Prüfbericht-Nr.: *Test Report No.*:	**16081781 001**	**Auftrags-Nr.:** *Order No.*:	**174061986**	Seite 1 von 26 *Page 1 of 26*
Kunden-Referenz-Nr.: *Client Reference No.*:	660876	**Auftragsdatum:** *Order date*:	11 Jan, 2017	

Auftraggeber: *Client*:	Bonaverde GmbH c/o MCB GmbH Rosenthaler Str. 2 10119 Berlin Germany
Prüfgegenstand: *Test item*:	Roast, Grind, Brew Coffee Maker
Bezeichnung / Typ-Nr.: Identification / Type No.:	Berlin
Auftrags-Inhalt: *Order content*:	FCC Part 15C
Prüfgrundlage: *Test specification*:	FCC 47 CFR Part 15 (October 1, 2016) Subpart B section 15.225, 15.207 and 15.209 FCC KDB Publication 447498 D01 v06, ANSI C63.10:2013 RSS 210 Issue 9, RSS-102 Issue 5

Wareneingangsdatum: *Date of receipt*:	02 Mar, 2017
Prüfmuster-Nr.: *Test sample No.*:	174061986-001
Prüfzeitraum: *Testing period*:	Refer to test report.
Ort der Prüfung: *Place of testing*:	TÜV Rheinland (Guangdong) Ltd.
Prüflaboratorium: *Testing laboratory*:	TÜV Rheinland (Guangdong) Ltd.
Prüfergebnis*: *Test result**:	Pass

geprüft von / *tested by*: Amy Wang

16 May, 2017 Amy Wang / Project Manager

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

kontrolliert von / *reviewed by*: Max Y. C. Yao

16 May, 2017 Max Y. C. Yao/ / Department Manager

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

Sonstiges / *Other*:
FCC ID: 2ALZRBONAVERDEBER

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT
RESULT: Passed

5.1.2 FIELD STRENGTH OF FUNDAMENTAL
RESULT: Passed

5.1.3 FREQUENCY STABILITY
RESULT: Passed

5.1.4 BANDWIDTH
RESULT: Passed

5.1.5 SPURIOUS EMISSION
RESULT: Passed

5.2.1 MAINS CONDUCTED EMISSIONS
RESULT: Passed

6.1.1 ELECTROMAGNETIC FIELDS
RESULT: Passed

Contents

1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:
Appendix 1: Test Result of Radiated Emissions

Test Specifications
The following standards were applied (in bold: product standards, otherwise: basic standards).

Table 1: Applied Standard and Test Levels

Radio
FCC 47 CFR Part 15 (October 1, 2016) Subpart B section 15.225, 15.207 and 15.209 FCC KDB Publication 447498 D01 v06, ANSI C63.10:2013

2. Test Sites

2.1 Test Facilities

Shenzhen Huatongwei International Inspection Co., Ltd
Bldg3, Hongfa Hi-tech Industrial Park, Genyu Road, Hongfa Hi-tech Industrial Park, Shenzhen, China

FCC-Registration No.: 317478
IC-Registration No.: 5377A&5377B.

2.2 List of Test and Measurement Instruments

Table 2: List of Test and Measurement Equipment

Output Power(Conducted) &Occupied Bandwidth&Emission Bandwidth&Band Edge Compliance&Conducted Spurious Emission						
No.	Equipment	Manufacturer	Model No.	SerialNo.	Last Cal.	Calibrated Interval
1	UNIVERSAL RADIO COMMUNICATION	Rohde&Schwarz	CMU200	112012	11/13/2016	1 Year
2	WIDEB.RADIO COMM.TESRER	Rohde&Schwarz	CMW500	1201.0002K 50	11/13/2016	1 Year
3	Spectrum Analyzer	Rohde&Schwarz	FSU26	201141	11/13/2016	1 Year
4	Splitter	Mini-Circuit	ZAPD-4	400059	11/13/2016	1 Year

Output Power (Radiated) &Radiated Spurious Emission						
No.	Equipment	Manufacturer	Model No.	SerialNo.	Last Cal.	Calibrated Interval
1	UNIVERSAL RADIO COMMUNICATION	Rohde&Schwarz	CMU200	112012	11/13/2016	1 Year
2	Spectrum Analyzer	Rohde&Schwarz	FSU26	201141	11/13/2016	1 Year
3	HORNANTENNA	ShwarzBeck	9120D	1012	11/13/2016	1 Year
4	HORNANTENNA	ShwarzBeck	9120D	1011	11/13/2016	1 Year
5	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	11/13/2016	1 Year
6	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	539	11/13/2016	1 Year
7	TURNTABLE	MATURO	TT2.0	----	N/A	1 Year
8	ANTENNA MAST	MATURO	TAM-4.0-P	----	N/A	1 Year
9	EMI Test Software	Audix	E3	N/A	N/A	1 Year
10	EMI Test Receiver	Rohde&Schwarz	ESIB 26	100009	11/13/2016	1 Year
11	RF Test Panel	Rohde&Schwarz	TS / RSP	335015/ 0017	11/13/2016	1 Year
12	High pass filter	Compliance Direction systems	BSU-6	34202	11/13/2016	1 Year
13	Splitter	Mini-Circuit	ZAPD-4	400059	11/13/2016	1 Year
14	Horn Antenna	SCHWARZBECK	BBHA9170	25841	11/13/2016	1 Year
15	Horn Antenna	SCHWARZBECK	BBHA9170	25842	11/13/2016	1 Year
16	Preamplifier	ShwarzBeck	BBV 9718	BBV 9718	11/13/2016	1 Year
17	Broadband Preamplifier	ShwarzBeck	BBV743	9743-0079	11/13/2016	1 Year
18	Signal Generator	Rohde&Schwarz	SMF100A	101932	11/13/2016	1 Year
19	Amplifer	Compliance Direction systems	PAP1-4060	120	11/13/2016	1 Year
20	TURNTABLE	ETS	2088	2149	11/13/2016	1 Year
21	ANTENNA MAST	ETS	2075	2346	11/13/2016	1 Year
22	HORNANTENNA	Rohde&Schwarz	HF906	100068	11/13/2016	1 Year
23	HORNANTENNA	Rohde&Schwarz	HF906	100039	11/13/2016	1 Year

