

FCC PART 15.249

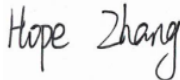
TEST REPORT

For

Hangzhou Hikvision Digital Technology Co., Ltd.

No.555 Qianmo Road, Binjiang District, Hangzhou 310052, China

FCC ID: 2ADTD-R0101060100

Report Type: Original Report		Product Type: Security Radar	
Test Engineer:	Hope Zhang		
Report Number:	RKSA190328001-00B		
Report Date:	2019-04-17		
Reviewed By:	Oscar Ye RF Leader		
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road,Kunshan,Jiangsu province,China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn		

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Hangzhou Hikvision Digital Technology Co., Ltd.
Test Model	DS-PR1-60
Series Model	DS-PR1-60-XYZ,DS-PR1-120,DS-PR1-120-XYZ, DS-PR2-100, DS-PR2-100-XYZ,DS-PR160,DS-PR160-XYZ, DS-PR1120,DS-PR1120-XYZ, DS-PRP100,DS-PRP100-XYZ, DS-PR160-UHK,DS-PR160-CKV, DS-PR160-UVS,DS-PR160-KVO, DS-PR160-HUN,DS-PR1120-UHK, DS-PR1120-CKV,DS-PR1120-UVS, DS-PR1120-KVO,DS-PR1120-HUN, DS-PRP100-UHK,DS-PRP100-CKV, DS-PRP100-UVS,DS-PRP100-KVO, DS-PRP100-HUN
Difference	Model NO.
Product	Security Radar
Dimension	206mm(W)* 228mm(H)* 61mm(D)
Rate Voltage	DC 12V power supply by Adapter or DC 56V power supply by POE

All measurement and test data in this report was gathered from production sample serial number: 20190328001. (Assigned by BACL, Kunshan). The EUT was received on 2019-03-28.

Objective

This type approval report is prepared on behalf of *Hangzhou Hikvision Digital Technology Co., Ltd.* in accordance with Part 2-Subpart J, and Part 15-Subparts A and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

No Related Submittal(s)/Grant(s).

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Lab Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19 dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	6.11dB
	1GHz~6GHz	4.45dB
	6GHz~18GHz	5.23dB
	18GHz~40GHz	5.65dB
Occupied Bandwidth		0.5kHz
Temperature		1.0°C
Humidity		6%

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614D01 and CAB identifier CN0004 under the ISED requirement. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Justification

Channel list:

Channel	Frequency (MHz)
1	24125

EUT Exercise Software

No software was used during the test.

Support Equipment List and Details

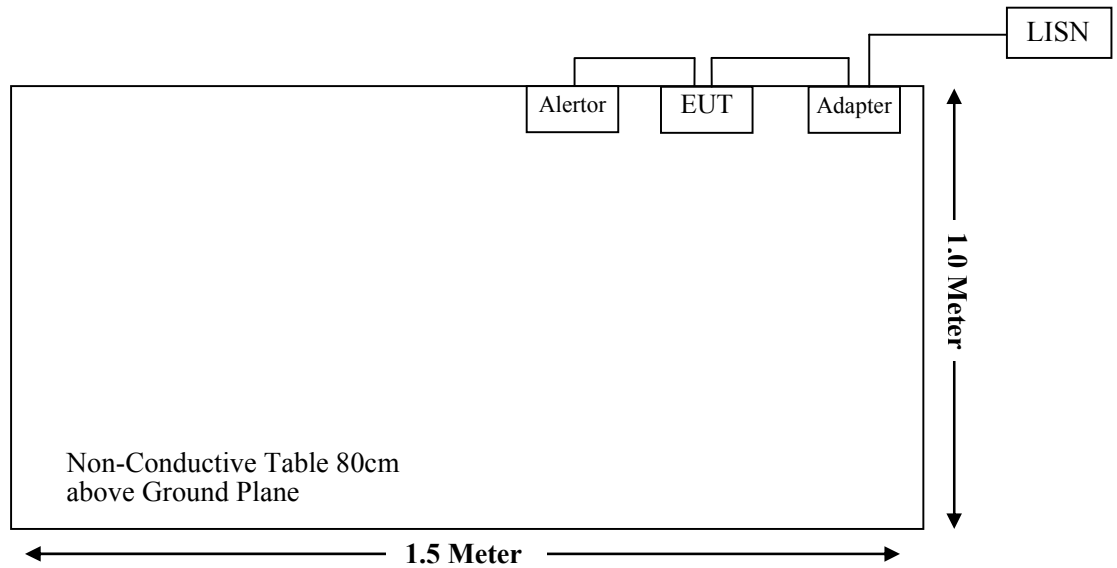
Manufacturer	Description	Model	Serial Number
SUPLET	POE	LAS60-57CN-RJ45	LNHBBFL0634410
HOIOTO	Adapter	ADS-26FSG-12 12024EPG	/
Hikvision	Alertor	DS013	/

External I/O Cable

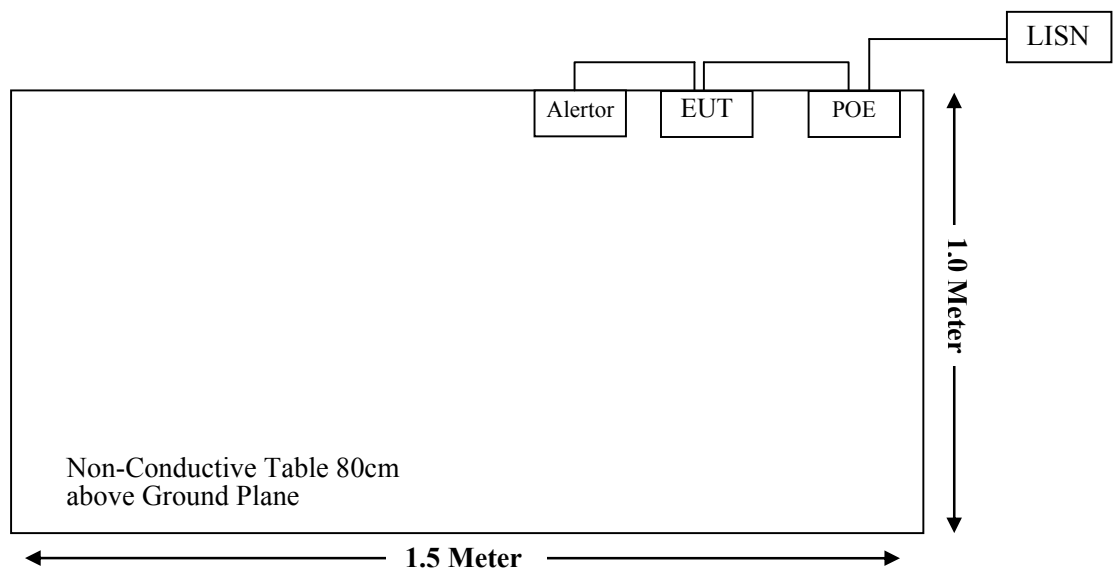
Cable Description	Shield Type	Length (m)	From Port	To
Power Cable	Unshielded	1.8	EUT	Adapter
RJ45 Cable	Unshielded	1.5	EUT	POE

