
	Test Report Serial No.:	111115-T1336-E-150	Report Issue Date:	2/4/2016	
	Measurement Date(s):	Nov 11-25, 2015	Report Revision No.:	Revision 1.1	
	FCC Rule Part(s):	47 CFR §2; §15.231	FCC Test Firm Reg. No.:	Accredited	
	IC Standard(s):	RSS-210    RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

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## 6.0 FIELD STRENGTH OF THE FUNDAMENTAL AND SPURIOUS EMISSIONS

### 6.1 References

<b>Normative Reference Standard</b>	FCC CFR 47 §15.231; §15.209; IC RSS-210 Issue 8
<b>Procedure Reference</b>	ANSI C63.4:2014

### 6.2 Limits

#### TX Emission Limits (FCC §15.231)

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emission (microvolts/meter)
40.66–40.70	2,250	225
70–130	1,250	125
130–174	1,250 to 3,750	125 to 375
174–260	3,750	375
260–470	3,750 to 12,500	375 to 1,250
Above 470	12,500	1,250
<sup>1</sup> Linear interpolations		

#### TX Emission Limits (IC RSS-210 A1.1.1)

Fundamental Frequency (MHz), excluding restricted band frequencies of RSS-Gen	Field Strength of the Fundamental (microvolts/meter)	Field Strength of Unwanted Emissions (microvolts/meter)
40.66–40.70	See Section A2.7	
70–130	1,250	125
130–174	1,250 to 3,750	125 to 375
174–260	3,750	375
260–470	3,750 to 12,500	375 to 1,250
Above 470	12,500	1,250
<sup>1</sup> Linear interpolations		

### 6.3 Environmental conditions

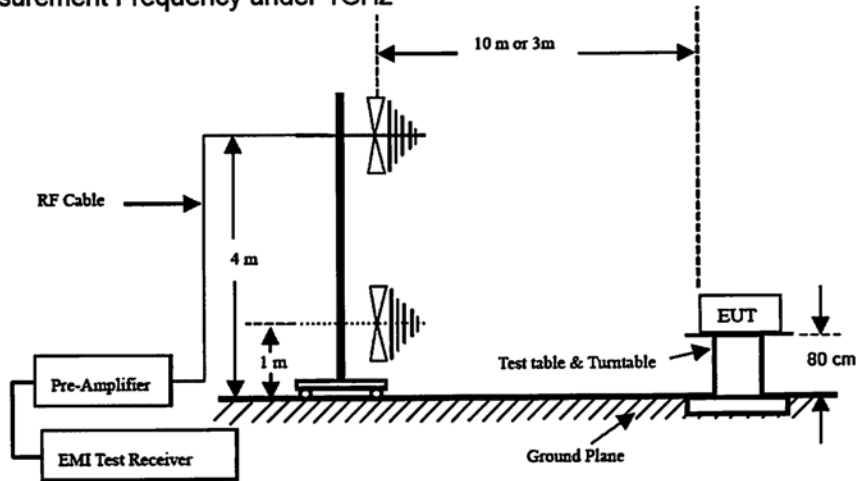
<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa



