

*FCC PART 15, SUBPART B and C
TEST REPORT**for*

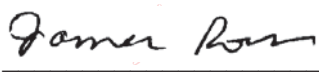
900 MHz MODULE

MODEL: 12-2121-00

Prepared for

ROBINSON ENGINEERING COMPANY, INC.
1914 SILVER STREET
GARLAND, TEXAS 75042Prepared by: 

KYLE FUJIMOTO

Approved by: 

JAMES ROSS

COMPATIBLE ELECTRONICS INC.
114 OLINDA DRIVE
BREA, CALIFORNIA 92823
(714) 579-0500

DATE: JULY 11, 2016

	REPORT BODY	APPENDICES					TOTAL
		<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	
PAGES	17	2	2	2	13	44	80

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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the federal government.

Device Tested: 900 MHz Module
Models: 12-2121-00
S/N: N/A

Product Description: The EUT is an RF Module to be used inside Robinson Engineering Company, Inc. products.

Modifications: The EUT was not modified in order to meet the specifications.

Customer: Robinson Engineering Company, Inc.
1914 Silver Street
Garland, Texas 75042

Test Dates: June 9 and 10, 2016

Test Specifications: Emissions requirements
CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.249

Test Procedure: ANSI C63.4, ANSI C63.10

Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

<i>TEST</i>	DESCRIPTION	RESULTS
1	Spurious Radiated RF Emissions, 10 kHz – 9300 MHz (Transmitter, Receiver, and Digital portion)	Complies with the Class B limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.249 Highest reading in relation to spec limit: 93.86 dBuV/m @ 915.12 MHz (*U = 4.54 dB)
2	Conducted RF Emissions, 150 kHz to 30 MHz	Complies with the Class B limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.207 Highest reading in relation to spec limit: 20.96 dBuV @ 0.300 MHz (*U = 2.86 dB)

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the 900 MHz Module, Model: 12-2121-00. The emissions measurements were performed according to the measurement procedure described in ANSI C63.4 and ANSI C63.10. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the Class B specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.249.



2. ADMINISTRATIVE DATA

2.1 Location of Testing

The emissions tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California 92823.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Robinson Engineering Company, Inc.

Mahmudual Islam Engineer

Compatible Electronics Inc.

Kyle Fujimoto Test Engineer

James Ross Test Engineer

2.4 Date Test Sample was Received

The test sample was received on July 11, 2016.

2.5 Disposition of the Test Sample

The test sample has not been returned to Robinson Engineering Company, Inc. as of the date of this test report.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
LISN	Line Impedance Stabilization Network
N/A	Not Applicable
Tx	Transmit
Rx	Receive

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this emissions Test Report.

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules – Radio frequency devices (including digital devices) – Intentional Radiators
FCC Title 47, Part 15 Subpart B	FCC Rules – Radio frequency devices (including digital devices) – Unintentional Radiators
EN 50147-2: 1997	Anechoic chambers. Alternative test site suitability with respect to site attenuation
ANSI C63.4 2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10 2013	American National Standard for Testing Unlicensed Wireless Devices

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration – Emissions

The RF Module (EUT) was connected to the host board via a 12-pin, 20-centimeter ribbon cable. The EUT was also connected to an antenna via its RF out port.

The host board was also connected to an AC/DC adapter via a small PCB connected directly to the host board.

The EUT was tested in three orthogonal axis and was programmed via dip switches on the host board so it could either transmit or receive at the low, middle, and high channels.

The EUT was investigated in both packet and transparent modes. It was determined that transparent mode was the worst case configuration and testing was done in this mode.

The X orientation is when the EUT is parallel to the ground. The Y orientation is when the EUT is perpendicular to the ground mounted vertically. The Z orientation is when the EUT is perpendicular to the ground mounted horizontally.

The EUT's amplitude and frequency did not change when the AC voltage was varied $\pm 15\%$.

The final radiated as well as the conducted data for the EUT as was taken in the mode described above. Please see Appendix E for the data sheets.

4.1.1 Cable Construction and Termination

Cable 1 This is a 20-centimeter unshielded cable connecting the EUT to the host board. The cable has a 12-pin connector at each end.

Cable 2 This is a 20-centimeter braid shielded cable connecting the EUT to the antenna. The cable has an RPSMA connector at the EUT end and is hard wired into the antenna.

Cable 3 This is a 2.5-meter unshielded cable connecting the AC/DC adapter to a small PCB directly connected to the host board. The cable is hard wired at each end.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT**5.1 EUT and Accessory List**

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
RF MODULE	ROBINSON ENGINEERING, INC.	N/A	N/A	NQHTRM900NTDB
AC/DC ADAPTER	PROAM	900-052	N/A	N/A
HOST BOARD	ROBINSON ENGINEERING, INC.	151222	N/A	N/A
SMALL PCB POWER BOARD	ROBINSON ENGINEERING, INC.	12-16120	N/A	N/A
ANTENNA	N/A	N/A	N/A	N/A

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
GENERAL TEST EQUIPMENT USED IN LAB D					
TDK TestLab	TDK RF Solutions, Inc.	9.22	700145	N/A	N/A
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A
EMI Receiver, 20 Hz – 26.5 GHz	Agilent Technologies	N9038A	MY51210150	December 29, 2015	1 Year
RF RADIATED EMISSIONS TEST EQUIPMENT					
CombiLog Antenna	Com-Power	AC-220	61060	September 3, 2015	1 Year
Preamplifier	Com-Power	PAM-118A	551024	May 12, 2016	1 Year
Loop Antenna	Com-Power	AL-130	17089	February 6, 2015	2 Year
Horn Antenna	Com-Power	AH-118	071175	February 26, 2016	2 Year
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
System Controller	Sunol Sciences Corporation	SC110V	112213-1	N/A	N/A
Turntable	Sunol Sciences Corporation	2011VS	N/A	N/A	N/A
Antenna-Mast	Sunol Sciences Corporation	TWR95-4	112213-3	N/A	N/A
RF CONDUCTED EMISSIONS TEST EQUIPMENT					
LISN	Com-Power	LI-215A	191951	June 9, 2015	2 Year
Transient Limiter	Com-Power	252A910	N/A	October 14, 2015	1 Year

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for emissions test location.

6.2 EUT Mounting, Bonding and Grounding

For frequencies 1 GHz and below: The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

For frequencies above 1 GHz: The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 1.5 meters above the ground plane.

The EUT was not grounded.

7. CHARACTERISTICS OF THE TRANSMITTER

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

7.1 Channel Number and Frequencies

There are 101 channels spaced every 250 kHz and the EUT uses FSK modulation.

Channel 0 = 902.62 MHz
Channel 1 = 902.87 MHz
Channel 2 = 918.28 MHz...
Channel 100 = 927.62 MHz

7.2 Antenna

The antenna has a reverse SMA connector and will be the antenna used with the EUT.

8. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

8.1 RF Emissions

8.1.1 Conducted Emissions Test

The EMI Receiver was used as a measuring meter. A quasi-peak and/or average reading was taken only where indicated in the data sheets. A transient limiter was used for the protection of the EMI Receiver input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the EMI Receiver. The output of the second LISN was terminated by a 50-ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding, and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI 63:4. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by computer software. The final qualification data is located in Appendix E.

The EUT was tested at 120 VAC. The six highest emissions are listed in Table 1.0.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Section 15.207 for conducted emissions. Please see Appendix E for the data sheets.

8.1.2 Radiated Emissions Test

The EMI Receiver was used as the measuring meter. A built-in, internal preamplifier was used to increase the sensitivity of the instrument. The EMI Receiver was initially used with the Analyzer mode feature activated. In this mode, the EMI receiver can then record the actual frequency to be measured. This final reading is then taken accurately in the EMI Receiver mode, which takes into account the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit. A quasi-peak reading was taken only for those readings, which are marked accordingly on the data sheets. The effective measurement bandwidth used for the radiated emissions test was according to the frequency measured (200 Hz for 10 kHz to 150 kHz, 9 kHz for 150 kHz to 30 MHz, 120 kHz for 30 MHz to 1 GHz and 1 MHz for 1 GHz to 9.3 GHz).

For emissions above 1 GHz, the RMS average detector function was used to average the emissions.

The EMI test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is in full compliance with ANSI C63.4, EN 50147-2 and CISPR 22. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

The EUT was tested at a 3-meter test distance. The six highest emissions are listed in Table 2.0.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Loop Antenna
150 kHz to 30 MHz	9 kHz	Loop Antenna
30 MHz to 1 GHz	120 kHz	CombiLog Antenna
1 GHz to 9.3 GHz	1 MHz	Horn Antenna

Test Results:

The EUT complies with the **Class B** limits of **CFR** Title 47, Part 15, Subpart B; and Subpart C sections 15.205, 15.209 and 15.249 for radiated emissions.

8.1.3 RF Emissions Test Results

Table 1.0 CONDUCTED EMISSION RESULTS
900 MHz Module
Model: 12-2121-00

Frequency MHz	Average Corrected Reading* dBuV	Average Specification Limit dBuV	Delta (Cor. Reading – Spec. Limit) dB
0.300 (BL) (Receive)	20.96 (Avg)	-29.51	50.47
0.290 (BL) (Transmit)	21.22 (Avg)	-29.58	50.80
0.262 (WL) (Receive)	21.53 (Avg)	-29.62	51.14
0.250 (WL) (Transmit)	21.78 (Avg)	-29.75	51.53
0.250 (BL)(Receive)	21.60 (Avg)	-29.82	51.41
0.270 (WL)(Receive)	21.45 (Avg)	-29.83	51.28

Table 2.0 RADIATED EMISSION RESULTS
900 MHz Module
Model: 12-2121-00

Frequency MHz	EMI Reading (dBuV/m)	Specification Limit (dBuV)	Delta (Cor. Reading – Spec. Limit) dB
915.12 (H) (X-Axis)	93.86 (QP)	93.97	-0.11
927.62 (H) (X-Axis)	93.83 (QP)	93.97	-0.14
902.62 (H) (X-Axis)	93.58 (QP)	93.97	-0.39
902.62 (H) (Z-Axis)	93.49 (QP)	93.97	-0.48
927.62 (H) (Z-Axis)	92.96 (QP)	93.97	-1.01
927.62 (V) (Y-Axis)	92.61 (QP)	93.97	-1.36

Notes:

- * The complete emissions data is given in Appendix E of this report.
- (BL) Black Lead
- (WL) White Lead
- (V) Vertical
- (H) Horizontal
- (QP) Quasi-Peak
- (Avg) Average

9. CONCLUSIONS

The 900 MHz Module, Models: 12-2121-00, as tested, meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.249.



APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

LABORATORY ACCREDITATIONS AND RECOGNITIONS



For US, Canada, Australia/New Zealand, Japan, Taiwan, Korea, and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025. Please follow the link to the NIST/NVLAP site for each of our facilities' NVLAP certificate and scope of accreditation

NVLAP listing links

[Agoura Division](#) / [Brea Division](#) / [Silverado/Lake Forest Division](#)

.Quote from ISO-ILAC-IAF Communiqué on 17025:

"A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 Quality Management Systems — Requirements."



ANSI listing [CETCB](#)



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA).

US/EU MRA list [NIST MRA site](#)



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA).

APEC MRA list [NIST MRA site](#)

We are also listed for IT products by the following country/agency:



VCCI Support member: Please visit http://www.vcci.jp/vcci_e/



FCC Listing, from FCC OET site

[FCC test lab search](https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm) <https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm>



Compatible Electronics IC listing can be found at:

<http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home>

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.249 specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modifications were made to the EUT during the testing.



APPENDIX C***ADDITIONAL MODELS COVERED
UNDER THIS REPORT***

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

900 MHz Module
Model: 12-2121-00
S/N: N/A

There are no additional models covered under this report.



