MEASUREMENT REPORT

FCC PART 15.247 / RSS-247 UHF RFID

FCC ID:	HD5-IH250
IC:	1693B-IH250
APPLICANT:	Honeywell International Inc. Honeywell Safety and Productivity Solutions
Application Type:	Certification
Product:	Handheld UHF RFID Reader
Model No.:	IH25-0
Brand Name:	Honeywell
FCC Classification:	FCC Part 15 Spread Spectrum Transmitter (DSS)
FCC Rule Part(s):	Part 15 Subpart C (Section 15.247)
ISED Rule(s):	RSS-247 Issue 2, RSS-GEN Issue 5
Test Procedure(s):	ANSI C63.10-2013
Test Date:	October 29 ~ December 04, 2019

Reviewed By: Jame Yuan

(Jame Yuan)

Approved By: Robin Wu

(Robin Wu)

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date	Note
1910RSU007-U2	Rev. 01	Initial Report	12-04-2019	Valid

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Description Page

§2.1033 General Information

Applicant:	Honeywell International Inc. Honeywell Safety and Productivity Solutions
Applicant Address:	9680 Old Bailes Road, Fort Mill, SC 29707 United States
Manufacturer:	Honeywell International Inc. Honeywell Safety and Productivity Solutions
Manufacturer Address:	9680 Old Bailes Road, Fort Mill, SC 29707 United States
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- **MRT facility is a FCC registered (MRT Reg. No. 893164) test facility with the site description report on file and has met all the requirements specified in ANSI C63.4-2014.**
- **MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.**
- **MRT facility is a VCCI registered (R-20025, G-20034, C-20020, T-20020) test laboratory with the site description on file at VCCI Council.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications, Radio and SAR testing.**

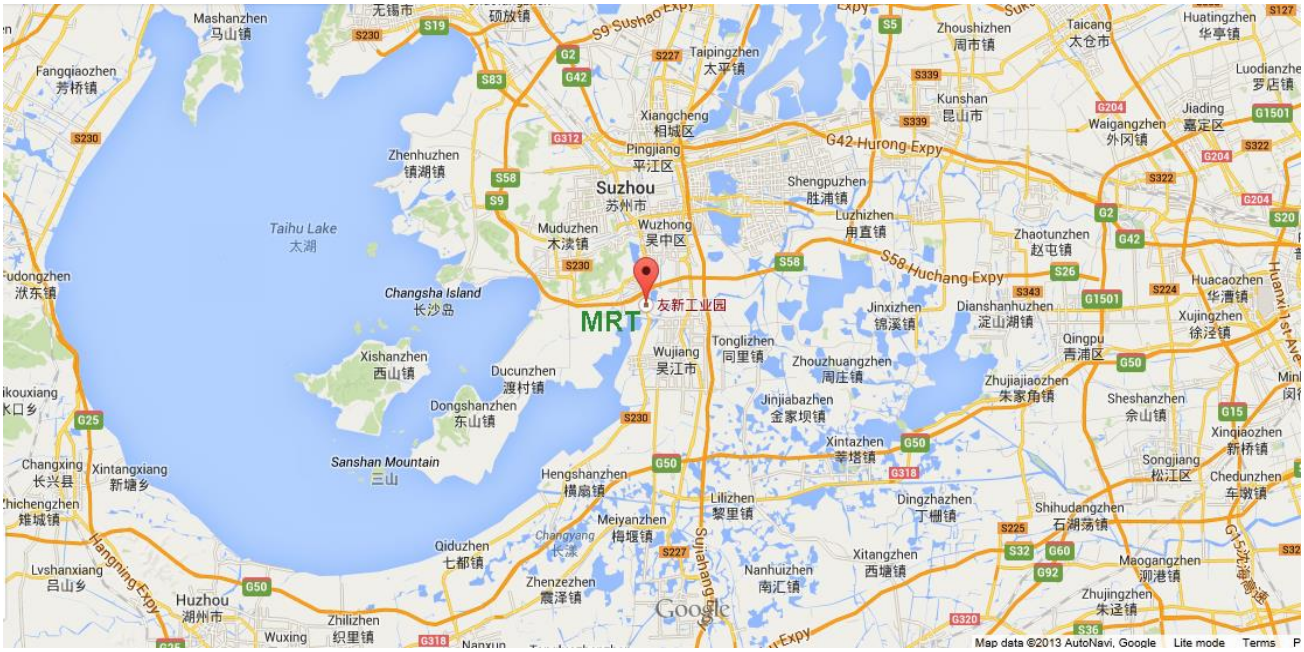
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada and Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The measurement facility compliant with the test site requirements specified in ANSI C63.4-2014.



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	Handheld UHF RFID Reader
Model No.	IH25-0
Brand Name	Honeywell
Bluetooth Version	v5.0 single mode (BLE Only)
RFID Specification	902MHz ~ 928MHz (Active)
Accessories	
Adapter	Model No.: ADS-12B-06 05010E Input Power: 100 - 240V ~ 50/60Hz, max 0.3A Output Power: 5VDC 2.0A
Battery	Model No.: BAT-EDA50US Capacitance: 15.2Wh, 4000mAh Rated Voltage: 3.8V

2.2. Product Specification Subjective to this Report

Operating Frequency	902.75 ~ 927.25MHz
Channel Number	50
Type of modulation	ASK
Antenna Type	PCB Antenna
Antenna Gain	3.0dBi

Note: For other features of this EUT, test report will be issued separately.

2.3. Operation Frequency / Channel List

Channel	Frequency	Channel	Frequency	Channel	Frequency
00	902.75 MHz	01	903.25 MHz	02	903.75 MHz
03	904.25 MHz	04	904.75 MHz	05	905.25 MHz
06	905.75 MHz	07	906.25 MHz	08	906.75 MHz
09	907.25 MHz	10	907.75 MHz	11	908.25 MHz
12	908.75 MHz	13	909.25 MHz	14	909.75 MHz
15	910.25 MHz	16	910.75 MHz	17	911.25 MHz
18	911.75 MHz	19	912.25 MHz	20	912.75 MHz
21	913.25 MHz	22	913.75 MHz	23	914.25 MHz
24	914.75 MHz	25	915.25 MHz	26	915.75 MHz
27	916.25 MHz	28	916.75 MHz	29	917.25 MHz
30	917.75 MHz	31	918.25 MHz	32	918.75 MHz
33	919.25 MHz	34	919.75 MHz	35	920.25 MHz
36	920.75 MHz	37	921.25 MHz	38	921.75 MHz
39	922.25 MHz	40	922.75 MHz	41	923.25 MHz
42	923.75 MHz	43	924.25 MHz	44	924.75 MHz
45	925.25 MHz	46	925.75 MHz	47	926.25 MHz
48	926.75 MHz	49	927.25 MHz	--	--

2.4. Test Mode

Test Mode	Mode 1: Normal Scan
	Mode 2: Fast Scan

2.5. Device Capabilities

This device contains the following capabilities:
Bluetooth v5.0 (DTS) and UHF RFID (DSS)

2.6. Test Software

The test utility software used during testing was “Bcc_Rfid_v1.13_release_191008”, and the version was V1.13.

2.7. EMI Suppression Device(s) / Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.8. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

RSP-100 Issue 12

The manufacturer, importer or distributor shall meet the labeling requirements set out in this section for every unit:

(i) prior to marketing in Canada, for products manufactured in Canada

(ii) prior to importation into Canada, for imported products

For information regarding the e-labeling option, see Notice 2014-DRS1003. The label for the certified product represents the manufacturer's or importer's compliance with Innovation, Science and Economic Development Canada's (ISED) regulatory requirements.

Please see attachment for IC label and label location.

3. DESCRIPTION of TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013), and the guidance was used in the measurement.

Deviation from measurement procedure…….....None

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions were used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- The antenna of the unit is **permanently attached.**
- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2020/04/15
Two-Line V-Network	R&S	ENV 216	MRTSUE06002	1 year	2020/06/13
Two-Line V-Network	R&S	ENV 216	MRTSUE06003	1 year	2020/06/13
Thermohygrometer	Testo	608-H1	MRTSUE06404	1 year	2020/08/08
Shielding Room	MIX-BEP	Chamber-SR2	MRTSUE06215	N/A	N/A

Radiated Emissions - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2020/08/01
PXA Signal Analyzer	Keysight	9030B	MRTSUE06395	1 year	2020/09/03
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2020/11/10
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2020/03/31
Broad Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2020/10/13
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2019/12/17
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2020/06/11
Thermohygrometer	Testo	608-H1	MRTSUE06403	1 year	2020/08/08
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2020/04/30

Radiated Emission - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Keysight	N9038A	MRTSUE06125	1 year	2020/08/01
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2020/11/10
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2020/10/13
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06171	1 year	2020/10/27
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2019/12/17
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2020/06/11
Temperature/Humidity Meter	Minggao	ETH529	MRTSUE06170	1 year	2019/12/13
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2020/04/30

Conducted Test Equipment - TR3

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2020/04/15
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06452	1 year	2020/07/11
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2020/04/15
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2020/11/18
USB wideband power sensor	Keysight	U2021XA	MRTSUE06446	1 year	2020/06/30
USB wideband power sensor	Keysight	U2021XA	MRTSUE06447	1 year	2020/06/30
Bluetooth Test Set	Anritsu	MT8852B-042	MRTSUE06389	1 year	2020/06/13
Audio Analyzer	Agilent	U8903B	MRTSUE06143	1 year	2020/06/13
Modulation Analyzer	HP	8901A	MRTSUE06098	1 year	2020/10/10
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2020/11/07
DC Power Supply	GWINSTEK	DPS-3303C	MRTSUE06064	N/A	N/A
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2020/11/07
Thermohygrometer	testo	608-H1	MRTSUE06401	1 year	2020/08/08

Software	**Version**	**Function**
EMI Software	V3	EMI Test Software

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

AC Conducted Emission Measurement - SR2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz~150kHz: 3.84dB 150kHz~30MHz: 3.46dB
Radiated Emission Measurement - AC1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): Horizontal: 30MHz~300MHz: 4.07dB 300MHz~1GHz: 3.63dB 1GHz~18GHz: 4.16dB Vertical: 30MHz~300MHz: 4.18dB 300MHz~1GHz: 3.60dB 1GHz~18GHz: 4.76dB
Radiated Emission Measurement - AC2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): Horizontal: 30MHz~300MHz: 3.75dB 300MHz~1GHz: 3.53dB 1GHz~18GHz: 4.28dB Vertical: 30MHz~300MHz: 3.86dB 300MHz~1GHz: 3.53dB 1GHz~18GHz: 4.33dB

7. TEST RESULT

7.1. Summary

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(1)(i)	RSS-247 [5.1]	20dB Bandwidth	≤500 kHz	Conducted	Pass	Section 7.2
15.247(b)(2)	RSS-247 [5.4(a)]	Peak Transmitter Output Power	<1 Watt if >at least 50 Hopping channels used		Pass	Section 7.3
15.247(a)(1)(i)	RSS-247 [5.1]	Number of Channels	≥ 50 Channels		Pass	Section 7.4
15.247(a)(1)(i)	RSS-247 [5.1]	Time of Occupancy	< 0.4 sec in 20 sec period		Pass	Section 7.5
15.247(d)	RSS-247 [5.5]	Band Edge / Out-of-Band Emissions	Conducted ≥ 20dBc		Pass	Section 7.6 Section 7.7
15.205, 15.209	RSS-247 [5.5]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	Pass	Section 7.8 Section 7.9
15.207	RSS-Gen [8.8]	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 7.10

Notes:

1) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
2) For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.

