



TEST REPORT

Report No.: DHQA-19JY0205VTSHPB
Test Model: DH-IPC-HDBW2431RP-ZAS-S2;
DH-IPC-HDBW3241RP-ZAS
Received: Jul.02, 2019
ISSUED: Jul.08, 2019

Applicant: ZHEJIANG DAHUA VISION TECHNOLOGY CO.,
LTD.
Address: No.1199, Bin'an Road, Binjiang District, Hangzhou,
P.R. China

Issued By: BUREAU VERITAS ADT (Shanghai) Corporation
Lab Location: No. 829, Xinzhuang Road, Shanghai, P.R.China
(201612)

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1. TEST PROGRAM

PRODUCT: IP CAMERA

TEST MODEL: DH-IPC-HDBW2431RP-ZAS-S2;
DH-IPC-HDBW3241RP-ZAS

SERIES MODEL: Refer to model list

APPLICANT: ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.

TESTED: Jul.02 to Jul.08, 2019

STANDARDS: 47 CFR FCC Part15, Subpart B, Class B
ANSI C63.4:2014

We, BUREAU VERITAS ADT (Shanghai) Corporation, declare that the equipment above has been tested and found compliance with the requirement limits of applicable standards. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate under the standards herein specified.

PREPARED BY : , **DATE:** Jul.08, 2019
Leon Yun
Testing Engineer

APPROVED BY : , **DATE:** Jul.08, 2019
Daniel Sun
Testing Manager





2. Summary of Test Procedure and Test Results

EMISSION (47 CFR FCC Part15, Subpart B)		
Test Item	Normative References	Test Result
Conducted Emission	47 CFR FCC Part15, Subpart B 15.107	Meets the Class B requirements
Radiated Emission	47 CFR FCC Part15, Subpart B 15.109	Meets the Class B requirements

Special Comment: All tests were performed on 120Vac 60Hz.



3. Test Configuration of Equipment under Test

3.1. Manufacturer information

Manufacturer : ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.

Address : No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China

3.2. Feature of Equipment under Test

Product Name:	IP CAMERA
Test Model:	DH-IPC-HDBW2431RP-ZAS-S2; DH-IPC-HDBW3241RP-ZAS
Series Model:	Refer to model list
Model Discrepancy:	All models just have different pixels and model names.
EUT Power Rating:	DC12V/1A; POE(802.3af)

Note: Please refer to user manual.

3.3. Description of support units

NO.	PRODUCT	BRAND	MODEL NO.
1	PC	Lenovo	Thinkpad L470
2	AC adapter	HONOR	ADS-12AM-12 12012EPCN
3	Network Cable	--	--
4	POE injector	TP-LINK	TL-POE150S



3.1. Model List

Test Model: DH-IPC-HDBW2431RP-ZAS-S2

Series Model: DH-IPC-HDBW2431RP-ZAS-S2; DH-IPC-HDBW2431RN-ZAS-S2;
IPC-HDBW2431RP-ZAS-S2; IPC-HDBW2431RN-ZAS-S2;
DH-IPC-HDBW2431R-ZAS-S2; IPC-HDBW2431R-ZAS-S2;
DH-IPC-HDBW2431RP-ZS-S2; DH-IPC-HDBW2431RN-ZS-S2;
IPC-HDBW2431RP-ZS-S2; IPC-HDBW2431RN-ZS-S2; DH-IPC-HDBW2431R-ZS-S2;
IPC-HDBW2431R-ZS-S2; DH-IPC-HDBW2231RP-ZAS-S2;
DH-IPC-HDBW2231RN-ZAS-S2; IPC-HDBW2231RP-ZAS-S2;
IPC-HDBW2231RN-ZAS-S2; DH-IPC-HDBW2231R-ZAS-S2;
IPC-HDBW2231R-ZAS-S2; DH-IPC-HDBW2231RP-ZS-S2;
DH-IPC-HDBW2231RN-ZS-S2; IPC-HDBW2231RP-ZS-S2; IPC-HDBW2231RN-ZS-S2;
DH-IPC-HDBW2231R-ZS-S2; IPC-HDBW2231R-ZS-S2;
DH-IPC-HDBW2531RP-ZAS-S2; DH-IPC-HDBW2531RN-ZAS-S2;
IPC-HDBW2531RP-ZAS-S2; IPC-HDBW2531RN-ZAS-S2;
DH-IPC-HDBW2531R-ZAS-S2; IPC-HDBW2531R-ZAS-S2;
DH-IPC-HDBW2531RP-ZS-S2; DH-IPC-HDBW2531RN-ZS-S2;
IPC-HDBW2531RP-ZS-S2; IPC-HDBW2531RN-ZS-S2; DH-IPC-HDBW2531R-ZS-S2;
IPC-HDBW2531R-ZS-S2; DH-IPC-HDBW2831RP-ZAS-S2;
DH-IPC-HDBW2831RN-ZAS-S2; IPC-HDBW2831RP-ZAS-S2;
IPC-HDBW2831RN-ZAS-S2; DH-IPC-HDBW2831R-ZAS-S2;
IPC-HDBW2831R-ZAS-S2; DH-IPC-HDBW2831RP-ZS-S2;
DH-IPC-HDBW2831RN-ZS-S2; IPC-HDBW2831RP-ZS-S2; IPC-HDBW2831RN-ZS-S2;
DH-IPC-HDBW2831R-ZS-S2; IPC-HDBW2831R-ZS-S2; IPC-HDBW2231R-ZS-27135-S2;
IPC-HDBW2231R-ZS-27135; IPC-HDBW2231R-ZAS-27135-S2;
IPC-HDBW2231R-ZAS-27135; IPC-HDBW2431R-ZS-27135-S2;
IPC-HDBW2431R-ZS-27135; IPC-HDBW2431R-ZAS-27135-S2;
IPC-HDBW2431R-ZAS-27135; IPC-HDBW2531R-ZS-27135-S2;
IPC-HDBW2531R-ZS-27135; IPC-HDBW2531R-ZAS-27135-S2;
IPC-HDBW2531R-ZAS-27135; IPC-HDBW2831R-ZS-27135-S2;
IPC-HDBW2831R-ZS-27135; IPC-HDBW2831R-ZAS-27135-S2;
IPC-HDBW2831R-ZAS-27135; N22AM3Z; N22AM6Z; N42BM3Z; N42BM6Z; N52BMAZ;
N52BM6Z; N82AM3Z; N82AM5Z; DR2431-ZS; DR2531-ZS; DR2831-ZAS;
DH-IPC-HDBW1431RP-ZS-S4; DH-IPC-HDBW1431RN-ZS-S4;
IPC-HDBW1431RP-ZS-S4; IPC-HDBW1431RN-ZS-S4; DH-IPC-HDBW1431R-ZS-S4;
IPC-HDBW1431R-ZS-S4; IPC-CD2C40M-ZS-2812; IPC-CD2C40M-ZS-2812-S2;

Note 1: All models only have model different names.



Test Model: DH-IPC-HDBW3241RP-ZAS

Series Model: DH-IPC-HDBW3241RP-ZS; DH-IPC-HDBW3241RP-ZAS;
DH-IPC-HDBW3241RN-ZS; DH-IPC-HDBW3241RN-ZAS; IPC-HDBW3241RP-ZS;
IPC-HDBW3241RP-ZAS; IPC-HDBW3241RN-ZS; IPC-HDBW3241RN-ZAS;
IPC-HDBW3241R-ZS; IPC-HDBW3241R-ZAS; DH-IPC-HDBW3241R-ZS;
DH-IPC-HDBW3241R-ZAS; DH-IPC-HDBW3441RP-ZS; DH-IPC-HDBW3441RP-ZAS;
DH-IPC-HDBW3441RN-ZS; DH-IPC-HDBW3441RN-ZAS; IPC-HDBW3441RP-ZS;
IPC-HDBW3441RP-ZAS; IPC-HDBW3441RN-ZS; IPC-HDBW3441RN-ZAS;
IPC-HDBW3441R-ZS; IPC-HDBW3441R-ZAS; DH-IPC-HDBW3441R-ZS;
DH-IPC-HDBW3441R-ZAS; DH-IPC-HDBW3541RP-ZS; DH-IPC-HDBW3541RP-ZAS;
DH-IPC-HDBW3541RN-ZS; DH-IPC-HDBW3541RN-ZAS; IPC-HDBW3541RP-ZS;
IPC-HDBW3541RP-ZAS; IPC-HDBW3541RN-ZS; IPC-HDBW3541RN-ZAS;
IPC-HDBW3541R-ZS; IPC-HDBW3541R-ZAS; DH-IPC-HDBW3541R-ZS;
DH-IPC-HDBW3541R-ZAS; DH-IPC-HDBW4231RP-Z-S4; DH-IPC-HDBW4431RP-Z-S4;
DH-IPC-HDBW4231RP-Z-S4-UAE; DH-IPC-HDBW4431RP-Z-S4-UAE; N23AM3Z;
N23AM5Z; N43AM3Z; N43AM5Z; N53AM3Z; N53AM5Z; IPC-HDBW3241R-ZS-27135;
IPC-HDBW3241R-ZAS-27135; IPC-HDBW3441R-ZS-27135;
IPC-HDBW3441R-ZAS-27135; IPC-HDBW3541R-ZS-27135;
IPC-HDBW3541R-ZAS-27135; DH-IPC-HDBW4443R-AS; DH-IPC-HDBW4443R-S;
DH-IPC-HDBW4443DR-AS; DH-IPC-HDBW4443DR-S; IPC-HDBW4443R-AS;
IPC-HDBW4443R-S; IPC-HDBW4443DR-AS; IPC-HDBW4443DR-S;
DH-IPC-HDBW5443R; DH-IPC-HDBW5443R-AS; DH-IPC-HDBW5443DR;
DH-IPC-HDBW5443DR-AS; IPC-HDBW5443R; IPC-HDBW5443R-AS;
IPC-HDBW5443DR; IPC-HDBW5443DR-AS;

Note 2: All series models only have different model names.

Note 3: Two test models have different mother boards.

3.2. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

This listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement		Value
Conducted emissions		2.55 dB
Radiated emissions	30 MHz ~ 1GHz	3.22 dB
	Above 1GHz	2.89 dB



4. Test of Conducted Emission

4.1. Test Limit

TEST STANDARD:

CFR 47 FCC Part 15, Subpart B (Section: 15.107)

FREQUENCY (MHz)	Class A (dB μ V)		Class B (dB μ V)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- NOTES:**
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 0.50 MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



4.4. Measurement Equipment

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	E1R1001	Mar.04, 2020
LISN ROHDE & SCHWARZ	ENV216	E1L1011	Jun.24, 2020
Software ADT	ADT_Cond_V7.3.0	N/A	N/A

4.5. Test Result and Data

4.5.1 Conducted Emission Test Data

DH-IPC-HDBW2431RP-ZAS-S2:

For DC12V port test on AC adapter

Phase : LINE

Location: Conduction 1

Date: 7/4/2019

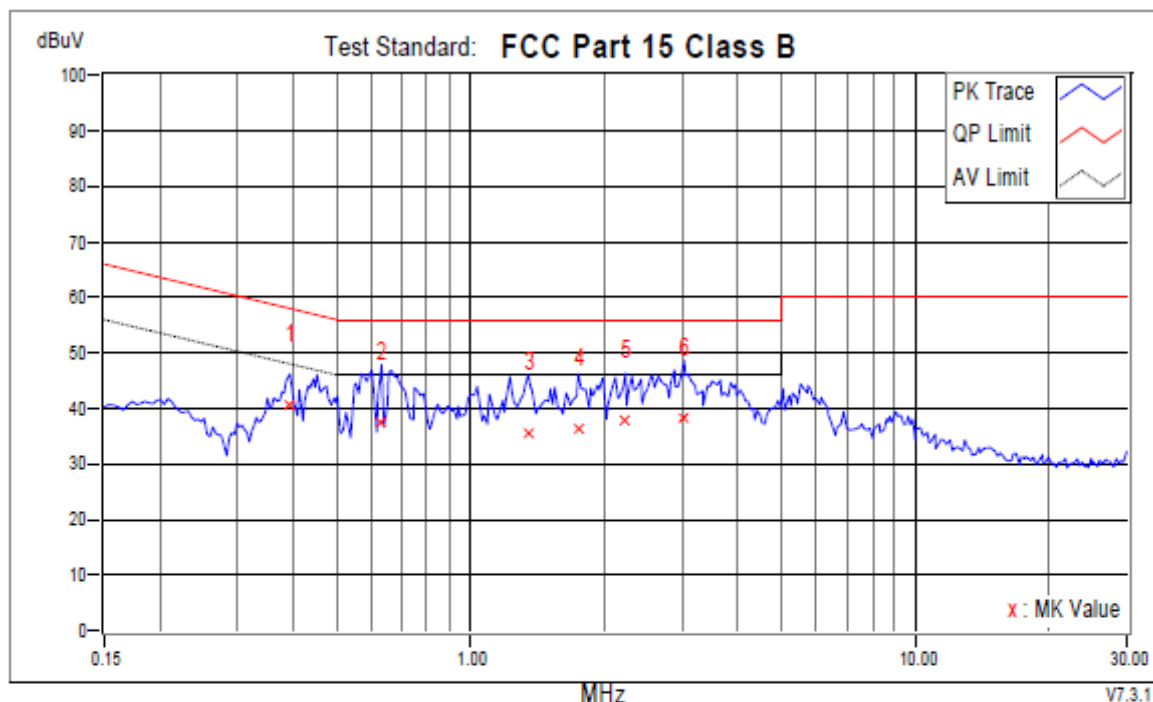
Time: 5:17:34 PM

Phase L1

Temperatuer (C): 22

Humidity (%): 48

Approved by:



	Frequency	Corr. Factor	Reading dBuV		Emission dBuV		Limit dBuV		Margins dB		Notes
No.	MHz	dB	QP	AV	QP	AV	QP	AV	QP	AV	
+1	0.39242	9.73	30.74	15.13	40.47	24.86	58.01	48.01	-17.54	-23.15	
2	0.63093	9.66	28.00	11.30	37.66	20.96	56.00	46.00	-18.34	-25.04	
3	1.34799	9.68	25.90	12.43	35.58	22.11	56.00	46.00	-20.42	-23.89	
4	1.74681	9.74	26.50	13.01	36.24	22.75	56.00	46.00	-19.76	-23.25	
5	2.23165	9.79	27.92	12.77	37.71	22.56	56.00	46.00	-18.29	-23.44	
6	3.02538	9.81	28.64	13.47	38.45	23.28	56.00	46.00	-17.55	-22.72	

