



EMC - TEST REPORT

Report Number : **68.760.17.689.01** Date of Issue: July 10, 2017

Model : PAMKUU

Product Type : Robot

Applicant : GUANGZHOU Walkera Technology Co., LTD

Address : Taishi Industrial Park, Dongchong Town, Nansha District,

511475 Guanzhou, Guangdong,

PEOPLE'S REPUBLIC OF CHINA

Production Facility : GUANGZHOU Walkera Technology Co., LTD

Address : Taishi Industrial Park, Dongchong Town, Nansha District,

511475 Guanzhou, Guangdong,

PEOPLE'S REPUBLIC OF CHINA

Test Result : Positive Negative

Total pages including Appendices : 24

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch is a subcontractor to TÜV SÜD Product Service GmbH according to the principles outlined in ISO 17025.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval.

1 Table of Contents

1	Table of Contents.....	2
2	Details about the Test Laboratory.....	3
3	Description of the Equipment Under Test.....	4
4	Summary of Test Standards.....	5
5	Summary of Test Results.....	6
6	General Remarks.....	7
7	Emission Test Results.....	8
	7.1 Radiated Emission Test.....	8
	7.2 Conducted Emission Test.....	21



2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park,
Nantou Checkpoint Road 2, Nanshan District,
Shenzhen City, 518052,
P. R. China

FCC Registration Number: 514049

Telephone: 86 755 8828 6998
Fax: 86 755 8828 5299

3 Description of the Equipment Under Test

Description of the Equipment Under Test

Product: Robot

Model no.: PAMKUU

FCC ID: S29PAMKUU

Serial number: NIL

Options and accessories: NIL

Ratings: 7.4VDC (Supplied by Inside Battery)

Remark: NIL



4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart B, 10-1-2016 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart B - Unintentional Radiators

5 Summary of Test Results

Emission Tests				
FCC Part 15 Subpart B,10-1-2016 Edition				
Test Condition Class B	Pages	Test Result		
		Pass	Fail	N/A
Radiated Emission 30MHz to 1000MHz	8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emission 1GHz to 18GHz	16	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emission on AC 150kHz to 30MHz	21	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.99dB; Vertical: 4.97dB;
Uncertainty for Radiated Emission in 3m chamber 1000MHz-18000MHz	Horizontal: 4.96dB; Vertical: 4.95dB;
Uncertainty for Conducted Emission 150kHz-30MHz (for test using AMN ENV216 or ENV4200)	3.46dB

6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: S29PAMKUU, which is submitted for FCC Part 15 subpart B, the intentional Radiators function subject to FCC Part 15 subpart C is not considered in this report and the certification authorization will be finish by the manufacturer before the marketing of product.

SUMMARY:

All tests according to the regulations cited on page 5 were

- Performed

- **Not** Performed

The Equipment Under Test

- **Fulfills** the general approval requirements.

- **Does not** fulfill the general approval requirements.

Sample Received Date: July 06, 2017

Testing Start Date: July 06, 2017

Testing End Date: July 10, 2017

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch-

Reviewed by:

Prepared by:

Laurent Yuan
EMC Project Manager

Henry Chen
EMC Project Engineer

7 Emission Test Results

7.1 Radiated Emission Test 30MHz – 1000MHz

Test Method

1: The EUT was placed on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

2: The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.

3: The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

4: For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

5: Use the following spectrum analyzer settings According to C63.10:

For Above 1GHz

Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 1MHz, VBW \geq RBW for peak measurement and VBW = 10Hz for average measurement, Sweep = auto, Detector function = peak, Trace = max hold.

For Below 1GHz

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 KHz, VBW \geq RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

Note:

1: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection (QP) at frequency below 1GHz.

2: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for peak detection (PK) at frequency above 1GHz.

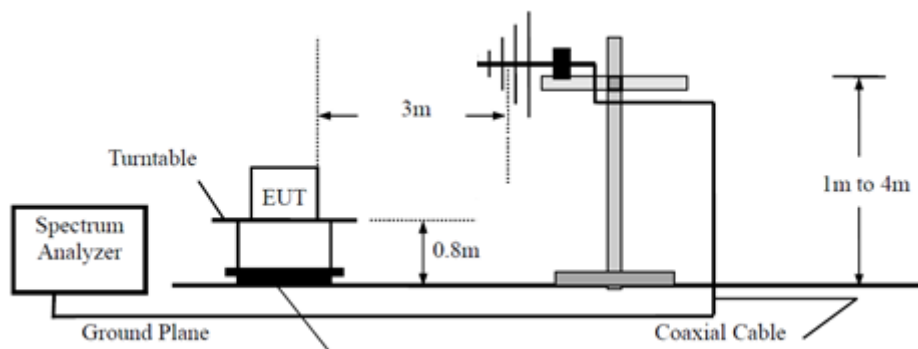
3: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average ((duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($20\log(1/\text{duty cycle})$).

4: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.

