TEST REPORT

No. I19D00119-SRD02

For

Client : Inseego Corp.

Production : Industrial Cellular Gateway with Ethernet,WiFi, Bluetooth,GPS/GLNSS and USB Connectivity

Model Name : SKG1EM7455

Brand Name : SKYUS 160NE

FCC ID : PKRISGSKG1EM7455

IC ID : 3229A-SKG1EM7455

Hardware Version : P2

Software Version : 2.110.1.2

Issued date : 2019-11-14

NOTE

1. The test results in this test report relate only to the devices specified in this report.
2. This report shall not be reproduced except in full without the written approval of East China Institute of Telecommunications.
3. For the test results, the uncertainty of measurement is not taken into account when judging the compliance with specification, and the results of measurement or the average value of measurement results are taken as the criterion of the compliance with specification directly.

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Revision Version

Report Number	Revision	Date	Memo
I19D00119-SRD02	00	2019-08-12	Initial creation of test report
I19D00119-SRD02	01	2019-11-07	Second creation of test report
I19D00119-SRD02	02	2019-11-14	Third creation of test report

CONTENTS

1. Test Laboratory

1.1. Testing Location

Company Name	East China Institute of Telecommunications
Address	7-8/F., Area G, No.668, Beijing East Road, Shanghai, China
Postal Code	200001
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FCC registration No	CN1177
IC registration No	10766A-1

1.2. Testing Environment

Normal Temperature	15℃-35℃
Relative Humidity	20%-75%

1.3. Project Data

Project Leader	Chen Minfei
Testing Start Date	2019-08-01
Testing End Date	2019-08-03

1.4. Signature

Wang Liang
(Prepared this test report)

Fan Songyan
(Reviewed this test report)

Zheng Zhongbin
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name	Inseego Corp.
Address	9605 Scranton Road, Suite 300, San Diego, CA 92121, USA
Telephone	+1 858-812-0606
Postcode	/

2.2. Manufacturer Information

Company Name	Inseego Corp.
Address	9605 Scranton Road, Suite 300, San Diego, CA 92121, USA
Telephone	+1 858-812-0606
Postcode	/

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

3.1. About EUT

Production	Industrial Cellular Gateway with Ethernet,WiFi,Bluetooth,GPS/GLNSS and USB Connectivity
Model name	SKG1EM7455
BLE Frequency	2402MHz-2480MHz
BLE Channel	Channel0-Channel39
BLE Modulation	GFSK;
Additional Communication Function	BT/BLE/2.4G WLAN 802.11 b/g/n20 5G WLAN 802.11 a/n20/ac20
Extreme Temperature	-30/+60℃
Nominal Voltage	12V
Extreme High Voltage	32V
Extreme Low Voltage	9V
Maximum of Antenna Gain	Bluetooth: 3dBi

Note:

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

b. The value of the antenna gain is provided by the customer. For specific antenna information, please check the antenna specifications of the customer.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
N14	/	2.110.1.2	P2	2019-07-30
N16	/	2.110.1.2	P2	2019-07-30
N20	/	2.110.1.2	P2	2019-07-25

*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	Type	Manufacturer
AE1	RF cable	---	AE1

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

4. Reference Documents

4.1. Documents supplied by applicant

All technical documents are supplied by the client or manufacturer, which is the basis of testing.

4.2. 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.	2018-10-01
RSS-247	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices	2017
RSS-Gen	General Requirements for Compliance of Radio Apparatus	2018
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013
KDB 558074	Guidance for Performing Compliance Measurements on Frequency Hopping Spread Spectrum systems (DSS) Operating Under §15.247	v05r02

5. Test Results

5.1. Summary of Test Results

Measurement Items	Sub-clause of Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.247(b)	RSS-2475.4	P
Peak Power Spectral Density	15.247(e)	RSS-2475.2	P
6dB Occupied Bandwidth	15.247(a)	RSS-2475.2	P
99% Occupied Bandwidth	/	RSS-Gen 6.6	P
Band Edges Compliance	15.247(d)	RSS-2475.5	P
Transmitter Spurious Emission-Conducted	15.247	RSS-2475.5	P
Transmitter Spurious Emission-Radiated	15.247	RSS-2475.5	P
AC Powerline Conducted Emission	15.107,15.207	RSS-247 Gen 3.2	P

Note: please refer to Annex A in this test report for the detailed test results.

The following terms are used in the above table.

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

5.2. Statements

The SKG1EM7455 is an initial product for testing.

ECIT only performed test cases which identified with P/NP/NA/F results in Annex A.

ECIT has verified that the compliance of the tested device specified in section 3 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 4 of this test report.

6. Test Equipments Utilized

6.1. Conducted Test System

Item	Instrument Name	Type	SN	Manufacturer	Cal. Date	Cal. interval
1	Vector Signal Analyzer	FSQ26	101091	R&S	2019-05-10	1 year
2	DC Power Supply	ZUP60-14	LOC-220Z006-0007	TDL-Lambda	2019-05-10	1 year

6.2. Radiated Emission Test System

Item	Instrument Name	Type	SN	Manufacturer	Cal. Date	Cal. interval
1	Universal Radio Communication Tester	CMU200	123123	R&S	2019-05-10	1 year
2	EMI Test Receiver	ESU40	100307	R&S	2019-05-10	1 year
3	TRILOG Broadband Antenna	VULB9163	VULB9163-515	Schwarzbeck	2017-02-25	3 years
4	Double- ridged Waveguide Antenna	ETS-3117	00135890	ETS	2017-01-11	3 years
5	2-Line V-Network	ENV216	101380	R&S	2019-05-10	1 year

6.3. Conducted Test Software

Software Name	Version
Eagle1.0	20181112

6.4. Radiated Test Software

Software Name	Version
EMC32	V10.35.02

Anechoic chamber

Fully anechoic chamber by ETS.

7. Measurement Uncertainty

Measurement uncertainty for all the testing in this report are within the limit specified in ECIT documents . The detailed measurement uncertainty is defined in ECIT documents.

Measurement Items	Range	Confidence Level	Calculated Uncertainty
Peak Output Power-Conducted	2402MHz-2480MHz	95%	±0.544dB
Peak Power Spectral Density	2402MHz-2480MHz	95%	±0.544dB
6dB Bandwidth	2402MHz-2480MHz	95%	±62.04Hz
Frequency Band Edges-Conducted	2390MHz-2488.5MHz	95%	±0.544dB
Conducted Emission	30MHz-2GHz	95%	±0.90dB
Conducted Emission	2GHz-3.6GHz	95%	±0.88dB
Conducted Emission	3.6GHz-8GHz	95%	±0.96dB
Conducted Emission	8GHz-20GHz	95%	±0.94dB
Conducted Emission	20GHz-22GHz	95%	±0.88dB
Conducted Emission	22GHz-26GHz	95%	±0.86dB
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
AC Power line Conducted Emission	0.15MHz-30MHz	95%	±3.66 db

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 Ω

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

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =30 %, Max. = 60 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

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 kΩ
Ground system resistance	< 0.5 Ω
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. Detailed Test Results

ANNEX A.1. Peak Output Power-Conducted

A.1.1 Measurement Limit

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

A.1.2 Test Condition:

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

A.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.

