Test Report Serial Number:	**45461360R1.0**
Test Report Date:	**5 October 2016**
Project Number:	**1357**

EMC Test Report - New Filing

Applicant:

President Electronics USA
1004 Collier Ctr. Way, Suite 206
Naples, FL, 34110
USA

FCC ID:	IC Registration Number
2AEOCUT566	**20240-UT566**
Product Model Number / HVIN	Product Name / PMN
McKinley USA	**McKinley USA**

In Accordance With:

FCC 47 CFR Part 95 Subpart D, Part 15 Subpart B
Licensed Non-Broadcast Station Transmitter (TNB)

SS-GEN, RSS-236 Issue 1
Citizen Band (26.960 to 27.410 MHz)

Approved By:

Ben Hewson, President
Celltech Labs Inc.
21-364 Lougheed Rd.
Kelowna, BC, V1X 7R8
Canada

Test Lab Certificate: 2470.01 **IC Registration 3874A-1** **FCC Registration: 714830**

Table of Contents

1.0 DOCUMENT CONTROL

Tested By:	**Art Voss**
Prepared By:	**Art Voss**
Reviewed By:	**Ben Hewson**

Issue Number	Description	By	Issue Date
1.0	Initial Release	Art Voss	4 October 2016

2.0 TEST RESULT SUMMARY

TEST SUMMARY

Referenced Standard(s): FCC CFR Title 47 Parts 2, 95D, 15B

Appendix	Description of Test	Procedure Reference	Applicable Rule Part(s) FCC	Applicable Rule Part(s) ISEDC	Test Date	Result
A	Conducted Power (Fundemental)	ANSI/TIA/EIA-382-A ANSI C63.4:2014	§2.1046 §95.639	RSS-Gen RSS-236 5.2	29 Sep 2016	Pass
B	Modulation Response	ANSI/TIA/EIA-603-D ANSI C63.4:2014	§2.1047 §95.637	RSS-Gen	29 Sep 2016	Pass
C	Occupied Bandwidth	ANSI/TIA/EIA-603-D ANSI C63.4:2014	§2.1049 §95.633	RSS-Gen RSS-236 5.3.2	30 Sep 2016	Pass
	Emission Mask	ANSI/TIA/EIA-603-D ANSI C63.4:2014	§2.1049 §95.635	RSS-Gen RSS-236 5.4.4	30 Sep 2016	Pass
D	Conducted TX Spurious Emissions	ANSI/TIA/EIA-603-D ANSI C63.4:2014	§2.1051 §95.635	RSS-Gen RSS-236 5.4.4	1 Oct 2016	Pass
E	Radiated TX Spurious Emissions	ANSI/TIA/EIA-603-D ANSI C63.4:2014	§2.1053 §95.635	RSS-Gen RSS-236 5.4.4	3 Oct 2016	Pass
F	Radiated Receiver Emissions	ANSI C63.4:2014	§15 Subpart B	§15 Subpart B	3 Oct 2016	Pass
G	Frequency Stability	ANSI/TIA/EIA-603-D ANSI C63.4:2014	§2.1055 §95.625	RSS-Gen	2 Oct 2016	Pass

3.0 PASS/FAIL CRITERIA

Pass / Fail Criteria
Unless otherwise noted in the Appendices, the pass/fail criteria is the limit set forth in the reference standards. The DUT is considered to have passed the requirements if the measurement and test results obtained during the described measurement procedure is no greater than the specified limits as defined. The pass/fail statements made in this report only apply to the unit tested.

I attest that the data reported herein is true and accurate within the tolerance of the Measurement Instrument Uncertainty; that all tests and measurements were performed in accordance with accepted practices or procedures; and that all tests and measurements were performed by me or by trained personnel under my direct supervision. The results of this investigation are based solely on the test sample(s) provided by the client which were not adjusted, modified or altered in any manner whatsoever, except as required to carry out specific tests or measurements. This test report has been completed in accordance with ISO/IEC 17025.	Art Voss, P.Eng. Technical Manager Celltech Labs Inc. 5 October 2016 Date

4.0 SCOPE

Scope
This report outlines the measurements made and results collected during electromagnetic emissions testing of the: **President Electronics USA, Model McKinley USA, FCC ID: 2AEOCUT566, ISEDC ID: 20240-UT466** The measurement results were applied against the applicable EMC requirements and limits outlined in the technical rules and regulations set forth in the Federal Communication's Commission Code of Federal Regulations Title 47 Part 2, Part 15 Subpart B and Part 95D and Industry Canada Spectrum Management & Telecommunications Policy RSS-Gen and RSS-236.

5.0 NORMATIVE REFERENCES

Normative References	
ANSI / ISO 17025:2005	General Requirements for competence of testing and calibration laboratories
IEEE/ANSI C63.4:2014	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI/TIA/EIA-382-A	Minimum Standards - Citizens Band Radion Service Amplitude Modulated (AM) Transceivers Operating in the 27MHz Band
CFR Title 47 Part 2	Code of Federal Regulations Title 47: Telecommunication Part 2: Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
CFR Title 47 Part 95D	Code of Federal Regulations Title 47: Telecommunication Part 95D: Citizens Band (CB) Radio Service
CFR Title 47 Part 15	Code of Federal Regulations Title 47: Telecommunication Part 15: Radio Frequency Devices Subpart B: Unintensional Radiators
Industry Canada Spectrum Management & Telecommunications Policy RSS-Gen Issue 4:	General Requirements and Information for the Certification of Radiocommunication Equipment
Industry Canada Spectrum Management & Telecommunications Policy RSS-236 Issue 1:	General Radio Service Equipment Operating in the Band 26.960 to 27.410 MHz (Citizens Band)

6.0 FACILITIES AND ACCREDITATIONS

Facility and Accreditation
The facilities used to evaluate this device outlined in this report are located at 21-364 Lougheed Road, Kelowna, British Columbia, Canada V1X 7R8. The radiated emissions site conforms to the requirements set forth in ANSI C63.4 and is filed and listed with the FCC under Test Firm Registration Number 714830 and Industry Canada under Test Site File Number IC 3874A-1. Celltech is accredited to ISO 17025, through accrediting body A2LA and with certificate 2470.01.

7.0 CLIENT AND DEVICE INFORMATION

Client Information		
Applicant Name	President Electronics USA	
Applicant Address	1004 Collier Ctr. Way, Suite 206	
	Naples, FL, 34110	
	USA	
DUT Information		
Device Identifier(s):	**FCC ID:**	2AEOCUT566
	IC:	20240-UT566
Device Type:	Mobile CB Radio Transceiver	
Type of Equipment:	Analog Transceiver	
Device Model(s) / HVIN:	McKinley USA	
Device Marketing Name / PMN:	McKinley USA	
Firmware Version ID Number / FVIN:	n/a	
Host Marketing Name / HMN:	n/a	
Test Sample Serial No.:	T/A Sample - Identical Prototype	
Transmit Frequency Range:	26.965 - 27.405 MHz (Chan. 1-40)	
Number of Channels:	40	
Manuf. Max. Rated Output Power:	4.0W AM, 12.0W SSB	
Manuf. Max. Rated BW/Data Rate:	350kHz, 250kbps	
Antenna Make and Model:	n/a	
Antenna Type and Gain:	External Whip, 0dBi nominal (3dBi maximum).	
Modulation:	AM	
Mode:	n/a	
Emission Designator:	5K40A3E, 3K30J3E	
DUT Power Source:	12-24 VDC External	
Deviation(s) from standard/procedure:	None	
Modification of DUT:	None	

APPENDIX A – CONDUCTED POWER

Test Conditions	
Normative Reference	FCC 47 CFR §2.1046, §95D, RSS-236

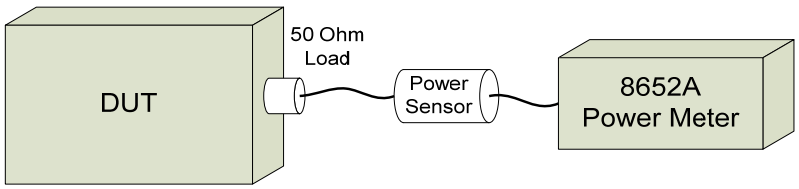
Limits	
§95.639	4.0W, 36dBm
RSS-236, 5.2	12.0W, 40.8dBm SSB

Environmental Conditions (Typical)	
Temperature	25°C
Humidity	<60%
Barometric Pressure	101 +/- 3kPa

Equipment List

Asset Number	Manufacturer	Model Number	Description
00110	Gigatronics	8652A	Power Meter
00237	Gigatronics	80334A	Power Sensor

Set-Up Drawing



Conducted Power Measurement (AM)

Method of Measurement: The RF power is measured with a 50 ohm resistive watt-meter connected at the EUT's RF output connector. Nominimal DC power of 13.8VDC is applied.

Measured Output Power (Ch 1):	3.55W (35.5dBm)
Measured Output Power (Ch 19):	3.72W (35.7dBm)
Measured Output Power (Ch 40):	3.47W (35.4dBm)
FCC CFR 47 §2.1033(c)(8): Power to Transmitter:	I_{Rx} = 0.490A, I_{Tx} =2.62A
	$I_{Xmitter}$ = 2.13A
	(13.8VDC)(2.62) = 29.4W
Manufacturer's Rated Output Power:	4.0W
FCC/IC Limit:	4.0W
Result:	**Complies**

Conducted Power Measurement (SSB)

Measured Output Power (Ch 1 USB):	10.0W (40dBm)
Measured Output Power (Ch 1 LSB):	10.0W (40dBm)
FCC CFR 47 §2.1033(c)(8): Power to Transmitter:	I_{Rx} = 0.490A, I_{Tx} =2.62A
	$I_{Xmitter}$ = 2.13A
	(13.8VDC)(2.62) = 29.4W
Audio Input 500Hz + 2.4kHz Tone:	1.5V
Manufacturer's Rated Output Power:	12.0W
FCC/IC Limit:	12.0W
Result:	**Complies**

APPENDIX B – MODULATION CHARACTERISTICS

Test Conditions	
Normative Reference	FCC 47 CFR §2.1047, Part 95D, 95.637, RSS-236, 5.3.2

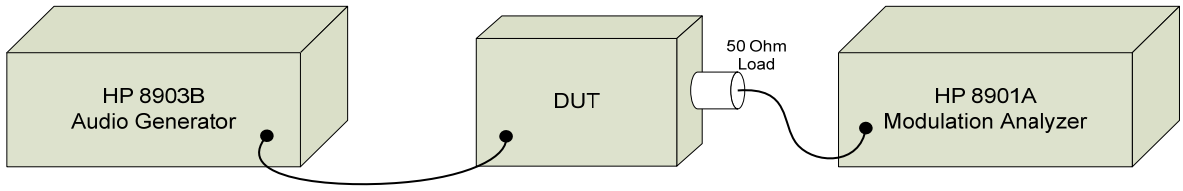
Limits	
FCC §2.1047	a) Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted.