7.2. 20dB Bandwidth Measurement

7.2.1.Test Limit

The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

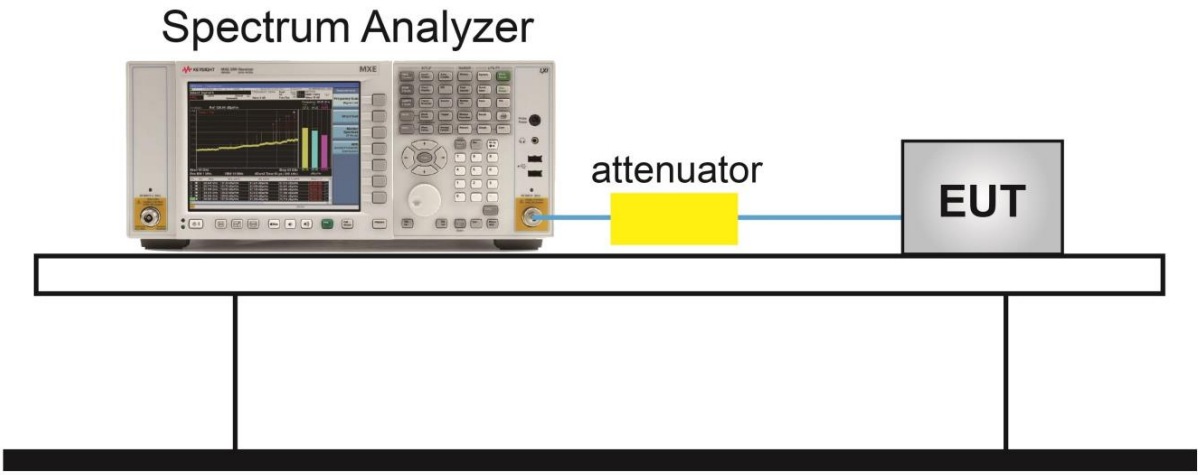
7.2.2.Test Procedure Used

ANSI C63.10-2013 - Section 6.9.2

7.2.3.Test Setting

1. Set RBW ≥ 1% to 5% of the 20dB bandwidth
2. VBW = Approximately three times RBW
3. Span = Approximately 2 to 5 times the 20dB bandwidth, centered on a hopping channel
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace to stabilize
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

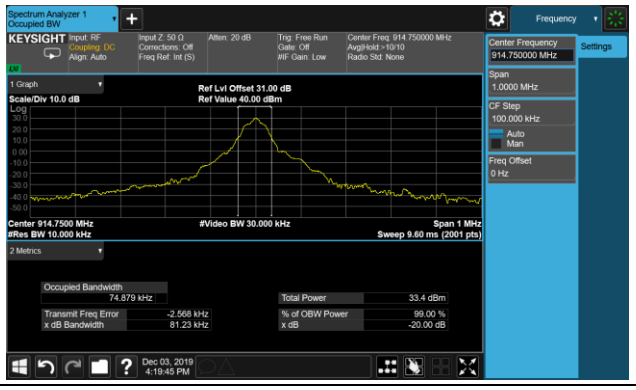
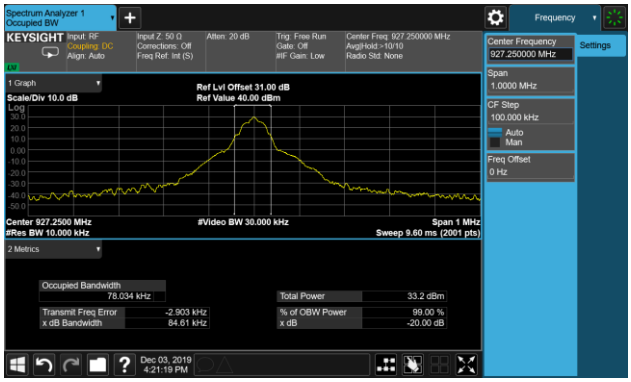
7.2.4.Test Setup

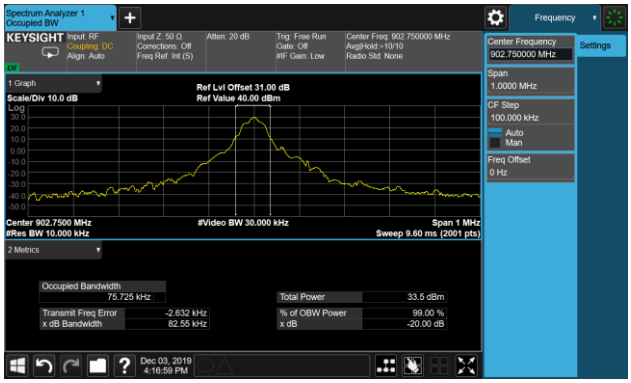
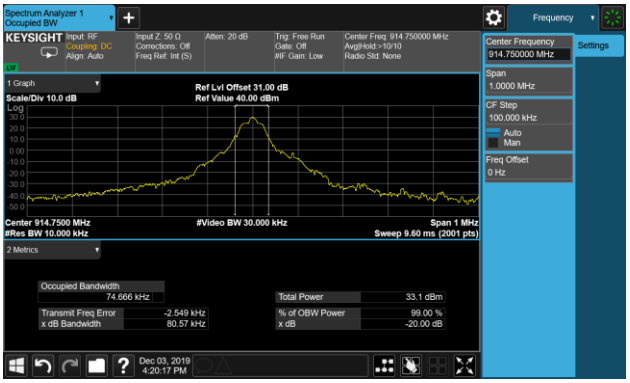
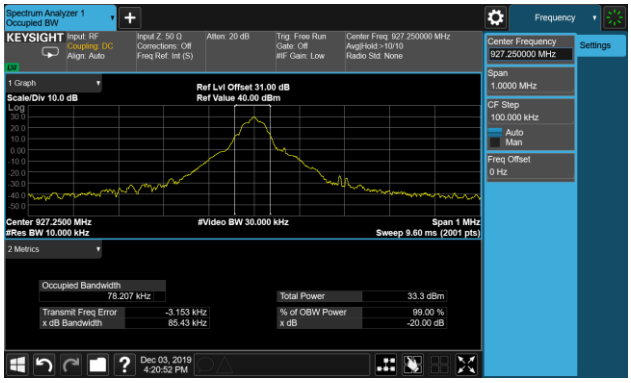


7.2.5.Test Result

Product	Handheld UHF RFID Reader	Temperature	25°C
Test Engineer	Snake Ni	Relative Humidity	52%
Test Site	TR3	Test Date	2019/12/03

Test Mode	Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Result	99% Bandwidth (kHz)
Mode 1	00	902.75	80.90	≤ 500	Pass	75.61
	24	914.75	81.23	≤ 500	Pass	74.88
	49	927.25	84.61	≤ 500	Pass	78.03
Mode 2	00	902.75	82.55	≤ 500	Pass	75.73
	24	914.75	80.57	≤ 500	Pass	74.67
	49	927.25	85.43	≤ 500	Pass	78.21

Mode 1 - 20dB Bandwidth	
Channel 00 (902.75MHz)	**Channel 24 (914.75MHz)**
	
Channel 49 (927.25MHz)	
	

Mode 2 - 20dB Bandwidth	
Channel 00 (902.75MHz)	**Channel 24 (914.75MHz)**
	
Channel 49 (927.25MHz)	
	

7.3. Output Power Measurement

7.3.1.Test Limit

For FHSS operating in the band 902-928 MHz, the maximum peak conducted output power shall not exceed 1.0 W, and the e.i.r.p. shall not exceed 4 W if the hopset uses 50 or more hopping channels.

7.3.2.Test Procedure Used

ANSI C63.10 Section 7.8.5 - Peak Power Measurement

ANSI C63.10 Section 11.9.2.3.2 - Average Power Measurement

7.3.3.Test Setting

Peak Power Measurement

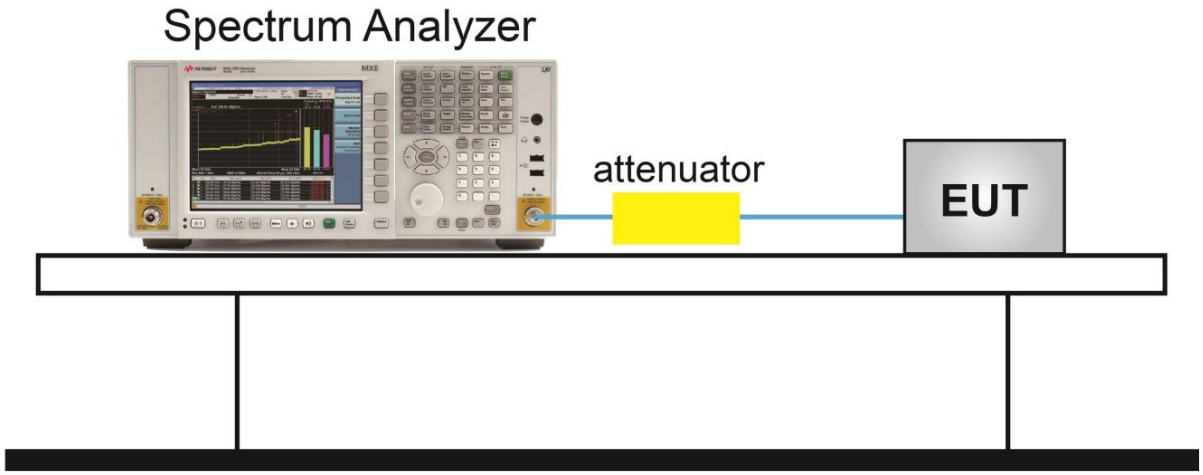
1. Set RBW ≥ the 20 dB bandwidth of the emission being measured.
2. VBW ≥ RBW
3. Span = approximately five times the 20dB bandwidth, centered on a hopping channel
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power (don't forget added the external attenuation and cable loss)

Average Power Measurement

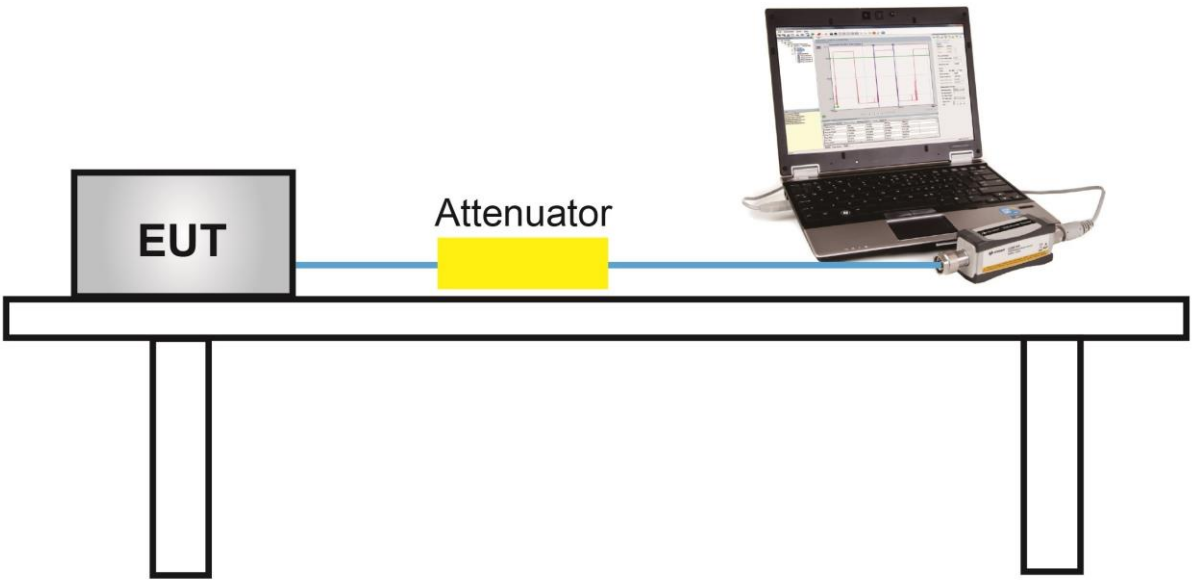
Average power measurements were perform only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

