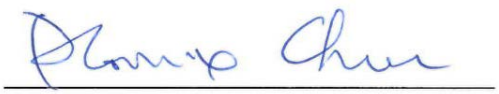
FCC Test Report

Equipment	:	**Wireless Bump Bar**
Brand Name	:	**POSIFLEX**
Model No.	:	**BB-3000W (where W can be 0-9,A-Z or blank)**
FCC ID	:	**V93BB3000W**
Standard	:	**47 CFR FCC Part 15.249**
Operating Band	:	**902 MHz – 928 MHz**
FCC Classification	:	**DXX**
Applicant / Manufacturer	:	**POSIFLEX TECHNOLOGY, INC. No.23, Datong St., Tucheng Dist., New Taipei City 23679, Taiwan (R.O.C.)**

The product sample received on Dec. 29, 2016 and completely tested on Jun. 27, 2017. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



Phoenix Chen / Assistant Manager

Testing Laboratory
1190

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APPENDIX A. TEST PHOTOS

PHOTOGRAPHS OF EUT V01

Summary of Test Result

Conformance Test Specifications					
Report Clause	**Ref. Std. Clause**	**Description**	**Measured**	**Limit**	**Result**
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]:0.433MHz 31.10 (Margin 16.10dB) - AV 32.61 (Margin 24.59dB) - QP	FCC 15.207	Complied
3.2	15.215(c)	Emission Bandwidth	0.1950 MHz; fall in band	Information only	Complied
3.3	15.249(a)	Fundamental Emissions	[dBuV/m at 3m]: 87.46 (Margin 6.54dB) quasi peak	[dBuV/m at 3m]: quasi peak: 94	Complied
3.4	15.249(a)/ (d)	Transmitter Radiated Unwanted Emissions	[dBuV/m at 3m]:2745 MHz 54.53 (Margin 19.47dB) - PK 52.61 (Margin 1.39dB) - AV	Harmonics: 54 dBuV/m@3m Other band: 50 dB or FCC 15.209, whichever is the lesser attenuation.	Complied

Revision History

Report No.	Version	Description	Issued Date
FR681919ZW	Rev. 01	Initial issue of report	Aug. 04, 2017

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information					
Frequency Range (MHz)	**Modulation**	**Ch. Frequency (MHz)**	**Channel Number**	**Fundamental Field Strength (dBuV/m)**	**Co-location**
902-928	GFSK	915	1	87.46	N/A
Note 1: Field strength performed quasi peak level at 3m. Note 2: Co-location, Co-location is generally defined as simultaneously transmitting (co-transmitting) antennas within 20 cm of each other. (i.e., EUT has simultaneously co-transmitting that operating 900MHz and 2.4GHz.)					

1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	1	-	-	chip antenna	fixed on board	1.59

1.1.3 Type of EUT

Operational Condition	
EUT Power Type	From host system
Type of EUT	
☒	Stand-alone
☐	Combined (EUT where the radio part is fully integrated within another device) Combined Equipment - Brand Name / Model No.: …
☐	Plug-in radio (EUT intended for a variety of host systems) Host System - Brand Name / Model No.: …
☐	Other:

1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle	
☐ Operated normally mode for worst duty cycle	
☒ Operated test mode for worst duty cycle	
Test Signal Duty Cycle (x)	**Duty Cycle Correction Factor [dB] – (20 log x)**
☒ 100%	0
If worst duty < 100%, average emission = peak emission + 20 log x	

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15
- ANSI C63.10-2013

1.3 Testing Location Information

Testing Location					
☒	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)			
		TEL : 886-3-327-3456	FAX : 886-3-327-0973		
Test site Designation No. TW1190 with FCC.					
Test Condition		**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
RF Conducted		TH07-HY	Candy Wu	22.9°C / 64%	12/Jun/2017
Radiated		03CH09-HY	Jeff Lin	22.6°C / 51.6%	31/May/2017
AC Conduction		CO01-NH	Willy	22°C / 55%	27/Jun/2017

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	2.1 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	2.6 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	2.9 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%

2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

Modulation Used for Conformance Testing	
Test Mode	**Field Strength (dBuV/m at 3 m)**
Z-wave-Transmit	87.46

2.2 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration	
Test Mode	**Test Channel Frequencies (MHz)**
Z-wave-Transmit	915

2.3 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral (120Vac / 60Hz)
Operating Mode	Operating Mode Description
1	USB Mode

The Worst Case Mode for Following Conformance Tests		
Tests Item	Emission Bandwidth, Fundamental Emissions, Radiated Unwanted Emissions	
Test Condition	Radiated measurement	
User Position	☐ EUT will be placed in fixed position.	
	☒ EUT will be placed in mobile position and operating multiple positions.	
	☐ EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions.	
Operating Mode	☒ 1. USB Mode	
Test Mode	Z-wave-Transmit	
Orthogonal Planes of EUT	**Y Plane**	**Z Plane**
	V	