Environmental Conditions (Typical)	
Temperature	25°C
Humidity	<60%
Barometric Pressure	101 +/- 3kPa

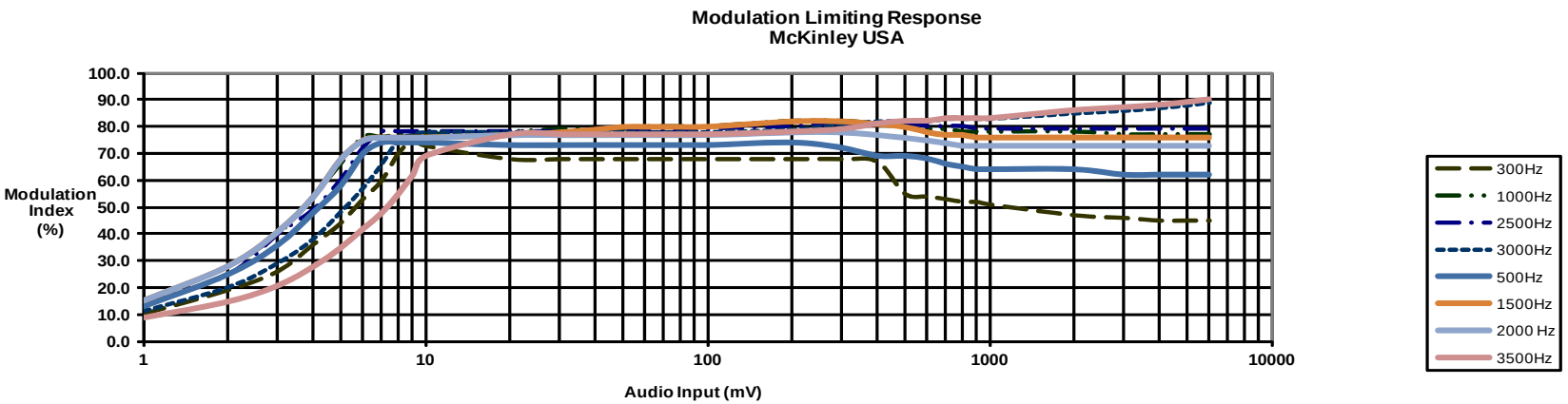
Equipment List

Asset Number	Manufacturer	Model Number	Description
00223	HP	8901A	Modulation Analyzer
00224	HP	8903B	Audio Generator

Set-Up Drawing



Modulation Limiting Response

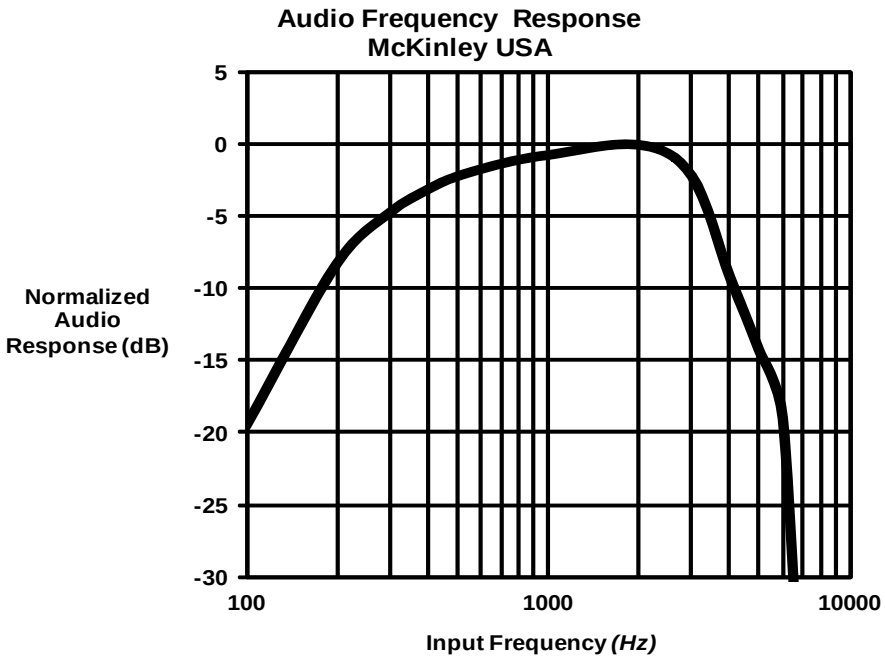


Measured Modulation Response [Modulation Index (%)]

Freq (Hz)	Audio Input (mV)																																
	1	2	3	4	5	6	7	8	9	10	20	30	40	50	60	70	80	90	100	200	300	400	500	600	700	800	900	1000	2000	3000	4000	5000	6000
300	10.0	19.0	26.0	36.0	44.0	53.0	60.0	70.0	75.0	73.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	67.0	55.0	54.0	53.0	52.0	52.0	51.0	47.0	46.0	45.0	45.0	45.0
500	13.0	25.0	36.0	48.0	58.0	70.0	74.0	74.0	74.0	74.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	74.0	72.0	69.0	69.0	68.0	66.0	65.0	64.0	64.0	64.0	62.0	62.0	62.0	62.0
1000	15.0	28.0	40.0	54.0	66.0	76.0	76.0	77.0	77.0	77.0	78.0	79.0	79.0	79.0	80.0	80.0	80.0	80.0	80.0	82.0	82.0	81.0	80.0	79.0	79.0	78.0	78.0	78.0	78.0	77.0	77.0	77.0	77.0
1500	15.0	28.0	41.0	54.0	68.0	75.0	76.0	76.0	76.0	76.0	77.0	78.0	79.0	80.0	80.0	80.0	80.0	80.0	80.0	82.0	82.0	81.0	80.0	78.0	77.0	77.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0
2000	15.0	28.0	41.0	54.0	68.0	75.0	76.0	76.0	76.0	76.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	78.0	78.0	77.0	76.0	75.0	74.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0
2500	14.0	25.0	40.0	49.0	60.0	72.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	79.0	80.0	81.0	81.0	81.0	80.0	80.0	80.0	79.0	79.0	79.0	79.0	79.0	79.0	79.0
3000	11.0	20.0	29.0	38.0	48.0	57.0	66.0	75.0	77.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	79.0	81.0	82.0	82.0	82.0	83.0	83.0	83.0	83.0	85.0	86.0	87.0	88.0	89.0
3500	9.0	15.0	21.0	28.0	35.0	42.0	48.0	55.0	62.0	69.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	78.0	79.0	81.0	82.0	82.0	83.0	83.0	83.0	83.0	86.0	87.0	88.0	89.0	90.0

Audio Frequency Response

Measured Audio Response		
Freq (Hz)	Audio Response (@ 50% MI) (mV)	(dB)*
100	33.000	-19.489
200	9.000	-8.203
300	6.000	-4.682
400	5.000	-3.098
500	4.500	-2.183
750	4.000	-1.160
1000	3.800	-0.714
2000	3.500	0.000
3000	4.500	-2.183
4000	10.000	-9.119
5000	18.000	-14.224
6000	31.000	-18.946
7500	1000.000	-49.119
10000	1000.000	-49.119
* Normalize to 2000Hz		

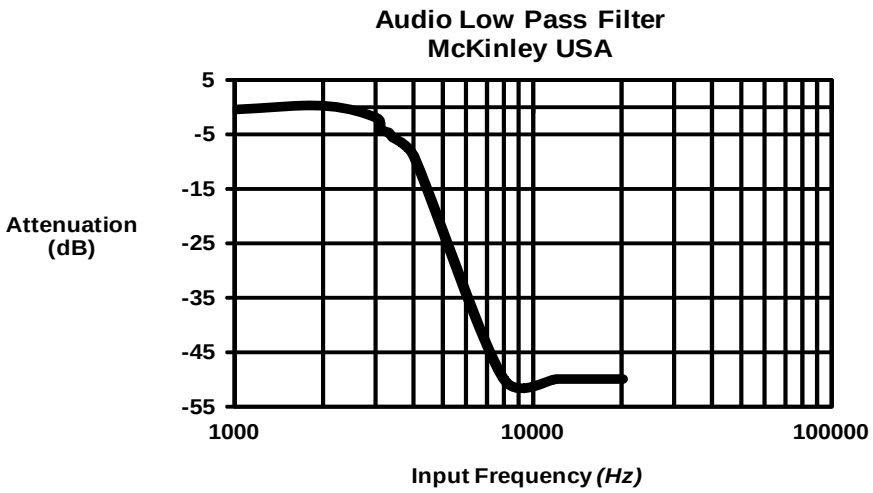


Note: 50% MI could not be achieved at 7500Hz and above.

Audio Frequency at -6dB Attenuation:	3500Hz
Result:	Complies

Audio Low Pass Filter Response

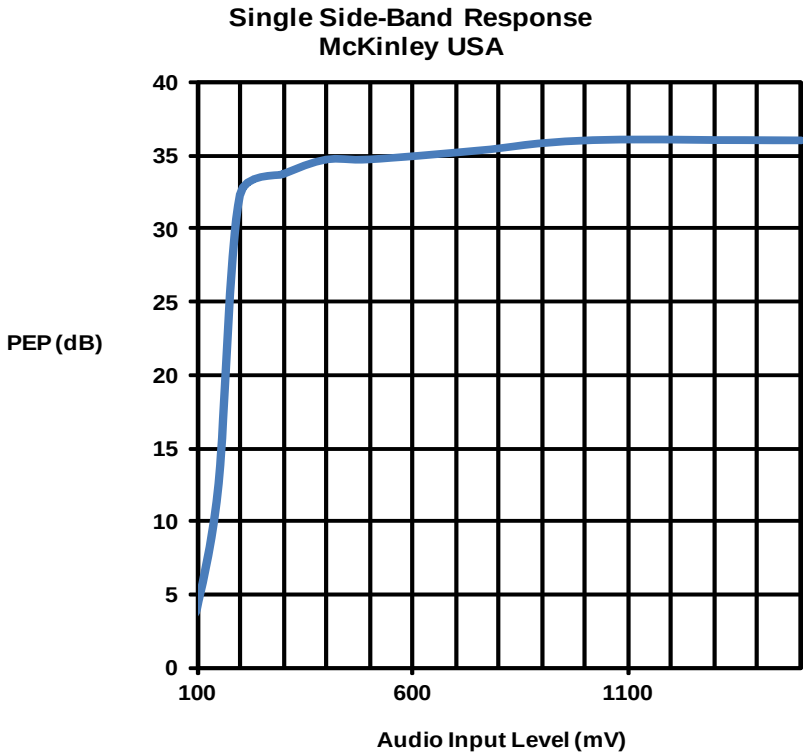
Measured Audio Response	
Freq	Attenuation
(Hz)	*(dB)*
1000	-0.700
2000	0.000
3000	-2.200
3100	-4.300
3300	-4.900
3400	-5.800
4000	-9.200
8000	-50.000
12000	-50.000
16000	-50.000
20000	-50.000



Cut-Off Frequency @ > -6dB:	3500 Hz
Result:	Complies

Single Side-Band Audio Response

Single Side Band Audio Response 500H & 2.4kHz	
Input *(mV)*	**PEP *(dB)***
1	0.2
10	0.4
20	0.8
30	1.6
40	1.8
50	1.9
60	2.0
70	3.0
80	3.4
90	3.5
100	4.0
150	12.4
200	32.3
300	33.7
400	34.7
500	34.7
750	35.3
1000	36.0
1500	36.0



