



Report No:  
File reference No:

FCC 1609149  
2016-10-10

Applicant: Guangdong Samzuk Technology & Development Co.,Ltd

Product: 20 Channel Intercom

Model No: FTAN20AA,FTAN20AB, FTAN20AC,FTAN20AD

Trademark: **SAMCOM**

Test Standards: FCC Part 95, Subpart B and Subpart E;

Test result: It is herewith confirmed and found to comply with the requirements set up by ANSI C63.10, FCC Part 95, Subpart B and Subpart E; regulations for the evaluation of electromagnetic compatibility

Approved By

*Jack Chung*

Jack Chung  
Manager

Dated: Oct 10, 2016

**Results appearing herein relate only to the sample tested**

**The technical reports is issued errors and omissions exempt and is subject to withdrawal at**

**SHENZHEN TIMEWAY TESTING LABORATORIES**

Room 512-519, 5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen, Guangdong, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timeway-lab.com



### **Special Statement:**

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

#### **CNAS-LAB Code: L2292**

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

#### **FCC-Registration No.: 899988**

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.:899988.

#### **IC- Registration No.: IC5205A-02**

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration No.: IC 5205A-02.

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## 1.0 General Details

### 1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TESTING LABORATORIES.  
Address: Room 512-519,5/F., East Tower,Building 4, Anhua Industrial Zone, Futian District,Shenzhen, Guangdong China  
Telephone: (755) 83448688  
Fax: (755) 83442996  
Site on File with the Federal Communications Commission – United States  
Registration Number: 899988  
For 3m & 10 m OATS  
Site Listed with Industry Canada of Ottawa, Canada  
Registration Number: IC: 5205A-02  
For 3m & 10 m OATS

### 1.2 Applicant Details

Applicant: Guangdong Samzuk Technology Development Co,Ltd  
Address: High-Tech Zone Xinggong Avenue East Heyuan City  
Telephone: 0762-3116133  
Fax: 0762-3116833

### 1.3 Description of EUT

Product: 20 channel intercom  
Manufacturer: Guangdong Samzuk Technology Development Co,Ltd  
Address: High-Tech Zone Xinggong Avenue East Heyuan City  
Brand Name: **SAMCOM**  
Additional Brand Name: N/A  
Model Number: FTAN20AA  
Additional Model Number: FTAN20AB, FTAN20AC,FTAN20AD  
Type of Modulation FM

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Frequency List:

Note: CH0 to CH13 are FRS and CH14 to CH19 are GMRS

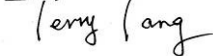
CH0	462.6625MHz	CH1	467.7125MHz	CH2	467.6875MHz	CH3	467.6625MHz
CH4	467.6375MHz	CH5	467.6125MHz	CH6	467.5875MHz	CH7	467.5625MHz
CH8	462.7125MHz	CH9	462.6875MHz	CH10	462.6375MHz	CH11	462.6125MHz
CH12	462.5875MHz	CH13	462.5625MHz	CH14	462.7250MHz	CH15	462.7000MHz
CH16	462.6750MHz	CH17	462.6500MHz	CH18	462.6250MHz	CH19	462.6000MHz

Antenna: Integral antenna with Gain 2.0 dBi  
Rating: Input: DC5V, 1.0A  
Power Supply: Model No.: R1018  
Input: 100-240V, 50/60Hz, 0.3A Max; Output: 5V, 1000mA

1.4 Submitted Sample: 2 Samples

1.5 Test Duration  
2016-09-26 to 2016-10-09

1.6 Test Uncertainty  
Conducted Emissions Uncertainty =3.6dB  
Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer   
The sample tested by \_\_\_\_\_

Print Name: Terry Tang

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<b>2.0 Test Equipment</b>					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
TWO Line-V-NETW	R&S	EZH3-Z5	100294	2016-08-20	2017-08-29
TWO Line-V-NETW	R&S	EZH3-Z5	100253	2016-08-20	2017-08-19
Ultra Broadband ANT	R&S	HL562	100157	2016-08-24	2017-08-23
ESDV Test Receiver	R&S	ESDV	100008	2016-08-22	2017-08-21
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2016-08-19	2017-08-20
System Controller	CT	SC100	-	--	--
Loop Antenna	EMCO	6502	00042960	2016-08-23	2017-08-22
ESPI Test Receiver	R&S	ESI26	838786/013	2016-08-19	2017-08-20
Horn Antenna	R&S	BBHA 9170	BBHA9170265	2016-08-24	2017-08-23
Horn Antenna	R&S	BBHA 9120D	9120D-631	2016-08-24	2017-08-23
Power meter	Anritsu	ML2487A	6K00003613	2016-08-19	2017-08-18
Power sensor	Anritsu	MA2491A	32263	2016-08-19	2017-08-18
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2016-08-24	2017-08-23
9*6*6 Anechoic	--	--	N/A	2016-08-24	2017-08-23
EMI Test Receiver	RS	ESCS30	100139	2016-08-19	2017-08-20
Modulation Analyser	HP	8901B	3104A03367	2016-06-10	2017-06-09

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### 3.0 Technical Details

#### 3.1 Summary of test results

<b>The EUT has been tested according to the following specifications:</b>			
<b>Standard</b>	<b>Test Type</b>	<b>Result</b>	<b>Notes</b>
FCC Part 15.207	Conducted Emission	Pass	<b>Complies</b>
FCC Part 95.639	Maximum Transmitter Power	Pass	<b>Complies</b>
FCC Part 95.637	Modulation Characteristic	Pass	<b>Complies</b>
FCC Part 95.633	Occupied Bandwidth	Pass	<b>Complies</b>
FCC Part 95.633	Emission Mask	Pass	<b>Complies</b>
FCC Part 95.621 and 95.626	Frequency Tolerance	Pass	<b>Complies</b>
FCC Part 95.635	Spurious Radiated Emissions	Pass	<b>Complies</b>

#### 3.2 Test Standards

**FCC Part 95, ANSI C63.10:2013**

#### 4.0 EUT Modification

**No modification by SHENZHEN TIMEWAY TESTING LABORATORIES**

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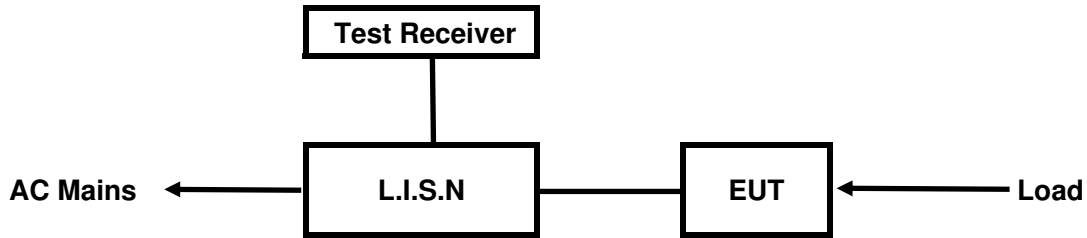
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**5. Power Line Conducted Emission Test**

5.1 Schematics of the test



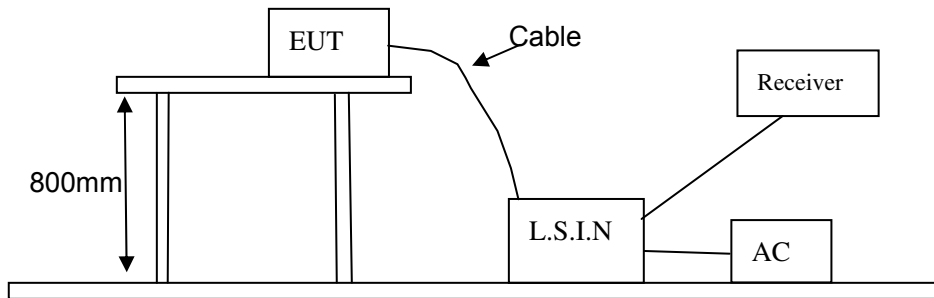
EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2013. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.10-2013.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.10-2013. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

One channels are provided to the EUT

A. EUT

Device	Manufacturer	Model	FCC ID
20 channel intercom	Guangdong Samzuk Technology Development Co,Ltd	FTAN20AA, FTAN20AB, FTAN20AC, FTAN20AD	2AIOQ-FTAN20AA

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B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable
N/A				

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10-2013

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency(MHz)	Class A Limits (dB $\mu$ V)		Class B Limits (dB $\mu$ V)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ~ 0.50	79.0	66.0	66.0~56.0*	56.0~46.0*
0.50 ~ 5.00	73.0	60.0	56.0	46.0
5.00 ~ 30.00	73.0	60.0	60.0	50.0

- Notes: 1. \*Decreasing linearly with logarithm of frequency.  
 2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

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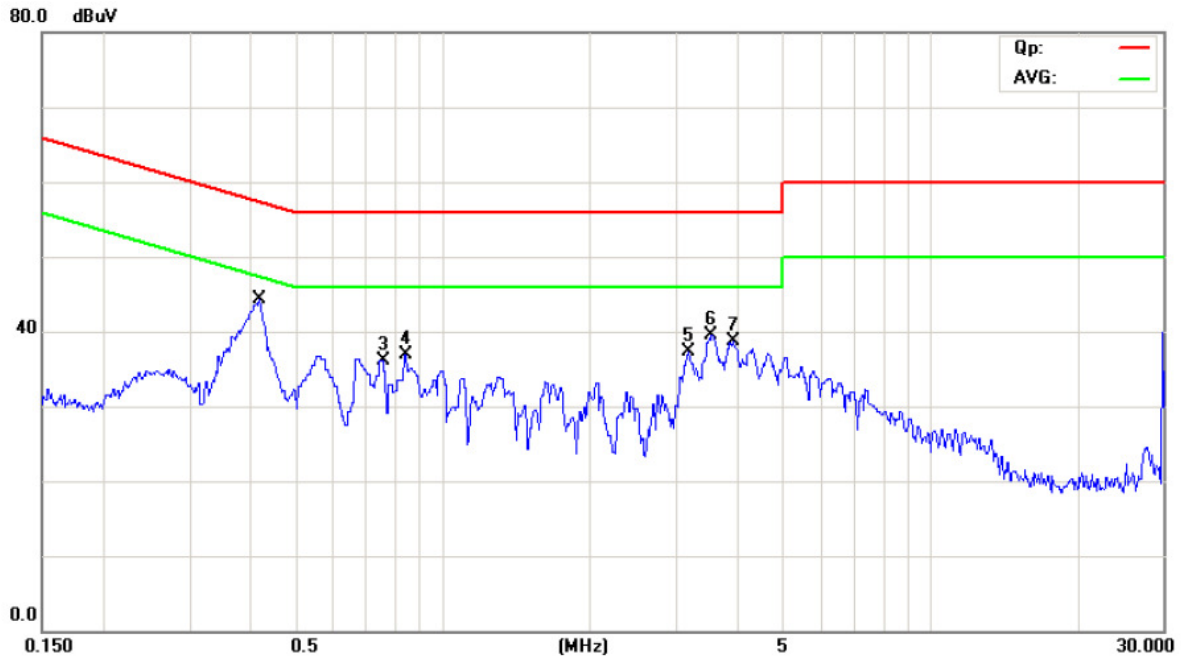


**A Conducted Emission on Line Terminal of the power line (150kHz to 30MHz)**

EUT set Condition: Keep Transmitting

**Results: Pass**

Please refer to following diagram for individual



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.4206	28.50	11.29	39.79	57.44	-17.65	QP	
2		0.4206	18.10	11.29	29.39	47.44	-18.05	AVG	
3		0.7475	24.54	11.63	36.17	56.00	-19.83	peak	
4		0.8375	25.09	11.73	36.82	56.00	-19.18	peak	
5		3.1775	24.45	12.77	37.22	56.00	-18.78	peak	
6	*	3.5487	26.58	12.92	39.50	56.00	-16.50	peak	
7		3.9312	25.69	13.07	38.76	56.00	-17.24	peak	

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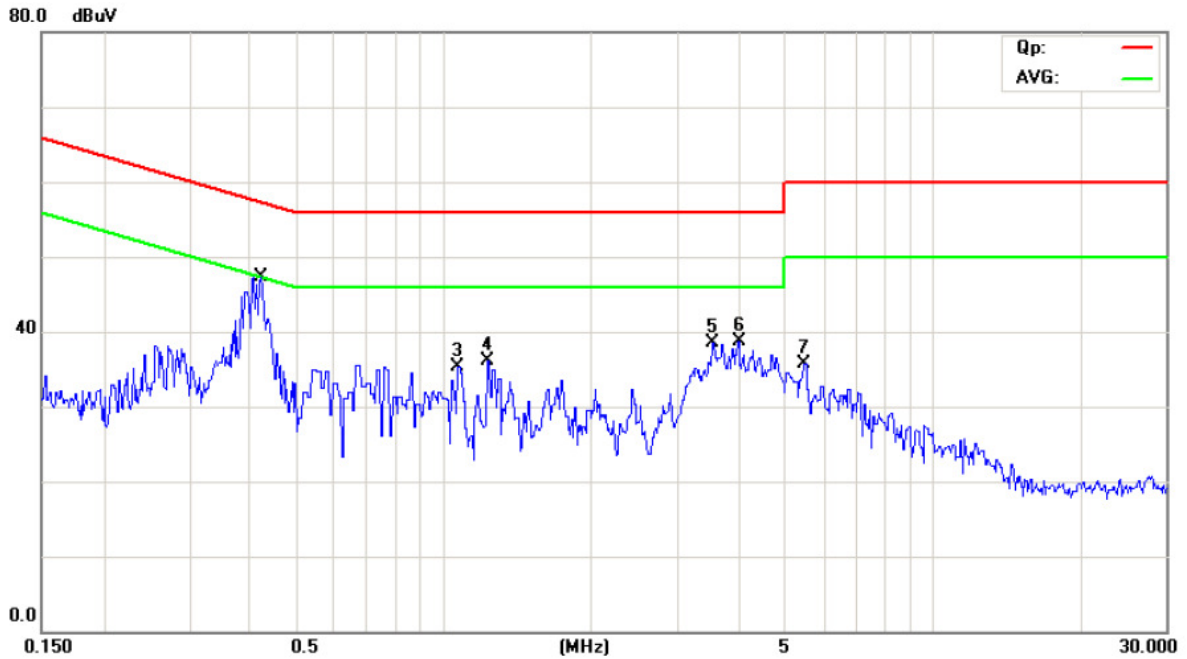


**B Conducted Emission on Neutral Terminal of the power line (150kHz to 30MHz)**

EUT set Condition: Keep Transmitting

**Results: Pass**

Please refer to following diagram for individual



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.4241	24.70	11.29	35.99	57.37	-21.38	QP	
2		0.4241	18.00	11.29	29.29	47.37	-18.08	AVG	
3		1.0737	23.34	11.93	35.27	56.00	-20.73	peak	
4		1.2312	24.13	11.99	36.12	56.00	-19.88	peak	
5		3.5487	25.53	12.92	38.45	56.00	-17.55	peak	
6	*	3.9875	25.52	13.10	38.62	56.00	-17.38	peak	
7		5.5000	22.44	13.29	35.73	60.00	-24.27	peak	

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## 6. Frequency Tolerance

### 6.1 Applicable standard

According to FCC §2.1055(a) (1), the frequency stability shall be measured with variation of ambient temperature from  $-30^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ , and according to FCC 2.1055(d) (2), the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point which is specified by the manufacturer.

