



TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

## TEST REPORT

To:	<b>B.E.A. INC.</b>	To:	-
Attn:	Randy Wickman	Attn:	-
Address:	RIDC Park West, 100 Enterprise Drive, Pittsburgh, PA 15275	Address:	-
Fax:	18885232462	Fax:	-
E-mail:	<a href="mailto:rwickman@beainc.com">rwickman@beainc.com</a>	E-mail:	-
This document includes: 197 pages			
Factory name:	<b>Unidentified</b>	Offer:	BEA07NO13-01ETZHFP-R1
Location:	Unidentified	Sample No:	--
		Start date:	January 18, 2008
		Finish date:	January 25, 2008
		Test Requested:	FCC Part 15.231 Certification Procedure
		Test Method:	47 CFR Part 15 (10-1-05 Edition) ANSI C63.4 – 2003
		Re-testing:	NONE
<b>TD433 SERIES TRANSMITTERS, MODEL 10TD433HH4(Master), 10TD433HH, 10TD433HH2, 10TD433HH3, 10TD433PB3V &amp; 10TD433PB9V (FCC ID: G9B-10TD433)</b>		Test Result:	SEE PAGE 5 TO 18
<b>The results given in this report are related to the tested specimen of the described electrical apparatus.</b>			
<b>CONCLUSION: The submitted sample was found to comply with requirement of FCC Part 15.231 Subpart C.</b>			
Authorized Signature:			
Director of Operation: Patrick Wong			
Date: January 25, 2008			

**BUREAU VERITAS HONG KONG LIMITED –  
KWAI CHUNG OFFICE  
LCIE ELECTRICAL DIVISION  
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## TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

### Location of the test site

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003 (FCC Registration No.: 597719). A Semi-Anechoic Chamber Testing Site is set up for investigation and located at :

#### GUANGDONG ELECTRONIC & ELECTRICAL PRODUCTS INSPECTION AND SUPERVISION INSTITUTE

No.45 South St., Shayongnan Village, Sanyuanli  
Guangzhou City,  
Guangdong Province,  
China 51400

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2003 (FCC Registration No.: 597719). A shielded room is located at :

#### GUANGDONG ELECTRONIC & ELECTRICAL PRODUCTS INSPECTION AND SUPERVISION INSTITUTE

No.45 South St., Shayongnan Village, Sanyuanli  
Guangzhou City,  
Guangdong Province,  
China 51400

*The performed tests have been conducted by the above EMC testing locations and under supervision of a BVLCIE's engineer.*

### List of measuring equipment

For test frequency range: 30MHz to 1000MHz

Equipment	Manufacturer	Model No.	Serial No.	Cal. Due
EMI Receiver	R&S	ESIB7	100192	2008/03/29
Antenna	R&S	HL-562	100172	2008/08/14
RF Cable	R&S	/	/	2008/08/14
RF Cable	R&S	/	/	2008/08/14
RF Cable	R&S	/	/	2008/08/14
3m anechoic chamber	ETS	RFD-F-100	/	2008/08/14
Shielding Room	ETS	RFD-100	/	2008/05/24



## TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

For test frequency range: 1GHz to 7GHz

Equipment	Manufacturer	Model No.	Serial No.	Cal. Due
EMI Receiver	R&S	ESIB7	100192	2008/03/29
Antenna	Xibao	GH18H	061101#	2008/05/24
HF Cable	Xibao	/	/	2008/05/24
3m anechoic chamber	ETS	RFD-F-100	/	2008/05/24
Shielding Room	ETS	RFD-100	/	2008/05/24

### Sample Description and Final Test Mode Selection on Multiple Model

After the verification by witness on all EUT 10TD433HH4(Master), 10TD433HH, 10TD433HH2, 10TD433HH3, 10TD433PB3V &, 10TD433PB9V, and after checking the schematic found that they share the same schematic (Difference are found about its button, and externally or internally powered but not involved about the transmitter part (intentional radiator) being certified by this application). And per client info, all the transmitter part (intentional radiator) are identical

EUT 10TD433HH4(Master), 10TD433HH, 10TD433HH2, 10TD433HH3, 10TD433PB3V &, 10TD433PB9V are pre-scanned and the worst case is found on 10TD433HH4(Master), the following report shows only the result of the 10TD433HH4(Master).

All the exhibits regarding to this verification have been filed by this FCC application.



## TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

### Description of the radiated emission test

#### Test Procedure:

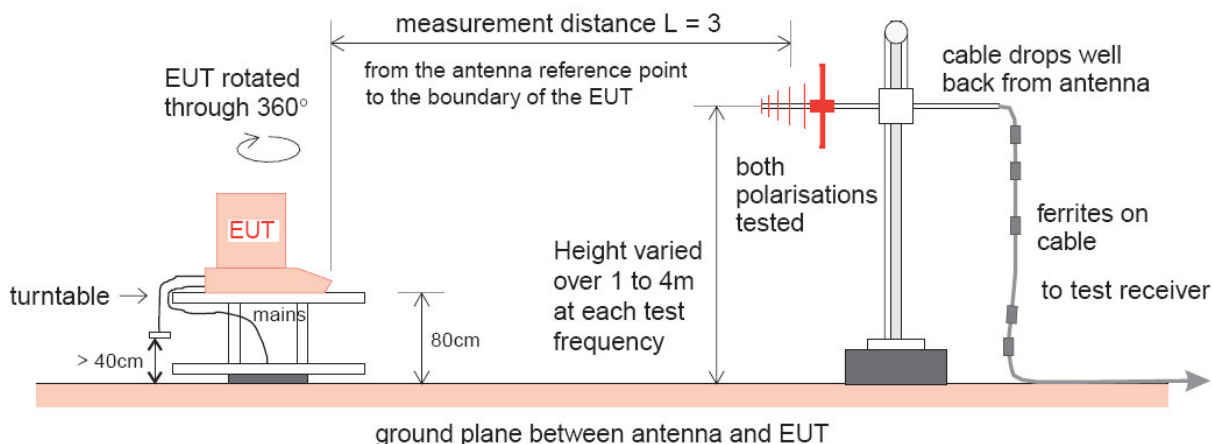
Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003 and found compliance with FCC Part 15.231(b).