Output Power (Radiated) &Radiated Spurious Emission						
No.	Equipment	Manufacturer	Model No.	SerialNo.	Last Cal.	Calibrated Interval
24	WIDEB.RADIO COMM.TESRER	R&S	CMW500	1201.0002K50	11/13/2016	1 Year

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements are ±3dB.

Table 3: Emission Measurement Uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	±1.5%
RF Output Power, Conducted	±0.8dB
Power Spectral Density, Conducted	±0.8dB
Unwanted Emission, Conducted	±1.4dB
All Emissions, Radiated	±3.3dB
Temperature	±0.8°C
Humidity	±3%
DC and Low Frequency Voltages	±2.5%
Time	±1%
Duty Cycle	±3%
Conducted Emission	3.6 dB

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a Coffee Maker working at 13.56 MHz.
For details refer to the User Guide, Data Sheet and Circuit Diagram.

3.2 Ratings and System Details

Table 4: Basic Information of EUT

Item	EUT information
Kind of Equipment	Coffee Maker
Type Designation	Berlin
Brand Name	Bonaverde
FCC ID	2ALZRBONAVERDEBER

Table 5: Technical Specification of EUT

Technical Specification	Value
Operating Frequency	13.56 MHz
Operation Voltage	AC 120V, 60Hz
Modulation	CW
Antenna type	Internal Antenna
Device type	Portable device

3.3 Independent Operation Modes

Basic operation modes are:
A. Transmitting

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum emission level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Setup for testing: Test samples are provided with a digital interface which makes it possible to control them through a test software installed on a notebook computer.

4.3 Special Accessories and Auxiliary Equipment

N/A.