Measurement Results:

For GFSK

Channel	Ch0 2402 MHz	Ch19 2440 MHz	CH39 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	-0.898	-1.249	-1.463	P
	Fig.1	Fig.2	Fig.3	
EIRP(dBm)	2.102	1.751	1.537	

Conclusion: PASS

Test graphs an below

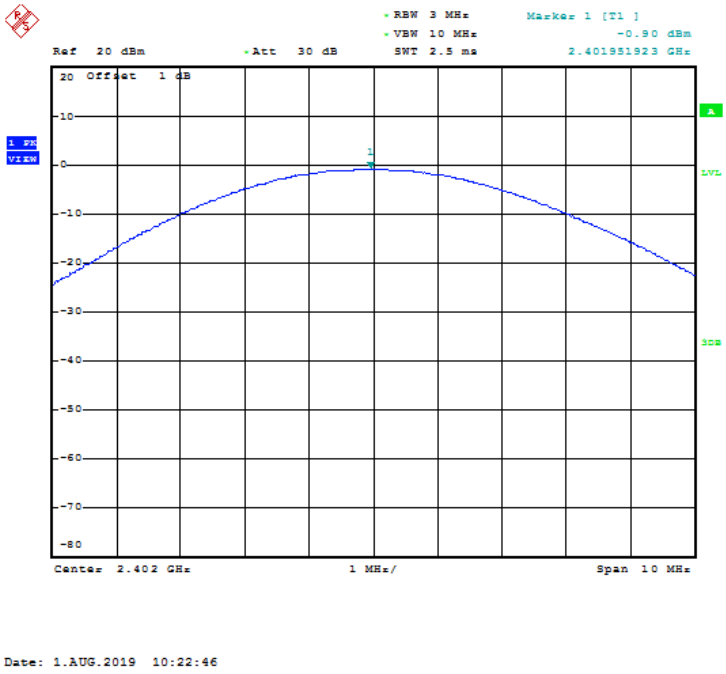


Fig.1 Peak Conducted Output Power CH0, DH1

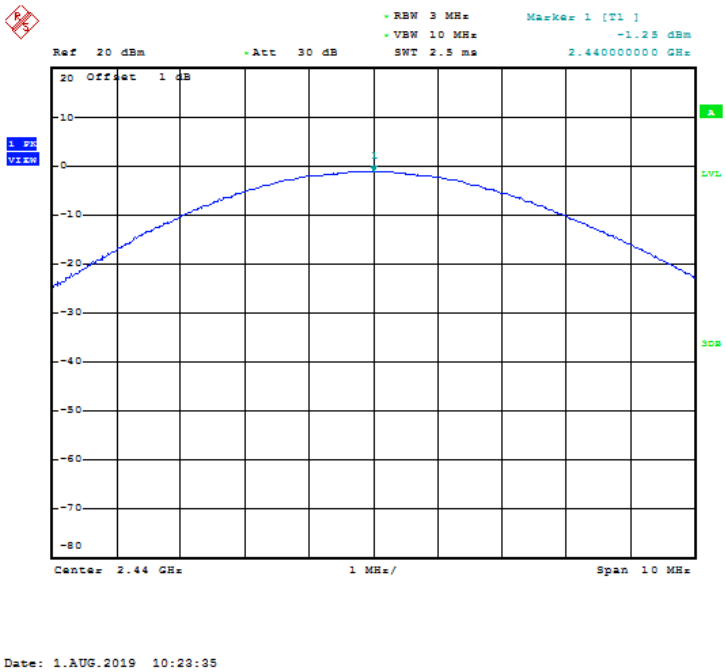


Fig.2 Peak Conducted Output Power CH19, DH1

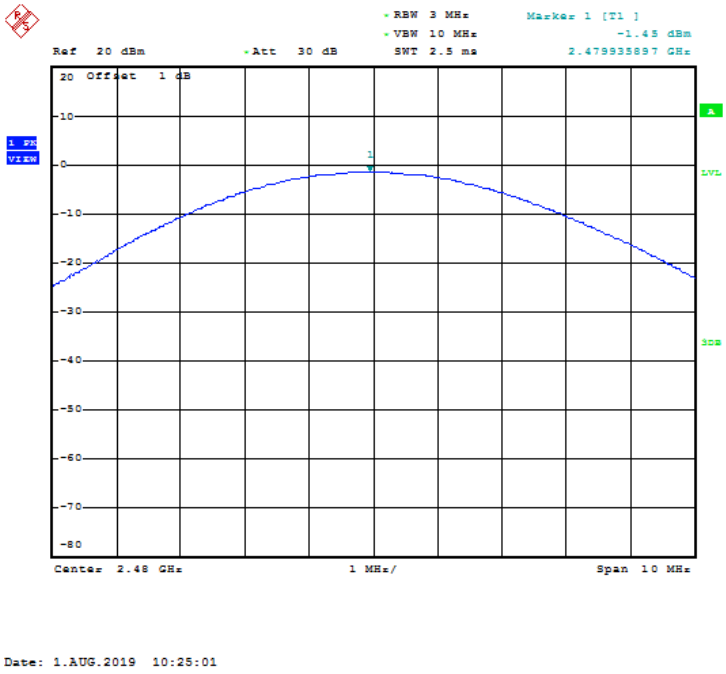


Fig.3 Peak Conducted Output Power CH39, DH1

ANNEX A.2. Peak Power Spectral Density

A.2.1 Measurement Limit:

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

A.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.

Measurement Results:

Mode	Channel	Power Spectral Density(dBm/3kHz)		Conclusion
BT-LE	00	Fig.4	-19.73	P
	19	Fig.5	-20.06	P
	39	Fig.6	-20.2	P

Test figure as below:

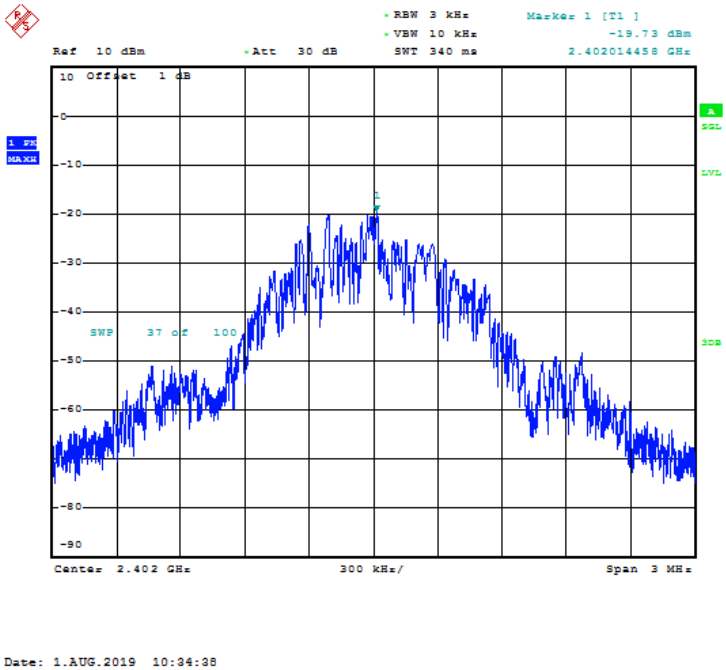


Fig.4 Power spectral density: CH0

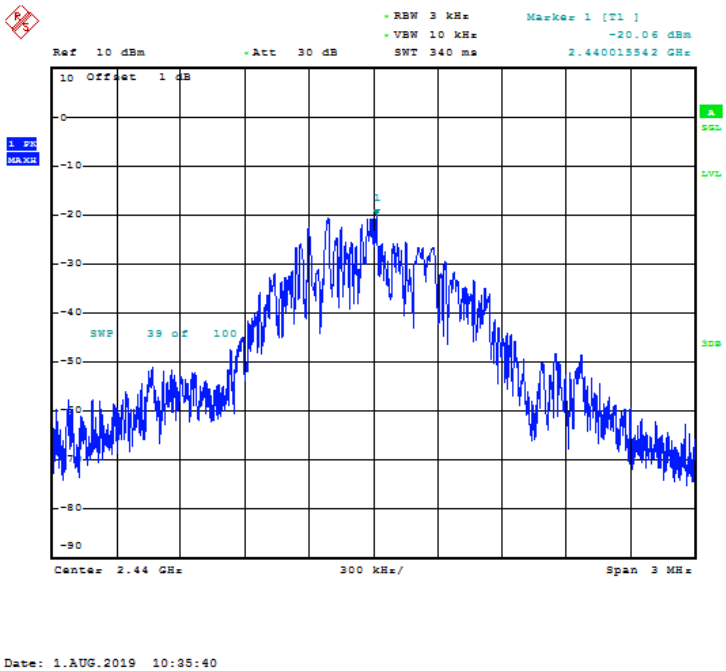


Fig.5 Power spectral density: CH19

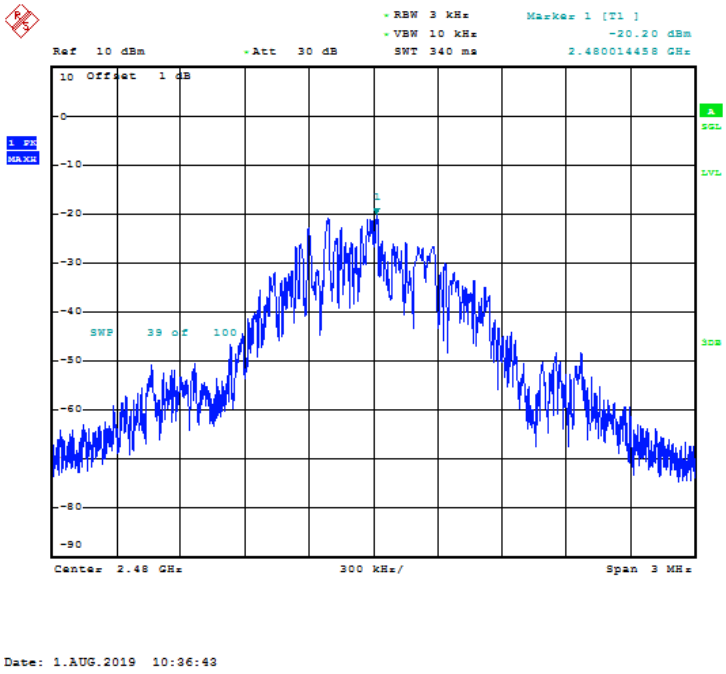


Fig.6 Power spectral density: CH39

ANNEX A.3. 6dB Bandwidth

A.3.1 Measurement Limit:

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

A.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.