The sample was placed 0.8m above the ground plane on a standard radiated emission test site. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.

The bandwidth of the EMI test receiver (R&S ESIB7) is set at 120kHz. Frequency range is from 30MHz to 1000 MHz. The bandwidth of the VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW 10Hz VBW for average emission above 1GHz

The frequency ranging from 30MHz to the 10th harmonics were checked.

#### Test Setup:



#### Test Setup and conditions:

The first button of the EUT was pressed to produce the highest emission.

Since the EUT is considered a portable unit, it was pre-tested on the positioned of each 3 axis.

Therefore only the test data of the worse case – X-axis was used for Radiated test.



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### Measurement Data:

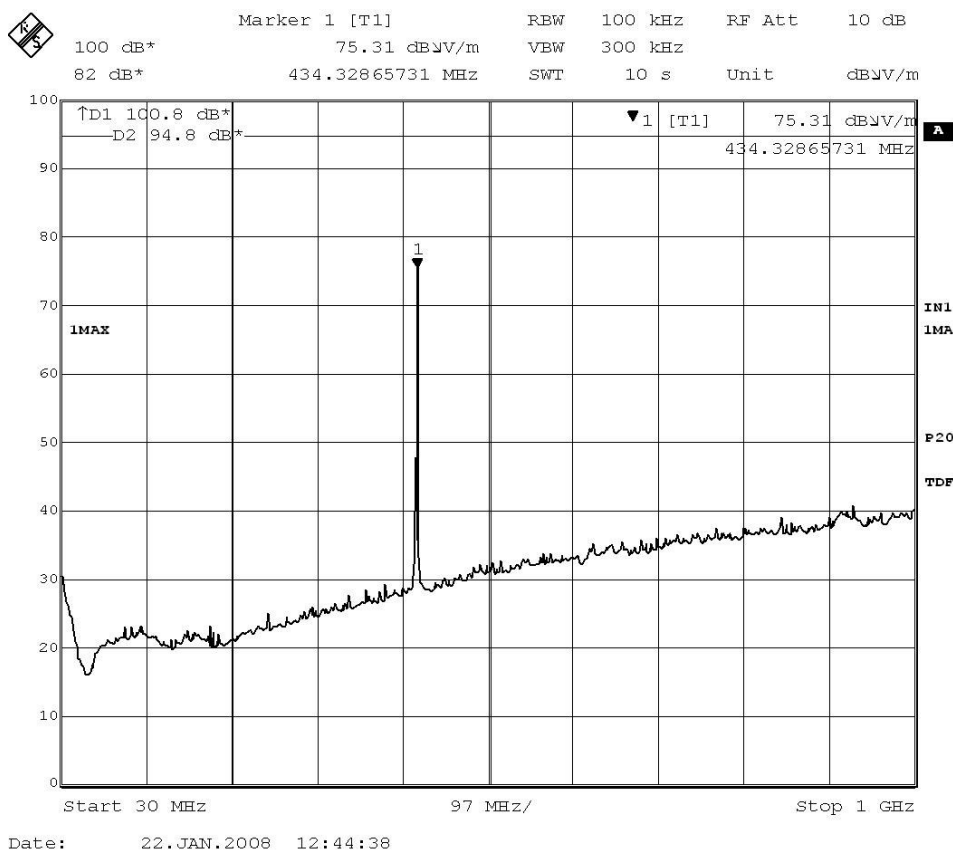
### Test Result:

All measurement data was indicated that the EUT meet the FCC 15.231 requirement.

### Fundamental Emissions

#### Vertical:

Field Strength of Fundamental Emissions				
Frequency MHz	Emission Level dB $\mu$ V/m	Limits dB $\mu$ V/m	Margin dB	Remark
434.33	75.31	100.80	-25.49	Peak



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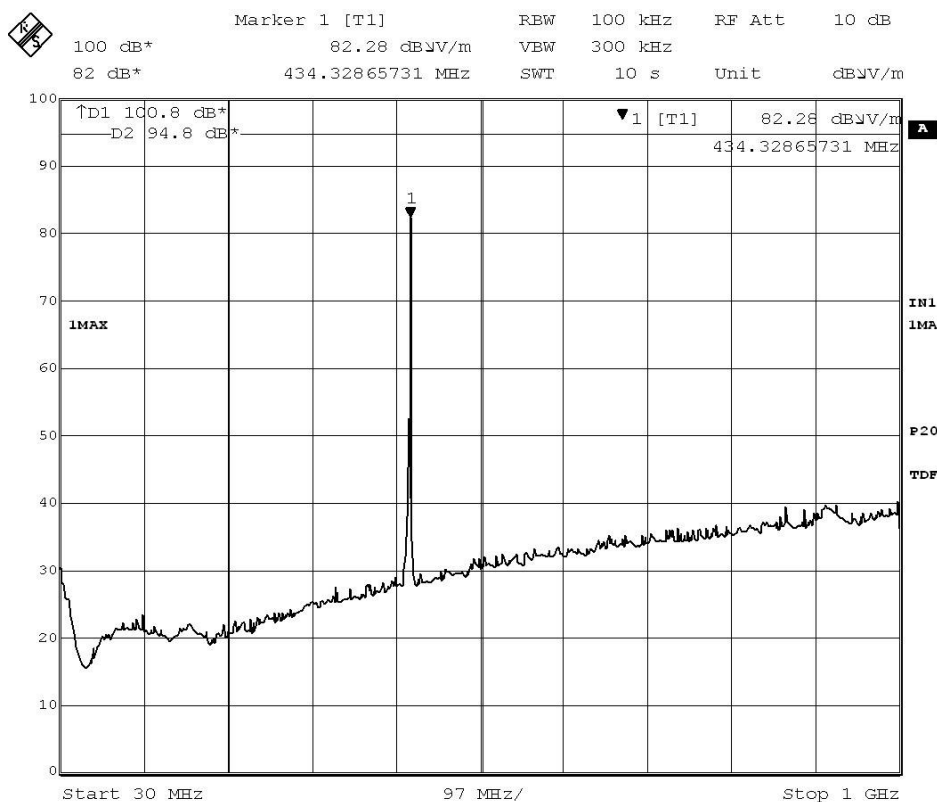
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## TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

