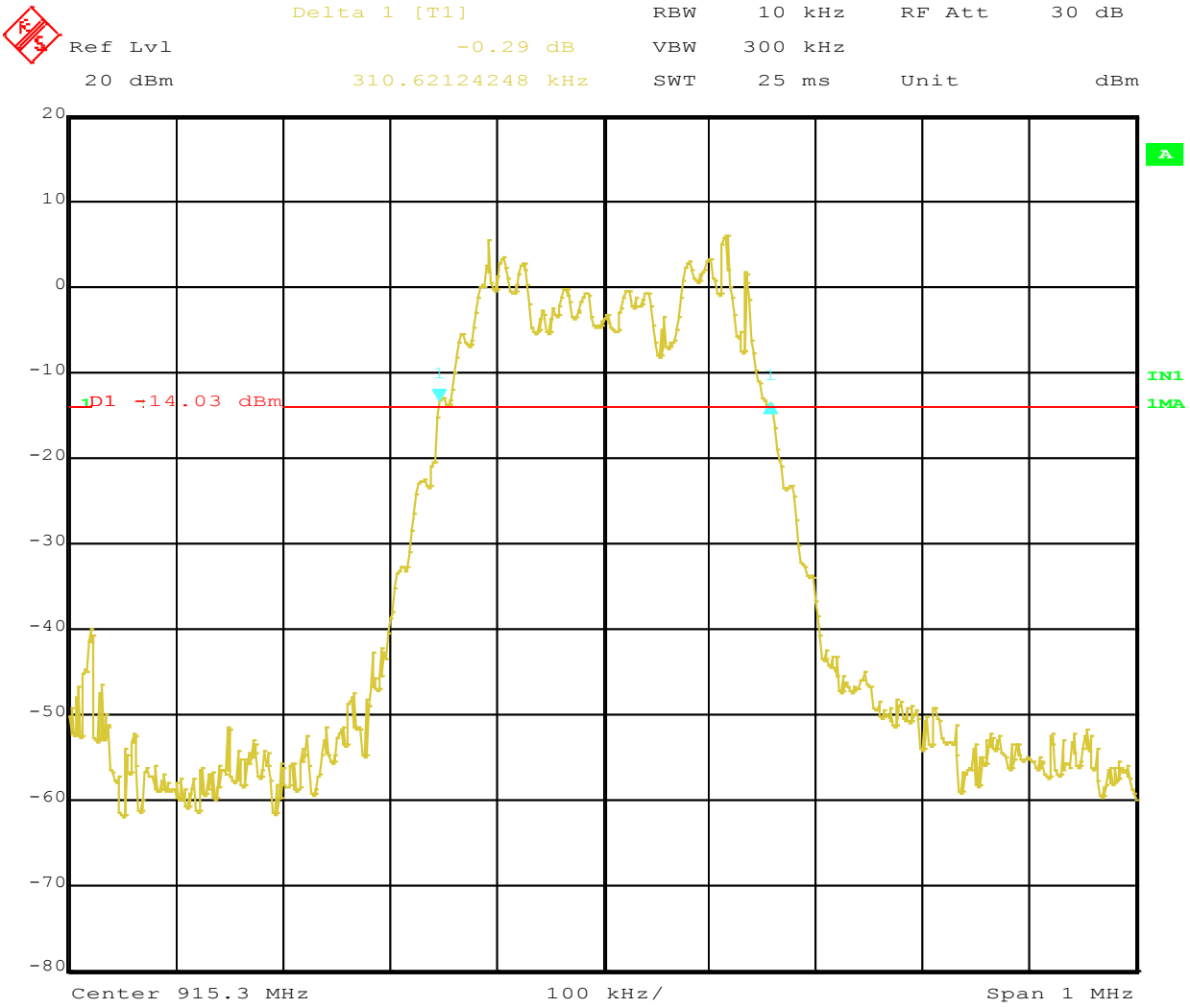
Test Data: **20 dB OBW Low End of Band Plot**



RESULTS: Meets Requirements

OCCUPIED BANDWIDTH

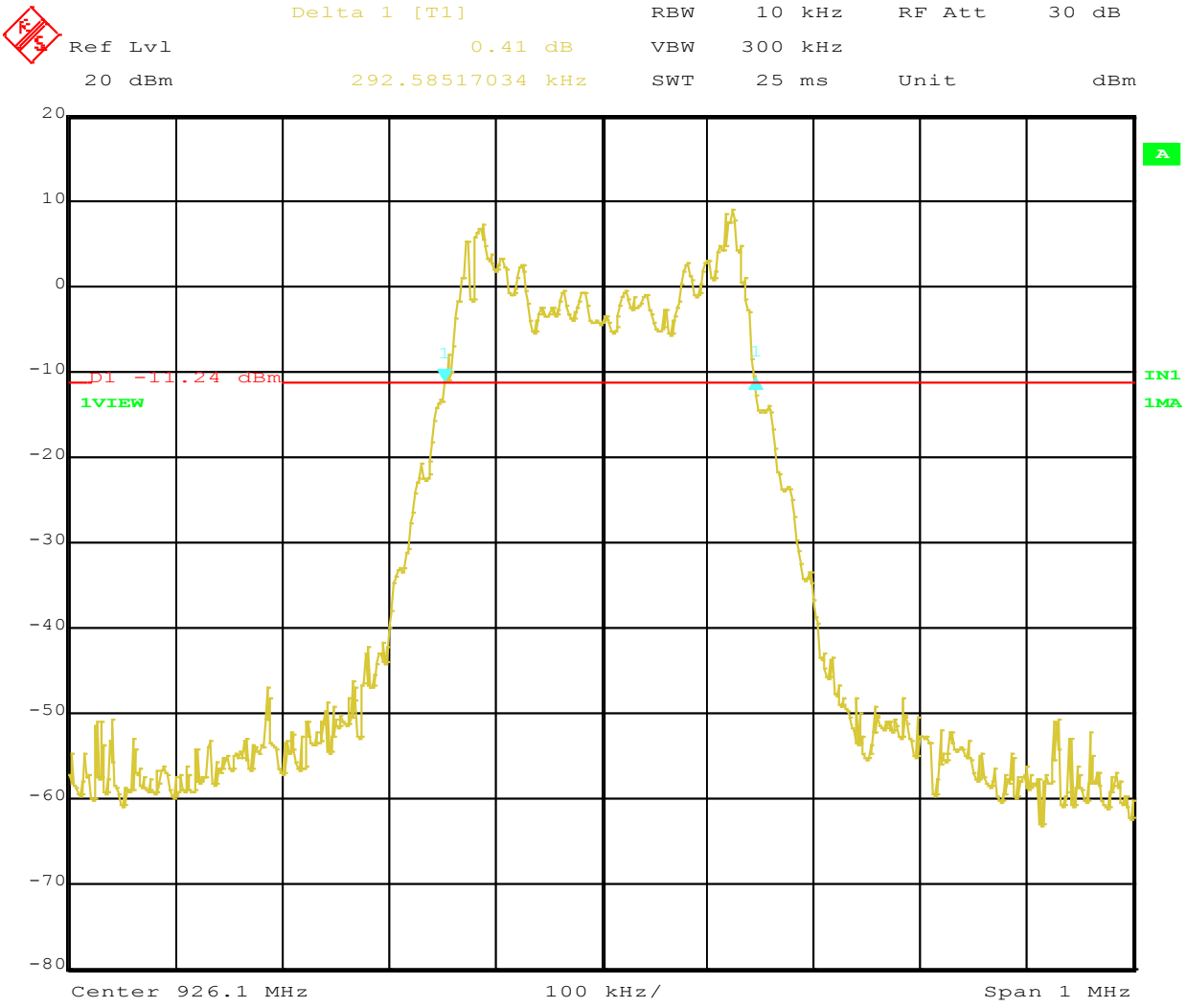
Test Data: **20 dB OBW Middle of Band Plot**



RESULTS: Meets Requirements

OCCUPIED BANDWIDTH

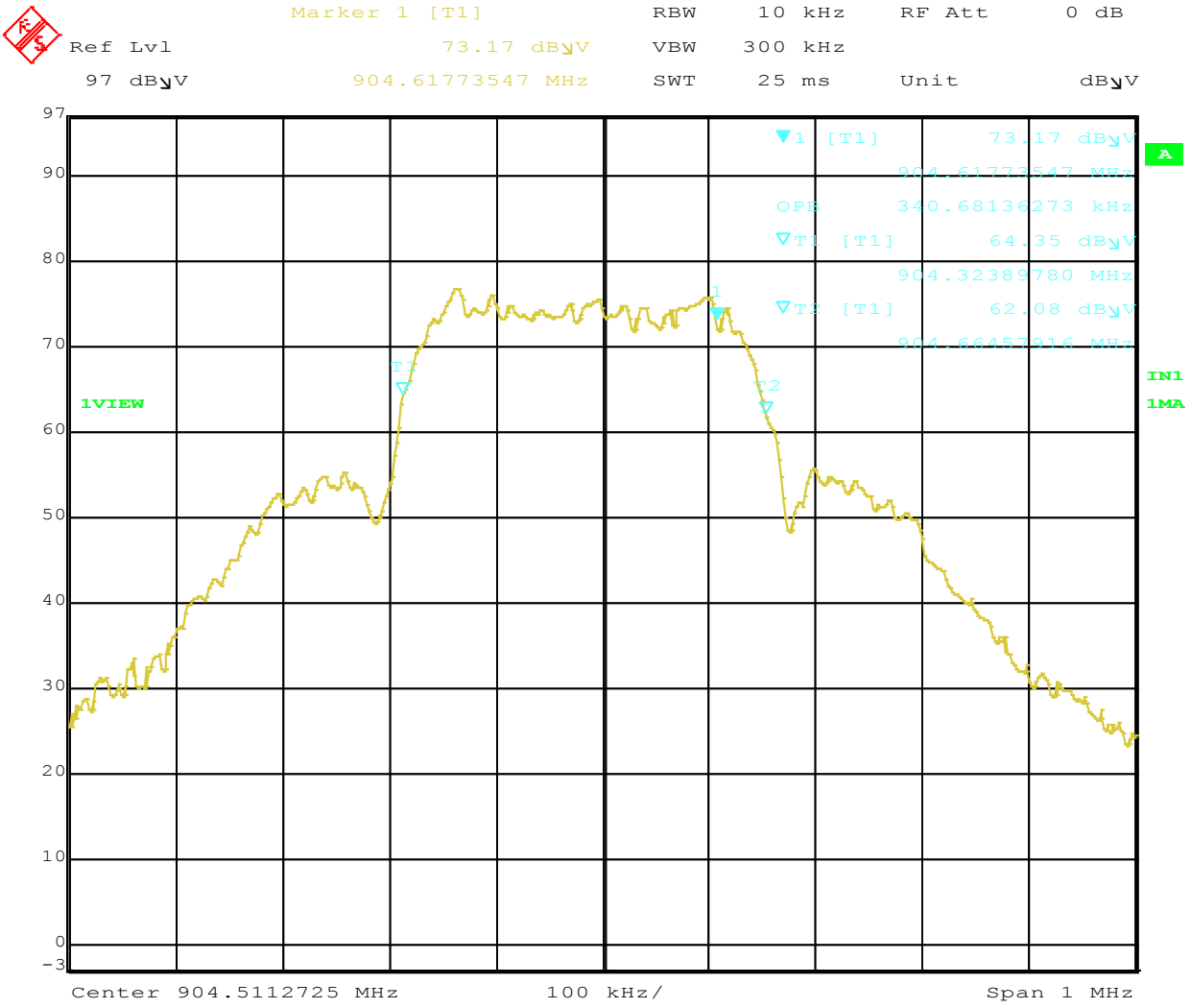
Test Data: **20 dB OBW High end of Band Plot**



