Full

TEST REPORT

No. I18D00229-SRD02

For

Client :	**Hisense International Co., Ltd.**
Production :	**Mobile Phone**
Model Name :	**KS964**
Brand Name :	**Hisense**
FCC ID :	**2ADOBKS964**
Hardware Version:	**V1.00**
Software Version:	**Hisense_KS964_MX01_L101.06**
Issued date:	**2019-01-10**

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of ECIT Shanghai.

Test Laboratory:

ECIT Shanghai, East China Institute of Telecommunications

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Revision Version

Report Number	Revision	Date	Memo
I18D00229-SRD02	00	2019-01-04	Initial creation of test report
I18D00229-SRD02	01	2019-01-10	Second creation of test report

CONTENTS

1. Test Laboratory

1.1. Testing Location

Company Name:	ECIT Shanghai, East China Institute of Telecommunications
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Postal Code:	200001
Telephone:	(+86)-021-63843300
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FCC registration No	958356

1.2. Testing Environment

Normal Temperature:	15-35℃
Extreme Temperature:	-10/+50℃
Relative Humidity:	25-75%

1.3. Project data

Project Leader:	Zhang Min
Testing Start Date:	2018-11-29
Testing End Date:	2018-12-24

1.4. Signature

Yang Dejun
(Prepared this test report)

Shi Hongqi
(Reviewed this test report)

Zheng Zhongbin
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Hisense International Co., Ltd.
Address:	Floor 22, Hisense Tower, 17 Donghai Xi Road, Qingdao, 266071, China
Telephone:	+86-532-80877742
Postcode:	/

2.2. Manufacturer Information

Company Name:	Hisense Communications Co., Ltd.
Address:	218 Qianwangang Road, Qingdao Economic & Technological Development Zone, Qingdao, China
Telephone:	+86-532-55753749
Postcode:	/

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

EUT Description	Mobile Phone
Model name	KS964
BLE Frequency	2402MHz-2480MHz
BLE Channel	Channel0-Channel39
BLE Modulation	GFSK;
GSM Frequency Band	GSM850/GSM900/GSM1800/GSM1900
UMTS Frequency Band	Band Ⅰ/Band Ⅱ/Band Ⅴ
CDMA Frequency Band	/
LTE Frequency Band	/
Additional Communication Function	BT4.2,BLE; WiFi 802.11b,g,n
Extreme Temperature	-10/+50℃
Nominal Voltage	3.8V
Extreme High Voltage	4.35V
Extreme Low Voltage	3.6V

Note: Photographs of EUT are shown in ANNEX A of this test report.

3.2. Internal Identification of EUT used during the test

EUT ID*	Model Name	SN or IMEI	HW Version	SW Version	Date of receipt
N19(Main supply)	KS964	869981040000565	V1.00	Hisense_KS964_MX01_L101.06	2018-12-29
N15(Main supply)	KS964	869981040000714	V1.00	Hisense_KS964_MX01_L101.06	2018-12-29
N18(Secondary supply)	KS964	869981040000128	V1.00	Hisense_KS964_MX01_L101.06	2018-12-29

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN
AE1	RF cable	---
AE2	---	---

*AE ID: is used to identify the test sample in the lab internally.

3.4. The difference between two models

Main supply is same as Secondary supply, the two samples are only different on the supplier of TP/LCD/CAM/Memory.

4. Reference Documents

4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15,Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.	2018/10/1
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013

5. Summary of Test Results

A brief summary of the tests carried out is shown as following.

Measurement Items	Sub-clause of Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.247(b)	/	P
Peak Power Spectral Density	15.247(e)	/	P
6dB Occupied Bandwidth	15.247(a)	/	P
Band Edges Compliance	15.247(d)	/	P
Transmitter Spurious Emission-Conducted	15.247	/	P
Transmitter Spurious Emission-Radiated	15.247	/	P
AC Powerline Conducted Emission	15.107,15.207	/	P

Please refer to part 5 for detail.

The measurements are according to ANSI C63.10.

Terms used in Verdict column

P	Pass, the EUT complies with the essential requirements in the standard.
NP	Not Perform, the test was not performed by ECIT.
NA	Not Applicable, the test was not applicable.
F	Fail, the EUT does not comply with the essential requirements in the standard.

Test Conditions

Tnom	Normal Temperature
Tmin	Low Temperature
Tmax	High Temperature
Vnom	Normal Voltage
Vmin	Low Voltage
Vmax	High Voltage
Hnom	Norm Humidity

Anom	Norm Air Pressure

For this report, all the test case listed above are tested under Normal Temperature and Normal Voltage, and also under norm humidity, the specific conditions as following:

Temperature	Tnom	25℃
Voltage	Vnom	3.8V
Humidity	Hnom	48%
Air Pressure	Anom	1010hPa

Note:

a. All the test data for each data were verified, but only the worst case was reported.

b. The GFSK was set in DH1.

c. The DC and low frequency voltages' measurement uncertainty is ±2%.

5.1. Notes

All reported tests were carried out on a sample equipment to demonstrate limited compliance with section 3.

The test results of this test report relate exclusively to the item(s) tested as specified in section 5.

5.2. Statements

The KS964, support GSM/GPRS/WCDMA /BT/BLE/ WLAN, manufactured by Hisense Communications Co., Ltd., which is a new product for testing.

Note: The product has two prototypes, the two samples are only different on the supplier of TP/LCD/CAM/Memory. In this report, we test all cases about main supply, and we only test AC Powerline and the worse case of RSE about secondary supply.

ECIT has verified that the compliance of the tested device specified in section 5 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 5 of this test report.

6. Test result

6.1. Peak Output Power-Conducted

6.1.1 Measurement Limit

Standard	Limit (dBm)
FCC Part 15.247(b)(1)	< 30

6.1.2 Test Condition:

DTS procedure	RBW	VBW	Span	Sweeptime
BT-LE	3MHz	10MHz	9MHz	Auto

6.1.3 Test procedure

The measurement is according to ANSI C63.10 clause 11.9.1

a) Set the RBW ≥ DTS bandwidth.

b) Set VBW ≥ [3 × RBW].

c) Set span ≥ [3 × RBW].

d) Sweep time = auto couple.

e) Detector = peak.

f) Trace mode = max hold.

g) Allow trace to fully stabilize.

h) Use peak marker function to determine the peak amplitude level.

6.1.4 Measurement Uncertainty:

Measurement Uncertainty	±0.88dB

Measurement Results:

For GFSK

Channel	Ch0 2402 MHz	Ch19 2440 MHz	CH39 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	-2.847	-1.275	-1.825	P
	Fig.1	Fig.2	Fig.3	

Conclusion: PASS

Test graphs an below

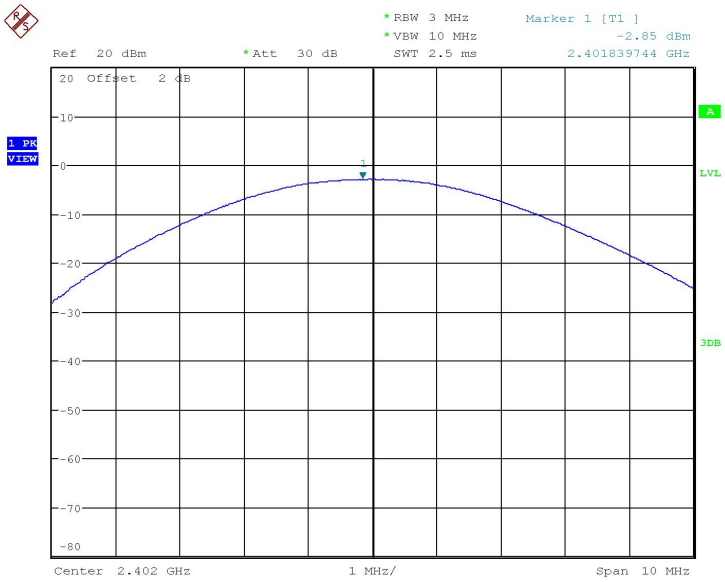


Fig.1 Peak Conducted Output Power CH0, DH1

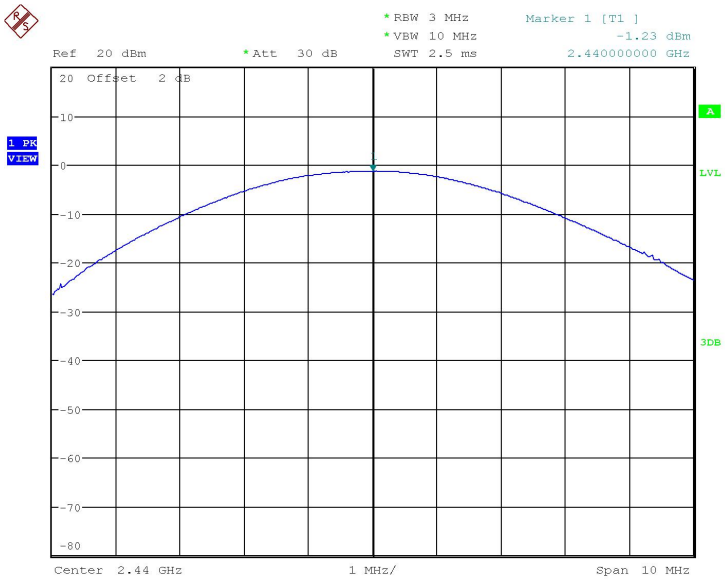


Fig.2 Peak Conducted Output Power CH19, DH1

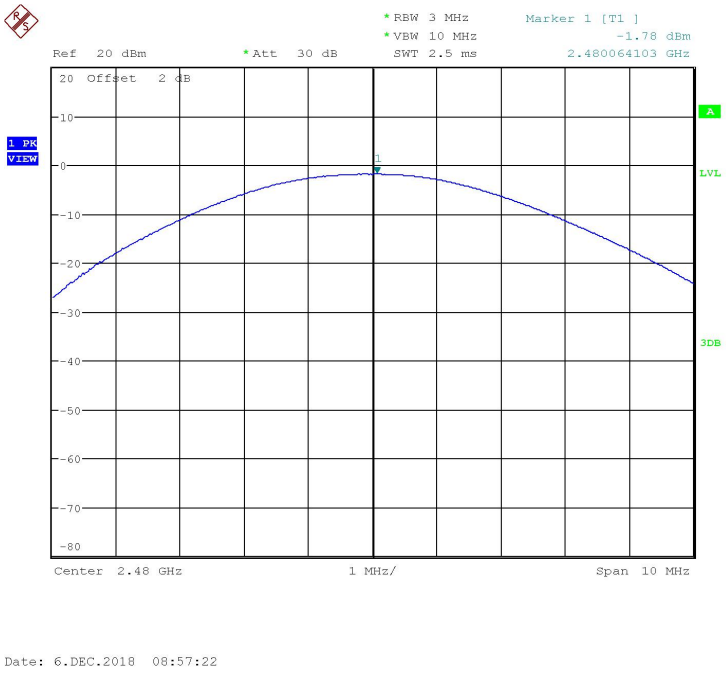


Fig.3 Peak Conducted Output Power CH39, DH

6.2. Peak Power Spectral Density

6.2.1 Measurement Limit:

Standard	Limit
FCC CFR Part 15.247(e)	< 8dBm/3 KHz

6.2.2 Test procedures

The measurement is according to ANSI C63.10 clause 11.10.

