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Electromagnetic Compatibility

TEST REPORT

FCC 47 CFR Part 15 Subpart C §15.247 and IC RSS-210

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Accreditations (ISO 17025):

Standard Council of Canada: Accredited Laboratory No. 743
International Accreditation Service Inc: Accredited Laboratory: No. TL-239

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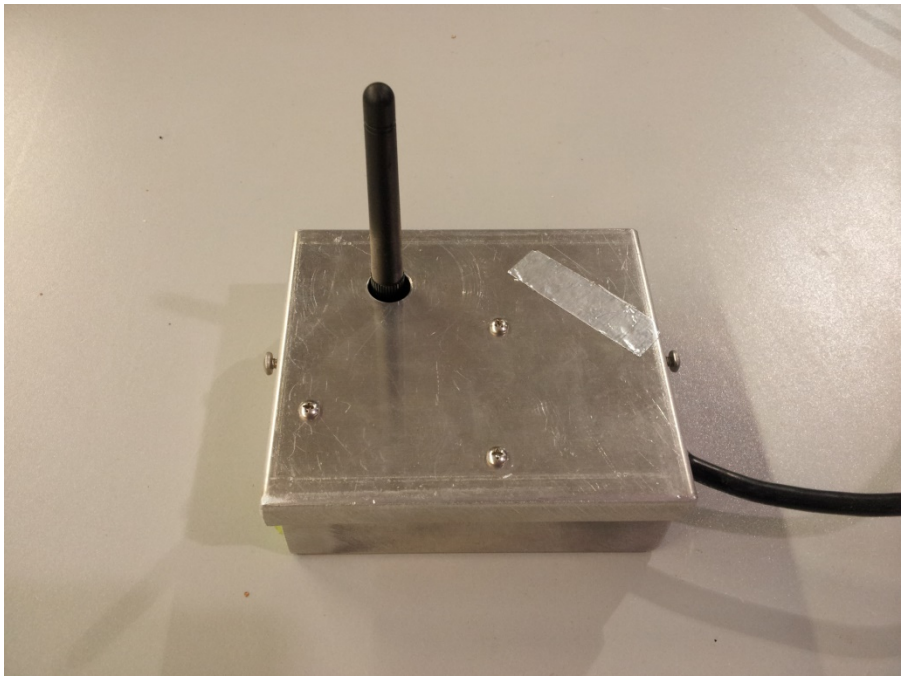
Applicant's name……..: Premier Lighting Ltd.
Address……..: 1052 Boundary Road Burnaby, BC, Canada V5K4T3
Contact……: Mr. Ion Toma Email…….: ion@premier-lighting.net
Phone……..: (604)294-2334 Fax…….: (604)294-2126

Test item description.....: PLGLEMRV-10 (Park Kit Garage Lighter)

Manufacturer.....: Premier Lighting Ltd.

FCC ID……: 2ACESPLGLEMRV-10

IC……: 11843A-PLGLEMRV10



PLGLEMRV-10 mounted in Reference test enclosure

Final assembled sub-unit in potting compound

Revision History

Date	Report Number	Rev #	Details	Authors Initials
May 27 2014	E10555-1305	0.0	Draft Test Report	AJ
Aug 21, 2014	E10555-1305	1.0	Final Release	DJ
Sep 19, 2014	E10555-1305	2.0	Revised tables 19-21 to show total emissions Added RF Exposure and Product Description information	DJ
Nov 19, 2014	E10555-1305	3.0	Added plots for Bandedge in Non-Hopping mode	DJ
Dec 04, 2014	E10555-1305	4.0	Added references to DA 00-705 and photos of setup for Loop antenna	DJ

All previous versions of this report have been superseded by the latest dated revision as listed in the above table. Please dispose of all previous electronic and paper printed revisions accordingly.

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List of Figures

List of Tables

The following tests demonstrate testimony for the FCC & IC Marks for Transceivers / electromagnetic compatibility testing for this EUT.

Test / Requirement Description	Deviations from:		Pass / Fail	Applicable FCC Rule Parts	Applicable Industry Canada Rule Parts
	Base Standard	Test Basis			
Antenna Requirements	No	No	Pass	N/A	RSS-Gen, Issue 3
Maximum Peak Conducted Output Power Level	No	No	Pass	FCC Subpart C 15.247 (b) (3)	RSS-210, Issue 8
Spurious Conducted Emissions	No	No	Pass	FCC Subpart C 15.247 (d)	RSS-210, Issue 8
AC Mains Power Line Conducted Emissions	No	No	Pass	FCC Subpart C 15.207 (a)	RSS-210, Issue 8
Radiated Spurious Emissions	No	No	Pass	FCC Subpart C 15.209 (a)	RSS-210, Issue 8
Band Edge	No	No	Pass	FCC Subpart C 15.209	RSS-210, Issue 8
Hopping Frequency Separation	No	No	Pass	FCC Subpart C 15.247 (a) (1)	RSS-210, Issue 8
Number of Hopping Channels	No	No	Pass	FCC Subpart C 15.247 (a) (1) (iii)	RSS-210, Issue 8
Time of Occupancy	No	No	Pass	FCC Subpart C 15.247 (a) (1) (iii)	RSS-210, Issue 8

Tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC 15.247 & Industry Canada RSS-210. The manufacturer is responsible for the tested product configuration, continued product compliance with these standards listed, and for the appropriate auditing of subsequent products as required.

X

Tested By
Aman Jathaul, EMC Project Manager

X

Reviewed By
David Johanson RF/EMC Test Engineer

Section I: Product Description

Applicant:	Premier Lighting Ltd 1052 Boundary Road Burnaby, BC, Canada V5K4T3
Equipment Under Test:	Motion tracking sensor to analyze human movement.
Trade Name:	Park Kit Garage Lighter
Model:	PLGLEMRV-10

Introduction:

The PLGLEMRV-10 (EUT) is a wireless communications subunit employed only in Premier Lighting Ltd. LED Lighting and Control Systems. It is in its own enclosure and is added as a subunit of the LED Light assembly. It is used to control the light level of the LED lighting assembly.

It is designed to control a wireless network of lights produced by Premier Lighting, under an application code developed by Premier Lighting. It uses the Micrel MICRF505 Transceiver using the 902-928MHz ISM band.

EUT Test Configuration:

The PLGLEMRV-10 (EUT) was provided preprogrammed with custom firmware for EMC compliance testing.

The EUT is assembled and then fully potted to provide environmental and tamper protection. The potting process is also used to permanently fix the Antenna into the unit so that it can not be removed or replaced. It was tested with in its own housing and un-potted to provide easy access to the Antenna Port for testing and programming.

The EUT requires 120Vac nominal to operate, which it receives from the AC Mains through an AC filter and Ferrite that is part of the AC protection circuitry. The Ferrite 28A2029-0A2 manufactured by Laird Tech and the Corcom 6VdK1 filter are an integral part of this unit, but is only added during the final production of the LED Light assembly.

The EUT has RS-232 communication ports that are only used during the final programming of the LED Light assembly in the factory before shipment. This is used to add some client specific information and the IP address of the Light assembly. The factory removes and replaces an access port cover plate that is on the heatsink of the Light assemply located near the antenna to use the RS-232 ports.

The EUT was programmed using the RS-232 interface and Hyperterminal command strings provided by Premier Lighting. The EUT was verified in various orientations for the radiated emissions to find the worst case orientation. All radiated emissions were done with the EUT in the Horizontal orientation with the antenna in a vertical orientation as shown in the set-up photos, which was designated the worst case orientation.

The EUT was tested as a sub-assembly due to problems and consistency of testing the radio circuitry inside of the entire lighting assembly. The additional wiring for the control of the lighting assembly and the motion sensor were nt included in the test since they are part of the Lighting control circuitry instead of the radio transmitter.

EUT DESCRIPTION

EUT	PLGLEMRV-10 (Park Kit Garage Lighter)
FCC ID	2ACESPLGLEMRV-10
IC	11843A-PLGLEMRV10
Manufacturer	Premier Lighting Ltd
FRN	0023452030
Model/Type	PLGLEMRV-10
Serial No.	#1
Transmitter Type	Frequency Hopping System
Frequency Range	904-926MHz
Transmit Power	0.007W
Modulation	FSK
Number of Channels	25
Antenna	1dBi Omni antenna
Input	120VAC 60Hz
Received Date	Dec-10-2013
Received By	Aman
Sample Log	QAI Product Control Log (QM 1305 - Sample Inventory)

ANTENNA DESCRIPTION

Polarization	Omni Antenna
Compact Size	10x75mm
Connector	Fully potted into assembly (SMA)
Frequency Range	902 – 928 MHz
Linear Max Gain	1dBi
Impedance	50 Ω
VSWR	<2.0:1

Section II: Information for Test Report of Measurements

ENVIRONMENTAL CONDITIONS:

Day 1: Dec-10-2013	Temperature: 21.0ºC, R.H.: 40.0%, Barometric Pressure: 1015.8 mBar.
Day 2: Dec-11-2013	Temperature: 22.1ºC, R.H.: 39.7%, Barometric Pressure: 1016.3 mBar.
Day 3: Dec -12-2013	Temperature: 21.1ºC, R.H.: 39.0%, Barometric Pressure: 1016.3 mBar.
Day 4: Dec -12-2013	Temperature: 20.4ºC, R.H.: 39.0%, Barometric Pressure: 1016.3 mBar.

Test Facilities

Main Laboratory Headquarters: Quality Auditing Institute
Headquarters Location/Address: 16 – 211 Schoolhouse Street, Coquitlam, BC, 3K 4X9, Canada

Associated Laboratory: Quality Auditing Institute (Remote Location)

EMC Test Laboratory Location/Address: 19473 Fraser Way, Pitt Meadows, BC, V3Y 2V4, Canada

FCC Test Site Registration Number: 3 m /10 m Open Area Test Site [OATS] and
3 m Semi-Anechoic Chamber [SAC]: 226383
Industry Canada Test Site Registration Number (3m SAC): 9543B-1
Standard Council of Canada: ISO/IEC 17025:2005 Accredited Laboratory No. 743
International Accreditation Service Inc.: ISO/IEC 17025:2005 Accredited Laboratory: No. TL-239

Test Equipment List

Test Bench Equipment List

Manufacturer	Model	Description	Serial No.	Last Cal	Cal Due Date
Tektronix	TDS754C	Oscilloscope	B012403	10-Oct-2013	10-Oct-2016
HP	8648C	Signal Generator	3623A03622	30-Oct-2012	30-Oct-2015
Boonton	4200-S/17	RF MicroWattmeter	430519 BG	13-Mar-2013	13-Mar-2016
Boonton	51033-6E	Power Sensor 100kHz-18GHz	15779	18-Mar-2013	18-Mar-2016
Rohde & Schwarz	ESU40	EMI Receiver	100011	26-June-2012	26-Jun-2015
Rohde & Schwarz	ESCI	EMI Receiver	1000123	29-Mar-2012	29-Mar-2015

Semi-Anechoic Chamber Equipment List

Manufacturer	Model	Description	Serial No.	Last Cal	Cal Due Date
ETS Lindgren	2165	Turntable	00043677	N/A	N/A
ETS Lindgren	2125	Mast	00077487	N/A	N/A
Rohde & Schwarz	ESU40	EMI Receiver	100011	26-June-2012	26-Jun-2015
FCC	FCC-LISN-50-25-2	LISN	9927	30-Nov-2012	30-Nov-2015
EMCO	6502	60cm Active Loop Antenna 9kHz to 30MHz	2178	14-Jun-2013	10-Jun-2015

Sunol Sciences	JB3	Biconilog Antenna 30MHz – 3GHz	A042004	31-Oct-2012	31-Oct-2015
AILTECH/Eaton	94455-1	Biconical Antenna 20-200MHz	0931	14-Jun-2013	14-Jun-2016
EMCO	93146	Log Periodical Antenna 200-1000MHz	9811-5136	14-Jun-2013	10-Jun-2016
COM-POWER	AHA-118	Dual Ridge Horn Antenna 1-18GHz	711040	14-Jun-2013	14-Jun-2016
EMCO	3160-09	Pyramidal Horn Antenna 18-26GHz	9701-1071	30-Aug-2013	30-Aug-2016
EMCO	3160-10	Pyramidal Horn Antenna 26-40GHz	9708-1055	30-Aug-2013	30-Aug-2016
ETS Lindgren	S201	3 meter Semi-Anechoic Chamber	1030	N/A	N/A

Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	±1 x 10-5 MHz
Radiated Emissions	±3 dB
Temperature	±1°C
Humidity	±5 %
DC and low frequency voltages	±3 %

Section III: IC RSS-210 Iss.8 Report of Measurements

Markings

According to FCC 47 CFR Part 15 Section 15.19 and ICES 003, a statement similar to the following must be included on an identification label, which also uniquely identifies the Manufactured date, either explicitly or through a Serial number etc.:

> "This equipment complies with FCC Rules, Part 15 and Industry Canada's ICES 003 for a Class B Digital Device. Operation is subject to two conditions:
>
> 1) This device may not cause harmful interference, and
>
> 2) This device must accept any interference that may cause any undesired operation"

Additionally, if the manufacturer markets product to Quebec, the following supplemental information should be added to the label:

> "Cet Apparreil numerique de la Classe B respecte toutes les exigences du Reglement sur le material brouilleur du Canada."

Labeling

According to FCC 47 CFR Part 15 Subpart C Section 15.105, and ICES 003, the following statement must be included in a prominent location in your User's Manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful intereference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

It is also required according to FCC 47 CFR Part 15 Subpart B Section 15.21 that a caution is included such as:

> Caution: Changes or modifications to this equipment, not expressly approved by the manufacturer could void the user's authority to operate the equipment.

This product is License Exempt for FCC and IC. There is a requirement for this product to be submitted for certification and requires both an FCC ID and an IC ID number to be added to the labels in accordance with FCC 47 CFR Part 2 Subpart J (2.901 to 2.956) as well as IC Self-Marking standards.

Test Results – Summary

Testing was performed pursuant to Industry Canada RSS-210 Issue 8.

Test	Standard	Description	Result
Radiated Emissions Idle Mode Subclause 8.2	RSS-210 2.2(b)	The radiated emissions are measured in the 0.009 - 9280MHz range	Complies
Conducted Emissions Idle Mode Subclause 8.3	RSS-GEN Issue3 Class B Limits	The Conducted Emissions are measured on the phase and neutral power lines in the 0.15 – 30.0 MHz range	Complies
Radiated Emissions Transmit Mode	RSS-210 A8.5	The radiated emissions are measured in the 0.009 -9280MHz range	Complies
Output Power and EIRP Emissions	RSS-210 A8.4(1)	Output power will not exceed 1 Watt and the E.I.R.P. will not exceed 4 Watts	Complies

Part 1 - Radiated Emissions Testing

DATE: Dec 12, 2013

TEST STANDARD: RSS-210 2.2(b)

TEST SETUP: The EUT was operated and tested at 240Vac and 120Vac 60Hz in its normal mode of operation. It was in receive mode for these tests.

MINIMUM STANDARD: Class B Limit:

Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

METHOD OF MEASUREMENT: Measurements were made using a spectrum analyzer with a 9kHz RBW, Peak detector. Any emissions that are close to the limit are measured using a test receiver with a 9kHz bandwidth, CISPR Quasi-Peak detector as well as an averaging meter. The EUT was set up in a 3 meter semi-anechoic chamber, using the manufacturer's specified normal cabling configuration, with all cables over 1 meter in length bundled at 1 meter and retained from the floor. A typical application was tested.

Emissions in both horizontal and vertical polarization were measured while rotating the EUT on a turntable to maximize the emissions signal strength and the results recorded on the attached plots.

MODIFICATIONS: Ferrite 28A2029-0A2 manufactured by Laird Tech added on the AC input cable.

EMISSIONS DATA: See Appendix A for corresponding frequencies.

RESULTS: Pass: Complied with the standard.

Part 2 - Conducted Emissions Testing

DATE: Dec 10, 2013

TEST STANDARD: RSS-GEN Issue 3 (7.2.4)

MINIMUM STANDARD: Class B Limit:

TEST SETUP: The EUT was connected to the conducted emissions LISN appartus. The device was operated and tested at 240Vac and 120Vac 60Hz.

MINIMUM STANDARD: Class B Limit:

Frequency (MHz)	Conducted Limit (dBµV)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56	56 to 46
0.5 – 5	56	46
5 – 30	60	50

METHOD OF MEASUREMENT: Measurements were made using a spectrum analyzer with a 9kHz RBW, Peak detector. Any emissions that are close to the limit are measured using a test receiver with a 9kHz bandwidth, CISPR Quasi-Peak detector as well as an averaging meter. AC mains conducted emissions were performed both in transmit and standby mode.

MODIFICATIONS: Corcom 6VdK1 filter added to the AC input.

EMISSIONS DATA: See Appendix A for Plots and Data.

RESULTS: Pass: Complied with the standard.

Part 3 - Radiated Emissions – Transmit Mode

DATE: June 24, 2013

TEST STANDARD: RSS-210 Iss.8 Annex 8 Frequency Hopping Systems 902-928MHz Band.

MINIMUM STANDARD: **A8.1 – Frequency Hopping Systems (General Conditions)**

Frequency hopping systems are spread spectrum systems in which the carrier is modulated with coded information in a conventional manner causing a conventional spreading of the RF energy about the carrier frequency. The frequency of the carrier is not fixed but changes at fixed intervals under the direction of a coded sequence. Frequency hopping systems are not required to employ all available hopping frequencies during each transmission. However the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream.

Incorporation of intelligence into a frequency hopping system that enables it to recognize other users of the band and to avoid occupied frequencies is permitted, provided that the frequency hopping system does it individually, and independently chooses or adapts its hopset. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

(a) The bandwidth of a frequency hopping channel is the 20 dB emission bandwidth, measured with the hopping stopped. The system RF bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The hopset shall be such that the near-term distribution of frequencies appears random, with sequential hops randomly distributed in both direction and magnitude of change in the hopset while the long-term distribution appears evenly distributed.

(b) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(c) For frequency hopping systems in the band 902-928 MHz: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping channels and the average time of occupancy on any channel shall not be greater than 0.4 seconds within a 20 second period. If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping channels and the average time of occupancy on any channel shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

A8.4 Transmitter Output Power and e.i.r.p. Requirements

(1) For frequency hopping systems operating in the band 902-928 MHz, the maximum peak conducted output power shall not exceed 1.0 W, and the e.i.r.p. shall not exceed 4 W, if the hopset uses 50 or more hopping channels; the maximum peak conducted output power shall not exceed 0.25 W, and the e.i.r.p. shall not exceed 1 W, if the hopset uses less than 50 hopping channels. As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power (see RSS-Gen).

A8.5 Out-of-band Emissions

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under Section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB.

TEST SETUP: The EUT was operated and tested at 240Vac and 120V 60Hz for the tests and the unit was transmitting at its maximum rate based on the energy that it could sustain in normal operation.

METHOD OF MEASUREMENT: Measurements were made using a spectrum analyzer. The EUT was set up in a 3 meter Semi-Anechoic test site, using the manufacturer's specified normal cabling configuration, with all cables over 1 meter in length bundled at 1 meter and retained from the floor.

Emissions in both horizontal and vertical polarization were measured while rotating the EUT on a turntable to maximize the emissions signal strength and the results recorded on the attached plots.

The lowest, middle and highest channels were measured for all radiated emissions 10kHz to 10 GHz. The EUT was investigated in 3 orthogonal orientations and the worst orientation was used for the final measurements. The EUT was tested and placed in the Vertical orientation on the table top as indicated in the test photos.

All frequencies 0.009 -1000MHz were tested at 3m and all frequencies 1GHz and up were tested at 1m in accordance with ANSI c63.4.

No emissions were detectable 0.009kHz to 30MHz so no results were measured.

EMISSIONS DATA: See Figures 9-23 and Tables 19-21 in Appendix A for corresponding data. A summary of the results as per the above requirements.

Test	Standard	Results
Spread Spectrum Method of Modulation	RSS-210 A8.1	This product meets the requirements of a Frequency Hopping Spread Spectrum (FHSS) system operating in the 902-928MHz band
Output Power and EIRP	RSS-210 A8.4(1)	See the Measurement Data section in Part 4 of this Section. The output EIRP is a maximum of 3.75mW. The conducted output power is 7.06mW.
Out of Band Emissions	RSS-210 A8.5	No transmitter Radiated Spurious Emissions were detected 9kHz to 30MHz and above 10GHz.See Tables 22-23 in Appendix A. All radiated emissions were within the RSS-210 A8.5 limit.
Channel Bandwidth	RSS-210 A8.1(a)	See Figures 12 - 14 in Appendix A. The 20dB bandwidth was measured to be 326 kHz.
Channel Separation	RSS-210 A8.1(c)	See Figure 15 in Appendix A. The Channel separation was measured to be 888 kHz.
Number of Hopping Channels	RSS-210 A8.1(c)	See Figures 16 -19 in Appendix A. The number of frequencies used is 25.
Hopping Channels Time of Occupancy	RSS-210 A8.1(c)	See Figures 20 and 21 in Appendix A; Time betwen 2 consecutive transmissions on the same frequency is 1.636 Seconds, dwell time per frequency is 9.76ms, therefore occupancy time per frequency within a 10 Second period is 59.66ms.