According to FCC §95.621(b), Each GMRS transmitter for mobile station, small base station and control station operation must be maintained within a frequency tolerance of 0.0005%. Each GMRS transmitter for base station (except small base), mobile relay station or fixed station operation must be maintained within a frequency tolerance of 0.00025%.

According to FCC §95.626(b), Each FRS Unit must be maintained within a frequency tolerance of 0.00025 % ( 2.5 ppm).

### 6.2 Measurement Procedure

#### 6.2.1 Frequency stability versus environmental temperature

1. Setup the configuration per figure 1 for frequencies measurement inside an environment chamber, Install new battery in the EUT.
2. Turn on EUT and set SA center frequency to the EUT radiated frequency. Set SA Resolution Bandwidth to 1KHz and Video Resolution Bandwidth to 1KHz and Frequency Span to 50KHz. Record this frequency as reference frequency.
3. Set the temperature of chamber to  $50^{\circ}\text{C}$ . Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.
4. Repeat step 2 with a  $10^{\circ}\text{C}$  decreased per stage until the lowest temperature  $-30^{\circ}\text{C}$  is measured, record all measured frequencies on each temperature step.

#### 6.2.2 Frequency stability versus input voltage

1. Setup the configuration per figure 1 for frequencies measured at temperature if it is within  $15^{\circ}\text{C}$  to  $25^{\circ}\text{C}$ . Otherwise, an environment chamber set for a temperature of  $20^{\circ}\text{C}$  shall be used.
2. Set SA center frequency to the EUT radiated frequency. Set SA Resolution Bandwidth to 1 KHz and Video Resolution Bandwidth to 1KHz. Record this frequency as reference frequency.
3. Supply the EUT primary voltage at the operating end point which is specified by manufacturer and record the frequency.

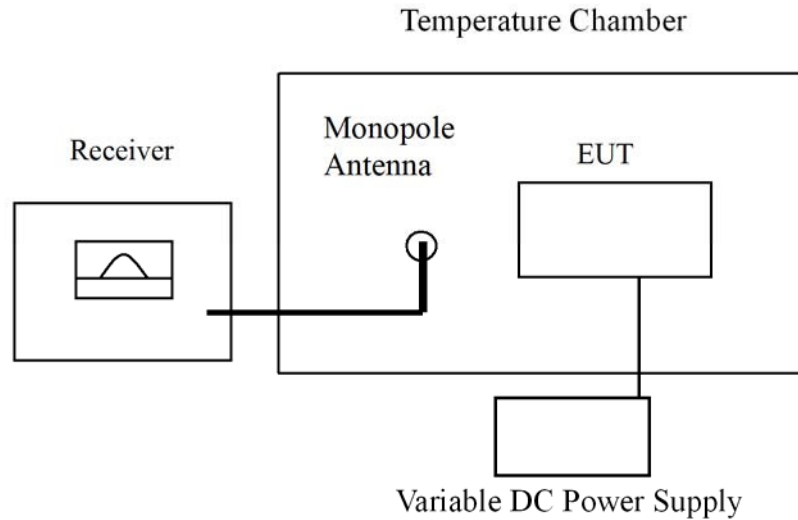
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**6.3 TEST SETUP BLOCK DIAGRAM**



**Figure 1**

**6.5 TEST RESULT**

(1) Frequency stability versus input voltage (The end point voltage is 4.3V)

Channel	Power Supplied (Vdc)	Frequency Measured (MHz)	Frequency Deviation (ppm)	Nominal Frequency	Limit (ppm)
CH4	4.3V	467.636962	-1.15	467.6375MHz	±2.5
CH10	4.3V	462.636808	-1.50	462.6375MHz	±2.5
CH17	4.3V	462.649351	-1.40	462.6500MHz	±5.0

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(2)Frequency stability versus ambient temperature

**Test Results**

**CH4**

Environment Temperature(°C)	Power Supplied (Vdc)	Frequency Measured (MHz)	Frequency Deviation (ppm)	Nominal Frequency	Limit(ppm)
50	5.0	467.636857	-1.37	467.6375MHz	±2.5
40	5.0	467.636873	-1.34	467.6375MHz	±2.5
30	5.0	467.636982	-1.11	467.6375MHz	±2.5
20	5.0	467.636835	-1.42	467.6375MHz	±2.5
10	5.0	467.636946	-1.18	467.6375MHz	±2.5
0	5.0	467.637014	-1.04	467.6375MHz	±2.5
-10	5.0	467.637058	-0.95	467.6375MHz	±2.5
-20	5.0	467.636952	-1.17	467.6375MHz	±2.5
-30	5.0	467.636816	-1.46	467.6375MHz	±2.5

**CH10**

Environment Temperature(°C)	Power Supplied (Vdc)	Frequency Measured (MHz)	Frequency Error (ppm)	Nominal Frequency	Limit(ppm)
50	5.0	462.636976	-1.13	462.6375MHz	±2.5
40	5.0	462.636892	-1.31	462.6375MHz	±2.5
30	5.0	462.636925	-1.24	462.6375MHz	±2.5
20	5.0	462.636940	-1.21	462.6375MHz	±2.5
10	5.0	462.636857	-1.39	462.6375MHz	±2.5
0	5.0	462.636994	-1.09	462.6375MHz	±2.5
-10	5.0	462.637012	-1.05	462.6375MHz	±2.5
-20	5.0	462.637058	-0.96	462.6375MHz	±2.5
-30	5.0	462.637103	-0.86	462.6375MHz	±2.5

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CH17

Environment Temperature(°C)	Power Supplied (Vdc)	Frequency Measured (MHz)	Frequency Error (ppm)	Nominal Frequency	Limit(ppm)
50	5.0	462.649672	-0.71	462.6500MHz	±5.0
40	5.0	462.649584	-0.90	462.6500MHz	±5.0
30	5.0	462.649515	-1.05	462.6500MHz	±5.0
20	5.0	462.649613	-0.84	462.6500MHz	±5.0
10	5.0	462.649389	-1.32	462.6500MHz	±5.0
0	5.0	462.649457	-1.17	462.6500MHz	±5.0
-10	5.0	462.649493	-1.10	462.6500MHz	±5.0
-20	5.0	462.649525	-1.02	462.6500MHz	±5.0
-30	5.0	462.649594	-0.88	462.6500MHz	±5.0

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**7. EMISSION BANDWIDTH and Mask**

**7.1 PROVISIONS APPLICABLE**

Per FCC §2.1049 and FCC §95.633(a), The *authorized bandwidth* (maximum permissible bandwidth of a transmission) for emission type H1D, J1D, R1D, H3E, J3E or R3E is 4 kHz. The authorized bandwidth for emission type A1D or A3E is 8 kHz. The authorized bandwidth for emission type F1D, G1D, F3E or G3E is 20 kHz

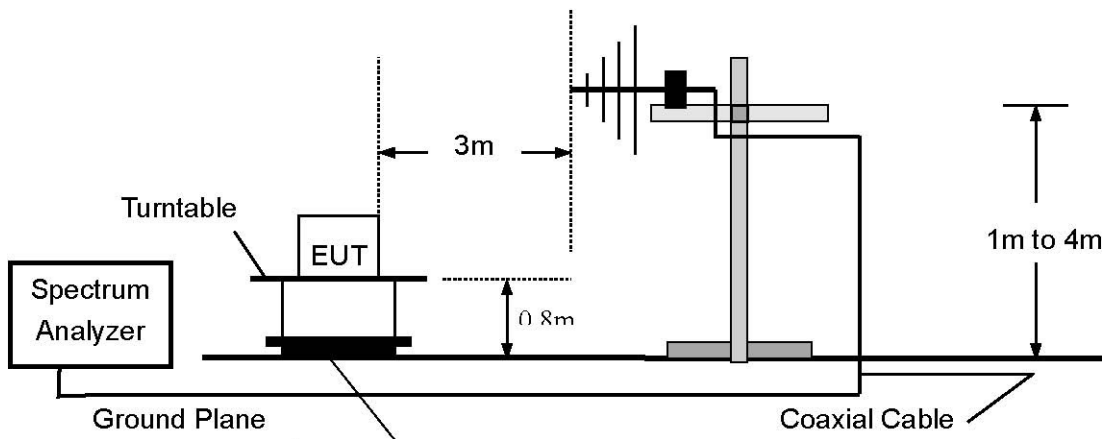
Per FCC §2.1049 and FCC §95.633(a) (c), the authorized bandwidth for emission type F3E or F2D transmitted by an FRS Unit is 12.5 kHz.

- (1) At least 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.
- (3) At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.
- (7) At least  $43 + 10 \log_{10}(T)$  dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

**7.2 MEASUREMENT PROCEDURE**

TIA-603-C, section 2.2.11

**7.3 Test Setup Block Diagram**



**7.4 Measurement Result:**

Bandwidth			
Operating Frequency	Test Data	Limits	Result
467.6375MHz	10.62kHz	12.5kHz	Pass
462.6375MHz	10.62kHz	12.5kHz	Pass
462.6500MHz	10.62kHz	20kHz	Pass

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**Emission Designator:**

**Bn=2M + 2DK**

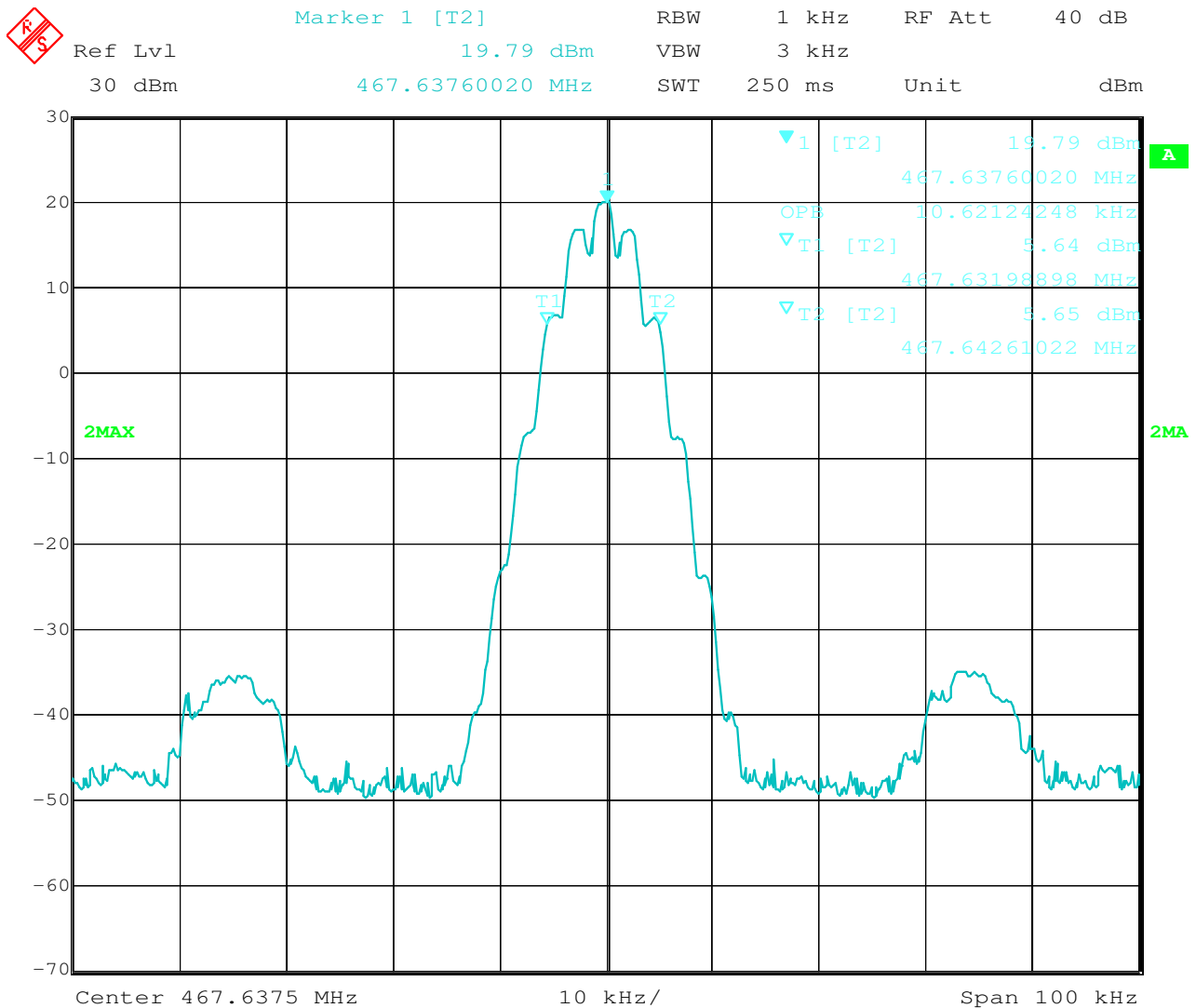
**Where M = 3 KHz, D = 2.5 KHz, K = 1**

**Bn =2\*3 + 2\*2.5 = 11KHz**

**Type of emission: 11K0F3E**

**7.5 Test Plots:**

**For Channel 04 467.6375MHz**

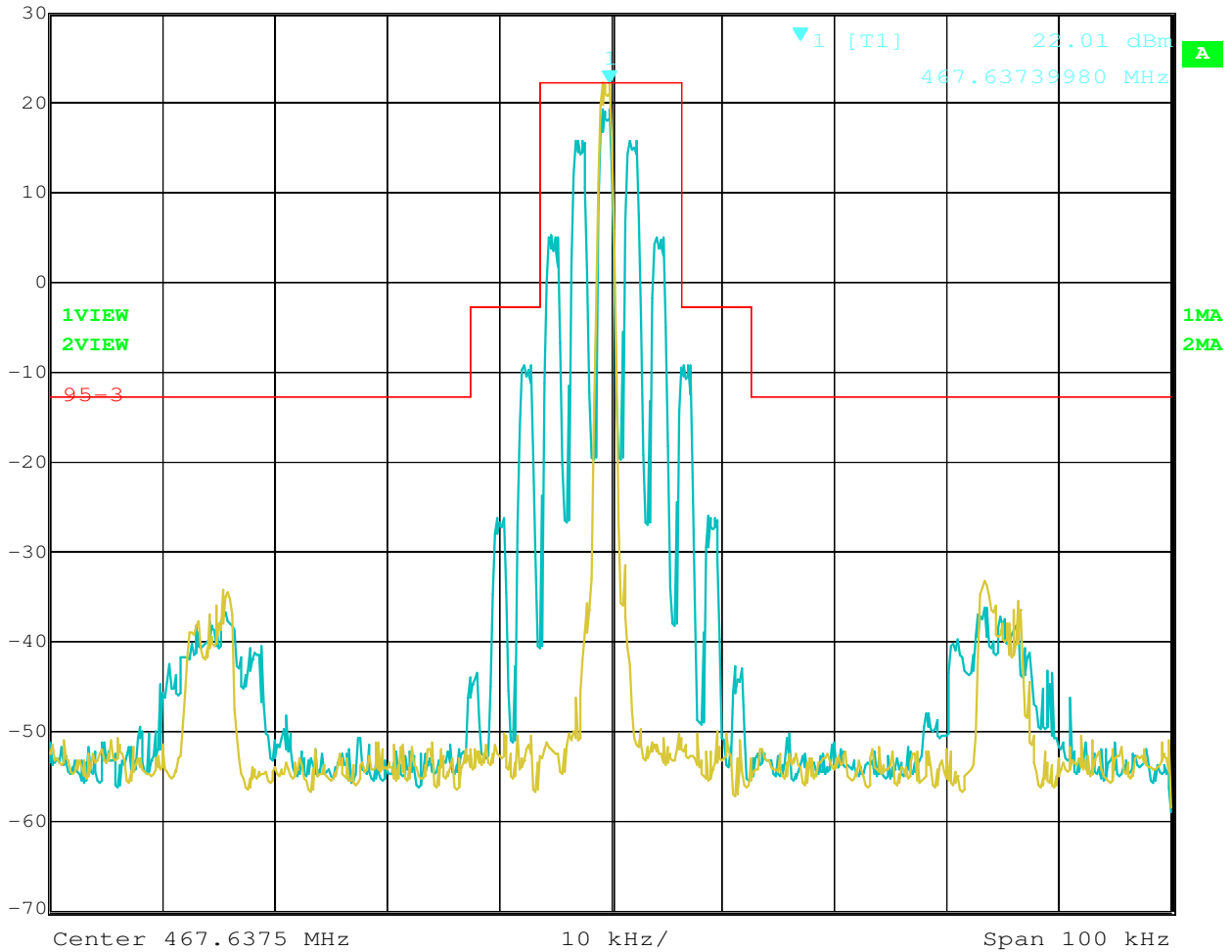


Date: 8.OCT.2016 12:54:30

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Ref Lvl	Marker 1 [T1]	RBW	300 Hz	RF Att	40 dB
30 dBm	22.01 dBm	VBW	1 kHz		
	467.63739980 MHz	SWT	5.6 s	Unit	dBm



