

**Advanced
Compliance Laboratory**

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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT
of

NEWMOM TAG
MODEL: IT-724E
FCC ID: ST2-IT724E IC:6012A-IT724E

August 20, 2019

This report concerns (check one): Original grant <input checked="" type="checkbox"/> Class II change <input type="checkbox"/>	
Equipment type: <u>Low Power Intentional Radiator</u>	
Test Specifications: <input type="checkbox"/> FCC Part 15C Sec. 15.249 <input type="checkbox"/> Industry Canada RSS-210 (Issue 8) & RSS-Gen (Issue 3)	
Deferred grant requested per 47 CF 0.457(d)(1)(ii)? yes <input type="checkbox"/> no <input checked="" type="checkbox"/>	
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:	0048-190606-01



Lab Code: 200101

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

Table of Contents

Report Cover Page	1
Table of Contents	2
Figures.....	3
1. GENERAL INFORMATION	4
1.1 Verification of Compliance	4
1.2 Equipment Modifications.....	5
1.3 Product Information	6
1.4 Test Methodology.....	6
1.5 Test Facility	6
1.6 Test Equipment	6
1.7 Statement for the Document Use	7
2. PRODUCT LABELING.....	8
3. SYSTEM TEST CONFIGURATION.....	9
3.1 Justification	9
3.2 Special Accessories.....	9
3.3 Configuration of Tested System	9
4. SYSTEM SCHEMATICS	13
5. RADIATED EMISSION DATA	14
5.1 Field Strength Calculation	14
5.2 Test Methods and Conditions	14
5.3 Test Data	14
6. EUT RECEIVING MODE VERIFICATION.....	22
7. PHOTOS OF TESTED EUT	23

Figures

Figure 2.1 FCC/IC ID Label	8
Figure 2.2 Location of Label	8
Figure 3.1 Radiated Test Setup.....	12
Figure 4.1 EUT Schematics	13
Figure 7.1 Front View	24
Figure 7.2 Back View	25
Figure 7.3 PCB Component Side View	26
Figure 7.4 PCB Foil Side View.....	27

1. GENERAL INFORMATION

1.1 Verification of Compliance

EUT: NEWMOM TAG

Model: IT-724E
 (all models are electrical identical)

Applicant: 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

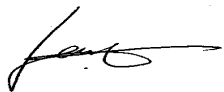
Test Complete Date: August 20, 2019

Report Number: 0048-190606-01

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. 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 August 20, 2019

1.2 Equipment Modifications

N/A

1.3 Product Information

System Configuration

ITEM	DESCRIPTION	FCC/IC ID	CABLE
Product	NEWMOM TAG IT-724E ⁽¹⁾	ST2-IT724E 6012A-IT724E	
Housing	PLASTICS		
Power Supply	3V DC Battery		
Operation Freq.	904MHz ~ 926MHz, 125KHz		
Receiver	IT-724(RX)	Verification	

(1) EUT submitted for grant.

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 3130**”. 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	25/09/19
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	12/11/19
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	13/11/19
Electro-Meterics	ALR-25M/30	289	10KHz-30MHz Active Loop Antenna	28/05/20
COM-POWER	L1215A	191994	Line Impedance Stabilization Networks	24/03/20
Fischer Custom	LISN-2	900-4-0009	Line Impedance Stabilization Networks	18/03/20
EMCO	3115	4945	Double Ridge Guide Horn Antenna	28/11/19
Agilent	E4440A	US40420700	PSA Spectrum Analyzer	17/06/20