RESULTS: Meets Requirements

OCCUPIED BANDWIDTH

Test Data: **99% OBW Low End of Band Plot**

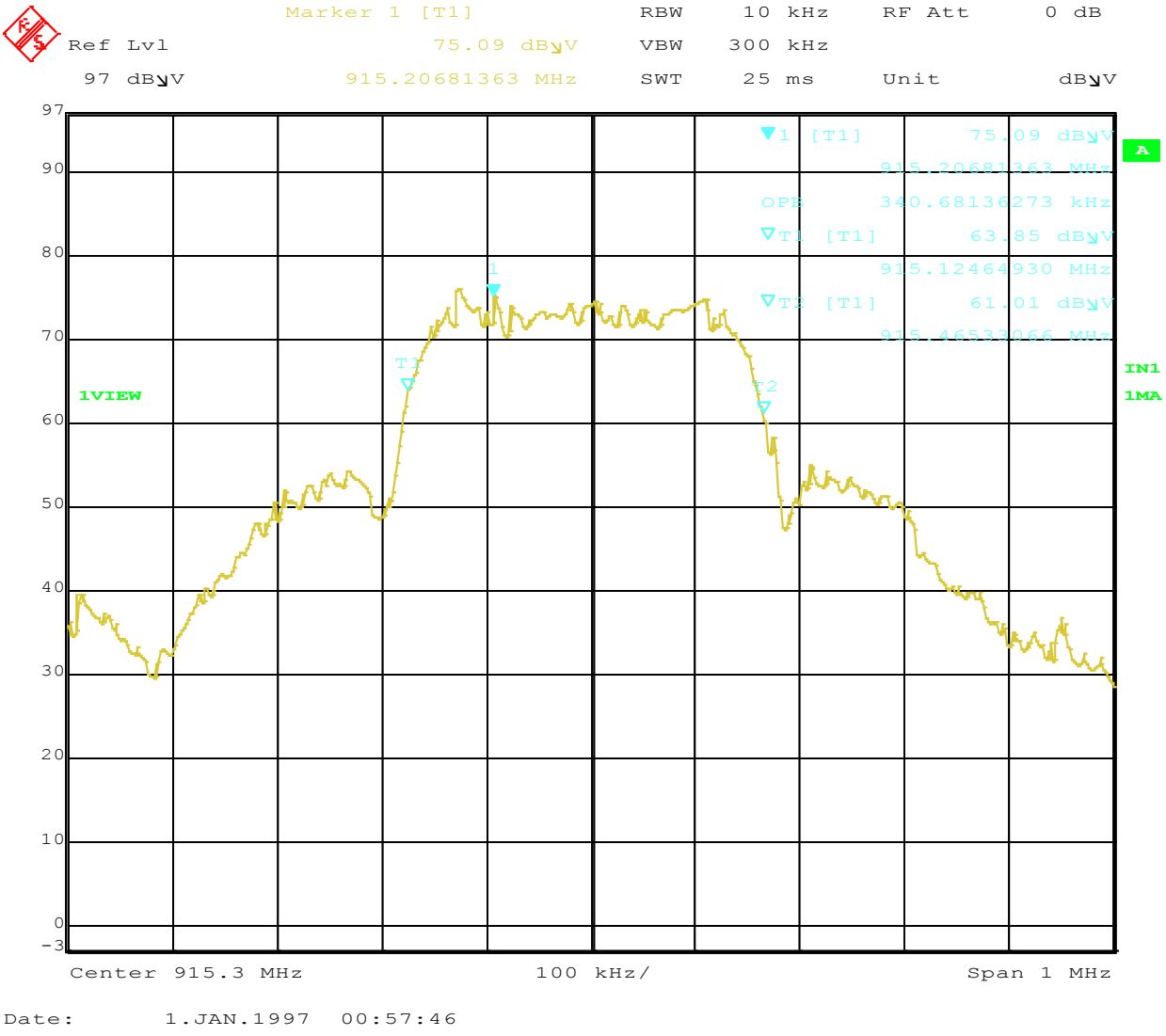


Date: 1.JAN.1997 00:56:05

RESULTS: Meets Requirements

OCCUPIED BANDWIDTH

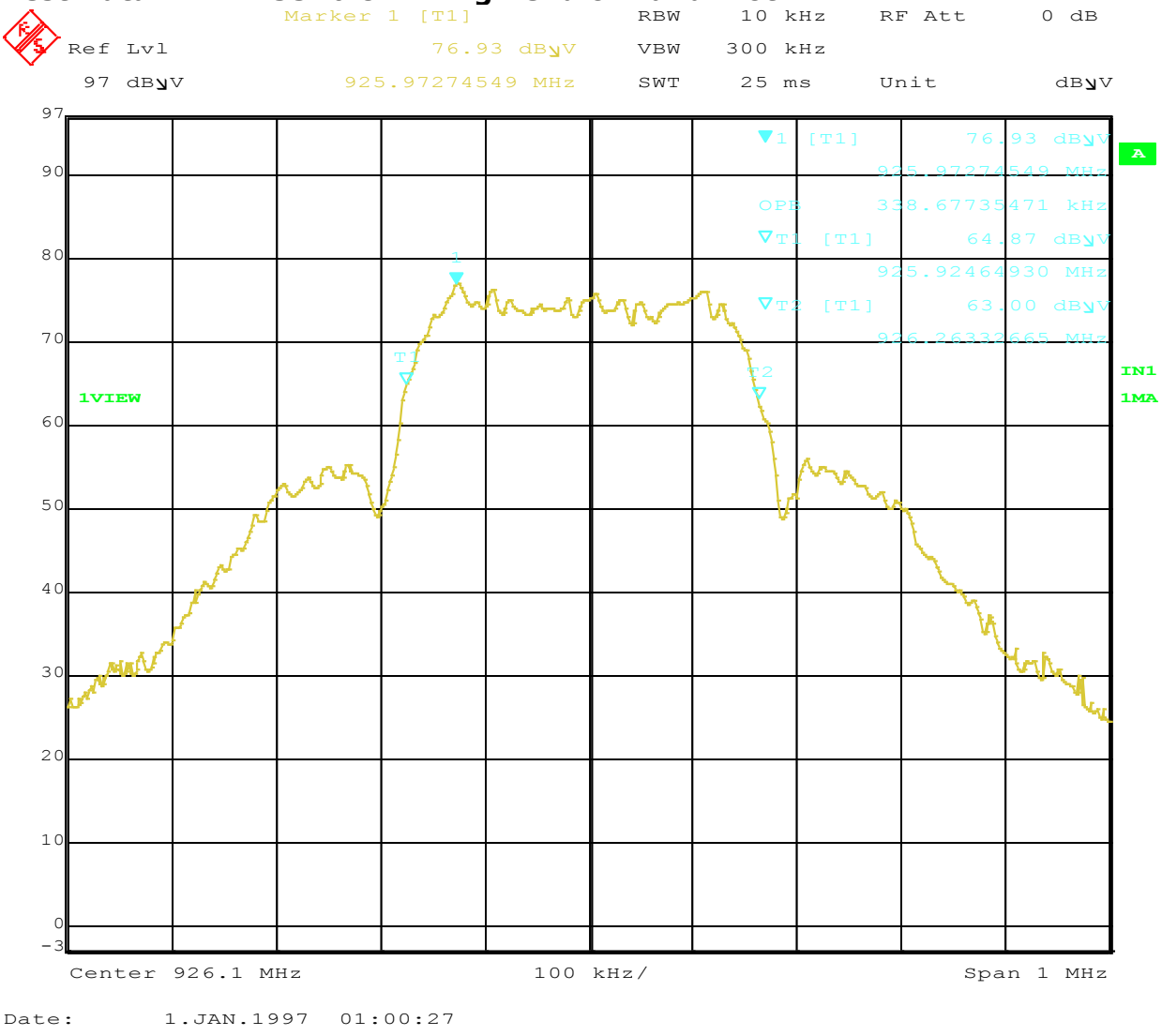
Test Data: **99% OBW Middle of Band Plot**



RESULTS: Meets Requirements

OCCUPIED BANDWIDTH

Test Data: **99% OBW High end of Band Plot**



RESULTS: Meets Requirements

OCCUPIED BANDWIDTH

FHSS REQUIREMENTS

Rules Part No.: FCC 15.247(a)(1)(i) (2), IC RSS 247 § 5.1.1, 5.1.2, 5.1.3

Requirements:

(a) Operation under the provisions of this Section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

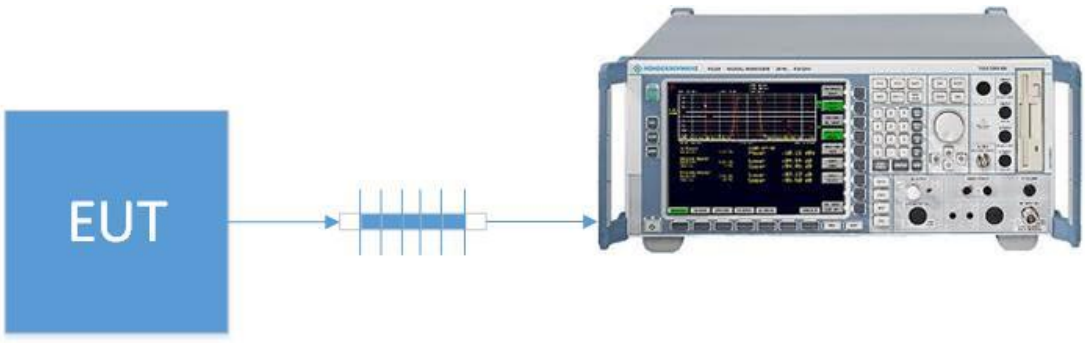
(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(i) 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; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

(2) For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

Test Method: ANSI C63.10 § 7.8.2 Carrier frequency separation
ANSI C63.10 § 7.8.3 Number of hopping frequencies
ANSI C63.10 § 7.8.3 Time of Occupancy
DA 00-705 § Pseudorandom Frequency Hopping Sequence
DA 00-705 § Equal Hopping Frequency Use
DA 00-705 § System Receiver Input Bandwidth

Setup:



FHSS REQUIREMENTS

Test Data: FHSS Channel Separation Measurement Table

Separation (KHz)	Limit (KHz)	Pass / Fail
901.9	25	Pass

Test Data: Number of Hopping Channels Measurement Table

Number of channels	Limit	Pass / Fail
25	25	Pass

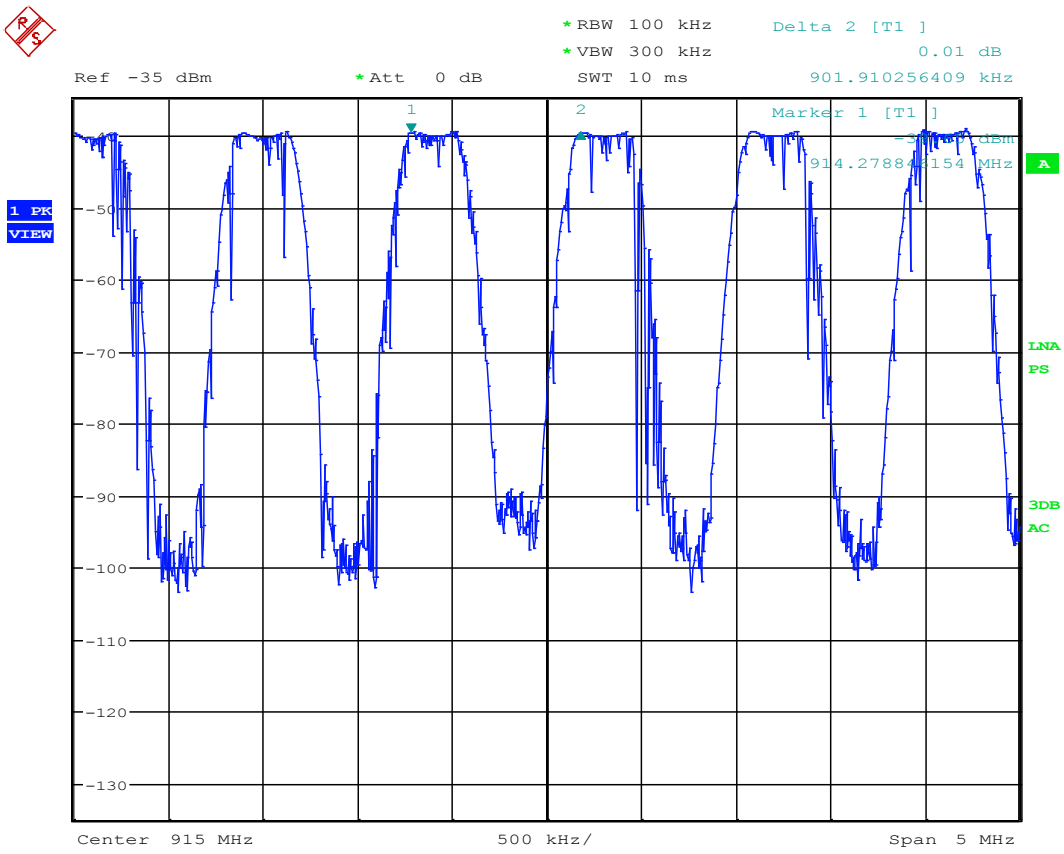
Test Data: Hopping Channel Occupancy Time Measurement Table

