FCC Test Report

Report No.:	RF180820C22D R2
FCC ID:	A5M-A940WC
Test Model:	Yoga A940-27ICB
Machine Type:	F0E4*******, F0E5*******
	(Where postfix x(or*) will be combination of blank, or numbers 0~9, or letters A~Z. It indicates the information for sales, warranty, and marketing geography, with no impact on RF compliance of the product.)
Received Date:	Sep. 04, 2018
Test Date:	Oct. 19 ~ Oct. 20, 2018
Issued Date:	Dec. 06, 2018
Applicant:	Lenovo (Beijing) limited
Address:	No. 6 chuang Ye Road, Shang Di Information Industry Base , Haidian District, Beijing 10085, CHINA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF180820C22D	Original release	Nov. 07, 2018
RF180820C22D R1	Revised Antenna type	Nov. 28, 2018
RF180820C22D R2	Added test plots for Radiated Emission Test (Frequency below 1GHz)	Dec. 06, 2018

1 Certificate of Conformity

Product:	All-In-One-Computer
Brand:	Lenovo
Model No.:	Yoga A940-27ICB
Machine Type:	F0E4*******, F0E5******* (Where postfix x(or*) will be combination of blank, or numbers 0~9, or letters A~Z. It indicates the information for sales, warranty, and marketing geography, with no impact on RF compliance of the product.)
Sample Status:	Engineering sample
Applicant:	Lenovo (Beijing) limited
Test Date:	Oct. 19 ~ Oct. 20, 2018
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.209) ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Pettie Chen , **Date:** Dec. 06, 2018

Pettie Chen / Senior Specialist

Approved by : Bruce Chen , **Date:** Dec. 06, 2018

Bruce Chen / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.209)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -24.80dB at 0.25748MHz.
15.209	Radiated Emission Test	Pass	Meet the requirement of limit. Minimum passing margin is -0.2dB at 720.00MHz.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.94 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~ 1000MHz	3.87 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	All-In-One-Computer
Brand	Lenovo
Test Model	Yoga A940-27ICB
Machine Type	F0E4*******, F0E5******* (Where postfix x(or*) will be combination of blank, or numbers 0~9, or letters A~Z. It indicates the information for sales, warranty, and marketing geography, with no impact on RF compliance of the product.)
Sample Status	Engineering sample
Power Supply Rating	20Vdc (adapter)
Modulation Type	FSK
Operating Frequency	110~145kHz
Field Strength	81.0dBuV/m
Antenna Type	Loop antenna
Accessory Device	Adapter
Data Cable Supplied	NA

Note:

1. The EUT uses following adapter.

Brand	Lenovo
Model	A18-230P1A
Input Power	100-240 Vac, 50-60 Hz, 3.5 A
Output Power	20 Vdc, 11.5 A
Power Cable	1.75m non-shielded power cable with two cores

2. The EUT has WPC (Wireless Power Consortium) technology.
3. WPC Vender: Luxshare; WPC Model: LPS-15WP D

3.2 Description of Test Modes

1 channel is provided to this EUT

Channel	Freq. (kHz)
1	127

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO		DESCRIPTION
	RE<1G	PLC	
A	√	√	Charging Mode
B	√	√	Standby Mode

Where **RE<1G:** Radiated Emission below 1GHz **PLC:** Power Line Conducted Emission

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel
A, B	1	1

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel
A, B	1	1

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE<1G	23 deg. C, 64% RH	120Vac, 60Hz	Willy Cheng
PLC	23 deg. C, 65% RH	120Vac, 60Hz	Willy Cheng

