





FCC C2PC Test Report

FCC ID : SQG-CL4490

Equipment : ConnexLink 900MHz 1W RS232

ConnexLink 900MHz 1W RS485

ConnexLink 900MHz 1W RS232/422/485 Refer to section 1.1.1 for more details

Model No. : CL4490-1000-232 ; CL4790-1000-232

CL4490-1000-485; CL4790-1000-485

CL4490-1000-PRO

Refer to section 1.1.1 for more details

Brand Name : Ezurio

Applicant : Ezurio LLC

Address : W66N220 Commerce Court, Cedarburg, WI

53012 United States Of America

Standard : 47 CFR FCC Part 15.247

Received Date : Aug. 24, 2023

Tested Date : Sep. 07 ~ Sep. 25, 2023

We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by: Approved by:

Along Chen / Assistant Manager Gary Chang / Manager

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- **Appendix F. AC Power Line Conducted Emissions**



Release Record

| Report No. | Version | Description | Issued Date |
|-------------|---------|---------------|--------------|
| FR232903-02 | Rev. 01 | Initial issue | May 17, 2024 |

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Summary of Test Results

| FCC Rules | Test Items | Measured | Result | |
|-----------------|----------------------------------|---|--------|--|
| 15.207 | AC Power Line Conducted Emission | [dBuV]: 23.845MHz 36.57 (Margin -13.43dB) - AV | Pass | |
| 15.247(d) | TX Unwanted Emissions | [dBuV/m at 3m]: 368.53MHz | Pass | |
| 15.209 | TX Offwarted Efficiency | 41.65 (Margin -4.35dB) - PK | 1 033 | |
| 15.247(d) | Band Edge | Meet the requirement of limit | Pass | |
| 15.247(b)(2)(3) | Conducted Output Power | Power [dBm]: 27.96 | Pass | |
| 15.247(a)(1)(i) | Number of Hopping Channels | Meet the requirement of limit | Pass | |
| 15.247(a)(1) | Hopping Channel Separation | Meet the requirement of limit | Pass | |
| 15.247(a)(1)(i) | 20 dB and Occupied Bandwidth | Meet the requirement of limit | Pass | |
| 15.247(f) | Dwell Time | Meet the requirement of limit | Pass | |
| 15.203 | Antenna Requirement | Meet the requirement of limit | Pass | |

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

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1 General Description

1.1 Information

This is a Class II Permissive Change report (C2PC).

This report is issued as a supplementary report to the original project no. FR232903, FR232903-01. The modification is concerned with following items:

- ♦ Change is power amplifier is replacing
- Relative PCB layout is modified
- Changing the brand and applicant name

Therefore, related test items had been performed and presented in the following sections.

1.1.1 Product Details

The following models are provided to this EUT.

| Model Name | Product Name | Description |
|-----------------|---------------------------------------|---------------------------------------|
| CL4490-1000-232 | ConnexLink 900MHz 1W RS232 | DB-9 Male (RS232) |
| CL4790-1000-232 | ConnexLink 900MHz 1W RS232 | DB-9 Male (RS232) / SW different |
| CL4490-1000-485 | ConnexLink 900MHz 1W RS485 | Terminal Block (RS485) |
| CL4790-1000-485 | ConnexLink 900MHz 1W RS485 | Terminal Block (RS485) / SW different |
| CL4490-1000-PRO | ConnexLink 900MHz 1W RS232/422/485 | DB-9 Female/DIP Switch |

1.1.2 Specification of the Equipment under Test (EUT)

| RF General Information | | | | | |
|---|-----------|-------------|----------|-----|--|
| Frequency Range Ch. Freq. Channel List Data Rate Channel Band (kHz) | | | | | |
| 902 ~ 928 | 902 ~ 928 | 50 channels | 76.8kbps | 145 | |

Note 1: RF output power specifies that Maximum Peak Conducted Output Power.

Note 2: The device uses FSK modulation.

Note 3: The device supports FHSS mode.

1.1.3 Antenna Details

| Ant. No. | Model | Туре | Connector | Gain (dBi) |
|----------|-------------|--------|-----------|------------|
| 1 | S467AH-915S | dipole | R-SMA | 2.0 |
| 2 | S331AH-915 | dipole | R-SMA | 2.0 |

Note: Antenna 1 with worst gain was chosen for final test

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1.1.4 Power Supply Type of Equipment under Test (EUT)

| HW Version | 2.0 |
|-------------------|--|
| Power Supply Type | 12Vdc from adapter 7.5Vdc from adapter (For Model CL4490-1000-PRO only) |

1.1.5 Accessories

| | Accessories | | | | |
|-----|--|---|--|--|--|
| No. | Equipment | Description | | | |
| 1 | AC adapter | Brand: ITE Model: MU12AY120100-A1 I/P: 100-240Vac, 50/60Hz, 0.3A O/P: 12Vdc, 1A Power Line: 1.48m non-shielded without core | | | |
| 2 | RS232 (for CL4x90-1000-PRO) | 1.85m non-shielded without core | | | |
| 3 | RS232 (for CL4x90-1000-232) | 1.85m non-shielded without core | | | |
| 4 | AC adapter (For CL4490-1000-PRO only) | Brand: GlobTek Model: GT-41052-1509-1.5 I/P: 100-240Vac, 50-60Hz, 0.6A O/P: 7.5Vdc, 2.0A, 15.0W Power Line: 1.9m non-shielded with one core | | | |
| 5 | AC adapter | Brand: CWT Model: 2AEA012FA3A I/P: 100-240Vac, 50/60Hz, 0.35A O/P: 12Vdc, 1A Power Line: 1.51m non-shielded without core | | | |

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1.1.6 Channel List

| Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| 0 | 902.213 | 13 | 909.06 | 26 | 915.903 | 39 | 922.751 |
| 1 | 902.74 | 14 | 909.585 | 27 | 916.431 | 40 | 923.278 |
| 2 | 903.267 | 15 | 910.111 | 28 | 916.958 | 41 | 923.805 |
| 3 | 903.795 | 16 | 910.638 | 29 | 917.486 | 42 | 924.333 |
| 4 | 904.321 | 17 | 911.167 | 30 | 918.012 | 43 | 924.858 |
| 5 | 904.846 | 18 | 911.692 | 31 | 918.538 | 44 | 925.385 |
| 6 | 905.375 | 19 | 912.217 | 32 | 919.063 | 45 | 925.911 |
| 7 | 905.9 | 20 | 912.743 | 33 | 919.591 | 46 | 926.439 |
| 8 | 906.428 | 21 | 913.27 | 34 | 920.116 | 47 | 926.965 |
| 9 | 906.952 | 22 | 913.7 | 35 | 920.643 | 48 | 927.492 |
| 10 | 907.478 | 23 | 914.325 | 36 | 921.172 | 49 | 927.256 |
| 11 | 908.01 | 24 | 914.852 | 37 | 921.697 | | |
| 12 | 908.532 | 25 | 915.378 | 38 | 922.223 | | |

1.1.7 Test Tool and Duty Cycle

| Test Tool | Laird Technologies Config, Version: V6.07 | | |
|-----------|---|------|--|
| Mode | Duty Cycle (%) Duty Factor (dB) | | |
| FSK | 100.00% | 0.00 | |

1.1.8 Power Index of Test Tool

| Test Frequency (MHz) | Power Index |
|----------------------|-------------|
| 902.213 | 0x0D |
| 915.378 | 0x0D |
| 927.492 | 0x0B |

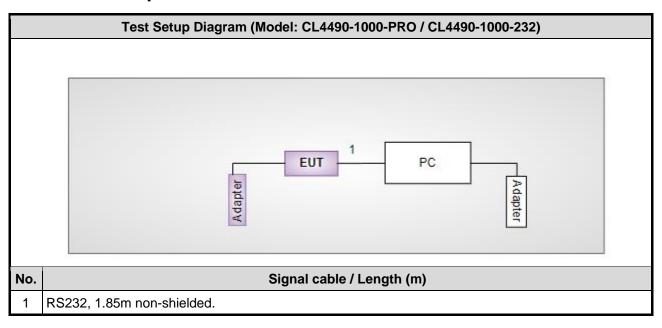
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1.2 Local Support Equipment List

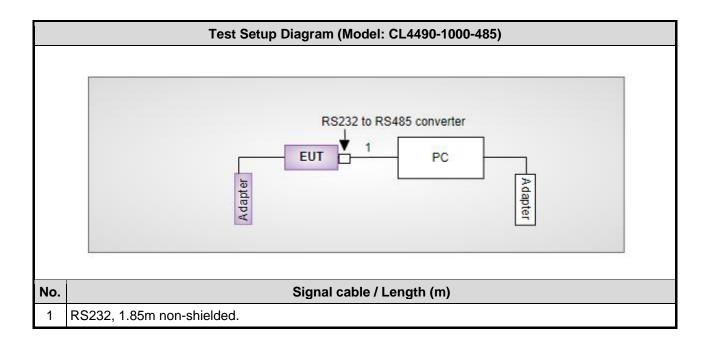
| Support Equipment List | | | | | |
|--|-----------------------------|-------|-----------|--|------------------------|
| No. Equipment Brand Model FCC ID Remarks | | | | | Remarks |
| 1 | PC | MSI | Cubi B164 | | Provided by applicant. |
| 2 | RS232 to RS485 converter | UTEK | UT-2201 | | Provided by applicant. |
| 3 | PC adapter | AcBel | ADC027 | | Provided by applicant. |

1.3 Test Setup Chart



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1.4 The Equipment List

| Test Item | Conducted Emission | | | | | |
|-----------------------------------|---|----------------------|------------|------------------|-------------------|--|
| Test Site | Conduction room 1 / (| CO01-WS) | | | | |
| Tested Date | Sep. 21, 2023 | | | | | |
| Instrument | Brand | Model No. | Serial No. | Calibration Date | Calibration Until | |
| Receiver | R&S | ESR3 | 101658 | Feb. 17, 2023 | Feb. 16, 2024 | |
| LISN | R&S | ENV216 | 101579 | May 09, 2023 | May 08, 2024 | |
| LISN (Support Unit) | SCHWARZBECK | Schwarzbeck 8127 | 8127667 | Jan. 03, 2023 | Jan. 02, 2024 | |
| RF Cable-CON | Woken CFD200-NL CFD200-NL-001 Oct. 17, 2022 Oct. 16, 2023 | | | | | |
| 50 ohm terminal (Support Unit) | NA | 50 | 01 | Jun. 14, 2023 | Jun. 13, 2024 | |
| Measurement Software | AUDIX | e3 | 6.120210k | NA | NA | |
| Note: Calibration Inte | rval of instruments liste | d above is one year. | | | | |

| Test Item | RF Conducted | | | | | |
|-------------------------------|-------------------------|------------------------|------------|------------------|-------------------|--|
| Test Site | (TH01-WS) | | | | | |
| Tested Date | Sep. 25, 2023 | | | | | |
| Instrument | Brand | Model No. | Serial No. | Calibration Date | Calibration Until | |
| Spectrum Analyzer | R&S | FSV40 | 101910 | Apr. 14, 2023 | Apr. 13, 2024 | |
| Power Meter | Anritsu | ML2495A | 1241002 | Nov. 23, 2022 | Nov. 22, 2023 | |
| Power Sensor | Anritsu | MA2411B | 1207366 | Nov. 23, 2022 | Nov. 22, 2023 | |
| Attenuator | Pasternack | PE7005-20 | 20-1 | Oct. 06, 2022 | Oct. 05, 2023 | |
| BANDREJECT FILTER 800-1000 | K&L | 3TNF-800/1000-0.2-O/O | 17 | Oct. 11, 2022 | Oct. 10, 2023 | |
| HIGHPASS FILTER 1.5-15G | WHK | WHK1.5/15G-10ST | 21 | Oct. 06, 2022 | Oct. 05, 2023 | |
| Measurement Software | Sporton | SENSE-15247_FS | V5.10.8 | NA | NA | |
| Note: Calibration Inte | rval of instruments lis | ted above is one year. | | | | |

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| Test Item | Radiated Emission | | | | |
|----------------------------|-----------------------|---------------------------|------------------|------------------|-------------------|
| Test Site | 966 chamber1 / (03C | H01-WS) | | | |
| Tested Date | Sep. 07 ~ Sep. 12, 20 |)23 | | | |
| Instrument | Brand | Model No. | Serial No. | Calibration Date | Calibration Until |
| Receiver | R&S | ESR3 | 101657 | Mar. 03, 2023 | Mar. 02, 2024 |
| Spectrum Analyzer | R&S | FSV40 | 101498 | Nov. 21, 2022 | Nov. 20, 2023 |
| Loop Antenna | R&S | HFH2-Z2 | 100330 | Nov. 01, 2022 | Oct. 31, 2023 |
| Bilog Antenna | SCHWARZBECK | VULB9168 | VULB9168-522 | Jul. 31, 2023 | Jul. 30, 2024 |
| Horn Antenna 1G-18G | SCHWARZBECK | BBHA 9120 D | BBHA 9120 D 1096 | Nov. 25, 2022 | Nov. 24, 2023 |
| Horn Antenna 18G-40G | SCHWARZBECK | BBHA 9170 | BBHA 9170517 | Oct. 27, 2022 | Oct. 26, 2023 |
| Preamplifier | EMC | EMC02325 | 980225 | Jun. 28, 2023 | Jun. 27, 2024 |
| Preamplifier | EMC | EMC118A45SE | 980898 | Jul. 14, 2023 | Jul. 13, 2024 |
| Preamplifier | EMC | EMC184045SE | 980903 | Jul. 17, 2023 | Jul. 16, 2024 |
| Loop Antenna Cable | KOAX KABEL | 101354-BW | 101354-BW | Oct. 04, 2022 | Oct. 03, 2023 |
| LF cable 3M | Woken | CFD400NL-LW | CFD400NL-001 | Oct. 04, 2022 | Oct. 03, 2023 |
| LF cable 11M | EMC | EMCCFD400-NW-N W-11000 | 200801 | Oct. 04, 2022 | Oct. 03, 2023 |
| LF cable 1M | EMC | EMCCFD400-NM-N M-1000 | 160502 | Oct. 04, 2022 | Oct. 03, 2023 |
| RF Cable | EMC | EMC104-35M-35M- 8000 | 210920 | Oct. 04, 2022 | Oct. 03, 2023 |
| RF Cable | EMC | EMC104-35M-35M- 3000 | 210922 | Oct. 04, 2022 | Oct. 03, 2023 |
| Attenuator | Pasternack | PE7005-10 | 10-1 | Oct. 06, 2022 | Oct. 05, 2023 |
| HIGHPASS FILTER 1.5-15G | WHK | WHK1.5/15G-10ST | 21 | Oct. 06, 2022 | Oct. 05, 2023 |
| Measurement Software | AUDIX | e3 | 6.120210g | NA | NA |

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1.5 Test Standards

47 CFR FCC Part 15.247 ANSI C63.10-2013

1.6 Reference Guidance

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

1.7 Deviation from Test Standard and Measurement Procedure

None

1.8 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

| Measurement Uncertainty | | | |
|-----------------------------|-------------|--|--|
| Parameters | Uncertainty | | |
| Bandwidth | ±34.130 Hz | | |
| Conducted power | ±0.808 dB | | |
| Power density | ±0.583 dB | | |
| TX Unwanted Emission ≤ 1GHz | ±3.41 dB | | |
| TX Unwanted Emission > 1GHz | ±4.59 dB | | |

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2 Test Configuration

2.1 Testing Facility

| Test Laboratory | International Certification Corporation |
|----------------------|--|
| Test Site | CO01-WS, 03CH01-WS, TH01-WS |
| Address of Test Site | No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.) |

FCC Designation No.: TW2732FCC site registration No.: 181692

➤ ISED#: 10807A

➤ CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

| Test item | Modulation Mode | Test Frequency (MHz) | Radiated / Conducted Measurement | Test Configuration | Mode |
|---|--------------------|-----------------------------|--|-----------------------|------|
| AC Power Line Conducted Emission | FSK | 902.213 / 915.378 / 927.492 | Conducted | 1, 2, 3 | Tx |
| TX Unwanted Emissions ≤ 1GHz | FSK | 902.213 / 915.378 / 927.492 | Radiated | 1, 2, 3 | Тх |
| TX Unwanted Emissions >1GHz | FSK | 902.213 / 915.378 / 927.492 | Radiated | 1, 3 | Тх |
| Conducted Output Power Hopping Channel Separation 20dB and Occupied bandwidth | FSK | 902.213 / 915.378 / 927.492 | Conducted | 1, 3 | Tx |

NOTE:

- 1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement X, Y, and Z-plane. The **Z-plane** result was found as the worst case and was shown in this report.
- 2. Test configurations are listed as below:
 - 1) Configuration 1: Model: CL4490-1000-232
 - 2) Configuration 2: Model: CL4490-1000-485
 - 3) Configuration 3: Model: CL4490-1000-PRO
- Three adapters (ITE, GlobTek and CWT) had been covered during the pretest, and found that **ITE adapter** was the worst case and was selected for final test.