2.4 Support Equipment

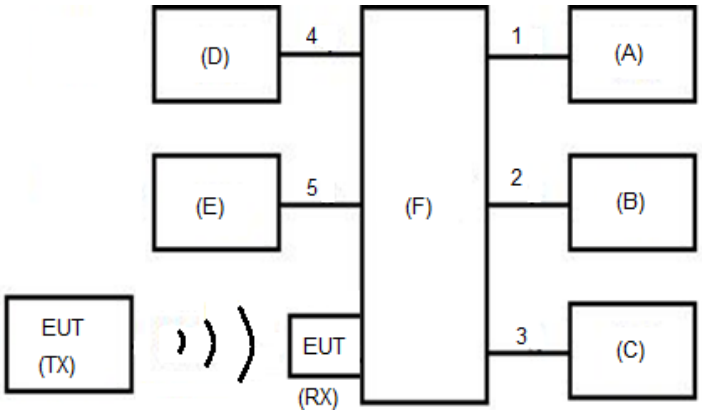
Support Equipment - RF Conducted				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E5410	DOC
2	Adapter for NB	DELL	HA65NM130	DOC

Support Equipment - Radiated				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E6400	DOC
2	Adapter for NB	DELL	LA65NS2-01	DOC

Support Equipment - AC Conduction				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	LCD MONITOR 19”	DELL	E198WFPF	DoC
B	Keyboard	Lenovo	KU-0225	DoC
C	MOUSE	Lenovo	M-U0025-O	DoC
D	Printer (DJ400)	HP	C2642A	B94C2642X
E	Modem	ACEEX	DM1414	IFAXDM1414
F	PC	Lenovo	C61	DoC

2.5 Test Setup Diagram

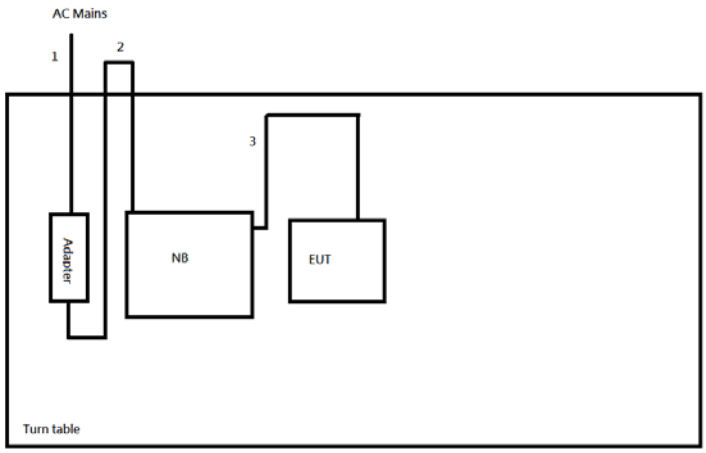
Test Setup Diagram – AC Line Conducted Emission Test



The EUT is insert into support unit F.

Item	Connection	Shielded	Length(m)	Remark
1	D-SUB Cable	D-Shielded	1.80	-
2	USB Cable	AL-F-Shielded	1.50	-
3	USB Cable	AL-F-Shielded	1.50	-
4	LPT Cable	D-Shielded	1.70	-
5	RS-232 Cable	D-Shielded	1.15	-

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length(m)	Remark
1	AC power line	N	1.8m	-
2	DC power line	N	1.8m	-
3	USB cable	Y	1.8m	-

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

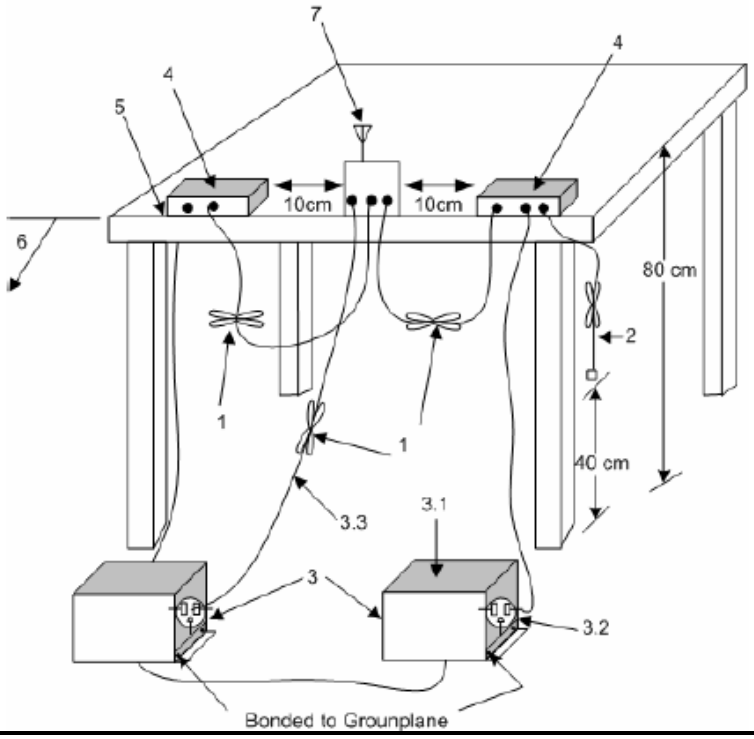
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