Maximum Peak Envelope Power:	**36dBm (4W)**
Limit:	**4.1dBm (12W)**
	Complies

APPENDIX C – OCCUPIED BANDWIDTH

Test Conditions	
Normative Reference	FCC 47 CFR §2.1049, §95.633, RSS-210 A6

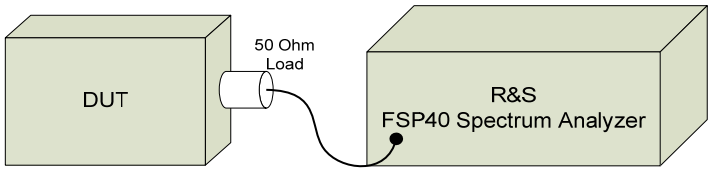
Limits	
47 CFR §2.1049	The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured…

Environmental Conditions (Typical)	
Temperature	25°C
Humidity	<60%
Barometric Pressure	101 +/- 3kPa

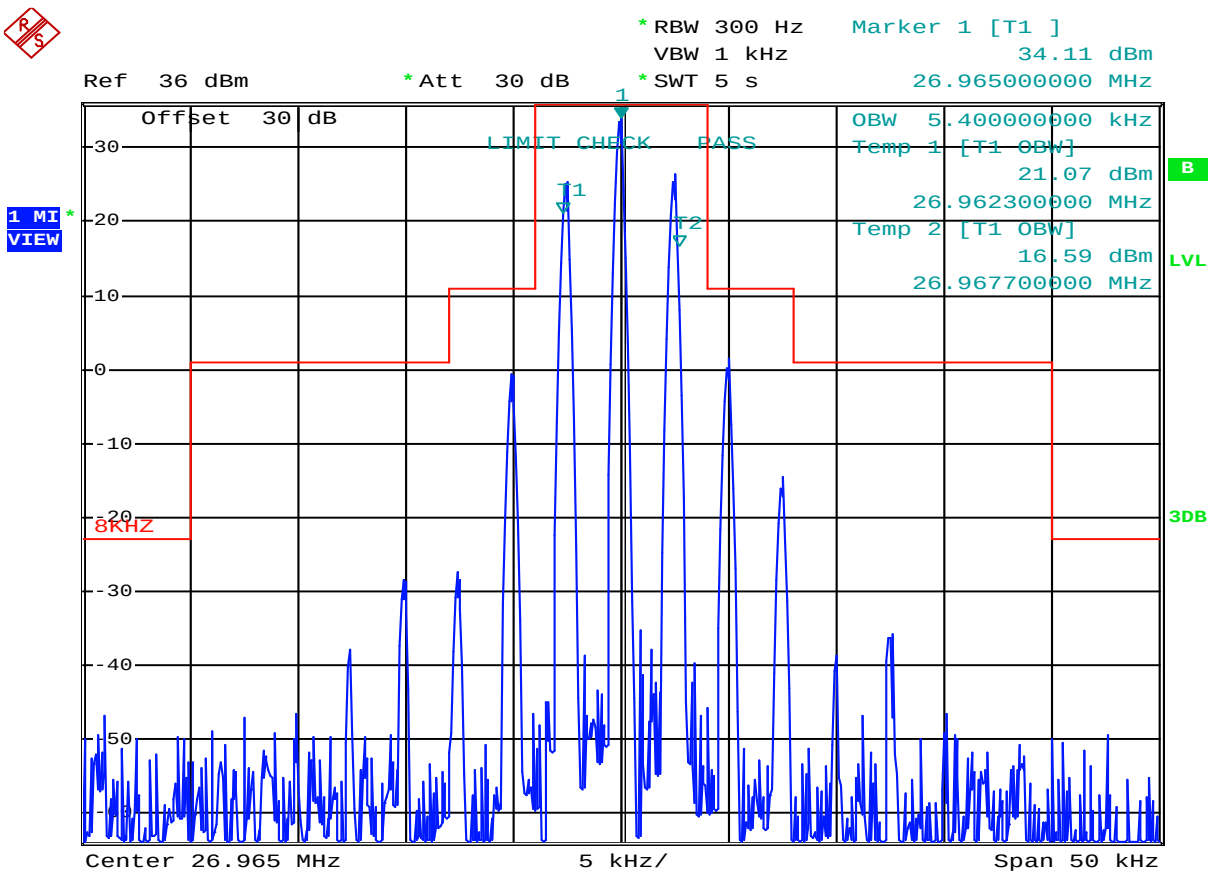
Equipment List

Asset Number	Manufacturer	Model Number	Description
00241	R&S	FSU40	Spectrum Analyzer

Set-Up Drawing



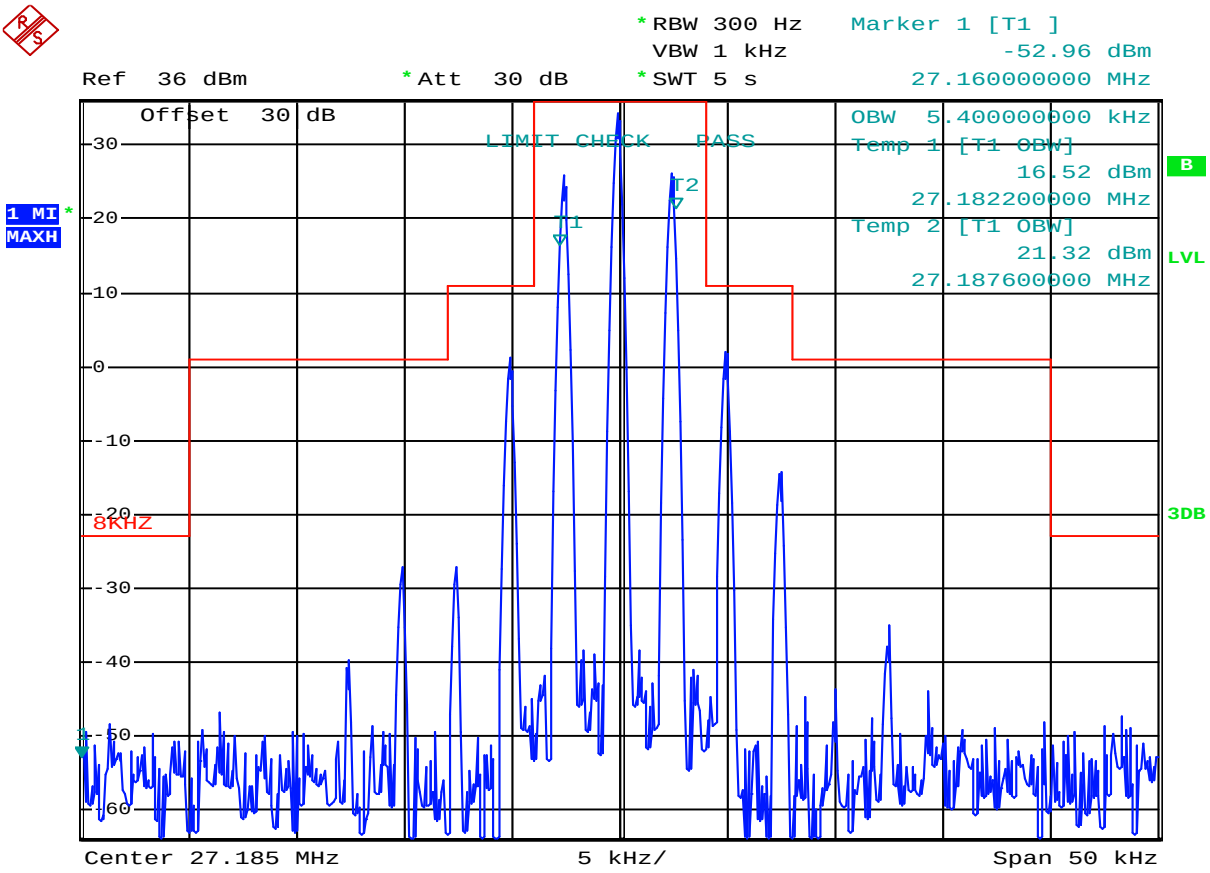
Occupied Bandwidth



Date: 30.SEP.2016 14:52:56

Channel Frequency (Ch 1):	26.965MHz
Modulation:	CW
Audio Input Frequency:	2.5kHz
Audio Input Level: >16dB Level @ 50% Modulation:	30mV
Emission Designator:	A3E
Authorized Bandwidth (§95.633):	8kHz
Measured Occupied Bandwidth (99%):	**5.4kHz**
Result:	**Complies**

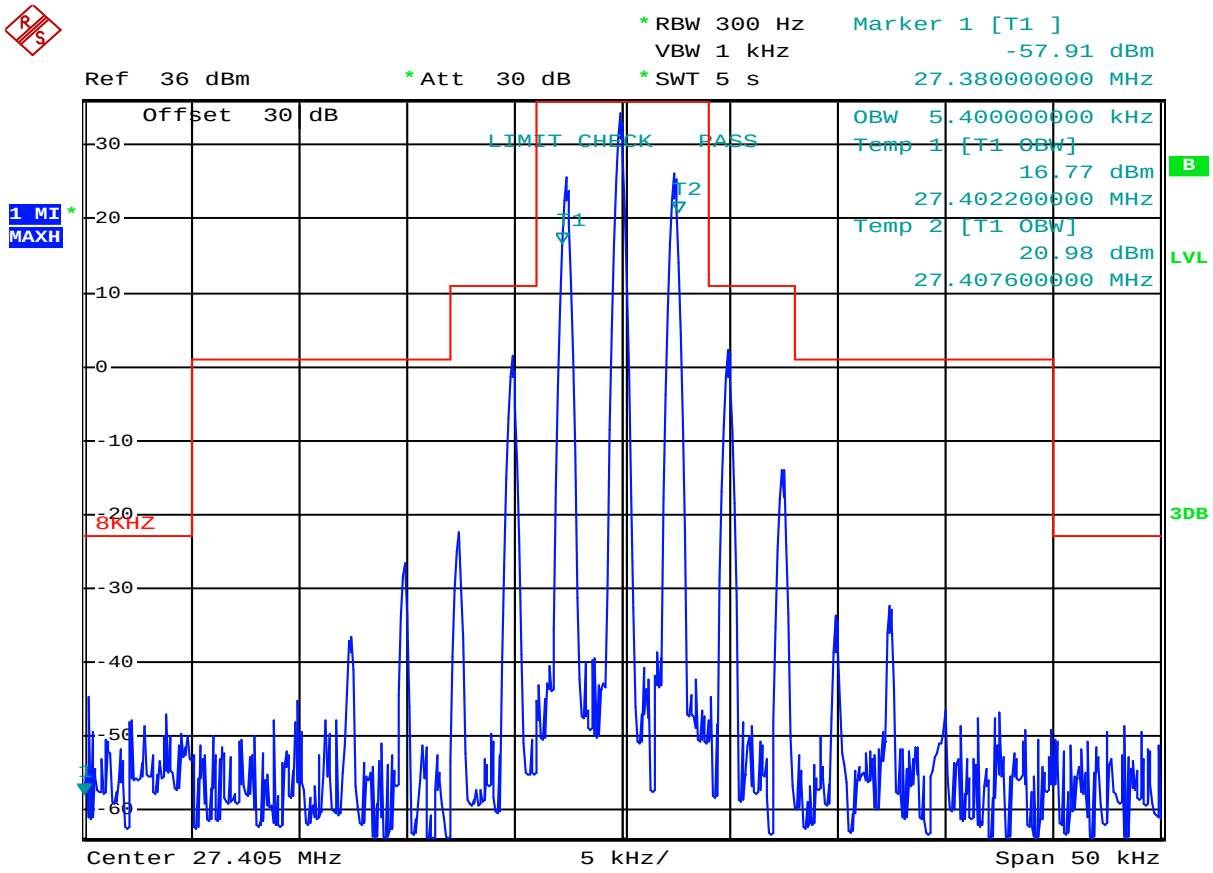
Occupied Bandwidth



Date: 30.SEP.2016 14:57:26

Channel Frequency (Ch 19):	27.185MHz
Modulation:	CW
Audio Input Frequency:	2.5kHz
Audio Input Level: >16dB Level @ 50% Modulation:	30mV
Emission Designator:	A3E
Authorized Bandwidth (§95.633):	8kHz
Measured Occupied Bandwidth (99%):	**5.4kHz**
Result:	**Complies**