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3 Transmitter Test Results

3.1 TX Unwanted Emissions into Restricted Frequency Bands

3.1.1 Limit of TX Unwanted Emissions into Restricted Frequency Bands

| Restricted Band Emissions Limit | | | | | |
|---------------------------------|-----------------------|-------------------------|----------------------|--|--|
| Frequency Range (MHz) | Field Strength (uV/m) | Field Strength (dBuV/m) | Measure Distance (m) | | |
| 0.009~0.490 | 2400/F(kHz) | 48.5 - 13.8 | 300 | | |
| 0.490~1.705 | 24000/F(kHz) | 33.8 - 23 | 30 | | |
| 1.705~30.0 | 30 | 29 | 30 | | |
| 30~88 | 100 | 40 | 3 | | |
| 88~216 | 150 | 43.5 | 3 | | |
| 216~960 | 200 | 46 | 3 | | |
| Above 960 | 500 | 54 | 3 | | |

Note 1:

Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit **Note 2**:

Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.1.2 Test Procedures

- 1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
- 2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
- 3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

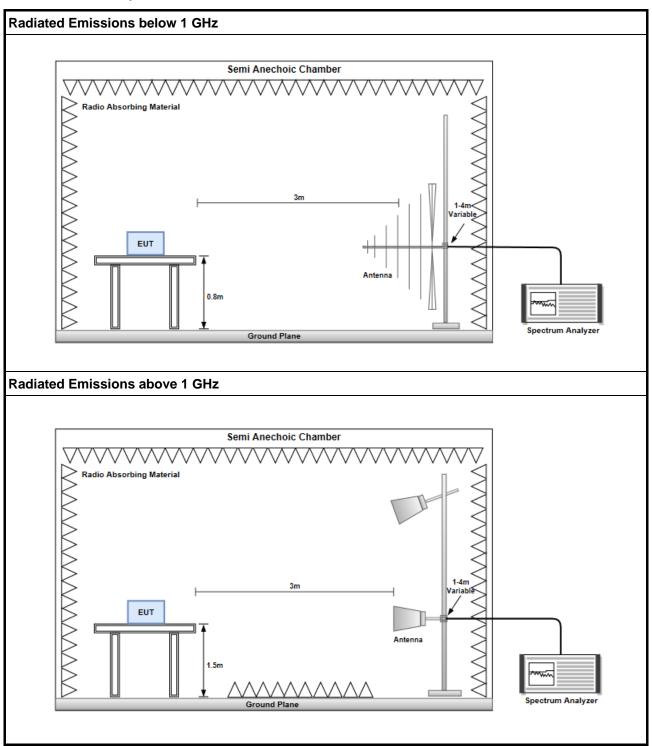
Note:

- 1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
- 2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
- 3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

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3.1.3 Test Setup



3.1.4 Test Results

Refer to Appendix A.

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3.2 TX Unwanted Emissions into Non-Restricted Frequency Bands

3.2.1 Limit of TX Unwanted Emissions into Non-Restricted Frequency Bands

The peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz.

3.2.2 Test Procedures

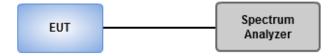
Reference Level Measurement

- 1. Set the RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
- Set Sweep time = auto couple, Trace mode = max hold.
- 3. Allow trace to fully stabilize.
- 4. Use the peak marker function to determine the maximum amplitude level.

Unwanted Emissions Level Measurement

- 1. Set RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
- 2. Trace Mode = max hold, Sweep = auto couple.
- 3. Allow the trace to stabilize.
- Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

3.2.3 Test Setup



3.2.4 Test Results

| Ambient Condition | 24°C / 64% | Tested By | Brad Wu |
|-------------------|------------|-----------|---------|
| | , , . | | |

Refer to Appendix B.

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3.3 Conducted Output Power

3.3.1 Limit of Conducted Output Power

1W

3.3.2 Test Procedures

- A wideband power meter is used for power measurement. Bandwidth of power senor and meter is 50MHz
- 2 If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power

3.3.3 Test Setup



3.3.4 Test Results

| | Ambient Condition | 24°C / 64% | Tested By | Brad Wu |
|--|-------------------|------------|-----------|---------|
|--|-------------------|------------|-----------|---------|

Refer to Appendix C.

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3.4 20dB and Occupied Bandwidth

3.4.1 Test Procedures

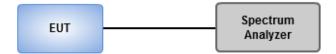
20dB Bandwidth

- 1. Set RBW=3kHz, VBW=10kHz, Sweep time=Auto, Detector=Peak Trace max hold.
- 2 Allow trace to stabilize.
- 3 Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

Occupied Bandwidth

- 1. Set RBW=3kHz, VBW=10kHz, Sweep time = Auto, Detector=Peak, Trace max hold
- 2 Allow trace to stabilize
- 3. Use Occupied bandwidth function of spectrum analyzer to measuring 99% occupied bandwidth

3.4.2 Test Setup



3.4.3 Test Results

| Ambient Condition | 24°C / 64% | Tested By | Brad Wu |
|-------------------|------------|-----------|---------|
|-------------------|------------|-----------|---------|

Refer to Appendix D.

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3.5 Channel Separation

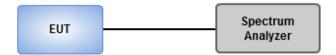
3.5.1 Limit of Channel Separation

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

3.5.2 Test Procedures

- Set RBW=10kHz, VBW=30kHz, Sweep time=Auto, Detector=Peak Trace max hold.
- 2 Allow trace to stabilize.
- 3 Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The EUT shall show compliance with the appropriate regulatory limit

3.5.3 Test Setup



3.5.4 Test Results

| | 0.400 / 0.40/ | T (15 | D 114/ |
|-------------------|---------------|-----------|---------|
| Ambient Condition | 24°C / 64% | Tested By | Brad Wu |

Refer to Appendix E.

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3.6 AC Power Line Conducted Emissions

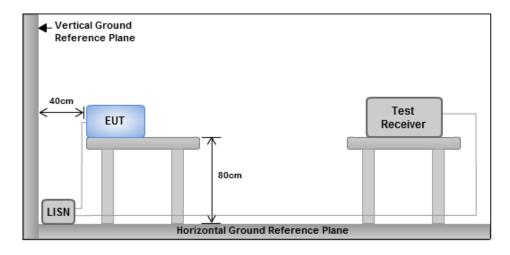
3.6.1 Limit of AC Power Line Conducted Emissions

| Conducted Emissions Limit | | | | | |
|---|--|--|--|--|--|
| Conducted Emissions Limit | | | | | |
| Frequency Emission (MHz) Quasi-Peak Average | | | | | |
| 0.15-0.5 66 - 56 * 56 - 46 * | | | | | |
| 0.5-5 56 46 | | | | | |
| 5-30 60 50 | | | | | |

3.6.2 Test Procedures

- 1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
- 2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
- 3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
- 4. This measurement was performed with AC 120V / 60Hz.

3.6.3 Test Setup



Note: 1. Support units were connected to second LISN.

Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.6.4 Test Result of Conducted Emissions

Refer to Appendix F.

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4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corporation (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website http://www.icertifi.com.tw.

Linkou

Tel: 886-2-2601-1640 No.30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan (R.O.C.)

Kwei Shan

Tel: 886-3-271-8666
No.3-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)
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St., Kwei Shan Dist., Tao Yuan
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Kwei Shan Site II

Tel: 886-3-271-8640 No.14-1, Lane 19, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666 Fax: 886-3-318-0345

Email: ICC_Service@icertifi.com.tw

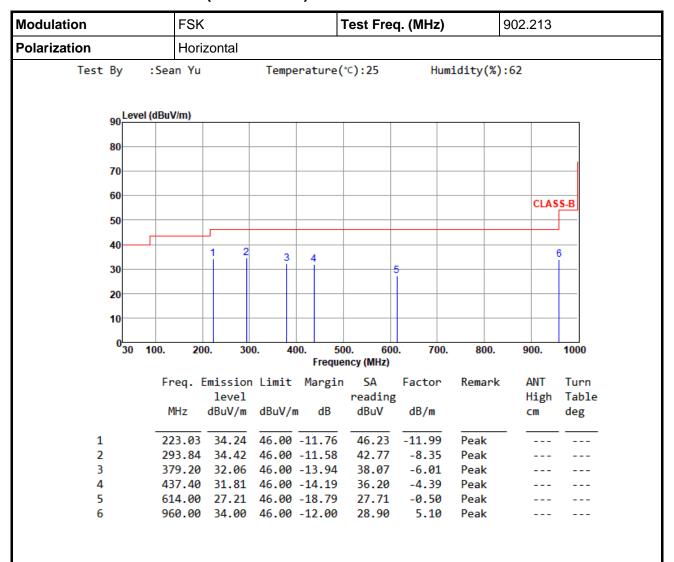
==END==

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Model: CL4490-1000-232

TX Unwanted Emissions (Below 1GHz)



Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

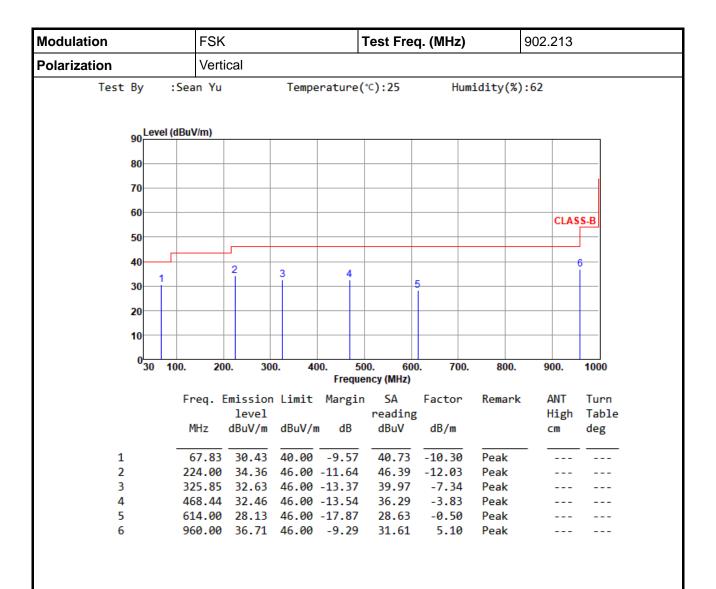
*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

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Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

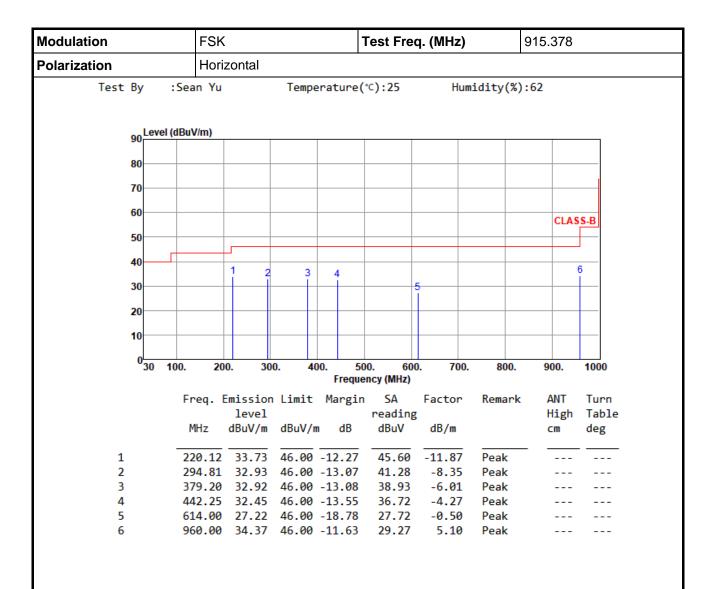
*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

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Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

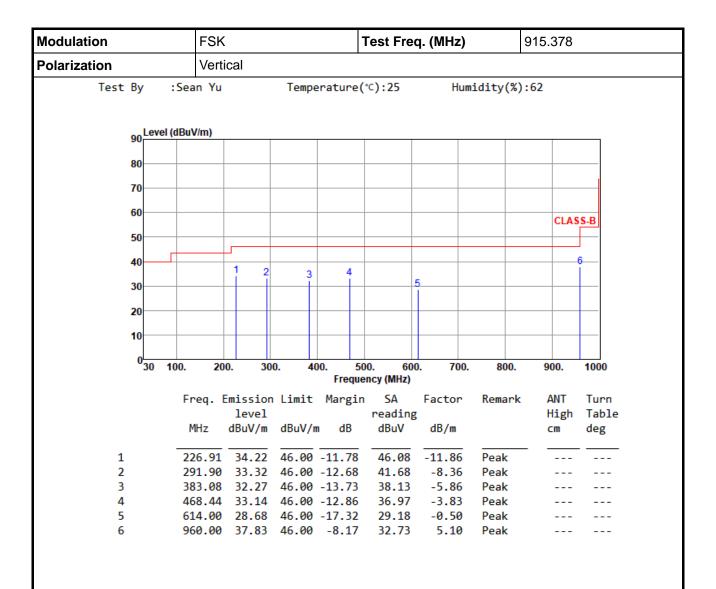
*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

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Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

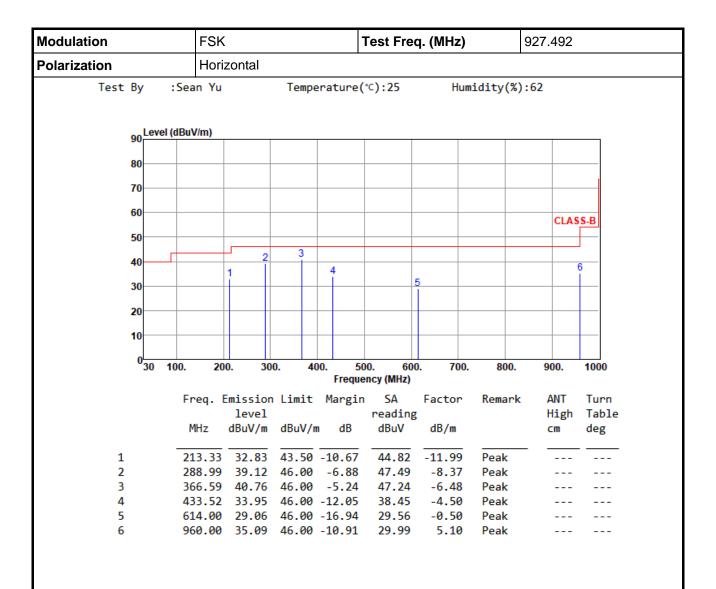
*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

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Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

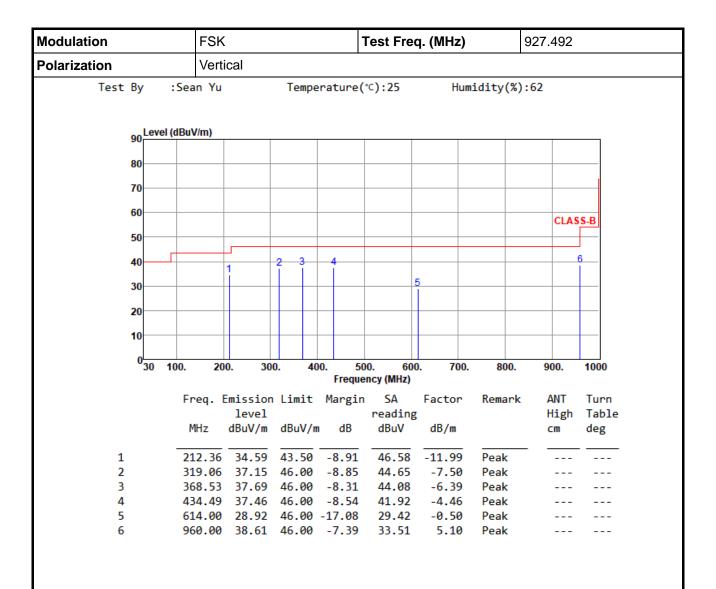
*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

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Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