### Horizontal:

Field Strength of Fundamental Emissions				
Frequency MHz	Emission Level dB $\mu$ V/m	Limits dB $\mu$ V/m	Margin dB	Remark
434.33	82.28	100.80	-18.52	Peak



Date: 22.JAN.2008 12:45:28

### Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty:  $\pm 3.7$ dB

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# TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

## Fundamental Emission (QP)

Vertical:

Field Strength of Fundamental Emissions				
Frequency MHz	Emission Level dB $\mu$ V/m	Limits dB $\mu$ V/m	Margin dB	Remark
434.08	53.10	80.80	-27.70	QP



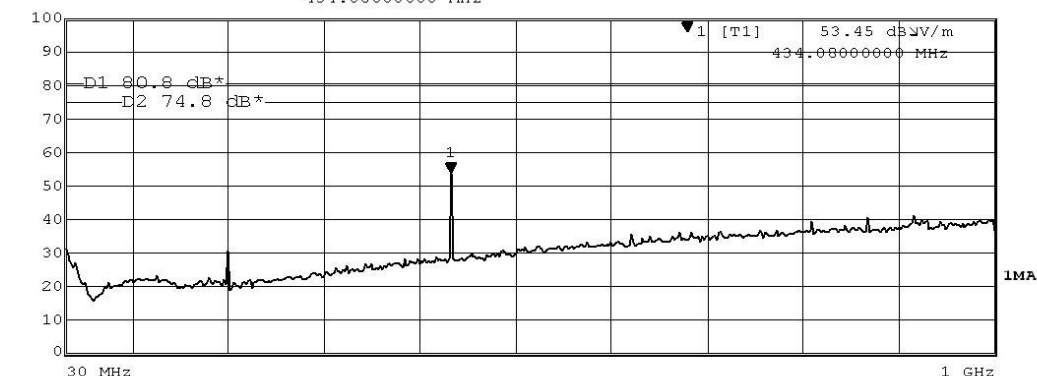
Att 10 dB  
Preamp INPUT 1

Det QP Trd HL562  
ResBW 120 kHz  
Meas T 10 s Unit dB $\mu$ V/m

FREQUENCY 434.0800000 MHz  
LEVEL QPK 53.10 dB $\mu$ V/m



UNCAL Marker 1 [T1]  
53.45 dB $\mu$ V/m  
434.0800000 MHz



Date: 25.JAN.2008 16:51:35

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## Horizontal:

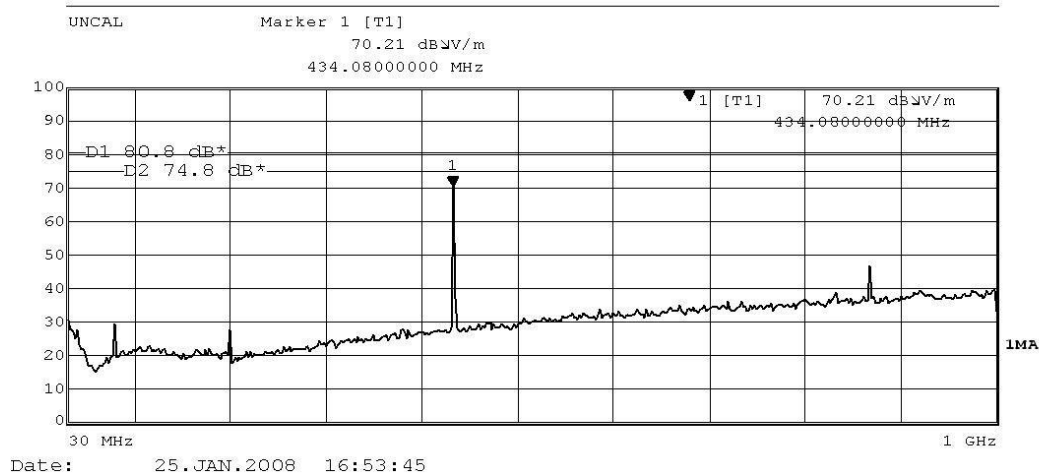
Field Strength of Fundamental Emissions				
Frequency MHz	Emission Level dB $\mu$ V/m	Limits dB $\mu$ V/m	Margin dB	Remark
434.08	69.98	80.80	-10.82	QP



Att 10 dB  
Preampl INPUT 1

Det QP Trd HL562  
ResBW 120 kHz  
Meas T 10 s Unit dB $\mu$ V/m

FREQUENCY 434.0800000 MHz  
LEVEL QPK 69.98 dB $\mu$ V/m



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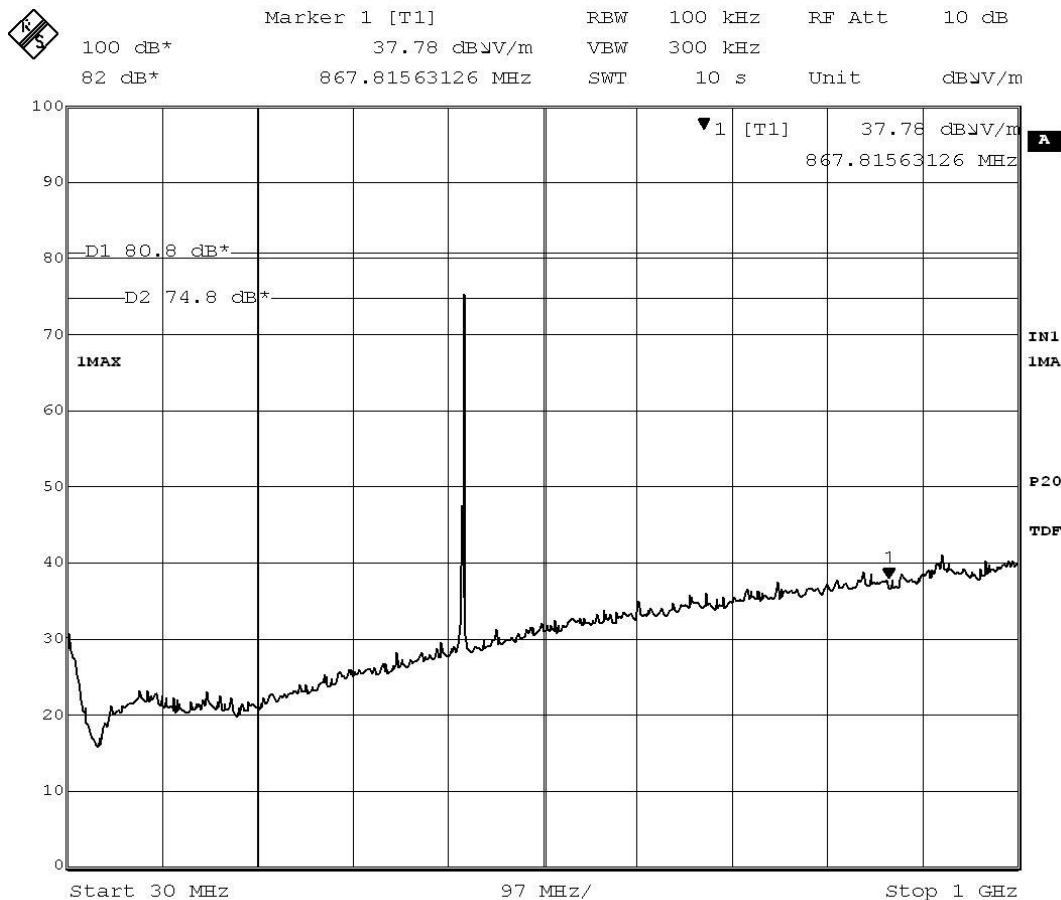
# TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