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

Location: Conduction 1

Date: 7/4/2019

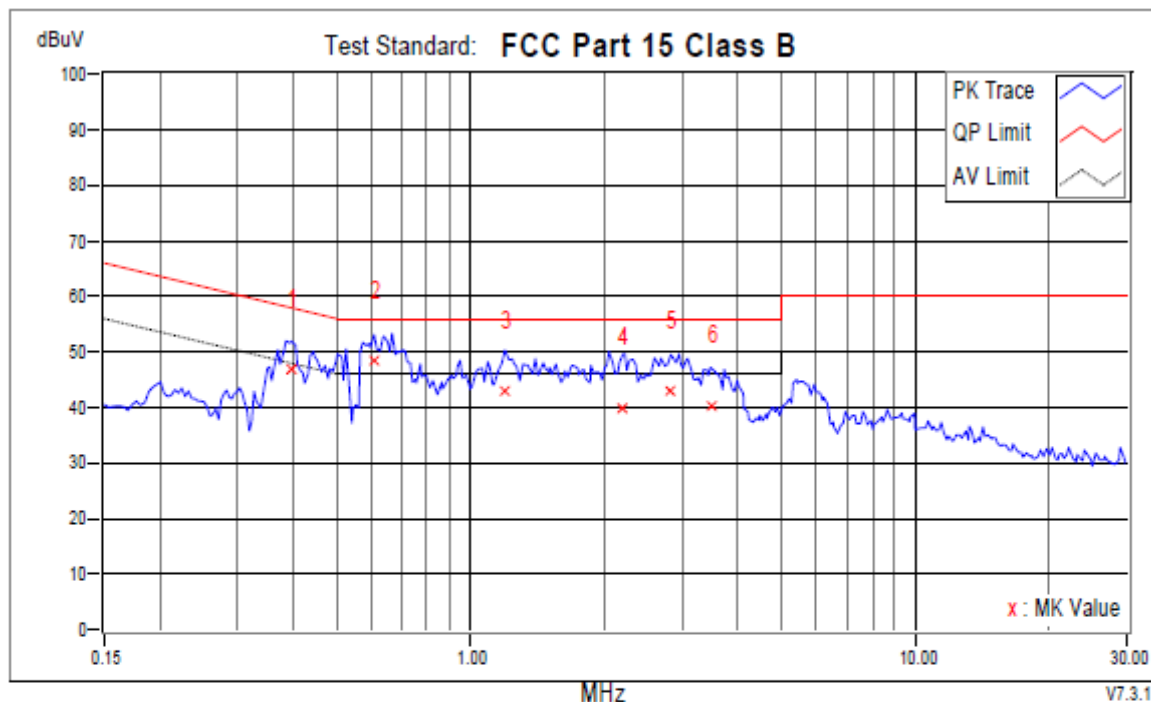
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Phase N

Temperature (C): 22

Humidity (%): 48

Approved by:



No.	Frequency MHz	Corr. Factor dB	Reading dBuV		Emission dBuV		Limit dBuV		Margins dB		Notes
			QP	AV	QP	AV	QP	AV	QP	AV	
1	0.39633	9.88	36.88	26.49	46.76	36.37	57.93	47.93	-11.17	-11.56	
+2	0.60747	9.84	38.54	23.43	48.38	33.27	56.00	46.00	-7.62	-12.73	
3	1.19550	9.92	32.96	22.20	42.88	32.12	56.00	46.00	-13.12	-13.88	
4	2.20428	9.95	30.08	20.22	40.03	30.17	56.00	46.00	-15.97	-15.83	
5	2.82206	9.97	33.16	19.64	43.13	29.61	56.00	46.00	-12.87	-16.39	
6	3.46721	9.87	30.22	17.37	40.09	27.24	56.00	46.00	-15.91	-18.76	

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.

For POE port test on POE adapter

Phase : LINE

Location: Conduction 1

Date: 7/4/2019

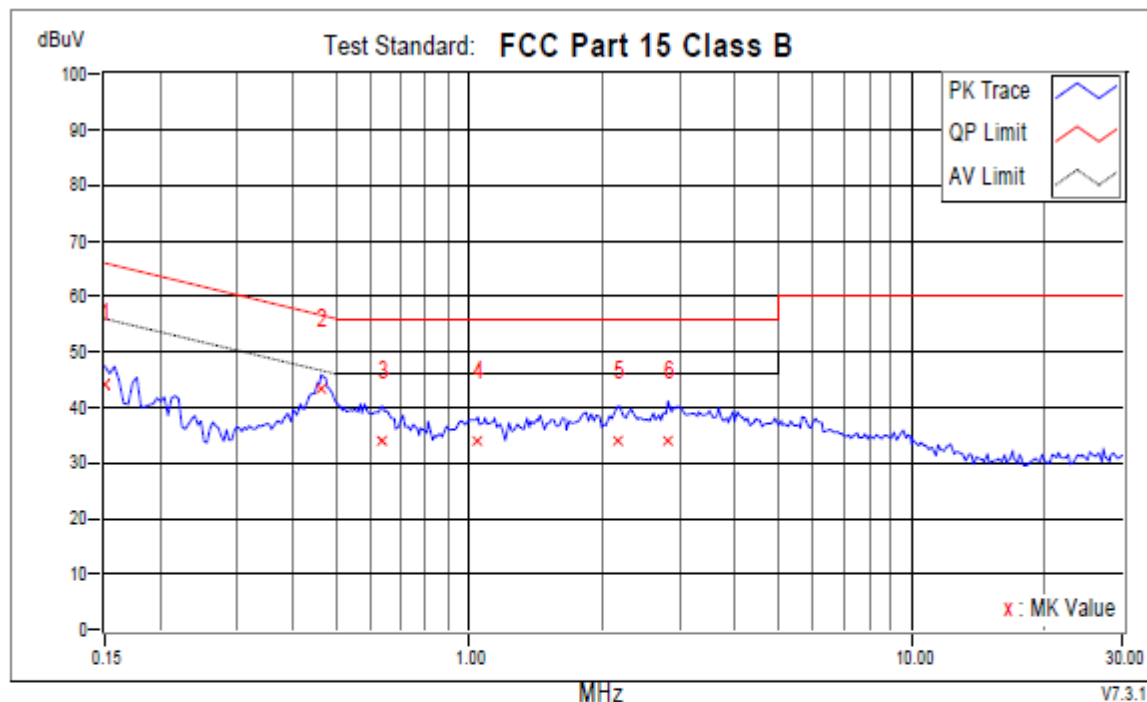
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Phase L1

Temperature (C): 22

Humidity (%): 48

Approved by:



No.	Frequency MHz	Corr. Factor dB	Reading dBuV		Emission dBuV		Limit dBuV		Margins dB		Notes
			QP	AV	QP	AV	QP	AV	QP	AV	
1	0.15000	9.86	34.16	18.44	44.02	28.30	66.00	56.00	-21.98	-27.70	
+2	0.46280	9.74	33.60	26.10	43.34	35.84	56.64	46.64	-13.31	-10.81	
3	0.63484	9.66	24.48	16.29	34.14	25.95	56.00	46.00	-21.86	-20.05	
4	1.04692	9.63	24.48	16.45	34.11	26.08	56.00	46.00	-21.89	-19.92	
5	2.16127	9.78	24.36	16.50	34.14	26.28	56.00	46.00	-21.86	-19.72	
6	2.81424	9.80	24.12	15.72	33.92	25.52	56.00	46.00	-22.08	-20.48	

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

Location: Conduction 1

Date: 7/4/2019

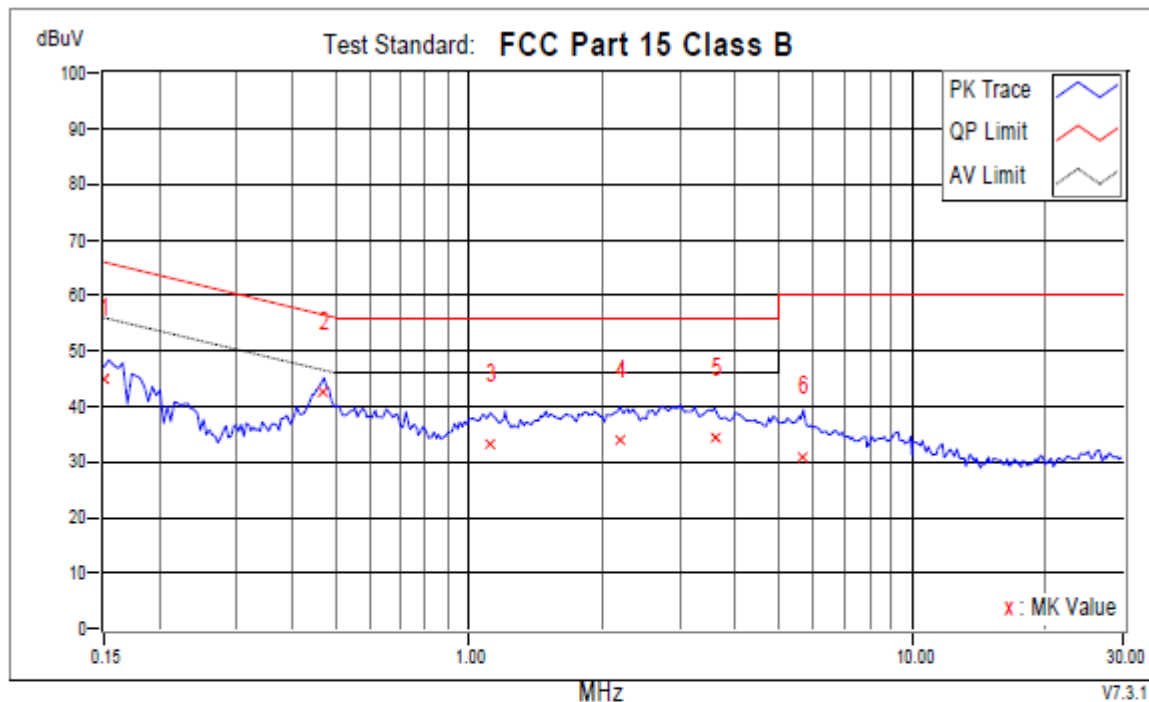
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Phase N

Temperatuer (C): 22

Humidity (%): 48

Approved by:



No.	Frequency MHz	Corr. Factor dB	Reading dBuV		Emission dBuV		Limit dBuV		Margins dB		Notes
			QP	AV	QP	AV	QP	AV	QP	AV	
1	0.15000	9.87	34.94	20.49	44.81	30.36	66.00	56.00	-21.19	-25.64	
+2	0.47062	9.86	32.54	25.44	42.40	35.30	56.50	46.50	-14.10	-11.20	
3	1.11730	9.92	23.46	14.13	33.38	24.05	56.00	46.00	-22.62	-21.95	
4	2.19255	9.95	24.14	15.43	34.09	25.38	56.00	46.00	-21.91	-20.62	
5	3.58451	9.85	24.48	15.37	34.33	25.22	56.00	46.00	-21.67	-20.78	
6	5.68027	9.66	21.32	13.17	30.98	22.83	60.00	50.00	-29.02	-27.17	

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.

DH-IPC-HDBW3241RP-ZAS

For DC12V port test on AC adapter

Phase : LINE

Location: Conduction 1

Date: 7/5/2019

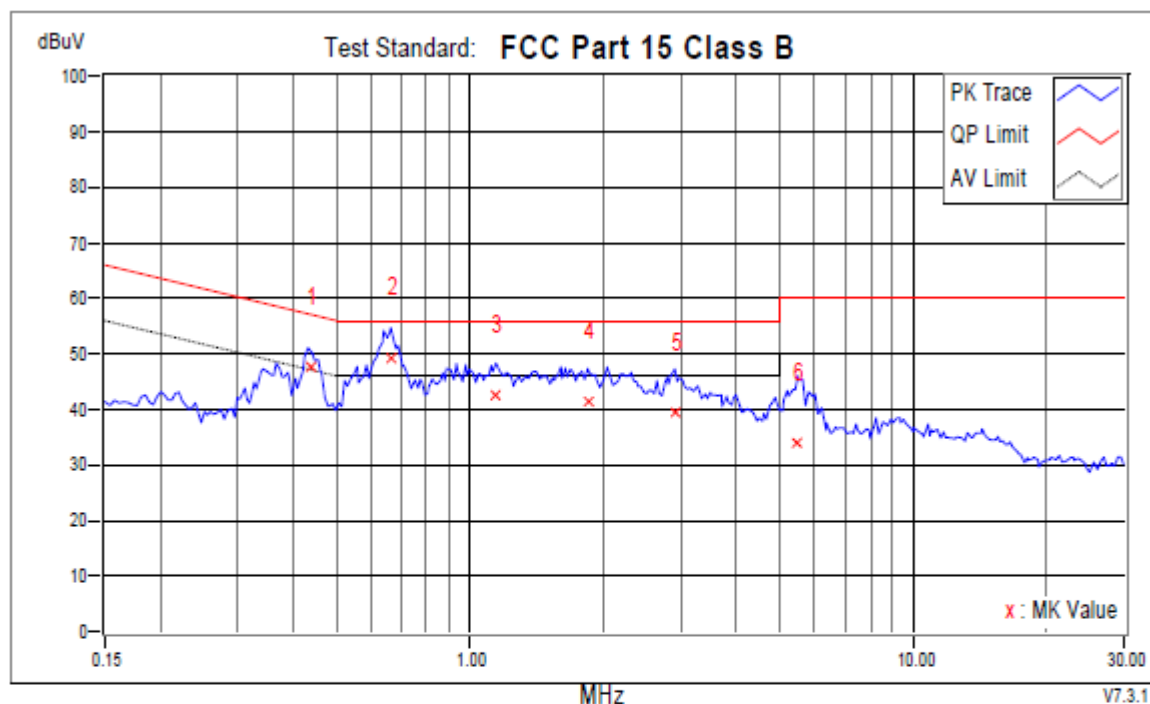
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Phase L1

Temperatuer (C): 22

Humidity (%): 48

Approved by:



No.	Frequency MHz	Corr. Factor dB	Reading dBuV		Emission dBuV		Limit dBuV		Margins dB		Notes
			QP	AV	QP	AV	QP	AV	QP	AV	
1	0.43934	9.73	37.80	29.47	47.53	39.20	57.07	47.07	-9.54	-7.87	
+2	0.66221	9.64	39.58	26.77	49.22	36.41	56.00	46.00	-6.78	-9.59	
3	1.14467	9.64	32.88	22.46	42.52	32.10	56.00	46.00	-13.48	-13.90	
4	1.84456	9.76	31.70	21.86	41.46	31.62	56.00	46.00	-14.54	-14.38	
5	2.90026	9.81	29.46	18.54	39.27	28.35	56.00	46.00	-16.73	-17.65	
6	5.49650	9.87	24.20	15.06	34.07	24.93	60.00	50.00	-25.93	-25.07	

