FCC PART 15, SUBPART C
ISEDC RSS-247, ISSUE 2, FEBRUARY 2017

TEST REPORT

for

The Detection Group

4550 Kearny Villa Road, Suite 110,
San Diego, CA 92123, USA

FCC ID: 2AK4V-DT-500
IC: 22517-DT500

Report Type:	**Product Type:**
Original Report	Smart Base Station

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Report Number:	R17020114-247 DTS (SBS)
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R17020114-247 DTS (SBS)	Original Report	2017-09-05

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report was prepared on behalf of ODI Innovation, and their product model: DT-500 Smart Base Station, FCC ID: 2AK4V-DT-500, IC: 22517-DT500 or the "EUT" as referred to in this report. The EUT was a 906-924 MHz smart base station that provides bidirectional flows of data among sensors, valve controller and hubs. The EUT also contains a Cell Module (FCC ID: UDV-1103022011008, IC: 8460A-20110302008), which enables the EUT to communicate with the cloud server for data update and exchange.

1.2 Mechanical Description of EUT

The EUT measures approximately 262 mm (L) x49 mm (W) x 171 mm (H).

The test data gathered are from typical production sample, serial number: 40 000003 assigned by ODI Innovation.

1.3 Objective

This report is prepared on behalf of *ODI Innovation*, in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communication Commission's, ISEDC RSS-GEN, and ISEDC RSS-247 rules.

The objective is to determine compliance with FCC Part 15.247 and ISEDC RSS-247 rules for Output Power, Antenna Requirements, Standalone RF Exposure, Simultaneous Transmission RF Exposure, 6 dB Bandwidth, Power Spectral Density, 100 kHz Bandwidth of Band Edges Measurement, Conducted, Radiated Spurious Emissions, and Co-location Radiated Spurious Emissions.

1.4 Related Submittal(s)/Grant(s)

FCC Part 15, Subpart C, Equipment DTS with FCC ID: 2AK4V-DT-501, IC: 22517-DT501
FCC Part 15, Subpart C, Equipment DTS with FCC ID: 2AK4V-DT-502, IC: 22517-DT502
FCC Part 15, Subpart C, Equipment DTS with FCC ID: 2AK4V-DT-503, IC: 22517-DT503

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and FCC KDB 558074 D01 DTS Meas Guidance v04: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Parameter	Measurement uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.57 dB
Power Spectral Density, conducted	±1.48dB
Unwanted Emissions, conducted	±1.57dB
AC power line Conducted Emission	±2.0 dB
Temperature	±2 ° C
Humidity	±5 %
DC and low frequency voltages	±1.0 %
Time	±2 %
Duty Cycle	±3 %

Type of Measurement: ANSI C63.4-2014 Radiated Emissions (in the BACL 5 m - 3 SAC) Note: Measurements up to 1 GHz made using an Brands ESCI EMI Receiver; Measurements from 1 GHz to 40 GHz made using an Brands ESU40 EMI Receiver	**BACL Typical U_{LAB} Value** (for a k=2 Coverage Factor, equivalent to ~ 95% level of confidence)	**U_{CISPR} Value** worst-allowable values of the latest version of CISPR 16-4-2 (for a k=2 Coverage Factor, equivalent to ~ 95% level of confidence)
Radiated Electric Field Disturbance – Horizontal Polarization, 30 MHz – 200 MHz (i.e., Radiated Emissions measured at 3 meters distance)	4.76 dB (No Tilting)	5.06 dB (No Tilting)
Radiated Electric Field Disturbance – Vertical Polarization, 30 MHz – 200 MHz (i.e., Radiated Emissions at 3 meters distance)	5.13 dB (No Tilting)	5.17 dB (No Tilting)
Radiated Electric Field Disturbance – Horizontal Polarization, 200 MHz – 1000 MHz (i.e., Radiated Emissions measured at 3 meters distance)	5.29 dB (No Tilting)	5.34 (No Tilting)
Radiated Electric Field Disturbance – Vertical Polarization, 200 MHz – 1000 MHz (i.e., Radiated Emissions measured at 3 meters distance)	5.53 dB (No Tilting)	6.32 dB (No Tilting)
Radiated Electric Field Disturbance Horizontal and Vertical Polarizations, 1 GHz – 6 GHz (i.e., Radiated Emissions measured at 3 meters distance)	4.36 dB (No Tilting)	5.18 dB (No Tilting)
Radiated Electric Field Disturbance Horizontal and Vertical Polarizations, 1 GHz – 6 GHz (i.e., Radiated Emissions measured at 3 meters distance)	4.00 dB (With Bore-sighting)	U_{CISPR} Value is Not Specified
Radiated Electric Field Disturbance Horizontal and Vertical Polarizations, 6 GHz – 18 GHz (i.e., Radiated Emissions measured at 3 meters distance)	4.23 dB (With Bore-sighting)	U_{CISPR} Value is Not Specified
Radiated Electric Field Disturbance Horizontal and Vertical Polarizations, 18 GHz – 26.5 GHz (i.e., Radiated Emissions measured at 1 meter distance)	4.81 dB (With Bore-sighting)	U_{CISPR} Value is Not Specified
Radiated Electric Field Disturbance Horizontal and Vertical Polarizations, 26.5 GHz – 40 GHz (i.e., Radiated Emissions at 1 meter distance)	5.00 dB (With Bore-sighting)	U_{CISPR} Value is Not Specified

1.7 Test Facility Registrations

BACLs test facilities that are used to perform Radiated and Conducted Emissions tests are currently recognized by the Federal Communications Commission as Accredited with NIST Designation Number US1129.

BACL's test facilities that are used to perform Radiated and Conducted Emissions tests are currently registered with Industry Canada under Registration Numbers: 3062A-1, 3062A-2, and 3062A-3.

BACL is a Chinese Taipei Bureau of Standards Metrology and Inspection (BSMI) validated Conformity Assessment Body (CAB), under Appendix B, Phase I Procedures of the APEC Mutual Recognition Arrangement (MRA). BACL's BSMI Lab Code Number is: SL2-IN-E-1002R

BACL's test facilities that are used to perform AC Line Conducted Emissions, Telecommunications Line Conducted Emissions, Radiated Emissions from 30 MHz to 1 GHz, and Radiated Emissions from 1 GHz to 6 GHz are currently recognized as Accredited in accordance with the Voluntary Control Council for Interference [VCCI] Article 15 procedures under Registration Number A-0027.

1.8 Test Facility Accreditations

Bay Area Compliance Laboratories Corp. (BACL) is:

A- ***An independent, 3rd-Party, Commercial Test Laboratory accredited to ISO/IEC 17025:2005 by A2LA (Test Laboratory Accreditation Certificate Number 3297.02),*** in the fields of: Electromagnetic Compatibility and Telecommunications. Unless noted by an Asterisk (*) in the Compliance Matrix (See Section 3 of this Test Report), BACL's ISO/IEC 17025:2005 Scope of Accreditation includes all of the Test Method Standards and/or the Product Family Standards detailed in this Test Report..

BACL's ISO/IEC 17025:2005 Scope of Accreditation includes a comprehensive suite of EMC Emissions, EMC Immunity, Radio, RF Exposure, Safety and wireline Telecommunications test methods applicable to a wide range of product categories. These product categories include Central Office Telecommunications Equipment [including NEBS - Network Equipment Building Systems], Unlicensed and Licensed Wireless and RF devices, Information Technology Equipment (ITE); Telecommunications Terminal Equipment (TTE); Medical Electrical Equipment; Industrial, Scientific and Medical Test Equipment; Professional Audio and Video Equipment; Industrial and Scientific Instruments and Laboratory Apparatus; Cable Distribution Systems, and Energy Efficient Lighting.

B- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3297.03)*** to certify

- For the USA (Federal Communications Commission):
    1- All Unlicensed radio frequency devices within FCC Scopes A1, A2, A3, and A4;
    2- All Licensed radio frequency devices within FCC Scopes B1, B2, B3, and B4;
    3- All Telephone Terminal Equipment within FCC Scope C.
- For the Canada (Industry Canada):
    1 All Scope 1-Licence-Exempt Radio Frequency Devices;
    2 All Scope 2-Licensed Personal Mobile Radio Services;
    3 All Scope 3-Licensed General Mobile and Fixed Radio Services;
    4 All Scope 4-Licensed Maritime and Aviation Radio Services;
    5 All Scope 5-Licensed Fixed Microwave Radio Services
    6 All Broadcasting Technical Standards (BETS) in the Category I Equipment Standards List.
- For Singapore (Info-Communications Development Authority (IDA)):
    1 All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2011, Annex 2
    2. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2011, Annex 2

- For the Hong Kong Special Administrative Region:
  1 All Radio Equipment, per KHCA 10XX-series Specifications;
  2 All GMDSS Marine Radio Equipment, per HKCA 12XX-series Specifications;
  3 All Fixed Network Equipment, per HKCA 20XX-series Specifications.
- For Japan:
  1 MIC Telecommunication Business Law (Terminal Equipment):
  - All Scope A1 - Terminal Equipment for the Purpose of Calls;
  - All Scope A2 - Other Terminal Equipment
  2 Radio Law (Radio Equipment):
  - All Scope B1 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 1 of the Radio Law
  - All Scope B2 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 2 of the Radio Law
  - All Scope B3 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 3 of the Radio Law

C- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3297.01)*** to certify Products to USA's Environmental Protection Agency (EPA) ENERGY STAR Product Specifications for:

1 Electronics and Office Equipment:
- for Telephony (ver. 3.0)
- for Audio/Video (ver. 3.0)
- for Battery Charging Systems (ver. 1.1)
- for Set-top Boxes and Cable Boxes (ver. 4.1)
- for Televisions (ver. 6.1)
- for Computers (ver. 6.0)
- for Displays (ver. 6.0)
- for Imaging Equipment (ver. 2.0)
- for Computer Servers (ver. 2.0)

2 Commercial Food Service Equipment
- for Commercial Dishwashers (ver. 2.0)
- for Commercial Ice Machines (ver. 2.0)
- for Commercial Ovens (ver. 2.1)
- for Commercial Refrigerators and Freezers

3 Lighting Products
- For Decorative Light Strings (ver. 1.5)
- For Luminaires (including sub-components) and Lamps (ver. 1.2)
- For Compact Fluorescent Lamps (CFLs) (ver. 4.3)
- For Integral LED Lamps (ver. 1.4)

4 Heating, Ventilation, and AC Products
- for Residential Ceiling Fans (ver. 3.0)
- for Residential Ventilating Fans (ver. 3.2)

5 Other
- For Water Coolers (ver. 3.0)

D. A NIST Designated Phase-I and Phase-II Conformity Assessment Body (CAB) for the following economies and regulatory authorities under the terms of the stated MRAs/Treaties:

- Australia: ACMA (Australian Communication and Media Authority) – APEC Tel MRA -Phase I;
- Canada: (Industry Canada - IC) Foreign Certification Body – FCB – APEC Tel MRA -Phase I and Phase II;
- Chinese Taipei (Republic of China – Taiwan):
  - BSMI (Bureau of Standards, Metrology and Inspection) APEC Tel MRA -Phase I;
  - NCC (National Communications Commission) APEC Tel MRA -Phase I;

- European Union:
    - Radio and Teleterminal Equipment (RandTTE) Directive 1995/5/EC
      US -EU EMC and Telecom MRA CAB
- Hong Kong Special Administrative Region: (Office of the Telecommunications Authority – OFTA)
  APEC Tel MRA -Phase I and Phase II
- Israel – US-Israel MRA Phase I
- Republic of Korea (Ministry of Communications - Radio Research Laboratory) APEC Tel MRA -Phase I
- Singapore: (Infocomm Development Authority - IDA) APEC Tel MRA -Phase I and Phase II;
- Japan: VCCI - Voluntary Control Council for Interference US-Japan Telecom Treaty VCCI Side Letter-
- USA:
    - ENERGY STAR Recognized Test Laboratory – US EPA
    - Telecommunications Certification Body (TCB) – US FCC;
- Vietnam: APEC Tel MRA -Phase I;

2 System Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.10-2013 and FCC KDB 558074 D01 DTS Meas Guidance v04.

The EUT was tested in a testing mode to represent worst-case results during the final qualification test. Both radios were activated for Radio Co-location evaluation.

2.2 EUT Exercise Software

The client configured the firmware of the EUT before each tests to change the channel.

2.3 Duty Cycle Correction Factor

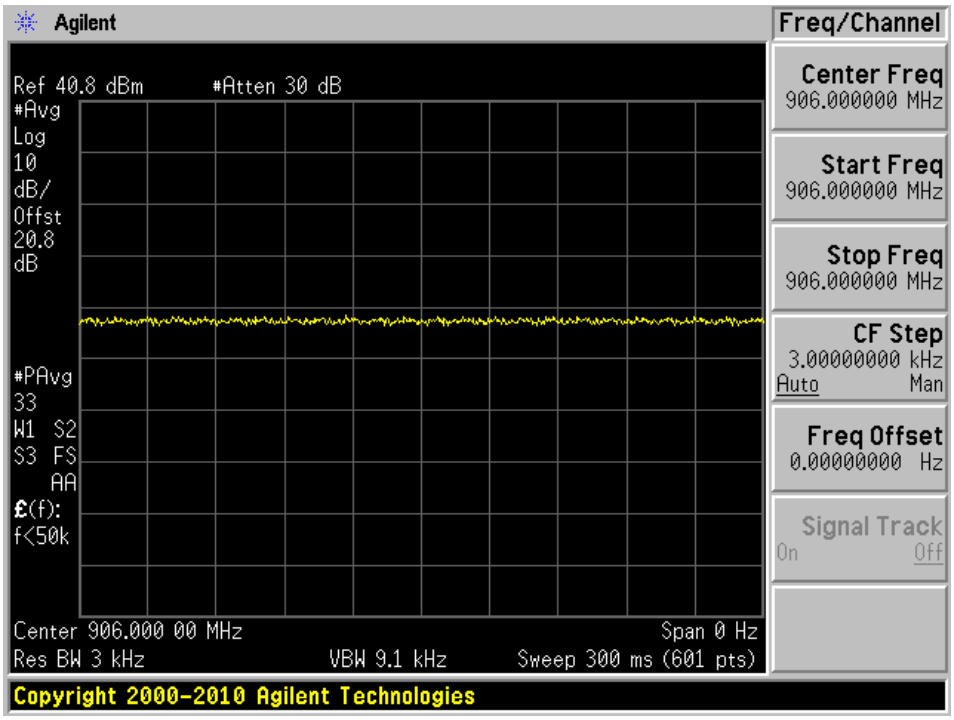
According to KDB 558074 D01 DTS Meas Guidance v04 section 6.0:

Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%). When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be utilized to ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration (T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data is being acquired (i.e., no transmitter off-time is to be considered).

Radio Mode	On Time (us)	Period (us)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
902 -928MHz	Continuous	Continuous	100%	0

Duty Cycle = On Time (ms)/ Period (ms)
Duty Cycle Correction Factor (dB) = 10*log (1/Duty Cycle)

Please refer to the following plots.



2.4 Test Channels

Evaluated Channels	Frequency (MHz)
Low	906
Middle	914
High	924

2.5 Equipment Modifications

N/A

2.6 Local Support Equipment

Manufacturer/Product Type	Description	Model No.	Serial No.
Dell	Windows Laptop	E6410	-

2.7 Support Equipment

There was no support equipment included, or intended for use with EUT during these tests.

2.8 Interface Ports and Cabling

Cable Description	Length (m)	To	From
RF Cable	< 1 m	PSA	EUT
Mini-USB-to-USB cable	< 1 m	EUT	laptop

3 Summary of Test Results

Results reported relate only to the product tested.

FCC & ISEDC Rules	Description of Test	Results
FCC §15.203 ISEDC RSS-Gen Clause 8.3	Antenna Requirement	Compliant
FCC §15.207 ISEDC RSS-Gen Clause 8.8	AC Line Conducted Emissions	Compliant
FCC §2.1091, §15.247(i) ISEDC RSS-102	RF Exposure	Compliant
FCC §2.1051, §15.247 (d) ISEDC RSS-247 Clause 5.5	Spurious Emissions at Antenna Port	Note[1]
FCC §2.1053, §15.209, §15.247 (d) ISEDC RSS-247 Clause 5.5 ISEDC RSS-Gen Clause 8.9 & 8.10	Radiated Spurious Emissions	Compliant
FCC §15.247(a)(2) ISEDC RSS-247 Clause 5.2 (a)	6 dB and 99% Emission Bandwidth	Note[1]
FCC §15.247(b)(3) ISEDC RSS-247 Clause 5.4 (d)	Maximum Peak Output Power	Note[1]
FCC §15.247(d) ISEDC RSS-247 Clause 5.5	100 kHz Bandwidth of Frequency Band Edge	Note[1]
FCC §15.247(e) ISEDC RSS-247 Clause 5.2 (b)	Power Spectral Density	Note[1]

Note[1]: Refer to R1702012-247 (Sensor) Report with FCC ID: 2AK4V-DT-502, IC: 22517-DT502.

