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FCC/ Industry Canada Certification Test Report
For the
NBB Controls & Components AG Germany
PLANAR B, C, D

FCC ID: SJ7BCD915
IC ID: 2634B-BCD915

WLL JOB# **10918-01 Rev 0**
September 23, 2009

WLL JOB# **10918-01 Rev 1**
October 16, 2009

Prepared for:

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Prepared By:

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Gaithersburg, Maryland 20879

ACCREDITED
Testing Certificate 2675.01

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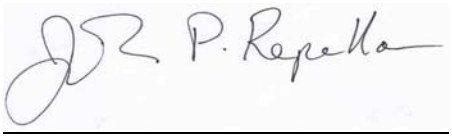

John P. Repella
QA Manager

Reviewed by:

Steven D. Koster
EMC Operations Manager

Abstract

This report has been prepared on behalf of NBB Controls & Components AG Germany to support the attached Application for Equipment Authorization. The test report and application are submitted for an Intentional Radiator under Part 15.249 (7/2008) of the FCC Rules and Regulations Spectrum Management and Telecommunications Policy RSS-210 of Industry Canada. This Certification Test Report documents the test configuration and test results for a NBB Controls & Components AG Germany Planar B, C, and D Controllers.

Testing was performed on an Open Area Test Site (OATS) of Washington Laboratories, Ltd, 7560 Lindbergh Drive, Gaithersburg, MD 20879. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by the American Association for Laboratory Accreditation (A2LA) under Certificate 2675.01 as an independent FCC test laboratory.

The NBB Controls & Components AG Germany Planar B Controller complies with the limits for an Intentional Radiator device under FCC Part 15.249 and RSS-210 of Industry Canada.

Revision History	Reason	Date
Rev 0	Initial Release	09/23/2009
Rev 1	Added explanation of measurement procedure, added missing data, removed erroneous document references	10/16/2009

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1 Introduction

1.1 Compliance Statement

The NBB Controls & Components AG Germany Planar B, C, D Controller complies with the limits for an Intentional Radiator device under FCC Part 15.249 (7/2008) and Industry Canada RSS-210.

1.2 Test Scope

Tests for radiated and conducted emissions were performed. All measurements were performed in accordance with the 2003 version of ANSI C63.4. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation.

1.3 Contract Information

Customer:	NBB Controls & Components AG Germany Otto-Hahn-Strasse 1-3 Olbronn-Durn, D 75248 Germany
Purchase Order Number:	N/A
Quotation Number:	64844

1.4 Test Dates

Testing was performed on the following date(s):	7/10/09-7/13/09

1.5 Test and Support Personnel

Washington Laboratories, LTD	John P. Repella
Client Representative	Thomas Burchard

1.6 Abbreviations

A	**A**mpere
ac	**a**lternating **c**urrent
AM	Amplitude Modulation
Amps	**Amp**eres
b/s	**b**its per **s**econd
BW	**B**and**W**idth
CE	**C**onducted **E**mission
cm	**c**enti**m**eter
CW	**C**ontinuous **W**ave
dB	**d**eci**B**el
dc	**d**irect **c**urrent
EMI	**E**lectro**m**agnetic **I**nterference
EUT	**E**quipment **U**nder **T**est
FM	**F**requency **M**odulation
G	**g**iga - prefix for 10^9 multiplier
Hz	**H**ertz
IF	**I**ntermediate **F**requency
k	**k**ilo - prefix for 10^3 multiplier
LISN	**L**ine **I**mpedance **S**tabilization **N**etwork
M	**M**ega - prefix for 10^6 multiplier
m	**m**eter
µ	**m**icro - prefix for 10^{-6} multiplier
NB	**N**arrow**b**and
QP	**Q**uasi-**P**eak
RE	**R**adiated **E**missions
RF	**R**adio **F**requency
rms	**r**oot-**m**ean-**s**quare
SN	**S**erial **N**umber
S/A	**S**pectrum **A**nalyzer
V	**V**olt

2 Equipment Under Test

2.1 EUT Identification & Description

The NBB Controls & Components AG Germany Planar B Controller is a handheld remote control for various crane operations.

Table 1: Device Summary

ITEM	DESCRIPTION
Manufacturer:	NBB Controls & Components AG Germany
FCC ID:	SJ7BCD915
IC ID:	2634B-BCD915
Model(s):	Planar B, C, D Controller
FCC Rule Parts:	§15.249
Frequency Range:	915-916.65
Maximum Output Power:	28619 µV/m @ 3m
Modulation:	F1D
Occupied Bandwidth:	25kHz
Keying:	Manual
Type of Information:	Data
Number of Channels:	67
Power Output Level	Fixed
Antenna Connector	Soldered Wire
Antenna Type	Internal
Interface Cables:	None
Power Source & Voltage:	Battery Power LiIon 3.0VDC

2.2 Test Configuration

The Planar B, C and D Controllers were evaluated individually and configured in a stand alone condition. Three orthogonals were evaluated.

2.3 Testing Algorithm

The Planar Controller was configured in a stand alone condition transmitting on a single channel during test. The controller was set to transmit on three separate channels a low, middle and a high channel in the transmitter's operational band.

