

**Advanced
Compliance Laboratory**

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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

of

MINI MM PATIENT /ASSET TAG
MODEL: ITD/U-7623E/H,ITD/U-7622E/H,ITD/U-766E/H
FCC ID: ST2-ITD766 IC:6012A-ITD766

05/14/2021

This report concerns (check one): Original grant ☒ Class II change ☐
Equipment type: Low Power Intentional Radiator

Test Specifications:

☐ FCC Part 15C Sec. 15.249

☐ Industry Canada RSS-210 (Issue 8) & RSS-Gen (Issue 3)

Deferred grant requested per 47 CF 0.457(d)(1)(ii)? yes ☐ no ☒

If yes, defer until: _____ (date)

Company agrees to notify the Commission by _____ (date)
of the intended date of announcement of the product so that the grant can be
issued on that date.

Report prepared for:

CENTRAK, INC.

Report prepared by:

Advanced Compliance Lab

Report number:

0048-210430-01



Lab Code: 200101

The test result in this report IS supported and covered by the NVLAP accreditation

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1. GENERAL INFORMATION

1.1 Verification of Compliance

EUT: MINI MM PATIENT /ASSET TAG
Model: ITD/U-7623E/H,ITD/U-7622E/H,ITD/U-766E/H
(all models are electrical identical)*

Applicant: CENTRAK, INC.
826 Yardley-Newtown Road
Newtown, PA 18940, USA

Manufacturer: CENTRAK, INC.

Test Type: FCC Part 15.249 & 15.209
IC RSS-210 (Issue 9) A2.9 & RSS-Gen (Issue 5)

Result: PASS

Tested by: ADVANCED COMPLIANCE LABORATORY

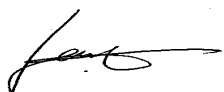
Test Complete Date: 05/14/2021

Report Number: 0048-210430-01

The above equipment was tested by Compliance Laboratory, Advanced Technologies, Inc. for compliance with the requirement set forth in the FCC rules and regulations Part 15 subpart C & IC RSS-210/RSS-Gen. This said equipment in the configuration described in the report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

	Prob. Dist.	Uncertainty(dB)	Uncertainty(dB)	Uncertainty(dB)
		30-1000MHz	1-6.5GHz	Conducted
Combined Std. Uncertainty u_c	norm.	± 2.36	± 2.99	± 1.83



Wei Li
Lab Manager
Advanced Compliance Lab

Date 05/14/2021

EUT name: Mini MM Patient /Asset Tag Model No. ITD/U-7623E/H,ITD/U-7622E/H,ITD/U-766E/H
FCC ID: ST2-ITD766, IC:6012A-ITD766

* For model number details (all electronic indential):

3 General models for FCC approval: ITD/U-7623E/H, ITD/U-7622E/H, ITD/U-766E/H

12model listing for IC approval:

1. ITD-7622E
2. ITD-7622E H
3. ITDU-7622E
4. ITDU-7622E H
5. ITD-7623E
6. ITD-7623E H
7. ITDU-7623E
8. ITDU-7623E H
9. ITD-766E
10. ITD-766E H
11. ITDU-766E
12. ITDU-766E H

1.2 Equipment Modifications

N/A

1.3 Product Information

System Configuration

ITEM	DESCRIPTION	FCC/IC ID	CABLE
Product	MINI MM PATIENT /ASSET TAG ITD/U-7623E/H,ITD/U-7622E/H,ITD/U-766E/H (1)	ST2-ITD766 6012A-ITD766	
Housing	PLASTICS		
Power Supply	3V DC Battery		
Operation Freq.	904MHz ~ 926MHz		

(1) EUT submitted for grant. It also contains certified WiFi module (TI, CC3120MOD with FCC ID: Z64-C03120MOD IC: 451I-CC3120MOD) and BLE chip (TI, CC1352R, under the same Centrak FCC/IC ID application). All transmitters are not operated simultaneously.