4 FCC §15.203 and ISEDC RSS-Gen - Antenna Requirements

4.1 Applicable Standards

According to FCC §15.203:

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. 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 §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.

And according to FCC §15.247 (b) (4), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to ISEDC RSS-Gen Clause 8.3: Transmitter Antenna

The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the license-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna.

License-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the license-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of license-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. 9 When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).

4.2 Antenna Description

Antenna usage	Frequency Range (MHz)	Maximum Antenna Gain (dBi)
BPSK	906-924	1.2
Cell Modem	850/900/1800/1900	2.0

Note: Customer declares the EUT will be professionally installed.

5 FCC § 2.1091, §15.247(i) and ISEDC RSS-102 – RF Exposure

5.1 Applicable Standards

According to FCC §15.247(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	* (100)	30
1.34-30	824/f	2.19/f	* ($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Before equipment certification is granted, the procedure of ISEDC RSS-102 must be followed concerning the exposure of humans to RF field

According to RSS-102 section 4. Exposure Limits

Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m^2)	Reference Period (minutes)
$0.003\text{-}10^{21}$	83	90	-	Instantaneous*
0.1-10	-	$0.73/f$	-	6**
1.1-10	$87/f^{0.5}$	-	-	6**
10-20	27.46	0.0728	2	6
20-48	$58.07/f^{0.25}$	$0.1540/f^{0.25}$	$8.944/f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142f^{0.3417}$	$0.008335f^{0.3417}$	$0.02619f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000/f^{1.2}$

Note: f is frequency in MHz.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

5.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

5.3 Standalone RF Exposure Evaluation Results for FCC

906-924 MHz Radio

Maximum peak output power at antenna input terminal (dBm):	25
Maximum peak output power at antenna input terminal (mW):	316.23
Prediction distance (cm):	20
Prediction frequency (MHz):	914
Maximum Antenna Gain, typical (dBi):	1.2
Maximum Antenna Gain (numeric):	1.318
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.083
FCC MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	0.609

GSM850 /WCDMA Band 5

Maximum source-based, time-averaged power at antenna input terminal (dBm):	24.80
Maximum source-based, time-averaged power at antenna input terminal (mW):	301.995
Prediction distance (cm):	20
Prediction frequency (MHz):	825
Maximum Antenna Gain, typical (dBi):	2.0
Maximum Antenna Gain (numeric):	1.58
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.095
FCC MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	0.55

PCS1900 /WCDMA Band 2

Maximum source-based, time-averaged power at antenna input terminal (dBm):	23.60
Maximum source-based, time-averaged power at antenna input terminal (mW):	229.09
Prediction distance (cm):	20
Prediction frequency (MHz):	1850.2
Maximum Antenna Gain, typical (dBi):	2.0
Maximum Antenna Gain (numeric):	1.58
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.072
FCC MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1

5.4 Standalone RF Exposure Evaluation Results for ISED

906-924 MHz Radio

Maximum peak output power at antenna input terminal (dBm):	25
Maximum peak output power at antenna input terminal (W):	0.31623
Prediction distance (m):	0.20
Prediction frequency (MHz):	914
Maximum Antenna Gain, typical (dBi):	1.2
Maximum Antenna Gain (numeric):	1.318
Power density of prediction frequency at 0.2 m (W/m^2):	0. 83
ISED MPE limit for uncontrolled exposure at prediction frequency (W/m^2):	2.764

GSM850 /WCDMA Band 5

Maximum source-based, time-averaged power at antenna input terminal (dBm):	24.80
Maximum source-based, time-averaged power at antenna input terminal (W):	0.301995
Prediction distance (m):	0.20
Prediction frequency (MHz):	825
Maximum Antenna Gain, typical (dBi):	2.0
Maximum Antenna Gain (numeric):	1.58
Power density of prediction frequency at 0.2 m (W/m^2):	0.95
ISED MPE limit for uncontrolled exposure at prediction frequency (W/m^2):	2.578

PCS1900 /WCDMA Band 2

Maximum source-based, time-averaged power at antenna input terminal (dBm):	23.60
Maximum source-based, time-averaged power at antenna input terminal (W):	0.22909
Prediction distance (m):	0.20
Prediction frequency (MHz):	1850.2
Maximum Antenna Gain, typical (dBi):	2.0
Maximum Antenna Gain (numeric):	1.58
Power density of prediction frequency at 0.2 m (W/m^2):	0.72
ISED MPE limit for uncontrolled exposure at prediction frequency (W/m^2):	4.478

5.5 Simultaneous Transmission RF Exposure Evaluation Results

FCC

906-924 MHz Radio + GSM850/WCDMA Band 5 = 0.083/0.609 + 0.095/0.55 = 0.31<1

906-924 MHz Radio + PCS1900/WCDMA Band 2 = 0.083/0.609 + 0.072/1 = 0.21<1

ISED

906-924 MHz Radio + GSM850/WCDMA Band 5 = 0.82/2.764 + 0.95/2.578 = 0.665<1

906-924 MHz Radio + PCS1900/WCDMA Band 2 = 0.82/2.764 + 0.72/4.478 = 0.457<1

5.6 Conclusion

The EUT is compliant with the FCC and ISED RF Exposure requirements for both standalone and simultaneous transmission configurations when a 20 cm separation distance from all persons is provided.

6 FCC §15.207 and ISEDC RSS-Gen Clause 8.8 - AC Line Conducted Emissions

6.1 Applicable Standards

As per FCC §15.207 Conducted limits:

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 frequencies ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56 Note1	56 to 46 Note2
0.5-5	56	46
5-30	60	50

Note1: Decreases with the logarithm of the frequency.
Note2: A linear average detector is required

6.2 Test Setup

The measurement was performed at site, using the setup per ANSI C63.10-2013 measurement procedure. The specification used were FCC §15.207 and ISEDC RSS-Gen limits.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The AC/DC power adapter of the EUT was connected with LISN-1 which provided 120 V / 60 Hz AC power.

6.3 Test Procedure

During the conducted emissions test, the power cord of the EUT host system was connected to the mains outlet of the LISN-1.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data were recorded in the peak, quasi-peak, and average detection mode. Quasi-Peak readings are distinguished with a “QP.” Average readings are distinguished with an “Ave”.

6.4 Corrected Amplitude and Margin Calculation

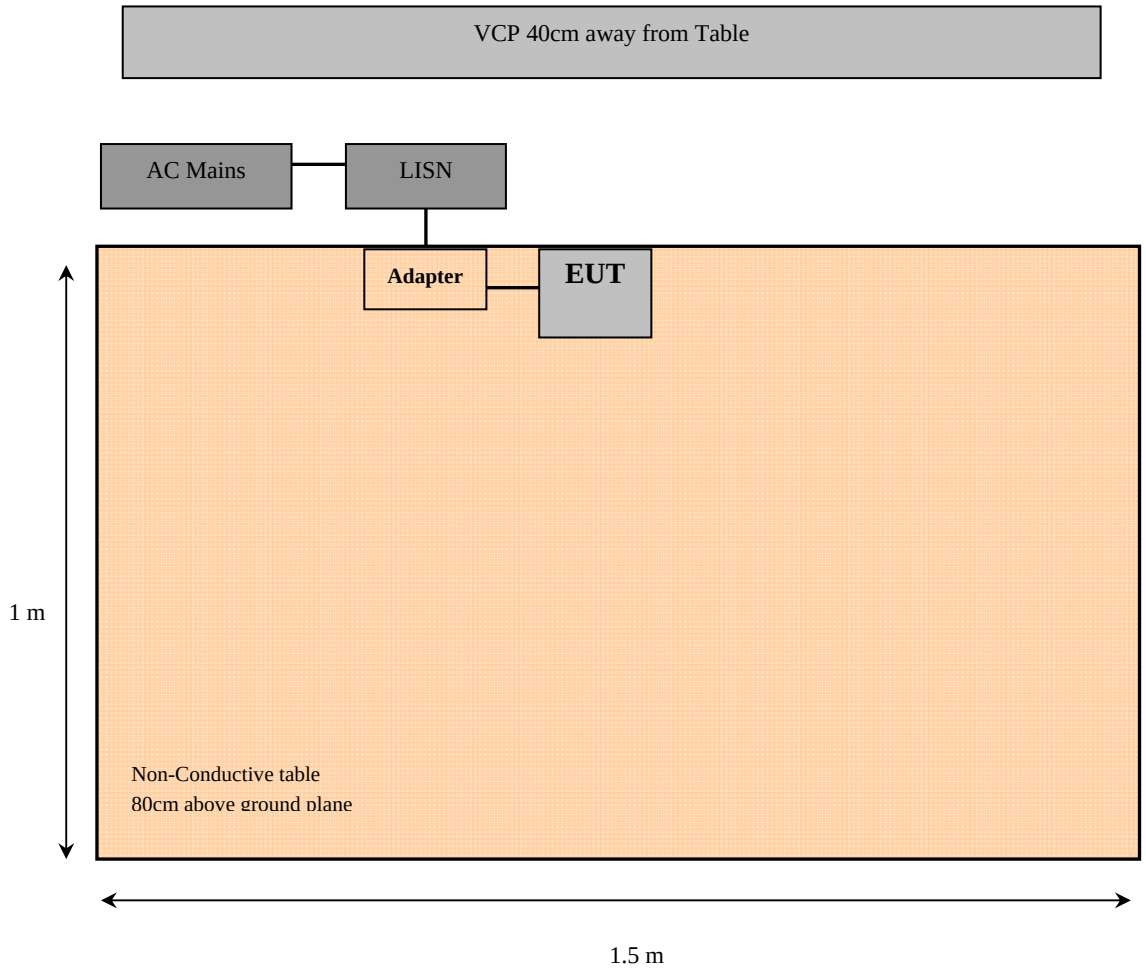
The Corrected Amplitude (CA) is calculated by adding LISN/ISN VDF (Voltage Division Factor), the Cable Loss (CL), the Attenuator Factor (Atten) to indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + LISN VDF+CL + Atten