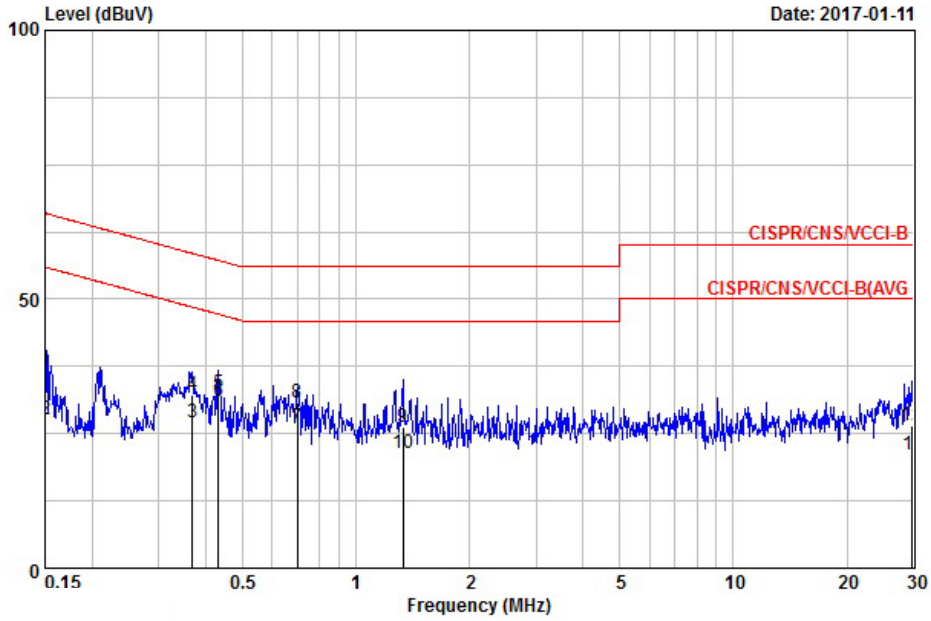
3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

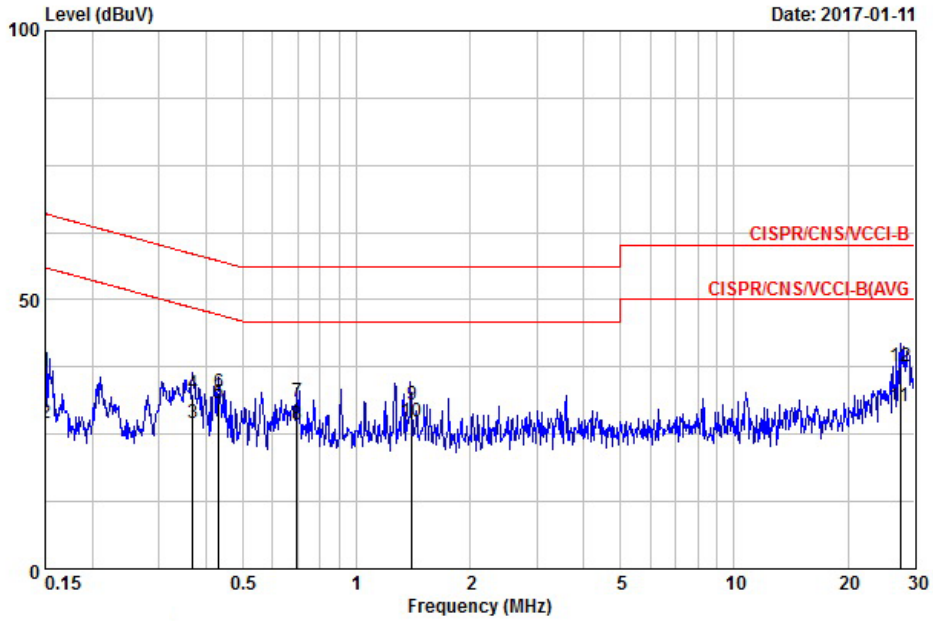
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	USB Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.150	36.74	-29.26	66.00	26.49	10.15	0.10	QP
2	0.150	27.56	-28.44	56.00	17.31	10.15	0.10	AVERAGE
3	0.369	27.12	-21.40	48.52	16.70	10.31	0.10	AVERAGE
4	0.369	32.20	-26.32	58.52	21.78	10.31	0.10	QP
5	0.433	32.61	-24.59	57.20	22.20	10.31	0.10	QP
6 @	0.433	31.10	-16.10	47.20	20.69	10.31	0.10	AVERAGE
7	0.701	26.16	-19.84	46.00	15.83	10.23	0.10	AVERAGE
8	0.701	30.66	-25.34	56.00	20.33	10.23	0.10	QP
9	1.331	26.28	-29.72	56.00	15.96	10.18	0.14	QP
10	1.331	21.28	-24.72	46.00	10.96	10.18	0.14	AVERAGE
11	29.841	21.18	-28.82	50.00	10.10	10.68	0.40	AVERAGE
12	29.841	26.58	-33.42	60.00	15.50	10.68	0.40	QP