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

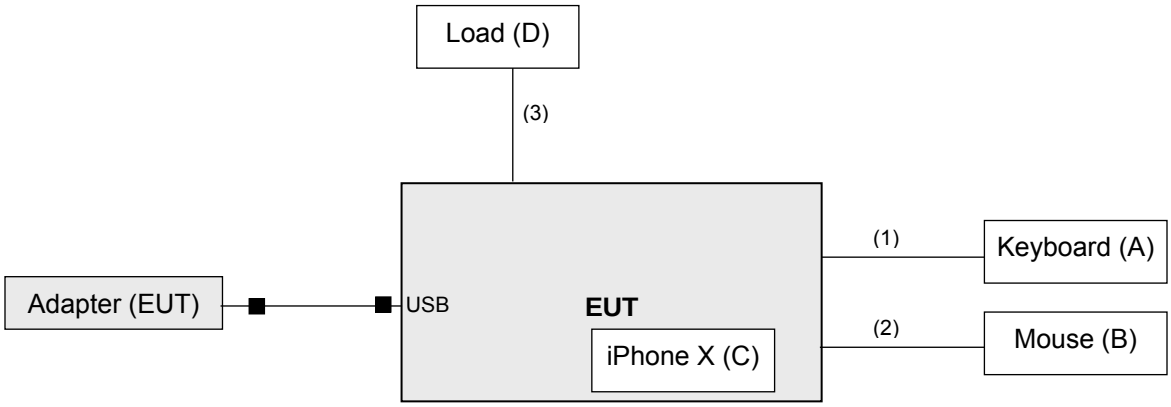
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Keyboard	DELL	SK-8115	CN-OJ4635-71616-53-OCAE	FCC DoC Approved	-
B.	Mouse	DELL	MS111-P	CN-011D3V-71581-1CJ-0936	FCC DoC Approved	-
C.	iPhone X	Apple	A1901	NA	NA	-
D.	Load	NA	NA	NA	NA	-

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB cable	1	2	Y	0	-
2.	USB cable	1	1.8	Y	0	-
3.	RJ45 cable	1	1.5	N	0	-

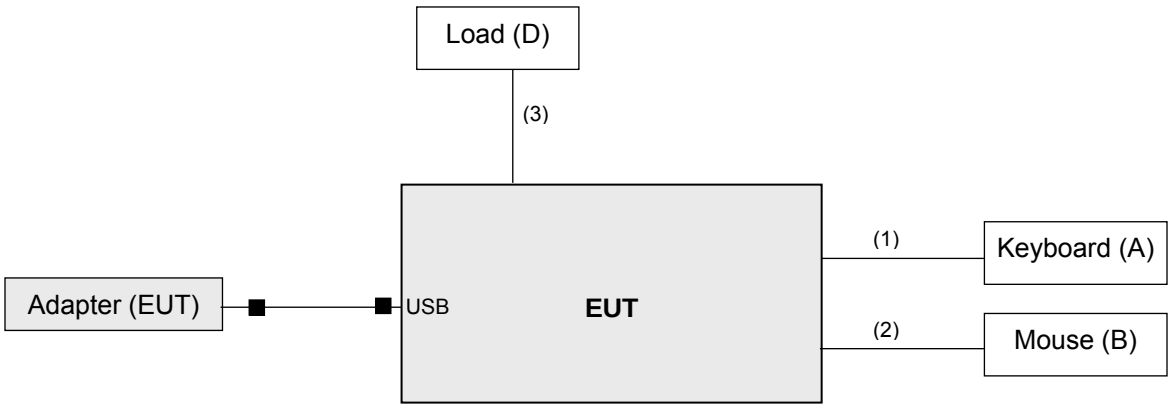
Note: The core(s) is(are) originally attached to the cable(s)

3.3.1 Configuration of System under Test

Test Mode A



Test Mode B



3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.209)

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

For Frequency below 30MHz

Frequency (MHz)	Field Strength (dBuV/m)		Measurement Distance (meters)
	uV/m	dBuV/m	
0.009 – 0.490	2400 / F (kHz)	48.52-13.80	300
0.490 – 1.705	24000 / F (kHz)	33.80-22.97	30
1.705 – 30.0	30	29.54	30

