

Prüfbericht-Nr.: <i>Test report no.:</i>	IN24GHRL 001	Auftrags-Nr.: <i>Order no.:</i>	146879464 010	Seite 1 von 40 Page 1 of 40
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	2566340	Auftragsdatum: <i>Order date:</i>	2024-02-06	
Auftraggeber: <i>Client:</i>	75F Inc., 1650 W, 82nd St, #200, Bloomington, Minnesota, USA - 55431			
Prüfgegenstand: <i>Test item:</i>	Hyper Lite			
Bezeichnung <i>Identification</i>	7X-HS-K9X-X	Serien -Nr.: <i>Serial no.:</i>	Engineering Sample	
Auftrags-Inhalt: <i>Order content:</i>	Testing and issue of Test Report			
Prüfgrundlage: <i>Test specification:</i>	FCC Part 15 Subpart C 15.247,15.205, 15.207 & 15.209 RSS 247 Issue 3, RSS Gen Issue 5			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-06-04			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003735739-001 A003735739-002			
Prüfzeitraum: <i>Testing period:</i>	2024-06-04 - 2024-06-05			
Ort der Prüfung: <i>Place of testing:</i>	Wireless laboratory, Bangalore			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (India) Pvt. Ltd. 27/B,2nd cross road, Electronic city Phase1, Bangalore-560100, India FCC Test Site Registration No: 496599 IC Test Site Registration No: 27711			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i>	2024-10-01	Ausstellatum: <i>Issue date:</i>	2024-10-04	
Stellung / Position:	Likhithesh M D Senior Engineer	Stellung / Position:	Madhu K N Asst. Manager	
Sonstiges / Other:	FCC ID: 2AVZO-101057 IC: 25972-101057 HVIN: 101057HSL			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient N/A = not applicable
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. <i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i>
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. <i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i>
4	Die Entscheidungsregel für Konformitätserklärungen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. <i>The decision rule for statements of conformity in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report.</i>

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TEST SUMMARY

Test Item	FCC	RSS	Result
Maximum conducted output power	FCC 15.247(b)(3)	RSS-247 issue 3 5.4 (d)	Pass
Maximum Power Spectral Density	FCC 15.247(e)	RSS-247 issue 3 5.2 (a) & RSS Gen Issue 5 6.7	Pass
Occupied bandwidth and 6dB Bandwidth	15.247 (a) (2)	RSS-247 issue 3 5.2 (b)	Pass
Emissions in non-restricted frequency bands	15.247 (d)	RSS-247 issue 3 5.5	Pass
Spurious Radiated Emissions and Restricted Bands of Operation	FCC 15.209 / FCC 15.205	RSS-GEN issue 5 Clause 8.9, 8.10	Pass
Conducted Spurious Emission on AC Power lines	FCC 15.207	RSS-Gen Issue 5, Section 8.8	Pass

Product Category: Electronics Testing
Test Discipline: EMC Test Facility

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REVISION HISTORY OF THIS REPORT

Report Number	Version	Description	Issue date
IN24GHRL 001	01	Initial issue of report	2024.10.04

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1 GENERAL REMARKS

1.1 Attachments

All attachments are part of this test report and are issued in separate document.

1. TEST SETUP PHOTOS
2. EUT EXTERNAL PHOTOS
3. EUT INTERNAL PHOTOS
4. FCC LABEL AND LABEL LOCATION
5. BLOCK DIAGRAM
6. SPECIFICATION OF EUT
7. SCHEMATIC DIAGRAMS
8. BILL OF MATERIAL
9. USER MANUAL
10. Maximum Permissible Exposure Information

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2 TEST SITES

2.1 Testing Facilities

- | | |
|---|--|
| <p>1. TÜV Rheinland (India) Pvt.Ltd.,
27/B, 2nd Cross,
ElectronicCityPhase1
Bangalore – 560 100,
India
Radiated Measurement site type:
Fully anechoic chamber (used for above 1 GHz
measurements)</p> | <p>2. TUV Rheinland (India) Pvt.Ltd.,
108, Beside ISBR Business School,
Electronic city Phase I
Bangalore - 560 100,
India
Radiated Measurement site type:
Semi anechoic chamber (used for below 1 GHz
measurements)</p> |
|---|--|

2.2 List of Test and Measurement Instruments

Table 1: List of test and measurement instruments

Equipment	Manufacturer	Model Name	Serial Number	Firmware Versions	Calibration Due Date	Periodicity	Test Facility
EMI Receiver	Rohde & Schwarz	ESW 44	101773	4.73 SP5	26.01.2025	Yearly	
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1944	-	28.10.2024	Yearly	Radiated Spurious Emission
Biconical Antenna	Schwarzbeck	VHBB9124+ BBA9106	9124-1208+9106-0525	-	31.10.2024	Yearly	
Log-Periodic Antenna	Schwarzbeck	VULP 9118 A	VULP9118A-0733	-	02.11.2024	Yearly	
Fully Anechoic Chamber	Albatross	-	-	-	-	-	
Spectrum Analyzer	Agilent	E4407B	US4119277 2	A.14.06	01.04.2025	Yearly	Antenna – Port Conducted Test

Table 2: Instrument application Software versions

SL. No.	Test Type	Application software	Version
1	Radiated spurious emission measurement in FAC	EMC 32	10.60.20
2	Radiated spurious emission measurement in 10mtr SAC	BAT EMC	3.20.0.17

3 GENERAL PRODUCT INFORMATION

3.1 Product Function and Intended Use

HyperStat Split has 2 parts, HyperLite and Connect module. HyperLite is installed inside a zone. This monitors Air quality (with up to 8 onboard sensors) and it is equipped with a 2.8" TFT screen paired with mechanical buttons and a touch slider for taking user inputs and displaying zone data. The Connect Module is installed inside the RTU/FCU and do stage or modulated controls and can accept up to 8 Universal analog inputs.