Block Diagram of Test Setup

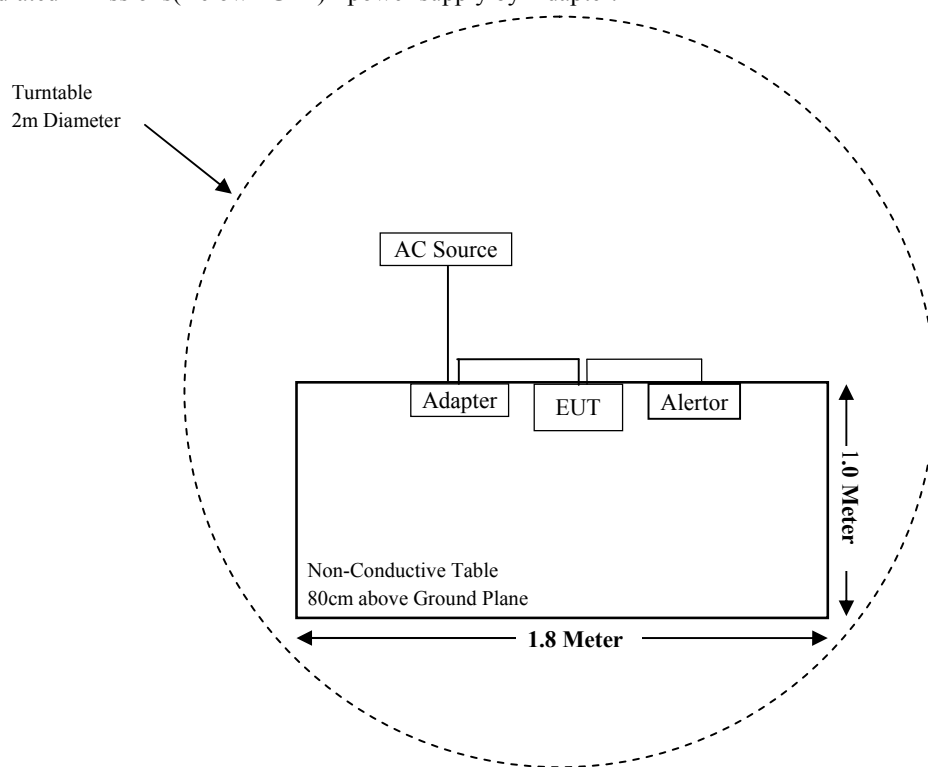
For Conducted Emissions - power supply by Adapter:



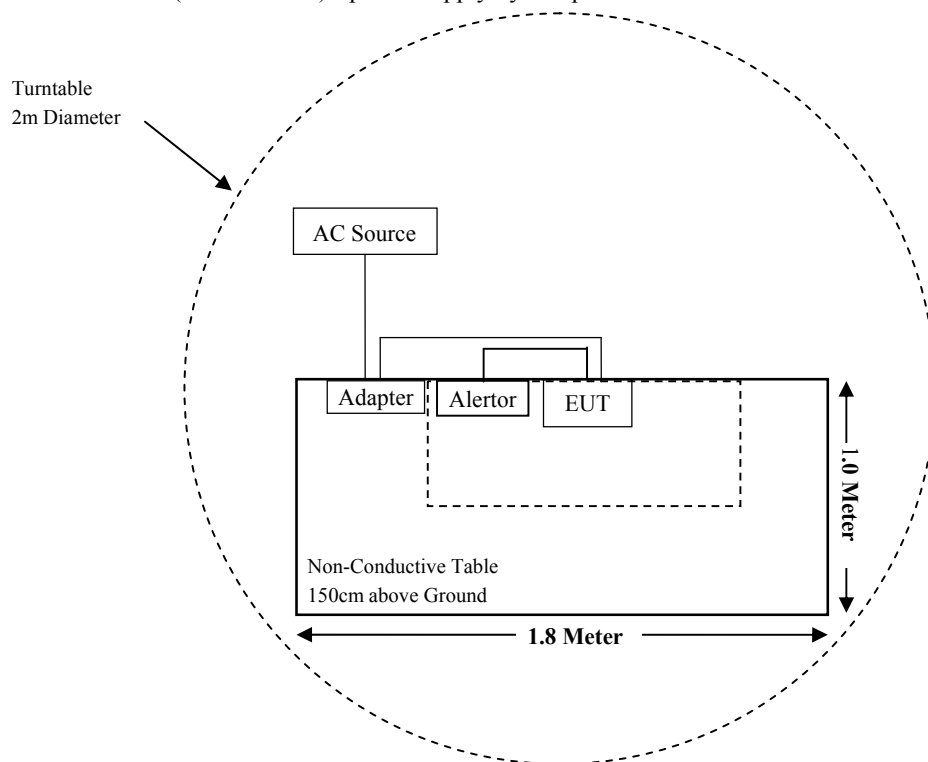
For Conducted Emissions - power supply by POE:



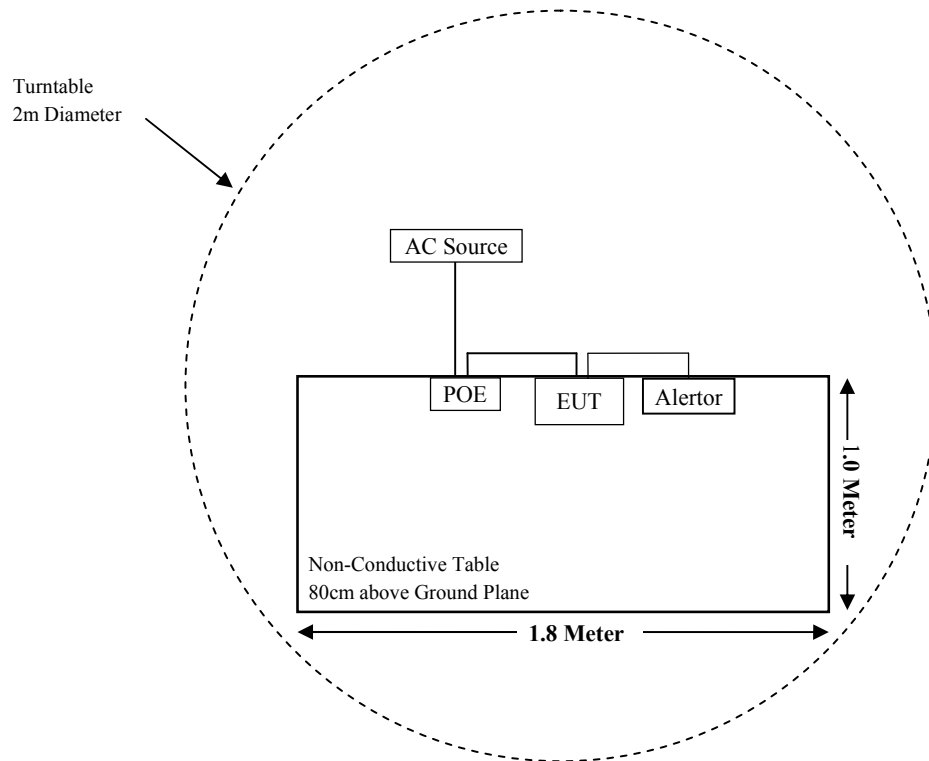
For Radiated Emissions(Below 1GHz) - power supply by Adapter:



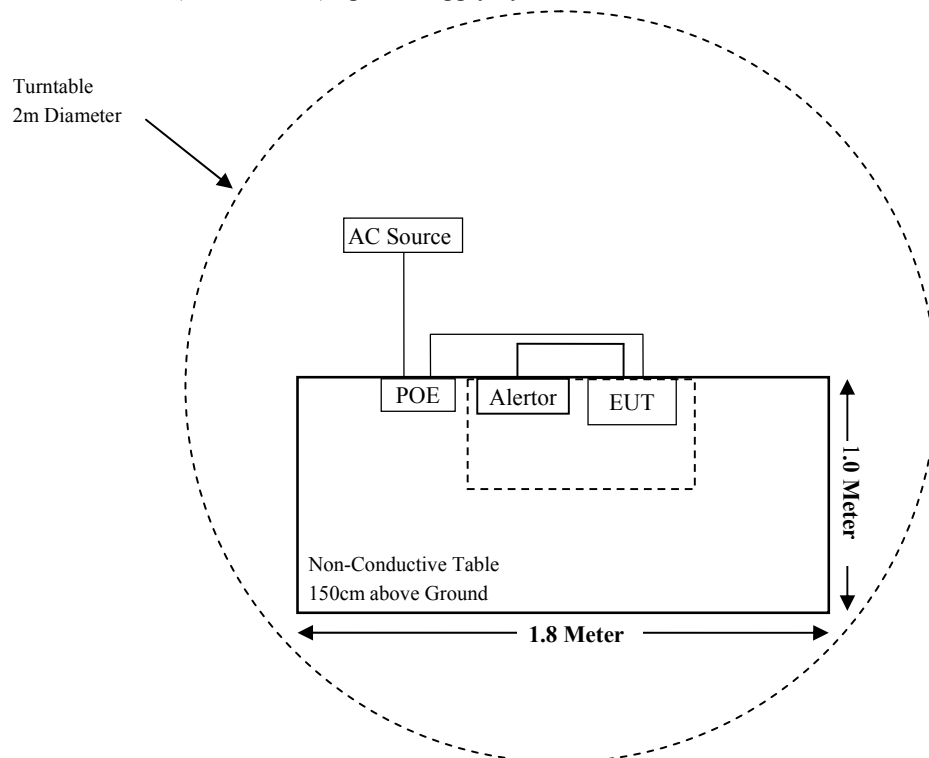
For Radiated Emissions(Above 1GHz) - power supply by Adapter:



For Radiated Emissions(Below 1GHz) - power supply by POE:



For Radiated Emissions(Above 1GHz) - power supply by POE:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207(a)	Conduction Emissions	Compliant
15.205, §15.209, §15.249	Radiated Emissions& Out of Band Emission	Compliant
§15.215 (c)	20 dB Bandwidth	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test (Chamber 1#)					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2018-11-30	2019-11-29
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2016-12-26	2019-12-25
Sonoma Instrument	Pre-amplifier	310N	171205	2018-08-14	2019-08-13
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-8	008	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2018-08-15	2019-08-14
Radiated Emission Test (Chamber 2#)					
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2018-08-27	2019-08-26
Agilent	Spectrum Analyzer	8565E	3442A0253	2018-10-25	2019-10-24
ETS-LINDGREN	Horn Antenna	3115	9207-3900	2017-07-15	2020-07-14
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-12-12	2019-12-11
OML	Harmonic Mixer	WR19/M19HWD	U60313-1	2016-10-14	2019-10-14
OML	Horn Antenna	M19RH	11648-01	2016-10-14	2019-10-14
Agilent	Harmonic Mixer	11970V	2521A01767	2016-12-07	2019-12-07
Flann Microwave	Horn Antenna	861V/385	736	2016-12-07	2019-12-07
OML	Harmonic Mixer	WR12/M12HWD	E60120-1	2016-10-19	2019-10-19
OML	Horn Antenna	M12RH	E60120-2	2016-10-19	2019-10-19
OML	Harmonic Mixer	WR08/M08HWD	F60313-1	2016-10-24	2019-10-24
OML	Horn Antenna	M08RH	F60313-2	2016-10-24	2019-10-24
A.H.Systems, inc	Amplifier	2641-1	491	2019-02-20	2020-02-19
EM Electronics Corporation	Amplifier	EM18G40G	060726	2019-03-20	2020-03-19
Narda	Attenuator	10dB	010	2018-08-15	2019-08-14
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2018-08-15	2019-08-14

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCS30	834115/007	2018-11-30	2019-11-29
Rohde & Schwarz	LISN	ESH3-Z5	862770/011	2018-11-30	2019-11-29
BACL	Auto test Software	BACL-EMC	CE001	/	/
Narda	Attenuator/6dB	10690812-2	26850-6	2019-01-10	2020-01-09
MICRO-COAX	Coaxial Cable	Cable-15	015	2018-08-15	2019-08-14

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used.

Antenna Connector Construction

The EUT has a PCB antenna and antenna gain is 12.5 dBi , which was permanently attached, fulfill the requirement of this section, please refer to the EUT photos.

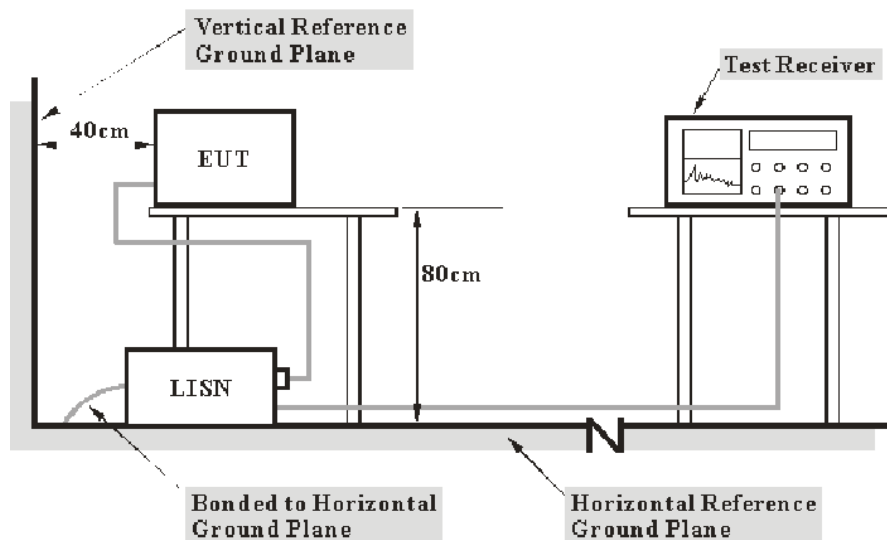
Result: Compliant.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

EUT Setup



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

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Factor & Margin Calculation

The Corrected Factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Corrected Factor (dB)} = \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V)} - \text{Corrected Amplitude (dB}\mu\text{V)}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