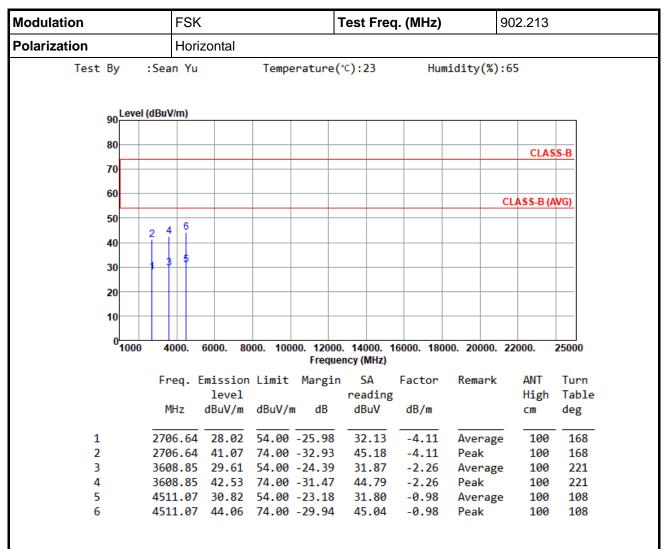
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

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TX Unwanted Emissions (Above 1GHz)



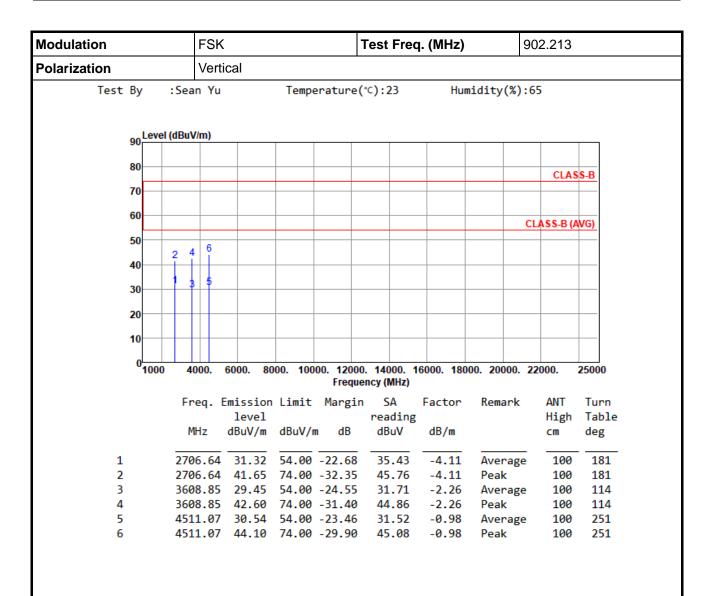
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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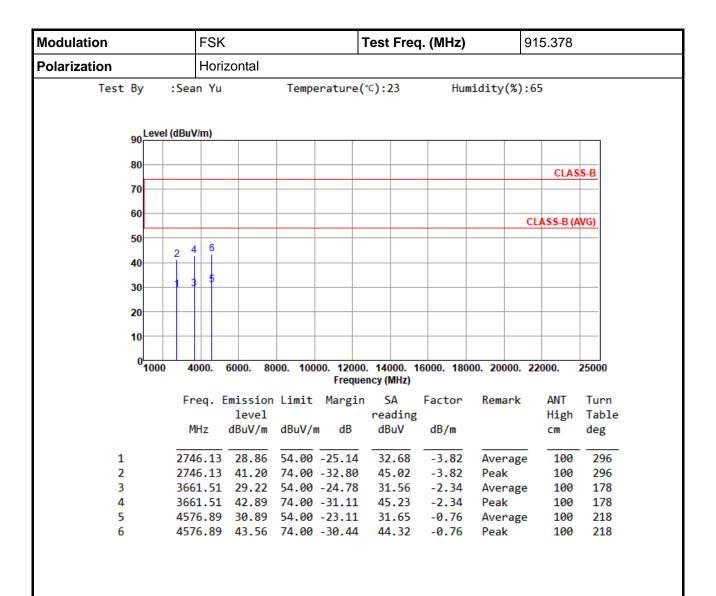
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

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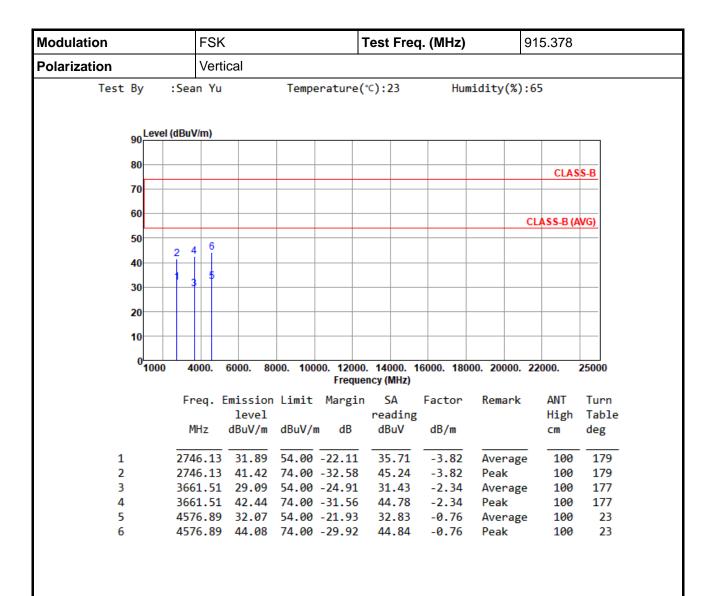
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

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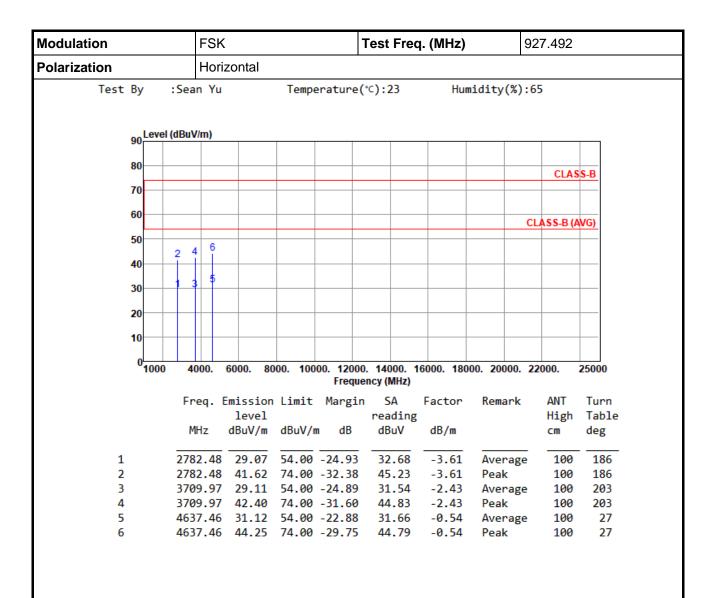
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

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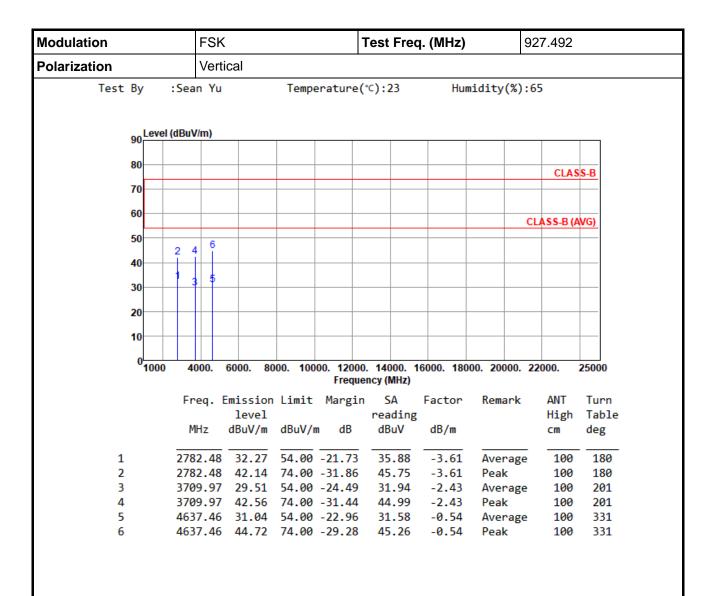
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

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Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

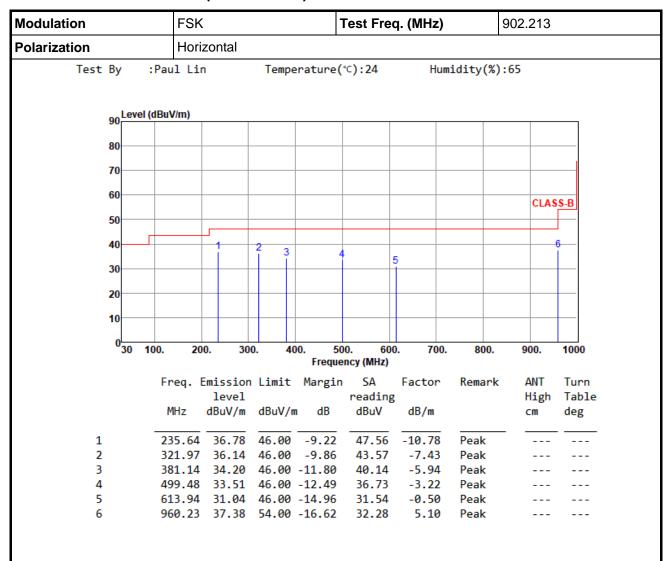
Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

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Model: CL4490-1000-485

TX Unwanted Emissions (Below 1GHz)



Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

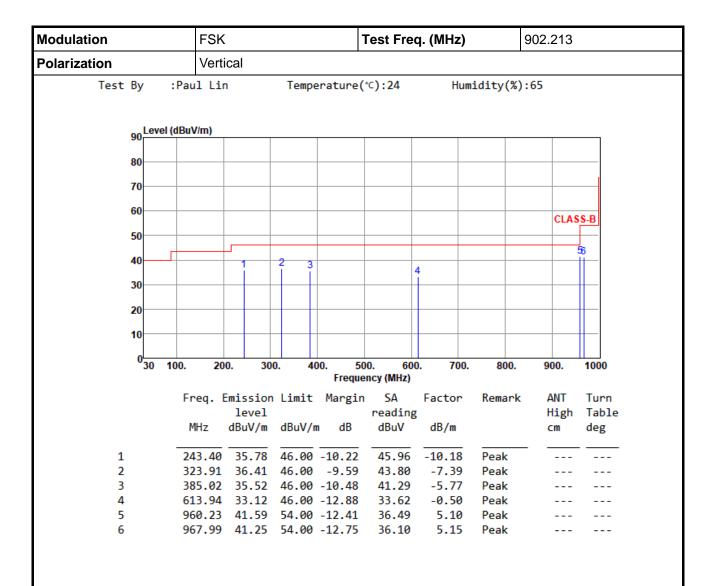
*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

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Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

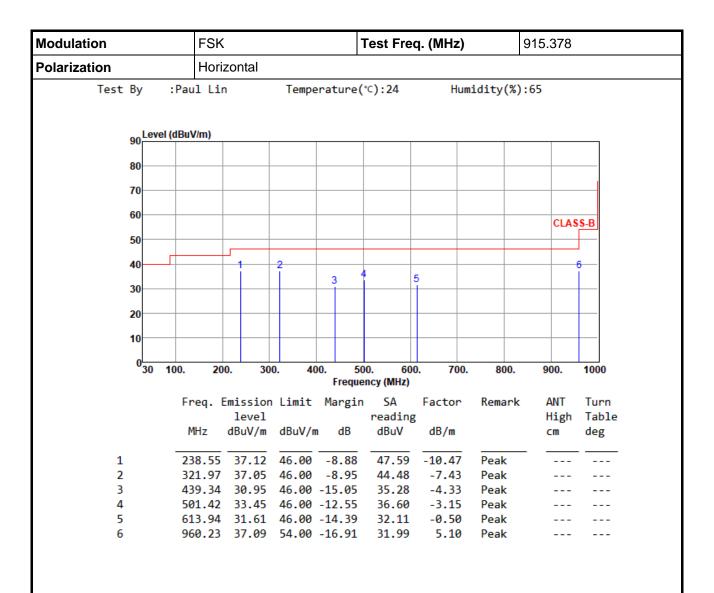
*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

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Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

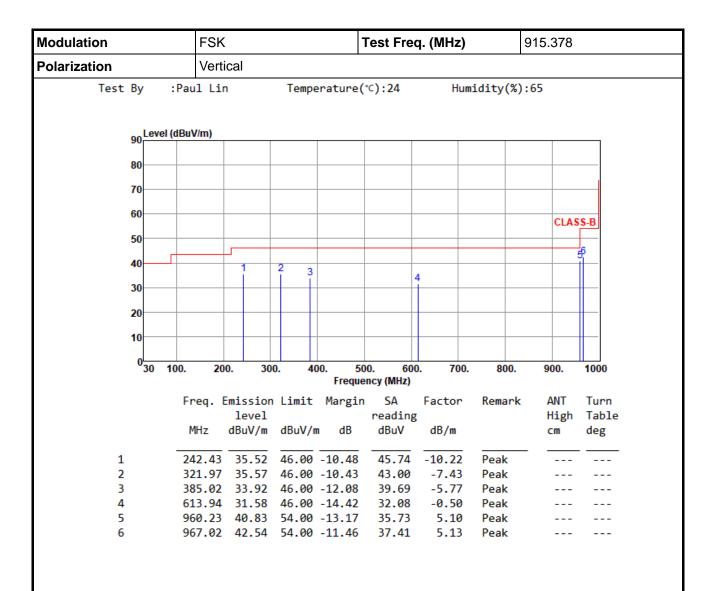
*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

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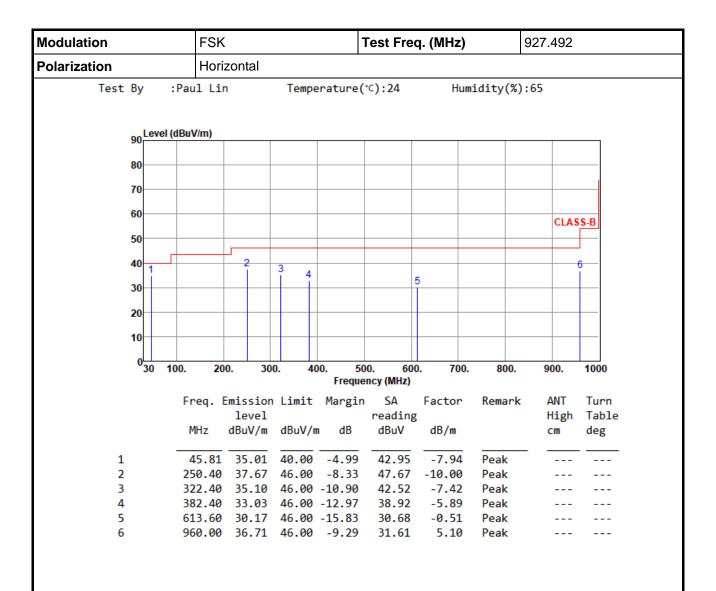
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.





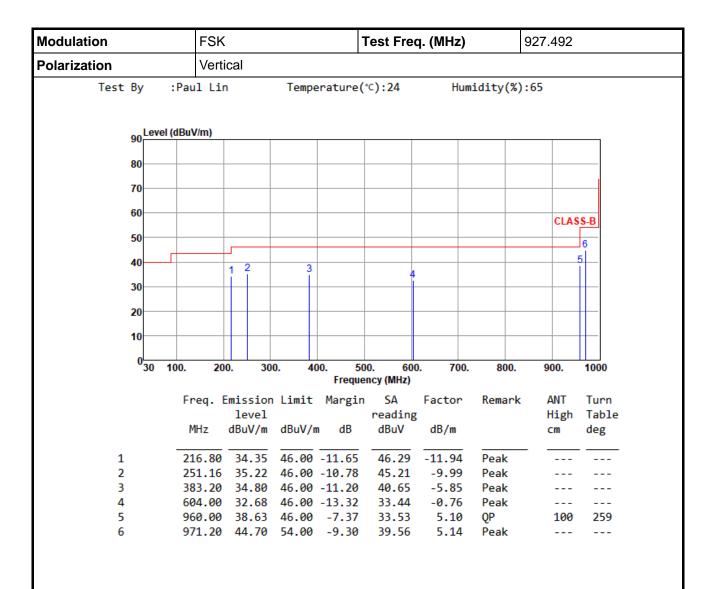
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.





Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

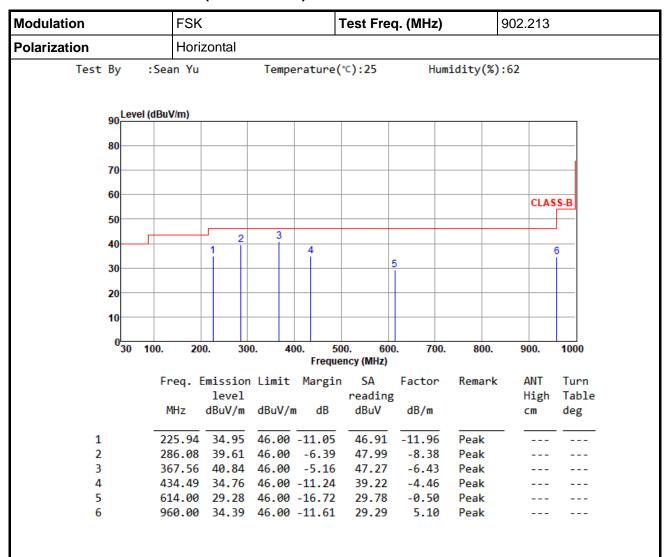
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.



Model: CL4490-1000-PRO

TX Unwanted Emissions (Below 1GHz)



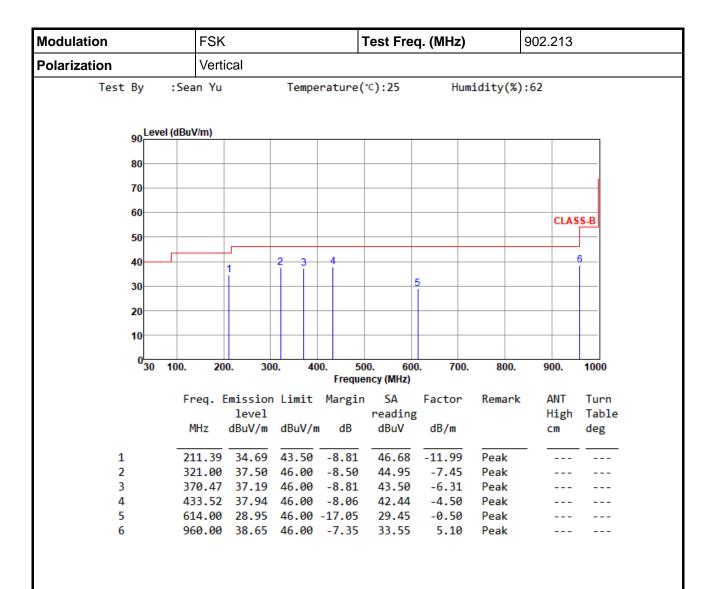
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.





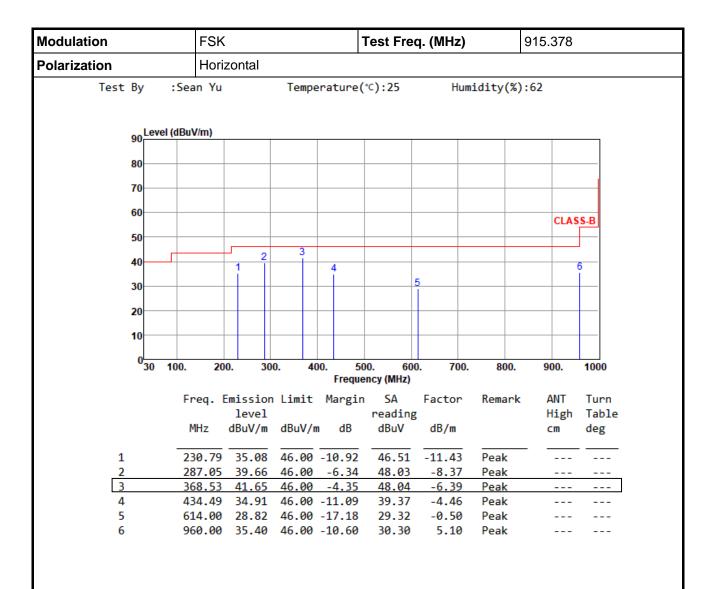
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.





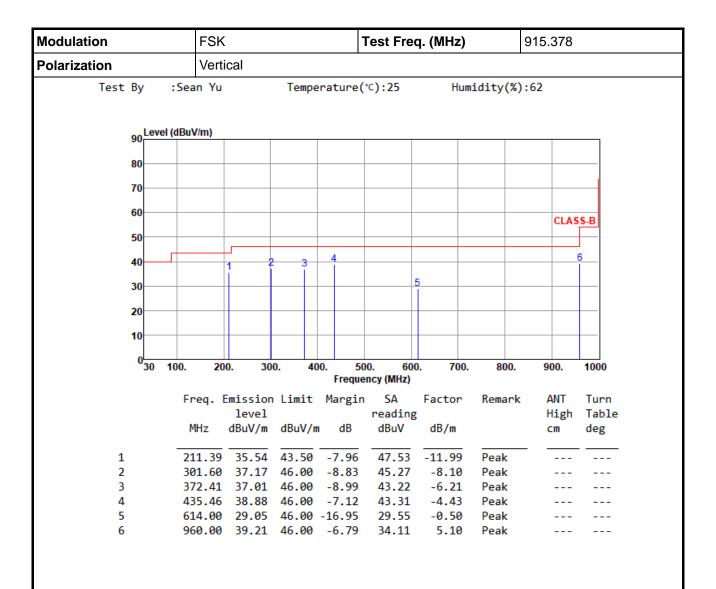
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.





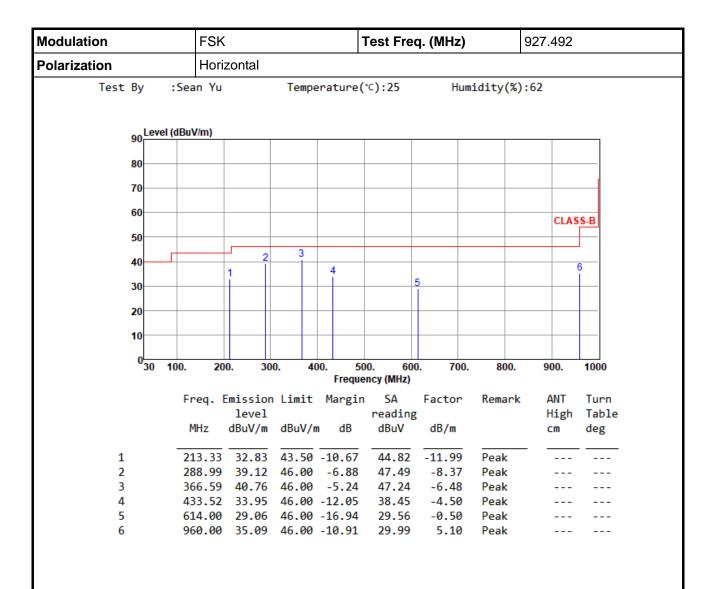
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.





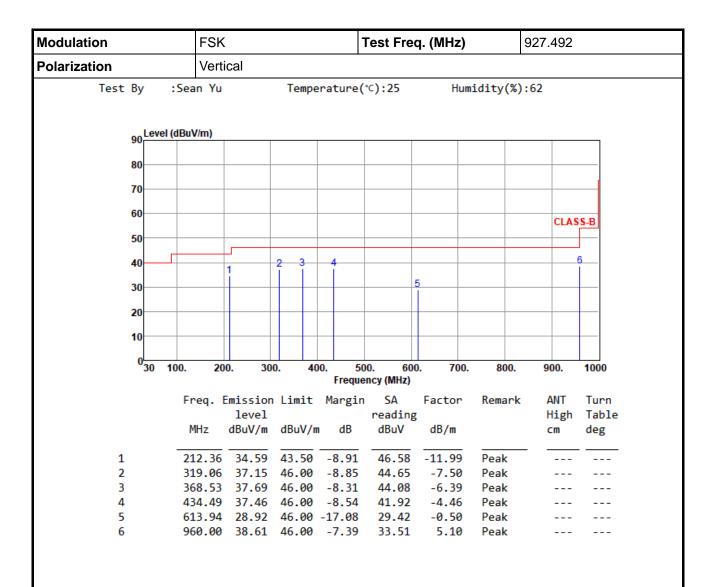
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.





Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

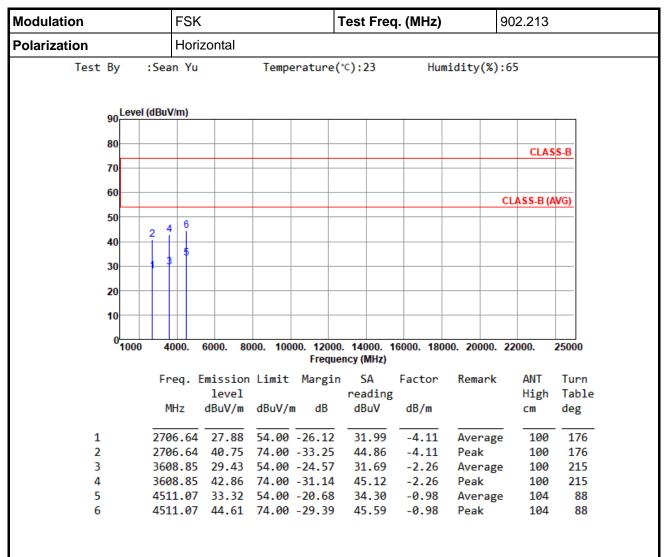
*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.



TX Unwanted Emissions (Above 1GHz)

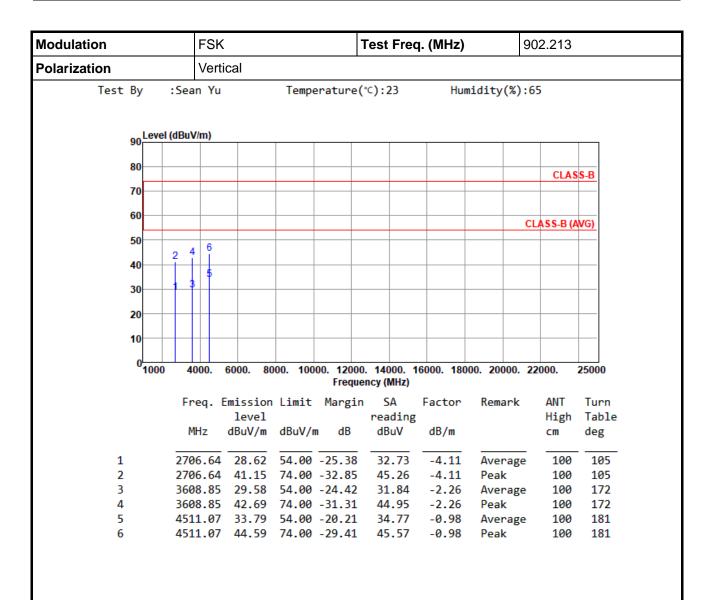


Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



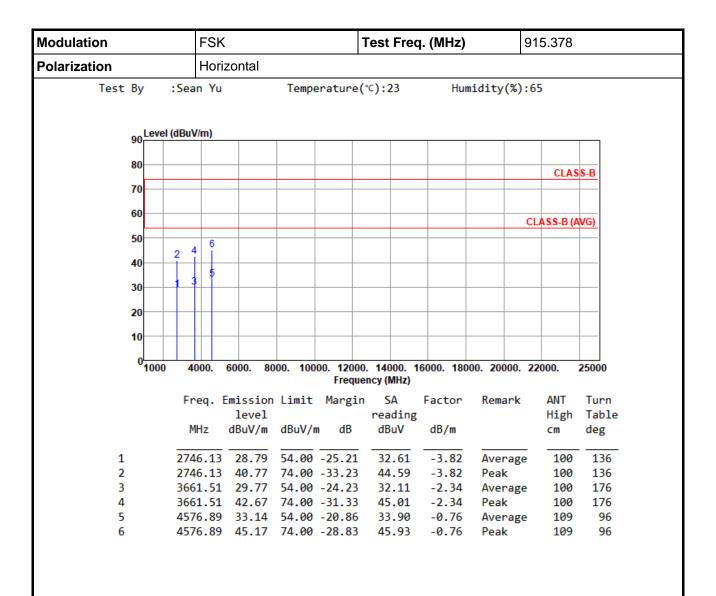


Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



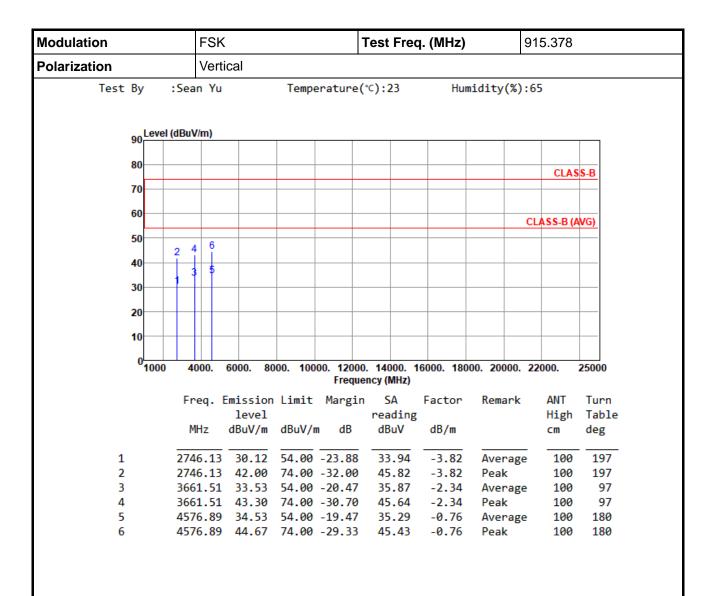


Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



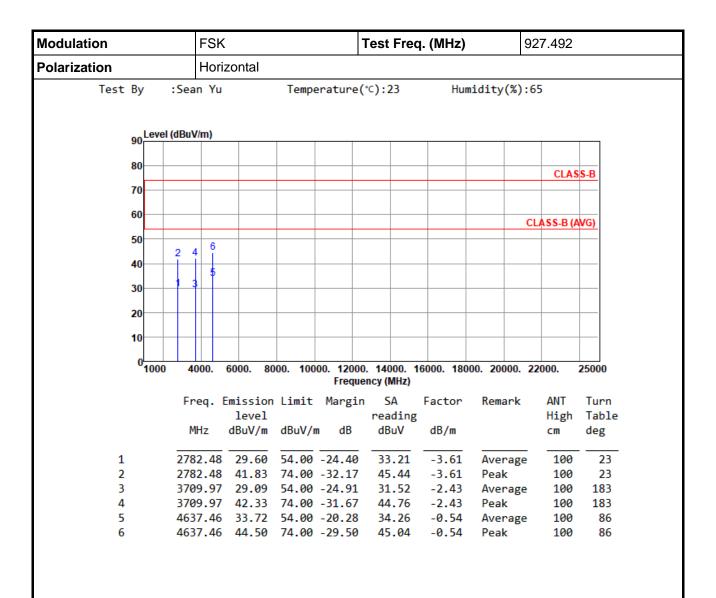


Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



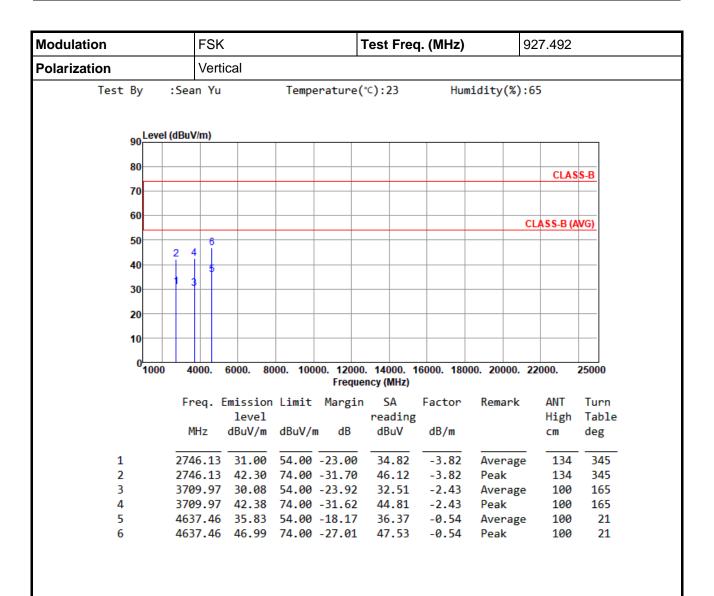


Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).





