



TEST REPORT

No. I20N01974-BLE

for

Spectralink Corporation

Mobile Phone

Model Name: VC9240

with

Hardware Version: DVT1

Software Version: V138

FCC ID: IYG9240

IC: 2128B-9240

Issued Date: 2020-09-07

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 SAICT.

Test Laboratory:

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1. Summary of Test Report

1.1. Test Items

| Description | Mobile Phone |
|---------------------|-------------------------|
| Model Name | VC9240 |
| Applicant's name | Spectralink Corporation |
| Manufacturer's Name | Spectralink Corporation |

1.2. Test Standards

FCC Part15-2019; ANSI C63.10-2013; RSS-247 Issue 2; RSS-Gen Issue 5 A1

1.3. Test Result

Pass

1.4. Testing Location

Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China

1.5. Project data

| Testing Start Date: | 2020-07-22 |
|---------------------|------------|
| Testing End Date: | 2020-09-04 |

1.6. Signature

Lin Zechuang (Prepared this test report)

Tang Weisheng (Reviewed this test report)

Zhang Bojun (Approved this test report)





2. Client Information

2.1. Applicant Information

| Company Name: | Spectralink Corporation |
|----------------|---|
| Address: | 2560 55th Street, Boulder CO 80301, USA |
| Contact Person | Paul Hampton |
| E-Mail | Paul.Hampton@spectralink.com |
| Telephone: | +1303-441-7593 |
| Fax: | / |

2.2. Manufacturer Information

| Company Name: | Spectralink Corporation |
|----------------|---|
| Address: | 2560 55th Street, Boulder CO 80301, USA |
| Contact Person | Paul Hampton |
| E-Mail | Paul.Hampton@spectralink.com |
| Telephone: | +1303-441-7593 |
| Fax: | / |





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

3.1.<u>About EUT</u> Description

| Description | Mobile Phone |
|------------------------------|------------------------------|
| Model Name | VC9240 |
| Brand Name | Spectralink |
| Frequency Range | 2400MHz~2483.5MHz |
| Type of Modulation | GFSK |
| Number of Channels | 40 |
| Antenna Type | Integrated |
| Antenna Gain | 1.5dBi |
| Power Supply | 3.85V DC by Battery |
| FCC ID | IYG9240 |
| IC | 2128B-9240 |
| Condition of EUT as received | No abnormality in appearance |

Note1: According to the customer's description, VC9240 is a variant of VC9253. The differences between them are as follows.

Different rear cover and antenna frame. The VC9253 with scanner lens while the VC9240 without scanner lens, and their software is different because the VC9240 without driver code of scanner. Their Antenna is different, and the antenna gain of VC9240 is 1.5dBi while the antenna gain of VC9253 is 1.6dBi.

The conduction test data has been adjusted and the radiation test has been retested. The initial model report number is I20N01960-BLE.

Note2: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Shenzhen Academy of Information and Communications Technology.

| 5.2. <u>mtem</u> | 5.2. Internal identification of Eor used during the test | | | |
|------------------|--|-------------------|------------|---------------------|
| EUT ID* | SN or IMEI | HW Version | SW Version | Receive Date |
| UT07aa | velc02bdcjd000t | DVT1 | V138 | 2020-07-20 |
| UT01aa | velc02bdcjd0020 | DVT1 | V138 | 2020-07-22 |
| UT02aa | velc02bdcjd0058 | DVT1 | V138 | 2020-07-22 |
| | | | | |

3.2. Internal Identification of EUT used during the test

*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 | AE ID* |
|--------|-------------|--------|
| AE1 | Battery | / |
| AE2 | Charger | / |
| AE3 | Data Cable | / |

AE1

Model BLI9200100





| Manufacturer Capacity Nominal Voltage | Ningbo Veken Battery Co., Ltd. 3040mAh 3.85V |
|---|--|
| AE2 | |
| Model | IN-CA-310Q |
| Manufacturer | INNO VISION INTERNATIONAL HOLDINGS LTD. |
| AE3 | |
| Model | XG-US008 |
| Manufacturer | Xunguang Electronics Co.,Ltd. |

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

3.4. General Description

The Equipment under Test (EUT) is a model of Mobile Phone with integrated antenna and battery. It consists of normal options: Lithium Battery, Charger and USB Cable. Manual and specifications of the EUT were provided to fulfil the test. Samples undergoing test were selected by the client.





4. <u>Reference Documents</u>

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant 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 Part 15 | FCC CFR 47, Part 15, Subpart C: | 2019 |
| | 15.205 Restricted bands of operation; | |
| | 15.209 Radiated emission limits, general requirements; | |
| | 15.247 Operation within the bands 902–928MHz, | |
| | 2400–2483.5 MHz, and 5725–5850 MHz | |
| ANSI C63.10 | American National Standard of Procedures for Compliance | 2013 |
| | Testing of Unlicensed Wireless Devices | |
| RSS-247 | Spectrum Management and Telecommunications Radio | Issue 2 |
| | Standards Specification | February, 2017 |
| | Digital Transmission Systems (DTSs), Frequency Hopping | |
| | Systems (FHSs) and License-Exempt Local Area Network | |
| | (LE-LAN) Devices | |
| RSS-Gen | Spectrum Management and Telecommunications Radio | Issue 5 |
| | Standards Specification | March,2019 |
| | • | |
| | General Requirements for Compliance of Radio Apparatus | Amendment 1 |





5. Test Results

5.1. <u>Testing Environment</u>

| Normal Temperature: | 15~35°C |
|---------------------|---------|
| Relative Humidity: | 20~75% |

5.2. Test Results

| No | Test cases | Sub-clause of Part 15C | Sub-clause of IC | Verdict |
|----|-----------------------------|------------------------|----------------------|---------|
| 0 | Antenna Requirement | 15.203 | / | Р |
| 1 | Maximum Peak Output Power | 15.247 (b) | RSS-247 section 5.4 | Р |
| 2 | Peak Power Spectral Density | 15.247 (e) | RSS-247 section 5.2 | Р |
| 3 | 6dB Bandwidth | 15.247 (a) | RSS-247 section 5.2 | Р |
| 4 | Band Edges Compliance | 15.247 (d) | RSS-247 section 5.5 | Р |
| 5 | Transmitter Spurious | 15.247 (d) | RSS-247 section 5.5/ | Р |
| 5 | Emission - Conducted | 15.247 (u) | RSS-Gen section 6.13 | P |
| 6 | Transmitter Spurious | 15.247, 15.205, 15.209 | RSS-247 section 5.5/ | Р |
| 6 | Emission - Radiated | 15.247, 15.205, 15.209 | RSS-Gen section 6.13 | |
| 7 | AC Power line Conducted | 15.107, 15.207 | RSS-Gen section 8.8 | Р |
| 1 | Emission | 13.107, 13.207 | 100-0en section 0.0 | F |
| 8 | Occupied Bandwidth | / | RSS-Gen section 6.7 | Р |

See **ANNEX A** for details.