7.3.4.Test Setup

Peak Power Measurement



Average Power Measurement



7.3.5.Test Result

Product	Handheld UHF RFID Reader	Temperature	25°C
Test Engineer	Snake Ni	Relative Humidity	52%
Test Site	TR3	Test Date	2019/12/04

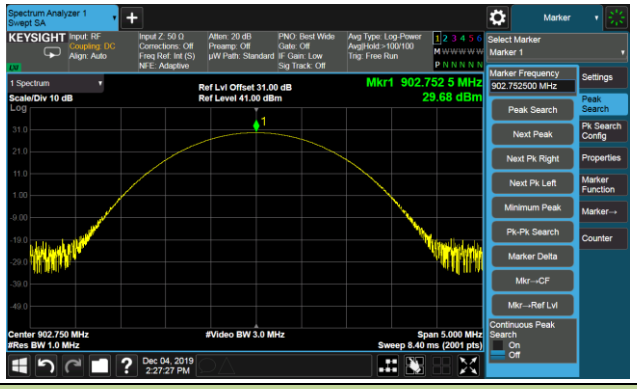
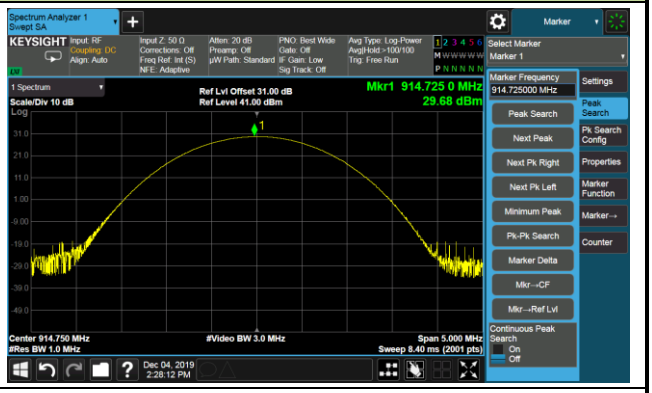
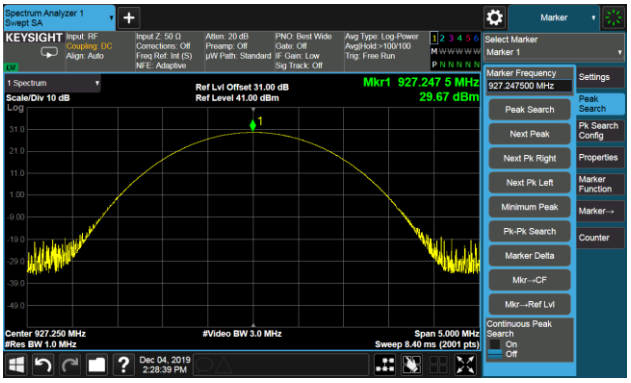
Test Mode	Channel No.	Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	E.R.I.P (dBm)	E.I.R.P Limit (dBm)
Mode 1	00	902.75	29.68	≤ 30.00	32.68	≤ 36.00
	24	914.75	29.68	≤ 30.00	32.68	≤ 36.00
	49	927.25	29.67	≤ 30.00	32.67	≤ 36.00
Mode 2	00	902.75	29.58	≤ 30.00	32.58	≤ 36.00
	24	914.75	29.58	≤ 30.00	32.58	≤ 36.00
	49	927.25	29.41	≤ 30.00	32.41	≤ 36.00

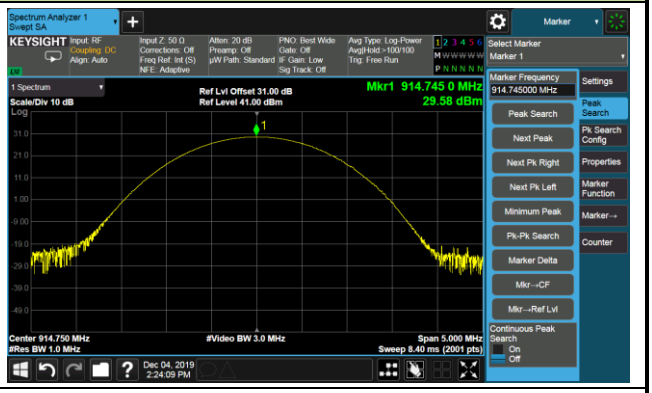
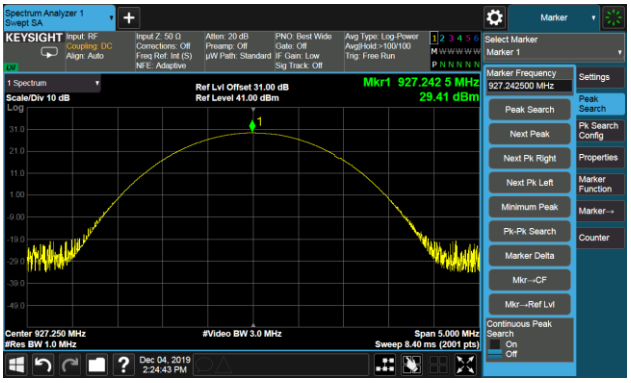
Note: E.I.R.P (dBm) = Peak Power (dBm) + Antenna Gain (dBi), Antenna Gain = 3.0 dBi.

Test Result of Average Output Power (Reporting Only)

Test Mode	Channel No.	Frequency (MHz)	Average Power (dBm)	Average Power Limit (dBm)	E.R.I.P (dBm)	E.I.R.P Limit (dBm)
Mode 1	00	902.75	29.24	≤ 30.00	32.24	≤ 36.02
	24	914.75	29.13	≤ 30.00	32.13	≤ 36.02
	49	927.25	29.23	≤ 30.00	32.23	≤ 36.02
Mode 2	00	902.75	28.66	≤ 30.00	31.66	≤ 36.02
	24	914.75	28.62	≤ 30.00	31.62	≤ 36.02
	49	927.25	28.69	≤ 30.00	31.69	≤ 36.02

Note: E.I.R.P (dBm) = Average Power (dBm) + Antenna Gain (dBi), Antenna Gain = 3.0 dBi.

Mode 1 Output Power	
Channel 00 (902.75MHz)	**Channel 24 (914.75MHz)**
	
Channel 49 (927.25MHz)	
	

Mode 2 Output Power	
Channel 00 (902.75MHz)	**Channel 24 (914.75MHz)**
	
Channel 49 (927.25MHz)	
	

7.4. Number of Hopping Channels Measurement

7.4.1.Test Limit

This frequency hopping system must employ a minimum of 50 hopping channels.

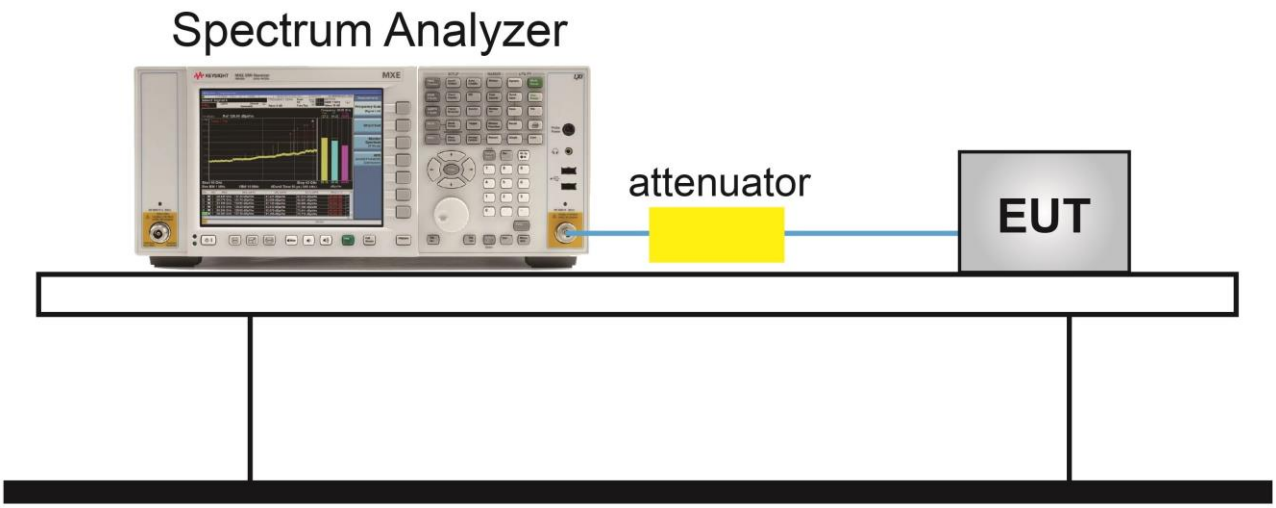
7.4.2.Test Procedure Used

ANSI C63.10-2013 - Section 7.8.3

7.4.3.Test Setting

1. Span = The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
2. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
3. VBW ≥ RBW
4. Sweep time = Auto couple
5. Detector = Peak
6. Trace mode = Max hold
7. Allow the trace to stabilize

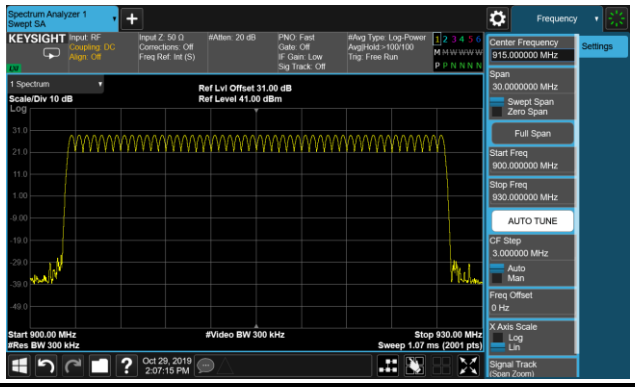
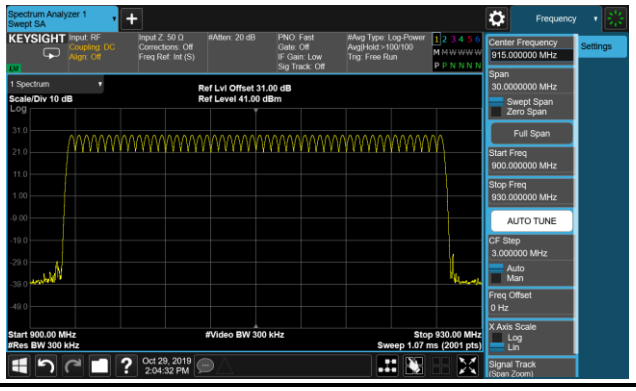
7.4.4.Test Setup



7.4.5.Test Result

Product	Handheld UHF RFID Reader	Temperature	25 °C
Test Engineer	Snake Ni	Relative Humidity	52%
Test Site	TR3	Test Date	2019/10/29

Test Mode (Hopping)	Channel Numbers	Frequency (MHz)	Limit (Hopping Channels)	Result
Mode 1	50	902.75 ~ 927.25	≥ 50	Pass
Mode 2	50	902.75 ~ 927.25	≥ 50	Pass

Number of Hopping Channels	
Mode 1	**Mode 2**
	

7.5. Time of Occupancy Measurement

7.5.1.Test Limit

The maximum permissible time of occupancy is 400ms within a 20 second period.

