

FCC Part 15B TEST REPORT

S T S

Report No.: STS1812078E01

Issued for

Shenzhen DophiGo IoT Technology Co., Ltd.

16/F, Building B1, Nanshan Park, No.1001 Xueyuan Ave, Nanshan District, Shenzhen, China

Product Name:	DophiGo Indoor Chime	
Brand Name:	DophiGo	
Model Name:	DPH-DI-200	
Series Model:	DPH-DI-xxx (x on behalf of 0-9)	
FCC ID:	2ARG7DPHDI200	
Test Standard:	FCC 47 CFR Part 15: Subpart B	

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TEST RESULT CERTIFICATION

	Shenzhen DophiGo IoT Technology Co., Ltd.	
Address	16/F, Building B1, Nanshan Park, No.1001 Xueyuan Ave, Nanshan District, Shenzhen, China	
Manufacture's Name:	Shenzhen DophiGo IoT Technology Co., Ltd.	
Address	16/F, Building B1, Nanshan Park, No.1001 Xueyuan Ave, Nanshan District, Shenzhen, China	
Product Description		
Product Name:	DophiGo Indoor Chime	
Brand Name:	DophiGo	
Model Name:	DPH-DI-200	
Series Model:	DPH-DI-xxx (x on behalf of 0-9)	
Standards	FCC 47 CFR Part 15: Subpart B	
Test Procedure:	ANSI C63.4-2014	

This device described above has been tested by STS, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test:

 Date of Performance of Tests
 18 Dec. 2018~22 Dec. 2018

 Date of Issue
 23 Dec. 2018

 Test Result
 Pass

Compiled by : Mickey beg (Mickey Deng) (Mickey Deng) Chopin Xiao) Authorized Signatory : Mickey beg (Mickey Deng) Chopin Xiao) (Chopin Xiao) (Vita Li)

Shenzhen STS Test Services Co., Ltd.

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Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	23 Dec. 2018	STS1812078E01	ALL	Initial Issue



Shenzhen STS Test Services Co., Ltd.



1. SUMMARY OF THE TEST RESULTS

Test procedures according to the technical standards:

EMISSION			
Standard	ltem	Result	Remarks
FCC 47 CFR Part 15 Subpart B	Conducted Emission	PASS	Meet Class B limit
FOC 47 CFK Fait 15 Subpait B	Radiated Emission	PASS	Meet Class B limit

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

1.1 TEST FACTORY

Company Name:	Shenzhen STS Test Services Co. Ltd.	
Address: 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong, China		
Telephone: +86-755 3688 6288		
Fax:	+86-755 3688 6277	
Desistration No.	FCC Registration No.: 625569	
Registration No.:	IC Registration No.: 12108A; A2LA Certificate No.: 4338.01;	

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 % $^{\circ}$

No.	Item	Uncertainty
1	Conducted Emission (9KHz-150KHz)	±3.18dB
2	Conducted Emission (150KHz-30MHz)	±2.70dB
3	All emissions,radiated(<1G) 9KHz-30MHz	±2.50dB
4	All emissions,radiated(<1G) 30MHz-200MHz	±3.43dB
5	All emissions,radiated(<1G) 200MHz-1000MHz	±3.57dB
6	All emissions, radiated (>1G)	±4.13dB

Shenzhen STS Test Services Co., Ltd.



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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	DophiGo Indoor Chime	
Brand Name	DophiGo	
Model Name	DPH-DI-200	
Series Model	DPH-DI-xxx (x on behalf of 0-9)	
Model Difference	Where $x = 0.9$, indicating that the enclosure has multiple colors and different areas of sale, without compromising safety and EMC performance.	
Test Sample Number	181218030	
Frequency Bands	434Mhz	
Modulation Mode	FSK	
Power Source	Input: AC110-220V, Rated Power: 1 W, Frequency: 50/60Hz	
Hardware Version Number	DPH001_SY50N76_V0.2	
Software Version Number	fw_dph_vdoorbell_in_mcu_v1.0.0	

Note: For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

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2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	RX

For Conducted Test		
Final Test Mode	Description	
Mode 1	RX	

For Radiated Test			
Final Test Mode Description			
Mode 1	RX		

NOTE: The test modes were carried out for all operation modes. Only worst case will be show in this report.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF THE SYSTEM TESTED



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2.4 DESCRIPTION OF THE 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.