Worst case emission levels are provided in the test results data.

2.4 Test Location

All measurements herein were performed at Washington Laboratories, Ltd. test center in Gaithersburg, MD. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by the American Association for Laboratory Accreditation (A2LA) under Certificate 2675.01 as an independent FCC test laboratory.

2.5 Measurements

2.5.1 References

ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation

ANSI C63.4 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

2.6 Measurement Uncertainty

All results reported herein relate only to the equipment tested. For the purposes of the measurements performed by Washington Laboratories, the measurement uncertainty is ±2.3 dB. This has been calculated for a *worst-case situation* (radiated emissions measurements performed on an open area test site).

The following measurement uncertainty calculation is provided:

$$\text{Total Uncertainty} = (A^2 + B^2 + C^2)^{1/2}/(n-1)$$

Where:

A = Antenna calibration uncertainty, in dB = 2 dB

B = Spectrum Analyzer uncertainty, in dB = 1 dB

C = Site uncertainty, in dB = 4 dB

n = number of factors in uncertainty calculation = 3

Thus, Total Uncertainty = $0.5\ (2^2 + 1^2 + 4^2)^{1/2} = \pm 2.3$ dB.

3 Test Equipment

Table 2 shows a list of the test equipment used for measurements along with the calibration information.

Table 2: Test Equipment List

Test Name:	**Radiated Emissions**	Test Date:	**07/13/2009**
Asset #	**Manufacturer/Model**	**Description**	**Cal. Due**
69	HP, 85650A	Adapter, QP	06/28/2010
73	HP, 8568B	Analyzer, Spectrum	06/28/2010
71	HP, 85685A	Preselector, RF	06/28/2010
644	Sunol Science JB1	BiConalog Antenna	12/29/2009
425	ARA, DRG-118/A	Antenna, DRG, 1-18GHz	08/08/2009
522	HP, 8449B	Pre-Amplifier, 1-26.5GHz	07/15/2009
667	MegaPhase, LLC EM18-S1NK5-600	Test cable for OATS testing DC to 18 GHz	04/23/2010
74	HP, 8593A	Analyzer, Spectrum	03/21/2010
520	Megaphase, LLC TM40-K1K1-36	Cable, Coaxial - 36" Long - 40GHz 2.9mm	09/29/2009

Test Name:	**Conducted Emissions Voltage**	Test Date:	**07/16/2009**
Asset #	**Manufacturer/Model**	**Description**	**Cal. Due**
125	Solar, 8028-50-TS-24-BNC	LISN	07/10/2010
126	Solar, 8028-50-TS-24-BNC	LISN	07/10/2010
68	HP, 85650A	Adapter, QP	07/10/2010
70	HP, 85685A	Preselector, RF w/opt 8ZE	07/10/2010
72	HP, 8568B	Analyzer, Spectrum	07/10/2010

4 Test Results

4.1 Duty Cycle Correction

Measurements may be adjusted where pulsed RF is utilized to find the average level associated with a quantity. This calculation is applied to limits for pulsed licensed and unlicensed devices.

- For Unlicensed Intentional Radiators under 47CFR Part 15, all duty cycle measurements compared to a 100 millisecond period
- duty cycle = on time/100 milliseconds

Duty Cycle Correction was not required for this device.

4.2 Occupied Bandwidth: (FCC Part §2.1049 and RSS-210 A1.1.3)

Occupied bandwidth was performed by coupling the output of the EUT to the input of a spectrum analyzer.

At full modulation, the occupied bandwidth was measured as shown:

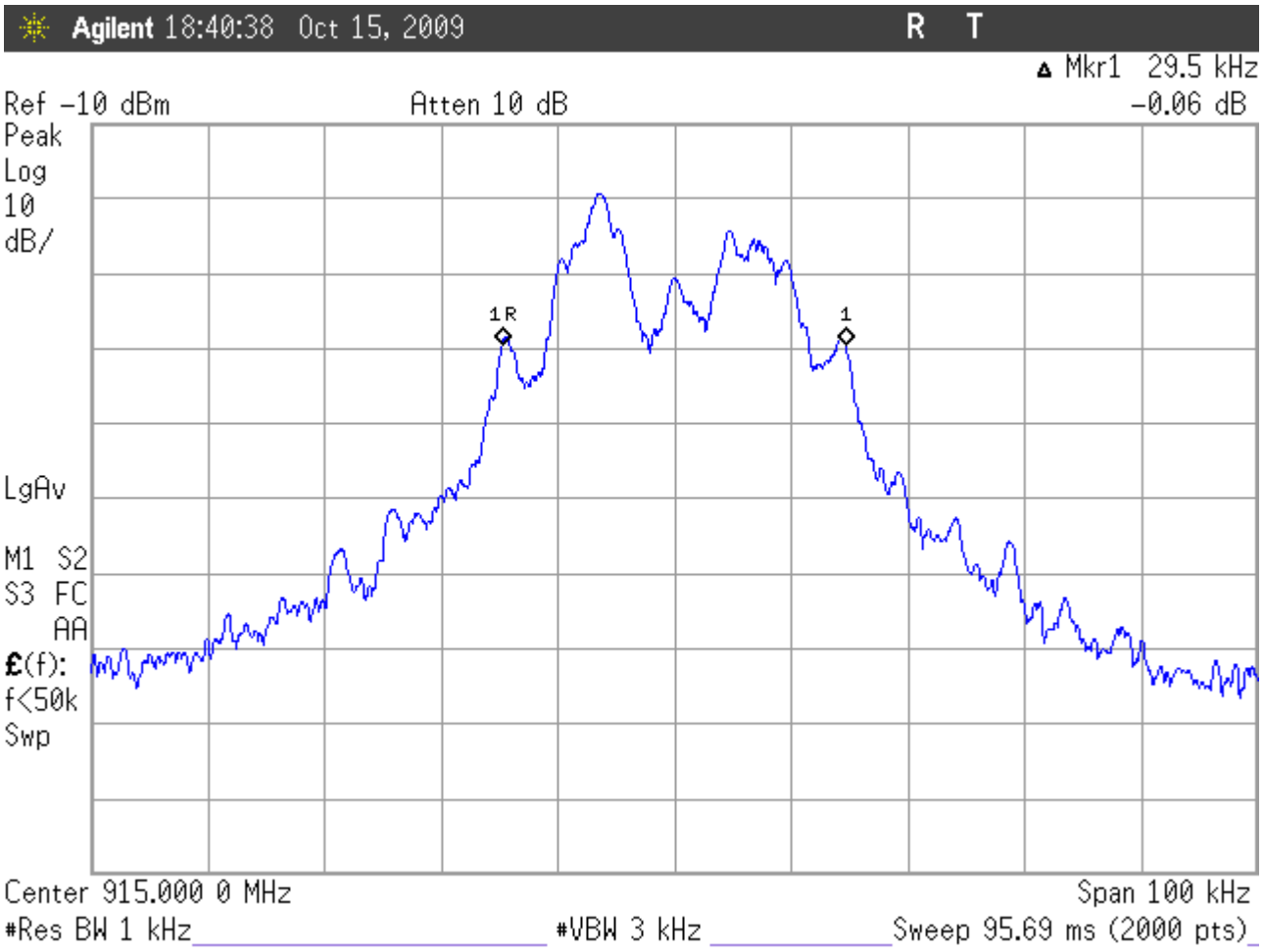

Figure 1: Planar B, Occupied Bandwidth, Low Channel

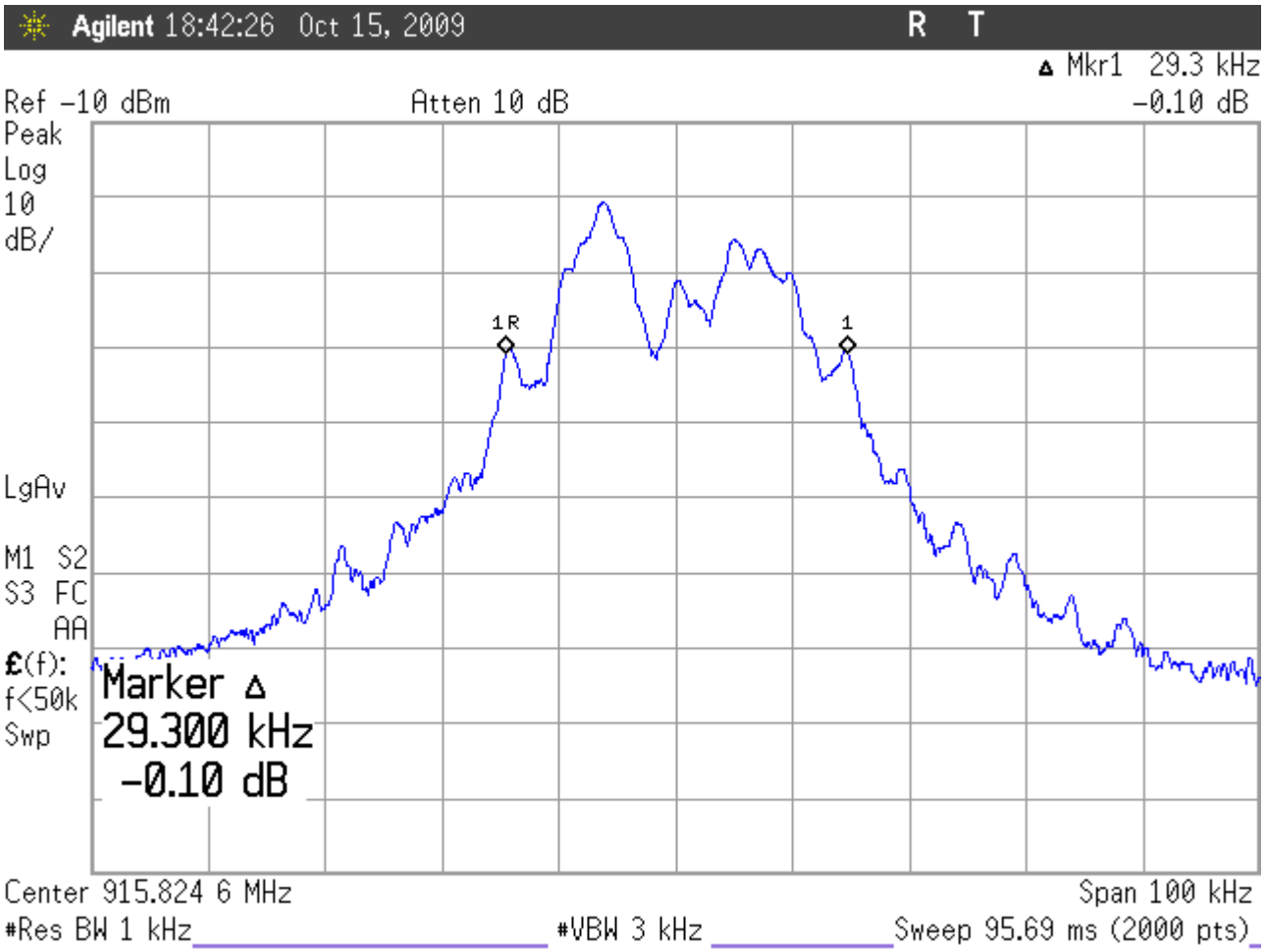

Figure 2: Planar B, Occupied Bandwidth, Mid Channel

Figure 3: Planar B, Occupied Bandwidth, High Channel

Figure 4: Planar C, Occupied Bandwidth, Low Channel

Figure 5: Planar C, Occupied Bandwidth, Mid Channel

Figure 6: Planar C, Occupied Bandwidth, High Channel