For Frequency between 30-1000MHz

Frequency (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
30-88	90	39.1	100	40.0
88-216	150	43.5	150	43.5
216-960	210	46.4	200	46.0
Above 960	300	49.5	500	54.0

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	May 29, 2018	May 28, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 12, 2017	Dec. 11, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Dec. 11, 2017	Dec. 10, 2018
HORN Antenna SCHWARZBECK	9120D	209	Dec. 13, 2017	Dec. 12, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 01, 2017	Nov. 30, 2018
Loop Antenna TESEQ	HLA 6121	45745	Jun. 14, 2018	Jun. 13, 2019
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 21, 2018	Aug. 20, 2019
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Apr. 03, 2018	Apr. 02, 2019
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 21, 2018	Aug. 20, 2019
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-SM-8000	Cable-CH3-03 (309224+170907)	Aug. 21, 2018	Aug. 20, 2019
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 3.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
5. The IC Site Registration No. is IC 7450F-3.

4.1.3 Test Procedures

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

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

c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

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

c. 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.

d. 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.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

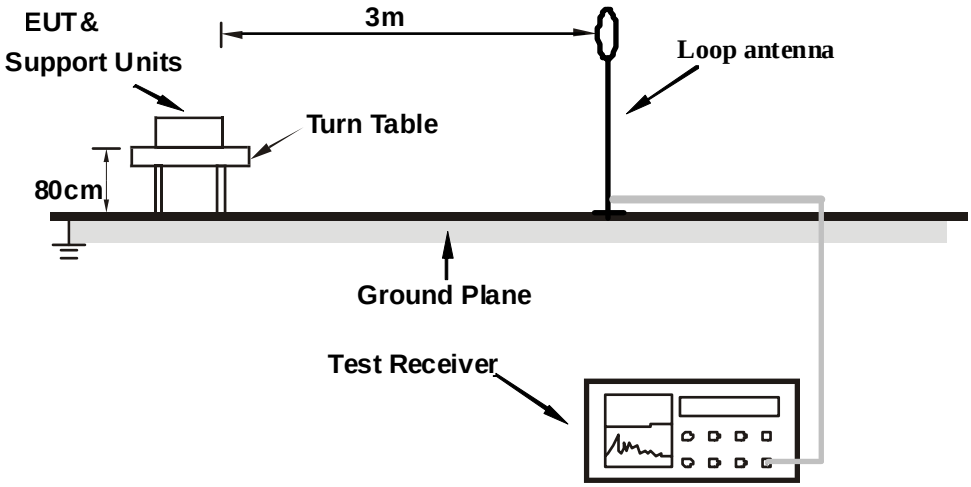
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

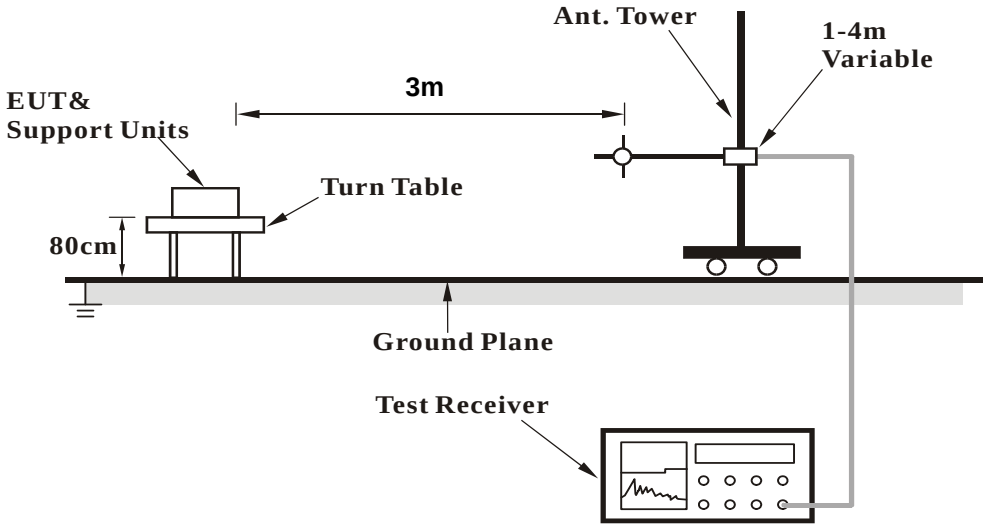
No deviation.