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Line
Operating Function	USB Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.150	36.65	-29.35	66.00	26.41	10.14	0.10	QP
2	0.150	27.20	-28.80	56.00	16.96	10.14	0.10	AVERAGE
3	0.369	27.09	-21.43	48.52	16.78	10.21	0.10	AVERAGE
4	0.369	32.41	-26.11	58.52	22.10	10.21	0.10	QP
5 @	0.433	30.85	-16.35	47.20	20.53	10.22	0.10	AVERAGE
6	0.433	32.66	-24.54	57.20	22.34	10.22	0.10	QP
7	0.697	30.95	-25.05	56.00	20.61	10.24	0.10	QP
8	0.697	26.90	-19.10	46.00	16.56	10.24	0.10	AVERAGE
9	1.401	30.40	-25.60	56.00	19.91	10.34	0.15	QP
10	1.401	27.37	-18.63	46.00	16.88	10.34	0.15	AVERAGE
11	27.562	30.21	-19.79	50.00	18.99	10.82	0.40	AVERAGE
12	27.562	37.74	-22.26	60.00	26.52	10.82	0.40	QP

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

3.2 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

Emission Bandwidth Limit
☒ Emission bandwidth falls completely within authorized band.

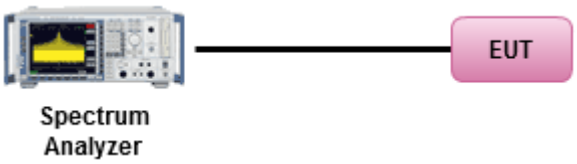
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10, clause 6.9.1 for 20 dB emission bandwidth and 99% occupied bandwidth measurement.

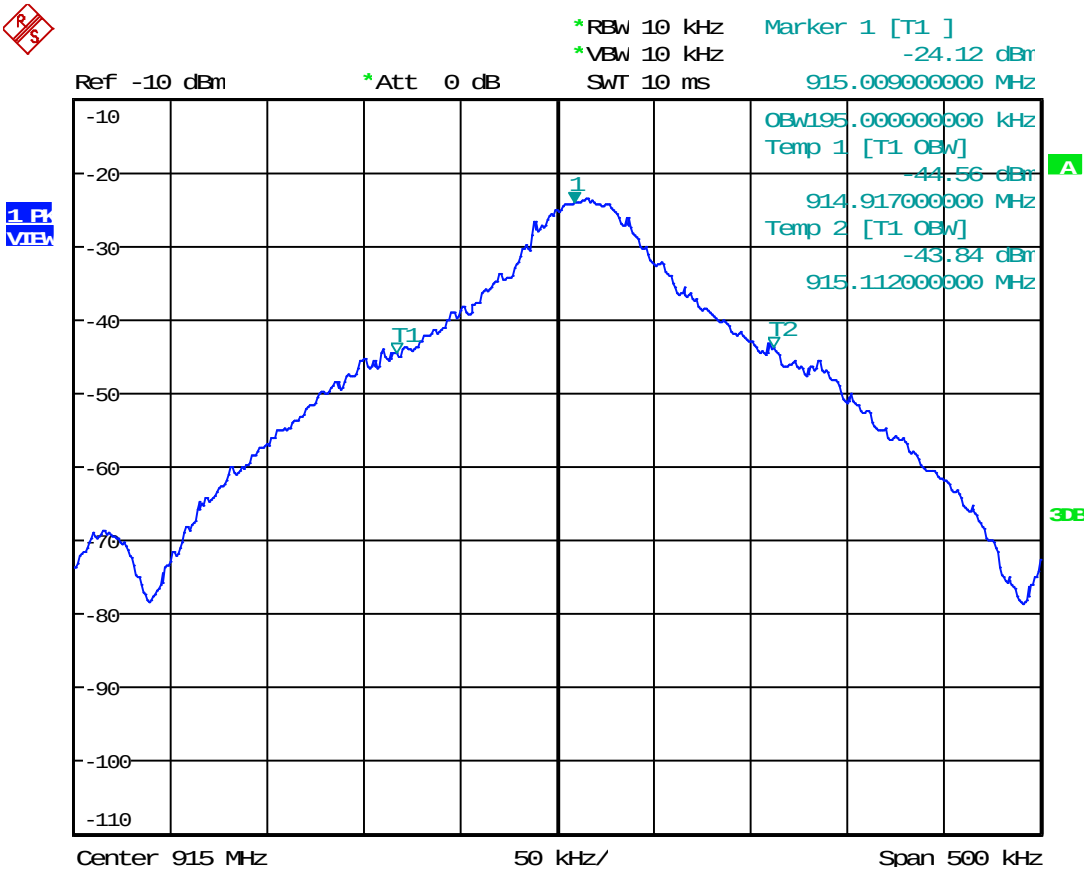
3.2.4 Test Setup

Emission Bandwidth


3.2.5 Test Result of Emission Bandwidth

Emission Bandwidth Result					
Modulation Mode	**Frequency (MHz)**	**20dB Bandwidth (MHz)**	**99% Bandwidth (MHz)**	**F_L at 20dB BW (MHz)**	**F_H at 20dB BW (MHz)**
Z-wave-Transmit	915	0.1850	0.1950	914.9270	915.1120
Limit		**N/A**	**N/A**	**902**	**928**
Result		**Complied**			

