



FCC TEST REPORT

Pego Limited

Facilities multi-sensor

Test Model: Pod 3 Max

Additional Model No.: Pod 3 Mini

Prepared for : Pego Limited
Address : 64 New Cavendish St, London W1G 8TB, United Kingdom

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
Address : Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

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Date of receipt of test sample : December 22, 2022
Number of tested samples : 2
Sample No. : A121522059
Serial number : Prototype
Date of Test : December 22, 2022 ~ January 05, 2023
Date of Report : January 06, 2023





FCC SDoC TEST REPORT	
FCC 47 CFR Part 15 Subpart B, Class B, ANSI C63.4 -2014	
Report Reference No.	: LCSA121522059E
Date Of Issue	: January 06, 2023
Testing Laboratory Name	: Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure...	: Full application of Harmonised standards <input checked="" type="checkbox"/> : Partial application of Harmonised standards <input type="checkbox"/> : Other standard testing method <input type="checkbox"/>
Applicant's Name	: Pego Limited
Address	: 64 New Cavendish St, London W1G 8TB, United Kingdom
Test Specification	
Standard	: FCC 47 CFR Part 15 Subpart B, Class B, ANSI C63.4 -2014
Test Report Form No.	: LCSEMC-1.0
TRF Originator	: Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	: Dated 2011-03
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Test Item Description	: Facilities multi-sensor
Trade Mark	: Pego
Test Model	: Pod 3 Max
Ratings	: Input: 56V==0.536A, 30W
Result	: Positive

Compiled by:

Vera Deng/ Administrator

Supervised by:

Cary Luo/ Technique principal

Approved by:

Gavin Liang/ Manager





FCC -- TEST REPORT

Test Report No. : LCSA121522059E	<u>January 06, 2023</u> Date of issue
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Test Model	: Pod 3 Max
EUT.....	: Facilities multi-sensor
Applicant.....	: Pego Limited
Address.....	: 64 New Cavendish St, London W1G 8TB, United Kingdom
Telephone.....	: /
Fax.....	: /
Manufacturer.....	: Pego Limited
Address.....	: 64 New Cavendish St, London W1G 8TB, United Kingdom
Telephone.....	: /
Fax.....	: /
Factory.....	: /
Address.....	: /
Telephone.....	: /
Fax.....	: /

Test Result according to the standards on page 6: **Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.





Revision History

Report Version	Issue Date	Revision Content	Revised By
000	January 06, 2023	Initial Issue	---





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1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	FCC 47 CFR Part 15 Subpart B, Class B, ANSI C63.4 -2014	Class B	PASS
Radiated disturbance	FCC 47 CFR Part 15 Subpart B, Class B, ANSI C63.4 -2014	Class B	PASS
N/A is an abbreviation for Not Applicable.			

Test mode:		
Mode 1	Normal Operation	Record





2. GENERAL INFORMATION

2.1. Description of Device (EUT)


EUT : Facilities multi-sensor

Trade Mark : Pego

Test Model : Pod 3 Max

Additional Model No. : Pod 3 Mini

Model Declaration : PCB board, structure and internal of these model(s) are the same, So no additional models were tested

Power Supply : Input: 56V  0.536A, 30W

Highest internal frequency (Fx) : Fx > 1 GHz





2.2. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
Lenovo	Notebook	B470	WB05067151	FCC

Note: Auxiliary equipment is provided by the laboratory.

2.3 External I/O Cable

I/O Port Description	Quantity	Cable
--	--	--

2.4. Description of Test Facility

Site Description

EMC Lab.

: NVLAP Accreditation Code is 600167-0.
FCC Designation Number is CN5024.
CAB identifier is CN0071.
CNAS Registration Number is L4595.





2.5. Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

2.6. Measurement Uncertainty

Test	Parameters	Expanded Uncertainty (Ulab)	Expanded Uncertainty (Ucisp)
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.63 dB ± 2.35 dB	± 3.8 dB ± 3.4 dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	± 3.68 dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 3.48 dB	± 5.3 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 3.90 dB	± 5.2 dB

(1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

(2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.