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

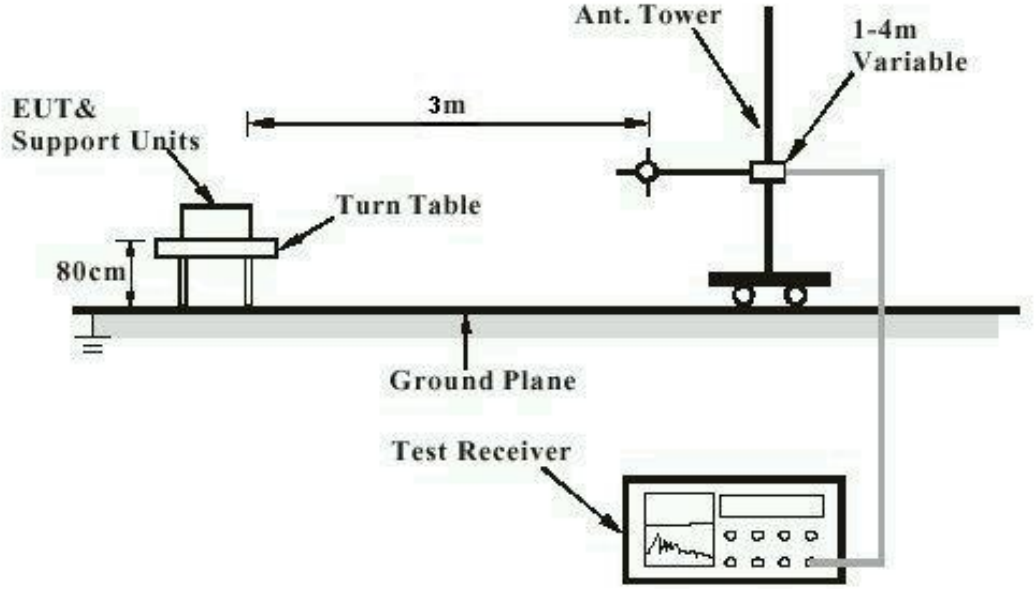


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

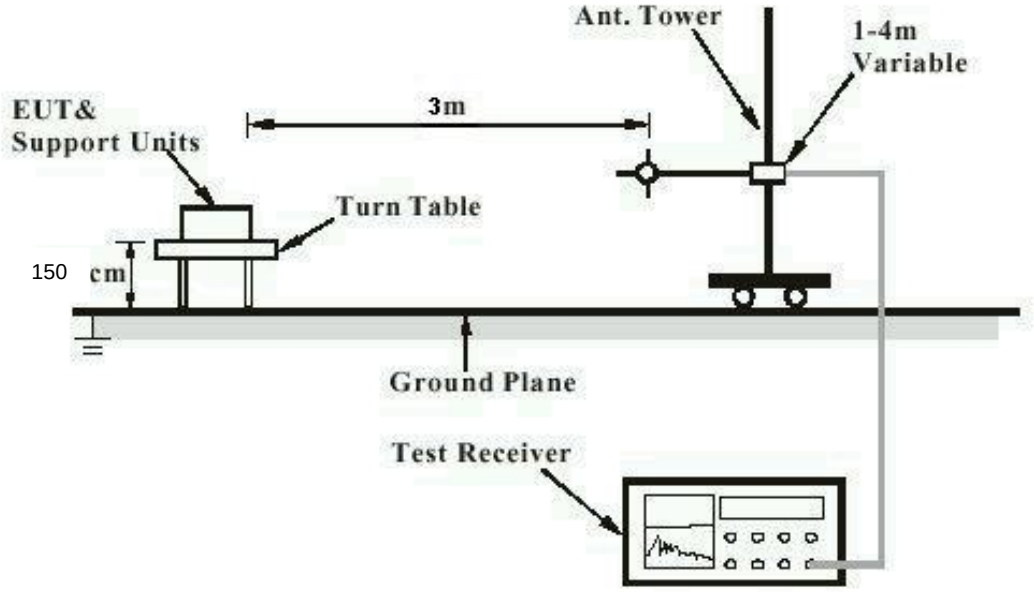
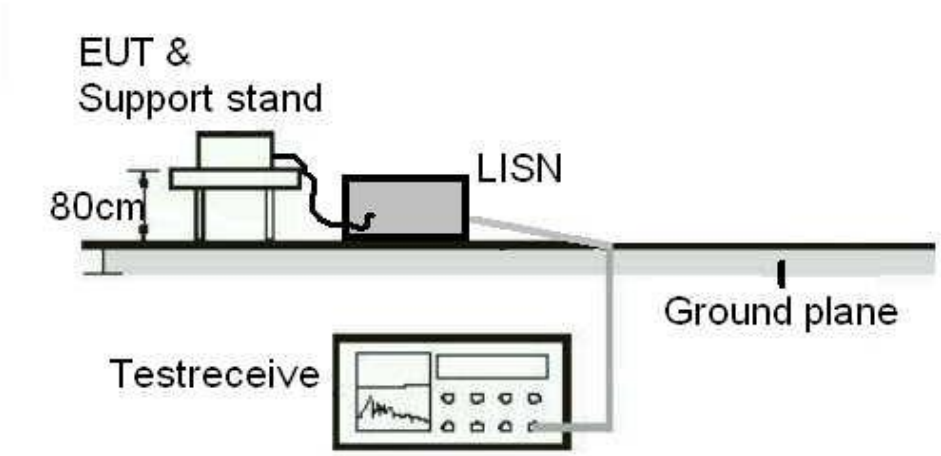


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Passed**

Standard	:	Part 15.203 RSS-Gen 7.1.4
Requirement	:	use of approved antennas only

The antenna is a printed PCB trace with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.

Refer to EUT photo for details.

5.1.2 Field strength of fundamental

RESULT: **Passed**

Test standard	:	LP0002(2011) 3.2 FCC Part 15. 225 RSS-210 B.6
Basic standard	:	ANSI C63.10:2013

Test setup

Test Frequency	:	13.56 MHz
Operation Mode	:	A

The Emission Mask for NCC LP0002 is more strict than the emission mask for FCC Part 15. 225 and RSS-210 A2.6. The device can fulfil the NCC LP0002 requirements, therefore only the emission mask for NCC LP0002 is shown in the table below.

Table 6: Test result of Field strength of fundamental and modulation sidebands

Frequency (MHz)	Test Result	Detector	Limits		Pass/Fail
	dBµV/m @10m		dBµV/m@10m	dBµV/m@30m	
13.110–13.410	30.26	QP	59.59	40.5	Pass
13.410–13.553	31.04	QP	69.55	50.5	Pass
13.560	42.58	QP	103.08	84.0	Pass
13.567–13.710	39.68	QP	69.55	50.5	Pass
13.710–14.010	31.58	QP	59.59	40.5	Pass

For details refer to Appendix 1.

5.1.3 Frequency Stability

RESULT: **Passed**

Test standard	:	FCC Part 15. 225(e)
Basic standard	:	ANSI C63.10:2013 Clause 6.8
Limits	:	15.225(e): The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.
Kind of test site	:	Shielded room

Test setup

Test Frequency	:	13.56 MHz
Operation Mode	:	A
Relative humidity	:	50-65 %
Atmospheric pressure	:	100-103 kPa

Table 7: Test result of Frequency Stability

Power (VAC)	Temperature (℃)	13.56MHz		Result
		Freq. Dev. (Hz)	Deviation (ppm)	
120	-30	400	29.50	PASS
	-20	240	17.70	
	-10	130	9.59	
	0	180	13.27	
	+10	120	8.85	
	+20	190	14.01	
	+30	150	11.06	
	+40	210	15.49	
	+50	170	12.54	

5.1.4 Bandwidth

RESULT: **Passed**

Test standard	:	FCC Part 15. 205(d)(7) RSS-Gen
Basic standard	:	ANSI C63.10:2013, KDB558074
Kind of test site	:	Shielded room