APPENDIX D

DIAGRAMS AND CHARTS

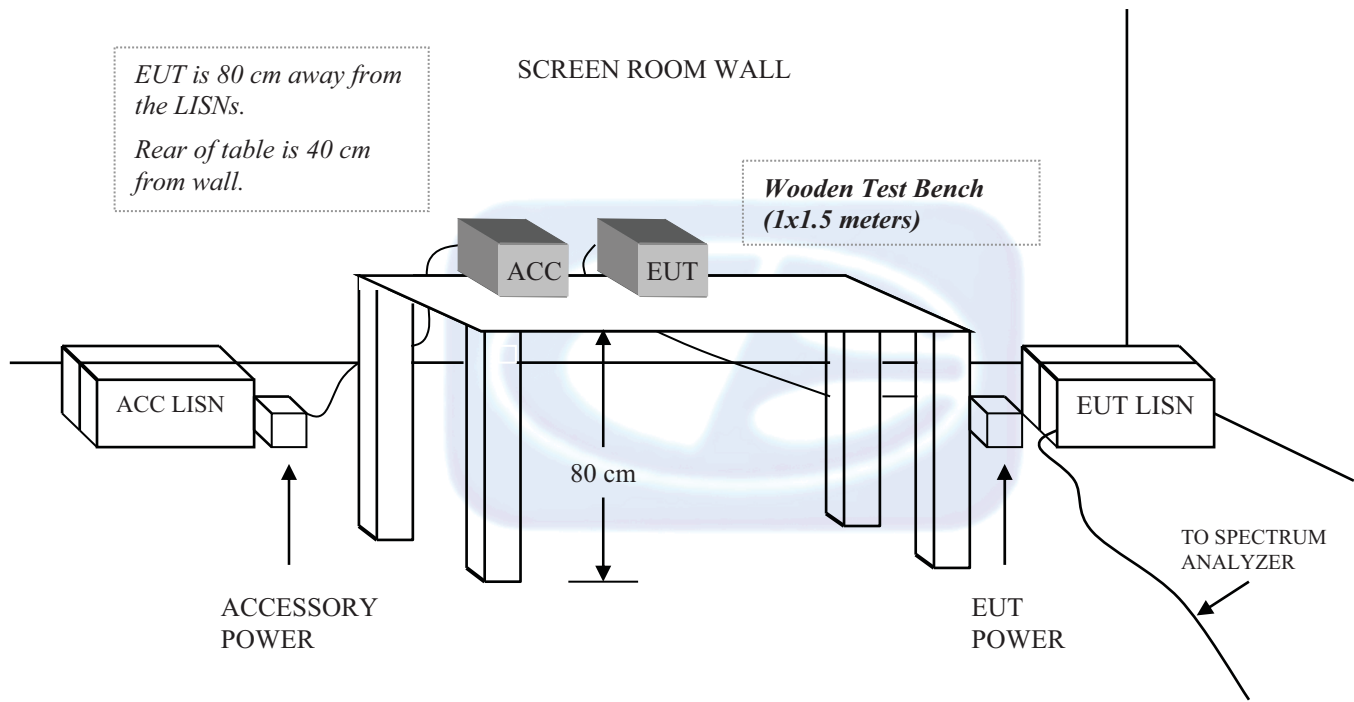
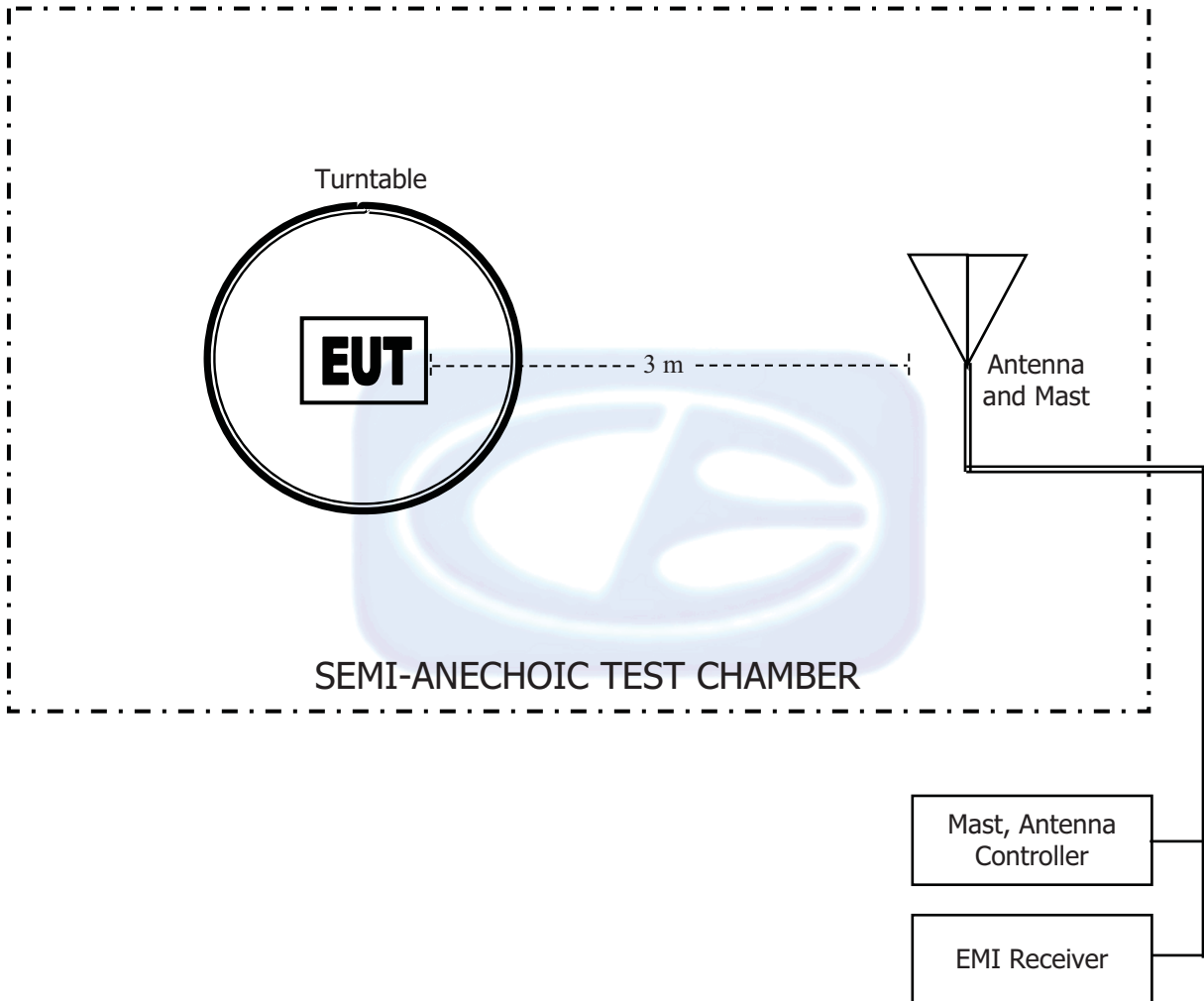
FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

FIGURE 2: LAYOUT OF THE SEMI MI-ANECHOIC TEST CHAMBER



COM-POWER AL-130**LOOP ANTENNA**

S/N: 17089

CALIBRATION DATE: FEBRUARY 6, 2015

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-33.18	18.32
0.01	-34.10	17.40
0.02	-38.65	12.85
0.03	-39.28	12.22
0.04	-40.09	11.41
0.05	-40.85	10.65
0.06	-40.88	10.62
0.07	-41.07	10.43
0.08	-41.04	10.46
0.09	-41.19	10.31
0.1	-41.20	10.30
0.2	-41.52	9.98
0.3	-41.53	9.97
0.4	-41.42	10.08
0.5	-41.53	9.97
0.6	-41.53	9.97
0.7	-41.43	10.07
0.8	-41.23	10.27
0.9	-41.13	10.37
1	-41.14	10.36
2	-40.80	10.70
3	-40.66	10.84
4	-40.61	10.89
5	-40.33	11.17
6	-40.53	10.97
7	-40.47	11.03
8	-40.48	11.02
9	-39.93	11.57
10	-39.81	11.69
15	-43.35	8.15
20	-39.16	12.34
25	-40.24	11.26
30	-43.18	8.32

COM-POWER AC-220**COMBILOG ANTENNA****S/N: 61060****CALIBRATION DATE: SEPTEMBER 3, 2015**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	24.00	200	13.00
35	24.30	250	15.30
40	25.40	300	18.20
45	21.50	350	17.90
50	22.50	400	18.60
60	15.40	450	19.80
70	12.70	500	21.60
80	11.10	550	22.40
90	13.40	600	23.70
100	13.80	650	24.30
120	15.40	700	24.00
125	15.40	750	24.50
140	13.10	800	24.30
150	17.20	850	26.30
160	13.20	900	26.90
175	14.20	950	26.00
180	14.30	1000	25.60

COM POWER AH-118**HORN ANTENNA****S/N: 071175****CALIBRATION DATE: FEBRUARY 26, 2016**

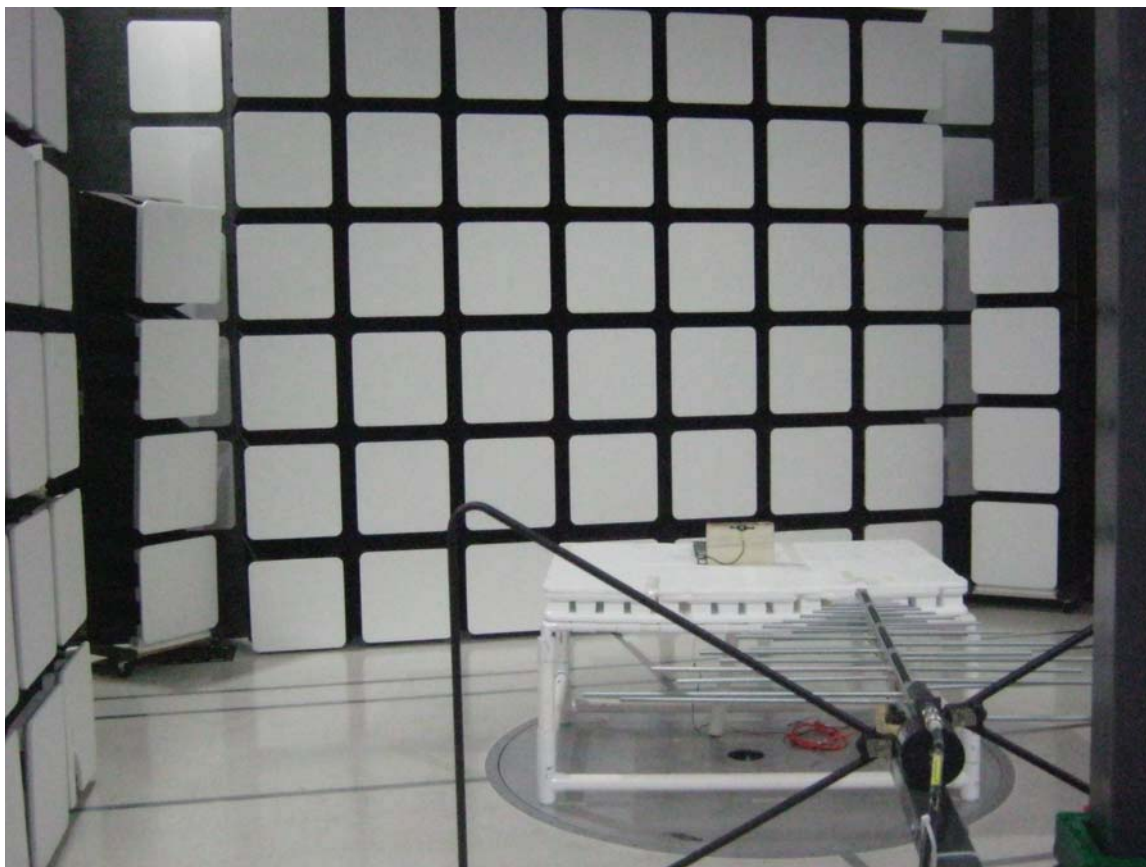
FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	23.93	10.0	39.33
1.5	25.54	10.5	39.64
2.0	28.09	11.0	41.04
2.5	30.21	11.5	44.29
3.0	30.15	12.0	41.22
3.5	30.17	12.5	41.50
4.0	31.90	13.0	41.62
4.5	33.51	13.5	40.63
5.0	33.87	14.0	39.94
5.5	35.08	14.5	41.84
6.0	34.81	15.0	42.69
6.5	34.26	15.5	39.03
7.0	36.33	16.0	39.07
7.5	37.03	16.5	41.40
8.0	37.56	17.0	43.18
8.5	40.07	17.5	47.01
9.0	38.92	18.0	46.48
9.5	38.21		