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. Set analyzer center frequency to DTS channel center frequency.
4. Set the span to 1.5 times the DTS bandwidth.
5. Set the RBW to 3 kHz $\leqslant$ RBW $\leqslant$ 100 kHz.
6. Set the VBW $\geqslant$ [3 $\times$ RBW].
7. Detector = peak.
8. Sweep time = auto couple.
9. Trace mode = max hold.
10. Allow trace to fully stabilize.
11. Use the peak marker function to determine the maximum amplitude level within the RBW.
12. If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

6.2.3 Measurement Uncertainty:

Measurement Uncertainty	±0.88dB

Measurement Results:

Mode	Channel	Power Spectral Density(dBm/3kHz)		Conclusion
BT-LE	0	Fig.4	-21.32	P
	19	Fig.5	-20.69	P
	39	Fig.6	-21.03	P

Test figure as below:

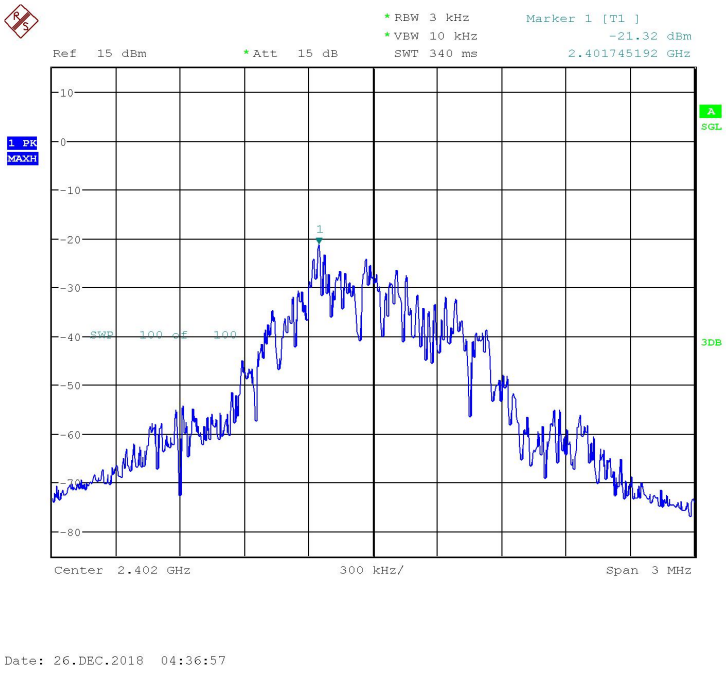


Fig.4 Power spectral density: CH0

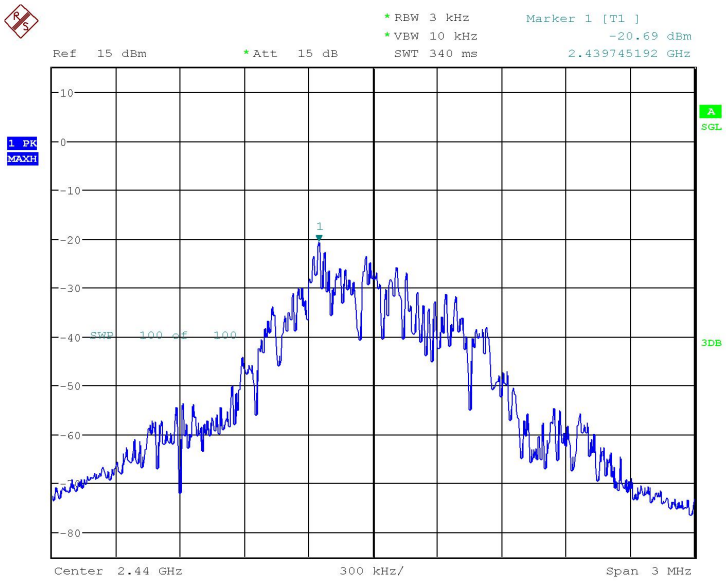


Fig.5 Power spectral density: CH19

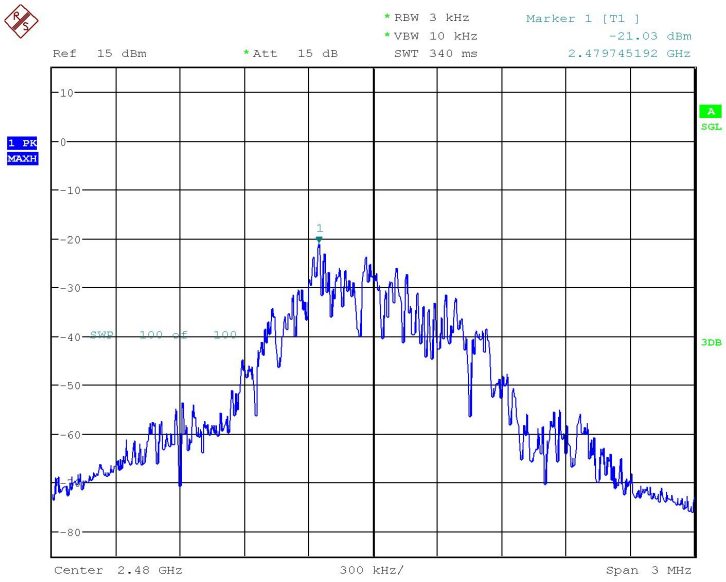


Fig.6 Power spectral density: CH39

6.3. 6dB Bandwidth

6.3.1 Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (a) (1)	⩾500k

6.3.2 Test procedures

The measurement is according to ANSI C63.10 clause 11.8.

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. Set RBW = 100 kHz.
4. Set the VBW ⩾ [3 × RBW].
5. Detector = peak.
6. Trace mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize.
9. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3.3 Measurement Uncertainty:

Measurement Uncertainty	±0.0031MHz

Measurement Result:

For GFSK

Channel	6dB Bandwidth (kHz)		Conclusion
0	Fig.7	510	P
19	Fig.8	510	P
39	Fig.9	510	P

Conclusion: PASS

Test graphs as below:

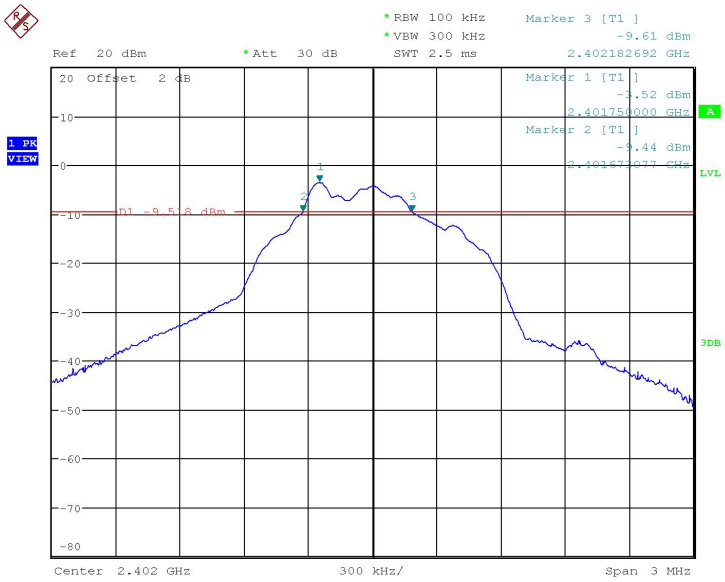


Fig.7 6dB Bandwidth: Ch0

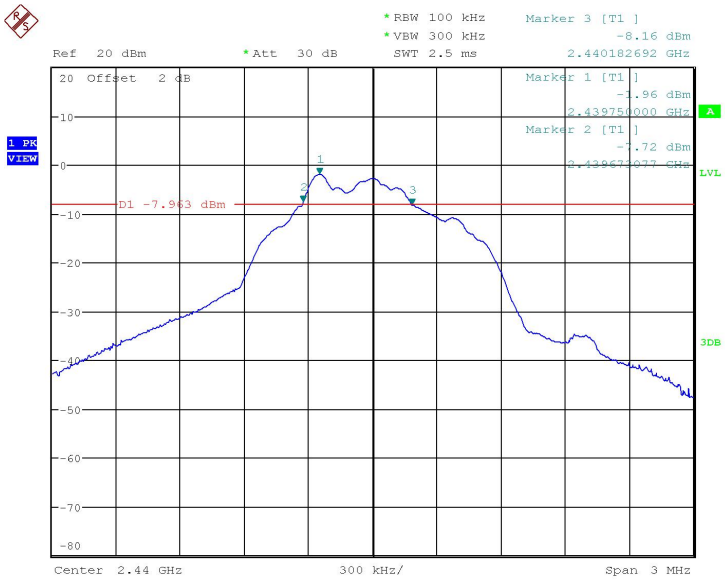


Fig.8 6dB Bandwidth: Ch19

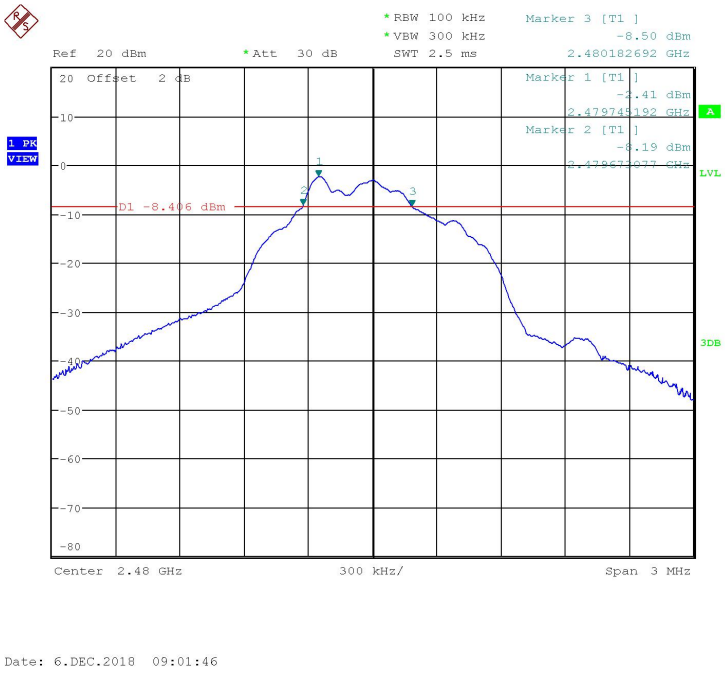


Fig.9 6dB Bandwidth: Ch39

6.4. Frequency Band Edges-Conducted

6.4.1 Measurement Limit:

Standard	Limited(dBc)
FCC 47 CFR Part 15.247(d)	>20

6.4.2 Test procedure

The measurement is according to ANSI C63.10 clause 11.13.2

1) Span: Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products that fall outside of the authorized band of operation.