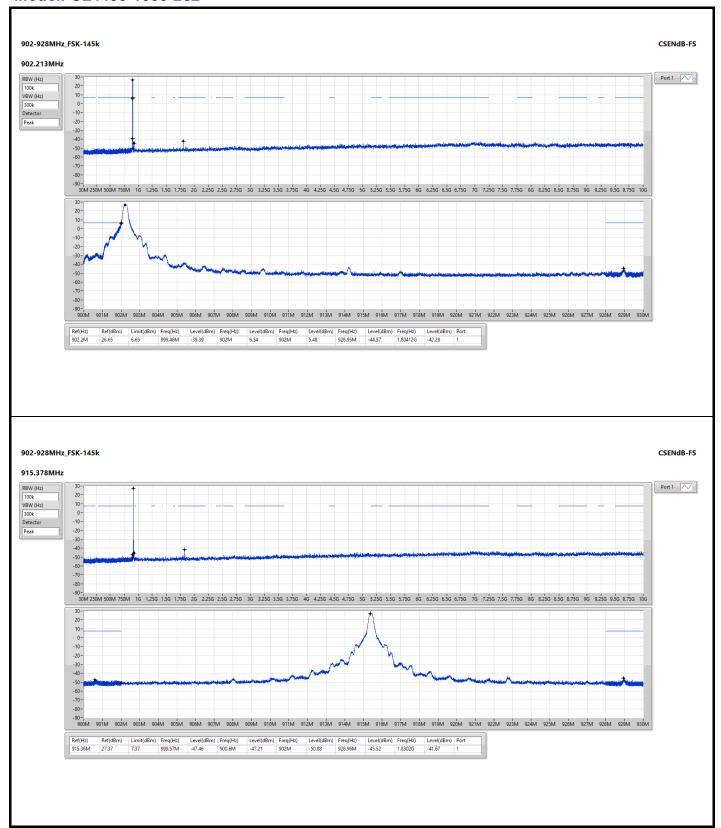
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor, cable loss and amplifier gain

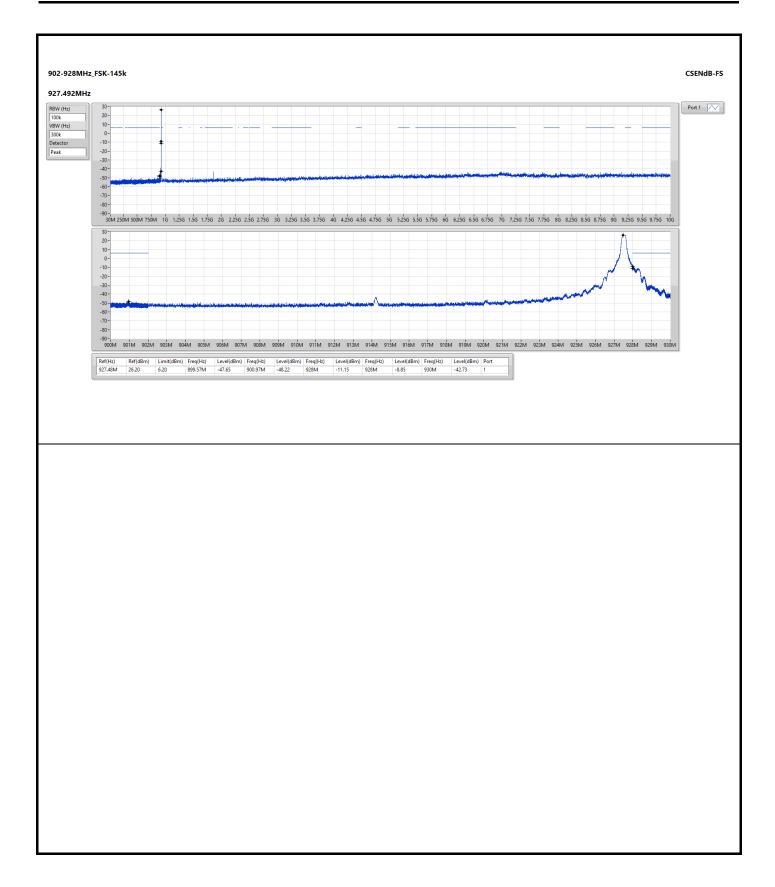
Note 2: Margin (dB) = Emission level (dBuV/m) - Limit (dBuV/m).



Model: CL4490-1000-232

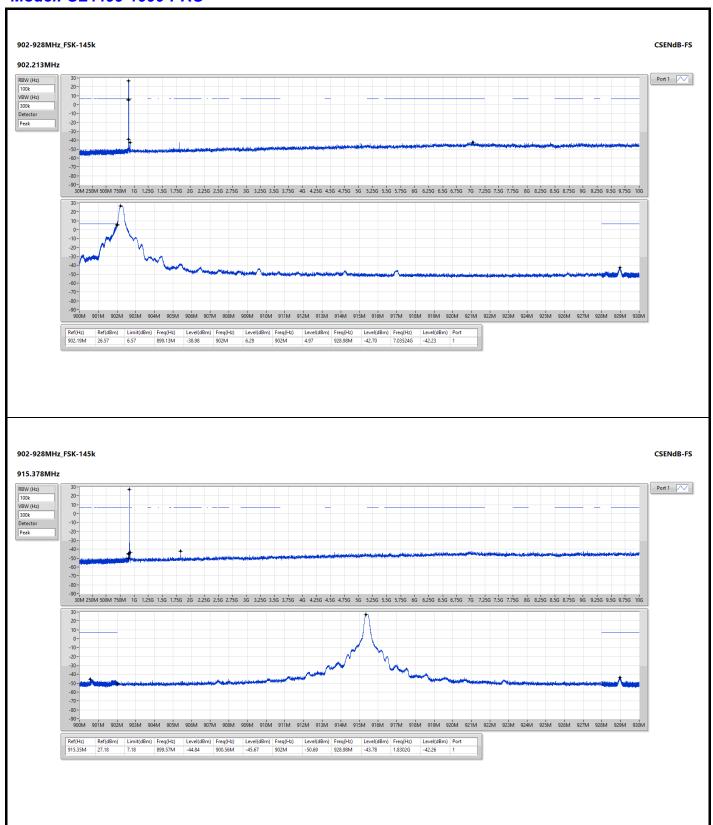




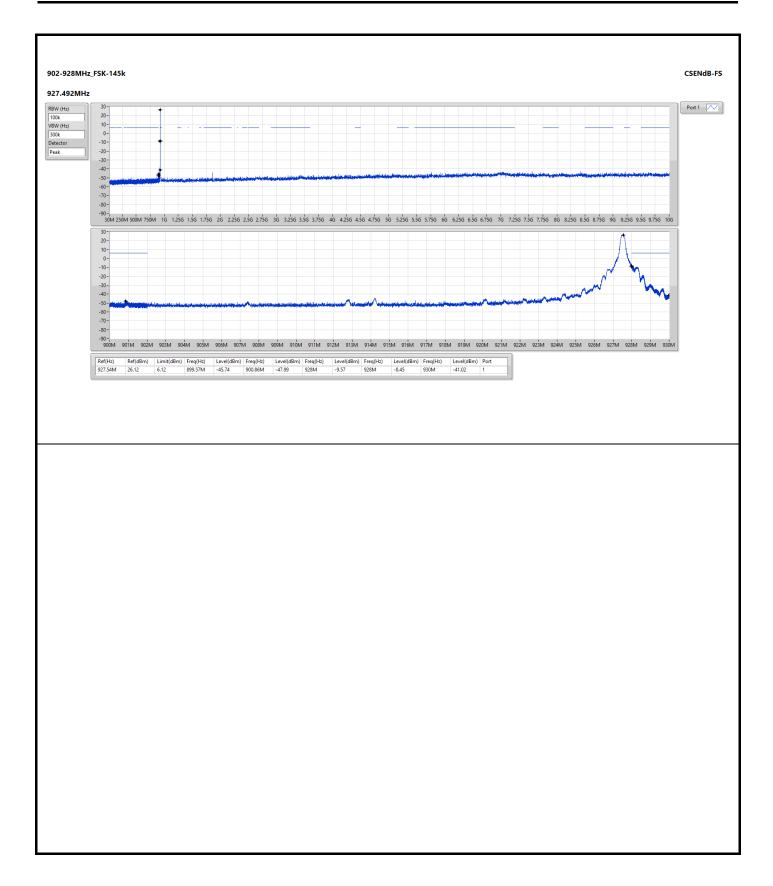




Model: CL4490-1000-PRO













Model: CL4490-1000-232

Summary

| Mode | Total Power (dBm) | Power (W) |
|------------|----------------------|--------------|
| 902-928MHz | - | - |
| FSK-145k | 27.96 | 0.62517 |

Result

| Mode | Result | Antenna Gain | Total Power | Power Limit | EIRP | EIRP Limit |
|------------|--------|-----------------|-------------|-------------|-------|------------|
| | | (dBi) | (dBm) | (dBm) | (dBm) | (dBm) |
| FSK-145k | - | - | - | - | - | - |
| 902.213MHz | Pass | 2.00 | 27.17 | 30.00 | 29.17 | 36.00 |
| 915.378MHz | Pass | 2.00 | 27.96 | 30.00 | 29.96 | 36.00 |
| 927.492MHz | Pass | 2.00 | 26.78 | 30.00 | 28.78 | 36.00 |

Model: CL4490-1000-PRO

Summary

| Mode | Total Power (dBm) | Power (W) |
|------------|----------------------|--------------|
| 902-928MHz | - | - |
| FSK-145k | 27.54 | 0.56754 |

Result

| Mode | Result | Antenna Gain | Total Power | Power Limit | EIRP | EIRP Limit |
|------------|--------|-----------------|-------------|-------------|-------|------------|
| | | (dBi) | (dBm) | (dBm) | (dBm) | (dBm) |
| FSK-145k | - | - | - | - | - | - |
| 902.213MHz | Pass | 2.00 | 27.17 | 30.00 | 29.17 | 36.00 |
| 915.378MHz | Pass | 2.00 | 27.54 | 30.00 | 29.54 | 36.00 |
| 927.492MHz | Pass | 2.00 | 26.54 | 30.00 | 28.54 | 36.00 |



Conducted Output Power (Average)

Appendix C

Model: CL4490-1000-232

Summary

| Mode | Total Power (dBm) | Power (W) |
|------------|----------------------|--------------|
| 902-928MHz | - | - |
| FSK-145k | 27.82 | 0.60534 |

Result

| Mode | Result | Antenna Gain | Total Power | Power Limit | EIRP | EIRP Limit |
|------------|--------|-----------------|-------------|-------------|-------|------------|
| | | (dBi) | (dBm) | (dBm) | (dBm) | (dBm) |
| FSK-145k | - | - | - | - | - | - |
| 902.213MHz | Pass | 2.00 | 27.10 | - | 29.10 | - |
| 915.378MHz | Pass | 2.00 | 27.82 | - | 29.82 | - |
| 927.492MHz | Pass | 2.00 | 26.43 | - | 28.43 | - |

Note: Average power is for reference only.

Model: CL4490-1000-PRO

Summary

| Mode | Total Power (dBm) | Power (W) |
|------------|----------------------|--------------|
| 902-928MHz | - | - |
| FSK-145k | 27.47 | 0.55847 |

Result

| Mode | Result | Antenna Gain | Total Power | Power Limit | EIRP | EIRP Limit |
|------------|--------|-----------------|-------------|-------------|-------|------------|
| | | (dBi) | (dBm) | (dBm) | (dBm) | (dBm) |
| FSK-145k | • | - | - | - | - | - |
| 902.213MHz | Pass | 2.00 | 27.03 | - | 29.03 | - |
| 915.378MHz | Pass | 2.00 | 27.47 | - | 29.47 | - |
| 927.492MHz | Pass | 2.00 | 26.44 | - | 28.44 | - |

Note: Average power is for reference only.



Appendix D



Model: CL4490-1000-232

Summary

| Mode | Max-N dB (Hz) | Max-OBW (Hz) | ITU-Code | Min-N dB (Hz) | Min-OBW (Hz) |
|------------|------------------|-----------------|----------|------------------|-----------------|
| 902-928MHz | - | - | - | - | - |
| FSK-145k | 183.75k | 311.094k | 311KF1D | 166.875k | 204.273k |

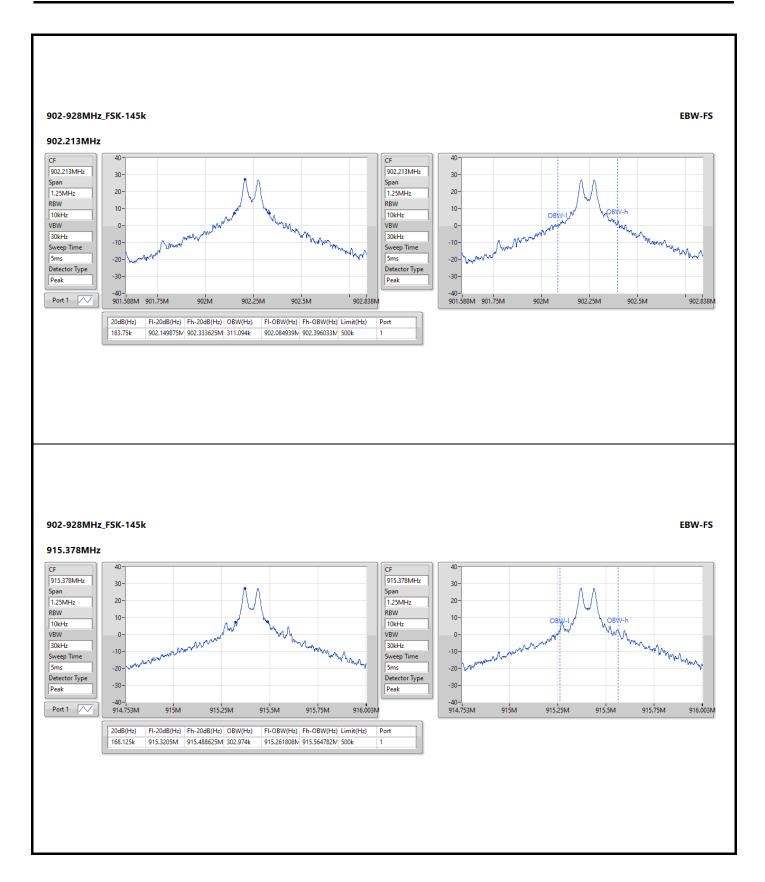
Max-N dB = Maximum 20dB down bandwidth; Max-OBW = Maximum 99% occupied bandwidth; Min-N dB = Minimum 20dB down bandwidth; Min-OBW = Minimum 99% occupied bandwidth

Result

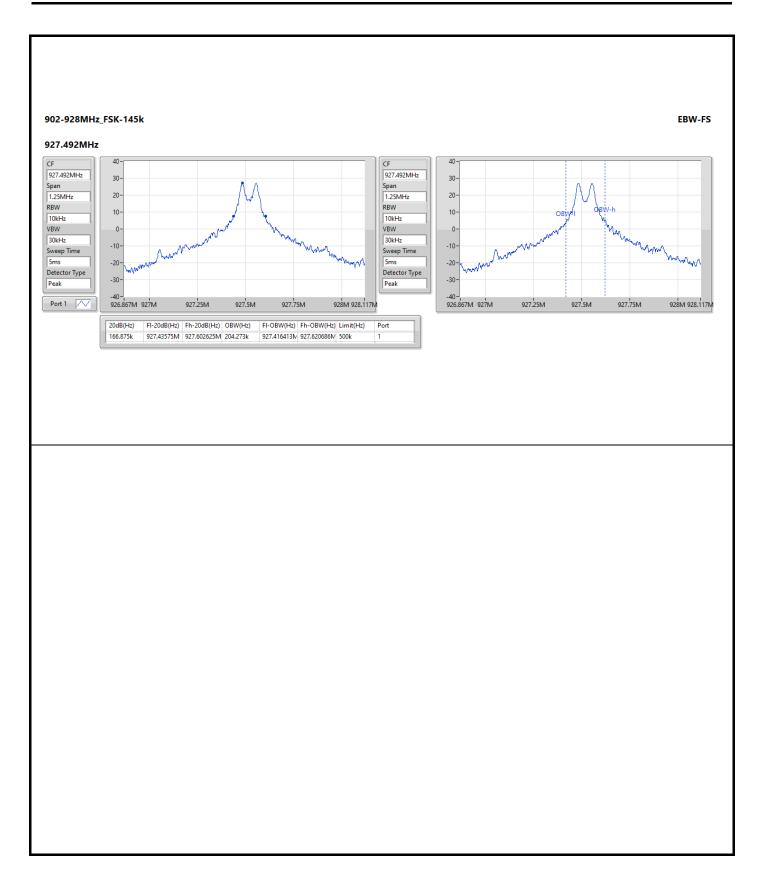
| Mode | Result | Limit | Port 1-N dB | Port 1-OBW |
|------------|--------|-------|-------------|------------|
| | | (Hz) | (Hz) | (Hz) |
| FSK-145k | - | - | - | - |
| 902.213MHz | Pass | 500k | 183.75k | 311.094k |
| 915.378MHz | Pass | 500k | 168.125k | 302.974k |
| 927.492MHz | Pass | 500k | 166.875k | 204.273k |