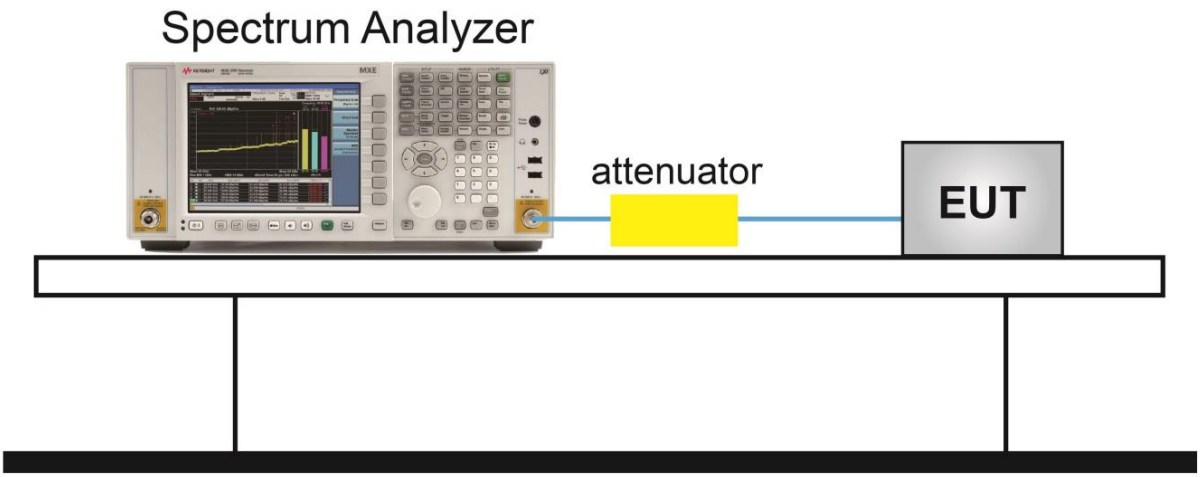
7.5.2.Test Procedure Used

ANSI C63.10-2013 - Section 7.8.4

7.5.3.Test Setting

1. Span = Zero span, centered on a hopping channel.
2. RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
3. VBW ≥ RBW
4. Sweep time = As necessary to capture the entire dwell time per hopping channel
5. Detector = Peak
6. Trace mode = Free run
7. Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time. An oscilloscope may be used instead of a spectrum analyzer. The EUT shall show compliance with the appropriate regulatory limit for the number of hopping channels. A plot of the data shall be included in the test report.

7.5.4.Test Setup



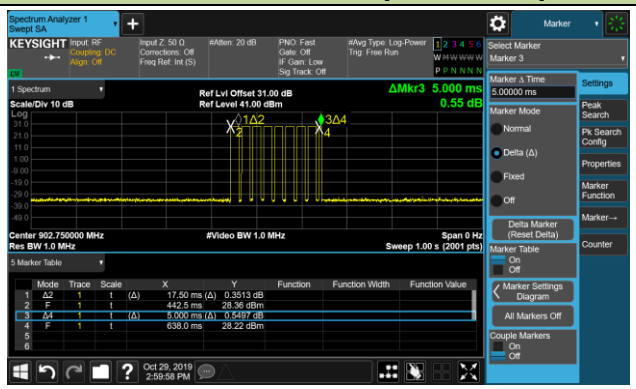
7.5.5.Test Result

Product	Handheld UHF RFID Reader	Temperature	25°C
Test Engineer	Snake Ni	Relative Humidity	52%
Test Site	TR3	Test Date	2019/10/29

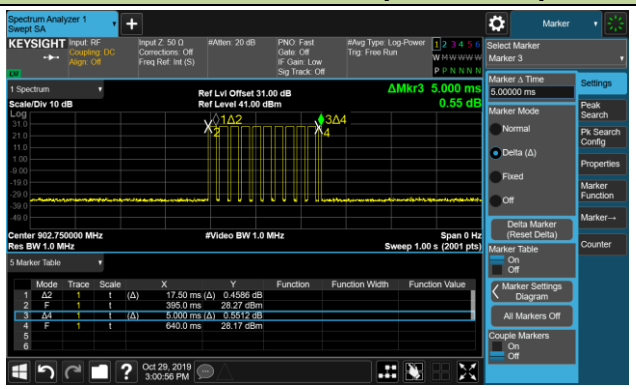
Test Mode	Channel No.	Frequency (MHz)	Hops Over Occupancy Time (Hops)	Packet Transfer Time (ms)	Time of Occupancy (ms)	Limit (ms)	Result
Mode 1	00	902.75	1	145	145	≤ 400	Pass
Mode 2	00	902.75	1	180	180	≤ 400	Pass

Packet Transfer Time

Mode 1 - Channel 00 (902.75MHz)

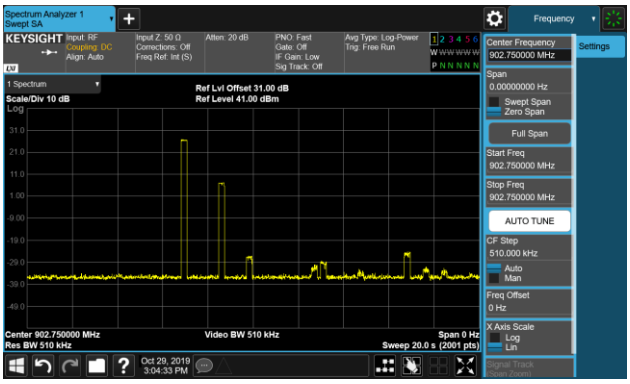


Mode 1 - Channel 00 (902.75MHz)

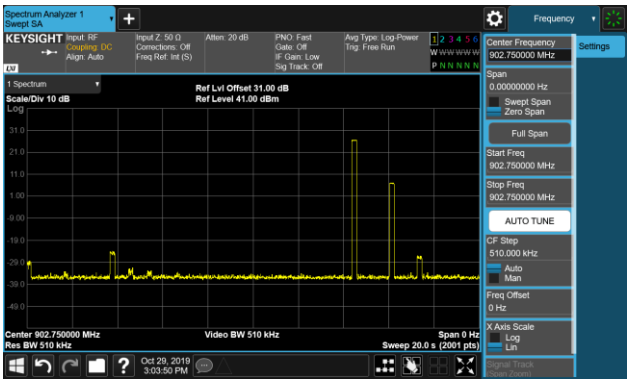


Hops Over Occupancy Time

Mode 1 - Channel 00 (902.75MHz)



Mode 2 - Channel 00 (902.75MHz)



7.6. Band-edge Compliance Measurement

7.6.1.Test Limit

The maximum permissible emission level is 20dBc. Any emissions were lying outside of the emission bandwidth and in authorized band edges to a field strength limit specified in Section 15.209 of the Title 47 CFR.

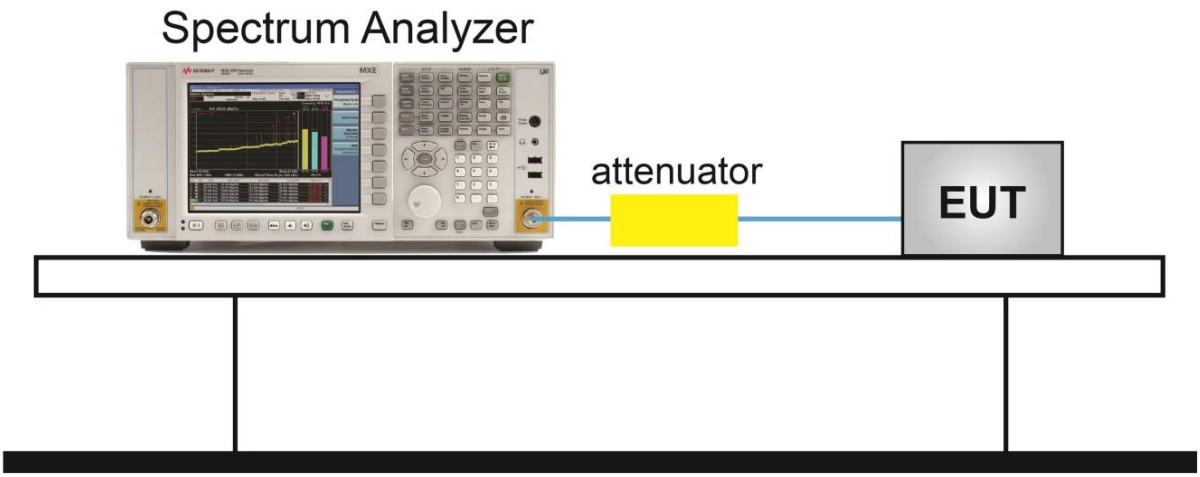
7.6.2.Test Procedure Used

ANSI C63.10-2013 - Section 6.10.4

7.6.3.Test Setting

1. Span = Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation.
2. RBW = 100kHz
3. VBW = 300kHz
4. Detector = Peak
5. Sweep time = Auto couple
6. Trace mode = Max hold
7. Allow the trace to stabilize. Set the marker on the emission at the band edge, or on the highest modulation product outside of the band, if this level is greater than that at the band edge. Enable the marker-delta function, than use the marker-to-peak function to move the marker to the peak of the in-band emission.

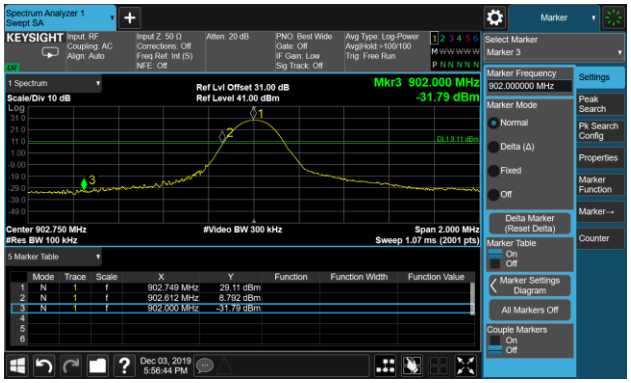
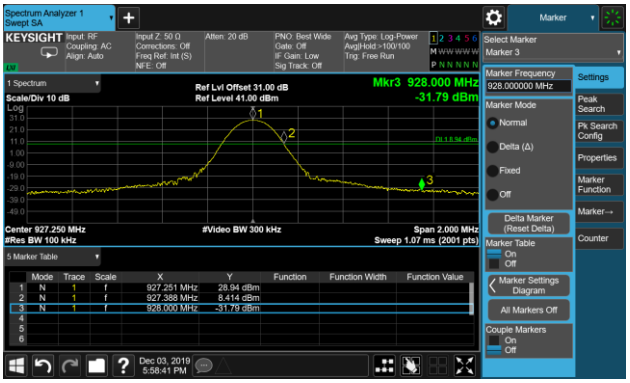
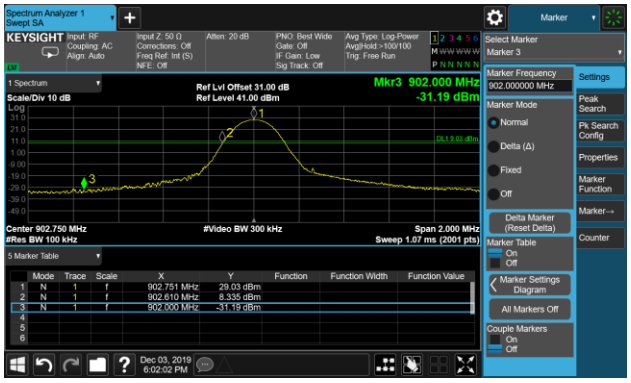
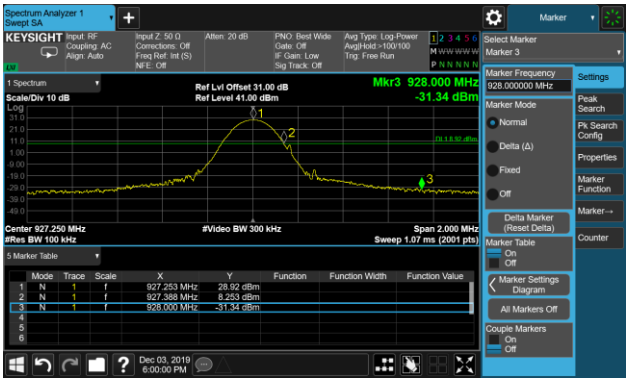
7.6.4.Test Setup