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

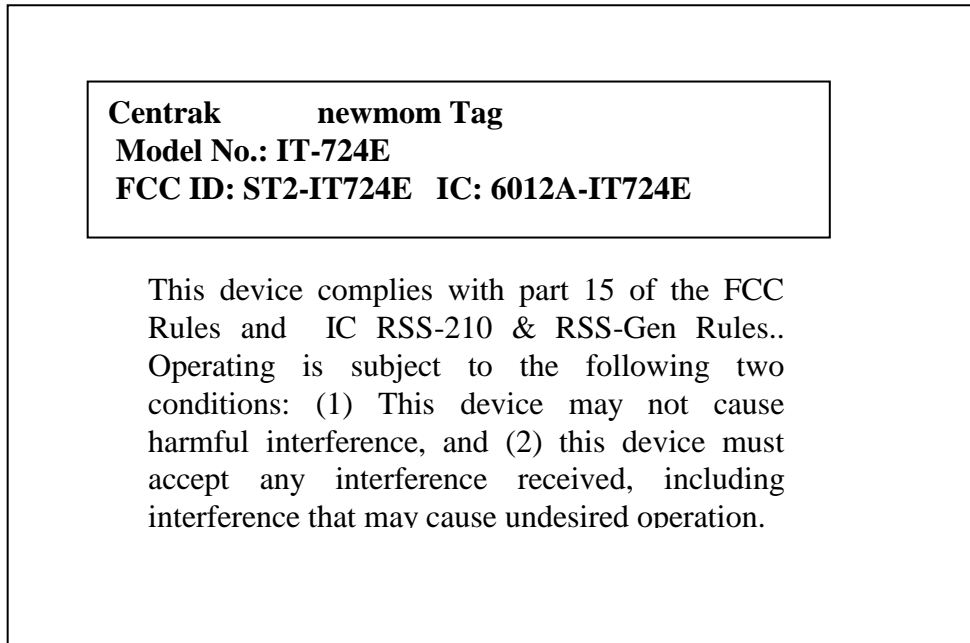


Figure 2.1 FCC/IC ID Label
(Only ID show on the EUT)



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.

Low Frequency channel=125KHz

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.

EUT name: newmom TAG

Model No. IT-724E
FCC ID: ST2-IT724E, IC:6012A-IT724E







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: Edward Lee

Date: August 20, 2019

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

Frequency (MHz)	Polarity (V,H) Position (X,Y,Z)	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/X	1.1	270	81.2				94	-12.8
1808	V/X	1.1	180	47.2	74	-26.8	19.2	54	
2712	V/X	1.1	270	47.8	74	-26.2	19.8	54	
904	H/X	1.1	270	90.2				94	-3.8
1808	H/X	1.0	270	49.8	74	-24.2	21.8	54	
2712	H/X	1.0	330	45.3	74	-28.7	17.3	54	
915	V/X	1.1	090	79.2				94	-14.8
1830	V/X	1.1	180	47.1	74	-26.9	19.1	54	
2745	V/X	1.1	270	46.4	74	-27.6	18.4	54	
915	H/X	1.0	090	86.7				94	-7.3
1828	H/X	1.1	270	49.4	74	-24.6	21.4	54	
2745	H/X	1.1	330	44.7	74	-29.3	16.7	54	
926	V/X	1.1	045	79.3				94	-14.7
1852	V/X	1.1	180	46.4	74	-27.6	18.4	54	
2778	V/X	1.1	270	44.8	74	-29.2	16.8	54	
926	H/X	1.0	000	85.9				94	-8.1
1852	H/X	1.1	270	48.4	74	-25.6	20.4	54	
2778	H/X	1.1	330	43.4	74	-30.6	15.4	54	
904	V/Y	1.1	180	90.6				94	-3.4
1808	V/Y	1.1	000	52.0	74	-22.0	24.0	54	
2712	V/Y	1.1	000	46.5	74	-27.5	18.5	54	
904	H/Y	1.0	180	82.0				94	-12.0
1808	H/Y	1.1	000	45.9	74	-28.1	17.9	54	
2712	H/Y	1.1	000	43.8	74	-30.2	15.8	54	
915	V/Y	1.1	235	85.8				94	-8.2
1830	V/Y	1.1	000	51.5	74	-22.5	23.5	54	
2745	V/Y	1.1	000	45.0	74	-29.0	17.0	54	
915	H/Y	1.0	180	81.8				94	-12.2
1828	H/Y	1.1	000	45.3	74	-28.7	17.3	54	
2745	H/Y	1.1	000	43.6	74	-30.4	15.6	54	
926	V/Y	1.1	045	86.8				94	-7.2

1852	V/Y	1.1	000	52.2	74	-21.8	24.2	54	
2778	V/Y	1.1	270	44.3	74	-29.7	16.3	54	
926	H/Y	1.0	180	80.7				94	-13.3
1852	H/Y	1.1	090	44.2	74	-29.8	16.2	54	
2778	H/Y	1.1	000	43.1	74	-30.9	15.1	54	
904	V/Z	1.1	330	83.8				94	-10.2
1808	V/Z	1.1	180	46.3	74	-27.7	18.3	54	
2712	V/Z	1.1	270	47.5	74	-26.5	19.5	54	
904	H/Z	1.0	270	86.6				94	-7.4
1808	H/Z	1.1	000	51.6	74	-22.4	23.6	54	
2712	H/Z	1.1	000	46.3	74	-27.7	18.3	54	
915	V/Z	1.1	270	83.9				94	-10.1
1830	V/Z	1.1	180	47.0	74	-27.0	19.0	54	
2745	V/Z	1.1	270	46.5	74	-27.5	18.5	54	
915	H/Z	1.0	330	86.8				94	-7.2
1830	H/Z	1.1	000	52.0	74	-22.0	24.0	54	
2745	H/Z	1.1	180	46.4	74	-27.6	18.4	54	
926	V/Z	1.1	270	82.8				94	-11.2
1852	V/Z	1.1	180	47.5	74	-26.5	19.5	54	
2778	V/Z	1.1	270	44.3	74	-29.7	16.3	54	
926	H/Z	1.0	270	86.2				94	-7.8
1852	H/Z	1.1	000	50.7	74	-23.3	22.7	54	
2778	H/Z	1.1	000	45.0	74	-29.0	17.0	54	