Figure 7: Planar D, Occupied Bandwidth, Low Channel

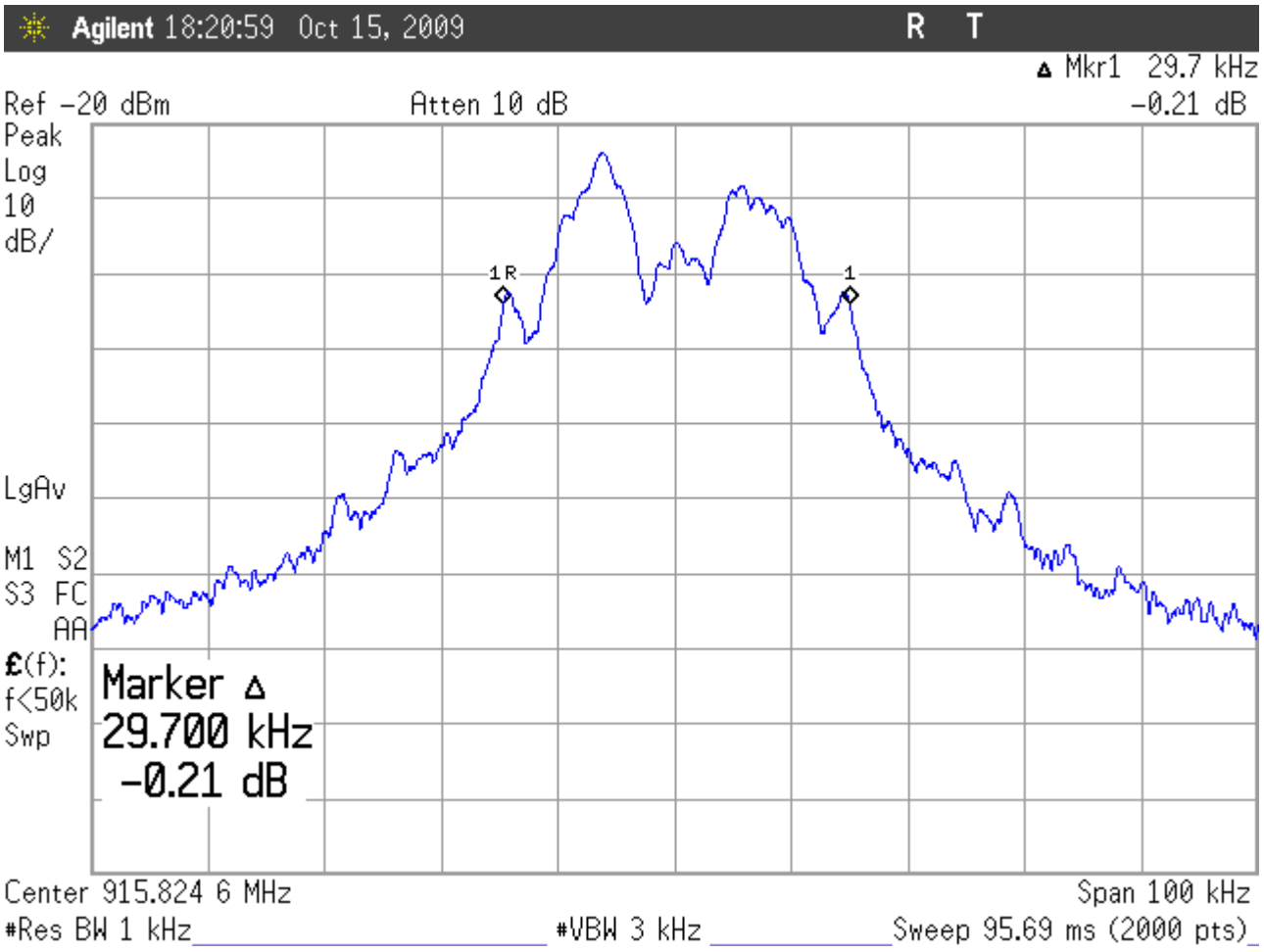

Figure 8: Planar D, Occupied Bandwidth, Mid Channel

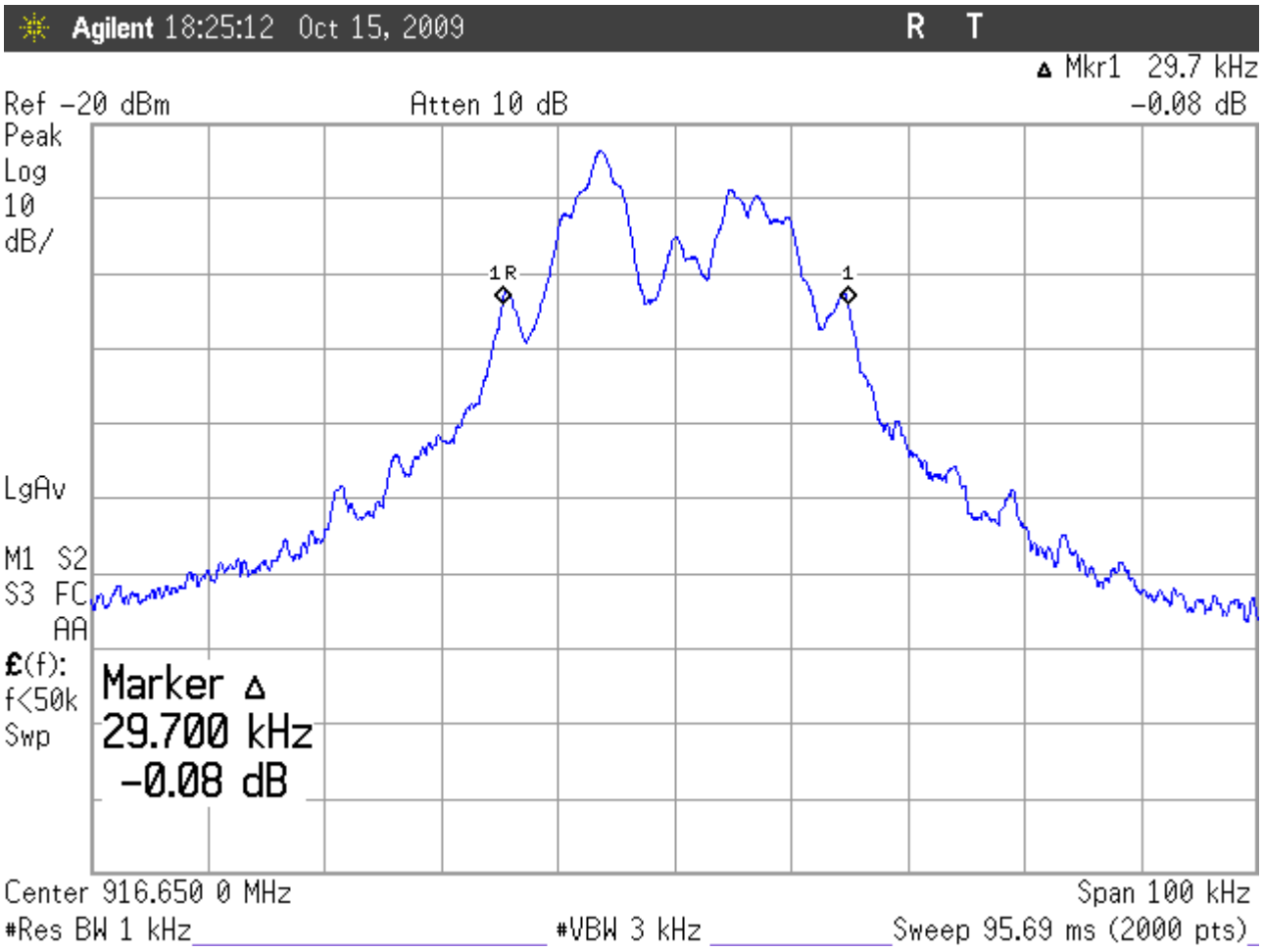

Figure 9: Planar D, Occupied Bandwidth, High Channel

Table 3 provides a summary of the Occupied Bandwidth Results for all three Planar Controllers.

Table 3: Occupied Bandwidth Results

Frequency	Planar B Bandwidth	Planar C Bandwidth	Planar D Bandwidth	Limit	Pass/Fail
Low Channel: 915MHz	29.5 kHz	29.8 kHz	29.9 kHz	1 MHz	Pass
Mid Channel: 915.8246MHz	29.3 kHz	29.9 kHz	29.7 kHz	1 MHz	Pass
High Channel: 916.65MHz	29.3 kHz	29.9 kHz	29.7 kHz	1 MHz	Pass

4.3 Radiated Emissions: (FCC Part §2.1053, RSS210 A2.9)

The EUT must comply with the radiated emission limits of 15.249(a) & RSS210 A2.9. The limits are as shown in the following table.