7.6.5.Test Result

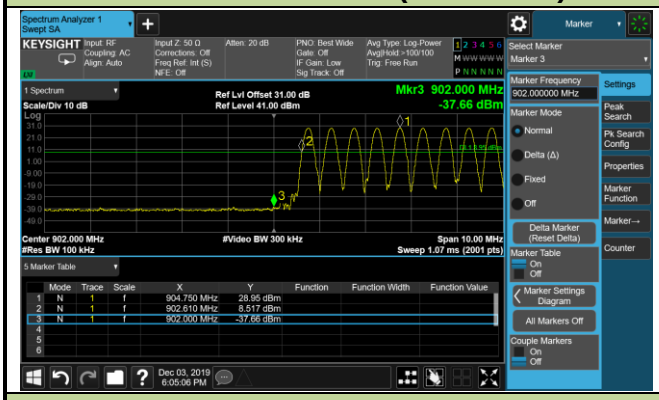
Product	Handheld UHF RFID Reader	Temperature	25°C
Test Engineer	Snake Ni	Relative Humidity	52%
Test Site	TR3	Test Date	2019/12/03

Test Mode	Channel No.	Frequency (MHz)	Limit	Result
Mode 1	00	902.75	20dBc	Pass
	49	927.25	20dBc	Pass
Mode 2	00	902.75	20dBc	Pass
	49	927.25	20dBc	Pass

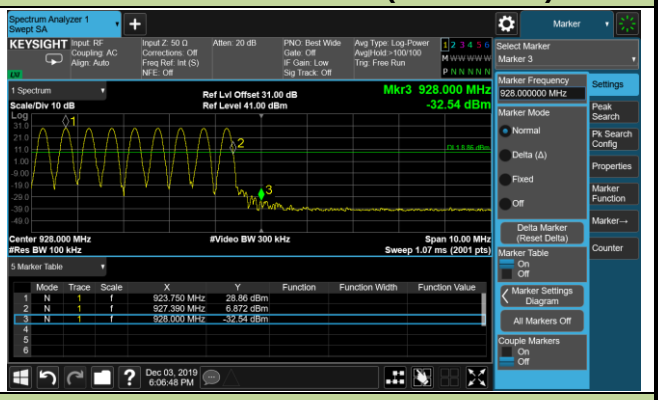
Band-edge Compliance	
Mode 1 - Channel 00 (902.75MHz)	**Mode 1 - Channel 49 (927.25MHz)**
	
Mode 2 - Channel 00 (902.75MHz)	**Mode 2 - Channel 49 (927.25MHz)**
	

Operation Frequency Range of 20dB Bandwidth within Hopping Mode

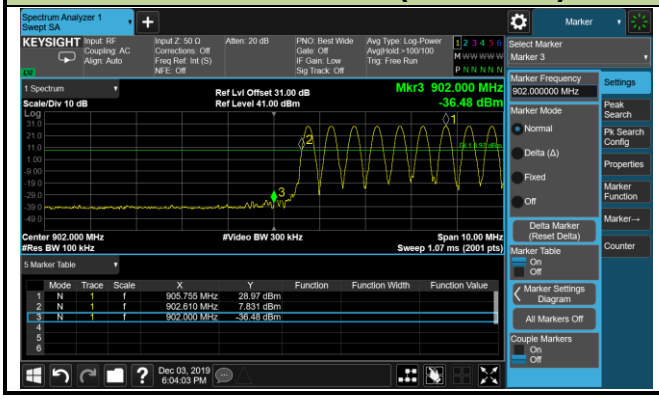
Mode 1 - Channel 00 (902.75MHz)



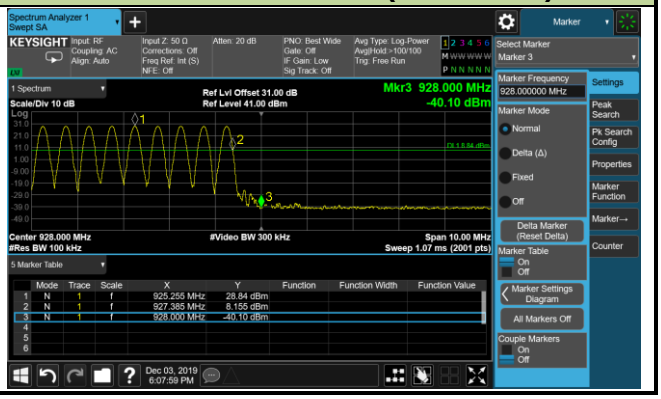
Mode 1 - Channel 49 (927.25MHz)



Mode 2 - Channel 00 (902.75MHz)



Mode 2 - Channel 49 (927.25MHz)



7.7. Conducted Spurious Emissions Measurement

7.7.1.Test Limit

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 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, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

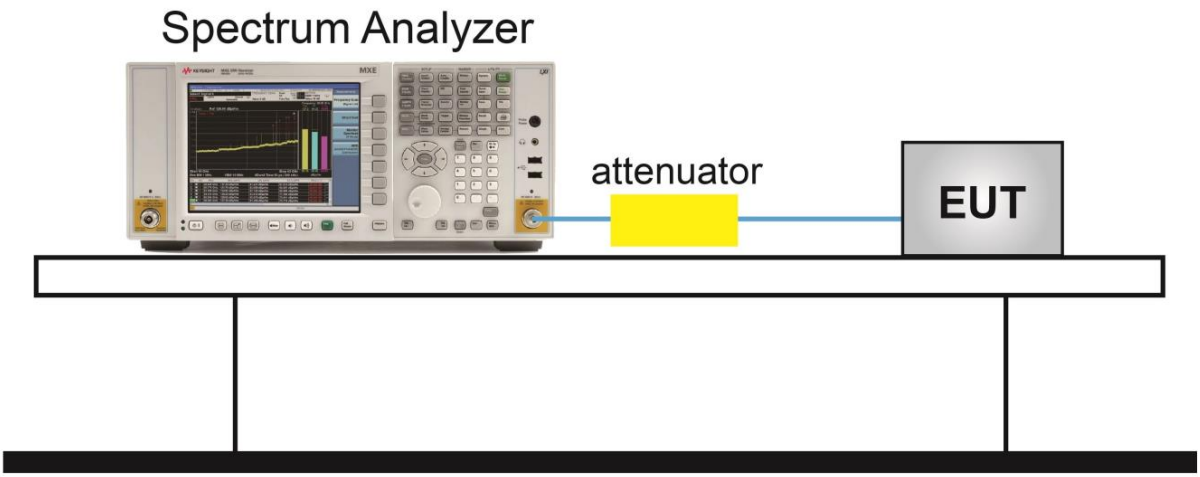
7.7.2.Test Procedure Used

ANSI C63.10-2013 - Section 7.8.8

7.7.3.Test Setting

1. Span = Wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
2. RBW = 100kHz
3. VBW = 300kHz
4. Detector = Peak
5. Sweep time = Auto couple
6. Trace mode = Max hold
7. Trace was allowed to stabilize
8. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this section.

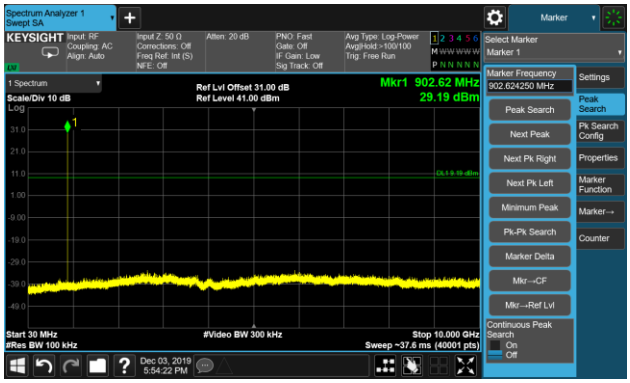
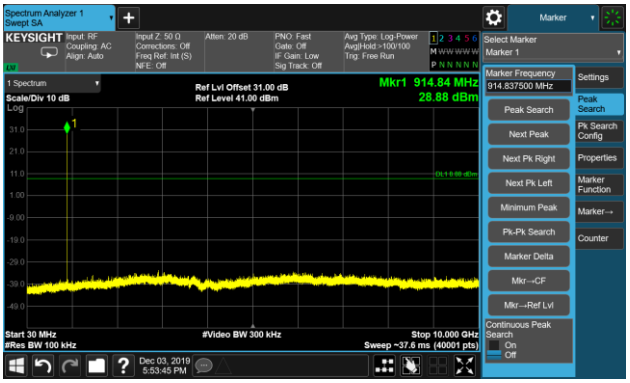
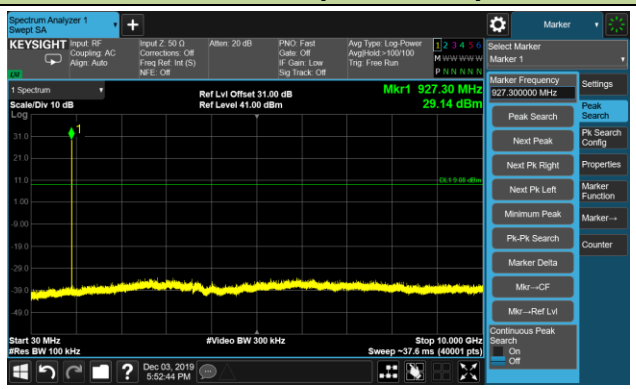
7.7.4.Test Setup