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Corrected Amplitude – Limit

6.5 Test Setup Block Diagram



6.6 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde and Schwarz	Receiver, EMI Test	ESCI 1166.5950K03	100338	2016-02-04	2 years
Rohde and Schwarz	Impulse Limiter	ESH3-Z2	101964	2016-07-22	1 year
Solar Electronics Company	High Pass Filter	Type 7930-100	7930150204	2017-03-13	1 Year
Suirong	30 ft conductive emission cable	LMR 400	-	2017-03-05	1 year
FCC	LISN	FCC-LISN-50-25-2-10-CISPR16	160131	2016-04-25	1year
Rohde and Schwarz	Wideband Radio Communication Tester	CMW500	120503	2015-10-22	2 years
Sunol Sciences	Antenna, Horn	DRH-118	A052704	2017-03-27	2 years
Vasona	Test software	V6.0 build 11	10400213	N/R	N/R

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

6.7 Test Environmental Conditions

Temperature:	20º C
Relative Humidity:	36 %
ATM Pressure:	101 kPa

The testing was performed by Frank Wang on 2017-04-01 in BACL Conducted test Site.

6.8 Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC 15C and ISEDC RSS-Gen standards' conducted emissions limits, with the margin reading of:

906-924 MHz

Connection: AC/DC adapter connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Line/Neutral)**	**Range (MHz)**
-9.67	0.453303	Neutral	0.15-30

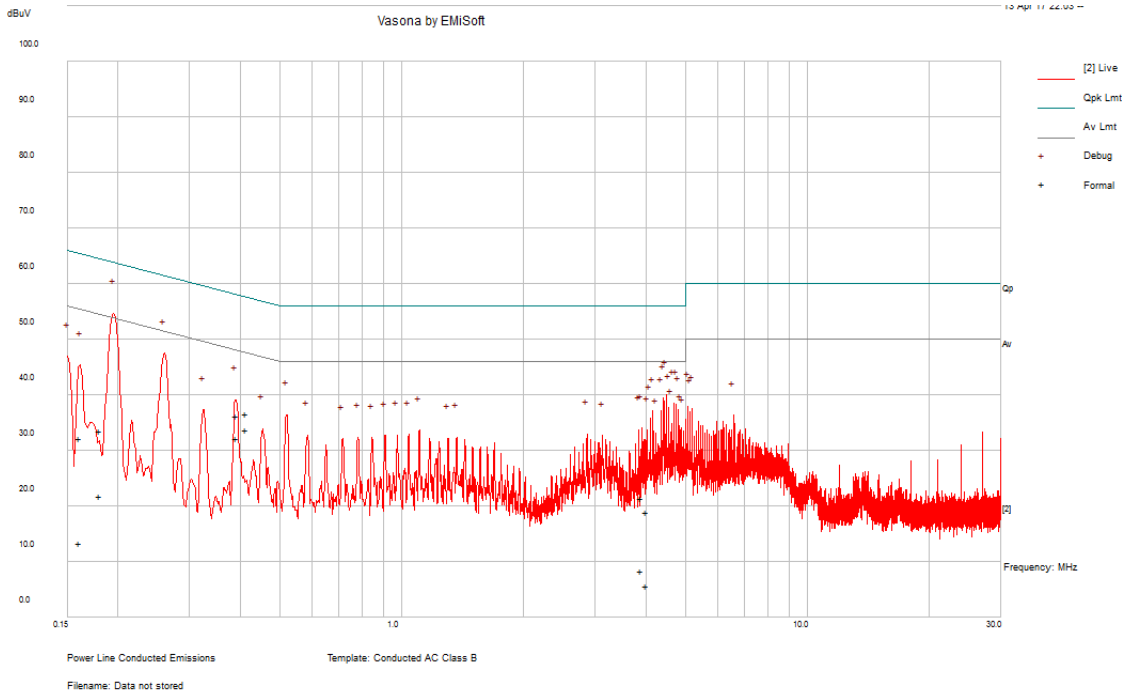
Colocation

Connection: AC/DC adapter connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Line/Neutral)**	**Range (MHz)**
-14.22	0.194834	Neutral	0.15-30

6.9 Conducted Emissions Test Plots and Data

906 -924 MHz

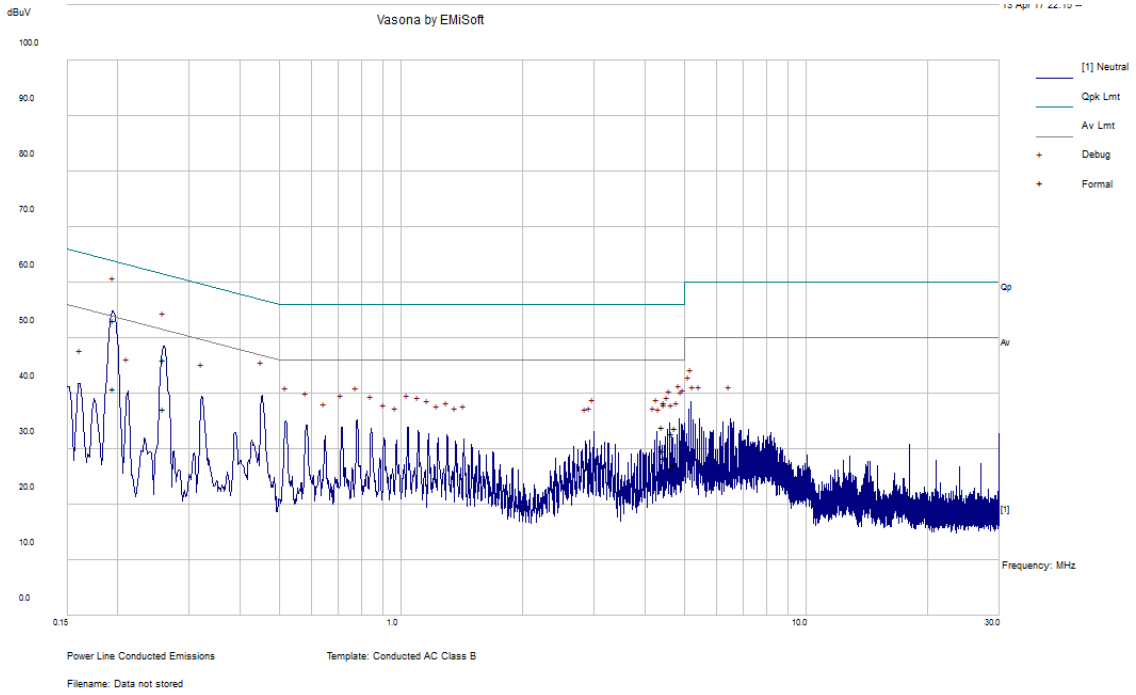
120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.195204	53.12	Line	63.81	-10.69	QP
0.259183	46.07	Line	61.46	-15.39	QP
4.481714	38.34	Line	56	-17.66	QP
4.414868	33.91	Line	56	-22.09	QP
4.675664	32.82	Line	56	-23.18	QP
4.739876	33.79	Line	56	-22.21	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.195204	40.94	Line	53.81	-12.87	Ave.
0.259183	37.17	Line	51.46	-14.28	Ave.
4.481714	28.4	Line	46	-17.6	Ave.
4.414868	29.71	Line	46	-16.29	Ave.
4.675664	26.31	Line	46	-19.69	Ave.
4.739876	27.23	Line	46	-18.77	Ave.

