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ELECTROMAGNETIC EMISSIONS **COMPLIANCE REPORT**





FCC Applicant: InfoChamp Systems Corporation

19F, No. 88, Chenggong 2nd Rd., Qianzhen Dist., Kaohsiung

City, Taiwan

FCC Manufacturer: CiaoDa Cloud Technology Co., Ltd.

17F.-1, No. 104, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei

Citv. Taiwan

Product Name: UHF RFID Reader Module

Brand Name: InfoChamp

ICSC-RFIDM01 Model No.:

N/A **Model Difference:**

Report Number: TERF2204000414E2

FCC ID 2A8BK-ICSC-M7E2

Date of EUT Received: Apr. 22, 2022

Date of Test: Jun. 09, 2022~Jul. 13, 2022

Issue Date: Oct. 19, 2022

Approved By

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT comply with FCC rule part §15.249.

The results of this report relate only to the sample identified in this report.

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Revision History						
Report Number Revision Description Issue Date Revised By R						
TERF2204000414E2	00	Original.	Sep. 15, 2022	Yi-Shan Tsai		
TERF2204000414E2	01	Revise antenna model of data	Sep. 27, 2022	Yi-Shan Tsai	*	
TERF2204000414E2	02	Add FCC Rules	Oct. 19, 2022	Yi-Shan Tsai	*	

Note:

1 . The remark "*" indicates modification of the report upon requests from certification

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GENERAL INFORMATION

1.1 **Product Description**

Product Name:	UHF RFID Reader Module
Brand Name:	InfoChamp
Model No.:	ICSC-RFIDM01
Model Difference:	N/A
Hardware Version:	N/A
Firmware Version:	N/A
EUT Series No.:	TE-2204000177P
Power Supply:	5Vdc
Test Software (Name/Version)	Stand-Alone RFID Reader Calibrator Software / V1.0.0.0

1.2 **RF Specification**

Radio Technology:	UHF RFID Reader Module
Frequency Range:	902 – 928MHz
Channel number:	99 channels
Modulation type:	PR-ASK
Transmit Power:	94.14 dBuV/m (Peak)

1.3 Antenna Designation

Antenna	Model	Freq.	Peak Antenna
Type		(MHz)	Gain (dBi)
Patch	1037D10A021213	902~928	5.24

Note: Antenna information is provided by the applicant.

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1.4 **Test Methodology of Applied Standards**

FCC Part 15, Subpart C §15.249 ANSI C63.10:2013

1.5 **Test Facility**

Laboratory	Test Site Address	Test Site Name	FCC Designa- tion number	IC CAB identifier
		SAC 1		
		SAC 3		
		Conduction 1		
	No.134, Wu Kung Road, New Taipei	Conducted 1		
	Industrial Park, Wuku District, New	Conducted 2	TW0027	
	Taipei City, Taiwan.	Conducted 3		TW3702
		Conducted 4		
		Conducted 5		
SGS Taiwan Ltd.		Conducted 6		
Central RF Lab.		Conduction C	-	
(TAF code 3702)		SAC C		
(1A1 Code 3702)		SAC D		
		SAC G		
	No 2 Koji 1st Pd. Cujeban District	Conducted A		
	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conducted B	TW0028	
	ladyuan City, Taiwan 333	Conducted C		
		Conducted D		
		Conducted E]	
		Conducted F		
		Conducted G		

Note: Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.

1.6 **Special Accessories**

There are no special accessories used while test was conducted.

1.7 **Equipment Modifications**

There was no modification incorporated into the EUT.

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SYSTEM TEST CONFIGURATION

2.1 **EUT Configuration**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 **EUT Exercise**

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 **Test Procedure**

2.3.1 Conducted Emissions

The EUT is a placed on a table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50uH/50 ohm of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Conducted Test (RF)

The active antenna port of the unlicensed wireless device is connected to the spectrum analyzer with attenuator to protect the instrumentation. If a second antenna port is available, it is tested at one operating frequency, with other port(s) appropriately terminated, to verify it has similar output characteristics as the fully tested port.

2.3.3 Radiated Emissions

The EUT is a placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping" the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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2.4 **Measurement Results Explanation Example**

2.4.1 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

2.4.2 For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

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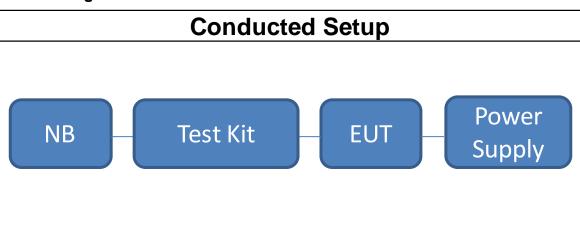
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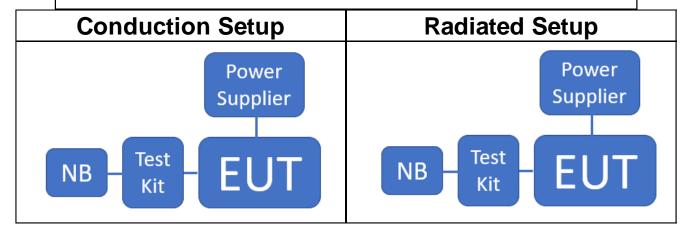
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2.5 **Test Configuration**