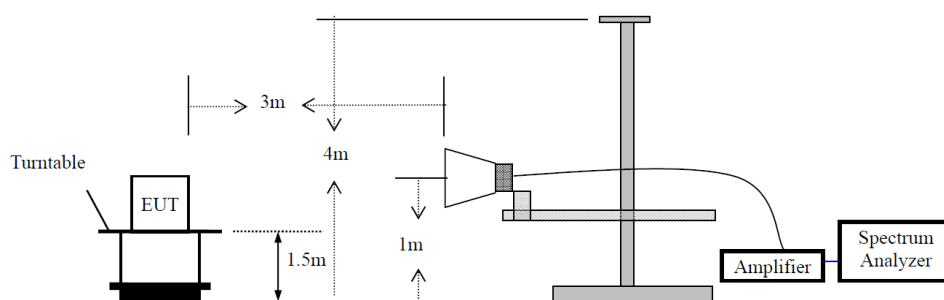
Radiated Emission Test 30MHz – 1000MHz

Test Setups

Below 1GHz



Above 1GHz



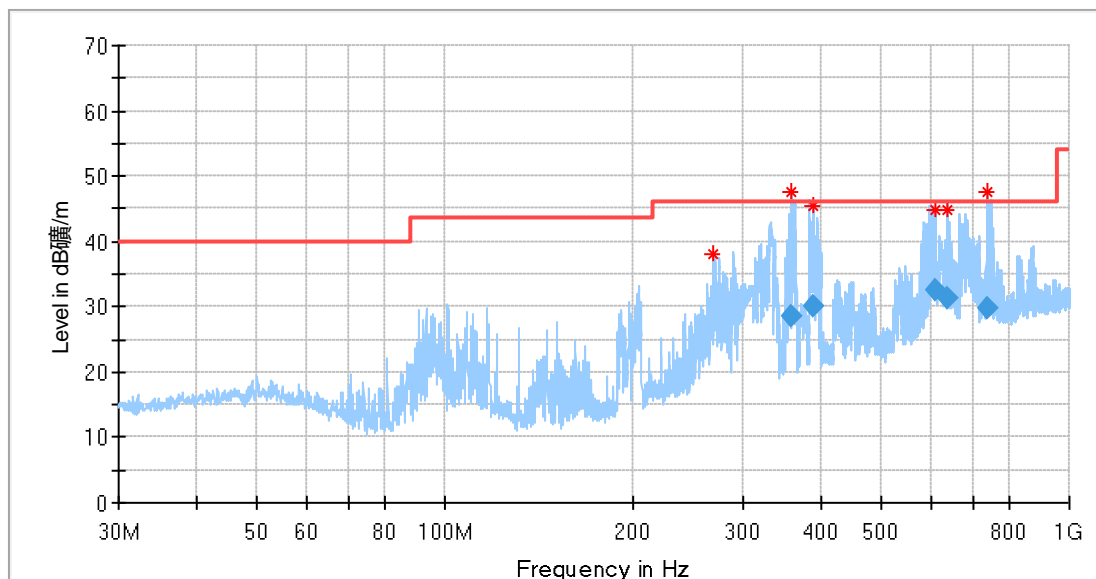
Limit

Frequency MHz	Field Strength uV/m	Field Strength dBµV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

Radiated Emission Test 30MHz – 1000MHz

EUT: Robot
M/N: PAMKUU
Operating Condition: ON
Test Specification: Horizontal
Comment: 7.4VDC (Supplied by Inside Battery)

Temperature (°C): 23.2 Relative Humidity (%): 52.6 Atmospheric Pressure(mbar) : 1009

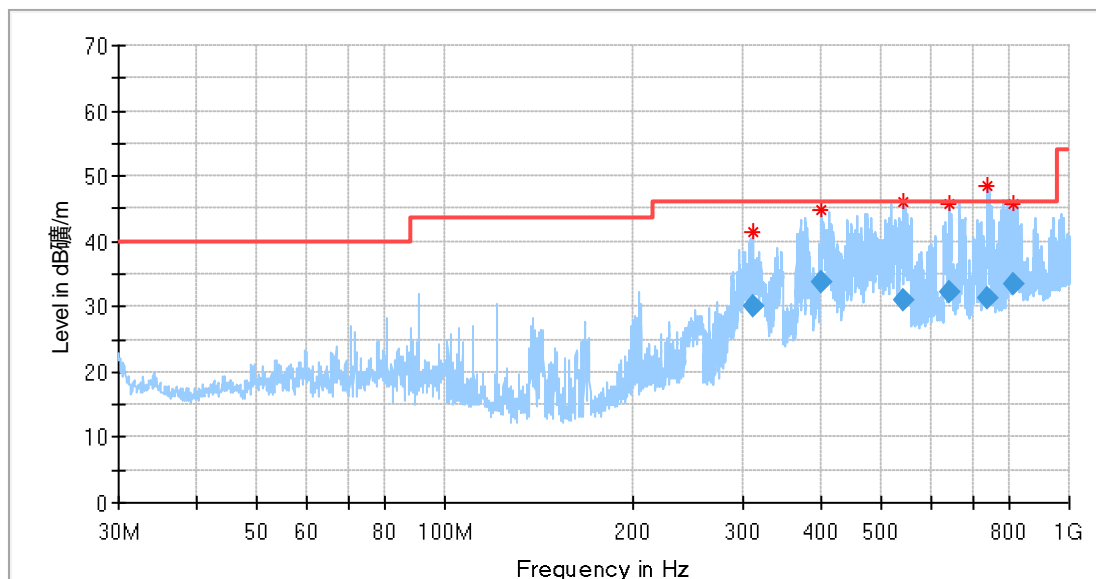


Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
358.163125	28.52	46.00	17.48	228.0	H	-43.0	19.7
389.081875	30.10	46.00	15.90	200.0	H	107.0	21.0
611.030000	32.60	46.00	13.40	100.0	H	41.0	26.1
638.190000	31.32	46.00	14.68	200.0	H	0.0	26.2
736.826875	29.80	46.00	16.20	100.0	H	41.0	26.9

