Prüfbericht-Nr.: *Test report No.:*	**60355911 001**	**Auftrags-Nr.:** *Order No.:*	168156061	Seite 1 von 22 *Page 1 of 22*
Kunden-Referenz-Nr.: *Client reference No.:*	N/A	**Auftragsdatum:** *Order date.:*	13.03.2020	
Auftraggeber: *Client:*	**SHENZHEN DBK ELECTRONICS CO.,LTD.** No.8 Qinghua Road, Zhu Viliage, Fucheng New Community, Guanlan Street, Longhua District, Shenzhen City, Guangdong Province, China			
Prüfgegenstand: *Test item:*	Qi Wireless Charging Pad			
Bezeichnung / Typ-Nr.: *Identification / Type No.:*	NS-MWPC5K, NS-MWPC5K-C, NS-MWPC5KTP, NS-xxxxxxxxxx, MD-xxxxxxxxxx, PT-xxxxxxxxxx, DX-xxxxxxxxxx, RF-xxxxxxxxxx ("X" = 0-9, A-Z, a-z, "-" or blank for market purpose) (Trademark: INSIGNIA, MODAL, Platinum, DYNEX, Rocketfish)			
Auftrags-Inhalt: *Order content:*	FCC Certification approval			
Prüfgrundlage: *Test specification:*	CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209			

Wareneingangsdatum: *Date of receipt:*	17.03.2020
Prüfmuster-Nr.: *Test sample No.:*	A001072446-026 A001072446-027
Prüfzeitraum: *Testing period:*	18.03.2020 - 01.04.2020
Ort der Prüfung: *Place of testing:*	TÜV Rheinland (Shenzhen) Co., Ltd.
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.
Prüfergebnis*: *Test result*:*	Pass

Refer to photos document

geprüft von / *tested by:*

Datum *Date*	Name/Stellung *Name/Position*	Unterschrift *Signature*
06.04.2020	Lin Lin / Senior Project Manager	

kontrolliert von / *reviewed by:*

Datum *Date*	Name/Stellung *Name/Position*	Unterschrift *Signature*
06.04.2020	Winnie Hou / Technical Certifier	

Sonstiges / *Other:*

FCC ID: 2ARVRWC073

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

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhalt
	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 specifications(s)		F(ail) = failed a.m. test specifications(s)	N/A = not applicable	N/T = not tested

Test Summary

5.1.1 ANTENNA REQUIREMENT
RESULT: Pass

5.1.2 RADIATED SPURIOUS EMISSION
RESULT: Pass

5.1.3 CONDUCTED EMISSIONS
RESULT: Pass

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 A: Photographs of the Test Set-up

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

No. 362 Huangguan Road Middle, Longhua District, Shenzhen 518110, China

FCC Registration No.: CN1260

IC Registration No.: 25069

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

TÜV Rheinland (Shenzhen) Co., Ltd.

Spurious Emissions Testing				
Description	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
EMI Test Receiver	R&S	ESR 7	102021	19.08.2020
Signal Analyzer	R&S	FSV 40	101439	21.08.2020
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	21.08.2020
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	20.08.2020
Amplifier	R&S	SCU-18F	180070	20.08.2020
Amplifier	R&S	SCU40A	100475	20.08.2020
Trilog Broadband Antenna (30 MHz - 1 GHz)	Schwarzbeck	VULB9162	193	02.09.2020
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	02.09.2020
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	02.09.2020
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	01.09.2020
Wideband Ridged Horn Antenna (12-18 GHz)	Steatite	QMS-00208	18313	02.09.2020
Test software	R&S	V10.40.10-EMC32	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	07.06.2020
Conducted Emissions				
Description	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
EMI Test Receiver	R&S	ESR3	102428	03.09.2020
Artificial Mains Network	R&S	ENV216	102333	19.08.2020
Attenuator	R&S	ESH2Z31	100300	19.08.2020
EMC32 test software	R&S	EMC32(Ver.10.50.0 1)	N/A	N/A

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 as below table

Test	Parameters	Expanded uncertainty (U_{lab})	Expanded uncertainty (U_{cispr})
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 3.70 dB ± 3.30 dB	± 3.8 dB ± 3.4 dB
Radiated Emission (3m SAC)	Level accuracy (30MHz to 1000MHz)	± 4.52 dB	± 6.3 dB
	Level accuracy (above 1000MHz)	± 4.37 dB	N/A

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at No. 362 Huangguan Road Middle, Longhua District, Shenzhen 518110, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The device is a Qi Wireless Charging Pad.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment	Qi Wireless Charging Pad
Type Designation	NS-MWPC5K, NS-MWPC5K-C, NS-MWPC5KTP, NS-xxxxxxxxxx, MD-xxxxxxxxxx, PT-xxxxxxxxxx, DX-xxxxxxxxxx, RF-xxxxxxxxxx ("X" = 0-9, A-Z, a-z, "-" or blank for market purpose) Note1: All the models are identical except the model name and/or color. Note2: The model NS-MWPC5K was select to test as master device.
Trademark	INSIGNIA, MODAL, Platinum, DYNEX, Rocketfish
FCC ID	2ARVRWC073
Input Voltage	AC/DC Operated, Model: USB-159US Input: 100-240Vac, 50/60Hz, Output: 5Vdc, 2.4A
Test voltage	120Vac, 60Hz
Technical Specification of WPT	
Operating Frequency	110-205KHz
Modulation	FSK
Antenna Type	Coil Antenna
Antenna number	1
Wireless Charger output power	Max. 5W