3.2 Ratings and System Details of Equipment under Test

Table 3: Ratings and System Details as declared by Client*

Protocol		LoRa
Operating Frequency Range		902MHz to 928MHz
Channel Spacing		200kHz
Tx Transmitting Power		11dBm
Maximum measured e.i.r.p		10.29 dBm @ 906MHz for Hyperlite
Modulation		BPSK
Data Rate		20kbps
Number of antennas		1
Antenna Gain & Antenna Type		-0.8 dBi & Monopole Antenna
Supply Voltage to Product		24Vdc/Vac Nominal
Environmental conditions	Storage	-17 to 50°C
	Operational	
EUT Dimension (W x H)		114mm x 165mm

***Disclaimer:** The information/data is supplied by the client and the same is considered to arrive at the final value. Any changes made apart from the specified specification, can directly impact on the tests results. Refer the products user manual for more details.

3.3 Measurement Uncertainty:

Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$

Table 4: Measurement Uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	$\pm 5 \%$
RF output power, conducted	$\pm 1.5 \text{ dB}$
Power Spectral Density, conducted	$\pm 3 \text{ dB}$
Unwanted Emissions, conducted	$\pm 3 \text{ dB}$
All emissions, radiated	$\pm 6 \text{ dB}$
Temperature	$\pm 3 \text{ }^{\circ}\text{C}$
Supply Voltages	$\pm 3 \%$
Time	$\pm 5 \%$

4 TEST SET-UP AND OPERATION MODE

4.1 Principle of Configuration Selection

Transmission was enabled with highest possible duty cycle on low, mid and high channels.

4.2 Test Operation and Test Software

Hardware Version Identification Number(HVIN): 101057HSL
Software version: 4.105
Software Name: TERATERM
Hardware Name: HyperLite
Hardware revision: 101057 rev 1.1

4.3 Special Accessories and Auxiliary Equipment

- None

4.4 Countermeasures to achieve EMC Compliance

- None

4.5 Simultaneous Transmission

This product does not support Simultaneous operation.

4.6 List of frequencies

Frequency Band (GHz)	Channel No.	Frequency (MHz)
Sub-GHz (902 MHz – 928 MHz)	Low	906
	:	:
	Mid	914
	:	:
	High	924

Table 5: List of Sub-GHz Center frequencies

Channel used for Sub-GHz testing.

Channel Low: 906MHz

Channel Mid: 914MHz

Channel High: 924MHz

Note:

TUV Sample Identification Number: A003735739-001 Radiated & Conducted test Sample.

5 OPERATIONAL DESCRIPTION

HyperStat Lite is powered using the 75F *PoR* (Power over RS485) bus from the Connect Module which supplies 24V DC as well as RS485 communication signal to enable to and fro data transfer in a half-duplex manner. HyperStat Lite features up to 8 onboard sensors (temperature, humidity, CO2, PIR, Sound, illuminance, and an optional PM2.5/PM10) along with the capacity to expand the portfolio by having a Sensor bus to connect further 75F OWI-supported sensors. HyperStat lite Features connectivity options like LW mesh for connecting with 75F CCU as well as BLE 5.1.

6 TEST METHODOLOGY

6.1 Radiated Emission Test

The radiated emission measurement was performed according to the procedures in ANSI C63.10-2013. The equipment under test (EUT) was placed at the middle of the 80 cm high turntable for below 1 GHz & 1.5 m height for above 1 GHz measurement, and the EUT is 3 meters far from the measuring antenna. The turntable was rotated 360° for obtaining the maximum emission. The height of the measuring antennas was scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained. The measurement above 1000 MHz was performed by horn antenna, The measurement below 30 MHz was performed by loop antenna, Measurement from 30 MHz to 200 MHz was performed by Baloon and Biconical Antenna, and measurement from 200 MHz to 1 GHz was performed by Log-Periodic Antenna.

The EUT was rotated around the X-, Y-, and Z-Axis and the results from worst case axis are recorded.