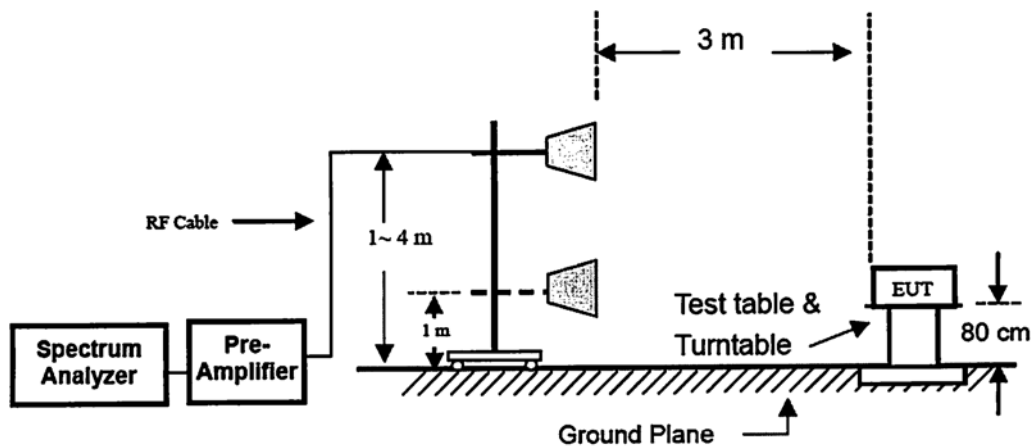


## 6.5 Test Measurement Configuration.

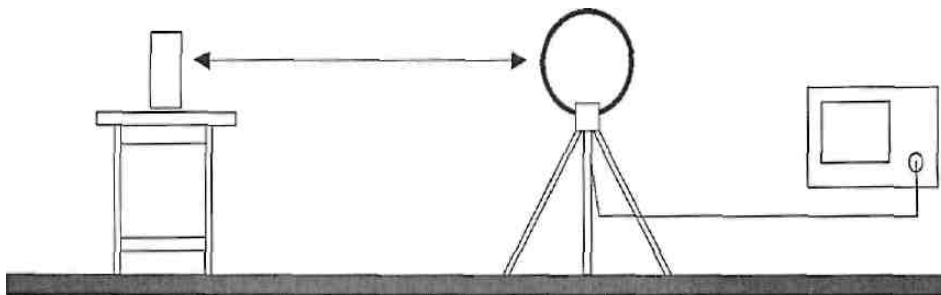
### Measurement Frequency under 1GHz



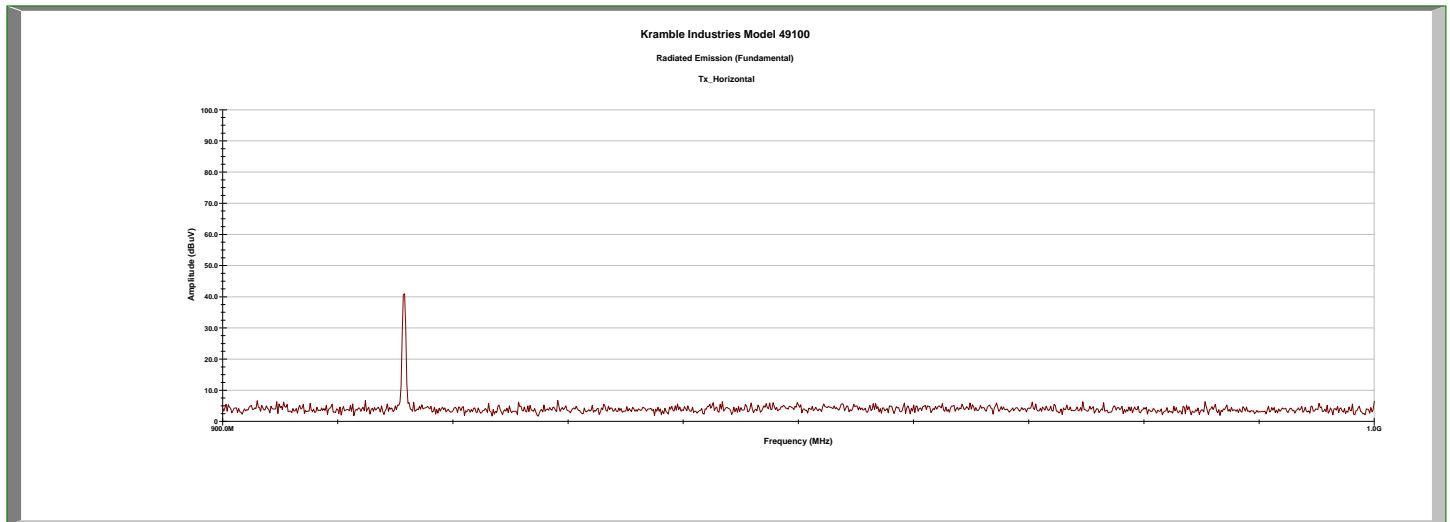
### Measurement Frequency above 1GHz



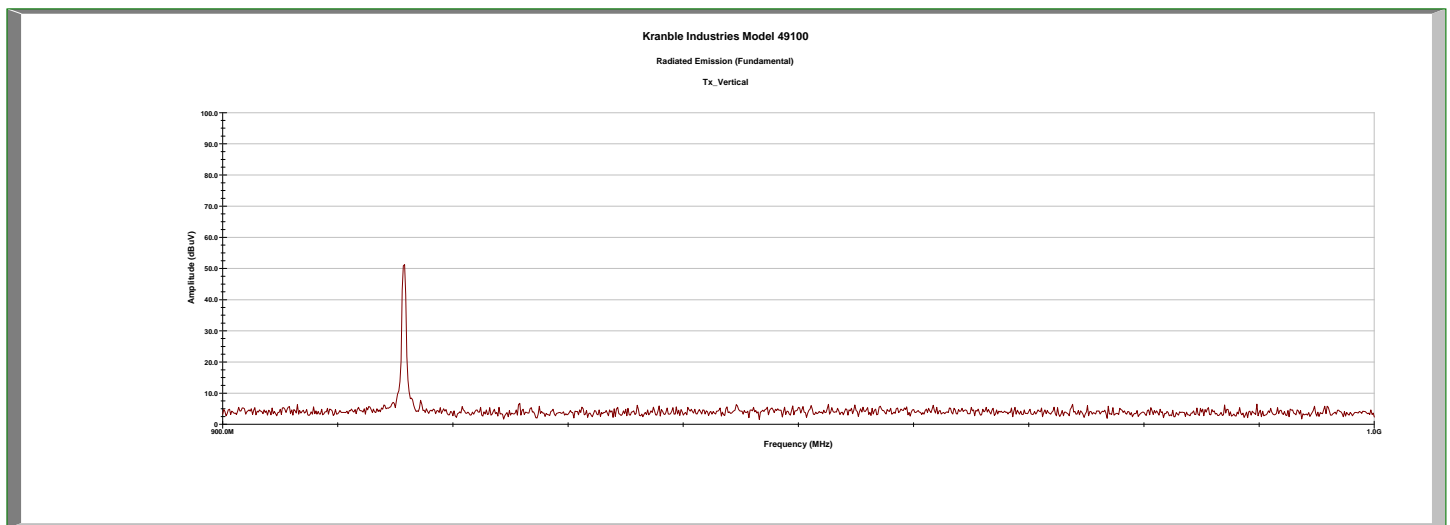
### Measurement Frequency under 30 MHz



### TX Radiated Emissions Scan, 900 MHz-1GHz, Horizontal



### TX Radiated Emissions Scan, 900 MHz-1GHz, Vertical



- Emissions for the transmitter