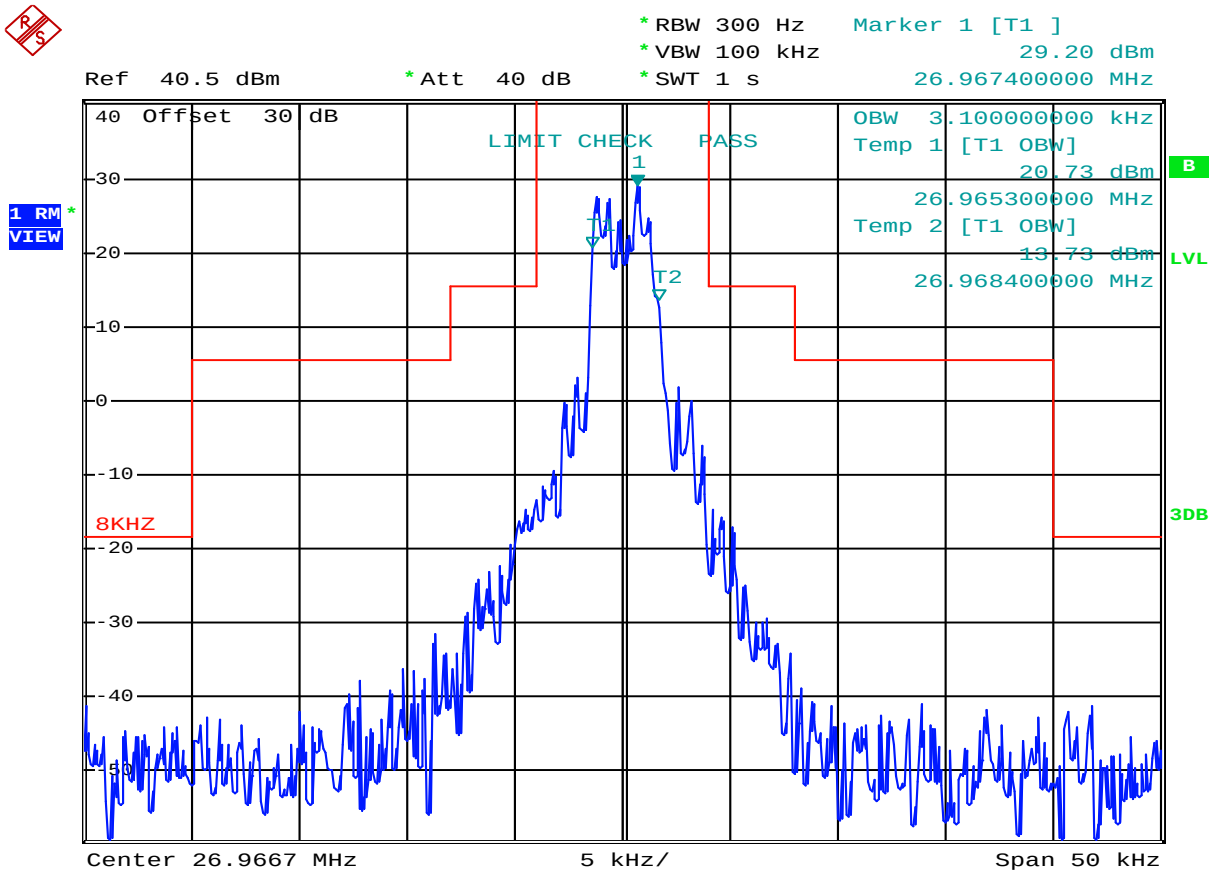
Occupied Bandwidth



Date: 30.SEP.2016 14:59:04

Channel Frequency (Ch 40):	27.405MHz
Modulation:	CW
Audio Input Frequency:	2.5kHz
Audio Input Level: >16dB Level @ 50% Modulation:	30mV
Emission Designator:	A3E
Authorized Bandwidth (§95.633):	8kHz
Measured Occupied Bandwidth (99%):	**5.4kHz**
Result:	**Complies**

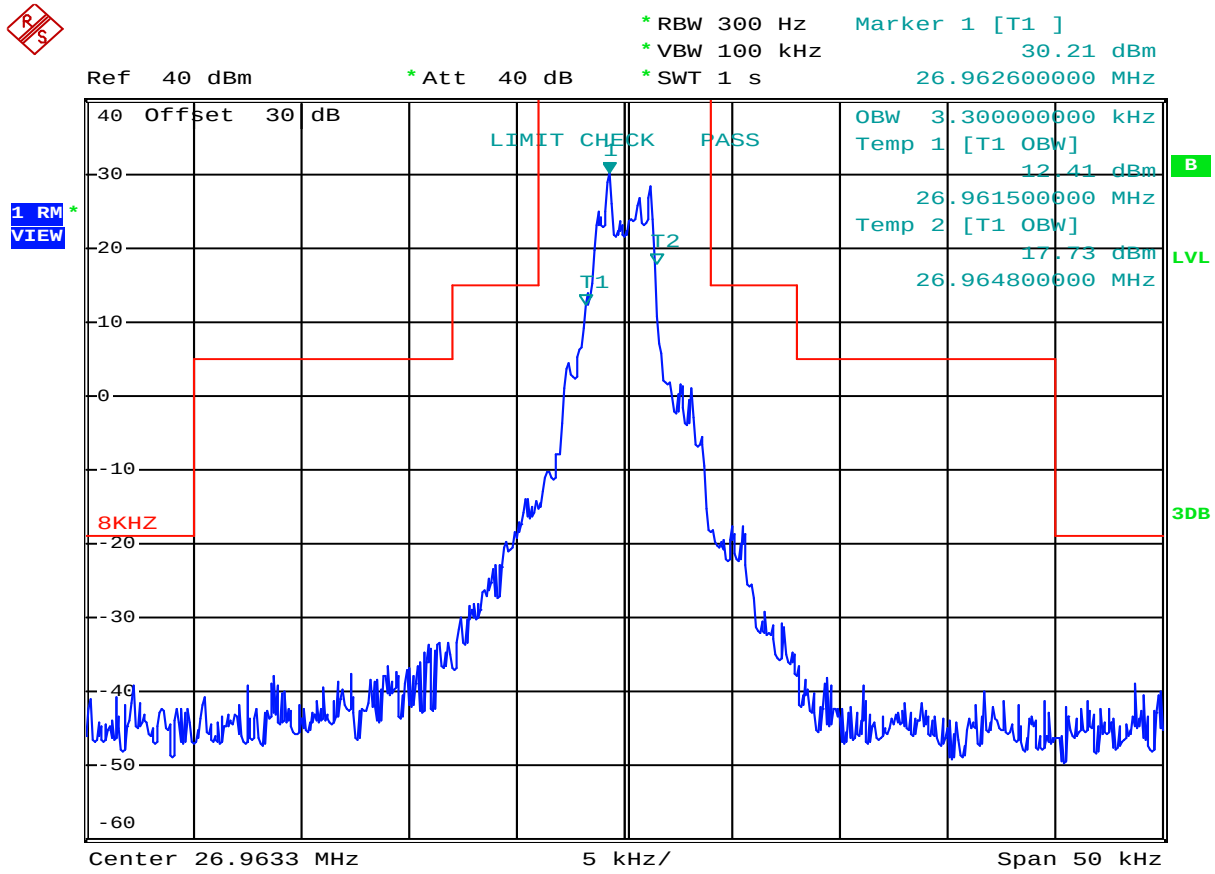
Occupied Bandwidth



Date: 6.OCT.2016 13:54:07

Channel Frequency (Ch 1 USB):	26.965MHz
Modulation:	CW
Audio Input Frequency:	500Hz & 2.4kHz
Audio Input Level: >16dB Level @ 50% Modulation:	300mV
Emission Designator:	J3E
Authorized Bandwidth (§95.633):	8kHz
Measured Occupied Bandwidth (99%):	**3.1kHz**
Result:	**Complies**