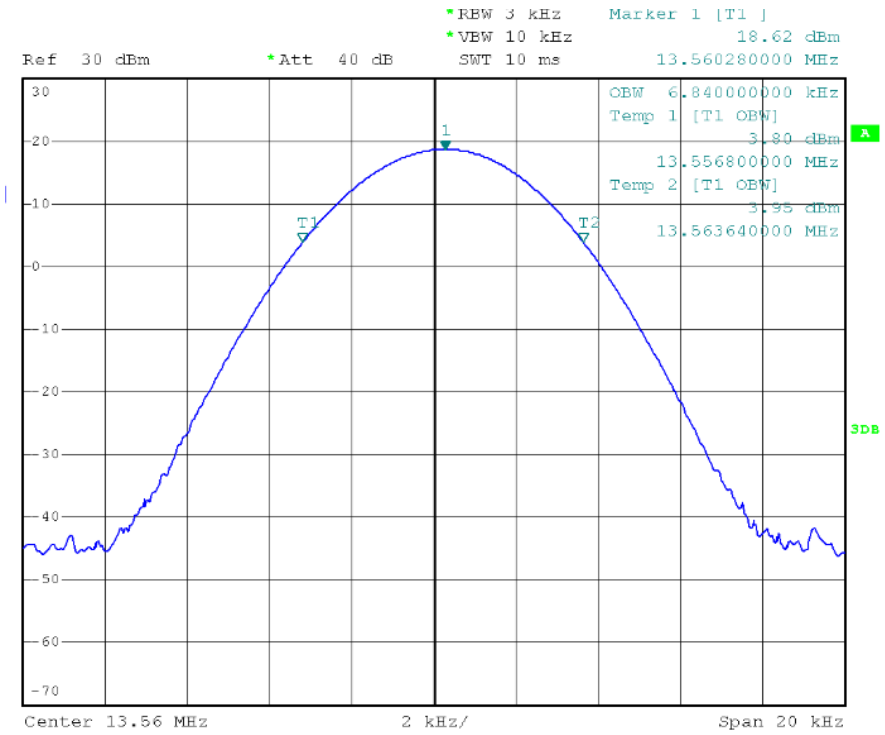
Test setup

Operation Mode	:	A
Ambient temperature	:	22-26 °C
Relative humidity	:	50-65 %
Atmospheric pressure	:	100-103 kPa

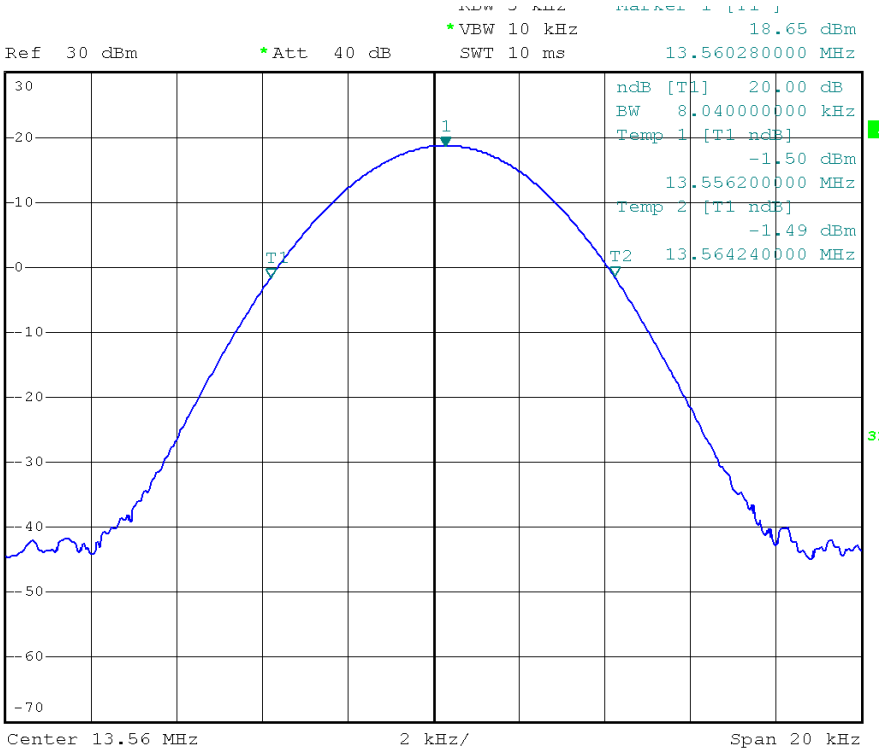
Table 8: Test result of Bandwidth

Channel	Frequency (MHz)	99% Bandwidth (kHz)	20 dB Bandwidth (kHz)
1	13.56	6.84	8.04

Test Plot of 99% Bandwidth



Test Plot of 20dB Bandwidth



5.1.5 Spurious Emission

RESULT: **Passed**

Test standard	:	FCC part 15.209 FCC part 15.225 RSS-210 B.6
Basic standard	:	ANSI C63.10: 2013
Limits	:	The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in § 15.209. RSS-210: 30 microvolts/m (29.5 dBµV/m) at 30 m, outside the band 13.110-14.010 MHz.
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Operation mode	:	A

Remark: Testing was carried out within frequency range 30MHz to the tenth harmonic.

For details refer to Appendix 1.

The Radiated Emissions testing was performed in the X, Y and Z axis orientation. The X Axis orientation is the worst-case and recorded in this test report.