RESULTS: Pass: Complied with the standard.

Part 4 - Output Power and EIRP Emissions

DATE: Dec 13 2013

TEST STANDARD: RSS-210 Iss.8 A8.4 – Frequency Hopping Spread Spectrum Systems 902-928MHz

MINIMUM STANDARD: For frequency hopping systems operating in the band 902-928 MHz, the maximum peak conducted output power shall not exceed 1.0 W, and the e.i.r.p. shall not exceed 4 W, if the hopset uses 50 or more hopping channels; the maximum peak conducted output power shall not exceed 0.25 W, and the e.i.r.p. shall not exceed 1 W, if the hopset uses less than 50 hopping channels.

TEST SETUP: Refer to setup in Part 3 above.

METHOD OF MEASUREMENT: The Antenna is connected directly to the PCB using a coaxial pigtail; the conducted output power was measured at this point. A 40dB attenuator was used to protect the instumentattion. See Figures 9-11.

EIRP was measured at the 3m distance and the measurement was adjusted to account for cable loss and Antenna factor.

EIRP measurements

Freq	Corrected Field at 3m	3m EIRP
(MHz)	**(dBµV/m)**	**(dBm)**
904.3	99.8	4.64
915.11	100.9	5.74
926.14	99.3	4.14

Conducted Output Power measurements

Freq	Meas. Output Power	Correction Factor*	Output Power
(MHz)	**(dBm)**	**(dB)**	**(dBm)**
904.3	-31.91	40.3	8.39
915.11	-31.91	40.4	8.49
926.14	-31.99	40.4	8.41

* Correction Factor accounts for an external attenuator and 0.5dB cable loss.

RESULTS: Pass: Complied with the standard.

Part 5 - Out of Band Emissions

DATE:	Dec 13, 2013
TEST STANDARD:	RSS-210 A8.5
MINIMUM STANDARD:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under Section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB.
TEST SETUP:	Refer to the setup in Part 3 above.
METHOD OF MEASUREMENT:	Measurements were made using a horn antenna connected directly into a spectrum analyzer. The EUT was set up in a 1 meter open field test site, using the manufacturer's specified normal cabling configuration, with all cables over 1 meter in length bundled at 1 meter and retained from the floor. An application which transmitted a constant CW at the highest output power was used. Emissions in the horizontal and vertical polarization were measured while rotating the EUT on a turntable to maximize the emissions signal strength and the results recorded on the attached plots. Due to the presence of high ambient noise making it impossible to measure an emission at the required distance, the measurement was performed at 1 meter distance and the limit is adjusted per EN61000-6-3:2001 The following formula was used to convert the maximum field strength (FS) in volts/meter to calculate the EUT output power (TP) in Watts: TP = ((FS x D) x 2) / (30 x G) Where D is the distance in meters between the two antennas and G is the EUT antenna numerical gain referenced to isotropic gain.
MEASUREMENT DATA:	See Tables 19 to 21 in Appendix A.
RESULTS:	Pass: Complied with the standard.

Section IV: FCC 47 CFR Part 15/C Report of Measurements

General

Tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC 47CFR Part 15 – Subpart C - Intentional Radiators. The Testing was performed pursuant to ANSI 63.4, 2003.

Additionally, the specific section used for compliance is 15.247 – Operation within the bands 902-928MHz – limited to frequency hopping intentional radiator. This includes the use of the FCC Public Notice DA 00-705 (Filing and Measurement Guidelines for Frequency hopping Spread Spectrum Systems) that was used as a guide to the tests that were performed.

Labeling Requirements

Please refer to labeling requirements as outlined above in Section 1.

Test Results - Summary

Testing was performed pursuant to ANSI 63.4, 2009 and DA 00-705

Test	Standard	Description	Result
Radiated Emissions Idle Mode	FCC 47 CFR Part 15 Subpart B Class B Limits	The radiated emissions are measured in the 0.009 - 9280MHz range	Complies
Conducted Emissions Idle Mode	FCC 47 CFR Part 15 Subpart B Class B Limits	The conducted emissions are measured on the phase and neutral power lines in the 0.15 – 30.0 MHz range.	Complies
Antenna Requirement	FCC 47 CFR Part 15 Subpart C section 15.203	Proper Antenna is specified and used	Complies
Radiated Emissions Transmit Mode – Frequency Hopping Spread Spectrum Operation	FCC 47 CFR Part 15 Subpart C – Scetion 15.247	Radiated emission characteristics for Spread Sprectrum devices operating in the range 902-928 MHz that use the Spread Spectrum Modulation technique. Emissions are measured in the 0.009 - 9280MHz range.	Complies

Part 1 - Radiated Emission Testing

DATE: Dec 12, 2013

TEST STANDARD: FCC 47 CFR, Part 15, Subpart B Class B and Subpart C-Section 15.247

TEST VOLTAGE: 120Vac 60Hz

TEST SETUP: The equipment was set up in a 3-meter semi-anechoic chamber. Emissions in both horizontal and vertical polarization's were measured while rotating the EUT on a turntable to maximize the emissions signal strength and the results recorded on the attached plots. In cases where the presence of high ambient noise makes it impossible to measure an emission at the required distance, the measurement is performed at a closer distance and the limit is adjusted 20dB per Decade using the formula

20*Log (d1/d2)

Where d1 is the required distance and d2 is the new distance.

MINIMUM STANDARD: When the EUT is operating in Receive mode FCC Part 15 Subpart B Unintentional Radiators Limits for a Class B product.:

Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

DEVICE DESCRIPTIONS: Refer to the Equipment Under Test information in the Section 1 above, for EUT Descriptions.

CABLING DETAILS: The EUT was set up using the manufacturer's specified normal cabling configuration.

Cable	**Pins**	**Connector**	**Load/Termination**	**Shielded**	**Ferites**
Power	3	Terminal	No	No	No

MODIFICATIONS: Ferrite 28A2029-0A2 manufactured by Laird Tech added on the AC input cable.

MEASUREMENT DATA: See Appendix A for Plots.

EMISSIONS DATA: See Appendix A for corresponding frequencies.

No emissions were detectable 0.009kHz to 30MHz so no results were measured. All other emmisions that were attenuated by more than 20dB from the permissible value are not reported in accordance with 15.31(o).

RESULTS: Pass: Complied with the standard.

Part 2 - Antenna Requirement – 15.203

2.1 APPLICABLE REGULATIONS:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

2.2 RESULTS: Pass: Complied with the standard. EUT uses the PENSON, P/N: OM09090101, 902-928MHz 1/4Wavelenght 1dBi Omni antenna. This is then sealed in an epoxy potting compound..

Part 3 - Conducted Emissions Tests – 15.207

3.1 Applicable Regulations

15.207 - (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	**Conducted Limit (dbµV)**	
	Quasi-Peak	**Average**
0.15 – 0.5	66 to 56	56 to 46
0.5 – 5	56	46
5 – 30	60	50

METHOD OF MEASUREMENT: Measurements were made using a spectrum analyzer with a 9kHz RBW, Peak detector. Any emissions that are close to the limit are measured using a test receiver with a 9kHz bandwidth, CISPR Quasi-Peak detector as well as an averaging meter. AC mains conducted emissions were performed both in transmit and standby mode.

MODIFICATIONS: Corcom 6VdK1 filter added to the AC input.

EMISSIONS DATA: See Appendix A for Plots and Data.

RESULTS: Pass: Complied with the standard.

Part 4 - Frequency Hopping Spread Spectrum Operation – 15.247

4.1 APPLICABLE REGULATIONS:

15.247(a) Operation under the provisions of this Section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

(2) For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

(g) Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

(h) The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

4.2 TEST PROCEDURES:

TEST STANDARD: FCC 47 CFR, Part 15, Subpart C 15.247

DEVICE DESCRIPTIONS: Refer to the Equipment Under Test Section, above, for EUT Descriptions.

TEST SETUP:

Frequency Range Measured	30MHz – 10000MHz
Test Distance	1m and 3m
Test Instrumentation Resolution	120kHz (30MHz to 1000MHz) 1MHz (1000MHz to 10000MHz)
Receive Antenna Scan Height	1m – 4m
Receive Antenna Polarization	Vertical and Horizontal

CABLING DETAILS:

Cable	Pins	Connector	Load/Termination	Shielded	Ferrites
Power	3	Terminal	No	No	No

MODIFICATIONS: No modifications were required for the devices to pass the test.

MEASUREMENT DATA: See Figures 9-23 and Table 19-21 in Appendix A.

RESULTS: Pass: Complied with the standard.

Part 5 - Output Power and EIRP Emissions

DATE: Dec 13 2013

TEST STANDARD: FCC 47 CFR Part 15 Subpart C §15.247(b)(2) – Hopping Frequency Systems 902-928MHz

MINIMUM STANDARD: **15.247(b)(2)** – For the band 902-928MHz, the transmitter output power shall not exceed 1.0 watt and the E.I.R.P shall not exceed 4W for systems employing at least 50 Hopping Channels.

TEST SETUP: Refer to setup in Part 1 above.

METHOD OF MEASUREMENT: The Antenna is connected directly to the PCB using a coaxial pigtail; the conducted output power was measured at this point. A 40dB attenuator was used to protect the instumentattion. See Figures 9-11.

EIRP was measured at the 3m distance and the measurement was adjusted to account for cable loss and Antenna factor.

EIRP measurements

Freq	Corrected Field at 3m	3m EIRP
(MHz)	(dBµV/m)	(dBm)
904.3	99.8	4.64
915.11	100.9	5.74
926.14	99.3	4.14

Conducted Output Power measurements

Freq	Meas. Output Power	Correction Factor*	Output Power
(MHz)	(dBm)	(dB)	(dBm)
904.3	-31.91	40.3	8.39
915.11	-31.91	40.4	8.49
926.14	-31.99	40.4	8.41

* Correction Factor accounts for an external attenuator and 0.5dB cable loss.

RESULTS: Pass: Complied with the standard.

Part 6 - Restricted Bands Review – 15.205(b)

6.1 APPLICABLE REGULATIONS:

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

6.2 RESULTS

All of the measurements for the Part 15 device were made when the EUT was set into transmitting mode to allow measurements of spurious emissions. The spurious frequencies that have been identified to fall into restricted bands are the various harmonics generated from 902 to 928 MHz. The restricted bands affected are 2655-2900MHz, 3600-4400MHz, 4500-5150MHz, 5350- 5460MHz, 7250-7750MHz, 8025-8500MHz and 9000-9200MHz.

EMISSIONS DATA: See Tables 19-21 in Appendix A for corresponding data.

RESULTS: Pass: Complied with the standard.

Part 7 - RF Exposure Evaluation

FCC 1.1310 states the criteria listed in the table below shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Section 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Section 2.1093. Further information on evaluating compliance with these limits can be found in the FCC's OST/OET Bulletin Number 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radiofrequency Radiation".

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (s)
(A) Limits for Occupational/Control Exposures				
300-1500	-	-	F/300	6
1500-100,000	-	-	5	6
(B) Limits for General Population/Uncontrolled Exposures				
300-1500	-	-	F/1500	6
1500-100,000	-	-	1	30

TABLE 1 - POWER DENSITY LIMITS

1.1 EUT Operating Condition

- The antenna used for this product is a Flexilbe PCB trace antenna connected to a UFL Connector and is designed for a Peak antenna gain of 3.5 dBi (peak)
- Highest measured conducted output level = 19.6dBm
- From Table 1, the Maximum Power Density safe exposure level for General Population Uncontrolled Exposure of 30 Seconds for the frequency range of 2.4 to 2.4835GHz is $1mW/cm^2$.
-

Conducted Output Power (dBm)	Max Antenna Gain	Max EIRP (mW)	Power Density Limit Allowed (mW/cm^2)	Safe distance (cm)
19.6	3.5	204	1	4.1

1.2 RF Exposure Evaluation Distance Calculation

$$d = \sqrt{\left(\frac{EIRP}{4\pi S}\right)}$$

where: d = Distance to the center of radiation of the antenna (cm) for the allowable Power Density

S = Allowable Power density Limit (mW/cm^2)

EIRP = Equivalent isotropically radiated power (mW) = $10^{[\text{TX Power (dBm) + Ant Gain (dBi)}/10]}$

As shown above, the minimum distance where the MPE limit is reached is 4.1 cm from the EUT with the 3.5dBi antenna.

It is recommended that the unit is positioned so that the typical distance from the antenna to the end user is 20cm or greater.

Appendix A: Test Plots RT-900

Part 1 - Unintentional Radiated Emissions, Idle Mode

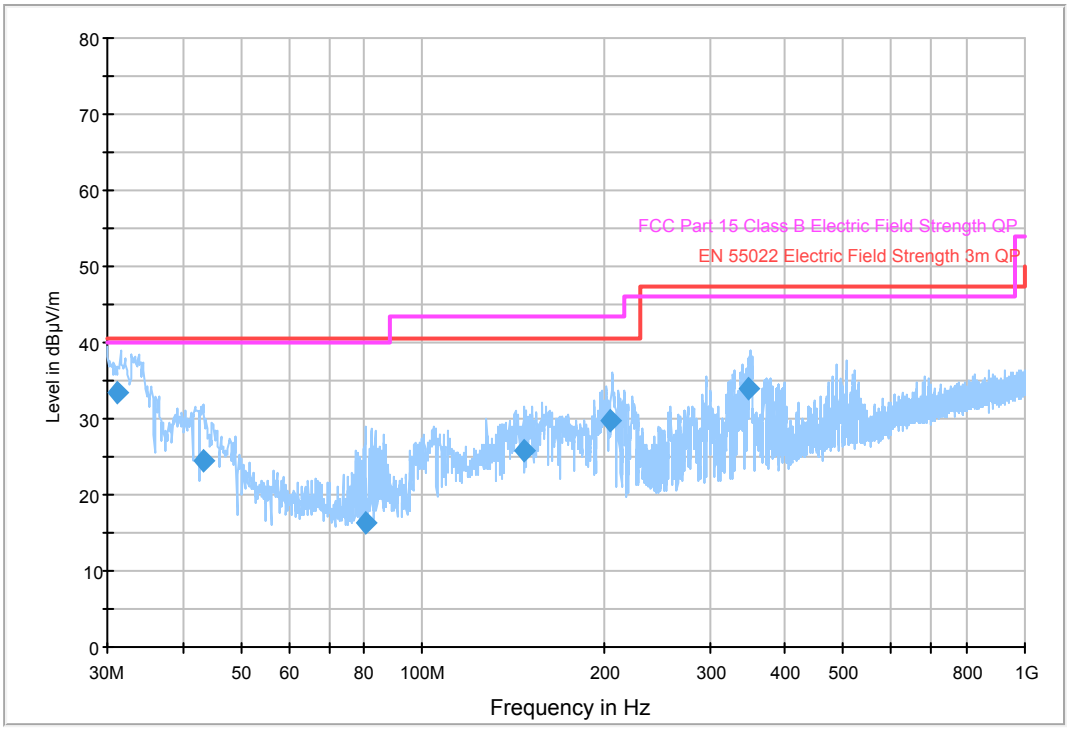


Table 1: FCC/IC Class B Radiated Emissions Idle Mode-3m

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
31.053000	36.4	1000.000	120.000	122.0	V	257.0	26.5	3.5	40
43.242200	26.5	1000.000	120.000	192.0	V	91.0	17.9	14	40
80.583720	25.4	1000.000	120.000	150.0	V	219.0	15.0	14.6	40
147.482080	25.9	1000.000	120.000	244.0	H	208.0	19.8	17.6	43.5
205.453640	29.6	1000.000	120.000	122.0	H	263.0	18.6	13.9	43.5
348.053800	33.8	1000.000	120.000	100.0	H	320.0	22.0	12.2	46.0

*Unintentional emissions were investigated measured from 0.009Mhz -1000MHz. In accordance with 15.31(o) emissions that are 20dB below the permissible value have not been reported.

Part 2 - Intentional Radiated Emissions, Tx Mode

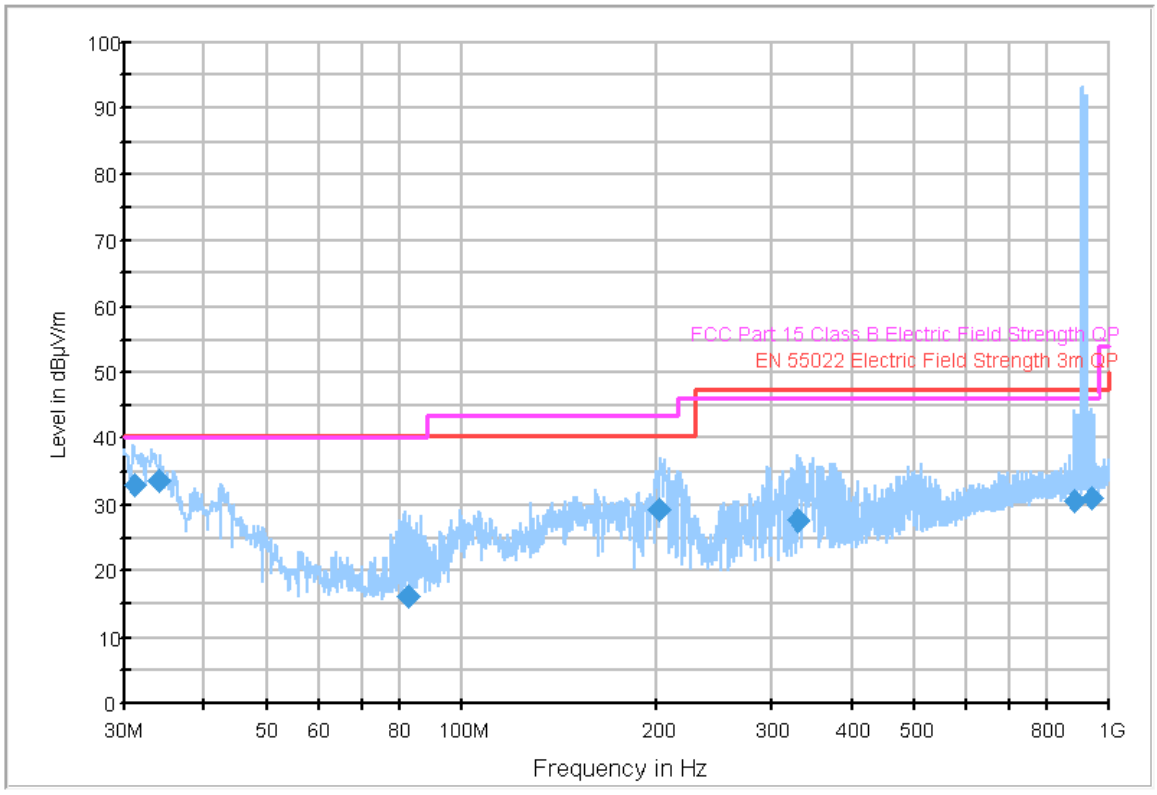


Table 2: FCC/IC Class B Emissions, Tx Mode - 3m*

Frequency	QuasiPeak	Meas. Time	Bandwidth	Antenna height	Polarity	Turntable position	Corr.	Margin	Limit
(MHz)	(dBµV/m)	(ms)	(kHz)	(cm)		(deg)	(dB)	(dB)	(dBµV/m)
31.061169	32.9	1000	120	100	V	270	26.5	7.1	40
33.91188	33.7	1000	120	100	V	180	24.4	6.3	40
82.53408	25.9	1000	120	100	V	272	15.2	14.1	40
201.37952	29.3	1000	120	247	H	302	19.7	14.2	43.5
330.6328	28.4	1000	120	300	H	219	21.6	17.6	46
883.48008	35.1	1000	120	300	H	167	29.6	10.9	46
936.71456	38.6	1000	120	100	V	211	29.9	7.4	46

* Unintentional emissions were investigated and measured from 0.009MHz -1000MHz. No transmitter Radiated Spurious Emissions were detected 9kHz to 30MHz and above 4GHz. In accordance with 15.31(o) emissions that are 20dB below the permissible value have not been reported.
*Frequency signals above the limit lines are fundamental frequencies at 902-928MHz.