Accessories equipment

Item	Equipment	Mfr/Brand	Model/Type No.
N/A	N/A	N/A	N/A

Auxiliary equipment

Item	Equipment	Mfr/Brand	Model/Type No.
N/A	N/A	N/A	N/A

Cable

Item	Туре	Shielded Type	Ferrite Core	Length
N/A	N/A	N/A	N/A	N/A

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in ^rLength ^l column.
- (3) "YES" is means "shielded" "with core"; "NO" is means "unshielded" "without core".



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

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.

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
EMI Test Receiver	R&S	ESCI	101427	2018.10.13	2019.10.12
Bilog Antenna	TESEQ	CBL6111D	45873	2017.11.02	2020.11.01
Horn Antenna	SCHWARZB ECK	BBHA 9120D	9120D-1343	2018.10.19	2021.10.18
Pre-mplifier(1G-18G)	SKET	LNPA-01018G- 45	SK2018080901	2018.10.13	2019.10.12
Pre-mplifier(0.1M-3G Hz)	EM	EM330	060665	2018.07.10	2019.07.09
Spectrum Analyzer	Agilent	N9020A	MY49100060	2018.10.13	2019.10.12
RE Cable (9K-1G)	N/A	R01	N/A	2018.10.13	2019.10.12
RE Cable (1G-18G)	N/A	R02	N/A	2018.10.13	2019.10.12
Temperature & Humidity	Mieo	HH660	N/A	2018.10.11	2019.10.10
Horn Antenna(18-40GHz)	A-INFO	LB-180400-KF	J211020657	2018.03.11	2021.03.10

Radiation Test equipment

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
EMI Test Receiver	R&S	ESCI	101427	2018.10.13	2019.10.12
LISN	R&S	ENV216	101242	2018.10.11	2019.10.10
LISN	ETS	3810/2NM	00023625	2018.10.11	2019.10.10
Absorbing Clamp	R&S	MDS-21	100668	2018.10.17	2019.10.16
CE Cable	N/A	C01	N/A	2018.10.13	2019.10.12
Temperature & Humidity	Mieo	HH660	N/A	2018.10.11	2019.10.10

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3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits

	Conducted Emission Limits (dBuV)				
FREQUENCY (MHz)	Clas	ss A	Class B		
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	
0.50 -5.0	73.00	60.00	56.00	46.00	
5.0 -30.0	73.00	60.00	60.00	50.00	

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

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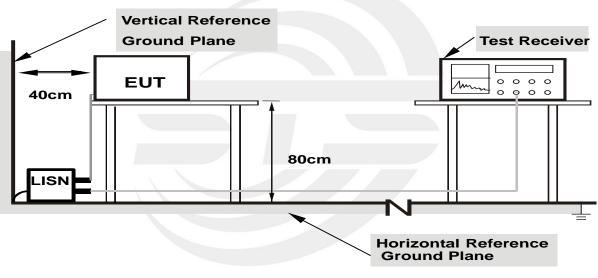
3.1.2 TEST PROCEDURE

- a. The EUT was 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. For the actual test configuration, please refer to the related Item -EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN. 2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



3.1.6 TEST RESULTS

Temperature:	24.7 °C	Relative Humidity:	56%
Phase:	L	Test Mode:	Mode 1
Test Voltage:	AC 120V/60Hz		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2660	34.63	20.56	55.19	61.24	-6.05	QP
2	0.2660	14.97	20.56	35.53	51.24	-15.71	AVG
3	0.3580	33.18	20.59	53.77	58.77	-5.00	QP
4	0.3580	17.22	20.59	37.81	48.77	-10.96	AVG
5	0.4460	32.00	20.49	52.49	56.95	-4.46	QP
6	0.4460	19.22	20.49	39.71	46.95	-7.24	AVG
7	1.0260	27.57	20.16	47.73	56.00	-8.27	QP
8	1.0260	22.17	20.16	42.33	46.00	-3.67	AVG
9	3.2100	26.11	19.97	46.08	56.00	-9.92	QP
10	3.2100	21.19	19.97	41.16	46.00	-4.84	AVG
11	5.3500	24.87	19.93	44.80	60.00	-15.20	QP
12	5.3500	19.15	19.93	39.08	50.00	-10.92	AVG