3. TEST RESULTS

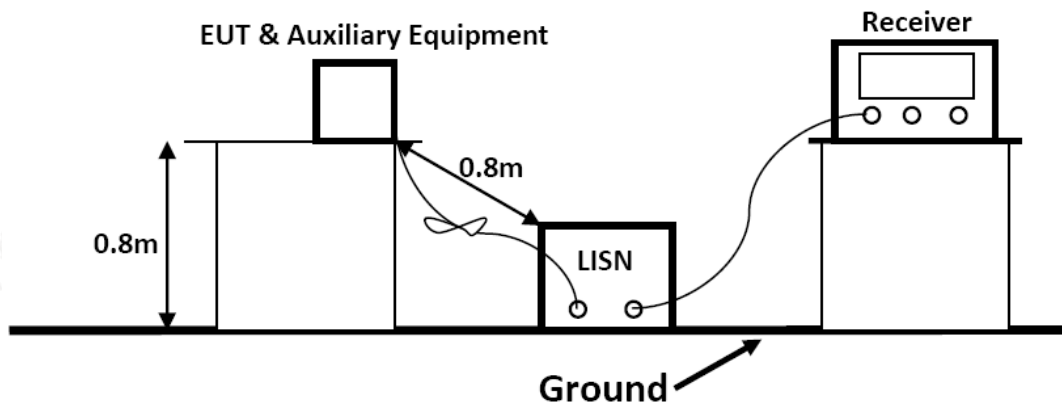
3.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1.1. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	Farad	EZ	/	N/A	N/A
2	EMI Test Receiver	R&S	ESR3	102312	2022-02-18	2023-02-17
3	Artificial Mains	R&S	ENV216	101288	2022-06-16	2023-06-15
4	Pulse Limiter	R&S	ESH3-Z2	102750-NB	2022-08-17	2023-08-16
5	Impedance Stabilization Network	TESEQ	ISN T800	45130	2022-10-29	2023-10-28

3.1.2. Block Diagram of Test Setup



3.1.3. Test Standard

Power Line Conducted Emission Limits (Class B)

Frequency (MHz)			Limit (dB μ V)	
			Quasi-peak Level	Average Level
0.15	~	0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50	~	5.00	56.0	46.0
5.00	~	30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.

NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

3.1.4. EUT Configuration on Test

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

3.1.5. Operating Condition of EUT

3.1.5.1. Setup the EUT as shown on Section 3.1.2





3.1.5.2. Turn on the power of all equipments.

3.1.5.3. Let the EUT work in measuring Mode 1 and measure it.

3.1.6. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC/ANSI C63.4-2014 on Conducted Emission Measurement.

The bandwidth of the test receiver is set at 9kHz.

The frequency range from 150kHz to 30MHz is investigated

3.1.7. Test Results

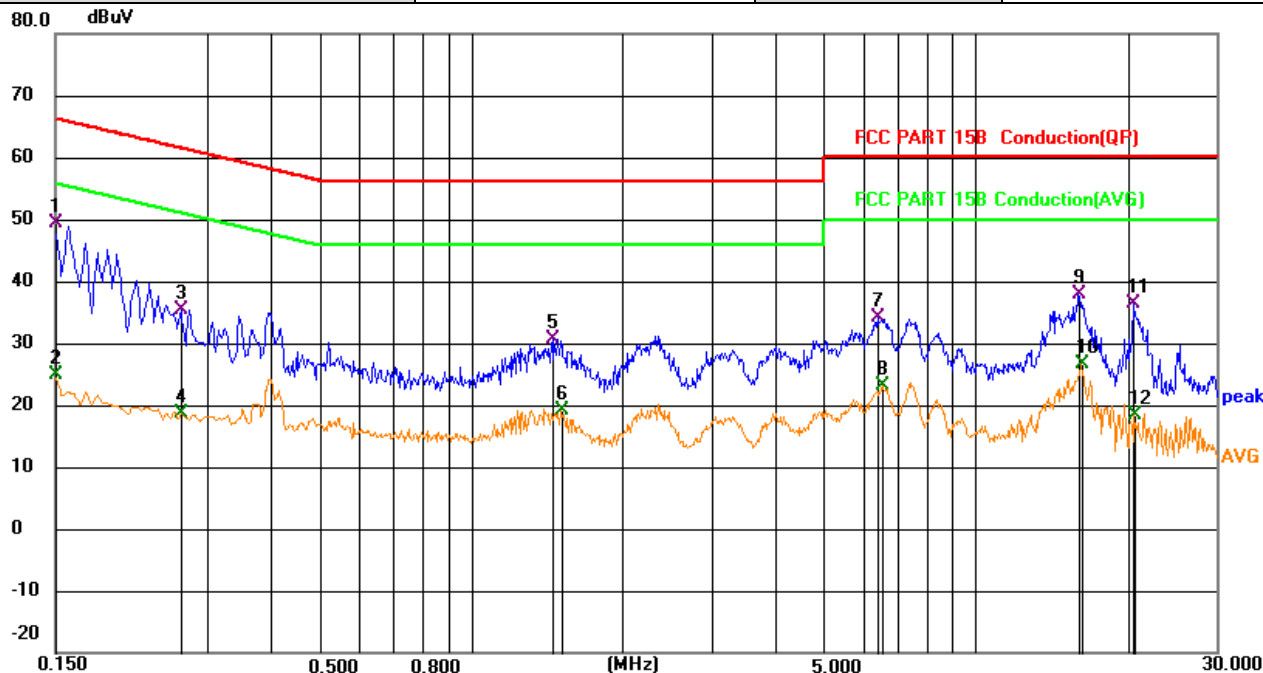
PASS.