2) Reference level: As required to keep the signal from exceeding the maximum instrument input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.

3) Attenuation: Auto (at least 10 dB preferred).

4) Sweep time: Coupled.

5) Resolution bandwidth: 100 kHz.

6) Video bandwidth: 300 kHz.

7) Detector: Peak.

8) Trace: Max hold.

6.4.3 Measurement Uncertainty:

Measurement Uncertainty	±4.56dB

Measurement results

For GFSK

Channel	Band Edge Power (dBc)	Conclusion
0	Fig.10	P
39	Fig.11	P

Conclusion: PASS

Test graphs an below

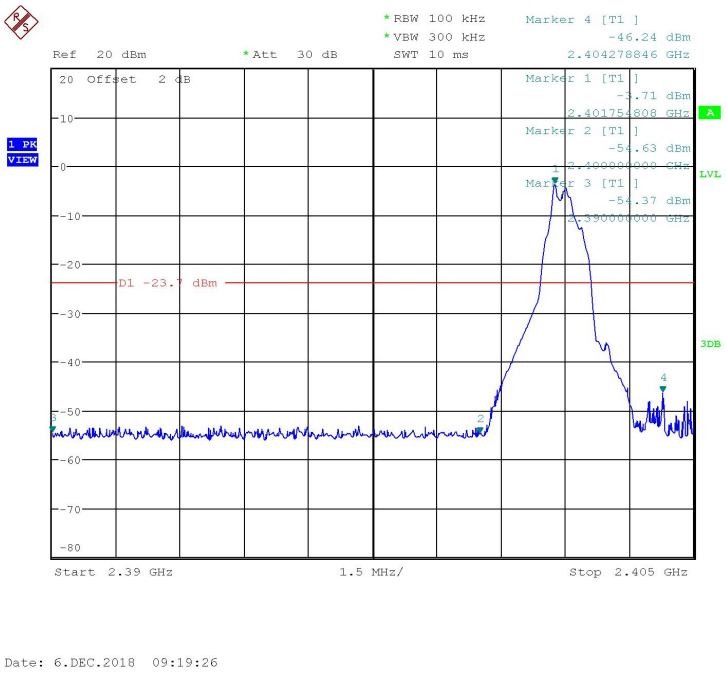


Fig.10 Frequency Band Edge: GFSK, Ch0, Hopping OFF

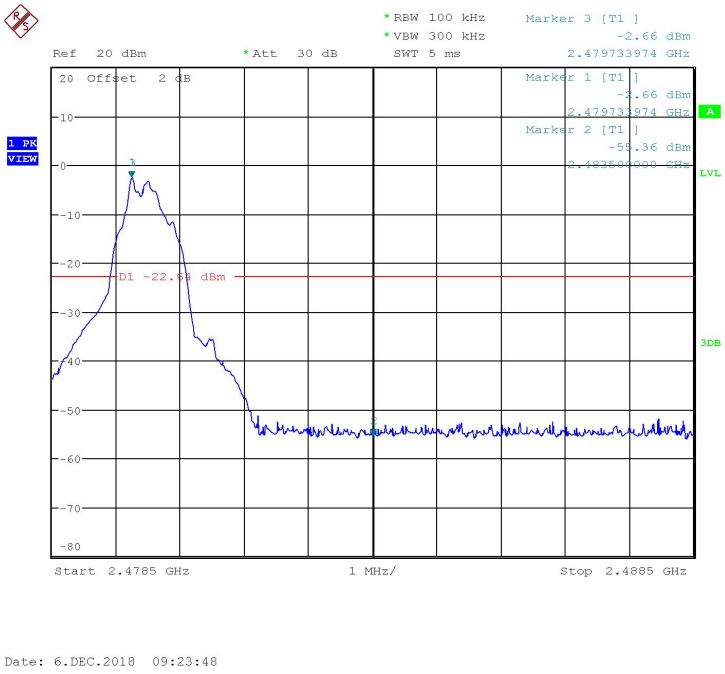


Fig.11 Frequency Band Edge: GFSK, Ch39, Hopping OFF

6.5. Conducted Emission

6.5.1 Measurement Limit:

Standard	Limit
FCC 47 CFR Part15.247 (d)	20dB below peak output power in 100KHz bandwidth

6.5.2 Test procedures

This measurement is according to ANSI C63.10 clause 11.11.

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.

Reference level measurement

3. Set instrument center frequency to DTS channel center frequency.
4. Set the span to ≥ 1.5 times the DTS bandwidth.
5. Set the RBW = 100 kHz.
6. Set the VBW ≥ [3 × RBW].
7. Detector = peak.
8. Sweep time = auto couple.
9. Trace mode = max hold.
10. Allow trace to fully stabilize.
11. Use the peak marker function to determine the maximum PSD level.

Emission level measurement

12. Set the center frequency and span to encompass frequency range to be measured.

13. Set the RBW = 100 kHz.
14. Set the VBW ⩾ [3 × RBW].
15. Detector = peak.
16. Sweep time = auto couple.
17. Trace mode = max hold.
18. Allow trace to fully stabilize.
19. Use the peak marker function to determine the maximum amplitude level.

6.5.3 Measurement Uncertainty:

Measurement Uncertainty	±4.56dB

Measurement Results:

Channel	Frequency Range	Test Results	Conclusion
Ch0 2402MHz	Center Freq.	Fig.12	P
	30MHz~26.5GHz	Fig.13	P
Ch19 2440MHz	Center Freq.	Fig.14	P
	30MHz~26.5GHz	Fig.15	P
Ch39 2480MHz	Center Freq.	Fig.16	P
	30MHz~26.5GHz	Fig.17	P