COM-POWER PA-118**PREAMPLIFIER**

S/N: 551024

CALIBRATION DATE: MAY 12, 2016

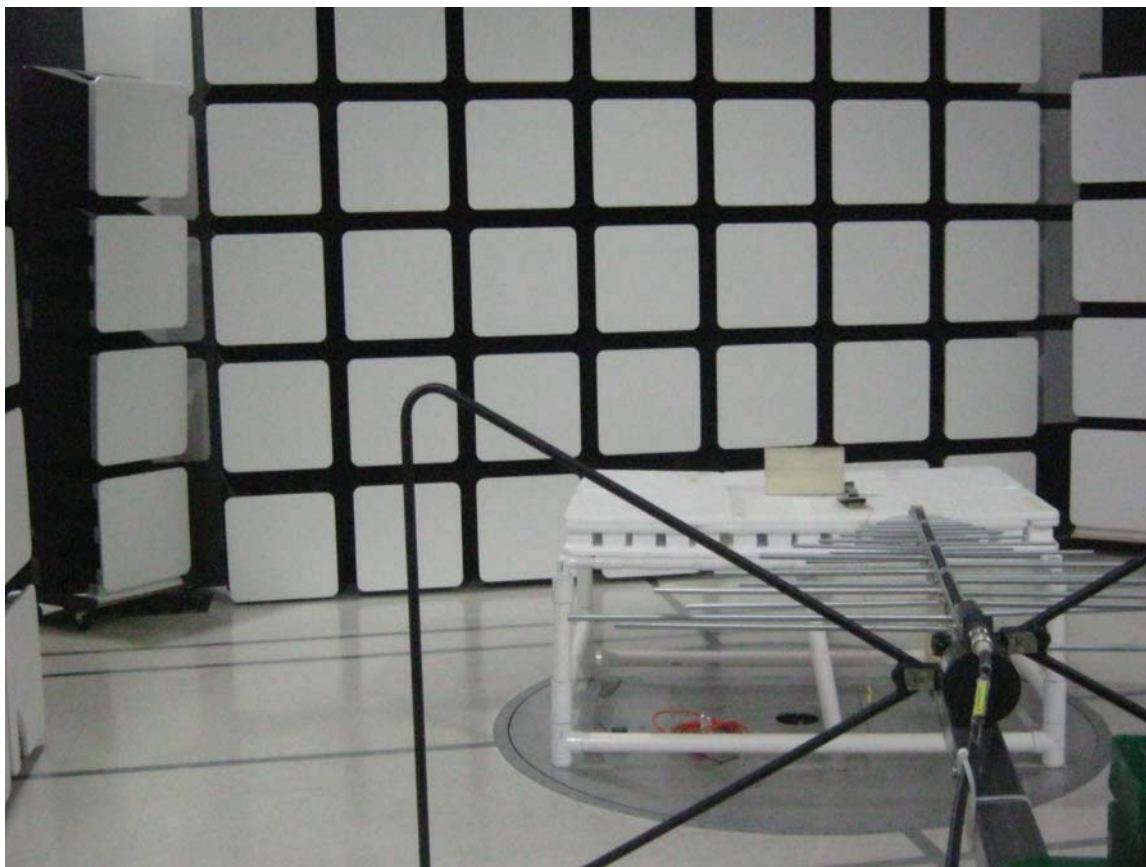
FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	39.84	6.0	39.05
1.1	39.40	6.5	38.94
1.2	39.58	7.0	39.25
1.3	39.68	7.5	39.09
1.4	39.91	8.0	39.01
1.5	39.78	8.5	38.60
1.6	39.50	9.0	38.64
1.7	39.81	9.5	39.67
1.8	39.89	10.0	39.30
1.9	39.94	11.0	39.15
2.0	39.57	12.0	39.24
2.5	40.39	13.0	39.49
3.0	40.63	14.0	39.44
3.5	40.80	15.0	39.94
4.0	40.86	16.0	40.09
4.5	39.94	17.0	40.06
5.0	34.47	18.0	39.76
5.5	39.32		



FRONT VIEW

ROBINSON ENGINEERING COMPANY, INC.
900 MHz MODULE
MODEL: 12-2121-00
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

ROBINSON ENGINEERING COMPANY, INC.
900 MHz MODULE
MODEL: 12-2121-00
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



FRONT VIEW

ROBINSON ENGINEERING COMPANY, INC.
900 MHz MODULE
MODEL: 12-2121-00
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



REAR VIEW

ROBINSON ENGINEERING COMPANY, INC.
900 MHz MODULE
MODEL: 12-2121-00
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

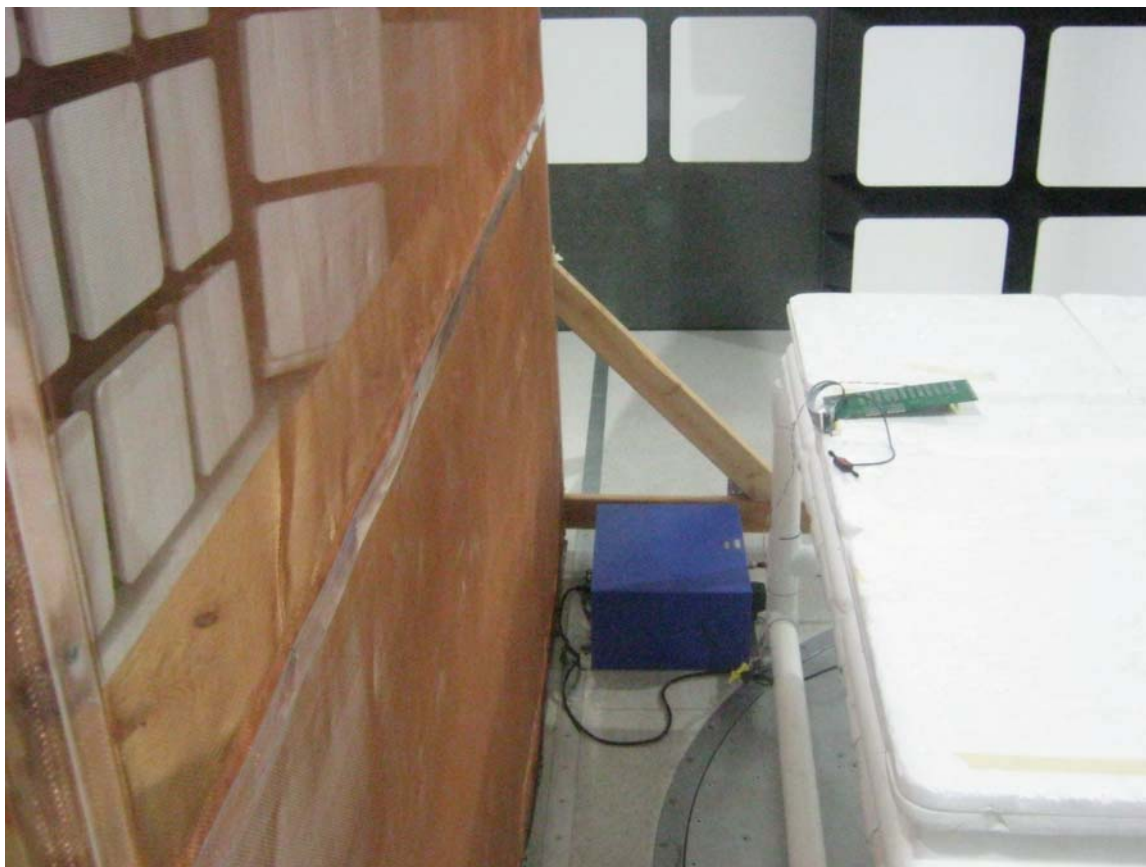
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



FRONT VIEW

ROBINSON ENGINEERING COMPANY, INC.
900 MHz MODULE
MODEL: 12-2121-00
FCC SUBPART B AND C – CONDUCTED EMISSIONS

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

ROBINSON ENGINEERING COMPANY, INC.
900 MHz MODULE
MODEL: 12-2121-00
FCC SUBPART B AND C – CONDUCTED EMISSIONS

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

APPENDIX E

DATA SHEETS

***RADIATED EMISSIONS
DATA SHEETS***

FCC 15.249

Robinson Engineering Company, Inc.
 900 MHz Module
 Model: 12-2121-00

Date: 06/09/2016
 Lab: D
 Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1805.24	41.56	V	73.97	-32.41	Peak	41.75	236.21	
1805.24	30.55	V	53.97	-23.42	Avg	41.75	236.21	
2707.86	44.77	V	73.97	-29.20	Peak	145.50	236.31	
2707.86	34.43	V	53.97	-19.54	Avg	145.50	236.31	
3610.48	46.13	V	73.97	-27.84	Peak	260.25	194.10	
3610.48	34.42	V	53.97	-19.55	Avg	260.25	194.10	
4513.10								No Emission
4513.10								Detected
5415.72								No Emission
5415.72								Detected
6318.34								No Emission
6318.34								Detected
7220.96								No Emission
7220.96								Detected
8123.58								No Emission
8123.58								Detected
9026.20								No Emission
9026.20								Detected

FCC 15.249Robinson Engineering Company, Inc.
900 MHz Module
Model: 12-2121-00Date: 06/09/2016
Lab: D
Tested By: Kyle Fujimoto**Low Channel****Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1805.24	40.84	V	73.97	-33.13	Peak	134.00	197.74	
1805.24	31.01	V	53.97	-22.96	Avg	134.00	197.74	
2707.86	45.07	V	73.97	-28.90	Peak	291.25	190.04	
2707.86	32.48	V	53.97	-21.50	Avg	291.25	190.04	
3610.48	44.71	V	73.97	-29.26	Peak	267.50	192.58	
3610.48	32.26	V	53.97	-21.71	Avg	267.50	192.58	
4513.10								No Emission
4513.10								Detected
5415.72								No Emission
5415.72								Detected
6318.34								No Emission
6318.34								Detected
7220.96								No Emission
7220.96								Detected
8123.58								No Emission
8123.58								Detected
9026.20								No Emission
9026.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
900 MHz Module
Model: 12-2121-00

Date: 06/09/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1805.24	41.88	V	73.97	-32.10	Peak	42.25	234.52	
1805.24	30.30	V	53.97	-23.67	Avg	42.25	234.52	
2707.86	45.03	V	73.97	-28.94	Peak	53.00	134.58	
2707.86	33.35	V	53.97	-20.62	Avg	53.00	134.58	
3610.48	46.18	V	73.97	-27.79	Peak	5.00	238.58	
3610.48	34.12	V	53.97	-19.85	Avg	5.00	238.58	
4513.10								No Emission
4513.10								Detected
5415.72								No Emission
5415.72								Detected
6318.34								No Emission
6318.34								Detected
7220.96								No Emission
7220.96								Detected
8123.58								No Emission
8123.58								Detected
9026.20								No Emission
9026.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
 900 MHz Module
 Model: 12-2121-00

Date: 06/09/2016
 Lab: D
 Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1805.24	44.43	H	73.97	-29.54	Peak	249.75	209.56	
1805.24	38.70	H	53.97	-15.27	Avg	249.75	209.56	
2707.86	45.49	H	73.97	-28.48	Peak	26.75	142.76	
2707.86	37.38	H	53.97	-16.59	Avg	26.75	142.76	
3610.48	44.99	H	73.97	-28.98	Peak	64.00	117.80	
3610.48	34.41	H	53.97	-19.57	Avg	64.00	117.80	
4513.10								No Emission
4513.10								Detected
5415.72								No Emission
5415.72								Detected
6318.34								No Emission
6318.34								Detected
7220.96								No Emission
7220.96								Detected
8123.58								No Emission
8123.58								Detected
9026.20								No Emission
9026.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
 900 MHz Module
 Model: 12-2121-00

Date: 06/09/2016
 Lab: D
 Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1805.24	48.02	H	73.97	-25.96	Peak	166.75	184.31	
1805.24	44.99	H	53.97	-8.98	Avg	166.75	184.31	
2707.86	46.45	H	73.97	-27.52	Peak	273.33	199.23	
2707.86	37.43	H	53.97	-16.54	Avg	273.25	199.23	
3610.48	46.47	H	73.97	-27.50	Peak	355.00	202.25	
3610.48	35.02	H	53.97	-18.96	Avg	355.00	202.25	
4513.10								No Emission
4513.10								Detected
5415.72								No Emission
5415.72								Detected
6318.34								No Emission
6318.34								Detected
7220.96								No Emission
7220.96								Detected
8123.58								No Emission
8123.58								Detected
9026.20								No Emission
9026.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
 900 MHz Module
 Model: 12-2121-00

Date: 06/09/2016
 Lab: D
 Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1805.24	41.38	H	73.97	-32.59	Peak	110.25	167.53	
1805.24	31.54	H	53.97	-22.43	Avg	110.25	167.53	
2707.86	46.06	H	73.97	-27.91	Peak	355.00	175.25	
2707.86	37.15	H	53.97	-16.82	Avg	355.00	175.25	
3610.48	46.38	H	73.97	-27.59	Peak	274.00	178.25	
3610.48	34.25	H	53.97	-19.72	Avg	274.00	178.25	
4513.10								No Emission
4513.10								Detected
5415.72								No Emission
5415.72								Detected
6318.34								No Emission
6318.34								Detected
7220.96								No Emission
7220.96								Detected
8123.58								No Emission
8123.58								Detected
9026.20								No Emission
9026.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
 900 MHz Module
 Model: 12-2121-00