Port X-N dB = Port X 20dB down bandwidth; Port X-OBW = Port X 99% occupied bandwidth











Model: CL4490-1000-PRO

Summary

| Mode | Max-N dB (Hz) | Max-OBW (Hz) | ITU-Code | Min-N dB (Hz) | Min-OBW (Hz) |
|------------|------------------|-----------------|----------|------------------|-----------------|
| 902-928MHz | - | - | - | - | - |
| FSK-145k | 164.375k | 314.218k | 314KF1D | 148.75k | 168.666k |

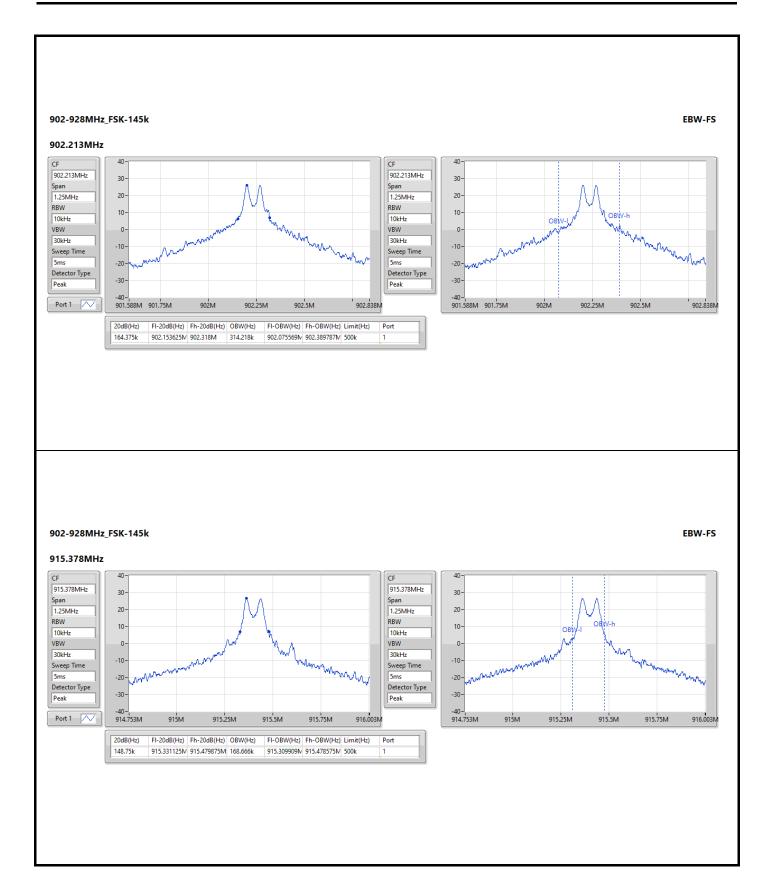
Max-N dB = Maximum 20dB down bandwidth; Max-OBW = Maximum 99% occupied bandwidth; Min-N dB = Minimum 20dB down bandwidth; Min-OBW = Minimum 99% occupied bandwidth

Result

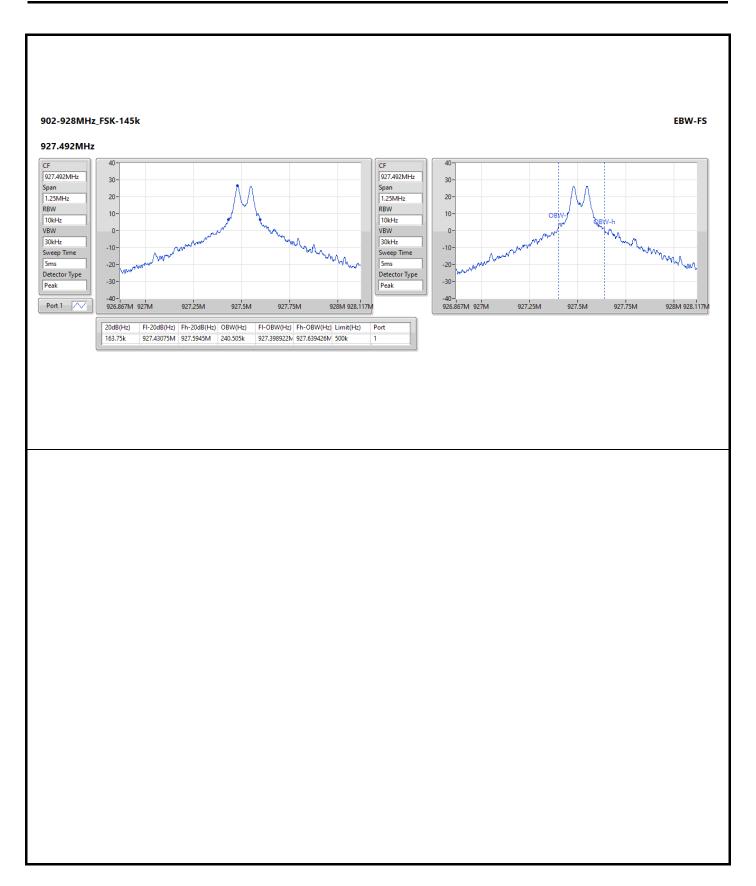
| Mode | Result | Limit (Hz) | Port 1-N dB (Hz) | Port 1-OBW (Hz) |
|------------|--------|---------------|---------------------|--------------------|
| FSK-145k | - | - | - | - |
| 902.213MHz | Pass | 500k | 164.375k | 314.218k |
| 915.378MHz | Pass | 500k | 148.75k | 168.666k |
| 927.492MHz | Pass | 500k | 163.75k | 240.505k |

Port X-N dB = Port X 20dB down bandwidth; Port X-OBW = Port X 99% occupied bandwidth











Model: CL4490-1000-232

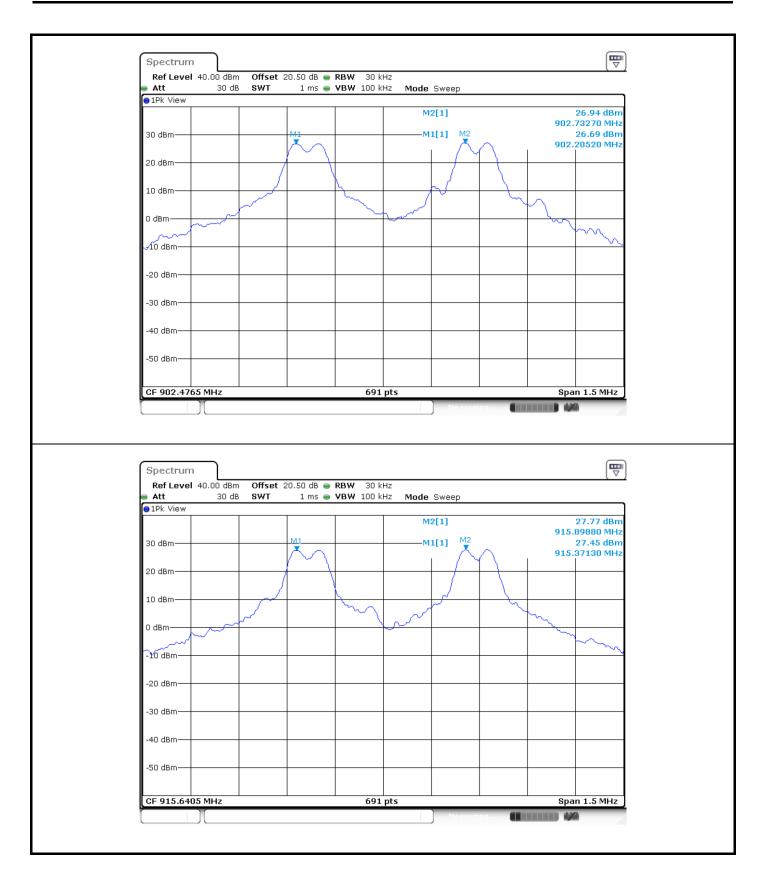
Summary

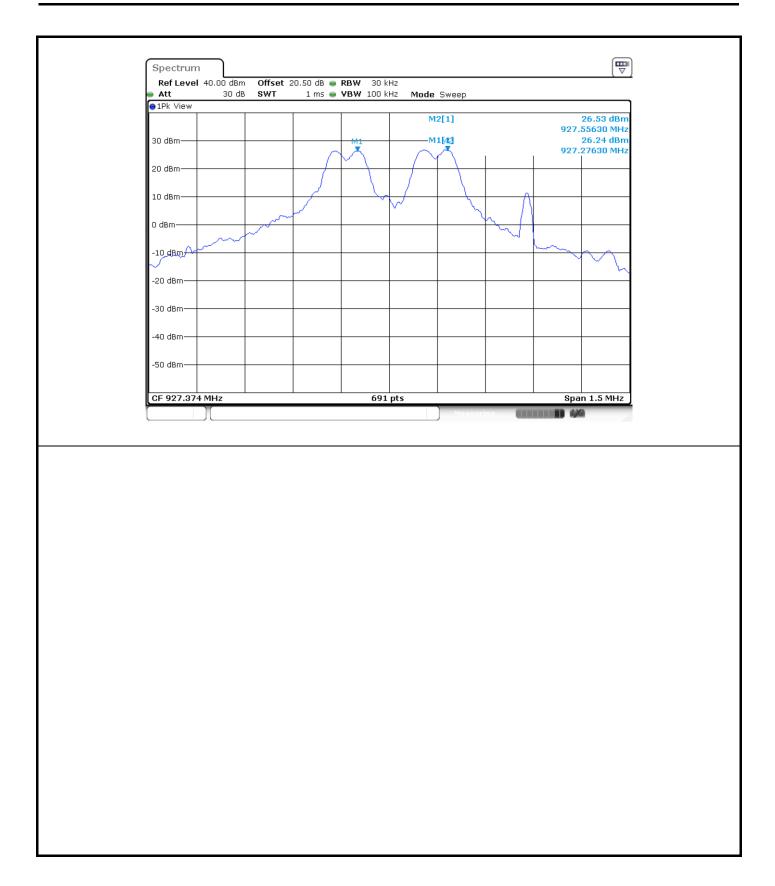
| Mode | Max-Space | Min-Space |
|------------|-----------|-----------|
| | (Hz) | (Hz) |
| 902-928MHz | - | - |
| FSK-145k | 527.5k | 280k |

Result

| Mode | Result | FI | Fh | Ch.Space | Limit |
|------------|--------|-----------|-----------|----------|----------|
| | | (Hz) | (Hz) | (Hz) | (Hz) |
| FSK-145k | - | - | - | - | - |
| 902.213MHz | Pass | 902.2052M | 902.7327M | 527.5k | 183.75k |
| 915.378MHz | Pass | 915.3713M | 915.8988M | 527.5k | 168.125k |
| 927.492MHz | Pass | 927.2763M | 927.5563M | 280k | 166.875k |









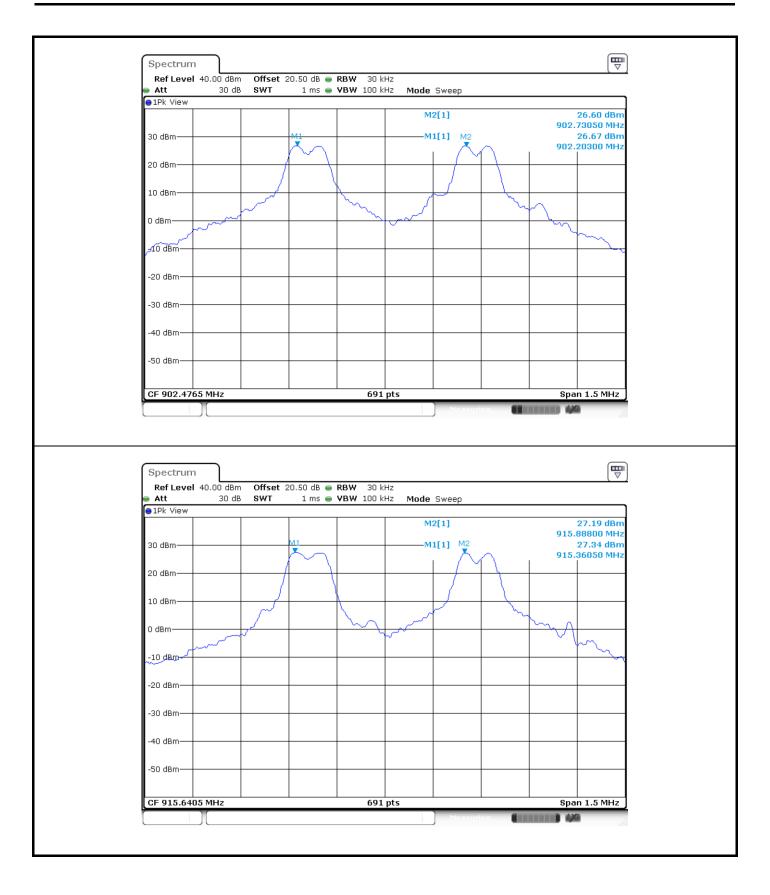
Model: CL4490-1000-PRO

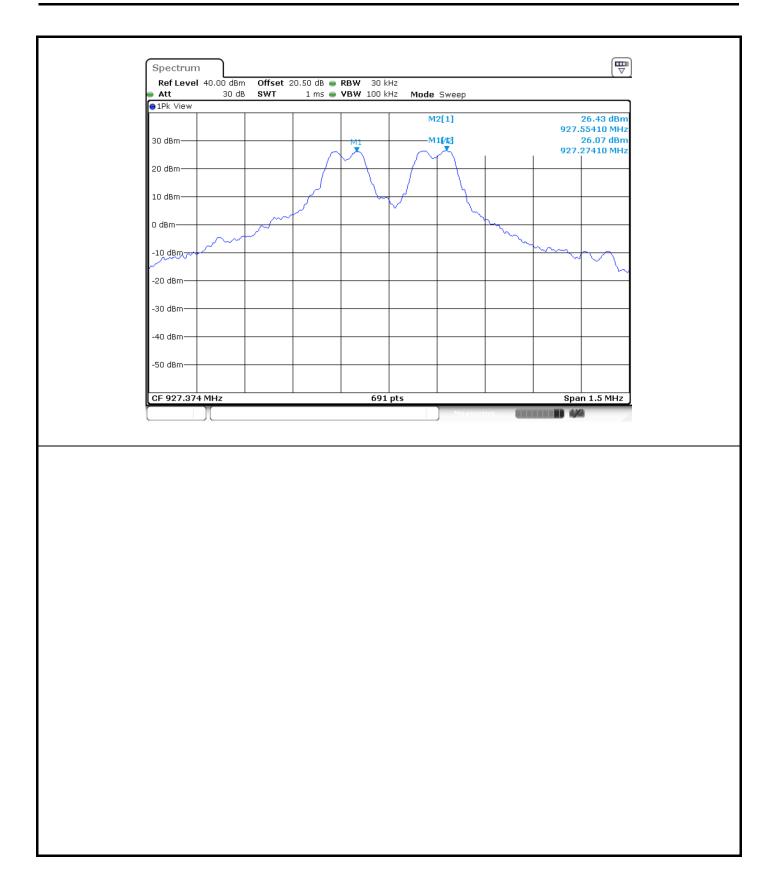
Summary

| Mode | Max-Space | Min-Space | |
|------------|-----------|-----------|--|
| | (Hz) | (Hz) | |
| 902-928MHz | - | - | |
| FSK-145k | 527.5k | 280k | |