Part 3 - A.C. Mains Conducted Emissions (Idle Mode)

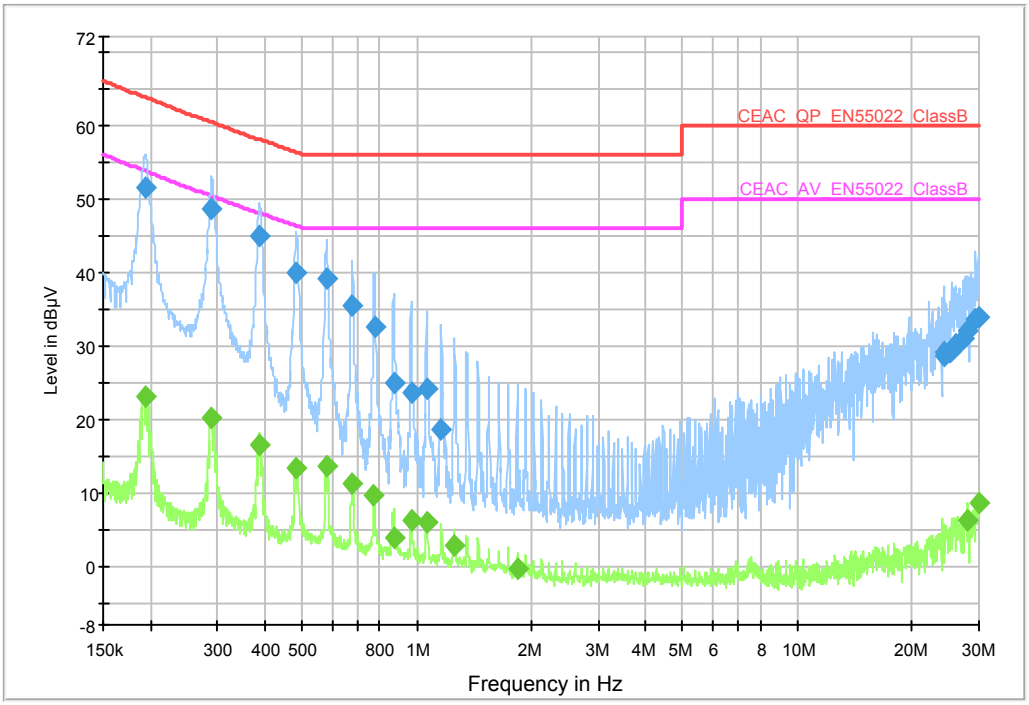


Figure 1: AC Conducted Emissions - Line 1 120VAC/60Hz (Idle Mode)

Table 3: Quasi Peak Data - AC Conducted Emissions - Line 1 120VAC/60Hz (Idle Mode)

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.194489	51.4	1000.000	9.000	On	L1	0.5	12.3	63.7
0.290028	48.5	1000.000	9.000	On	L1	0.4	11.8	60.3
0.386715	44.8	1000.000	9.000	On	L1	0.4	13.2	58.0
0.483700	39.9	1000.000	9.000	On	L1	0.4	16.4	56.3
0.580148	39.0	1000.000	9.000	On	L1	0.4	17.0	56.0
0.676633	35.4	1000.000	9.000	On	L1	0.5	20.6	56.0
0.773554	32.4	1000.000	9.000	On	L1	0.5	23.6	56.0
0.872075	24.8	1000.000	9.000	On	L1	0.5	31.2	56.0
0.967555	23.5	1000.000	9.000	On	L1	0.5	32.5	56.0
1.062817	24.1	1000.000	9.000	On	L1	0.5	31.9	56.0
1.160481	18.6	1000.000	9.000	On	L1	0.5	37.4	56.0
24.186601	29.0	1000.000	9.000	On	L1	0.9	31.0	60.0
24.332011	28.7	1000.000	9.000	On	L1	0.9	31.3	60.0
25.223014	29.1	1000.000	9.000	On	L1	0.9	30.9	60.0
25.374655	29.4	1000.000	9.000	On	L1	0.9	30.6	60.0
25.938514	30.2	1000.000	9.000	On	L1	0.9	29.8	60.0
27.267048	31.0	1000.000	9.000	On	L1	0.9	29.0	60.0

27.872958	**32.1**	**1000.000**	**9.000**	**On**	**L1**	**0.9**	**27.9**	**60.0**
29.476727	**33.6**	**1000.000**	**9.000**	**On**	**L1**	**0.9**	**26.4**	**60.0**
29.832222	**33.8**	**1000.000**	**9.000**	**On**	**L1**	**0.9**	**26.2**	**60.0**

Table 4: Average Data - AC Conducted Emissions - Line 1 120VAC/60Hz (Idle Mode)

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.194489	**22.9**	**1000.000**	**9.000**	**On**	**L1**	**0.5**	**30.8**	**53.7**
0.290028	**20.2**	**1000.000**	**9.000**	**On**	**L1**	**0.4**	**30.1**	**50.3**
0.387489	**16.5**	**1000.000**	**9.000**	**On**	**L1**	**0.4**	**31.5**	**48.0**
0.483700	**13.4**	**1000.000**	**9.000**	**On**	**L1**	**0.4**	**32.8**	**46.2**
0.578990	**13.5**	**1000.000**	**9.000**	**On**	**L1**	**0.4**	**32.5**	**46.0**
0.675283	**11.1**	**1000.000**	**9.000**	**On**	**L1**	**0.5**	**34.9**	**46.0**
0.772010	**9.7**	**1000.000**	**9.000**	**On**	**L1**	**0.5**	**36.3**	**46.0**
0.873819	**3.8**	**1000.000**	**9.000**	**On**	**L1**	**0.5**	**42.2**	**46.0**
0.965623	**6.3**	**1000.000**	**9.000**	**On**	**L1**	**0.5**	**39.7**	**46.0**
1.060695	**5.9**	**1000.000**	**9.000**	**On**	**L1**	**0.5**	**40.1**	**46.0**
1.254525	**2.9**	**1000.000**	**9.000**	**On**	**L1**	**0.5**	**43.1**	**46.0**
1.841119	**-0.5**	**1000.000**	**9.000**	**On**	**L1**	**0.5**	**46.5**	**46.0**
27.872958	**6.3**	**1000.000**	**9.000**	**On**	**L1**	**0.9**	**43.7**	**50.0**
30.000000	**8.6**	**1000.000**	**9.000**	**On**	**L1**	**0.9**	**41.4**	**50.0**

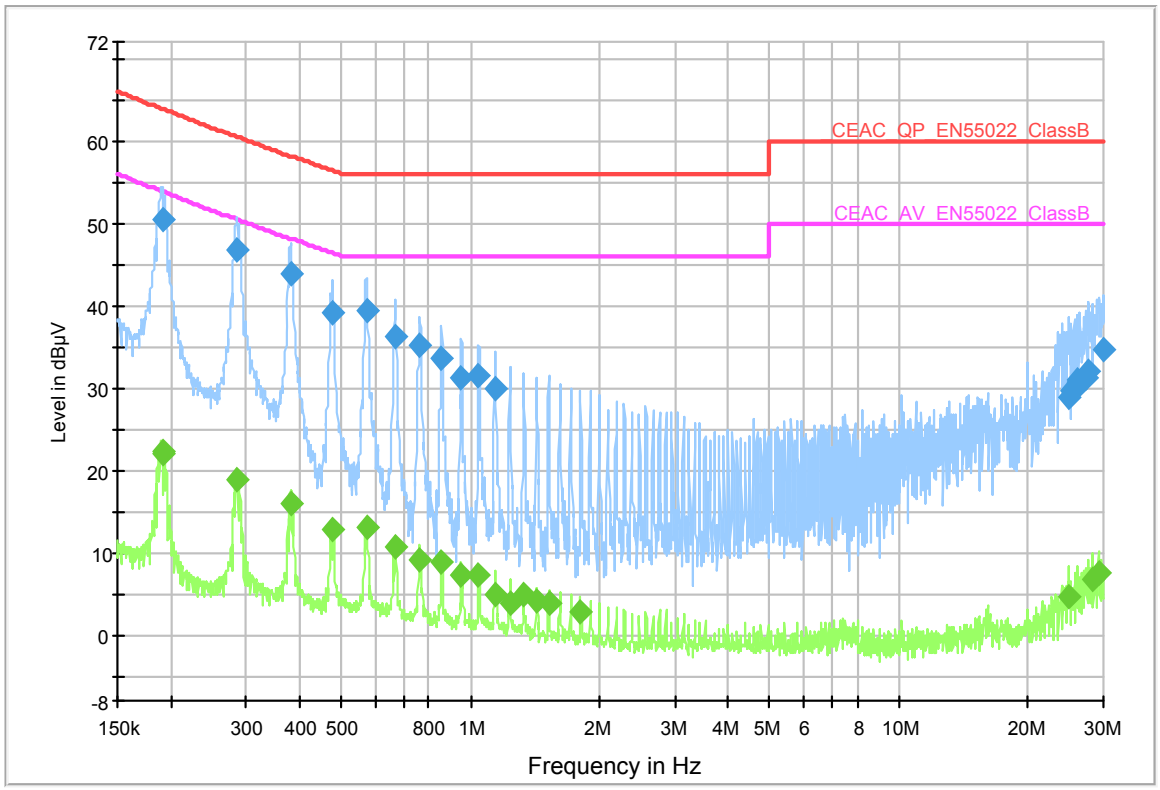


Figure 2: AC Conducted Emissions - Line 2 120VAC/60Hz (Idle Mode)

Table 5: Quasi Peak Data - AC Conducted Emissions - Line 2 120VAC/60Hz (Idle Mode)

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190642	50.5	1000.000	9.000	On	L2	0.5	13.4	63.9
0.285429	46.8	1000.000	9.000	On	L2	0.4	13.7	60.5
0.380583	43.8	1000.000	9.000	On	L2	0.4	14.3	58.1
0.476030	39.1	1000.000	9.000	On	L2	0.4	17.3	56.4
0.570949	39.4	1000.000	9.000	On	L2	0.4	16.6	56.0
0.667236	36.2	1000.000	9.000	On	L2	0.4	19.8	56.0
0.761288	35.3	1000.000	9.000	On	L2	0.5	20.7	56.0
0.856534	33.4	1000.000	9.000	On	L2	0.5	22.6	56.0
0.952212	31.2	1000.000	9.000	On	L2	0.5	24.8	56.0
1.045964	31.5	1000.000	9.000	On	L2	0.5	24.5	56.0
1.142079	29.8	1000.000	9.000	On	L2	0.5	26.2	56.0
24.823054	28.8	1000.000	9.000	On	L2	0.9	31.2	60.0
25.324007	29.6	1000.000	9.000	On	L2	0.9	30.4	60.0
25.629419	29.9	1000.000	9.000	On	L2	0.9	30.1	60.0
25.990391	30.9	1000.000	9.000	On	L2	0.9	29.1	60.0
26.146645	30.6	1000.000	9.000	On	L2	0.9	29.4	60.0

26.303839	**30.7**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**29.3**	**60.0**
27.212623	**31.3**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**28.7**	**60.0**
27.595893	**32.0**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**28.0**	**60.0**
29.951670	**34.6**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**25.4**	**60.0**

Table 6: Average Data - AC Conducted Emissions - Line 2 120VAC/60Hz (Idle Mode)

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190642	**22.4**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**31.4**	**53.8**
0.191788	**22.0**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**31.8**	**53.8**
0.286000	**18.9**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**31.5**	**50.4**
0.382107	**16.0**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**32.1**	**48.1**
0.476030	**12.9**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**33.5**	**46.4**
0.570949	**13.1**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**32.9**	**46.0**
0.667236	**10.7**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**35.3**	**46.0**
0.762810	**9.2**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**36.8**	**46.0**
0.856534	**8.8**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**37.2**	**46.0**
0.952212	**7.4**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**38.6**	**46.0**
1.045964	**7.4**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**38.6**	**46.0**
1.144364	**5.0**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**41.0**	**46.0**
1.239575	**3.9**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**42.1**	**46.0**
1.332020	**4.9**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**41.1**	**46.0**

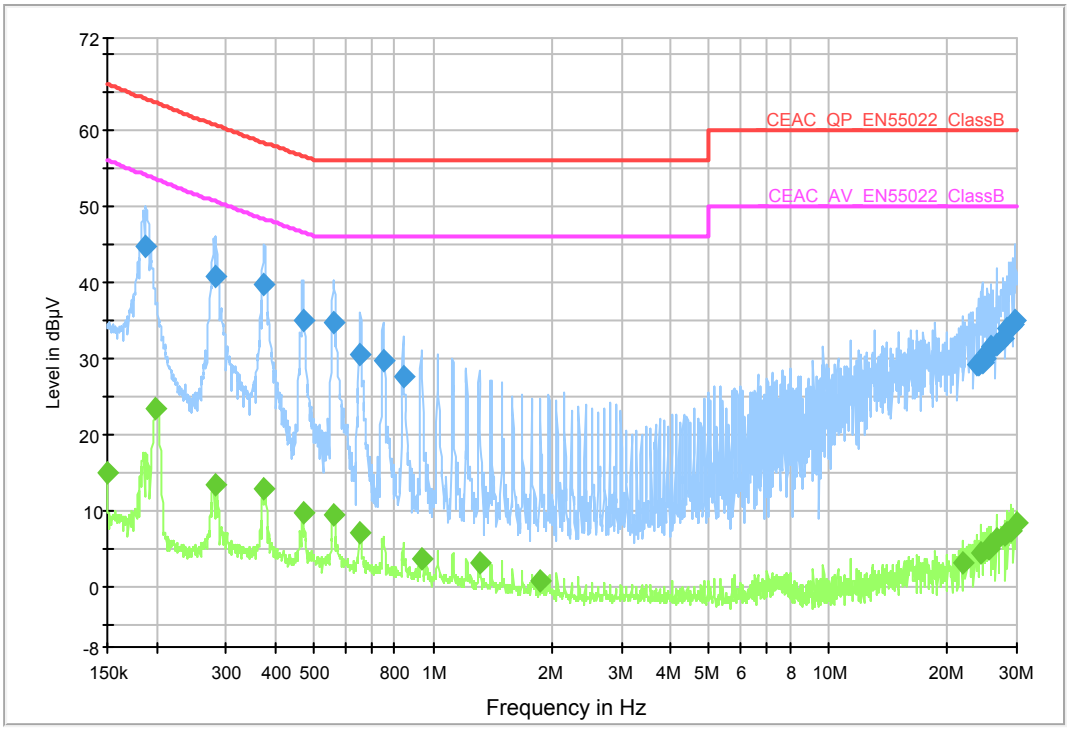


Figure 3: AC Conducted Emissions - Line 1 240VAC/60Hz (Idle Mode)

Table 7: Quasi-Peak Data - AC Conducted Emissions - Line 1 240VAC/60Hz (Idle Mode)

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.187244	44.6	1000.000	9.000	On	L1	0.5	19.4	64.0
0.280903	40.6	1000.000	9.000	On	L1	0.4	20.0	60.6
0.374548	39.7	1000.000	9.000	On	L1	0.4	18.6	58.3
0.468482	34.8	1000.000	9.000	On	L1	0.4	21.7	56.5
0.561895	34.7	1000.000	9.000	On	L1	0.4	21.3	56.0
0.655345	30.5	1000.000	9.000	On	L1	0.4	25.5	56.0
0.747721	29.5	1000.000	9.000	On	L1	0.5	26.5	56.0
0.841269	27.5	1000.000	9.000	On	L1	0.5	28.5	56.0
24.773507	29.8	1000.000	9.000	On	L1	0.9	30.2	60.0
25.324007	30.8	1000.000	9.000	On	L1	0.9	29.2	60.0
25.835070	31.4	1000.000	9.000	On	L1	0.9	28.6	60.0
26.727658	31.8	1000.000	9.000	On	L1	0.9	28.2	60.0
27.540812	32.4	1000.000	9.000	On	L1	0.9	27.6	60.0
28.265529	33.9	1000.000	9.000	On	L1	0.9	26.1	60.0
29.067335	34.1	1000.000	9.000	On	L1	0.9	25.9	60.0
29.242088	34.4	1000.000	9.000	On	L1	0.9	25.6	60.0

Table 8: Average Data - AC Conducted Emissions - Line 1 240VAC/60Hz (Idle Mode)

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	15.0	1000.000	9.000	On	L1	0.6	41.0	56.0
0.199208	23.4	1000.000	9.000	On	L1	0.5	30.1	53.5
0.280903	13.4	1000.000	9.000	On	L1	0.4	37.1	50.5
0.373054	12.8	1000.000	9.000	On	L1	0.4	35.5	48.3
0.468482	9.5	1000.000	9.000	On	L1	0.4	37.0	46.5
0.561895	9.4	1000.000	9.000	On	L1	0.4	36.6	46.0
0.655345	7.0	1000.000	9.000	On	L1	0.4	39.0	46.0
0.937113	3.6	1000.000	9.000	On	L1	0.5	42.4	46.0
1.308282	3.0	1000.000	9.000	On	L1	0.5	43.0	46.0
1.870784	0.6	1000.000	9.000	On	L1	0.5	45.4	46.0
21.887127	3.1	1000.000	9.000	On	L1	0.8	46.9	50.0
24.234974	4.3	1000.000	9.000	On	L1	0.9	45.7	50.0
25.476255	5.0	1000.000	9.000	On	L1	0.9	45.0	50.0
25.835070	5.4	1000.000	9.000	On	L1	0.9	44.6	50.0
26.621068	6.2	1000.000	9.000	On	L1	0.9	43.8	50.0
27.984562	6.7	1000.000	9.000	On	L1	0.9	43.3	50.0
28.265529	6.9	1000.000	9.000	On	L1	0.9	43.1	50.0

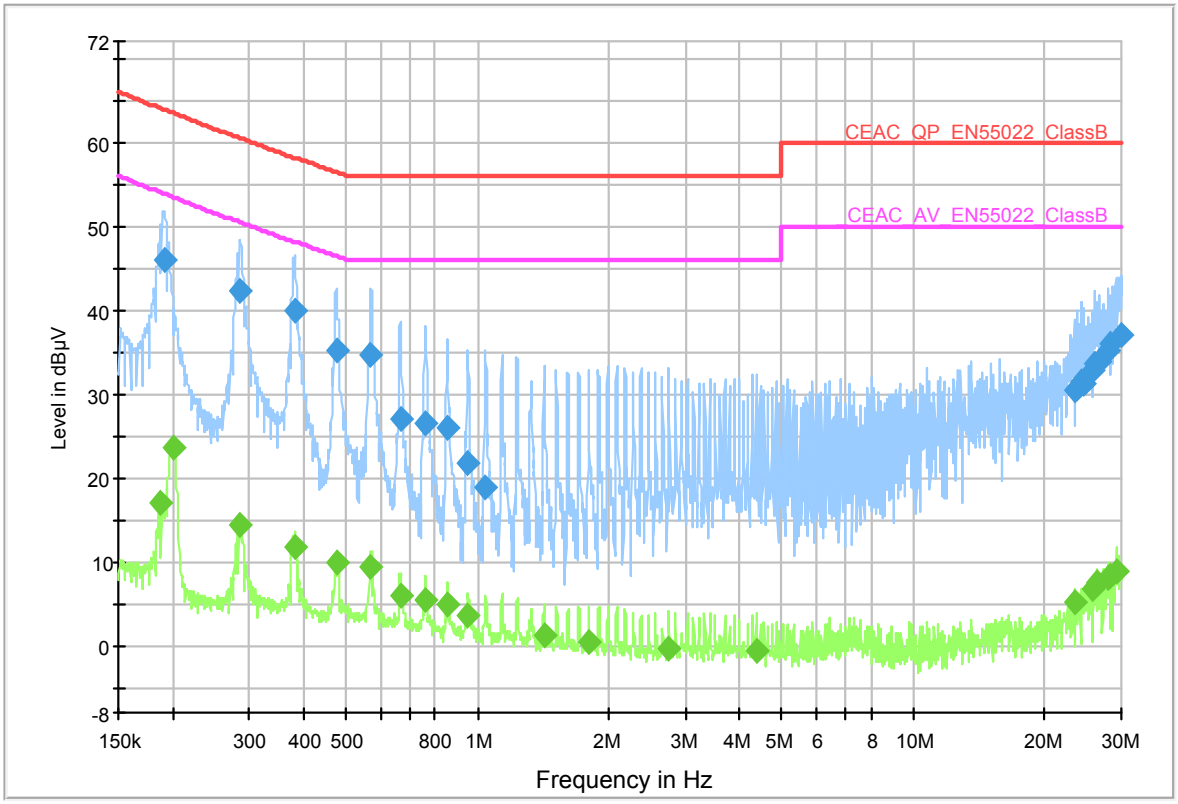


Figure 4: AC Conducted Emissions - Line 2 240VAC/60Hz (Idle Mode)