Date: 06/09/2016
 Lab: D
 Tested By: Kyle Fujimoto

Middle Channel

Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1830.24	40.66	V	73.97	-33.31	Peak	180.50	150.64	
1830.24	30.20	V	53.97	-23.77	Avg	180.50	150.64	
2745.36	45.69	V	73.97	-28.28	Peak	12.00	185.98	
2745.36	34.60	V	53.97	-19.37	Avg	12.00	185.98	
3660.48	46.74	V	73.97	-27.23	Peak	185.98	291.50	
3660.48	34.68	V	53.97	-19.29	Avg	185.98	291.50	
4575.60								No Emission
4575.60								Detected
5490.72								No Emission
5490.72								Detected
6405.84								No Emission
6405.84								Detected
7320.96								No Emission
7320.96								Detected
8236.08								No Emission
8236.08								Detected
9151.20								No Emission
9151.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
 900 MHz Module
 Model: 12-2121-00

Date: 06/09/2016
 Lab: D
 Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1830.24	46.87	V	73.97	-27.10	Peak	97.50	130.22	
1830.24	41.57	V	53.97	-12.40	Avg	97.50	130.22	
2745.36	48.44	V	73.97	-25.53	Peak	115.50	124.07	
2745.36	43.55	V	53.97	-10.42	Avg	115.50	124.07	
3660.48	44.36	V	73.97	-29.61	Peak	182.00	156.58	
3660.48	34.63	V	53.97	-19.34	Avg	182.00	156.58	
4575.60								No Emission
4575.60								Detected
5490.72								No Emission
5490.72								Detected
6405.84								No Emission
6405.84								Detected
7320.96								No Emission
7320.96								Detected
8236.08								No Emission
8236.08								Detected
9151.20								No Emission
9151.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
900 MHz Module
Model: 12-2121-00

Date: 06/09/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel

Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1830.24	40.33	V	73.97	-33.64	Peak	80.00	181.92	
1830.24	27.95	V	53.97	-26.02	Avg	80.00	181.92	
2745.36	46.53	V	73.97	-27.44	Peak	23.50	179.77	
2745.36	37.32	V	53.97	-16.65	Avg	23.50	179.77	
3660.48	46.43	V	73.97	-27.54	Peak	255.50	240.13	
3660.48	34.56	V	53.97	-19.41	Avg	255.50	240.13	
4575.60								No Emission
4575.60								Detected
5490.72								No Emission
5490.72								Detected
6405.84								No Emission
6405.84								Detected
7320.96								No Emission
7320.96								Detected
8236.08								No Emission
8236.08								Detected
9151.20								No Emission
9151.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
 900 MHz Module
 Model: 12-2121-00

Date: 06/09/2016
 Lab: D
 Tested By: Kyle Fujimoto

Middle Channel

Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1830.24	49.11	H	73.97	-24.86	Peak	181.75	102.22	
1830.24	46.55	H	53.97	-7.42	Avg	181.75	102.22	
2745.36	46.20	H	73.97	-27.78	Peak	29.50	130.76	
2745.36	35.40	H	53.97	-18.57	Avg	29.50	130.76	
3660.48	46.09	H	73.97	-27.88	Peak	199.75	137.14	
3660.48	34.79	H	53.97	-19.18	Avg	199.50	137.14	
4575.60								No Emission
4575.60								Detected
5490.72								No Emission
5490.72								Detected
6405.84								No Emission
6405.84								Detected
7320.96								No Emission
7320.96								Detected
8236.08								No Emission
8236.08								Detected
9151.20								No Emission
9151.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
900 MHz Module
Model: 12-2121-00

Date: 06/09/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel

Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1830.24	40.29	H	73.97	-33.68	Peak	339.50	129.08	
1830.24	27.89	H	53.97	-26.08	Avg	339.50	129.08	
2745.36	45.53	H	73.97	-28.44	Peak	135.50	171.47	
2745.36	36.48	H	53.97	-17.49	Avg	135.50	171.47	
3660.48	43.00	H	73.97	-30.98	Peak	66.25	142.46	
3660.48	34.44	H	53.97	-19.53	Avg	66.25	142.46	
4575.60								No Emission
4575.60								Detected
5490.72								No Emission
5490.72								Detected
6405.84								No Emission
6405.84								Detected
7320.96								No Emission
7320.96								Detected
8236.08								No Emission
8236.08								Detected
9151.20								No Emission
9151.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
 900 MHz Module
 Model: 12-2121-00

Date: 06/09/2016
 Lab: D
 Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1830.24	46.34	H	73.97	-27.63	Peak	10.75	165.08	
1830.24	33.76	H	53.97	-20.21	Avg	10.75	165.08	
2745.36	44.81	H	73.97	-29.16	Peak	152.00	131.41	
2745.36	36.48	H	53.97	-17.50	Avg	152.00	131.41	
3660.48	44.61	H	73.97	-29.36	Peak	56.25	122.16	
3660.48	34.97	H	53.97	-19.00	Avg	56.25	122.16	
4575.60								No Emission
4575.60								Detected
5490.72								No Emission
5490.72								Detected
6405.84								No Emission
6405.84								Detected
7320.96								No Emission
7320.96								Detected
8236.08								No Emission
8236.08								Detected
9151.20								No Emission
9151.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
 900 MHz Module
 Model: 12-2121-00

Date: 06/09/2016
 Lab: D
 Tested By: Kyle Fujimoto

High Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1855.24	40.56	V	73.97	-33.41	Peak	114.50	125.86	
1855.24	30.78	V	53.97	-23.19	Avg	114.50	125.86	
2782.86	48.07	V	73.97	-25.90	Peak	55.00	175.11	
2782.86	40.55	V	53.97	-13.43	Avg	55.00	175.11	
3710.48	46.65	V	73.97	-27.32	Peak	200.00	158.46	
3710.48	34.63	V	53.97	-19.34	Avg	200.00	158.46	
4638.10								No Emission
4638.10								Detected
5565.72								No Emission
5565.72								Detected
6493.34								No Emission
6493.34								Detected
7420.96								No Emission
7420.96								Detected
8348.58								No Emission
8348.58								Detected
9276.20								No Emission
9276.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
 900 MHz Module
 Model: 12-2121-00

Date: 06/09/2016
 Lab: D
 Tested By: Kyle Fujimoto

High Channel Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1855.24	49.90	V	73.97	-24.07	Peak	70.50	156.31	
1855.24	45.70	V	53.97	-8.27	Avg	70.50	156.31	
2782.86	49.06	V	73.97	-24.91	Peak	248.00	115.29	
2782.86	41.34	V	53.97	-12.63	Avg	248.00	115.29	
3710.48	43.47	V	73.97	-30.50	Peak	71.25	143.47	
3710.48	35.37	V	53.97	-18.60	Avg	71.25	143.47	
4638.10								No Emission
4638.10								Detected
5565.72								No Emission
5565.72								Detected
6493.34								No Emission
6493.34								Detected
7420.96								No Emission
7420.96								Detected
8348.58								No Emission
8348.58								Detected
9276.20								No Emission
9276.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
 900 MHz Module
 Model: 12-2121-00

Date: 06/09/2016
 Lab: D
 Tested By: Kyle Fujimoto

High Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1855.24	42.30	V	73.97	-31.67	Peak	107.00	142.88	
1855.24	32.39	V	53.97	-21.58	Avg	107.00	142.88	
2782.86	46.51	V	73.97	-27.46	Peak	255.50	173.44	
2782.86	36.62	V	53.97	-17.35	Avg	255.50	173.44	
3710.48	44.38	V	73.97	-29.59	Peak	108.75	146.64	
3710.48	35.14	V	53.97	-18.83	Avg	108.75	146.64	
4638.10								No Emission
4638.10								Detected
5565.72								No Emission
5565.72								Detected
6493.34								No Emission
6493.34								Detected
7420.96								No Emission
7420.96								Detected
8348.58								No Emission
8348.58								Detected
9276.20								No Emission
9276.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
 900 MHz Module
 Model: 12-2121-00

Date: 06/09/2016
 Lab: D
 Tested By: Kyle Fujimoto

High Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1855.24	40.48	H	73.97	-33.49	Peak	261.25	117.68	
1855.24	31.10	H	53.97	-22.87	Avg	261.25	117.68	
2782.86	50.22	H	73.97	-23.75	Peak	159.75	207.41	
2782.86	48.18	H	53.97	-5.79	Avg	159.75	207.41	
3710.48	43.43	H	73.97	-30.54	Peak	225.00	180.13	
3710.48	34.75	H	53.97	-19.22	Avg	225.00	180.13	
4638.10								No Emission
4638.10								Detected
5565.72								No Emission
5565.72								Detected
6493.34								No Emission
6493.34								Detected
7420.96								No Emission
7420.96								Detected
8348.58								No Emission
8348.58								Detected
9276.20								No Emission
9276.20								Detected

FCC 15.249

Robinson Engineering Company, Inc.
900 MHz Module
Model: 12-2121-00

Date: 06/09/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1855.24	45.64	H	73.97	-28.34	Peak	53.75	159.41	
1855.24	37.81	H	53.97	-16.16	Avg	53.75	159.41	
2782.86	45.66	H	73.97	-28.31	Peak	212.75	190.64	
2782.86	37.00	H	53.97	-16.97	Avg	212.75	190.64	
3710.48	46.56	H	73.97	-27.41	Peak	155.75	205.62	
3710.48	35.53	H	53.97	-18.44	Avg	155.75	205.62	
4638.10								No Emission
4638.10								Detected
5565.72								No Emission
5565.72								Detected
6493.34								No Emission
6493.34								Detected
7420.96								No Emission
7420.96								Detected
8348.58								No Emission
8348.58								Detected
9276.2								No Emission
9276.2								Detected

FCC 15.249

Robinson Engineering Company, Inc.
900 MHz Module
Model: 12-2121-00

Date: 06/09/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel
Transmit Mode - Z-Axis

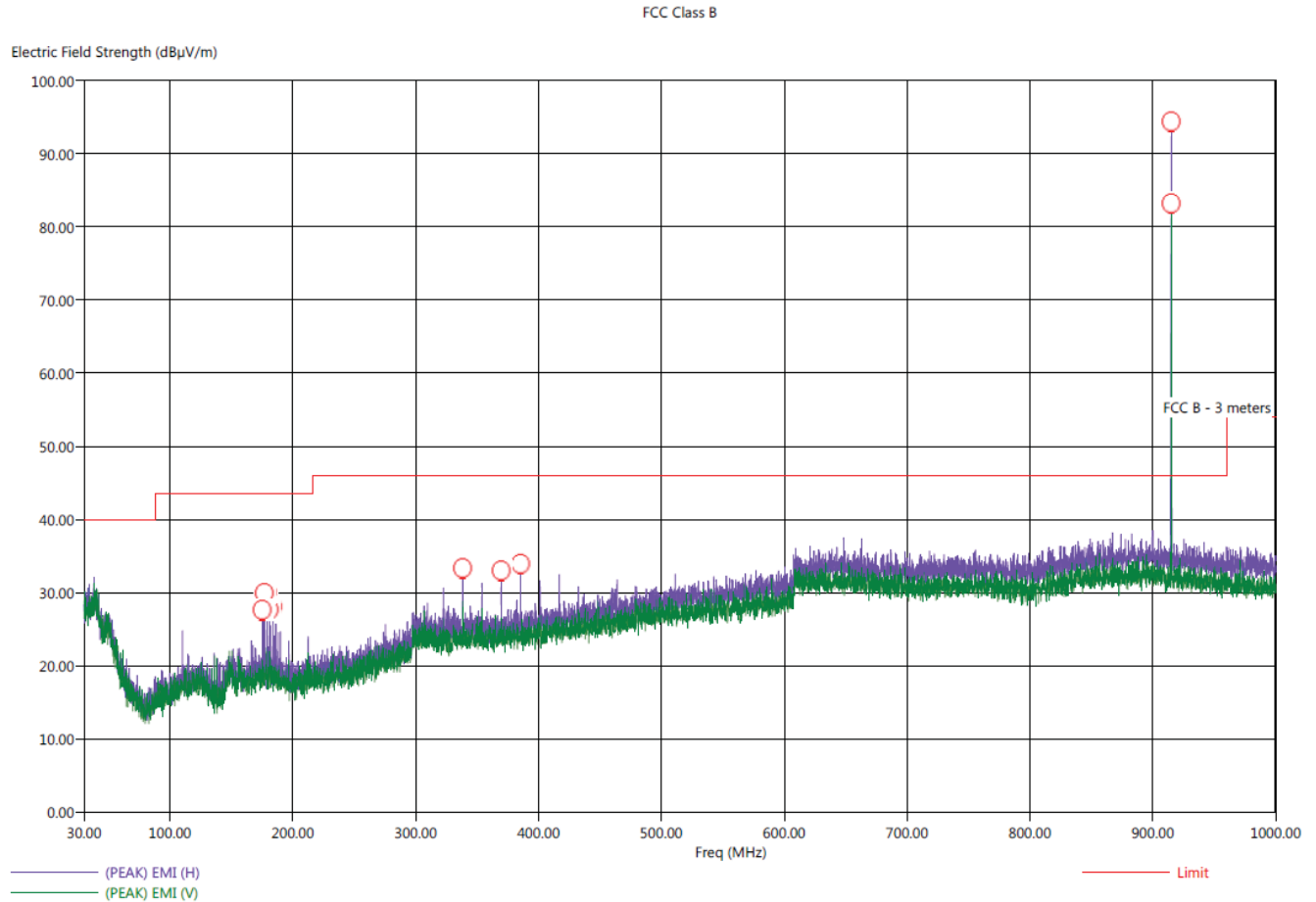
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
1855.24	51.66	H	73.97	-22.31	Peak	151.50	129.56	
1855.24	49.53	H	53.97	-4.44	Avg	151.50	129.56	
2782.86	46.60	H	73.97	-27.37	Peak	350.25	157.20	
2782.86	39.56	H	53.97	-14.41	Avg	350.25	157.20	
3710.48	46.06	H	73.97	-27.91	Peak	166.00	110.04	
3710.48	36.20	H	53.97	-17.77	Avg	166.00	110.04	
4638.10								No Emission
4638.10								Detected
5565.72								No Emission
5565.72								Detected
6493.34								No Emission
6493.34								Detected
7420.96								No Emission
7420.96								Detected
8348.58								No Emission
8348.58								Detected
9276.2								No Emission
9276.2								Detected