## **Field Strength of Spurious Emissions**

Operation frequency: 433MHz

Frequency Range: 30MHz-1000MHz (Vertical)

Frequency MHz	Emission Level dB $\mu$ V/m	Limits dB $\mu$ V/m	Margin dB	Remark
867.82	37.78	80.80	-43.02	Peak



Date: 22.JAN.2008 12:42:56

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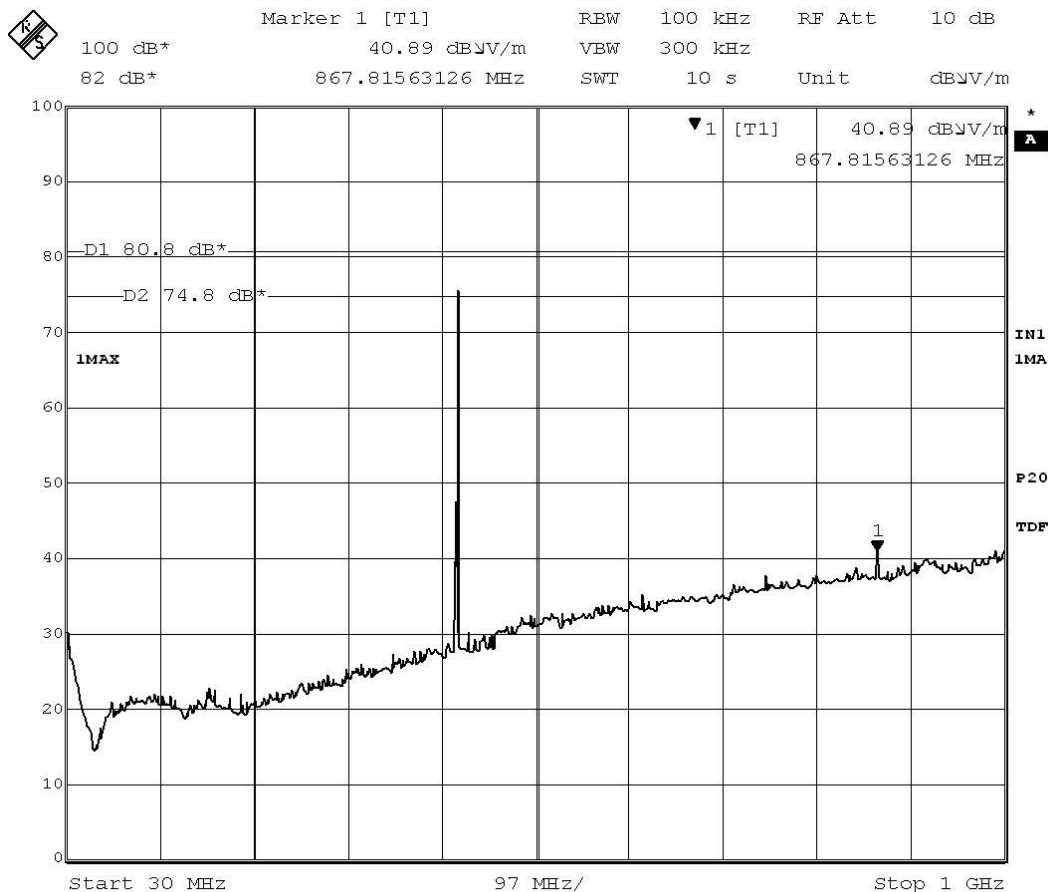


# TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

Operation frequency: 433 MHz

Frequency Range: 30MHz-1000MHz (Horizontal)

Frequency MHz	Emission Level dB $\mu$ V/m	Limits dB $\mu$ V/m	Margin dB	Remark
867.82	40.89	80.80	-39.91	Peak