Table 9: Quasi-Peak Data - AC Conducted Emissions - Line 2 240VAC/60Hz (Idle Mode)

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190642	46.1	1000.000	9.000	On	L2	0.5	17.8	63.9
0.284859	42.3	1000.000	9.000	On	L2	0.4	18.2	60.5
0.380583	39.8	1000.000	9.000	On	L2	0.4	18.3	58.1
0.475080	35.3	1000.000	9.000	On	L2	0.4	21.1	56.4
0.569809	34.6	1000.000	9.000	On	L2	0.4	21.4	56.0
0.665904	27.1	1000.000	9.000	On	L2	0.4	28.9	56.0
0.759768	26.4	1000.000	9.000	On	L2	0.5	29.6	56.0
0.853118	25.9	1000.000	9.000	On	L2	0.5	30.1	56.0
0.948415	21.7	1000.000	9.000	On	L2	0.5	34.3	56.0
1.043876	18.8	1000.000	9.000	On	L2	0.5	37.2	56.0
23.378873	30.3	1000.000	9.000	On	L2	0.8	29.7	60.0
23.708147	30.7	1000.000	9.000	On	L2	0.8	29.3	60.0
24.332011	31.5	1000.000	9.000	On	L2	0.9	28.5	60.0
24.625459	31.2	1000.000	9.000	On	L2	0.9	28.8	60.0
25.783503	32.8	1000.000	9.000	On	L2	0.9	27.2	60.0

26.042372	**33.6**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**26.4**	**60.0**
26.727658	**33.9**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**26.1**	**60.0**
29.951670	**37.1**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**22.9**	**60.0**

Table 10: Average Data - AC Conducted Emissions - Line 2 240VAC/60Hz (Idle Mode)

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.187619	**17.0**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**37.0**	**54.0**
0.200006	**23.6**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**29.8**	**53.4**
0.284290	**14.4**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**36.0**	**50.4**
0.381344	**11.8**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**36.3**	**48.1**
0.475080	**9.8**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**36.6**	**46.4**
0.569809	**9.5**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**36.5**	**46.0**
0.665904	**5.9**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**40.1**	**46.0**
0.759768	**5.5**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**40.5**	**46.0**
0.853118	**4.9**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**41.1**	**46.0**
0.948415	**3.4**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**42.6**	**46.0**
1.422806	**1.3**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**44.7**	**46.0**
23.378873	**5.2**	**1000.000**	**9.000**	**On**	**L2**	**0.8**	**44.8**	**50.0**
25.783503	**6.7**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**43.3**	**50.0**
26.251336	**7.4**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**42.6**	**50.0**
28.040531	**8.2**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**41.8**	**50.0**

Part 4 - A.C. Mains Conducted Emissions (Tx Mode)

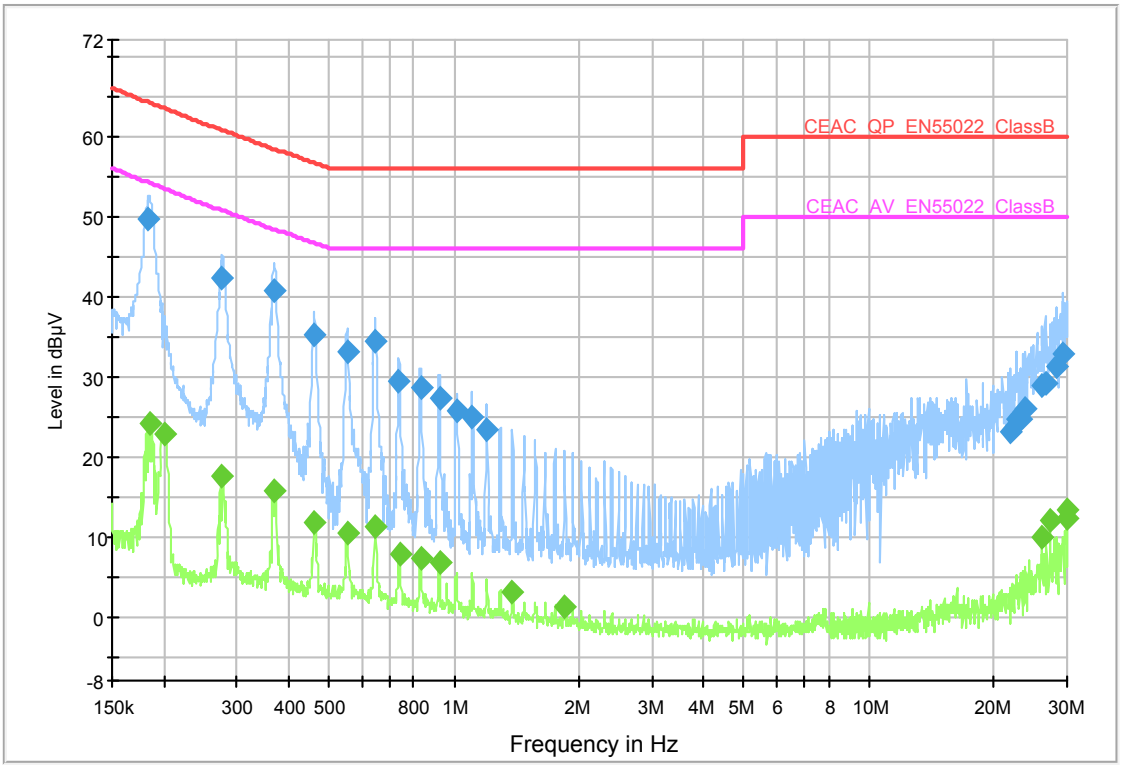


Figure 5: AC Conducted Emissions - Line 1 120VAC/60Hz (Tx Mode)

Table 11: Quasi-Peak Data - AC Conducted Emissions - Line 1 120VAC/60Hz (Tx Mode)

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.183907	49.6	1000.000	9.000	On	L1	0.5	14.6	64.2
0.276448	42.2	1000.000	9.000	On	L1	0.4	18.5	60.7
0.368609	40.7	1000.000	9.000	On	L1	0.4	17.7	58.4
0.461053	35.1	1000.000	9.000	On	L1	0.4	21.5	56.6
0.554091	32.9	1000.000	9.000	On	L1	0.4	23.1	56.0
0.644953	34.3	1000.000	9.000	On	L1	0.4	21.7	56.0
0.737336	29.4	1000.000	9.000	On	L1	0.5	26.6	56.0
0.829585	28.5	1000.000	9.000	On	L1	0.5	27.5	56.0
0.922253	27.3	1000.000	9.000	On	L1	0.5	28.7	56.0
1.015081	25.6	1000.000	9.000	On	L1	0.5	30.4	56.0
1.106147	24.8	1000.000	9.000	On	L1	0.5	31.2	56.0
1.198179	23.2	1000.000	9.000	On	L1	0.5	32.8	56.0
21.974763	23.0	1000.000	9.000	On	L1	0.8	37.0	60.0
22.733980	24.6	1000.000	9.000	On	L1	0.8	35.4	60.0

23.146480	**24.6**	**1000.000**	**9.000**	**On**	**L1**	**0.8**	**35.4**	**60.0**
23.850681	**25.9**	**1000.000**	**9.000**	**On**	**L1**	**0.8**	**34.1**	**60.0**
26.042372	**28.9**	**1000.000**	**9.000**	**On**	**L1**	**0.9**	**31.1**	**60.0**
26.567932	**29.2**	**1000.000**	**9.000**	**On**	**L1**	**0.9**	**30.8**	**60.0**
28.378704	**31.1**	**1000.000**	**9.000**	**On**	**L1**	**0.9**	**28.9**	**60.0**
29.476727	**32.9**	**1000.000**	**9.000**	**On**	**L1**	**0.9**	**27.1**	**60.0**

Table 12: Average Data - AC Conducted Emissions - Line 1 120VAC/60Hz (Tx Mode)

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.184644	**24.1**	**1000.000**	**9.000**	**On**	**L1**	**0.5**	**30.0**	**54.1**
0.201209	**22.9**	**1000.000**	**9.000**	**On**	**L1**	**0.5**	**30.5**	**53.4**
0.276448	**17.4**	**1000.000**	**9.000**	**On**	**L1**	**0.4**	**33.3**	**50.7**
0.367873	**15.7**	**1000.000**	**9.000**	**On**	**L1**	**0.4**	**32.7**	**48.4**
0.460133	**11.8**	**1000.000**	**9.000**	**On**	**L1**	**0.4**	**34.8**	**46.6**
0.554091	**10.5**	**1000.000**	**9.000**	**On**	**L1**	**0.4**	**35.5**	**46.0**
0.644953	**11.1**	**1000.000**	**9.000**	**On**	**L1**	**0.4**	**34.9**	**46.0**
0.738810	**7.9**	**1000.000**	**9.000**	**On**	**L1**	**0.5**	**38.1**	**46.0**
0.831244	**7.3**	**1000.000**	**9.000**	**On**	**L1**	**0.5**	**38.7**	**46.0**
0.922253	**6.8**	**1000.000**	**9.000**	**On**	**L1**	**0.5**	**39.2**	**46.0**
25.990391	**9.9**	**1000.000**	**9.000**	**On**	**L1**	**0.9**	**40.1**	**50.0**
27.267048	**12.0**	**1000.000**	**9.000**	**On**	**L1**	**0.9**	**38.0**	**50.0**
29.832222	**12.3**	**1000.000**	**9.000**	**On**	**L1**	**0.9**	**37.7**	**50.0**
30.000000	**13.2**	**1000.000**	**9.000**	**On**	**L1**	**0.9**	**36.8**	**50.0**

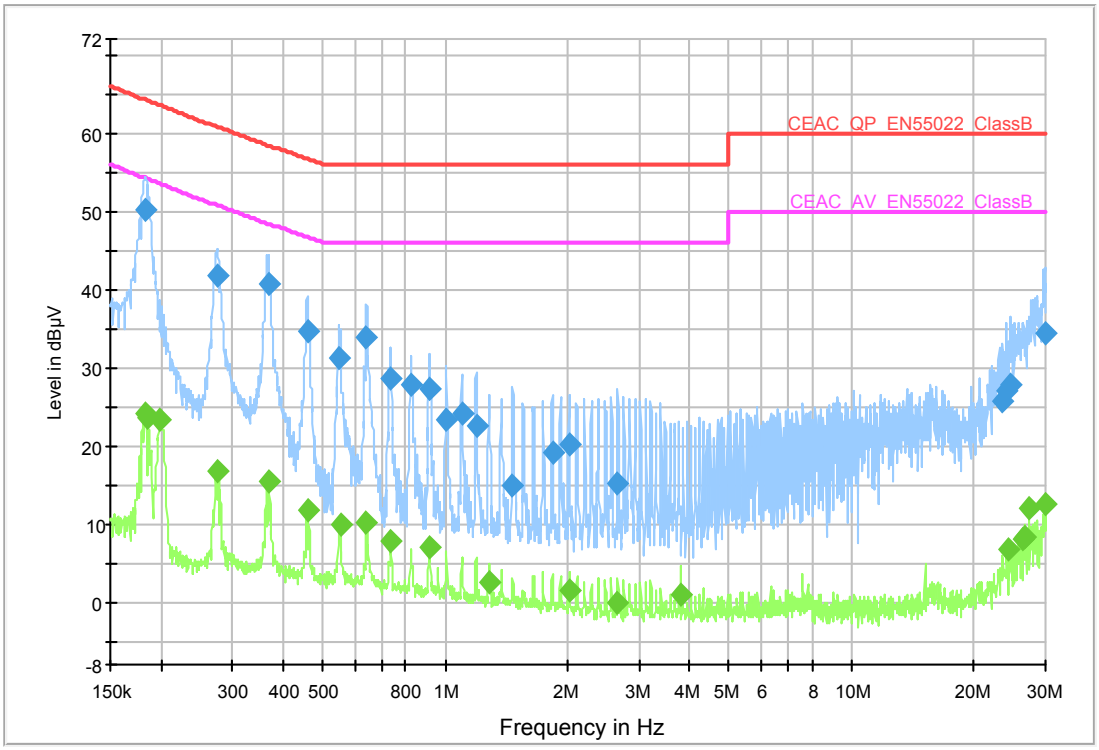


Figure 6: AC Conducted Emissions - Line 2 120VAC/60Hz (Tx Mode)

Table 13: Quasi-Peak Data - AC Conducted Emissions - Line 2 120VAC/60Hz (Tx Mode)

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182443	50.1	1000.000	9.000	On	L2	0.5	14.2	64.3
0.274796	41.8	1000.000	9.000	On	L2	0.4	19.0	60.8
0.367139	40.8	1000.000	9.000	On	L2	0.4	17.6	58.4
0.457383	34.7	1000.000	9.000	On	L2	0.4	22.0	56.7
0.548583	31.2	1000.000	9.000	On	L2	0.4	24.8	56.0
0.641099	33.7	1000.000	9.000	On	L2	0.4	22.3	56.0
0.732929	28.6	1000.000	9.000	On	L2	0.5	27.4	56.0
0.824627	27.8	1000.000	9.000	On	L2	0.5	28.2	56.0
0.916742	27.3	1000.000	9.000	On	L2	0.5	28.7	56.0
1.007001	23.4	1000.000	9.000	On	L2	0.5	32.6	56.0
1.099536	24.1	1000.000	9.000	On	L2	0.5	31.9	56.0
1.191018	22.6	1000.000	9.000	On	L2	0.5	33.4	56.0
1.463167	14.8	1000.000	9.000	On	L2	0.5	41.2	56.0
1.833776	19.0	1000.000	9.000	On	L2	0.5	37.0	56.0
2.018352	20.1	1000.000	9.000	On	L2	0.5	35.9	56.0
2.659148	15.2	1000.000	9.000	On	L2	0.5	40.8	56.0
23.613599	25.8	1000.000	9.000	On	L2	0.8	34.2	60.0

29.832222	34.3	1000.000	9.000	On	L2	0.9	25.7	60.0

Table 14: Average Data - AC Conducted Emissions - Line 2 120VAC/60Hz (Tx Mode)

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.183174	24.0	1000.000	9.000	On	L2	0.5	30.2	54.2
0.185383	23.5	1000.000	9.000	On	L2	0.5	30.6	54.1
0.199607	23.3	1000.000	9.000	On	L2	0.5	30.1	53.4
0.275346	16.7	1000.000	9.000	On	L2	0.4	34.0	50.7
0.367139	15.5	1000.000	9.000	On	L2	0.4	32.9	48.4
0.458298	11.6	1000.000	9.000	On	L2	0.4	35.1	46.7
0.551881	9.8	1000.000	9.000	On	L2	0.4	36.2	46.0
0.641099	10.3	1000.000	9.000	On	L2	0.4	35.7	46.0
0.734395	7.7	1000.000	9.000	On	L2	0.5	38.3	46.0
0.918575	6.9	1000.000	9.000	On	L2	0.5	39.1	46.0
1.282402	2.6	1000.000	9.000	On	L2	0.5	43.4	46.0
2.018352	1.4	1000.000	9.000	On	L2	0.5	44.6	46.0
26.834676	8.3	1000.000	9.000	On	L2	0.9	41.7	50.0
27.267048	12.1	1000.000	9.000	On	L2	0.9	37.9	50.0
29.832222	12.5	1000.000	9.000	On	L2	0.9	37.5	50.0

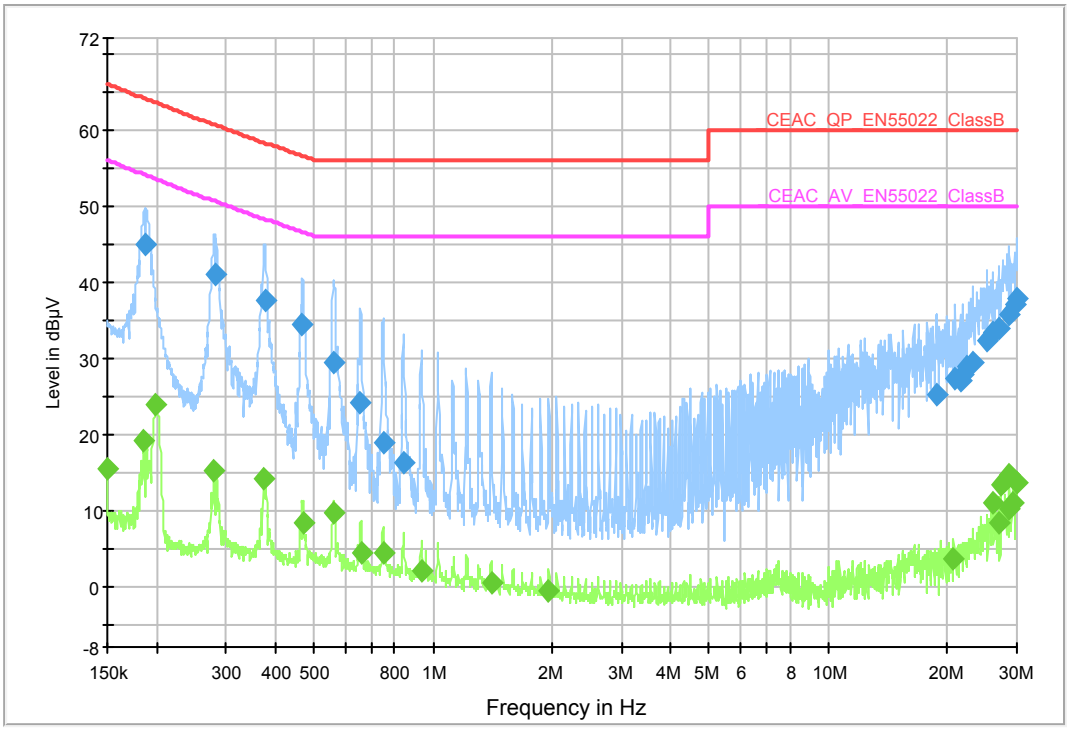


Figure 7: AC Conducted Emissions - Line 1 240VAC/60Hz (Tx Mode)

Table 15: Quasi-Peak Data - AC Conducted Emissions - Line 1 240VAC/60Hz (Tx Mode)

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.187619	44.9	1000.000	9.000	On	L1	0.5	19.1	64.0
0.280342	41.0	1000.000	9.000	On	L1	0.4	19.6	60.6
0.375297	37.5	1000.000	9.000	On	L1	0.4	20.7	58.2
0.467547	34.4	1000.000	9.000	On	L1	0.4	22.1	56.5
0.561895	29.5	1000.000	9.000	On	L1	0.4	26.5	56.0
0.655345	24.0	1000.000	9.000	On	L1	0.4	32.0	56.0
0.749216	18.9	1000.000	9.000	On	L1	0.5	37.1	56.0
20.987785	27.1	1000.000	9.000	On	L1	0.8	32.9	60.0
21.540064	27.1	1000.000	9.000	On	L1	0.8	32.9	60.0
21.843440	27.8	1000.000	9.000	On	L1	0.8	32.2	60.0
22.373488	28.7	1000.000	9.000	On	L1	0.8	31.3	60.0
23.239159	29.2	1000.000	9.000	On	L1	0.8	30.8	60.0
25.122424	32.3	1000.000	9.000	On	L1	0.9	27.7	60.0
26.094456	33.4	1000.000	9.000	On	L1	0.9	26.6	60.0
26.996006	33.8	1000.000	9.000	On	L1	0.9	26.2	60.0
28.720956	35.7	1000.000	9.000	On	L1	0.9	24.3	60.0
29.535681	36.9	1000.000	9.000	On	L1	0.9	23.1	60.0
29.951670	37.9	1000.000	9.000	On	L1	0.9	22.1	60.0

Table 16: Average Data - AC Conducted Emissions - Line 1 240VAC/60Hz (Tx Mode)

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	15.3	1000.000	9.000	On	L1	0.6	40.7	56.0
0.186125	19.0	1000.000	9.000	On	L1	0.5	35.1	54.1
0.199607	23.8	1000.000	9.000	On	L1	0.5	29.6	53.4
0.279782	15.1	1000.000	9.000	On	L1	0.4	35.5	50.6
0.373801	14.2	1000.000	9.000	On	L1	0.4	34.0	48.2
0.469419	8.4	1000.000	9.000	On	L1	0.4	38.1	46.5
0.560773	9.7	1000.000	9.000	On	L1	0.4	36.3	46.0
0.935242	2.1	1000.000	9.000	On	L1	0.5	43.9	46.0
25.990391	10.9	1000.000	9.000	On	L1	0.9	39.1	50.0
26.996006	8.4	1000.000	9.000	On	L1	0.9	41.6	50.0
28.549317	14.5	1000.000	9.000	On	L1	0.9	35.5	50.0
28.720956	10.1	1000.000	9.000	On	L1	0.9	39.9	50.0
29.359173	10.9	1000.000	9.000	On	L1	0.9	39.1	50.0
29.832222	13.5	1000.000	9.000	On	L1	0.9	36.5	50.0