120 V, 60 Hz – Neutral



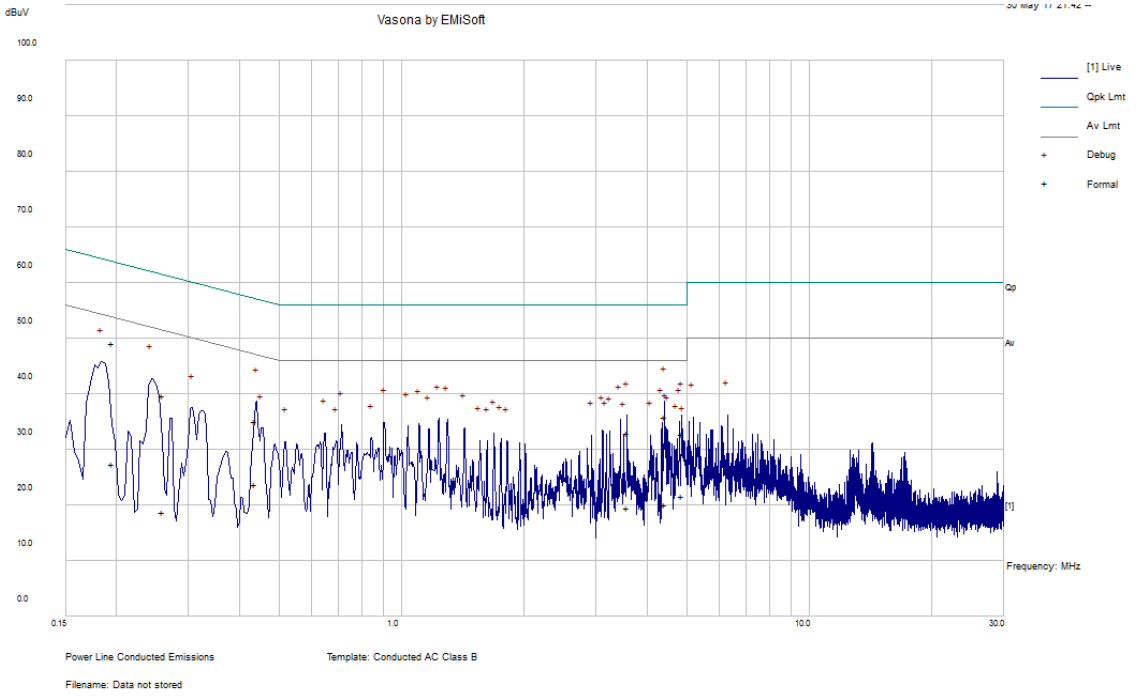
Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.1947	53.63	Neutral	63.83	-10.2	QP
0.260227	46.8	Neutral	61.42	-14.63	QP
0.453303	38.41	Neutral	56.81	-18.4	QP
0.324974	39.87	Neutral	59.58	-19.71	QP
4.866056	31.55	Neutral	56	-24.45	QP
0.779358	33.43	Neutral	56	-22.57	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.1947	40.9	Neutral	53.83	-12.94	Ave.
0.260227	38.28	Neutral	51.42	-13.14	Ave.
0.453303	37.15	Neutral	46.81	**-9.67**	Ave.
0.324974	33.75	Neutral	49.58	-15.83	Ave.
4.866056	26.63	Neutral	46	-19.37	Ave.
0.779358	33.91	Neutral	46	-12.09	Ave.

Radio Collocation

Note: the host device contains 906 MHz-924 MHz RF signal and GSM signal. Collocation refers to both signals are activated. After the pre-scan, the worst case RF signal at 906MHz and GSM850 band signal at 836.5MHz is transmitting simultaneously.

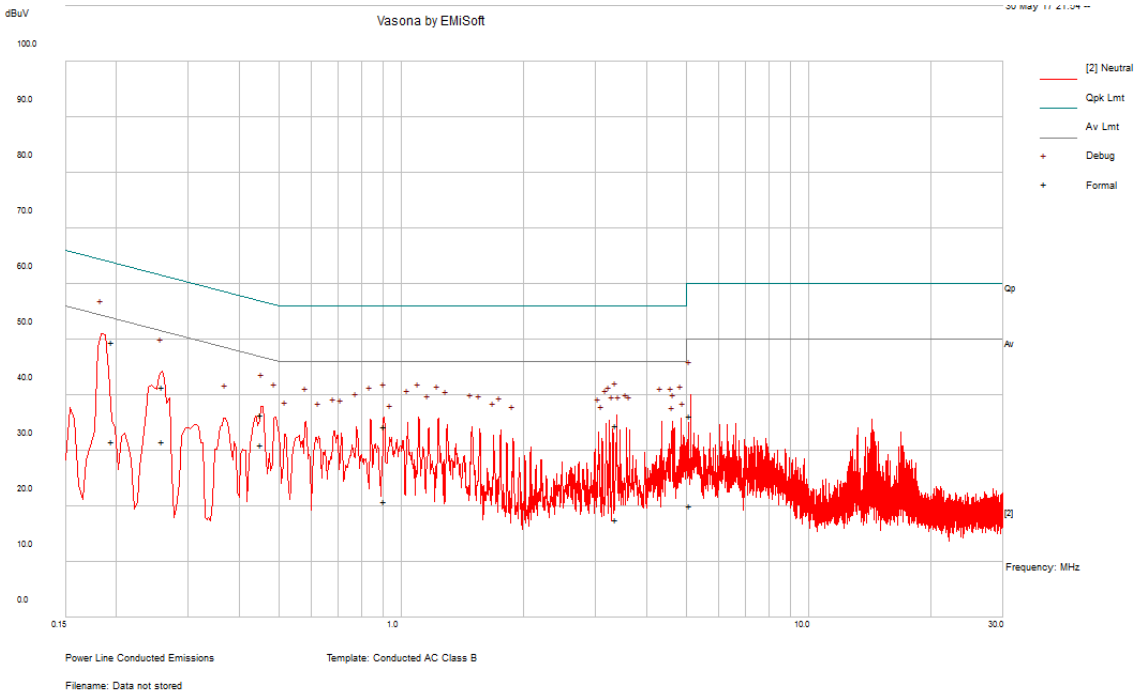
120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
4.410833	35.87	Line	56	-20.13	QP
0.436899	35.15	Line	57.12	-21.97	QP
0.19496	49.13	Line	63.82	-14.69	QP
0.259164	39.8	Line	61.46	-21.65	QP
4.867408	32.84	Line	56	-23.16	QP
3.568774	33.08	Line	56	-22.92	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
4.410833	20.11	Line	46	-25.89	Ave.
0.436899	23.88	Line	47.12	-23.24	Ave.
0.19496	27.37	Line	53.82	-26.46	Ave.
0.259164	18.75	Line	51.46	-32.71	Ave.
4.867408	21.75	Line	46	-24.25	Ave.
3.568774	19.61	Line	46	-26.39	Ave.

120 V, 60 Hz – Neutral



Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.194834	49.61	Neutral	63.83	**-14.22**	QP
0.259294	41.52	Neutral	61.45	-19.94	QP
0.452617	36.51	Neutral	56.83	-20.32	QP
3.373566	34.61	Neutral	56	-21.39	QP
5.12553	36.27	Neutral	60	-23.73	QP
0.908521	34.43	Neutral	56	-21.57	QP

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)	Detector (QP/Ave.)
0.194834	31.6	Neutral	53.83	-22.23	Ave.
0.259294	31.61	Neutral	51.45	-19.84	Ave.
0.452617	31.01	Neutral	46.83	-15.82	Ave.
3.373566	17.66	Neutral	46	-28.34	Ave.
5.12553	20.05	Neutral	50	-29.95	Ave.
0.908521	20.95	Neutral	46	-25.05	Ave.