and receiver were searched from the lowest frequency generated to the 10<sup>th</sup> harmonic of the fundamental frequency.
- All detected emissions are reported.
- Data reported was captured using a quasi-peak detector.
- The transmitter was tested with fully charged DC cells.
- N.D. = Not Detected.

## Fundamental Emission

$$E \text{ (dBuV/m)@3m} = V \text{ (dBuV)@3m} + AF_{\text{Bilog}} + CL_{\text{Total}} + CL_{4m}$$

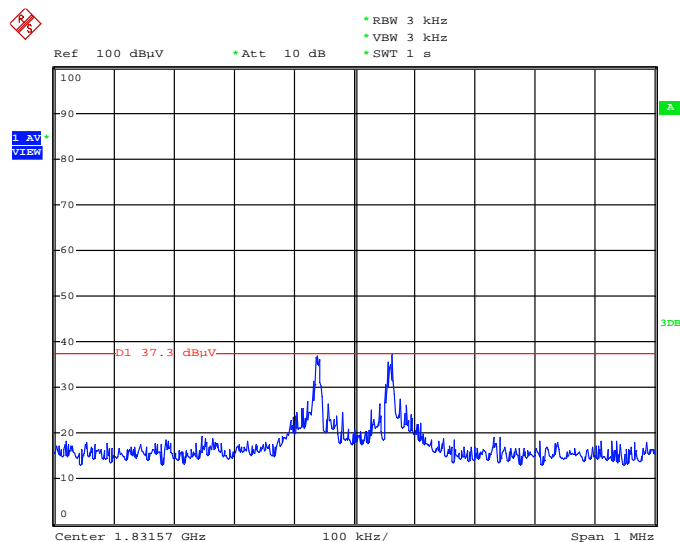
Where:

$AF_{\text{Bilog}}$  = Antenna Factor of Bilog Antenna

$CL_{\text{Total}}$  = Cable Loss of 25m Cable + Cable Loss of 4m Cable

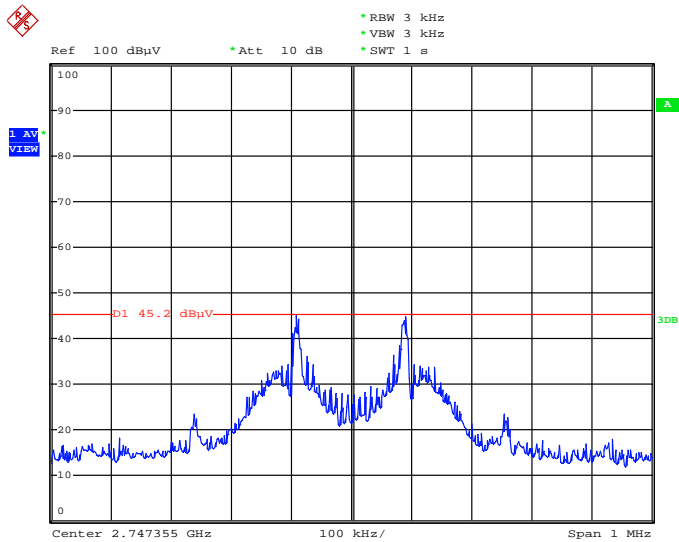
Emission Frequency	Ant. Pol.	Maximized Level	Cable Loss	Ant. Factor	Duty Cycle Factor	Field Strength	Limit	Margin	Result
[MHz]		[dBuV]	[dB]	[dB]	[-dB]	[dBuV]	[dBuV]	[dB]	
915.8	H	40.9	3.6	23.6	0	68.1	82.0	-13.9	Pass
915.8	V	51.2	3.6	23.5	0	78.3	82.0	-3.7	Pass

## Spurious Emissions 1GHz to 10GHz



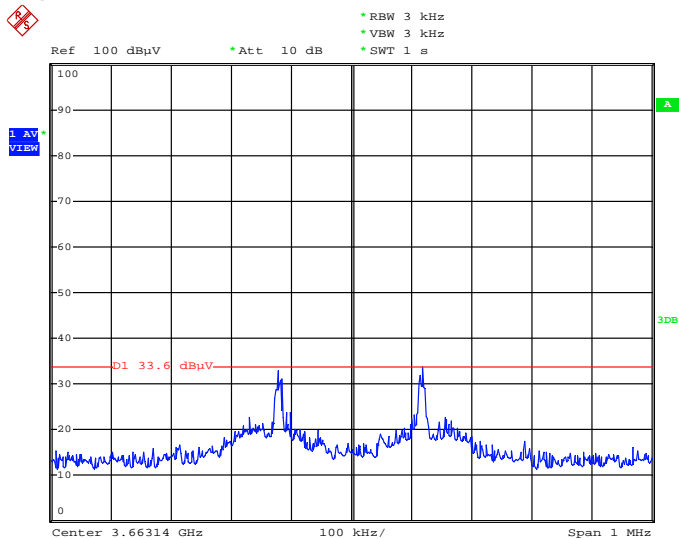
Date: 20.NOV.2015 14:36:14

2<sup>nd</sup> Harmonic – 1.83GHz, Horizontal  
V @ 3m = 37.3dBuV





Date: 20.NOV.2015 14:37:27

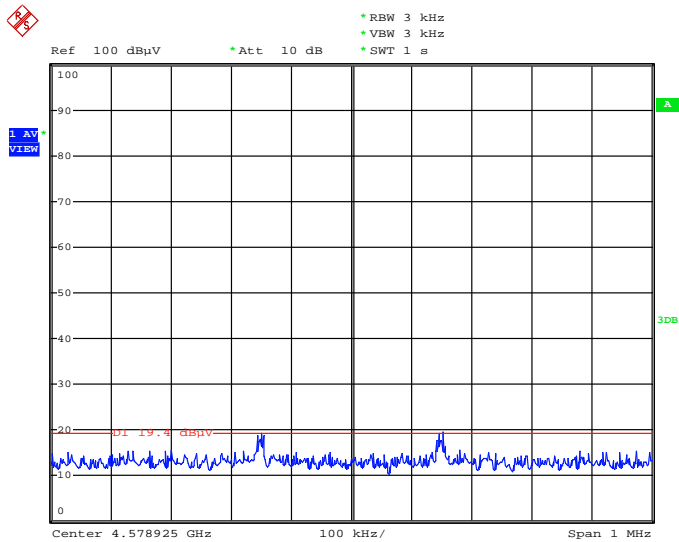
3<sup>rd</sup> Harmonic – 2.75GHz, Horizontal  
V @ 3m = 45.2dBuV