6.1.1 Test Setup Configuration

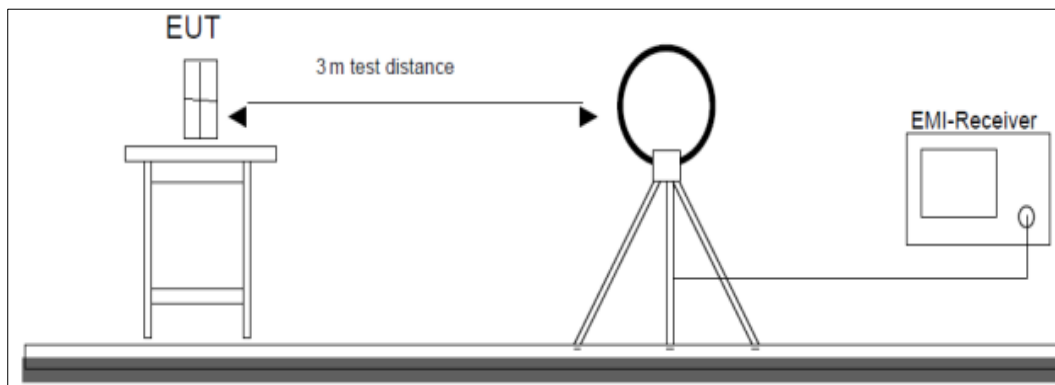


Figure 1: Frequency Range 9 kHz- 30 MHz

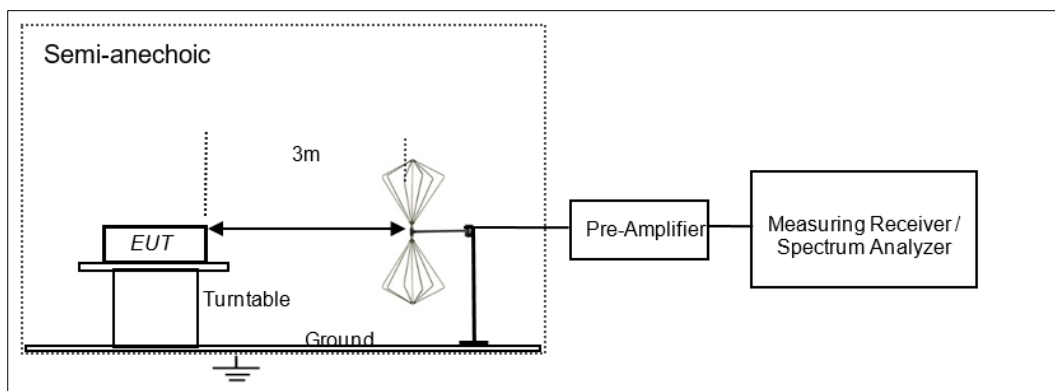


Figure 2: Frequency Range 30 MHz – 200 MHz

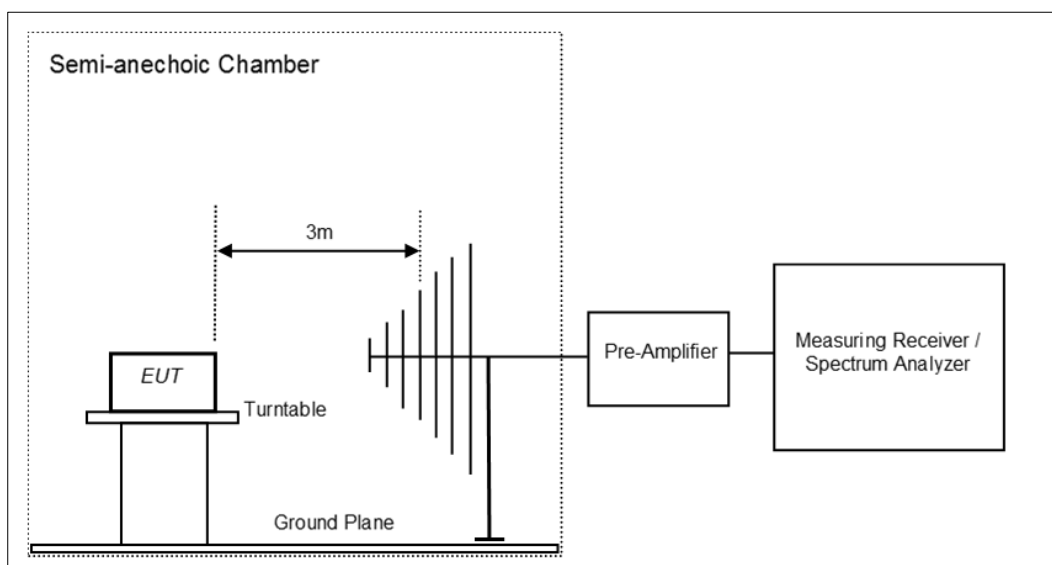


Figure 3: Frequency Range 200 MHz - 1GHz

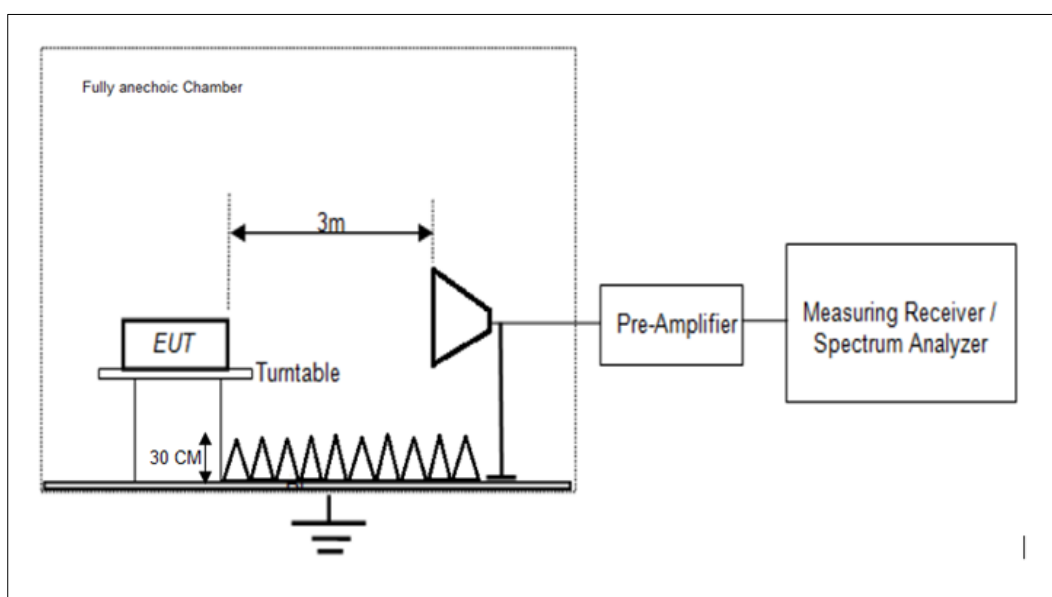


Figure 4: Frequency Range above 1 GHz

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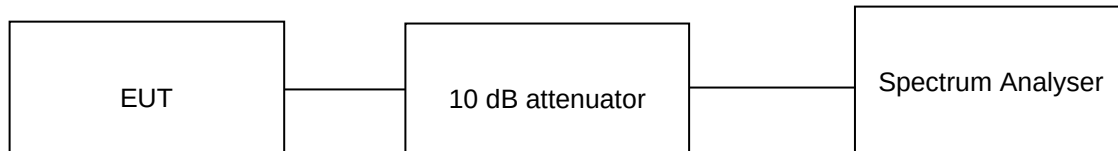
7 TEST RESULTS

7.1 Maximum Peak Conducted Output Power

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (b)(3) RSS-247 issue 3, section 5.4 (d)
Test Method	Subclause 11.9.1.1 of ANSI C63.10
Measurement Bandwidth	1MHz
Detector	Peak
Port of testing	Antenna port
Requirement	Power $\leq$ 1 W (30 dBm)



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.3 °C Voltage = 24VDC through DC power supply Relative humidity: 58%

KDB Guidelines applied:

Measurements were made as per section 9(b) in KDB 558074 D01 15.247 Measurement Guidance v05r02.