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

Location: Conduction 1

Date: 7/5/2019

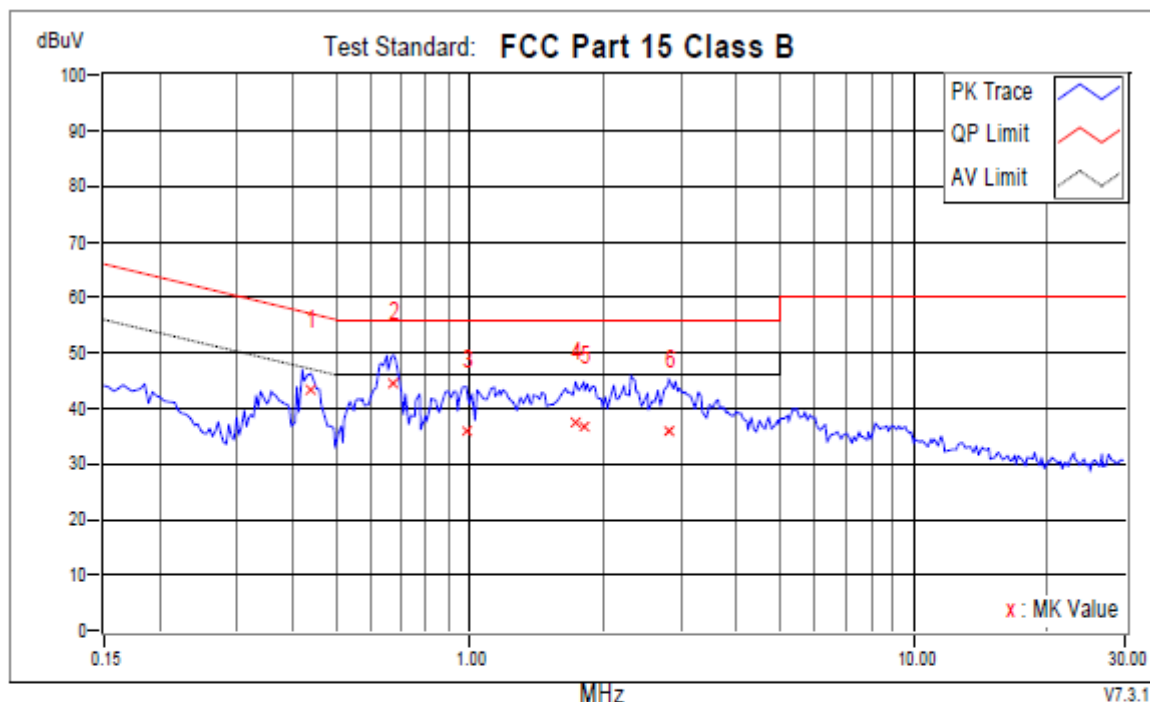
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Phase N

Temperature (C): 22

Humidity (%): 48

Approved by:



No.	Frequency	Corr. Factor	Reading dBuV		Emission dBuV		Limit dBuV		Margins dB		Notes
	MHz	dB	QP	AV	QP	AV	QP	AV	QP	AV	
1	0.43543	9.87	33.66	20.23	43.53	30.10	57.15	47.15	-13.62	-17.05	
+2	0.67394	9.83	34.70	19.26	44.53	29.09	56.00	46.00	-11.47	-16.91	
3	0.98283	9.92	25.94	12.35	35.86	22.27	56.00	46.00	-20.14	-23.73	
4	1.73117	9.93	27.48	14.80	37.41	24.73	56.00	46.00	-18.59	-21.27	
5	1.80937	9.94	26.88	14.61	36.82	24.55	56.00	46.00	-19.18	-21.45	
6	2.80642	9.97	26.14	13.32	36.11	23.29	56.00	46.00	-19.89	-22.71	

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.

For POE port test on POE adapter

Phase : LINE

Location: Conduction 1

Date: 7/5/2019

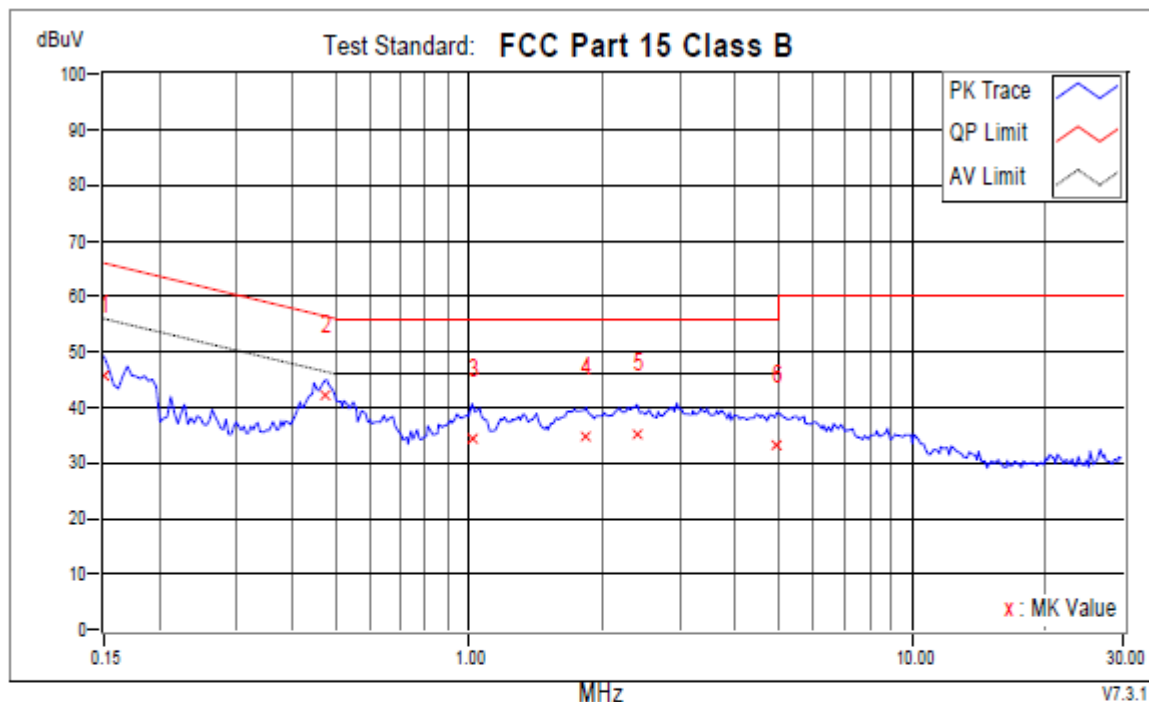
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Phase L1

Temperature (C): 22

Humidity (%): 48

Approved by:



No.	Frequency MHz	Corr. Factor dB	Reading dBuV		Emission dBuV		Limit dBuV		Margins dB		Notes
			QP	AV	QP	AV	QP	AV	QP	AV	
1	0.15000	9.86	35.72	20.74	45.58	30.60	66.00	56.00	-20.42	-25.40	
+2	0.47453	9.74	32.56	25.36	42.30	35.10	56.43	46.43	-14.14	-11.34	
3	1.01564	9.62	24.86	15.61	34.48	25.23	56.00	46.00	-21.52	-20.77	
4	1.83674	9.75	25.20	14.54	34.95	24.29	56.00	46.00	-21.05	-21.71	
5	2.39587	9.79	25.20	17.46	34.99	27.25	56.00	46.00	-21.01	-18.75	
6	4.95692	9.86	23.26	14.87	33.12	24.73	56.00	46.00	-22.88	-21.27	

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

Location: Conduction 1

Date: 7/5/2019

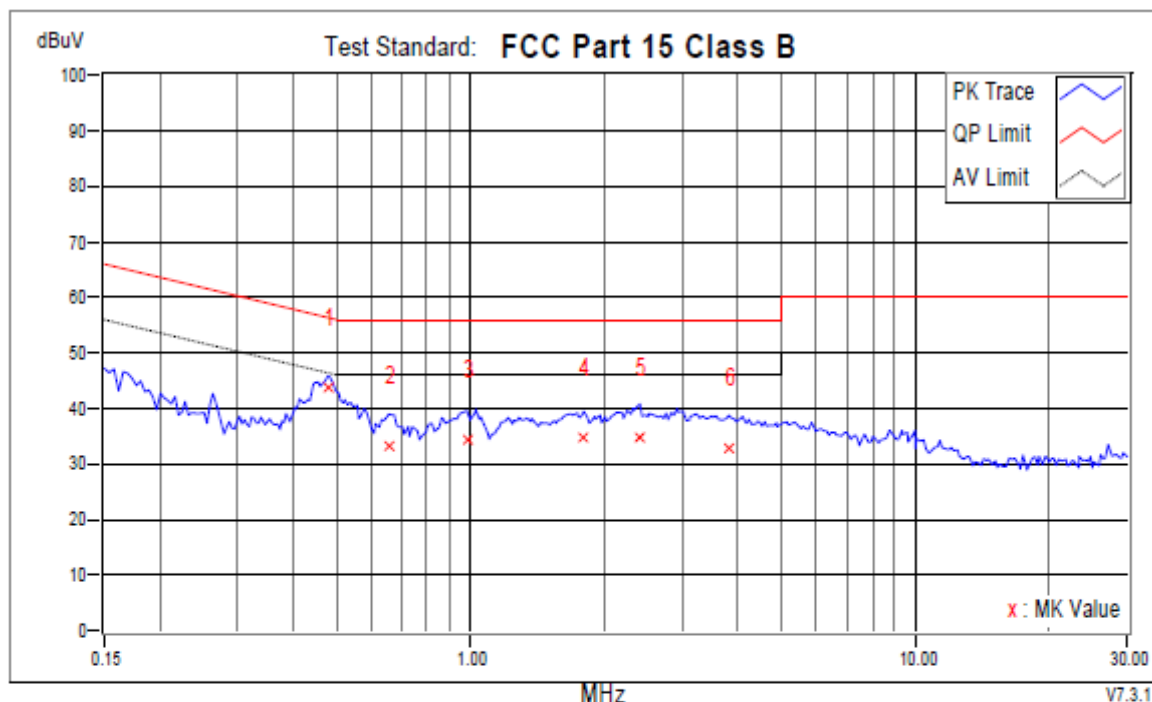
Time: 2:26:50 PM

Phase N

Temperatuer (C): 22

Humidity (%): 48

Approved by:



No.	Frequency MHz	Corr. Factor dB	Reading dBuV		Emission dBuV		Limit dBuV		Margins dB		Notes
			QP	AV	QP	AV	QP	AV	QP	AV	
+1	0.47844	9.86	33.88	26.44	43.74	36.30	56.37	46.37	-12.62	-10.06	
2	0.65439	9.84	23.34	16.34	33.18	26.18	56.00	46.00	-22.82	-19.82	
3	0.98283	9.92	24.46	16.66	34.38	26.58	56.00	46.00	-21.62	-19.42	
4	1.79764	9.94	24.84	14.99	34.78	24.93	56.00	46.00	-21.22	-21.07	
5	2.40369	9.96	24.96	17.27	34.92	27.23	56.00	46.00	-21.08	-18.77	
6	3.81520	9.79	23.08	14.13	32.87	23.92	56.00	46.00	-23.13	-22.08	

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.

4.6. Test Photographs

DH-IPC-HDBW2431RP-ZAS-S2



DH-IPC-HDBW3241RP-ZAS







5. Test of Radiated Emission

5.1. Test Limit

TEST STANDARD:

CFR 47 FCC Part 15, Subpart B (Section: 15.109)

FOR FREQUENCY BELOW 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 – 88	90	39.1	100	40.0
88 – 216	150	43.5	150	43.5
216 – 960	210	46.4	200	46.0
960 – 1000	300	49.5	500	54.0

FOR FREQUENCY ABOVE 1000 MHz

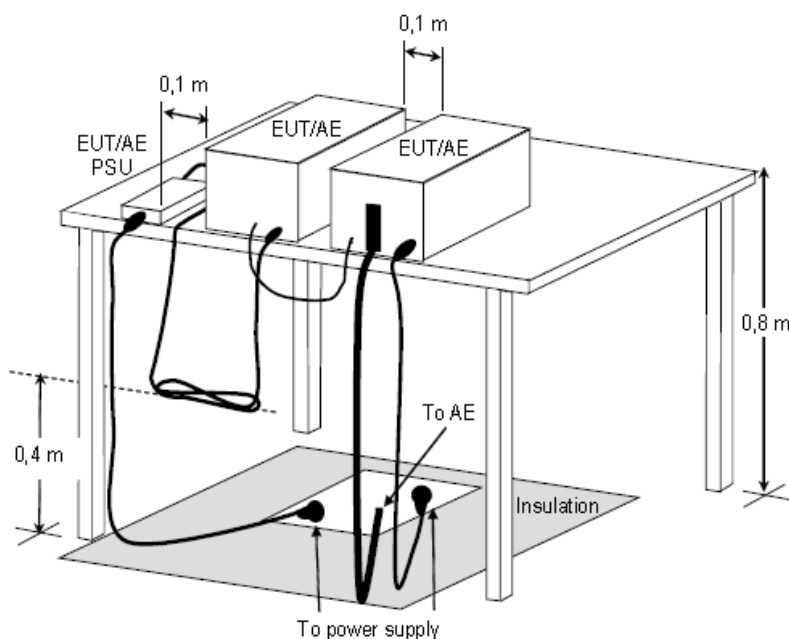
FREQUENCY (MHz)	Class A ($\text{dB}\mu\text{V/m}$) (at 3m)		Class B ($\text{dB}\mu\text{V/m}$) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0

- Note:** (1) The lower limit shall apply at the transition frequencies.
 (2) Emission level ($\text{dB}\mu\text{V/m}$) = $20 \log$ Emission level ($\mu\text{V/m}$).
 (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

5.2. Test Procedures

- The EUT was placed on a rotatable table top 0.8 meter above ground.
- The EUT was set 3/10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