1.4 Test Methodology

Radiated tests were performed according to the procedures in ANSI C63.4-2014 at an antenna to EUT distance of 3 meters.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated and conducted data are located at Hillsborough, New Jersey, USA. This site is accepted by FCC to perform measurements under Part 15 or 18 (US5347) and also designated by IC as “ **site IC 3130A**”. ACL is recognized by ISED as a wireless testing laboratory (CAB ID: US0100) . The NVLAP Lab code for accreditation of FCC EMC Test Method is: 200101-0.

1.6 Test Equipment

Manufacture	Model	Serial No.	Description	Cal Due dd/mm/yy
Hewlett-Packard	HP8546A	3448A00290	EMI Receiver	25/09/21
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	12/11/21
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	13/11/21
Electro-Meterics	ALR-25M/30	289	10KHz-30MHz Active Loop Antenna	28/05/21
COM-POWER	L1215A	191994	Line Impedance Stabilization Networks	24/03/22
Fischer Custom	LISN-2	900-4-0009	Line Impedance Stabilization Networks	18/03/22
EMCO	3115	4945	Double Ridge Guide Horn Antenna	28/11/21
Agilent	E4440A	US40420700	PSA Spectrum Analyzer	17/06/21

All Test Equipment Used are Calibrated Traceable to NIST Standards. Calibration interval: 2 year.

1.7 Statement for the Document Use

This report shall not be reproduced except in full, without the written approval of the laboratory. And this report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. & Canada Government.