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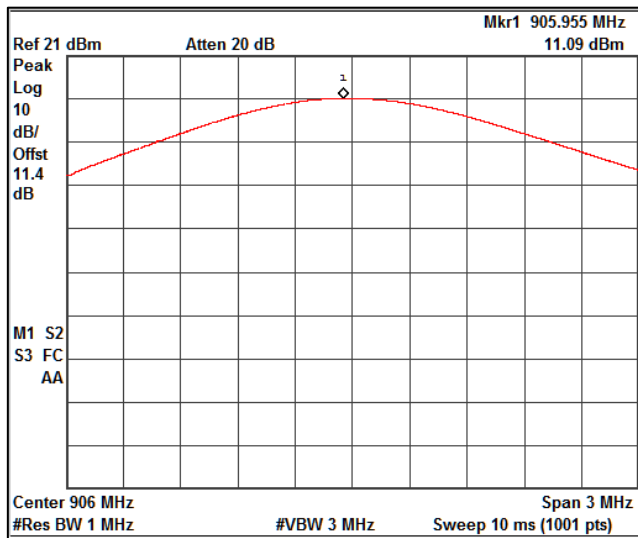
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Test results:

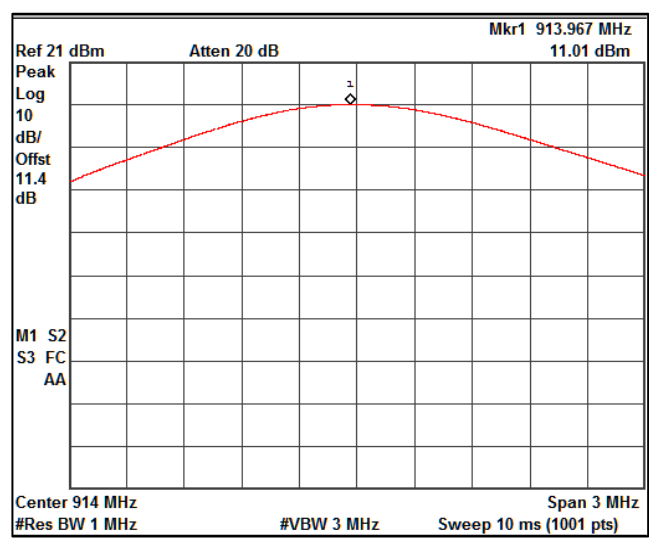
Note:

1. All the losses are included during measurement and final values are mentioned in the test report
2. Total Peak Output power (dBm) = Measured Peak power (dBm) + Attenuator factor (10dB) + Cable loss (1.4dB)
3. This product do not support additional beamforming gain / directional gain, it uses single antenna and hence Directional gain of the single antenna is -0.8 dBi.

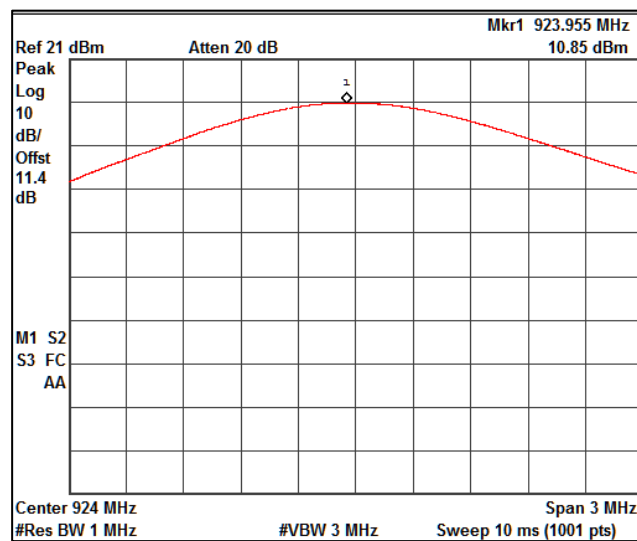
Channel Frequency (MHz)	Measured Power (dBm)	Antenna Gain (dBi)	Maximum (e.i.r.p)	Power Limit (dBm)
906	11.09	-0.8	10.29	30
914	11.01	-0.8	10.21	30
924	10.85	-0.8	10.05	30



Channel Frequency: 906MHz



Channel Frequency: 914MHz



Channel Frequency: 924MHz

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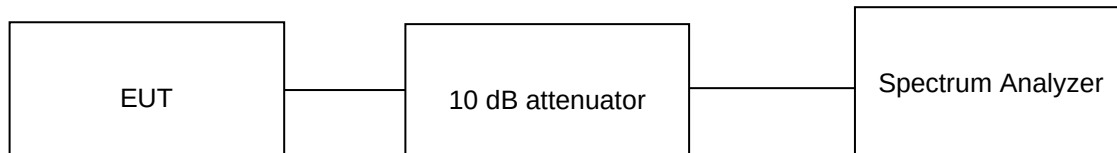
7.2 Occupied bandwidth

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (a) (2) / RSS-247 issue 3 5.2 (a) & RSS Gen issue 5 6.7
Test Method	Subclause 11.8.1 of ANSI C63.10 for DTS Subclause 6.9.3 of ANSI C63.10 for Occupied channel Bandwidth
Measurement Bandwidth	100 kHz for DTS Bandwidth 30 kHz for Occupied channel Bandwidth
Detector	Peak
Port of testing	Antenna port
Requirement	Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz..