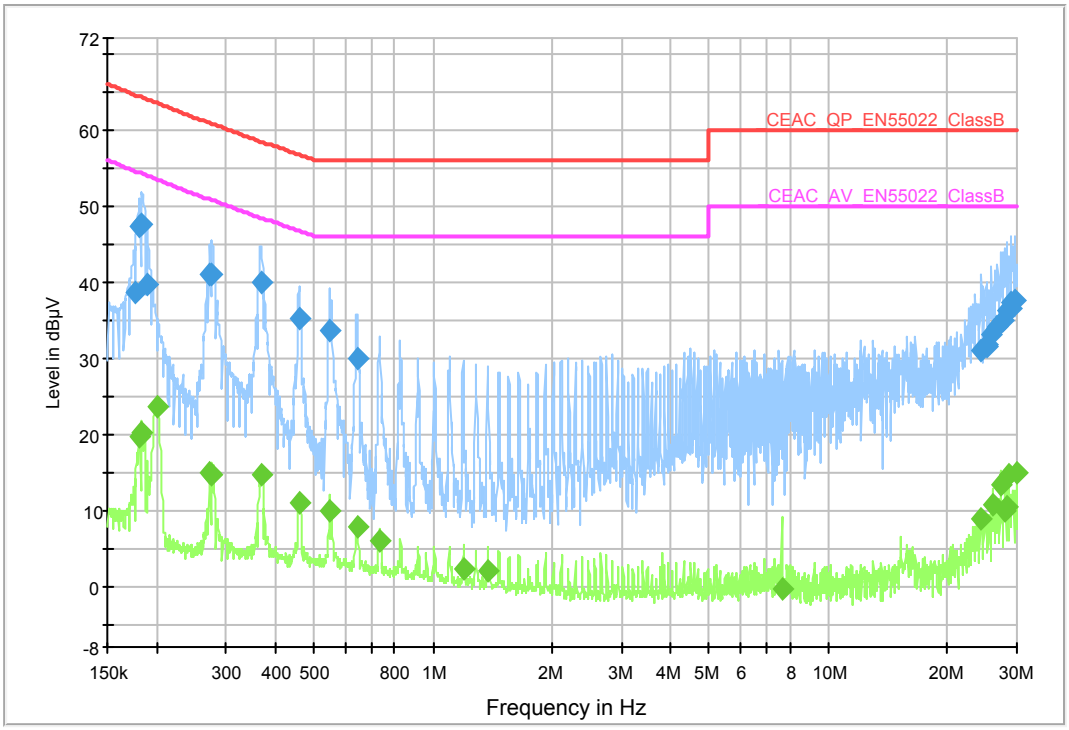


Figure 8: AC Conducted Emissions - Line 2 240VAC/60Hz (Tx Mode)

Table 17: Quasi-Peak Data - AC Conducted Emissions - Line 2 240VAC/60Hz (Tx Mode)

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.175999	38.5	1000.000	9.000	On	L2	0.5	26.1	64.6
0.181716	47.3	1000.000	9.000	On	L2	0.5	17.0	64.3
0.183540	47.5	1000.000	9.000	On	L2	0.5	16.7	64.2
0.188747	39.7	1000.000	9.000	On	L2	0.5	24.3	64.0
0.273154	41.0	1000.000	9.000	On	L2	0.4	19.8	60.8
0.274796	40.9	1000.000	9.000	On	L2	0.4	19.9	60.8
0.367139	40.0	1000.000	9.000	On	L2	0.4	18.4	58.4
0.458298	35.2	1000.000	9.000	On	L2	0.4	21.5	56.7
0.549680	33.5	1000.000	9.000	On	L2	0.4	22.5	56.0
0.642381	29.8	1000.000	9.000	On	L2	0.4	26.2	56.0
25.072280	31.4	1000.000	9.000	On	L2	0.9	28.6	60.0
25.223014	31.8	1000.000	9.000	On	L2	0.9	28.2	60.0
25.886740	33.1	1000.000	9.000	On	L2	0.9	26.9	60.0
26.834676	34.0	1000.000	9.000	On	L2	0.9	26.0	60.0
27.540812	34.9	1000.000	9.000	On	L2	0.9	25.1	60.0
28.378704	36.3	1000.000	9.000	On	L2	0.9	23.7	60.0
28.893626	36.5	1000.000	9.000	On	L2	0.9	23.5	60.0
29.125470	37.2	1000.000	9.000	On	L2	0.9	22.8	60.0

29.594752	**37.4**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**22.6**	**60.0**

Table 18: Average Data - AC Conducted Emissions - Line 2 240VAC/60Hz (Tx Mode)

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.180630	**19.6**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**34.7**	**54.3**
0.183907	**20.1**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**34.1**	**54.2**
0.200406	**23.5**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**29.9**	**53.4**
0.273154	**14.8**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**36.0**	**50.8**
0.274796	**14.7**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**36.0**	**50.7**
0.366406	**14.6**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**33.8**	**48.4**
0.458298	**10.9**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**35.8**	**46.7**
0.549680	**10.0**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**36.0**	**46.0**
0.642381	**7.7**	**1000.000**	**9.000**	**On**	**L2**	**0.4**	**38.3**	**46.0**
0.732929	**6.0**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**40.0**	**46.0**
1.193400	**2.2**	**1000.000**	**9.000**	**On**	**L2**	**0.5**	**43.8**	**46.0**
24.283444	**8.8**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**41.2**	**50.0**
25.990391	**10.6**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**39.4**	**50.0**
27.267048	**13.4**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**36.6**	**50.0**
28.378704	**10.4**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**39.6**	**50.0**
28.549317	**14.6**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**35.4**	**50.0**
30.000000	**14.9**	**1000.000**	**9.000**	**On**	**L2**	**0.9**	**35.1**	**50.0**

Part 5 - Output Power

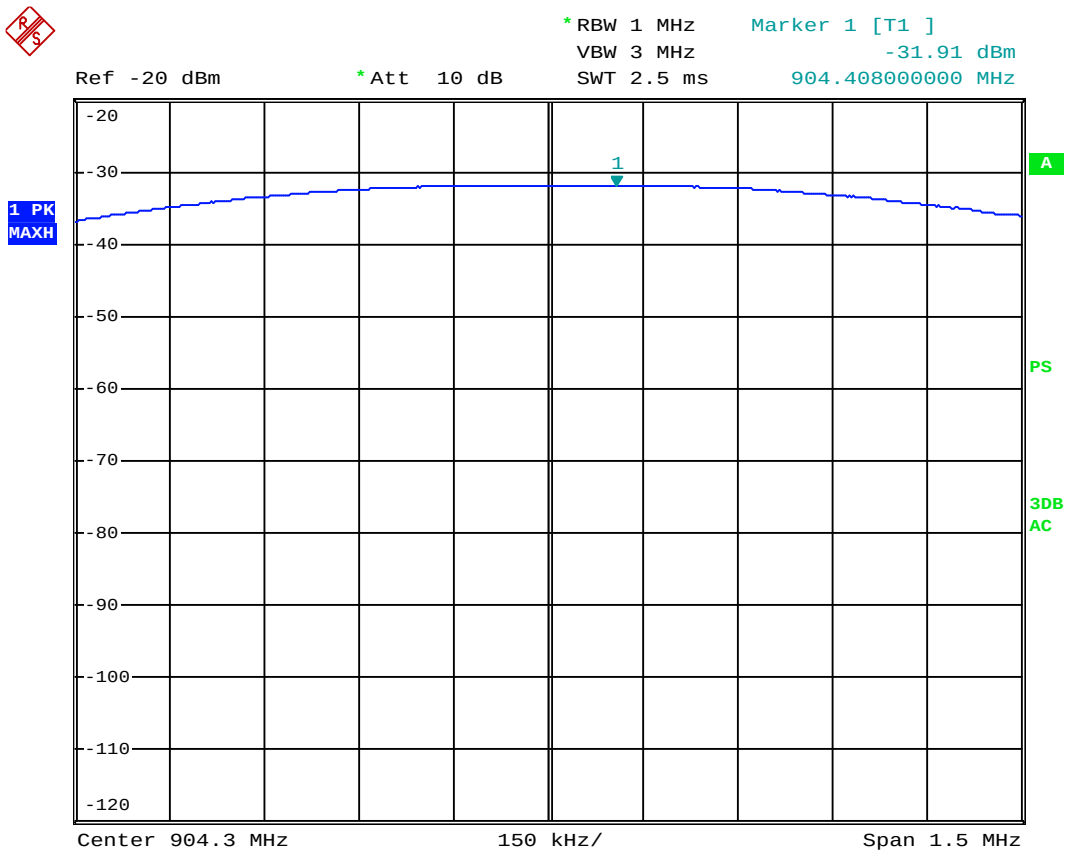


Figure 9: Output Power at LOW Frequency

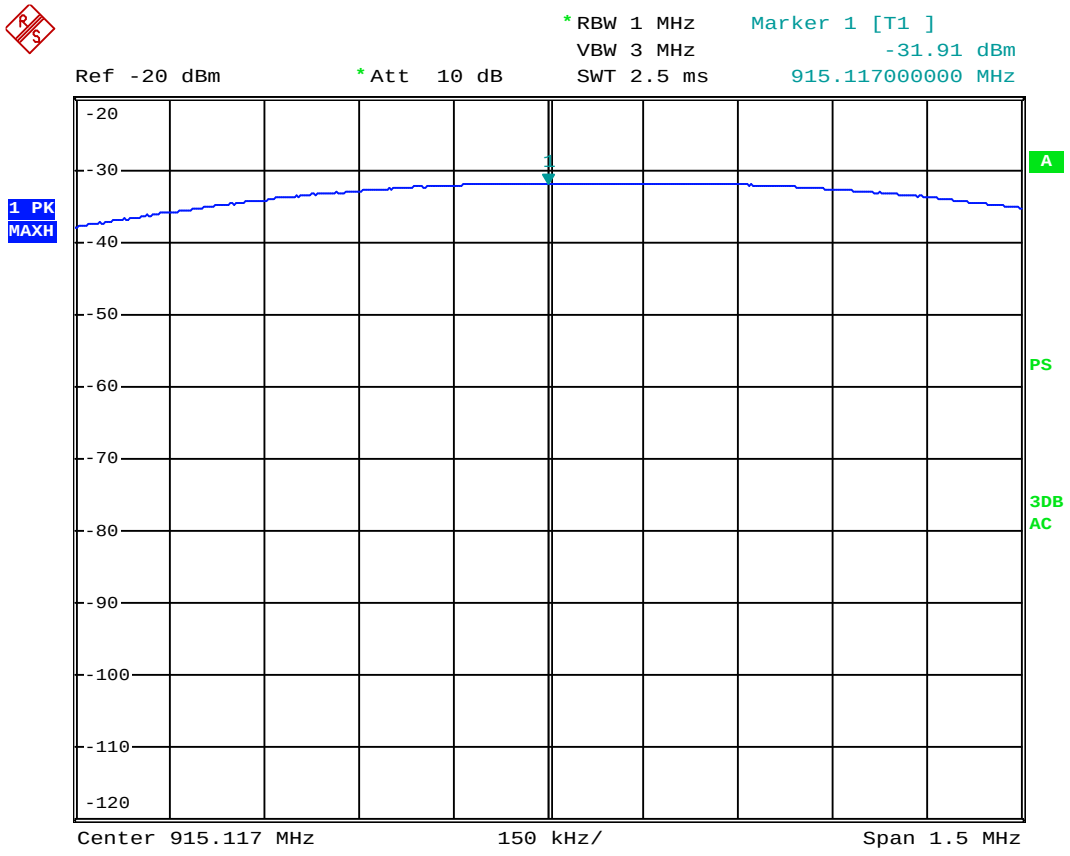


Figure 10: Output Power at MID Frequency

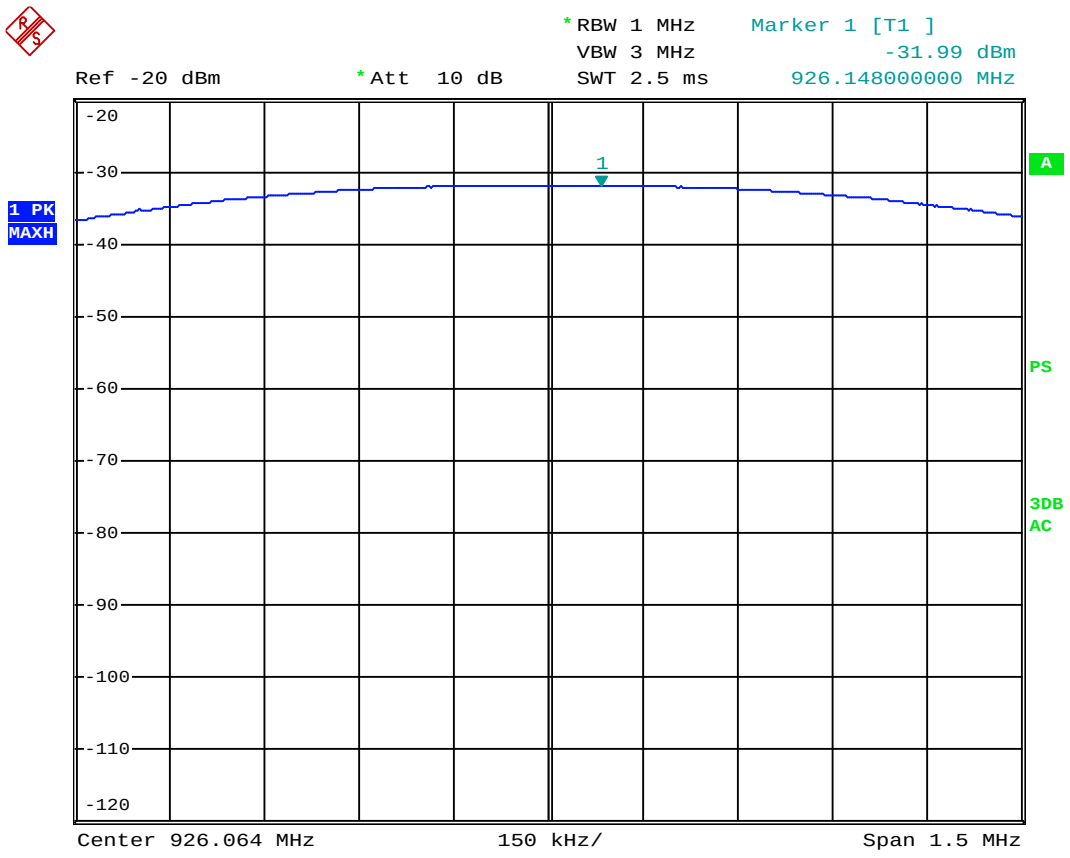
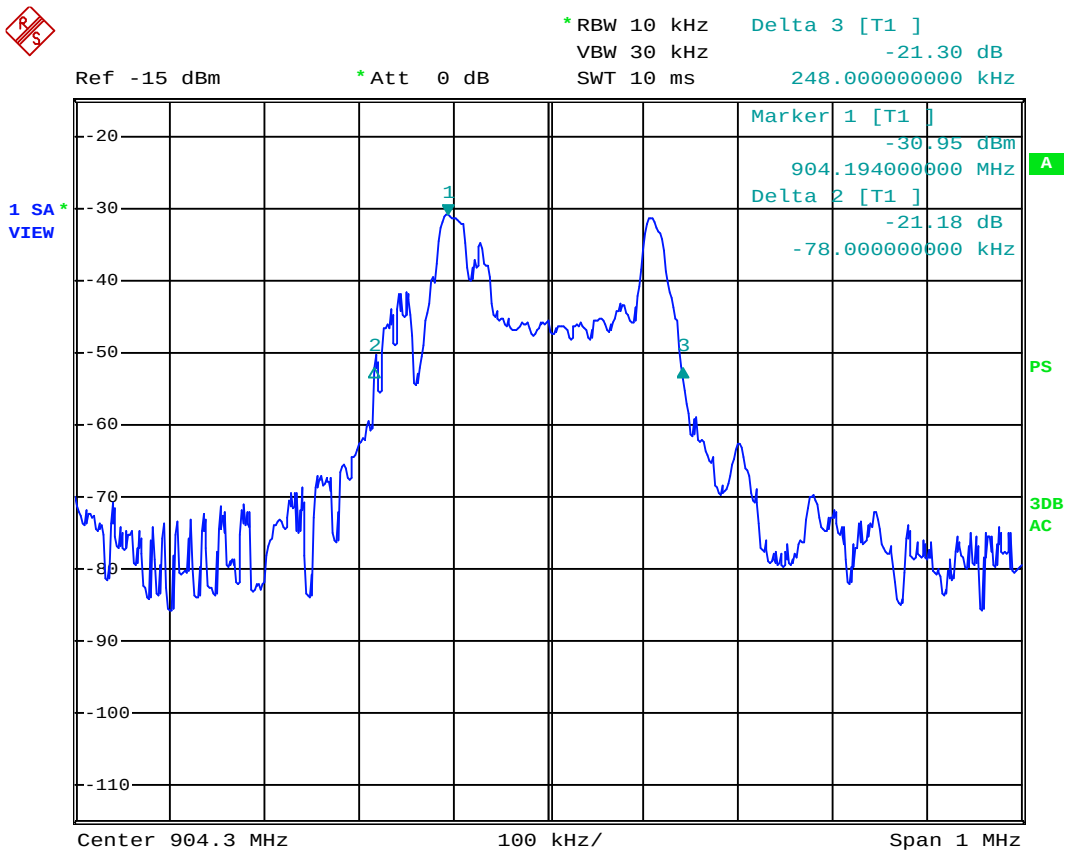


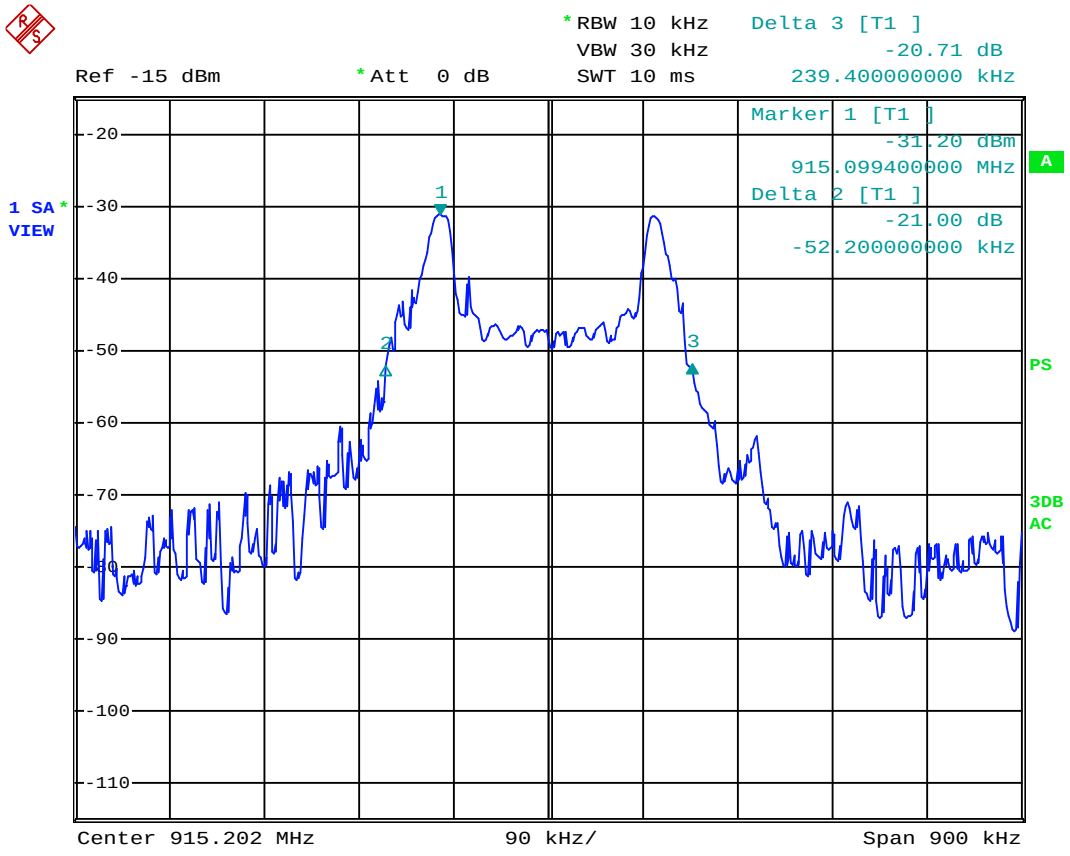
Figure 11: Output Power at HIGH Frequency