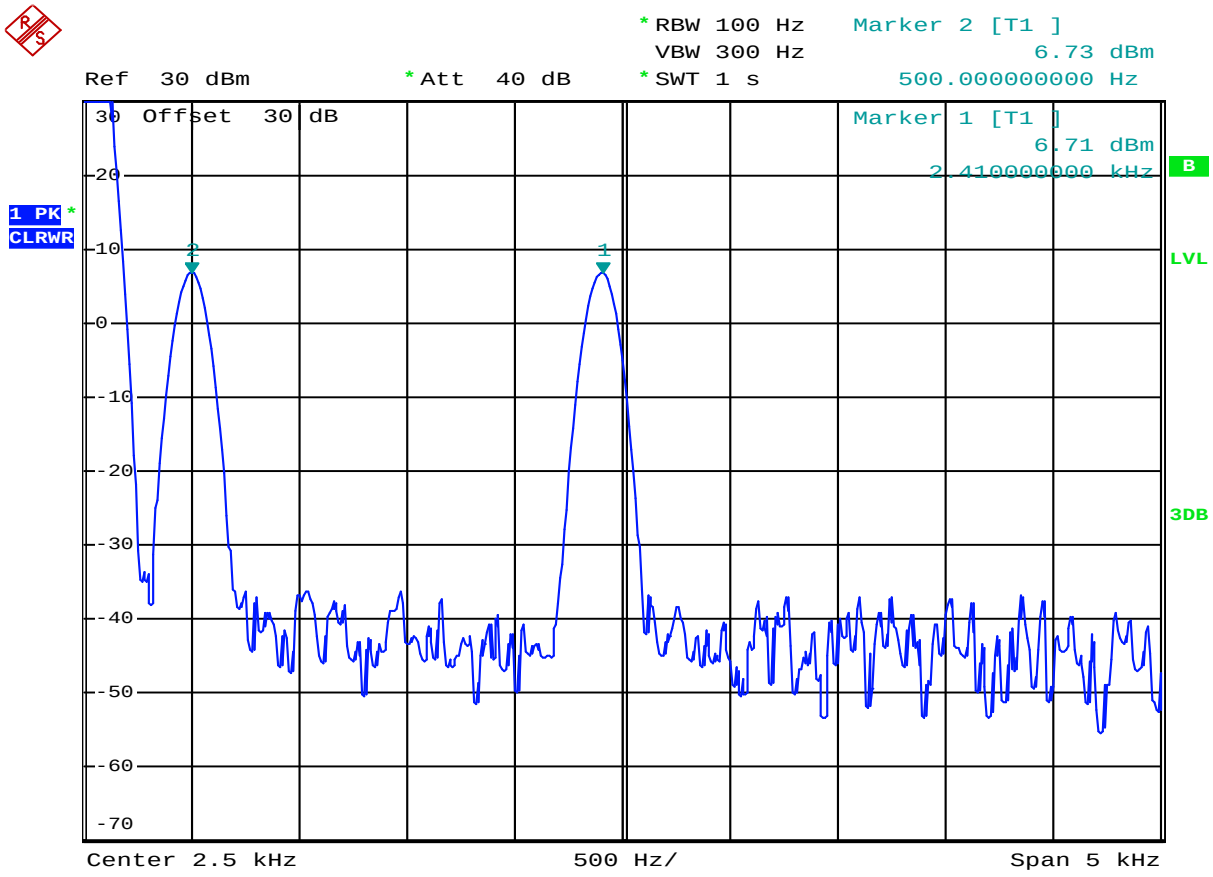
Occupied Bandwidth



Date: 6.OCT.2016 13:56:37

Channel Frequency (Ch 1 LSB):	26.965MHz
Modulation:	CW
Audio Input Frequency:	500Hz & 2.4kHz
Audio Input Level: >16dB Level @ 50% Modulation:	300mV
Emission Designator:	J3E
Authorized Bandwidth (§95.633):	8kHz
Measured Occupied Bandwidth (99%):	**3.3kHz**
Result:	**Complies**

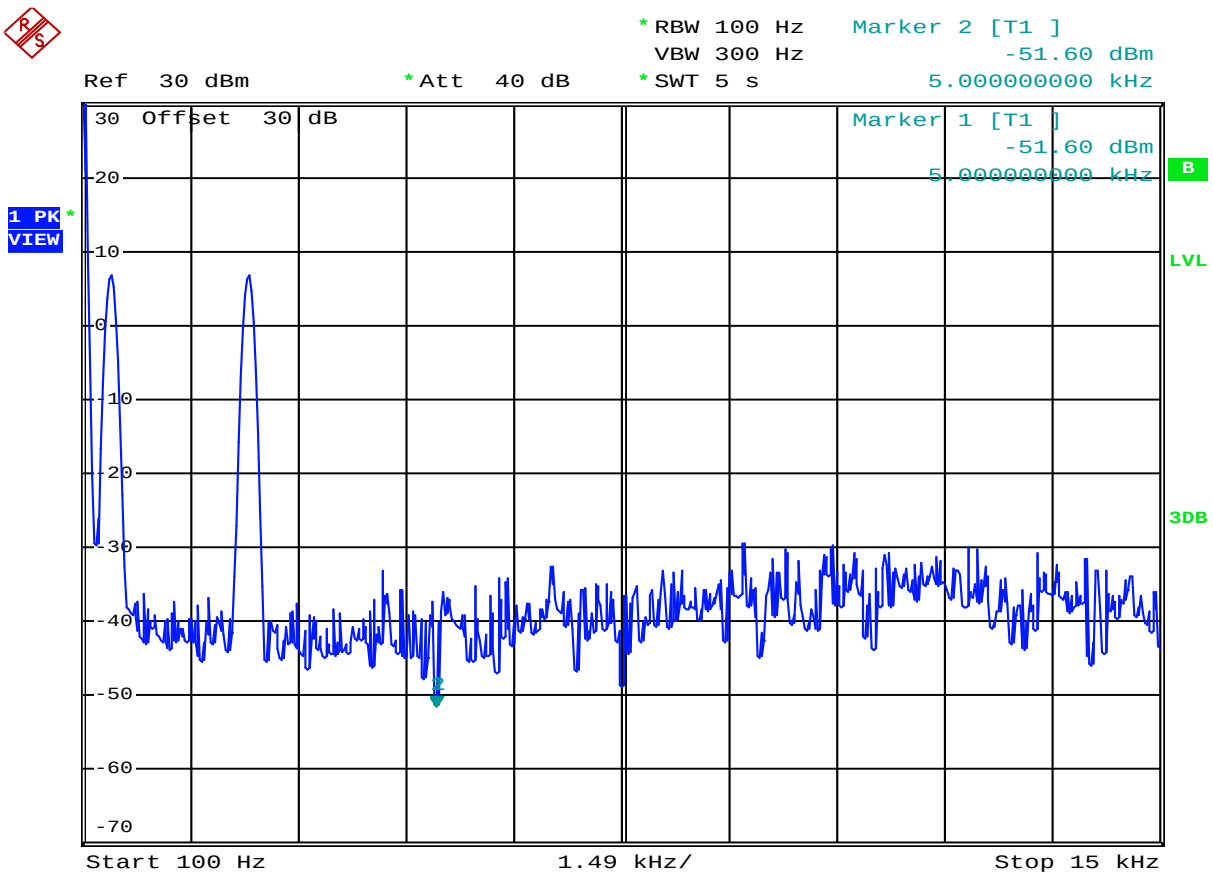
Occupied Bandwidth (Two-Tone Audio Input)



Date: 6.OCT.2016 12:55:20

Audio Frequency:	500Hz & 2.4kHz

Occupied Bandwidth (Two-Tone Audio Input)



Date: 6.OCT.2016 12:56:20

Audio Frequency:	500Hz & 2.4kHz

APPENDIX D – CONDUCTED SPURIOUS EMISSIONS

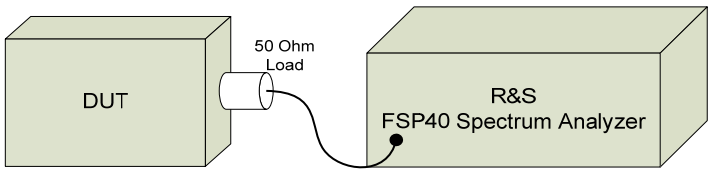
Test Conditions	
Normative Reference	FCC 47 CFR §95.635, RSS-236

Limits	
§95.635(1), (3), (8), (9)	(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. (2) At least 25 dB on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 150% of the authorized bandwidth. (8) At least 53 + 10 log10 (T) dB on any frequency removed from the center of the authorized bandwidth by more than 250%. (9) At least 60 dB on any frequency twice or greater than twice the fundamental frequency.
Environmental Conditions (Typical)	
Temperature	25°C
Humidity	<60%
Barometric Pressure	101 +/- 3kPa

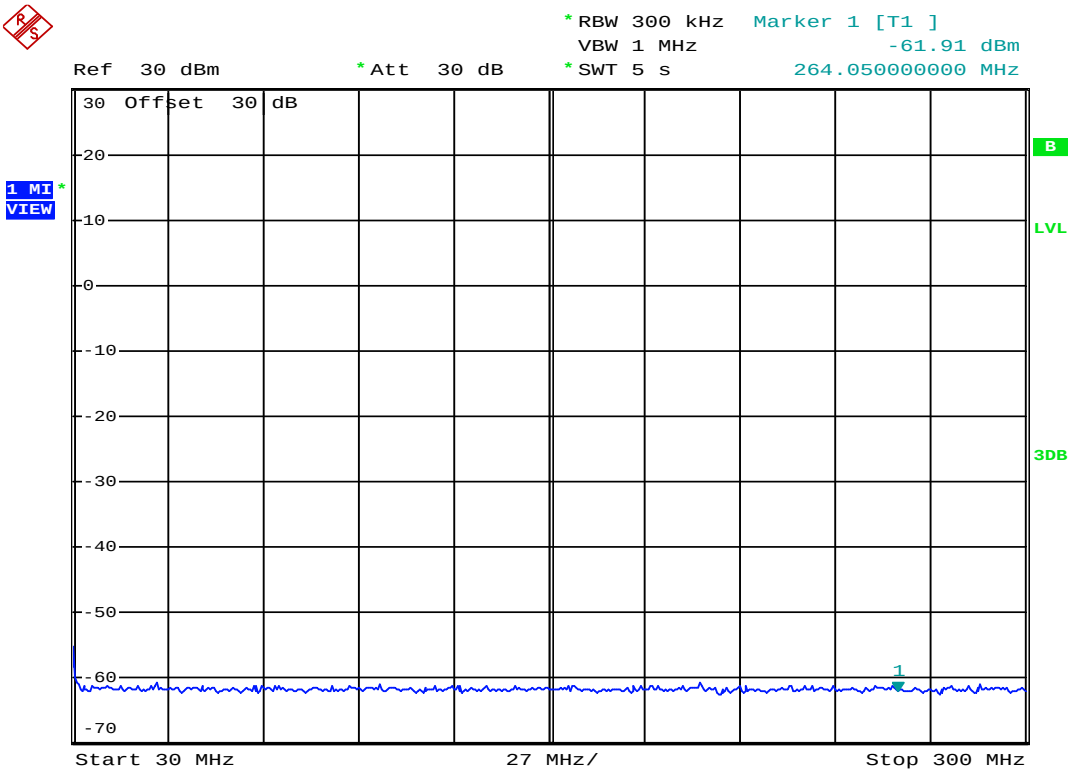
Equipment List

Asset Number	Manufacturer	Model Number	Description
00241	R&S	FSU40	Spectrum Analyzer