5.3. Statements

SAICT has evaluated the test cases requested by the applicant/manufacturer as listed in section 5.2 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in section 4.2.





6. Test Equipments Utilized

Conducted test system

| No. | Equipment | Model | Serial Number | Manufacturer | Calibration Due date | Calibratio n Period |
|-----|---------------------------|--------|------------------|-----------------|-------------------------|------------------------|
| 1 | Vector Signal Analyzer | FSV40 | 100903 | Rohde & Schwarz | 2021-01-15 | 1 year |
| 2 | Test Receiver | ESCI | 100701 | Rohde & Schwarz | 2021-08-09 | 1 year |
| 3 | LISN | ENV216 | 102067 | Rohde & Schwarz | 2021-07-16 | 1 year |

Radiated emission test system

| NO. | Equipment | Model | Serial Manufacturer | | Calibration | Calibration |
|-----|---------------|------------|---------------------|-----------------|-------------|-------------|
| NO. | Equipment | WOder | Number | Manufacturer | Due date | Period |
| 1 | Loop Antenna | HLA6120 | 35779 | TESEQ | 2022-04-25 | 3 years |
| 2 | BiLog Antenna | 3142E | 00224831 | ETS-Lindgren | 2021-05-17 | 3 years |
| 3 | Horn Antenna | 3117 | 00066577 | ETS-Lindgren | 2022-04-02 | 3 years |
| 4 | Test Receiver | ESR7 | 101676 | Rohde & Schwarz | 2020-11-27 | 1 year |
| 5 | Spectrum | FSV40 | 101192 | Rohde & Schwarz | 2021-01-14 | 1 voor |
| 5 | Analyser | F3V40 | 13740 101192 | Konde & Schwarz | 2021-01-14 | 1 year |
| 6 | Chamber | FACT3-2.0 | 1285 | ETS-Lindgren | 2021-07-19 | 2 years |
| 7 | Antonno | QSH-SL-18- | 17013 | Q-par | 2023-01-06 | 3 years |
| | Antenna | 26-S-20 | | | | |

Test software

| No. | Equipment | Manufacturer | Version |
|-----|------------------|-----------------|----------|
| 1 | TechMgr Software | CAICT | 2.1.1 |
| 2 | EMC32 | Rohde & Schwarz | 8.53.0 |
| 3 | EMC32 | Rohde & Schwarz | 10.01.00 |

EUT is engineering software provided by the customer to control the transmitting signal. The EUT was programmed to be in continuously transmitting mode.

Anechoic chamber

Fully anechoic chamber by ETS-Lindgren





7. Laboratory Environment

Semi-anechoic chambe

| Temperature | Min. = 15 °C, Max. = 35 °C | |
|-----------------------------------|---|--|
| Relative humidity | Min. = 20 %, Max. = 75 % | |
| Shielding effectiveness | 0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB | |
| Electrical insulation | > 2MΩ | |
| Ground system resistance | <4 Ω | |
| Normalised site attenuation (NSA) | $< \pm 4$ dB, 3 m distance, from 30 to 1000 MHz | |

Shielded room

| Temperature | Min. = 15 °C, Max. = 35 °C |
|--------------------------|--|
| Relative humidity | Min. = 20 %, Max. = 75 % |
| Shielding effectiveness | 0.014MHz-1MHz> 60 dB; 1MHz-1000MHz>90 dB |
| Electrical insulation | > 2MΩ |
| Ground system resistance | <4 Ω |

Fully-anechoic chamber

| Temperature | Min. = 15 °C, Max. = 35 °C |
|---------------------------------------|---|
| Relative humidity | Min. = 20 %, Max. = 75 % |
| Shielding effectiveness | 0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB |
| Electrical insulation | > 2MΩ |
| Ground system resistance | <4 Ω |
| Voltage Standing Wave Ratio (VSWR) | \leq 6 dB, from 1 to 18 GHz, 3 m distance |
| Uniformity of field strength | Between 0 and 6 dB, from 80 to 6000 MHz |





8. <u>Measurement Uncertainty</u>

| Test Name | Uncertainty (<i>k</i> =2) | | |
|---|----------------------------|--------|--|
| 1. RF Output Power - Conducted | 1.32 | dB | |
| 2.Power Spectral Density - Conducted | 2.32 | dB | |
| 3. Occupied channel bandwidth - Conducted | 66+ | lz | |
| | 30MHz≪f≪1GHz | 1.41dB | |
| 4 Transmitter Spurious Emission Conducted | 1GHz≪f≪7GHz | 1.92dB | |
| 4 Transmitter Spurious Emission - Conducted | 7GHz≪f≪13GHz | 2.31dB | |
| | 13GHz≪f≪26GHz | 2.61dB | |
| | 9kHz≪f≪30MHz | 1.70dB | |
| 5 Tronomittor Spurious Emission Redicted | 30MHz≪f≪1GHz | 4.90dB | |
| 5. Transmitter Spurious Emission - Radiated | 1GHz≪f≪18GHz | 4.60dB | |
| | 18GHz≪f≪40GHz | 4.10dB | |
| 6. AC Power line Conducted Emission | 150kHz≪f≪30MHz | 3.00dB | |





ANNEX A: Detailed Test Results

A.0 Antenna requirement

Measurement Limit:

| Standard | Requirement | | | | |
|--------------|--|--|--|--|--|
| | An intentional radiator shall be designed to ensure that no antenna other than that | | | | |
| | furnished by the responsible party shall be used with the device. The use of a | | | | |
| | permanently attached antenna or of an antenna that uses a unique coupling to the | | | | |
| | intentional radiator shall be considered sufficient to comply with the provisions of | | | | |
| | this section. The manufacturer may design the unit so that a broken antenna can | | | | |
| | be replaced by the user, but the use of a standard antenna jack or electrical | | | | |
| FCC CRF Part | connector is prohibited. This requirement does not apply to carrier current devices | | | | |
| 15.203 | or to devices operated under the provisions of §15.211, §15.213, §15.217, | | | | |
| | §15.219, or §15.221. Further, this requirement does not apply to intentional | | | | |
| | radiators that must be professionally installed, such as perimeter protection | | | | |
| | systems and some field disturbance sensors, or to other intentional radiators | | | | |
| | which, in accordance with §15.31(d), must be measured at the installation site. | | | | |
| | However, the installer shall be responsible for ensuring that the proper antenna is | | | | |
| | employed so that the limits in this part are not exceeded. | | | | |

Conclusion: The Directional gains of antenna used for transmitting is 1.5 dBi.