Number of hops	Dwell Time (ms)	Total Occupancy Time (ms)	Limit (sec)	Pass / Fail
180	2.13	383.4	≤ 0.4	Pass

RESULTS: Meets Requirements

FHSS REQUIREMENTS

Test Data: Channel Separation Plot

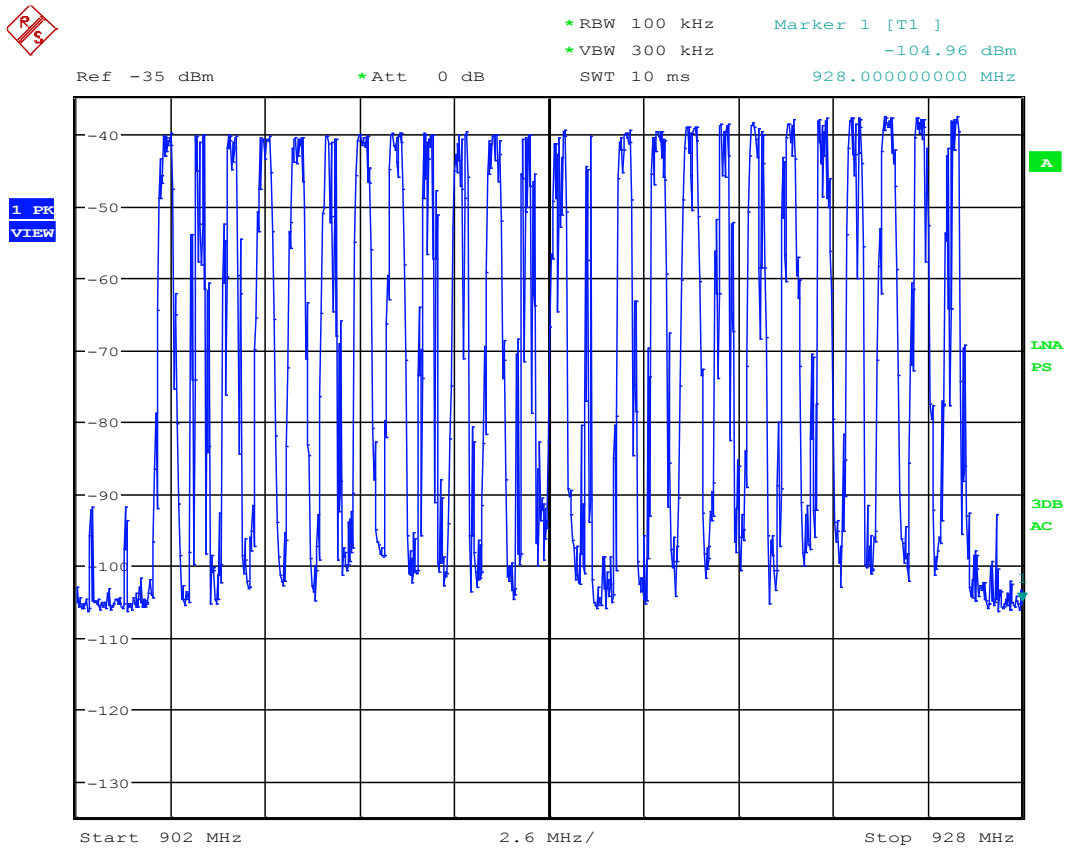


Date: 31.OCT.2019 16:21:45

RESULTS: Meets Requirements

FHSS REQUIREMENTS

Test Data: Number of Hopping Channels

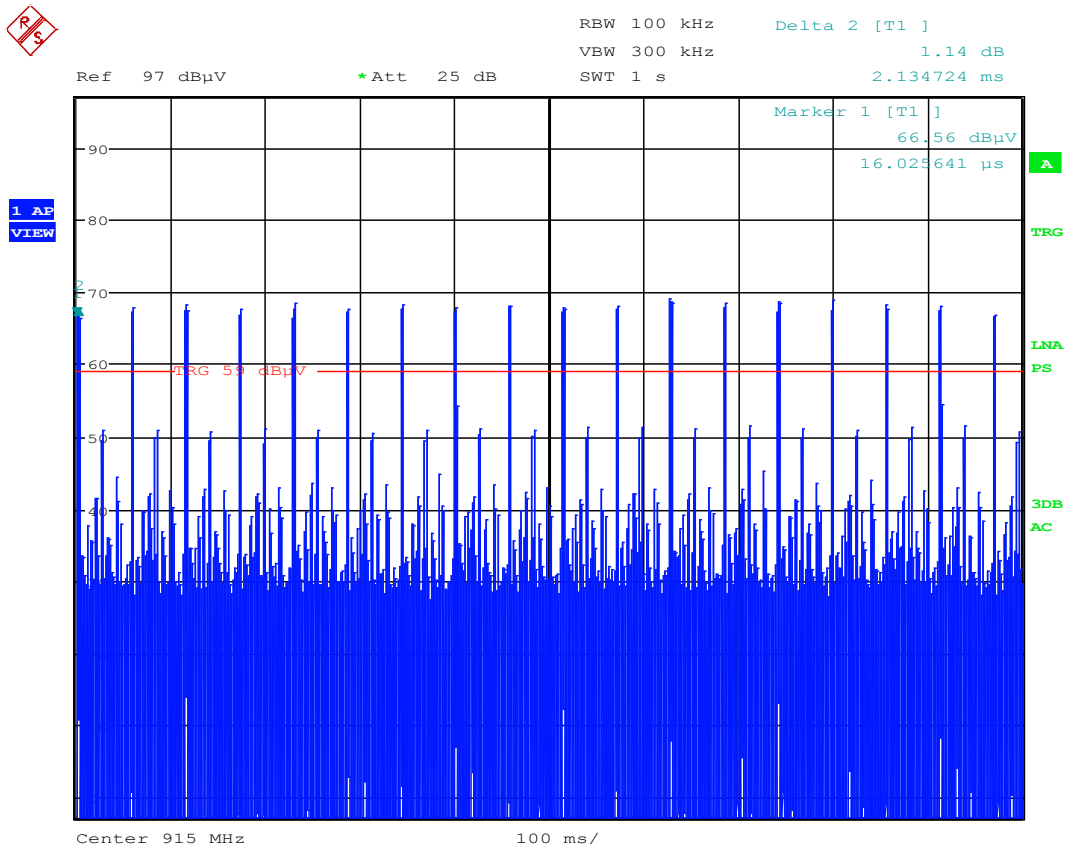


Date: 31.OCT.2019 16:08:40

RESULTS: Meets Requirements

FHSS REQUIREMENTS

Test Data: **Number of Hopping Channels in 1s Plot**



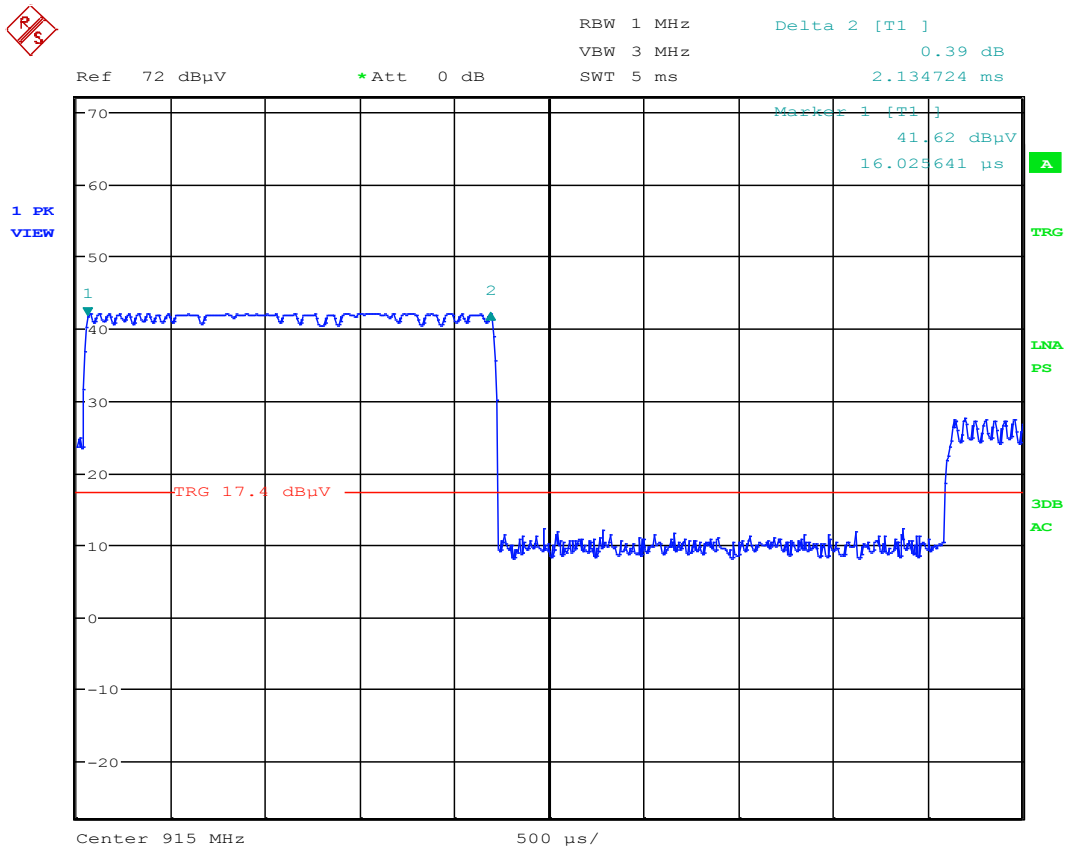
Date: 4.DEC.2019 11:48:26

Number of channels in 1 second	Number of channels in 10 second
18	180

RESULTS: Meets Requirements

FHSS REQUIREMENTS

Test Data: Channel Occupancy Time Plot



Date: 4.DEC.2019 10:52:38

RESULTS: Meets Requirements

FHSS REQUIREMENTS

PEAK POWER OUTPUT

Rules Part No.: FCC 15.247(b) (2) (4), IC RSS 247 § 5.4.1

Requirements:

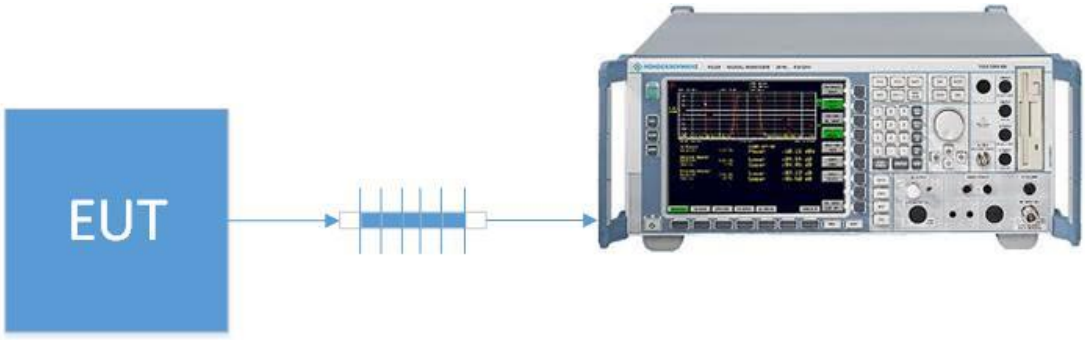
(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