Table 4: Radiated Emissions Limits

Fundamental Frequency	Field Strength of Fundamental (µV/m)	Field Strength of Harmonics (µV/m)
902 – 928 MHz	50,000	500
2400 – 2483.5 MHz	50,000	500
5725 – 5875 MHz	50,000	500
24.00 – 24.25 GHz	250,000	2500

4.3.1 Test Procedure

The requirements of FCC Part 15 (7/2008) and ICES-003 call for the EUT to be placed on an 80 cm high 1 X 1.5 meters non-conductive motorized turntable for radiated testing on a 10-meter open field test site. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Bi-conical and log periodic broadband antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. The output of the antenna was connected to the input of the spectrum analyzer and the emissions in the frequency range of 30 MHz to 1 GHz were measured. The peripherals were placed on the table in accordance with ANSI C63.4-2003. Cables were varied in position to produce maximum emissions. Both the horizontal and vertical field components were measured.

The output from the antenna was connected, via a preamplifier, to the input of the spectrum analyzer. The detector function was set to peak. The measurement bandwidth of the spectrum analyzer system was set to at least 120 kHz, with all post-detector filtering no less than 10 times the measurement bandwidth.

Above 1GHz, peak measurements are compared to both the average and peak emission limits. Frequencies above 1GHz were performed using a measurement bandwidth of 1MHz with a video bandwidth setting of 1MHz for the measurement. The EUT was placed on motorized turntable for radiated testing on a 3-meter open field test site. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Receiving antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. The peripherals were placed on the table in accordance with ANSI C63.4-2003. Cables were varied in position to produce maximum emissions. Both the horizontal and vertical field components were measured.

The emissions were measured using the following resolution bandwidths:

Frequency Range	Resolution Bandwidth	Video Bandwidth
30MHz-1000 MHz	120kHz	>100 kHz
>1000 MHz	1 MHz	<30 Hz (Avg.) 1MHz (Peak)

Emissions were measured to the 10th harmonic of the transmit frequency. Worst case emission levels are shown.

The following is a sample calculation used in the data tables for calculating the final field strength of spurious emissions and comparing these levels to the specified limits.

Sample Calculation:

Spectrum Analyzer Voltage (SA Level): V dBµV

Antenna Factor (Ant Corr): AFdB/m

Cable Loss Correction (Cable Corr): CCdB

Duty Cycle Correction (Average) DCCdB

Amplifier Gain: GdB

Electric Field (Corr Level): EdBµV/m = VdBµV + AFdB/m + CCdB + DCCdB – GdB

Table 5: Radiated Emission Test Data

Common Emissions to all three units:

Frequency (MHz)	Polarity H/V	Azimuth (Degree)	Ant. Height (m)	SA Level (dBuV)	Corr Factors (dB)	Corr. Level (uV/m)	Limit (uV/m)	Margin (dB)	Comments
33.42	V	0.00	1.00	6.40	20.0	20.9	100.0	-13.6	Amb
76.31	V	0.00	1.00	5.30	9.6	5.6	100.0	-25.1	Amb
138.73	V	0.00	1.00	4.00	14.4	8.4	150.0	-25.1	Amb
209.78	V	0.00	1.00	9.90	13.2	14.3	150.0	-20.4	Amb
371.90	V	0.00	1.00	3.40	18.6	12.6	200.0	-24.0	Amb
463.50	V	0.00	1.00	8.60	20.5	28.6	200.0	-16.9	Amb
519.29	V	0.00	1.00	4.00	21.0	17.8	200.0	-21.0	Amb
669.28	V	0.00	1.00	10.80	23.7	53.0	200.0	-11.5	Amb
33.42	H	0.00	3.00	7.00	20.0	22.4	100.0	-13.0	Amb
75.93	H	0.00	3.00	5.50	9.6	5.7	100.0	-24.9	Amb
138.41	H	0.00	3.00	6.50	14.5	11.2	150.0	-22.5	Amb
209.78	H	0.00	3.00	7.70	13.2	11.1	150.0	-22.6	Amb
371.90	H	0.00	3.00	3.00	18.6	12.0	200.0	-24.4	Amb
463.50	H	0.00	3.20	4.10	20.5	17.1	200.0	-21.4	Amb
519.29	H	0.00	3.20	15.80	21.0	69.4	200.0	-9.2	Amb
669.27	H	0.00	3.20	16.10	23.7	97.5	200.0	-6.2	Amb