Date: 8.OCT.2016 12:47:14

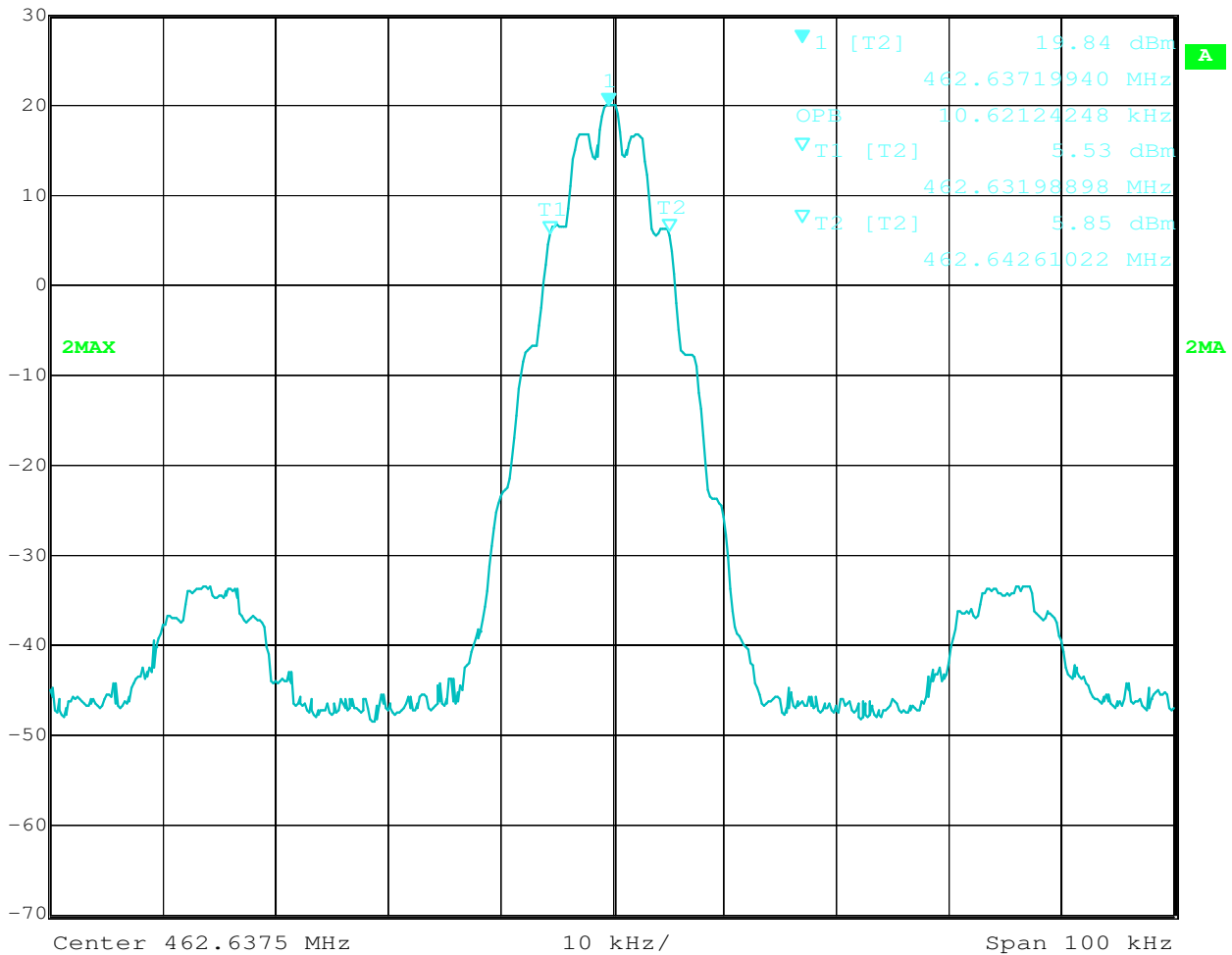
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**For Channel 10 462.6375MHz**



Ref Lvl	30 dBm	Marker 1 [T2]	19.84 dBm	RBW	1 kHz	RF Att	40 dB
			462.63719940 MHz	VBW	3 kHz		
				SWT	250 ms	Unit	dBm

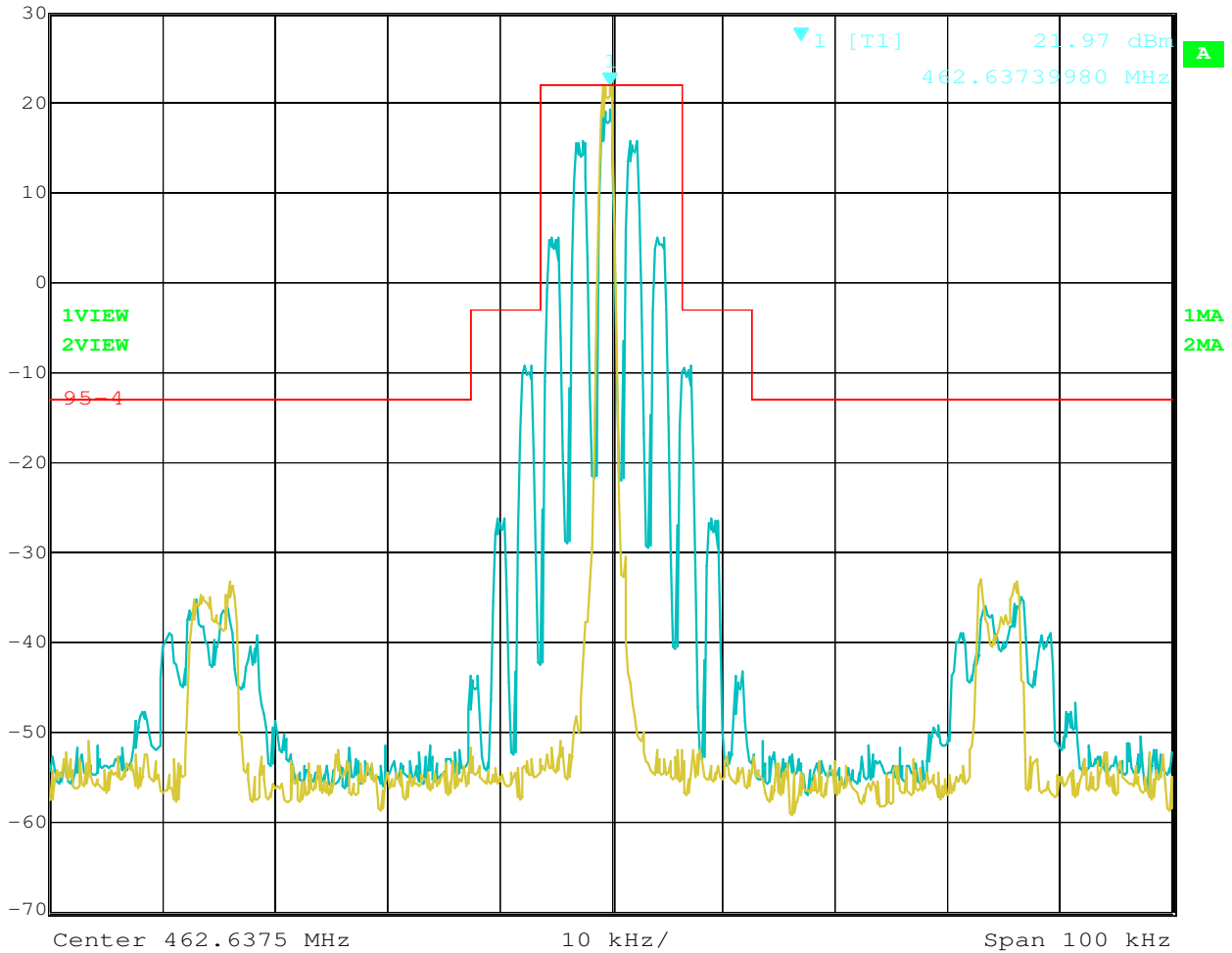


Date: 8.OCT.2016 15:13:01

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Ref Lvl	Marker 1 [T1]	RBW	300 Hz	RF Att	40 dB
30 dBm	21.97 dBm	VBW	1 kHz		
	462.63739980 MHz	SWT	5.6 s	Unit	dBm



Date: 8.OCT.2016 15:43:25

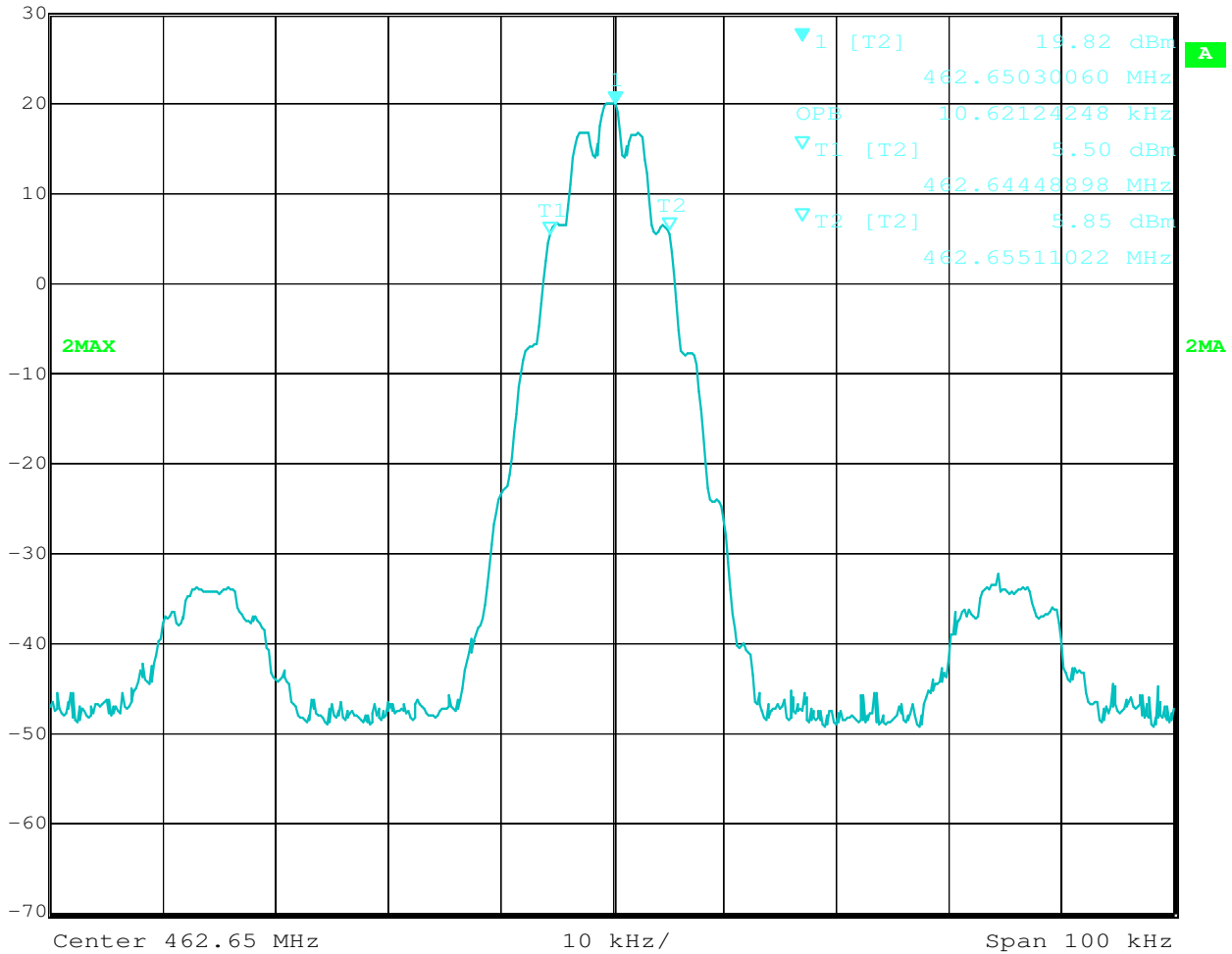
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**For Channel 17 462.6500MHz**



Ref Lvl	30 dBm	Marker 1 [T2]	19.82 dBm	RBW	1 kHz	RF Att	40 dB
			462.65030060 MHz	VBW	3 kHz	Unit	dBm
				SWT	250 ms		