Measurement Result:

For GFSK

Channel	6dB Bandwidth (kHz)		Conclusion
0	Fig.7	688	P
19	Fig.8	688	P
39	Fig.9	692	P

Conclusion: PASS

Test graphs as below:

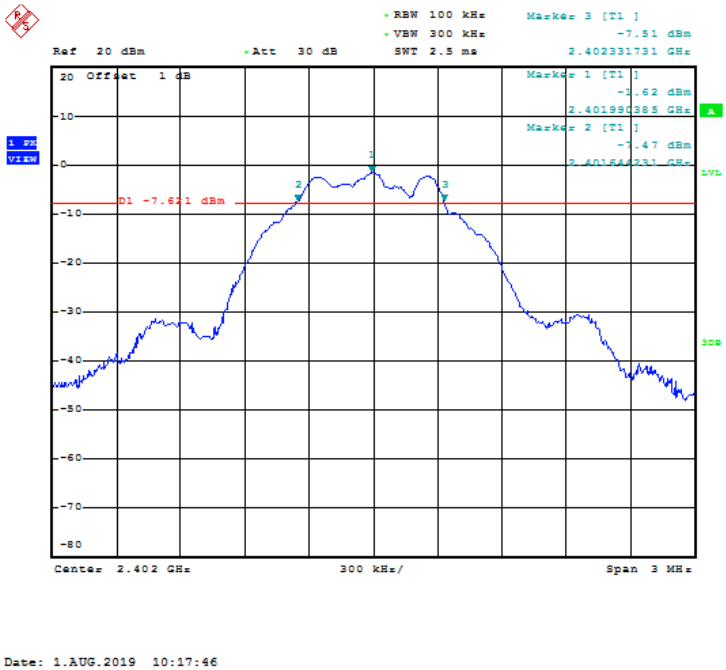


Fig.7 6dB Bandwidth: Ch0

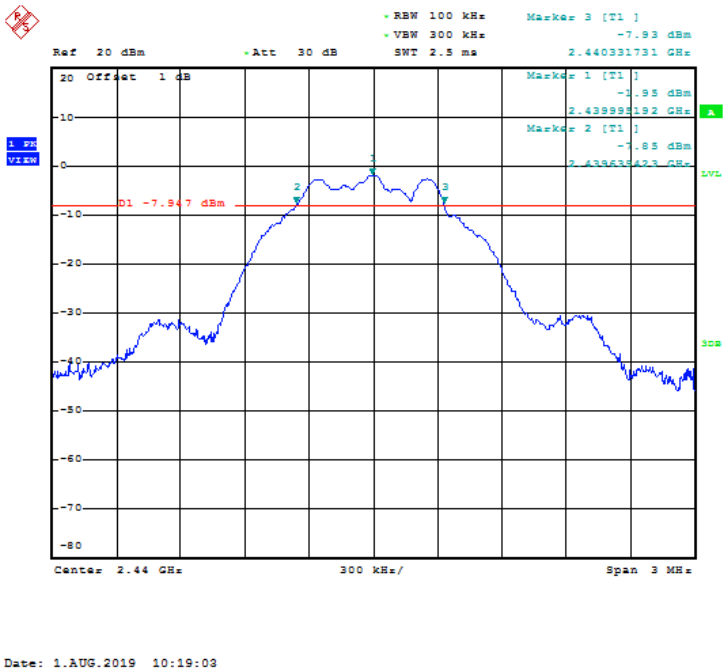


Fig.8 6dB Bandwidth: Ch19

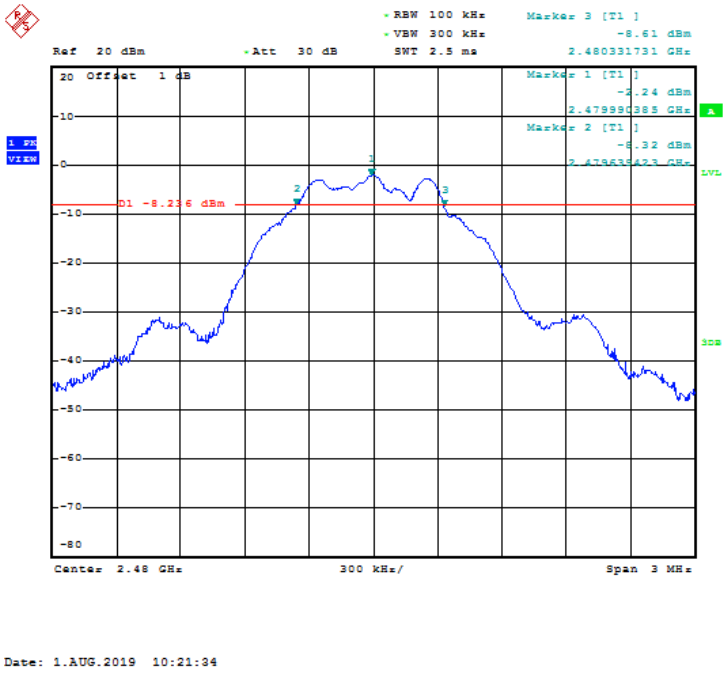


Fig.9 6dB Bandwidth: Ch39

ANNEX A.4. 99% Bandwidth

A.4.1 Measurement Limit:

Standard	Limit
RSS-Gen	⩾500k

A.4.2 Test procedures

The measurement is according to RSS-GEN clause 6.7

1. The EUT output RF connector was connected with a short cable to the spectrum analyzer.
2. Enable EUT transmit in fixed channel as center frequency of spectrum analyzer.
3. Setting spectrum analyzer as below, RBW : ~1% of the span without going below 1%; VBW: 3RBW; SPAN: Lowest frequency separation that is used within the Hopping sequence; Detector mode: RMS; Trace mode: MAX Hold; Sweep time:1s
4. Use the 99 % bandwidth function of the spectrum analyzer to measure the Occupied Channel Bandwidth of the EUT.
5. This value shall be recorded.