Planar B, TX @ 915MHz

Frequency (MHz)	Polarity H/V	Azimuth (Degree)	Ant. Height (m)	SA Level (dBuV)	Corr Factors (dB)	Corr. Level (uV/m)	Limit (uV/m)	Margin (dB)	Comments
907.21	V	225.00	1.10	4.30	28.4	43.4	200.0	-13.3	
908.00	V	225.00	1.70	4.40	28.5	44.0	200.0	-13.2	
915.00	V	225.00	1.70	53.60	28.5	12735.0	50000.0	-11.9	Fundamental CH 1
921.98	V	225.00	1.80	2.90	28.7	38.1	200.0	-14.4	
1830.00	V	270.00	1.80	50.60	-4.1	210.3	500.0	-7.5	Ave
2745.00	V	270.00	1.80	41.20	-0.4	109.2	500.0	-13.2	Ave
1830.00	V	270.00	1.80	50.60	-7.4	144.9	5000.0	-30.8	Peak
2745.00	V	270.00	1.80	41.20	-2.0	91.0	5000.0	-34.8	Peak
899.86	H	180.00	1.00	4.10	28.5	42.6	200.0	-13.4	
900.22	H	180.00	1.00	6.00	28.5	53.1	200.0	-11.5	
907.21	H	180.00	1.00	9.90	28.4	82.6	200.0	-7.7	
908.00	H	180.00	1.00	10.00	28.5	83.8	200.0	-7.6	
915.00	H	180.00	1.00	60.40	28.5	27861.2	50000.0	-5.1	Fundamental CH 1
921.98	H	180.00	1.00	6.20	28.7	55.7	200.0	-11.1	
922.72	H	180.00	1.00	6.30	28.8	56.6	200.0	-11.0	
1830.00	H	0.00	1.80	52.80	-4.1	270.9	500.0	-5.3	Ave
2745.00	H	0.00	1.80	42.20	-0.4	122.6	500.0	-12.2	Ave
1830.00	H	0.00	1.80	52.80	-7.4	186.7	5000.0	-28.6	Peak
2745.00	H	0.00	1.80	42.20	-2.0	102.1	5000.0	-33.8	Peak

Planar B, TX @ 916.65MHz

Frequency (MHz)	Polarity H/V	Azimuth (Degree)	Ant. Height (m)	SA Level (dBuV)	Corr Factors (dB)	Corr. Level (uV/m)	Limit (uV/m)	Margin (dB)	Comments
908.04	V	225.00	1.70	3.10	28.5	37.8	200.0	-14.5	
910.46	V	225.00	1.70	6.10	28.5	53.7	200.0	-11.4	
916.65	V	225.00	1.70	54.00	28.5	13386.1	50000.0	-11.4	Fundamental CH 67
917.85	V	225.00	1.70	4.50	28.6	45.0	200.0	-13.0	
922.80	V	225.00	1.70	4.40	28.8	45.5	200.0	-12.9	
923.98	V	0.00	0.00	0.00	28.8	27.7	200.0	-17.2	
1833.30	V	270.00	1.80	48.49	-4.1	165.2	500.0	-9.6	Ave
2749.95	V	270.00	1.80	41.50	-0.4	113.3	500.0	-12.9	Ave
1833.30	V	270.00	1.80	48.49	-7.3	114.1	5000.0	-32.8	Peak
2749.95	V	270.00	1.80	41.50	-2.0	94.2	5000.0	-34.5	Peak
908.05	H	180.00	1.00	7.90	28.5	65.8	200.0	-9.7	
910.46	H	180.00	1.00	11.40	28.5	98.9	200.0	-6.1	
915.42	H	180.00	1.00	5.70	28.5	51.3	200.0	-11.8	
916.65	H	180.00	1.00	60.60	28.5	28618.9	50000.0	-4.8	Fundamental CH 67
917.85	H	180.00	1.00	7.50	28.6	63.5	200.0	-10.0	
922.77	H	180.00	1.00	7.80	28.8	67.3	200.0	-9.5	
1833.30	H	0.00	1.80	49.51	-4.1	185.8	500.0	-8.6	Ave
2749.95	H	0.00	1.80	42.68	-0.4	129.8	500.0	-11.7	Ave
1833.30	H	0.00	1.80	49.51	-7.3	128.3	5000.0	-31.8	Peak
2749.95	H	0.00	1.80	42.68	-2.0	107.9	5000.0	-33.3	Peak

Planar C, TX @ 915MHz

Frequency (MHz)	Polarity H/V	Azimuth (Degree)	Ant. Height (m)	SA Level (dBuV)	Corr Factors (dB)	Corr. Level (uV/m)	Limit (uV/m)	Margin (dB)	Comments
915.00	V	225.00	1.70	49.40	28.5	7852.4	50000.0	-16.1	Fundamental CH 1
921.98	V	225.00	1.70	2.60	28.7	36.8	200.0	-14.7	
922.72	V	225.00	1.70	2.10	28.8	34.9	200.0	-15.2	
915.00	H	180.00	1.50	49.30	28.5	7762.5	50000.0	-16.2	Fundamental CH 1
921.98	H	180.00	1.50	3.60	28.7	41.3	200.0	-13.7	
922.72	H	180.00	1.50	2.20	28.8	35.3	200.0	-15.1	