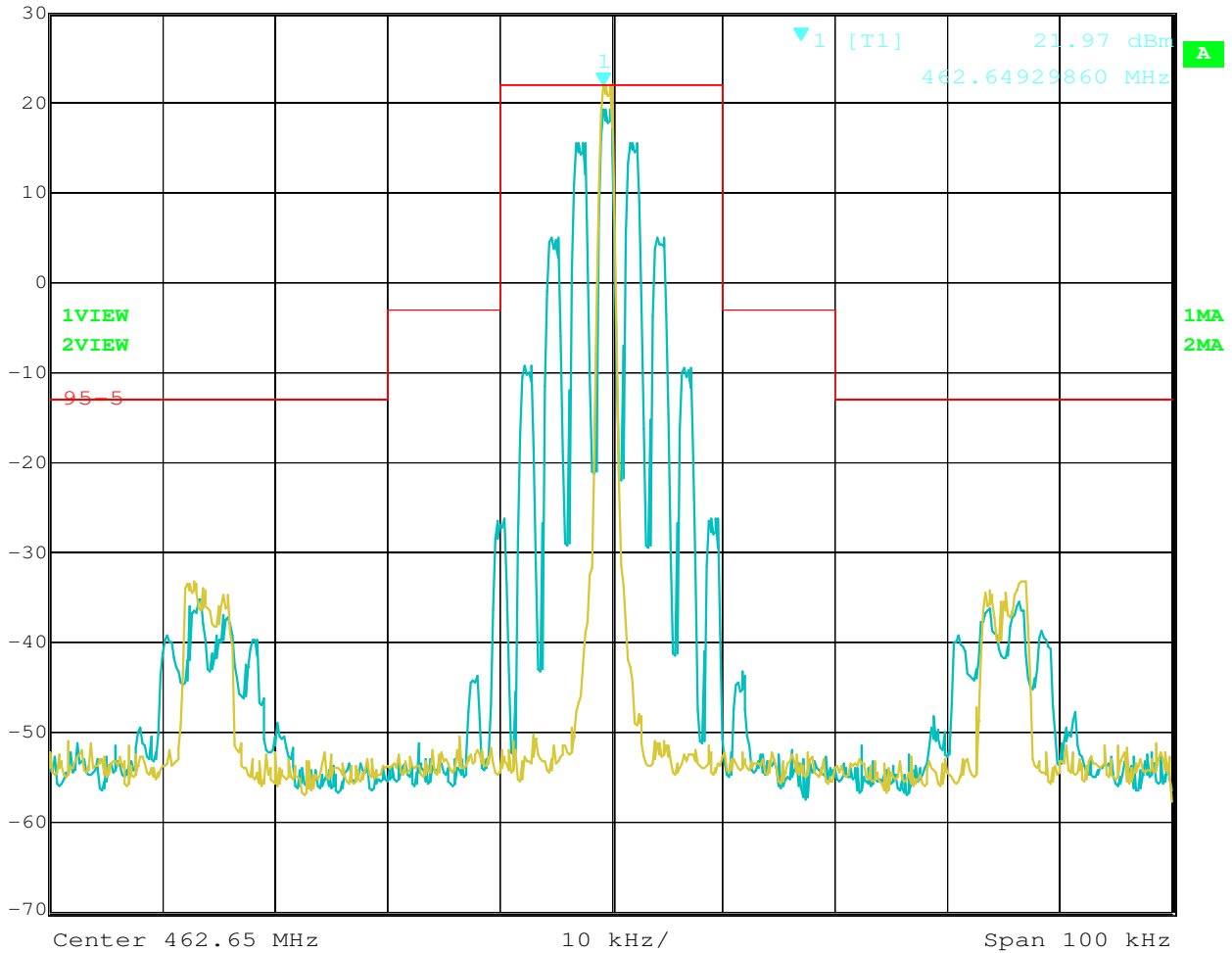


Date: 8.OCT.2016 15:33:58

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Ref Lvl	Marker 1 [T1]	RBW	300 Hz	RF Att	40 dB
30 dBm	21.97 dBm	VBW	1 kHz		
	462.64929860 MHz	SWT	5.6 s	Unit	dBm



Date: 8.OCT.2016 15:31:14

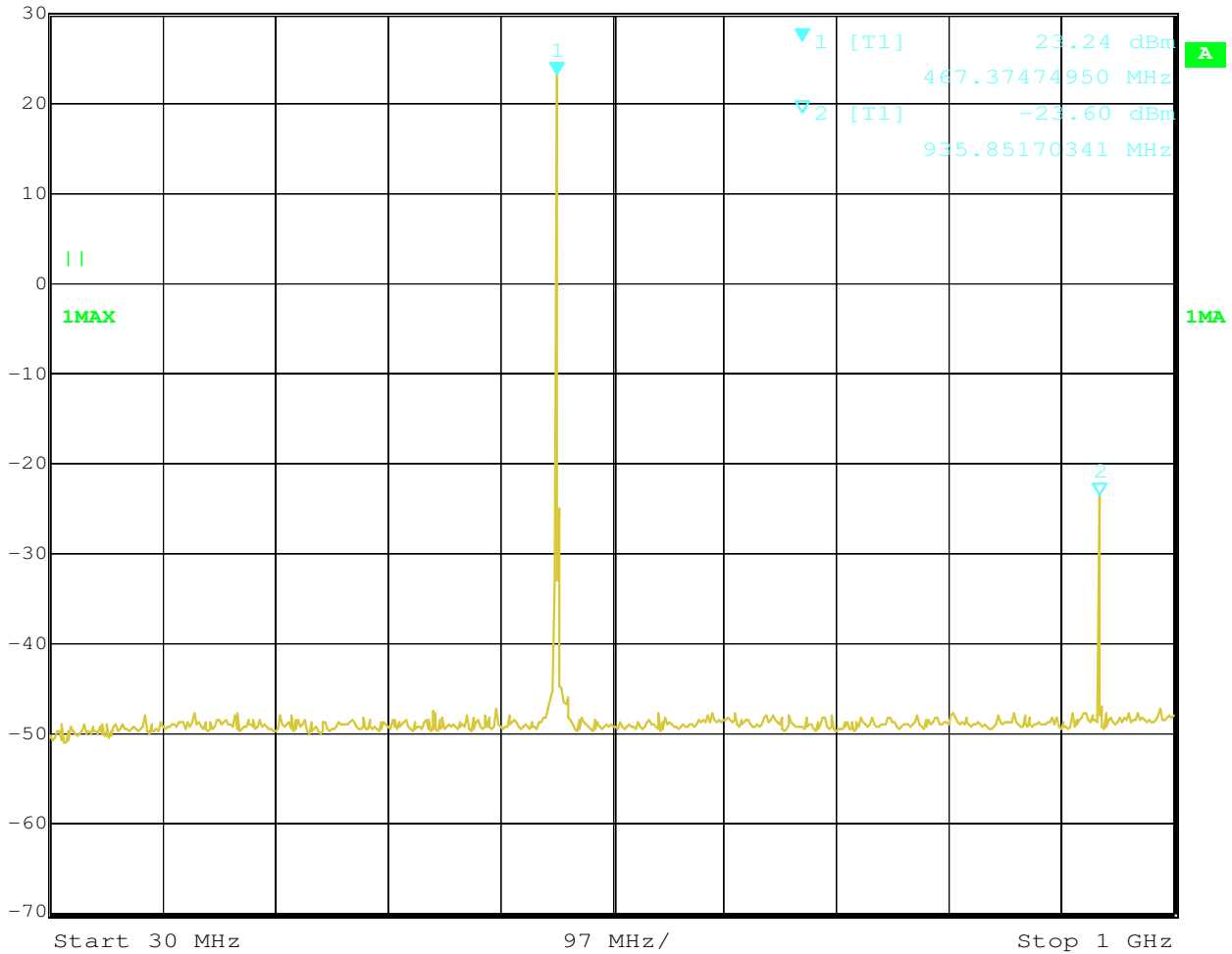
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**Channel 04 467.6375MHz**



	Marker 1 [T1]	RBW	100 kHz	RF Att	40 dB
Ref Lvl	23.24 dBm	VBW	300 kHz		
30 dBm	467.37474950 MHz	SWT	245 ms	Unit	dBm

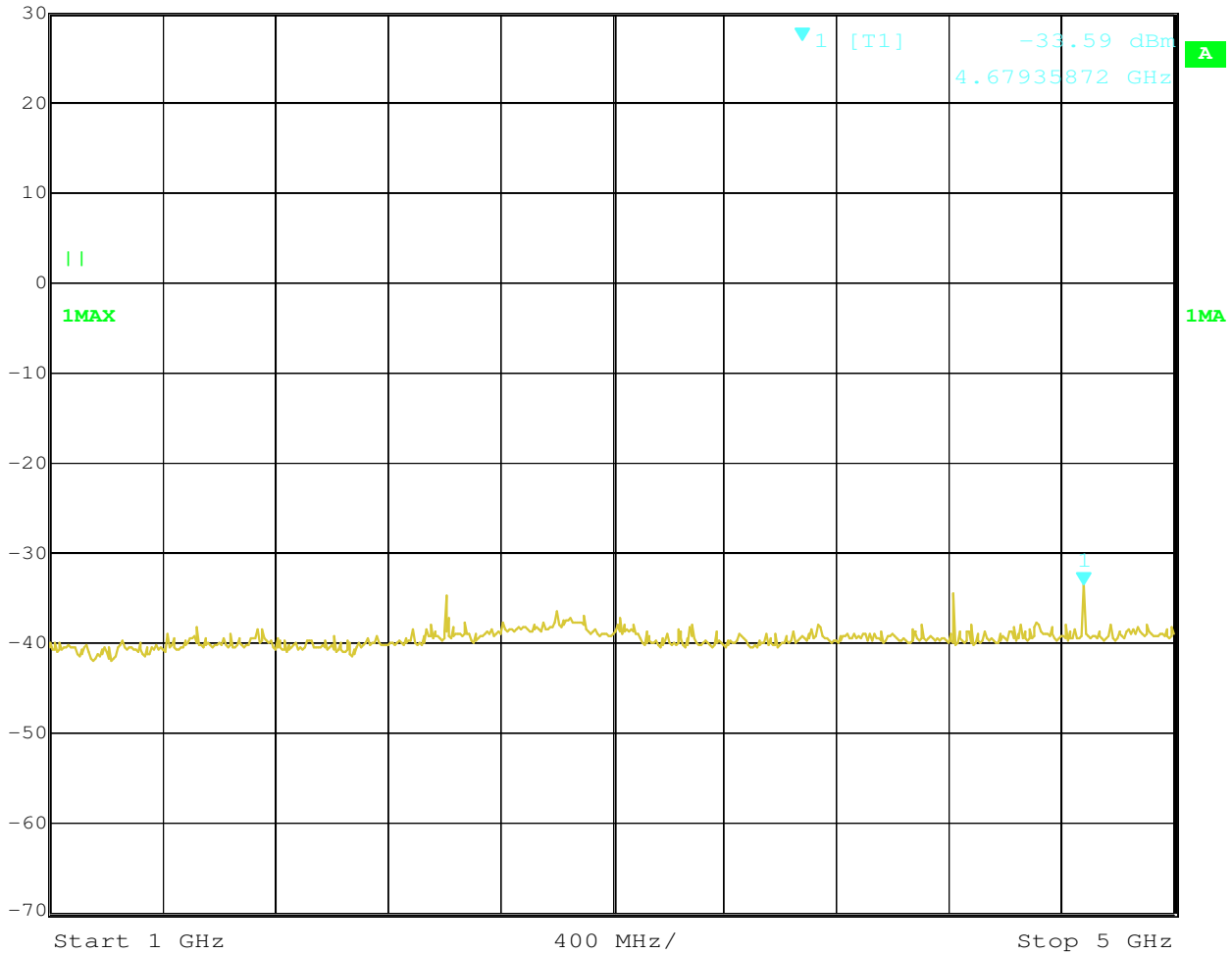


Date: 8.OCT.2016 11:03:38

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Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	40 dB
30 dBm	-33.59 dBm	VBW	3 MHz		
	4.67935872 GHz	SWT	10 ms	Unit	dBm



Date: 8.OCT.2016 11:04:22

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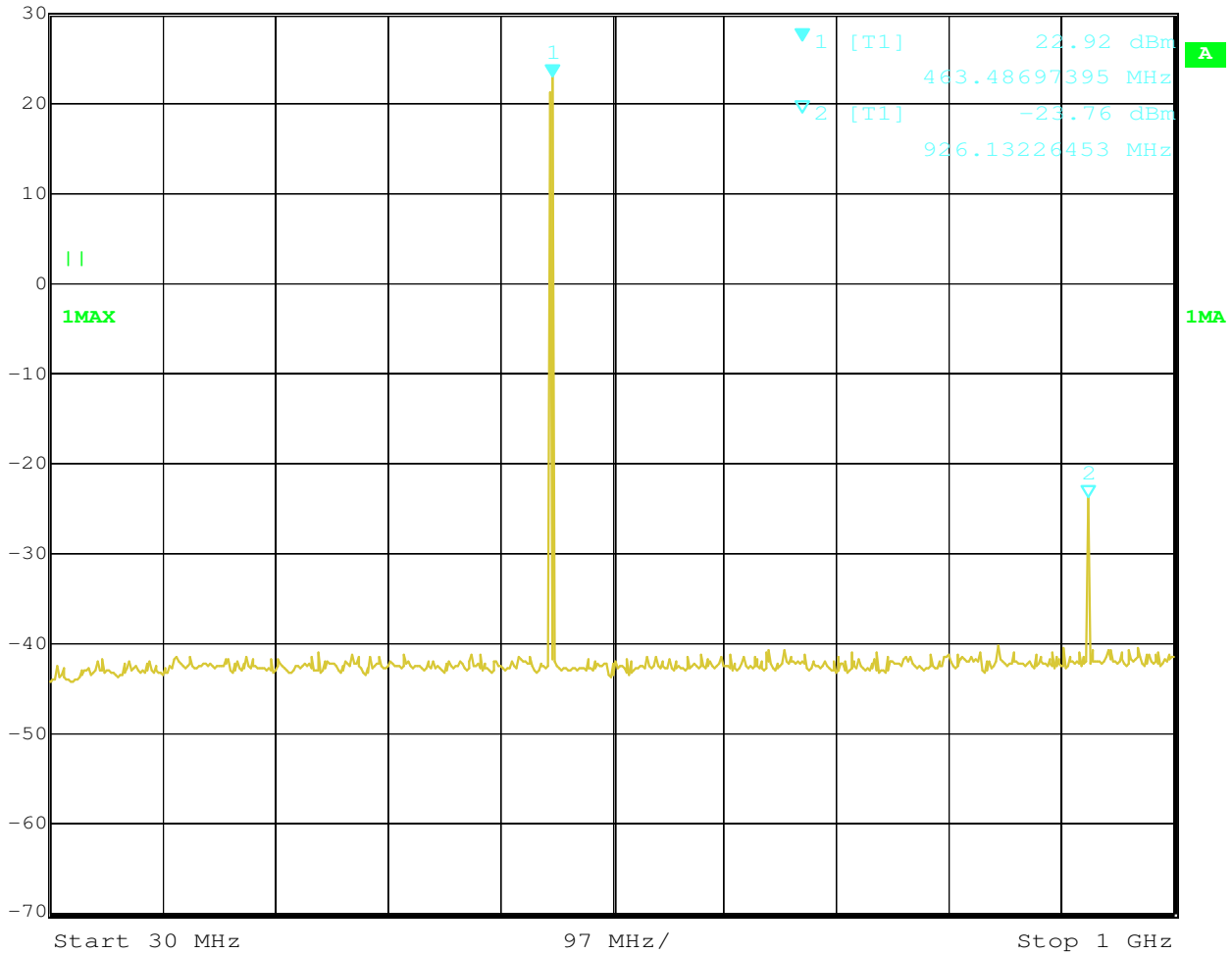




**Channel 10 462.6375MHz**



Ref Lvl	30 dBm	Marker 1 [T1]	22.92 dBm	RBW	100 kHz	RF Att	40 dB
			463.48697395 MHz	VBW	300 kHz	Unit	dBm
				SWT	245 ms		