3.3 Independent Operation Modes

The basic operation modes are:

A. On, Wireless charging

B. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- User Manual

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5&6. All testing were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.2, all tests were performed on model NS-MWPC5K in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 3: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Electrical Load	HANK Electronics Co., Ltd.	1824	C190124-017-002-001	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 Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

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

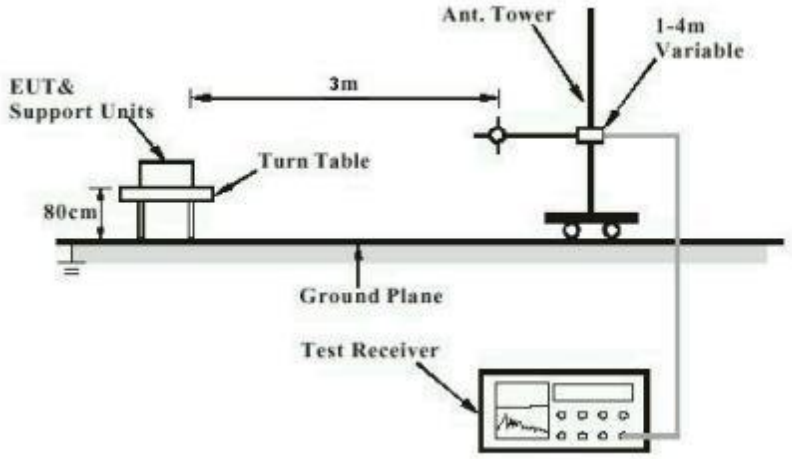
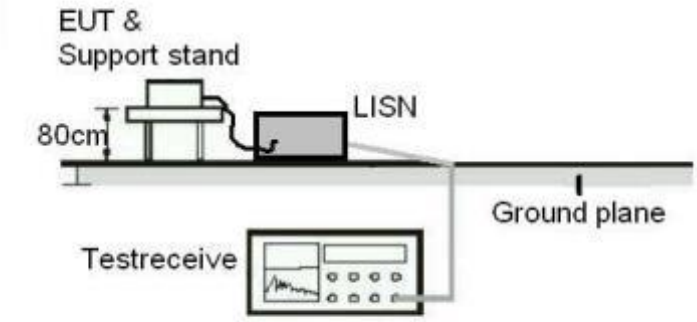


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Pass**

Test Specification

Test standard : Part 15.203

According to the manufacturer declared, the EUT has an internal antenna, and the antenna is permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2 Radiated Spurious Emission

RESULT: **Pass**

Test Specification

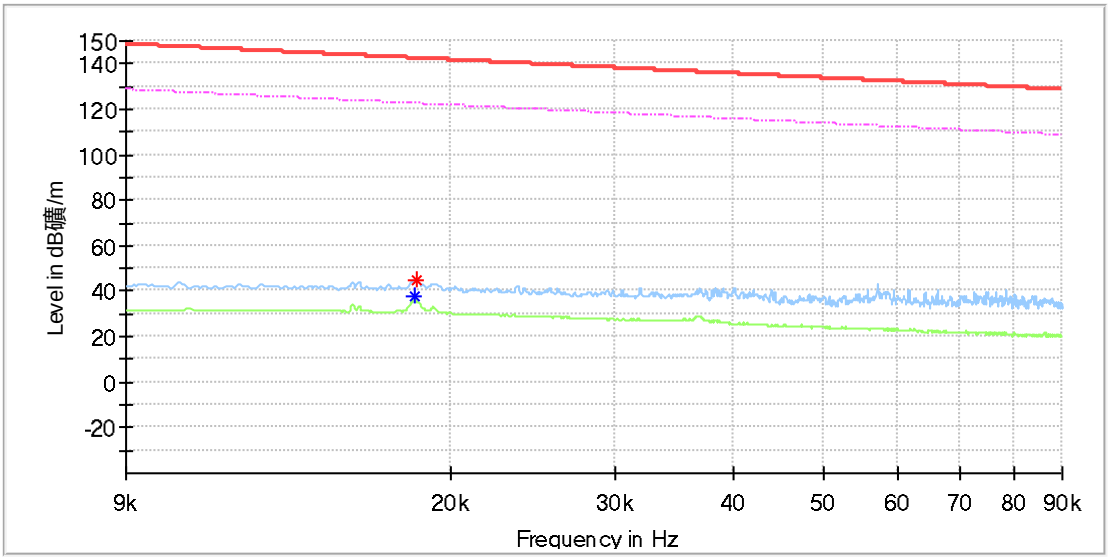
Test standard	:	FCC Part 15.209 & 15.205
Basic standard	:	ANSI C63.10: 2013
Limits	:	Refer to 15.209(a)
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	18.03.2020 ~ 19.03.2020
Input voltage	:	120Vac, 60Hz
Operation mode	:	A
Ambient temperature	:	23 ℃
Relative humidity	:	48 %
Atmospheric pressure	:	101 kPa