Test Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.3 °C Voltage = 24VDC through DC power supply Relative humidity: 58%

KDB Guidelines applied:

Measurements were made as per section 8.2 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

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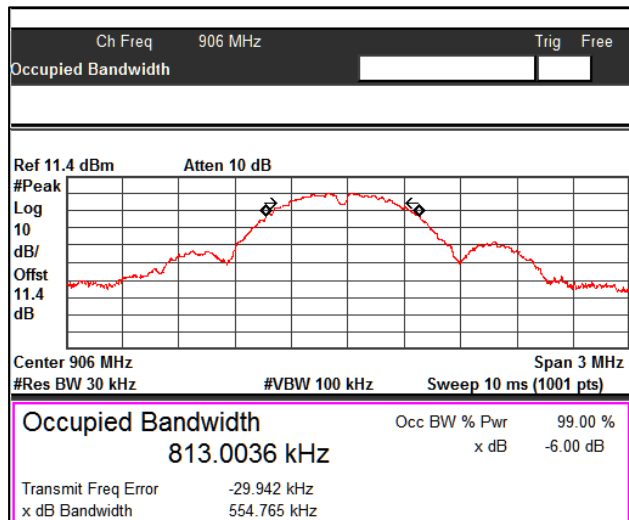
Test results:

Note:

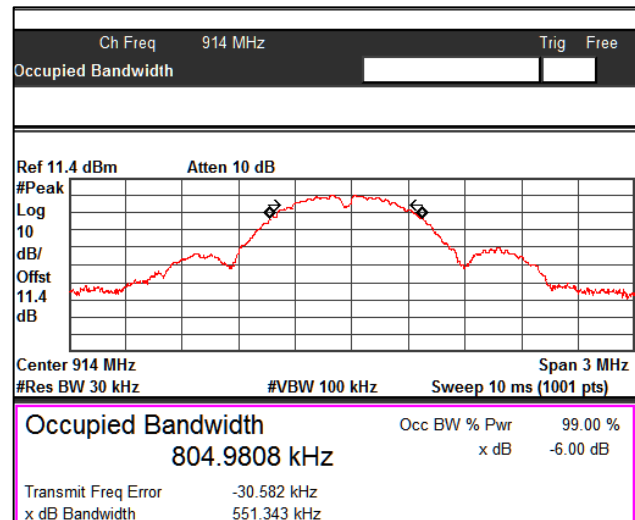
1. All the losses are included during measurement and final values are mentioned in the test report.
2. This product does not support additional beamforming gain / directional gain, it uses single antenna and hence Directional gain of the single antenna is -0.8 dBi.

Channel Frequency (MHz)	6 dB Bandwidth (kHz)	99% OBW (kHz)	Minimum 6dB Limit (kHz)
906	675.62	813.00	≥500
914	670.03	804.98	
924	668.06	799.61	

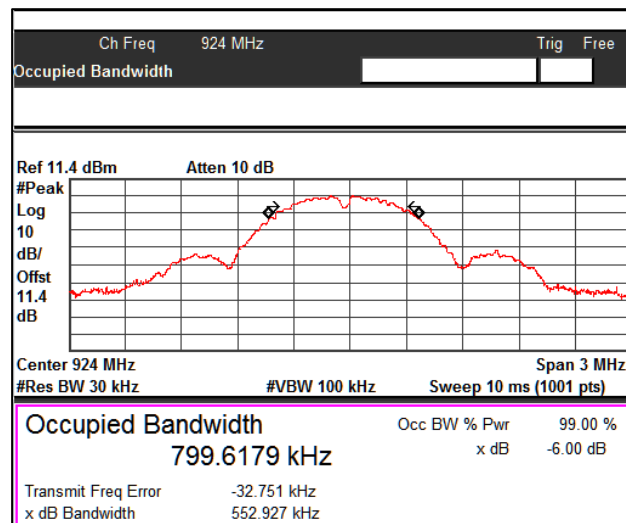
99% Bandwidth:



Channel Frequency: 906MHz



Channel Frequency: 914MHz



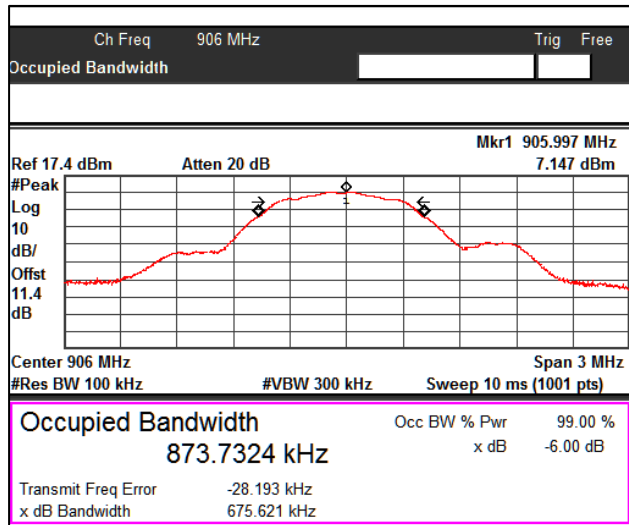
Channel Frequency: 924MHz

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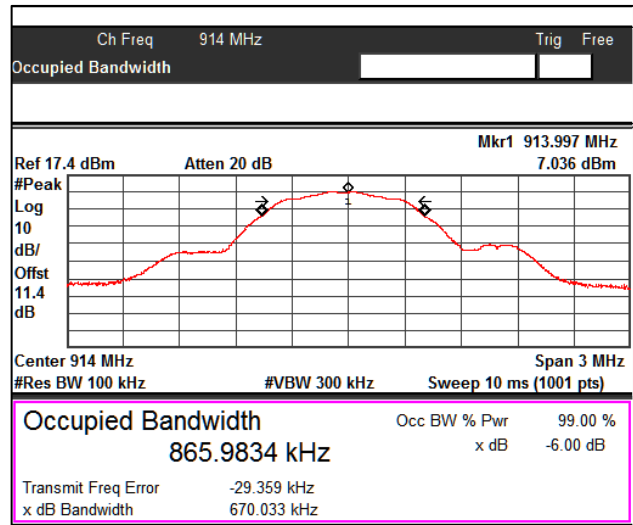
Channel frequency: 906MHz
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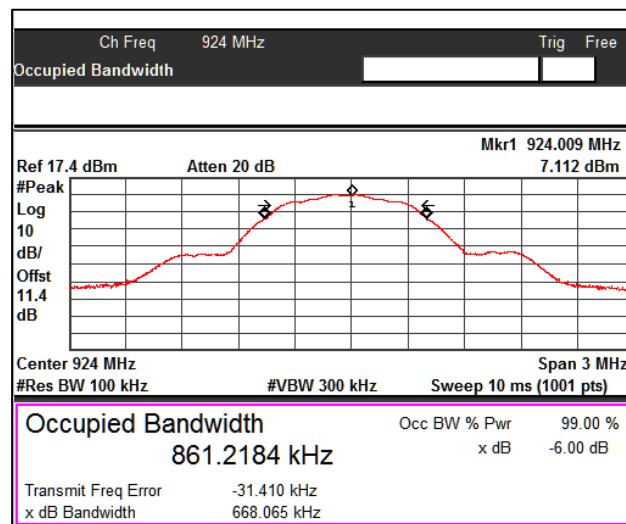
DTS Bandwidth(6dB):