2. PRODUCT LABELING

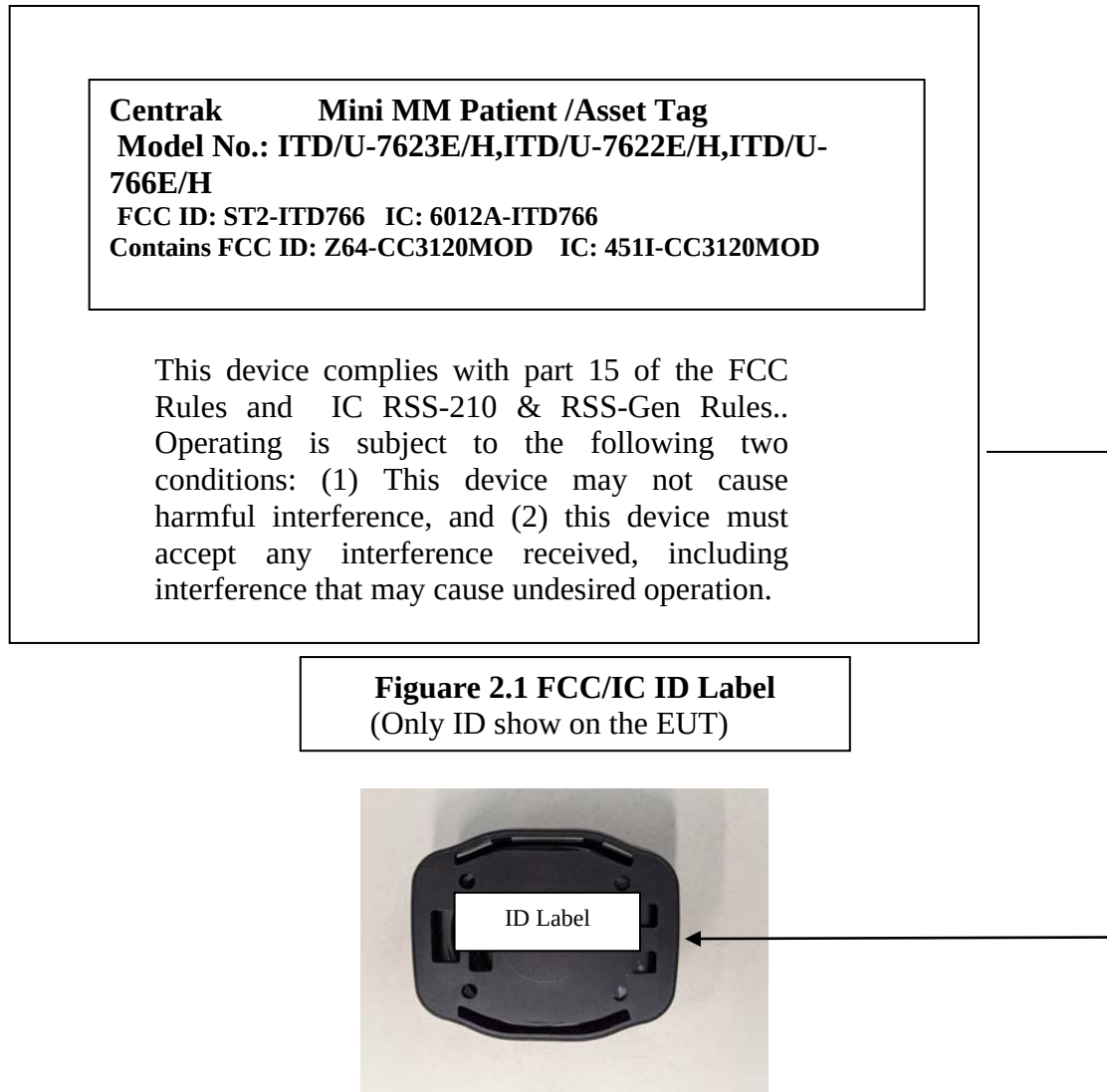


Figure 2.2 Location of the Label

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). Customized antenna on PCB was used.

Testing was performed as EUT was continuously operated at the following frequency channels: Low=904MHz, Middle= 915MHz, High=926MHz.

Fresh external battery was used for extended operating time. However, EUT was checked with the internal battery and it was confirmed that the readings obtained with the fresh external battery remain representative of the device as marketed.

3.2 Special Accessories

N/A

3.3 Configuration of Tested System

The following figure(s) illustrate this system, which is tested standing along.

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Figure 3.1 Radiated Test Setup

4. SYSTEM SCHEMATICS

See Attachment.

Figure 4.1 System Schematics

5. RADIATED EMISSION DATA

5.1 Field Strength Calculation

The corrected field strength is automatically calculated by EMI Receiver using following:

$$FS = RA + AF + CF + AG$$

where FS: Corrected Field Strength in dB μ V/m

RA: Amplitude of EMI Receiver before correction in dB μ V

AF: Antenna Factor in dB/m

CF: Cable Attenuation Factor in dB

AG: Built-in Preamplifier Gain in dB (Stored in receiver as part of the calibration data)

THE "DUTY CYCLE CORRECTION FACTOR" FOR SPURIOUS RADIATED EMISSIONS IS;
 $20 \log * (4 \text{ ms} / 100 \text{ ms}) = -28 \text{ dB}$, WHICH WAS USED TO CORRECT THE AVERAGE RADIATED EMISSION READINGS.

5.2 Test Methods and Conditions

The initial step in collecting radiated data is a EMI Receiver scan of the measurement range below 30MHz using peak detector and 9KHz IF bandwidth / 30KHz video bandwidth. For the range 30MHz - 1GHz, 100KHz IF bandwidth / 100KHz video bandwidth are used. Both bandwidths are 1MHz for above 1GHz measurement. The frequency range from 9KHz up to 10th harmonics were investigated.

5.3 Test Data

The following data lists the significant emission frequencies, polarity and position, peak reading of the EMI Receiver, the FCC limit, and the difference between the peak reading and the limit. Explanation of the correction and calculation are given in section 5.1.

Test Personnel: 

Typed/Printed Name: David Tu

Date: 05/14/2021

Radiated Test Data (CH-904MHz/915MHz/926MHz)