FCC Class B and FCC 15.249Robinson Engineering Company, Inc.
900 MHz Module
Model: 12-2121-00Date: 06/09/2016
Lab: D
Tested By: Kyle Fujimoto**Non Harmonic Emissions from the Tx and Digital Portion - 10 kHz to 30 MHz****Non Harmonic Emissions from the Tx and Digital Portion - 1 GHz to 9.3 GHz**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the Digital Portion from 10 kHz to 30 MHz for both Vertical and Horizontal Polarizations
								No Non Harmonic Emissions Found for the Tx Mode from 10 kHz to 30 MHz for both Vertical and Horizontal Polarizations
								Investigated in the X-Axis, Y-Axis, and Z-Axis
								No Emissions Found for the Digital Portion from 1 GHz to 9.3 GHz for both Vertical and Horizontal Polarizations
								No Non Harmonic Emissions Found for the Tx Mode from 1 GHz to 9.3 GHz for both Vertical and Horizontal Polarizations
								Investigated in the X-Axis, Y-Axis, and Z-Axis

Title: Pre-Scan - FCC Class B
File: 3 - Agilent - Pre-Scan - AC Mode - X-Axis - FCC Class B - 30 MHz to 1000 MHz - 06-09-2016.set
Operator: Kyle Fujimoto
EUT Type: 900 MHz Module
EUT Condition: The EUT is continuously transmitting at the Middle Channel - X-Axis
Company: Robinson Engineering Company, Inc.
Model: 12-2121-00
Note: The Frequency at 915.12 MHz is subject to FCC Part 15.249 limits instead.

6/9/2016 10:43:44 AM
Sequence: Preliminary Scan



Title: Radiated Final - FCC Class B

File: 3 - Agilent - Final Scan - AC Mode - X-Axis - FCC Class B - 30 MHz to 1000 MHz - 06-09-2016.set

Operator: Kyle Fujimoto

EUT Type: 900 MHz Module

EUT Condition: The EUT is continuously transmitting at the Middle Channel - X-Axis

Comments: Company: Robinson Engineering Company, Inc.

Model: 12-2121-00

6/9/2016 11:47:49 AM

Sequence: Final Measurements

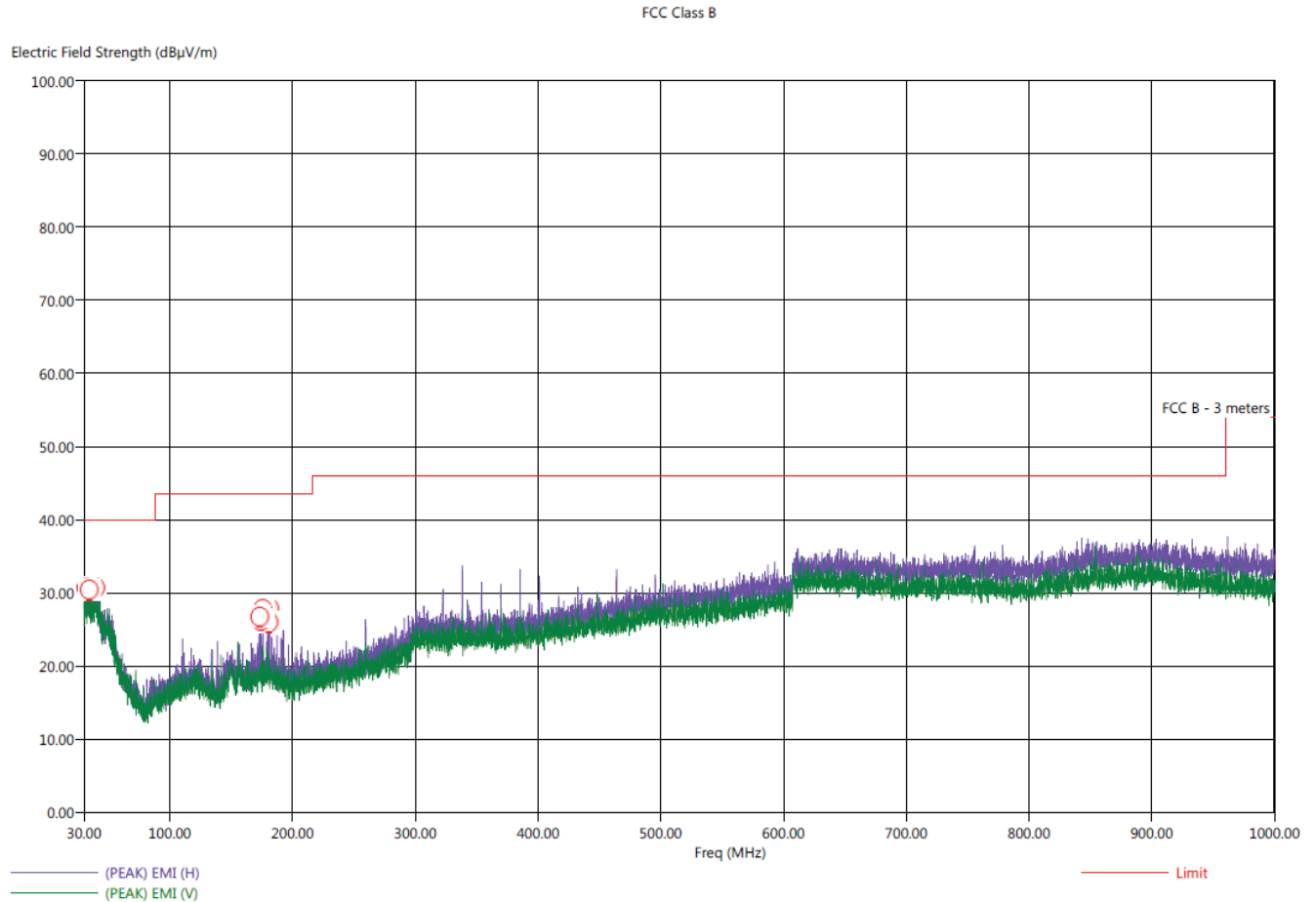
FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBμV/m)	(OP) EMI (dBμV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBμV/m)	Transducer (dB)	Cable (dB)	Ttbl Aql (deg)	Twr Ht (cm)
136.60	H	24.44	15.42	-19.06	-28.08	43.50	13.60	0.85	257.25	223.41
175.10	H	31.57	22.10	-11.93	-21.40	43.50	14.21	0.99	112.00	206.76
176.90	H	31.82	22.27	-11.68	-21.23	43.50	14.24	1.00	128.25	127.83
179.10	H	31.94	22.68	-11.56	-20.82	43.50	14.29	1.01	106.00	128.13
180.90	H	35.08	29.97	-8.42	-13.53	43.50	14.24	1.01	114.00	160.31
183.60	H	30.75	21.47	-12.75	-22.03	43.50	14.03	1.03	116.50	208.43
338.20	H	35.54	33.35	-10.46	-12.65	46.00	17.97	1.44	252.50	112.91
369.60	H	36.77	34.15	-9.23	-11.85	46.00	18.19	1.50	222.00	112.61
385.40	H	35.11	32.83	-10.89	-13.17	46.00	18.40	1.53	80.00	272.13



Title: Pre-Scan - FCC Class B
File: 4 - Agilent - Pre-Scan - AC Mode - Rx Mode - FCC Class B - 30 MHz to 1000 MHz - 06-09-2016.set
Operator: Kyle Fujimoto
EUT Type: 900 MHz RF Module
EUT Condition: The EUT is continuously receiving at the Middle Channel - X-Axis
Comments: Company: Robinson Engineering Company, Inc.
Model: 12-2121-00

6/9/2016 1:09:19 PM
Sequence: Preliminary Scan



Title: Radiated Final - FCC Class B
File: 4 - Agilent - Final Scan - Rx Mode - X-Axis - FCC Class B - 30 MHz to 1000 MHz - 06-09-2016.set
Operator: Kyle Fujimoto
EUT Type: 900 MHz RF Module
EUT Condition: The EUT is continuously Receiving - X-Axis Worst Case
Comments: Company: Robinson Engineering Company, Inc.
Model: 12-2121-00

6/9/2016 1:19:26 PM
Sequence: Final Measurements

FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBμV/m)	(QP) EMI (dBμV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBμV/m)	Transducer (dB)	Cable (dB)	Ttbl Agl (deg)	Twr Ht (cm)
31.26	V	34.28	28.86	-5.72	-11.14	40.00	23.99	0.35	288.00	351.89
32.08	V	23.77	17.13	-16.23	-22.87	40.00	15.51	0.55	24.00	207.17
33.56	V	22.94	16.45	-20.56	-27.05	43.50	15.39	0.81	104.00	384.49
171.52	H	22.73	17.83	-23.27	-28.17	46.00	14.88	1.22	244.75	287.83
186.52	H	33.82	26.15	-12.18	-19.85	46.00	20.90	1.73	91.50	159.29
181.53	H	36.58	31.32	-9.42	-14.68	46.00	25.92	2.66	113.75	111.17