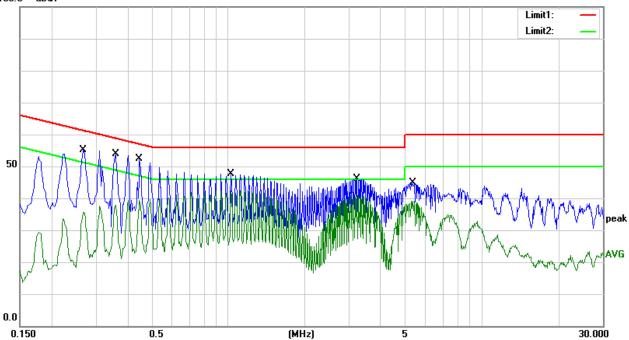
Remark:

1. All readings are Quasi-Peak and Average values.

2. Margin = Result (Result = Reading + Factor)-Limit

3. Factor= Cable Loss +Antenna Factor-Amplifier Gain

100.0 dBuV



Shenzhen STS Test Services Co., Ltd.



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Temperature:	24.7 °C	Relative Humidity:	56%
Phase:	N	Test Mode:	Mode 1
Test Voltage:	AC 120V/60Hz		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2220	33.99	20.34	54.33	62.74	-8.41	QP
2	0.2220	16.45	20.34	36.79	52.74	-15.95	AVG
3	0.3140	33.41	20.69	54.10	59.86	-5.76	QP
4	0.3140	18.12	20.69	38.81	49.86	-11.05	AVG
5	0.9380	30.04	20.18	50.22	56.00	-5.78	QP
6	0.9380	24.26	20.18	44.44	46.00	-1.56	AVG
7	3.2580	28.38	19.98	48.36	56.00	-7.64	QP
8	3.2580	22.01	19.98	41.99	46.00	-4.01	AVG
9	5.4420	27.08	19.92	47.00	60.00	-13.00	QP
10	5.4420	21.17	19.92	41.09	50.00	-8.91	AVG
11	14.4580	23.94	19.99	43.93	60.00	-16.07	QP
12	14.4580	8.04	19.99	28.03	50.00	-21.97	AVG

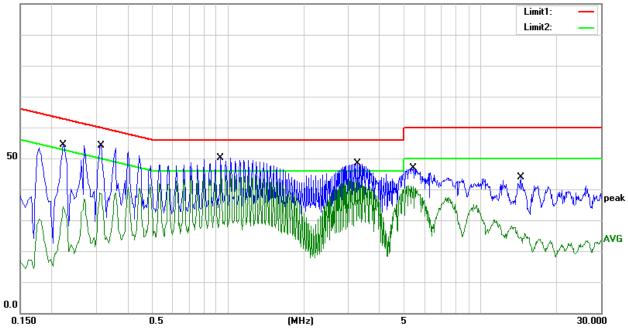
Remark:

1. All readings are Quasi-Peak and Average values.

2. Margin = Result (Result = Reading + Factor)-Limit

3. Factor= Cable Loss +Antenna Factor-Amplifier Gain

100.0 dBuV



Note: The test voltage is 100-240V, both of which have assessment tests, and the worst test data is in the report.

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3.2 RADIATED EMISSION MEASUREMENT

3.2.1 Radiated Emission Limits

In case the emission fall within the restricted band specified on 15.105(a)&109(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF THE RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (d	Class A (dBuV/m) (at 3M)		Class B (dBuV/m) (at 3M)		
	PEAK	AVERAGE	PEAK	AVERAGE		
Above 1000	80	60	74	54		

Note:

(1) The limit for radiated test was performed in the following: FCC PART 15B.

- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

FREQUENCY RANGE OF THE RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper	
frequency of measurement used in the device	Range (MHz)
or on which the device operates or tunes	(vii iz)
(MHz)	
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower



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Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	5th harmonic (Peak/AV)
RB / VB (emission in restricted	30MHz to 1000MHz: 100 KHz / 300 KHz
band)	Above 1000MHz: 1 MHz / 3 MHz

Receiver Parameter	Setting	
Attenuation	Auto	
Start ~ Stop Frequency	30MHz to 1000MHz: 100 KHz / 300 KHz	
	Above 1000MHz: 1 MHz / 3 MHz	

3.2.2 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic 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. The height of antenna is varied from 1 meter to 4 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 1GHz.
- f. For the actual test configuration, please refer to the related Item -EUT Test Photos.

Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

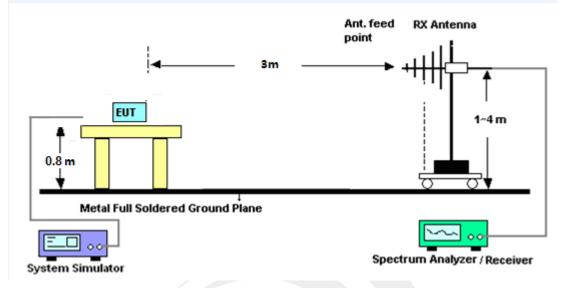
3.2.3 DEVIATION FROM TEST STANDARD

No deviation

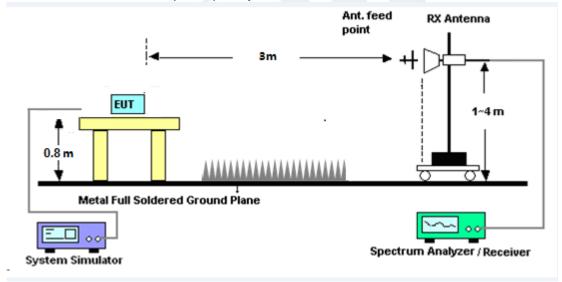


3.2.4 TEST SETUP

(A) Radiated Emission Test-Up Frequency 30MHz~1GHz



(B) Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the following during the testing.



3.2.6 TEST RESULTS

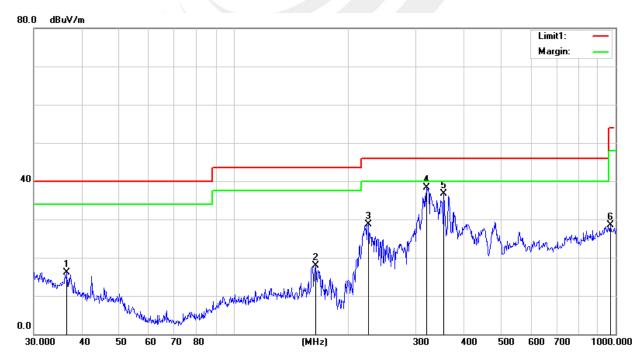
30MHz -1000MHz

Temperature:	24.6 °C	Relative Humidity:	55%
Phase:	Horizontal	Test Mode:	Mode 1
Test Voltage:	AC 120V/60Hz		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36.6375	30.78	-14.59	16.19	40.00	-23.81	QP
2	164.3301	36.69	-18.86	17.83	43.50	-25.67	QP
3	225.3080	47.44	-18.77	28.67	46.00	-17.33	QP
4	319.9370	52.46	-14.17	38.29	46.00	-7.71	QP
5	355.4273	50.04	-13.34	36.70	46.00	-9.30	QP
6	968.9338	28.66	-0.13	28.53	54.00	-25.47	QP

Remark:

- 1. All readings are Quasi-Peak.
- 2. Margin = Result (Result = Reading + Factor)-Limit
- 3. Factor= Cable Loss +Antenna Factor-Amplifier Gain



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Temperature:	24.6 °C	Relative Humidity:	55%
Phase:	Vertical	Test Mode:	Mode 1
Test Voltage:	AC 120V/60Hz		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36.8953	44.21	-14.73	29.48	40.00	-10.52	QP
2	47.4918	46.81	-20.19	26.62	40.00	-13.38	QP
3	75.7114	43.56	-23.30	20.26	40.00	-19.74	QP
4	222.9502	48.07	-18.93	29.14	46.00	-16.86	QP
5	325.5758	49.82	-14.12	35.70	46.00	-10.30	QP
6	982.6200	28.42	-0.14	28.28	54.00	-25.72	QP

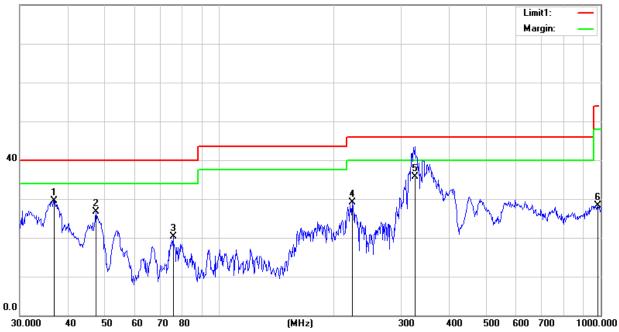
Remark:

1. All readings are Quasi-Peak.

2. Margin = Result (Result = Reading + Factor)-Limit

3. Factor= Cable Loss +Antenna Factor-Amplifier Gain





Shenzhen STS Test Services Co., Ltd.