Planar C, TX @ 916.65MHz

Frequency (MHz)	Polarity H/V	Azimuth (Degree)	Ant. Height (m)	SA Level (dBuV)	Corr Factors (dB)	Corr. Level (uV/m)	Limit (uV/m)	Margin (dB)	Comments
916.65	V	315.00	1.00	48.80	28.5	7356.2	50000.0	-16.6	Fundamental CH 67
917.85	V	315.00	1.00	2.10	28.6	34.1	200.0	-15.4	
922.79	V	315.00	1.00	4.00	28.8	43.5	200.0	-13.3	
916.65	H	0.00	1.40	47.20	28.5	6118.6	50000.0	-18.2	Fundamental CH 67
922.79	H	0.00	1.50	3.60	28.8	41.5	200.0	-13.7	

Planar D, TX @ 915MHz

Frequency (MHz)	Polarity H/V	Azimuth (Degree)	Ant. Height (m)	SA Level (dBuV)	Corr Factors (dB)	Corr. Level (uV/m)	Limit (uV/m)	Margin (dB)	Comments
915.00	V	0.00	1.70	45.40	28.5	4954.5	50000.0	-20.1	Fundamental CH 1
915.00	H	90.00	2.60	51.80	28.5	10351.4	50000.0	-13.7	Fundamental CH 1
921.98	H	90.00	2.60	2.40	28.7	36.0	200.0	-14.9	
922.72	H	90.00	2.60	2.10	28.8	34.9	200.0	-15.2	

Planar D, TX @ 916.65MHz

Frequency (MHz)	Polarity H/V	Azimuth (Degree)	Ant. Height (m)	SA Level (dBuV)	Corr Factors (dB)	Corr. Level (uV/m)	Limit (uV/m)	Margin (dB)	Comments
916.65	V	45.00	1.40	42.50	28.5	3561.7	50000.0	-22.9	Fundamental CH 67
910.46	H	45.00	2.70	2.10	28.5	33.9	200.0	-15.4	
915.42	H	45.00	2.70	3.00	28.5	37.6	200.0	-14.5	
916.65	H	45.00	2.70	53.30	28.5	12349.6	50000.0	-12.1	Fundamental CH 67
917.85	H	45.00	2.70	2.00	28.6	33.7	200.0	-15.5	
922.79	H	45.00	2.70	4.50	28.8	46.1	200.0	-12.8	

4.4 Conducted Emissions (AC Power Line)

The EUT was placed on an 80 cm high 1 x 1.5 m non-conductive table above a ground plane. Power to the EUT was provided through a Solar Corporation 50 Ω/50 µH Line Impedance Stabilization Network bonded to a 3 x 2 meter ground plane. The LISN has its AC input supplied from a filtered AC power source. Power and data cables were moved about to obtain maximum emissions.

The 50 Ω output of the LISN was connected to the input of the spectrum analyzer and the emissions in the frequency range of 150 kHz to 30 MHz were measured. The detector function was set to quasi-peak or peak, as appropriate, and the resolution bandwidth during testing was at least 9 kHz, with all post-detector filtering no less than 10 times the resolution bandwidth.

The units do not transmit while they are charging so the conducted data is for the charge mode only. AC Power Line conducted emissions test data are included in Table 6.

Table 6: AC Power Line Conducted Emissions Test Data Sheet

NEUTRAL

Frequency (MHz)	Level QP (dBµV)	Level AVG (dBµV)	Cable Loss (dB)	LISN Corr (dB)	Level QP Corr (dBµV)	Level Corr Avg (dBµV)	Limit QP (dBµV)	Limit AVG (dBµV)	Margin QP (dB)	Margin AVG (dB)
0.387	29.5	12.2	10.2	0.3	40.0	22.7	58.1	48.1	-18.1	-25.5
0.405	31.7	12.3	10.2	0.2	42.2	22.8	57.8	47.8	-15.6	-25.0
0.415	32.3	12.5	10.2	0.2	42.8	23.0	57.6	47.6	-14.8	-24.6
0.516	23.4	9.6	10.3	0.1	33.8	20.0	56.0	46.0	-22.2	-26.0
2.059	9.4	6.9	10.6	0.3	20.2	17.7	56.0	46.0	-35.8	-28.3
7.916	22.5	9.2	11.0	0.9	34.3	21.0	60.0	50.0	-25.7	-29.0

PHASE

Frequency (MHz)	Level QP (dBµV)	Level AVG (dBµV)	Cable Loss (dB)	LISN Corr (dB)	Level QP Corr (dBµV)	Level Corr Avg (dBµV)	Limit QP (dBµV)	Limit AVG (dBµV)	Margin QP (dB)	Margin AVG (dB)
0.387	29.9	12.6	10.2	0.2	40.3	23.0	58.1	48.1	-17.8	-25.1
0.405	31.9	12.5	10.2	0.2	42.3	22.9	57.8	47.8	-15.5	-24.8
0.415	32.1	12.0	10.2	0.2	42.5	22.4	57.6	47.6	-15.0	-25.1
0.516	22.7	8.8	10.3	0.1	33.2	19.2	56.0	46.0	-22.8	-26.8
2.059	16.3	10.2	10.6	0.3	27.2	21.0	56.0	46.0	-28.8	-25.0
7.916	19.2	8.4	11.0	0.7	30.9	20.1	60.0	50.0	-29.1	-29.9