Measurement Result:

For GFSK

Channel	99% Bandwidth (MHz)		Conclusion
0	Fig.10	1.062	P
19	Fig.11	1.062	P
39	Fig.12	1.062	P

Conclusion: PASS

Test graphs as below:

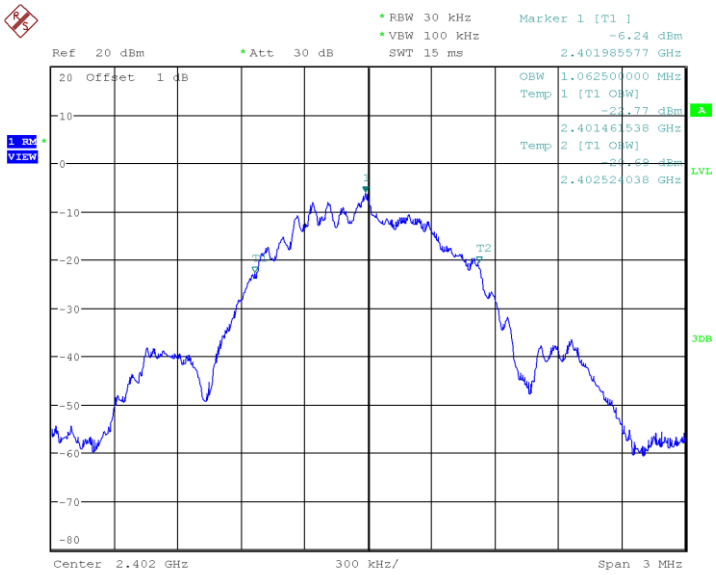


Fig.10 99% Bandwidth: Ch0

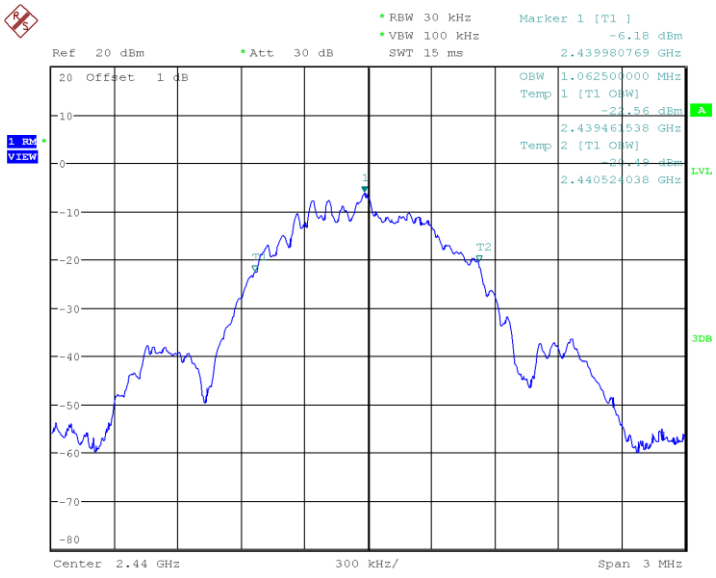


Fig.11 99% Bandwidth: Ch19

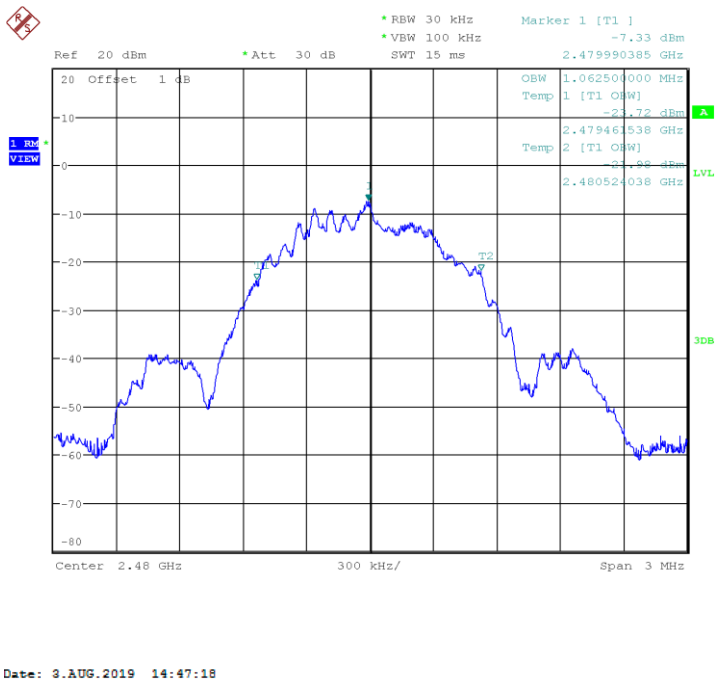


Fig.12 99% Bandwidth: Ch39

ANNEX A.5. Frequency Band Edges-Conducted

A.5.1 Measurement Limit:

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

A.5.2 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.

Measurement results

For GFSK

Channel	Band Edge Power (dBc)	Conclusion
0	Fig.13	P
39	Fig.14	P

Conclusion: PASS

Test graphs an below

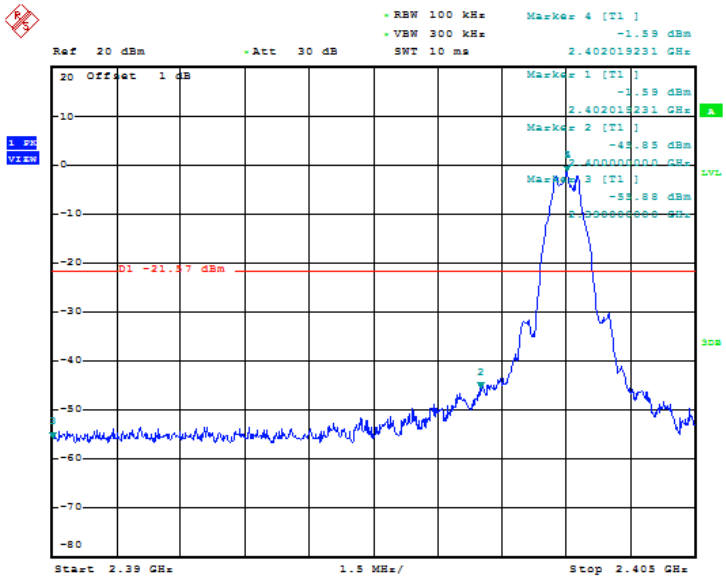


Fig.13 Frequency Band Edge: GFSK, Ch0

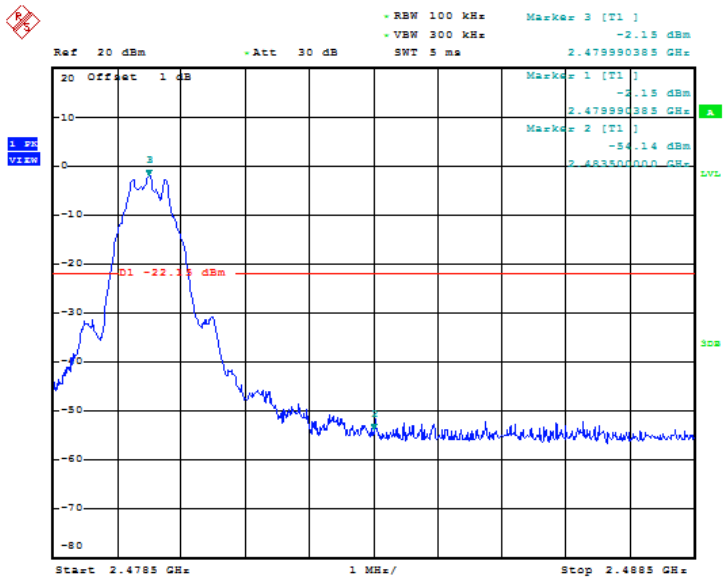


Fig.14 Frequency Band Edge: GFSK, Ch39

ANNEX A.6. Conducted Emission

A.6.1 Measurement Limit:

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

A.6.2 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.

Measurement Results:

Channel	Frequency Range	Test Results	Conclusion
Ch0 2402MHz	Center Freq.	Fig.15	P
	30MHz~26GHz	Fig.16	P
Ch19 2440MHz	Center Freq.	Fig.17	P
	30MHz~26GHz	Fig.18	P
Ch39 2480MHz	Center Freq.	Fig.19	P