(2) For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Method: ANSI C63.10 § 7.8.5 Output Power test procedure for FHSS

Setup:



PEAK POWER OUTPUT

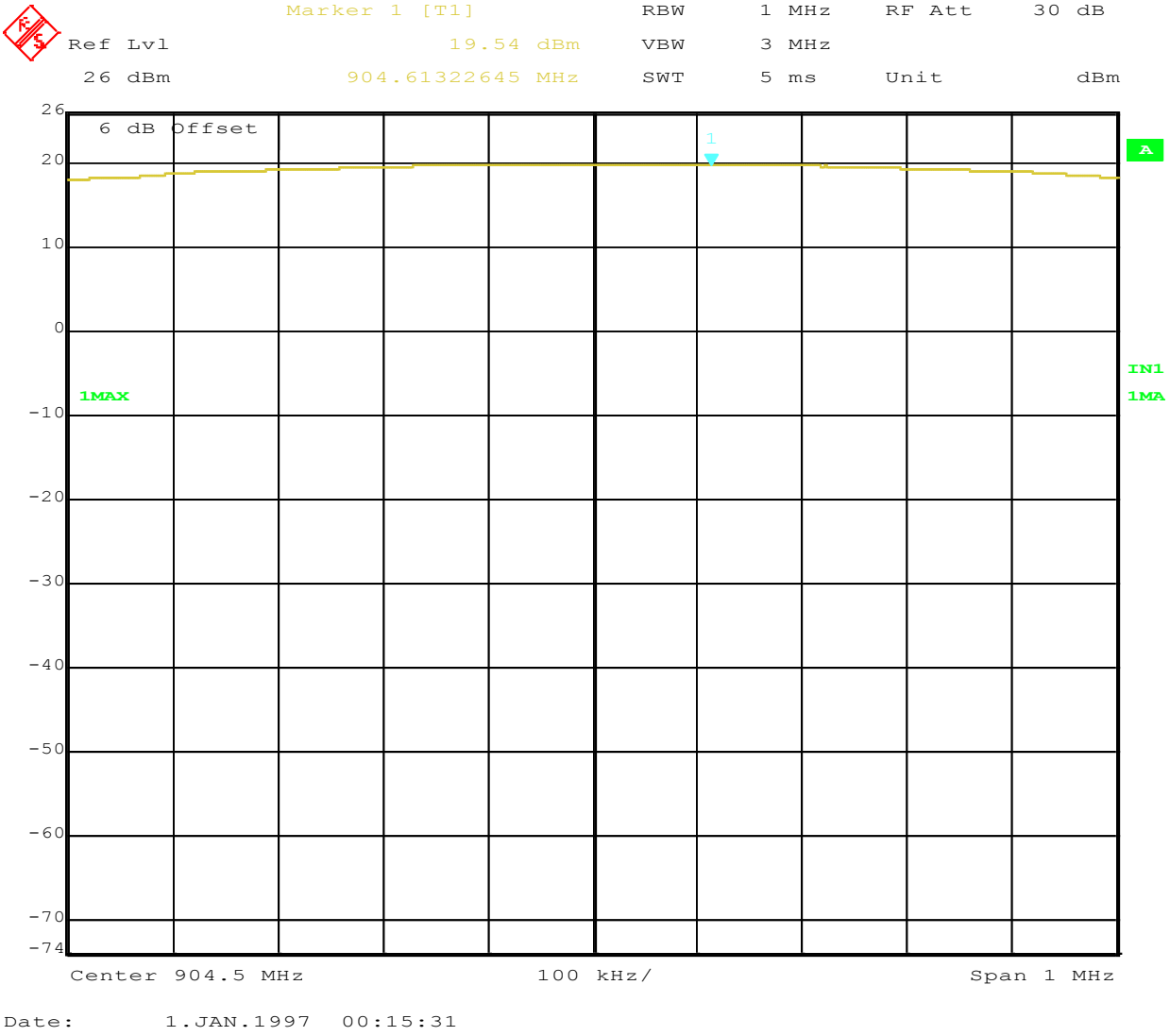
Test Data: Peak Power Output Measurement Table

Peak Conducted Power Output Measurement				
Tuned Frequency (MHz)	PConducted (dBm)	PConducted (W)	Limit (W)	Margin (W)
904.5	19.54	0.08995	0.25	0.16005
915.3	19.27	0.08453	0.25	0.16547
926	18.92	0.07798	0.25	0.17202

Peak EIRP Power Output Calculation				
Tuned Frequency (MHz)	PConducted (dBm)	EIRP (W)	Limit (W)	Margin (W)
904.5	19.54	0.14928	1.00	0.85072
915.3	19.27	0.14028	1.00	0.85972
926	18.92	0.12942	1.00	0.87058

PEAK POWER OUTPUT

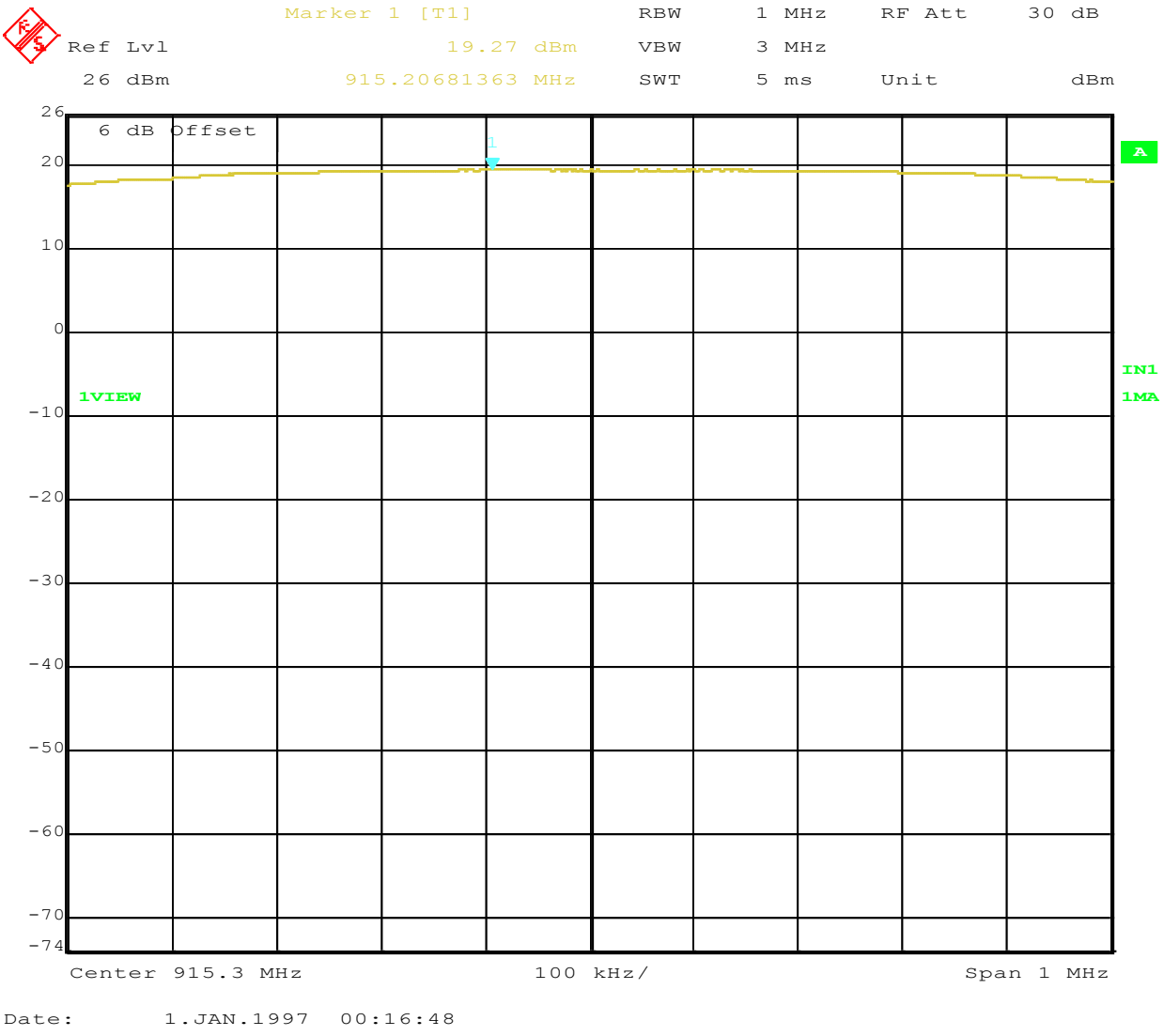
Test Data: **Low End of Band Peak Conducted Power Plot**



RESULTS: Meets Requirements

PEAK POWER OUTPUT

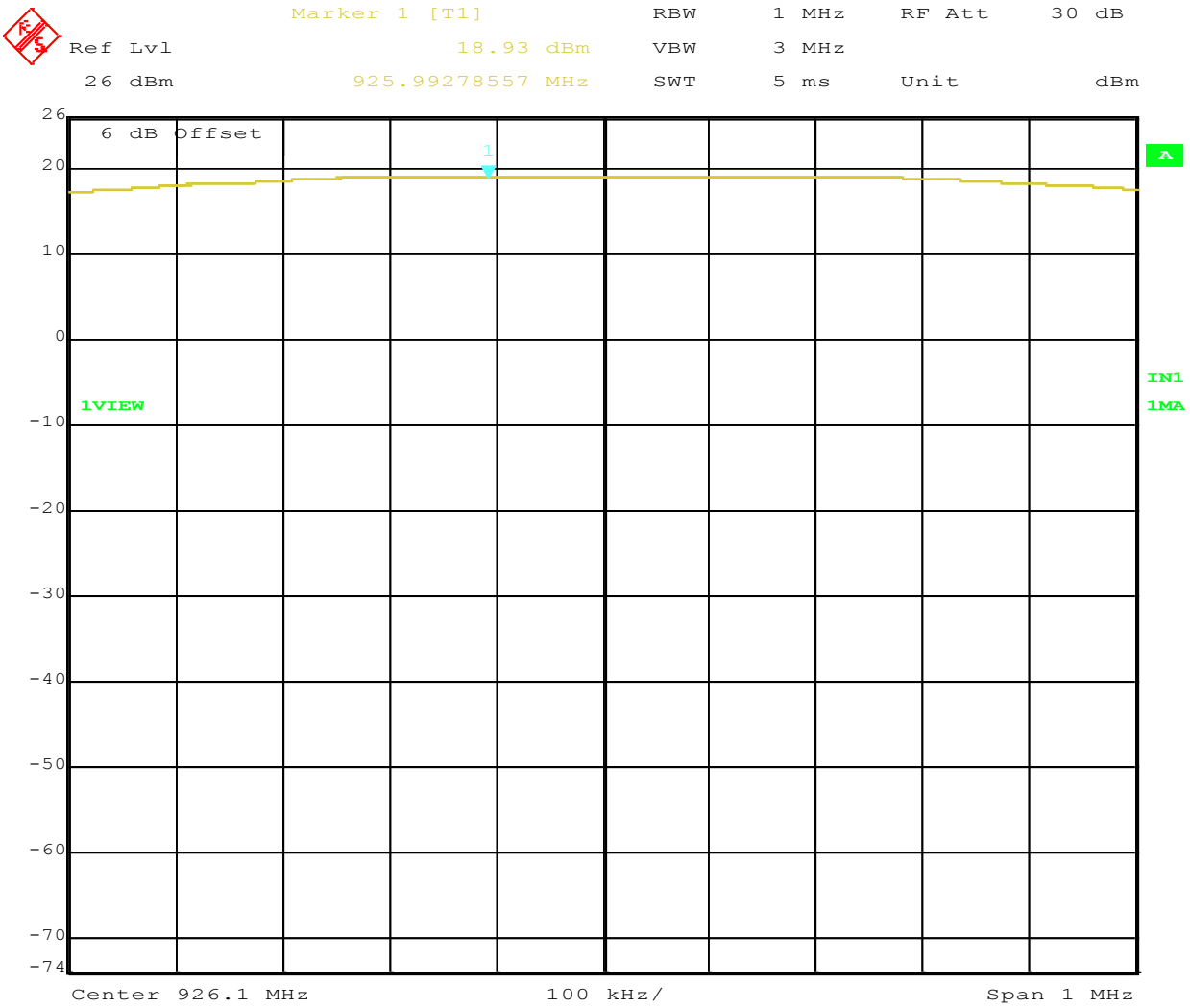
Test Data: **Middle of Band Peak Conducted Power Plot**