Conclusion: PASS

Test graphs as below

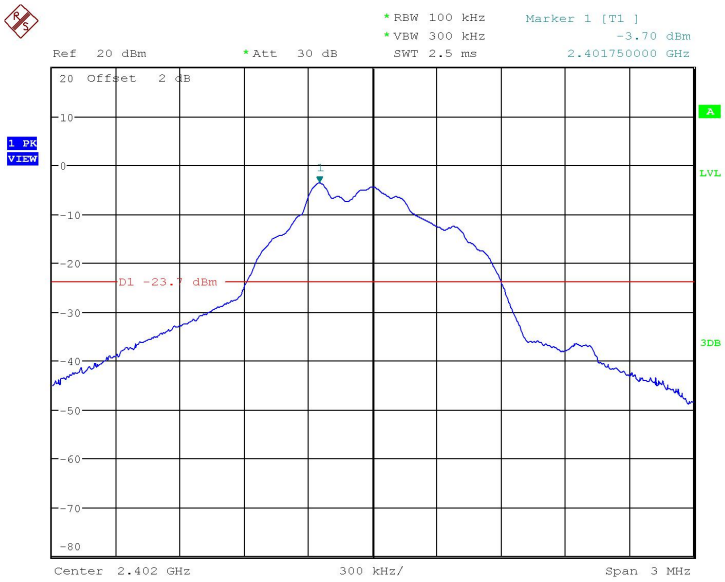


Fig.12 Conducted spurious emission: Ch0, 2402MHz

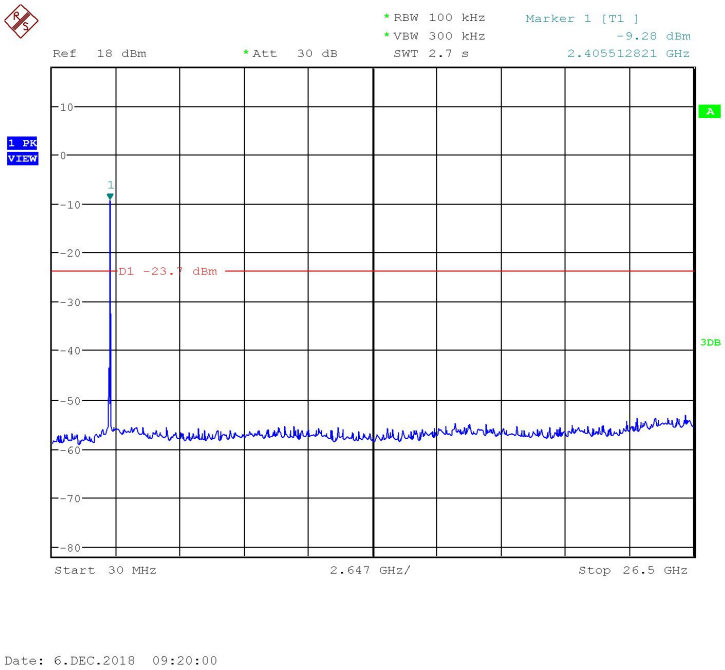


Fig.13 Conducted spurious emission: Ch0, 30MHz~26GHz

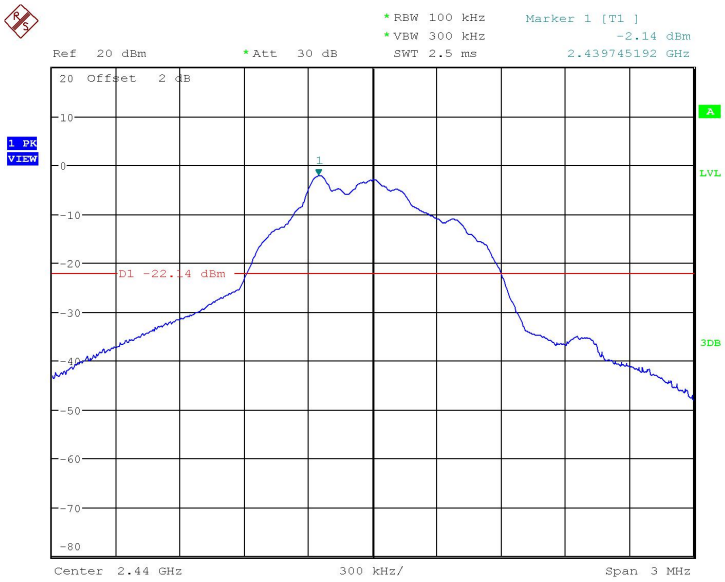


Fig.14 Conducted spurious emission: Ch19, 2440MHz

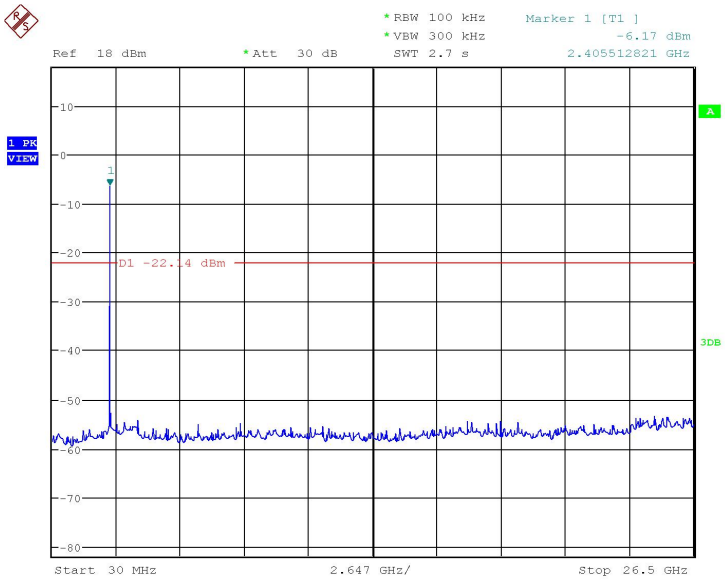


Fig.15 Conducted spurious emission: Ch19, 30MHz~26GHz

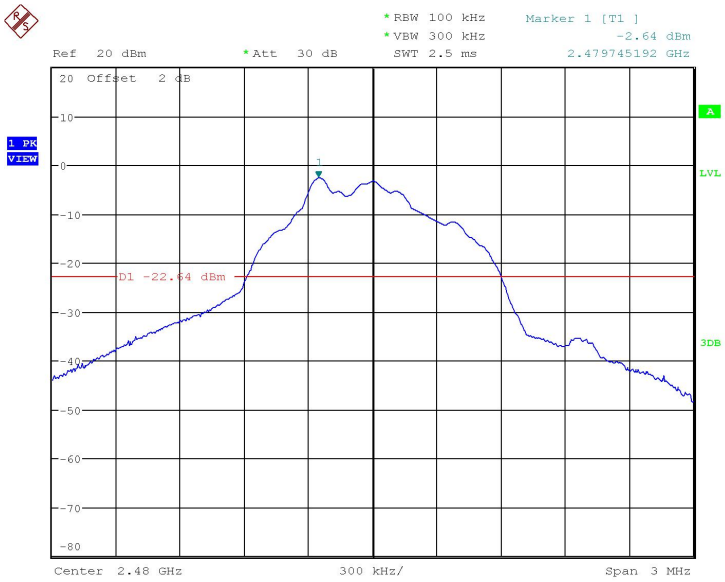


Fig.16 Conducted spurious emission: Ch39, 2480MHz

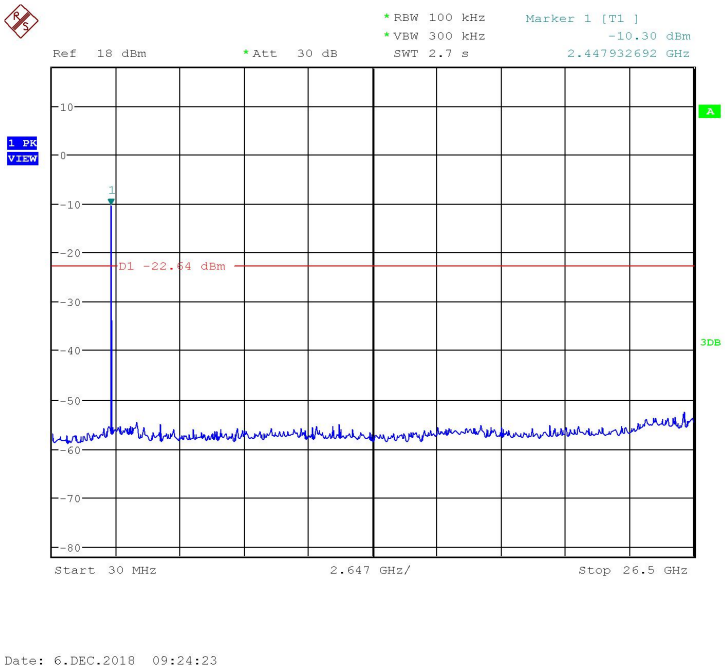


Fig.17 Conducted spurious emission: Ch39, 30MHz~26GHz

6.6. Radiated Emission

6.6.1 Measurement Limit:

Standard	Limit

FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power

In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see 15.205(c)).

Limit in restricted band:

Frequency of emission (MHz)	Field strength (uV/m)	Field strength (dBuV/m)
30~88	100	40
88~216	150	43.5
216~960	200	46
Above 960	500	54

Measurement Uncertainty

Measurement Items	Range	Confidence Level	Calculated Uncertainty
Transmitter Spurious Emission-Radiated	9KHz-30MHz	95%	±5.66db
Transmitter Spurious Emission-Radiated	30MHz-1000MHz	95%	±4.98db
Transmitter Spurious Emission-Radiated	1000MHz -18000MHz	95%	±5.06db
Transmitter Spurious Emission-Radiated	18000MHz -40000MHz	95%	±5.20db

6.6.2 Test Method

Portable, small, lightweight, or modular devices that may be handheld, worn on the body, or placed on a table during operation shall be positioned on a non-conducting platform, the top of which is 80 cm above the reference ground plane. The preferred area occupied by the EUT arrangement is 1 m by 1.5 m, For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. but it may be larger or smaller to accommodate various sized EUTs. For testing purposes, ceiling- and wall-mounted devices also shall be positioned on a tabletop (see also ANSI C63.10-2013 section 6.3.4 and 6.3.5). In making any tests involving handheld, body-worn, or ceiling-mounted equipment, it is essential to recognize that the measured levels may be dependent on the orientation (attitude) of the three orthogonal axes of the EUT. Thus, exploratory tests as specified in 8.3.1 shall be carried out for various axes orientations to determine the attitude having maximum or near-maximum emission level.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three

orthogonal orientations.

Frequency of emission (MHz)	RBW/VBW	Sweep Time (s)
30~1000	100KHz/300KHz	5
1000~4000	1MHz/3MHz	15
4000~18000	1MHz/3MHz	40
18000~26500	1MHz/3MHz	20

6.6.3 Measurement Results:

A "reference path loss" is established and A_{Rpi} is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

A_{Rpi} = Cable loss + Antenna Gain-Preamplifier gain

Result=P_{Mea} + A_{Rpi}

Main supply

Channel	Frequency Range	Test Results	Conclusion
Ch0 2402MHz	30MH~1GHz	Fig.18	P
	1GHz~3GHz	Fig.19	P
	3GHz~18GHz	Fig.20	P

Channel	Frequency Range	Test Results	Conclusion
Ch39 2480MHz	30MH~1GHz	Fig.21	P
	1GHz~3GHz	Fig.22	P
	3GHz~18GHz	Fig.23	P

Ch0 30MHz-1GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
34.8	13.1	-21.9	35	V
35.6	14.63	-21.8	36.43	V
220.9	13.95	-24	37.95	V
387.9	13.8	-19.5	33.3	V
540.9	17.16	-15.7	32.86	V

879.5	22.95	-9.9	32.85	H

Ch0 1GHz-3GHz (Peak)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2648.0	54.11	7.7	46.41	H
2706.4	54.35	7.9	46.45	H
2777.9	54.61	7.8	46.81	V
2854.6	55.73	8.4	47.33	V
2910.0	55.49	8.8	46.69	H
2949.7	55.62	8.6	47.02	H

Ch0 1GHz-3GHz (Average)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2648.0	42.32	7.7	34.62	H
2706.4	42.47	7.9	34.57	H
2777.9	42.53	7.8	34.73	V
2854.6	42.91	8.4	34.51	V
2910.0	43.4	8.8	34.6	H
2949.7	43.31	8.6	34.71	H

Ch0 3GHz-18GHz (Peak)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
14312.5	54.91	20.6	34.31	V
15391.2	55.19	22.6	32.59	H
15955.5	58.26	24.8	33.46	V
16293.4	58.16	25.7	32.46	V
16833.1	59.52	27.3	32.22	H
17518.2	59.73	27.6	32.13	V

Ch0 3GHz-18GHz (Average)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
14312.5	42.58	20.6	21.98	V
15391.2	43.6	22.6	21	H
15955.5	46.37	24.8	21.57	V
16293.4	46.51	25.7	20.81	V
16833.1	47.52	27.3	20.22	H
17518.2	47.84	27.6	20.24	V

Ch39 30MHz-1GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
34.6	12.32	-22	34.32	V
36.4	14.64	-21.6	36.24	V
48.5	12.32	-20	32.32	H
108.3	9.01	-23.4	32.41	V
220.9	13.87	-24	37.87	V
831.5	21.96	-10.8	32.76	V

Ch39 1GHz-3GHz (Peak)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2729.0	54.67	7.8	46.87	V
2805.5	54.85	7.9	46.95	H
2827.0	55.92	8.1	47.82	V
2862.7	55.84	8.5	47.34	H
2924.7	55.56	8.8	46.76	H
2960.3	54.95	8.7	46.25	V

Ch39 1GHz-3GHz (Average)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2729.0	42.38	7.8	34.58	V

2805.5	42.66	7.9	34.76	H
2827.0	42.8	8.1	34.7	V
2862.7	43.04	8.5	34.54	H
2924.7	43.48	8.8	34.68	H
2960.3	43.35	8.7	34.65	V

Ch39 3GHz-18GHz (Peak)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
12978.8	52.27	17.3	34.97	H
13930.8	52.58	18.5	34.08	H
14947.0	54.57	20.6	33.97	H
16025.3	59.89	25.3	34.59	V
16881.9	60.08	27.4	32.68	H
17800.4	60.04	28.4	31.64	V

Ch39 3GHz-18GHz (Average)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
14947.0	42.47	20.6	21.87	H
16025.3	47.18	25.3	21.88	V
16881.9	47.91	27.4	20.51	H
17800.4	47.72	28.4	19.32	V

Secondary supply

Channel	Frequency Range	Test Results	Conclusion
Ch0 2402MHz	30MH~1GHz	Fig.24	P
	1GHz~3GHz	Fig.25	P
	3GHz~18GHz	Fig.26	P

Ch0 30MHz-1GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity

34.1	13.39	-22	35.39	V
35.3	13.46	-21.9	35.36	V
37.2	23.88	-21.4	45.28	H
110.8	8.87	-23.6	32.47	H
476.7	15.53	-17.4	32.93	H
807.6	21.73	-10.8	32.53	V

Ch0 1GHz-3GHz (Peak)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2619.6	54.58	7.5	47.08	H
2670.2	54.98	7.8	47.18	H
2766.2	53.76	7.8	45.96	H
2832.3	54.9	8.2	46.7	H
2931.1	56.34	8.7	47.64	H
2972.2	55.38	8.8	46.58	H

Ch0 1GHz-3GHz (Average)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2619.6	42.1	7.5	34.6	H
2670.2	42.58	7.8	34.78	H
2832.3	42.74	8.2	34.54	H
2931.1	43.53	8.7	34.83	H
2972.2	43.54	8.8	34.74	H

Ch0 3GHz-18GHz (Peak)