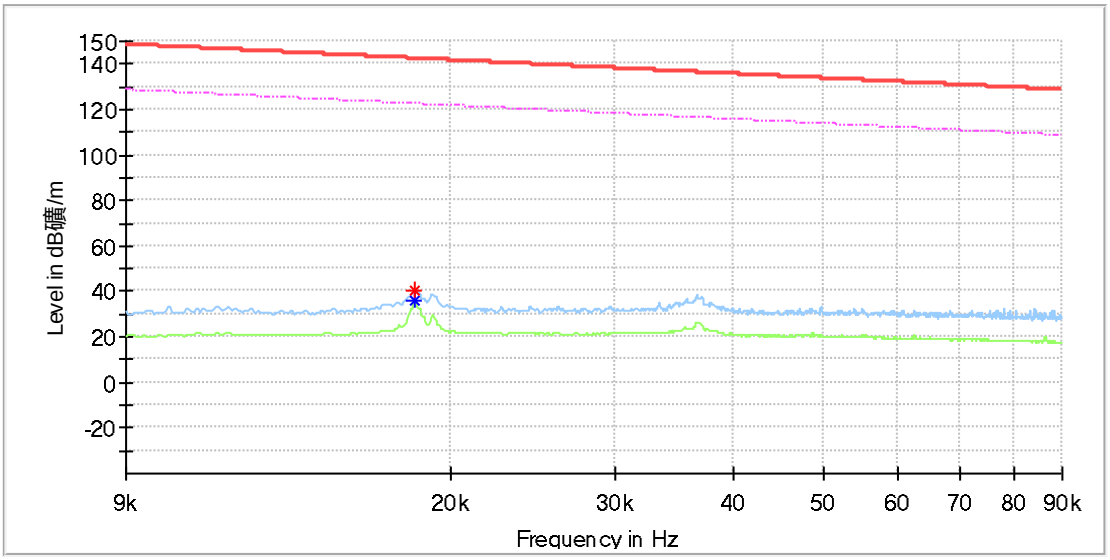
9KHz – 90KHz

X axis



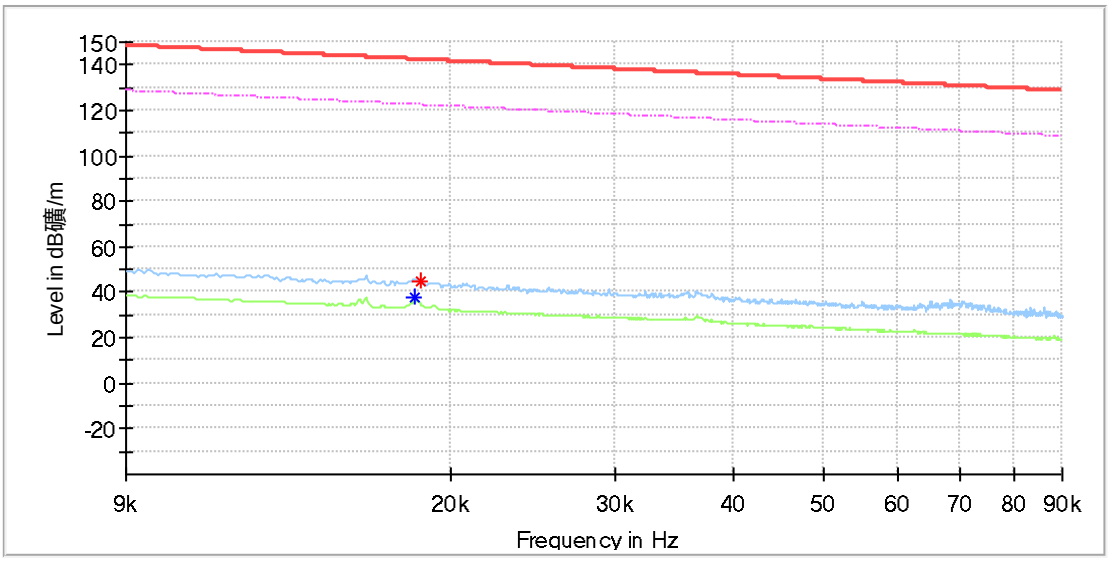
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB/m)	Preamp (dB)
0.018315	---	37.42	122.35	84.93	100.0	334.0	20.0	0.0
0.018373	44.86	---	142.31	97.44	100.0	287.0	20.0	0.0

Y axis



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB/m)	Preamp (dB)
0.018315	---	36.03	122.35	86.32	100.0	139.0	20.0	0.0
0.018315	40.72	---	142.33	101.62	100.0	139.0	20.0	0.0