RESULTS: Meets Requirements

PEAK POWER OUTPUT

Test Data: **High End of Band Peak Conducted Power Plot**



RESULTS: Meets Requirements

BANDEDGE

Rule Part No.: FCC 15.247(d), IC RSS 247 Section 5.5

Requirements:

§15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

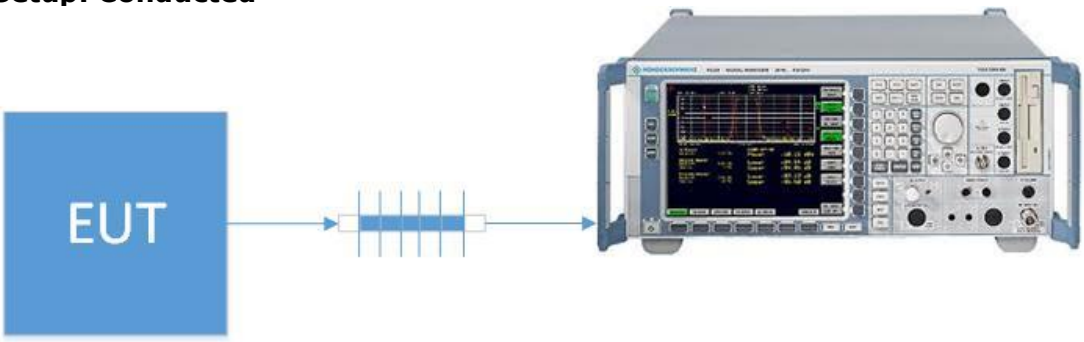
(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

RSS 247, Section 5.5:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Test Method: ANSI C63.10 § 6.10.4 Authorized band-edge relative method (non-restricted
ANSI C63.10 § 6.10.6 Marker Delta Method (restricted band edge)
ANSI C63.10 § 6.3 Radiated Emissions testing- Common

Setup: Conducted

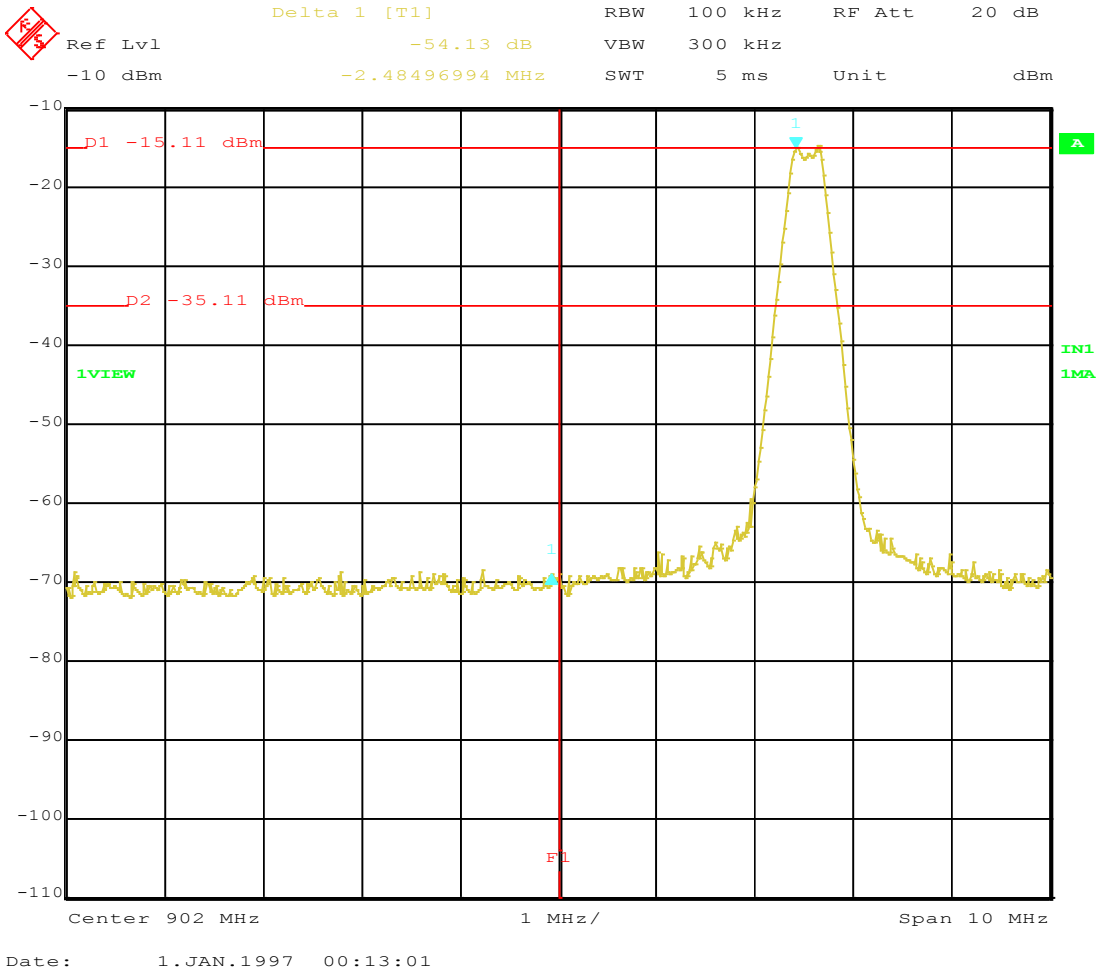


BANDEDGE

Test Data: Bandedge Measurement Table

Bandedge	Tuned Frequency (MHz)	Measured Level (dBc)	Limit (dBc)	Margin (dB)
Lower	904.5	54.13	20	34.17
	Hopping	57.7	20	37.7
Upper	926	58.68	20	38.68
	Hopping	52.4	20	32.4

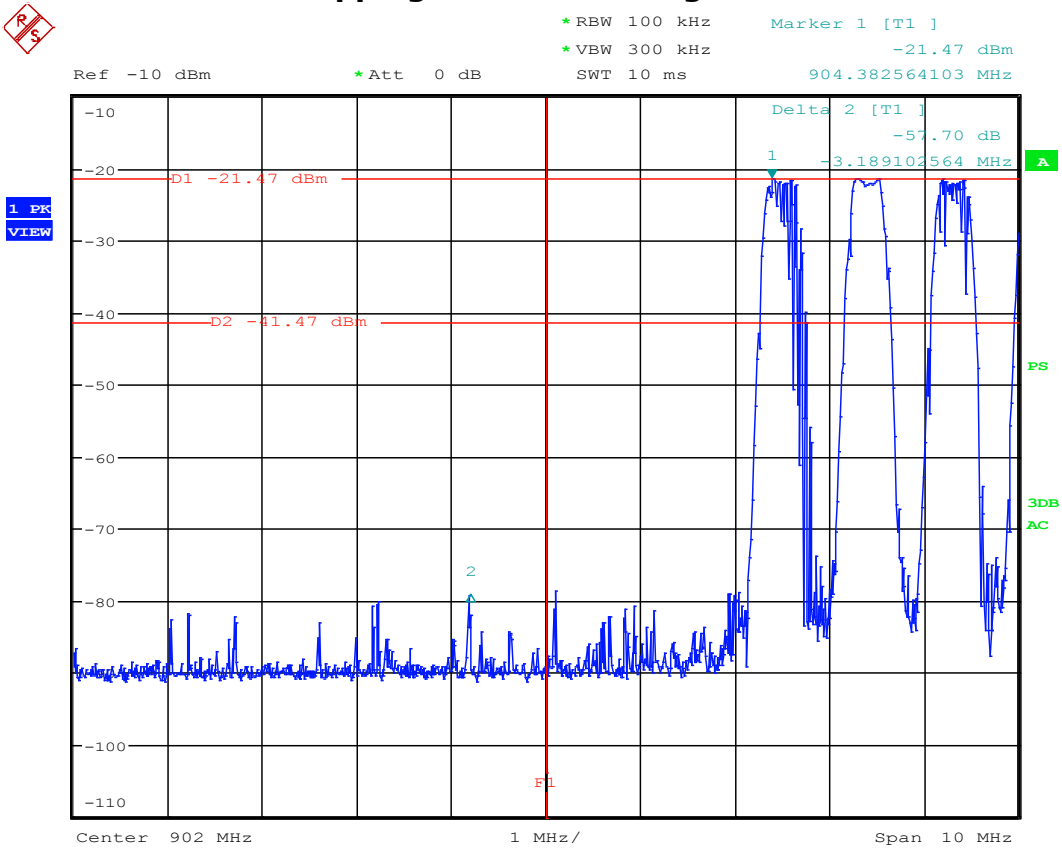
Test Data: Low End of Band Lower Band Edge Plot