Set-Up Drawing



Conducted Spurious Emissions

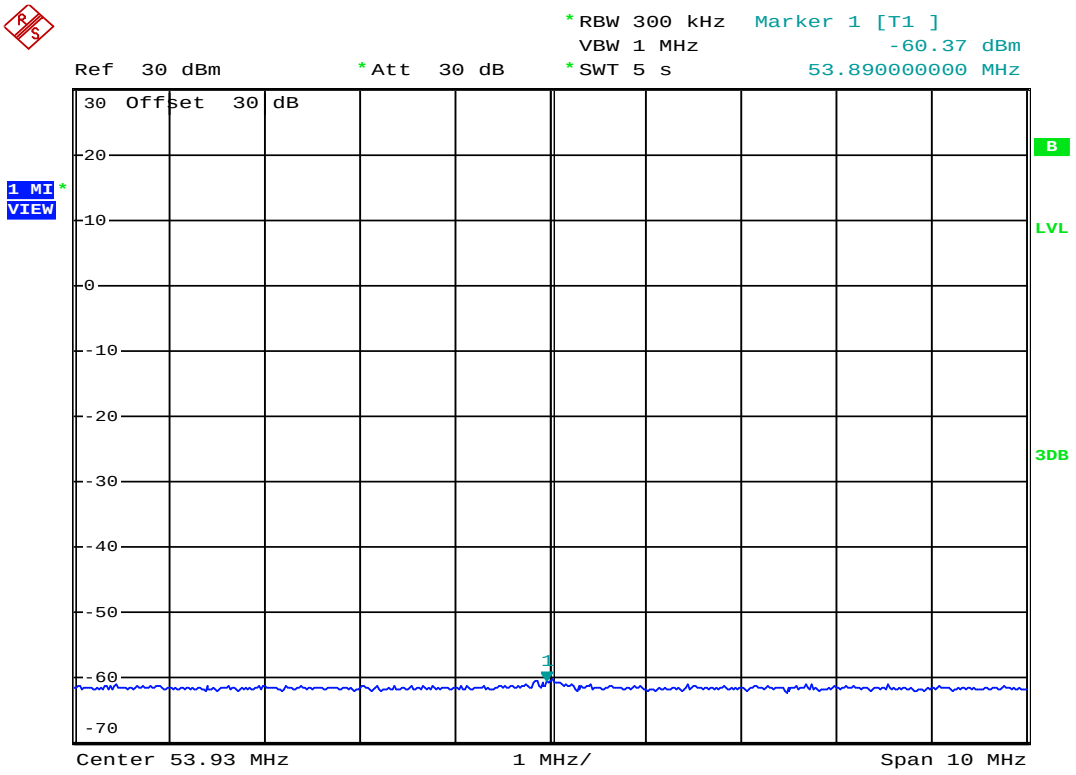


Date: 30.SEP.2016 15:58:28

Plot for Reference Only

Frequency Span (> 10th Harmonic):	30MHz to 300MHz
Channel Frequency (Ch 1):	26.965MHz
Modulation:	None

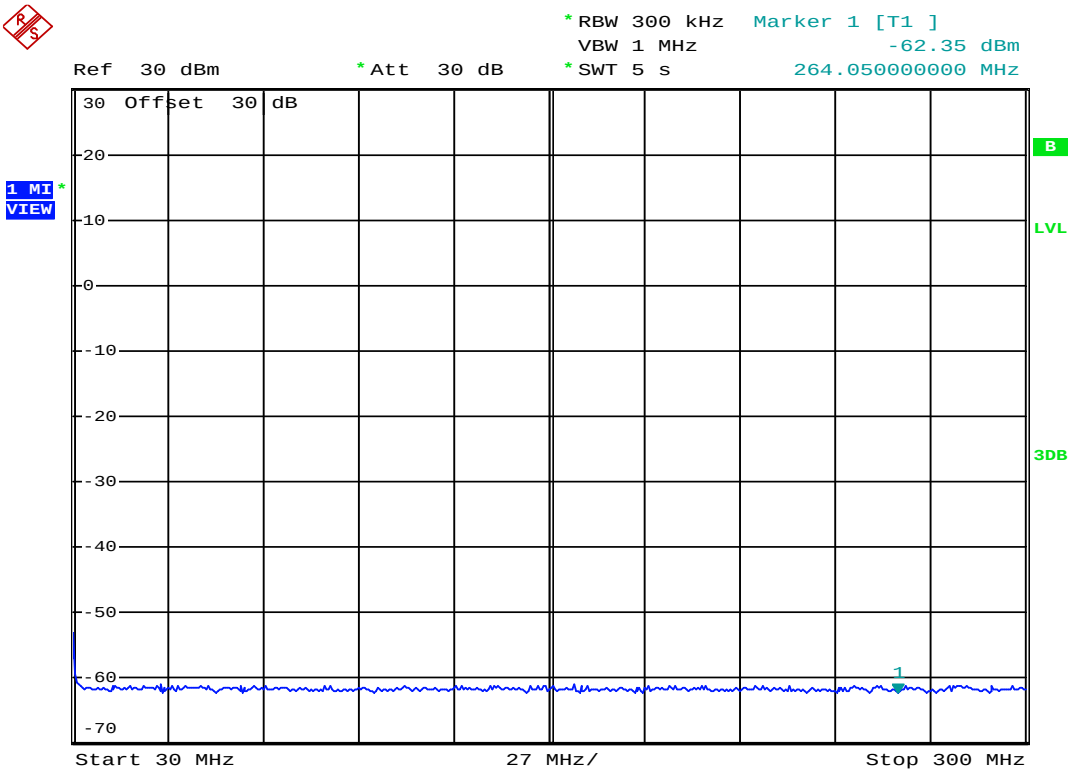
Conducted Spurious Emissions



Date: 30.SEP.2016 16:06:21

Emission Frequency (2nd Harmonic):	53.93MHz
Channel Frequency (Ch 1):	26.965MHz
Modulation:	None

Conducted Spurious Emissions

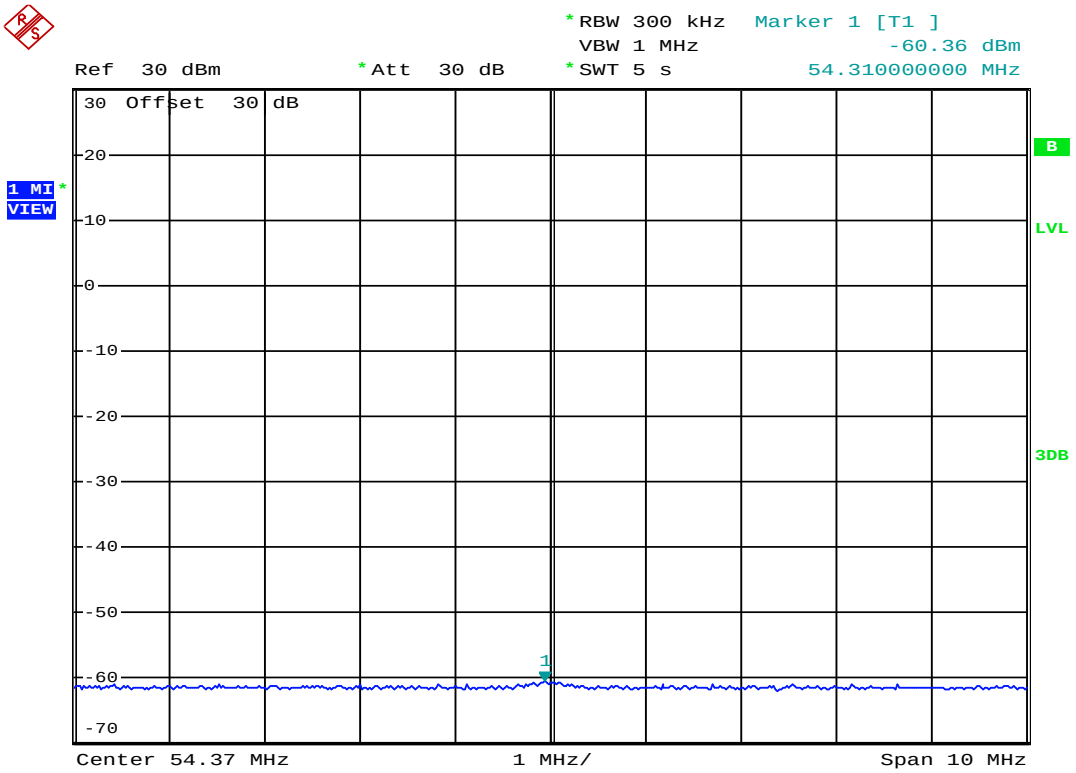


Date: 30.SEP.2016 15:59:16

Plot for Reference Only

Frequency Span (> 10th Harmonic):	30MHz to 300MHz
Channel Frequency (Ch 19):	27.185MHz
Modulation:	None

Conducted Spurious Emissions



Date: 30.SEP.2016 16:04:34

Emission Frequency (2nd Harmonic):	54.37MHz
Channel Frequency(Ch 19):	27.185MHz
Modulation:	None

§95.635(b)(1), (3), (8), (9) Conducted Spurious Emissions						
Frequency (MHz)	DUT Modulation	Fundemental Power [P] (dBm)	Out of Band Emission [P_E] (dBm)	Attenuation [dB]	Limit (dB)	Margin (dB)
54.81	None	35.4	-57.9	93.3	60.0	33.30
Attenuation = P - P_E Margin = Limit - Attenuation						
				Result:	**Complies**	

Notes:

All Spurious Emissions were evaluated to the 10th harmonic (270.4MHz). No other emissions were observed.
Data for fundamental and bandedge presented using a peak detector compared to average limits

APPENDIX E – RADIATED TX SPURIOUS EMISSIONS

Test Conditions	
Normative Reference	FCC 47 CFR §95.635, RSS-236
Procedure Reference	ANSI/TIA/EIA-603-D, ANSI C63.4

Limits	
§95.635(1), (3), (8), (9)	(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. (2) At least 25 dB on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 150% of the authorized bandwidth. (8) At least 53 + 10 log10 (T) dB on any frequency removed from the center of the authorized bandwidth by more than 250%. (9) At least 60 dB on any frequency twice or greater than twice the fundamental frequency.

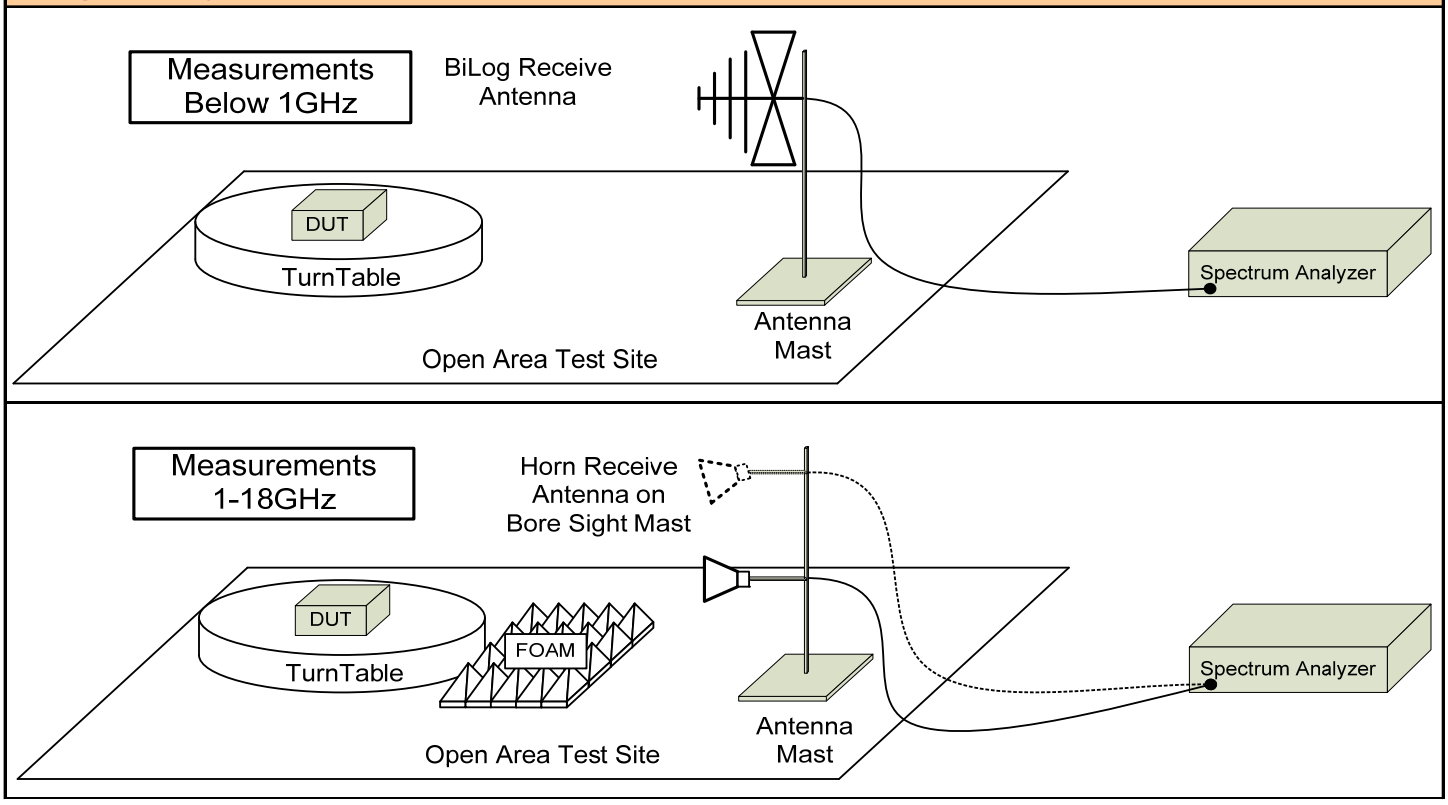
Environmental Conditions (Typical)	
Temperature	25°C
Humidity	<60%
Barometric Pressure	101 +/- 3kPa