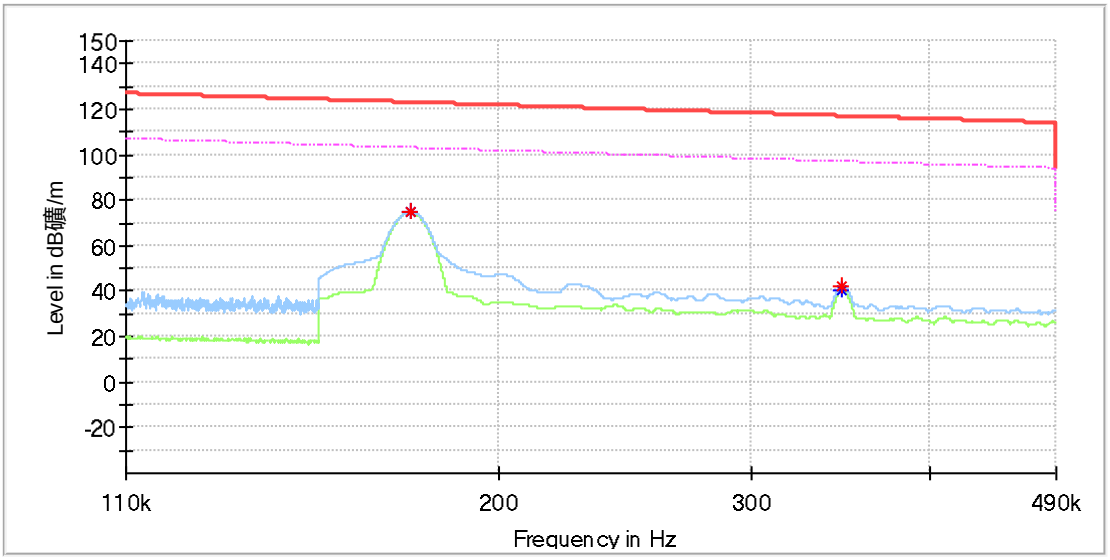
Z axis



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB/m)	Preamp (dB)
0.018315	---	37.95	122.35	84.40	100.0	23.0	20.0	0.0
0.018546	45.20	---	142.22	97.02	100.0	74.0	20.0	0.0