The RF transmitter uses an integrate antenna without connector.





A.1 Maximum Peak Output Power

Method of Measurement: See ANSI C63.10-clause 11.9.1.1

Use the following spectrum analyzer settings:

- a) Set the RBW = 1 MHz.
- b) Set VBW = 3 MHz.
- c) Set span = 3 MHz.
- 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 Limit:

| Standard | Limit (dBm) | E.I.R.P Limit (dBm) | |
|---------------------------|-------------|---------------------|--|
| FCC 47 CRF Part 15.247(b) | . 30 | < 36 | |
| & RSS-247 section 5.4 | < 30 | | |

Measurement Results:

| Mode | Frequency (MHz) | Peak Conducted Output Power(dBm) | E.I.R.P(dBm) | Conclusion |
|------|-----------------|-------------------------------------|--------------|------------|
| | 2402(CH0) | -0.20 | 1.30 | Р |
| GFSK | 2440(CH19) | 1.03 | 2.53 | Р |
| | 2480(CH39) | 0.12 | 1.62 | Р |

Conclusion: Pass





A.2 Peak Power Spectral Density

Method of Measurement: See ANSI C63.10-clause 11.10.2

Measurement Limit:

| Standard | Limit |
|-----------------------------|---------------|
| FCC 47 CRF Part 15.247(e) & | < 8 dBm/3 kHz |
| RSS-247 section 5.2 | |

Measurement Results:

| Mode | Frequency (MHz) | Peak Power Spectral Density (dBm) | | Conclusion |
|------|-----------------|--------------------------------------|--------|------------|
| | 2402(CH0) | Fig.1 | -15.04 | Р |
| GFSK | 2440(CH19) | Fig.2 | -13.61 | Р |
| | 2480(CH39) | Fig.3 | -14.77 | Р |

See below for test graphs. Conclusion: PASS

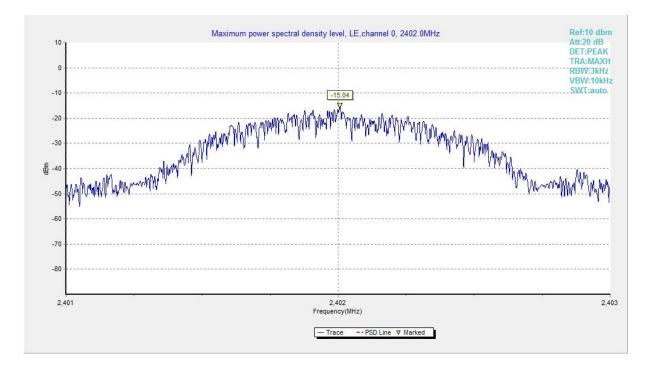
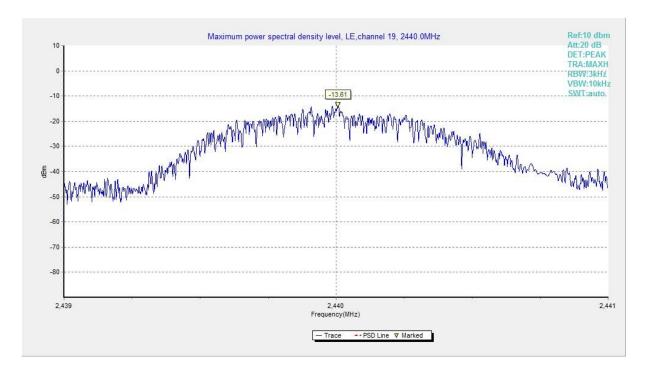


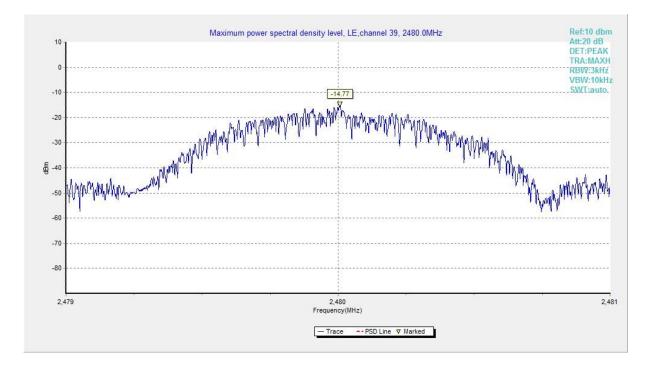
Fig.1 Power Spectral Density (Ch 0)

















A.3 6dB Bandwidth

Measurement Limit:

| Standard | Limit (kHz) |
|------------------------------|-------------|
| FCC 47 CFR Part 15.247 (a) & | > 500 |
| RSS-247 section 5.2 | ≥ 500 |

Measurement Result:

| Mode | Frequency (MHz) | Test Results (kHz) | | Conclusion |
|------|-----------------|---------------------|--------|------------|
| | 2402(CH0) | Fig.4 | 685.00 | Р |
| GFSK | 2440(CH19) | Fig.5 | 684.00 | Р |
| | 2480(CH39) | Fig.6 | 685.50 | Р |

See below for test graphs. Conclusion: PASS

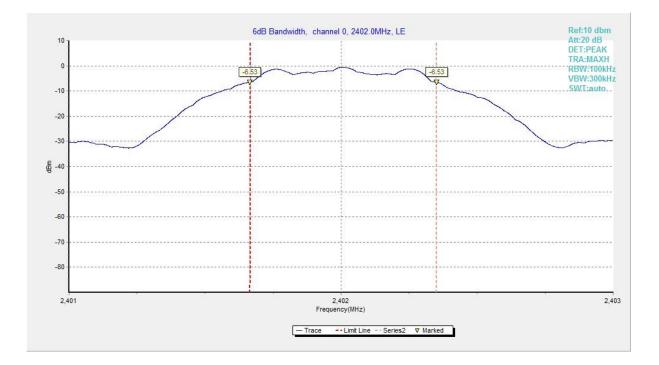
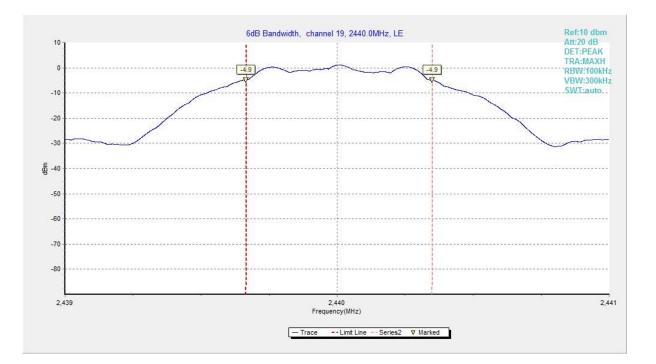