Frequency (MHz)	Polarity (V,H) Position (X)	Antenna Height (m)	Azimuth (Degree)	Peak /QP Reading at 3m (2) (dBuV/m)	FCC/IC 3m Peak Limit (3) (dBuV/m)	Difference To Peak Limit (dBuV/m)	Average Reading with Correction (>1GHz) (dBuV/m)	FCC/IC 3m QP/Average Limit (1) (dBuV/m)	Difference To AVG Limit (dBuV/m)
904	V	1.1	180	83.56				94	-10.44
1808	V	1.1	90	47.90	74	-26.10	19.90	54	-34.1
2712	V	1.1	000	46.26	74	-27.74	18.26	54	-35.74
904	H	1.0	090	80.40				94	-13.6
1808	H	1.0	270	48.59	74	-25.71	20.59	54	-33.41
2712	H	1.0	000	45.96	74	-28.04	17.96	54	-36.04
915	V	1.1	180	84.42				94	-9.58
1830	V	1.1	000	46.76	74	-27.24	18.76	54	-35.24
2745	V	1.1	270	44.81	74	-29.19	16.81	54	-37.19
915	H	1.0	090	80.73				94	-13.27
1830	H	1.1	090	46.60	74	-27.40	18.60	54	-35.40
2745	H	1.1	000	46.17	74	-27.84	18.71	54	-35.29
926	V	1.1	180	85.69				94	-8.31
1852	V	1.1	000	47.72	74	-26.28	19.72	54	-34.28
2778	V	1.1	270	45.83	74	-28.17	17.83	54	-36.17
926	H	1.0	090	80.35				94	-13.65
1852	H	1.1	270	44.70	74	-29.30	16.70	54	-37.30
2778	H	1.1	090	45.06	74	-28.94	17.60	54	-36.40

(1) The limit for emissions within the 902-928MHz band is 50mV(94dB) per FCC Sec. 15.249 & IC RSS-210 Annex 2.9. The limit for its harmonics is 500uV (54dB). Other spurious emissions shall be lower than either its fundamental by 50dB or the limit defined in Sec. 15.209, whichever is higher.

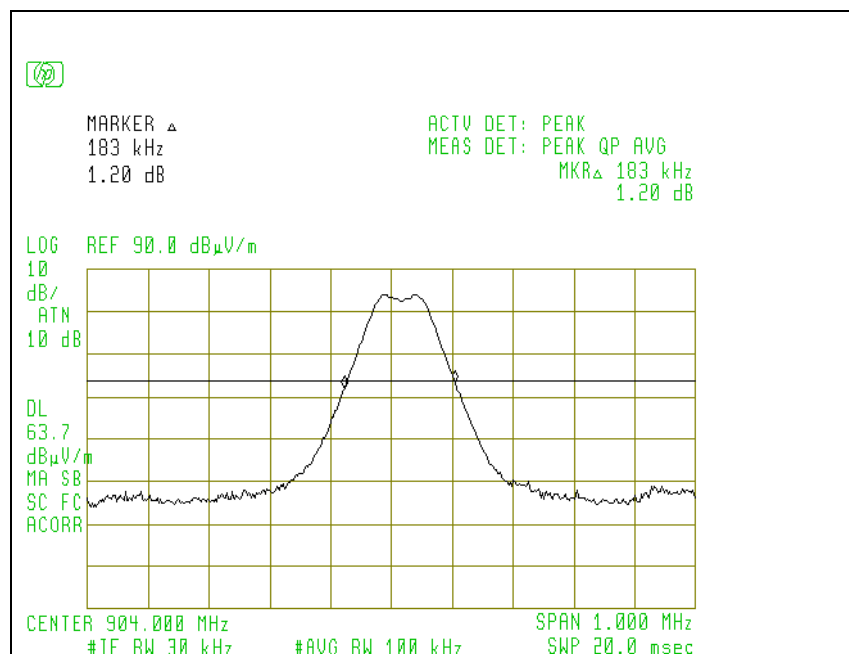
(2) If the peak reading is less than the FCC/IC quasi-peak or average limit, it'll be not necessary to show the measured/ calculated quasi-peak or average reading.

(3) For above 1GHz range, peak reading shall meet the limit: average Limit+20dB.