Date: 22.JAN.2008 12:39:51

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty:  $\pm 3.7$ dB

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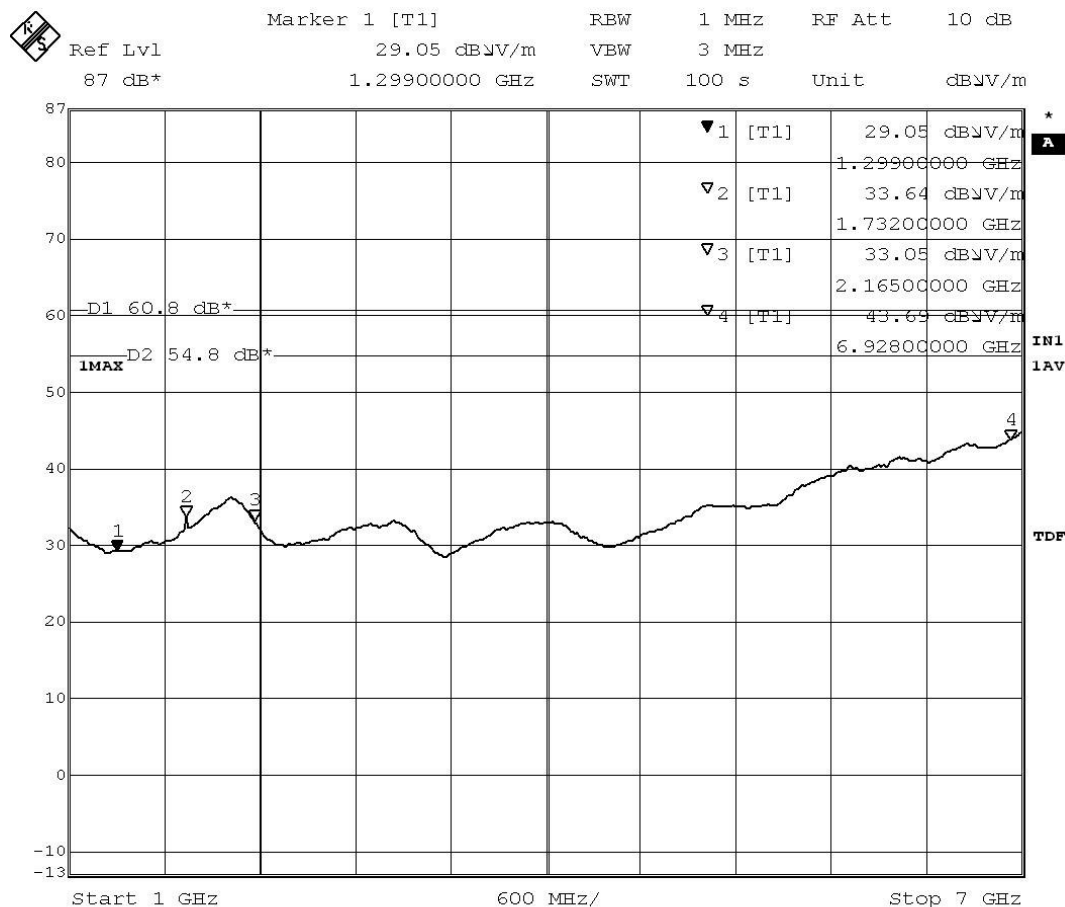


# TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

Operation frequency: 433MHz

Frequency Range: 1GHz-7GHz (Vertical)

Frequency GHz	Emission Level dB $\mu$ V/m	Limits dB $\mu$ V/m	Margin dB	Remark
1.30	29.05	54.00	-24.95	Peak
1.73	33.64	54.00	-20.36	Peak
2.17	33.05	54.00	-20.95	Peak
6.93	43.69	54.00	-10.31	Peak



Date: 22.JAN.2008 11:33:10

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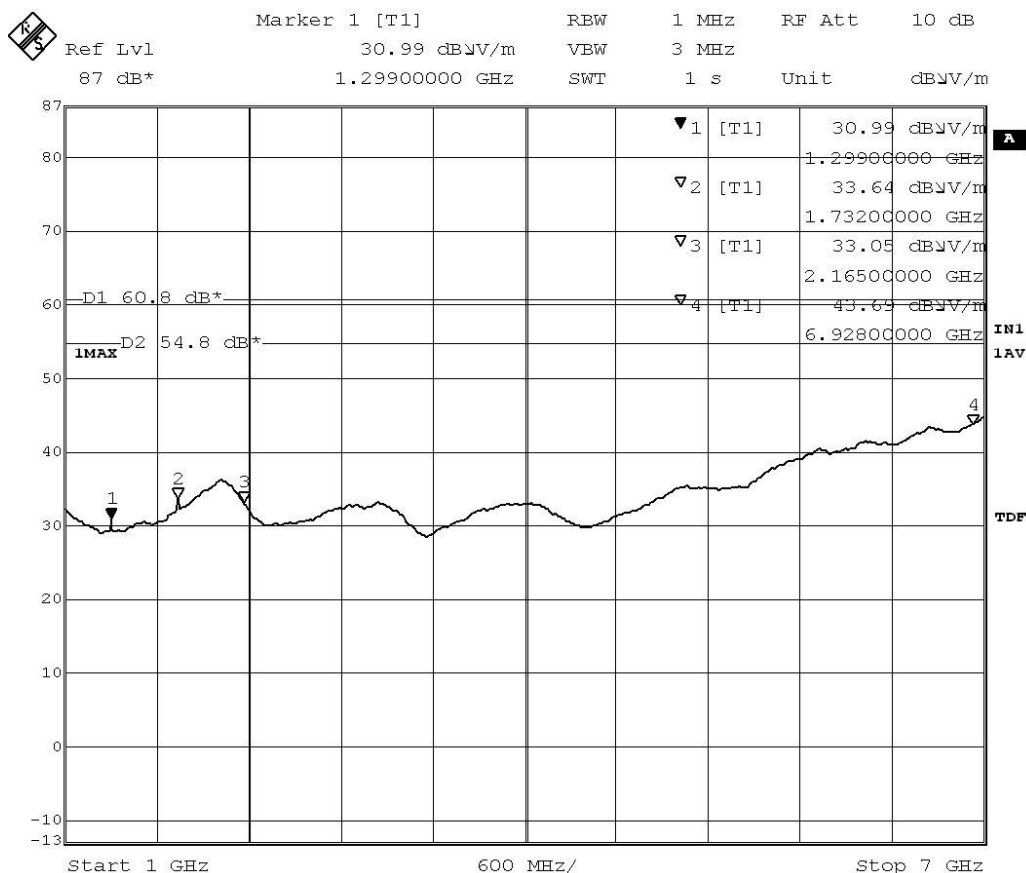


# TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

Operation frequency: 433MHz

Frequency Range: 1GHz-7GHz (Horizontal)

Frequency GHz	Emission Level dB $\mu$ V/m	Limits dB $\mu$ V/m	Margin dB	Remark
1.30	30.99	54.00	-23.01	Peak
1.73	33.64	54.00	-20.36	Peak
2.17	33.05	54.00	-20.95	Peak
6.93	43.69	54.00	-10.31	Peak