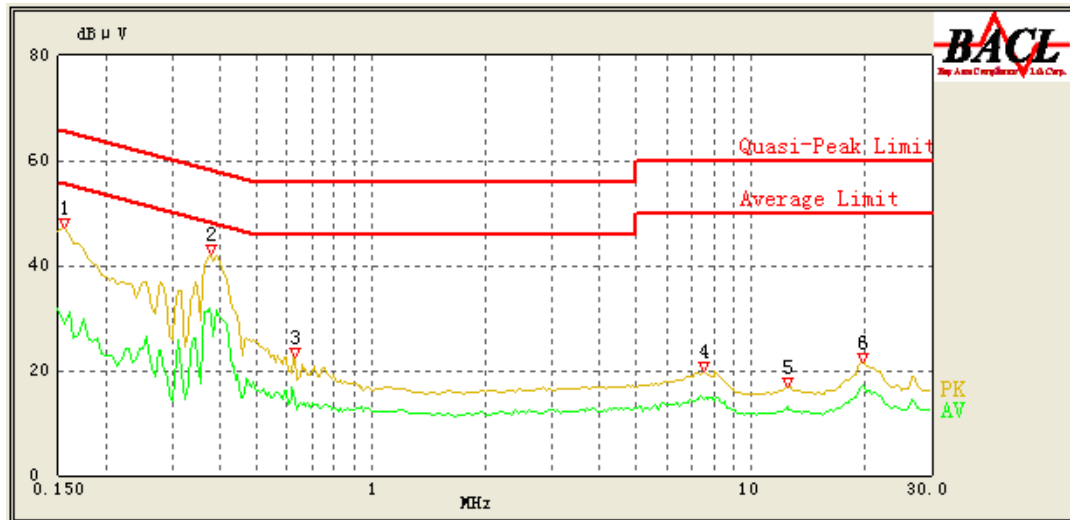
Test Data

Environmental Conditions

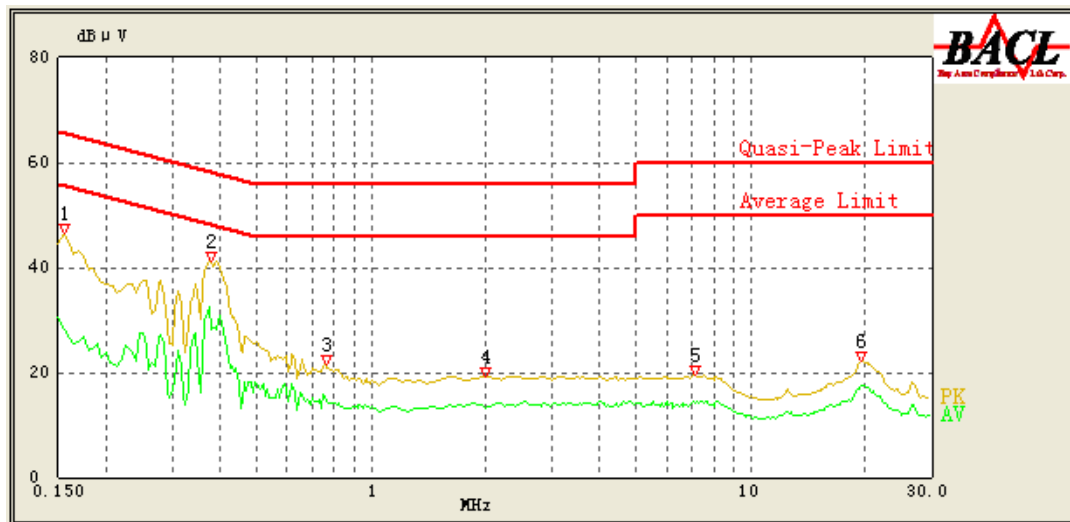
Temperature:	24.2°C
Relative Humidity:	51 %
ATM Pressure:	101.2kPa

The testing was performed by Hope Zhang on 2019-04-15.

EUT operation mode: Transmitting

AC 120V/60 Hz, Line - power supply by Adapter

Frequency (MHz)	Reading (dBμV)	Detector (PK/AV/QP)	Bandwidth (kHz)	Line	Corr. (dB)	Limit (dBμV)	Margin (dB)	Comment
0.155	47.30	QP	9.000	L1	16.06	65.73	18.43	Compliant
0.155	28.91	AV	9.000	L1	16.06	55.73	26.82	Compliant
0.380	42.07	QP	9.000	L1	16.05	58.28	16.21	Compliant
0.380	30.43	AV	9.000	L1	16.05	48.28	17.85	Compliant
0.630	22.54	QP	9.000	L1	16.00	56.00	33.46	Compliant
0.630	14.35	AV	9.000	L1	16.00	46.00	31.65	Compliant
7.500	19.67	QP	9.000	L1	15.99	60.00	40.33	Compliant
7.500	14.36	AV	9.000	L1	15.99	50.00	35.64	Compliant
12.500	16.94	QP	9.000	L1	16.13	60.00	43.06	Compliant
12.500	13.03	AV	9.000	L1	16.13	50.00	36.97	Compliant
19.750	21.65	QP	9.000	L1	16.43	60.00	38.35	Compliant
19.750	17.05	AV	9.000	L1	16.43	50.00	32.95	Compliant

AC 120V/60 Hz, Neutral - power supply by Adapter

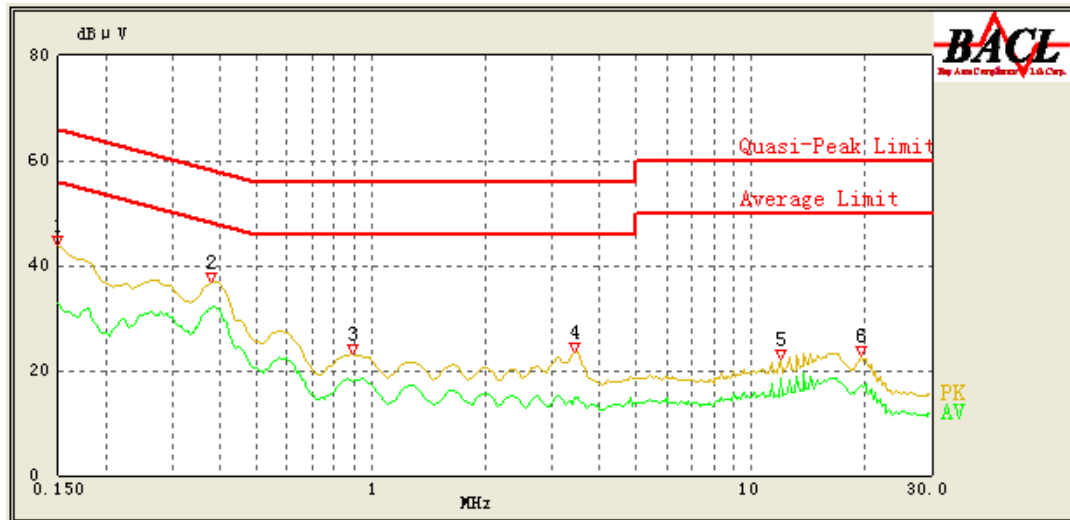
Frequency (MHz)	Reading (dBμV)	Detector (PK/AV/QP)	Bandwidth (kHz)	Line	Corr. (dB)	Limit (dBμV)	Margin (dB)	Comment
0.155	46.41	QP	9.000	N	16.06	65.73	19.32	Compliant
0.155	28.12	AV	9.000	N	16.06	55.73	27.61	Compliant
0.380	41.11	QP	9.000	N	16.09	58.28	17.17	Compliant
0.380	28.20	AV	9.000	N	16.09	48.28	20.08	Compliant
0.760	21.45	QP	9.000	N	15.98	56.00	34.55	Compliant
0.760	15.45	AV	9.000	N	15.98	46.00	30.55	Compliant
2.000	19.31	QP	9.000	N	15.91	56.00	36.69	Compliant
2.000	13.20	AV	9.000	N	15.91	46.00	32.80	Compliant
7.150	19.52	QP	9.000	N	15.92	60.00	40.48	Compliant
7.150	14.29	AV	9.000	N	15.92	50.00	35.71	Compliant
19.550	22.12	QP	9.000	N	16.15	60.00	37.88	Compliant
19.550	17.48	AV	9.000	N	16.15	50.00	32.52	Compliant

Note:

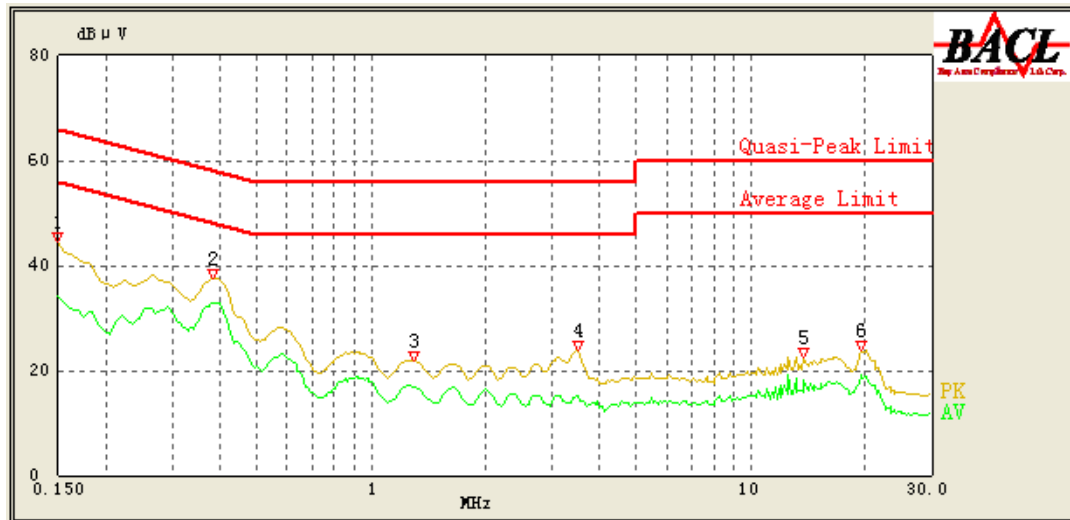
1) Corr.=LISN VDF (Voltage Division Factor) + Cable Loss