5.3. Typical Test Setup



**Figure D.8 – Example measurement arrangement for table-top EUT
(Radiated emission measurement)**



5.4. Measurement Equipment

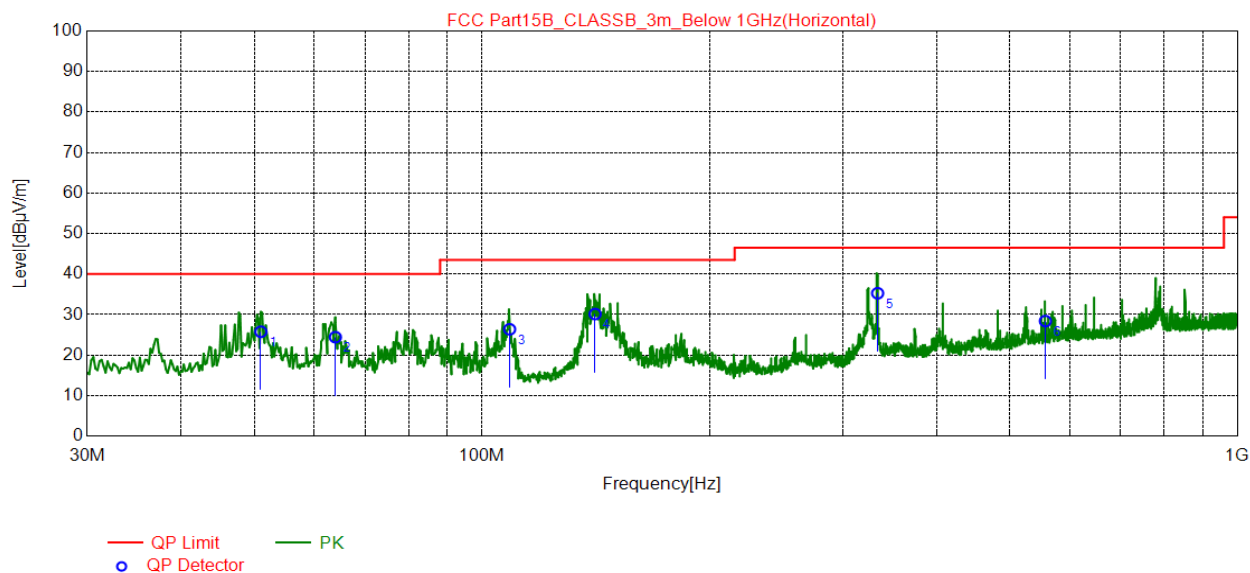
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
EMI Test Spectrum ROHDE & SCHWARZ	ESR7	E1R1005	Dec.03, 2019
Spectrum Analyzer Keysight	N9030B	E1S1003	Jun.24, 2020
Broad-Band Antenna Schwarzbeck	VULB9168	E1A1001	Jan.26, 2020
Double Riaged Vroadband Horn Antenna Schwarzbeck	BBHA9120D	E1A101M7	Jan.26, 2020
Preamplifier Agilent	8447D	E1A2001	Jun.24, 2020
Preamplifier Agilent	EMC051845SE	E1A2009	May.20, 2020

5.5. Test Result and Data (30MHz ~ 1GHz)

DH-IPC-HDBW2431RP-ZAS-S2:

For DC12V port test on AC adapter

Position: Horizontal

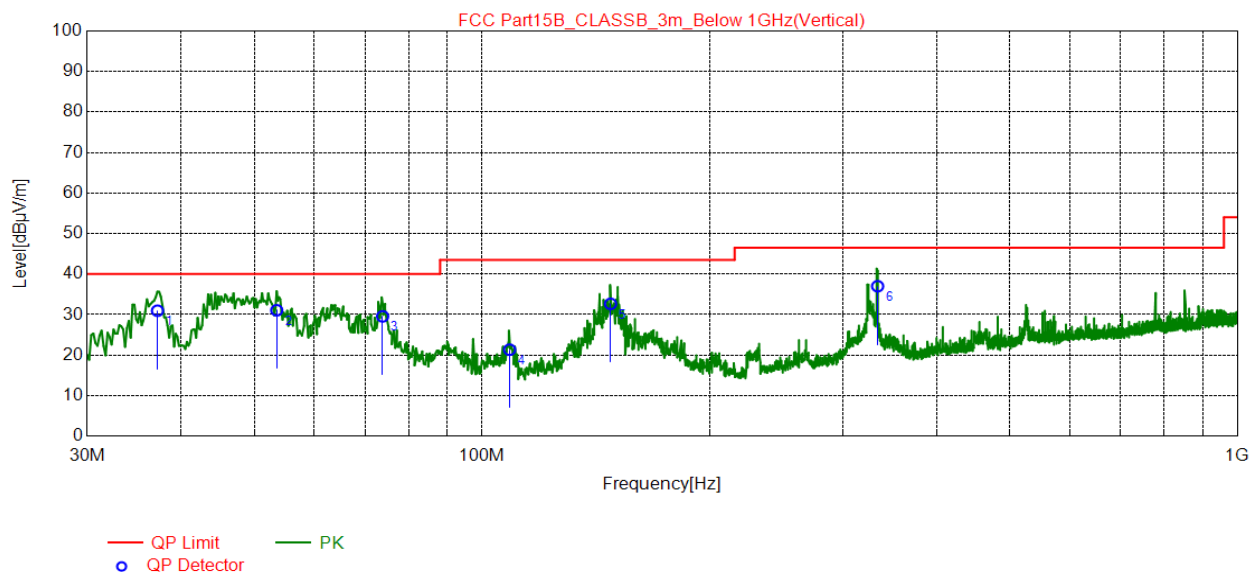


NO.	Freq. [MHz]	QP Reading [dB μ V/m]	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	50.95	36.09	-10.32	25.77	40.00	14.23	100	343	Horizontal
2	63.95	35.5	-11.07	24.43	40.00	15.57	100	343	Horizontal
3	108.7	40.57	-14.20	26.37	43.50	17.13	200	184	Horizontal
4	141.1	40.89	-10.75	30.14	43.50	13.36	200	149	Horizontal
5	333.9	43.91	-8.64	35.27	46.50	11.23	100	274	Horizontal
6	556.9	32.2	-3.80	28.40	46.50	18.10	200	300	Horizontal

REMARKS:

1. Q.P. is abbreviation of quasi-peak individually.
2. The emission levels of other frequencies were very low against the limit.
3. QP Margin value = QP Limit value – QP value
4. Factor = Antenna Factor + Amplifier Factor + Cable loss
5. QP value = Factor + Reading Value.

Position: Vertical



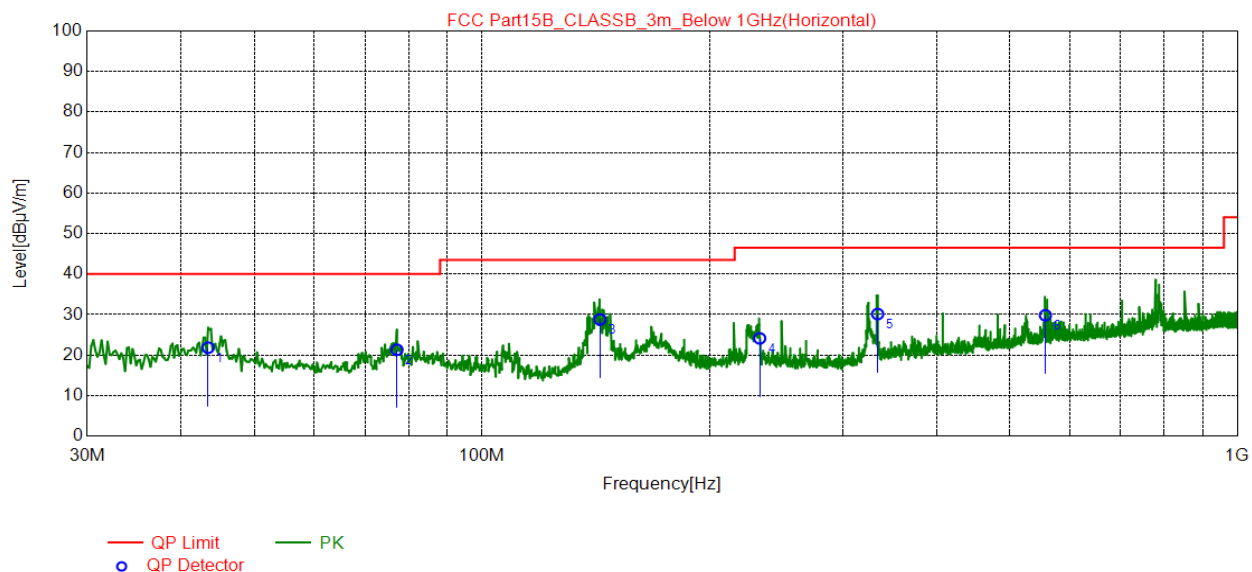
NO.	Freq. [MHz]	QP Reading [dB μ V/m]	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	37.17	42.31	-11.35	30.96	40.00	9.04	100	182	Vertical
2	53.47	41.42	-10.35	31.07	40.00	8.93	100	226	Vertical
3	73.84	42.59	-13.02	29.57	40.00	10.43	100	126	Vertical
4	108.7	35.53	-14.20	21.33	43.50	22.17	100	81	Vertical
5	147.9	43.25	-10.60	32.65	43.50	10.85	100	185	Vertical
6	333.9	45.64	-8.64	37.00	46.50	9.50	200	344	Vertical

REMARKS:

1. Q.P. is abbreviation of quasi-peak individually.
2. The emission levels of other frequencies were very low against the limit.
3. QP Margin value = QP Limit value – QP value
4. Factor = Antenna Factor + Amplifier Factor + Cable loss
5. QP value = Factor + Reading Value.

For POE port test on POE adapter

Position: Horizontal

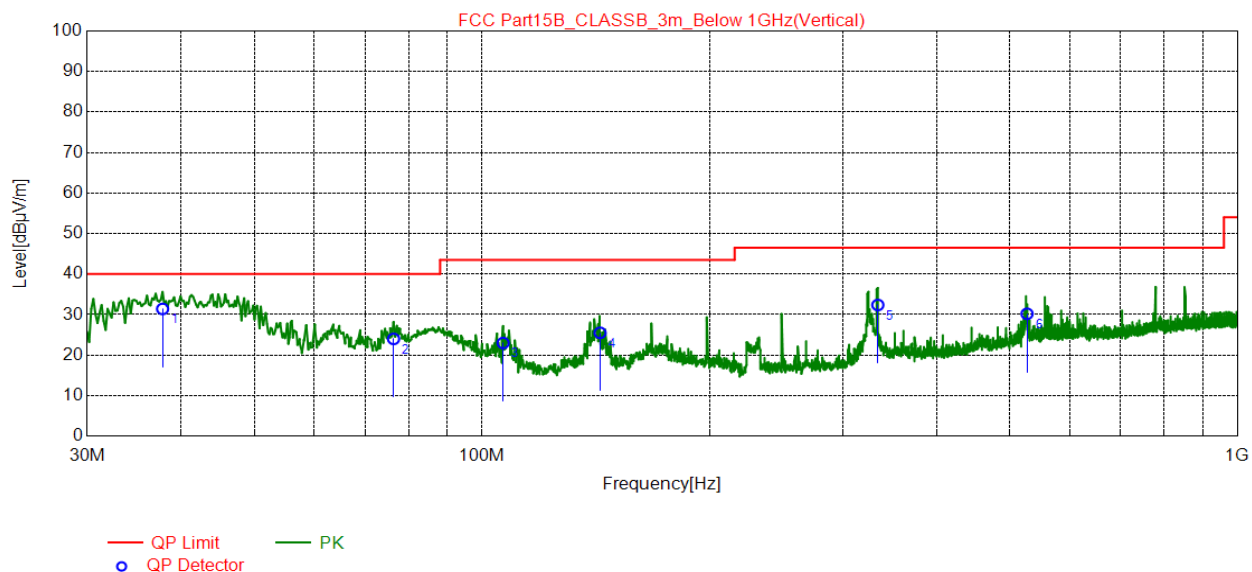


NO.	Freq. [MHz]	QP Reading [dB μ V/m]	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	43.38	32.62	-10.80	21.82	40.00	18.18	100	88	Horizontal
2	77.14	35.22	-13.90	21.32	40.00	18.68	200	143	Horizontal
3	143.2	39.5	-10.70	28.80	43.50	14.70	200	121	Horizontal
4	233.1	36.26	-12.13	24.13	46.50	22.37	100	75	Horizontal
5	333.9	38.78	-8.64	30.14	46.50	16.36	100	242	Horizontal
6	556.9	33.62	-3.80	29.82	46.50	16.68	100	75	Horizontal

REMARKS:

1. Q.P. is abbreviation of quasi-peak individually.
2. The emission levels of other frequencies were very low against the limit.
3. QP Margin value = QP Limit value – QP value
4. Factor = Antenna Factor + Amplifier Factor + Cable loss
5. QP value = Factor + Reading Value.

Position: Vertical



NO.	Freq. [MHz]	QP Reading [dB μ V/m]	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	37.76	42.69	-11.29	31.40	40.00	8.60	100	132	Vertical
2	76.36	37.69	-13.69	24.00	40.00	16.00	100	145	Vertical
3	106.6	37.37	-14.38	22.99	43.50	20.51	100	82	Vertical
4	143.2	36.21	-10.70	25.51	43.50	17.99	100	170	Vertical
5	334.1	41.02	-8.64	32.38	46.50	14.12	200	209	Vertical
6	526.6	34.61	-4.41	30.20	46.50	16.30	100	198	Vertical

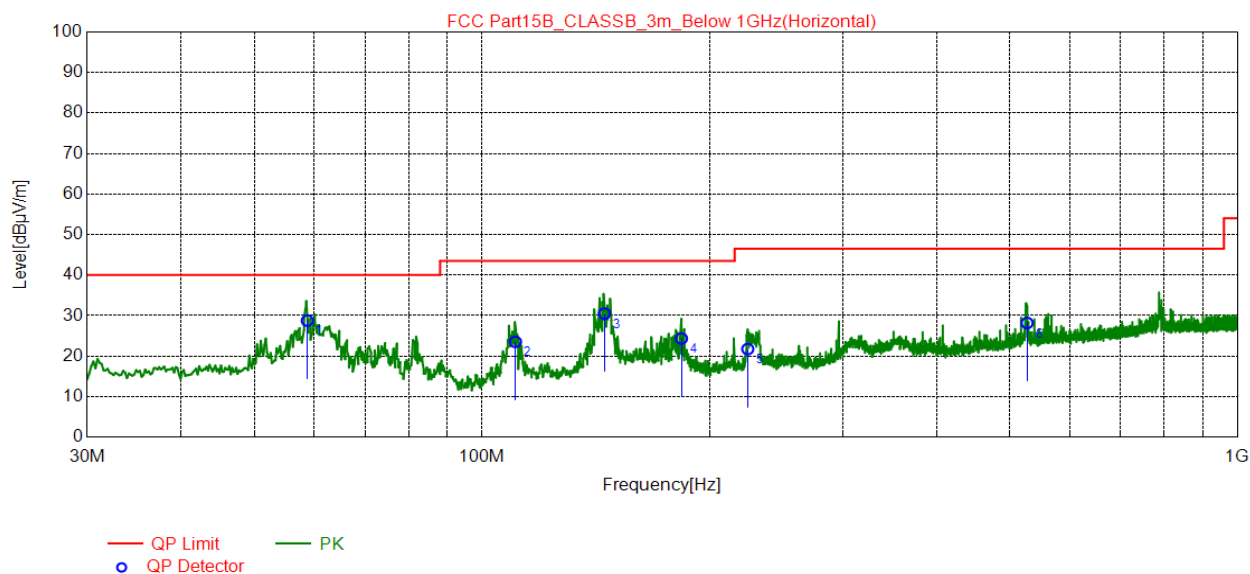
REMARKS:

1. Q.P. is abbreviation of quasi-peak individually.
2. The emission levels of other frequencies were very low against the limit.
3. QP Margin value = QP Limit value – QP value
4. Factor = Antenna Factor + Amplifier Factor + Cable loss
5. QP value = Factor + Reading Value.