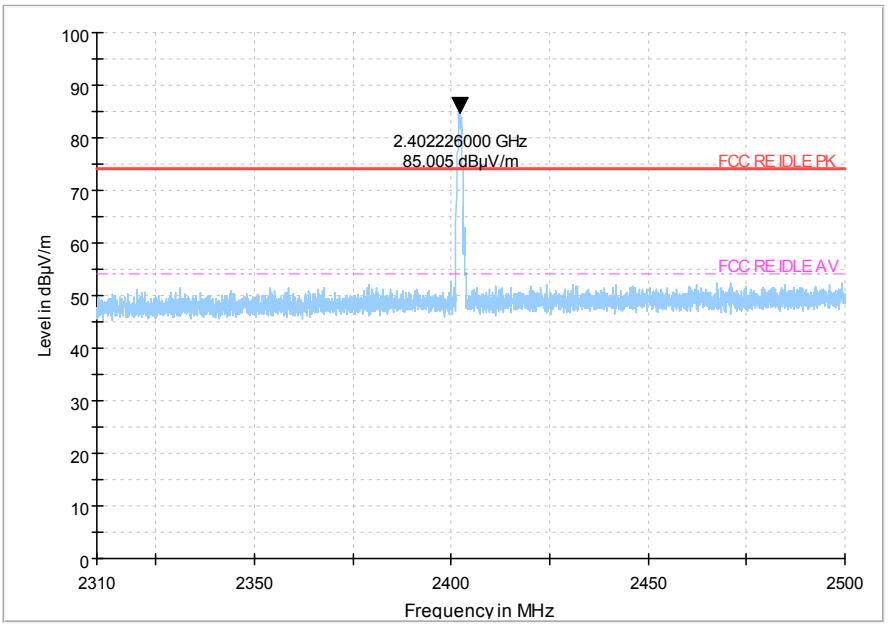
Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
12878.7	53.39	16.9	36.49	H
14285.8	54.66	20.6	34.06	V
15586.3	56.87	22.8	34.07	V

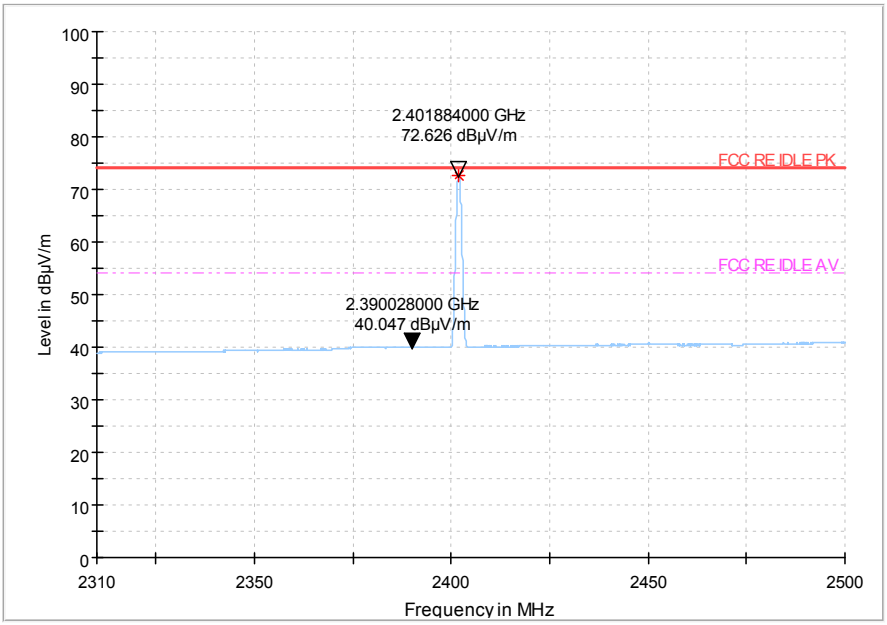
16235.2	59.17	25.2	33.97	H
16881.5	60.7	27.4	33.3	V
17799.5	60.77	28.4	32.37	V

Ch0 3GHz-18GHz (Average)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
14285.8	42.54	20.6	21.94	V
15586.3	44.62	22.8	21.82	V
16235.2	46.2	25.2	21	H
16881.5	47.94	27.4	20.54	V
17799.5	47.54	28.4	19.14	V

Note: Only the worst case is written in the report.
Conclusion: PASS
Test graphs as below:
Main supply





Bandedge: CH0

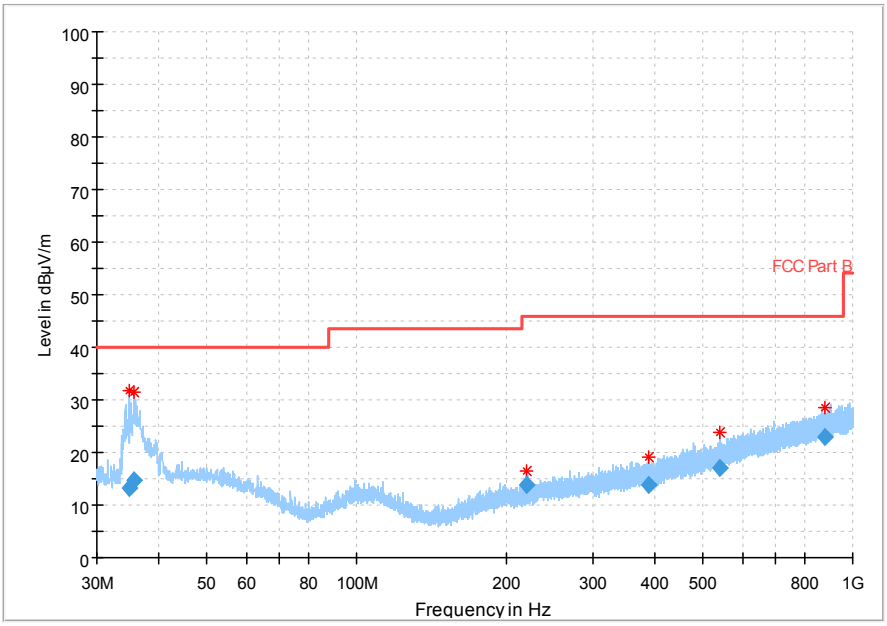


Fig.18 Radiated emission: CH0, 30MHz~1GHz

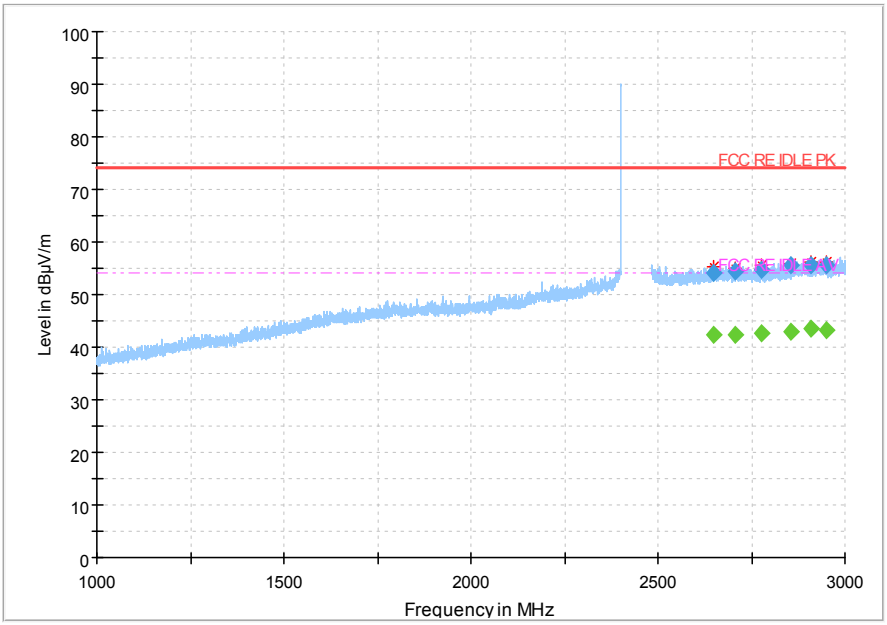


Fig.19 Radiated emission: CH0, 1GHz~3GHz

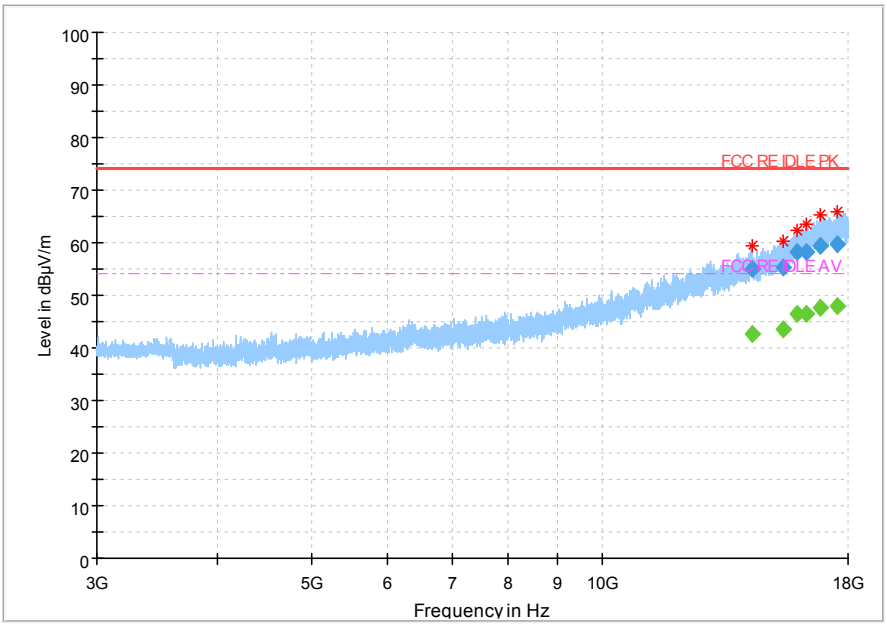
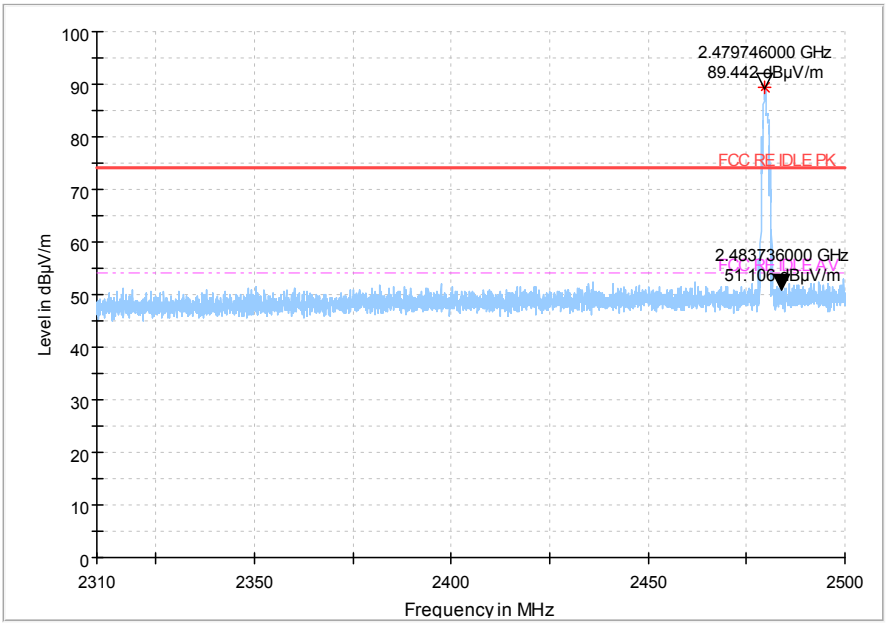
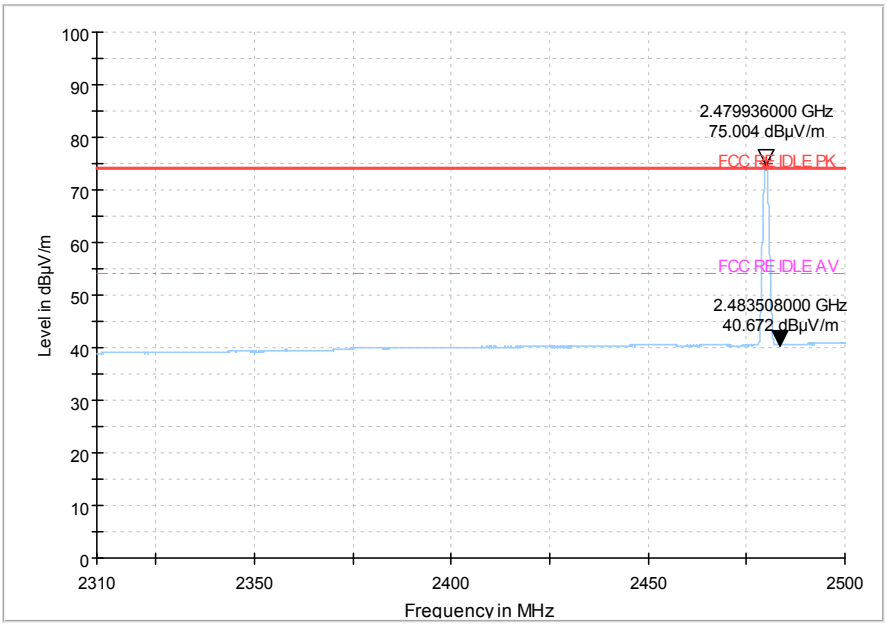