Radiated Emission Test 30MHz – 1000MHz

EUT: Robot
M/N: PAMKUU
Operating Condition: ON
Test Specification: Vertical
Comment: 7.4VDC (Supplied by Inside Battery)

Temperature (°C): 23.2 Relative Humidity (%): 52.6 Atmospheric Pressure(mbar) : 1009

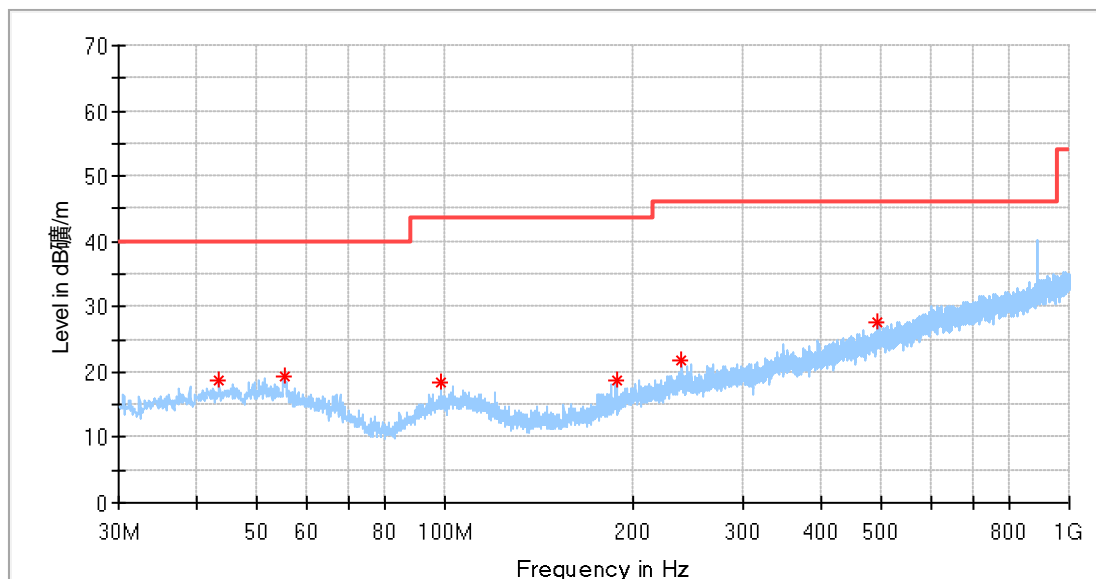


Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
311.300000	30.10	46.00	15.90	100.0	V	0.0	20.7
401.146250	33.62	46.00	12.38	100.0	V	306.0	23.4
542.281250	30.96	46.00	15.04	100.0	V	0.0	26.0
642.009375	32.22	46.00	13.78	100.0	V	0.0	27.7
740.175312	31.18	46.00	14.82	249.0	V	-56.0	29.2
810.971250	33.40	46.00	12.60	100.0	V	0.0	29.8

Radiated Emission Test 30MHz – 1000MHz

EUT: Robot
M/N: PAMKUU
Operating Condition: Charging
Test Specification: Horizontal
Comment: 120VAC/60Hz (Supplied by DC source)

Temperature (°C): 23.2 Relative Humidity (%): 52.6 Atmospheric Pressure(mbar) : 1009

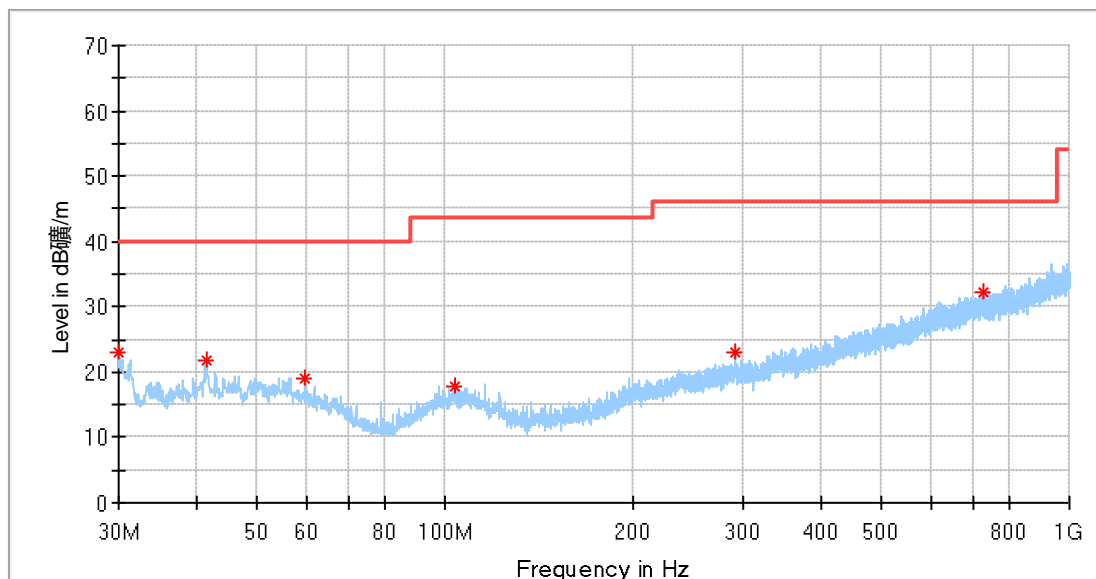


Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
43.458750	18.62	40.00	21.38	200.0	H	95.0	17.3
55.220000	19.41	40.00	20.59	200.0	H	0.0	17.5
98.566875	18.46	43.50	25.04	200.0	H	123.0	15.9
187.867500	18.74	43.50	24.76	200.0	H	95.0	14.9
239.641250	21.78	46.00	24.22	100.0	H	0.0	17.8
491.659375	27.62	46.00	18.38	200.0	H	337.0	23.5