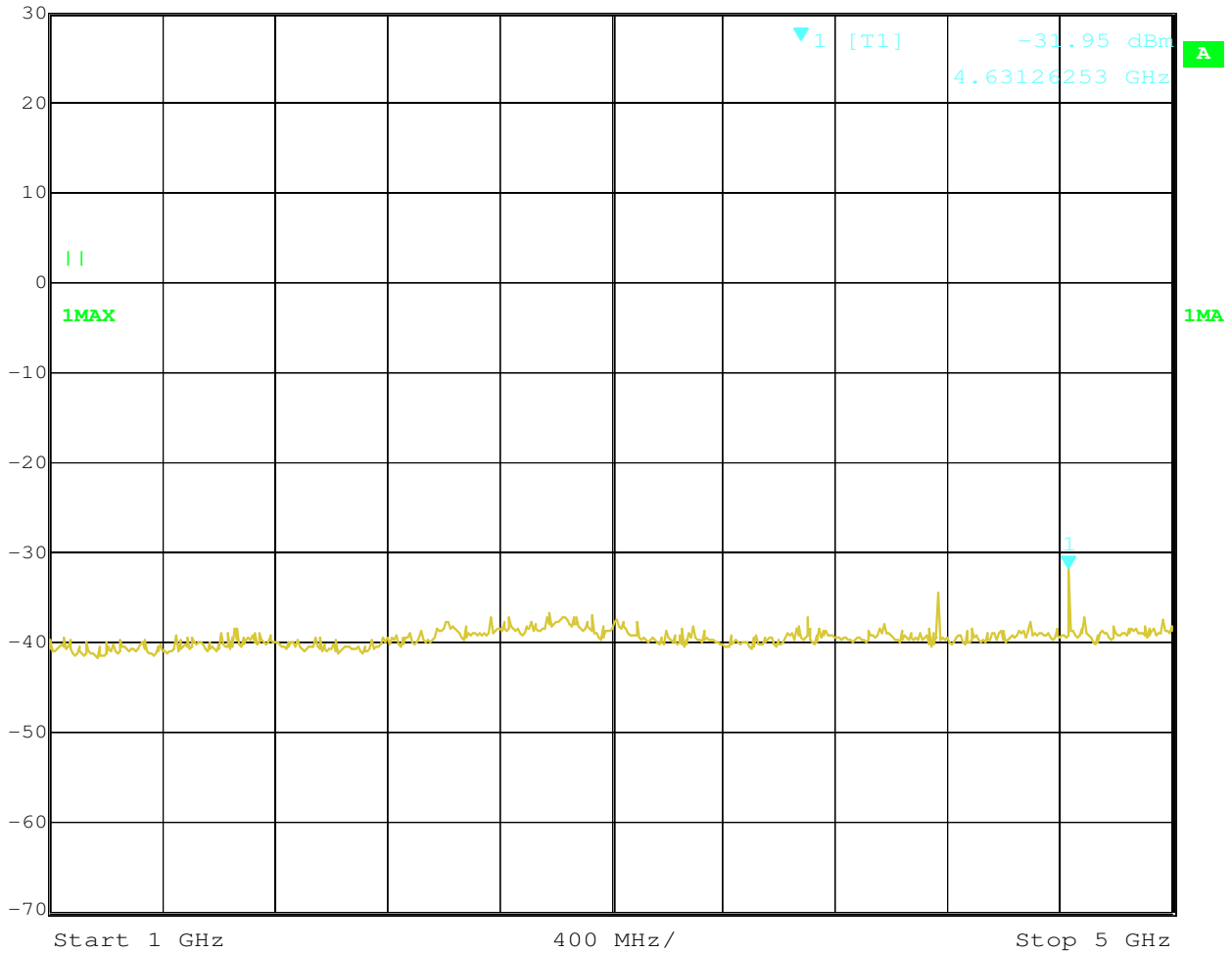


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Marker 1 [T1]	RBW	1 MHz	RF Att	40 dB
-31.95 dBm	VBW	3 MHz		
4.63126253 GHz	SWT	10 ms	Unit	dBm
Ref Lvl				
30 dBm				



Date: 8.OCT.2016 11:01:59

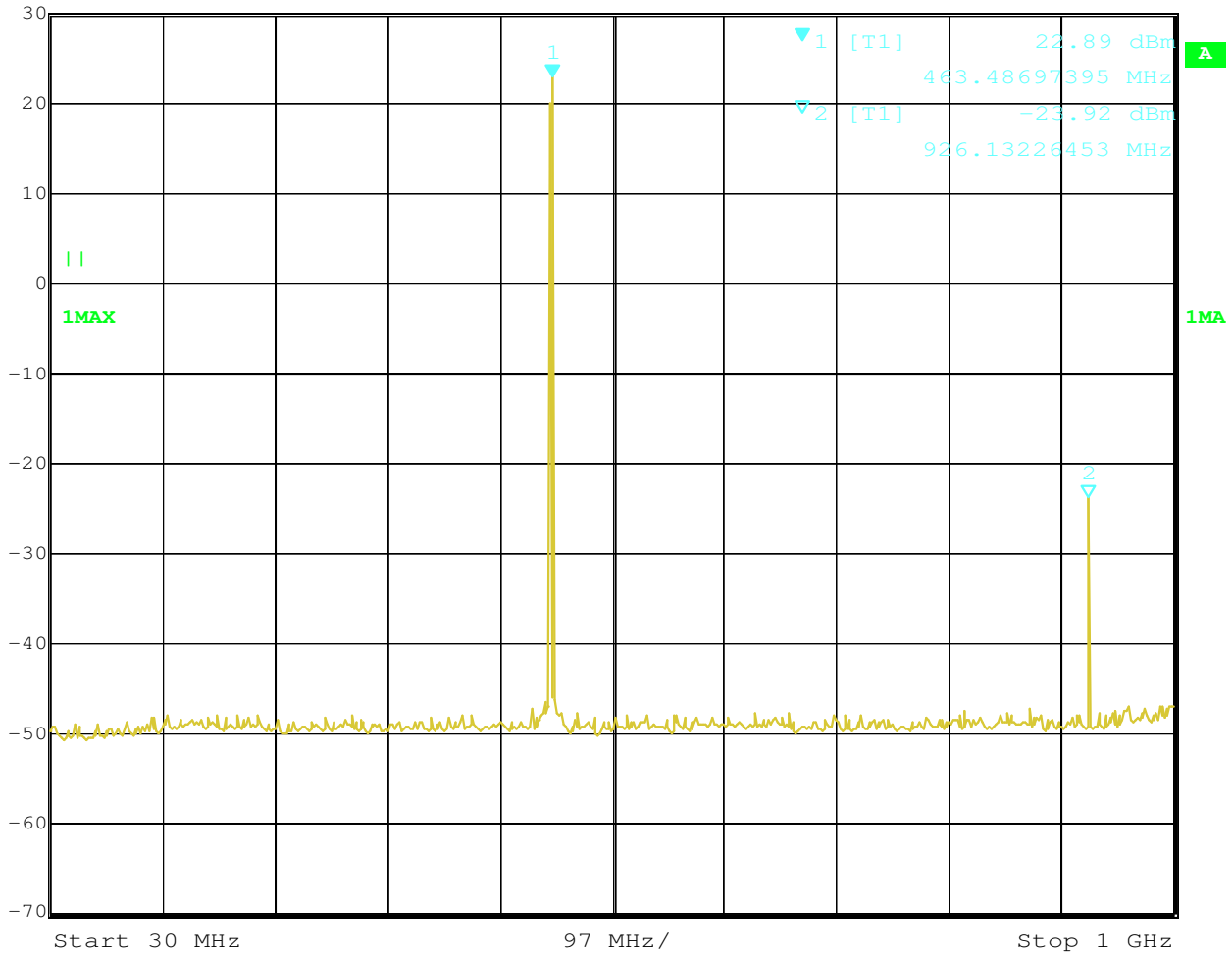
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**Channel 17 462.6500MHz**



Ref Lvl	22.89 dBm	RBW	100 kHz	RF Att	40 dB
30 dBm	463.48697395 MHz	VBW	300 kHz	Unit	dBm
		SWT	245 ms		

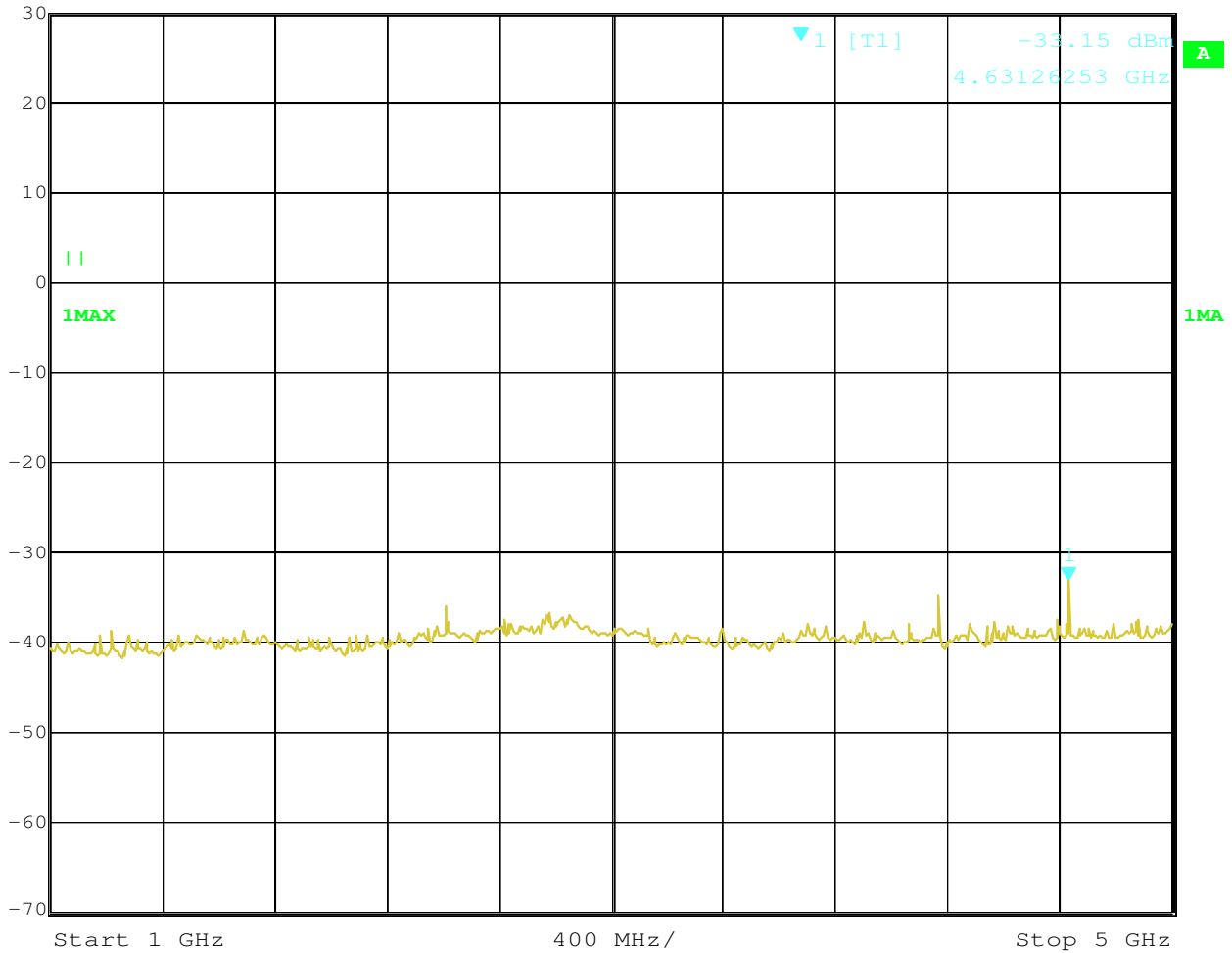


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Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	40 dB
30 dBm	-33.15 dBm	VBW	3 MHz		
	4.63126253 GHz	SWT	10 ms	Unit	dBm



Date: 8.OCT.2016 11:04:55

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## 8. UNWANTED RADIATION

### 8.1 PROVISIONS APPLICABLE

FCC §2.1053 and §95.635

### 8.2 MEASUREMENT PROCEDURE (Radiated Emissions)

- (1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.
- (2). The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- (3). The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- (4). The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- (5). The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
- (6). The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- (7). The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
- (8). The maximum signal level detected by the measuring receiver shall be noted.
- (9). The measurement shall be repeated with the test antenna set to horizontal polarization.
- (10). Replace the antenna with a proper Antenna (substitution antenna).
- (11). The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
- (12). The substitution antenna shall be connected to a calibrated signal generator.
- (13). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- (14). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- (15). The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- (16). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- (17). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

The report refers only to the sample tested and does not apply to the bulk.

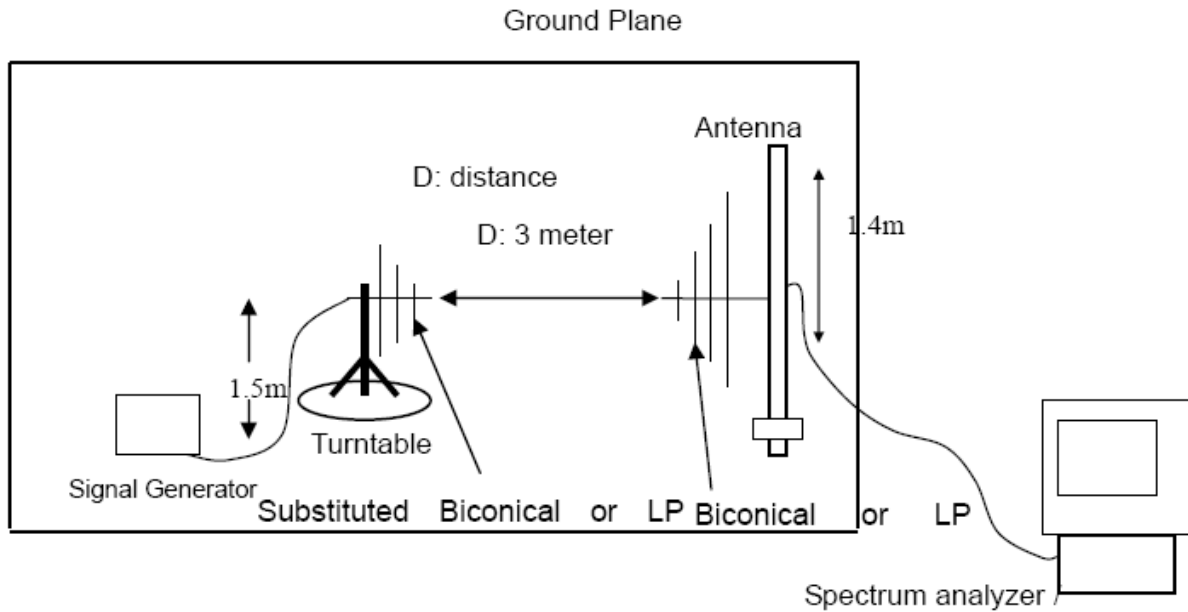
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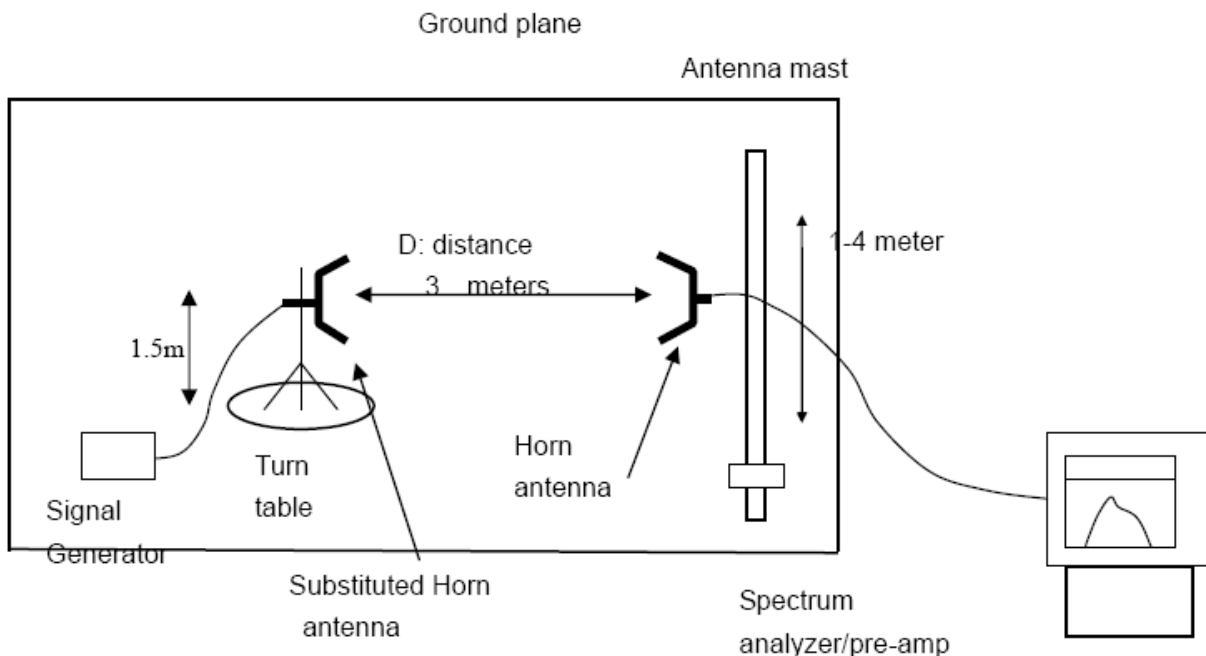