	30MHz~26GHz	Fig.20	P

Conclusion: PASS

Test graphs as below

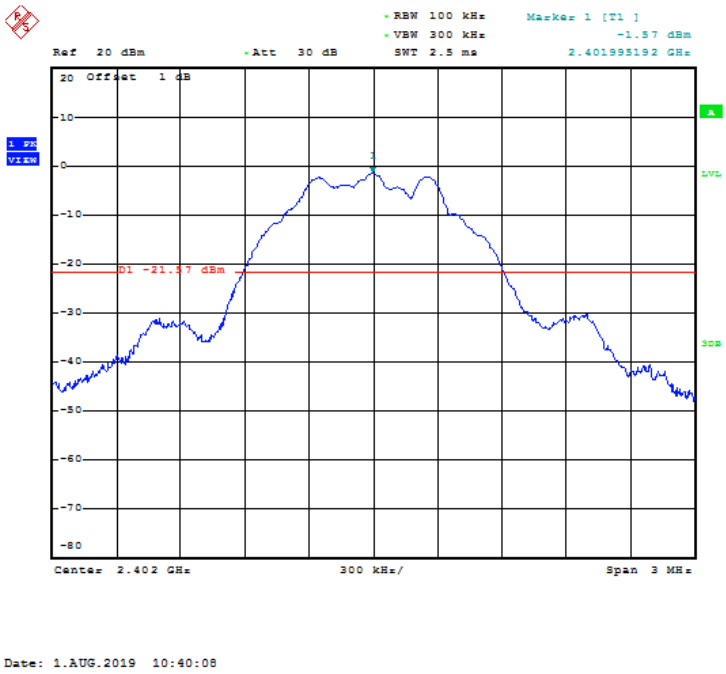


Fig.15 Conducted spurious emission: Ch0, 2402MHz

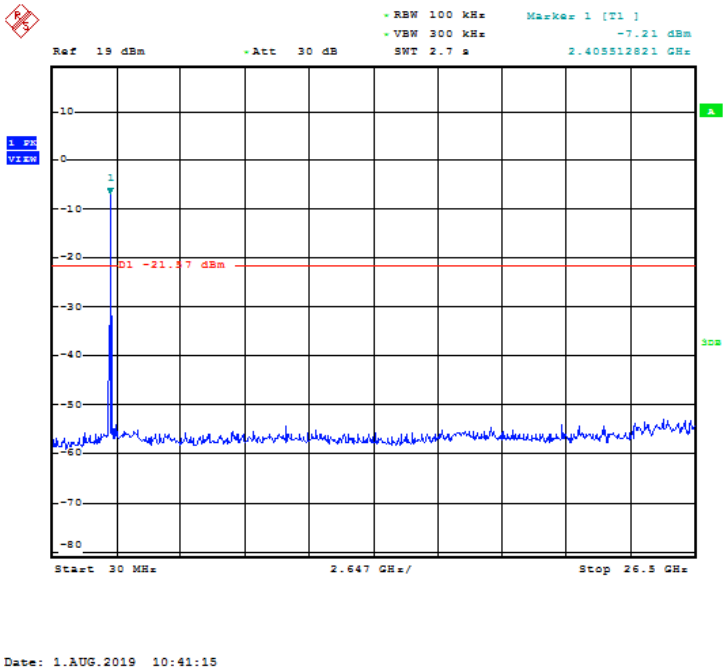


Fig.16 Conducted spurious emission: Ch0, 30MHz~26GHz

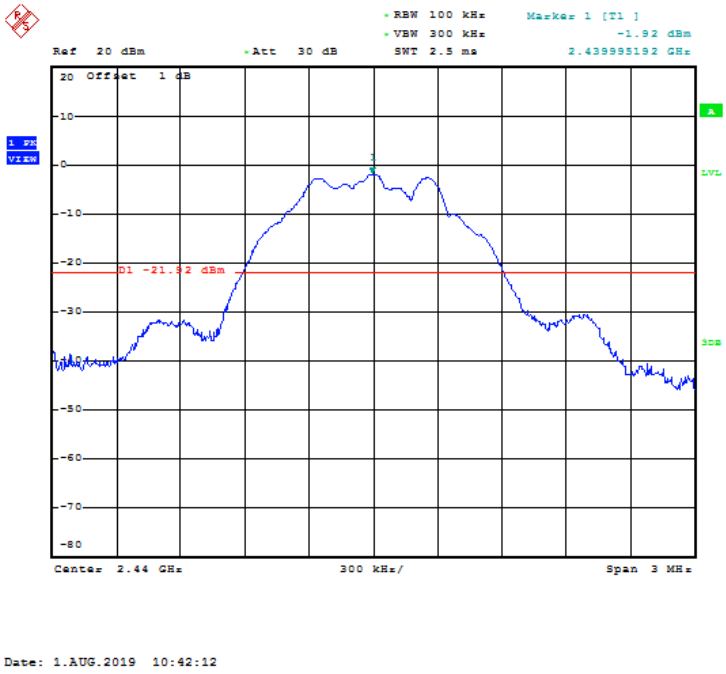


Fig.17 Conducted spurious emission: Ch19, 2440MHz

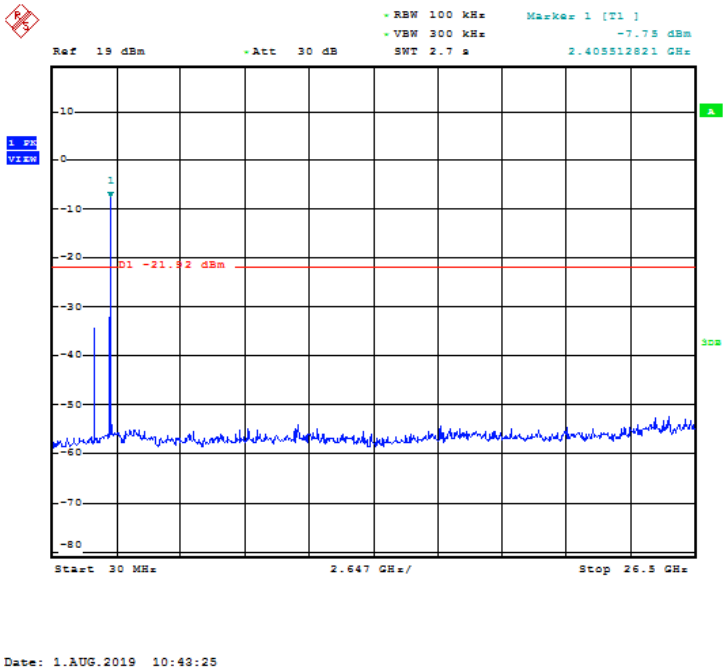


Fig.18 Conducted spurious emission: Ch19, 30MHz~26GHz

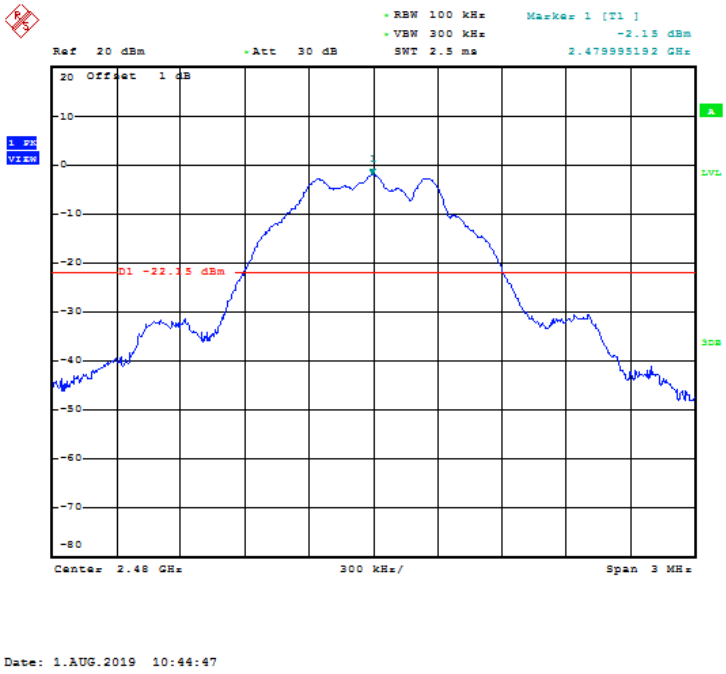


Fig.19 Conducted spurious emission: Ch39, 2480MHz

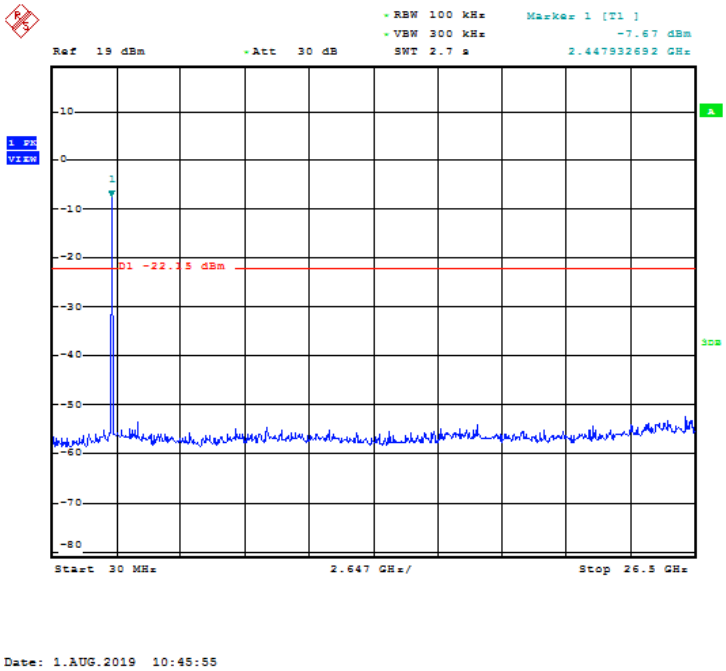


Fig.20 Conducted spurious emission: Ch39, 30MHz~26GHz

ANNEX A.7. Radiated Emission

A.7.1 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

A.7.2 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, 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