DH-IPC-HDBW3241RP-ZAS:

For DC12V port test on AC adapter

Position: Horizontal

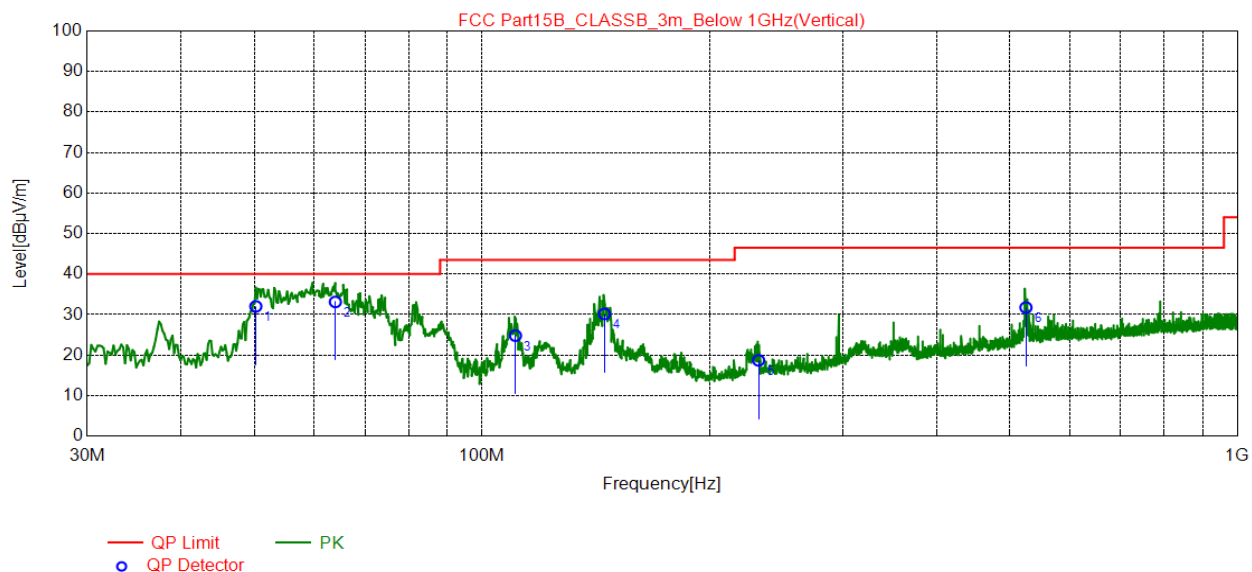


NO.	Freq. [MHz]	QP Reading [dB μ V/m]	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	58.71	39.19	-10.43	28.76	40.00	11.24	200	67	Horizontal
2	110.7	37.56	-14.03	23.53	43.50	19.97	200	180	Horizontal
3	145.2	41.16	-10.66	30.50	43.50	13.00	200	42	Horizontal
4	183.6	36.34	-12.00	24.34	43.50	19.16	200	208	Horizontal
5	224.7	34.66	-12.92	21.74	46.50	24.76	100	99	Horizontal
6	526.8	32.59	-4.40	28.19	46.50	18.31	200	117	Horizontal

REMARKS:

1. Q.P. is abbreviation of quasi-peak individually.
2. The emission levels of other frequencies were very low against the limit.
3. QP Margin value = QP Limit value – QP value
4. Factor = Antenna Factor + Amplifier Factor + Cable loss
5. QP value = Factor + Reading Value.

Position: Vertical



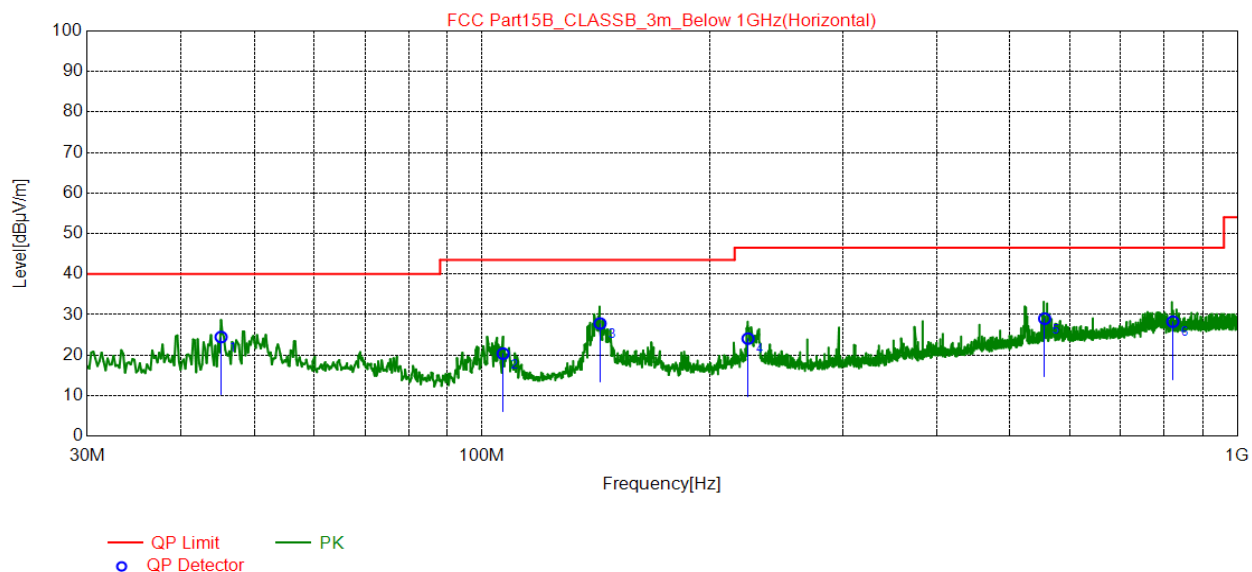
NO.	Freq. [MHz]	QP Reading [dB μ V/m]	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	50.17	42.33	-10.30	32.03	40.00	7.97	100	118	Vertical
2	63.95	44.19	-11.07	33.12	40.00	6.88	100	286	Vertical
3	110.7	38.84	-14.03	24.81	43.50	18.69	100	214	Vertical
4	145.2	40.82	-10.66	30.16	43.50	13.34	100	171	Vertical
5	232.3	30.9	-12.20	18.70	46.50	27.80	200	36	Vertical
6	524.8	36.18	-4.44	31.74	46.50	14.76	100	30	Vertical

REMARKS:

1. Q.P. is abbreviation of quasi-peak individually.
2. The emission levels of other frequencies were very low against the limit.
3. QP Margin value = QP Limit value – QP value
4. Factor = Antenna Factor + Amplifier Factor + Cable loss
5. QP value = Factor + Reading Value.

For POE port test on POE adapter

Position: Horizontal

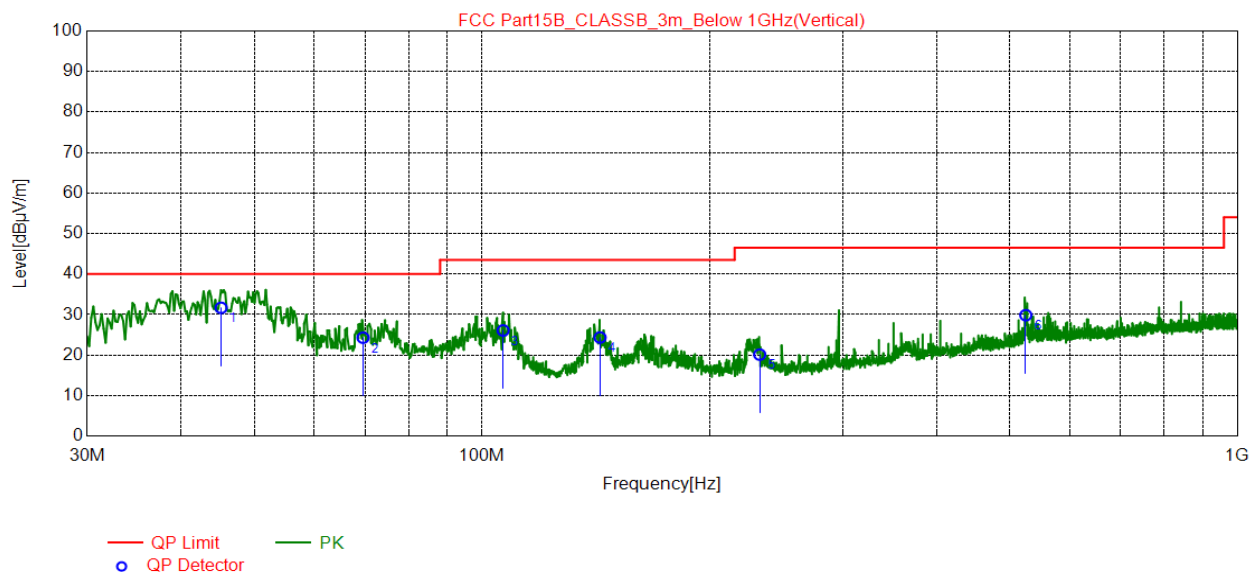


NO.	Freq. [MHz]	QP Reading [dB μ V/m]	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	45.13	35.13	-10.67	24.46	40.00	15.54	100	343	Horizontal
2	106.6	34.73	-14.38	20.35	43.50	23.15	200	215	Horizontal
3	143.2	38.5	-10.70	27.80	43.50	15.70	200	180	Horizontal
4	224.9	36.96	-12.90	24.06	46.50	22.44	100	113	Horizontal
5	555.7	32.81	-3.82	28.99	46.50	17.51	100	276	Horizontal
6	821.5	28.43	-0.18	28.25	46.50	18.25	100	78	Horizontal

REMARKS:

1. Q.P. is abbreviation of quasi-peak individually.
2. The emission levels of other frequencies were very low against the limit.
3. QP Margin value = QP Limit value – QP value
4. Factor = Antenna Factor + Amplifier Factor + Cable loss
5. QP value = Factor + Reading Value.

Position: Vertical



NO.	Freq. [MHz]	QP Reading [dB μ V/m]	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	45.13	42.34	-10.67	31.67	40.00	8.33	100	196	Vertical
2	69.57	36.23	-11.94	24.29	40.00	15.71	100	246	Vertical
3	106.6	40.46	-14.38	26.08	43.50	17.42	100	67	Vertical
4	143.2	35.05	-10.70	24.35	43.50	19.15	100	174	Vertical
5	233.1	32.26	-12.13	20.13	46.50	26.37	200	20	Vertical
6	524.7	34.31	-4.45	29.86	46.50	16.64	100	33	Vertical

REMARKS:

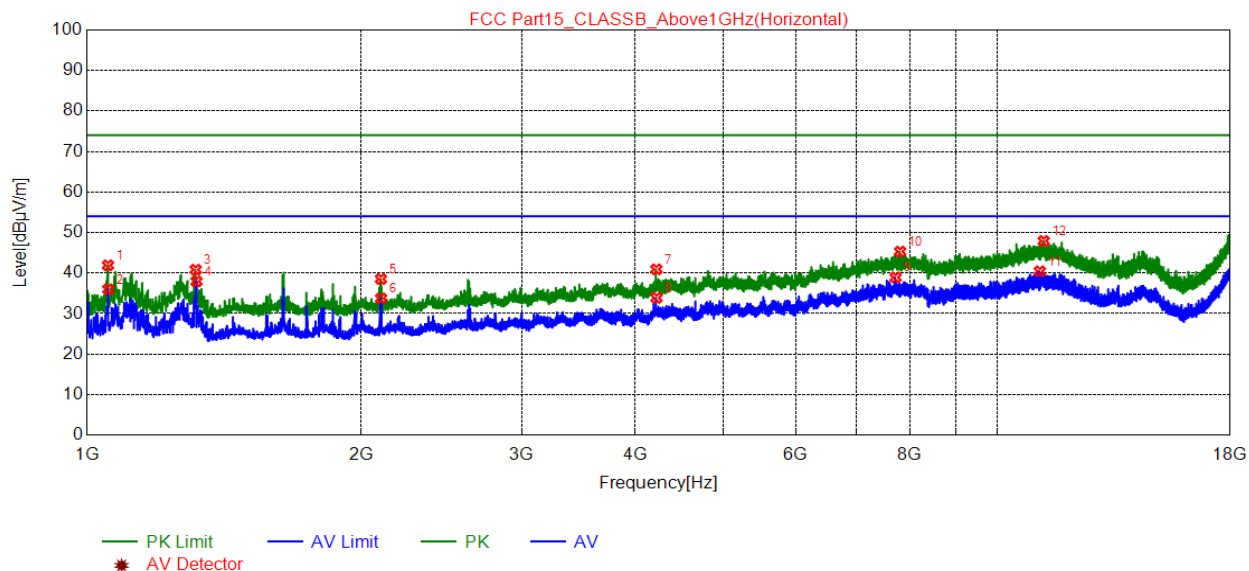
1. Q.P. is abbreviation of quasi-peak individually.
2. The emission levels of other frequencies were very low against the limit.
3. QP Margin value = QP Limit value – QP value
4. Factor = Antenna Factor + Amplifier Factor + Cable loss
5. QP value = Factor + Reading Value.