Worst Emission Bandwidth Plots



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3.3 Fundamental Emissions

3.3.1 Fundamental Emissions Limit

Fundamental Emissions E-Field Strength Limit (3m)	
☒	902-928 MHz Band: 94 dBuV/m (quasi peak)
☐	2400-2483.5 MHz Band: 94 dBuV/m (average)
☐	5725-5785 MHz Band: 94 dBuV/m (average)

3.3.2 Measuring Instruments

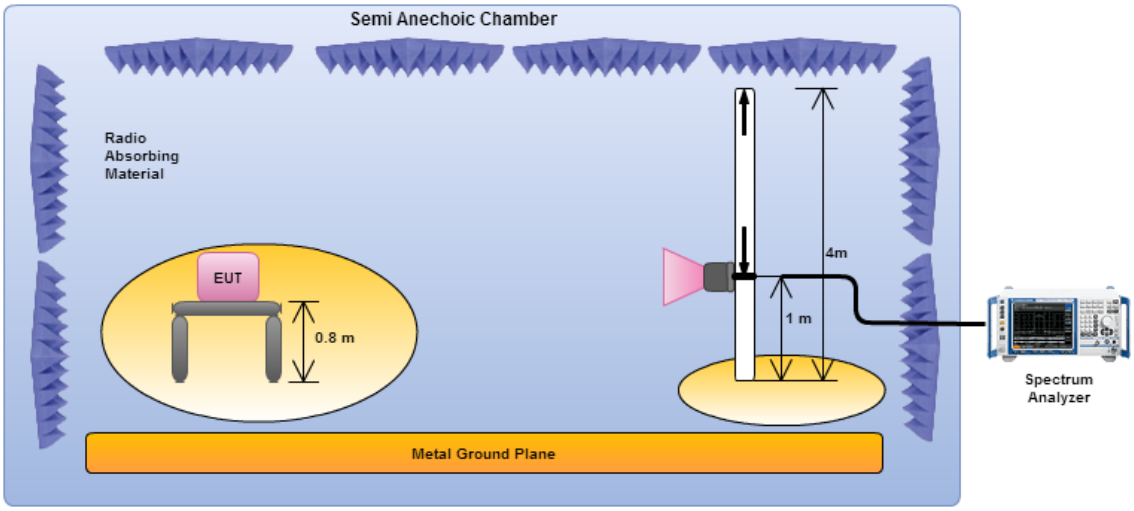
Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

☒	The average emission levels shall be measured in [duty cycle ≥ 100 or by duty cycle correction factor].	
☒	For the transmitter emissions shall be measured using following options below:	
	☒	Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW) – Duty cycle ≥ 100%.
	☐	Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions. Adjusted by a “duty cycle correction factor”, derived from 20log (dwell time/100 ms). Average emission = peak emission + 20 log (duty cycle).
	☒	Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions and test distance is 3m.	

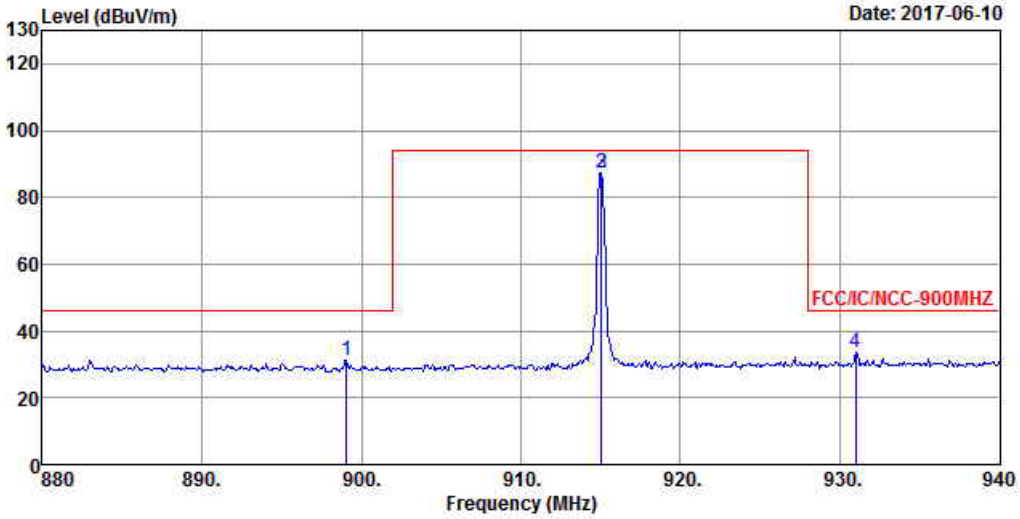
3.3.4 Test Setup

Fundamental Emissions



3.3.5 Test Result of Fundamental Emissions

Field Strength of Fundamental Emissions Result					
Modulation Mode	**Frequency (MHz)**	**Fundamental (dBuV/m)@3m**	**Margin (dB)**	**Limit (dBuV/m)@3m**	**Type**
Z-wave-Transmit	915.040	87.46	6.54	94	peak
Result		**Complied**			



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	899.080	31.09	-14.91	46.00	35.80	27.76	5.06	37.53	Peak
2	915.040	87.46	-6.54	94.00	91.49	28.27	5.17	37.47	Peak
3	915.040	87.32	-6.68	94.00	91.35	28.27	5.17	37.47	QP
4	931.000	33.40	-12.60	46.00	36.69	28.83	5.29	37.41	Peak

Note 1: Measurement worst emissions of receive antenna polarization: Horizontal.