2.6 Control Unit(s)

AC Power-Line Conducted Emission Test Site: Conduction C						
EQUIPMENT TYPE	EQUIPMENT TYPE MFR MODEL NUMBER SERIAL NUMBER LAST CAL. CAL DUE.					
Notebook Lenovo L480 P0002332 N/A N/A						

Radiated Emission Test Site: SAC C						
EQUIPMENT TYPE MFR MODEL NUMBER SERIAL NUMBER LAST CAL. CAL DUE.						
Notebook Lenovo L480 P0002332 N/A N/A						

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3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power Line Conducted Emission	Compliant
§15.249(a)(e) §15.249(a), (d) 15.209	Radiated Emission	Compliant
§15.215 (c)	Emission Bandwidth	Compliant
§15.203	Antenna Requirement	Compliant

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DESCRIPTION OF TEST MODES

4.1 **Operating Frequencies**

ITEM	FREQUENCY	ITEM	FREQUENCY	ITEM	FREQUENCY	ITEM	FREQUENCY
1	902.75 MHz	27	909.25 MHz	53	915.75 MHz	79	922.25 MHz
2	903 MHz	28	909.5 MHz	54	916 MHz	80	922.5 MHz
3	903.25 MHz	29	909.75 MHz	55	916.25 MHz	81	922.75 MHz
4	903.5 MHz	30	910 MHz	56	916.5 MHz	82	923 MHz
5	903.75 MHz	31	910.25 MHz	57	916.75 MHz	83	923.25 MHz
6	904 MHz	32	910.5 MHz	58	917 MHz	84	923.5 MHz
7	904.25 MHz	33	910.75 MHz	59	917.25 MHz	85	923.75 MHz
8	904.5 MHz	34	911 MHz	60	917.5 MHz	86	924 MHz
9	904.75 MHz	35	911.25 MHz	71	917.75 MHz	87	924.25 MHz
10	905 MHz	36	911.5 MHz	72	918 MHz	88	924.5 MHz
11	905.25 MHz	37	911.75 MHz	73	918.25 MHz	89	924.75 MHz
12	905.5 MHz	38	912 MHz	74	918.5 MHz	90	925 MHz
13	905.75 MHz	39	912.25 MHz	75	918.75 MHz	91	925.25 MHz
14	906 MHz	40	912.5 MHz	76	919 MHz	92	925.5 MHz
15	906.25 MHz	41	912.75 MHz	77	919.25 MHz	93	925.75 MHz
16	906.5 MHz	42	913 MHz	78	919.5 MHz	94	926 MHz
17	906.75 MHz	43	913.25 MHz	79	919.75 MHz	95	926.25 MHz
18	907 MHz	44	913.5 MHz	70	920 MHz	96	926.5 MHz
19	907.25 MHz	45	913.75 MHz	71	920.25 MHz	97	926.75 MHz
20	907.5 MHz	46	914 MHz	72	920.5 MHz	98	927 MHz
21	907.75 MHz	47	914.25 MHz	73	920.75 MHz	99	927.25 MHz
22	908 MHz	48	914.5 MHz	74	921 MHz		
23	908.25 MHz	49	914.75 MHz	75	921.25 MHz		
24	908.5 MHz	50	915 MHz	76	921.5 MHz		
25	908.75 MHz	51	915.25 MHz	77	921.75 MHz		
26	909 MHz	52	915.5 MHz	78	922 MHz		

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THE WORST TEST MODES AND CHANNEL DETAILS

- 1. The EUT has been tested under operating condition.
- 2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

RADIATED EMISSION TEST

RADIATED LIMISSION TEST.							
RADIATED EMISSION TEST (BELOW 1 GHz)							
MODE	AVAILABLE FREQUENCY	TESTED FREQUENCY	MODULATION	DATA RATE (Mbps)	ANTENNA PORT		
RFID 902.75~927.25 915 PR-ASK N/A MAII							
	RADIATED	EMISSION TES	T (ABOVE 1 GHz	<u>z)</u>			
MODE AVAILABLE TESTED MODULATIO				DATA RATE (Mbps)	ANTENNA PORT		
RFID	902.75~927.25	902.75, 915, 927.25	PR-ASK	N/A	MAIN		

Note: The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

ANTENNA PORT CONDUCTED MEASUREMENT:

	CONDUCTED TEST						
MODE AVAILABLE TESTED MODULATION RATE (Mbps)							
RFID	902.75~927.25	902.75, 915, 927.25	PR-ASK	N/A	MAIN		

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MEASUREMENT UNCERTAINTY

Test Items	Ur	ncertaint	y
AC Power Line Conducted Emission	+/-	2.34	dB
Emission Bandwidth	+/-	1.53	Hz
Undesignable radiated emission measurement	+/-	1.68	dB
Temperature	+/-	0.4	°C
Humidity	+/-	3.5	%
DC / AC Power Source	+/-	1	%