Fig.20 Radiated emission: CH0, 3GHz~18GHz





Bandedge:CH39

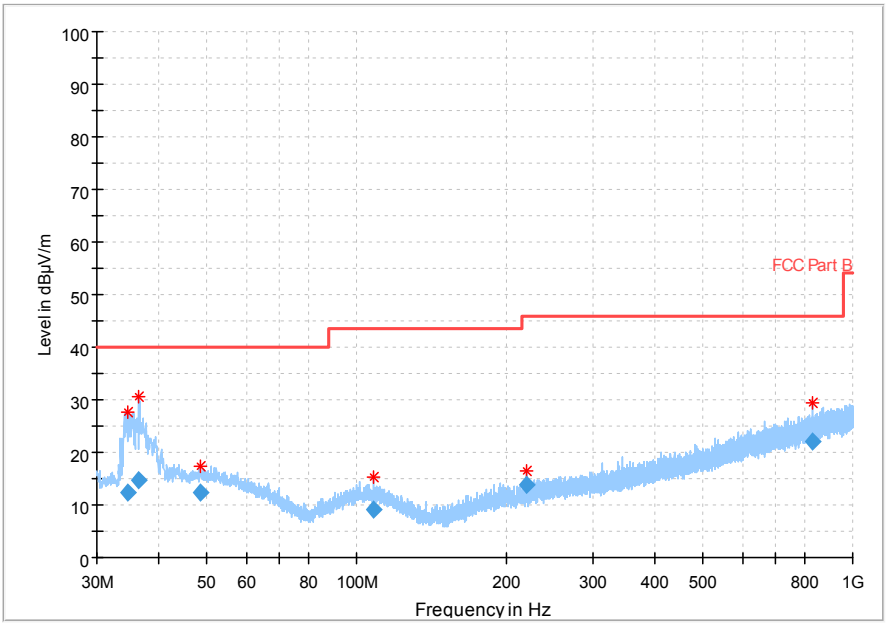


Fig.21 Radiated emission: CH39, 30MHz~1GHz

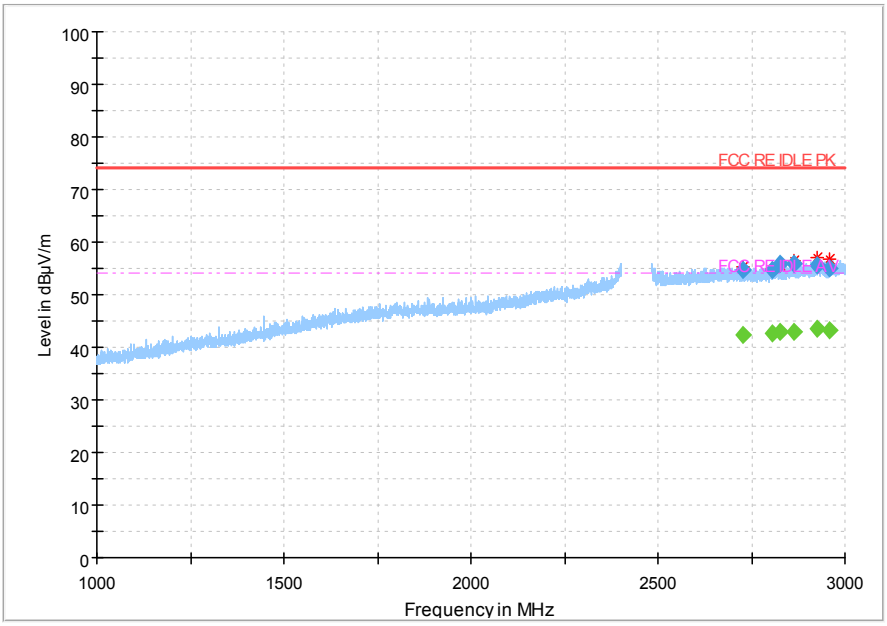


Fig.22 Radiated emission: CH39, 1GHz~3GHz

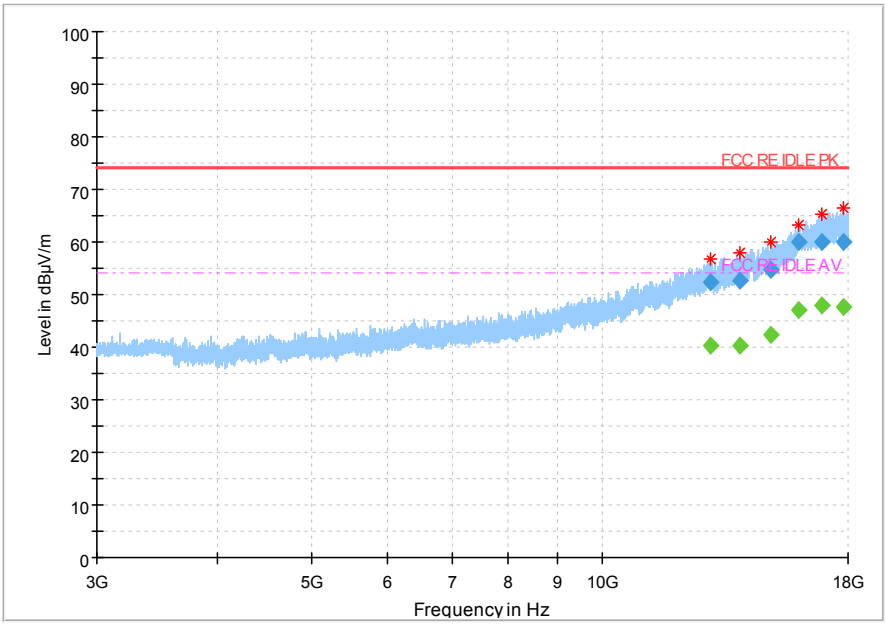
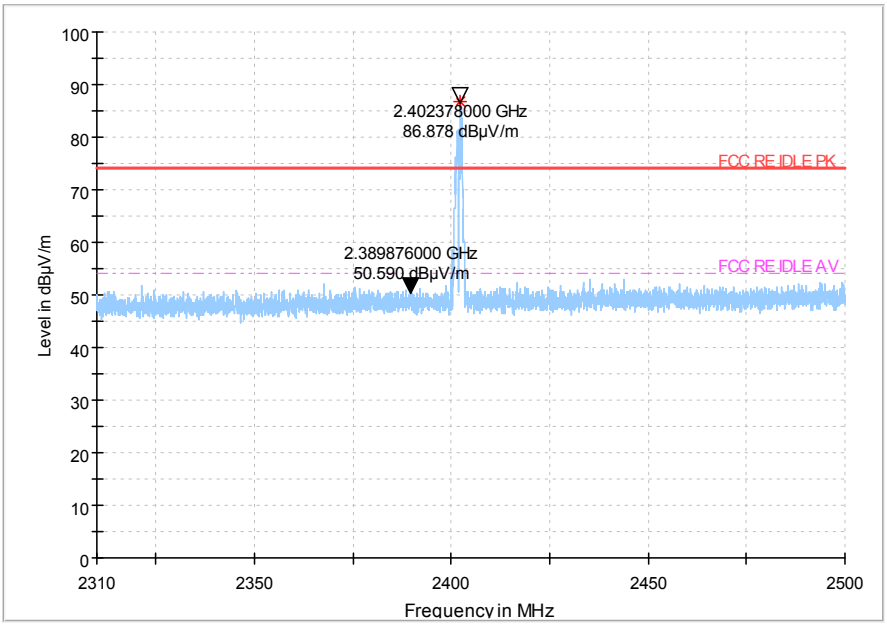
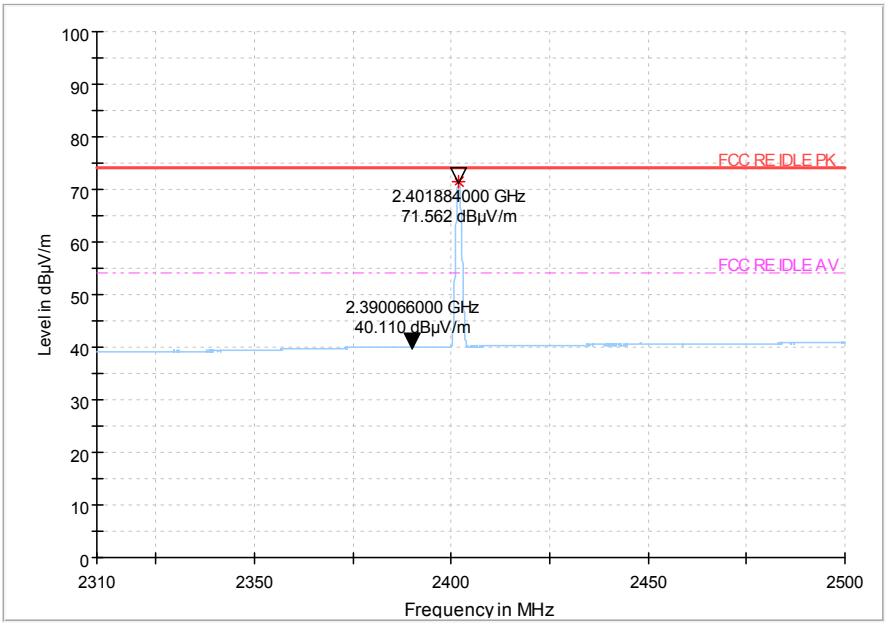