Date: 22.JAN.2008 11:35:23

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty:  $\pm 3.7$ dB

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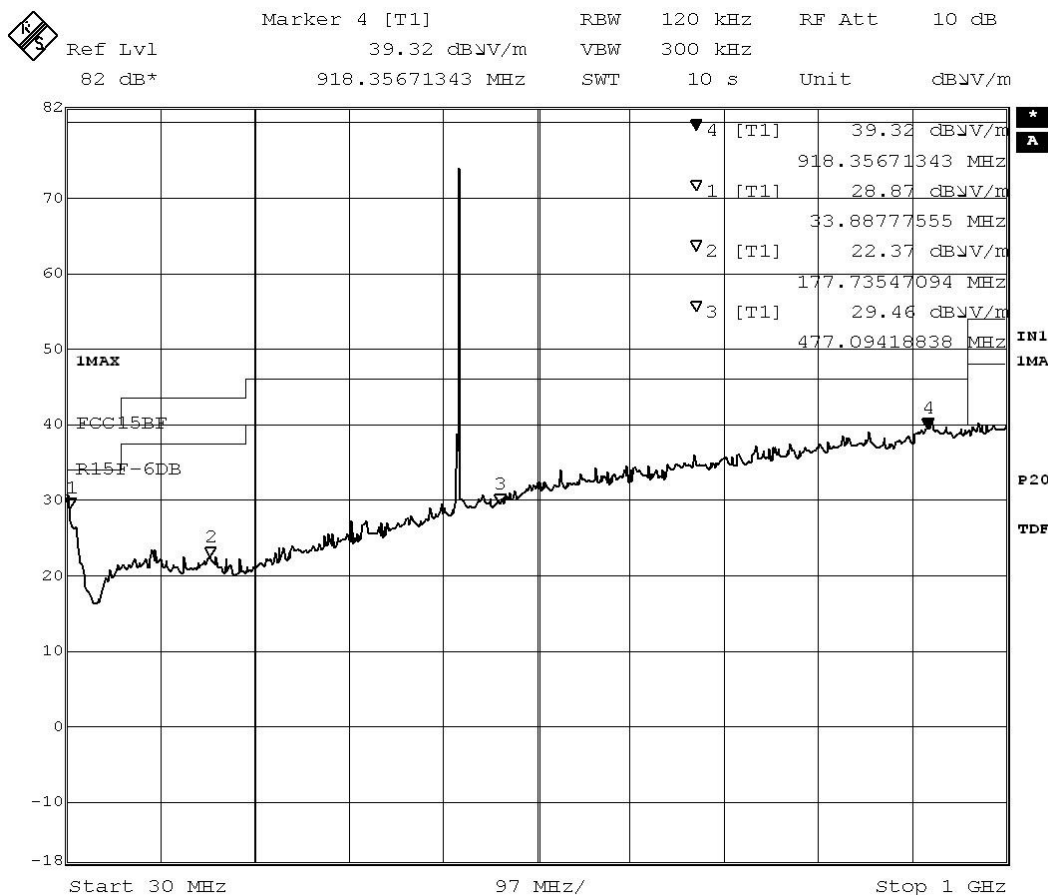


# TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

## Test Results of Radiated Emissions

Frequency Range: 30MHz-1000MHz (Vertical)

Frequency MHz	Emission Level dB $\mu$ V/m	Limits dB $\mu$ V/m	Margin dB	Remark
33.89	28.87	40.00	-11.13	QP
177.74	22.37	43.50	-21.13	QP
477.09	29.46	46.00	-16.54	QP
918.36	39.32	46.00	-6.68	QP



Date: 22.JAN.2008 11:56:33

Remark: Emission Level=Reading.

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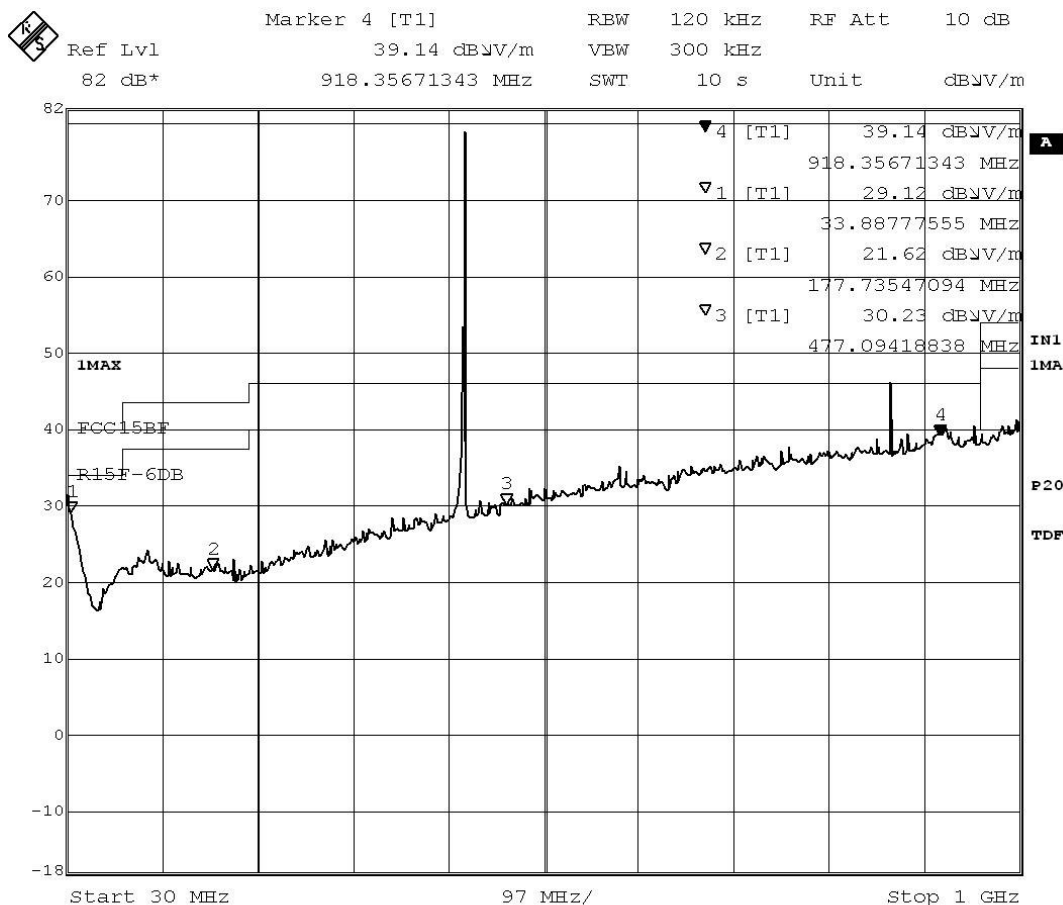
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# TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