The test result please refer to the next page.





Test Model	Pod 3 Max	Test Mode	Mode 1
Environmental Conditions	24.2°C, 53.5% RH	Test Engineer	Mening Su
Pol	Line	Test Voltage	AC 120V/60Hz

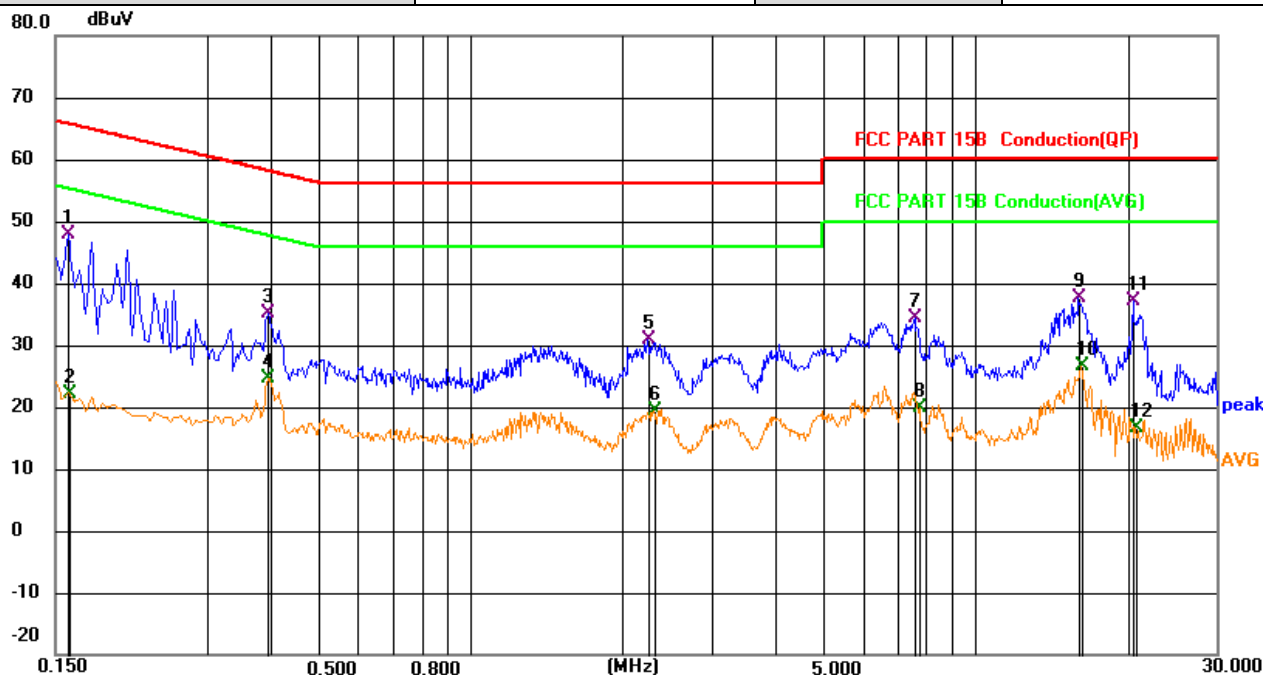


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector
1	*	0.1500	29.75	19.63	49.38	66.00	-16.62	QP
2		0.1500	5.20	19.63	24.83	56.00	-31.17	AVG
3		0.2658	15.82	19.63	35.45	61.25	-25.80	QP
4		0.2658	-0.92	19.63	18.71	51.25	-32.54	AVG
5		1.4485	10.97	19.66	30.63	56.00	-25.37	QP
6		1.5033	-0.60	19.67	19.07	46.00	-26.93	AVG
7		6.3859	14.35	19.72	34.07	60.00	-25.93	QP
8		6.5227	3.34	19.72	23.06	50.00	-26.94	AVG
9		15.9698	18.02	19.91	37.93	60.00	-22.07	QP
10		16.1399	6.74	19.93	26.67	50.00	-23.33	AVG
11		20.4854	16.18	20.18	36.36	60.00	-23.64	QP
12		20.5944	-1.79	20.18	18.39	50.00	-31.61	AVG





Test Model	Pod 3 Max	Test Mode	Mode 1
Environmental Conditions	24.2°C, 53.5% RH	Test Engineer	Mening Su
Pol	Neutral	Test Voltage	AC 120V/60Hz



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector
1	*	0.1590	28.16	19.63	47.79	65.52	-17.73	QP
2		0.1598	2.42	19.63	22.05	55.47	-33.42	AVG
3		0.3976	15.38	19.63	35.01	57.90	-22.89	QP
4		0.3976	5.09	19.63	24.72	47.90	-23.18	AVG
5		2.2471	11.12	19.68	30.80	56.00	-25.20	QP
6		2.3055	-0.23	19.68	19.45	46.00	-26.55	AVG
7		7.6021	14.68	19.75	34.43	60.00	-25.57	QP
8		7.7325	0.12	19.76	19.88	50.00	-30.12	AVG
9		16.0126	17.66	19.91	37.57	60.00	-22.43	QP
10		16.2241	6.65	19.93	26.58	50.00	-23.42	AVG
11		20.5891	16.99	20.18	37.17	60.00	-22.83	QP
12		20.8051	-3.48	20.16	16.68	50.00	-33.32	AVG

Note: Margin= Reading level + Correct factor – Limit
 Correct Factor= Lism Factor+Cable Factor