(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.

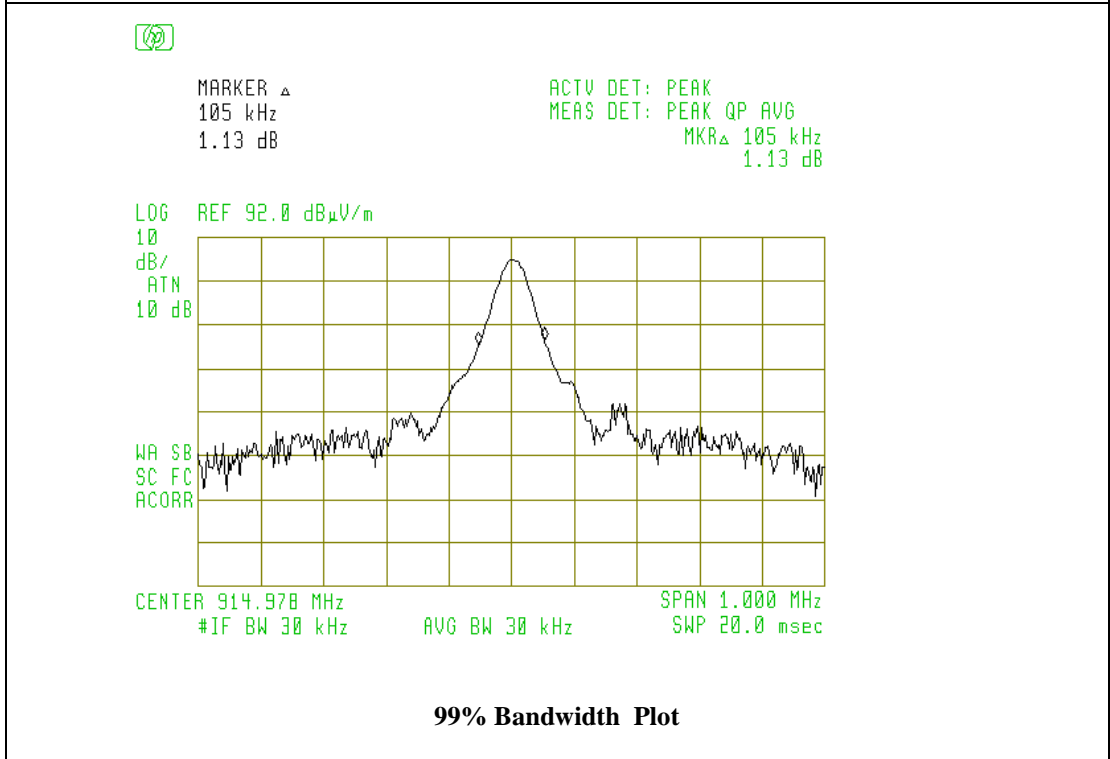
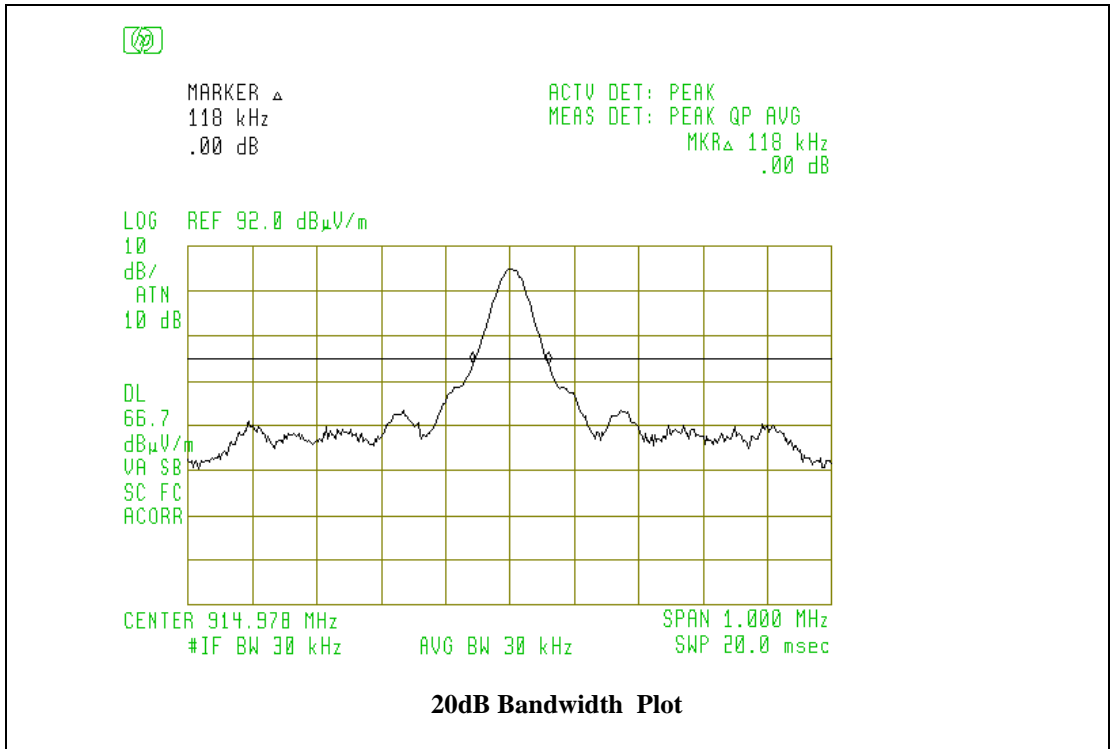
(2) If the peak reading is less than the FCC/IC quasi-peak or average limit, it'll be not necessary to show the measured/calculated quasi-peak or average reading.