5.2 Mains Conducted Emissions

5.2.1 Mains Conducted Emissions

RESULT: **Passed**

Test standard	:	FCC Part 15.207, 15.107 RSS Gen,
Limits	:	Mains Conducted emissions as defined in above test standards must comply with the mains conducted emission limits specified
Kind of test site	:	Shielded Room

Test setup

Test Channel	:	Middle
Operation mode	:	A

Remark: For details refer to Appendix 1.

6. Safety Human exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT: **Passed**

Test standard : FCC KDB Publication 447498 D01 v06
RSS-102 Issue 5 March 2015
SPR-002, Issue 1 September 2016

The minimum distance for the EUT is less than 5mm.

Since maximum peak output power of the transmitter is < 1mW, hence the EUT is excluded from SAR evaluation according to FCC KDB publication 447498 D01 v06: Mobile Portable RF Exposure.

Hence the EUT is exempted from routine evaluation limits (SAR Evaluation) according to clause 2.5.1 of RSS-102 Issue 5.

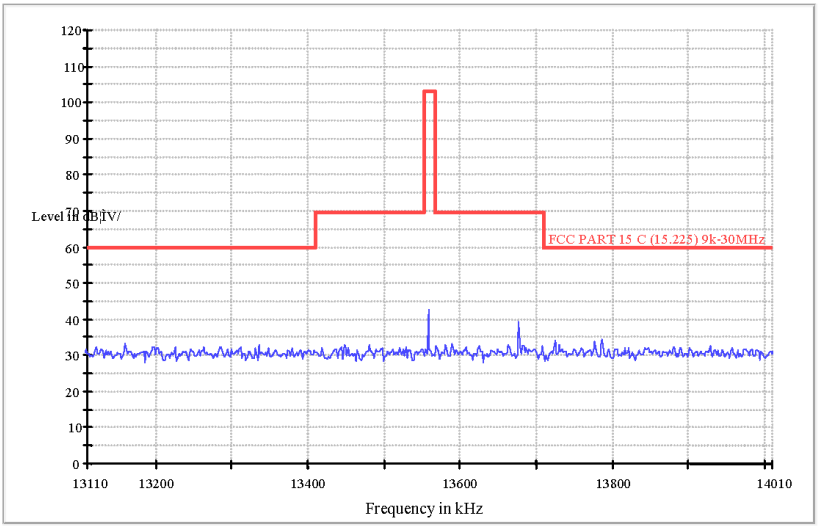
8. List of Tables

9. List of Photographs

H1

SET 10m Chamber Test Report

Copy of Low Magnetic Field 9K-30M Sweep



Test Description:	EMC32 Standard Report Setup
Operating Conditions:	Make Coffee + RFID Transmit
Operator Name:	Lemon
Sample Description	Coffee Maker
Model No	GM301
Temperature	24℃
Humidity	56%RH
Test Time	2017.3.28
Test cable	H

MEASUREMENT RESULT: "QuasiPeak"

2017-3-28

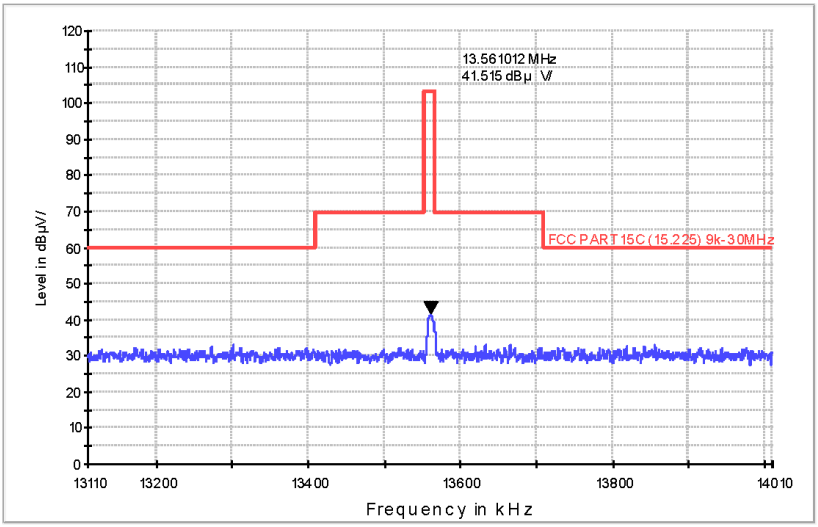
Frequency MHz	Level dBµV/m	Limit dBµV/m
13.160000	30.26	59.59
13.519000	31.04	69.55
13.562000	42.58	103.08
13.681000	39.68	69.55
13.854000	31.58	59.59

2017-3-28

V1

SET 10m Chamber Test Report

Copy of Low Magnetic Field 9K-30M Sweep



Test Description:	EMC32 Standard Report Setup
Operating Conditions:	Make Coffee + RFID Transmit
Operator Name:	Lemon
Sample Description	Coffee Maker
Model No	GM301
Temperature	24℃
Humidity	56%RH
Test Time	2017.3.28
Test cable	V

MEASUREMENT RESULT: "QuasiPeak"

2017-3-28

Frequency MHz	Level dBµV/m	Limit dBµV/m
13.260000	30.17	59.59
13.552000	30.29	69.55
13.561000	41.51	103.08
13.578000	30.27	69.55
13.905000	30.08	59.59