Radiated Spurious Emission Measurement Uncertainty								
	+/-	2.57	dB	9kHz~30MHz				
Polarization: Vertical	+/-	4.85	dB	30MHz - 1000MHz				
Polarization: vertical	+/-	4.45	dB	1GHz - 18GHz				
	+/-	4.24	dB	18GHz - 40GHz				
	+/-	2.57	dB	9kHz~30MHz				
Polarization: Horizontal	+/-	4.37	dB	30MHz - 1000MHz				
Polarization: Horizontal	+/-	4.45	dB	1GHz - 18GHz				
	+/-	4.24	dB	18GHz - 40GHz				

Note:

- 1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- 2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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7 MEASUREMENT EQUIPMENT USED

7.1 Emission from AC power line

AC Power-Line Conducted Emission Test Site: Conduction C								
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.			
LISN	SCHWARZBECK Mess- Elektronik	NSLK8127	973	04/13/2022	04/12/2023			
EMI Test Receiver	R&S	ESCI	101342	04/25/2022	04/24/2023			
Coaxial Cable	EC La b	RF-HY-CAB-250	RF-HY-CAB-250-01	03/27/2022	03/26/2023			
Coaxial Cable	EMC Instruments Corp	EMC5D-BM-BM-3000	1401004	03/27/2022	03/26/2023			
Pulse Limiter	EC La b	VTSD 9561F-N	485	03/27/2022	03/26/2023			
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R			

7.2 Conducted Measurement

Conducted Emission Test Site: Conducted E									
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.				
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	07/07/2022	07/06/2023				
DC Power Supply	Gwinstek	SPS-3610	GEV856769	08/04/2021	08/03/2022				
Test Software	SGS Taiwan	EMI Tool Function Alpha	Ver.1.0	N.C.R	N.C.R				
Temperature Chamber	TERCHY	MHK-120LK	1020582	06/21/2022	06/20/2023				
Attenuator	Marvelous	MVE2213-10	RF06	11/18/2021	11/17/2022				
DC Block	PASTERNACK	PE8210	RF158	11/18/2021	11/17/2022				

7.3 Radiated Measurement

Radiated Emission Test Site: SAC C							
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.		
Broadband Antenna	SCHWARZBECK	VULB 9168	9168-300	10/19/2021	10/18/2022		
Horn Antenna	SCHWARZBECK	BBHA9120D	1187	01/06/2022	01/05/2023		
Loop Antenna	ETS.LINDGREN	6502	148045	09/29/2021	09/28/2022		
EMI Test Receiver	R&S	ESU 40	100363	04/28/2022	04/27/2023		
Pre-Amplifier	EMC Instruments	EMC330	980096	11/18/2021	11/17/2022		
Pre-Amplifier	EMC Instruments	EMC0011830	980199	11/18/2021	11/17/2022		
Attenuator	Marvelous	WATT-218FS-10	RF20	11/18/2021	11/17/2022		
Coaxial Cable	Huber Suhner	SUCOFLEX 104	MY17388/4	11/18/2021	11/17/2022		
Coaxial Cable	Huber Suhner	RG 214/U	W22.03	11/18/2021	11/17/2022		
Test Software	audix	e3	20923 sgs Ver.9	N.C.R	N.C.R		

NOTE: N.C.R refers to Not Calibrated Required.

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CONDUCTED EMISSION TEST

8.1 Applicable Standard:

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range		imits BuV)
MHz	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

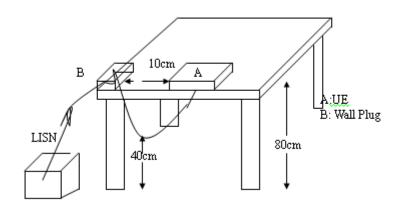
Note

- 1. The lower limit shall apply at the transition frequencies
- 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

8.2 **EUT Setup:**

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 120Vac/60Hz power source.

8.3 Test Setup



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8.4 **Measurement Procedure:**

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all phases of power being supplied by given UE are completed

8.5 **Measurement Result:**

Note: Refer to next page for measurement data and plots.

Note2: The * reveals the worst-case results that closet to the limit.



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AC POWER LINE CONDUCTED EMISSION TEST DATA

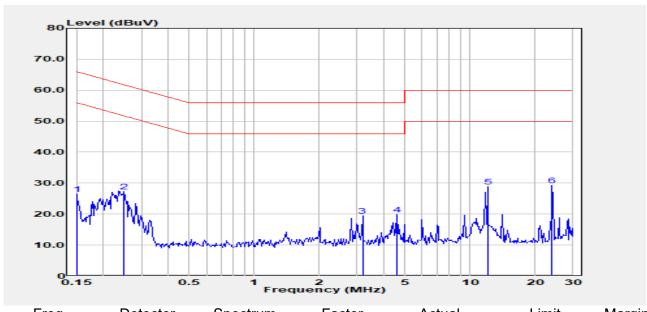
Report Number :TERF2204000414E2 Test Site :Conduction C

Test Mode :RFID **Test Date** :2022-06-09

Power :120V/60Hz Temp./Humi. :24.2/65

Probe :L1 Engineer :Andy Wang

Note:



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dΒμV	dB	dΒμV	dΒμV	dB
0.150	Peak	16.20	10.27	26.47	66.00	-39.53
0.249	Peak	16.98	10.28	27.26	61.78	-34.52
3.173	Peak	8.59	10.85	19.43	56.00	-36.57
4.598	Peak	9.19	10.59	19.78	56.00	-36.22
12.060	Peak	18.08	10.72	28.80	60.00	-31.20
24.015	Peak	18.24	10.98	29.21	60.00	-30.79

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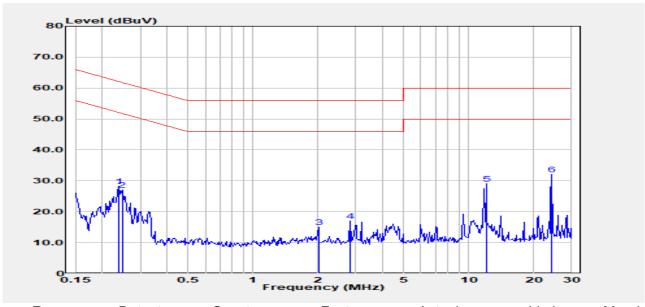
Report Number :TERF2204000414E2 Test Site :Conduction C

Test Mode :RFID Test Date :2022-06-09

Power :120V/60Hz Temp./Humi. :24.2/65

Probe :N Engineer :Andy Wang

Note: :



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dΒμV	dB	dΒμV	dΒμV	dB
0.239	Peak	18.01	10.28	28.29	62.13	-33.84
0.247	Peak	16.69	10.28	26.97	61.86	-34.89
2.012	Peak	3.97	11.14	15.11	56.00	-40.89
2.824	Peak	6.23	10.89	17.12	56.00	-38.88
12.060	Peak	18.40	10.67	29.07	60.00	-30.93
24.271	Peak	21.21	10.97	32.18	60.00	-27.82

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RADIATED EMISSION TEST

9.1 Applicable Standard

- 1. Only spurious emissions are permitted in any of the frequency bands listed in §15.205.
- 2. The field strength of fundamental and harmonic emissions, measured at 3 m, shall not exceed 50 mV/m and 0.5 mV/m respectively.
- 3. Emissions radiated outside of the specified frequency bands, except for harmonic emissions, shall be attenuated by at least 50 dB below the level of the fundamental emissions or to the general field strength limits listed in §15.209, whichever is less stringent.

9.2 Measurement Procedure

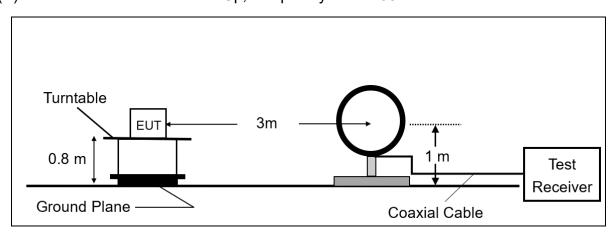
- The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compli-
- 3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 4. Repeat above procedures until all frequency measured were complete.

9.3 Test Results of Radiated Spurious Emissions from 9 kHz to 30MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o).

9.4 **Test Setup**

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz.



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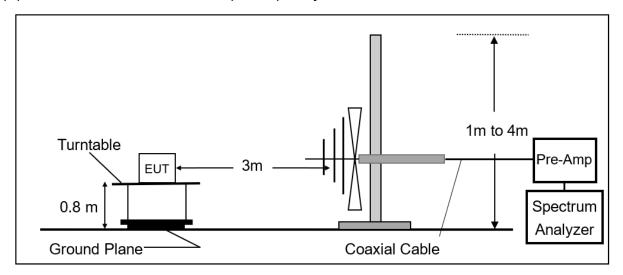
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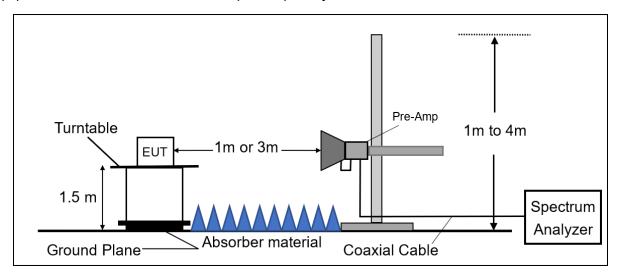
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(B) Radiated Emission Test Set-Up, Frequency From 30MHz to 1000MHz.



(C) Radiated Emission Test Set-Up, Frequency Above 1GHz.