5.6. Test Result and Data (1GHz ~ 18GHz)

DH-IPC-HDBW2431RP-ZAS-S2:

For DC12V port test on AC adapter

Position: Horizontal

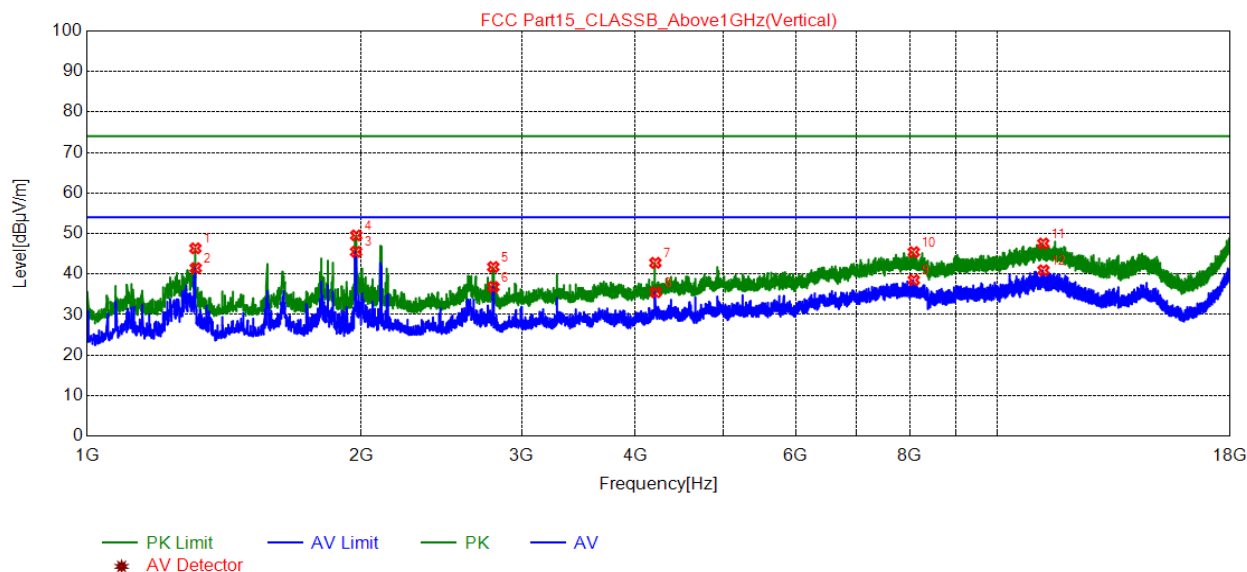


NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Detector
1	1054.4000	61.23	41.92	74.00	32.08	100	299	Horizontal	PK
2	1055.2500	55.32	36.01	54.00	17.99	100	299	Horizontal	AV
3	1316.2000	59.32	40.84	74.00	33.16	100	111	Horizontal	PK
4	1318.7500	56.42	37.95	54.00	16.05	100	330	Horizontal	AV
5	2102.4500	55.11	38.54	74.00	35.46	100	236	Horizontal	PK
6	2103.3000	50.32	33.75	54.00	20.25	100	236	Horizontal	AV
7	4218.9500	51.99	40.93	74.00	33.07	100	111	Horizontal	PK
8	4219.8000	44.92	33.87	54.00	20.13	100	111	Horizontal	AV
9	7723.5000	42.33	38.92	54.00	15.08	100	268	Horizontal	AV
10	7811.9000	48.54	45.30	74.00	28.70	100	142	Horizontal	PK
11	11121.8000	38.89	40.45	54.00	13.55	100	174	Horizontal	AV
12	11232.3000	46.26	47.92	74.00	26.08	100	299	Horizontal	PK

REMARKS:

1. The emission levels of other frequencies were very low against the limit.
2. Margin = Limit – Level

Position: Vertical



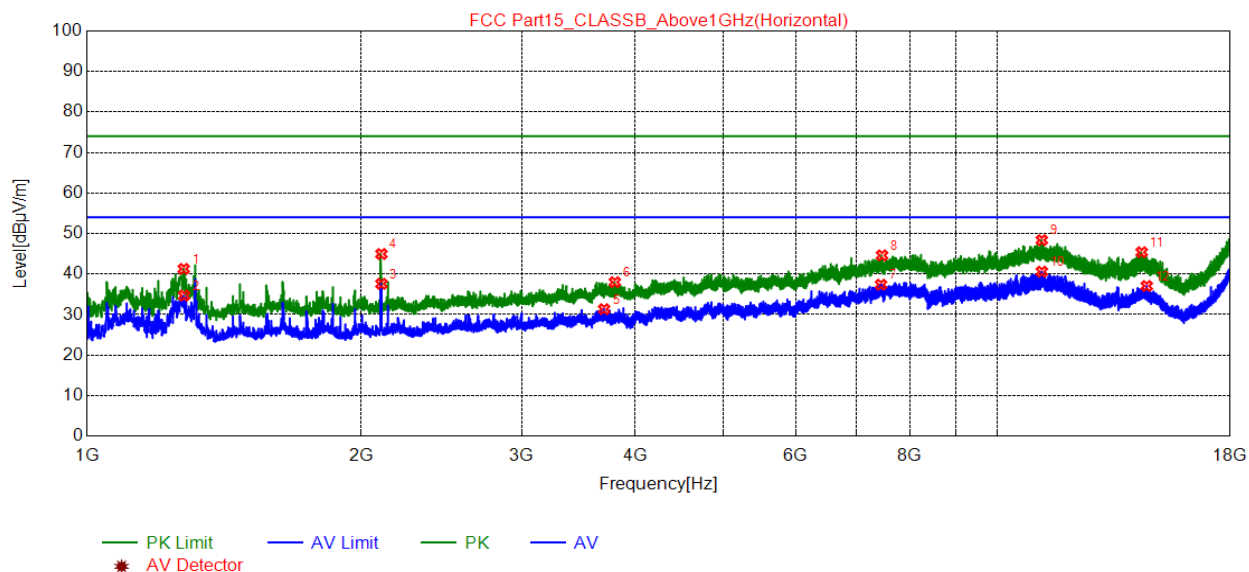
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Detector
1	1315.3500	64.83	46.35	74.00	27.65	100	312	Vertical	PK
2	1316.2000	59.96	41.48	54.00	12.52	100	312	Vertical	AV
3	1974.1000	62.33	45.49	54.00	8.51	100	60	Vertical	AV
4	1974.9500	66.38	49.54	74.00	24.46	100	60	Vertical	PK
5	2792.6500	56.68	41.75	74.00	32.25	100	123	Vertical	PK
6	2793.5000	51.74	36.81	54.00	17.19	100	123	Vertical	AV
7	4207.9000	53.86	42.77	74.00	31.23	100	91	Vertical	PK
8	4211.3000	46.58	35.50	54.00	18.50	100	91	Vertical	AV
9	8087.3000	41.60	38.51	54.00	15.49	100	154	Vertical	AV
10	8087.3000	48.51	45.42	74.00	28.58	100	123	Vertical	PK
11	11218.7000	45.89	47.55	74.00	26.45	100	280	Vertical	PK
12	11224.6500	39.27	40.93	54.00	13.07	100	91	Vertical	AV

REMARKS:

1. The emission levels of other frequencies were very low against the limit.
2. Margin = Limit –Level

For POE port test on POE adapter

Position: Horizontal

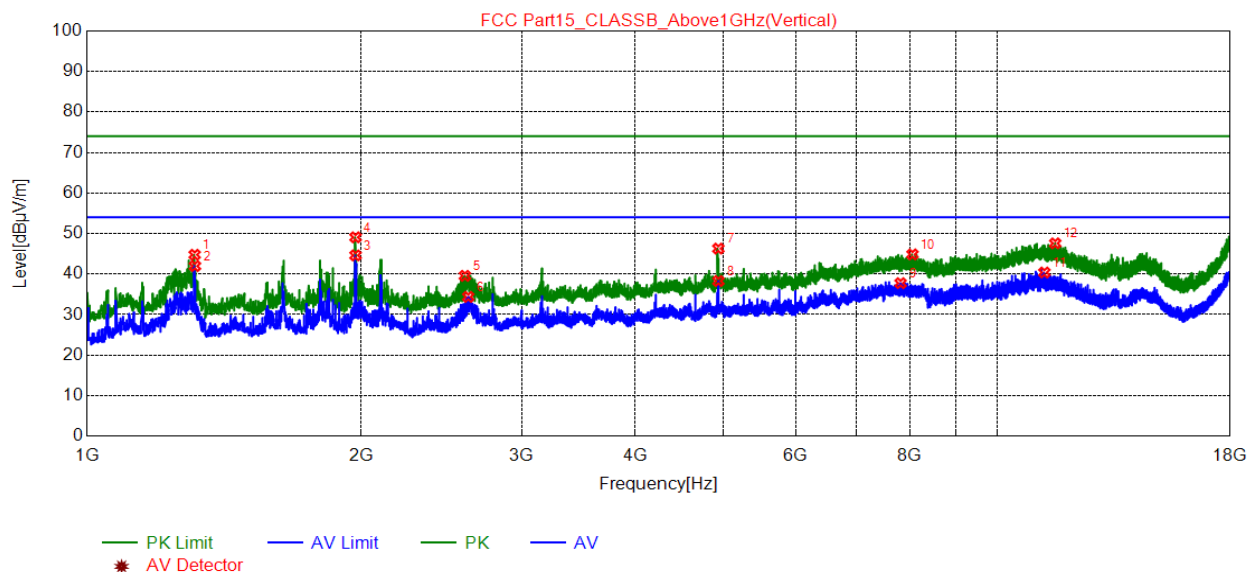


NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Detector
1	1277.1000	59.87	41.27	74.00	32.73	100	29	Horizontal	PK
2	1277.9500	53.27	34.67	54.00	19.33	100	60	Horizontal	AV
3	2105.0000	54.16	37.59	54.00	16.41	100	186	Horizontal	AV
4	2105.0000	61.53	44.96	74.00	29.04	100	186	Horizontal	PK
5	3696.2000	43.58	31.33	54.00	22.67	100	248	Horizontal	AV
6	3798.2000	50.02	38.00	74.00	36.00	100	186	Horizontal	PK
7	7443.8500	41.39	37.38	54.00	16.62	100	343	Horizontal	AV
8	7463.4000	48.57	44.62	74.00	29.38	100	312	Horizontal	PK
9	11177.9000	46.74	48.37	74.00	25.63	100	217	Horizontal	PK
10	11178.7500	38.97	40.60	54.00	13.40	100	217	Horizontal	AV
11	14389.2000	41.75	45.38	74.00	28.62	100	29	Horizontal	PK
12	14572.8000	33.41	37.06	54.00	16.94	100	312	Horizontal	AV

REMARKS:

1. The emission levels of other frequencies were very low against the limit.
2. Margin = Limit –Level

Position: Vertical



NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Detector
1	1312.8000	63.26	44.77	74.00	29.23	100	332	Vertical	PK
2	1313.6500	60.46	41.97	54.00	12.03	100	332	Vertical	AV
3	1971.5500	61.46	44.61	54.00	9.39	100	80	Vertical	AV
4	1971.5500	65.92	49.07	74.00	24.93	100	80	Vertical	PK
5	2599.7000	55.06	39.56	74.00	34.44	100	111	Vertical	PK
6	2621.8000	49.80	34.36	54.00	19.64	100	143	Vertical	AV
7	4933.8000	55.55	46.29	74.00	27.71	100	174	Vertical	PK
8	4934.6500	47.54	38.28	54.00	15.72	100	143	Vertical	AV
9	7821.2500	40.98	37.75	54.00	16.25	100	206	Vertical	AV
10	8060.1000	47.91	44.86	74.00	29.14	100	48	Vertical	PK
11	11251.0000	38.71	40.38	54.00	13.62	100	143	Vertical	AV
12	11562.9500	46.03	47.58	74.00	26.42	100	237	Vertical	PK

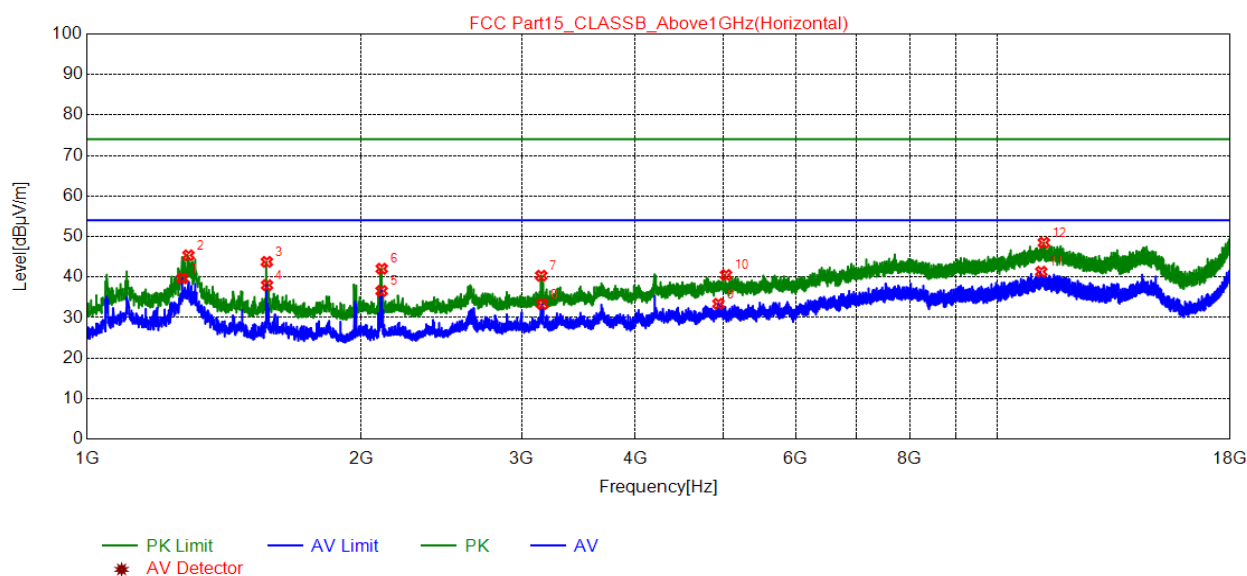
REMARKS:

1. The emission levels of other frequencies were very low against the limit.
2. Margin = Limit –Level

DH-IPC-HDBW3241RP-ZAS:

For DC12V port test on AC adapter

Position: Horizontal

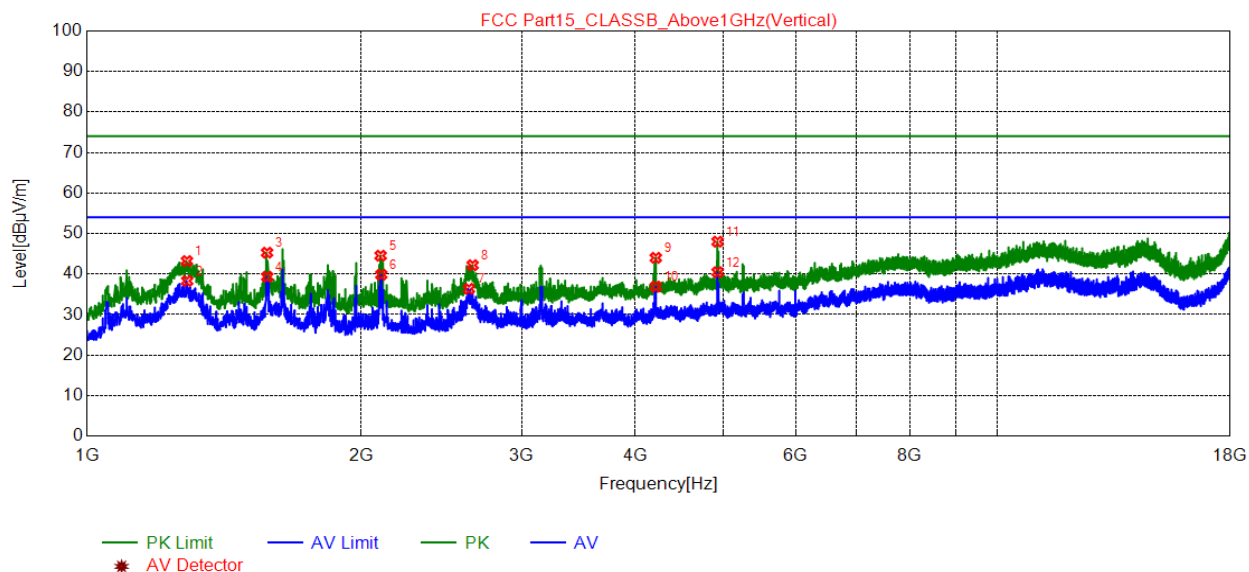


NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Detector
1	1272.8500	58.29	39.68	54.00	14.32	100	217	Horizontal	AV
2	1292.4000	63.92	45.37	74.00	28.63	100	186	Horizontal	PK
3	1575.4500	61.47	43.75	74.00	30.25	100	123	Horizontal	PK
4	1576.3000	55.72	38.00	54.00	16.00	100	123	Horizontal	AV
5	2105.8500	53.14	36.57	54.00	17.43	100	123	Horizontal	AV
6	2106.7000	58.63	42.06	74.00	31.94	100	123	Horizontal	PK
7	3153.0500	54.23	40.33	74.00	33.67	100	123	Horizontal	PK
8	3161.5500	47.19	33.32	54.00	20.68	100	154	Horizontal	AV
9	4934.6500	42.66	33.40	54.00	20.60	100	186	Horizontal	AV
10	5030.7000	49.67	40.52	74.00	33.48	100	217	Horizontal	PK
11	11161.7500	39.72	41.33	54.00	12.67	100	343	Horizontal	AV
12	11235.7000	46.82	48.49	74.00	25.51	100	343	Horizontal	PK