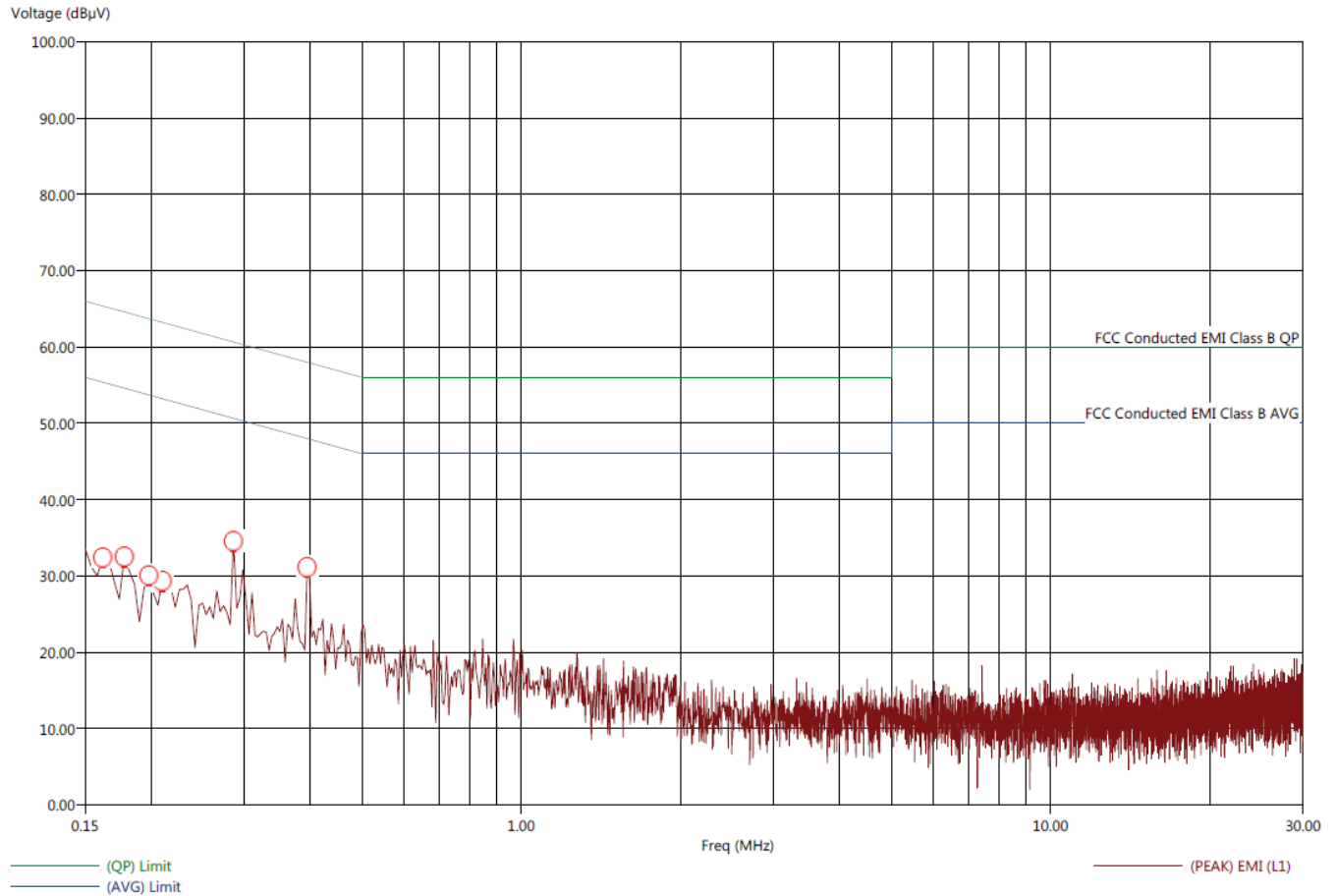


***CONDUCTED EMISSIONS
DATA SHEETS***

Title: FCC Class B - Conducted Emissions - Black Lead
File: 5 - Agilent - Pre-Scan - AC Mode - Tx - Black Lead - FCC Class B - 150 kHz to 30 MHz - 06-10-2016.set
Operator: Kyle Fujimoto
EUT Type: 900 MHz Module
EUT Condition: The EUT is continuously transmitting at the Middle Channel
Comments: Company: Robinson Engineering Company, Inc.
Note: 12-2121-00

6/10/2016 8:27:46 AM
Sequence: Preliminary Scan

FCC Class B - Conducted Emissions - Black Lead



Title: FCC Class B - Conducted Emissions - Black Lead
File: 5 - Agilent - Final Scan - AC Mode - Tx - Black Lead - FCC Class B - 150 kHz to 30 MHz - 06-10-2016.set
Operator: Kyle Fujimoto
EUT Type: 900 MHz Module
EUT Condition: The EUT is continuously transmitting at the Middle Channel
Comments: Company: Robinson Engineering, Inc.
Model: 12-2121-00

6/10/2016 8:32:04 AM
Sequence: Final Measurements

FCC Class B - Conducted Emissions - Black Lead

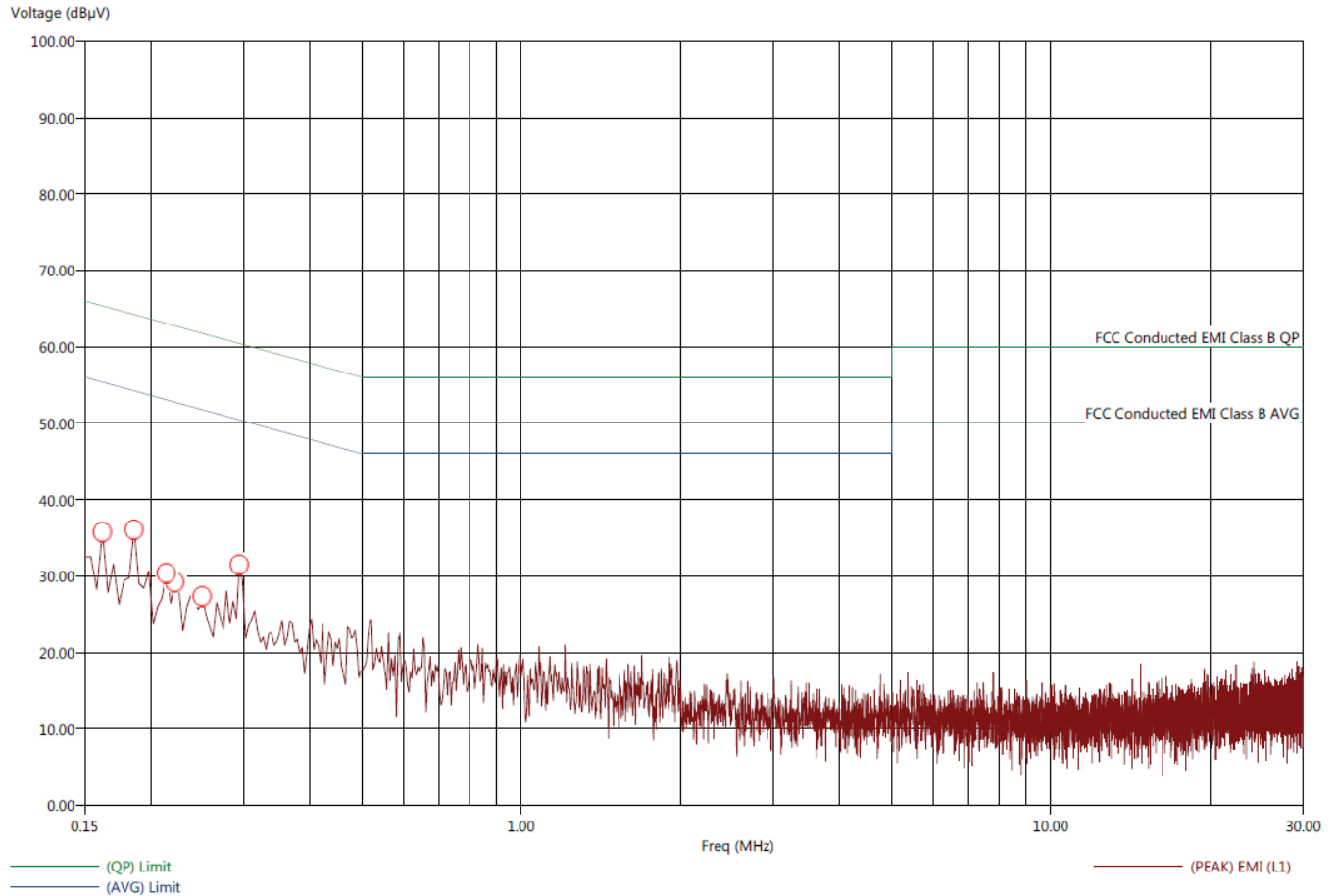
Freq (MHz)	(PEAK) EMI (dBµV)	(AVG) EMI (dBµV)	(AVG) Margin AVL (dB)	(AVG) Limit (dBµV)	Cable (dB)	Transducer (dB)	Filter (dB)
0.16	39.23	21.55	-33.63	55.18	0.07	0.457	9.83
0.18	40.83	21.10	-33.52	54.62	0.07	0.419	9.83
0.20	38.54	20.20	-33.27	53.47	0.08	0.343	9.83
0.21	37.21	20.10	-33.10	53.20	0.08	0.324	9.83
0.29	35.81	21.22	-29.58	50.80	0.08	0.163	9.83
0.39	31.76	17.77	-29.97	47.73	0.08	0.050	9.84



Title: FCC Class B - Conducted Emissions - White Lead
File: 6 - Agilent - Pre-Scan - AC Mode - Tx - White Lead - FCC Class B - 150 kHz to 30 MHz - 06-10-2016.set
Operator: Kyle Fujimoto
EUT Type: 900 MHz Module
EUT Condition: The EUT is continuously transmitting the Middle Channel
Comments: Company: Robinson Engineering Company, Inc.
Model: 12-2121-00

6/10/2016 8:33:23 AM
Sequence: Preliminary Scan

FCC Class B - Conducted Emissions - White Lead



Title: FCC Class B - Conducted Emissions - White Lead
File: 6 - Agilent - Final Scan - AC Mode - Tx - White Lead - FCC Class B - 150 kHz to 30 MHz - 06-10-2016.set
Operator: Kyle Fujimoto
EUT Type: 900 MHz Module
EUT Condition: The EUT is continuously transmitting at the Middle Chanel
Comments: Company: Robinson Engineering Company, Inc.
Model: 12-2121-00

6/10/2016 8:34:46 AM
Sequence: Final Measurements

FCC Class B - Conducted Emissions - White Lead

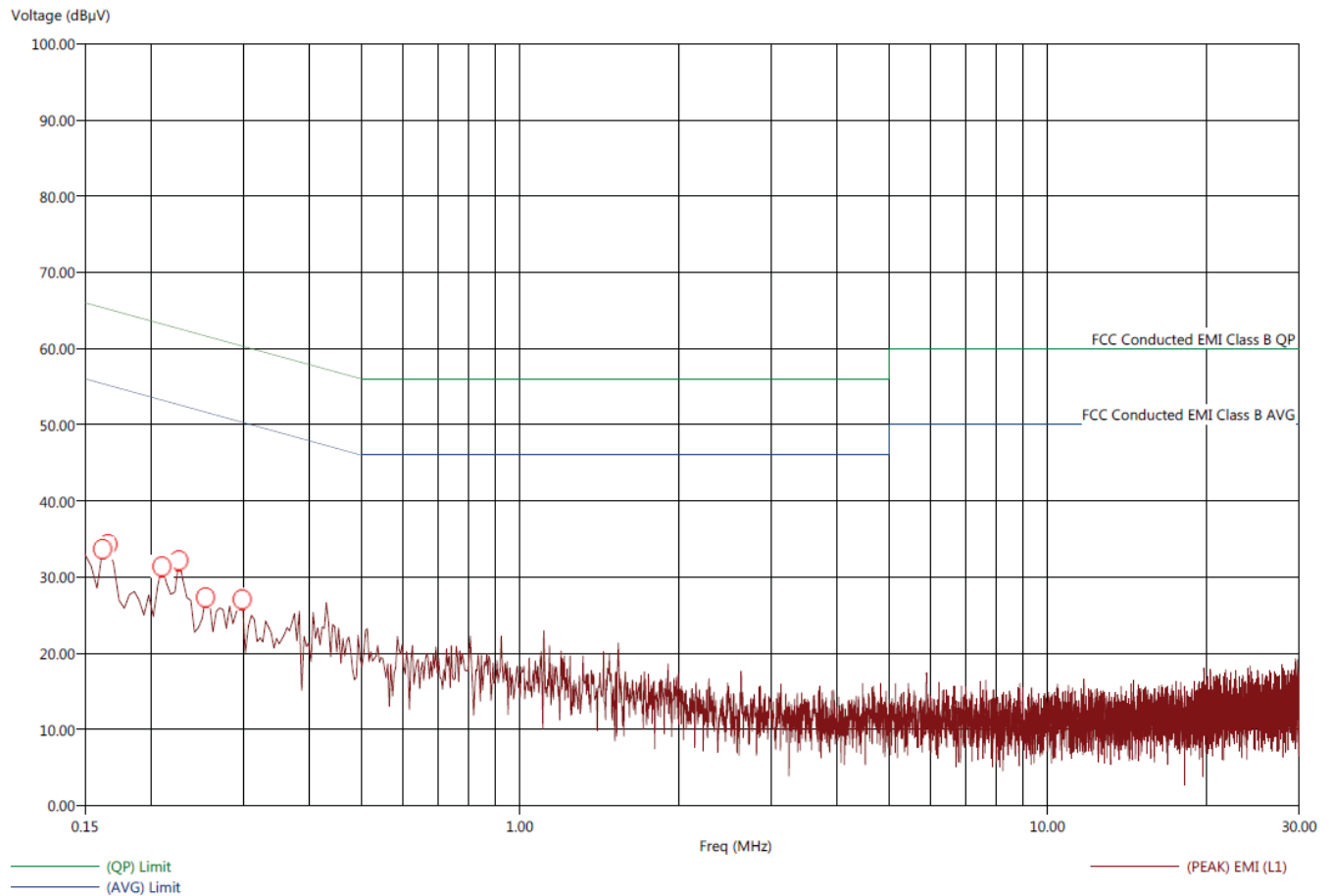
Freq (MHz)	(PEAK) EMI (dBµV)	(AVG) EMI (dBµV)	(AVG) Margin AVL (dB)	(AVG) Limit (dBµV)	Cable (dB)	Transducer (dB)	Filter (dB)
0.162	37.98	20.44	-34.67	55.12	0.07	0.440	9.83
0.186	37.40	19.58	-34.70	54.27	0.07	0.384	9.83
0.214	36.23	18.87	-34.12	52.99	0.08	0.298	9.83
0.222	36.25	18.86	-33.99	52.85	0.08	0.289	9.83
0.250	36.33	21.78	-29.75	51.53	0.08	0.201	9.83
0.294	35.86	20.70	-29.86	50.56	0.08	0.136	9.83