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9.5 **Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

		0. 0.1.1
Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable
		Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

Actual FS(dB μ V/m) = SPA. Reading level(dB μ V) + Factor(dB) Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre Amplifier Gain(dB)

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9.6 **Measurement Result**

9.6.1 Field Strength of the Fundamental Signal

Report Number :TERF2204000414E2 Test Site :SAC C

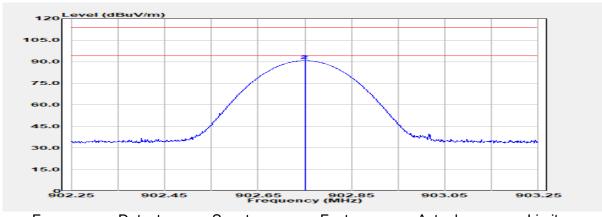
Operation Mode :RFID **Test Date** :2022-07-13

Test Frequency :902.75 MHz Temp./Humi. :25.4/55

Test Mode Antenna Pol. :Vertical :Main

EUT Pol :H Plane Engineer :Andy Wang

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
902.750	Average	89.35	0.83	90.18	94.00	-3.82
902.750	Peak	89.92	0.83	90.75	114.00	-23.25
	MHz 902.750	Mode MHz PK/QP/AV 902.750 Average	Mode Reading Level MHz PK/QP/AV dBμV 902.750 Average 89.35	Mode Reading Level MHz PK/QP/AV dBμV dB 902.750 Average 89.35 0.83	Mode Pk/QP/AV Reading Level ABμV FS ABμV/m 902.750 Average 89.35 0.83 90.18	Mode PK/QP/AV Reading Level ABμV FS ABμV/m @3m ABμV/m 902.750 Average 89.35 0.83 90.18 94.00

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Report Number Test Site :SAC C :TERF2204000414E2

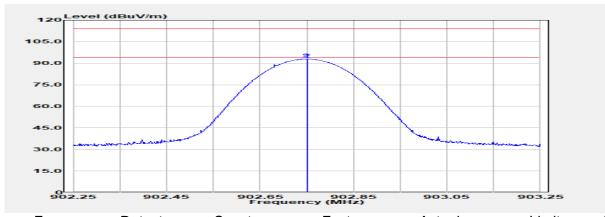
Operation Mode :RFID **Test Date** :2022-07-13

Test Frequency :902.75 MHz Temp./Humi. :25.4/55

Test Mode Antenna Pol. :Horizontal :Main

EUT Pol :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
902.750	Average	91.66	0.83	92.49	94.00	-1.51
902.750	Peak	92.10	0.83	92.93	114.00	-21.07

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Report Number :TERF2204000414E2 Test Site :SAC C

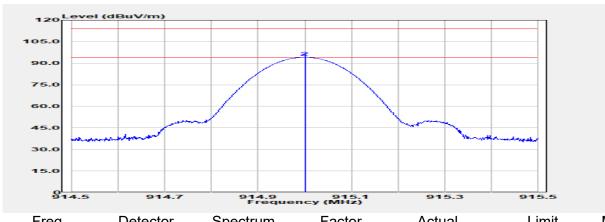
Operation Mode :RFID Test Date :2022-07-13

Test Frequency :915 MHz Temp./Humi. :25.4/55

Test Mode : Main Antenna Pol. : Vertical

EUT Pol :H Plane Engineer :Andy Wang

Ant :1037D10A021213 Note :



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBμV	dB	dBµV/m	dBμV/m	dB
915.000	Average	92.57	0.69	93.26	94.00	-0.74
915.000	Peak	93.45	0.69	94.14	114.00	-19.86

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Report Number Test Site :SAC C :TERF2204000414E2

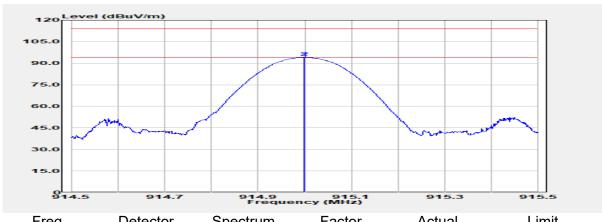
Operation Mode :RFID **Test Date** :2022-07-13

Test Frequency :915 MHz Temp./Humi. :25.4/55

Test Mode Antenna Pol. :Horizontal :Main

EUT Pol :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
 MHz	PK/QP/AV	dBμV	dB	dBµV/m	dBµV/m	dB
914.998	Average	92.77	0.69	93.46	94.00	-0.54
914.998	Peak	93.31	0.69	94.00	114.00	-20.00

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Report Number :TERF2204000414E2 Test Site :SAC C

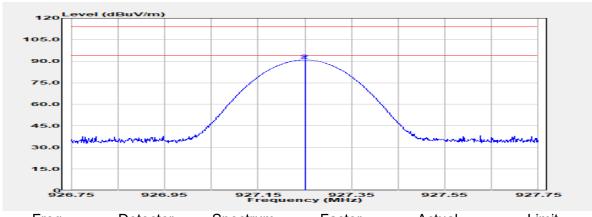
Operation Mode :RFID Test Date :2022-07-13

Test Frequency :927.25 MHz Temp./Humi. :25.4/55

Test Mode : Main Antenna Pol. : Vertical

EUT Pol :H Plane Engineer :Andy Wang

Ant :1037D10A021213 Note :



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dΒμV/m	dB
927.250	Average	89.22	0.88	90.10	94.00	-3.90
927.250	Peak	89.99	0.88	90.87	114.00	-23.13