Result

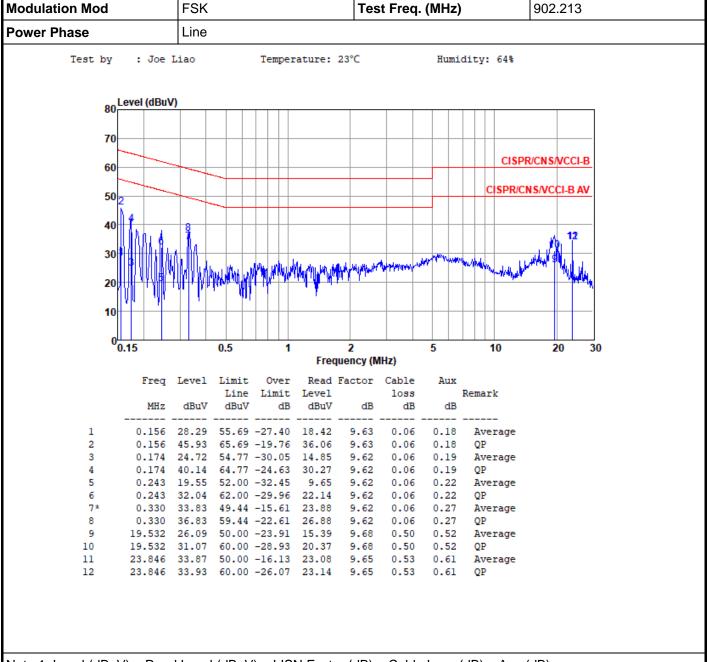
| Mode | Result | FI | Fh | Ch.Space | Limit |
|------------|--------|-----------|-----------|----------|----------|
| | | (Hz) | (Hz) | (Hz) | (Hz) |
| FSK-145k | - | - | - | - | - |
| 902.213MHz | Pass | 902.203M | 902.7305M | 527.5k | 164.375k |
| 915.378MHz | Pass | 915.3605M | 915.888M | 527.5k | 148.75k |
| 927.492MHz | Pass | 927.2741M | 927.5541M | 280k | 163.75k |







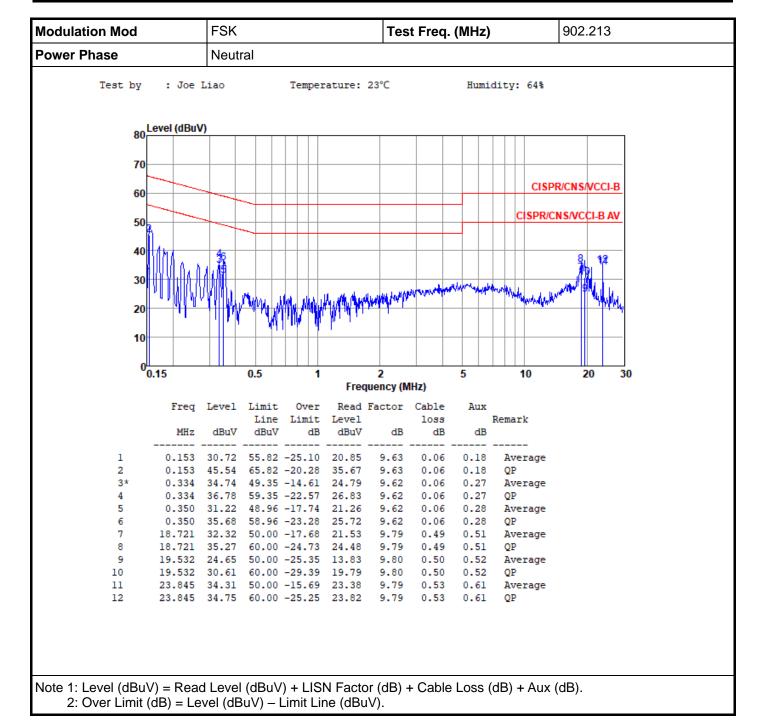
Model: CL4490-1000-232



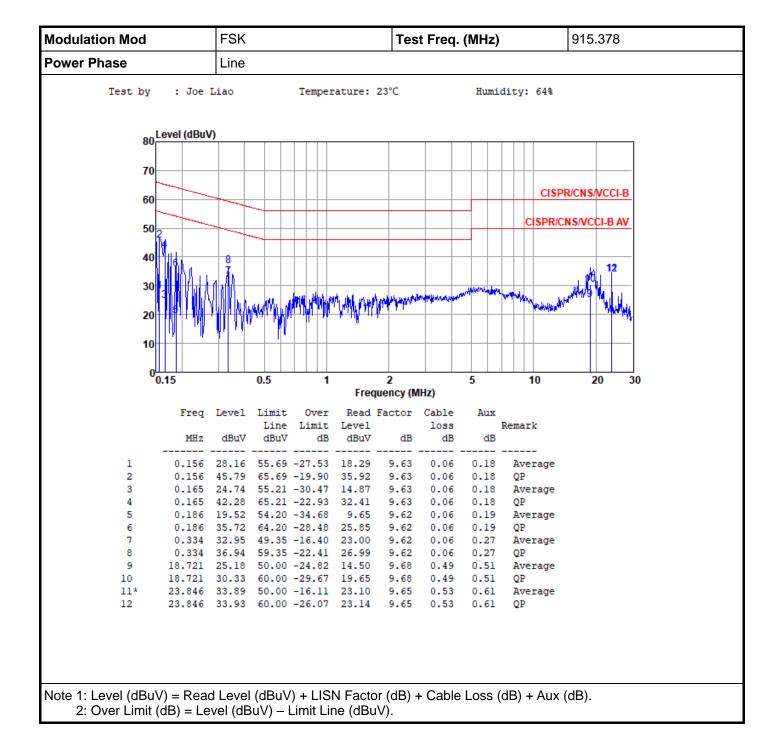
Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).

2: Over Limit (dB) = Level (dBuV) - Limit Line (dBuV).

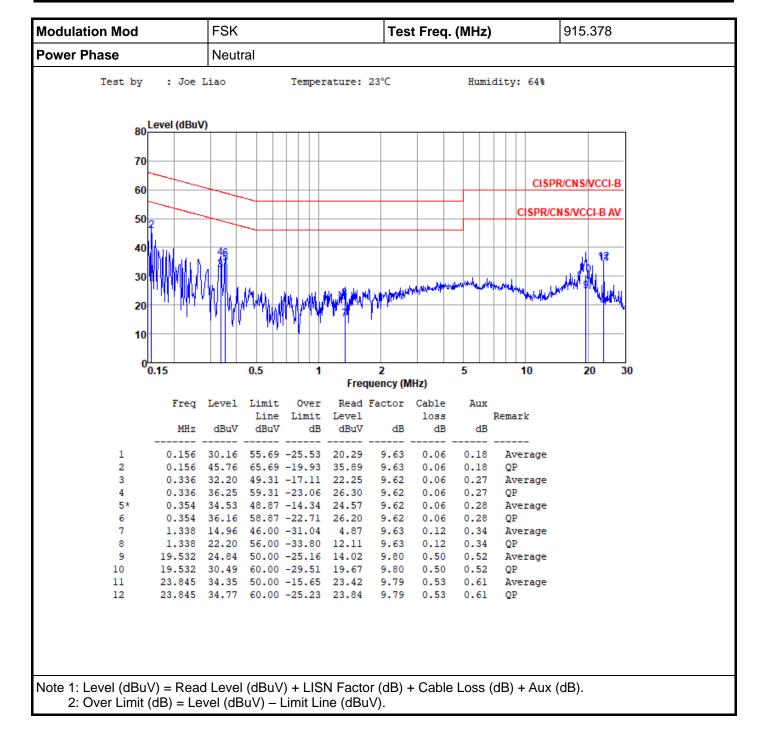






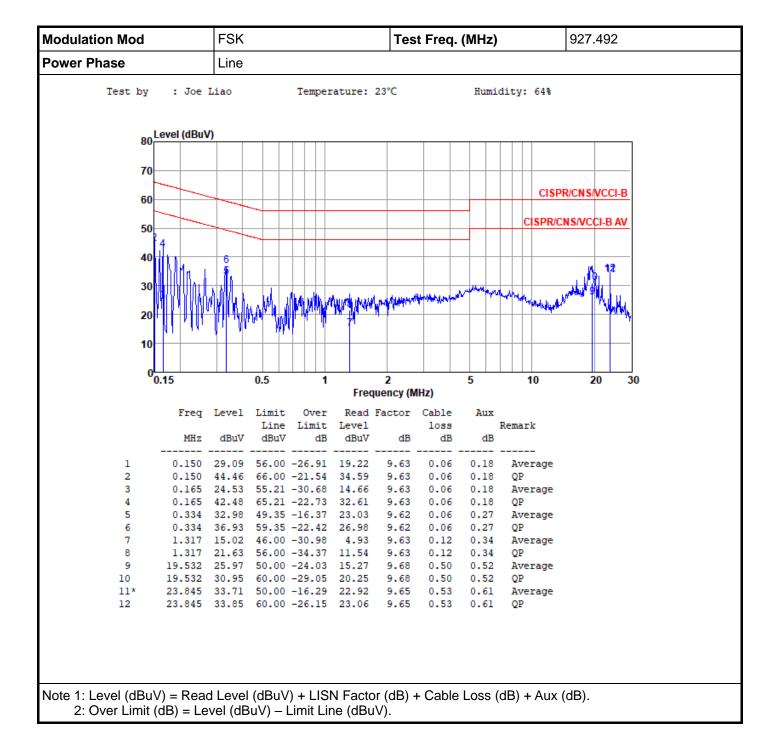






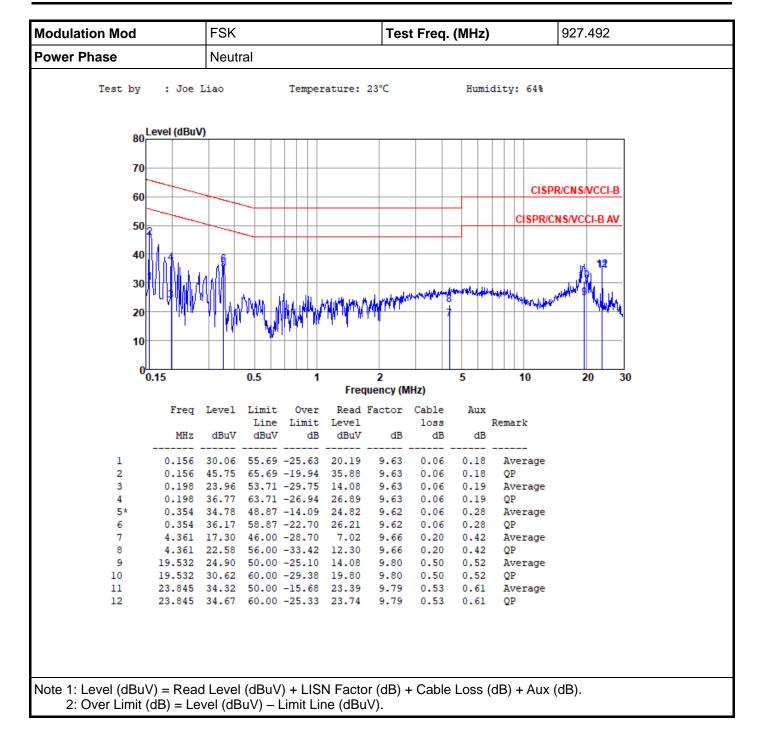
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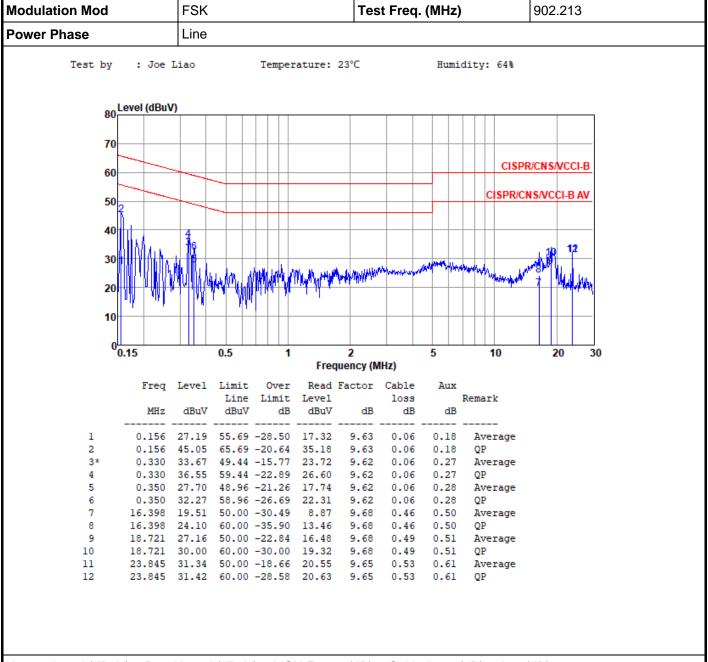




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Model: CL4490-1000-485

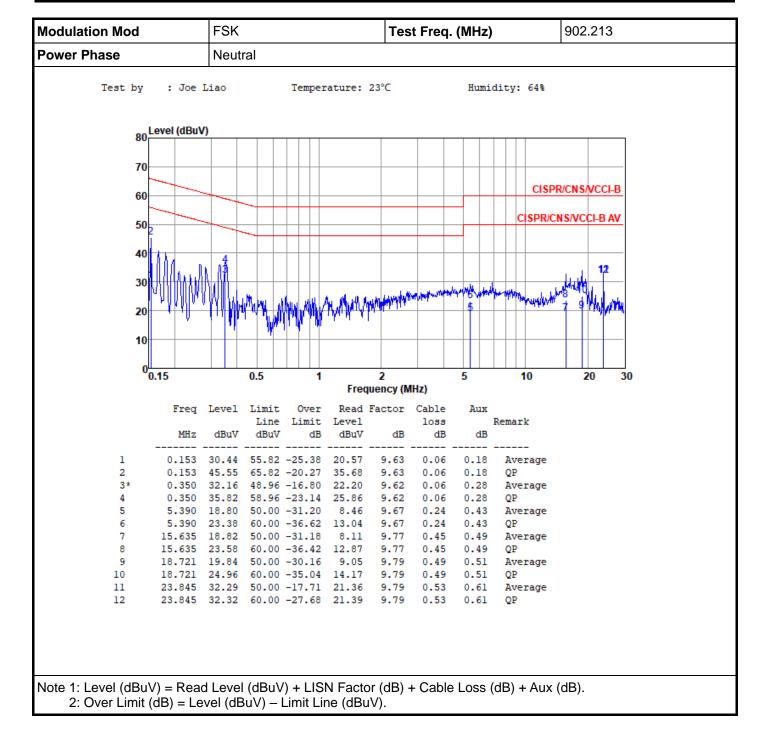


Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).

2: Over Limit (dB) = Level (dBuV) - Limit Line (dBuV).