4.1.5 Test Set Up

For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

Test Mode A

a. The EUT powered by adapter.
b. Put the iPhone on the EUT (wireless charging) during the test.

Test Mode B

a. The EUT powered by adapter.

4.1.7 Test Results

Below 30MHz Data:

Charging Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.127	81.0	105.5	-24.5	1.00	130	61.3	19.7
2	0.634	41.8	71.6	-29.8	1.00	127	21.6	20.2
3	14.043	43.7	69.5	-25.8	1.00	313	21.9	21.8
4	15.581	41.6	69.5	-27.9	1.00	127	19.8	21.8
5	17.311	44.2	69.5	-25.3	1.00	227	22.4	21.8
6	18.369	45.3	69.5	-24.2	1.00	36	23.5	21.8
7	19.474	43.0	69.5	-26.5	1.00	50	21.2	21.8
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.127	77.6	105.5	-27.9	1.00	58	57.9	19.7
2	0.730	40.2	70.3	-30.1	1.00	241	20.1	20.1
3	2.508	36.3	69.5	-33.2	1.00	202	16.7	19.6
4	14.043	39.5	69.5	-30.0	1.00	222	17.7	21.8
5	17.311	41.0	69.5	-28.5	1.00	182	19.2	21.8
6	18.369	46.0	69.5	-23.5	1.00	160	24.2	21.8
7	19.474	41.0	69.5	-28.5	1.00	273	19.2	21.8
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA GROUND-PARALLEL AT 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.127	73.8	105.5	-31.7	1.00	133	54.1	19.7
2	2.556	46.2	69.5	-23.3	1.00	19	26.6	19.6
3	3.373	46.5	69.5	-23.0	1.00	51	26.8	19.7
4	14.043	57.1	69.5	-12.4	1.00	6	35.3	21.8
5	14.428	54.5	69.5	-15.0	1.00	253	32.7	21.8
6	15.149	52.0	69.5	-17.5	1.00	122	30.2	21.8
7	17.311	56.8	69.5	-12.7	1.00	275	35.0	21.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40

Standby Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	B		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.254	46.6	99.5	-52.9	1.00	41	19.5	19.9
2	2.893	38.6	69.50	-30.9	1.00	320	19.1	19.5
3	14.043	42.7	69.50	-26.8	1.00	348	20.9	21.8
4	15.149	41.0	69.50	-28.5	1.00	6	19.2	21.8
5	18.898	42.2	69.50	-27.3	1.00	262	20.4	21.8
6	19.474	46.5	69.50	-23.0	1.00	270	24.7	21.8
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.254	48.6	99.5	-50.9	1.00	144	28.7	19.9
2	2.652	40.3	69.5	-29.2	1.00	8	20.7	19.6
3	14.043	44.8	69.5	-24.7	1.00	242	23.0	21.8
4	15.149	43.0	69.5	-26.5	1.00	251	21.2	21.8
5	17.311	45.5	69.5	-24.0	1.00	104	23.7	21.8
6	19.474	48.7	69.5	-20.8	1.00	130	26.9	21.8
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA GROUND-PARALLEL AT 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.254	47.14	99.5	-52.1	1.00	331	27.2	19.9
2	2.460	44.3	69.5	-25.2	1.00	284	24.6	19.7
3	14.043	53.9	69.5	-15.6	1.00	330	32.1	21.8
4	15.581	54.0	69.5	-15.5	1.00	343	32.2	21.8
5	17.311	57.5	69.5	-12.0	1.00	234	35.7	21.8
6	19.474	50.7	69.5	-18.8	1.00	48	28.9	21.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40