Frequency Range: 30MHz-1000MHz (Horizontal)

Frequency MHz	Emission Level dB $\mu$ V/m	Limits dB $\mu$ V/m	Margin dB	Remark
33.89	29.12	40.00	-10.88	QP
177.74	21.62	43.50	-21.88	QP
477.09	30.23	46.00	-15.77	QP
918.36	39.14	46.00	-6.86	QP



Date: 22.JAN.2008 11:57:24

Remark: Emission Level=Reading.

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## TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

### Description of the Occupied Bandwidth

#### Test Procedure:

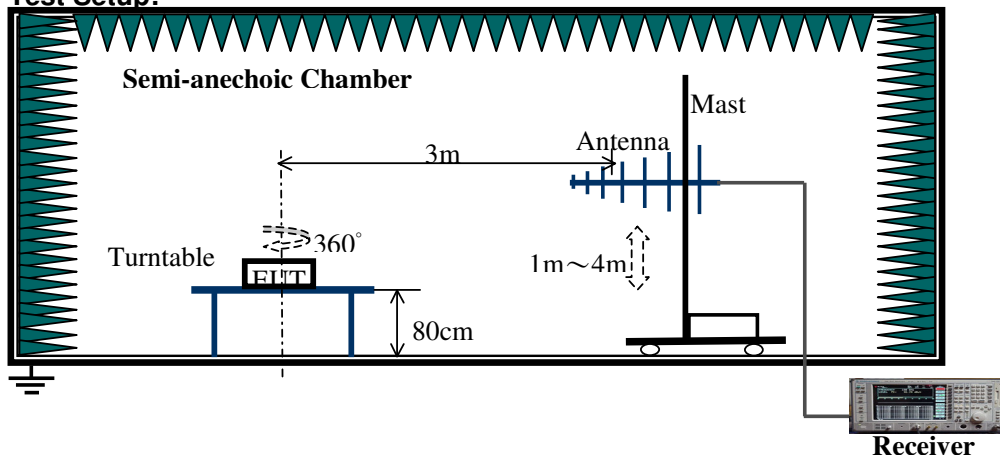
Occupied bandwidth measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003 and found compliance with FCC Part 15.231(c).

The EUT was placed on the top of a turntable 0.8 meters above the ground at a semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. The antenna used is a loop antenna. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to the heights from 1 to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

The test-receiver system was set to Peak Detector Function and Specified Bandwidth with Maximum Hold Mode. RBW= 10kHz. VBW=30kHz

Measure the 20dB bandwidth and compare with the required limit

#### Test Setup:



#### Test Setup and conditions:

The first button of the EUT was pressed to produce the highest emission.

Since the EUT is considered a portable unit, it was pre-tested on the positioned of each 3 axis. Therefore only the test data of the worse case - Y axis was used for Radiated test.





## TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

### Measurement Data:

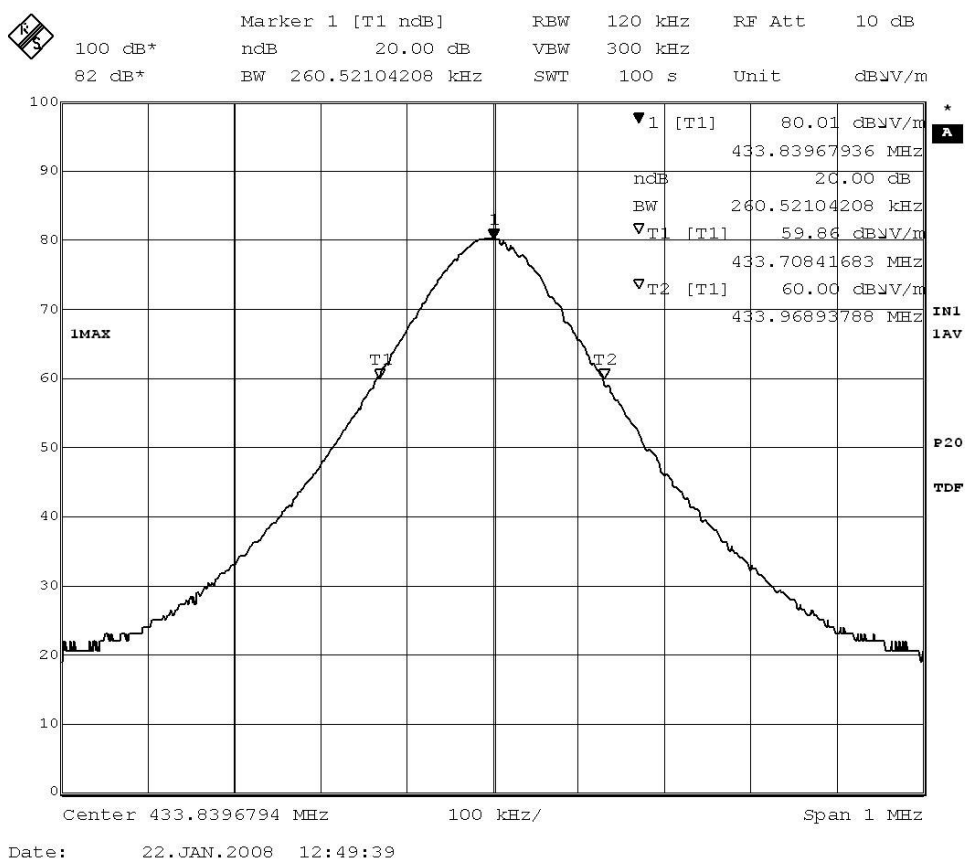
### Test Result:

All measurement data was indicated that the EUT meet the FCC 15.231 requirement.