2017-3-28

H

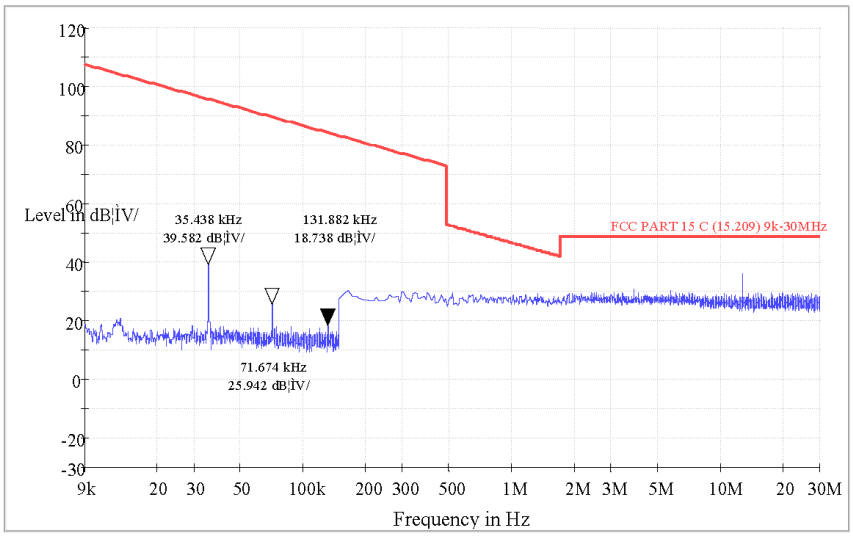
SET 10m Chamber Test Report

Test Description:	EMC32 Standard Report Setup
Operating Conditions:	Make Coffee + RFID Transmit
Operator Name:	Lemon
Sample Description	Coffee Maker
Model No	GM301
Temperature	24℃
Humidity	56%RH
Test Time	2017.3.28
Test cable	H

MEASUREMENT RESULT: "QuasiPeak"

2017-3-28

Frequency MHz	Level dBµV/m	Limit dBµV/m
0.0353400	39.58	95.3
0.0716700	25.94	88.4
0.1318000	18.74	83.5
0.0128000	30.42	81.4
0.5041000	30.04	51.2
13.561000	37.61	48.6



2017-3-28

16-05820-fcc1

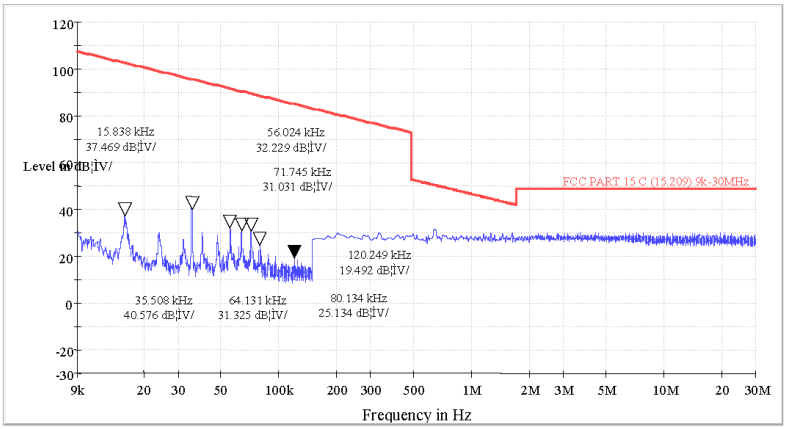
SET 10m Chamber Test Report

Test Description:	EMC32 Standard Report Setup
Operating Conditions:	Make Coffee + RFID Transmit
Operator Name:	Lemon
Sample Description	Coffee Maker
Model No	GM301
Temperature	24℃
Humidity	56%RH
Test Time	2017.3.28
Test cable	H

MEASUREMENT RESULT: "QuasiPeak"

2017-3-28

Frequency MHz	Level dBµV/m	Limit dBµV/m
0.0158400	37.47	104.5
0.0355100	40.58	95.6
0.0560200	32.23	90.3
0.0641000	31.33	89.1
0.0747400	31.03	88.0
0.5214000	31.80	50.1