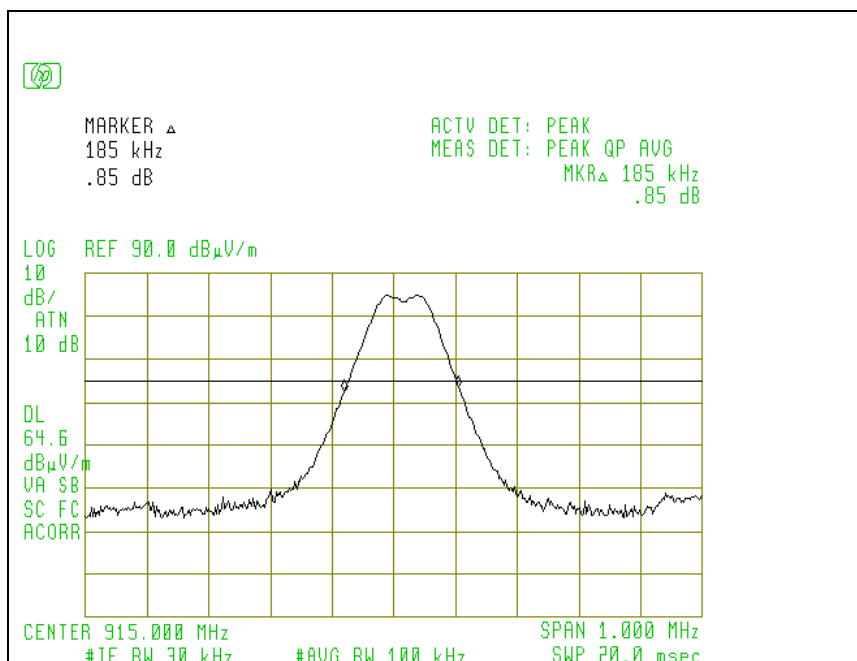
Other Spurious outside of the band 902-928MHz

Frequency (MHz)	Polarity (V,H)	Antenna Height (m)	Peak Reading at 3m (2) (dBuV/m)	FCC/IC 3m Limit (1) (dBuV/m)	Difference (dBuV/m)
49.6	H	1.8	32.3	39.1	-6.8
139.7	H	1.8	35.7	43.5	-7.8
144.8	H	1.8	36.7	43.5	-6.8
163	H	1.8	37.3	43.5	-6.2
194.5	H	1.8	36.3	43.5	-7.2
224	H	1.0	26.9	46.4	-19.5
240	H	1.0	22.8	46.4	-23.6
286	H	1.0	24.6	46.4	-21.8
312	H	1.0	26	46.4	-20.4
320	H	1.1	24.4	46.4	-22
36.4	H	1.1	32.6	39.1	-6.5
141.8	V	1.1	34.4	43.5	-9.1
148.2	V	1.1	35.8	43.5	-7.7
163.6	V	1.1	36.3	43.5	-7.2
198.3	V	1.1	36.2	43.5	-7.3
220	V	1.1	25.9	46.4	-20.5
278	V	1.1	24.3	46.4	-22.1
356	V	1.1	25.1	46.4	-21.3
430	V	1.1	26.3	46.4	-20.1
464	V	1.1	26.5	46.4	-19.9

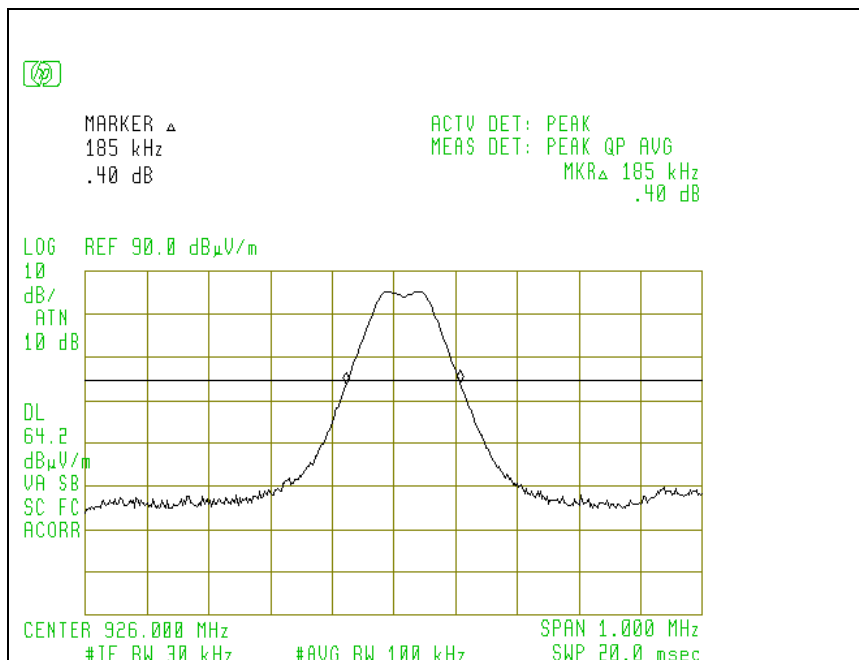
Comparing to the limit defined in FCC Sec. 15.209/IC RSS-Gen, emissions below the limit by 20dB were not recorded.