REMARKS:

1. The emission levels of other frequencies were very low against the limit.
2. Margin = Limit –Level

Position: Vertical



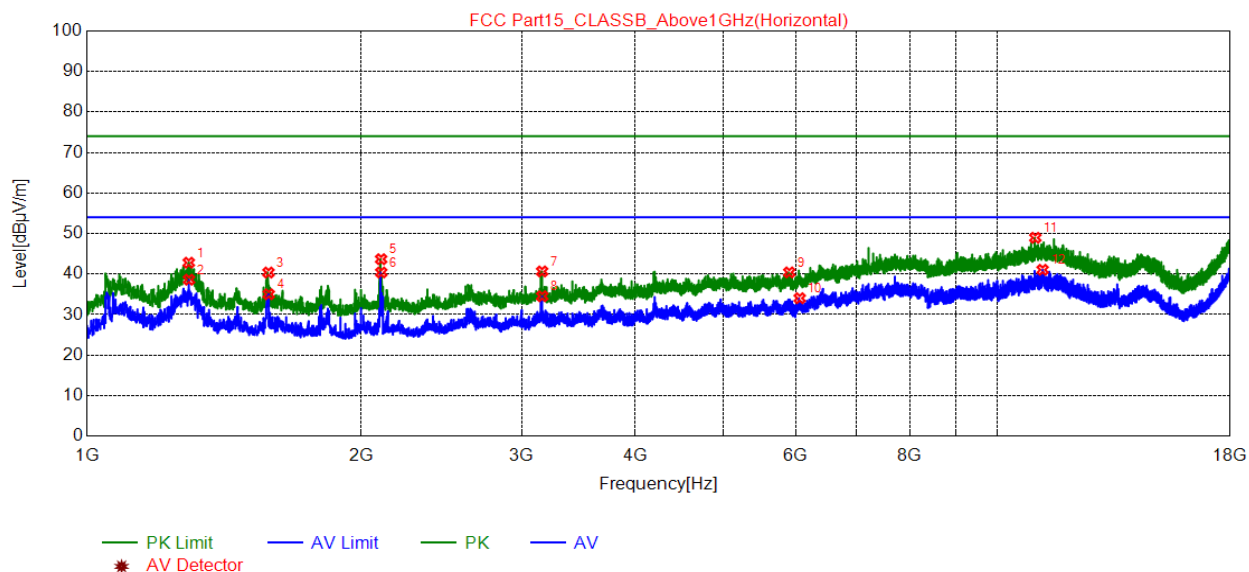
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Detector
1	1287.3000	61.78	43.21	74.00	30.79	100	112	Vertical	PK
2	1288.1500	56.87	38.30	54.00	15.70	100	112	Vertical	AV
3	1576.3000	63.00	45.28	74.00	28.72	100	80	Vertical	PK
4	1577.1500	57.06	39.34	54.00	14.66	100	80	Vertical	AV
5	2100.7500	61.11	44.53	74.00	29.47	100	112	Vertical	PK
6	2104.1500	56.42	39.85	54.00	14.15	100	143	Vertical	AV
7	2626.0500	51.78	36.36	54.00	17.64	100	175	Vertical	AV
8	2650.7000	57.54	42.19	74.00	31.81	100	175	Vertical	PK
9	4212.1500	55.08	44.01	74.00	29.99	100	143	Vertical	PK
10	4213.0000	47.97	36.90	54.00	17.10	100	143	Vertical	AV
11	4924.4500	57.27	48.00	74.00	26.00	100	175	Vertical	PK
12	4925.3000	49.73	40.46	54.00	13.54	100	143	Vertical	AV

REMARKS:

1. The emission levels of other frequencies were very low against the limit.
2. Margin = Limit – Level

For POE port test on POE adapter

Position: Horizontal

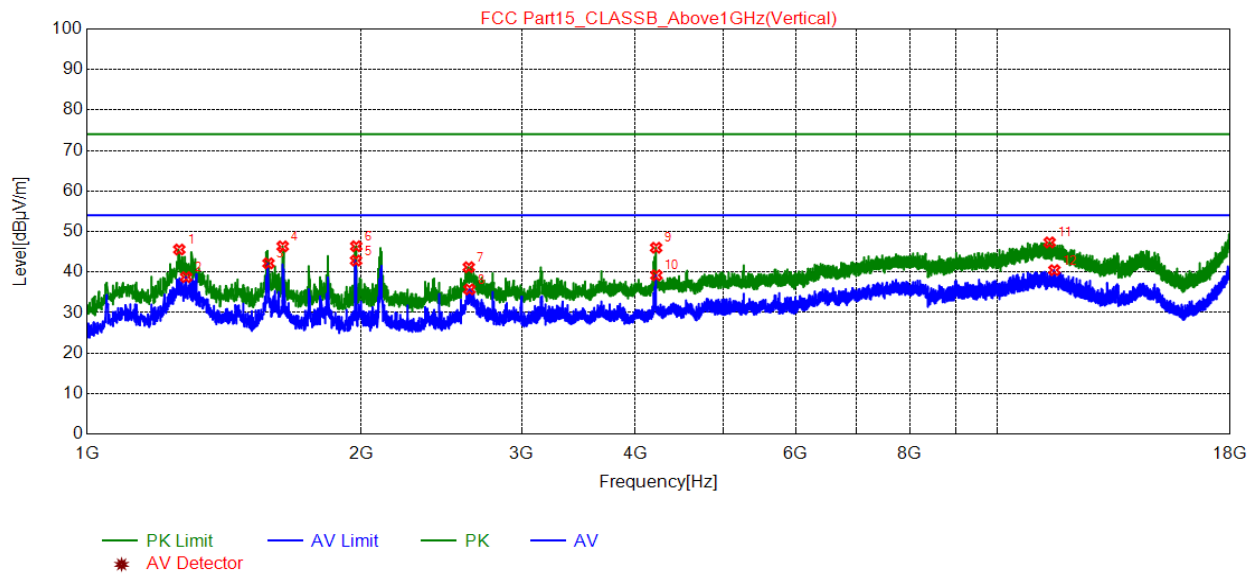


NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Detector
1	1293.2500	61.36	42.81	74.00	31.19	100	205	Horizontal	PK
2	1294.1000	57.16	38.61	54.00	15.39	100	205	Horizontal	AV
3	1582.2500	58.08	40.38	74.00	33.62	100	111	Horizontal	PK
4	1583.1000	52.72	35.02	54.00	18.98	100	111	Horizontal	AV
5	2103.3000	60.24	43.67	74.00	30.33	100	142	Horizontal	PK
6	2104.1500	56.96	40.39	54.00	13.61	100	142	Horizontal	AV
7	3159.8500	54.53	40.65	74.00	33.35	100	142	Horizontal	PK
8	3160.7000	48.40	34.52	54.00	19.48	100	142	Horizontal	AV
9	5902.8000	48.76	40.42	74.00	33.58	100	237	Horizontal	PK
10	6060.9000	42.20	34.04	54.00	19.96	100	205	Horizontal	AV
11	10996.0000	47.59	48.96	74.00	25.04	100	300	Horizontal	PK
12	11200.8500	39.39	41.05	54.00	12.95	100	80	Horizontal	AV

REMARKS:

1. The emission levels of other frequencies were very low against the limit.
2. Margin = Limit –Level

Position: Vertical



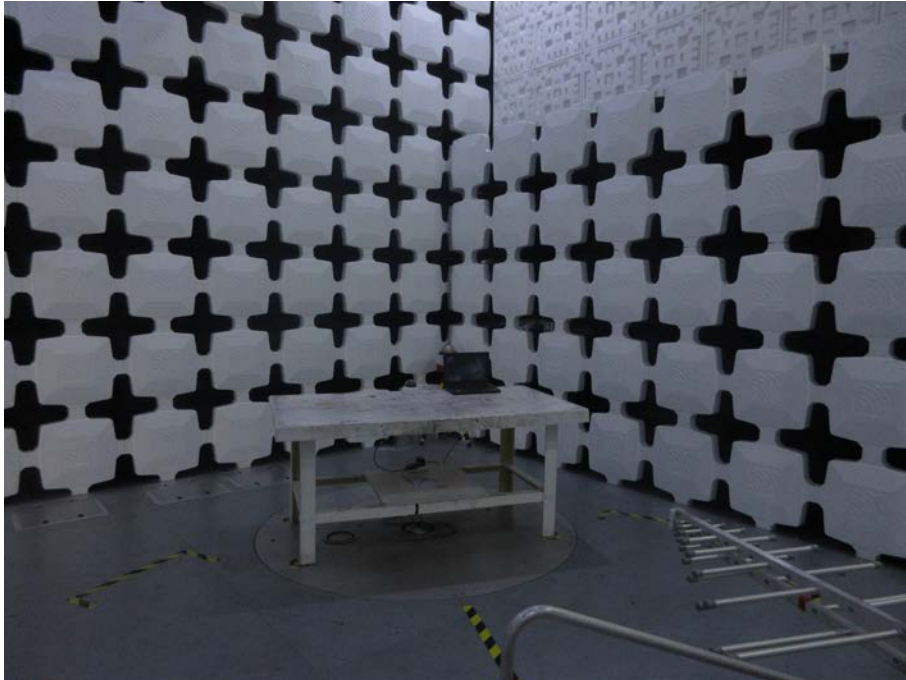
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Detector
1	1262.6500	64.20	45.56	74.00	28.44	100	154	Vertical	PK
2	1284.7500	57.33	38.75	54.00	15.25	100	28	Vertical	AV
3	1582.2500	59.85	42.15	54.00	11.85	100	186	Vertical	AV
4	1640.0500	63.91	46.34	74.00	27.66	100	60	Vertical	PK
5	1974.1000	59.67	42.83	54.00	11.17	100	91	Vertical	AV
6	1974.9500	63.21	46.37	74.00	27.63	100	60	Vertical	PK
7	2625.2000	56.63	41.20	74.00	32.80	100	154	Vertical	PK
8	2629.4500	51.13	35.72	54.00	18.28	100	186	Vertical	AV
9	4215.5500	57.06	46.00	74.00	28.00	100	186	Vertical	PK
10	4218.9500	50.26	39.20	54.00	14.80	100	186	Vertical	AV
11	11400.6000	45.64	47.31	74.00	26.69	100	186	Vertical	PK
12	11538.3000	38.87	40.48	54.00	13.52	100	249	Vertical	AV

REMARKS:

1. The emission levels of other frequencies were very low against the limit.
2. Margin = Limit – Level

5.7. Test Photographs (30MHz ~ 1000MHz)

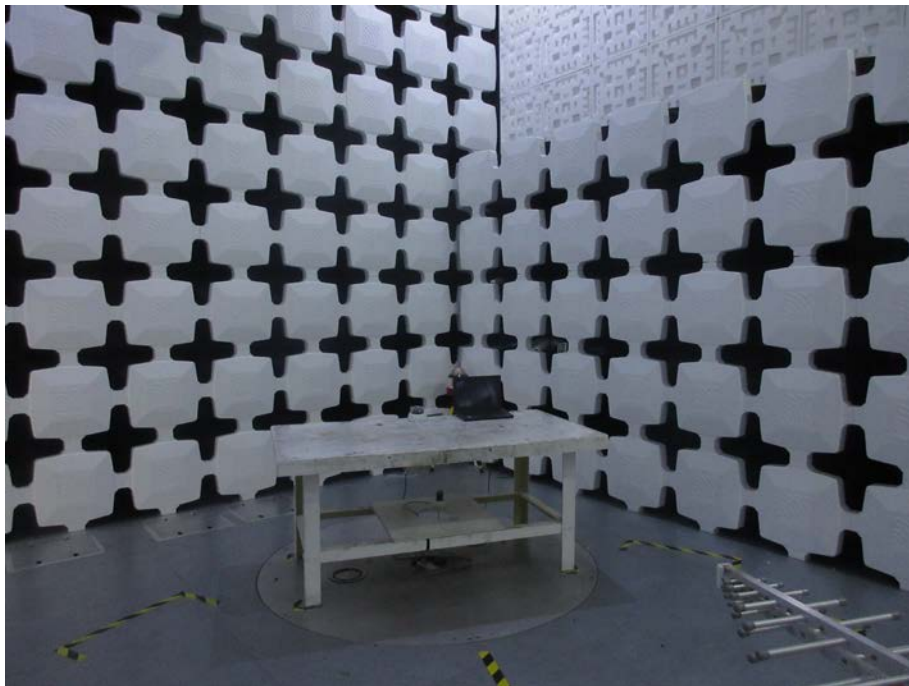
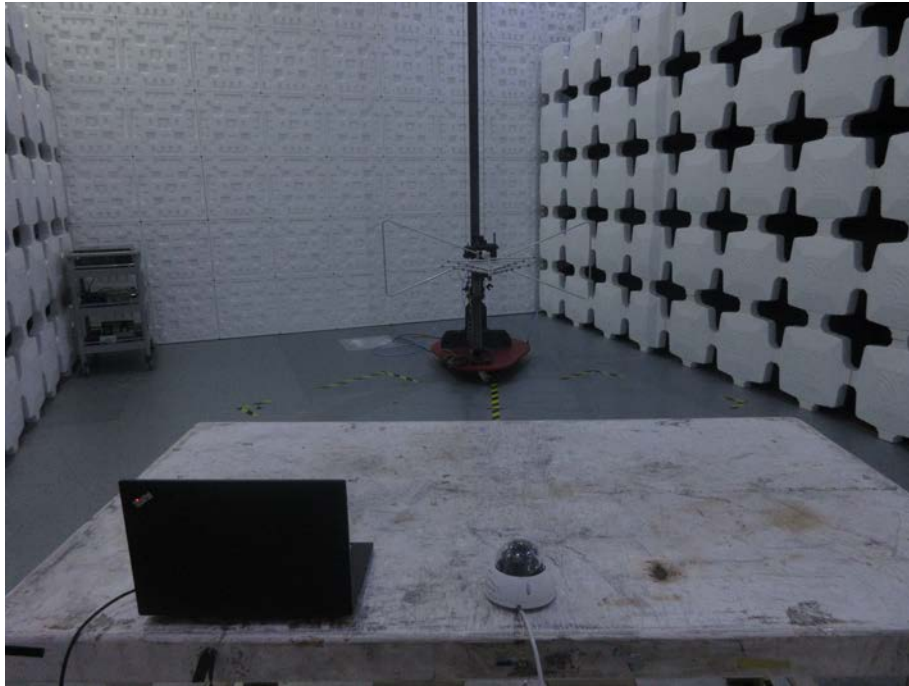
DH-IPC-HDBW2431RP-ZAS-S2