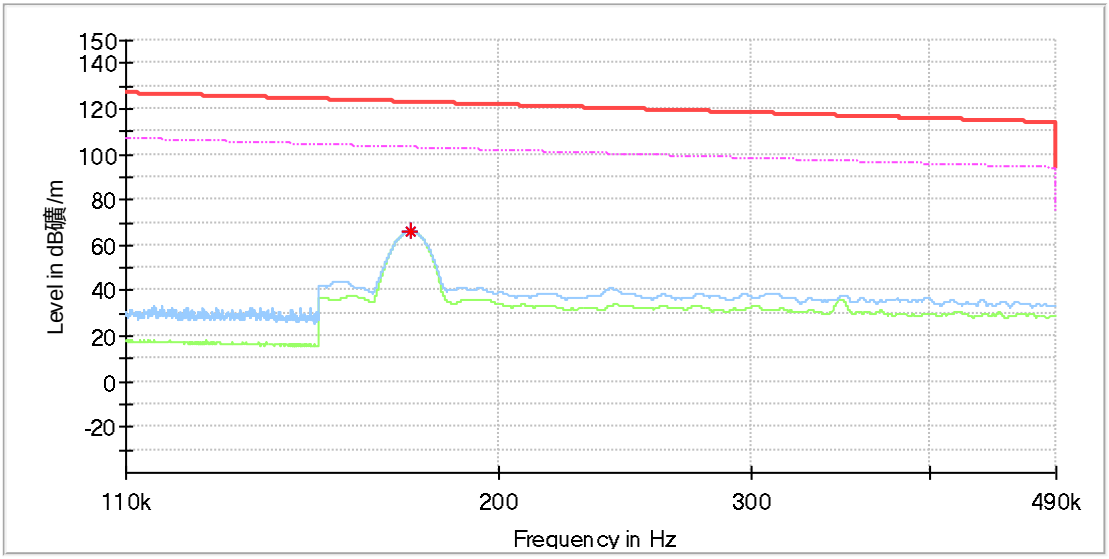
110KHz – 490KHz

X axis



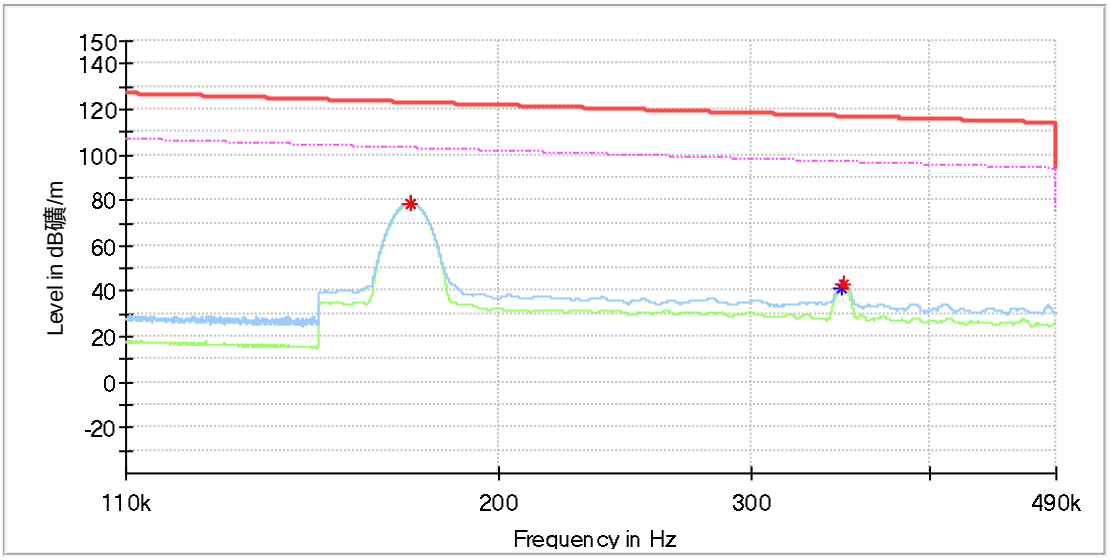
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB/m)	Preamp (dB)
0.173650	74.83	---	122.81	47.98	100.0	180.0	20.0	0.0
0.173650	---	74.63	102.81	28.18	100.0	180.0	20.0	0.0
0.347350	---	40.72	96.79	56.07	100.0	15.0	20.0	0.0
0.347700	42.04	---	116.78	74.74	100.0	15.0	20.0	0.0

Y axis



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB/m)	Preamp (dB)
0.173700	---	66.29	102.81	36.51	100.0	108.0	20.0	0.0
0.173750	66.39	---	122.80	56.41	100.0	108.0	20.0	0.0

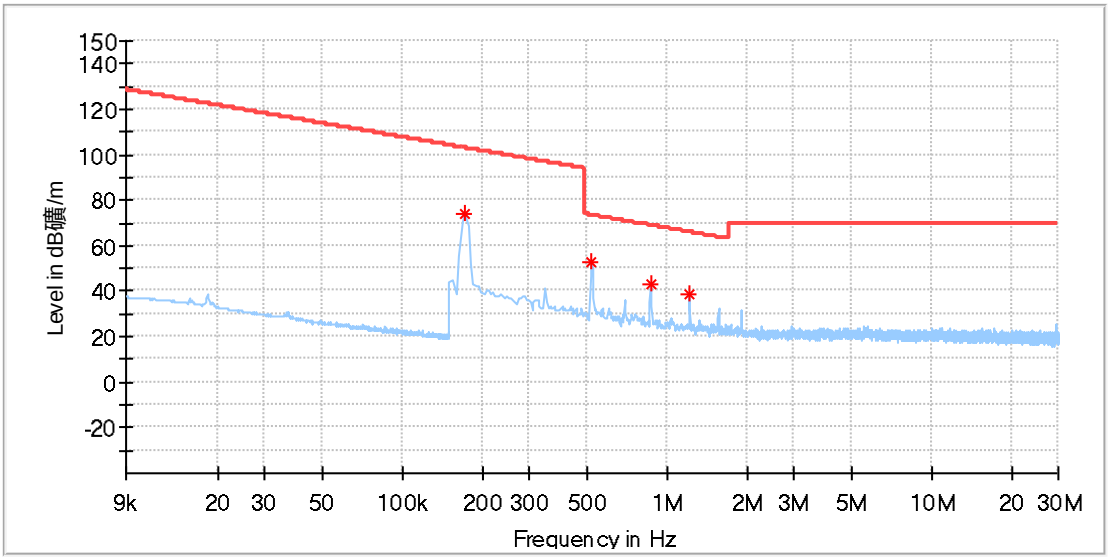
Z axis



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB/m)	Preamp (dB)
0.173500	78.77	---	122.81	44.04	100.0	227.0	20.0	0.0
0.173500	---	78.60	102.82	24.21	100.0	227.0	20.0	0.0
0.347650	---	41.53	96.78	55.26	100.0	4.0	20.0	0.0
0.348200	43.12	---	116.77	73.65	100.0	4.0	20.0	0.0