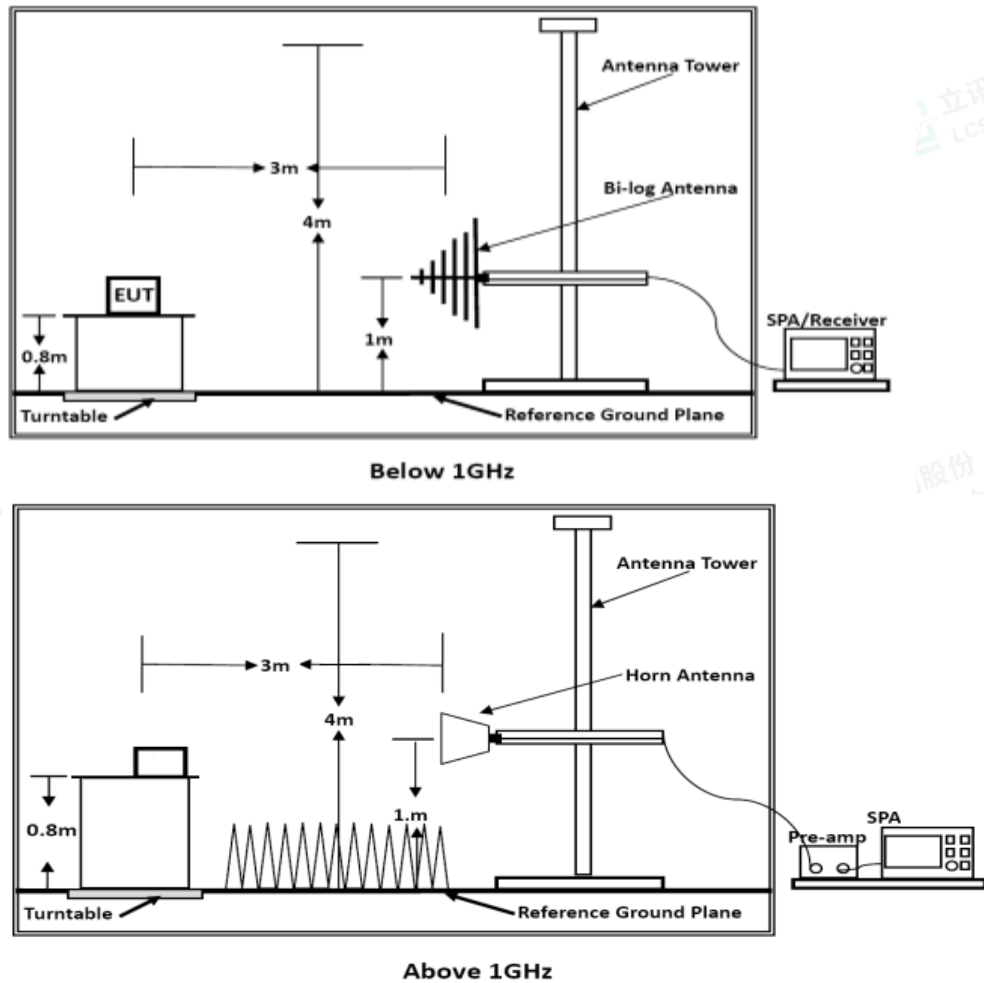
3.2. Radiated emission Measurement

3.2.1. Test Equipment

The following test equipments are used during the radiated emission measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	AUDIX	E3	/	N/A	N/A
2	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2021-09-12	2024-09-11
3	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2021-09-05	2024-09-04
4	EMI Test Receiver	R&S	ESR3	102311	2022-08-17	2023-08-16
5	Broadband Preamplifier	/	BP-01M18G	P190501	2022-06-16	2023-06-15
6	EMI Test Software	Farad	EZ	/	N/A	N/A
7	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2022-10-29	2023-10-28
8	EMI Test Receiver	R&S	ESPI	101940	2022-08-17	2023-08-16
9	High frequency antenna	SCHWARZBECK	BBHA 9170	791	2021-08-29	2024-08-28
10	High frequency antenna amplifier	SCHWARZBECK	BBV9719	9719-025	2021-08-29	2024-08-28

3.2.2. Block Diagram of Test Setup





3.2.3. Radiated Emission Limit (Class B)

Limits for Radiated Disturbance Below 1GHz

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
30 ~ 88	3	100	40
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46
960 ~ 1000	3	500	54
Remark: (1) Emission level (dB)μV = 20 log Emission level μV/m (2) The smaller limit shall apply at the cross point between two frequency bands. (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.			
Limits for Radiated Emission Above 1GHz			
Frequency (MHz)	Distance (Meters)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)
Above 1000	3	74	54
***Note: The lower limit applies at the transition frequency.			

3.2.4. EUT Configuration on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.2.5. Operating Condition of EUT

3.2.5.1. Setup the EUT as shown in Section 3.2.2.

3.2.5.2. Let the EUT work in test Mode 1 and measure it.

3.2.6. Test Procedure

EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated by-log antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2014 on radiated emission measurement.

3.2.7. Measuring Instruments and Setting

Please refer to equipment list in this report. The following table is the setting of spectrum analyzer and receiver





Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average

The frequency range from 30MHz to 1000MHz and above 1000MHz is checked.