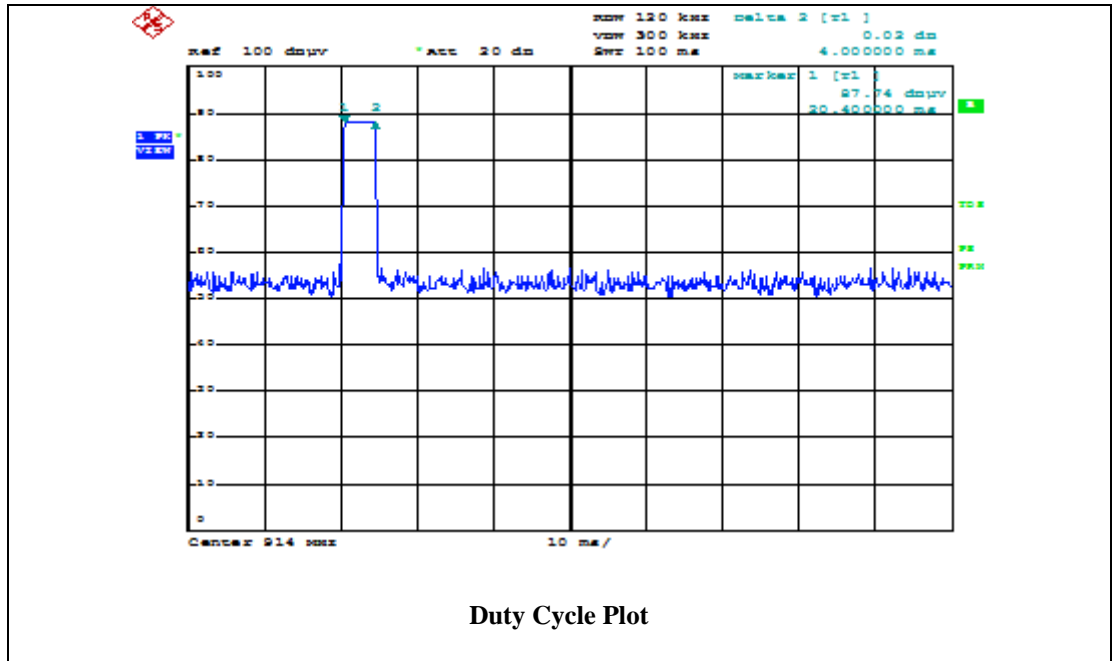
(3) For above 1GHz range, peak reading shall meet the limit: average Limit+20dB.