RESULTS: Meets Requirements

BANDEDGE

Test Data: Hopping Lower Band Edge Plot

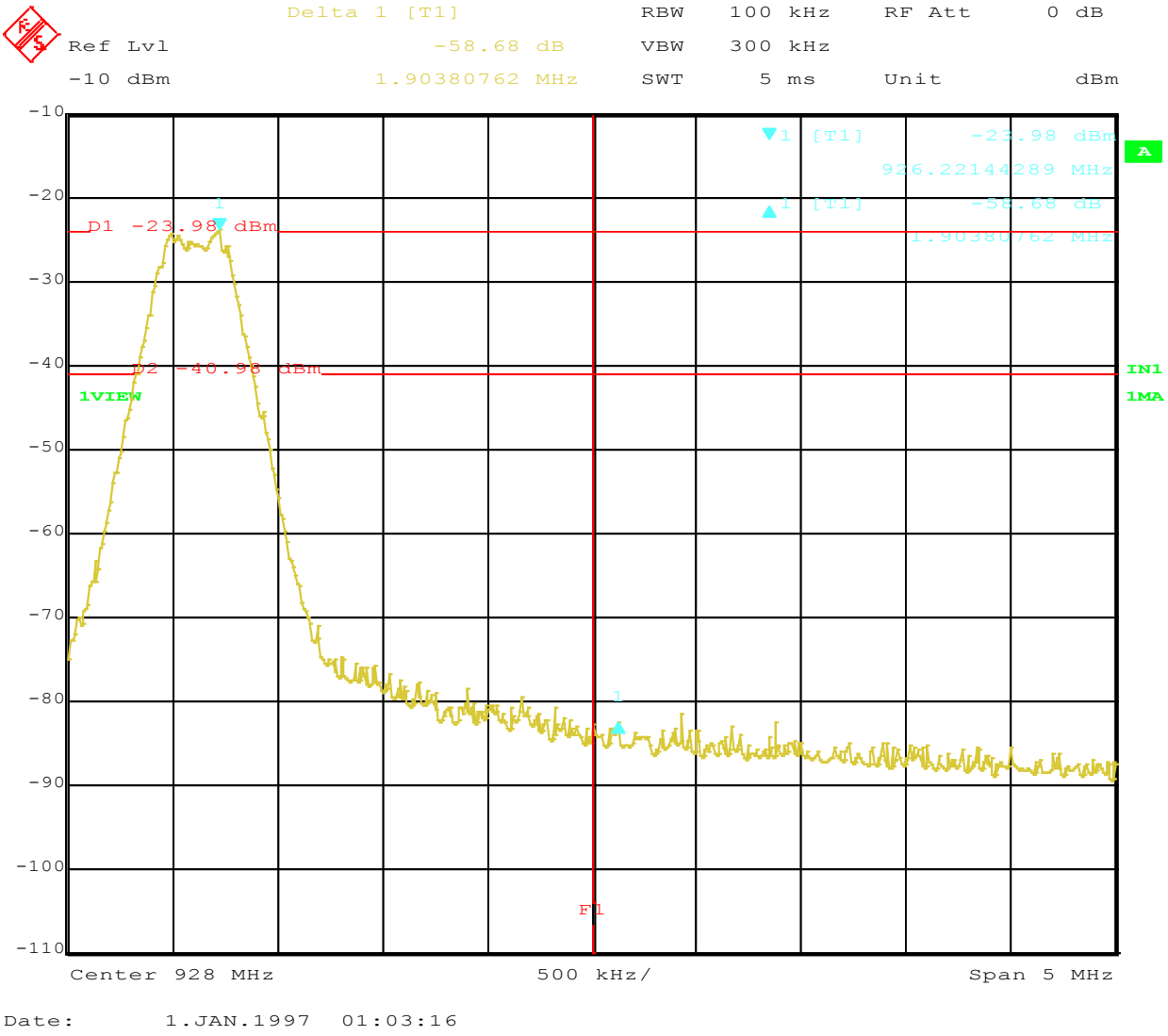


Date: 31.OCT.2019 16:43:38

RESULTS: Meets Requirements

BANDEDGE

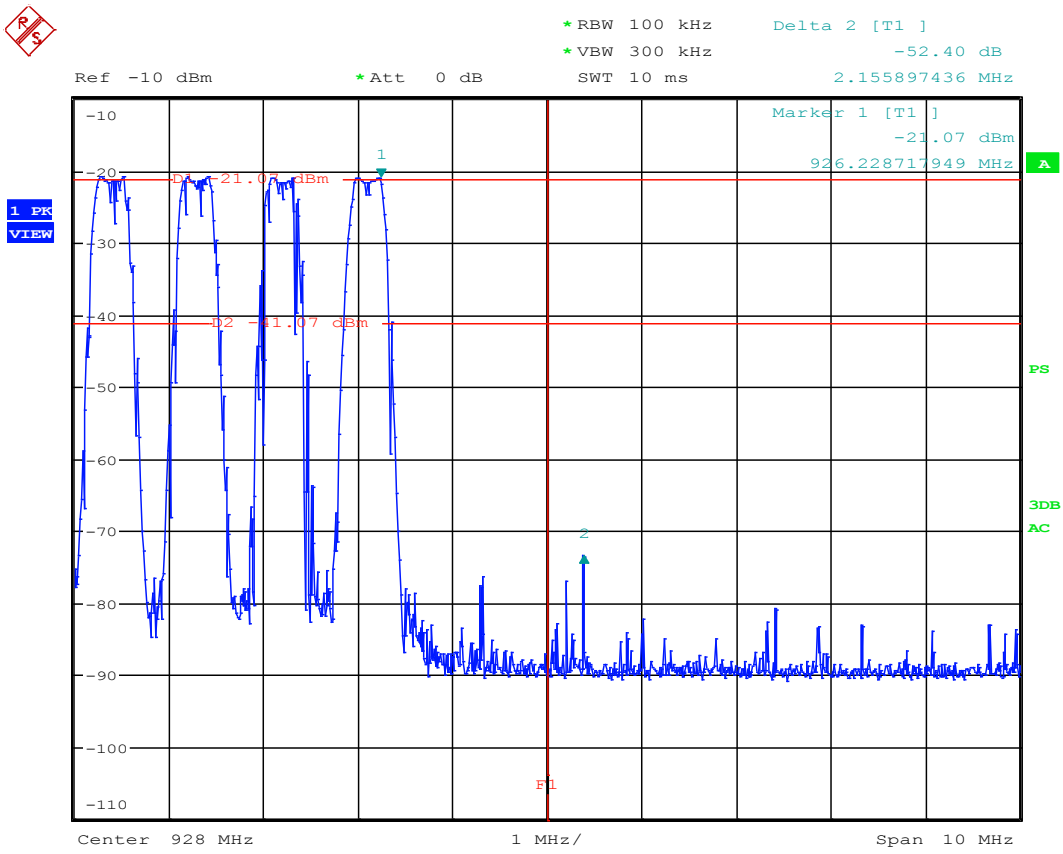
Test Data: **High End of Band Upper Band Edge Plot**



RESULTS: Meets Requirements

BANDEDGE

Test Data: Hopping Upper Band Edge Plot



Date: 31.OCT.2019 16:48:53

RESULTS: Meets Requirements

RADIATED SPURIOUS EMISSIONS

RULE PART NO.: FCC part 15.247 (d) & 15.209, IC RSS 247 Section 5.5 & RSS GEN Section 8.9

Requirements:

§15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

§15.209 Radiated emission limits; general requirements.

(a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Limit (μV/m)	Limit (dBμV/m)
0.009 – 0.490	2400/F(in kHz) @ 300m	-
0.490 – 1.705	24000/F(in kHz) @ 30m	-
1.705 kHz – 30	30.0 @ 30 m	29.54 @ 30m
30 – 88	100.0	40.0
88 – 216	150.0	43.5
216 – 960	200.0	46.0
Above 960	500.0	54.0

§15.35 Measurement detector functions and bandwidths.

(b) Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz. When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, *e.g.,* see §§15.250, 15.252, 15.253(d), 15.255, 15.256, and 15.509 through 15.519, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device, *e.g.,* the total peak power level. Note that the use of a pulse desensitization correction factor may be needed to determine the total peak emission level. The instruction manual or application note for the measurement instrument should be consulted for determining pulse desensitization factors, as necessary.

RADIATED SPURIOUS EMISSIONS

RSS 247, Section 5.5:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Test Procedure: ANSI C63.4 § Annex D Validation of radiated emissions standard test sites
ANSI C63.10 § 6.3 Common requirements radiated emissions
ANSI C63.10 § 6.4 Emissions below 30 MHz
ANSI C63.10 § 6.5 Emissions between 30 & 1000 MHz
ANSI C63.10 § 6.6 Emissions above 1 GHz

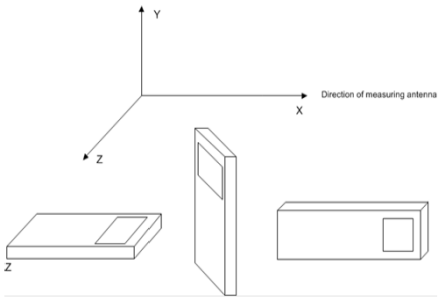
Radiated Emissions Test Setup:

EUT setup and arrangement was completed as described in ANSI C63.4. Exploratory measurements were taken following different peripheral placement and cable manipulations as described in ANSI C63.4. A photo is provided of the Test setup to record the exact peripheral equipment and cable manipulation arrangement found to produce the highest possible level of radiated emissions.
The test procedure used for radiated emissions is described ANSI C63.4 using a spectrum analyzer. The resolution bandwidth used was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. All cable loss and antenna factors were calibrated to provide plots with correction factors applied to results using the formula and example described below. The video bandwidth of the analyzer was always greater than or equal to the resolution bandwidth, and a peak detector with max hold was used.

The unit under test was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and verticals planes. The frequency was scanned from 30 MHz to 1.0 GHz. The EUT was measured in three parts of the tunable band of EUT and (3) orthogonal planes when necessary.

RADIATED SPURIOUS EMISSIONS

EUT Orientation(s):



Formula of Conversion Factors:

The field strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBµV) to the antenna correction factor supplied by the antenna manufacturer plus the coax loss. The antenna correction factors are stated in terms of dB. The gain of the preselector was accounted for in the spectrum analyzer meter reading.

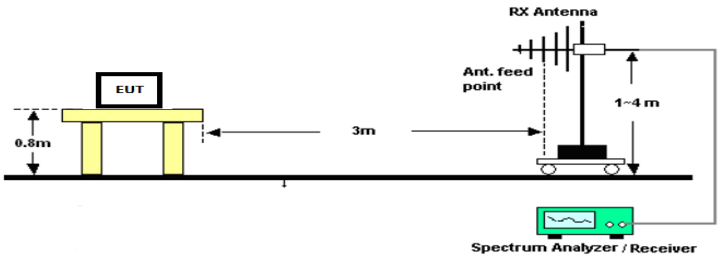
Field Strength Correction Factor Conversion Example:

Freq (MHz)	Meter Reading	+ ACF	+CL	= FS
33	20 dBµV	+ 10.36 dB/m	+0.40 dB	=30.76 dBµV/m @ 3m

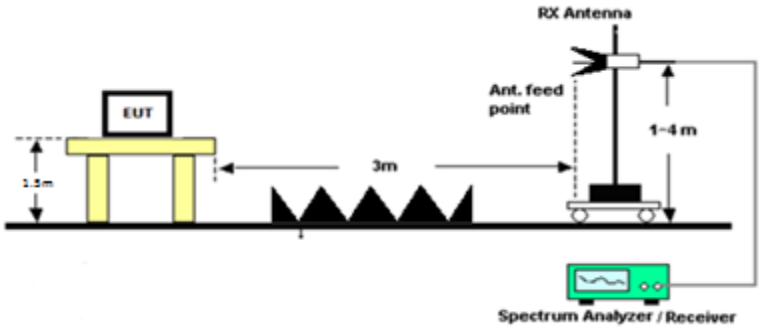
RADIATED SPURIOUS EMISSIONS

Test Setup:

Emissions 30 – 1000 MHz



Emissions above 1 GHz



RADIATED SPURIOUS EMISSIONS

Test Data: Fundamental Table

Tuned Frequency (MHz)	Detector	Meter Reading (dBµV)	Antenna Polarity	Coax Loss (dB)	Antenna Correction Factor (dB/m)	Distance (m)	Field Strength (dBµV/m)
904.50	PK	91.95	H	3.54	22.15	3.00	117.64
904.50	PK	88.23	V	3.54	22.15	3.00	113.92
915.30	PK	88.88	H	3.57	22.58	3.00	115.03
915.30	PK	75.54	V	3.57	22.58	3.00	101.69
926.10	PK	91.88	H	3.58	22.22	3.00	117.68
926.10	PK	77.66	V	3.58	22.22	3.00	103.46