(1 GHz to 25GHz.)

Temperature:	25 ℃	Relative Humidity:	69%
Phase:	Horizontal	Test Mode:	Mode 1
Test Voltage:	AC 120V/60Hz		

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector
1**	1282.000	24.06	-4.48	54.0	-29.94	AV
1	1282.000	34.57	-4.48	74.0	-39.43	Peak
2**	2410.000	31.52	0.80	54.0	-22.48	AV
2	2410.000	41.15	0.80	74.0	-32.85	Peak
3**	7510.000	26.64	10.59	54.0	-27.36	AV
3	7510.000	37.24	10.59	74.0	-36.76	Peak
4**	13660.000	41.89	23.37	54.0	-12.11	AV
4	13660.000	51.26	23.37	74.0	-22.74	Peak
5**	16432.000	42.65	21.73	54.0	-11.35	AV
5	16432.000	51.95	21.73	74.0	-22.05	Peak
6**	21604.000	46.84	23.98	54.0	-7.16	AV
6	21604.000	57.02	23.98	74.0	-16.98	Peak

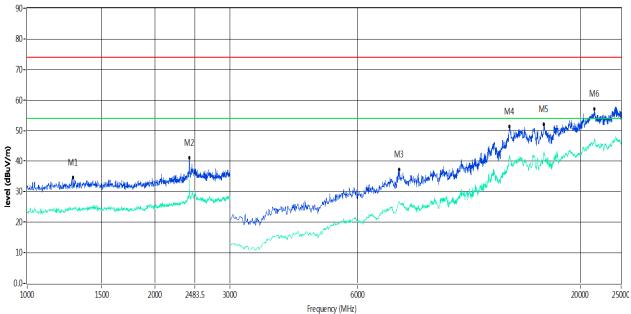
Remark:

1. All readings are Peak and Average values.

2. Margin = Result (Result = Reading + Factor)-Limit

3. Factor= Cable Loss +Antenna Factor-Amplifier Gain

RE_FCC Test Case_FCC 15B 1GHz-25GHz





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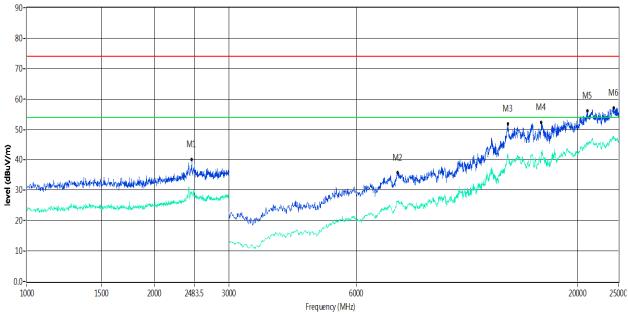
Temperature:	25 ℃	Relative Humidity:	69%
Phase:	Vertical	Test Mode:	Mode 1
Test Voltage:	AC 120V/60Hz		

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector
1**	2452.000	29.57	1.22	54.0	-24.43	AV
1	2452.000	40.10	1.22	74.0	-33.90	Peak
2**	7500.000	26.16	10.47	54.0	-27.84	AV
2	7500.000	35.76	10.47	74.0	-38.24	Peak
3**	13696.000	41.63	23.26	54.0	-12.37	AV
3	13696.000	51.81	23.26	74.0	-22.19	Peak
4**	16408.001	42.25	21.48	54.0	-11.75	AV
4	16408.001	52.32	21.48	74.0	-21.68	Peak
5**	21112.001	44.82	24.11	54.0	-9.18	AV
5	21112.001	56.16	24.11	74.0	-17.84	Peak
6**	24340.001	47.46	23.20	54.0	-6.54	AV
6	24340.001	57.16	23.20	74.0	-16.84	Peak

Remark:

- 1. All readings are Peak and Average values.
- 2. Margin = Result (Result = Reading + Factor)-Limit
- 3. Factor= Cable Loss +Antenna Factor-Amplifier Gain

RE_FCC Test Case_FCC 15B 1GHz-25GHz



Notes:

- 1. Measuring frequencies from 1 GHz to 25GHz.
- 2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode of the emission shown in Actual FS column.

** ** ** ** END OF THE REPORT ** ** ** **