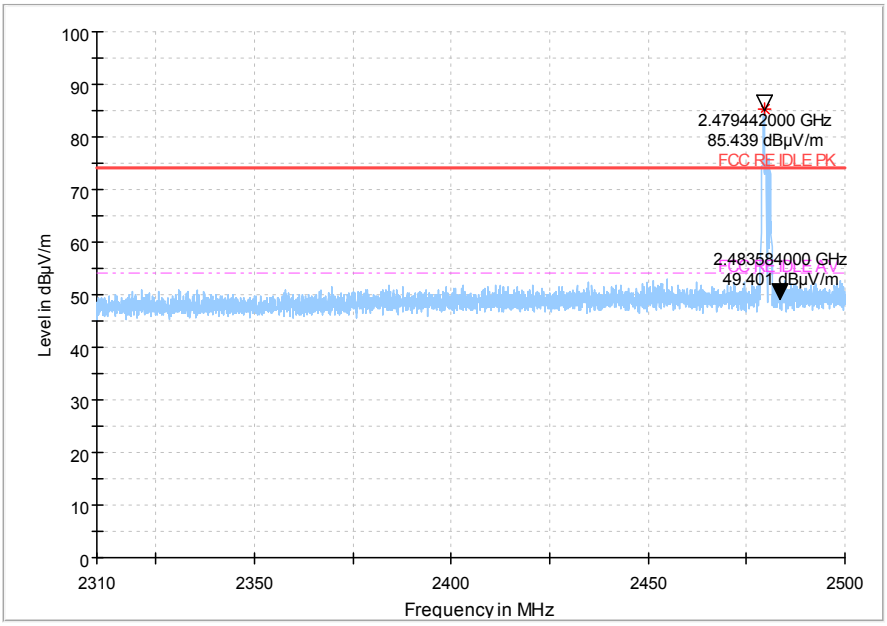
Fig.23 Radiated emission: CH39, 3GHz~18GHz

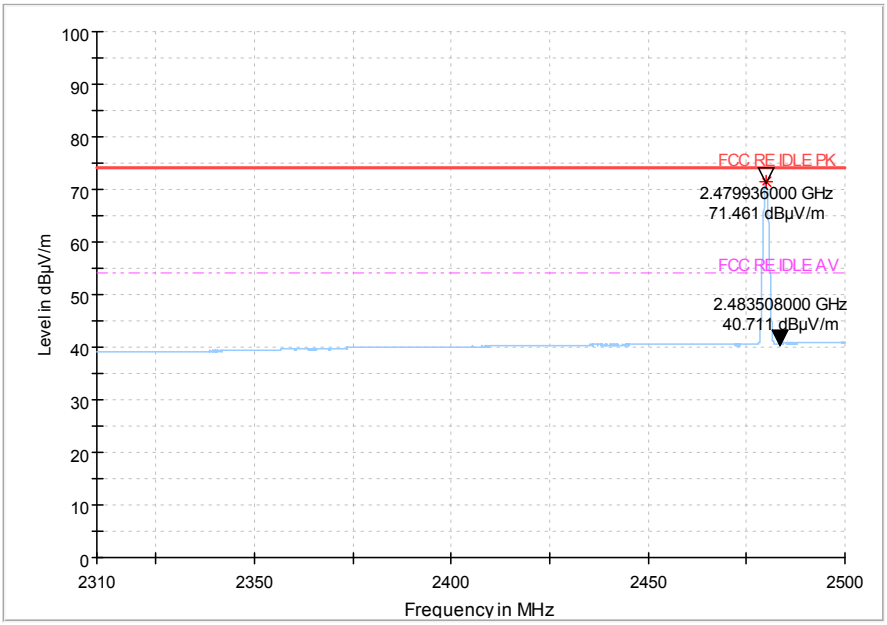
Secondary supply





Bandedge: CH0





Bandedge: CH39

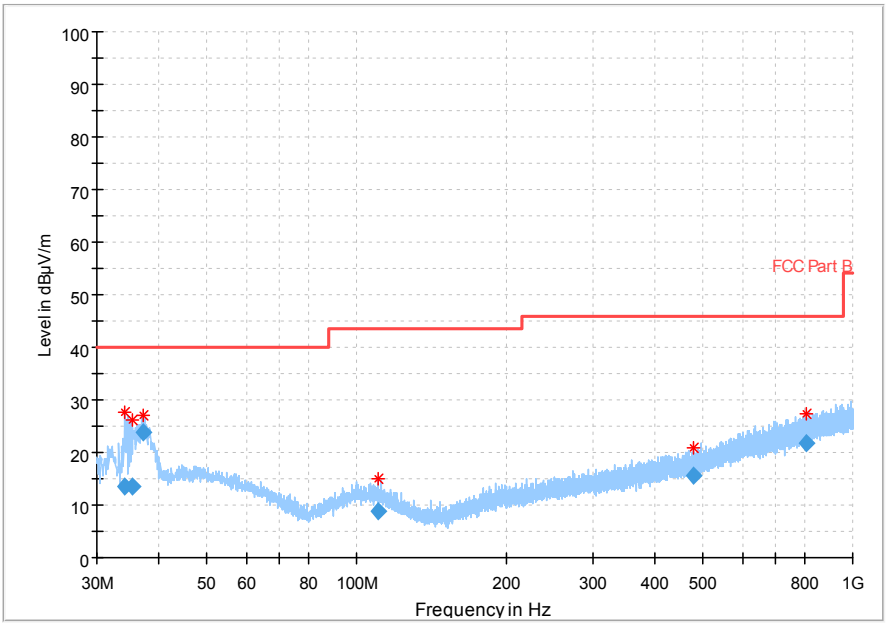


Fig.24 Radiated emission: CH0, 30MHz~1GHz

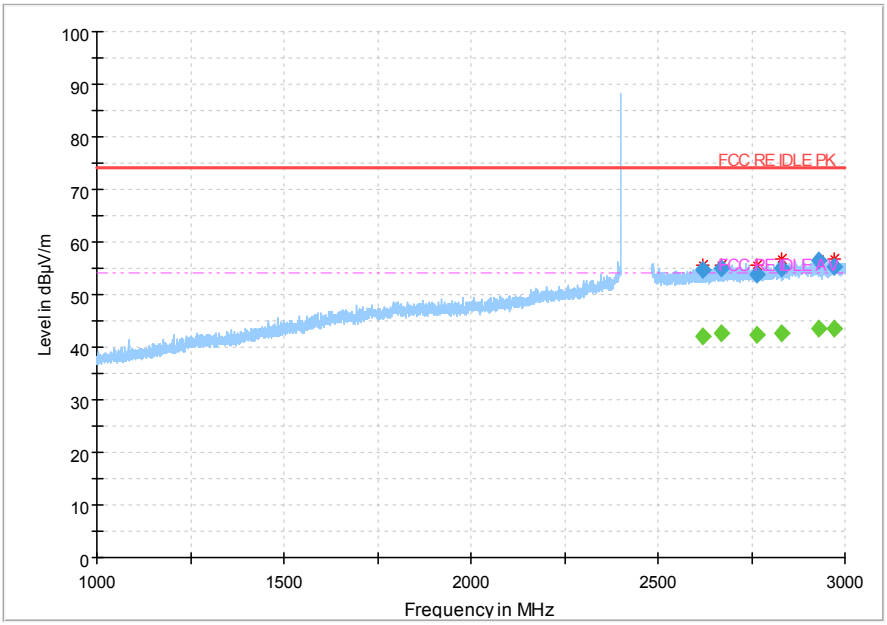


Fig.25 Radiated emission: CH0, 1GHz~3GHz

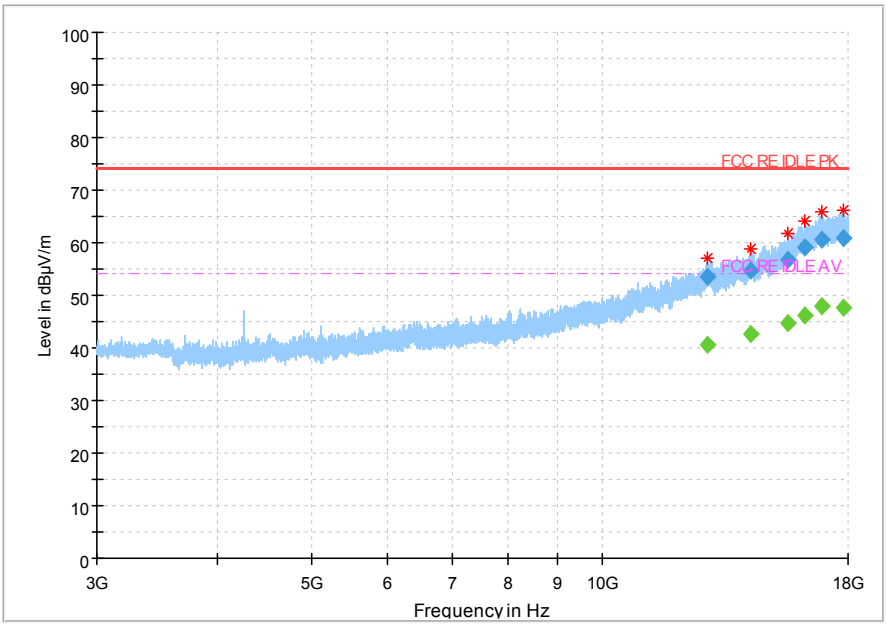
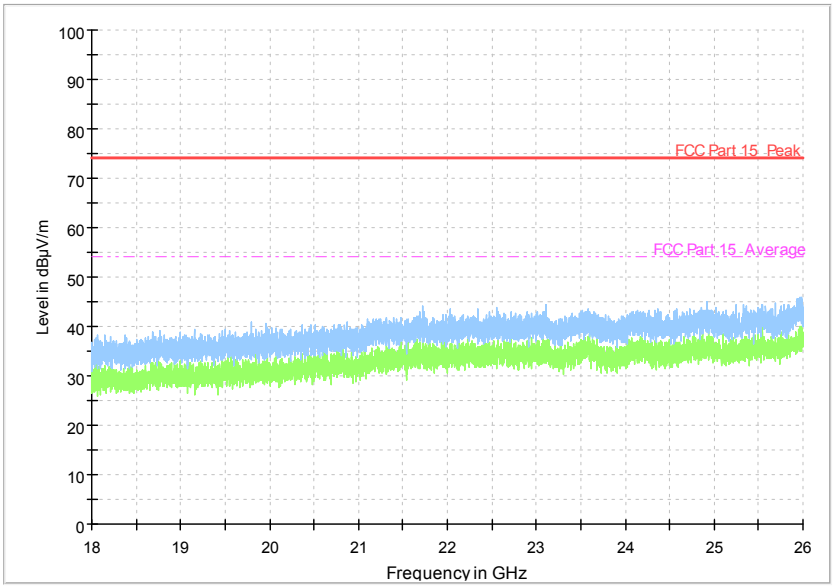


Fig.26 Radiated emission: CH0, 3GHz~18GHz



ALL Channel 18GHz~26GHz

6.7. AC Powerline Conducted Emission

Method of Measurement: See ANSI C63.10-2013-clause 6.2

1 The one EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is selected for the final measurement, while applying the appropriate modulating signal to the EUT.