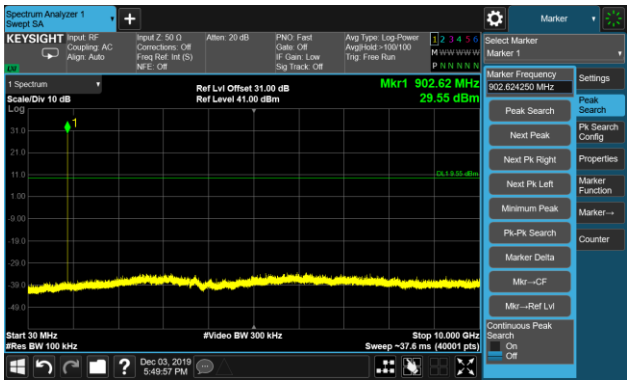
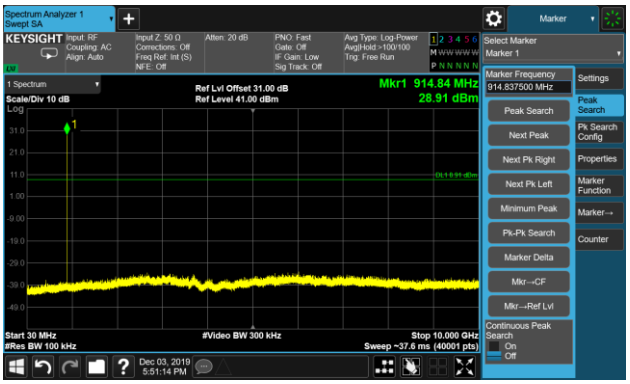
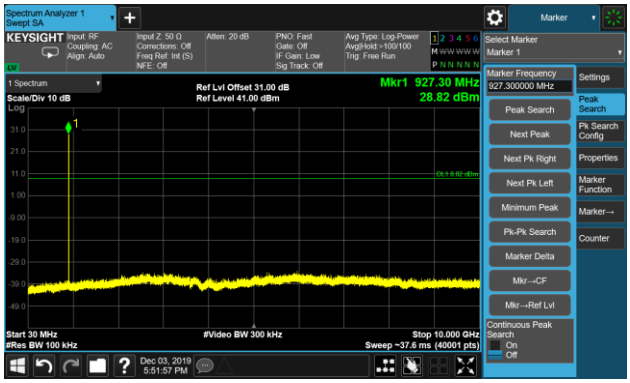


7.7.5.Test Result

Product	Handheld UHF RFID Reader	Temperature	25°C
Test Engineer	Snake Ni	Relative Humidity	52%
Test Site	TR3	Test Date	2019/12/03

Test Mode	Channel No.	Frequency (MHz)	Limit (MHz)	Result
Mode 1	00	902.75	20dBc	Pass
	24	914.75	20dBc	Pass
	49	927.25	20dBc	Pass
Mode 2	00	902.75	20dBc	Pass
	24	914.75	20dBc	Pass
	49	927.25	20dBc	Pass

Mode 1 Conducted Spurious Emissions	
Channel 00 (902.75MHz)	**Channel 24 (914.75MHz)**
	
Channel 49 (927.25MHz)	
	

Mode 2 Conducted Spurious Emissions	
Channel 00 (902.75MHz)	**Channel 24 (914.75MHz)**
	
Channel 49 (927.25MHz)	
	

7.8. Radiated Spurious Emission Measurement

7.8.1.Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Field Strength (μV/m)	Measured Distance (m)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.8.2.Test Procedure Used

ANSI C63.10 - Section 6.3 (General Requirements)

ANSI C63.10 - Section 6.4 (Standard test method below 30MHz)

ANSI C63.10 - Section 6.5 (Standard test method above 30MHz to 1GHz)

ANSI C63.10 - Section 6.6 (Standard test method above 1GHz)

7.8.3.Test Setting

Table 1 - RBW as a function of frequency

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

Quasi-Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = As specified in Table 1
4. Detector = CISPR quasi-peak
5. Sweep time = Auto couple
6. Trace was allowed to stabilize

Peak Measurements above 1GHz

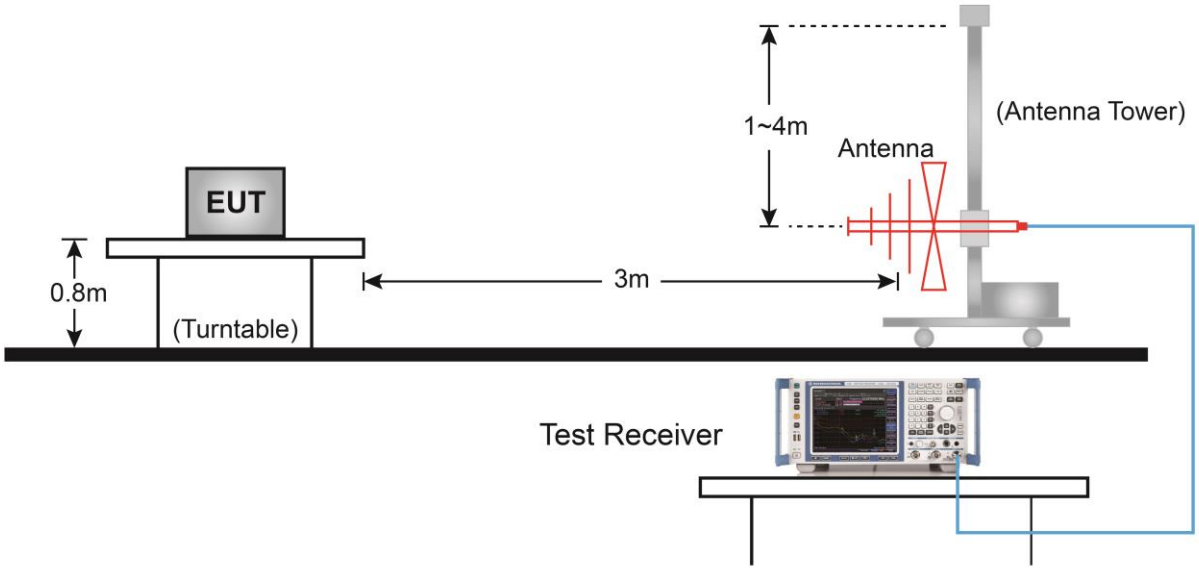
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = Peak
5. Sweep time = Auto couple
6. Trace mode = Max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz

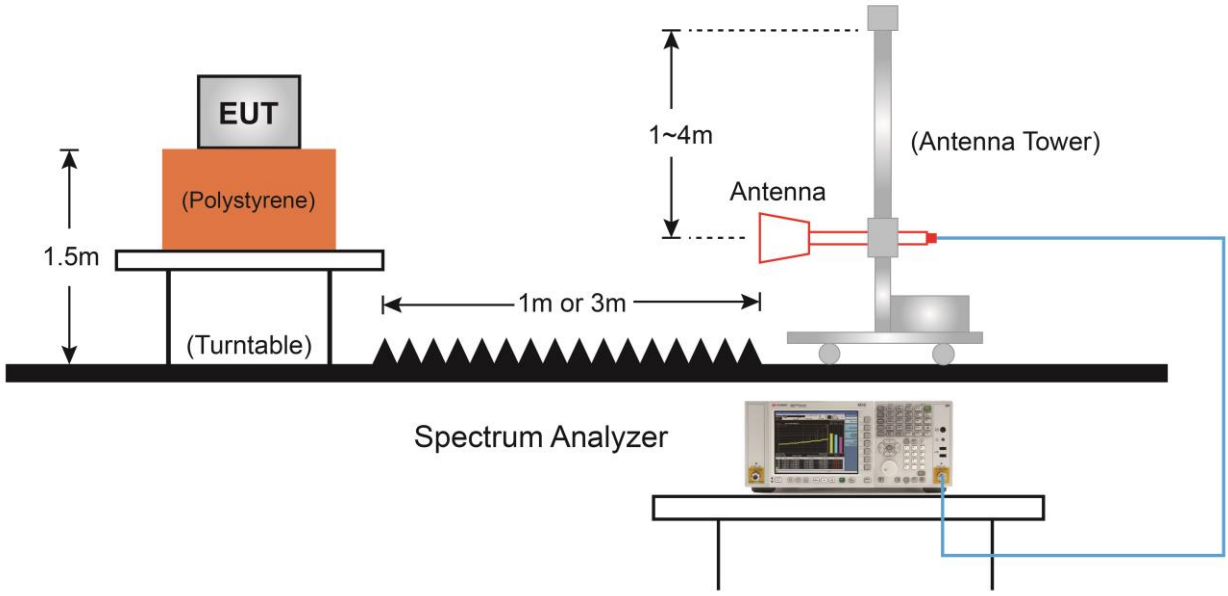
1. Use duty cycle correction factor method per FCC Part 15.35 (c)
2. Duty cycle = On time / 100 milliseconds
3. Average Emission Level = Peak Emission Level + 20 * Log (Duty Cycle)

7.8.4.Test Setup

Below 1GHz Test Setup:



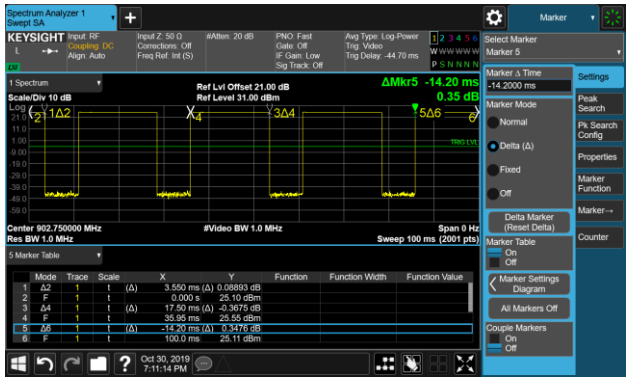
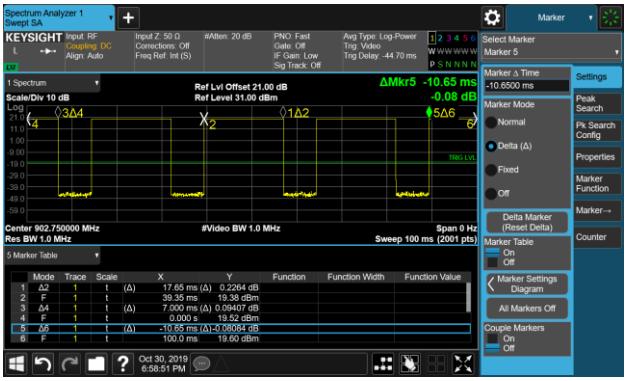
Above 1GHz Test Setup:



7.8.5.Test Result

Test Mode	Time On (ms)	One Period (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
Mode 1	70.25	100	70.25	-3.07
Mode 2	70.60	100	70.60	-3.02

Note: Duty Cycle Factor = 20*Log (Duty Cycle)

Duty Cycle	
Mode 1	Mode 2
	

Product	Handheld UHF RFID Reader	Temperature	25°C
Test Engineer	Larry Yan	Relative Humidity	56%
Test Site	AC1	Test Date	2019/11/29
Test Mode	Mode 1	Test Channel	00
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-10GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	1892.5	50.2	-3.9	N/A	46.3	102.4	-56.1	Peak	Horizontal
*	2139.0	41.9	-1.5	N/A	40.4	102.4	-62.0	Peak	Horizontal
	7290.0	37.8	11.7	N/A	49.5	74.0	-24.5	Peak	Horizontal
	8378.0	38.0	12.3	N/A	50.3	74.0	-23.7	Peak	Horizontal
*	3082.5	39.9	1.3	N/A	41.2	102.4	-61.2	Peak	Vertical
*	5658.0	36.2	7.3	N/A	43.5	102.4	-58.9	Peak	Vertical
	7409.0	37.3	11.8	N/A	49.1	74.0	-24.9	Peak	Vertical
	8131.5	38.8	12.5	N/A	51.3	74.0	-22.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (122.4dBμV/m) or 15.209 which is higher.

Note 2: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre Amplifier Gain (dB)

Note 3: Average measurement was not performed when the peak level lower than average limit.