3.2.8. Radiated Emission Noise Measurement Result

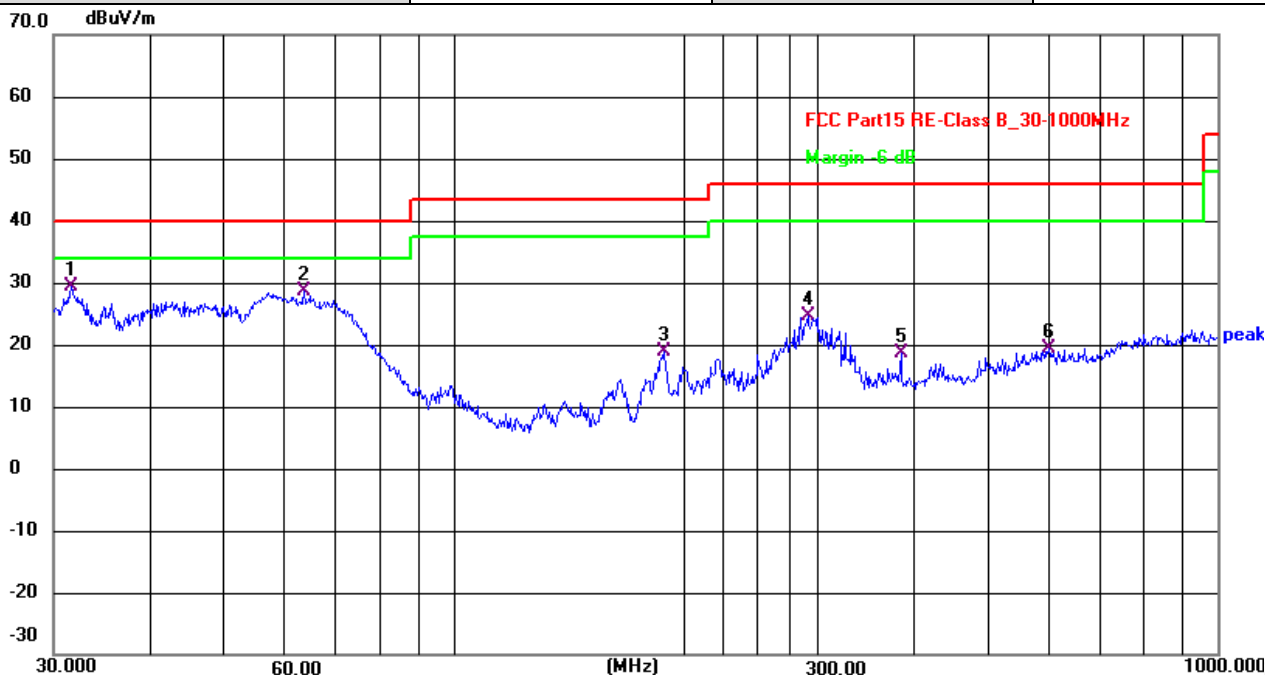
PASS.

The scanning waveforms please refer to the next page.





Test Model	Pod 3 Max	Test Mode	Mode 1
Environmental Conditions	23.8°C, 52.3% RH	Detector Function	Quasi-peak
Pol	Vertical	Distance	3m
Test Engineer	Mening Su	Test Voltage	AC 120V/60Hz