3.4 Transmitter Radiated Unwanted Emissions

3.4.1 Transmitter Radiated Unwanted Emissions Limit

Transmitter Radiated Unwanted Emissions Limit
Harmonics:
☒ 54 dBuV/m (average)
Other Unwanted Emissions:
☒ 50 dB below the level of the fundamental or FCC 15.209, whichever is the lesser attenuation.

3.4.2 Measuring Instruments

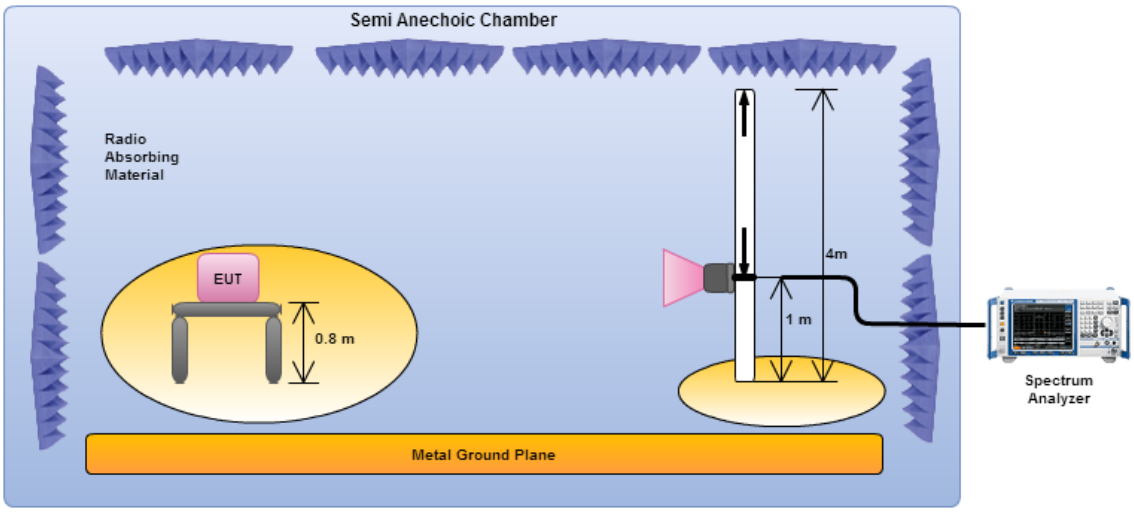
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method – General Information	
☒	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
☒	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
☒	Refer as ANSI C63.10, clause 6.9.2.2 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
☒	For the transmitter unwanted emissions shall be measured using following options below:
☒	Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW) – Duty cycle ≥ 100%.
☐	Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions. Adjusted by a “duty cycle correction factor”, derived from 20log (dwell time/100 ms). Average emission = peak emission + 20 log (duty cycle).
☒	Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.
☒	For the transmitter bandedge emissions shall be measured using following options below:
☒	Refer as ANSI C63.10, clause 6.9.2 for band-edge testing.
☐	Refer as ANSI C63.10, clause 6.9.3 for marker-delta method for band-edge measurements.
☒	For radiated measurement.
☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
☒	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1 GHz and test distance is 3m.
☒	The any unwanted emissions level shall not exceed the fundamental emission level.
☒	All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

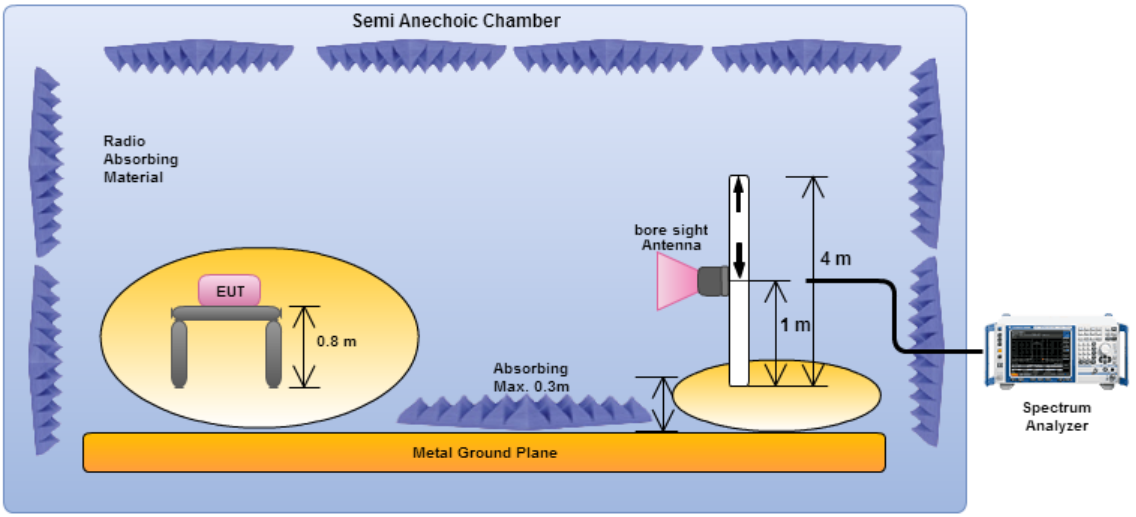
3.4.4 Test Setup

Transmitter Radiated Unwanted Emissions (below 1GHz)



Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna.