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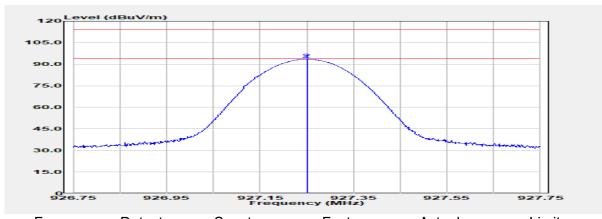
Report Number Test Site :SAC C :TERF2204000414E2

Operation Mode :RFID **Test Date** :2022-07-13

Test Frequency :927.25 MHz Temp./Humi. :25.4/55

Test Mode Antenna Pol. :Horizontal :Main **EUT Pol** :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dΒμV/m	dB
927.250	Average	92.11	0.88	92.99	94.00	-1.01
927,250	Peak	92.64	0.88	93.51	114.00	-20.49

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9.6.2 **Radiated Spurious Emission Measurement Result**

Report Number :TERF2204000414E2 Test Site :SAC C

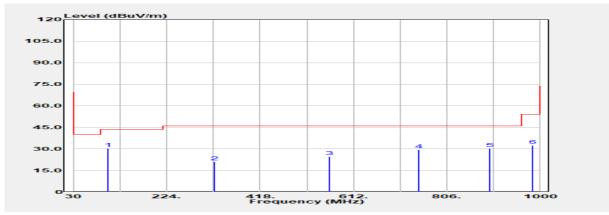
Operation Mode :RFID Test Date :2022-07-06

Test Frequency :915 MHz Temp./Humi. :21.8/62

Test Mode :Tx Antenna Pol. :Vertical

EUT Pol :H Plane Engineer :Andy Wang

:1037D10A021213 Ant Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
101.506	Peak	49.14	-18.70	30.45	43.50	-13.05
322.244	Peak	33.35	-12.21	21.14	46.00	-24.86
563.189	Peak	30.47	-5.78	24.69	46.00	-21.31
746.619	Peak	30.75	-1.19	29.57	46.00	-16.43
895.849	Peak	29.73	0.76	30.50	46.00	-15.50
984.455	Peak	30.17	2.26	32.43	54.00	-21.57

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Report Number Test Site :SAC C :TERF2204000414E2

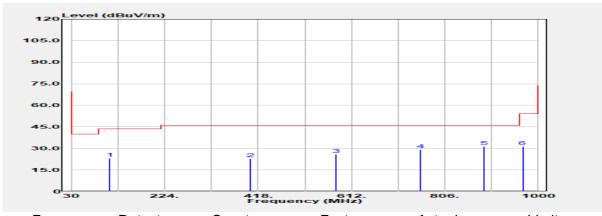
Operation Mode :RFID **Test Date** :2022-07-06

Test Frequency :915 MHz Temp./Humi. :21.8/62

Test Mode :Tx Antenna Pol. :Horizontal

EUT Pol :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dΒμV/m	dB
110.833	Peak	40.71	-17.53	23.18	43.50	-20.32
403.077	Peak	33.06	-10.07	22.99	46.00	-23.01
580.289	Peak	30.94	-4.97	25.97	46.00	-20.03
755.946	Peak	30.07	-1.03	29.04	46.00	-16.96
886.523	Peak	29.92	1.27	31.18	46.00	-14.82
967.356	Peak	29.26	2.14	31.40	54.00	-22.60

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Report Number Test Site :SAC C :TERF2204000414E2

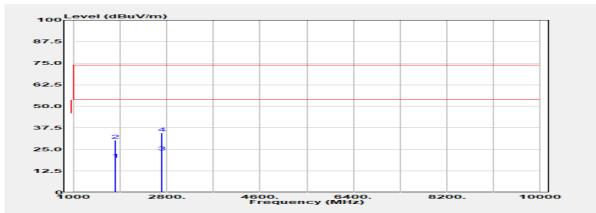
Operation Mode :RFID **Test Date** :2022-07-06

Test Frequency :902.75 MHz Temp./Humi. :21.8/62

Test Mode Antenna Pol. :Vertical :Tx

EUT Pol :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



		_				
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
•	Mode	Reading Level		FS	@3m	J
		•			_	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
		•			•	,
1805.500	Average	19.37	0.03	19.40	54.00	-34.60
	•					
1805.500	Peak	30.31	0.03	30.35	74.00	-43.65
2708.250	Average	20.22	3.40	23.62	54.00	-30.38
	Average	=		20.02		
2708.250	Peak	31.16	3.40	34.56	74.00	-39.44

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Report Number :TERF2204000414E2 Test Site :SAC C

Operation Mode :RFID Test Date :2022-07-06

Test Frequency :902.75 MHz Temp./Humi. :21.8/62

1001 Frequency 1002.70 WHZ 101119.71 drills 1.21.0702

Test Mode :Tx Antenna Pol. :Horizontal

EUT Pol :H Plane Engineer :Andy Wang

Ant :1037D10A021213 Note :



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
1805.500	Average	20.69	0.03	20.72	54.00	-33.28
1805.500	Peak	31.36	0.03	31.40	74.00	-42.60
2708.250	Average	21.07	3.40	24.47	54.00	-29.53
2708.250	Peak	32.29	3.40	35.69	74.00	-38.31