### Occupied bandwidth pursuant to the requirement of FCC Part 15.231

Test Frequency MHz	Band width kHz	Limit KHz
433.84	260.52	1084.6

### Test plots:



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## TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

### Description of the Duration of Transmission

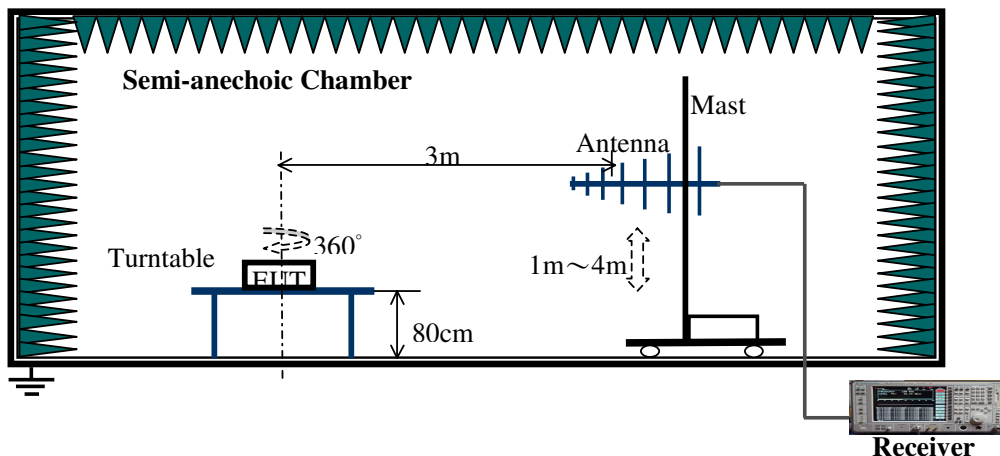
#### Test Procedure:

Occupied bandwidth measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003 and found compliance with FCC Part 15.231(a)(1).

The EUT was placed on the turntable and coupling the signal to the spectrum analyzer through an antenna.

The transmission duration was measured and recorded.

#### Test Setup:



All measurement data was indicated that the EUT meet the FCC 15.231 requirement.

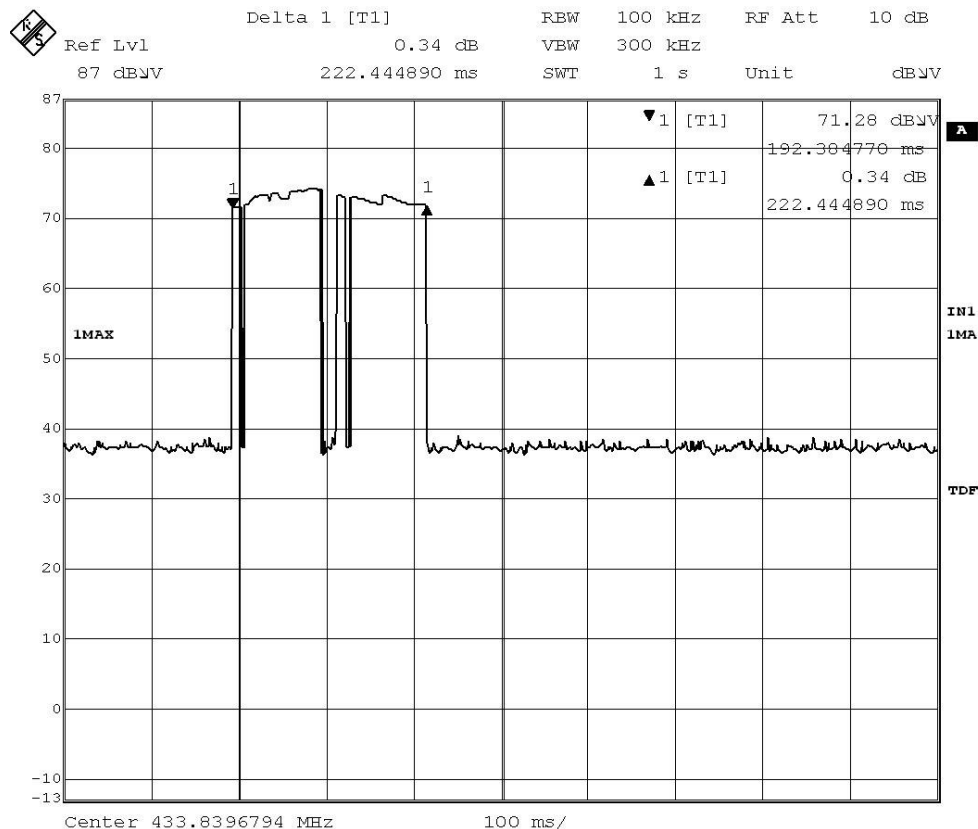
#### Duration of Transmission pursuant to the requirement of FCC Part 15.231

Push button	Frequency (MHz)	Transmission duration (ms)	Maximum limit (sec)	Pass / Fail
UP button	433	222.44	5	Pass



## TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

### Test plots:



Date: 21.JAN.2008 17:13:23

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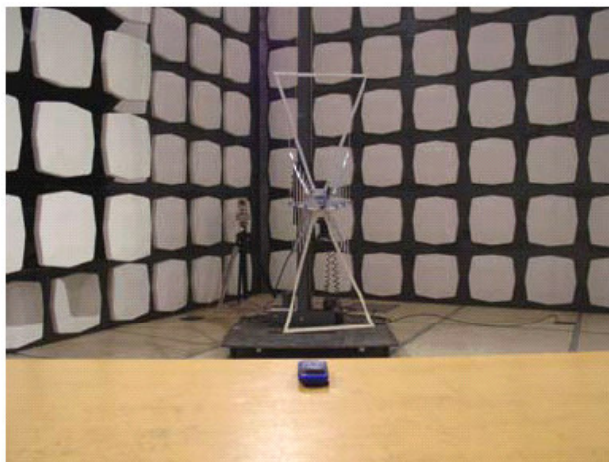
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## TEST REPORT N°: BEA-07-DE-H1537-ETZFB[2]

### Appendix I

#### Photographs of the test setup for the highest emission



\*\*\*\*\* End of Report \*\*\*\*\*