Transmitter Radiated Unwanted Emissions (Above 1GHz)



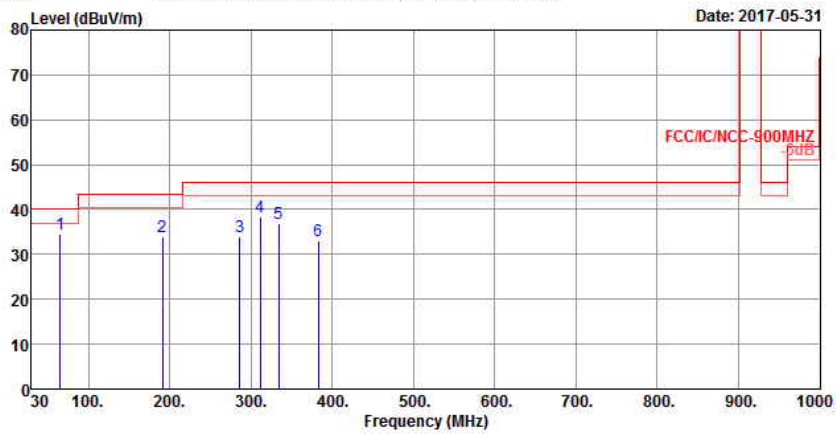
Electric field tests shall be performed in the frequency range of 1 GHz to 10th harmonic of highest fundamental frequency or 40 GHz using a calibrated horn antenna.

3.4.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

3.4.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

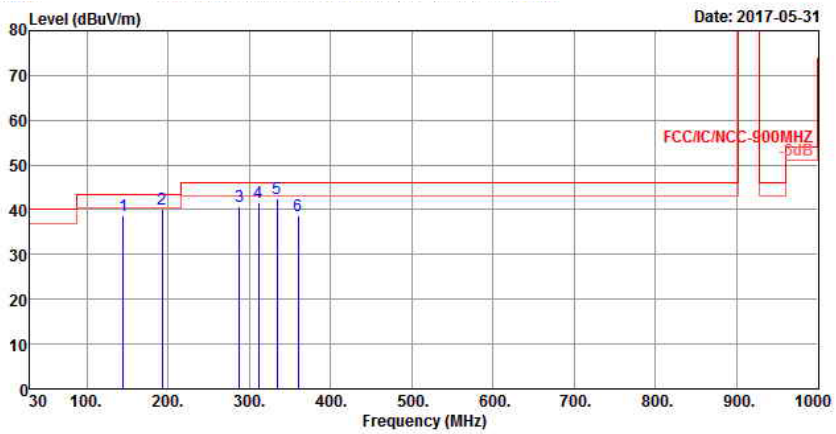
Transmitter Radiated Unwanted Emissions (Below 1GHz)			
Operating Mode	1	**Polarization**	V
Operating Function	USB Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	64.920	34.68	-5.32	40.00	59.50	10.93	1.30	37.05	Peak
2	191.020	33.80	-9.70	43.50	54.19	13.77	2.26	36.42	Peak
3	286.080	33.94	-12.06	46.00	49.73	17.78	2.86	36.43	Peak
4	311.300	38.45	-7.55	46.00	53.62	18.28	3.01	36.46	Peak
5	334.580	36.81	-9.19	46.00	51.41	18.83	3.07	36.50	Peak
6	383.080	33.19	-12.81	46.00	46.35	20.17	3.25	36.58	Peak

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical).
Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.

Transmitter Radiated Unwanted Emissions (Below 1GHz)			
Operating Mode	1	**Polarization**	H
Operating Function	USB Mode		

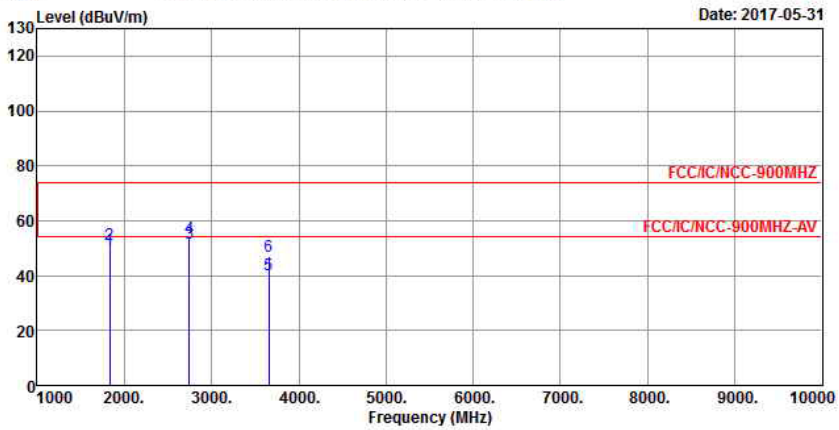


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	144.460	38.71	-4.79	43.50	57.06	16.28	1.98	36.61	Peak
2	192.960	40.26	-3.24	43.50	60.60	13.81	2.26	36.41	Peak
3	288.020	40.86	-5.14	46.00	56.58	17.83	2.88	36.43	Peak
4	311.300	41.70	-4.30	46.00	56.87	18.28	3.01	36.46	QP
5	334.580	42.54	-3.46	46.00	57.14	18.83	3.07	36.50	Peak
6	359.800	38.73	-7.27	46.00	52.51	19.61	3.15	36.54	Peak

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical).
Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.