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Report Number Test Site :SAC C :TERF2204000414E2

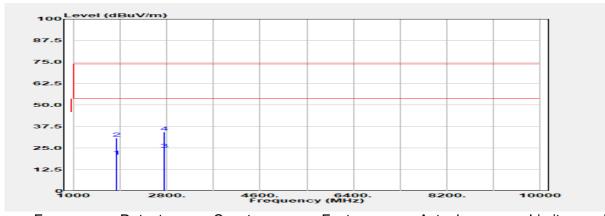
Operation Mode :RFID **Test Date** :2022-07-06

Test Frequency :915 MHz Temp./Humi. :21.8/62

Test Mode :Tx Antenna Pol. :Vertical

EUT Pol :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
1830.000	Average	20.26	0.10	20.36	54.00	-33.64
1830.000	Peak	30.62	0.10	30.73	74.00	-43.27
2745.000	Average	21.07	3.23	24.30	54.00	-29.70
2745.000	Peak	30.99	3.23	34.22	74.00	-39.78

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Report Number Test Site :SAC C :TERF2204000414E2

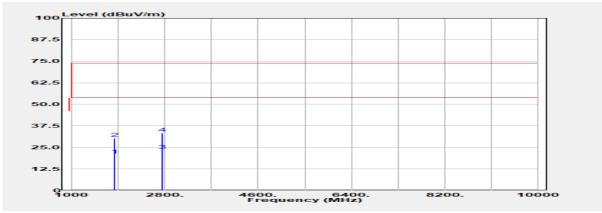
Operation Mode :RFID **Test Date** :2022-07-06

Test Frequency :915 MHz Temp./Humi. :21.8/62

Test Mode Antenna Pol. :Horizontal :Tx

EUT Pol :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



	Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	MHz	Mode PK/QP/AV	Reading Level dBuV	dB	FS dBµV/m	@3m dBµV/m	dB
-		114 (21 77 (4	<u>αυμι</u>		αυμ ν/	<u> </u>	
	1830.000	Average	20.34	0.10	20.44	54.00	-33.56
	1830.000	Peak	30.18	0.10	30.28	74.00	-43.72
	2745.000	Average	20.11	3.23	23.34	54.00	-30.66
	2745.000	Peak	30.11	3.23	33.34	74.00	-40.66

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Report Number Test Site :SAC C :TERF2204000414E2

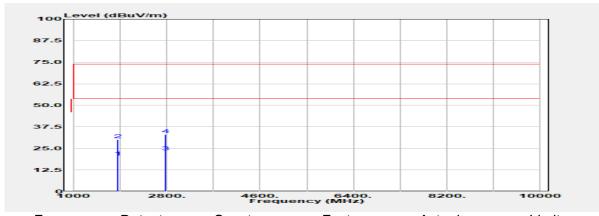
Operation Mode :RFID **Test Date** :2022-07-06

Test Frequency :927.25 MHz Temp./Humi. :21.8/62

Test Mode Antenna Pol. :Vertical :Tx

EUT Pol :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
1854.500	Average	19.76	0.20	19.96	54.00	-34.04
1854.500	Peak	29.83	0.20	30.03	74.00	-43.97
2781.750	Average	19.43	3.67	23.10	54.00	-30.90
2781.750	Peak	29.37	3.67	33.04	74.00	-40.96

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Report Number Test Site :SAC C :TERF2204000414E2

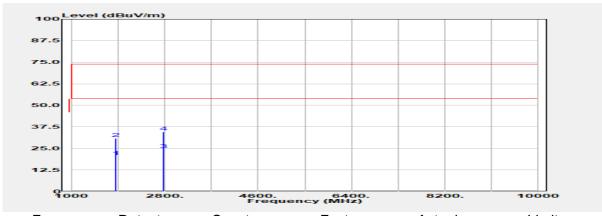
Operation Mode :RFID **Test Date** :2022-07-06

Test Frequency :927.25 MHz Temp./Humi. :21.8/62

Test Mode Antenna Pol. :Horizontal :Tx

EUT Pol :H Plane :Andy Wang Engineer

Ant :1037D10A021213 Note



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
•	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
1854.500	Average	20.11	0.20	20.31	54.00	-33.69
1854.500	Peak	30.56	0.20	30.77	74.00	-43.23
2781.750	Average	20.53	3.67	24.20	54.00	-29.80
2781.750	Peak	30.91	3.67	34.58	74.00	-39.42

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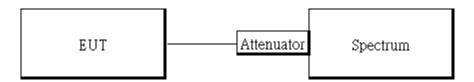
10 EMISSION BANDWIDTH

10.1 Applicable Standard

§2.1049 (h) & 15.215(c)

Intentional radiators operating under the alternative provisions to the general emis-(c) sion limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

10.1 **Test Setup**



10.2 **Measurement Procedure**

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- Set the spectrum analyzer as

RBW=1% of the approximate emission bandwidth,

VBW = 3 times RBW.

Span= 2 to 5 times of the OBW.

Sweep=auto

Detector = Peak, and Max hold

Turn on the -20 dB Bandwidth function, max reading.