Test Data: Low End of Band Table

Tuned Frequency (MHz)	Emission Frequency (MHz)	15.205 Restricted Band	15.205, 15.35, 15.247(d) Detector	Meter Reading (dBµV)	Antenna Polarity	Coax Loss (dB)	Duty Cycle Correction (dB)	Antenna Correction Factor (dB/m)	Distance (m)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dBm)
904.50	1809.00		PK	8.24	H	4.90	0.00	30.40	3.00	43.54	97.68	54.14
904.50	1809.00				H	4.90	0.00	30.40	3.00		97.68	
904.50	1809.00		PK	11.17	V	4.90	0.00	30.40	3.00	46.47	97.68	51.21
904.50	1809.00				V	4.90	0.00	30.40	3.00		97.68	
904.50	2713.50	X	PK	10.63	H	6.01	0.00	32.47	3.00	49.11	73.98	24.87
904.50	2713.50	X	AVG	10.63	H	6.01	0.00	32.47	3.00	49.11	53.98	4.87
904.50	2713.50	X	PK	12.43	V	6.01	0.00	32.47	3.00	50.91	73.98	23.07
904.50	2713.50	X	AVG	12.43	V	6.01	0.00	32.47	3.00	50.91	53.98	3.07
904.50	3618.00	X	PK	-1.40	H	6.63	0.00	33.14	3.00	38.37	73.98	35.61
904.50	3618.00	X	AVG	-1.40	H	6.63	0.00	33.14	3.00	38.37	53.98	15.61
904.50	3618.00	X	PK	-0.68	V	6.63	0.00	33.14	3.00	39.09	73.98	34.89
904.50	3618.00	X	AVG	-0.68	V	6.63	0.00	33.14	3.00	39.09	53.98	14.89
904.50	4522.50	X	PK	-2.54	H	7.40	0.00	33.94	3.00	38.79	73.98	35.19
904.50	4522.50	X	AVG	-2.54	H	7.40	0.00	33.94	3.00	38.79	53.98	15.19
904.50	4522.50	X	PK	-0.03	V	7.40	0.00	33.94	3.00	41.30	73.98	32.68
904.50	4522.50	X	AVG	-0.03	V	7.40	0.00	33.94	3.00	41.30	53.98	12.68
904.50	5427.00	X	PK	-3.91	H	8.15	0.00	34.42	3.00	38.65	73.98	35.32
904.50	5427.00	X	AVG		H	8.15	0.00	34.42	3.00	42.56	53.98	11.41
904.50	5427.00	X	PK	1.21	V	8.15	0.00	34.42	3.00	43.77	73.98	30.20
904.50	5427.00	X	AVG		V	8.15	0.00	34.42	3.00	42.56	53.98	11.41
904.50	6331.50		PK	-3.43	H	8.70	0.00	35.39	3.00	40.66	97.68	57.02
904.50	6331.50				H	8.70	0.00	35.39	3.00		97.68	
904.50	6331.50		PK	-4.82	V	8.70	0.00	35.39	3.00	39.27	97.68	58.41
904.50	6331.50				V	8.70	0.00	35.39	3.00		97.68	
904.50	7236.00		PK	-2.77	H	9.52	0.00	36.34	3.00	43.09	97.68	54.60
904.50	7236.00				H	9.52	0.00	36.34	3.00		97.68	
904.50	7236.00		PK	0.91	V	9.52	0.00	36.34	3.00	46.77	97.68	50.92
904.50	7236.00				V	9.52	0.00	36.34	3.00		97.68	
904.50	8140.50	X	PK	-3.44	H	9.93	0.00	35.80	3.00	42.29	73.98	31.69
904.50	8140.50	X	AVG	-3.44	H	9.93	0.00	35.80	3.00	42.29	53.98	11.69
904.50	8140.50	X	PK	-1.58	V	9.93	0.00	35.80	3.00	44.15	73.98	29.83
904.50	8140.50	X	AVG	-1.58	V	9.93	0.00	35.80	3.00	44.15	53.98	9.83
904.50	9045.00	X	PK	-0.80	H	10.74	0.00	36.14	3.00	46.08	73.98	27.89
904.50	9045.00	X	AVG	-0.80	H	10.74	0.00	36.14	3.00	46.08	53.98	7.89
904.50	9045.00	X	PK	-1.69	V	10.74	0.00	36.14	3.00	45.19	73.98	28.78
904.50	9045.00	X	AVG	-1.69	V	10.74	0.00	36.14	3.00	45.19	53.98	8.78

RADIATED SPURIOUS EMISSIONS

Test Data: Middle of Band Table

Tuned Frequency (MHz)	Emission Frequency (MHz)	15.205 Restricted Band	15.205, 15.35, 15.247(d) Detector	Meter Reading (dBµV)	Antenna Polarity	Coax Loss (dB)	Duty Cycle Correction (dB)	Antenna Correction Factor (dB/m)	Distance (m)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dBm)
915.30	1830.60		PK	5.76	H	4.94	0.00	30.65	3.00	41.35	97.68	56.33
915.30	1830.60		PK	5.18	V	4.94	0.00	30.65	3.00	40.77	97.68	56.91
915.30	1830.60				H	4.94	0.00	30.65	3.00		97.68	
915.30	1830.60				V	4.94	0.00	30.65	3.00		97.68	
915.30	2745.90	X	PK	5.65	H	6.09	0.00	32.39	3.00	44.13	73.98	29.85
915.30	2745.90	X	PK	4.25	V	6.09	0.00	32.39	3.00	42.73	73.98	31.25
915.30	2745.90	X	AVG	5.65	H	6.09	0.00	32.39	3.00	44.13	53.98	9.85
915.30	2745.90	X	AVG	4.25	V	6.09	0.00	32.39	3.00	42.73	53.98	11.25
915.30	3661.20	X	PK	-1.66	H	6.62	0.00	33.20	3.00	38.16	73.98	35.82
915.30	3661.20	X	PK	-1.38	V	6.62	0.00	33.20	3.00	38.44	73.98	35.54
915.30	3661.20	X	AVG	-1.66	H	6.62	0.00	33.20	3.00	38.16	53.98	15.82
915.30	3661.20	X	AVG	-1.38	V	6.62	0.00	33.20	3.00	38.44	53.98	15.54
915.30	4576.50	X	PK	-3.36	H	7.53	0.00	34.03	3.00	38.20	73.98	35.78
915.30	4576.50	X	PK	-2.38	V	7.53	0.00	34.03	3.00	39.18	73.98	34.80
915.30	4576.50	X	AVG	-3.36	H	7.53	0.00	34.03	3.00	38.20	53.98	15.78
915.30	4576.50	X	AVG	-2.38	V	7.53	0.00	34.03	3.00	39.18	53.98	14.80
915.30	5491.80		PK	0.72	H	8.07	0.00	34.47	3.00	43.26	97.68	54.42
915.30	5491.80		PK	-0.72	V	8.07	0.00	34.47	3.00	41.82	97.68	55.86
915.30	5491.80				H	8.07	0.00	34.47	3.00		97.68	
915.30	5491.80				V	8.07	0.00	34.47	3.00		97.68	
915.30	6407.10		PK	-2.36	H	8.95	0.00	35.46	3.00	42.05	97.68	55.63
915.30	6407.10		PK	-4.01	V	8.95	0.00	35.46	3.00	40.40	97.68	57.28
915.30	6407.10				H	8.95	0.00	35.46	3.00		97.68	
915.30	6407.10				V	8.95	0.00	35.46	3.00		97.68	
915.30	7322.40	X	PK	-4.91	H	9.60	0.00	36.24	3.00	40.92	73.98	33.06
915.30	7322.40	X	PK	-5.48	V	9.60	0.00	36.24	3.00	40.35	73.98	33.63
915.30	7322.40	X	AVG	-4.91	H	9.60	0.00	36.24	3.00	40.92	53.98	13.06
915.30	7322.40	X	AVG	-5.48	V	9.60	0.00	36.24	3.00	40.35	53.98	13.63
915.30	8237.70	X	PK	-4.49	H	10.01	0.00	35.80	3.00	41.32	73.98	32.66
915.30	8237.70	X	PK	-5.30	V	10.01	0.00	35.80	3.00	40.51	73.98	33.47
915.30	8237.70	X	AVG	-4.49	H	10.01	0.00	35.80	3.00	41.32	53.98	12.66
915.30	8237.70	X	AVG	-5.30	V	10.01	0.00	35.80	3.00	40.51	53.98	13.47
915.30	9153.00	X	PK	-2.91	H	10.83	0.00	36.19	3.00	44.10	73.98	29.88
915.30	9153.00	X	PK	-4.22	V	10.83	0.00	36.19	3.00	42.79	73.98	31.19
915.30	9153.00	X	AVG	-2.91	H	10.83	0.00	36.19	3.00	44.10	53.98	9.88
915.30	9153.00	X	AVG	-4.22	V	10.83	0.00	36.19	3.00	42.79	53.98	11.19