Title: FCC Class B - Conducted Emissions - Black Lead
File: 7 - Agilent - Pre-Scan - AC Mode - Rx - Black Lead - FCC Class B - 150 kHz to 30 MHz - 06-10-2016.set
Operator: Kyle Fujimoto
EUT Type: 900 MHz Module
EUT Condition: The EUT is continuously receiving at the Middle Channel
Comments: Company: Robinson Engineering Company, Inc.
Note: 12-2121-00

6/10/2016 8:41:46 AM
Sequence: Preliminary Scan

FCC Class B - Conducted Emissions - Black Lead



Title: FCC Class B - Conducted Emissions - Black Lead
File: 7 - Agilent - Final Scan - AC Mode - Rx - Black Lead - FCC Class B - 150 kHz to 30 MHz - 06-10-2016.set
Operator: Kyle Fujimoto
EUT Type: 900 MHz Module
EUT Condition: The EUT is continuously receiving at the Middle Channel
Comments: Company: Robinson Engineering, Inc.
Model: 12-2121-00

6/10/2016 8:44:04 AM
Sequence: Final Measurements

FCC Class B - Conducted Emissions - Black Lead

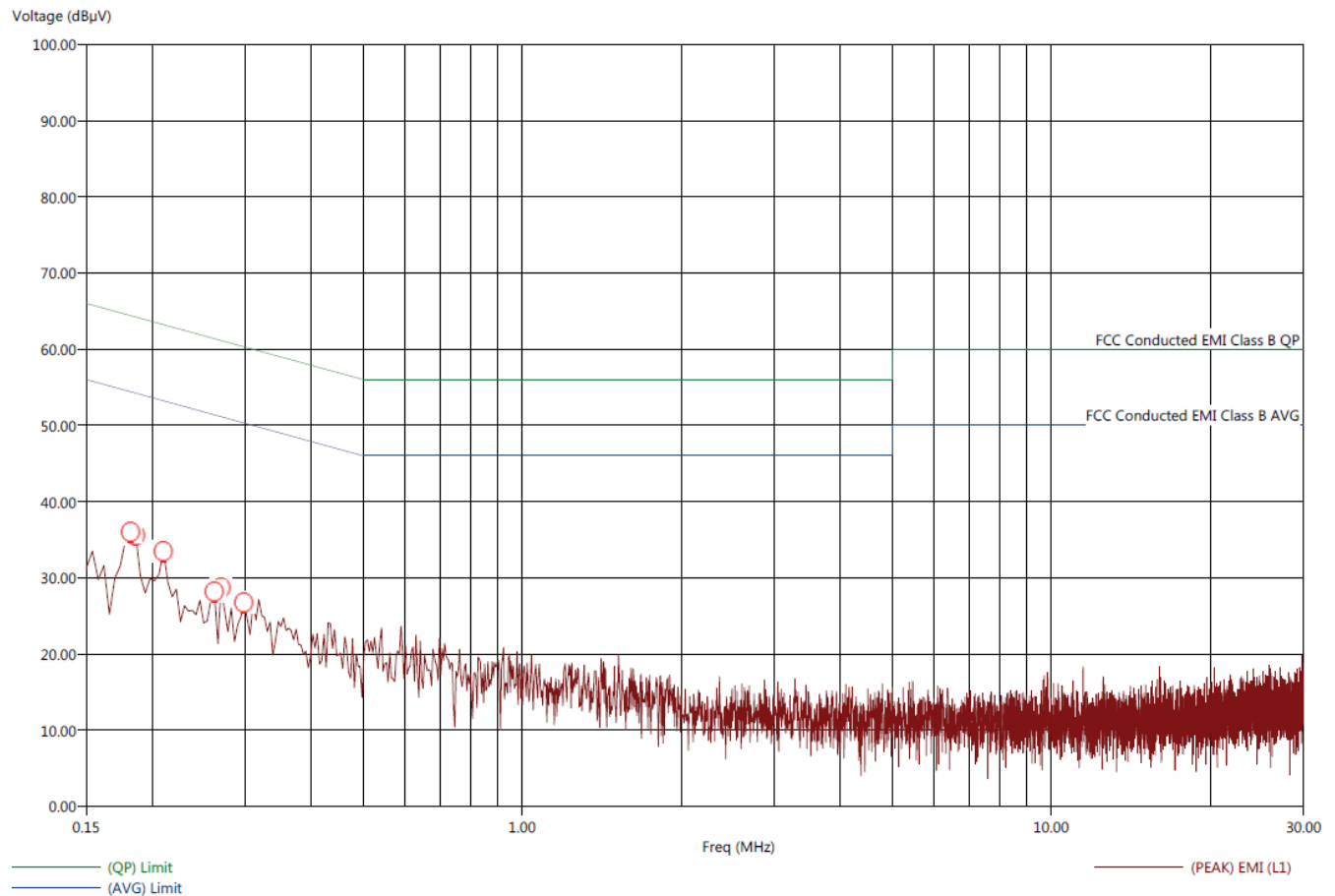
Freq (MHz)	(PEAK) EMI (dBµV)	(AVG) EMI (dBµV)	(AVG) Margin AVL (dB)	(AVG) Limit (dBµV)	Cable (dB)	Transducer (dB)	Filter (dB)
0.16	39.55	21.73	-33.82	55.55	0.06	0.482	9.83
0.17	40.79	21.53	-33.76	55.28	0.07	0.464	9.83
0.21	38.80	20.19	-33.26	53.45	0.08	0.341	9.83
0.23	37.95	19.46	-33.06	52.52	0.08	0.279	9.83
0.25	35.83	21.60	-29.82	51.41	0.08	0.204	9.83
0.30	34.73	20.96	-29.51	50.47	0.08	0.141	9.83



Title: FCC Class B - Conducted Emissions - White Lead
File: 8 - Agilent - Pre-Scan - AC Mode - Rx - White Lead - FCC Class B - 150 kHz to 30 MHz - 06-10-2016.set
Operator: Kyle Fujimoto
EUT Type: 900 MHz Module
EUT Condition: The EUT is continuously receiving the Middle Channel
Comments: Company: Robinson Engineering Company, Inc.
Model: 12-2121-00

6/10/2016 8:36:26 AM
Sequence: Preliminary Scan

FCC Class B - Conducted Emissions - White Lead



Title: FCC Class B - Conducted Emissions - White Lead
File: 8 - Agilent - Final Scan - AC Mode - Rx - White Lead - FCC Class B - 150 kHz to 30 MHz - 06-10-2016.set
Operator: Kyle Fujimoto
EUT Type: 900 MHz Module
EUT Condition: The EUT is continuously receiving at the Middle Channel
Comments: Company: Robinson Engineering Company, Inc.
Model: 12-2121-00

6/10/2016 8:37:53 AM
Sequence: Final Measurements

FCC Class B - Conducted Emissions - White Lead

Freq (MHz)	(PEAK) EMI (dBµV)	(AVG) EMI (dBµV)	(AVG) Margin AVL (dB)	(AVG) Limit (dBµV)	Cable (dB)	Transducer (dB)	Filter (dB)
0.182	37.33	19.82	-34.51	54.33	0.07	0.388	9.83
0.186	37.23	19.61	-34.49	54.10	0.08	0.372	9.83
0.210	36.76	19.12	-34.24	53.36	0.08	0.323	9.83
0.262	36.26	21.53	-29.62	51.14	0.08	0.175	9.83
0.270	36.24	21.45	-29.83	51.28	0.08	0.184	9.83
0.298	35.31	20.68	-29.87	50.55	0.08	0.136	9.83