Below 1GHz Data:

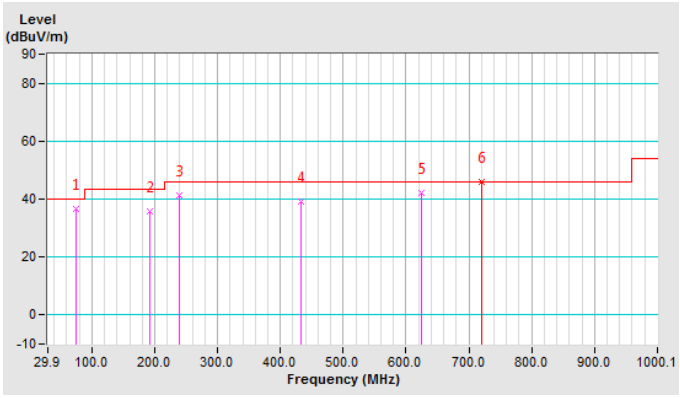
Charging Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 1GHz		
Test Mode	A		

Antenna Polarity & Test Distance: Horizontal At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	74.71	36.6 QP	40.0	-3.4	1.49 H	316	48.8	-12.2
2	191.34	35.6 QP	43.5	-7.9	1.49 H	10	47.1	-11.5
3	239.94	41.3 QP	46.0	-4.7	1.00 H	182	51.4	-10.1
4	432.38	39.2 QP	46.0	-6.8	1.99 H	113	43.7	-4.5
5	624.83	42.0 QP	46.0	-4.0	1.00 H	291	42.5	-0.5
6	**720.00**	**45.8 QP**	**46.0**	**-0.2**	**1.00 H**	**279**	**44.9**	**0.9**

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

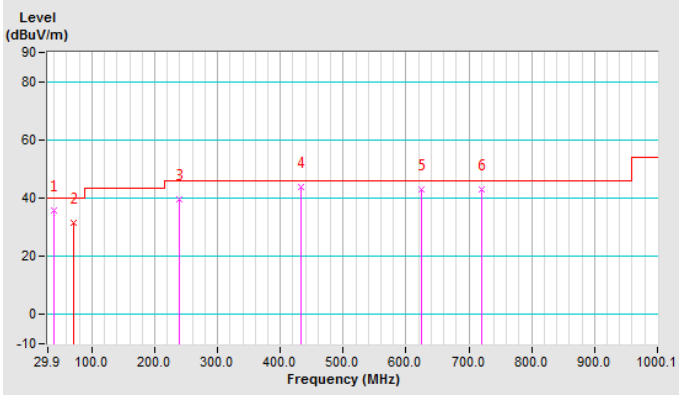


Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 1GHz		
Test Mode	A		

Antenna Polarity & Test Distance: Vertical At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	39.62	35.9 QP	40.0	-4.1	1.00 V	244	45.9	-10.0
2	70.81	31.5 QP	40.0	-8.5	1.48 V	69	43.0	-11.5
3	239.88	39.5 QP	46.0	-6.5	1.49 V	36	49.6	-10.1
4	432.37	43.9 QP	46.0	-2.1	1.00 V	174	48.4	-4.5
5	624.85	43.0 QP	46.0	-3.0	1.99 V	150	43.5	-0.5
6	720.12	42.8 QP	46.0	-3.2	1.49 V	145	41.8	1.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