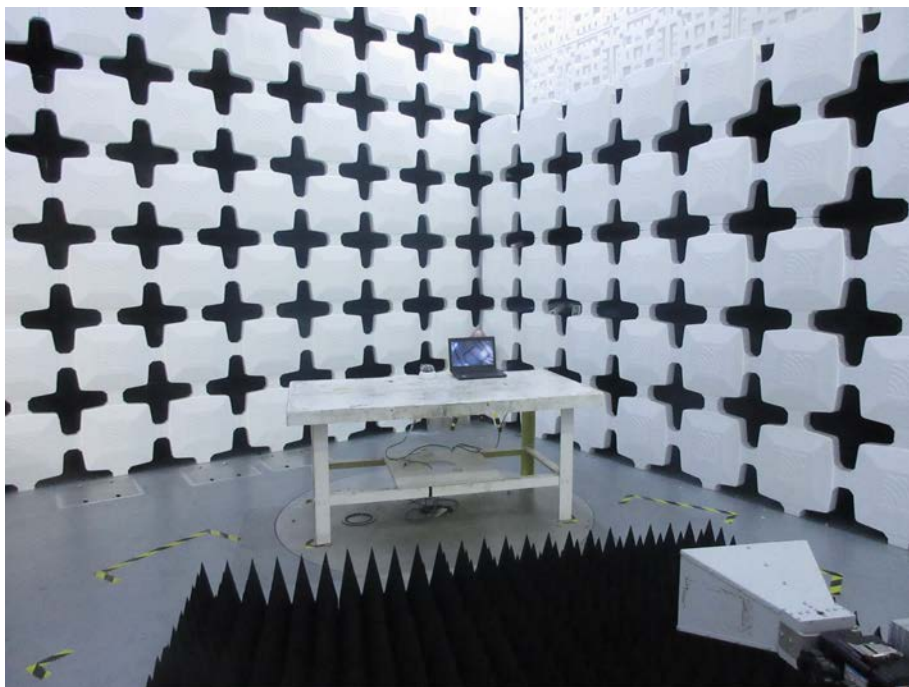
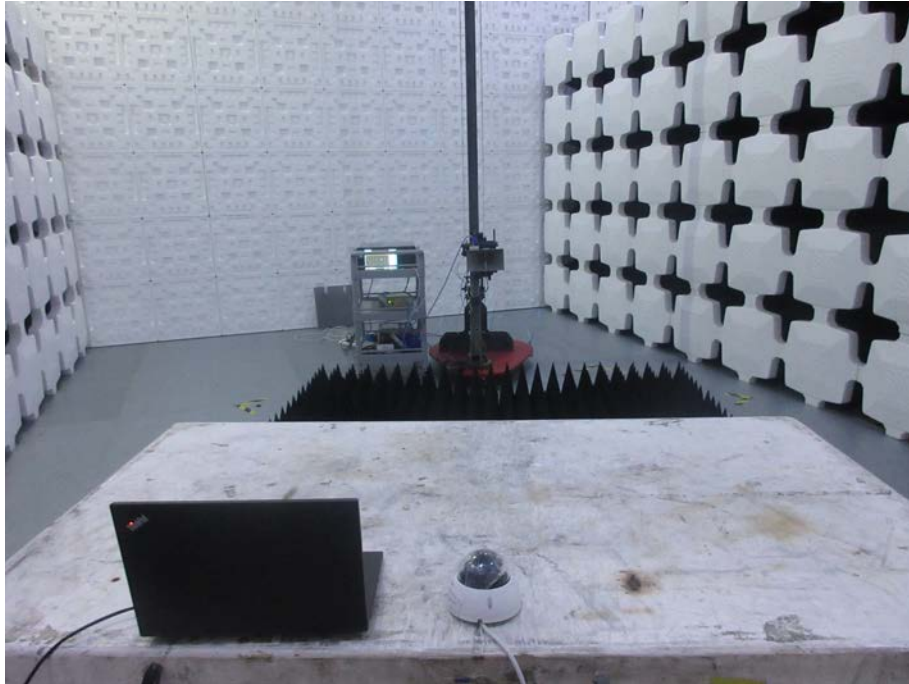
**BUREAU
VERITAS**

DH-IPC-HDBW3241RP-ZAS

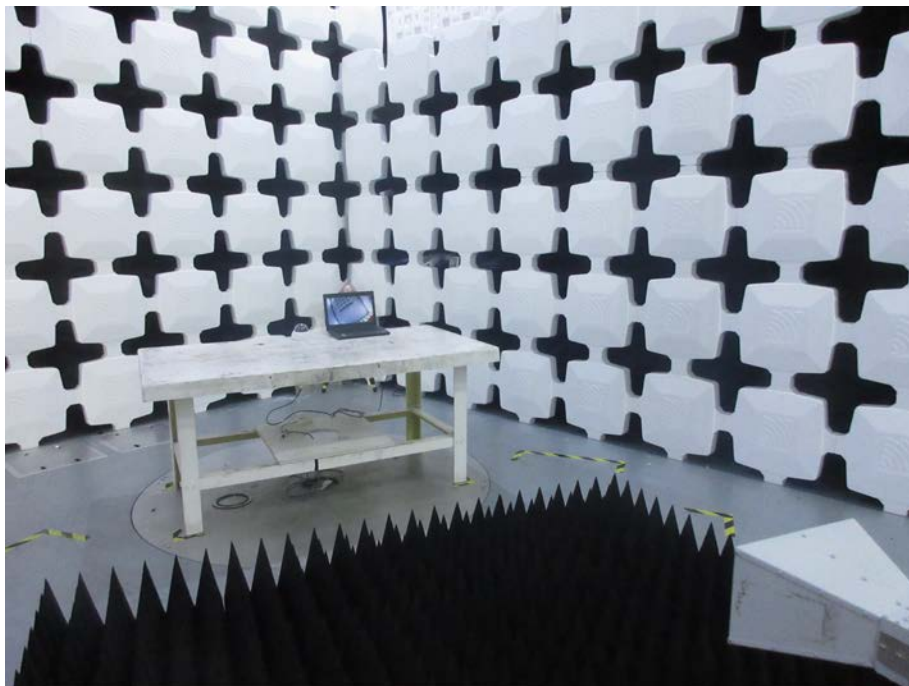
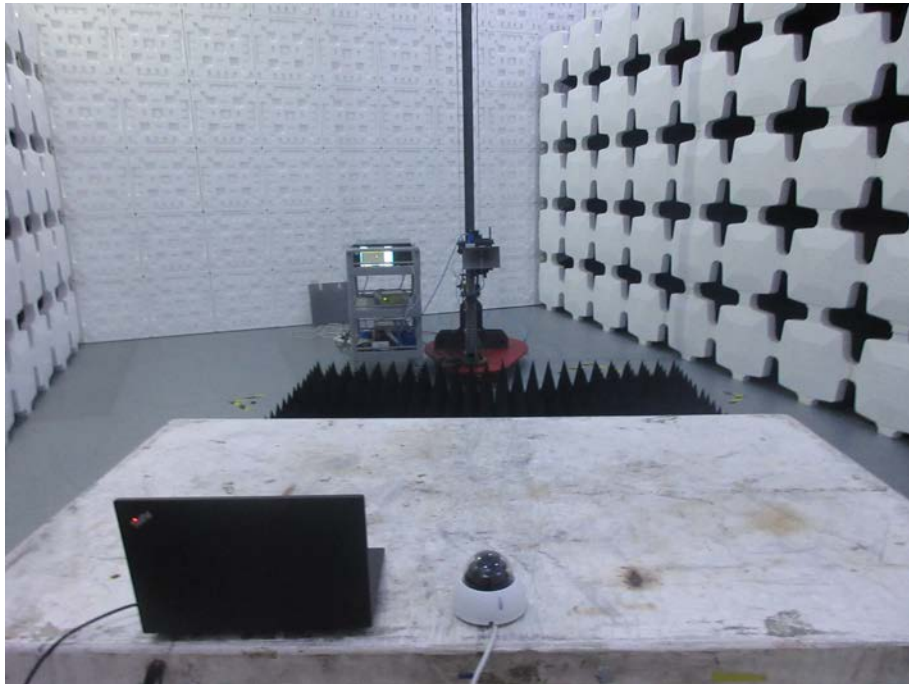


5.8. Test Photographs (1000MHz ~ 18000MHz)

DH-IPC-HDBW2431RP-ZAS-S2



DH-IPC-HDBW3241RP-ZAS

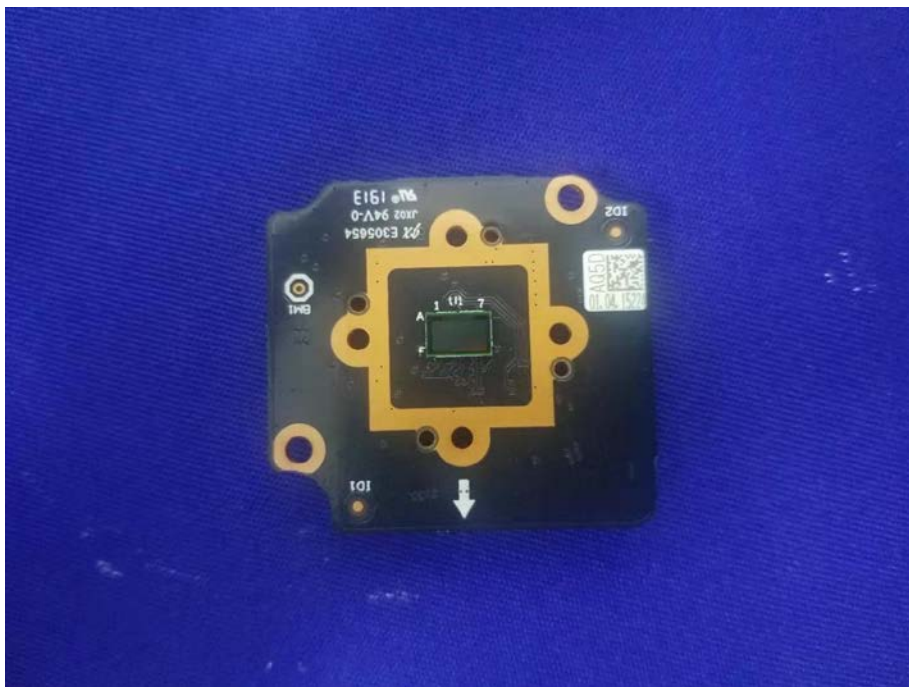


6. Photographs of EUT

DH-IPC-HDBW2431RP-ZAS-S2



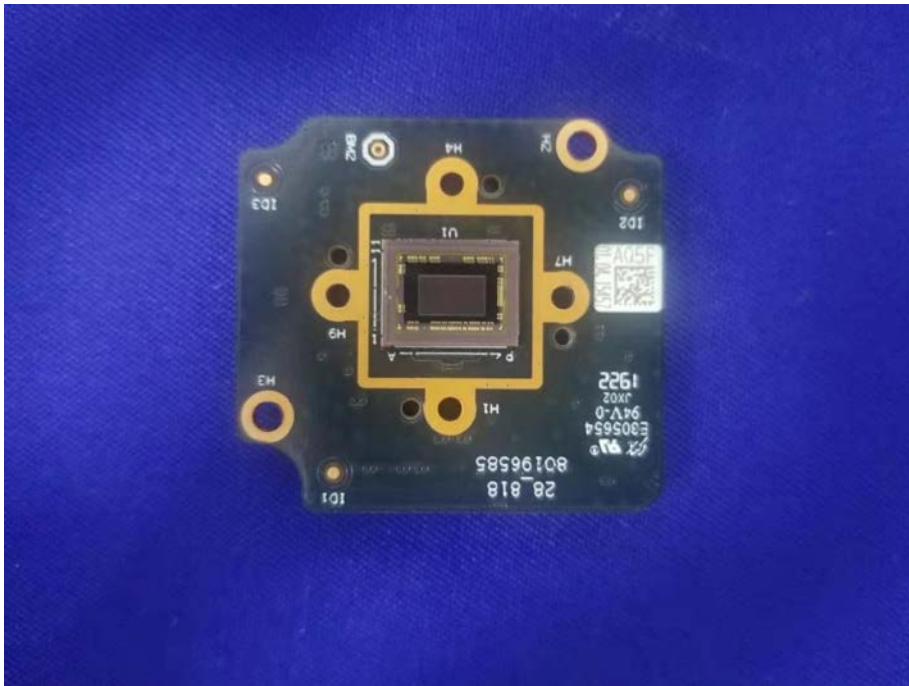
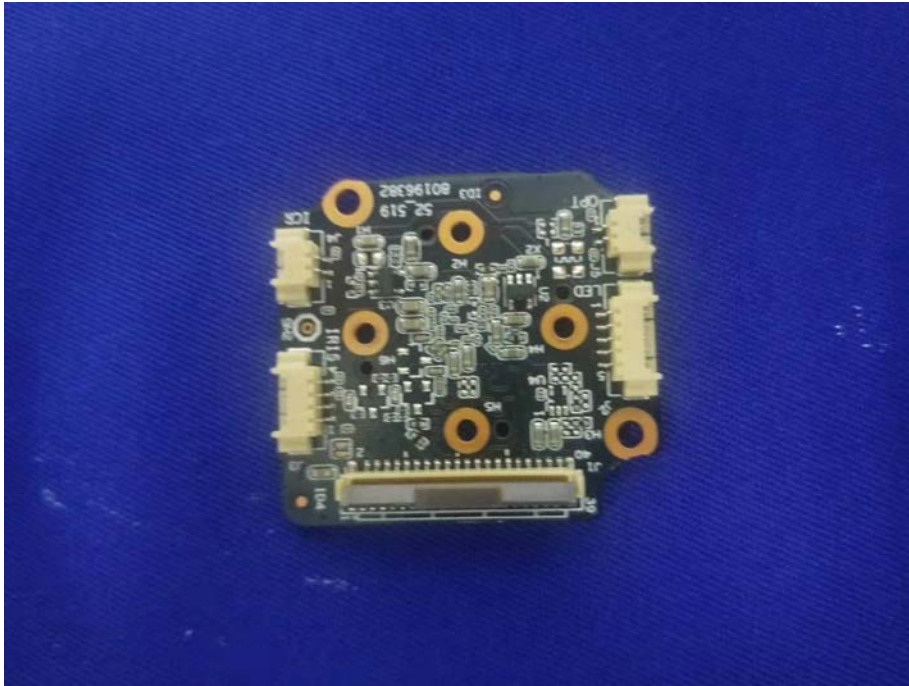




DH-IPC-HDBW3241RP-ZAS







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