Date: 20.NOV.2015 14:38:36

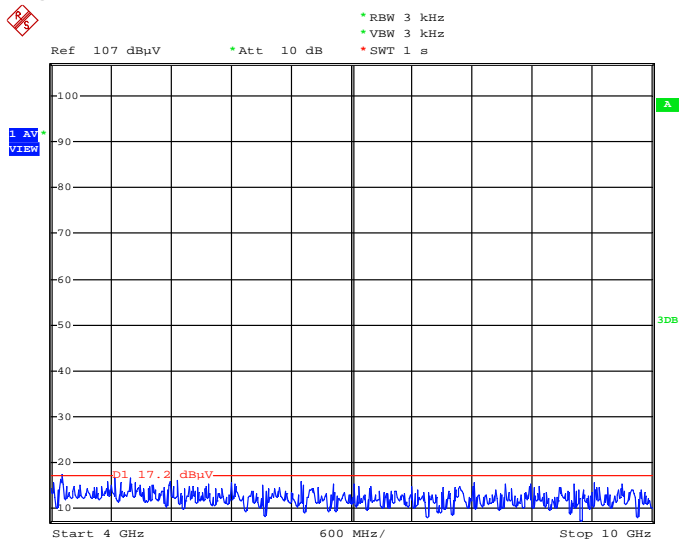
4<sup>th</sup> Harmonic – 3.66GHz, Horizontal  
V @ 3m = 33.6dBuV

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	IC Standard(s):	RSS-210    RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01




Date: 20.NOV.2015 14:39:26



5<sup>th</sup> Harmonic – 4.58GHz, Horizontal  
V @ 3m = 19.4dBuV

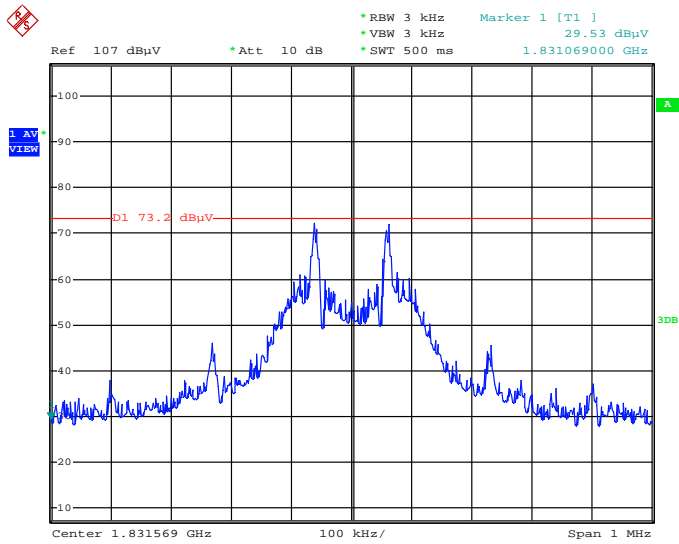


Date: 20.NOV.2015 14:55:00

Measurement Scan – 4GHz to 10GHz, Horizontal  
Max V @ 3m = 17.2dBuV

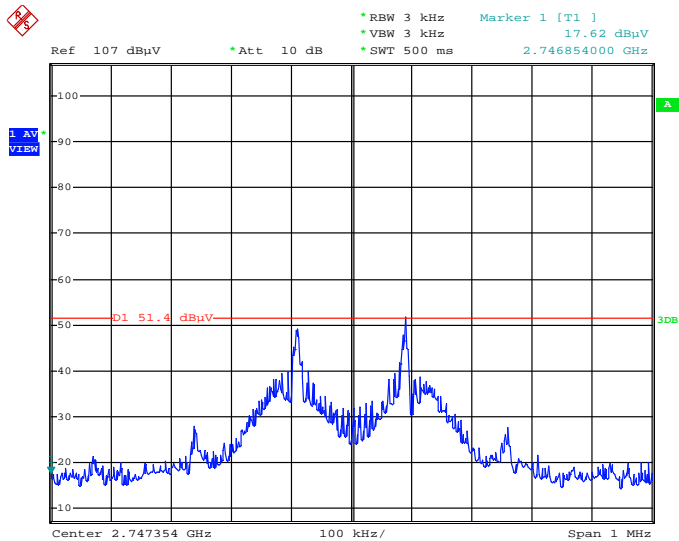
Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4	DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz	
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Date: 20.NOV.2015 15:22:16