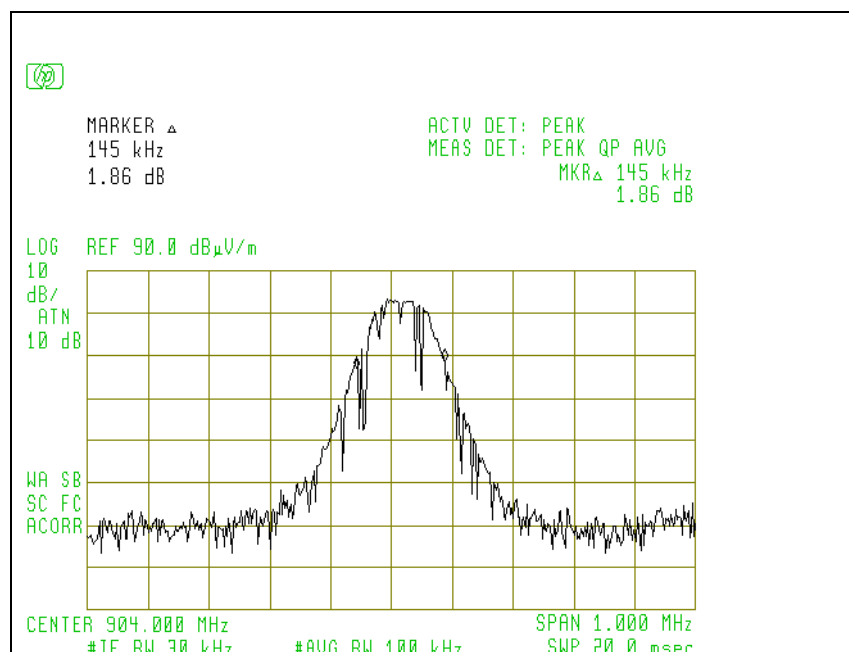
20dB Bandwidth 904 MHz Plot



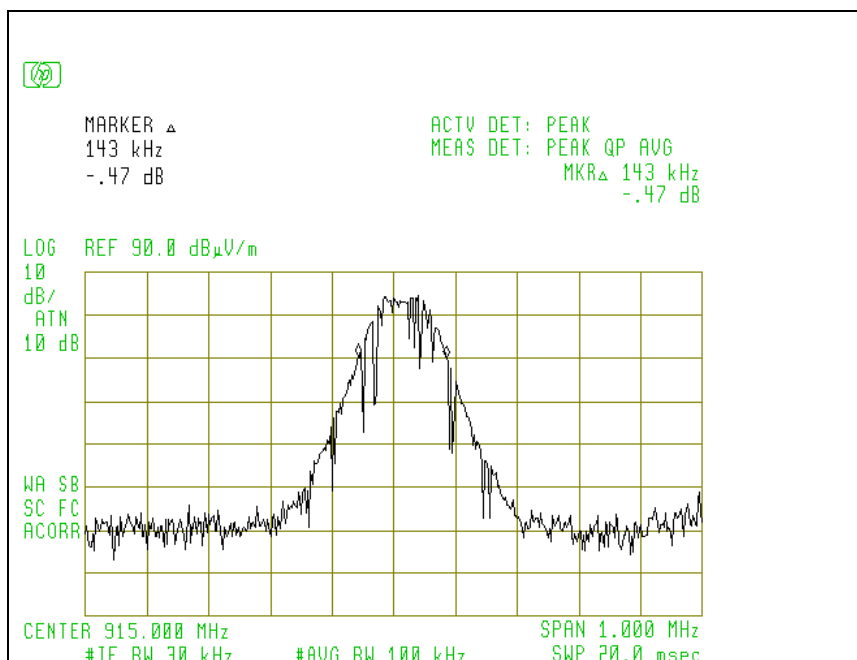
20dB Bandwidth 915 MHz Plot



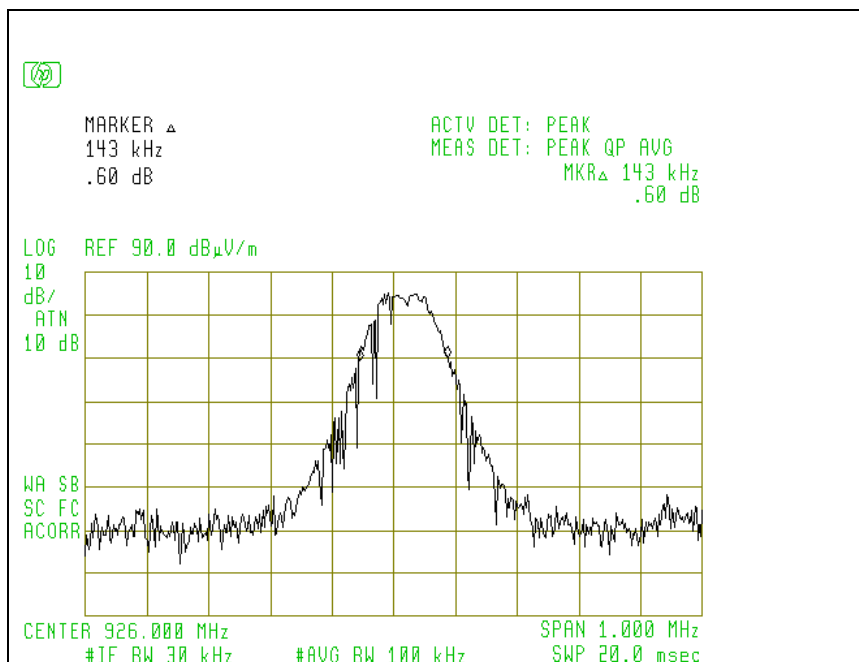
20dB Bandwidth 926 MHz Plot



99% Bandwidth 904 MHz Plot



99% Bandwidth 915 MHz Plot



99% Bandwidth 926 MHz Plot

6. EUT RECEIVING MODE VERIFICATION

Radiated Test Data for Receiving Mode (915MHz)

Frequency (MHz)	Polarity (V,H) Position	Antenna Height (m)	Peak Reading at 3m (2) (dBuV/m)	FCC/IC 3m Limit (1) (dBuV/m)	Difference (dBuV/m)
40.6	H	1.8	34.4	40	-5.6
145.6	H	1.8	36.3	43.5	-7.2
155.0	H	1.8	36.8	43.5	-6.7
161.8	H	1.8	36.6	43.5	-6.9
197.9	H	1.8	36.6	43.5	-6.9
700	H	1.0	38	46.5	-8.5
766	H	1.0	39.3	46.5	-7.2
874	H	1.0	40.8	46.5	-5.7
900	H	1.0	41.2	46.5	-5.3
2720	H	1.1	47	54.0	-7
2864	H	1.1	47.3	54.0	-6.7
33.8	V	1.1	33	40	-7
39.4	V	1.1	33.6	40	-6.4
152.0	V	1.1	36.6	43.5	-6.9
240	V	1.1	30.8	46.5	-15.7
464	V	1.1	34.9	46.5	-11.6
600	V	1.1	37.7	46.5	-8.8
700	V	1.1	38	46.5	-8.5
750	V	1.1	39.4	46.5	-7.1
900	V	1.1	41.5	46.5	-5
2784	V	1.1	47	54.0	-7
2820	V	1.1	47.3	54.0	-6.7

- (1) Receiving mode spurious emissions shall be lower than the limit defined in FCC Sec. 15.209 & IC RSS-GEN.
(2) If the peak reading is less than the FCC/IC quasi-peak or average limit, it'll be not necessary to show the measured/ calculated quasi-peak or average reading.