Fig.4 6dB Bandwidth (Ch 0)









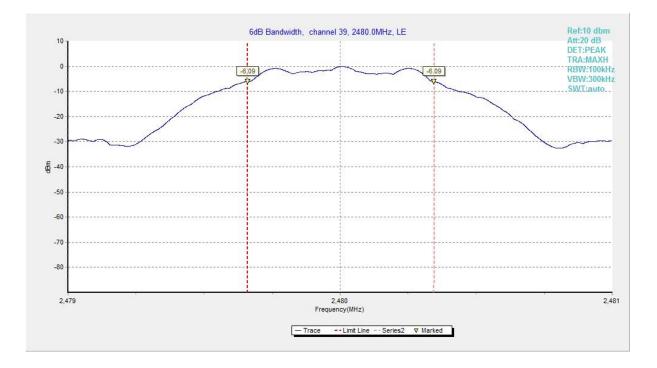


Fig.6 6dB Bandwidth (Ch 39)





A.4 Band Edges Compliance

Measurement Limit:

| Standard | Limit (dB) |
|------------------------------|------------|
| FCC 47 CFR Part 15.247 (d) & | × 20 |
| RSS-247 section 5.5 | > 20 |

Measurement Result:

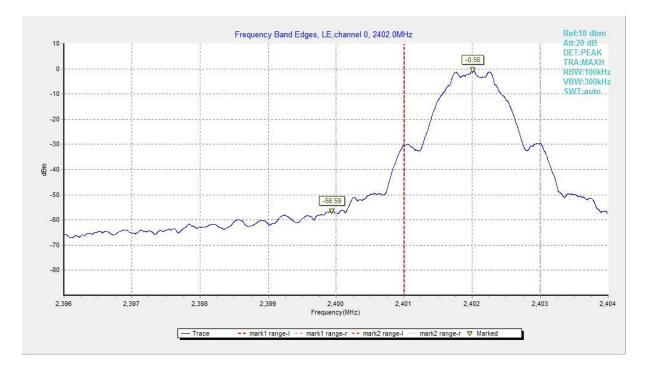
| Mode | Frequency (MHz) | Test Results (dBc) | | Conclusion |
|------|-----------------|--------------------|-------|------------|
| GFSK | 2402(CH0) | Fig.7 | 56.03 | Р |
| GFSK | 2480(CH39) | Fig.8 | 59.63 | Р |

See below for test graphs.

Conclusion: PASS









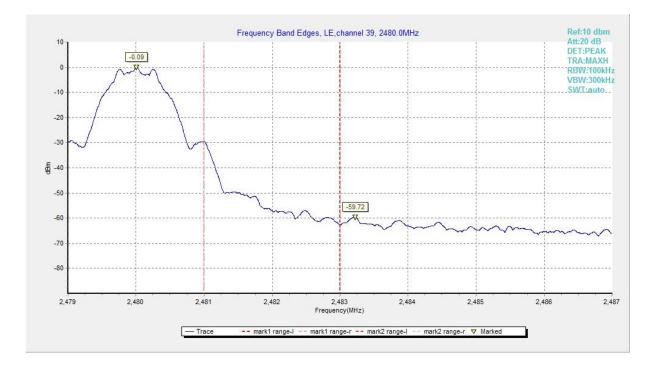


Fig.8 Band Edges (Ch 39)





A.5 Transmitter Spurious Emission - Conducted

Measurement Limit:

| Standard | Limit |
|----------------------------------|---|
| FCC 47 CFR Part 15.247 (d) & | 20dB below peak output power in 100 kHz |
| RSS-247 5.5/RSS-Gen section 6.13 | bandwidth |

Measurement Results:

| MODE | Channel | Frequency Range | Test Results | Conclusion |
|------|--------------|-----------------|--------------|------------|
| | | 2.402 GHz | Fig.9 | Р |
| | 0 | 1GHz -3GHz | Fig.10 | Р |
| | | 3GHz-10GHz | Fig.11 | Р |
| | | 2.440 GHz | Fig.12 | Р |
| | 19 | 1GHz -3GHz | Fig.13 | Р |
| GFSK | | 3GHz-10GHz | Fig.14 | Р |
| | | 2.480 GHz | Fig.15 | Р |
| | 39 | 1GHz -3GHz | Fig.16 | Р |
| | | 3GHz-10GHz | Fig.17 | Р |
| | All channels | 30MHz-1GHz | Fig.18 | Р |
| | All chammers | 10GHz-26GHz | Fig.19 | Р |

See below for test graphs.

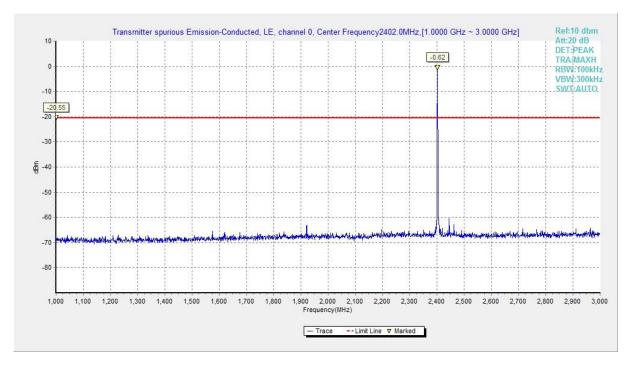
Conclusion: Pass



Fig.9 Conducted Spurious Emission (Ch0, Center Frequency)









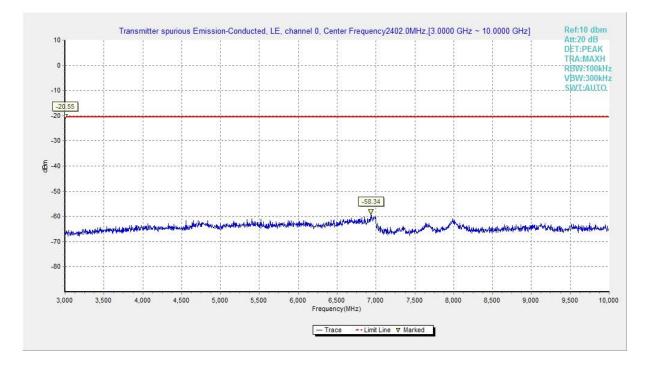


Fig.11 Conducted Spurious Emission (Ch0, 3 GHz-10 GHz)







Fig.12 Conducted Spurious Emission (Ch19, Center Frequency)