Product	Handheld UHF RFID Reader	Temperature	25°C
Test Engineer	Larry Yan	Relative Humidity	56%
Test Site	AC1	Test Date	2019/11/29
Test Mode	Mode 1	Test Channel	24
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3142.0	39.4	1.4	N/A	40.8	102.2	-61.4	Peak	Horizontal
*	3507.5	38.7	1.8	N/A	40.5	102.2	-61.7	Peak	Horizontal
	7409.0	44.8	11.8	N/A	56.6	74.0	-17.4	Peak	Horizontal
	7409.0	44.8	11.8	-3.1	53.3	54.0	-0.7	Average	Horizontal
	8233.5	38.5	12.3	N/A	50.8	74.0	-23.2	Peak	Horizontal
*	3031.5	39.5	1.0	N/A	40.5	102.2	-61.7	Peak	Vertical
*	3448.0	38.5	1.5	N/A	40.0	102.2	-62.2	Peak	Vertical
	5071.5	38.2	6.7	N/A	44.9	74.0	-29.1	Peak	Vertical
	7383.5	42.7	11.8	N/A	54.5	74.0	-19.5	Peak	Vertical
	7383.5	42.7	11.8	-3.1	51.4	54.0	-2.6	Average	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (122.2dBμV/m) or 15.209 which is higher.

Note 2: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Average Measure Level = Peak Measure Level + Duty Cycle Factor

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre Amplifier Gain (dB)

Note 3: Average measurement was not performed when the peak level lower than average limit.

Product	Handheld UHF RFID Reader	Temperature	25°C
Test Engineer	Larry Yan	Relative Humidity	56%
Test Site	AC1	Test Date	2019/11/29
Test Mode	Mode 1	Test Channel	49
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3142.0	40.0	1.4	N/A	41.4	101.9	-60.5	Peak	Horizontal
*	3422.5	38.7	1.3	N/A	40.0	101.9	-61.9	Peak	Horizontal
	7349.5	38.0	11.9	N/A	49.9	74.0	-24.1	Peak	Horizontal
	8148.5	38.3	12.5	N/A	50.8	74.0	-23.2	Peak	Horizontal
*	5887.5	36.6	7.6	N/A	44.2	101.9	-57.7	Peak	Vertical
*	6593.0	37.1	9.8	N/A	46.9	101.9	-55.0	Peak	Vertical
	7502.5	36.0	11.9	N/A	47.9	74.0	-26.1	Peak	Vertical
	8233.5	39.8	12.3	N/A	52.1	74.0	-21.9	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (121.9dBμV/m) or 15.209 which is higher.

Note 2: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Average Measure Level = Peak Measure Level + Duty Cycle Factor

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre Amplifier Gain (dB)

Note 3: Average measurement was not performed when the peak level lower than average limit.

Product	Handheld UHF RFID Reader	Temperature	25°C
Test Engineer	Larry Yan	Relative Humidity	56%
Test Site	AC1	Test Date	2019/11/29
Test Mode	Mode 2	Test Channel	00
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3074.0	39.9	1.2	N/A	41.1	102.7	-61.6	Peak	Horizontal
*	3558.5	38.8	2.0	N/A	40.8	102.7	-61.9	Peak	Horizontal
	4986.5	37.8	6.4	N/A	44.2	74.0	-29.8	Peak	Horizontal
	7596.0	37.9	11.8	N/A	49.7	74.0	-24.3	Peak	Horizontal
*	3057.0	39.5	1.2	N/A	40.7	102.7	-62.0	Peak	Vertical
*	3422.5	38.3	1.3	N/A	39.6	102.7	-63.1	Peak	Vertical
	4731.5	37.1	5.6	N/A	42.7	74.0	-31.3	Peak	Vertical
	7638.5	37.4	11.4	N/A	48.8	74.0	-25.2	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (122.7dBμV/m) or 15.209 which is higher.

Note 2: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Average Measure Level = Peak Measure Level + Duty Cycle Factor

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre Amplifier Gain (dB)

Note 3: Average measurement was not performed when the peak level lower than average limit.

Product	Handheld UHF RFID Reader	Temperature	25°C
Test Engineer	Larry Yan	Relative Humidity	56%
Test Site	AC1	Test Date	2019/11/29
Test Mode	Mode 2	Test Channel	24
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3091.0	39.9	1.3	N/A	41.2	102.2	-61.0	Peak	Horizontal
*	5751.5	36.2	7.4	N/A	43.6	102.2	-58.6	Peak	Horizontal
	7613.0	36.9	11.8	N/A	48.7	74.0	-25.3	Peak	Horizontal
	8386.5	36.9	12.4	N/A	49.3	74.0	-24.7	Peak	Horizontal
*	3040.0	39.2	1.0	N/A	40.2	102.2	-62.0	Peak	Vertical
*	3397.0	37.6	1.3	N/A	38.9	102.2	-63.3	Peak	Vertical
	7443.0	36.1	12.1	N/A	48.2	74.0	-25.8	Peak	Vertical
	8233.5	37.4	12.3	N/A	49.7	74.0	-24.3	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (122.2dBμV/m) or 15.209 which is higher.

Note 2: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Average Measure Level = Peak Measure Level + Duty Cycle Factor

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre Amplifier Gain (dB)

Note 3: Average measurement was not performed when the peak level lower than average limit.

Product	Handheld UHF RFID Reader	Temperature	25°C
Test Engineer	Larry Yan	Relative Humidity	56%
Test Site	AC1	Test Date	2019/11/29
Test Mode	Mode 2	Test Channel	49
Remark	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Duty Cycle Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3108.0	37.7	1.2	N/A	38.9	101.5	-62.6	Peak	Horizontal
*	5921.5	36.0	7.8	N/A	43.8	101.5	-57.7	Peak	Horizontal
	7698.0	36.3	11.7	N/A	48.0	74.0	-26.0	Peak	Horizontal
	8165.5	36.5	12.4	N/A	48.9	74.0	-25.1	Peak	Horizontal
*	3159.0	39.0	1.3	N/A	40.3	101.5	-61.2	Peak	Vertical
*	3507.5	38.3	1.8	N/A	40.1	101.5	-61.4	Peak	Vertical
	7494.0	35.2	11.8	N/A	47.0	74.0	-27.0	Peak	Vertical
	8148.5	36.9	12.5	N/A	49.4	74.0	-24.6	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (121.5dBμV/m) or 15.209 which is higher.

Note 2: Peak Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

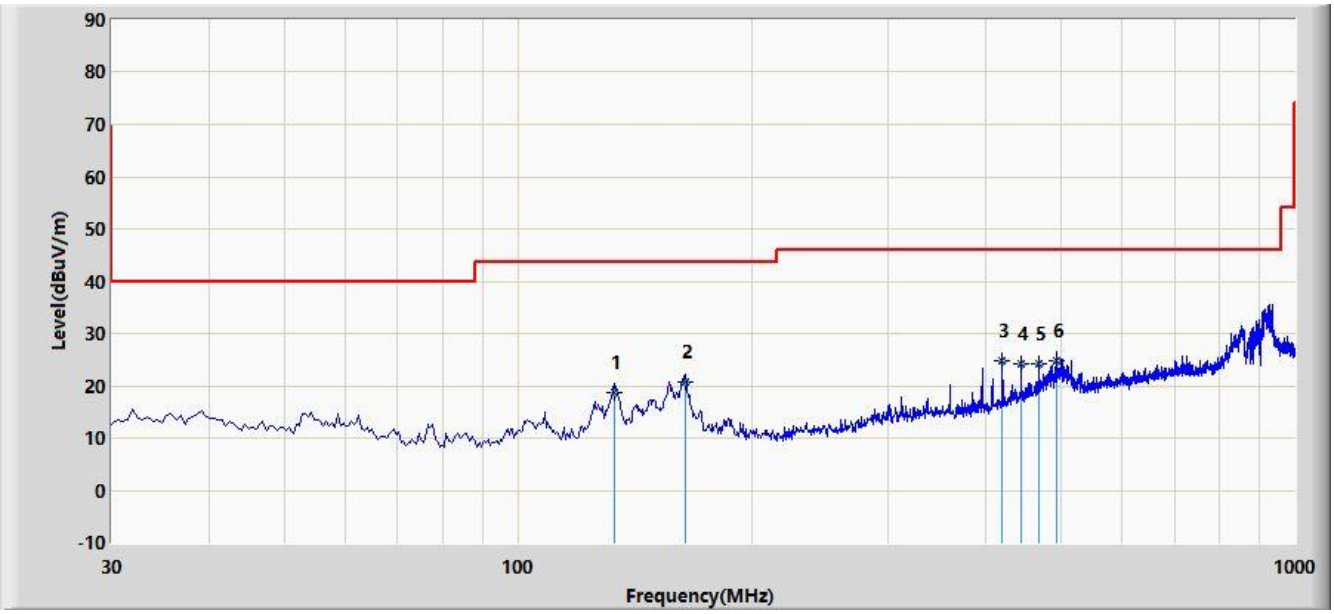
Average Measure Level = Peak Measure Level + Duty Cycle Factor

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre Amplifier Gain (dB)

Note 3: Average measurement was not performed when the peak level lower than average limit.

The Worst Case of Radiated Emission below 1GHz:

Site: AC1	Time: 2019/12/03 - 19:32
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: AC1_VULB 9168 _20-2000MHz	Polarity: Horizontal
EUT: Handheld UHF RFID Reader	Power: By Battery
Worst Case Mode: Transmit by normal operating at Channel 902.75MHz	



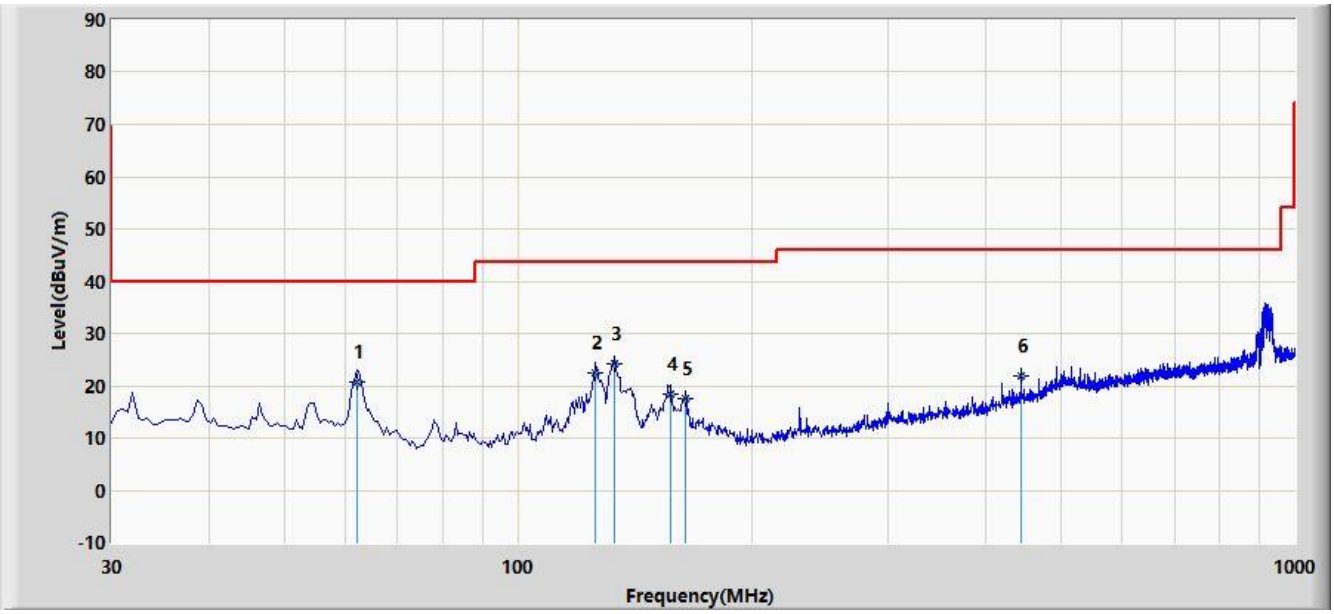
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			133.305	18.715	4.670	-24.785	43.500	14.045	QP
2			164.345	20.687	5.830	-22.813	43.500	14.857	QP
3			420.425	24.730	7.640	-21.270	46.000	17.090	QP
4			444.675	24.295	6.580	-21.705	46.000	17.715	QP
5			468.440	24.264	6.190	-21.736	46.000	18.075	QP
6		*	492.690	24.875	6.490	-21.125	46.000	18.385	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