Radiated Emission Test 30MHz – 1000MHz

EUT: Robot
M/N: PAMKUU
Operating Condition: Charging
Test Specification: Vertical
Comment: 120VAC/60Hz (Supplied by DC source)

Temperature (°C): 23.2 Relative Humidity (%): 52.6 Atmospheric Pressure(mbar) : 1009

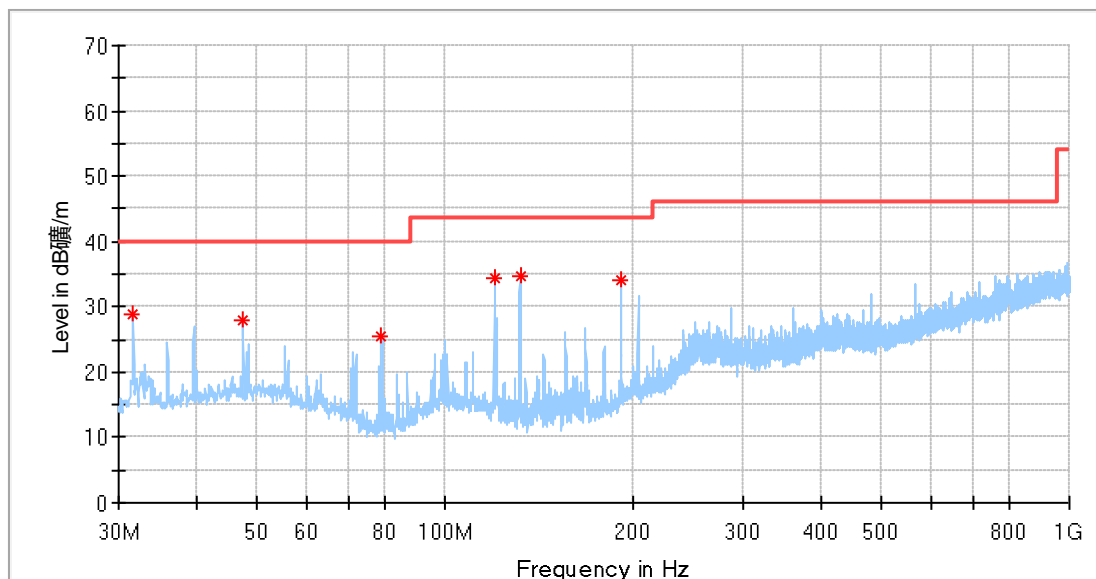


Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.060625	23.17	40.00	16.83	100.0	V	305.0	15.2
41.518750	21.74	40.00	18.26	100.0	V	0.0	17.5
59.585000	18.89	40.00	21.11	100.0	V	359.0	16.5
103.901875	17.85	43.50	25.65	200.0	V	0.0	16.3
291.778750	23.06	46.00	22.94	200.0	V	345.0	19.5
727.187500	32.32	46.00	13.68	200.0	V	255.0	28.1

Radiated Emission Test 30MHz – 1000MHz

EUT: Robot
M/N: PAMKUU
Operating Condition: Data transmitting
Test Specification: Horizontal
Comment: 7.4VDC (Supplied by Inside Battery)

Temperature (°C): 23.2 Relative Humidity (%): 52.6 Atmospheric Pressure(mbar) : 1009

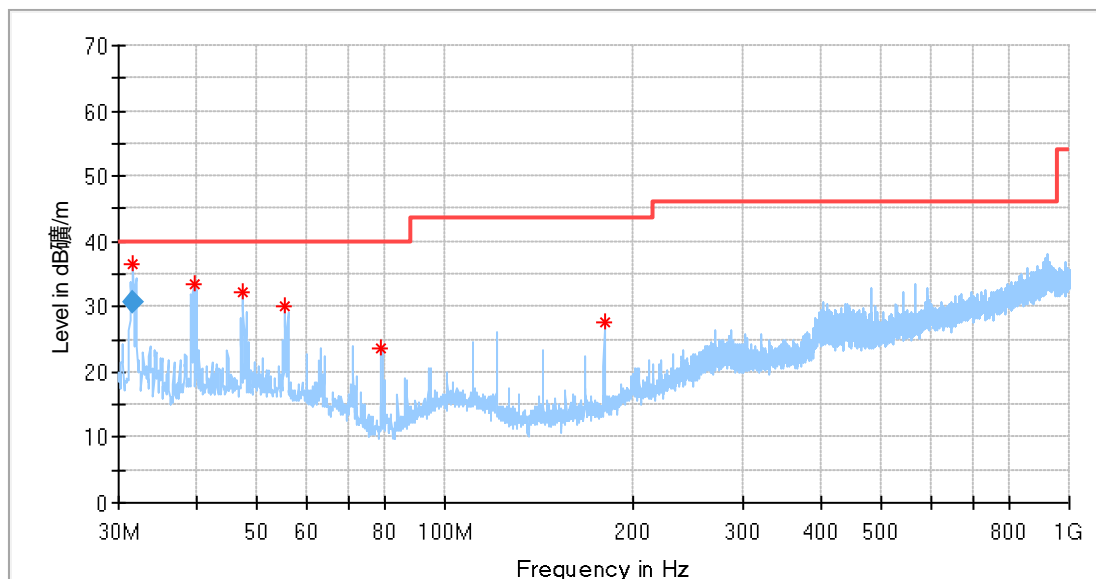


Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
31.636875	28.86	40.00	11.14	200.0	H	80.0	14.8
47.520625	27.83	40.00	12.17	200.0	H	80.0	17.7
79.166875	25.52	40.00	14.48	200.0	H	107.0	11.7
119.846250	34.36	43.50	9.14	100.0	H	0.0	14.5
131.850000	34.70	43.50	8.80	100.0	H	0.0	12.7
191.808125	34.18	43.50	9.32	100.0	H	235.0	15.4