7 FCC §2.1053, §15.209, §15.247(d) and ISEDC RSS-247 Clause 5.5, RSS-GEN Clause 8.9 & 8.10 - Spurious Radiated Emissions

7.1 Applicable Standards

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

As Per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423		
0.495 – 0.505	16.69475 – 16.69525	960 – 1240	4. 5 – 5. 15
2.1735 – 2.1905	25.5 – 25.67	1300 – 1427	5. 35 – 5. 46
4.125 – 4.128	37.5 – 38.25	1435 – 1626.5	7.25 – 7.75
4.17725 – 4.17775	73 – 74.6	1645.5 – 1646.5	8.025 – 8.5
4.20725 – 4.20775	74.8 – 75.2	1660 – 1710	9.0 – 9.2
6.215 – 6.218	108 – 121.94	1718.8 – 1722.2	9.3 – 9.5
6.26775 – 6.26825	123 – 138	2200 – 2300	10.6 – 12.7
6.31175 – 6.31225	149.9 – 150.05	2310 – 2390	13.25 – 13.4
8.291 – 8.294	156.52475 – 156.52525	2483.5 – 2500	14.47 – 14.5
8.362 – 8.366	156.7 – 156.9	2690 – 2900	15.35 – 16.2
8.37625 – 8.38675	162.0125 –167.17	3260 – 3267	17.7 – 21.4
8.41425 – 8.41475	167.72 – 173.2	3.332 – 3.339	22.01 – 23.12
12.29 – 12.293	240 – 285	3 3458 – 3 358	23.6 – 24.0
12.51975 – 12.52025	322 – 335.4	3.600 – 4.400	31.2 – 31.8
12.57675 – 12.57725	399.9 – 410		36.43 – 36.5
13.36 – 13.41	608 – 614		Above 38.6

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table

Frequency (MHz)	Field Strength (micro volts/meter)	Measurement Distance (meters)
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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz.

However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

As per FCC §15.247 (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 §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c).

As per ISEDC RSS-Gen 8.9,

> Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in Table 4 or Table 5 below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission.

Table 4 – General Field Strength Limits for Licence-Exempt Transmitters at Frequencies Above 30 MHz

Frequency (MHz)	Field Strength (µv/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960*	500

* Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for license-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.

Note: Transmitting devices are not permitted in restricted frequency bands unless stated otherwise in the specifISEDC RSS.

As per ISEDC RSS-247 §5.5, in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

According to FCC §22.917 the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

7.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.10-2013. The specifications used were FCC 15C, ISEDC RSS-Gen, and ISEDC RSS-27 limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

7.3 Test Procedure

For the radiated emissions test, the EUT host, and all support equipment power cords were connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT was set 3 meter away from the testing antenna, which was varied from 1-4 meter, and the EUT was placed on a turntable, which was 0.8 meter and 1.5 meter above the ground plane for below and above 1000 MHz measurements, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna's polarity should be changed between horizontal and vertical.

The spectrum analyzer or receiver was set as:

Below 1000 MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000 MHz:

(1) Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
(2) Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

7.4 Corrected Amplitude and Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + AF + CL + Atten – Ga

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Corrected Amplitude – Limit

7.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde and Schwarz	Receiver, EMI Test	ESCI 1166.5950K03	100338	2016-02-04	2 year
Agilent	Analyzer, Spectrum	E4440A	US 42221851	2016-06-10	1 year
Sunol Science Corp	System Controller	SC99V	011003-1	N/R	N/R
Sunol Sciences	Antenna, Biconi-Log	JB3	A020106-2	2015-07-11	2 Years
EMCO	Antenna, Horn	3115	9511-4627	2016-01-28	2 years
Sunol Sciences	Antenna, Horn	DRH-118	A052704	2017-03-27	2 years
HP	Amplifier, Pre	8447D	2944A06639	2016-06-28	1 year
IW	Yellow High Frequency Cable	DC 1531	SPS-2303-3840-SPS	2016-08-05	1 Year
Suirong	30 ft conductive emission cable	LMR400	C0013	2017-03-21	1 Year
Suirong	30 ft conductive emission cable	LMR400	C0014	2017-03-21	1 Year
Wainwright Instruments	Band Reject Filter	WRCGV900/930-880/950-40/8SS	-	Each time1	1 year
-	SMA cable	-	C0002	Each time[1]	N/A
HP	Pre-Amplifier	8449B OPT HO2	3008A0113	2016-05-23	1year
Rohde and Schwarz	Wideband Radio Communication Tester	CMW500	120503	2015-10-22	2 years
Vasona	Test software	V6.0 build 11	10400213	N/R	N/R

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL *attests that all calibrations have been performed per the A2LA requirements, traceable to NIST.*

7.6 Test Environmental Conditions

Temperature:	20-22 ºC
Relative Humidity:	39-43 %
ATM Pressure:	101 kPa

The testing was performed by Rudy Sun from 2017-04-12 in 5m chamber 3.

7.7 Summary of Test Results

According to the data hereinafter, the EUT complied with FCC Title 47, Part 15C, ISEDC RSS-Gen, and ISEDC RSS-247 standards' radiated emissions limits, and had the worst margin of:

906 -924 MHz

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode, channel**
-0.87	384.01875	Horizontal	914MHz

Colocation

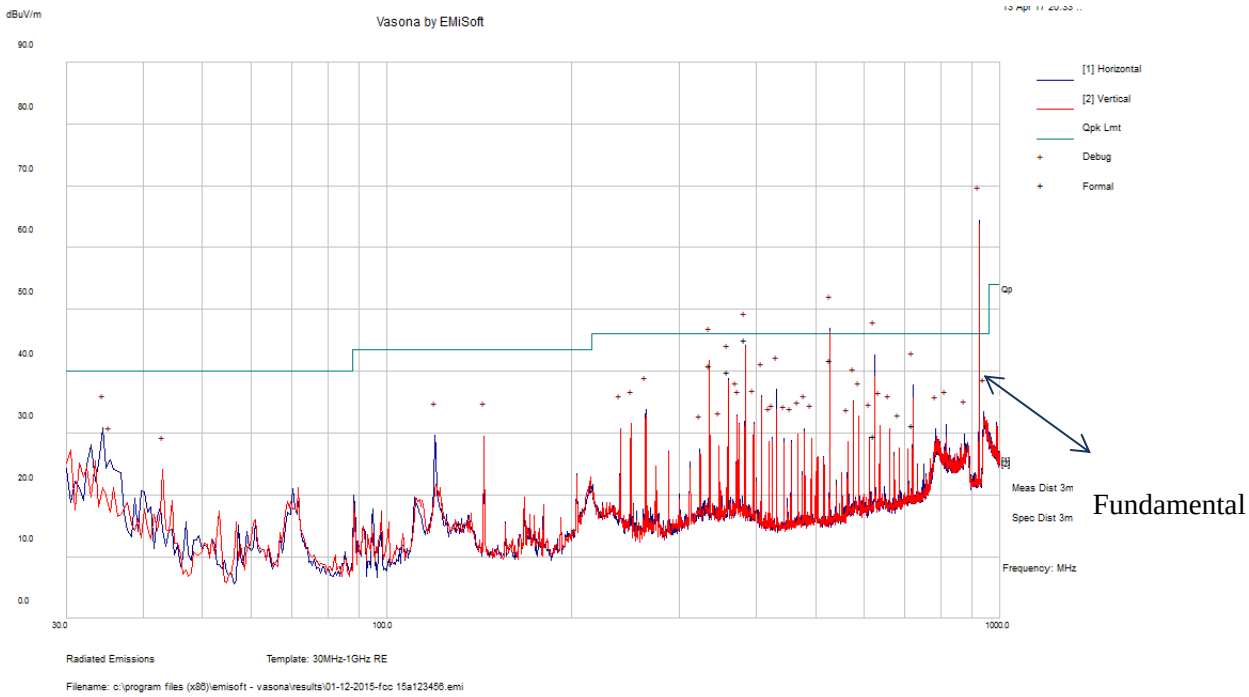
Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode**
-8.86	2718	Vertical	Colocation

Please refer to the following table and plots for specific test result details.

7.8 Radiated Emissions Test Results

1) 30 MHz – 1 GHz Worst Case, Measured at 3 meters

906 -924 MHz Standalone:



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comment
528.01875	41.82	107	H	124	46	-4.18	QP
384.01875	45.13	115	H	310	46	**-0.87**	QP
624.05925	29.49	133	H	254	46	-16.51	QP
336.01625	41	100	V	61	46	-5	QP
360.0265	39.94	130	H	245	46	-6.06	QP
720.0345	31.26	101	H	349	46	-14.74	QP

Note:The 900 MHz Band Reject Filter was added during the testing.

Radio collocation configuration:

Note: After the pre-scan, the worst case radio co-location configuration is RF signal at 906 MHz and GSM850 Band signal at 836.5 MHz.