Equipment List

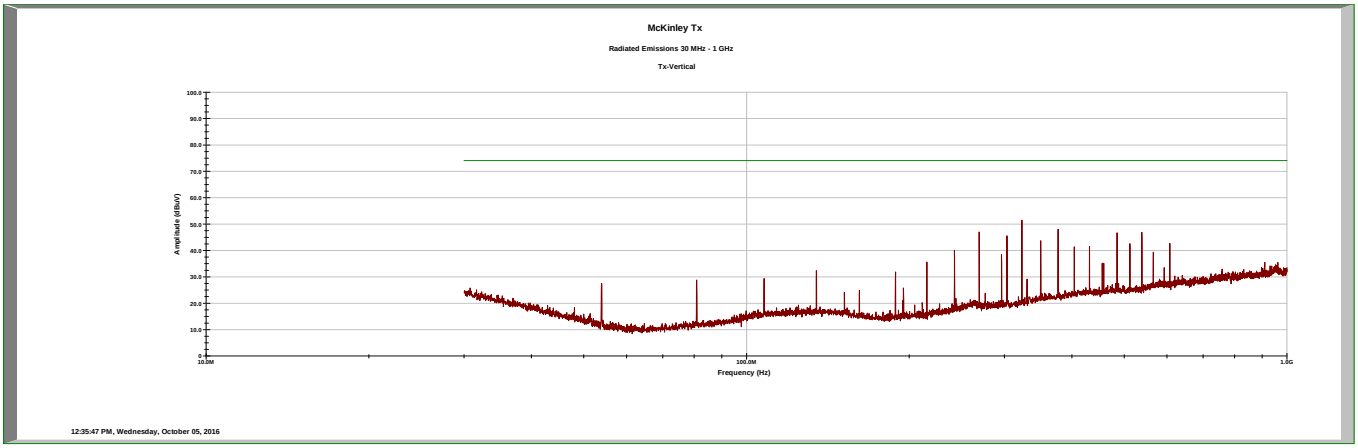
Asset Number	Manufacturer	Model Number	Description
00051	HP	8566B	Spectrum Analyzer
00049	HP	85650A	Quasi-peak Adapter
00047	HP	85685A	RF Preselector
00072	EMCO	2075	Mini-mast
00073	EMCO	2080	Turn Table
00071	EMCO	2090	Multi-Device Controller
00265	Miteq	JS32-00104000-58-5P	Microwave L/N Amplifier
00241	R&S	FSU40	Spectrum Analyzer
00050	Chase	CBL-6111A	Bilog Antenna
00275	Coaxis	LMR400	25m Cable
00276	Coaxis	LMR400	4m Cable
00278	TILE	34G3	TILE Test Software
00034	ETS	3115	Double Ridged Guide Horn

CNR: Calibration Not Required
COU: Calibrate On Use

Set-Up Drawing - DUT Measurement



Radiated Spurious Emissions (Tx)



Plot for Reference Only

Freqency	Antenna Polarization	Emission Level @ 3m [E_{Meas}]	Antenna Factor [AF]	Cable Loss [L_{Cable}]	Substitution Method Correction [L_{Sub}]	Correction dBuV/m @3m to dBm [F_{Corr}]	Corrected Emission @ 3m [E_{Corr}]	Limit @ 3m [E_{Lim}]	Margin
(MHz)		*(dBuV/m)*	*(dB)*	*(dB)*	*(dB)*	*(dBuV/m)*	*(dBm)*	*(dBm)*	*(dB)*
53.9	H	12.1	7.1	0.8	0.5	97.4	-76.9	-24.0	52.9
80.8	H	14.5	7.9	0.9	-0.7	97.4	-74.8	-24.0	50.8
107.8	H	17.4	11.3	0.9	0.2	97.4	-67.6	-24.0	43.6
134.8	H	26.2	12.6	1.0	1.7	97.4	-55.9	-24.0	31.9
151.8	H	35.1	11.8	1.1	1.2	97.4	-48.2	-24.0	24.2
188.7	H	38.6	9.6	1.2	1.5	97.4	-46.5	-24.0	22.5
215.6	H	26.9	10.1	1.3	-0.3	97.4	-59.4	-24.0	35.4
242.6	H	31.9	12.4	1.4	0.8	97.4	-50.9	-24.0	26.9
269.5	H	32.2	13.7	1.5	0.5	97.4	-49.5	-24.0	25.5
323.2	H	41.1	14.2	1.6	0.2	97.4	-40.3	-24.0	16.3
53.9	V	19.6	7.1	0.8	0.5	97.4	-69.4	-24.0	45.4
80.8	V	19.8	7.9	0.9	-0.7	97.4	-69.5	-24.0	45.5
107.8	V	17.1	11.3	0.9	0.2	97.4	-67.9	-24.0	43.9
134.8	V	17.5	12.6	1.0	1.7	97.4	-64.6	-24.0	40.6
188.7	V	21.0	9.6	1.2	1.5	97.4	-64.1	-24.0	40.1
215.6	V	24.2	10.1	1.3	-0.3	97.4	-62.1	-24.0	38.1
242.6	V	26.2	12.4	1.4	0.8	97.4	-56.6	-24.0	32.6
269.5	V	31.7	13.7	1.5	0.5	97.4	-50.0	-24.0	26.0
323.2	V	35.6	14.2	1.6	0.2	97.4	-45.8	-24.0	21.8

$E_{Corr} = E_{Meas} + AF + L_{Cable} + L_{Sub} - F_{Corr}$

$Margin = E_{Lim} - E_{Corr}$

Result: Complies

No Emissions within 20dB of limit detected

Notes

Worst-case emissions shown

The device was searched to the 10th harmonic of the fundamental (270 MHz)

Data presented may use a peak detector and compared to quasi-peak limit

All detected emissions have been reported

APPENDIX F – RADIATED RX SPURIOUS EMISSIONS

Test Conditions	
Normative Reference	FCC 47 CFR §15.109
Procedure Reference	ANSI/TIA/EIA-603-D, ANSI C63.4

Limits	
FCC §15.109	30-88MHz: 40dBuV/m 88-216MHz: 43.5dBuV/m 216-960MHz: 46dBuV/m > 960MHz: 54dBuV/m

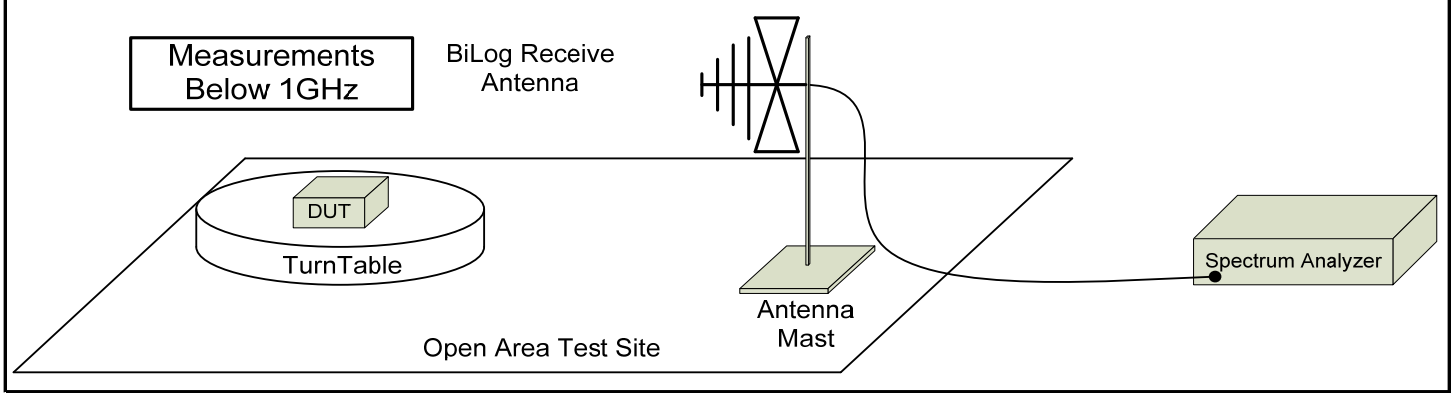
Environmental Conditions (Typical)	
Temperature	25°C
Humidity	<60%
Barometric Pressure	101 +/- 3kPa