### 8.3 Substitution Method: (Radiated Emissions)

#### Radiated Below 1GHz



#### Radiated Above 1 GHz



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**8.4 MEASUREMENT RESULTS:**

Calculation: Limit (dBm)= EL-43-10log10 (T)=-13dBm

Notes: EL is the emission level of the Output Power expressed in dBm, in this application, the EL is 27 dBm

Channel 04 467.6375MHz

Frequency (MHz)	Antennal Polarity	Emission (dBm)	Limit (dBm)
935.275	Vertical	-36.55	-13
1402.913	Vertical	-42.19	-13
1870.55	Vertical	-46.62	-13
935.275	Horizontal	-40.38	-13
1402.913	Horizontal	-47.25	-13

Channel 10 462.6375MHz

Frequency (MHz)	Antennal Polarity	Emission (dBm)	Limit (dBm)
925.275	Vertical	-36.31	-13
1387.913	Vertical	-42.70	-13
1850.55	Vertical	-47.08	-13
925.275	Horizontal	-40.59	-13
1387.913	Horizontal	-47.67	-13

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Channel 17 462.6500MHz

Frequency (MHz)	Antennal Polarity	Emission (dBm)	Limit (dBm)
925.30	Vertical	-36.61	-13
1387.95	Vertical	-42.53	-13
1850.60	Vertical	-46.83	-13
925.30	Horizontal	-40.13	-13
1387.95	Horizontal	-47.56	-13

**Note: ERP was recorded.**

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## 9. Modulation Characteristics

### 9.1 PROVISIONS APPLICABLE

According to CFR 47 section 2.1047(a), for Voice Modulation Communication Equipment, the frequency response of the audio modulation circuit over a range of 100 to 5000Hz shall be measured.

Part95.637: A GMRS transmitter that transmits emission types F1D, G1D, or G3E must not exceed a peak frequency deviation of plus or minus 5 kHz. A GMRS transmitter that transmits emission type F3E must not exceed a peak frequency deviation of plus or minus 5 kHz. A FRS unit that transmits emission type F3E must not exceed a peak frequency deviation of plus or minus 2.5 kHz, and the audio frequency response must not exceed 3.125 kHz

### 9.2 MEASUREMENT METHOD

#### 9.2.1 Modulation Limit

- (1). Configure the EUT as shown in figure 1, adjust the audio input for 60% of rated system deviation at 1KHz using this level as a reference (0dB) and vary the input level from -20 to +20dB. Record the frequency deviation obtained as a function of the input level.
- (2). Repeat step 1 with input frequency changing to 300, 1000, 1500 and 3000Hz in sequence.

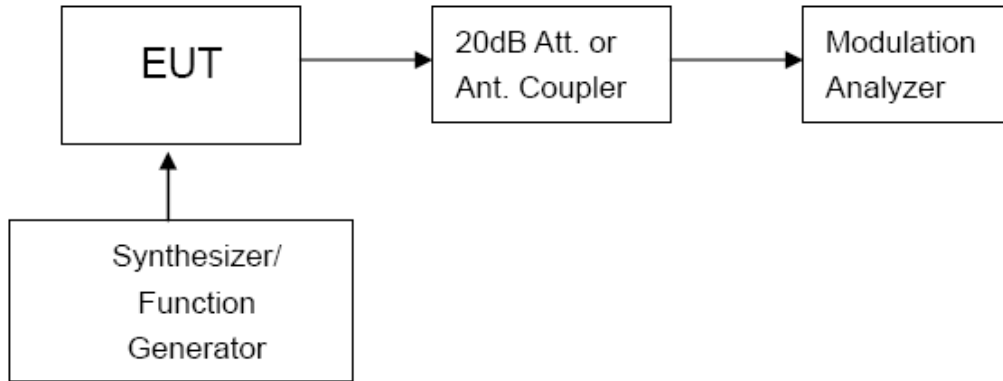
#### 9.2.2 Audio Frequency Response

- (1). The EUT and test equipment were set up as shown in figure 2.
- (2). Adjust the Modulation Analyzer for the following setting:
  - a) High-pass filter : off
  - b) Low-pass filter : 15 kHz
  - c) Detector : positive peak
  - d) Function : FM
- (3). The audio signal input was adjusted to obtain 20 % modulation at 1 kHz, and this point was taken as the 0 dB reference level.
- (4). With input levels held constant and below limiting at all frequencies, the audio signal generator was varied from 300 Hz to 5 kHz.
- (5). The response in dB relative to 1 kHz was then measured, using the Modulation Analyzer.

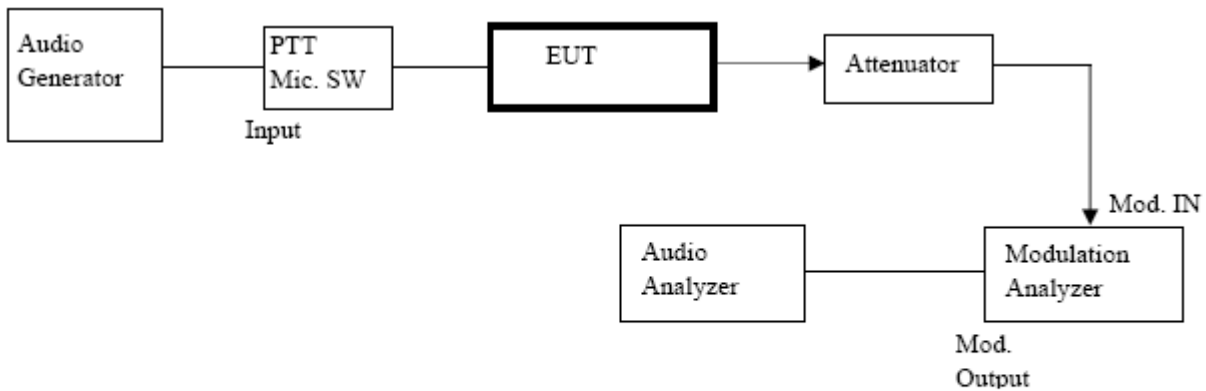
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**Figure 1: Modulation characteristic measurement configuration**



**Figure 2: Audio Frequency Response Measurement Configure**

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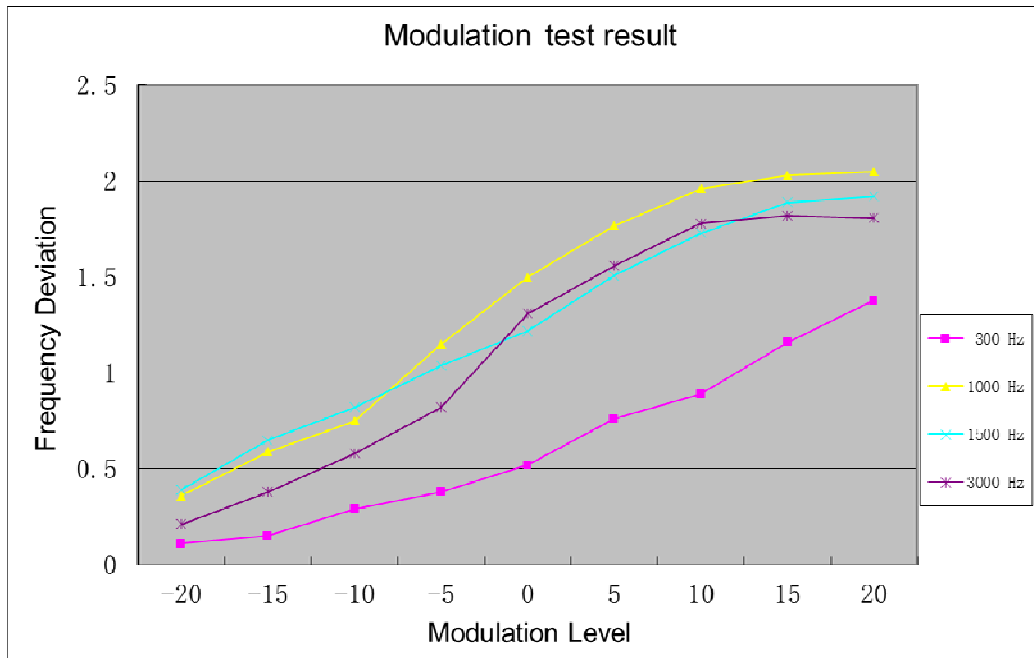


**9.4 MEASUREMENT RESULT**

**(a). Modulation Limit:**

**CH4 (467.6375MHz)**

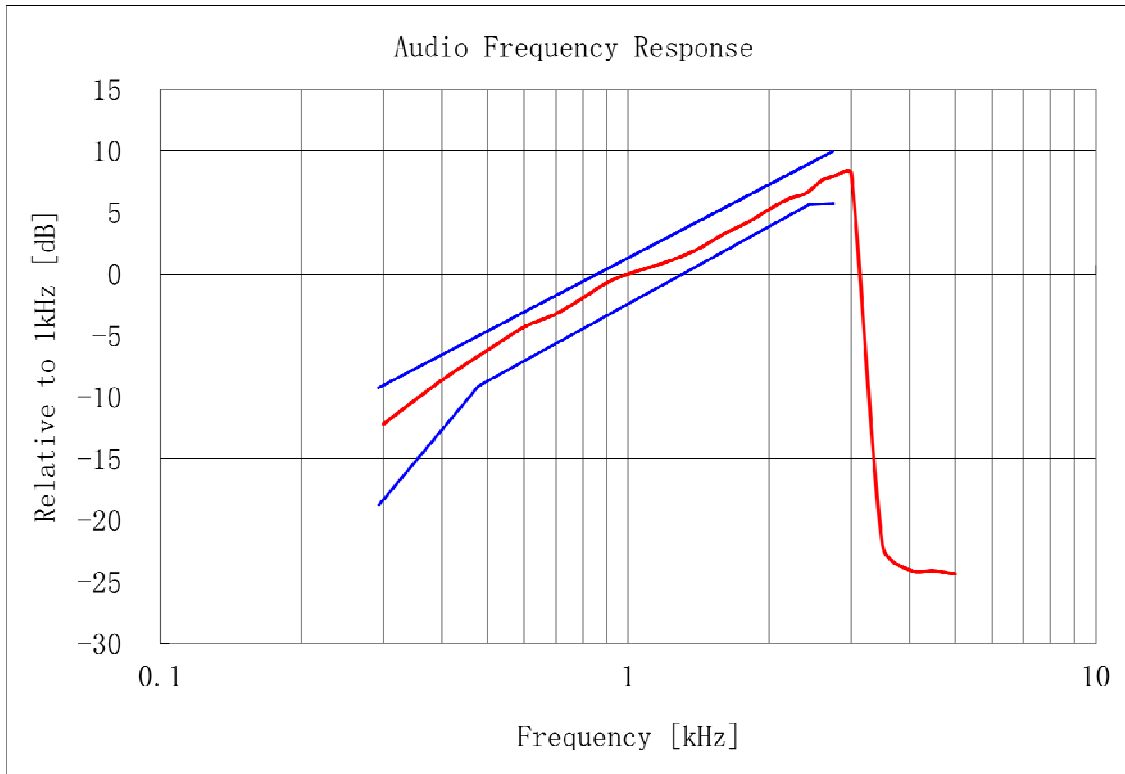
Modulation Level (dB)	Peak Freq. Deviation At 300 Hz	Peak Freq. Deviation At 1000 Hz	Peak Freq. Deviation At 1500 Hz	Peak Freq. Deviation At 3000 Hz
-20	0.11	0.36	0.39	0.21
-15	0.15	0.59	0.65	0.38
-10	0.29	0.75	0.82	0.58
-5	0.38	1.15	1.04	0.82
0	0.52	1.5	1.22	1.31
5	0.76	1.77	1.51	1.56
10	0.89	1.96	1.73	1.78
15	1.16	2.03	1.89	1.82
20	1.38	2.05	1.92	1.81



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**(b). Audio Frequency Response:**

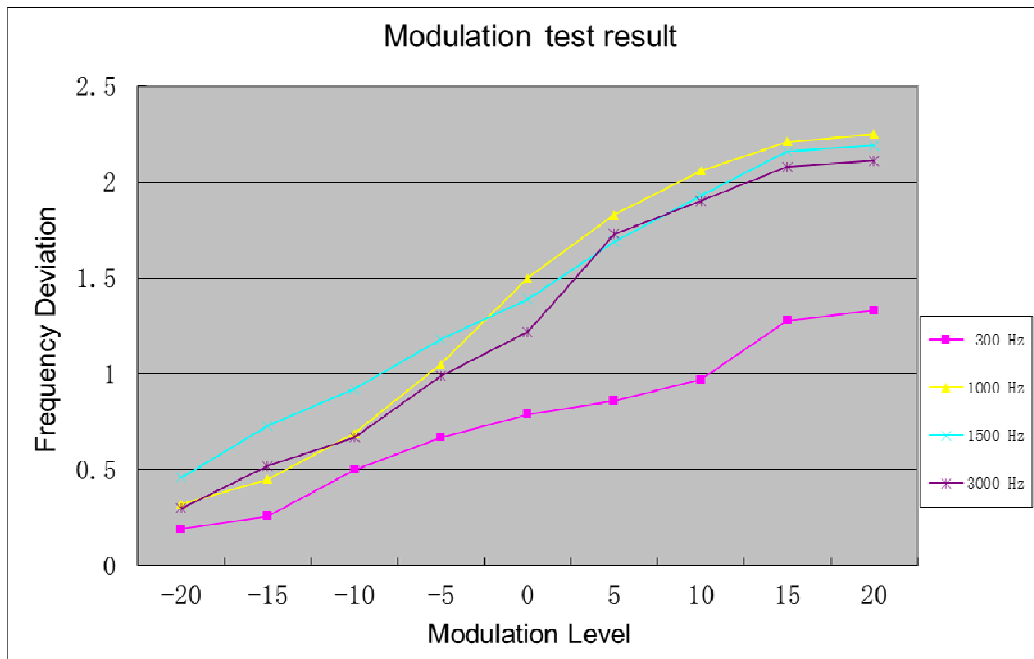


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**CH17 (462.6500MHz)**

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz	Peak Freq. Deviation At 1000 Hz	Peak Freq. Deviation At 1500 Hz	Peak Freq. Deviation At 3000 Hz
-20	0.19	0.32	0.46	0.3
-15	0.26	0.45	0.73	0.52
-10	0.5	0.69	0.92	0.67
-5	0.67	1.05	1.18	0.99
0	0.79	1.5	1.39	1.22
5	0.86	1.83	1.69	1.73
10	0.97	2.06	1.93	1.9
15	1.28	2.21	2.16	2.08
20	1.33	2.25	2.19	2.11