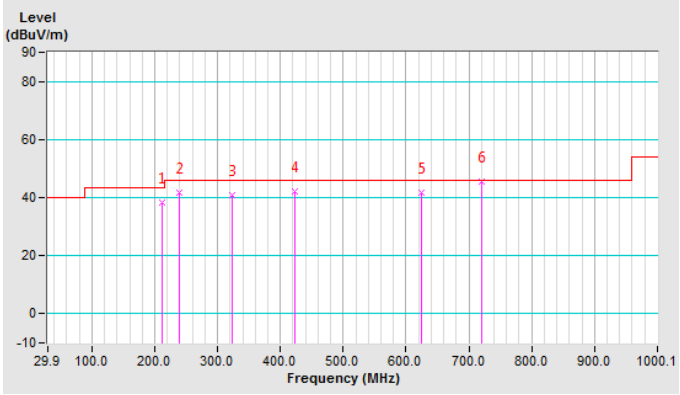
Standby Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 1GHz		
Test Mode	B		

Antenna Polarity & Test Distance: Horizontal At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	212.66	38.4 QP	43.5	-5.1	1.00 H	255	50.0	-11.6
2	239.88	41.5 QP	46.0	-4.5	1.99 H	352	51.6	-10.1
3	323.49	40.7 QP	46.0	-5.3	1.00 H	183	47.5	-6.8
4	422.65	42.3 QP	46.0	-3.7	1.99 H	256	47.2	-4.9
5	624.85	41.7 QP	46.0	-4.3	1.00 H	303	42.2	-0.5
6	720.12	45.7 QP	46.0	-0.3	1.00 H	297	44.7	1.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

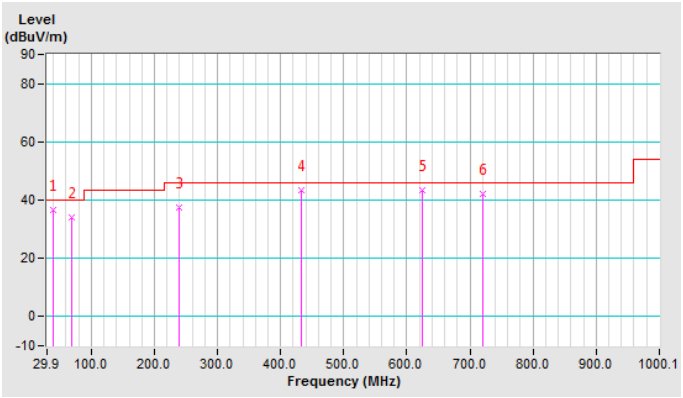


Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 1GHz		
Test Mode	B		

Antenna Polarity & Test Distance: Vertical At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	39.62	36.8 QP	40.0	-3.2	1.00 V	297	46.8	-10.0
2	68.79	34.1 QP	40.0	-5.9	2.00 V	16	45.0	-10.9
3	239.88	37.6 QP	46.0	-8.4	1.50 V	6	47.7	-10.1
4	432.37	43.6 QP	46.0	-2.4	1.00 V	173	48.1	-4.5
5	624.85	43.3 QP	46.0	-2.7	2.00 V	146	43.8	-0.5
6	720.12	42.1 QP	46.0	-3.9	1.50 V	69	41.1	1.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102412	Feb. 08, 2018	Feb. 07, 2019
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 05, 2018	Sep. 04, 2019
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Feb. 05, 2018	Feb. 04, 2019
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Aug. 13, 2018	Aug. 12, 2019
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 2.
3. The VCCI Site Registration No. is C-2047.