2<sup>nd</sup> Harmonic – 1.83GHz, Vertical  
V @ 3m = 73.2dBuV

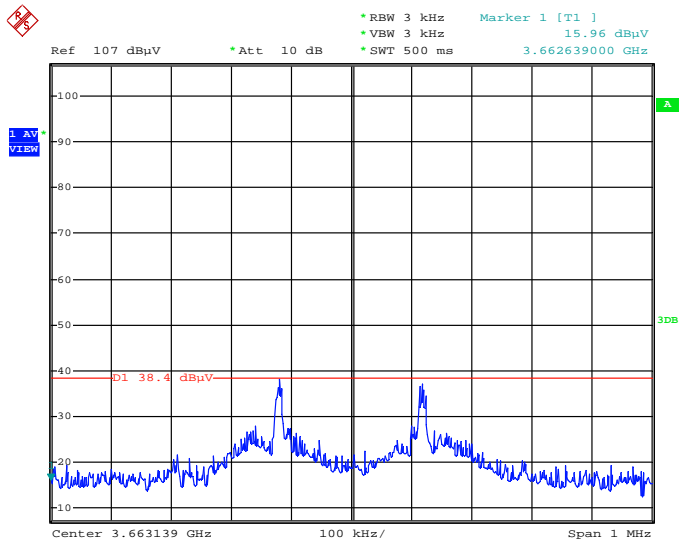


Date: 20.NOV.2015 15:23:01

3<sup>rd</sup> Harmonic – 2.75GHz, Vertical  
V @ 3m = 51.4dBuV

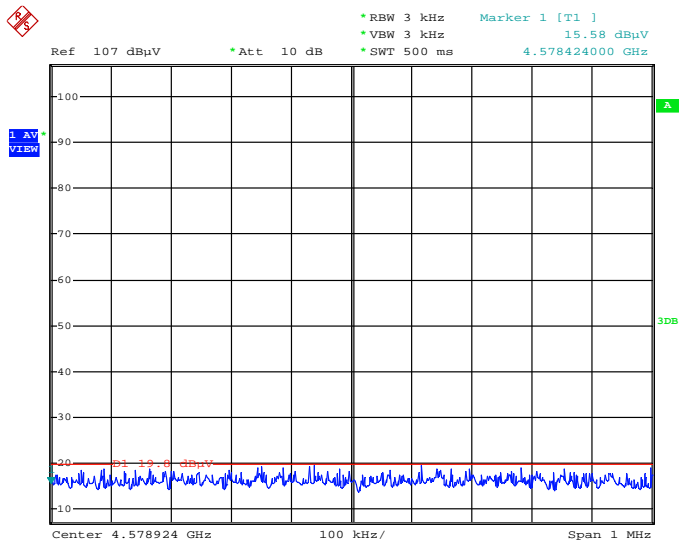
Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4	DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz	
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	IC Standard(s):	RSS-210    RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01




Date: 20.NOV.2015 15:23:35

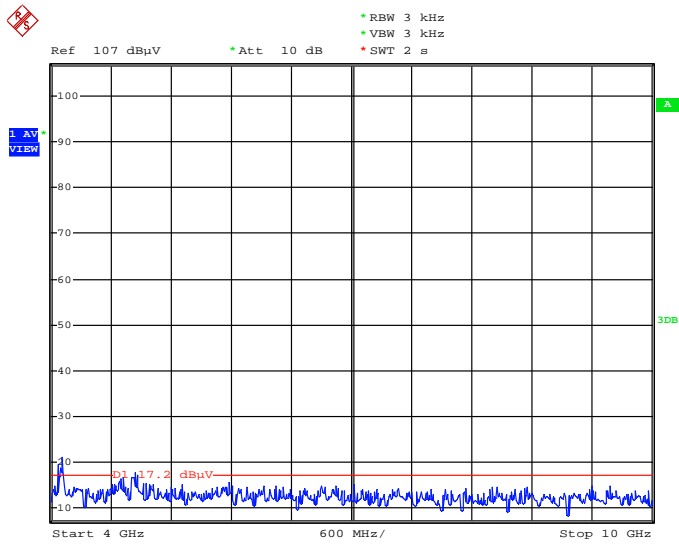
4<sup>th</sup> Harmonic – 3.66GHz, Vertical  
V @ 3m = 38.4dBuV



Date: 20.NOV.2015 15:24:09

5<sup>th</sup> Harmonic – 4.58GHz, Vertical  
V @ 3m = 19.8dBuV



Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4	DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz	
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Measurement Scan 4GHz to 10GHz, Vertical  
Max V @ 3m = 17.2dBuV



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	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	
					Test Lab Certificate No. 2470.01

$$E \text{ (dBuV/m)@3m} = V \text{ (dBuV)@3m} + AF_{\text{Horn}} + CL_{\text{Total}} + CL_{4\text{m}} + G_{\text{PreAmp}}$$

Where:

$AF_{\text{Horn}}$  = Antenna Factor of Horn Antenna (+dB)


$CL_{\text{Total}}$  = Cable Loss of 25m Cable (+dB) + Cable Loss of 4m Cable (+dB)

$G_{\text{PreAmp}}$  = Gain of PreAmp (-dB)