Radiated Emission Test 30MHz – 1000MHz

EUT: Robot
M/N: PAMKUU
Operating Condition: Data transmitting
Test Specification: Vertical
Comment: 7.4VDC (Supplied by Inside Battery)

Temperature (°C): 23.2 Relative Humidity (%): 52.6 Atmospheric Pressure(mbar) : 1009



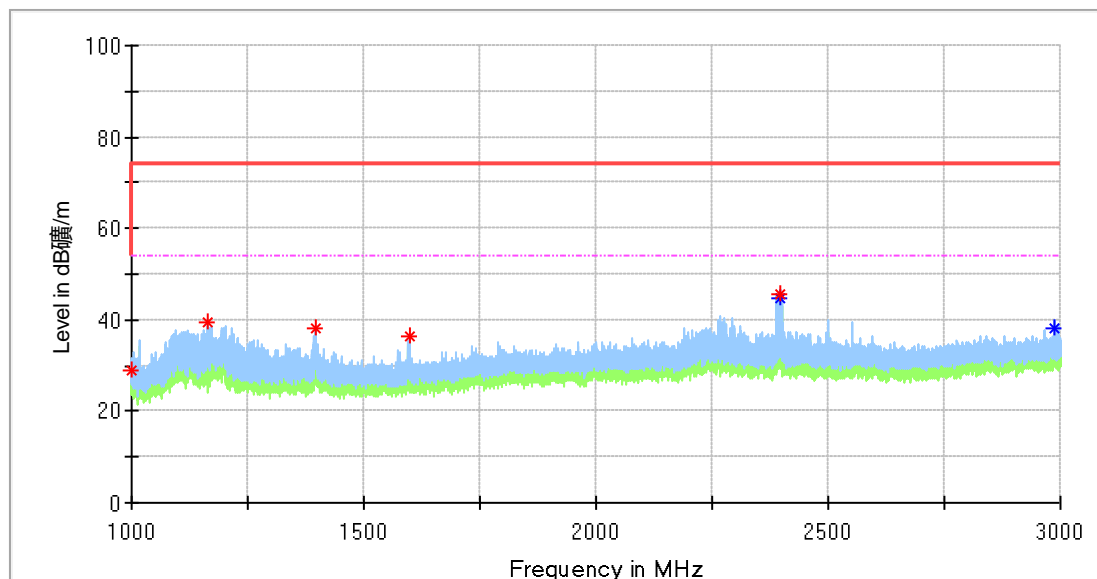
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
39.578750	33.54	40.00	6.46	100.0	V	0.0	16.9
47.520625	32.09	40.00	7.91	100.0	V	0.0	18.0
55.401875	30.03	40.00	9.97	100.0	V	0.0	17.8
79.166875	23.74	40.00	16.26	200.0	V	0.0	11.9
179.804375	27.76	43.50	15.74	100.0	V	299.0	14.3

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
31.636875	30.80	40.00	9.20	100.0	V	0.0	15.0

Radiated Emission Test 1000MHz – 3000MHz

EUT: Robot
M/N: PAMKUU
Operating Condition: Data transmitting
Test Specification: Horizontal
Comment: 7.4VDC (Supplied by Inside Battery)

Temperature (°C): 23.2 Relative Humidity (%): 52.6 Atmospheric Pressure(mbar) : 1009