Other Spurious outside of the band 902-928MHz

Frequency (MHz)	Polarity (V,H) Position (X,Y,Z)	Antenna Height (m)	Azimuth (Degree)	Peak Reading at 3m (2) (dBuV/m)	Peak Reading After Correction (dBuV/m)	FCC/IC 3m Limit (1) (dBuV/m)	Difference (dBuV/m)
294	V/Y	1.1	220	31.9		46.5	-14.6
494	V/Y	1.1	090	36.4		46.5	-10.1
600	V/Y	1.1	160	37.2		46.5	-9.3
687	V/Y	1.1	220	39.5		46.5	-7.0
718	V/Y	1.0	180	39.4		46.5	-7.1
873	V/Y	1.0	100	40.9		46.5	-5.6
496	H/X	1.2	150	34.0		46.5	-12.5
640	H/X	1.0	180	35.6		46.5	-10.9
690	V/Y	1.1	220	37.0		46.5	-9.5
703	V/Y	1.0	180	38.7		46.5	-7.8
714	H/X	1.0	180	38.7		46.5	-7.8
894	H/X	1.1	120	40.4		46.5	-6.1

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





125KHz Transmission Radiated Test Data

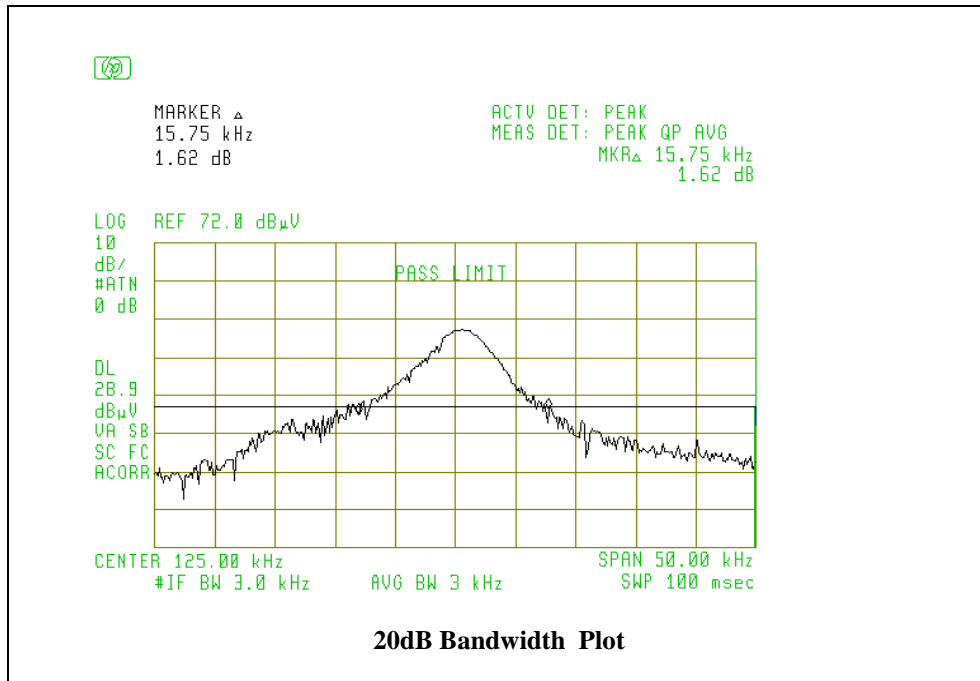
EUT is powered by fresh battery.

EUT at X Orientation as worst case:

Frequency (MHz)	Polarity (V,H) Position Z	Antenna Height (m)	Azimuth (Degree)	Peak Reading at 3m (2) (dBuV/m)	Reading After Correction (dBuV/m)	FCC Limit@ 3m (1) (dBuV/m)	Difference (dBuV/m)
0.125	Loop	1.0	020	62.3		105.6	-43.3
0.251	Loop	1.0	010	47.6		99.6	-52.0
0.376	Loop	1.0	020	45.1		73.7	-28.6
0.502	Loop	1.0	340	39.8		70.1	-30.3

- (1) The limit for emissions per Sec. 15.209 with distance correction factor (40dB/decade at f<30MHz).
- (2) If each peak reading is less than the FCC QP or average limit, it'll be not necessary to show the measured/ calculated QP or average reading (QP detector shall be used except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz, in which an average detector shall be employed).

20 dB Bandwidth at 125KHz =15.75KHz



99% Bandwidth at 125KHz = 18.75KHz