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10.3 **Measurement Results:**

Main

UHF RFID

Frequency (MHz)	20dB				
	BW				
(IVIF12)	(MHz)				
902.75	0.2531				
915	0.2529				
927.25	0.2534				

Aux

Frequency (MHz)	20dB BW (MHz)
902.75	0.2529
915	0.2531
927.25	0.2531

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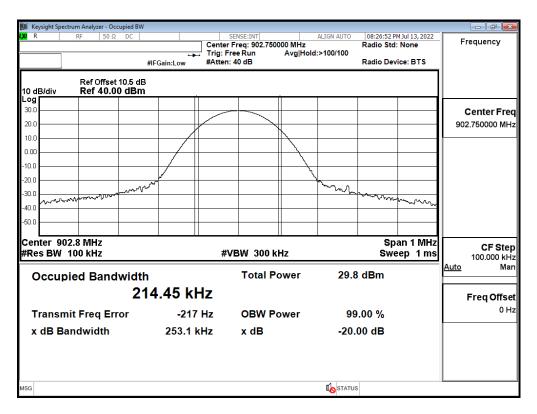


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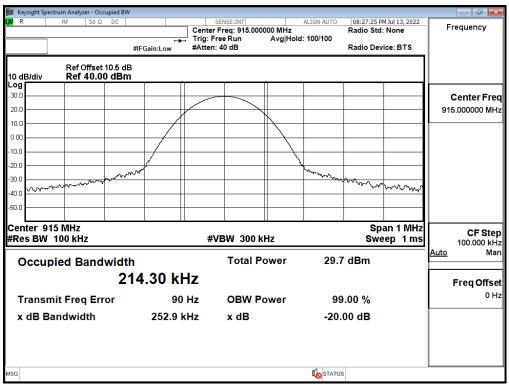


Main

CH Low



CH Mid



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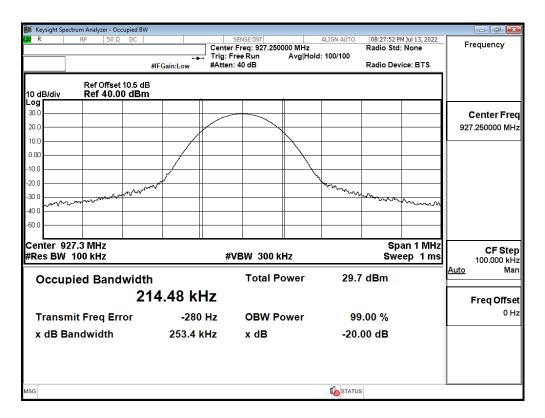
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CH High



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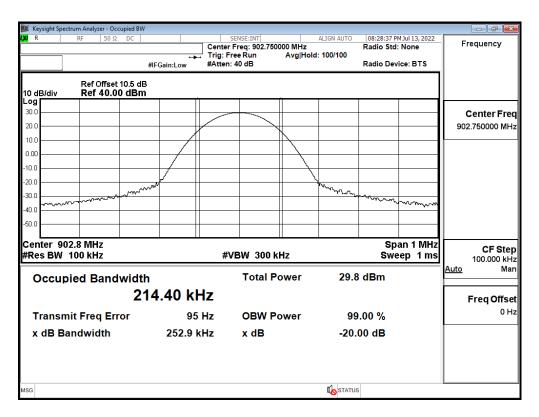


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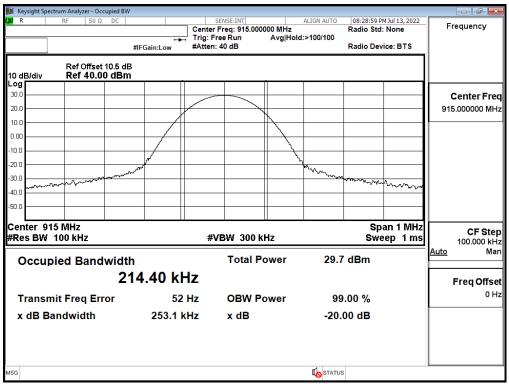


Aux

CH Low



CH Mid



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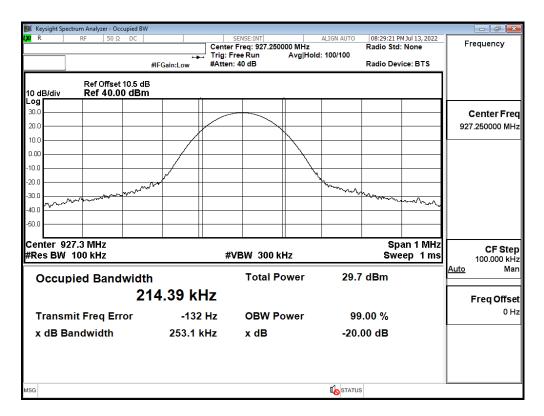
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CH High



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ANTENNA REQUIREMENT

8.1 Standard Applicable:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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 manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

8.2 Antenna Connected Construction:

The antenna complies with this requirement and no consideration of replacement. Please see EUT photo for details.

~ End of Report ~

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