4.2.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

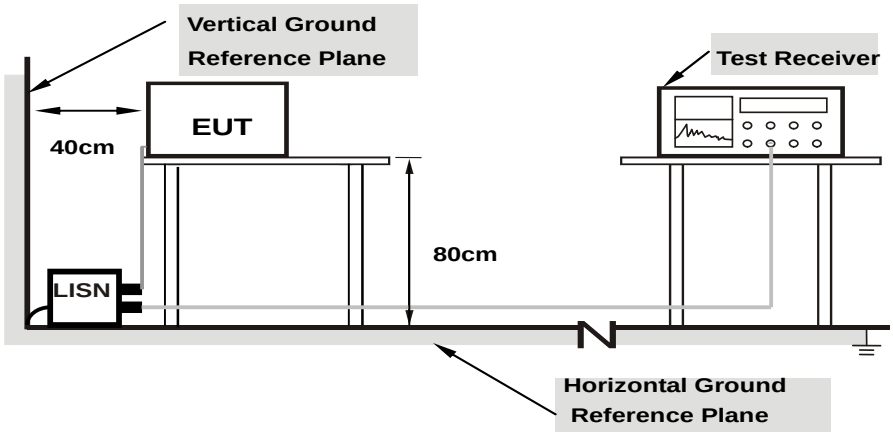
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

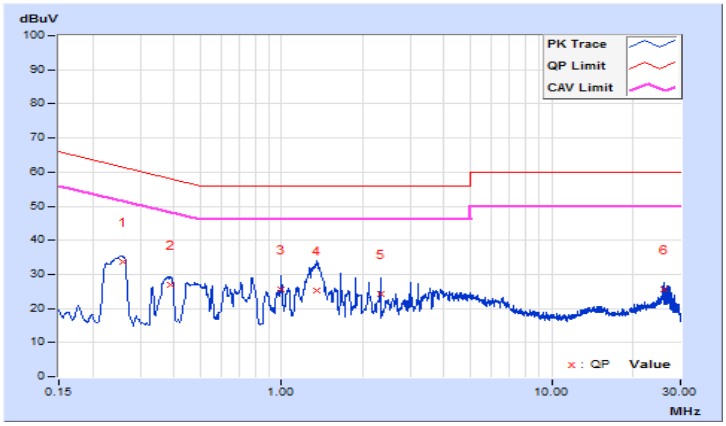
Charging Mode

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.25748**	**10.07**	**23.49**	**16.64**	**33.56**	**26.71**	**61.51**	**51.51**	**-27.95**	**-24.80**
2	0.39077	10.07	16.83	7.70	26.90	17.77	58.05	48.05	-31.15	-30.28
3	0.99769	10.08	15.63	1.64	25.71	11.72	56.00	46.00	-30.29	-34.28
4	1.35522	10.08	15.26	8.32	25.34	18.40	56.00	46.00	-30.66	-27.60
5	2.32575	10.10	13.99	2.34	24.09	12.44	56.00	46.00	-31.91	-33.56
6	26.13975	10.49	15.08	7.47	25.57	17.96	60.00	50.00	-34.43	-32.04

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

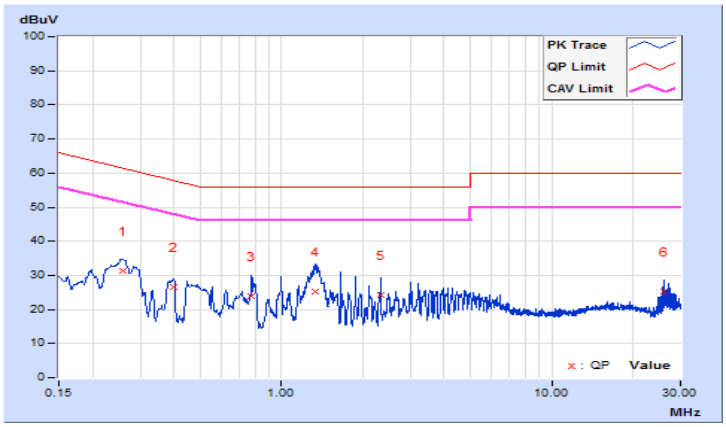


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.25748	10.06	21.14	13.23	31.20	23.29	61.51	51.51	-30.31	-28.22
2	0.39911	10.06	16.42	5.99	26.48	16.05	57.87	47.87	-31.39	-31.82
3	0.77550	10.07	13.93	1.87	24.00	11.94	56.00	46.00	-32.00	-34.06
4	1.32675	10.07	15.11	8.75	25.18	18.82	56.00	46.00	-30.82	-27.18
5	2.32575	10.09	14.02	3.19	24.11	13.28	56.00	46.00	-31.89	-32.72
6	26.13975	10.36	14.92	7.32	25.28	17.68	60.00	50.00	-34.72	-32.32