***BAND EDGES
DATA SHEETS***

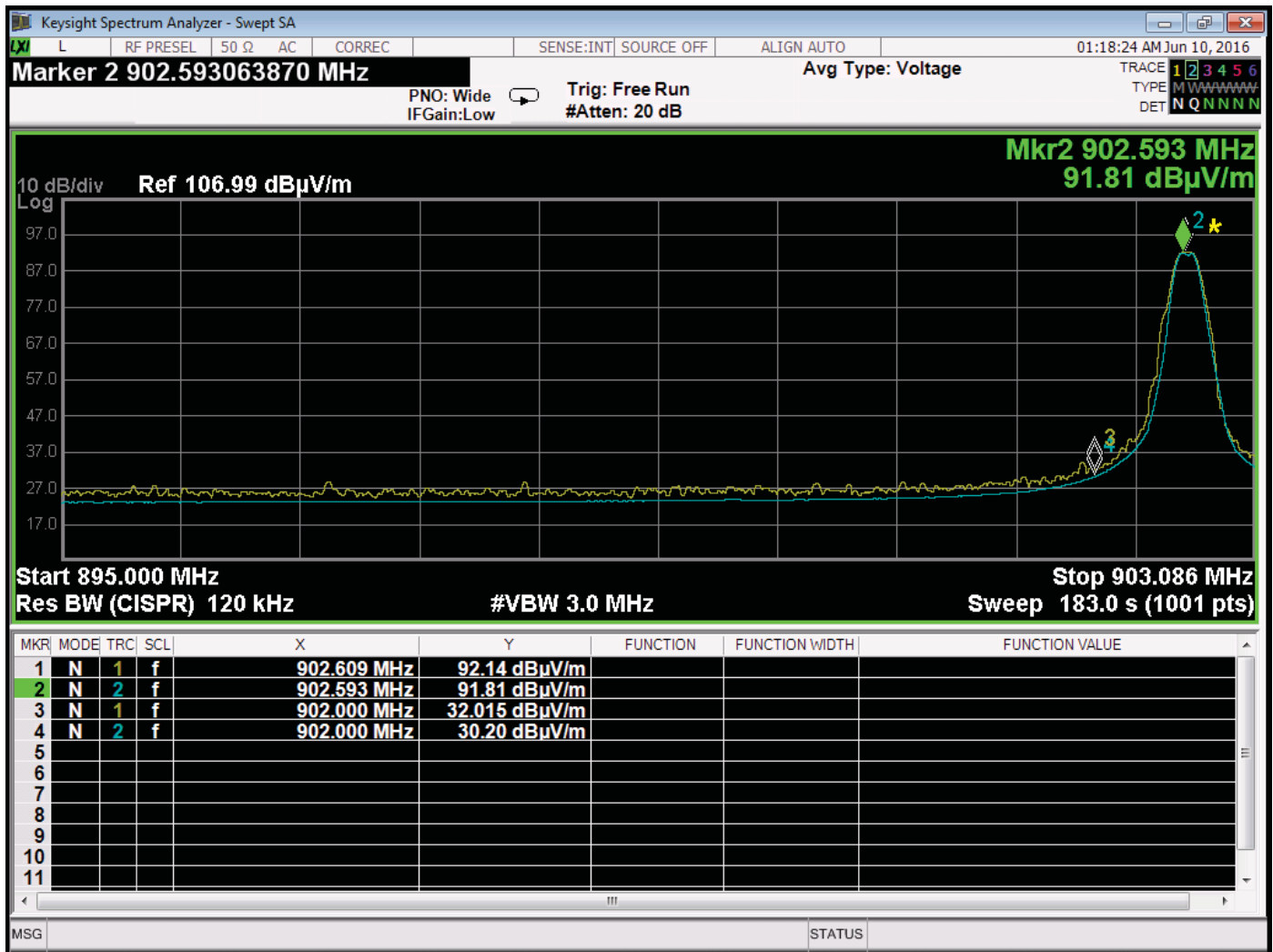
FCC 15.249

Robinson Engineering Company, Inc.
 900 MHz Module
 Model: 12-2121-00

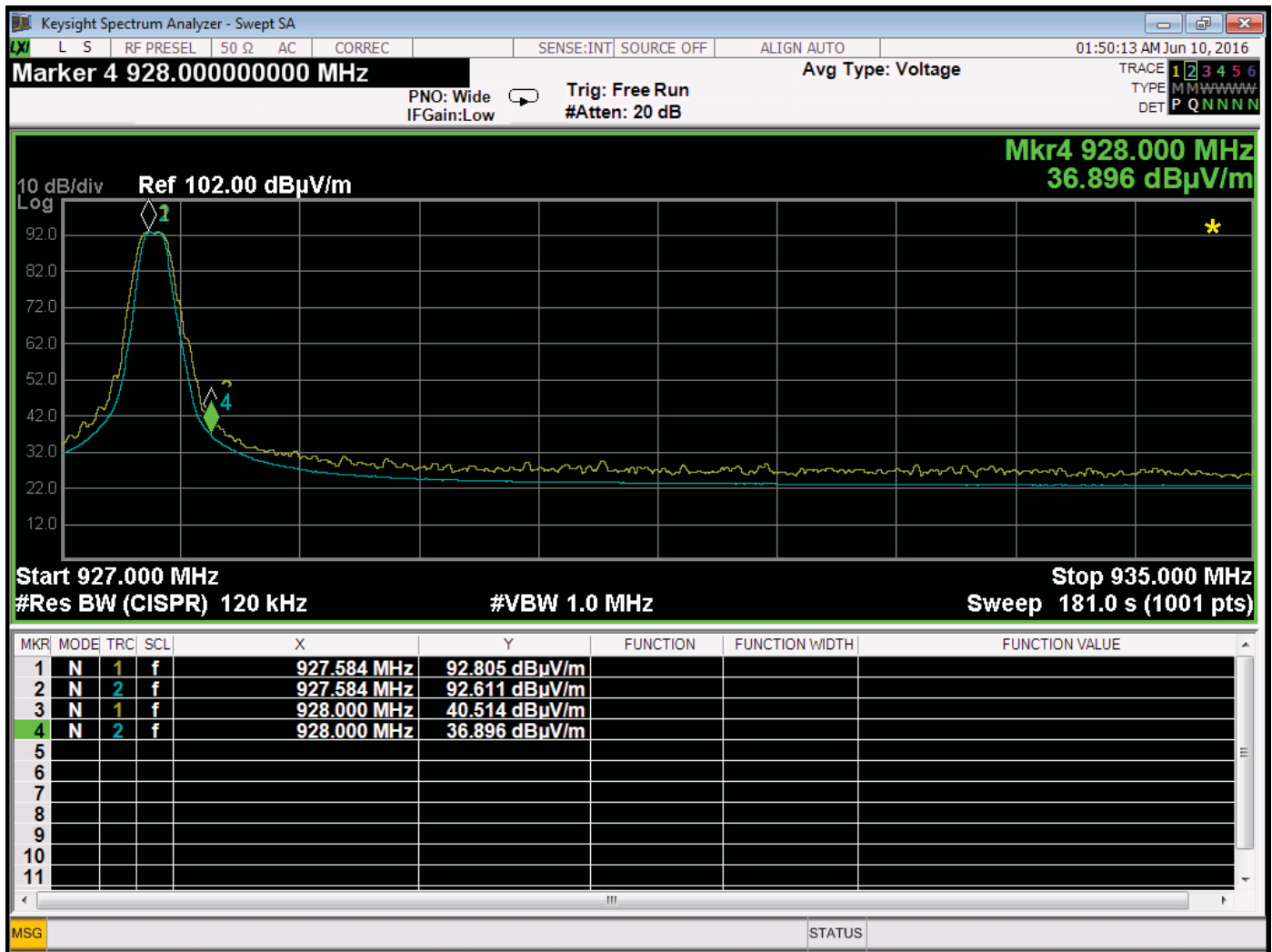
Date: 06/10/2016
 Lab: D
 Tested By: Kyle Fujimoto

Band Edges

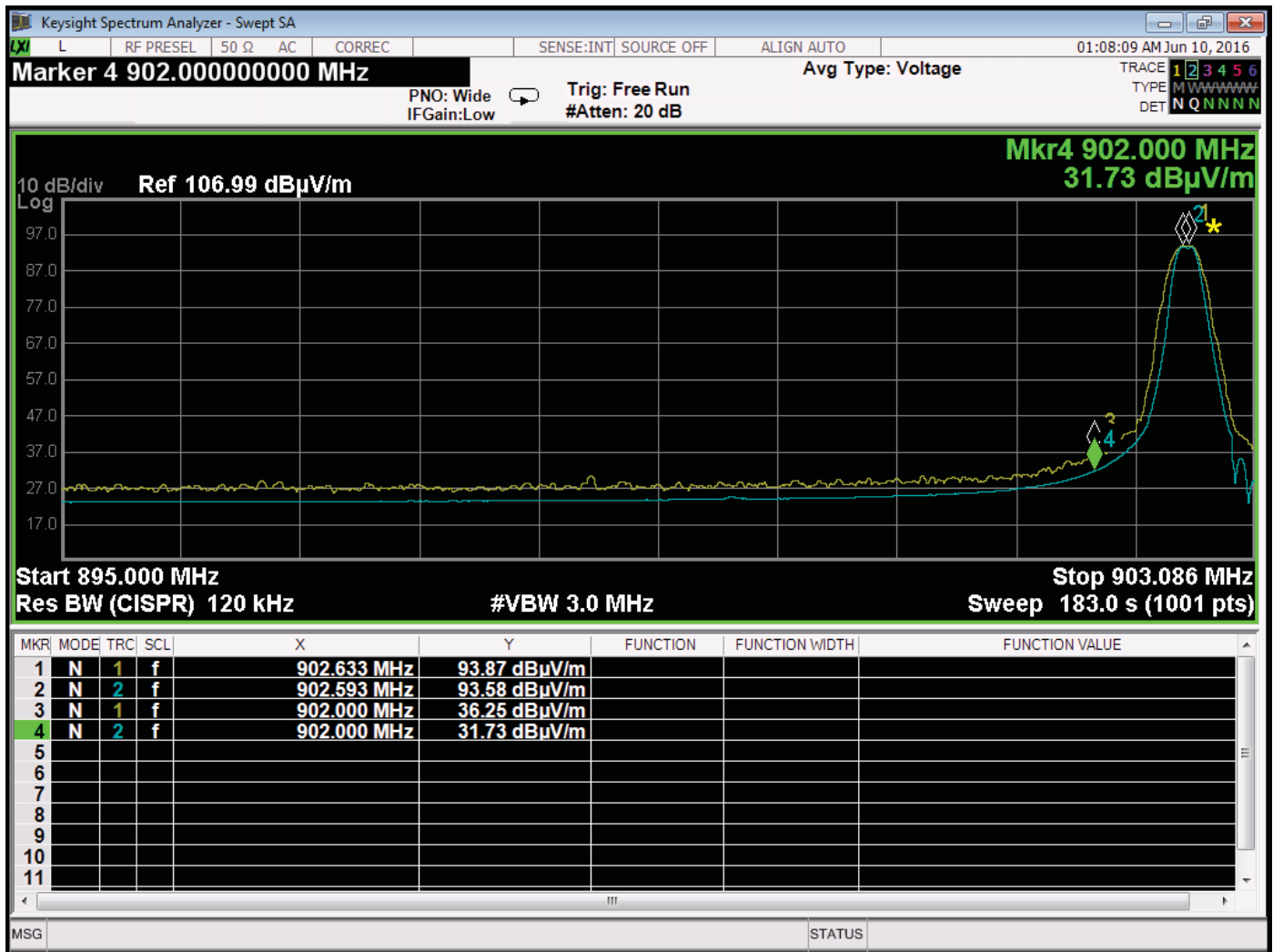
Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
902.62	93.87	H	93.97	-0.10	Peak	182.25	207.41	Low Channel
902.62	93.58	H	93.97	-0.39	QP	182.25	207.41	Fund. X-Axis Worst Case
902.00	36.25	H	46.00	-9.75	Peak	182.25	207.41	Band Edge
902.00	31.73	H	46.00	-14.27	QP	182.25	207.41	Low Channel
902.62	92.14	V	93.97	-1.83	Peak	263.75	111.35	Low Channel
902.62	91.81	V	93.97	-2.16	QP	263.75	111.35	Fund. Y-Axis Worst Case
902.00	32.02	V	46.00	-13.99	Peak	263.75	111.35	Band Edge
902.00	30.20	V	46.00	-15.80	QP	263.75	111.35	Low Channel
927.62	94.06	H	93.97	0.09	Peak	189.75	209.02	High Channel
927.62	93.83	H	93.97	-0.14	QP	189.75	209.02	Fund. X-Axis Worst Case
928.00	41.55	H	46.00	-4.45	Peak	189.75	209.02	Band Edge
928.00	38.08	H	46.00	-7.92	QP	189.75	209.02	High Channel
927.62	92.81	V	93.97	-1.16	Peak	227.25	105.20	High Channel
927.62	92.61	V	93.97	-1.36	QP	227.25	105.20	Fund. Y-Axis Worst Case
928.00	40.51	V	46.00	-5.49	Peak	227.25	105.20	Band Edge
928.00	36.90	V	46.00	-9.10	QP	227.25	105.20	High Channel



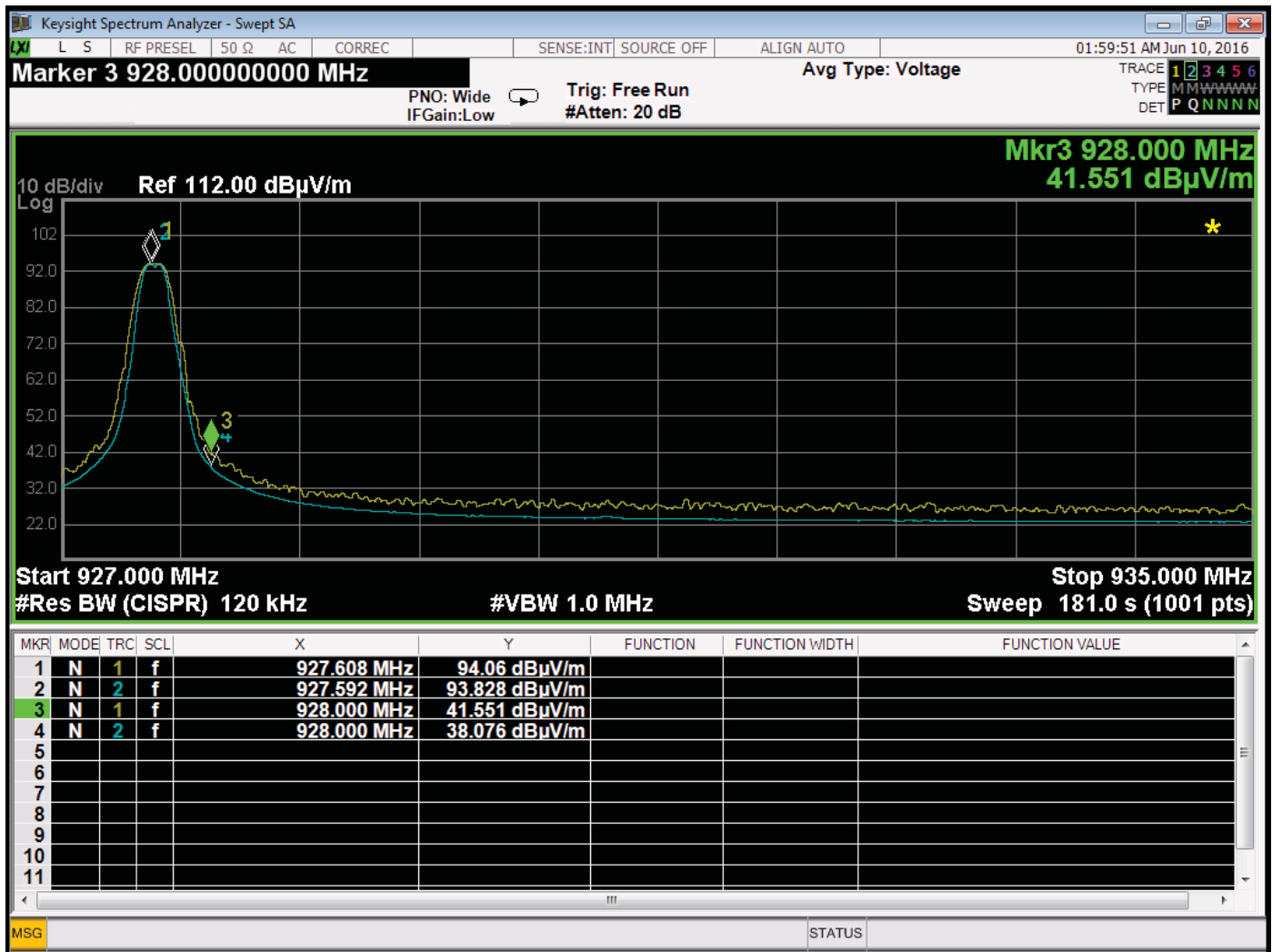
Band Edge – Vertical Polarization – Low Channel – Model: 12-2121-00 – Y-Axis Worst Case



Band Edge – Vertical Polarization – High Channel – Model: 12-2121-00 – Y-Axis Worst Case



Band Edge – Horizontal Polarization – Low Channel – Model: 12-2121-00 – X-Axis Worst Case



Band Edge – Horizontal Polarization – High Channel – Model: 12-2121-00 – X-Axis Worst Case