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comment
30.2925	29.75	222	H	124	40	-10.25	QP

2) 1–10 GHz Measured at 3 meters

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 906 MHz											
906	80.56	222	100	H	24.11	2.33	0.00	107.00	-	-	PK
906	78.52	222	100	H	24.11	2.33	0.00	104.96	-	-	AV
906	91.93	317	104	V	24.11	2.33	0.00	118.37	-	-	PK
906	88.56	317	104	V	24.11	2.33	0.00	115.00	-	-	AV
1812	61.58	222	100	H	26.88	3.35	38.75	53.06	77.00	-23.94	PK
1812	55.21	222	100	H	26.88	3.35	38.75	46.69	74.96	-28.27	AV
1812	65.54	317	104	V	26.88	3.35	38.75	57.02	88.37	-31.35	PK
1812	59.42	317	104	V	26.88	3.35	38.75	50.90	85.00	-34.10	AV
2718	52.90	222	100	H	29.01	3.79	39.46	46.24	74.00	-27.76	PK
2718	45.55	222	100	H	29.01	3.79	39.46	38.89	54.00	-15.11	AV
2718	59.25	317	104	V	29.01	3.79	39.46	52.59	74.00	-21.41	PK
2718	54.22	317	104	V	29.01	3.79	39.46	47.56	54.00	-6.44	AV
3624	46.84	222	100	H	31.78	4.70	39.20	44.12	74.00	-29.88	PK
3624	37.24	222	100	H	31.78	4.70	39.20	34.52	54.00	-19.48	AV
3624	47.61	317	104	V	31.78	4.70	39.20	44.89	74.00	-29.11	PK
3624	39.15	317	104	V	31.78	4.70	39.20	36.43	54.00	-17.57	AV
4530	46.78	222	100	H	32.26	5.10	38.56	45.58	74.00	-28.42	PK
4530	36.13	222	100	H	32.26	5.10	38.56	34.93	54.00	-19.07	AV
4530	47.12	317	104	V	32.26	5.10	38.56	45.92	74.00	-28.08	PK
4530	36.19	317	104	V	32.26	5.10	38.56	34.99	54.00	-19.01	AV
5436	44.94	222	100	H	34.09	5.50	38.33	46.20	74.00	-27.80	PK
5436	34.48	222	100	H	34.09	5.50	38.33	35.74	54.00	-18.26	AV
5436	44.96	317	104	V	34.09	5.50	38.33	46.22	74.00	-27.78	PK
5436	34.51	317	104	V	34.09	5.50	38.33	35.77	54.00	-18.23	AV
6342	54.28	222	100	H	34.42	6.10	37.97	56.83	77.00	-20.17	PK
6342	43.70	222	100	H	34.42	6.10	37.97	46.25	74.96	-28.71	AV
6342	52.00	317	104	V	34.42	6.10	37.97	54.55	88.37	-33.82	PK
6342	41.58	317	104	V	34.42	6.10	37.89	44.21	85.00	-40.79	AV
7248	45.69	222	100	H	36.39	6.91	37.89	51.10	77.00	-25.90	PK
7248	35.85	222	100	H	36.39	6.91	37.89	41.26	74.96	-33.70	AV
7248	47.05	317	104	V	36.39	6.91	37.89	52.46	88.37	-35.91	PK
7248	35.94	317	104	V	36.39	6.91	39.20	40.04	85.00	-44.96	AV
8154	46.73	222	100	H	36.89	6.80	37.88	52.54	74.00	-21.46	PK
8154	37.11	222	100	H	36.89	6.80	37.88	42.92	54.00	-11.08	AV
8154	46.79	317	104	V	36.89	6.80	37.88	52.60	74.00	-21.40	PK
8154	36.08	317	104	V	36.89	6.80	37.88	41.89	54.00	-12.11	AV
9060	46.88	222	100	H	37.80	7.30	38.08	53.90	74.00	-20.10	PK
9060	36.70	222	100	H	37.80	7.30	38.08	43.72	54.00	-10.28	AV
9060	46.04	317	104	V	37.80	7.30	38.08	53.06	74.00	-20.94	PK
9060	35.83	317	104	V	37.80	7.30	38.08	42.85	54.00	-11.15	AV

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Middle Channel 914 MHz											
914	84.27	200	153	H	24.11	2.33	0.00	110.71	-	-	PK
914	82.14	200	153	H	24.11	2.33	0.00	108.58	-	-	AV
914	93.09	333	103	V	24.11	2.33	0.00	119.53	-	-	PK
914	90.98	333	103	V	24.11	2.33	0.00	117.42	-	-	AV
1828	63.17	200	153	H	26.88	3.35	38.75	54.65	80.71	-26.06	PK
1828	57.50	200	153	H	26.88	3.35	38.75	48.98	78.58	-29.60	AV
1828	65.10	333	103	V	26.88	3.35	38.75	56.58	89.53	-32.95	PK
1828	58.86	333	103	V	26.88	3.35	38.75	50.34	87.42	-37.08	AV
2742	52.79	200	153	H	29.01	3.79	39.46	46.13	74.00	-27.87	PK
2742	47.20	200	153	H	29.01	3.79	39.46	40.54	54.00	-13.46	AV
2742	59.73	333	103	V	29.01	3.79	39.46	53.07	74.00	-20.93	PK
2742	54.42	333	103	V	29.01	3.79	39.46	47.76	54.00	-6.24	AV
3656	47.76	200	153	H	31.78	4.70	39.20	45.04	74.00	-28.96	PK
3656	38.78	200	153	H	31.78	4.70	39.20	36.06	54.00	-17.94	AV
3656	46.24	333	103	V	31.78	4.70	39.20	43.52	74.00	-30.48	PK
3656	37.19	333	103	V	31.78	4.70	39.20	34.47	54.00	-19.53	AV
4570	46.34	200	153	H	32.26	5.10	38.56	45.14	74.00	-28.86	PK
4570	36.64	200	153	H	32.26	5.10	38.56	35.44	54.00	-18.56	AV
4570	46.58	333	103	V	32.26	5.10	38.56	45.38	74.00	-28.62	PK
4570	37.41	333	103	V	32.26	5.10	38.56	36.21	54.00	-17.79	AV
5484	43.59	200	153	H	34.09	5.50	38.33	44.85	80.71	-35.86	PK
5484	34.13	200	153	H	34.09	5.50	38.33	35.39	78.58	-43.19	AV
5484	44.50	333	103	V	34.09	5.50	38.33	45.76	89.53	-43.77	PK
5484	34.18	333	103	V	34.09	5.50	38.33	35.44	87.42	-51.98	AV
6398	54.36	200	153	H	34.42	6.10	37.97	56.91	80.71	-23.80	PK
6398	43.52	200	153	H	34.42	6.10	37.97	46.07	78.58	-32.51	AV
6398	55.76	333	103	V	34.42	6.10	37.97	58.31	89.53	-31.22	PK
6398	44.81	333	103	V	34.42	6.10	37.89	47.44	87.42	-39.98	AV
7312	46.21	200	153	H	36.39	6.91	37.89	51.62	74.00	-22.38	PK
7312	37.56	200	153	H	36.39	6.91	37.89	42.97	54.00	-11.03	AV
7312	46.20	333	103	V	36.39	6.91	37.89	51.61	74.00	-22.39	PK
7312	35.67	333	103	V	36.39	6.91	39.20	39.77	54.00	-14.23	AV
8226	44.84	200	153	H	36.89	6.80	37.88	50.65	74.00	-23.35	PK
8226	35.55	200	153	H	36.89	6.80	37.88	41.36	54.00	-12.64	AV
8226	44.76	333	103	V	36.89	6.80	37.88	50.57	74.00	-23.43	PK
8226	35.33	333	103	V	36.89	6.80	37.88	41.14	54.00	-12.86	AV
9140	45.99	200	153	H	37.80	7.30	38.08	53.01	74.00	-20.99	PK
9140	35.39	200	153	H	37.80	7.30	38.08	42.41	54.00	-11.59	AV
9140	45.56	333	103	V	37.80	7.30	38.08	52.58	74.00	-21.42	PK
9140	35.34	333	103	V	37.80	7.30	38.08	42.36	54.00	-11.64	AV