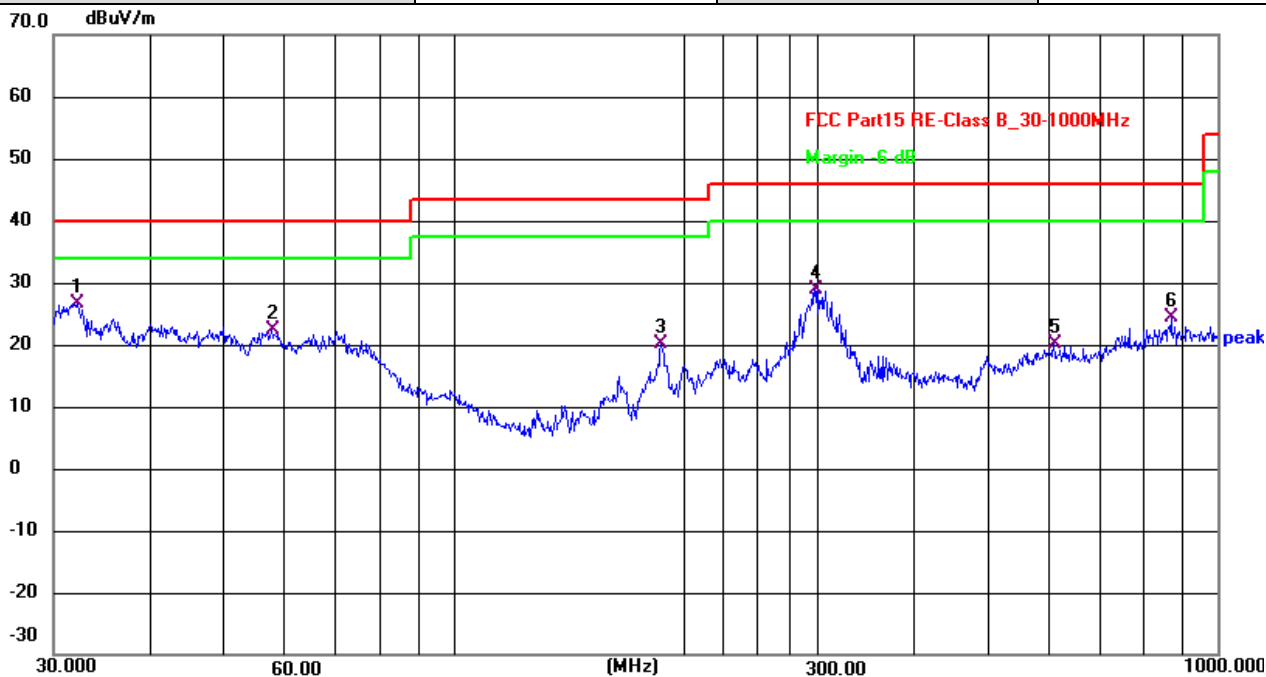


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	31.6201	47.54	-18.25	29.29	40.00	-10.71	QP
2	63.7588	47.64	-19.09	28.55	40.00	-11.45	QP
3	188.4125	37.30	-18.39	18.91	43.50	-24.59	QP
4	291.0358	40.08	-15.53	24.55	46.00	-21.45	QP
5	385.2804	33.35	-14.60	18.75	46.00	-27.25	QP
6	601.4265	29.96	-10.47	19.49	46.00	-26.51	QP





Test Model	Pod 3 Max	Test Mode	Mode 1
Environmental Conditions	23.8°C, 52.3% RH	Detector Function	Quasi-peak