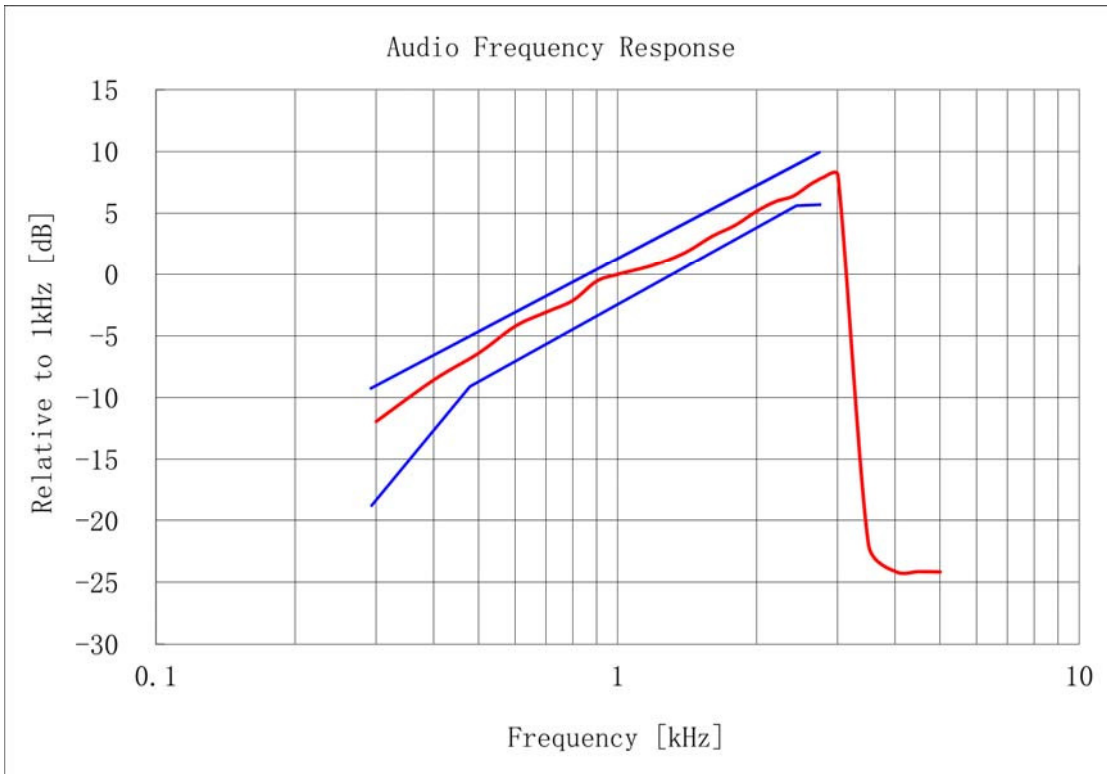
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**(b). Audio Frequency Response:**



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## 10. MAXIMUM TRANSMITTER POWER

### 10.1 PROVISIONS APPLICABLE

Per FCC §2.1046 and §95.639 (a) No GMRS transmitter, under any condition of modulation, shall exceed:  
(1) 50 W *Carrier power* (average TP during one unmodulated RF cycle) when transmitting emission type A1D, F1D, G1D, A3E, F3E or G3E.

Per FCC §2.1046 and §95.639(d), No FRS Unit, under any condition of modulation, shall exceed a 0.5 W effective radiated power (ERP).

### 10.2 TEST PROCEDURE

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the emissions were measured by the substitution.

### 10.3 TEST RESULT

Power Measurement Results	
Channel	Measurement Result (dBm)
Channel 04 (467.6375MHz)	23.68
Channel 10 (462.6375MHz)	23.52
Channel 17 (462.6500MHz)	23.55

Note: ERP was recorded.

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## **11. Radiated Emission on Receiving Mode**

### **11.1 Provisions Applicable**

FCC Part 15 Subpart B Section 15.109

### **11.2 TEST METHOD**

ANSI C 63.4: 2014

### **11.4 MEASURE RESULT (MEASURED AT 3M USING FCC PART15 B LIMITS)**

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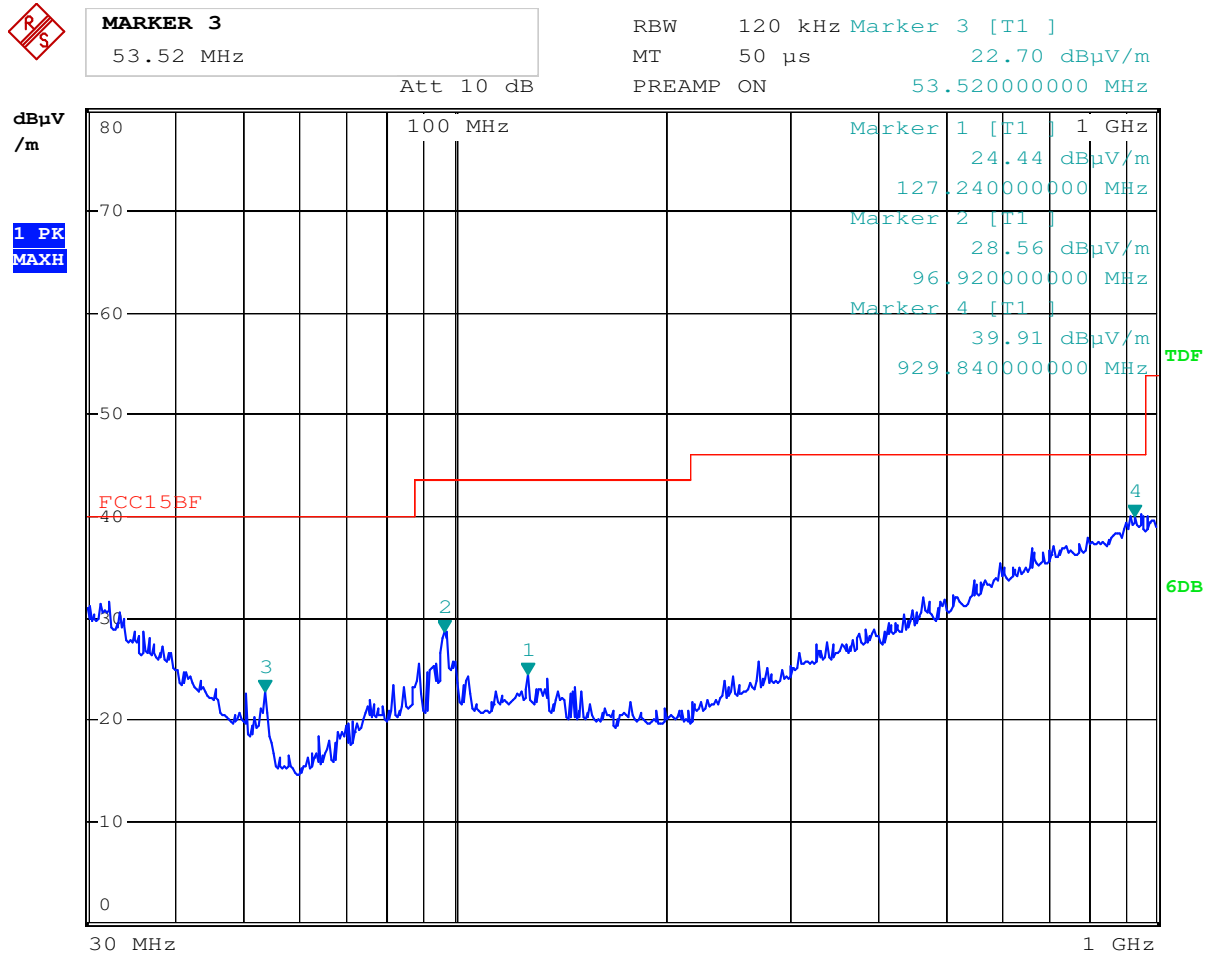




**A Radiated Disturbance In Vertical (30MHz----1000MHz)**

**EUT set Condition: Receiving**  
**Level: Class B**  
**Results: PASS**

Please refer to following diagram for individual



Date: 26.SEP.2016 18:16:31

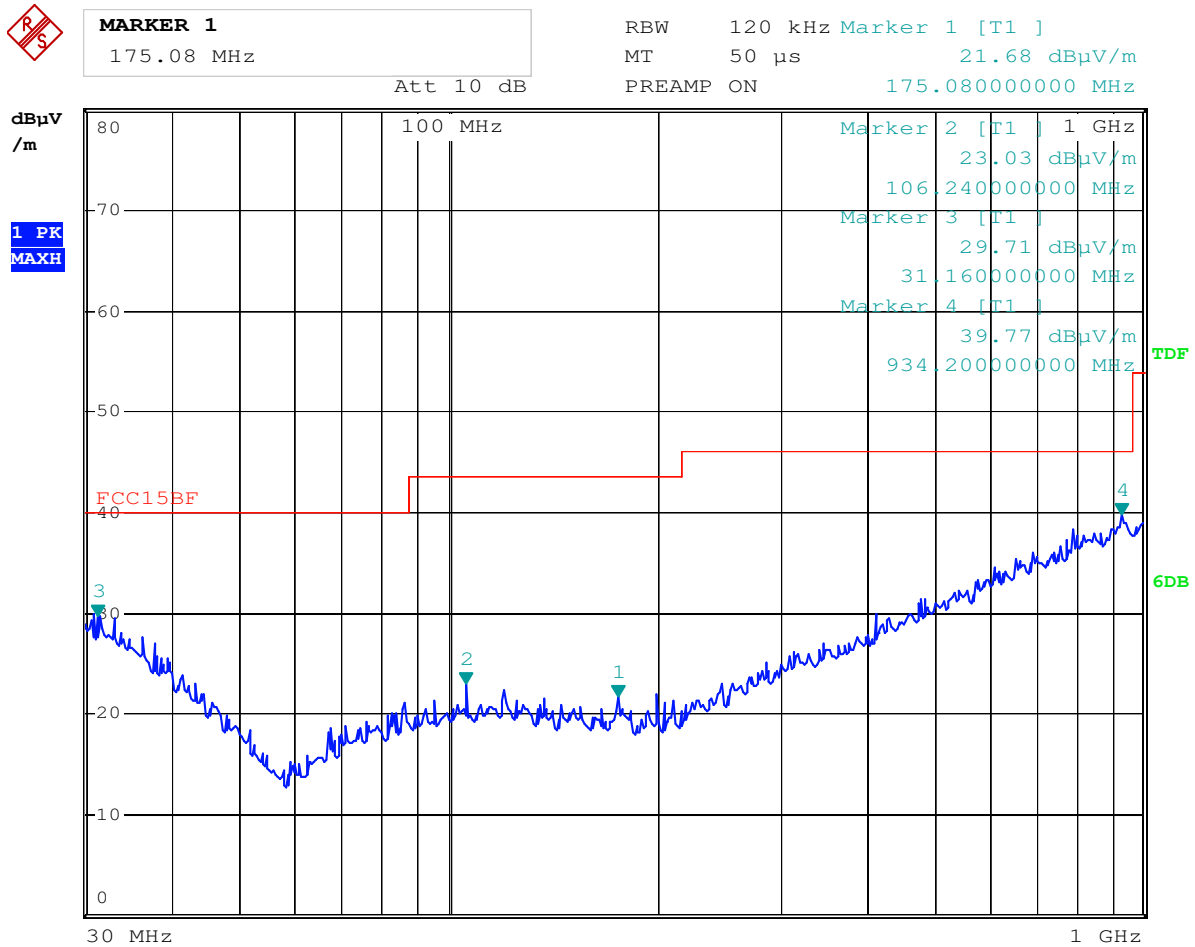
Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
53.52	22.70	V	40.00
127.24	24.44	V	40.00
96.92	28.56	V	40.00
929.84	39.91	V	46.00

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**B Radiated Disturbance In Horizontal (30MHz----1000MHz)**

**EUT set Condition:** Receiving  
**Level:** Class B  
**Results:** PASS  
 Please refer to following diagram for individual



Date: 26.SEP.2016 18:17:47

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
175.08	21.68	H	40.00
106.24	23.03	H	40.00
31.16	29.71	H	40.00
934.20	39.77	H	46.00

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## 12.0 FCC ID Label

FCC ID: 2AIOQ-FTAN20AA

**This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.**

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

### Mark Location:



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### 13.0 Photo of testing

#### 13.1 Conducted test View--



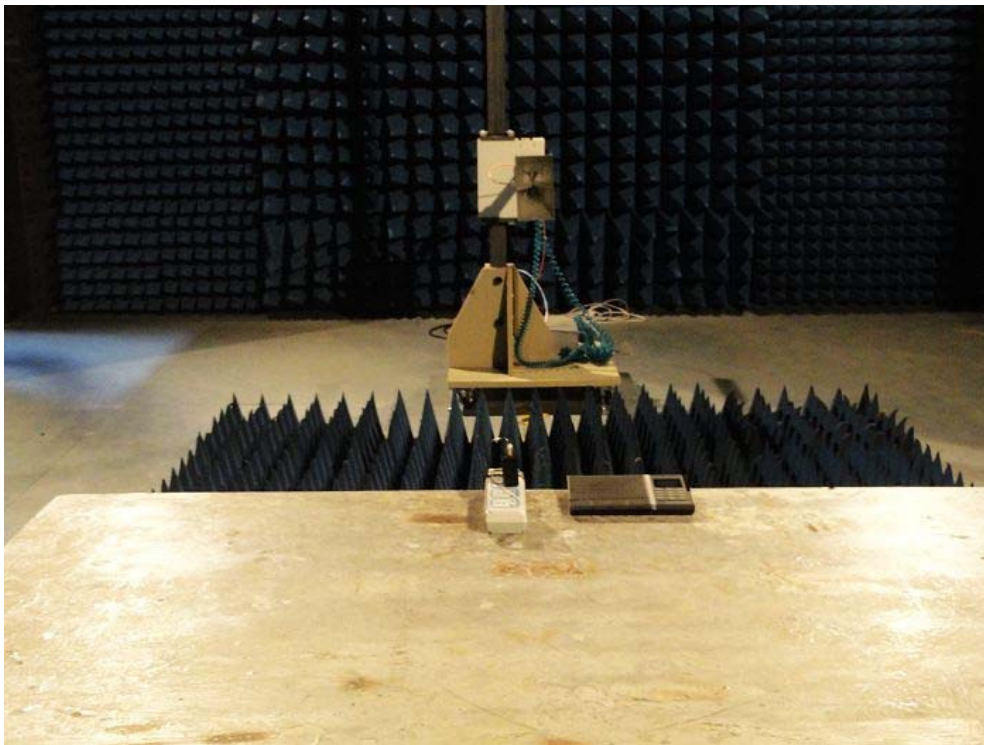
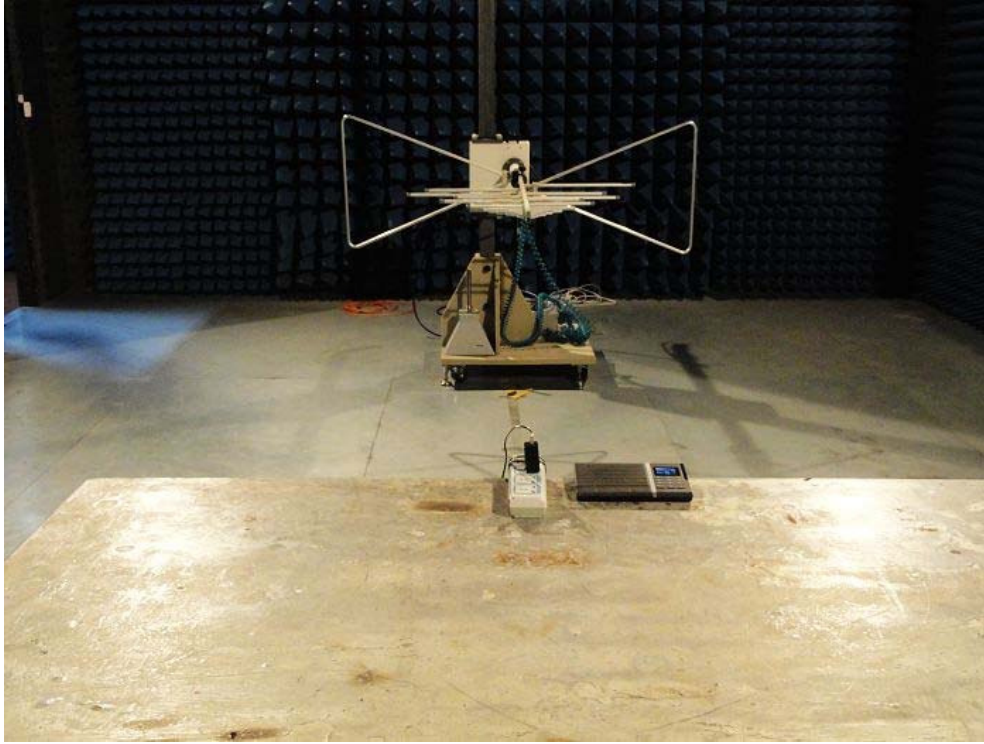
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### 13.2 Radiated emission test view