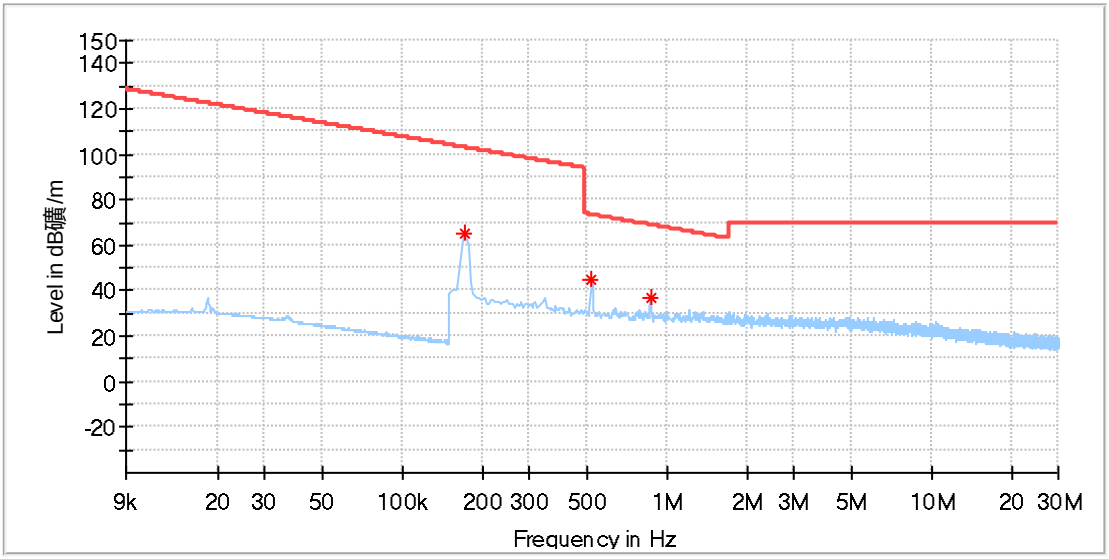
9KHz – 30MHz

X axis



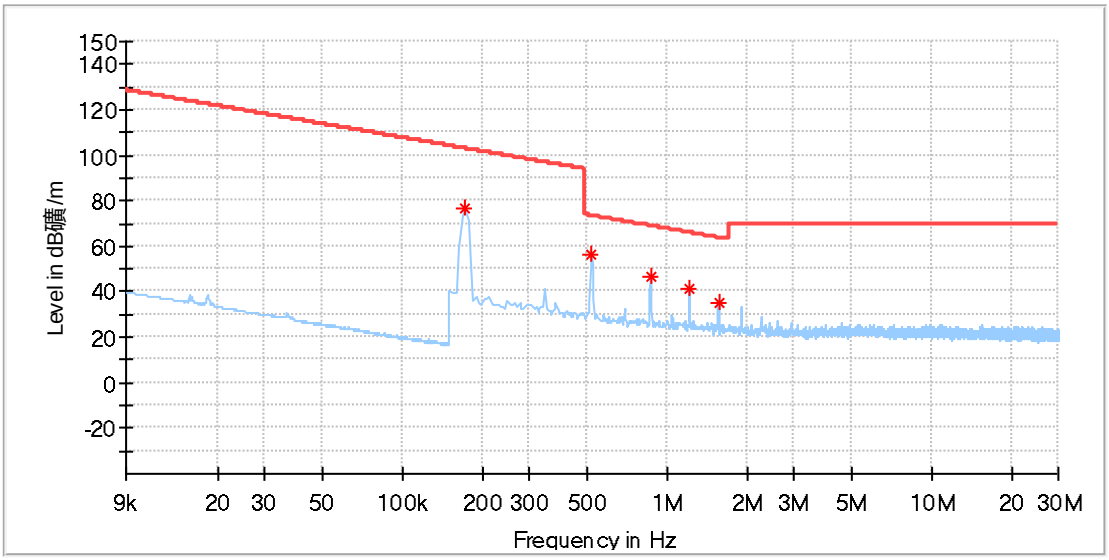
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB/m)	Preamp (dB)	Trd Corr. (dB/m)
0.171949	73.71	102.90	29.19	100.0	227.0	20.0	0.0	20.0
0.518735	53.02	73.31	20.29	100.0	227.0	20.0	0.0	20.0
0.869912	42.94	68.82	25.87	100.0	227.0	20.0	0.0	20.0
1.216699	39.01	65.90	26.90	100.0	227.0	20.0	0.0	20.0

Y axis



Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB/m)	Preamp (dB)	Trd Corr. (dB/m)
0.171949	64.82	102.90	38.08	100.0	309.0	20.0	0.0	20.0
0.518735	44.77	73.31	28.54	100.0	309.0	20.0	0.0	20.0
0.865522	36.44	68.86	32.42	100.0	63.0	20.0	0.0	20.0