Equipment List

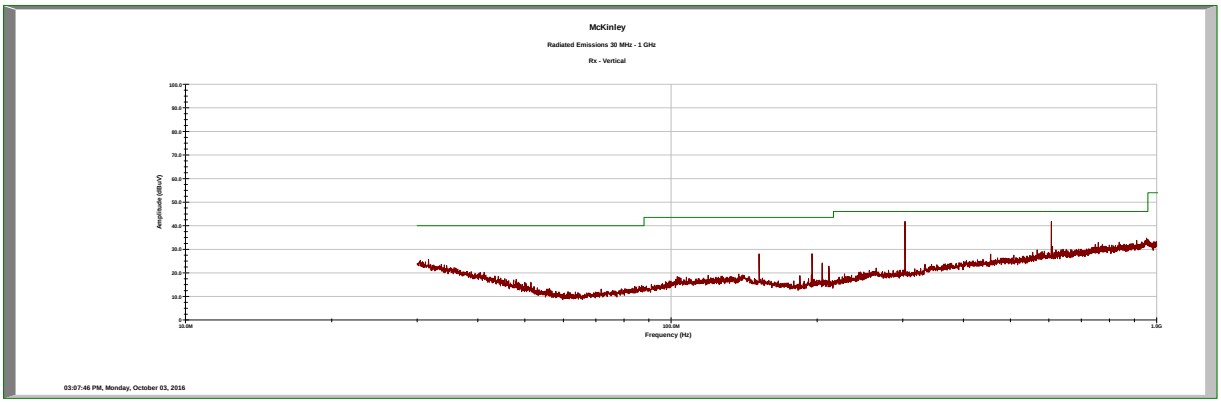
Asset Number	Manufacturer	Model Number	Description
00051	HP	8566B	Spectrum Analyzer
00049	HP	85650A	Quasi-peak Adapter
00047	HP	85685A	RF Preselector
00072	EMCO	2075	Mini-mast
00073	EMCO	2080	Turn Table
00071	EMCO	2090	Multi-Device Controller
00265	Miteq	JS32-00104000-58-5P	Microwave L/N Amplifier
00241	R&S	FSU40	Spectrum Analyzer
00050	Chase	CBL-6111A	Bilog Antenna
00275	Coaxis	LMR400	25m Cable
00276	Coaxis	LMR400	4m Cable
00278	TILE	34G3	TILE Test Software
00034	ETS	3115	Double Ridged Guide Horn

CNR: Calibration Not Required
COU: Calibrate On Use

Set-Up Drawing - DUT Measurement



Radiated Spurious Emissions (Rx)



Plot for Reference Only

Freqency (MHz)	Antenna Polarization	Emission Level @ 3m [E_{Meas}] (dBuV/m)	Antenna Factor [AF] (dB)	Cable Loss [L_{Cable}] (dB)	Substitution Method Correction [L_{Sub}] (dB)	Corrected Emission @ 3m [E_{Corr}] (dBuV/m)	Limit @ 3m [E_{Lim}] (dBuV/m)	Margin (dB)
152	H	14.8	11.8	1.1	n/a	27.7	43.5	15.8
195	H	27.1	9.9	1.1	n/a	38.1	43.5	5.4
205	H	23.7	10.3	1.2	n/a	35.2	43.5	8.3
212	H	21.8	10.5	1.3	n/a	33.6	46.0	12.4
304	H	18.3	13.9	1.6	n/a	33.8	46.0	12.2
608	H	14.0	20.0	2.4	n/a	36.4	46.0	9.6
152	V	15.1	11.8	1.1	n/a	28.0	46.0	18.0
195	V	17.1	9.9	1.1	n/a	28.1	46.0	17.9
205	V	12.1	10.3	1.2	n/a	23.6	43.5	19.9
212	V	11.1	10.5	1.3	n/a	22.9	43.5	20.6
304	V	26.3	13.9	1.6	n/a	41.8	43.5	1.7
608	V	19.3	20.0	2.4	n/a	41.7	46.0	4.3

$E_{Corr} = E_{Meas} + AF + L_{Cable} + L_{Sub}$

$Margin = E_{Lim} - E_{Corr}$

Result: Complies

Notes

Worst-case emissions shown

The device was searched to the 10th harmonic of the fundamental (270 MHz)

Data presented may use a peak detector and compared to quasi-peak limit

All detected emissions have been reported

APPENDIX G – FREQUENCY STABILITY

Test Conditions	
Normative Reference	FCC 47 CFR §2.1055, §95.625, RSS-Gen

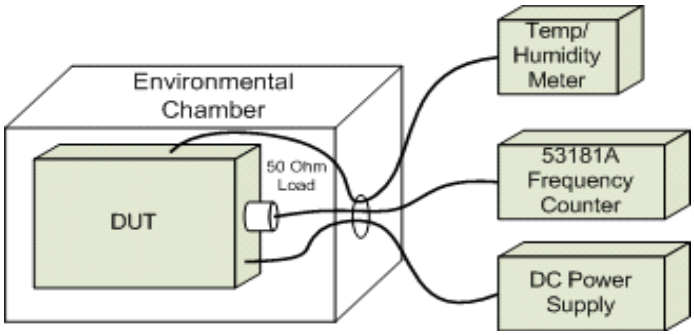
Limits	
FCC §95.625(b)	Each CB transmitter must be maintained within a frequency tolerance of 0.005%.

Test Conditions	
Temperature	-40°C to +50°C at 10°C Increments
Humidity	<100% Non Condensating
Voltage (VDC)	10.2(85%) - 13.8 - 27.6VDC(115%)

Equipment List

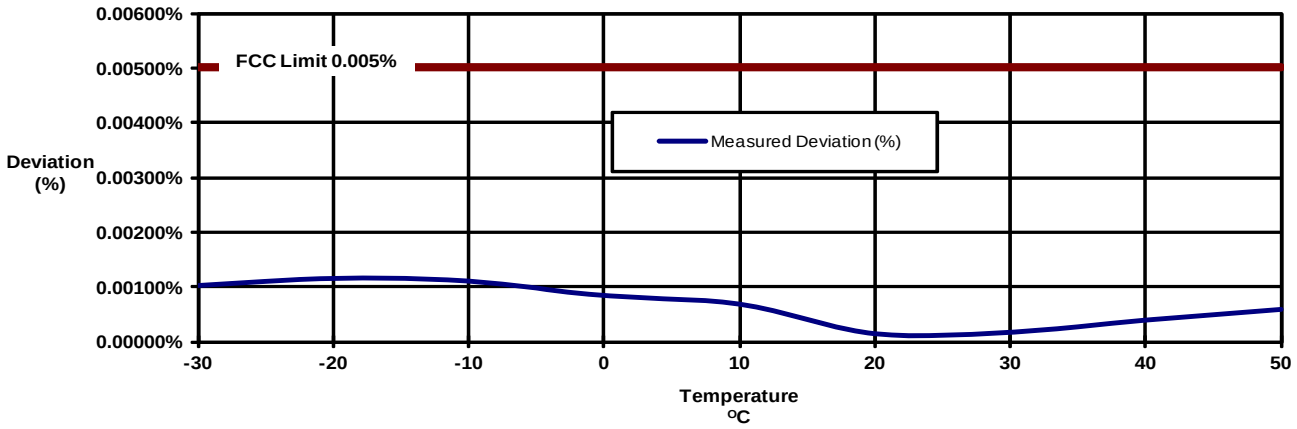
Asset Number	Manufacturer	Model Number	Description
00081	ESPEC	ECT-2	Environmental Chamber
00003	HP	53181A	Frequency Counter
00201	HP	E3611A	Power Supply
00234	VWR	61161-378	Temp/Humidity Meter

Set-Up Drawing



Frequency Stability

Nominal Frequency (MHz):	26.965
Nominal Channel BW (KHz):	8.0
Nominal Voltage (VDC):	13.8
Nominal Temperature (°C):	25



Frequency Stability Measurements (Temperature)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (Hz)	Deviation (%)
-30	26.965000	26.965277	277	0.00103%
-20	26.965000	26.965313	313	0.00116%
-10	26.965000	26.965299	299	0.00111%
0	26.965000	26.965227	227	0.00084%
10	26.965000	26.965185	185	0.00069%
20	26.965000	26.965038	38	0.00014%
30	26.965000	26.964955	45	0.00017%
40	26.965000	26.964895	105	0.00039%
50	26.965000	26.964841	159	0.00059%
			Maximum Deviation:	0.00111%
			Maximum Limit:	0.00500%
			Result:	Complies

Frequency Stability Measurements (Voltage)

Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (Hz)	Deviation (%)
27.6 (115%)	26.965000	26.965041	41	0.00015%
12 (100%)	26.965000	26.965038	38	0.00014%
10.2 (85%)	26.965000	26.965028	28	0.00010%
			Maximum Deviation:	0.00014%
			Maximum Limit:	0.00500%
			Result:	Complies

APPENDIX H – EQUIPMENT LIST AND CALIBRATION

Equipment List

Asset Number	Manufacturer	Model Number	Serial Number	Description	Last Calibrated	Calibration Interval
00003	HP	53181A	3736A05175	Frequency Counter	28 Apr 2014	Triennial
00034	ETS	3115	6267	Double Ridged Guide Horn	02 Dec 2015	Triennial
00047	HP	85685A	2837A00826	RF Preselector	30 Apr 2014	Triennial
00049	HP	85650A	2043A00162	Quasi-peak Adapter	30 Apr 2014	Triennial
00050	Chase	CBL-6111A	1607	Bilog Antenna	25 Apr 2014	Triennial
00051	HP	8566B	2747A05510	Spectrum Analyzer	30 Apr 2014	Triennial
00071	EMCO	2090	9912-1484	Multi-Device Controller	n/a	n/a
00072	EMCO	2075	0001-2277	Mini-mast	n/a	n/a
00073	EMCO	2080	0002-1002	Turn Table	n/a	n/a
00081	ESPEC	ECT-2	0510154-B	Environmental Chamber	CNR	n/a
00110	Gigatronics	8652A	1875801	Power Meter	29 Feb 2016	Triennial
00224	HP	8903B	3729A18691	Audio Analyzer	22 Dec 2014	Triennial
00234	VWR	61161-378	140320430	Temp/Humidity Meter	New	Triennial
00241	R&S	FSU40	100500	Spectrum Analyzer	23 Apr 2015	Triennial
00237	Gigatronics	80334A	1837001	Power Sensor	23 Jun 2014	Triennial
00265	Miteq	JS32-00104000-58-5P	1939850	Microwave L/N Amplifier	COU	n/a
00275	Coaxis	LMR400	n/a	25m Cable	COU	n/a
00276	Coaxis	LMR400	n/a	4m Cable	COU	n/a
00278	TILE	34G3	n/a	TILE Test Software	NCR	n/a

CNR: Calibration Not Required
COU: Calibrate On Use

APPENDIX I – MEASUREMENT INSTRUMENT UNCERTAINTY

CISPR 16-4 Measurement Uncertainty (U_{LAB})	
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence interval using a coverage factor of k=2	
30MHz - 200MHz	
U_{LAB} = 5.14dB U_{CISPR} = 6.3dB	
200MHz - 1000MHz	
U_{LAB} = 5.90dB U_{CISPR} = 6.3dB	
1GHz - 6GHz	
U_{LAB} = 4.80dB U_{CISPR} = 5.2dB	
6GHz - 18GHz	
U_{LAB} = 5.1dB U_{CISPR} = 5.5dB	
If the calculated uncertainty **U_{lab}** is **less** than **U_{CISPR}** then:	
1	Compliance is deemed to occur if **NO** measured disturbance exceeds the disturbance limit
2	Non-Compliance is deemed to occur if **ANY** measured disturbance **EXCEEDS** the disturbance limit
If the calculated uncertainty **U_{lab}** is **greater** than **U_{CISPR}** then:	
3	Compliance is deemed to occur if **NO** measured disturbance, increased by (**U_{lab} - U_{CISPR}**), exceeds the disturbance limit
4	Non-Compliance is deemed to occur if **ANY** measured disturbance, increased by (**U_{lab} - U_{CISPR}**), **EXCEEDS** the disturbance limit