Pol	Horizontal	Distance	3m
Test Engineer	Mening Su	Test Voltage	AC 120V/60Hz



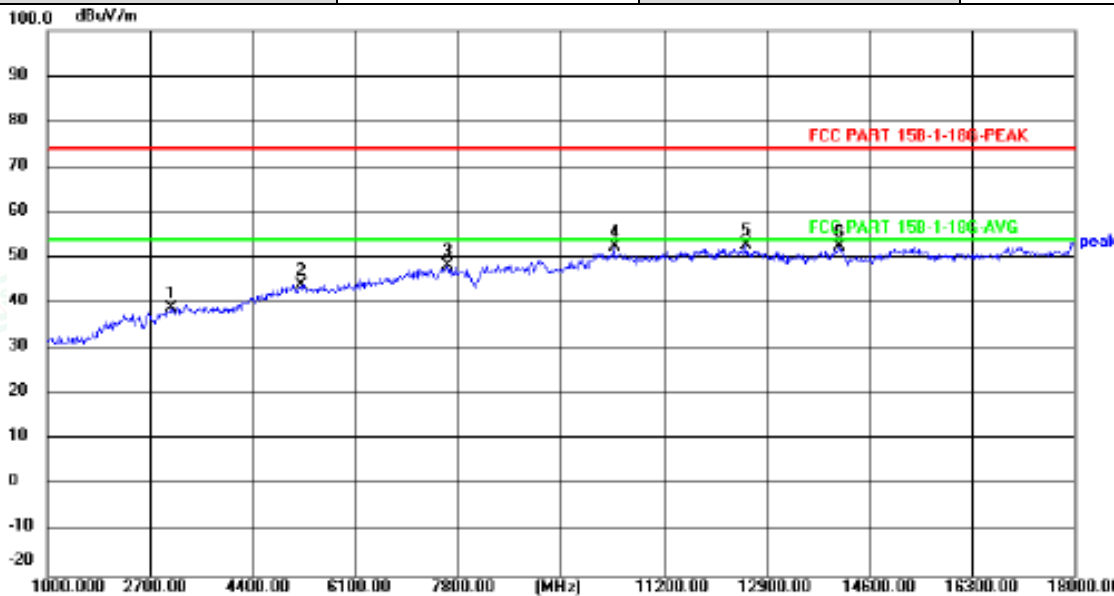
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	32.1794	44.91	-18.16	26.75	40.00	-13.25	QP
2	57.7962	40.85	-18.45	22.40	40.00	-17.60	QP
3	187.0956	37.80	-17.73	20.07	43.50	-23.43	QP
4	297.2240	44.47	-15.60	28.87	46.00	-17.13	QP
5	609.9217	30.88	-10.70	20.18	46.00	-25.82	QP
6	869.1302	33.17	-8.75	24.42	46.00	-21.58	QP