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 924 MHz											
924	82.51	360	100	H	24.11	2.33	0.00	108.95	-	-	PK
924	80.34	360	100	H	24.11	2.33	0.00	106.78	-	-	AV
924	92.23	324	101	V	24.11	2.33	0.00	118.67	-	-	PK
924	89.70	324	101	V	24.11	2.33	0.00	116.14	-	-	AV
1848	54.95	360	100	H	26.88	3.35	38.75	46.43	78.95	-32.52	PK
1848	48.48	360	100	H	26.88	3.35	38.75	39.96	76.78	-36.82	AV
1848	57.55	324	101	V	26.88	3.35	38.75	49.03	88.67	-39.64	PK
1848	49.17	324	101	V	26.88	3.35	38.75	40.65	86.14	-45.49	AV
2772	49.83	360	100	H	29.01	3.79	39.46	43.17	74.00	-30.83	PK
2772	39.14	360	100	H	29.01	3.79	39.46	32.48	54.00	-21.52	AV
2772	50.05	324	101	V	29.01	3.79	39.46	43.39	74.00	-30.61	PK
2772	40.13	324	101	V	29.01	3.79	39.46	33.47	54.00	-20.53	AV
3696	50.31	360	100	H	31.78	4.70	39.20	47.59	74.00	-26.41	PK
3696	40.78	360	100	H	31.78	4.70	39.20	38.06	54.00	-15.94	AV
3696	49.74	324	101	V	31.78	4.70	39.20	47.02	74.00	-26.98	PK
3696	41.23	324	101	V	31.78	4.70	39.20	38.51	54.00	-15.49	AV
4620	44.25	360	100	H	32.26	5.10	38.56	43.05	74.00	-30.95	PK
4620	34.49	360	100	H	32.26	5.10	38.56	33.29	54.00	-20.71	AV
4620	43.96	324	101	V	32.26	5.10	38.56	42.76	74.00	-31.24	PK
4620	35.02	324	101	V	32.26	5.10	38.56	33.82	54.00	-20.18	AV
5544	44.01	360	100	H	34.09	5.50	38.33	45.27	78.95	-33.68	PK
5544	34.79	360	100	H	34.09	5.50	38.33	36.05	76.78	-40.73	AV
5544	44.52	324	101	V	34.09	5.50	38.33	45.78	88.67	-42.89	PK
5544	34.76	324	101	V	34.09	5.50	38.33	36.02	86.14	-50.12	AV
6468	45.22	360	100	H	34.42	6.10	37.97	47.77	78.95	-31.18	PK
6468	35.37	360	100	H	34.42	6.10	37.97	37.92	76.78	-38.86	AV
6468	50.48	324	101	V	34.42	6.10	37.97	53.03	88.67	-35.64	PK
6468	44.42	324	101	V	34.42	6.10	37.89	47.05	86.14	-39.09	AV
7392	44.79	360	100	H	36.39	6.91	37.89	50.20	74.00	-23.80	PK
7392	35.80	360	100	H	36.39	6.91	37.89	41.21	54.00	-12.79	AV
7392	45.41	324	101	V	36.39	6.91	37.89	50.82	74.00	-23.18	PK
7392	35.72	324	101	V	36.39	6.91	39.20	39.82	54.00	-14.18	AV
8316	45.36	360	100	H	36.89	6.80	37.88	51.17	74.00	-22.83	PK
8316	35.59	360	100	H	36.89	6.80	37.88	41.40	54.00	-12.60	AV
8316	44.62	324	101	V	36.89	6.80	37.88	50.43	74.00	-23.57	PK
8316	35.26	324	101	V	36.89	6.80	37.88	41.07	54.00	-12.93	AV
9240	45.89	360	100	H	37.80	7.30	38.08	52.91	78.95	-26.04	PK
9240	35.71	360	100	H	37.80	7.30	38.08	42.73	76.78	-34.05	AV
9240	45.87	324	101	V	37.80	7.30	38.08	52.89	88.67	-35.78	PK
9240	35.67	324	101	V	37.80	7.30	38.08	42.69	86.14	-43.45	AV

Radio Collocation

Note: the host device contains 906MHz-924MHz RF signal and GSM signal. Collocation refers to both signals are activated. And after the pre-scan, the worst case RF signal at 906MHz and GSM850 Band signal at 836.5MHz is transmitting simultaneously.

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
906	81.31	0	212	H	24.11	2.33	0.00	107.75	-	-	PK
906	77.10	0	212	H	24.11	2.33	0.00	103.54	-	-	AV
906	83.92	0	258	V	24.11	2.33	0.00	110.36	-	-	PK
906	79.50	0	258	V	24.11	2.33	0.00	105.94	-	-	AV
1673	26.41	0	100	H	25.80	6.49	39.910	18.79	74.00	-55.21	PK
1673	11.95	0	100	H	25.80	6.49	39.910	4.33	54.00	-49.67	AV
1673	27.03	0	100	V	25.80	6.49	39.910	19.41	74.00	-54.59	PK
1673	11.68	0	100	V	25.80	6.49	39.910	4.06	54.00	-49.94	AV
1812	65.53	132	178	H	26.88	6.49	39.807	59.09	77.75	-18.66	PK
1812	57.67	132	178	H	26.88	6.49	39.807	51.23	73.54	-22.31	AV
1812	65.19	183	260	V	26.88	6.49	39.807	58.75	80.36	-21.61	PK
1812	55.57	183	260	V	26.88	6.49	39.807	49.13	75.94	-26.81	AV
2508	26.99	0	100	H	29.41	6.91	39.329	23.98	77.75	-53.77	PK
2508	12.09	0	100	H	29.41	6.91	39.329	9.08	73.54	-64.46	AV
2508	25.94	0	100	V	29.41	6.91	39.329	22.93	80.36	-57.43	PK
2508	12.06	0	100	V	29.41	6.91	39.329	9.05	75.94	-66.89	AV
2718	56.66	316	220	H	29.01	3.79	39.279	50.18	74.00	-23.82	PK
2718	46.05	316	220	H	29.01	3.79	39.279	39.57	54.00	-14.43	AV
2718	61.76	250	174	V	29.01	3.79	39.279	55.28	74.00	-18.72	PK
2718	51.62	250	174	V	29.01	3.79	39.279	45.14	54.00	**-8.86**	AV
3624	47.16	0	100	H	31.78	4.70	39.134	44.51	74.00	-29.49	PK
3624	33.60	0	100	H	31.78	4.70	39.134	30.95	54.00	-23.05	AV
3624	47.62	0	100	V	31.78	4.70	39.134	44.97	74.00	-29.03	PK
3624	33.44	0	100	V	31.78	4.70	39.134	30.79	54.00	-23.21	AV
4530	52.40	314	248	H	32.26	5.10	38.979	50.78	74.00	-23.22	PK
4530	39.79	314	248	H	32.26	5.10	38.979	38.17	54.00	-15.83	AV
4530	52.28	187	300	V	32.26	5.10	38.979	50.66	74.00	-23.34	PK
4530	40.50	187	300	V	32.26	5.10	38.979	38.88	54.00	-15.12	AV

8 FCC §15.247(a)(2) and ISEDC RSS-247 Clause 5.2 -Emission Bandwidth

8.1 Applicable Standards

FCC §15.247(a) (2) and ISEDC RSS-247 Clause 5.2

8.2 Test Results

Please refer to the Report: R1702012-247 (Sensor) section 7 (FCC ID: 2AK4V-DT-502, IC: 22517-DT502).

9 FCC §15.247(b) (3) and ISEDC RSS-247 Clause 5.4 (d) - Output Power Measurement

9.1 Applicable Standards

FCC §15.247(b) (3) and ISEDC RSS-247 Clause 5.4 (d)

9.2 Test Results

Please refer to the Report: R1702012-247 (Sensor) section 8 (FCC ID: 2AK4V-DT-502, IC: 22517-DT502).

10 FCC §15.247(d) and ISEDC RSS-247 Clause 5.5 – 100 kHz Bandwidth of Band Edges

10.1 Applicable Standards

FCC §15.247(d) and ISEDC RSS-247 Clause 5.5

10.2 Test Results

Please refer to the Report: R1702012-247 (Sensor) section 9 (FCC ID: 2AK4V-DT-502, IC: 22517-DT502).

11 FCC §15.247(e) and ISEDC RSS-247 Clause 5.2(b) – Power Spectral Density

11.1 Applicable Standards

FCC §15.247(e) and ISEDC RSS-247 Clause 5.2(b)

11.2 Test Results

Please refer to the Report: R1702012-247 (Sensor) section 10 (FCC ID: 2AK4V-DT-502, IC: 22517-DT502).

12 FCC §15.247(d) and ISEDC RSS-247 Clause 5.5– Spurious Emissions at Antenna Terminals

12.1 Applicable Standards

FCC §15.247(d) and ISEDC RSS-247 Clause 5.5

12.2 Test Results

Please refer to the Report: R1702012-247 (Sensor) section 11 (FCC ID: 2AK4V-DT-502, IC: 22517-DT502).