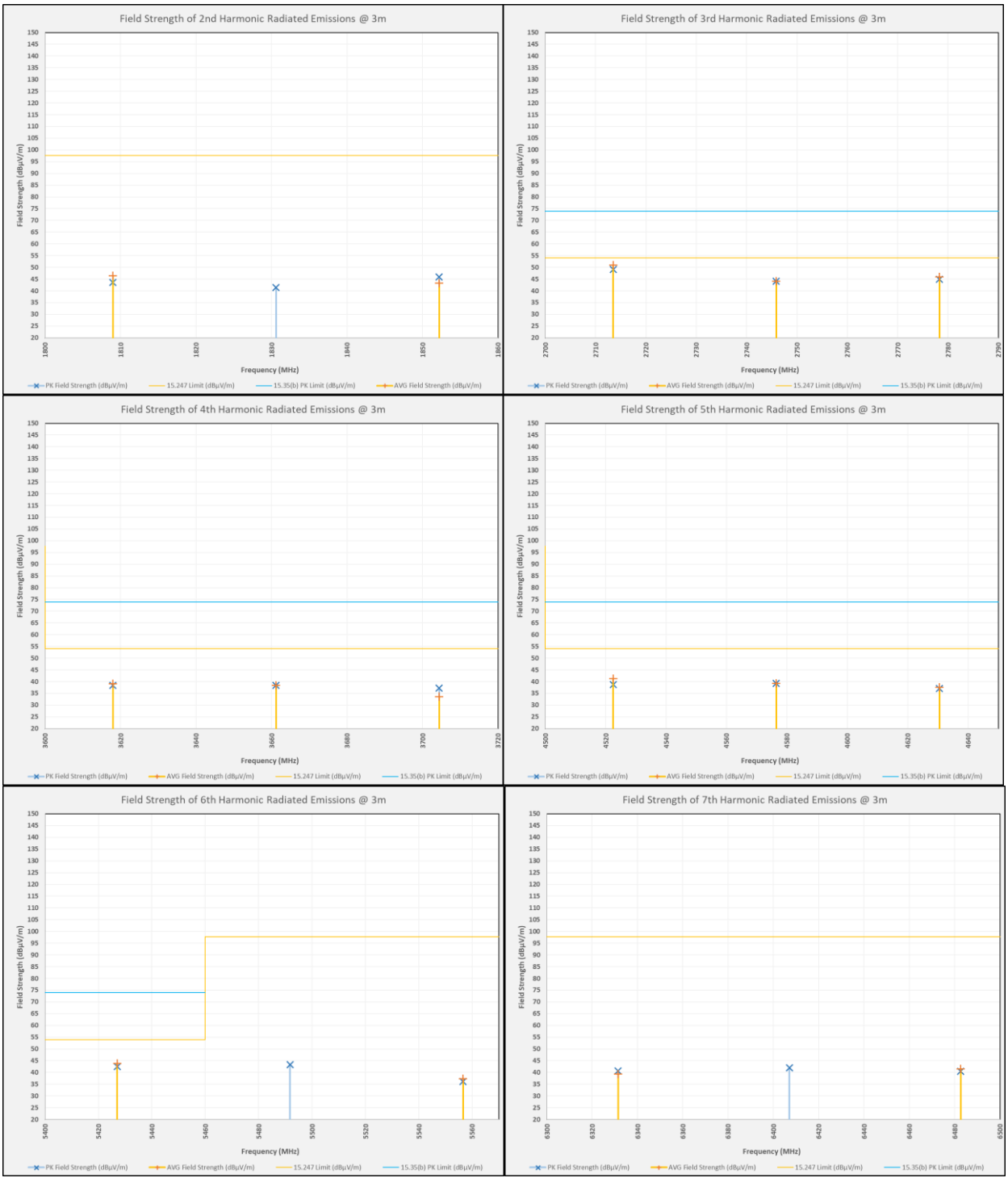
RADIATED SPURIOUS EMISSIONS

Test Data: High End of Band Table

Tuned Frequency (MHz)	Emission Frequency (MHz)	15.205 Restricted Band	15.205, 15.35, 15.247(d) Detector	Meter Reading (dBµV)	Antenna Polarity	Coax Loss (dB)	Duty Cycle Correction (dB)	Antenna Correction Factor (dB/m)	Distance (m)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dBm)
926.10	1852.20		PK	9.98	H	4.98	0.00	30.89	3.00	45.85	97.68	51.83
926.10	1852.20				H	4.98	0.00	30.89	3.00		97.68	
926.10	1852.20		PK	7.36	V	4.98	0.00	30.89	3.00	43.23	97.68	54.45
926.10	1852.20				V	4.98	0.00	30.89	3.00		97.68	
926.10	2778.30	X	PK	6.38	H	6.15	0.00	32.45	3.00	44.98	73.98	29.00
926.10	2778.30	X	AVG	6.38	H	6.15	0.00	32.45	3.00	44.98	53.98	9.00
926.10	2778.30	X	PK	7.28	V	6.15	0.00	32.45	3.00	45.88	73.98	28.10
926.10	2778.30	X	AVG	7.28	V	6.15	0.00	32.45	3.00	45.88	53.98	8.10
926.10	3704.40	X	PK	-2.61	H	6.58	0.00	33.19	3.00	37.16	73.98	36.82
926.10	3704.40	X	AVG	-2.61	H	6.58	0.00	33.19	3.00	37.16	53.98	16.82
926.10	3704.40	X	PK	-6.18	V	6.58	0.00	33.19	3.00	33.59	73.98	40.39
926.10	3704.40	X	AVG	-6.18	V	6.58	0.00	33.19	3.00	33.59	53.98	20.39
926.10	4630.50	X	PK	-4.41	H	7.54	0.00	33.96	3.00	37.09	73.98	36.89
926.10	4630.50	X	AVG	-4.41	H	7.54	0.00	33.96	3.00	37.09	53.98	16.89
926.10	4630.50	X	PK	-3.90	V	7.54	0.00	33.96	3.00	37.60	73.98	36.38
926.10	4630.50	X	AVG	-3.90	V	7.54	0.00	33.96	3.00	37.60	53.98	16.38
926.10	5556.60		PK	-6.31	H	8.06	0.00	34.41	3.00	36.16	97.68	61.53
926.10	5556.60				H	8.06	0.00	34.41	3.00		97.68	
926.10	5556.60		PK	-5.20	V	8.06	0.00	34.41	3.00	37.27	97.68	60.42
926.10	5556.60				V	8.06	0.00	34.41	3.00		97.68	
926.10	6482.70		PK	-4.08	H	9.05	0.00	35.53	3.00	40.50	97.68	57.18
926.10	6482.70				H	9.05	0.00	35.53	3.00		97.68	
926.10	6482.70		PK	-3.07	V	9.05	0.00	35.53	3.00	41.51	97.68	56.17
926.10	6482.70				V	9.05	0.00	35.53	3.00		97.68	
926.10	7408.80	X	PK	-5.31	H	9.50	0.00	36.05	3.00	40.24	73.98	33.74
926.10	7408.80	X	AVG	-5.31	H	9.50	0.00	36.05	3.00	40.24	53.98	13.74
926.10	7408.80	X	PK	-6.48	V	9.50	0.00	36.05	3.00	39.07	73.98	34.91
926.10	7408.80	X	AVG	-6.48	V	9.50	0.00	36.05	3.00	39.07	53.98	14.91
926.10	8334.90	X	PK	-4.54	H	10.14	0.00	35.89	3.00	41.48	73.98	32.50
926.10	8334.90	X	AVG	-4.54	H	10.14	0.00	35.89	3.00	41.48	53.98	12.50
926.10	8334.90	X	PK	-5.97	V	10.14	0.00	35.89	3.00	40.05	73.98	33.93
926.10	8334.90	X	AVG	-5.97	V	10.14	0.00	35.89	3.00	40.05	53.98	13.93
926.10	9261.00		PK	-6.49	H	10.86	0.00	36.31	3.00	40.69	97.68	56.99
926.10	9261.00				H	10.86	0.00	36.31	3.00		97.68	
926.10	9261.00		PK	-5.52	V	10.86	0.00	36.31	3.00	41.66	97.68	56.02
926.10	9261.00				V	10.86	0.00	36.31	3.00		97.68	

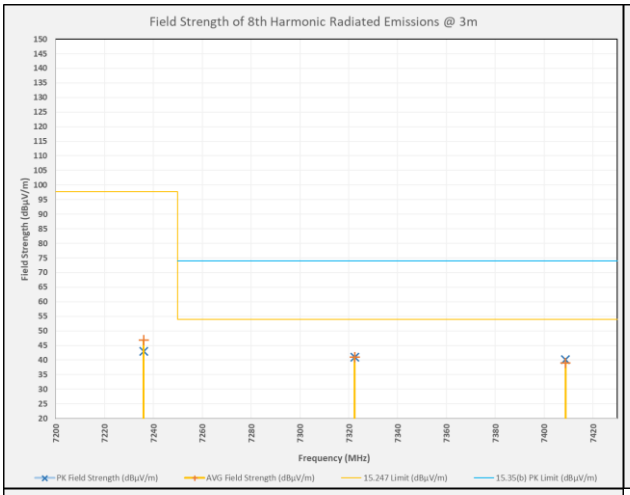
RADIATED SPURIOUS EMISSIONS

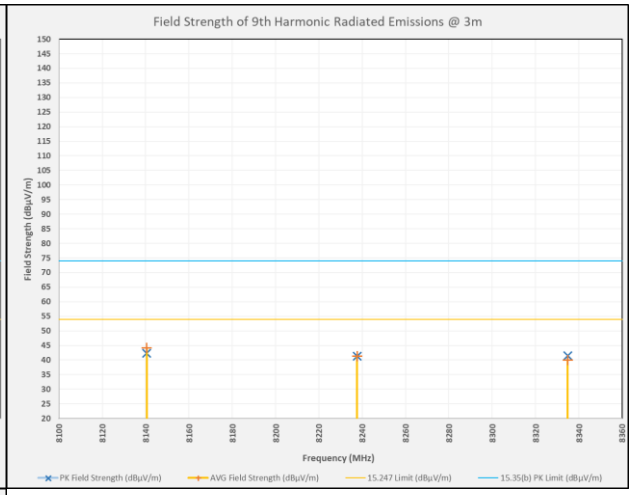
Test Data:

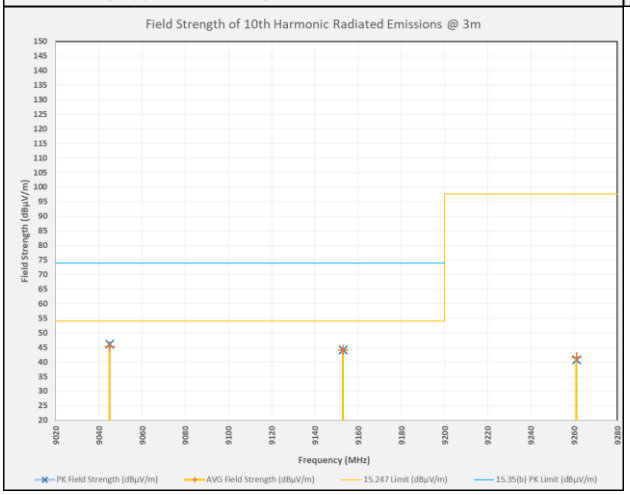


RADIATED SPURIOUS EMISSIONS

Test Data: Stopped Plots







AC POWER LINE CONDUCTED EMISSIONS

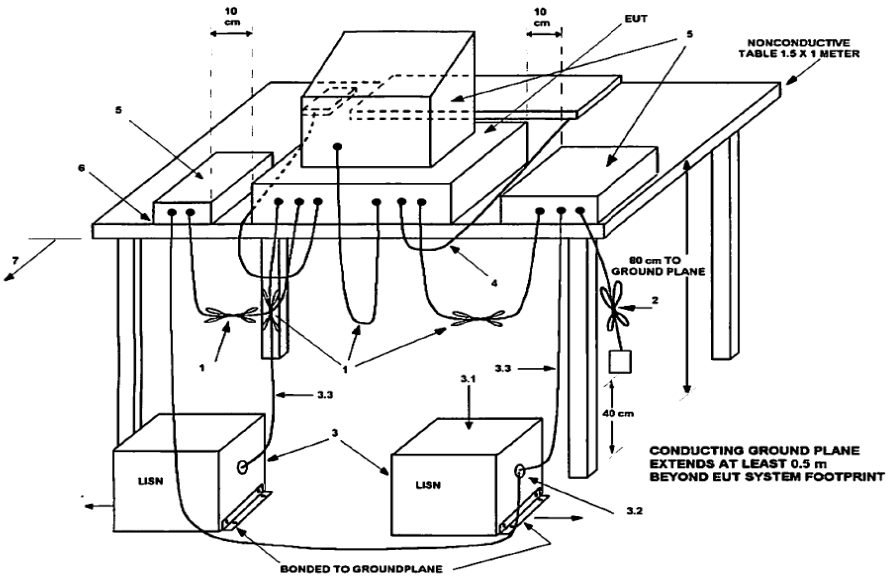
Rules Part No.: FCC 15.207(a)

Requirements:

Frequency (MHz)	Quasi Peak Limits (dBµV)	Average Limits (dBµV)
0.15 – 0.5	66 – 56 *	56 – 46 *
0.5 – 5.0	56	46
5.0 – 30	60	50
* Decrease with logarithm of frequency		

Test Method: ANSI C63.10 § 6.2 Test Method for AC power-line conducted emissions

Setup:



Results: N/A

EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Antenna: Active Loop	ETS-Lindgren	6502	62529	12/11/2017	12/11/2019
Antenna: Biconical 1057	Eaton	94455-1	1057	12/13/2017	12/13/2019
Antenna: Log-Periodic 1122	Electro-Metrics	LPA-25	1122	7/26/2017	7/26/2020
CHAMBER	Panashield	3M	N/A	3/15/2019	3/15/2021
EMI Test Receiver R & S ESU 40 Chamber	Rohde & Schwarz	ESU 40	100320	08/28/18	08/28/2021
Software: Field Strength Program	Timco	N/A	Version 4.10.7.0	N/A	N/A
Antenna: Double-Ridged Horn/ETS Horn 2	ETS-Lindgren	3117	41534	3/1/2017	3/1/2020
Bore-sight Antenna Positioning Tower	Sunol Sciences	TLT2	N/A	N/A	N/A
Coaxial Cable - Chamber 3 cable set (Primary)	Micro-Coax	Chamber 3 cable set (Primary)	KMKM-0244-01 KMKM-0670-00 KFKF-0198-01	4/12/2019	4/12/2021
Band Reject Filter 2.4 GHz	Micro-Tronics	BRM50702-02	0	4/12/2019	4/12/2021
Pre-amp	RF-LAMBDA	RLNA00M45GA	N/A	2/27/2019	2/27/2021
Antenna: Double-Ridged Horn 18-40 GHz	EMCO	3116	9011-2145	12/8/2017	12/8/2019

***EMI RECEIVER SOFTWARE VERSION**

The receiver firmware used was version 4.43 Service Pack 3

STATE OF THE MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The measurement uncertainty was calculated for all measurements listed in this test report according To CISPR 16–4 or ENTR 100-028 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: "Uncertainty in EMC Measurements" and is documented in the Timco Engineering, Inc. quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device. Hereafter the best measurement capability for Timco Engineering, Inc. is reported:

Test Items	Measurement Uncertainty	Notes
RF Frequency Accuracy	± 49.5 Hz	(1)
RF Conducted Power	±0.93dB	(1)
Conducted spurious emission of transmitter valid up to 40GHz	±1.86dB	
Occupied Bandwidth	±2.65%	
Audio Frequency Response	±1.86dB	
Modulation limiting	±1.88%	
Radiated RF Power	±1.4dB	
Maximum frequency deviation: Within 300 Hz and 6kHz of audio freq. Within 6kHz and 25kHz of audio Freq.	 ±1.88% ±2.04%	
Rad Emissions Sub Meth up to 26.5GHz	±2.14dB	
Adjacent channel power	±1.47dB	(1)
Transient Frequency Response	±1.88%	
Temperature	±1.0°C	(1)
Humidity	±5.0%	

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

END OF REPORT

Report Template Revision History

Document Name	Description of Change	Revision Date	Approved By
PT 15247 DSS RSS247 900MHz FHSS TempAntconn Rpt	Initial Issue	160225	SS Sanders
	Added Document History to Template	160920	G Greene
	Added Uc Tab & Note about QA Chaeck	170524	SS Sanders

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EQUIPMENT UNDER TEST PHOTOGRAPHS

Applicant: ADEMCO, INC.
FCC ID: CFS8DLPROINDMV
IC: 573F-8DLPROINDMV

Radiated Emissions Test Setup Photographs

Radiated Emissions