Part 6 - 20 dB Bandwidth



Date: 6.DEC.2013 12:01:55

Figure 12: 20dB Bandwidth at LOW Frequency – 326 kHz



Date: 6.DEC.2013 12:31:07

Figure 13: 20dB Bandwidth at MID Frequency – 291.2 kHz

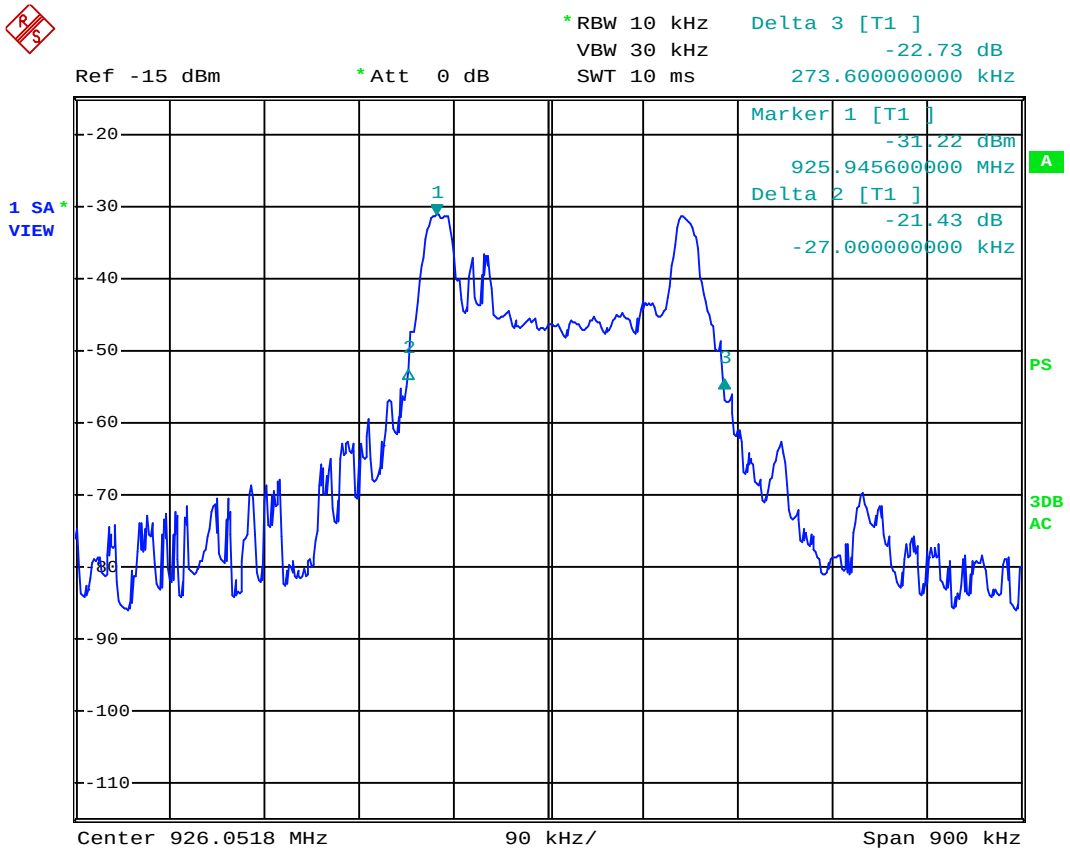
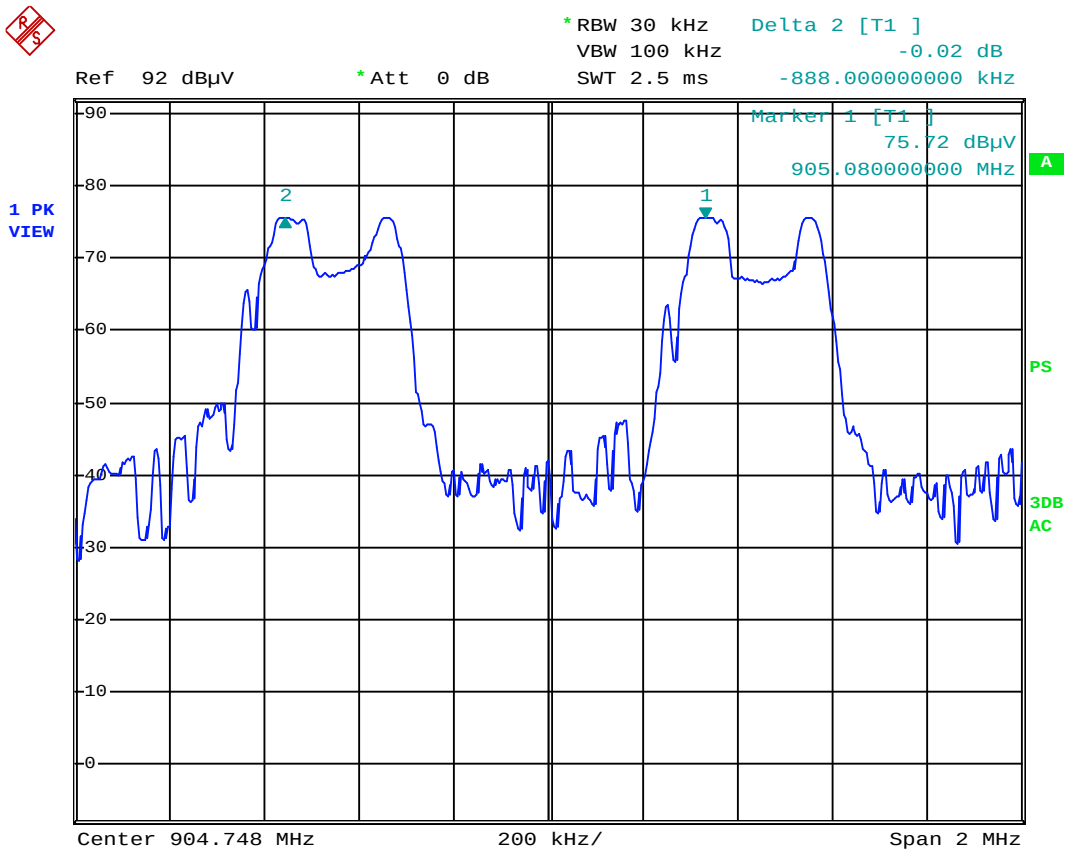


Figure 14: 20dB Bandwidth at HIGH Frequency – 300.6 kHz

Part 7 - Channel Separation



Date: 9.DEC.2013 12:50:17

Figure 15: Channel Separation = 888kHz

Part 8 - Number of Hopping Channels

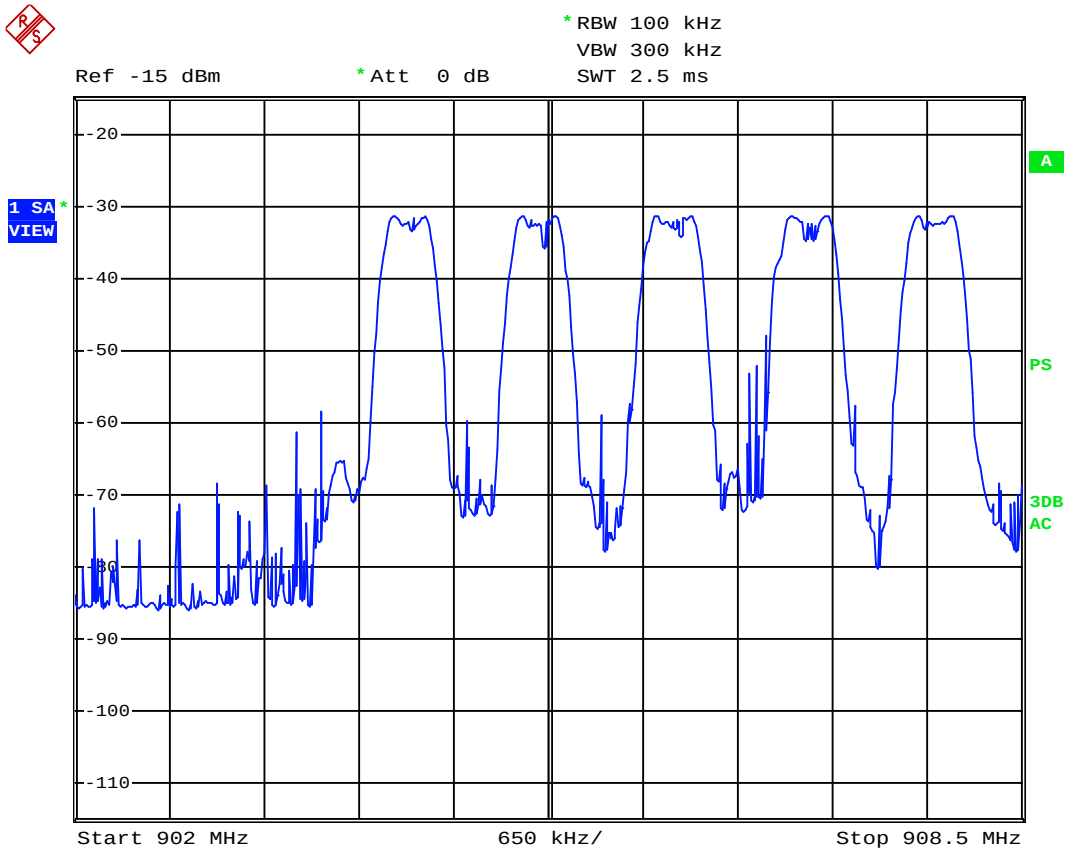
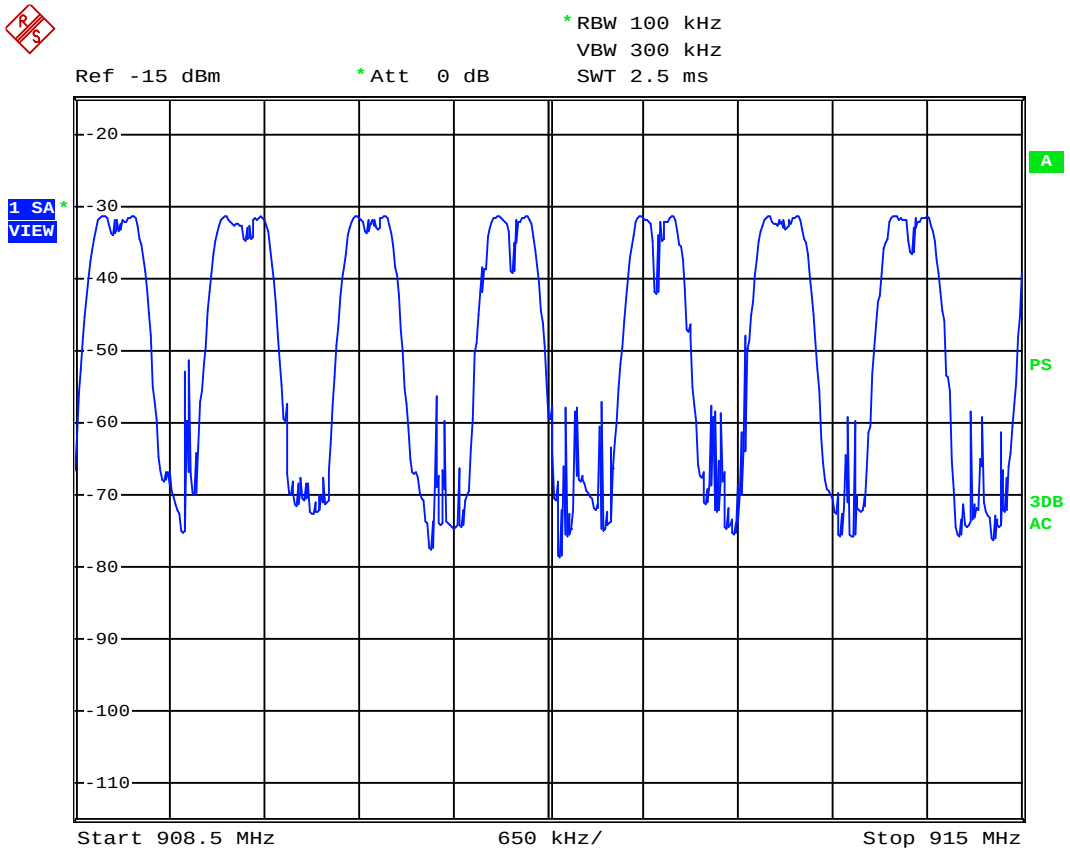
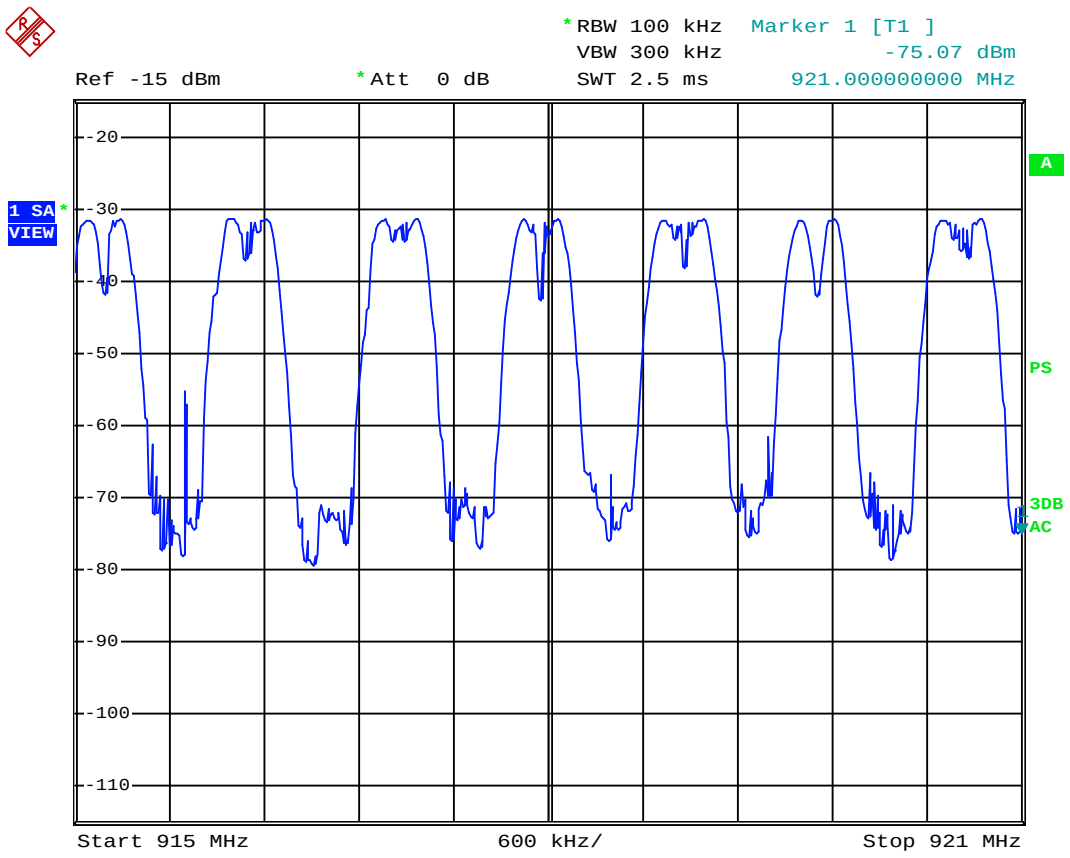