Site: AC1	Time: 2019/12/03 - 19:34
Limit: FCC_Part15.209_RE(3m)	Engineer: Tyler Yuan
Probe: AC1_VULB 9168 _20-2000MHz	Polarity: Vertical
EUT: Handheld UHF RFID Reader	Power: By Battery
Worst Case Mode: Transmit by normal operating at Channel 902.75MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	62.010	20.776	7.740	-19.224	40.000	13.036	QP
2			126.030	22.488	8.930	-21.012	43.500	13.558	QP
3			133.305	24.065	10.020	-19.435	43.500	14.045	QP
4			157.070	18.546	3.290	-24.954	43.500	15.255	QP
5			164.345	17.627	2.770	-25.873	43.500	14.857	QP
6			444.675	21.765	4.050	-24.235	46.000	17.715	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

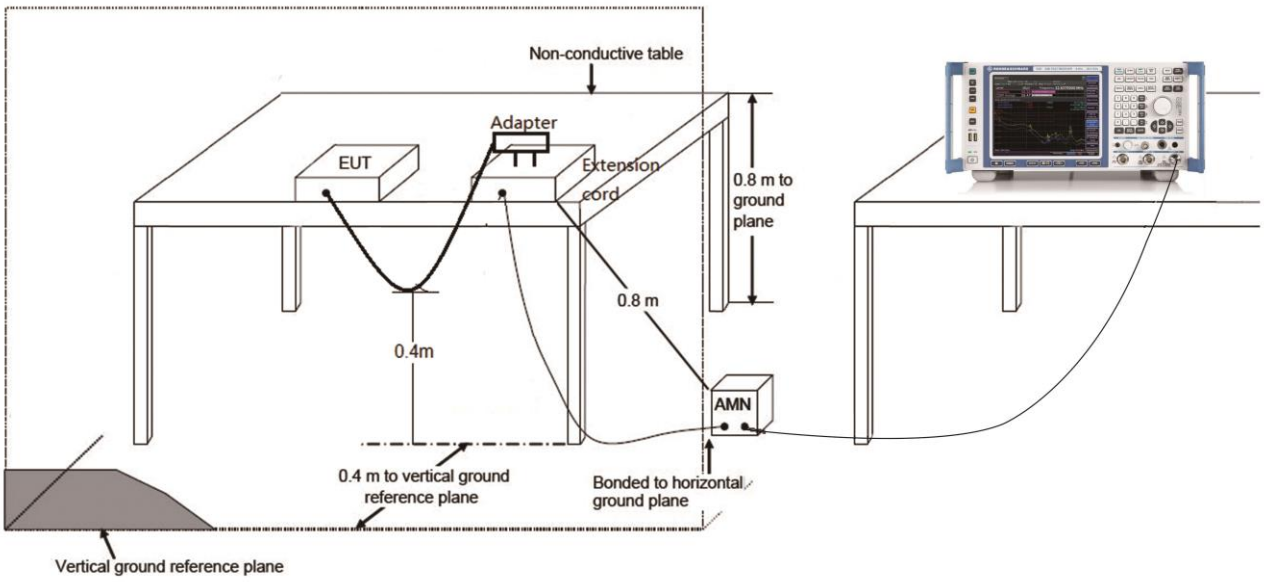
Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

7.9. AC Conducted Emissions Measurement

7.9.1.Test Limit

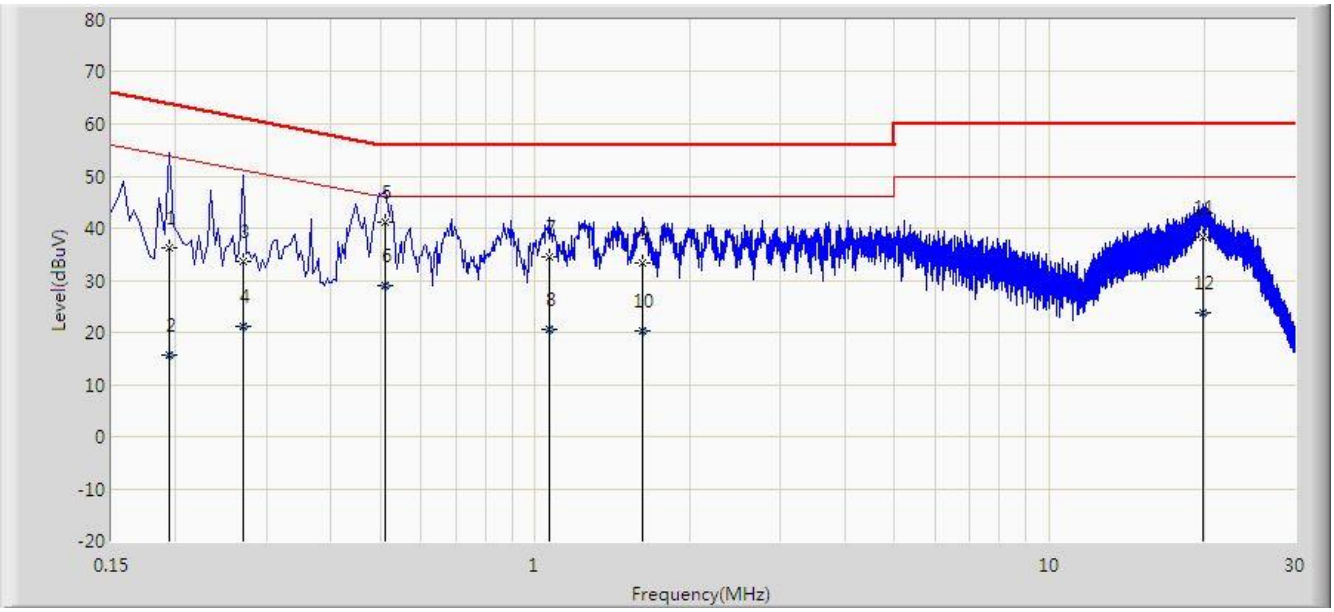
FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBμV)	Average (dBμV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50
Note 1: The lower limit shall apply at the transition frequencies. Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.		

7.9.2.Test Setup



7.9.3.Test Result

Site: SR2	Time: 2019/12/03 - 18:09
Limit: FCC_Part15.207_CE_AC Power	Engineer: Liz Yuan
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: Handheld UHF RFID Reader	Power: AC 120V/60Hz
Test Mode 1	

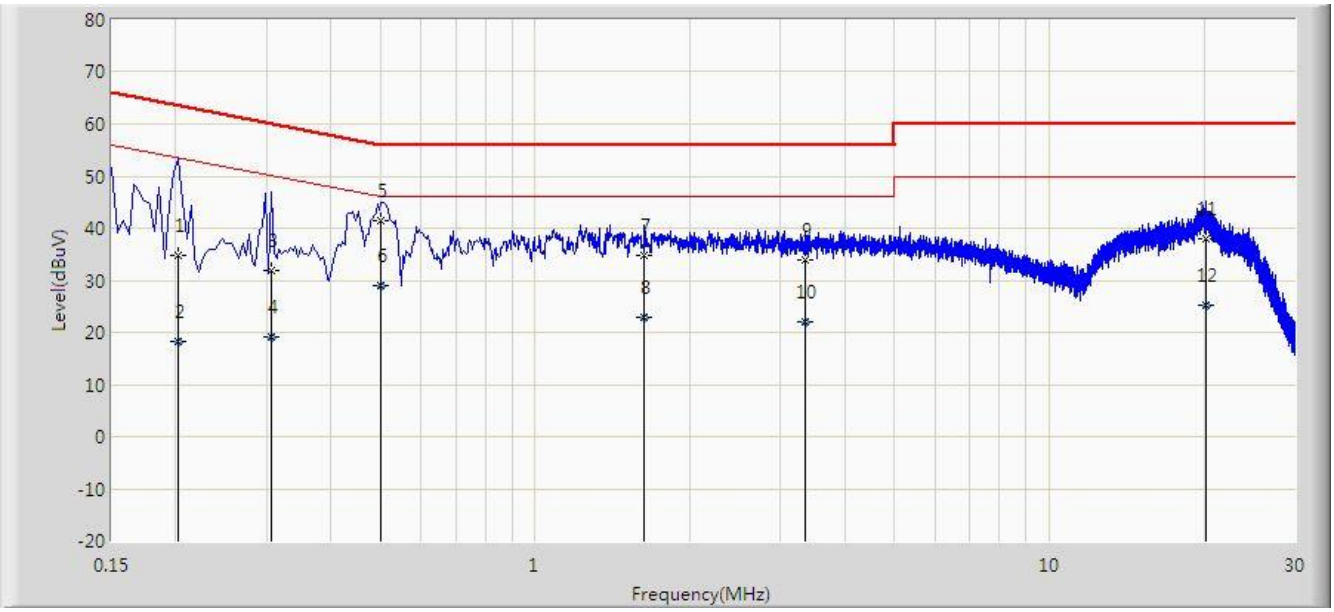


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.194	36.186	26.169	-27.678	63.864	10.017	QP
2			0.194	15.748	5.731	-38.116	53.864	10.017	AV
3			0.270	33.735	23.755	-27.383	61.118	9.980	QP
4			0.270	21.187	11.207	-29.930	51.118	9.980	AV
5		*	0.510	41.170	31.013	-14.830	56.000	10.157	QP
6			0.510	29.114	18.958	-16.886	46.000	10.157	AV
7			1.066	34.419	24.513	-21.581	56.000	9.906	QP
8			1.066	20.685	10.779	-25.315	46.000	9.906	AV
9			1.622	33.463	23.579	-22.537	56.000	9.884	QP
10			1.622	20.230	10.345	-25.770	46.000	9.884	AV
11			19.862	38.399	28.261	-21.601	60.000	10.138	QP
12			19.862	23.764	13.626	-26.236	50.000	10.138	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Site: SR2	Time: 2019/12/03 - 18:13
Limit: FCC_Part15.207_CE_AC Power	Engineer: Liz Yuan
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: Handheld UHF RFID Reader	Power: AC 120V/60Hz
Test Mode 1	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.202	34.848	24.840	-28.680	63.528	10.008	QP
2			0.202	18.344	8.337	-35.183	53.528	10.008	AV
3			0.306	31.740	21.698	-28.338	60.078	10.042	QP
4			0.306	19.010	8.968	-31.069	50.078	10.042	AV
5		*	0.502	41.366	31.189	-14.634	56.000	10.177	QP
6			0.502	29.117	18.940	-16.883	46.000	10.177	AV
7			1.630	34.654	24.768	-21.346	56.000	9.886	QP
8			1.630	23.040	13.154	-22.960	46.000	9.886	AV
9			3.350	33.900	23.998	-22.100	56.000	9.902	QP
10			3.350	22.162	12.260	-23.838	46.000	9.902	AV
11			20.110	37.840	27.670	-22.160	60.000	10.170	QP
12			20.110	25.284	15.114	-24.716	50.000	10.170	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

8. CONCLUSION

The data collected relate only the item(s) tested and show that the unit is in compliance with Part 15C of the FCC rules and ISED rules.

The End

Appendix A - Test Setup Photograph

Refer to “1910RSU007-UT” file.

Appendix B - EUT Photograph

Refer to “1910RSU007-UE” file.