A.7.3 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}

Channel	Frequency Range	Test Results	Conclusion
Ch0 2402MHz	30MH~1GHz	Fig.21	P
	1GHz~3GHz	Fig.22	P
	3GHz~18GHz	Fig.23	P
Bandedge (low)	2.31GHz~2.5GHz	Fig.24	P

Channel	Frequency Range	Test Results	Conclusion
Ch39 2480MHz	30MH~1GHz	Fig.25	P
	1GHz~3GHz	Fig.26	P
	3GHz~18GHz	Fig.27	P
Bandedge (high)	2.31GHz~2.5GHz	Fig.28	P

Ch0 30MHz-1GHz (Peak)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
48.0	27.87	-25.2	53.07	V
60.0	31.79	-27.1	58.89	V
120.0	33.01	-29	62.01	H
168.0	33.15	-29.6	62.75	H
216.0	32.95	-27.4	60.35	H
360.0	32.45	-24.3	56.75	H

Ch0 1GHz-3GHz (Peak)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2511.1	54.55	3.6	50.95	V
2610.6	53.93	3.9	50.03	V
2692.3	54.4	4.6	49.8	V

2757.8	53.89	4.3	49.59	H
2853.4	54.39	5.1	49.29	V
2932.1	55.64	5.5	50.14	H

Ch0 1GHz-3GHz (Average)

Frequency(MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
2511.1	41.75	3.6	38.15	V
2692.3	42.36	4.6	37.76	V
2853.4	42.7	5.1	37.6	V
2932.1	43.56	5.5	38.06	H

Ch0 3GHz-18GHz (Peak)

Frequency(MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
11757.7	49.84	13.3	36.54	V
12862.2	52.77	16.8	35.97	V
14015.1	53.46	18.8	34.66	H
15169.1	55.53	21.2	34.33	H
16232.9	57.77	25.2	32.57	V
17428.9	60.16	26.8	33.36	H

Ch0 3GHz-18GHz (Average)

Frequency(MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
15169.1	42.86	21.2	21.66	H
16232.9	45.86	25.2	20.66	V
17428.9	46.94	26.8	20.14	H

Ch39 30MHz-1GHz (Peak)

Frequency(MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
48.0	28.94	-25.3	54.24	V
60.0	32.07	-27	59.07	V

120.0	34.16	-28.7	62.86	H
144.0	31.22	-31.2	62.42	H
168.0	34.1	-29.6	63.7	H
384.0	31.79	-23.9	55.69	V

Ch39 1GHz-3GHz (Peak)

Frequency(MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
2513.5	54.02	3.5	50.52	H
2594.9	53.38	3.7	49.68	H
2677.4	54.31	4.5	49.81	H
2751.7	53.48	4.2	49.28	H
2840.9	54.85	5	49.85	V
2930.3	55.62	5.5	50.12	V

Ch39 1GHz-3GHz (Average)

Frequency(MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
2513.5	41.79	3.5	38.29	H
2677.4	42.41	4.5	37.91	H
2840.9	42.5	5	37.5	V
2930.3	43.59	5.5	38.09	V
2513.5	41.79	3.5	38.29	H

Ch39 3GHz-18GHz (Peak)

Frequency(MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
13365.0	52.79	16.7	36.09	H
14325.7	54.59	20.3	34.29	V
15045.5	56.16	21	35.16	H
15962.8	58.79	24.9	33.89	V
16830.4	60.46	27.3	33.16	H

17761.6	60.52	28	32.52	V

Ch39 3GHz-18GHz (Average)

Frequency(MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
14325.7	42.26	20.3	21.96	V
15045.5	42.9	21	21.9	H
15962.8	46.44	24.9	21.54	V
16830.4	47.49	27.3	20.19	H
17761.6	47.94	28	19.94	V

Note: Only the worst case is written in the report.

Conclusion: PASS

Test graphs as below:

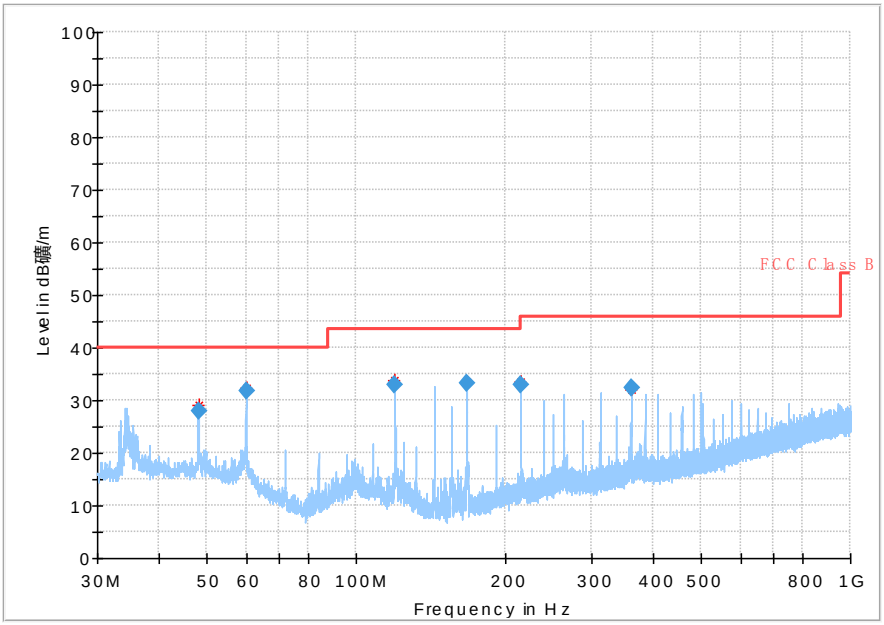


Fig.21 Radiated emission: Ch0, 30MHz~1GHz

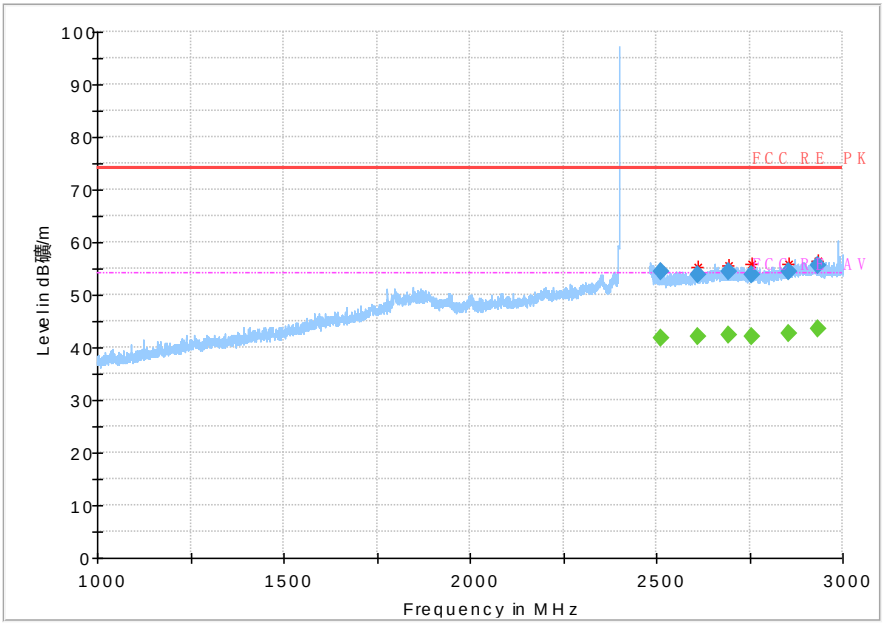


Fig.22 Radiated emission: Ch0, 1GHz~3GHz

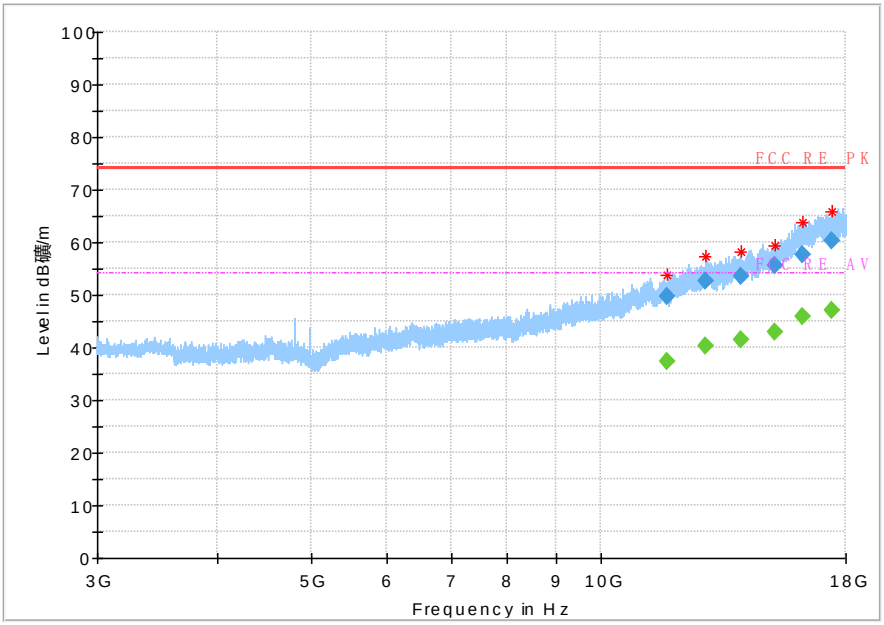


Fig.23 Radiated emission: Ch0, 3GHz~18GHz

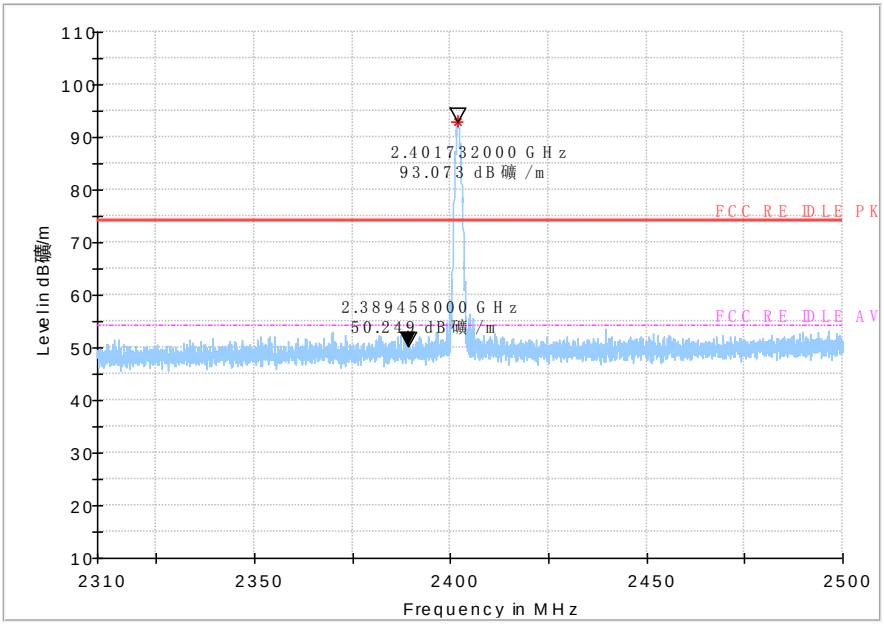


Fig.24 Bandedge:ch0

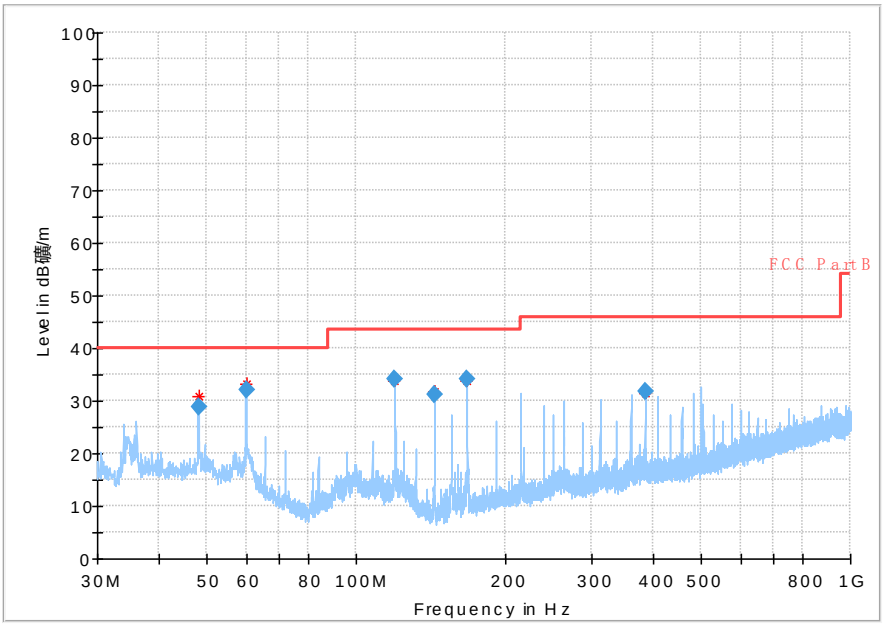


Fig.25 Radiated emission: Ch39, 30MHz~1GHz

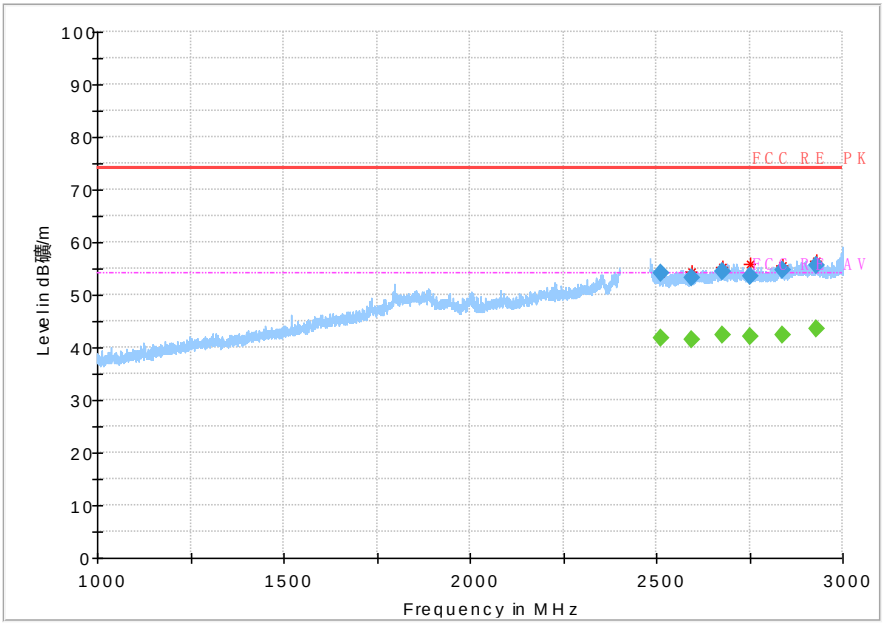


Fig.26 Radiated emission: Ch39, 1GHz~3GHz

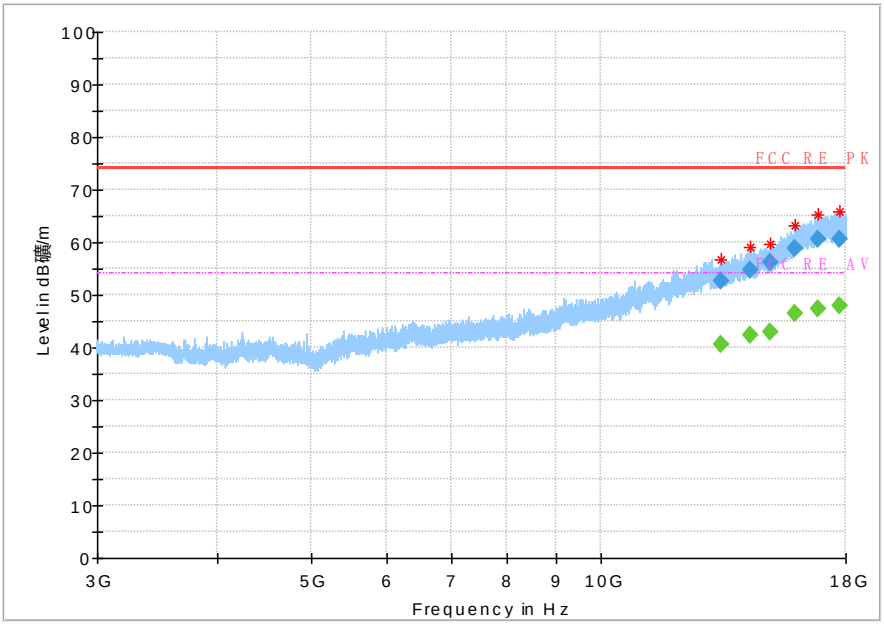


Fig.27 Radiated emission: Ch39, 3GHz~18GHz

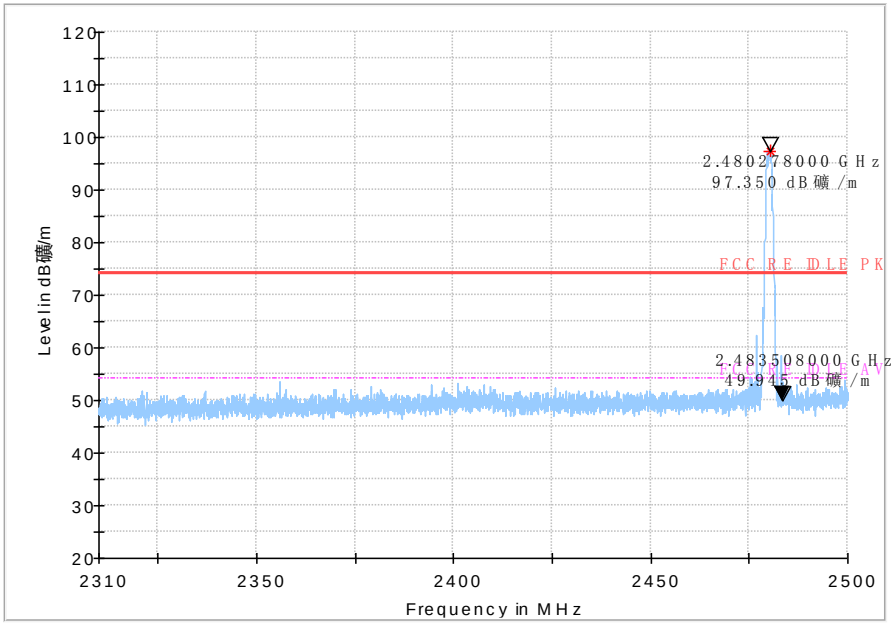
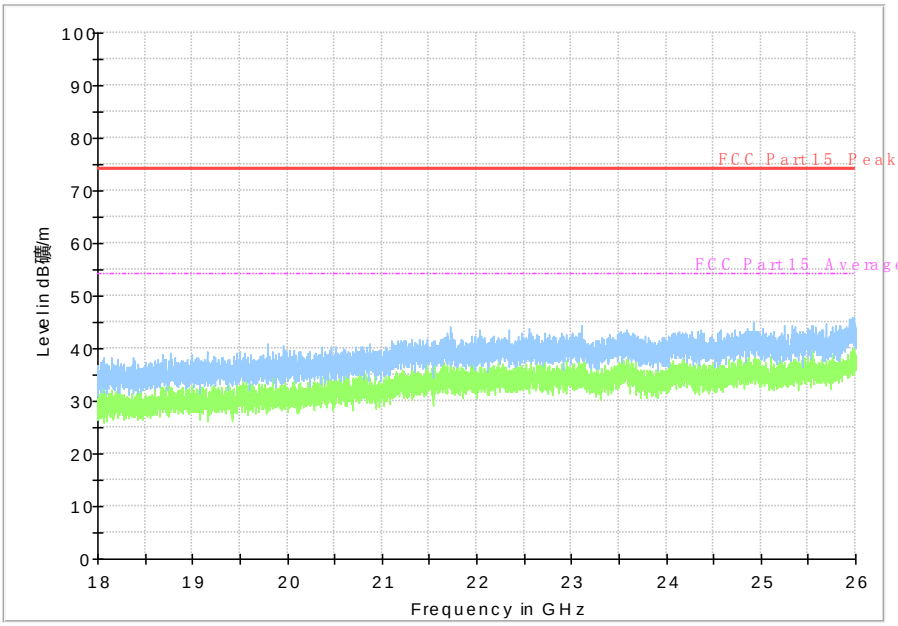


Fig.28 Bandedge:ch39



ALL Channel 18GHz~26GHz

ANNEX A.8. 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.

5 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 Result and limit:

(Quasi-peak-average Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Result (dBμV)	Conclusion
			With charger	
			BLE	
0.15 to 0.5	66 to 56	56 to 46	Fig.29	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

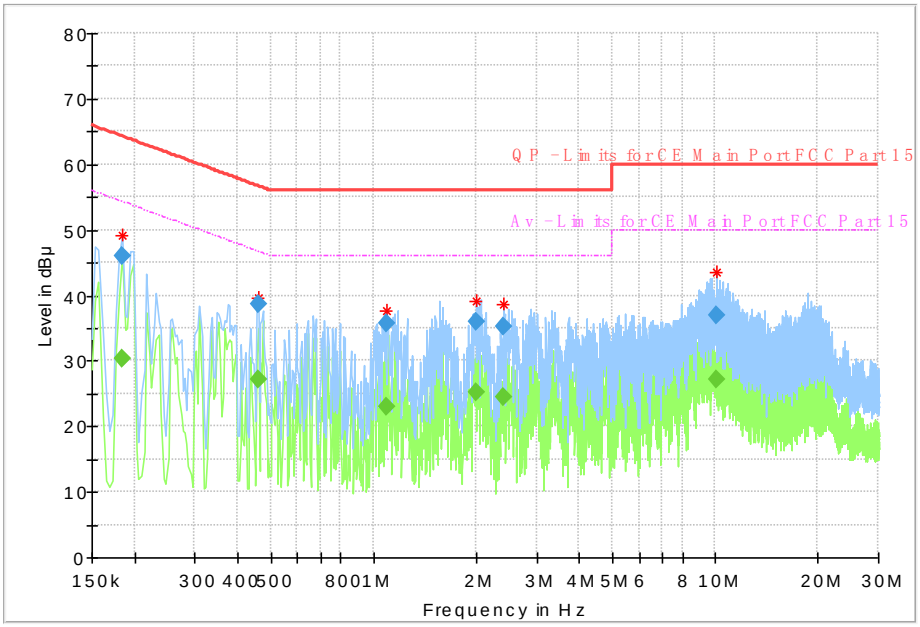


Fig.29 **AC Powerline Conducted Emission**

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.183581	---	30.37	54.32	23.95	15000.	9.000	L1	ON	9.8
0.183581	45.96	---	64.32	18.36	15000.	9.000	L1	ON	9.8
0.459694	38.71	---	56.70	17.99	15000.	9.000	N	ON	9.8
0.459694	---	27.07	46.70	19.62	15000.	9.000	N	ON	9.8
1.097738	35.66	---	56.00	20.34	15000.	9.000	N	ON	9.9
1.097738	---	22.88	46.00	23.12	15000.	9.000	N	ON	9.9
1.993238	35.93	---	56.00	20.07	15000.	9.000	N	ON	10.0
1.993238	---	25.12	46.00	20.88	15000.	9.000	N	ON	10.0
2.407406	35.22	---	56.00	20.78	15000.	9.000	N	ON	10.0
2.407406	---	24.48	46.00	21.52	15000.	9.000	N	ON	10.0
10.045275	---	27.19	50.00	22.81	15000.	9.000	L1	ON	11.3
10.045275	36.89	---	60.00	23.11	15000.	9.000	L1	ON	11.3

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 17025:2017 *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 April 2017*).

Presented this 6th day of May 2019.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2021

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

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