2) Margin = Limit – Reading

AC 120V/60 Hz, Line - power supply by POE



Frequency (MHz)	Reading (dBμV)	Detector (PK/AV/QP)	Bandwidth (kHz)	Line	Corr. (dB)	Limit (dBμV)	Margin (dB)	Comment
0.150	43.71	QP	9.000	L1	16.06	66.00	22.29	Compliant
0.150	32.94	AV	9.000	L1	16.06	56.00	23.06	Compliant
0.380	36.75	QP	9.000	L1	16.09	58.28	21.53	Compliant
0.380	31.74	AV	9.000	L1	16.09	48.28	16.54	Compliant
0.890	23.07	QP	9.000	L1	15.96	56.00	32.93	Compliant
0.890	17.95	AV	9.000	L1	15.96	46.00	28.05	Compliant
3.450	23.49	QP	9.000	L1	15.89	56.00	32.51	Compliant
3.450	14.91	AV	9.000	L1	15.89	46.00	31.09	Compliant
12.000	22.30	QP	9.000	L1	16.00	60.00	37.70	Compliant
12.000	18.48	AV	9.000	L1	16.00	50.00	31.52	Compliant
19.550	22.72	QP	9.000	L1	16.15	60.00	37.28	Compliant
19.550	17.32	AV	9.000	L1	16.15	50.00	32.68	Compliant

AC 120V/60 Hz, Neutral - power supply by POE

Frequency (MHz)	Reading (dBμV)	Detector (PK/AV/QP)	Bandwidth (kHz)	Line	Corr. (dB)	Limit (dBμV)	Margin (dB)	Comment
0.150	44.45	QP	9.000	N	16.06	66.00	21.55	Compliant
0.150	34.21	AV	9.000	N	16.06	56.00	21.79	Compliant
0.385	37.61	QP	9.000	N	16.09	58.17	20.56	Compliant
0.385	32.84	AV	9.000	N	16.09	48.17	15.33	Compliant
1.300	21.82	QP	9.000	N	15.93	56.00	34.18	Compliant
1.300	16.95	AV	9.000	N	15.93	46.00	29.05	Compliant
3.500	23.79	QP	9.000	N	15.89	56.00	32.21	Compliant
3.500	15.16	AV	9.000	N	15.89	46.00	30.84	Compliant
13.750	22.63	QP	9.000	N	16.01	60.00	37.37	Compliant
13.750	18.20	AV	9.000	N	16.01	50.00	31.80	Compliant
19.600	23.84	QP	9.000	N	16.15	60.00	36.16	Compliant
19.600	19.01	AV	9.000	N	16.15	50.00	30.99	Compliant

Note:

1) Corr.=LISN VDF (Voltage Division Factor) + Cable Loss

2) Margin = Limit – Reading

FCC§15.205, §15.209&§15.249- RADIATED EMISSIONS& OUT OF BAND EMISSION

Applicable Standard

As per FCC§15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

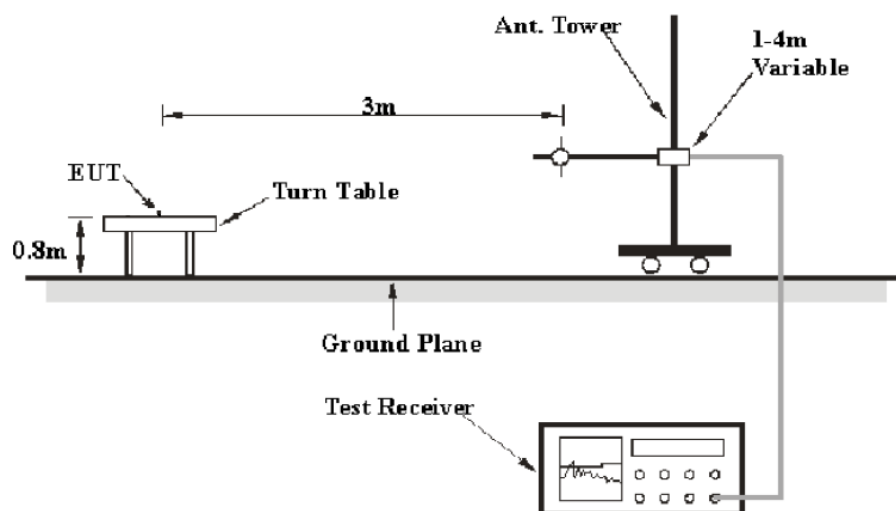
Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

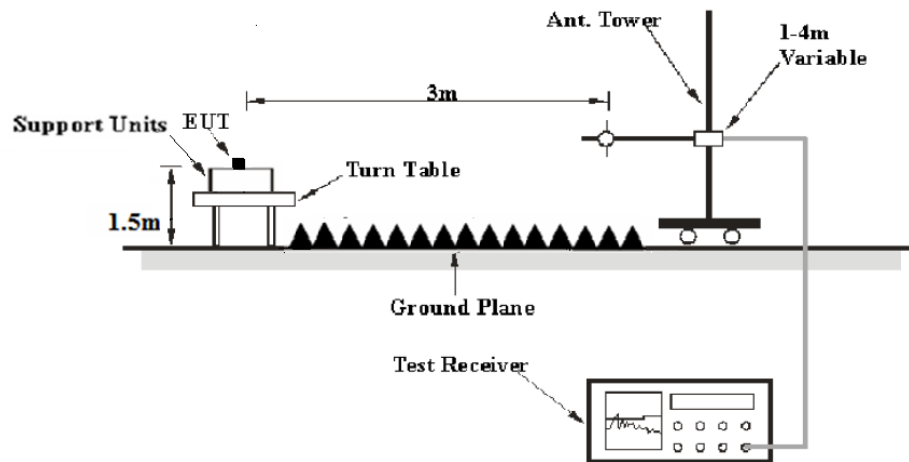
(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

EUT Setup

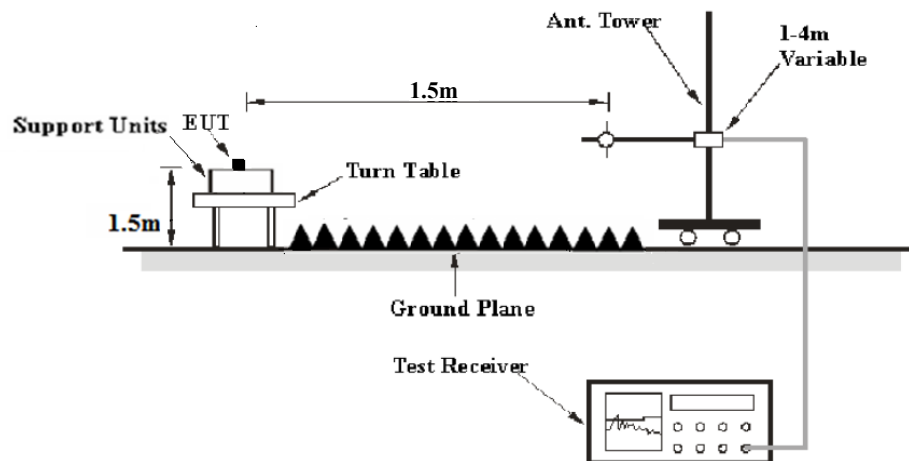
Below 1 GHz:



1 GHz-18GHz:



18 GHz-100GHz:



The radiated emission and out of band emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209/15.205 and FCC 15.249 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

Test Equipment Setup

The system was investigated from 30 MHz to 100 GHz.