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



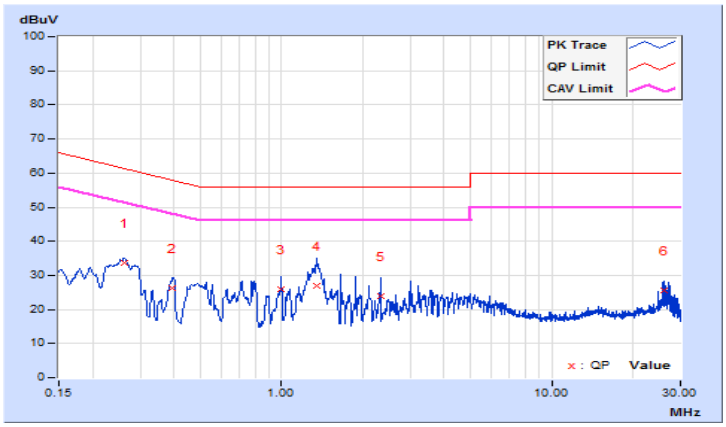
Standby Mode

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.26090	10.07	23.70	15.47	33.77	25.54	61.40	51.40	-27.63	-25.86
2	0.39596	10.07	16.23	9.14	26.30	19.21	57.94	47.94	-31.64	-28.73
3	0.99600	10.08	15.69	1.43	25.77	11.51	56.00	46.00	-30.23	-34.49
4	1.34700	10.08	16.72	9.42	26.80	19.50	56.00	46.00	-29.20	-26.50
5	2.32575	10.10	13.73	2.97	23.83	13.07	56.00	46.00	-32.17	-32.93
6	26.13975	10.49	14.99	7.39	25.48	17.88	60.00	50.00	-34.52	-32.12

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

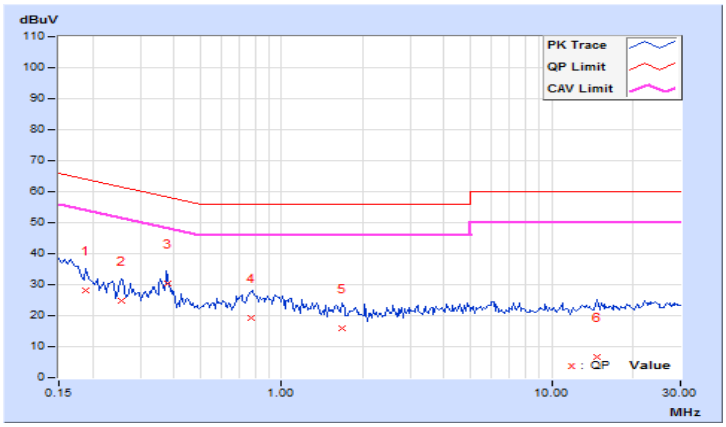


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18906	9.97	18.30	-0.97	28.27	9.00	64.08	54.08	-35.81	-45.08
2	0.25547	9.99	14.89	6.12	24.88	16.11	61.58	51.58	-36.70	-35.47
3	0.38047	10.02	20.43	10.46	30.45	20.48	58.27	48.27	-27.82	-27.79
4	0.77500	10.03	9.18	0.53	19.21	10.56	56.00	46.00	-36.79	-35.44
5	1.68359	10.07	5.70	-3.16	15.77	6.91	56.00	46.00	-40.23	-39.09
6	14.74219	10.58	-4.04	-8.39	6.54	2.19	60.00	50.00	-53.46	-47.81

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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