3.4.7 Transmitter Radiated Unwanted Emissions (Above 1GHz)

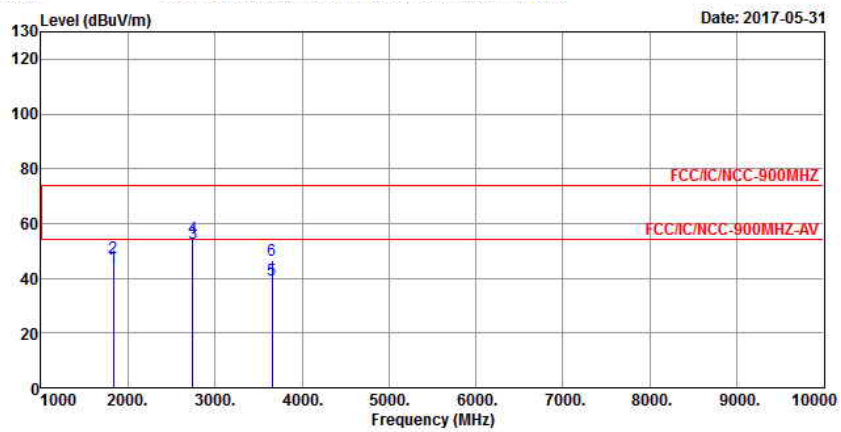
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	Z-wave-Transmit	**Test Freq.**	915
Operating Function	Transmit	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1830.000	49.31	-4.69	54.00	52.69	25.73	6.01	35.12	Average
2	1830.000	51.14	-22.86	74.00	54.52	25.73	6.01	35.12	Peak
3	2745.000	51.76	-2.24	54.00	52.49	27.94	6.63	35.30	Average
4	2745.000	53.74	-20.26	74.00	54.47	27.94	6.63	35.30	Peak
5	3660.000	40.51	-13.49	54.00	39.08	28.92	7.79	35.28	Average
6	3660.000	47.00	-27.00	74.00	45.57	28.92	7.79	35.28	Peak

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 3: For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
Note 4: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).
Note 5: No level of unwanted emissions exceeds the level of the fundamental emission.

Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	Z-wave-Transmit	**Test Freq.**	915
Operating Function	Transmit	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1830.000	44.24	-9.76	54.00	47.62	25.73	6.01	35.12	Average
2	1830.000	47.70	-26.30	74.00	51.08	25.73	6.01	35.12	Peak
3	2745.000	52.61	-1.39	54.00	53.34	27.94	6.63	35.30	Average
4	2745.000	54.53	-19.47	74.00	55.26	27.94	6.63	35.30	Peak
5	3660.000	39.47	-14.53	54.00	38.04	28.92	7.79	35.28	Average
6	3660.000	46.63	-27.37	74.00	45.20	28.92	7.79	35.28	Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 3: For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
Note 4: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).
Note 5: No level of unwanted emissions exceeds the level of the fundamental emission.

3.4.8 Transmitter Radiated Bandedge Emissions

902-928 MHz Transmitter Radiated Bandedge Emissions						
Modulation Mode	**Test Freq. (MHz)**	**Measure Distance (m)**	**Freq. (MHz) PK**	**Level (dBuV/m) PK**	**Limit (dBuV/m) QPK**	**Pol.**
Z-wave-Transmit	915	3	931.000	33.40	46.00	H
Note 1: Measurement worst emissions of receive antenna polarization.						

4 Test Equipment and Calibration Data

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz ~ 1GHz	25/Apr/2017	24/Apr/2018
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz	21/Jun/2016	20/Jun/2017
Amplifier	Agilent	8449B	3008A02096	1GHz ~ 26.5GHz	25/Apr/2017	24/Apr/2018
Amplifier	EMC	EMC9135	980232	9KHz~1GHz	25/Apr/2017	24/Apr/2018
Spectrum Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz ~ 44GHz	04/Jul/2016	03/Jul/2017
Bilog Antenna	TESEQ	CBL 6111D	35418	30MHz~1GHz	01/Oct/2016	30/Sep/2017
Horn Antenna	SCHWARZBECK	BBHA 9120D	BBHA9120D 1534	1GHz~18GHz	28/Apr/2017	27/Apr/2018
Loop Antenna	R&S	HFH2-Z2	100330	9 kHz~30 MHz	10/Nov/2016	09/Nov/2017
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	23/Jul/2016	22/Jul/2017
RF Cable-high	Jye Bao	RG142	03CH09-HY	1GHz ~ 40GHz	23/Jul/2016	22/Jul/2017

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	9kHz~40GHz	30/Dec/2016	29/Dec/2017