Figure 16: Number of Hopping Frequencies 902MHz to 908.5MHz - 5 Frequencies



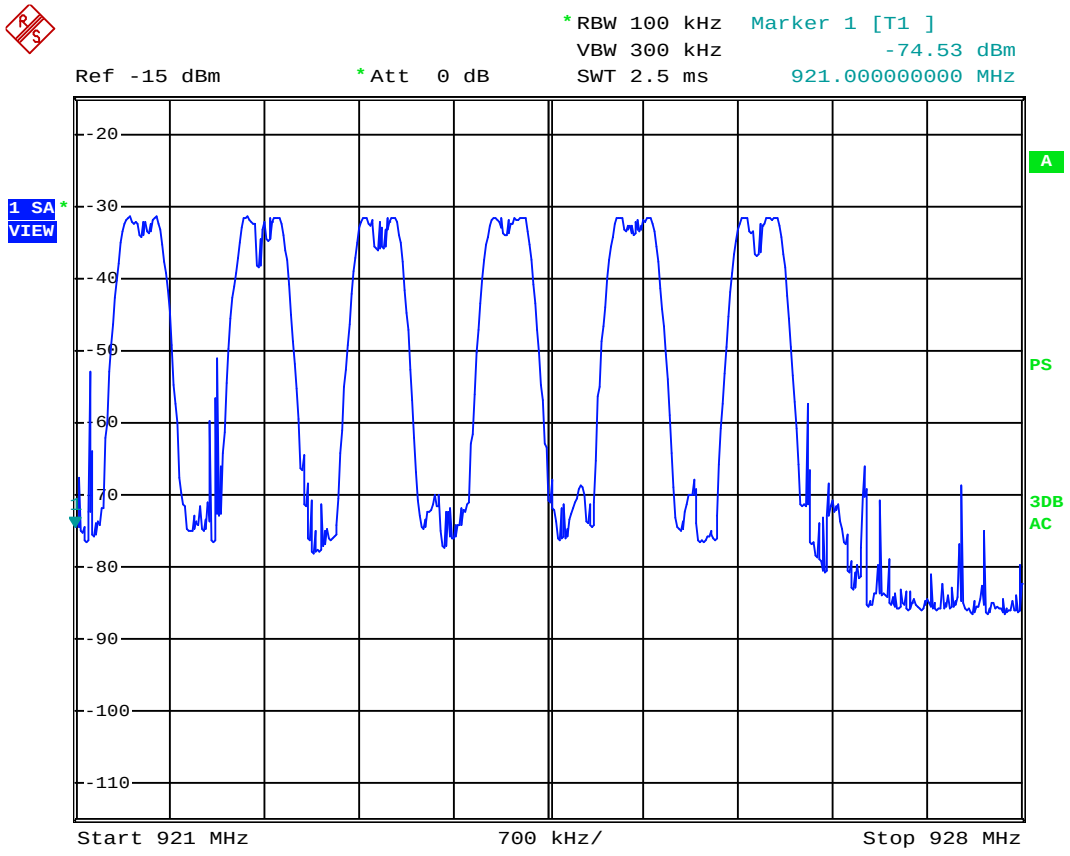
Date: 9.DEC.2013 09:23:40

Figure 17: Number of Hopping Frequencies 908.5MHz to 915MHz - 7 Frequencies



Date: 9.DEC.2013 09:26:50

Figure 18: Number of Hopping Frequencies 915MHz to 921MHz - 7 Frequencies



Date: 9.DEC.2013 09:28:48

Figure 19: Number of Hopping Frequencies 921MHz to 928MHz - 6 Frequencies

Part 9 - Dwell Time and Time of Occupancy

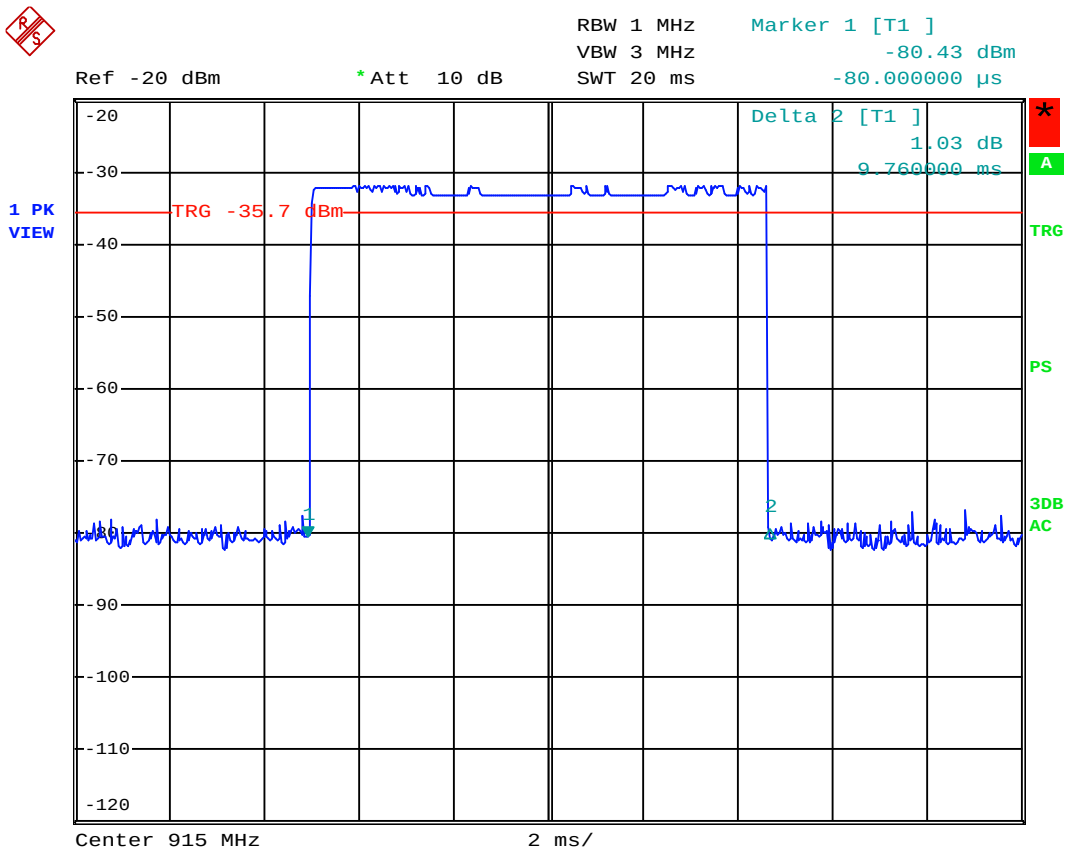
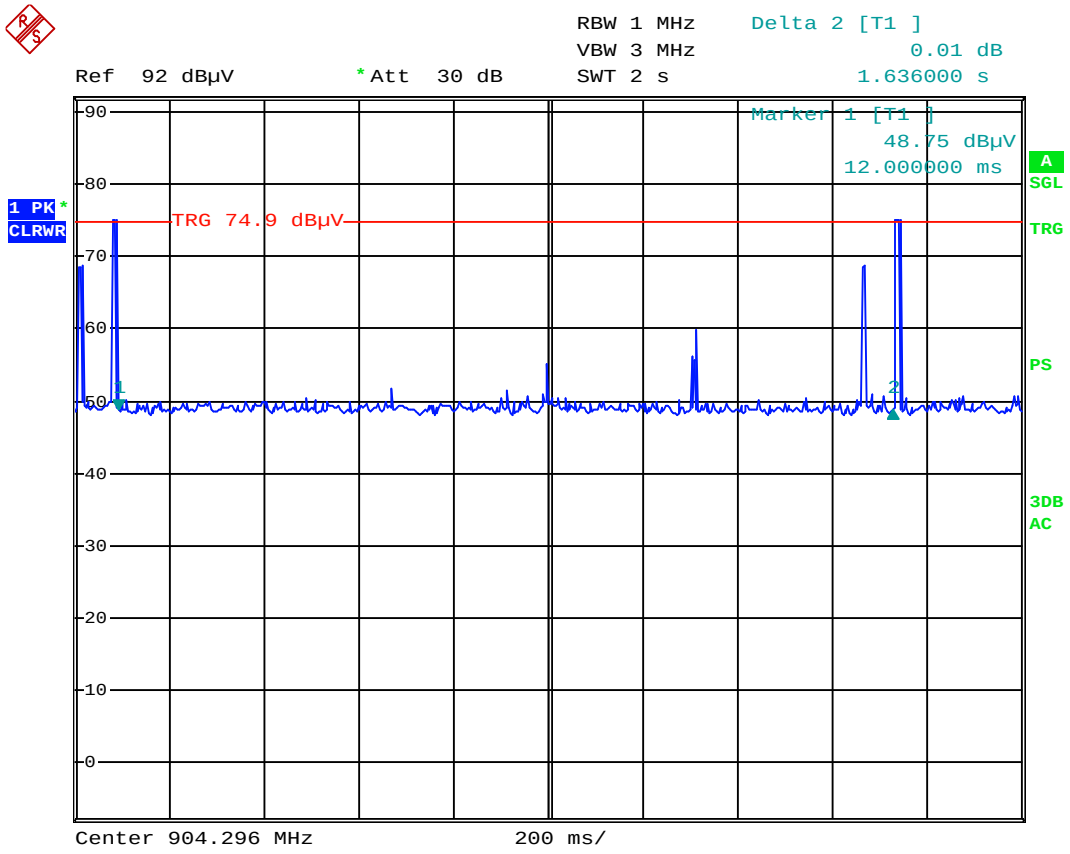


Figure 20: Dwell Time – 9.76ms

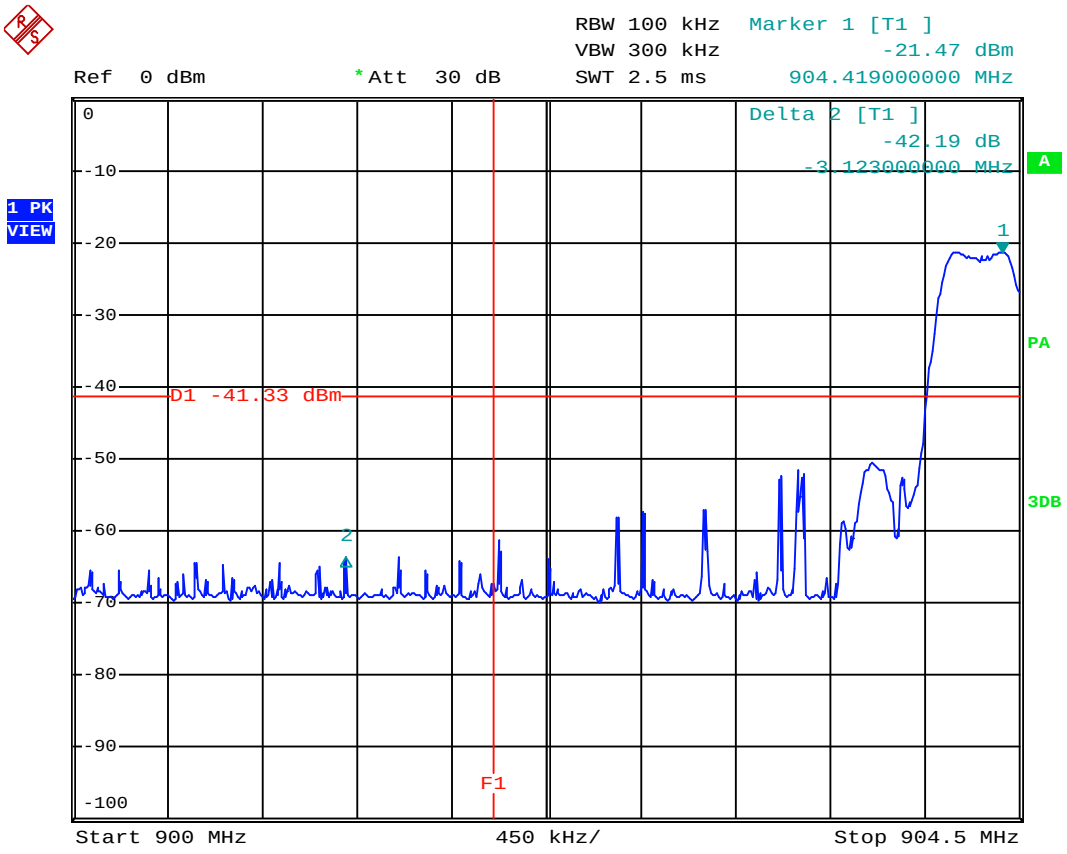


Date: 9.DEC.2013 15:16:32

Figure 21: Time Occupancy Per Frequency

(Time betwen 2 consecutive transmissions on the same frequency is 1.636 Seconds, dwell time per frequency is 9.76ms, therefore occupancy time per frequency within a 10 Second period is 59.66ms)

Part 10 - Channel Bandedge



Date: 23.OCT.2014 20:02:42

Figure 22: Low Channel Bandedge in Hopping Mode operation

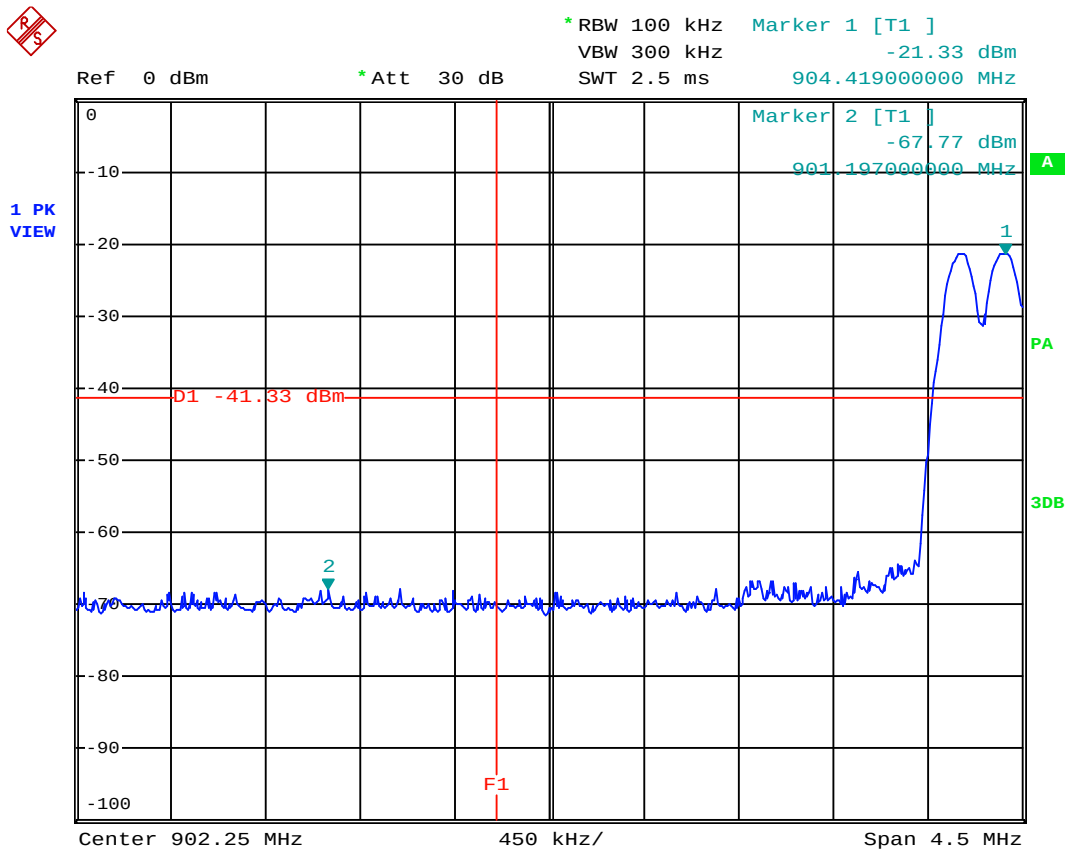
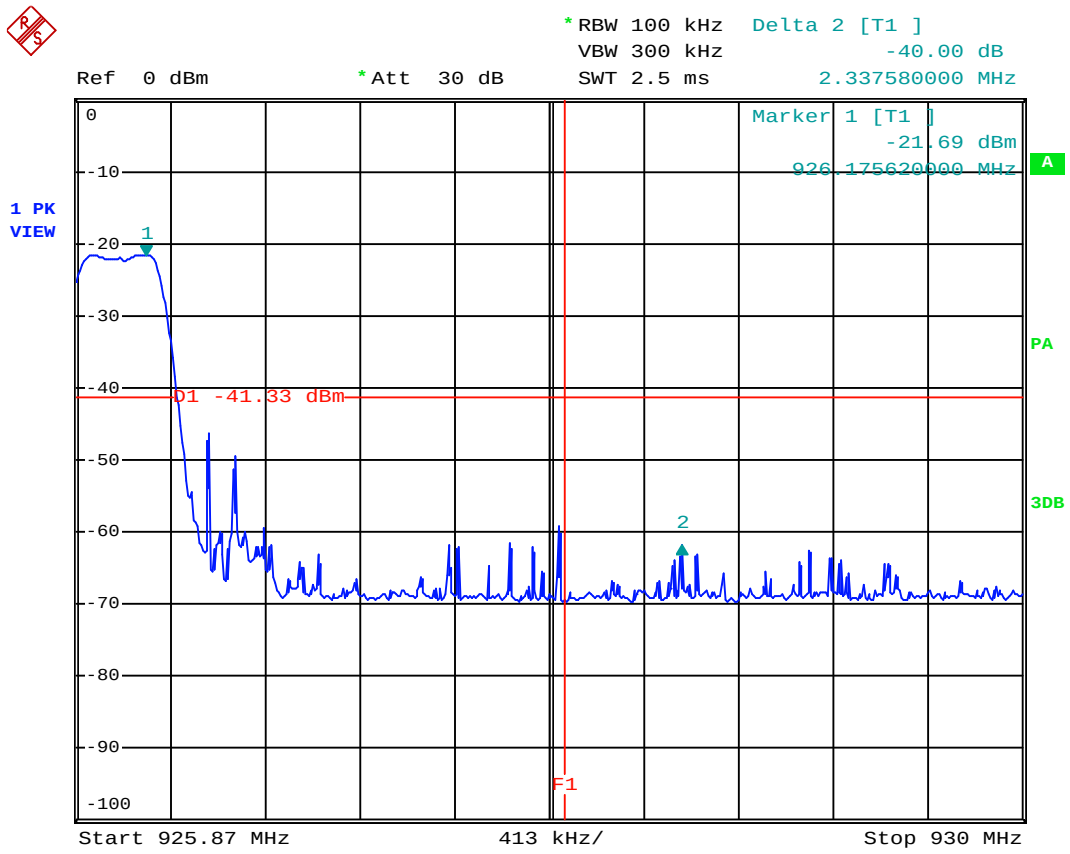
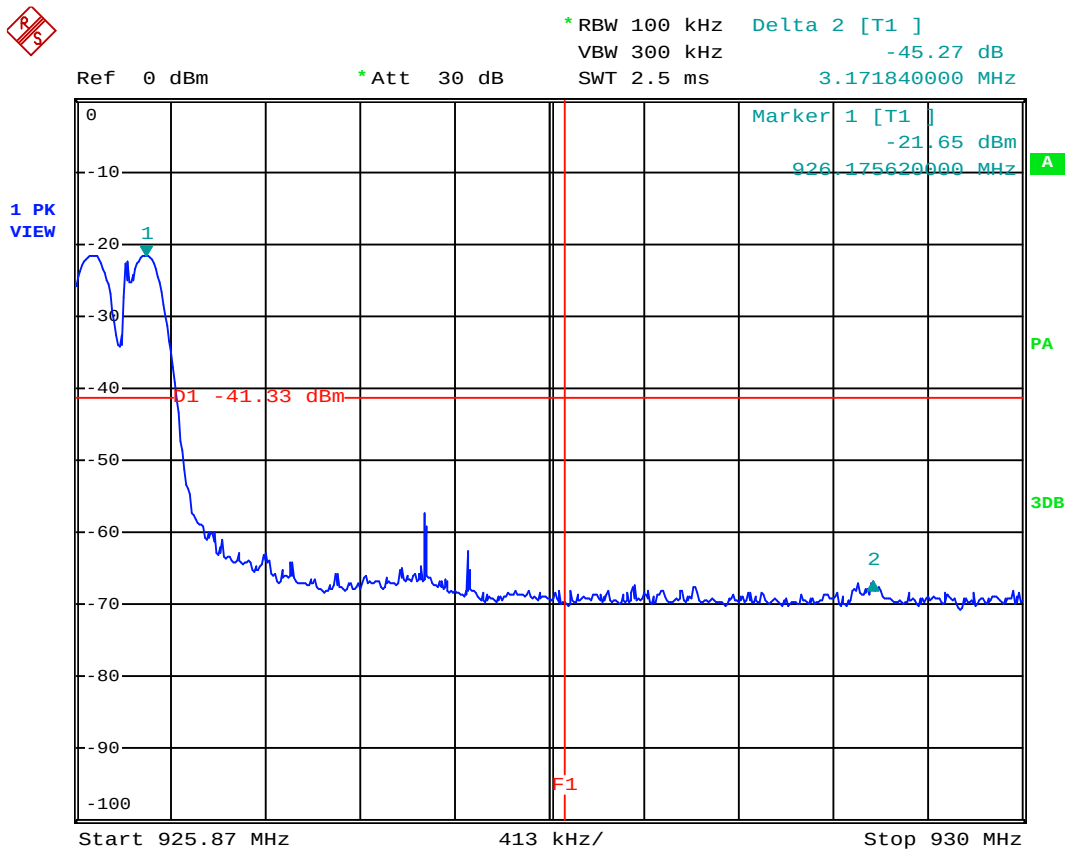


Figure 23: Low Channel Bandedge in Continuous, Non- Hopping Mode operation



Date: 23.OCT.2014 20:15:00

Figure 24: High Channel Bandedge in Hopping Mode Operation



Date: 23.OCT.2014 20:09:35

Figure 25: High Channel Bandedge in Continuous Non-Hopping Mode Operation

Part 11 - Radiated Spurious Emissions

No transmitter Radiated Spurious Emissions were detected 9kHz to 900MHz and above 4GHz.

The EUT worst case "ON" time was measured to be 9.76ms per 100ms. This equates to a duty cycle correction factor of -20.2dB that has been applied to the measured average values in accordance with 15.35(c). In accordance with 15.31(o) Measured Corrected emissions that are 20dB below the permissible value have not been reported.

Table 19a: Harmonics at Low Frequency - Peak

Frequency (MHz)	Measured Corrected Peak (dBuV)	Angle (deg)	Height (cm)	Pol (V/H)	Peak Limit (dBuV)	Delta Lim-Peak (dB)	Restricted Band
1808.8	69.5	161	100	V	79.8	10.3	No
1808.8	59.2	0	110	H	79.1	19.9	No
2713.3	51.5	36	100	V	74	22.5	Yes
2713.3	44.9	0	120	H	74	29.1	Yes
3617.2	46.2	352	100	V	74	27.8	Yes
3617.2	44.8	360	100	H	74	29.2	Yes

Table 20b: Harmonics at Low Frequency - Average

Frequency (MHz)	Measured Corrected Average (dBuV)	Angle (deg)	Height (cm)	Pol (V/H)	Duty Cycle Correction Factor	Final Average (dBuV)	Average Limit (dBuV)	Delta Lim-Avg (dB)	Restricted Band
1808.8	58.79	161	100	V	20.2	38.6	54	15.4	No
1808.8	49.1	0	110	H	20.2	28.9	54	25.1	No
2713.3	41.39	36	100	V	20.2	21.2	54	32.8	Yes
2713.3	33.57	0	120	H	20.2	13.4	54	40.6	Yes
3617.2	36.26	352	100	V	20.2	16.1	54	37.9	Yes
3617.2	35.96	360	100	H	20.2	15.8	54	38.2	Yes

Table 21a: Harmonics at Mid Frequency - Peak

Frequency (MHz)	Measured Corrected Peak (dBuV)	Angle (deg)	Height (cm)	Pol (V/H)	Peak Limit (dBuV)	Delta Lim-Peak (dB)	Restricted Band
1830.42	64.2	40	100	V	79.6	15.4	No
1830.3	58	8	121	H	80.9	22.9	No
2745.31	48.7	115	110	V	74	25.3	Yes
2745.28	45.1	353	110	H	74	28.9	Yes

Table 22b: Harmonics at Mid Frequency - Average

Frequency (MHz)	Measures Corrected Average (dBuV)	Angle (deg)	Height (cm)	Pol (V/H)	Duty Cycle Correction Factor	Final Average (dBuV)	Average Limit (dBuV)	Delta Lim-Avg (dB)	Restricted Band
1830.42	55.37	40	100	V	20.2	35.2	54	18.8	No
1830.3	48.64	8	121	H	20.2	28.4	54	25.6	No
2745.31	38.24	115	110	V	20.2	18.0	54	36.0	Yes
2745.28	33.72	353	110	H	20.2	13.5	54	40.5	Yes

Table 23a: Harmonics at High Frequency - Peak

Frequency (MHz)	Measured Corrected Peak (dBuV)	Angle (deg)	Height (cm)	Pol (V/H)	Peak Limit (dBuV)	Delta Lim-Peak (dB)	Restricted Band
1852.33	62	36	100	V	78.9	16.9	No
1852.25	54.1	69	110	H	79.3	25.2	No
2778.55	46.5	0	100	V	74	27.5	Yes
2778.55	44	352	110	H	74	30	Yes

Table 24b: Harmonics at High Frequency - Average

Frequency (MHz)	Measured Corrected Average (dBuV)	Angle (deg)	Height (cm)	Pol (V/H)	Duty Cycle Correction Factor	Final Average (dBuV)	Average Limit (dBuV)	Delta Lim-Avg (dB)	Restricted Band
1852.33	53.3	36	100	V	20.2	33.1	54	20.9	No
1852.25	44.5	69	110	H	20.2	24.3	54	29.7	No
2778.55	34.93	0	100	V	20.2	14.7	54	39.3	Yes
2778.55	34.08	352	110	H	20.2	11.9	54	40.1	Yes

Note:
1) Delta Lim-Avg(dB)=Corrected Averge Value – Dutycycle correction Factor – Average limit.
2) First harmonics of the Low mid and high frequencies did not fall under restricted bands as defined in 15.205, field strength of the emissions at this frequency(1808,1830 and 1852MHz) was 20dB below the fundamental field strength.