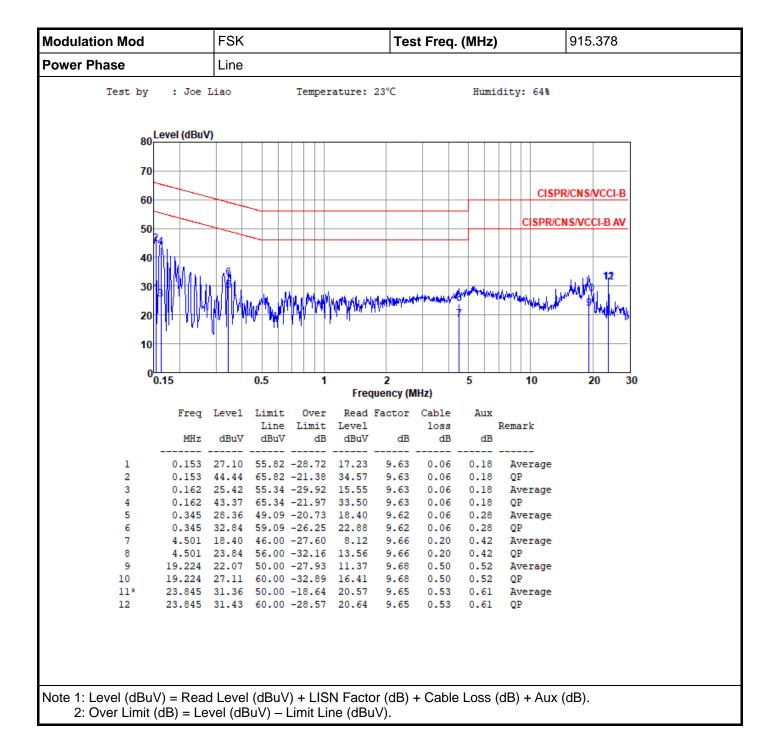
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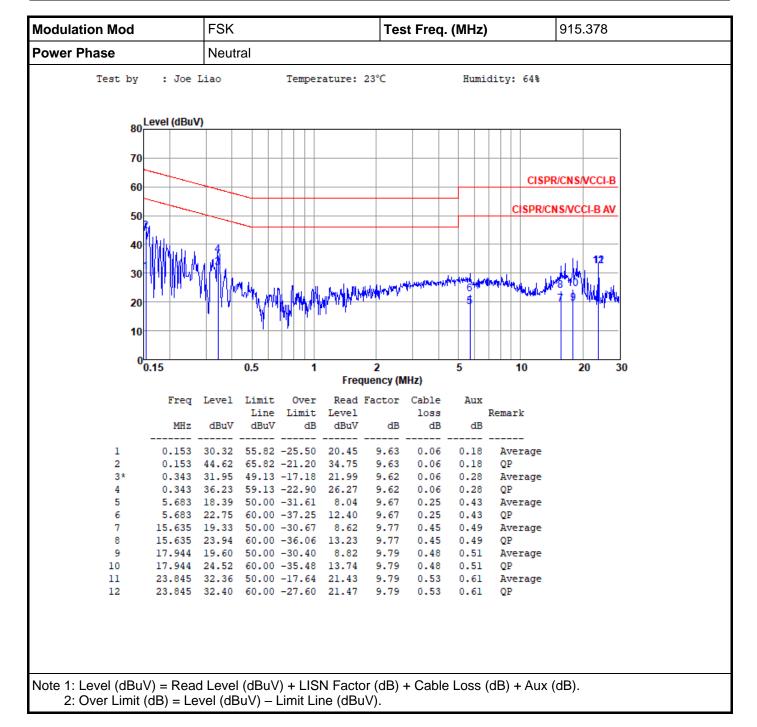
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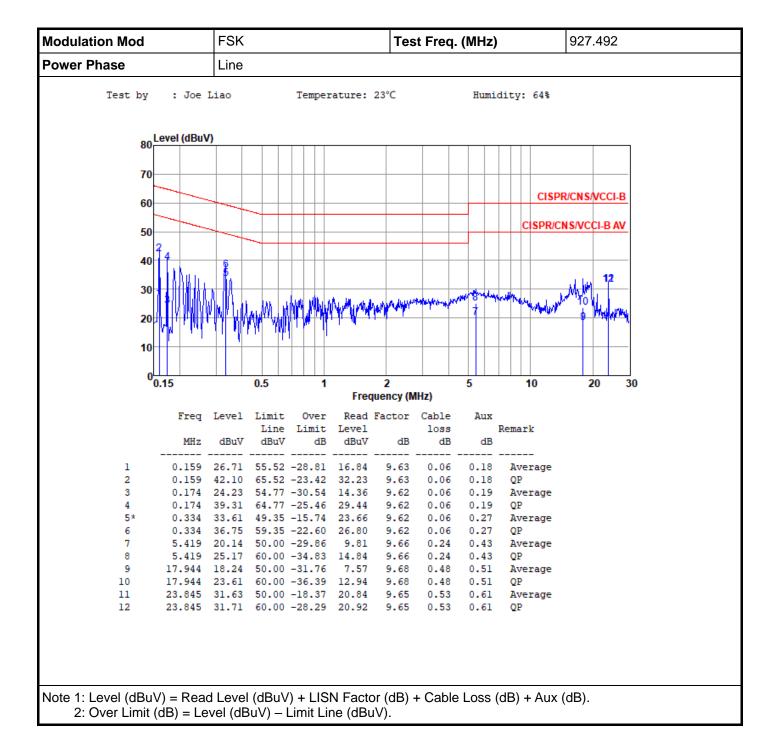
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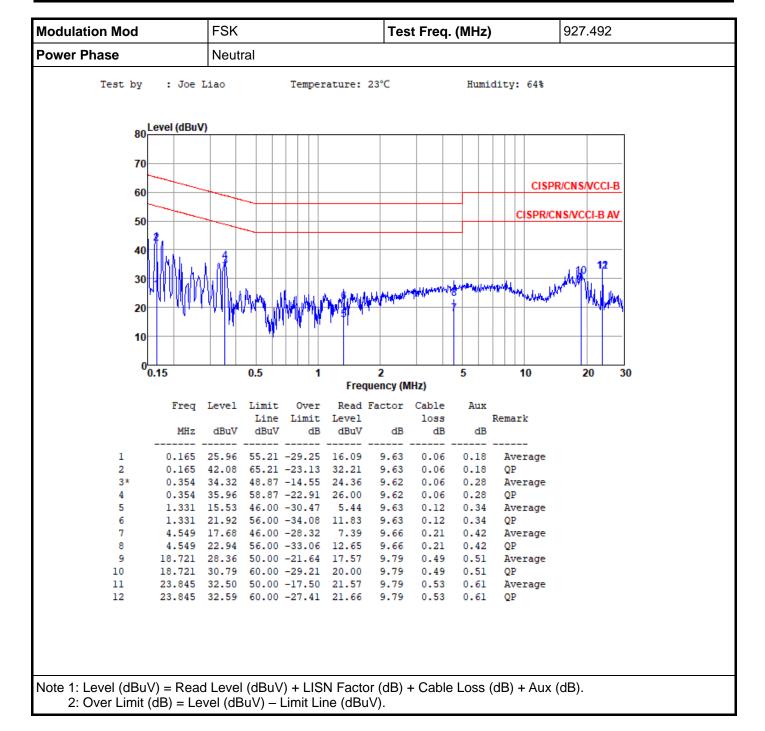
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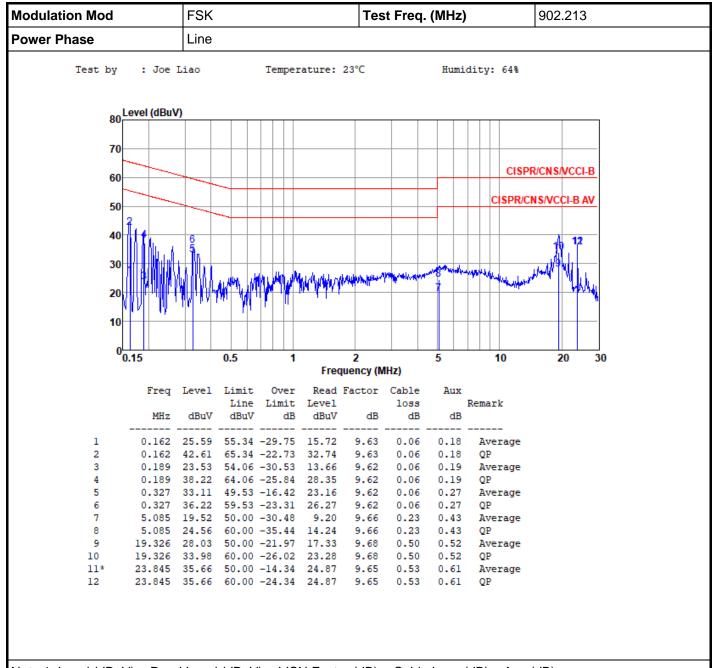




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Model: CL4490-1000-PRO

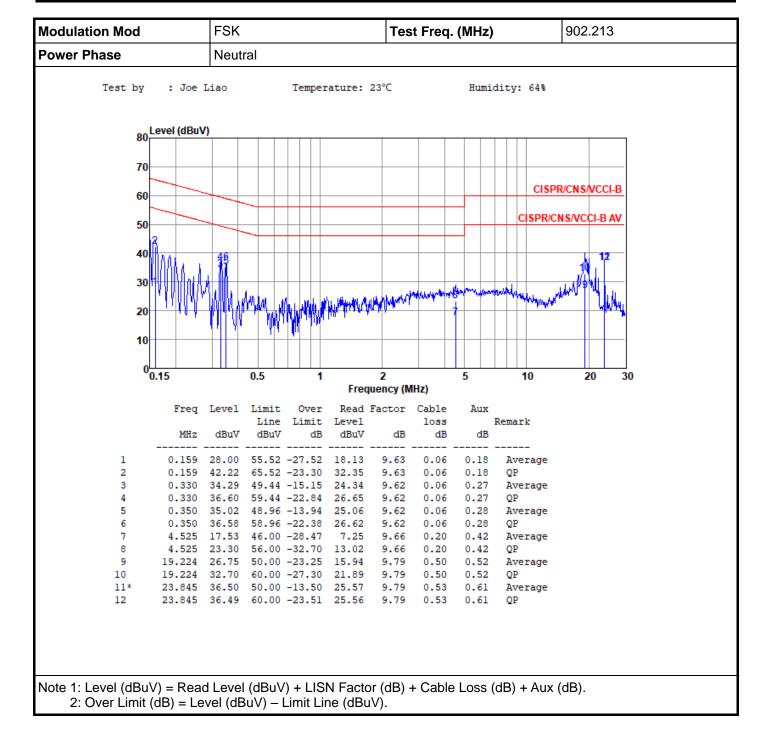


Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).

2: Over Limit (dB) = Level (dBuV) - Limit Line (dBuV).

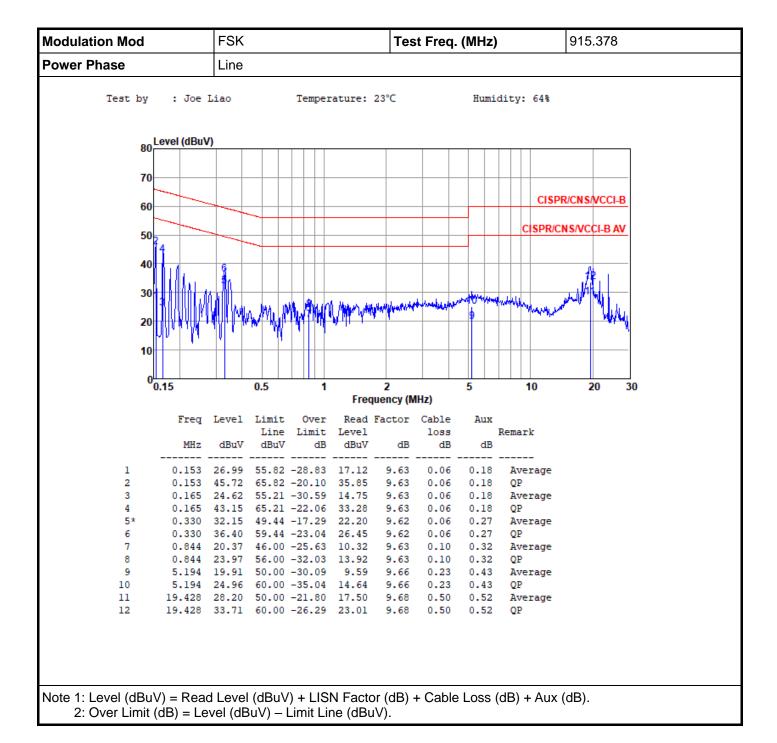
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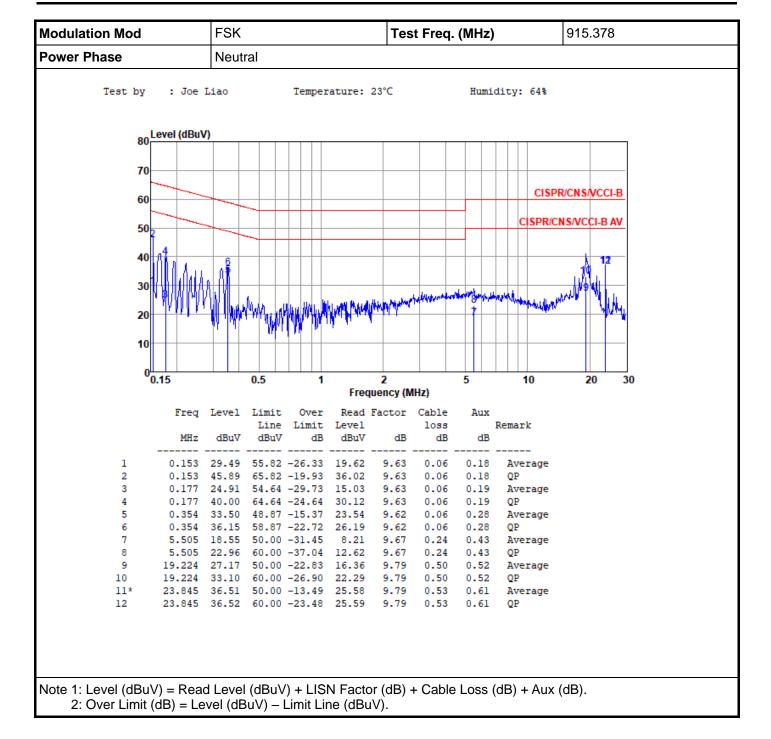
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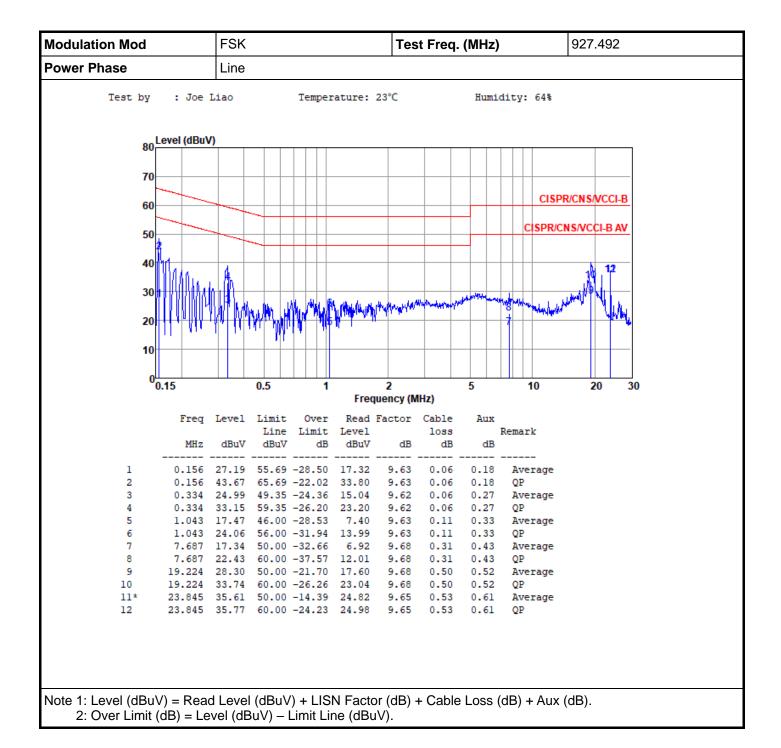
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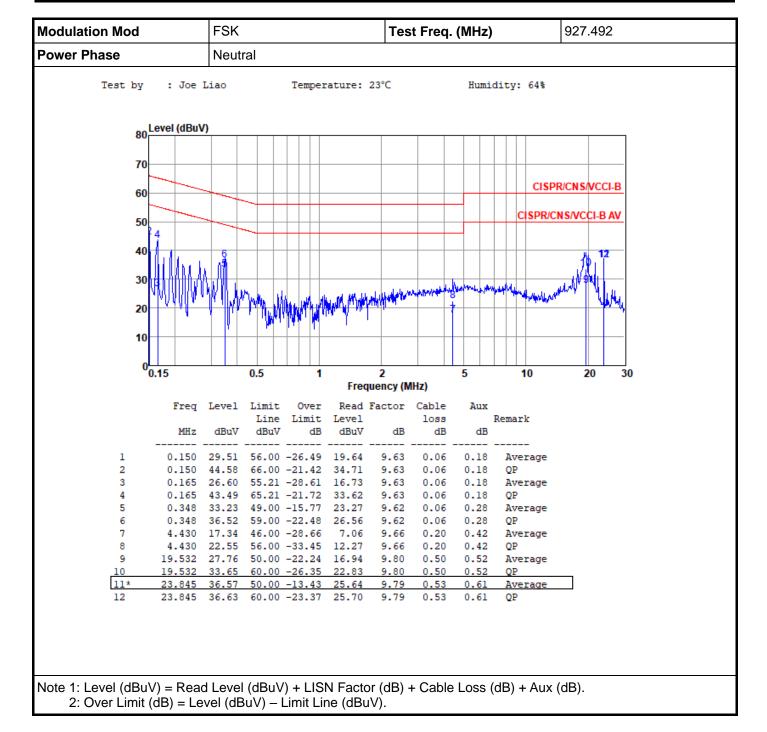
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