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Outside View



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Power Supply



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Power Supply

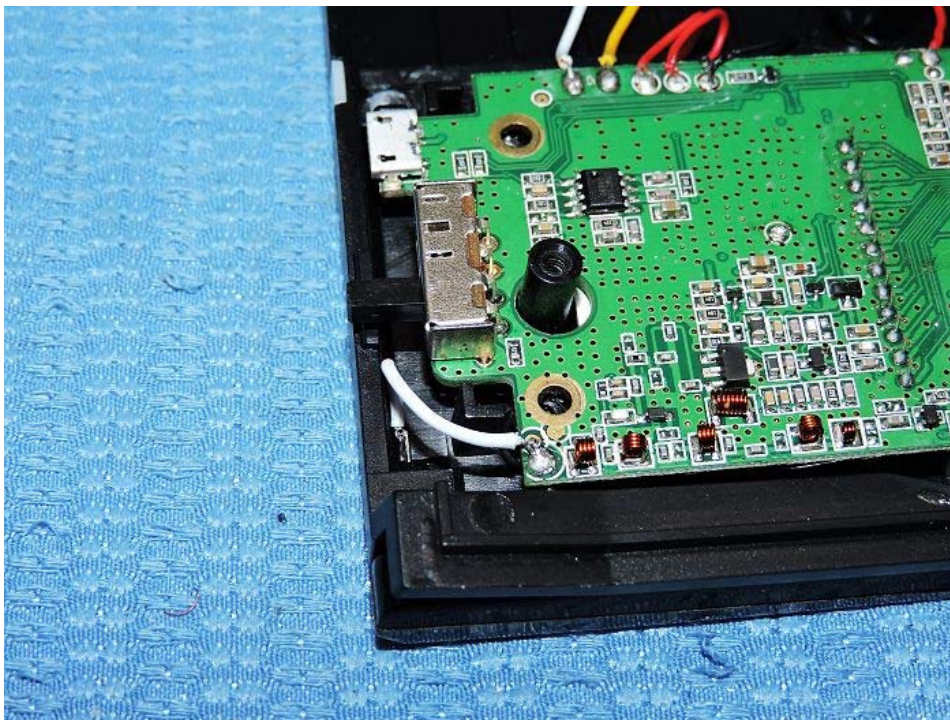


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Interior View

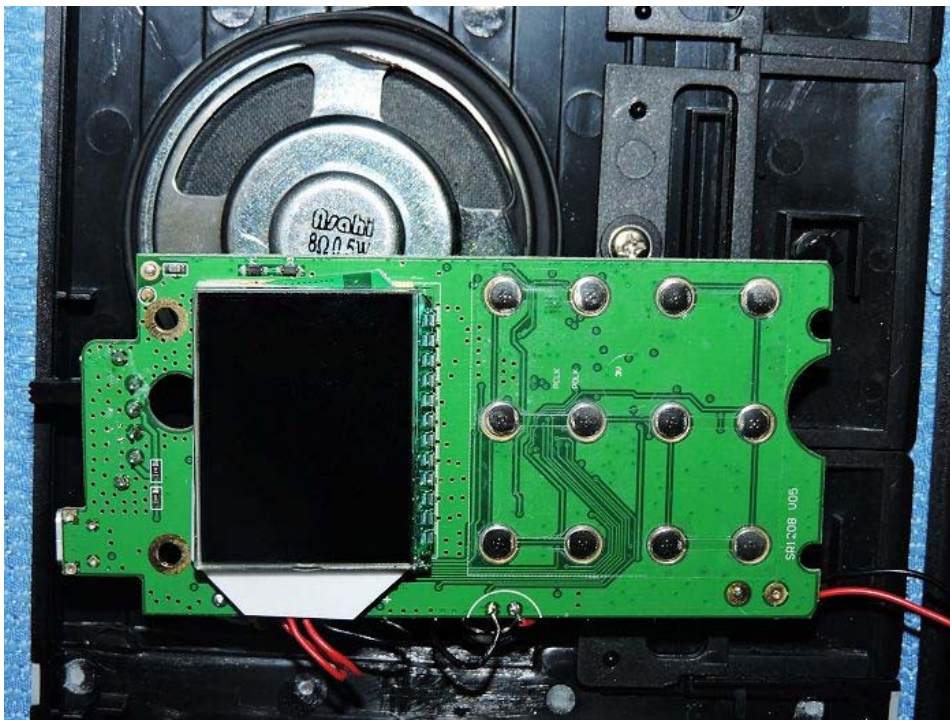
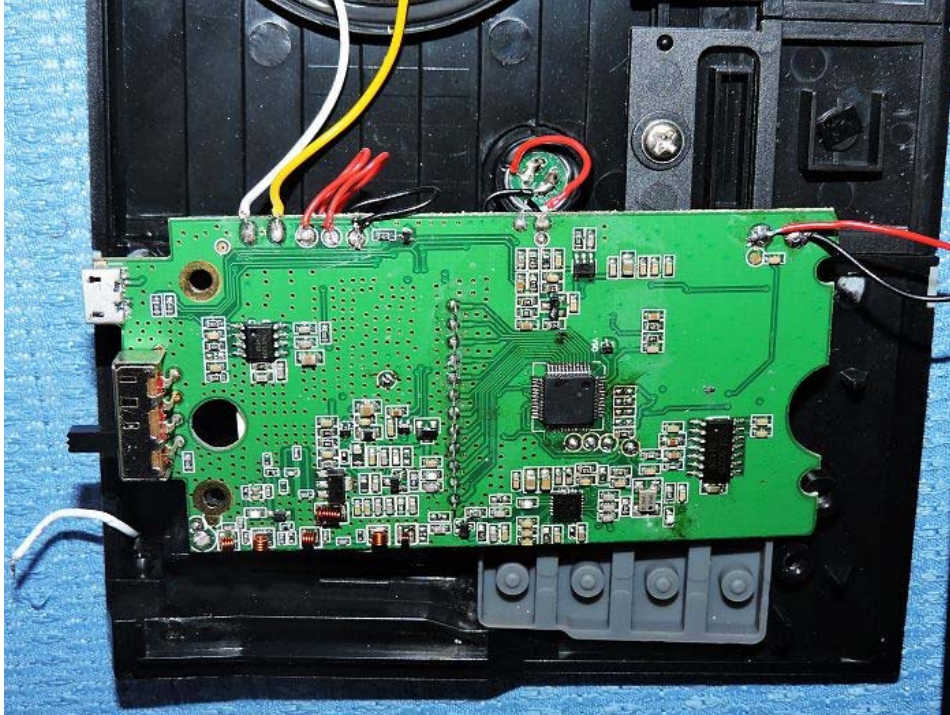


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Interior View

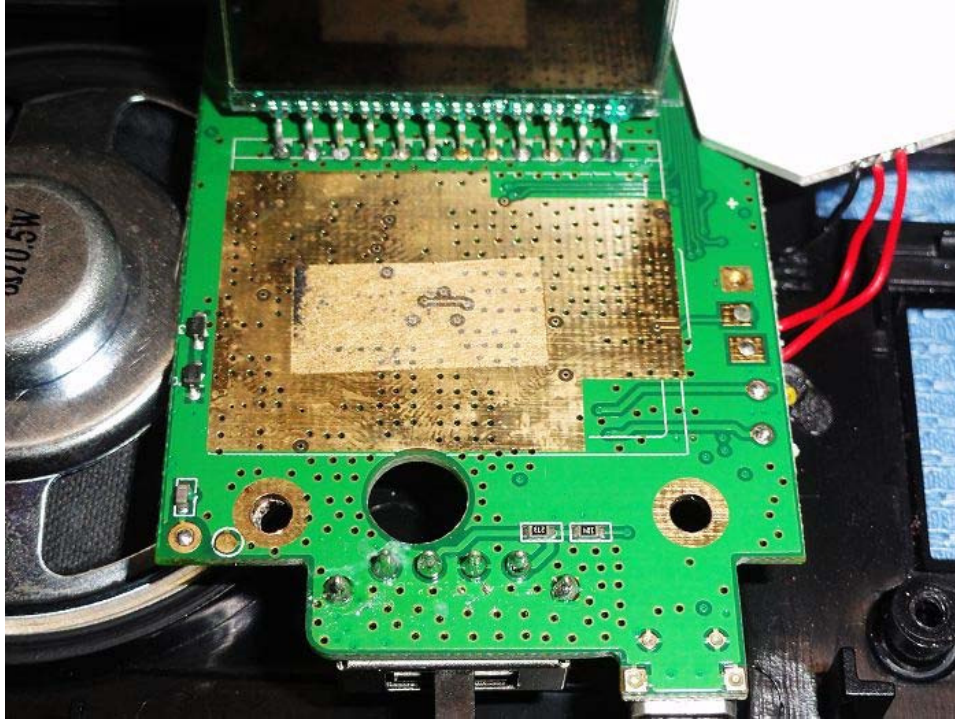


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Interior View

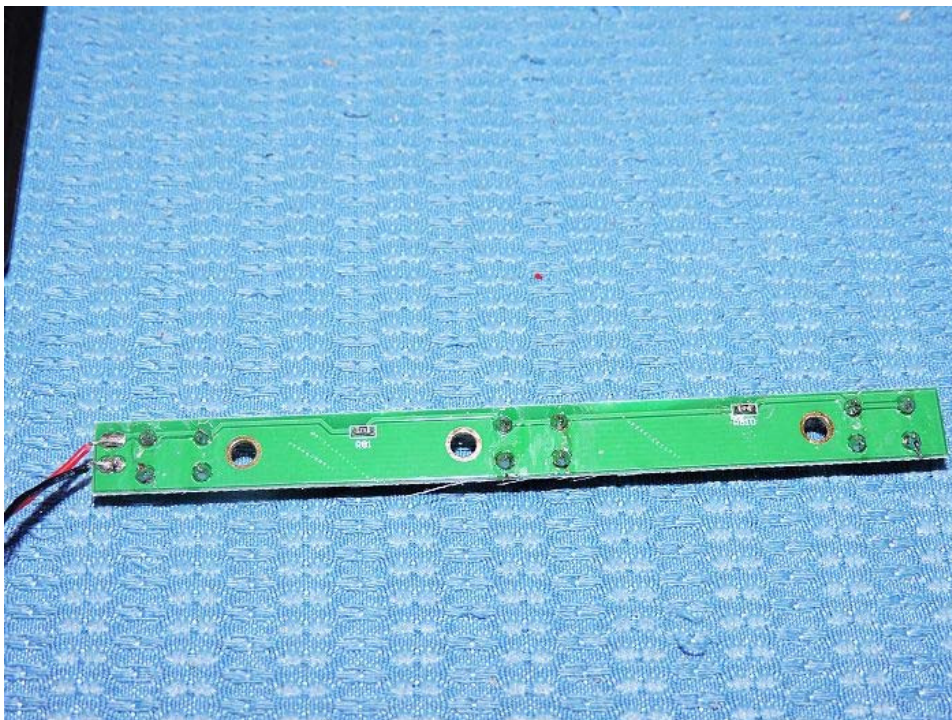
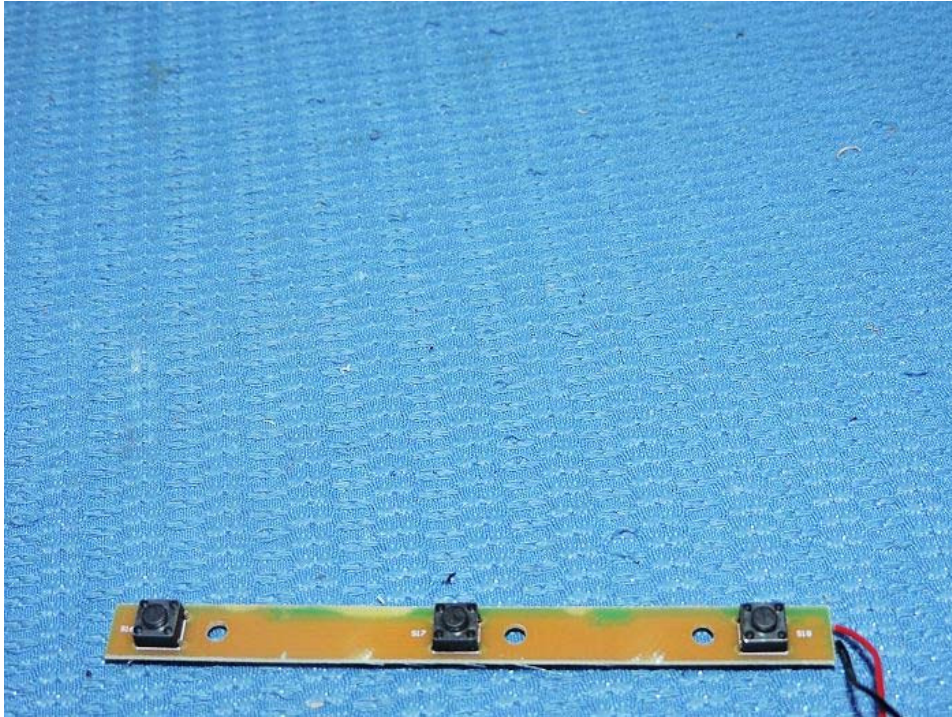


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Interior View



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