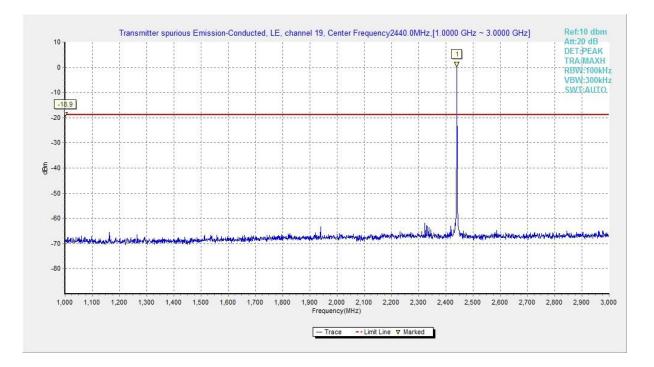


Fig.13 Conducted Spurious Emission (Ch19, 1 GHz-3 GHz)





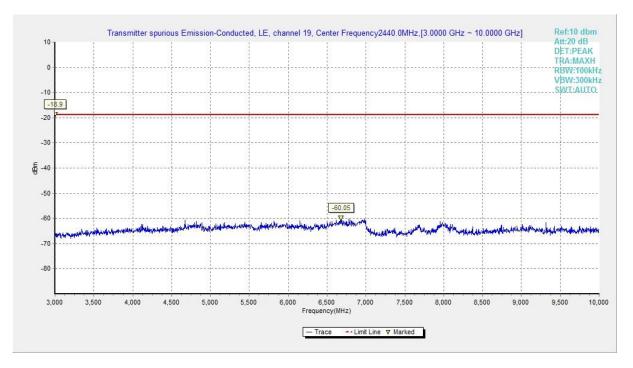


Fig.14 Conducted Spurious Emission (Ch19, 3 GHz-10 GHz)

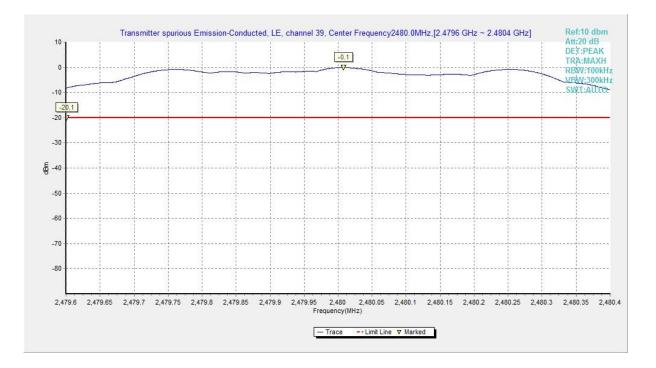
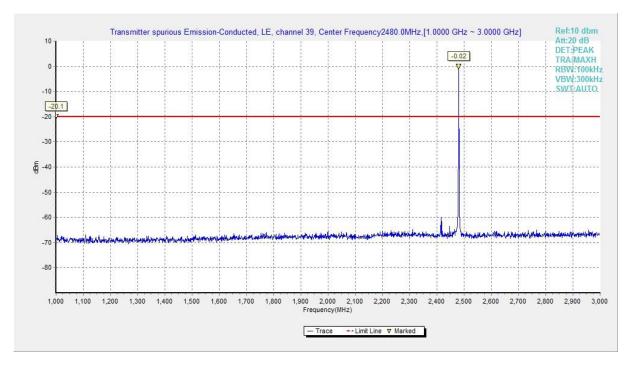


Fig.15 Conducted Spurious Emission (Ch39, Center Frequency)









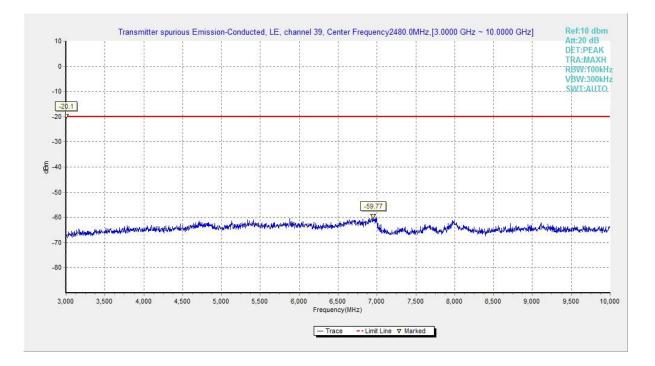


Fig.17 Conducted Spurious Emission (Ch39, 3 GHz-10 GHz)





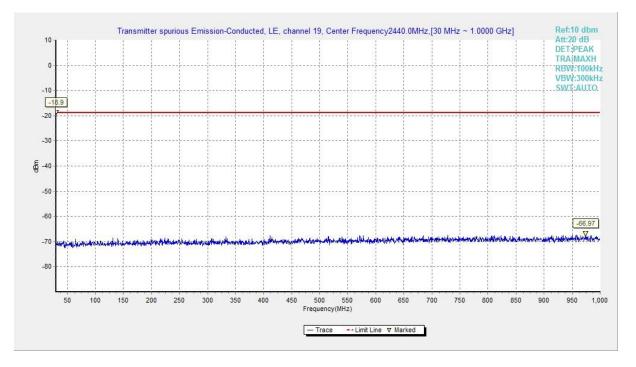


Fig.18 Conducted Spurious Emission (All channels, 30 MHz-1 GHz)

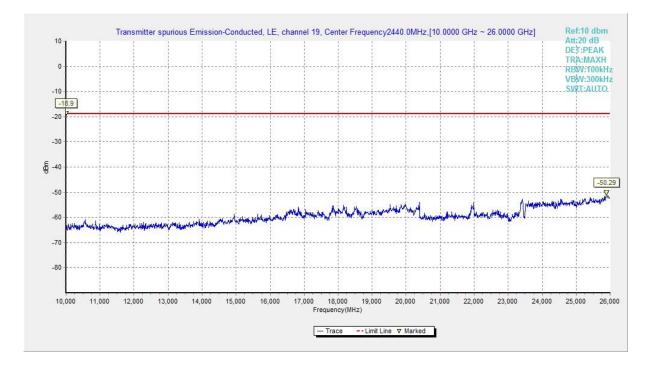


Fig.19 Conducted Spurious Emission (All channels, 10 GHz-26 GHz)





A.6 Transmitter Spurious Emission - Radiated

Measurement Limit:

| Standard | Limit |
|--|------------------------------|
| FCC 47 CFR Part 15.247, 15.205, 15.209 & | 20dB below peek output power |
| RSS-247 section 5.5/RSS-Gen section 6.13 | 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(µV/m) | Measurement distance(meters) |
|--------------------------------|----------------------|---------------------------------|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

Test Condition:

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 | 120kHz/300kHz | 5 |
| 1000-4000 | 1MHz/3MHz | 15 |
| 4000-18000 | 1MHz/3MHz | 40 |
| 18000-26500 | 1MHz/3MHz | 20 |

Note: According to the performance evaluation, the radiated emission margin of EUT is over 20dB in the band from 9kHz to 30MHz.Therefore, the measurement starts from 30MHz to tenth harmonic. The measurement results include the horizontal polarization and vertical polarization measurements.