Emission Frequency	Antenna Pol.	Emission Level (dBuV/m) @3m	Antenna Factor	Cable Loss	PreAmp Gain	Emission Level (dBuV/m@3m)	Limit (avg)	Margin	Result
[MHz]		[dBuV]	[dB]	[dB]	[-dB]	[dBuV]	[dBuV]	[dB]	
1832.0	V	73.2	26.7	3.7	54.5	49.1	62.0	-12.9	Pass
1832.0	H	37.3	26.8	3.7	54.5	13.3	62.0	-48.7	Pass
* 2748.0	V	51.4	28.8	5.6	54.0	31.8	54.0	-22.2	Pass
* 2748.0	H	45.2	28.9	5.6	54.0	25.7	54.0	-28.3	Pass
* 3664.0	V	38.4	31.3	7.2	53.6	23.3	54.0	-30.7	Pass
* 3664.0	H	33.6	31.3	7.2	53.6	18.5	54.0	-35.5	Pass
* 4580.0	V	19.8	32.3	8.3	52.5	7.9	54.0	-46.1	Pass
* 4580.0	H	19.4	32.4	8.3	52.5	7.6	54.0	-46.4	Pass
5496.0	V	N.D. 17.2	34.1	9.2	52.0	8.5	62.0	-53.5	Pass
5496.0	H	N.D. 17.2	34.2	9.2	52.0	8.6	62.0	-53.4	Pass
6412.0	V	N.D. 17.2				---	62.0	---	Pass
6412.0	H	N.D. 17.2				---	62.0	---	Pass
* 7328.0	V	N.D. 17.2				---	54.0	---	Pass
* 7328.0	H	N.D. 17.2				---	54.0	---	Pass
* 8244.0	V	N.D. 17.2				---	54.0	---	Pass
* 8244.0	H	N.D. 17.2				---	54.0	---	Pass
9140.0	V	N.D. 17.2				---	62.0	---	Pass
9140.0	H	N.D. 17.2				---	62.0	---	Pass

\* denotes restricted band.

- Emissions for the transmitter and receiver were searched from the lowest frequency generated to the 10<sup>th</sup> harmonic of the fundamental frequency.
- All detected emissions are reported.
- Data reported was captured using an average detector.
- The transmitter was tested with fully charged DC cells.
- N.D. = Not Detected.

Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4	DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz	
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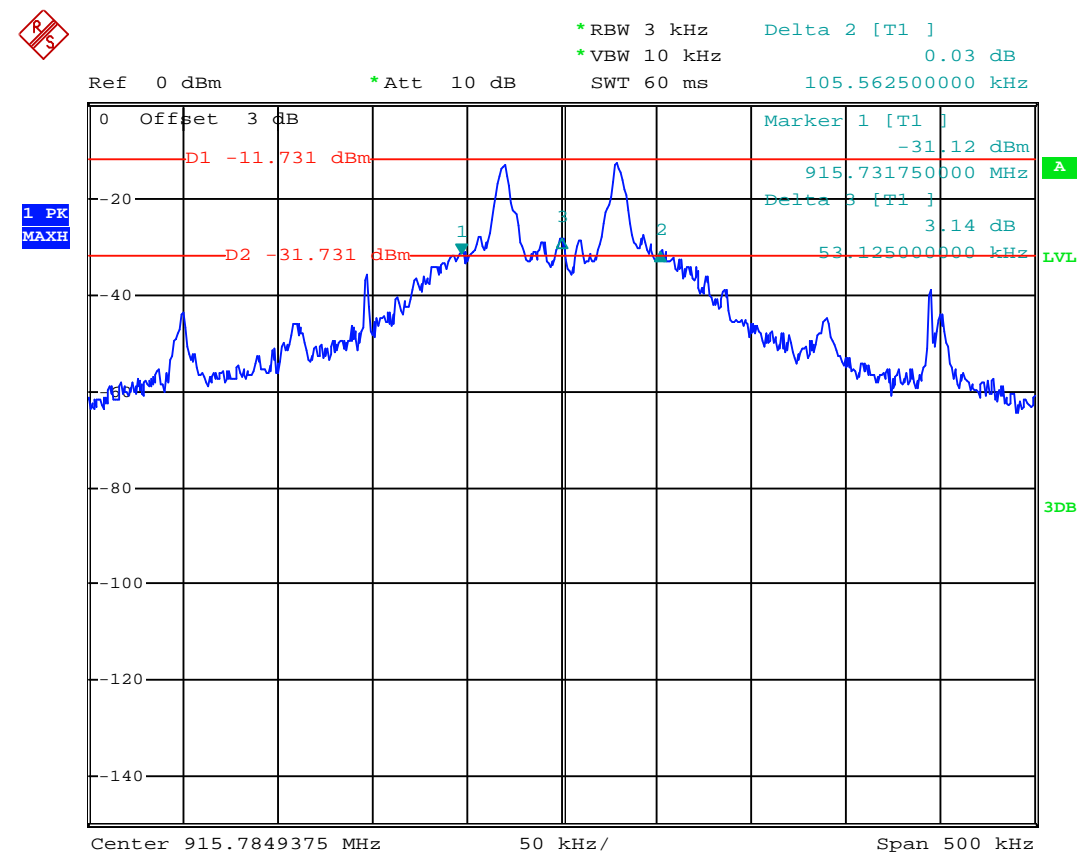