2017-3-28

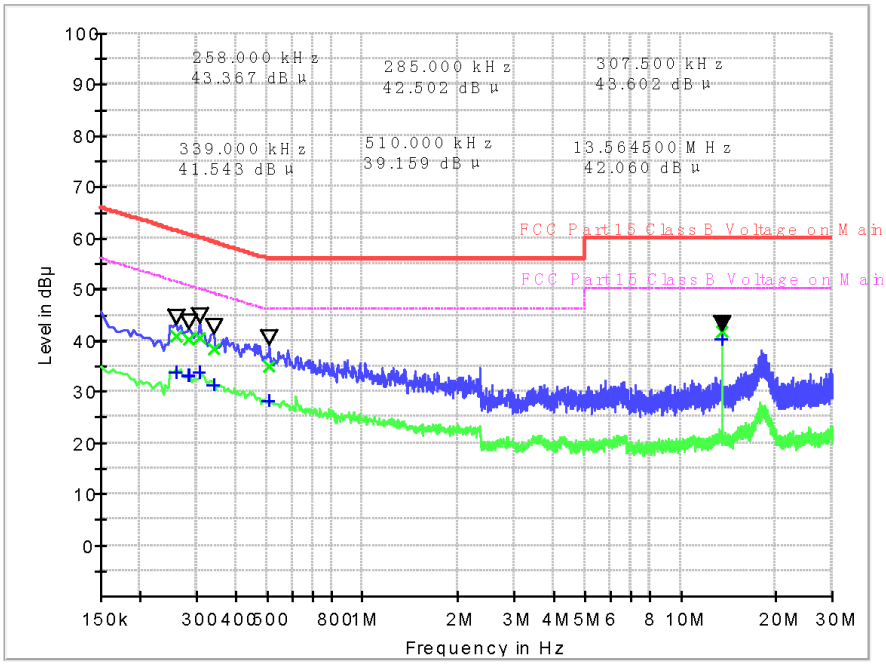
17-03717 L

EMC32 Report

Common Information

Test Description:	EMC32 Standard Report Setup
Operating Conditions:	Make coffee + RFID Traffic
Operator Name:	Lemon
Sample Description	Coffee Maker
Model No	GM301
Temperature	24℃
Humidity	56%RH
Test Time	2017.3.20
Test cable	L

FCC Part 15 Class B Voltage Test



Limit and Margin

Frequency (MHz)	MaxPeak (dBµV)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµ	Comment
0.258000	---	40.81	33.89	1000.0	9.000	L1	OFF	10.0	20.69	61.5	
0.285000	---	40.11	33.07	1000.0	9.000	L1	OFF	10.1	20.56	60.7	
0.285000	---	40.11	33.07	1000.0	9.000	L1	OFF	10.1	20.56	60.7	
0.307500	---	40.62	33.69	1000.0	9.000	L1	OFF	10.1	19.42	60.0	
0.339000	---	38.30	31.39	1000.0	9.000	L1	OFF	10.1	20.93	59.2	
0.510000	---	35.12	28.14	1000.0	9.000	L1	OFF	10.0	20.88	56.0	
13.564500	---	41.74	40.28	1000.0	9.000	L1	OFF	10.3	18.26	60.0	

(continuation of the "Limit and Margin" table from column 15 ...)

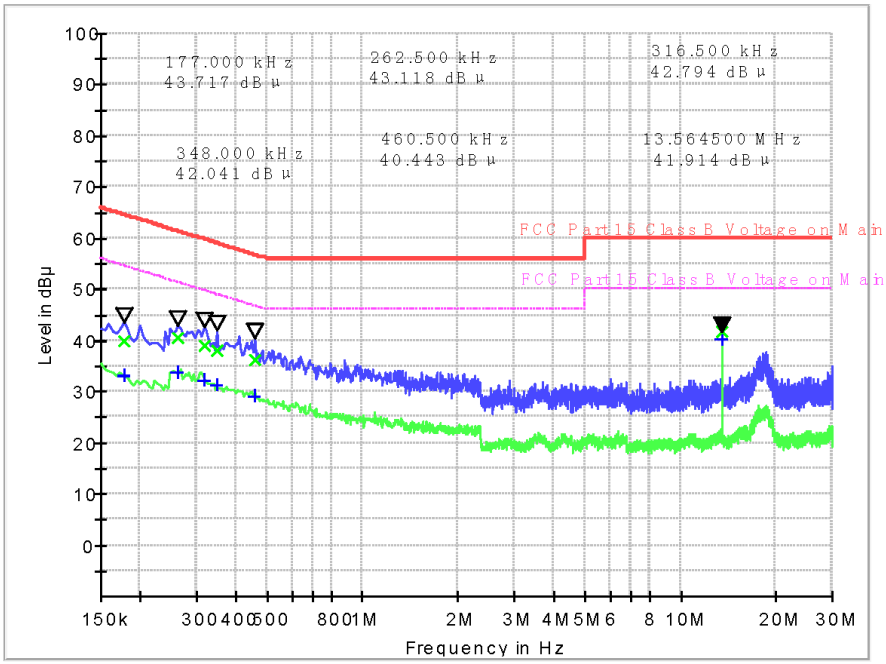
17-03717 N

EMC32 Report

Common Information

Test Description:	EMC32 Standard Report Setup
Operating Conditions:	Make coffee + RFID Traffic
Operator Name:	Lemon
Sample Description	RFID Transmit
Model No	GM301
Temperature	24℃
Humidity	56%RH
Test Time	2017.3.20
Test cable	N