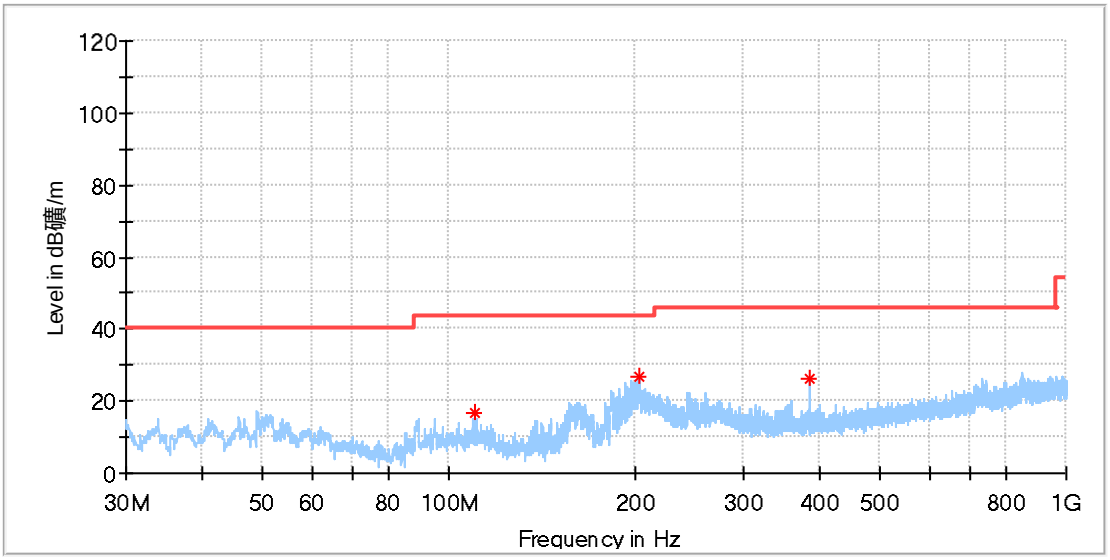
Z axis



Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/	Margin (dB)	Height (cm)	Azimuth (deg)	Corr. (dB/m)	Preamp (dB)	Trd Corr. (dB/m)
0.171949	76.48	102.90	26.42	100.0	2.0	20.0	0.0	20.0
0.518735	56.15	73.31	17.16	100.0	2.0	20.0	0.0	20.0
0.865522	46.88	68.86	21.98	100.0	2.0	20.0	0.0	20.0
1.212309	41.36	65.93	24.57	100.0	2.0	20.0	0.0	20.0
1.563485	35.55	63.72	28.18	100.0	2.0	20.0	0.0	20.0

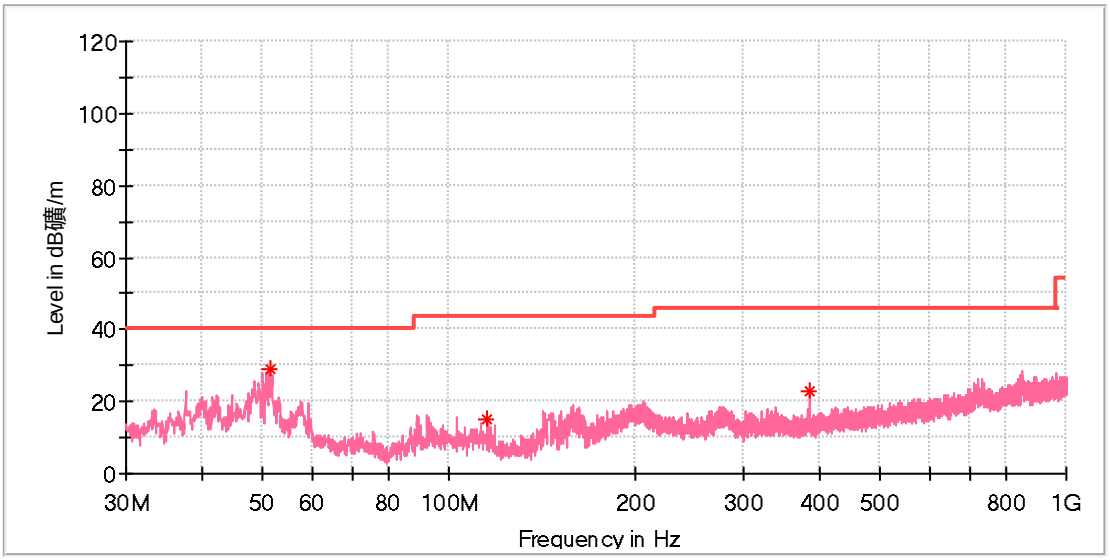
30MHz - 1GHz

Horizontal



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
110.364500	16.72	---	43.50	26.78	100.0	H	297.0	-19.4
203.727000	26.72	---	43.50	16.78	100.0	H	0.0	-19.3
383.080000	26.07	---	46.00	19.93	100.0	H	338.0	-14.5

Vertical



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
51.243000	29.24	---	40.00	10.76	100.0	V	37.0	-18.6
115.602500	15.23	---	43.50	28.27	100.0	V	356.0	-20.2
383.031500	22.83	---	46.00	23.17	100.0	V	291.0	-14.5