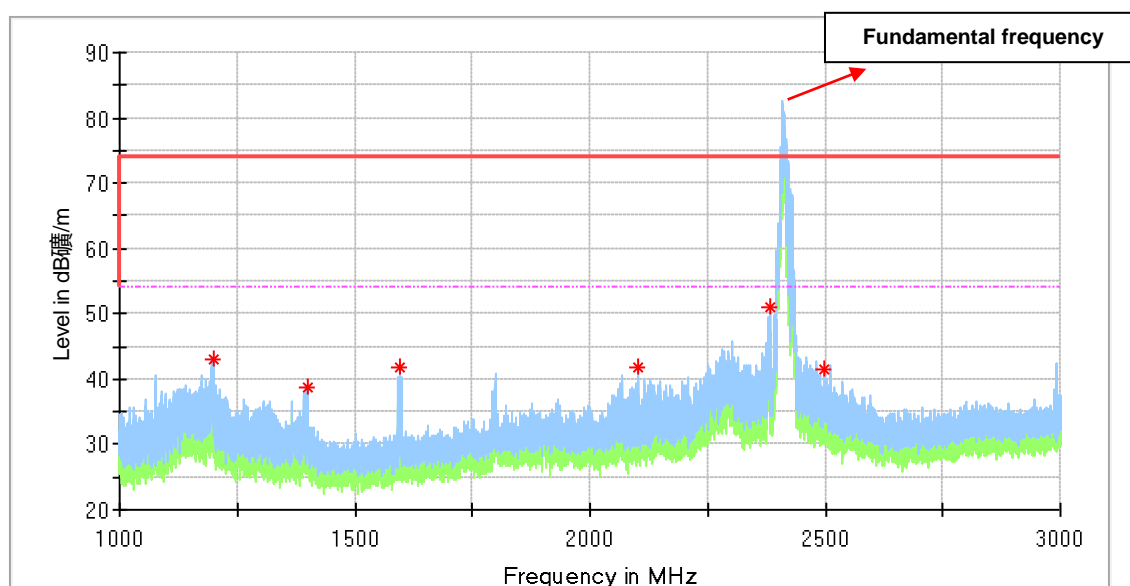


Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1000.000000	28.93	---	54.00	25.07	100.0	H	0.0	-15.6
1162.083333	39.60	---	74.00	34.40	100.0	H	64.0	-14.6
1394.666667	38.16	---	74.00	35.84	100.0	H	107.0	-13.2
1599.416667	36.52	---	74.00	37.48	100.0	H	107.0	-12.1
2394.583333	45.73	---	74.00	28.27	100.0	H	96.0	-8.0
2394.583333	---	44.81	54.00	9.19	100.0	H	96.0	-8.0
2986.583333	---	38.25	54.00	15.75	100.0	H	117.0	-5.6

Radiated Emission Test 1000MHz – 3000MHz

EUT: Robot
M/N: PAMKUU
Operating Condition: Data transmitting
Test Specification: Vertical
Comment: 7.4VDC (Supplied by Inside Battery)

Temperature (°C): 23.2 Relative Humidity (%): 52.6 Atmospheric Pressure(mbar) : 1009

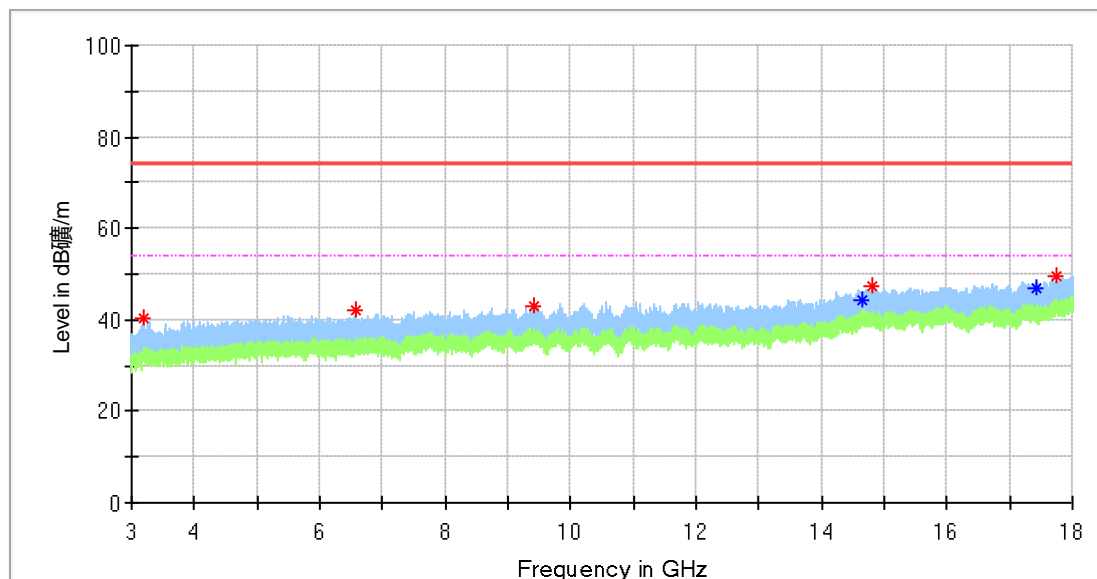


Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1198.083333	43.08	---	74.00	30.92	100.0	V	0.0	-14.3
1398.416667	38.87	---	74.00	35.13	100.0	V	128.0	-13.0
1594.833333	41.92	---	74.00	32.08	100.0	V	225.0	-12.0
2103.916667	41.77	---	74.00	32.23	100.0	V	29.0	-8.8
2384.000000	50.91	---	74.00	23.09	100.0	V	0.0	-8.0
2498.166667	41.50	---	74.00	32.50	100.0	V	0.0	-7.6

Radiated Emission Test 3000MHz – 18000MHz

EUT: Robot
M/N: PAMKUU
Operating Condition: Data transmitting
Test Specification: Horizontal
Comment: 7.4VDC (Supplied by Inside Battery)

Temperature (°C): 23.2 Relative Humidity (%): 52.6 Atmospheric Pressure(mbar) : 1009