FCC Part 15 Class B Voltage Test

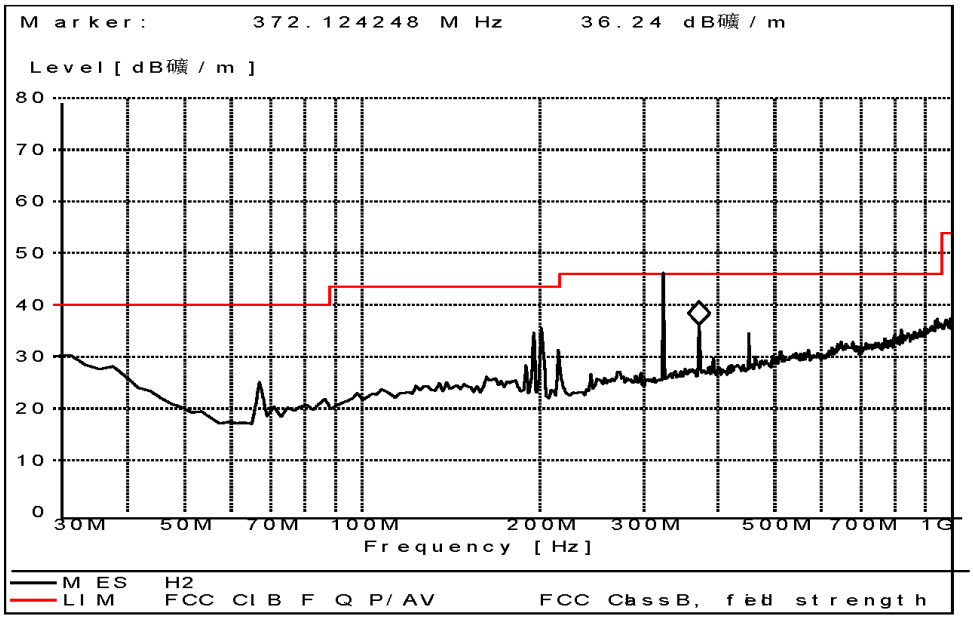


Limit and Margin

Frequency (MHz)	MaxPeak (dBµV)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµ	Comment
0.177000	---	39.93	33.06	1000.0	9.000	L1	OFF	9.9	24.70	64.6	
0.262500	---	40.63	33.75	1000.0	9.000	L1	OFF	10.0	20.72	61.4	
0.316500	---	39.11	32.21	1000.0	9.000	L1	OFF	10.1	20.69	59.8	
0.348000	---	38.13	31.21	1000.0	9.000	L1	OFF	10.1	20.88	59.0	
0.460500	---	36.10	29.25	1000.0	9.000	L1	OFF	10.0	20.58	56.7	
13.564500	---	41.83	40.34	1000.0	9.000	L1	OFF	10.3	18.17	60.0	

(continuation of the "Limit and Margin" table from column 15 ...)

Test Description:	EMC32 Standard Report Setup
Operating Conditions:	Make coffee + RFID Traffic
Operator Name:	Lemon
Sample Description	Coffee Maker
Model No	GM301
Temperature	24℃
Humidity	56%RH
Test Time	2017.3.22
Test cable	H

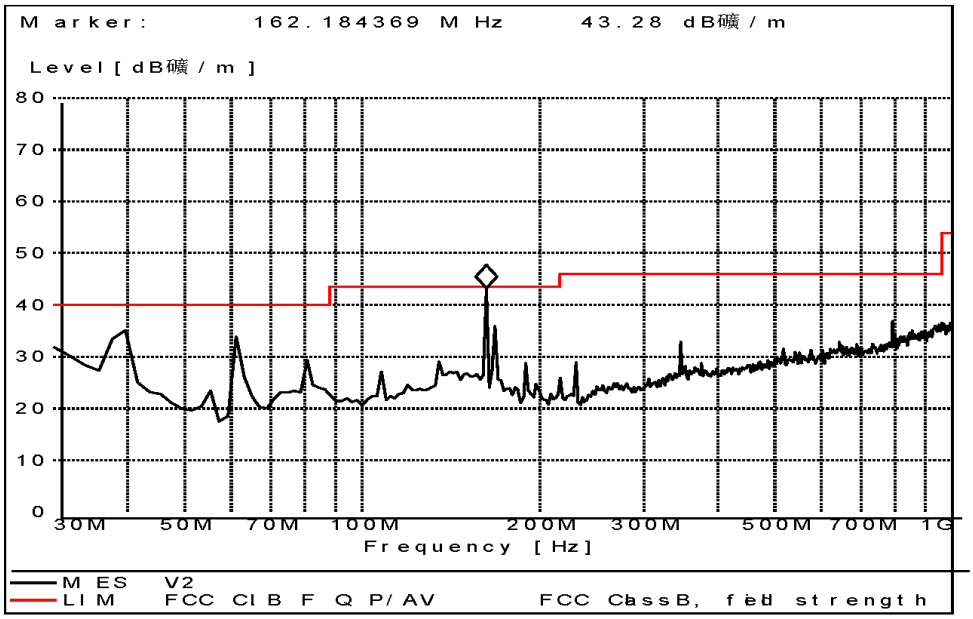


MEASUREMENT RESULT: "QuasiPeak"

2017-3-22 8:33

Frequency MHz	Level dBµV/m	Limit dBµV/m
30.000000	28.14	40.0
195.230000	32.64	43.5
201.050000	33.39	43.5
214.670000	28.69	43.5
323.530000	41.40	46.0
372.120000	34.25	46.0

Test Description:	EMC32 Standard Report Setup
Operating Conditions:	Make coffee + RFID Traffic
Operator Name:	Lemon
Sample Description	Coffee Maker
Model No	GM301
Temperature	24℃
Humidity	56%RH
Test Time	2017.3.22
Test cable	V



MEASUREMENT RESULT: "QuasiPeak"

2017-3-22 8:34

Frequency MHz	Level dBµV/m	Limit dBµV/m
39.720000	33.00	40.0
61.100000	31.93	40.0
134.970000	27.04	43.5
164.070000	38.54	43.5
230.220000	26.87	46.0
346.850000	30.94	46.0