Appendix B: Test Setup Photos

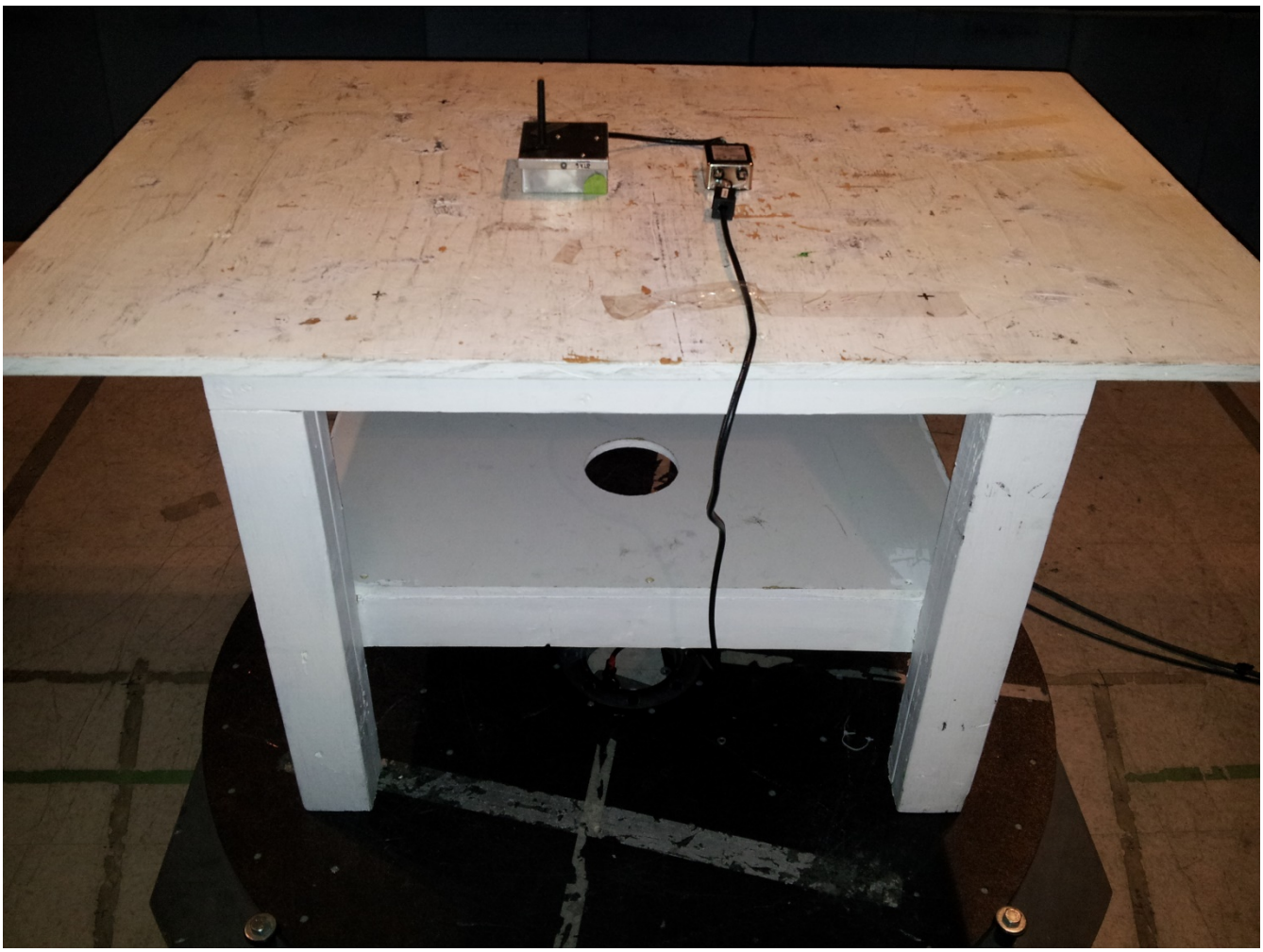


Figure 26: Radiated Emissions Test Setup

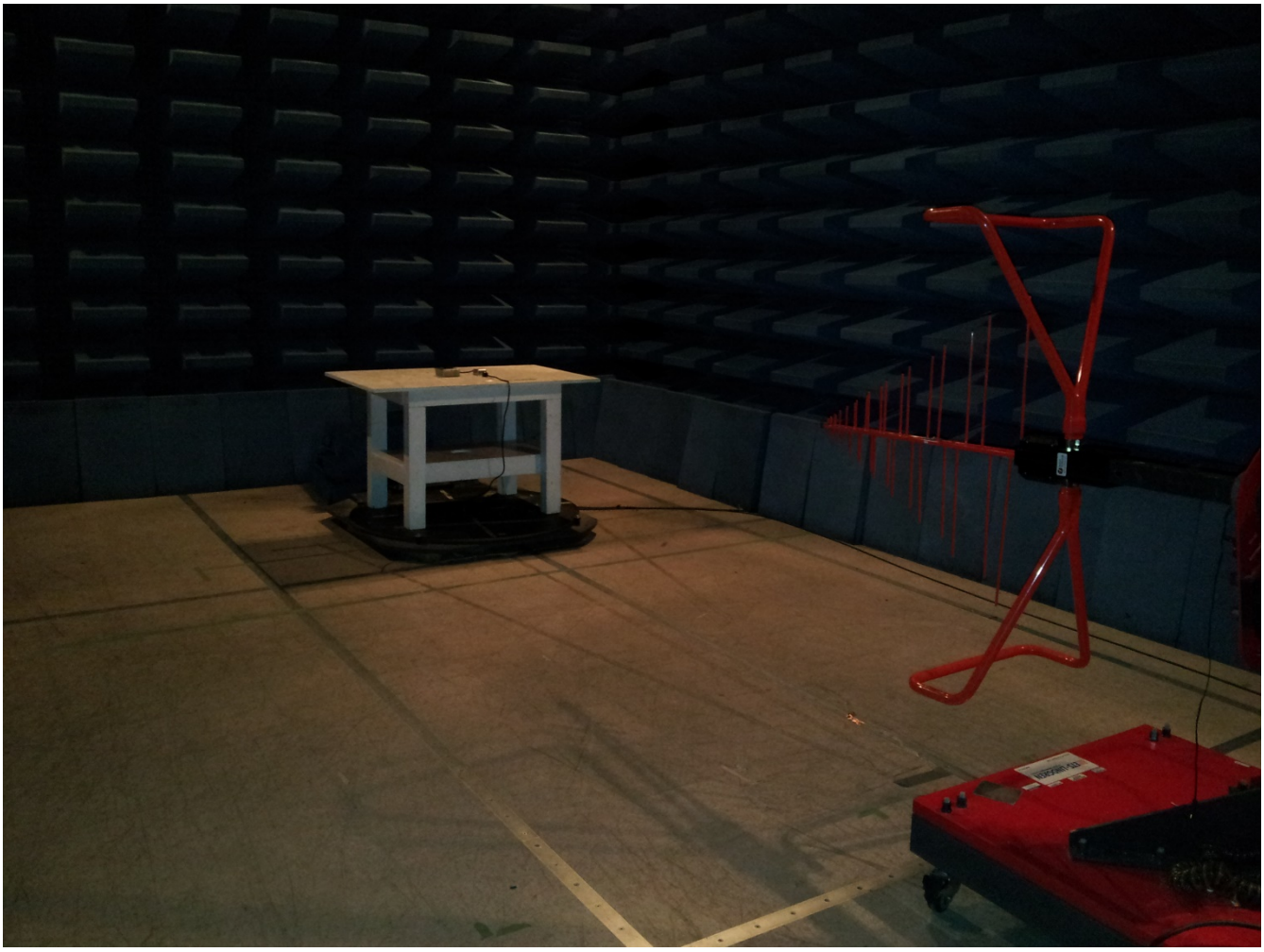


Figure 27:Emissions Test Setup – Intentional / Unintentional Radiated Emissions

Figure 28:Emissions Test Setup – Intentional / Unintentional Radiated Emissions with Ferrite and AC Filter

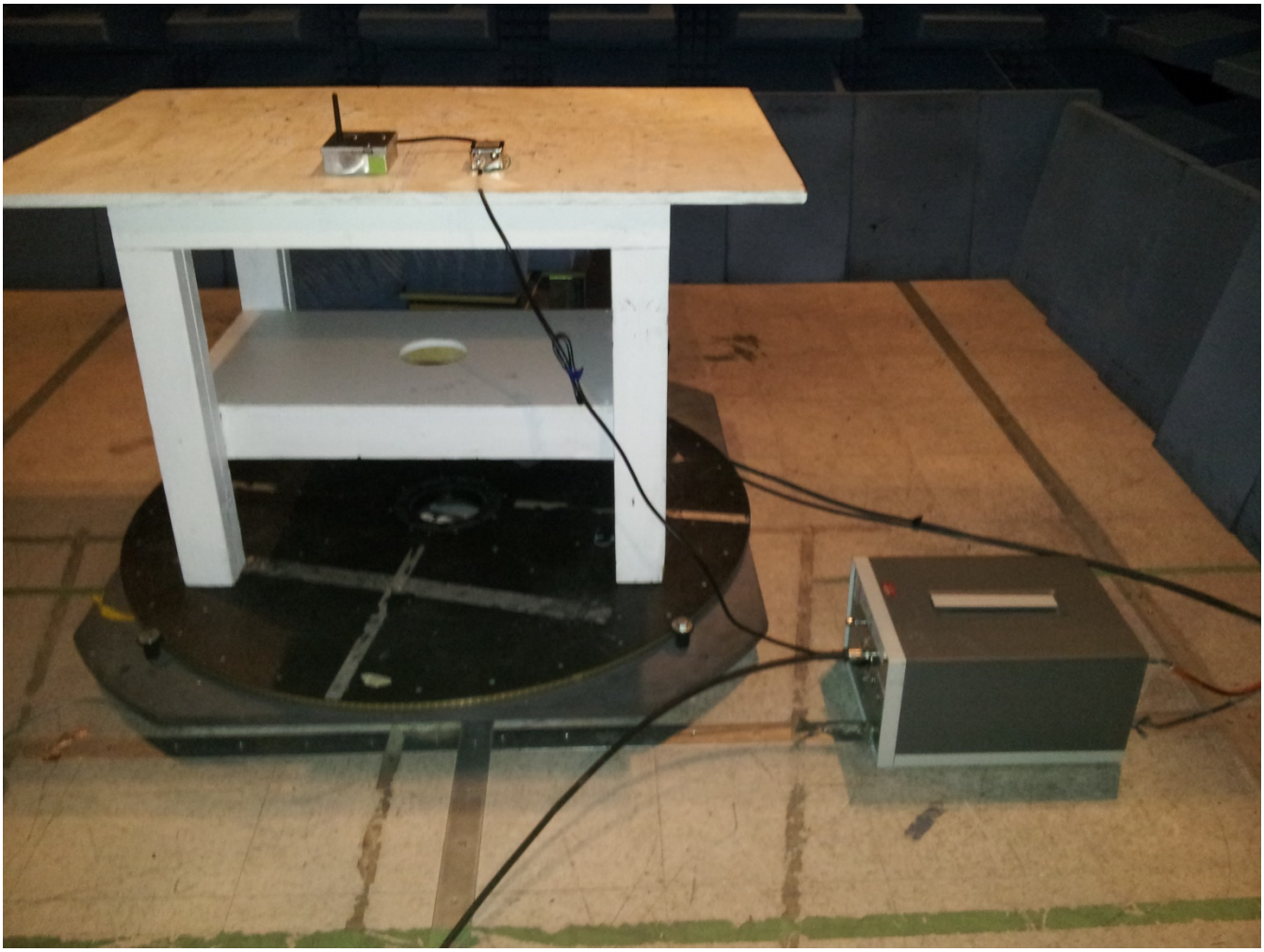


Figure 29:Emissions Test Setup – AC Mains Conducted Emissions

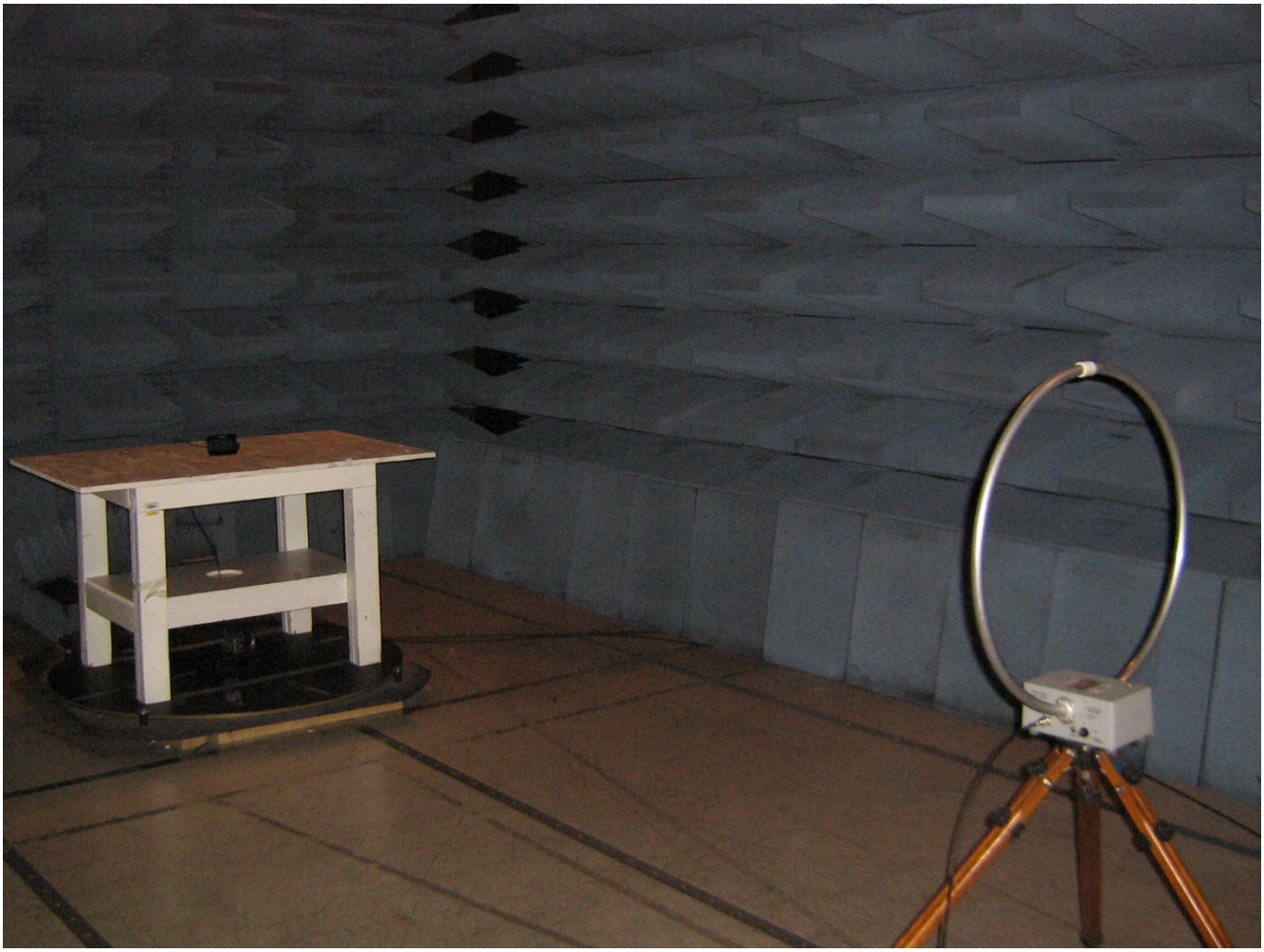


Figure 30: Emissions Test Setup – Spurious Emissions (9kHz to 30MHz)

(Typical Setup. Unit shown is not the EUT)

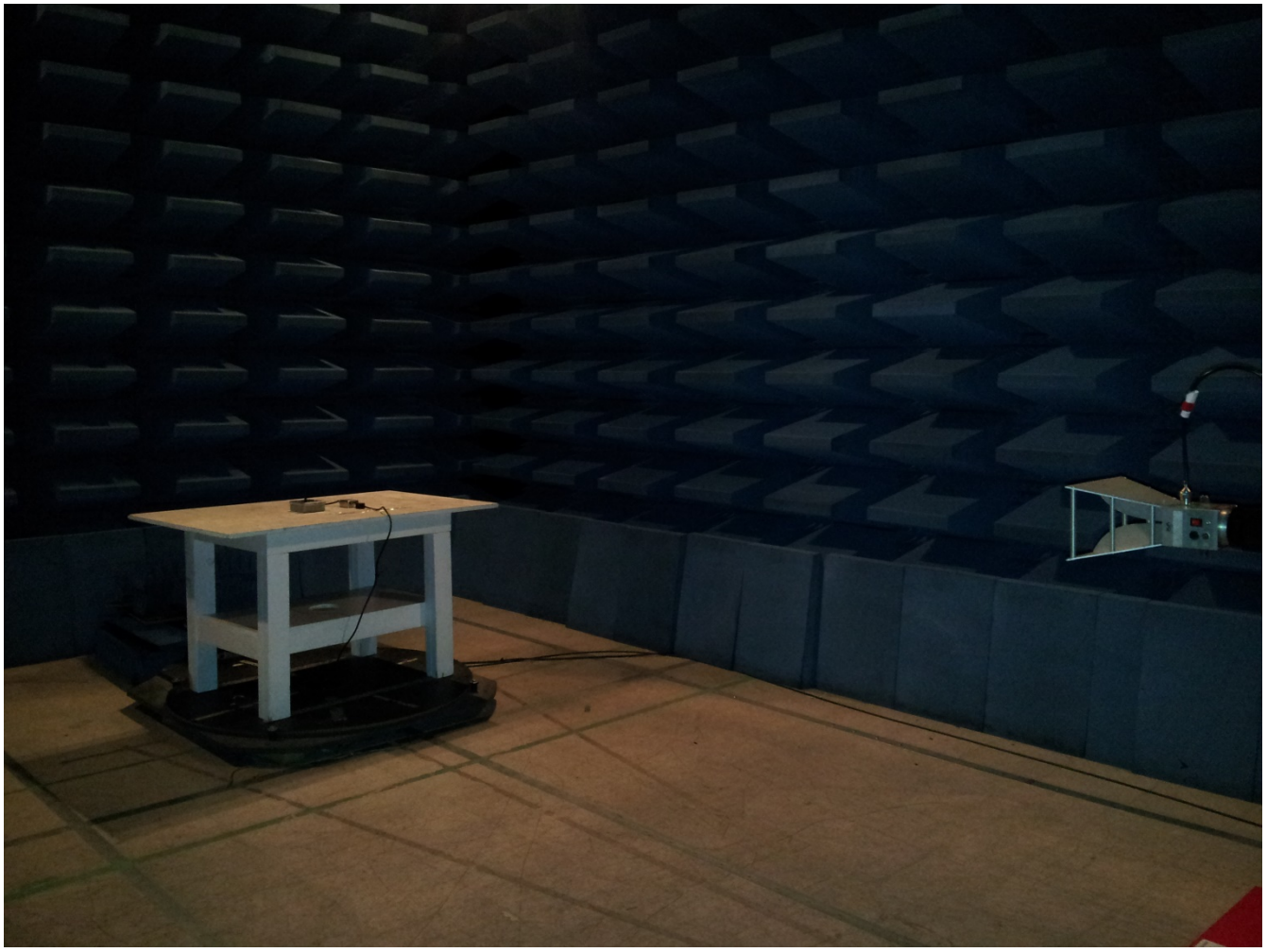


Figure 31: Emissions Test Setup – Intentional Harmonics(1-10GHz)