Channel Frequency: 906MHz



Channel Frequency: 914MHz



Channel Frequency: 924MHz

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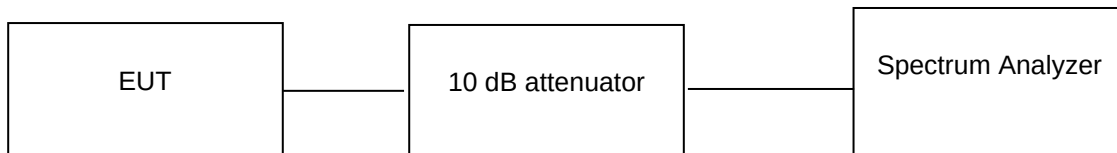
7.3 Power Spectral Density

Result

Pass

Test Specification	FCC Part 15 Subpart C Section 15.247 (e) / RSS-247 issue 3 Clause 5.2 (b)
Test Method	Subclause 11.10.2 of ANSI C63.10
Measurement Bandwidth	100 kHz
Detector	Peak
Port of testing	Antenna port
Requirement	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.3 °C Voltage = 24VDC through DC power supply Relative humidity: 58%

KDB Guidelines applied:

Measurements were made as per section 8.4 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

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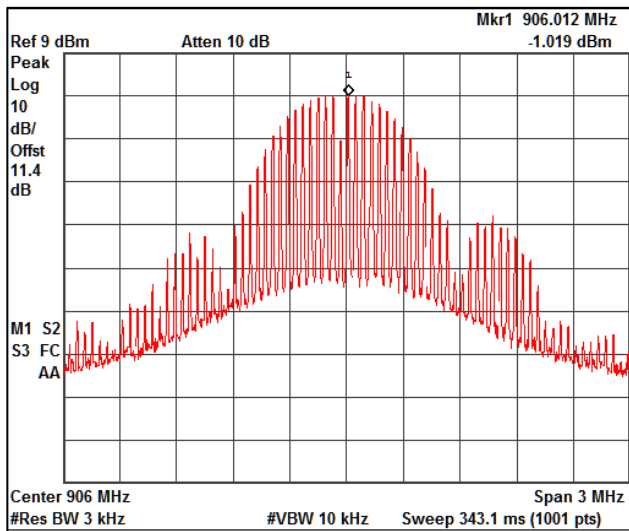
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Test results:

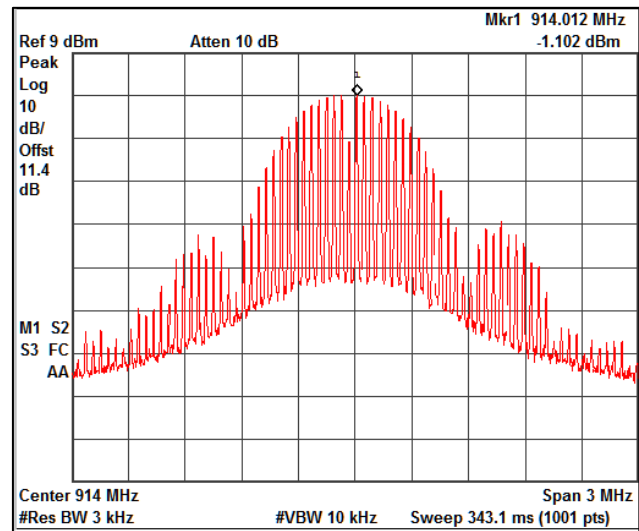
Note:

1. All the losses are included during measurement and final values are mentioned in the test report.
2. This product does not support additional beamforming gain / directional gain, it uses single antenna and hence Directional gain of the single antenna is -0.8 dBi.

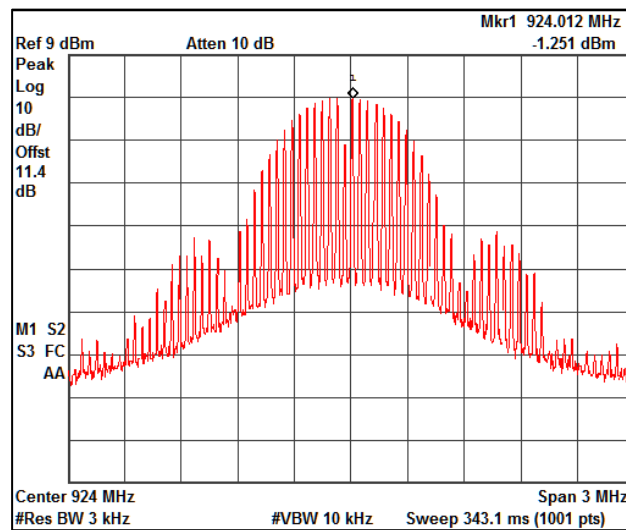
Channel Frequency (MHz)	Measured Power spectral density (dBm/3kHz)	Limit (dBm)
906	-1.01	8.00
914	-1.10	8.00
924	-1.25	8.00