5.1.3 Conducted emissions

RESULT: **Pass**

Test Specification

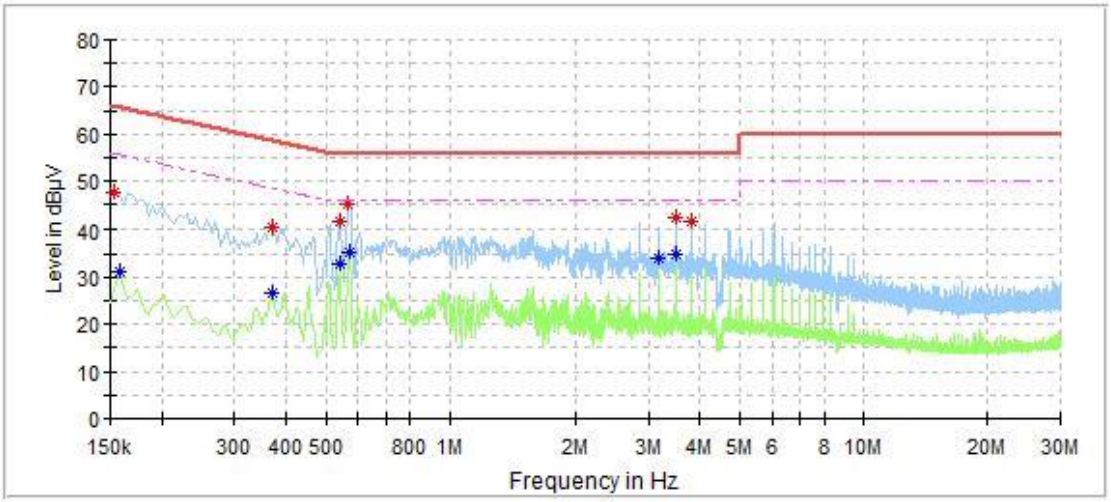
Test standard	:	FCC Part 15.207
Basic standard	:	ANSI C63.10: 2013
Frequency range	:	150KHz - 30MHz
Classification	:	Class B
Limit		FCC Part 15.207 (a)
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	01.04.2020
Input voltage	:	120Vac, 60Hz
Operation mode	:	A
Earthing	:	Not connected
Ambient temperature	:	23 ℃
Relative humidity	:	48 %
Atmospheric pressure	:	101 kPa

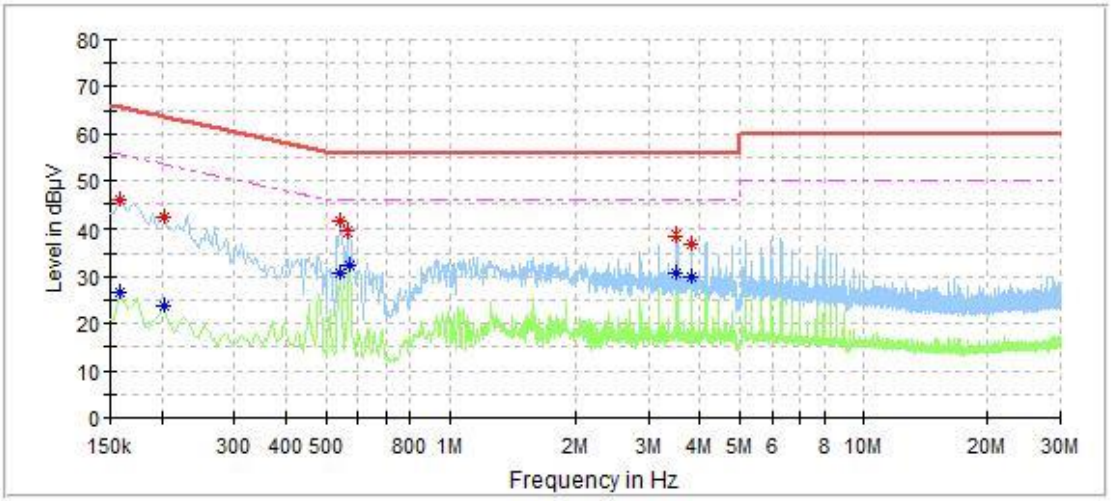
Refer to following test plots for details of test result.

L Line



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.154000	47.65	---	65.78	18.13	L1	9.6
0.158000	---	31.26	55.57	24.30	L1	9.6
0.370000	---	26.63	48.50	21.87	L1	9.7
0.370000	40.03	---	58.50	18.47	L1	9.7
0.540000	---	32.90	46.00	13.10	L1	9.7
0.540000	41.46	---	56.00	14.54	L1	9.7
0.568000	45.26	---	56.00	10.74	L1	9.7
0.572000	---	35.35	46.00	10.65	L1	9.7
3.176000	---	34.08	46.00	11.92	L1	9.8
3.492000	---	34.87	46.00	11.13	L1	9.8
3.496000	42.20	---	56.00	13.80	L1	9.8
3.808000	41.54	---	56.00	14.46	L1	9.8

N Line



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.158000	---	26.55	55.57	29.02	N	9.6
0.158000	45.97	---	65.57	19.60	N	9.6
0.202000	---	23.80	53.53	29.73	N	9.6
0.202000	42.37	---	63.53	21.16	N	9.6
0.540000	---	30.66	46.00	15.34	N	9.7
0.544000	41.35	---	56.00	14.65	N	9.7
0.568000	39.38	---	56.00	16.62	N	9.7
0.572000	---	32.50	46.00	13.50	N	9.7
3.504000	---	30.67	46.00	15.33	N	9.8
3.504000	38.62	---	56.00	17.38	N	9.8
3.820000	---	30.00	46.00	16.00	N	9.8
3.820000	37.09	---	56.00	18.91	N	9.8

6 Photographs of the Test Set-Up

Refer to test photo document.

7 List of Tables