Measurement Results:

| Mode | Channel | Frequency Range | Test Results | Conclusion |
|--------|-----------------------|---------------------|--------------|------------|
| | 0 | 1 GHz ~18 GHz | Fig.20 | Р |
| | 19 | 1 GHz ~18 GHz | Fig.21 | Р |
| | 39 | 1 GHz ~18 GHz | Fig.22 | Р |
| CESK | Restricted Band(CH0) | 2.31 GHz ~ 2.43 GHz | Fig.23 | Р |
| GFSK - | Restricted Band(CH39) | 2.45 GHz ~ 2.50 GHz | Fig.24 | Р |
| | | 9 kHz ~30 MHz | Fig.25 | Р |
| | All channels | 30 MHz ~1 GHz | Fig.26 | Р |
| | | 18 GHz ~ 26.5 GHz | Fig.27 | Р |

Worst Case Result

GFSK CH0 (1-18GHz)

| Frequency | MaxPeak | Limit | Margin | Pol | Corr. |
|--------------|----------|----------|--------|-----|--------|
| (MHz) | (dBuV/m) | (dBµV/m) | (dB) | | (dB/m) |
| 13652.250000 | 54.87 | 74.00 | 19.13 | V | 17 |
| 14588.500000 | 56.05 | 74.00 | 17.95 | V | 18 |
| 15573.250000 | 57.50 | 74.00 | 16.50 | V | 20 |
| 15582.000000 | 58.46 | 74.00 | 15.54 | V | 20 |
| 16984.750000 | 58.75 | 74.00 | 15.25 | V | 23 |
| 17199.750000 | 58.78 | 74.00 | 15.22 | V | 21 |

| Frequency | Average | Limit | Margin | Pol | Corr. |
|--------------|----------|----------|--------|-----|--------|
| (MHz) | (dBµV/m) | (dBµV/m) | (dB) | | (dB/m) |
| 13952.000000 | 42.64 | 54.00 | 11.36 | V | 17 |
| 14570.250000 | 43.58 | 54.00 | 10.42 | V | 18 |
| 15577.250000 | 44.88 | 54.00 | 9.12 | V | 20 |
| 16259.750000 | 46.00 | 54.00 | 8.00 | V | 21 |
| 17044.250000 | 46.68 | 54.00 | 7.32 | V | 22 |
| 17484.250000 | 46.10 | 54.00 | 7.90 | V | 22 |

GFSK CH19 (1-18GHz)

| Frequency | MaxPeak | Limit | Margin | Pol | Corr. |
|--------------|----------|----------|--------|------|--------|
| (MHz) | (dBuV/m) | (dBµV/m) | (dB) | 1.01 | (dB/m) |
| 13950.500000 | 54.93 | 74.00 | 19.07 | V | 17 |
| 14541.750000 | 55.92 | 74.00 | 18.08 | V | 18 |
| 15552.000000 | 57.16 | 74.00 | 16.84 | V | 19 |
| 16332.250000 | 57.76 | 74.00 | 16.24 | V | 21 |
| 17014.500000 | 59.17 | 74.00 | 14.83 | V | 23 |
| 17699.000000 | 58.10 | 74.00 | 15.90 | V | 23 |





| Frequency | Average | Limit | Margin | Pol | Corr. |
|--------------|----------|----------|--------|-----|--------|
| (MHz) | (dBµV/m) | (dBµV/m) | (dB) | | (dB/m) |
| 13958.750000 | 42.70 | 54.00 | 11.30 | V | 17 |
| 14566.250000 | 43.61 | 54.00 | 10.39 | V | 18 |
| 15577.250000 | 45.03 | 54.00 | 8.97 | V | 20 |
| 16262.250000 | 45.93 | 54.00 | 8.07 | V | 21 |
| 17020.750000 | 46.69 | 54.00 | 7.31 | V | 23 |
| 17704.250000 | 46.03 | 54.00 | 7.97 | V | 23 |

GFSK CH39 (1-18GHz)

| Frequency | MaxPeak | Limit | Margin | Pol | Corr. |
|--------------|----------|----------|--------|------|--------|
| (MHz) | (dBuV/m) | (dBµV/m) | (dB) | 1.01 | (dB/m) |
| 13641.000000 | 54.97 | 74.00 | 19.03 | V | 17 |
| 14528.000000 | 55.47 | 74.00 | 18.53 | V | 18 |
| 15573.250000 | 56.37 | 74.00 | 17.63 | V | 20 |
| 16266.000000 | 58.44 | 74.00 | 15.56 | V | 21 |
| 16680.500000 | 59.49 | 74.00 | 14.51 | V | 21 |
| 17900.250000 | 58.42 | 74.00 | 15.58 | V | 24 |

| Frequency (MHz) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Pol | Corr. (dB/m) |
|--------------------|---------------------|-------------------|----------------|-----|-----------------|
| 14003.250000 | 42.61 | 54.00 | 11.39 | V | 17 |
| 14561.500000 | 43.61 | 54.00 | 10.39 | V | 18 |
| 15576.750000 | 44.78 | 54.00 | 9.22 | V | 20 |
| 15670.250000 | 45.97 | 54.00 | 8.03 | V | 20 |
| 17050.000000 | 46.76 | 54.00 | 7.24 | V | 22 |
| 17461.750000 | 46.11 | 54.00 | 7.89 | V | 22 |

Note:

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss", and Antenna Factor, the gain of the preamplifier, the cable loss. P_{Mea} is the field strength recorded from the instrument.

The measurement results are obtained as described below:

Result= P_{Mea} +Cable Loss +Antenna Factor-Gain of the preamplifier.

See below for test graphs.