2 If the EUT is relocated from an exploratory test site to a final test site, the highest emissions shall be remaximized at the final test location before final ac power-line conducted emission measurements are performed.

3 The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment in the system) is then performed for the full frequency range for which the EUT is being tested for compliance without further variation of the EUT arrangement, cable positions, or EUT mode of operation.

4 If the EUT is comprised of equipment units that have their own separate ac power connections, e.g., floor-standing equipment with independent power cords for each shelf that are able to connect directly to the ac power network, each current-carrying conductor of one unit is measured while the other units are connected to a second (or more) LISN(s). All units shall be separately measured. If a power strip is provided by the manufacturer, to supply all of the units making up the EUT, only the conductors in the power cord of the power strip shall be measured.

If the EUT uses a detachable antenna, these measurements shall be made with a suitable dummy load connected to the antenna output terminals; otherwise, the tests shall be made with the antenna connected and, if adjustable, fully extended. When measuring the ac conducted emissions from a device that operates between 150 kHz and 30 MHz a

non-detachable antenna may be replaced with a dummy load for the measurements within the fundamental emission band of the transmitter, but only for those measurements.36 Record the six highest EUT emissions relative to the limit of each of the current-carrying conductors of the power cords of the equipment that comprises the EUT over the frequency range specified by the procuring or regulatory agency. Diagram or photograph the test setup that was used. See Clause 8 for full reporting requirements.

Test Condition:

Voltage（V）	Frequency（Hz）
120	60

Measurement Uncertainty

Measurement Items	Range	Confidence Level	Calculated Uncertainty
AC Power line Conducted Emission	0.15MHz-30MHz	95%	±5.66 db

Main supply

Measurement Result and limit:

(Quasi-peak-average Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV) With charger BLE	Conclusion
0.15 to 0.5	66 to 56	56 to 46	Fig.24	P
0.5 to 5	56	46		
5 to 30	60	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Conclusion: Pass

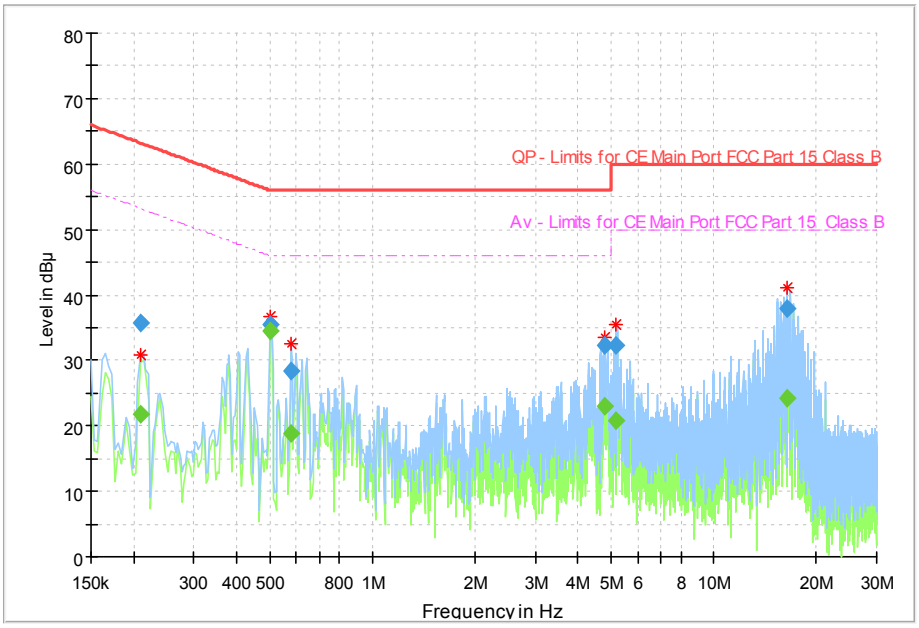


Fig.24 AC Powerline Conducted Emission

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.209700	---	21.68	53.22	31.53	1000.0	9.000	L1	ON	9.7
0.209700	35.67	---	63.22	27.55	1000.0	9.000	L1	ON	9.7
0.504469	---	34.60	46.00	11.40	1000.0	9.000	L1	ON	9.7
0.504469	35.36	---	56.00	20.64	1000.0	9.000	L1	ON	9.7
0.579094	---	18.90	46.00	27.10	1000.0	9.000	L1	ON	9.7
0.579094	28.33	---	56.00	27.67	1000.0	9.000	L1	ON	9.7
4.787944	---	22.88	46.00	23.12	1000.0	9.000	L1	ON	9.8
4.787944	32.20	---	56.00	23.80	1000.0	9.000	L1	ON	9.8
5.194650	---	20.70	50.00	29.30	1000.0	9.000	L1	ON	9.8
5.194650	32.18	---	60.00	27.82	1000.0	9.000	L1	ON	9.8
16.444369	---	24.32	50.00	25.68	1000.0	9.000	L1	ON	9.9
16.444369	37.99	---	60.00	22.01	1000.0	9.000	L1	ON	9.9

Secondary supply

Measurement Result and limit:

(Quasi-peak-average Limit)

Frequency range (MHz)	Quasi-peak Limit (dBµV)	Average Limit (dBµV)	Result (dBµV) With charger BLE	Conclusion
0.15 to 0.5	67 to 56	56 to 46	Fig.25	P
0.5 to 5	56	46		

5 to 30	60	50		
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Conclusion: Pass

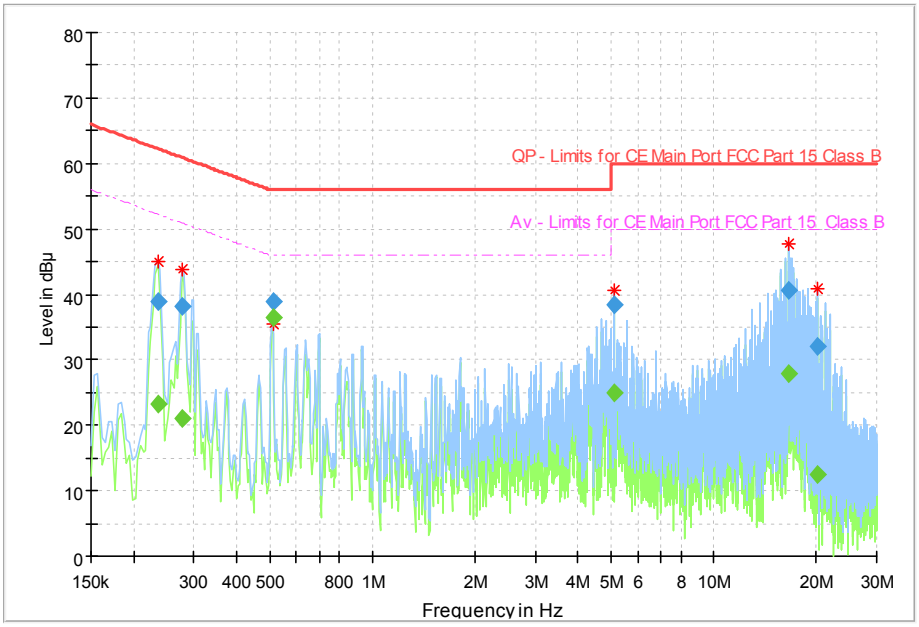


Fig.25 AC Powerline Conducted Emission

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.235819	---	23.18	52.24	29.06	1000.0	9.000	L1	ON	9.7
0.235819	38.99	---	62.24	23.26	1000.0	9.000	L1	ON	9.7
0.276863	---	20.97	50.91	29.94	1000.0	9.000	L1	ON	9.7
0.276863	38.19	---	60.91	22.72	1000.0	9.000	L1	ON	9.7
0.511931	---	36.44	46.00	9.56	1000.0	9.000	L1	ON	9.7
0.511931	38.94	---	56.00	17.06	1000.0	9.000	L1	ON	9.7
5.101369	---	24.94	50.00	25.06	1000.0	9.000	L1	ON	9.8
5.101369	38.45	---	60.00	21.55	1000.0	9.000	L1	ON	9.8
16.533919	---	27.86	50.00	22.14	1000.0	9.000	L1	ON	9.9
16.533919	40.63	---	60.00	19.37	1000.0	9.000	L1	ON	9.9
20.089800	---	12.40	50.00	37.60	1000.0	9.000	N	ON	9.9
20.089800	32.06	---	60.00	27.94	1000.0	9.000	N	ON	9.9

7. Test Equipment and Ancillaries Used For Tests

The test equipment and ancillaries used are as follows.

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Cal.interval
1	Vector Signal Analyzer	FSQ26	101096	Rohde&Schwarz	2018-05-11	1 Year
2	DC Power Supply	ZUP60-14	LOC-220Z006-0007	TDL-Lambda	2018-05-11	1 Year

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Cal.interval
1	Universal Radio Communication Tester	CMU200	123123	R&S	2018-05-11	1 Year
2	EMI Test Receiver	ESU40	100307	R&S	2018-05-11	1 Year
3	TRILOG Broadband Antenna	VULB9163	VULB9163-515	Schwarzbeck	2017-02-25	3 Year
4	Double-ridged Waveguide Antenna	ETS-3117	00135890	ETS	2017-01-11	3 Year
5	2-Line V-Network	ENV216	101380	R&S	2018-05-11	1 Year

Anechoic chamber

Fully anechoic chamber by Frankonia German.

8. Test Environment

Shielding Room1 (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Ground system resistance	< 0.5

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =25 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 k
Ground system resistance	< 0.5

Fully-anechoic chamber1 (6.9 meters×10.9 meters×5.4 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 25 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 k
Ground system resistance	< 0.5
VSWR	Between 0 and 6 dB, from 1GHz to 18GHz
Site Attenuation Deviation	Between -4 and 4 dB,30MHz to 1GHz
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

ANNEX A. Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

ANNEX B. Accreditation Certificate

Accredited Laboratory

A2LA has accredited

EAST CHINA INSTITUTE OF TELECOMMUNICATIONS

Shanghai, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

Presented this 15th day of March 2017.

President and CEO
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2019

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

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