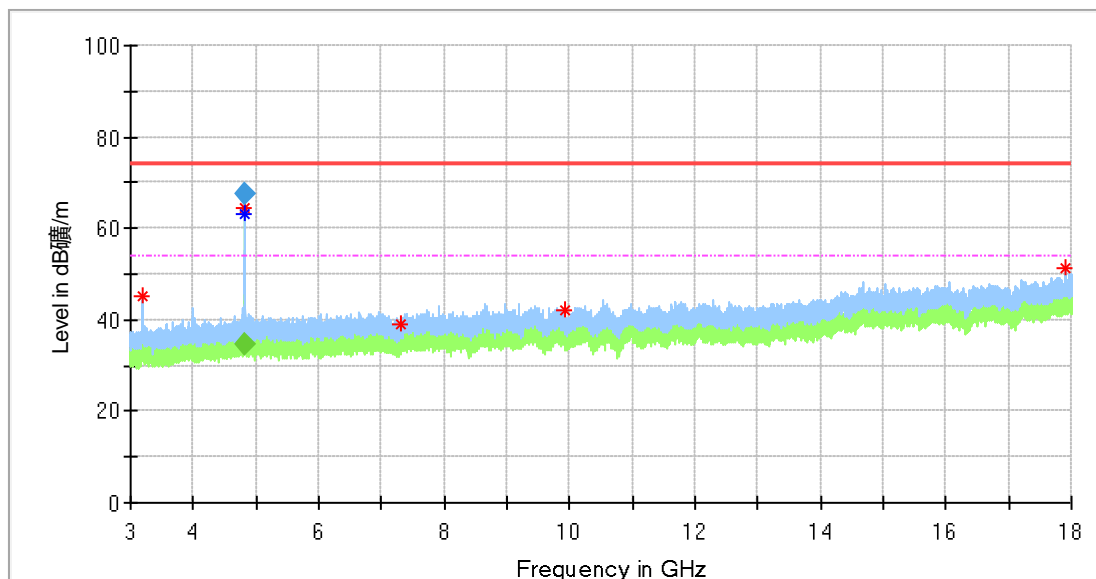


Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3191.250000	40.26	---	74.00	33.74	100.0	H	234.0	-3.6
6570.000000	42.26	---	74.00	31.74	100.0	H	0.0	2.5
9412.500000	43.00	---	74.00	31.00	100.0	H	146.0	5.6
14653.750000	---	44.11	54.00	9.89	100.0	H	221.0	13.9
14813.750000	47.15	---	74.00	26.85	100.0	H	0.0	14.4
17439.375000	---	46.89	54.00	7.11	100.0	H	134.0	16.5
17745.625000	49.70	---	74.00	24.30	100.0	H	0.0	17.9

Radiated Emission Test 3000MHz – 18000MHz

EUT: Robot
M/N: PAMKUU
Operating Condition: Data transmitting
Test Specification: Vertical
Comment: 7.4VDC (Supplied by Inside Battery)

Temperature (°C): 23.2 Relative Humidity (%): 52.6 Atmospheric Pressure(mbar) : 1009



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
3190.625000	44.98	---	74.00	29.02	100.0	V	348.0	-3.5
4823.750000	64.66	---	74.00	9.34	100.0	V	49.0	0.4
7299.375000	39.17	---	74.00	34.83	100.0	V	3.0	3.2
9940.625000	42.30	---	74.00	31.70	100.0	V	348.0	5.8
17895.625000	51.35	---	74.00	22.65	100.0	V	0.0	18.3

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
4824.070000	---	34.54	54.00	19.46	100.0	V	20.0	0.4
4824.070000	67.55	---	74.00	6.45	100.0	V	20.0	0.4

Test Equipment List

Radiated Emission Test

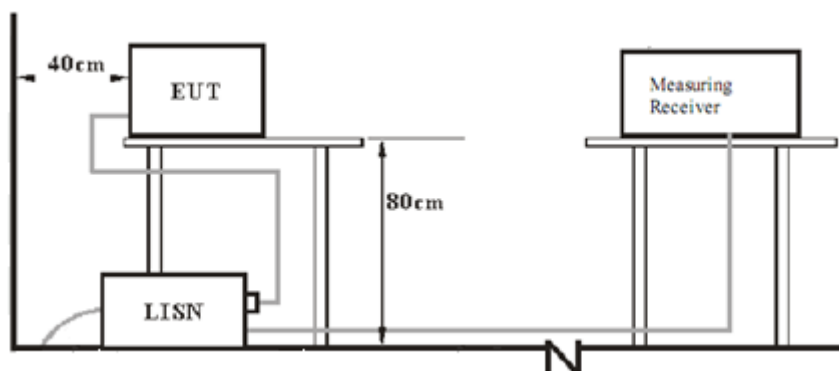
DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2017-7-15
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2017-8-3
Horn Antenna	Rohde & Schwarz	HF907	102294	2017-7-15
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2017-7-15
3m Semi-anechoic chamber	TDK	9X6X6	----	2019-5-29