Conclusion: Pass





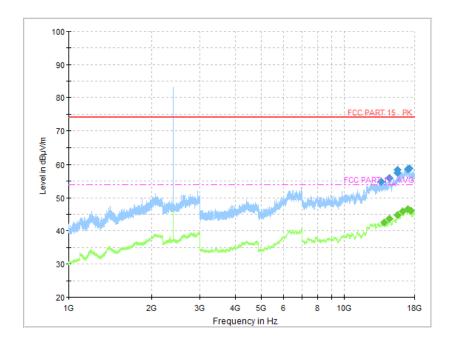


Fig.20 Radiated Spurious Emission (GFSK, Ch0, 1 GHz ~18 GHz)

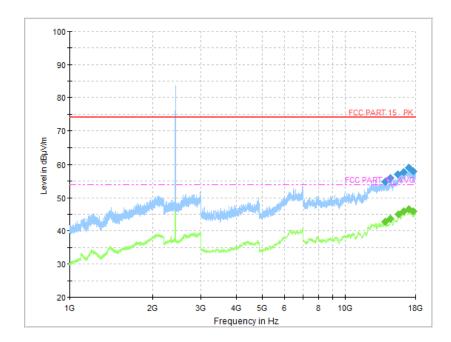


Fig.21 Radiated Spurious Emission (GFSK, Ch19, 1 GHz ~18 GHz)





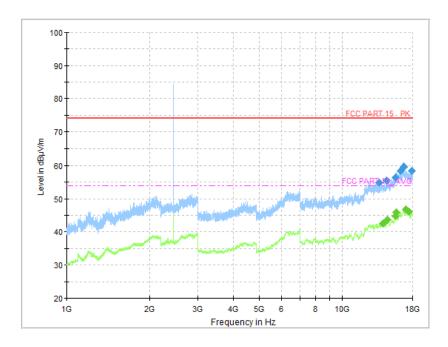


Fig.22 Radiated Spurious Emission (GFSK, Ch39, 1 GHz ~18 GHz)

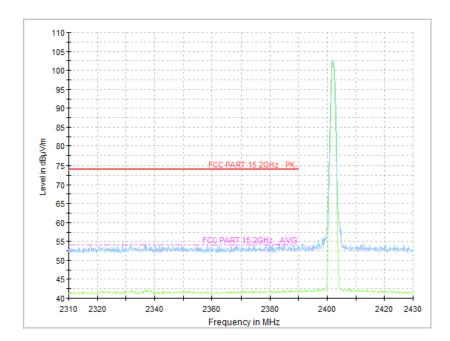


Fig.23 Radiated Band Edges (GFSK, Ch0, 2310GHz~2430GHz)



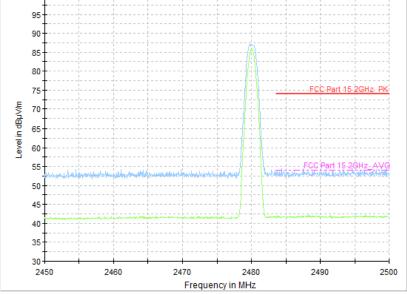


Fig.24 Radiated Band Edges (GFSK, Ch39, 2450GHz~2500GHz)

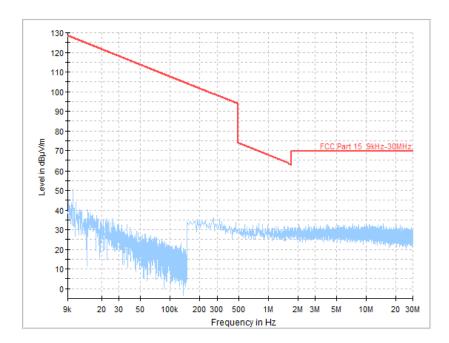


Fig.25 Radiated Spurious Emission (All Channels, 9 kHz-30 MHz)







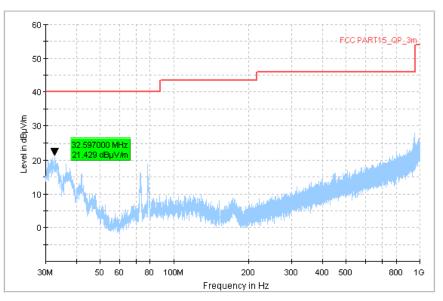


Fig.26 Radiated Spurious Emission (All Channels, 30 MHz-1 GHz)

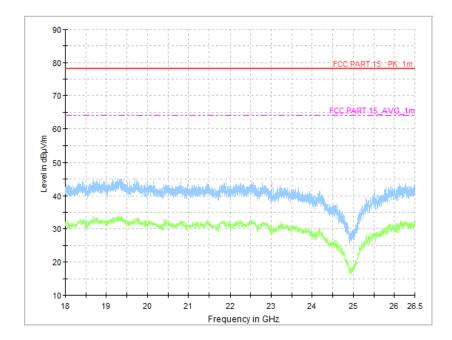


Fig.27 Radiated Spurious Emission (All Channels, 18 GHz-26.5 GHz)





A.7 AC Power line Conducted Emission

Test Condition:

| Voltage (V) | Frequency (Hz) |
|-------------|----------------|
| 120 | 60 |

Measurement Result and limit:

BLE (Quasi-peak Limit)

| Frequency range | Quasi-peak | Result (dBµV) | | Conclusion |
|-----------------|--------------|---------------|--------|------------|
| (MHz) | Limit (dBµV) | Traffic | Idle | Conclusion |
| 0.15 to 0.5 | 66 to 56 | | | |
| 0.5 to 5 | 56 | Fig.28 | Fig.29 | Р |
| 5 to 30 | 60 | | | |
| | | | | |

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

BLE (Average Limit)

| Frequency range | Average-peak | Result (dBμV) | | Conclusion |
|---|--------------|---------------|--------|------------|
| (MHz) | Limit (dBµV) | Traffic | Idle | Conclusion |
| 0.15 to 0.5 | 56 to 46 | | | |
| 0.5 to 5 | 46 | Fig.28 | Fig.29 | Р |
| 5 to 30 | 50 | | | |
| NOTE: The limit decreases linearly with the logarithm of the frequency in the range | | | | |
| 0.15 MHz to 0.5 MHz. | | | | |

Note: The measurement results include the L1 and N measurements.

See below for test graphs.