During the radiated emission test, the EMI test receiver Setup was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1GHz	1MHz	3 MHz	/	PK
	1MHz	3 MHz	/	Ave

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude (dB}\mu\text{V /m)} = \text{Meter Reading (dB}\mu\text{V)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Amplifier Gain (dB)}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Corrected Amplitude (dB}\mu\text{V /m)}$$

Test Results Summary

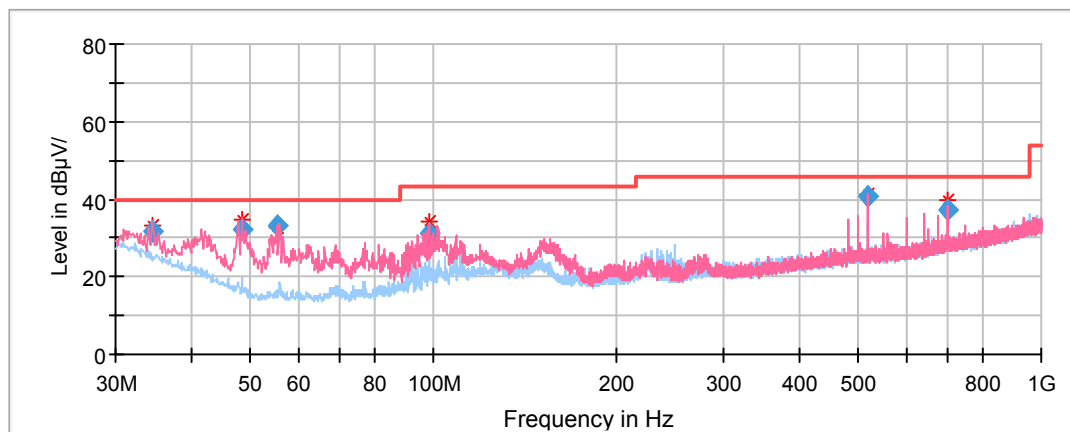
According to the data in the following table, the EUT complied with the FCC Part 15.209 &15.205 & 15.249.

Test Data**Environmental Conditions**

Temperature:	24.2°C
Relative Humidity:	51 %
ATM Pressure:	101.2kPa

The testing was performed by Hope Zhang on 2019-04-17.

Test Mode: Transmitting (Scan with X-Axis, Y-Axis and Z-Axis position, the worst case Z-Axis was recorded)

For Adapter:**30MHz-1G**

Frequency (MHz)	Corrected Amplitude	Rx Antenna		Turntable Degree	Corr. (dB)	Limit (dBμV/m)	Margin (dB)
	QuasiPeak (dB μ V/m)	Height (cm)	Polar (H/V)				
34.615850	31.73	101.0	V	228.0	-7.1	40.00	8.27
48.472300	32.34	101.0	V	218.0	-16.5	40.00	7.66
55.277550	33.20	101.0	V	77.0	-17.7	40.00	6.80
98.469000	31.04	101.0	V	315.0	-15.3	43.50	12.46
519.995550	40.82	101.0	V	8.0	-5.9	46.00	5.18
699.986100	37.39	101.0	V	359.0	-3.1	46.00	8.61

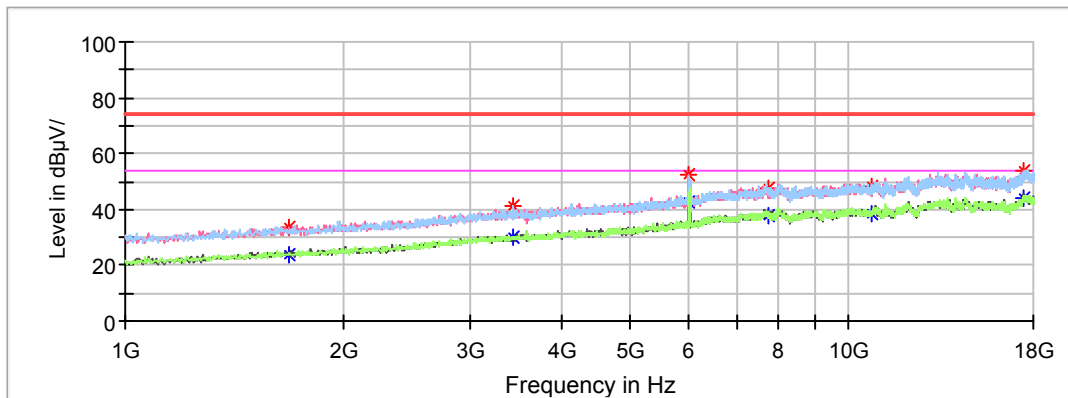
1GHz-18GHz

Note:

- Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected Amplitude
- The other spurious emission which is 20dB to the limit was not recorded.

Channel 1 (24125MHz)

Full Spectrum



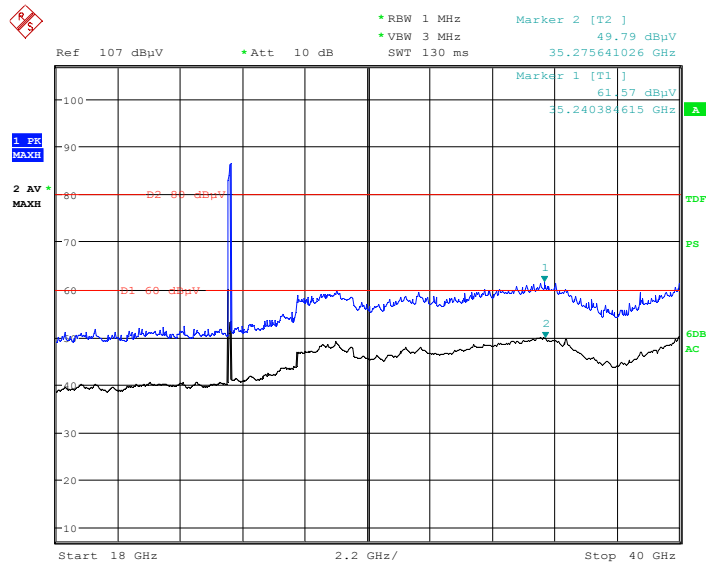
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corr. (dB)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
1683.400000	---	24.02	150.0	V	1.0	-9.3	54.00	29.98
1683.400000	33.56	---	150.0	V	1.0	-9.3	74.00	40.44
3434.400000	---	29.80	150.0	H	121.0	-3.7	54.00	24.20
3434.400000	40.94	---	150.0	H	121.0	-3.7	74.00	33.06
6018.400000	---	42.68	150.0	V	152.0	2.4	54.00	11.32
6018.400000	52.52	---	150.0	V	152.0	2.4	74.00	21.48
7752.400000	---	38.03	150.0	V	121.0	6.6	54.00	15.97
7752.400000	47.48	---	150.0	V	121.0	6.6	74.00	26.52
10730.800000	---	38.74	150.0	V	152.0	9.3	54.00	15.26
10730.800000	48.16	---	150.0	V	152.0	9.3	74.00	25.84
17479.800000	---	44.11	150.0	V	12.0	14.2	54.00	9.89
17479.800000	53.75	---	150.0	V	12.0	14.2	74.00	20.25

18GHz-100GHz:

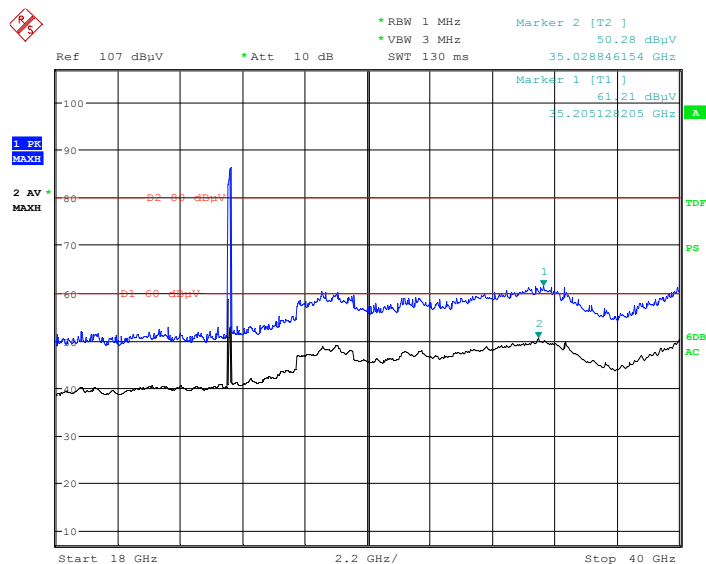
Note:

1. The test distance is 1.5m, the limit for Peak is 74dBuV/m@3m= 80dBuV/m @1.5m, the limit for Average is 54dBuV/m@3m= 60dBuV/m @1.5m

(Pre-scan with low, middle and high channels of operation in the X,Y and Z axes of orientation, the worst case **Z-axis** of orientation was recorded)

Horizontal

Date: 17.APR.2019 18:54:28

Vertical

Date: 17.APR.2019 19:11:08

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corr. (dB)	Limit (dB μ V/m)	Margin (dB)
	MaxPeak (dB μ V /m)	Average (dB μ V /m)	Height (cm)	Polar (H/V)				
48250	---	58.24	123	H	230	32.10	74	15.76
48250	68.26	---	123	H	230	32.10	94	25.74
48250	---	60.24	230	V	110	32.10	74	13.76
48250	69.36	---	230	V	110	32.10	94	24.64
72375	---	47.33	196	H	0	37.52	74	26.67
72375	51.14	---	196	H	0	37.52	94	42.86
72375	50.35	---	190	V	36	37.52	94	43.65
72375	---	48.67	190	V	36	37.52	74	25.33

Note:

Extrapolation factor of 20dB/decade from 3m to 1.5m

Distance extrapolation factor = $20 \log (\text{specific distance [3m]}/\text{test distance [1.5m]})$ dB

Limit line = Specific limits(dB μ V) + distance extrapolation factor (6dB)

Radiation spurious Band edge:

1. This test is performed with a 10dB Attenuator.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
3. Corrected Amplitude = Corrected Factor + Reading
4. Margin = Limit - Corrected. Amplitude

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corr. (dB)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
24125	---	83.65	142	H	205	20.88	114	30.35
24125	87.26	---	142	H	205	20.88	134	46.74
24125	---	82.21	242	V	166	20.88	114	31.79
24125	87.03	---	242	V	166	20.88	134	46.97
24000	---	46.95	106	V	23	20.46	60	13.05
24000	50.96	---	106	V	23	20.46	80	29.04
24250	51.21	---	132	V	45	20.46	80	28.79
24250	---	47.05	132	V	45	20.46	60	12.95

Note:

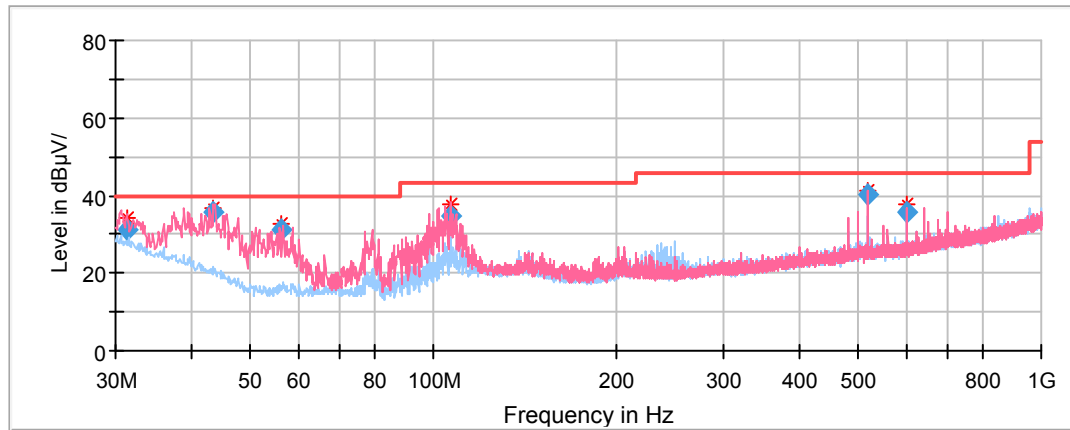
Extrapolation factor of 20dB/decade from 3m to 1.5m

Distance extrapolation factor = $20 \log (\text{specific distance [3m]}/\text{test distance [1.5m]})$ dB

Limit line = Specific limits(dBμV) + distance extrapolation factor (6dB)

For POE:

30MHz-1G



Frequency (MHz)	Corrected Amplitude	Rx Antenna		Turntable Degree	Corr. (dB)	Limit (dBμV/m)	Margin (dB)
	QuasiPeak (dB μ V/m)	Height (cm)	Polar (H/V)				
31.408649	31.38	101.0	V	113.0	-4.9	40.00	8.62
43.511550	35.70	101.0	V	72.0	-13.1	40.00	4.30
56.005050	30.99	101.0	V	87.0	-17.8	40.00	9.01
106.688200	34.89	101.0	V	308.0	-13.6	43.50	8.61
519.996450	40.34	101.0	V	40.0	-5.9	46.00	5.66
599.971350	35.75	101.0	V	318.0	-5.2	46.00	10.25

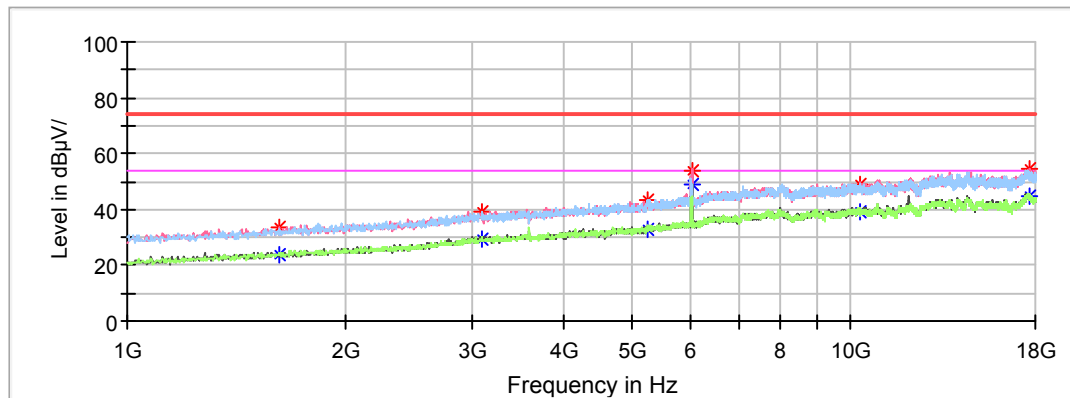
1GHz-18GHz

Note:

- Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude
- The other spurious emission which is 20dB to the limit was not recorded.