Note: Margin= Reading Level+Correct Factor – Limit
 Correct Factor=Antenna Factor+Cable Factor – Pre-Amplifier Factor





Test Model	Pod 3 Max	Test Mode	Mode 1 (Above 1GHz)
Environmental Conditions	23.9°C, 52.0% RH	Detector Function	Peak + AV
Pol	Vertical	Distance	3m
Test Engineer	Mening Su	Test Voltage	AC 120V/60Hz



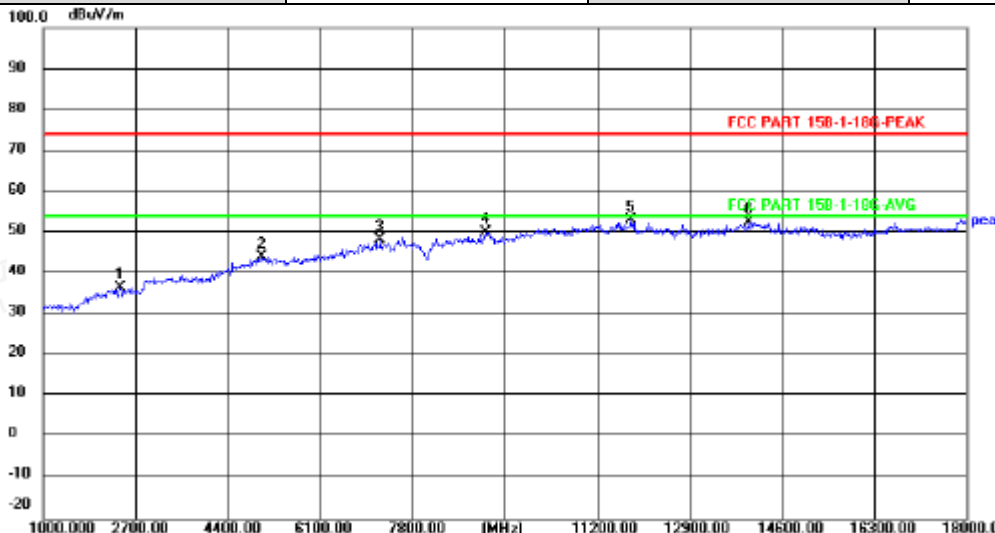
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	3057.000	48.49	-9.57	38.92	74.00	-35.08	peak
2	5199.000	47.91	-3.75	44.16	74.00	-29.84	peak
3	7630.000	47.50	0.66	48.16	74.00	-25.84	peak
4	10384.000	48.30	4.24	52.54	74.00	-21.46	peak
5	12577.000	46.29	6.43	52.72	74.00	-21.28	peak
6	14107.000	43.14	9.27	52.41	74.00	-21.59	peak

No.	Freq (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	38085	36.04	16.10	52.14	74.00	-21.86	Peak
2	38655	38.66	16.52	55.18	74.00	-18.82	Peak





Test Model	Pod 3 Max	Test Mode	Mode 1 (Above 1GHz)
Environmental Conditions	23.9°C, 52.0% RH	Detector Function	Peak + AV
Pol	Horizontal	Distance	3m
Test Engineer	Mening Su	Test Voltage	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2411.000	48.31	-11.65	36.66	74.00	-37.34	peak
2	5012.000	48.10	-4.10	44.00	74.00	-30.00	peak
3	7205.000	48.22	0.15	48.37	74.00	-25.63	peak
4	9143.000	47.93	2.13	50.06	74.00	-23.94	peak
5	11812.000	46.70	6.43	53.13	74.00	-20.87	peak
6	14005.000	43.30	9.18	52.48	74.00	-21.52	peak

No.	Freq (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	38110	35.07	16.10	51.17	74.00	-22.83	Peak
2	38663	39.17	16.52	55.69	74.00	-18.31	Peak

Note:

- Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- Measurements above show only up to 6 maximum emissions noted.
- Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- Factor = Antenna Factor + Cable Loss + Amplifier Factor
Emission Level = Reading level + Factor
Margin = Emission Level - Limit





4. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separated files for Test Setup Photos of the EUT.

5. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

6. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

-----THE END OF TEST REPORT-----