Conclusion: Pass





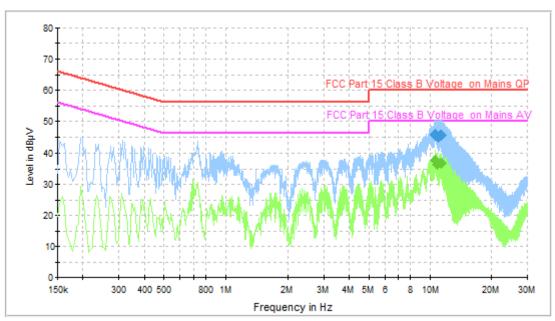


Fig.28 AC Power line Conducted Emission (Traffic)

| Frequency (MHz) | Quasi Peak (dBµV) | Limit (dBµV) | Margin (dB) | Line | Corr. (dB) |
|--------------------|----------------------|-----------------|----------------|------|---------------|
| 10.574000 | 45.6 | 60.0 | 14.4 | Ν | 9.8 |
| 10.598000 | 45.7 | 60.0 | 14.3 | Ν | 9.8 |
| 10.902000 | 44.9 | 60.0 | 15.1 | Ν | 9.9 |
| 10.942000 | 44.9 | 60.0 | 15.1 | Ν | 9.9 |
| 11.222000 | 45.6 | 60.0 | 14.4 | Ν | 9.9 |
| 11.386000 | 45.4 | 60.0 | 14.6 | Ν | 9.9 |

Measurement Results: Quasi Peak

Measurement Results: Average

| Frequency (MHz) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Line | Corr. (dB) |
|--------------------|-------------------|-----------------|----------------|------|---------------|
| 10.574000 | 37.9 | 50.0 | 12.1 | Ν | 9.8 |
| 10.582000 | 37.8 | 50.0 | 12.2 | Ν | 9.8 |
| 10.590000 | 37.9 | 50.0 | 12.1 | Ν | 9.8 |
| 10.706000 | 37.5 | 50.0 | 12.5 | Ν | 9.8 |
| 10.774000 | 36.5 | 50.0 | 13.5 | Ν | 9.9 |
| 11.302000 | 36.9 | 50.0 | 13.1 | Ν | 9.9 |





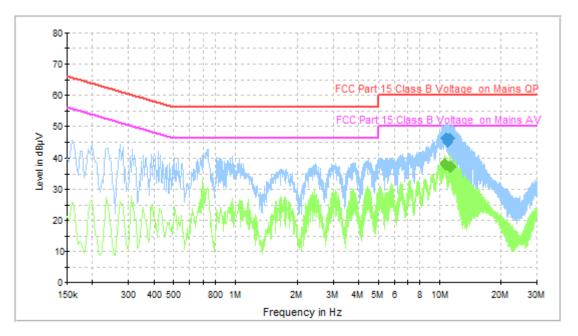


Fig.29 AC Power line Conducted Emission (Idle)

| Frequency (MHz) | Quasi Peak (dBµV) | Limit (dBµV) | Margin (dB) | Line | Corr. (dB) |
|--------------------|----------------------|-----------------|----------------|------|---------------|
| 10.658000 | 46.2 | 60.0 | 13.8 | Ν | 9.8 |
| 10.794000 | 46.1 | 60.0 | 13.9 | N | 9.9 |
| 10.834000 | 45.8 | 60.0 | 14.2 | N | 9.9 |
| 10.986000 | 44.9 | 60.0 | 15.1 | Ν | 9.8 |
| 10.994000 | 44.9 | 60.0 | 15.1 | Ν | 9.8 |
| 11.246000 | 46.0 | 60.0 | 14.0 | Ν | 9.9 |

Measurement Results: Quasi Peak

Measurement Results: Average

| Frequency (MHz) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Line | Corr. (dB) |
|--------------------|-------------------|-----------------|----------------|------|---------------|
| 10.618000 | 38.3 | 50.0 | 11.7 | Ν | 9.8 |
| 10.702000 | 37.9 | 50.0 | 12.1 | Ν | 9.8 |
| 11.238000 | 37.2 | 50.0 | 12.8 | Ν | 9.9 |
| 11.246000 | 37.2 | 50.0 | 12.8 | Ν | 9.9 |
| 11.322000 | 37.1 | 50.0 | 12.9 | Ν | 9.9 |
| 11.330000 | 37.3 | 50.0 | 12.7 | Ν | 9.9 |





A.8 Occupied Bandwidth

Measurement Limit:

| Standard | Limit (kHz) |
|---------------------|-------------|
| RSS-Gen section 6.7 | / |

Measurement Result:

| Mode | Frequency (MHz) | Test Results (kHz) | | Conclusion |
|------|-----------------|---------------------|---------|------------|
| GFSK | 2402(CH0) | Fig.30 | 1084.00 | 1 |
| | 2440(CH19) | Fig.31 | 1082.00 | 1 |
| | 2480(CH39) | Fig.32 | 1083.00 | 1 |

See below for test graphs.

Conclusion: PASS

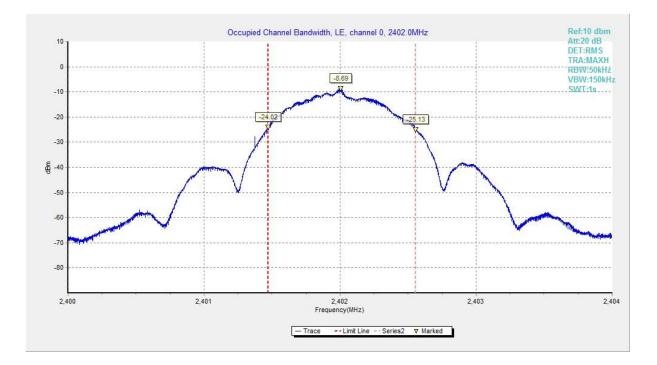
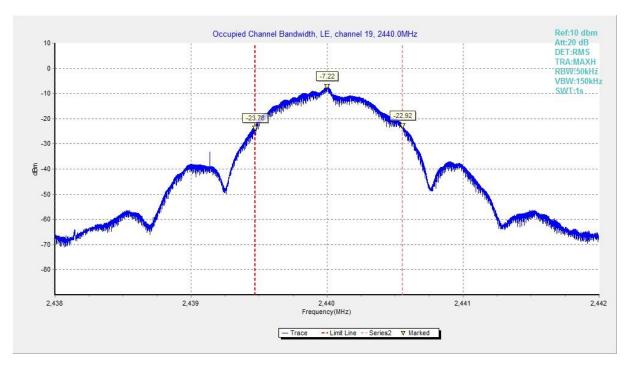


Fig.30 Occupied Bandwidth: GFSK, Channel 0









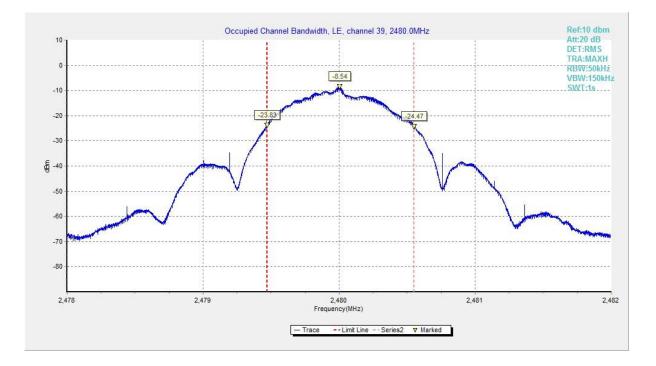


Fig.32 Occupied Bandwidth: GFSK, Channel 39

END OF REPORT