Channel 1 (24125MHz)

Full Spectrum



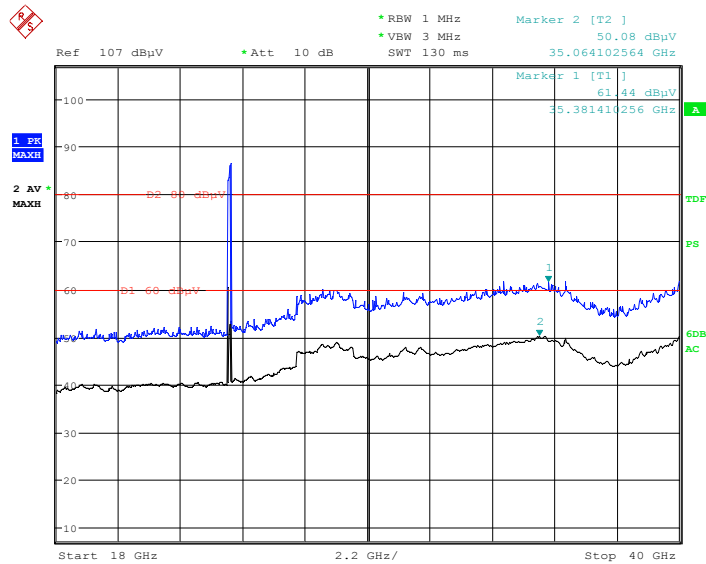
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corr. (dB)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV /m)	Average (dBµV /m)	Height (cm)	Polar (H/V)				
1622.200000	---	24.00	150.0	V	184.0	-9.5	54.00	30.00
1622.200000	33.66	---	150.0	V	184.0	-9.5	74.00	40.34
3101.200000	---	29.12	150.0	H	58.0	-4.2	54.00	24.88
3101.200000	39.12	---	150.0	H	58.0	-4.2	74.00	34.88
5243.200000	---	32.81	150.0	H	0.0	0.5	54.00	21.19
5243.200000	43.52	---	150.0	H	0.0	0.5	74.00	30.48
6035.400000	---	48.76	150.0	V	212.0	2.4	54.00	5.24
6035.400000	53.93	---	150.0	V	212.0	2.4	74.00	20.07
10326.200000	---	39.10	150.0	H	45.0	8.7	54.00	14.90
10326.200000	48.93	---	150.0	H	45.0	8.7	74.00	25.07
17629.400000	---	44.70	150.0	V	41.0	14.1	54.00	9.30
17629.400000	54.37	---	150.0	V	41.0	14.1	74.00	19.63

18GHz-100GHz:

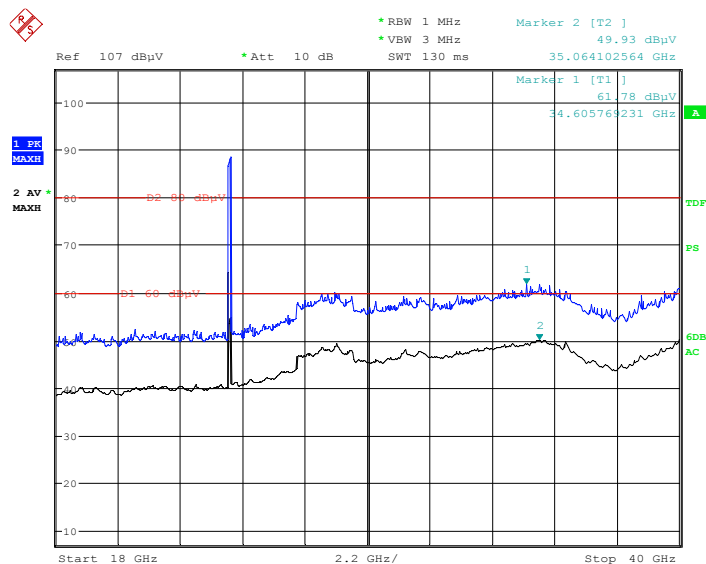
Note:

1. The test distance is 1.5m, the limit for Peak is 74dBuV/m@3m= 80dBuV/m @1.5m, the limit for Average is 54dBuV/m@3m= 60dBuV/m @1.5m

(Pre-scan with low, middle and high channels of operation in the X,Y and Z axes of orientation, the worst case **Z-axis** of orientation was recorded)

Horizontal

Date: 17.APR.2019 19:23:03

Vertical

Date: 17.APR.2019 19:34:00

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corr. (dB)	Limit (dB μ V/m)	Margin (dB)
	MaxPeak (dB μ V /m)	Average (dB μ V /m)	Height (cm)	Polar (H/V)				
48250	---	59.12	219	H	112	32.10	74	14.88
48250	68.33	---	219	H	112	32.10	94	25.67
48250	---	61.06	131	V	101	32.10	74	12.94
48250	68.81	---	131	V	101	32.10	94	25.19
72375	---	47.19	105	H	81	37.52	74	26.81
72375	50.86	---	105	H	81	37.52	94	43.14
72375	50.55	---	167	V	69	37.52	94	43.45
72375	---	48.27	167	V	69	37.52	74	25.73

Note:

Extrapolation factor of 20dB/decade from 3m to 1.5m

Distance extrapolation factor = $20 \log (\text{specific distance [3m]}/\text{test distance [1.5m]})$ dB

Limit line = Specific limits(dB μ V) + distance extrapolation factor (6dB)

Radiation spurious Band edge:

1. This test is performed with a 10dB Attenuator.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
3. Corrected Amplitude = Corrected Factor + Reading
4. Margin = Limit - Corrected. Amplitude

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corr. (dB)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
24125	---	83.24	142	H	205	20.88	114	30.76
24125	87.66	---	142	H	205	20.88	134	46.34
24125	---	81.95	242	V	166	20.88	114	32.05
24125	87.29	---	242	V	166	20.88	134	46.71
24000	---	47.02	116	V	36	20.46	60	12.98
24000	51.11	---	116	V	36	20.46	80	28.89
24250	51.62	---	102	V	197	20.46	80	28.38
24250	---	46.74	102	V	197	20.46	60	13.26

Note:

Extrapolation factor of 20dB/decade from 3m to 1.5m

Distance extrapolation factor = $20 \log (\text{specific distance [3m]}/\text{test distance [1.5m]})$ dB

Limit line = Specific limits(dBμV) + distance extrapolation factor (6dB)

FCC §15.215(c) – 20 dB BANDWIDTH TESTING

Applicable Standard

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Data

Environmental Conditions

Temperature:	24.2°C
Relative Humidity:	51 %
ATM Pressure:	101.2kPa

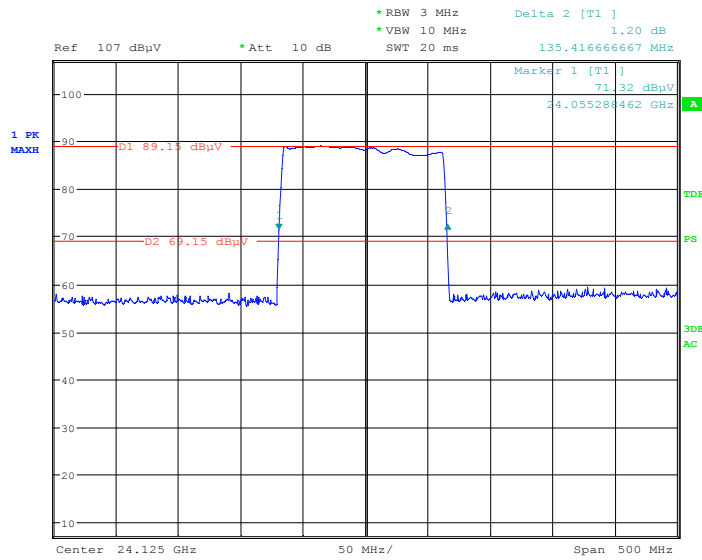
The testing was performed by Hope Zhang on 2019-04-15.

Test Result: Compliant.

Test Mode: Transmitting

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
1	24125	135.42

Channel 1



Date: 15.APR.2019 22:10:37

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