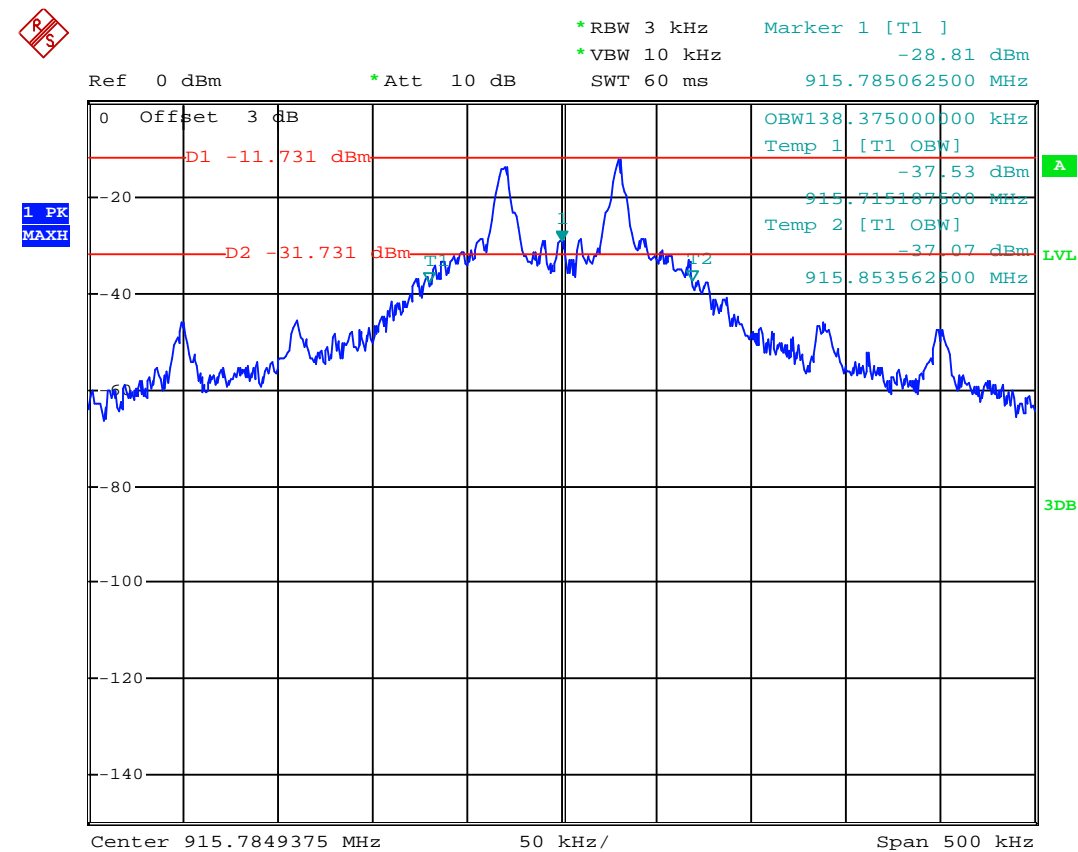
7.6 Test Data:

20dB Occupied Bandwidth		
TX Frequency	Measured 20dB bandwidth	Limit 20dB bandwidth
915.8 MHz	105.6 kHz	4.6 MHz




Date: 10.NOV.2015 09:43:59

99% Occupied Bandwidth		
TX Frequency	Measured 99% bandwidth	Limit 20dB bandwidth
916 MHz	138.4 kHz	4.6 MHz



Date: 10.NOV.2015    09:46:23

<b>Sign-Off</b>	
I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.	
	
Art Voss Sr. Engineer	