7.2 Conducted Emission Test 0.15MHz – 30MHz

Test Method

1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

Test Setups



Limit

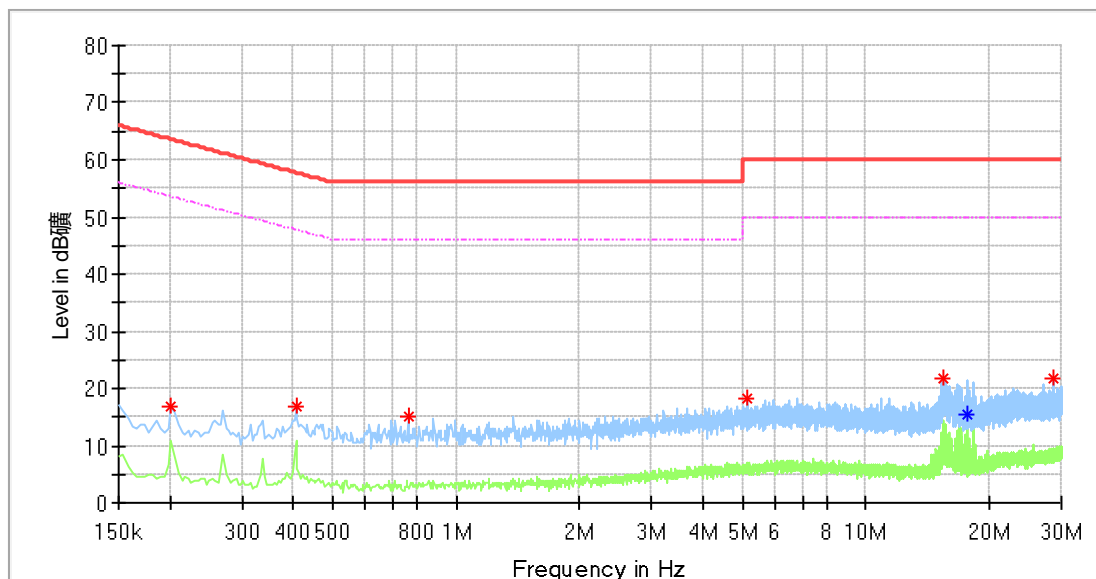
Frequency MHz	QP Limit dB μ V	AV Limit dB μ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Decreases with the logarithm of the frequency.

Conducted Emission Test 0.15MHz – 30MHz

EUT: Robot
M/N: PAMKUU
Operating Condition: ON
Test Specification: Power Line, L
Comment: 120VAC/60Hz (Supplied by DC source)

Temperature (°C): 23.2 Relative Humidity (%): 52.6 Atmospheric Pressure(mbar) : 1009

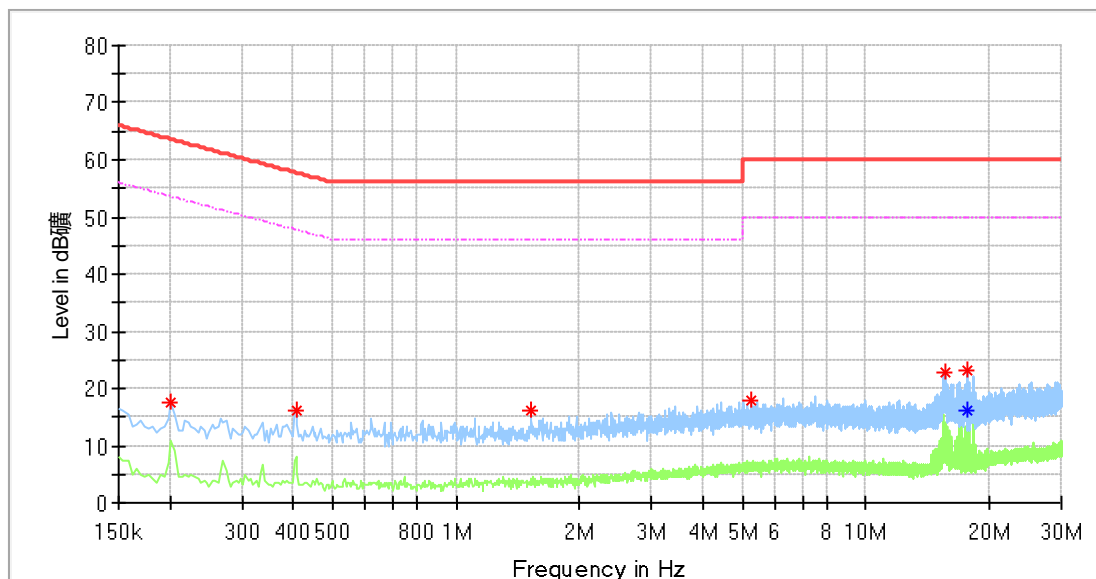


Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.202000	17.00	---	63.53	46.53	L1	10.2
0.406000	16.85	---	57.73	40.88	L1	11.6
0.766000	15.13	---	56.00	40.87	L1	10.2
5.106000	18.32	---	60.00	41.68	L1	10.4
15.462000	21.62	---	60.00	38.38	L1	10.7
17.694000	---	15.46	50.00	34.54	L1	10.9
28.566000	21.68	---	60.00	38.32	L1	11.5

Conducted Emission Test 0.15MHz – 30MHz

EUT: Robot
M/N: PAMKUU
Operating Condition: ON
Test Specification: Power Line, N
Comment: 120VAC/60Hz (Supplied by DC source)

Temperature (°C): 23.2 Relative Humidity (%): 52.6 Atmospheric Pressure(mbar) : 1009



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.202000	17.59	---	63.53	45.94	N	10.3
0.406000	16.19	---	57.73	41.54	N	10.3
1.526000	16.31	---	56.00	39.69	N	10.4
5.222000	17.77	---	60.00	42.23	N	10.6
15.594000	22.94	---	60.00	37.06	N	11.2
17.694000	---	16.23	50.00	33.77	N	11.4
17.694000	23.25	---	60.00	36.75	N	11.4

Test Equipment List

Conducted Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 3	101782	2017-7-15
LISN	Rohde & Schwarz	ENV4200	100249	2017-7-15
LISN	Rohde & Schwarz	ENV216	100326	2017-7-15
ISN	Rohde & Schwarz	ENY81	100177	2017-7-15
ISN	Rohde & Schwarz	ENY81-CA6	101664	2017-7-15
High Voltage Probe	Rohde & Schwarz	TK9420(VT94 20)	9420-58	2017-7-15
RF Current Probe	Rohde & Schwarz	EZ-17	100816	2017-7-15
Attenuator	Shanghai Huaxiang	TS2-26-3	080928189	2017-7-17