Channel Frequency: 906MHz



Channel Frequency: 914MHz



Channel Frequency: 924MHz

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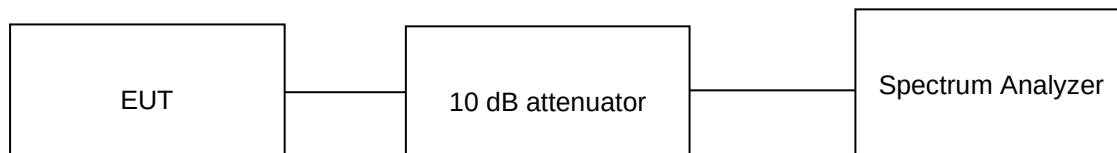
7.4 Emissions in non-restricted frequency bands and Conducted Spurious Emission

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (d) / RSS-247 issue 3 Clause 5.5
Test Method	Subclause 11.11.3 of ANSI C63.10
Measurement Bandwidth	100 kHz
Detector	Peak
Port of testing	Antenna port
Requirement	In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits

Test Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.3 °C Voltage = 24VDC through DC power supply Relative humidity: 58%

KDB Guidelines applied:

Measurements were made as per section 8.5 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

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Test results:

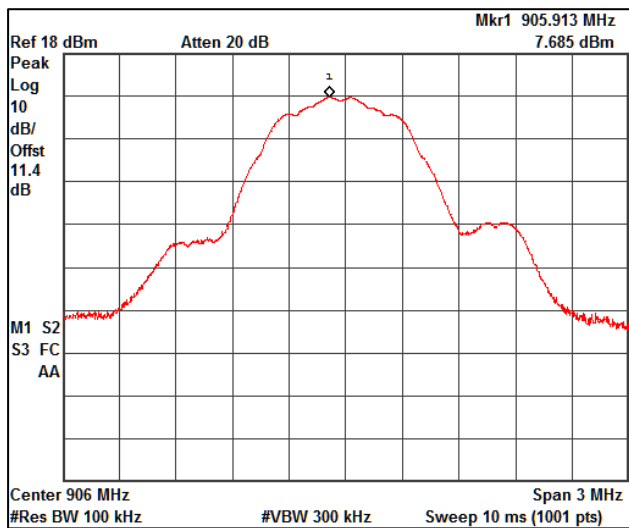
Note:

1. All the losses are included during measurement and final values are mentioned in the test report
2. This product do not support additional beamforming gain / directional gain, it uses single antenna and hence Directional gain of the single antenna is -0.8dBi.
3. Only worst-case results are reported

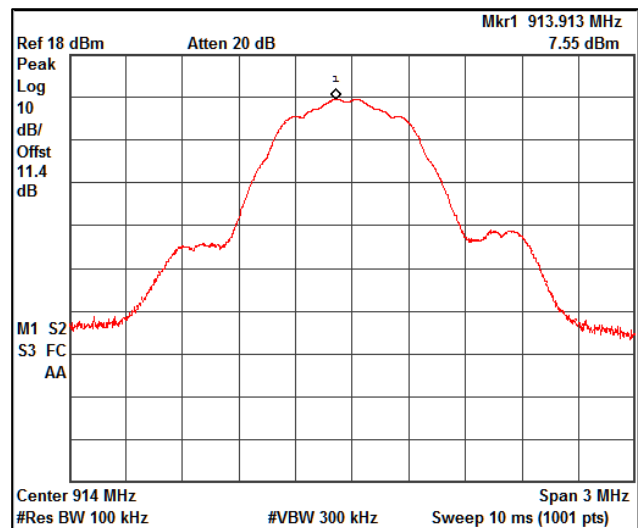
7.4.1 Band edge and reference plots

Channel Frequency (MHz)	Band edge frequency (MHz)	Value at band edge (A) (dBm)	Reference value (B) (dBm)	A-B (dBc)	Minimum Limit (dBc)
906.00	902	-48.73	7.68	-56.41	-20
924.00	928	-50.31	7.18	-57.49	-20

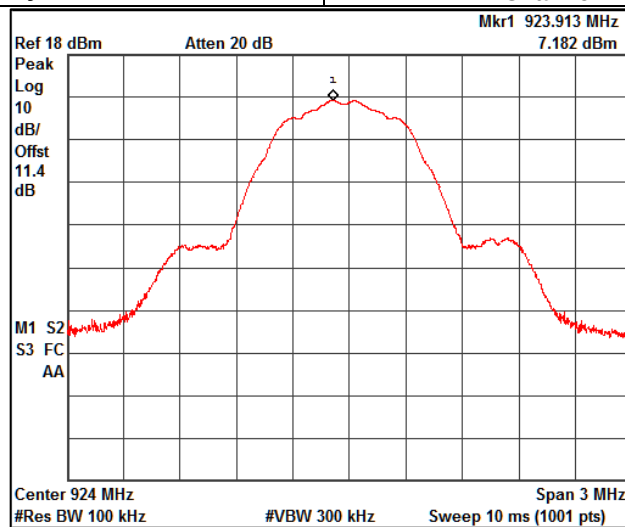
Reference Plots:



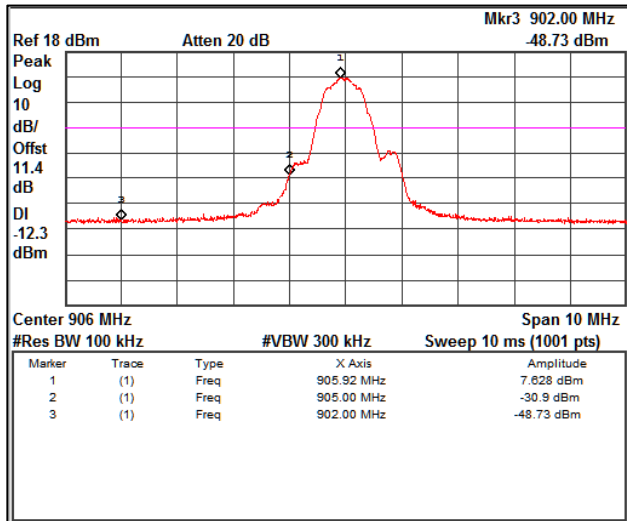
Channel Frequency: 906MHz



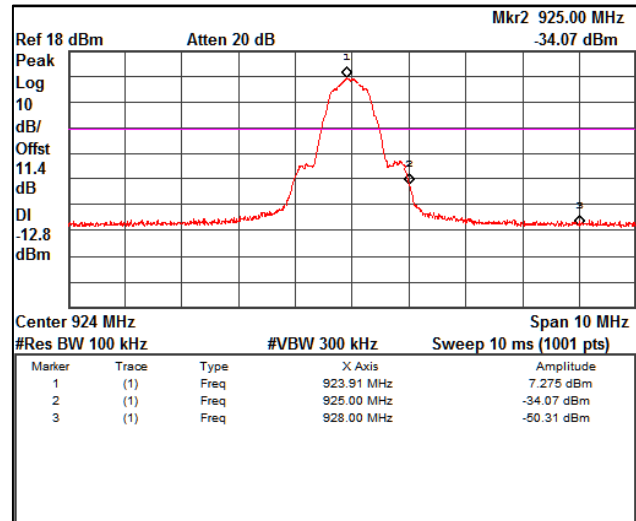
Channel Frequency: 914MHz



Channel Frequency: 924MHz

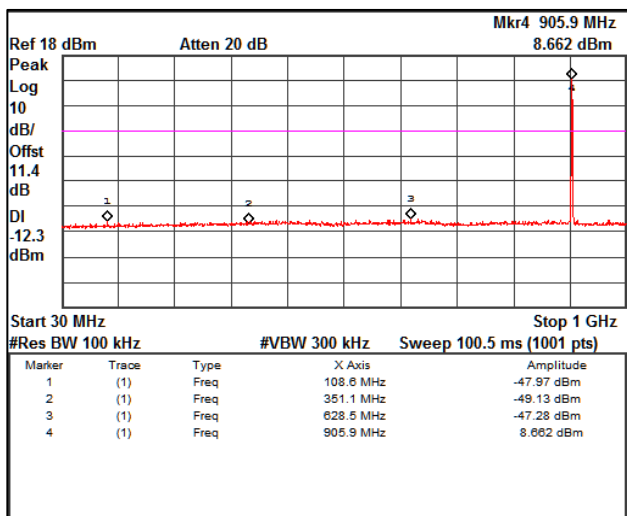


Band edge Channel Frequency 906MHz

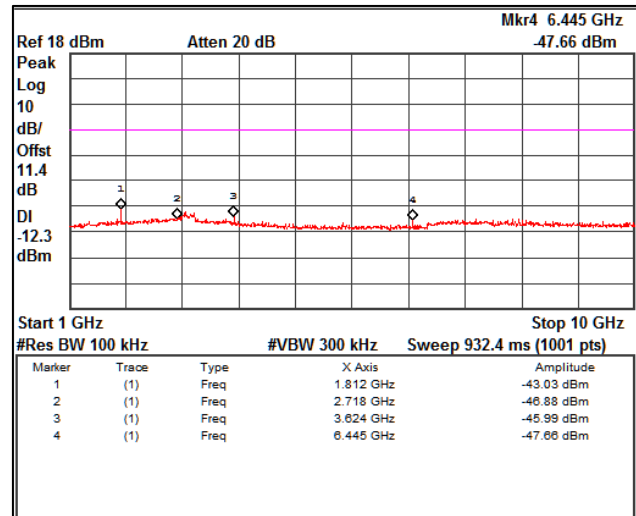


Band edge Channel Frequency 924MHz

7.4.2 Out-Of-Band Emissions



**Channel Frequency 906MHz
Frequency Range 30MHz – 1GHz**

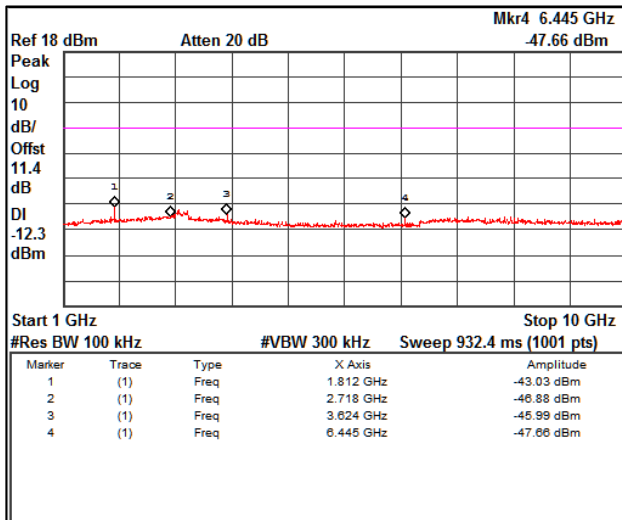


**Channel Frequency 906MHz
Frequency Range 1GHz – 10GHz**

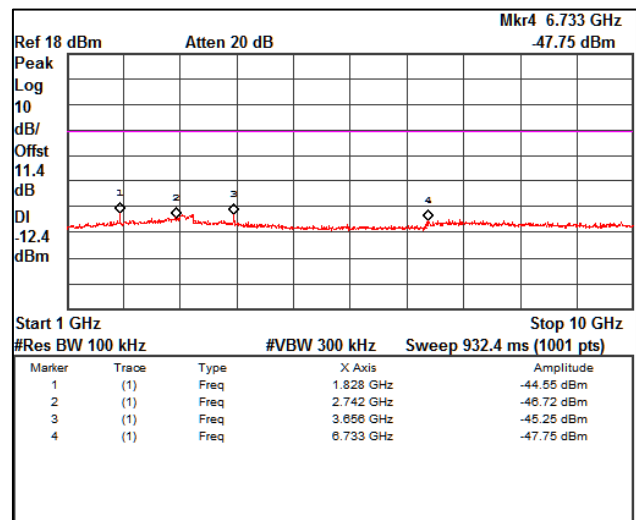
Prüfbericht - Nr.:
Test Report No.:

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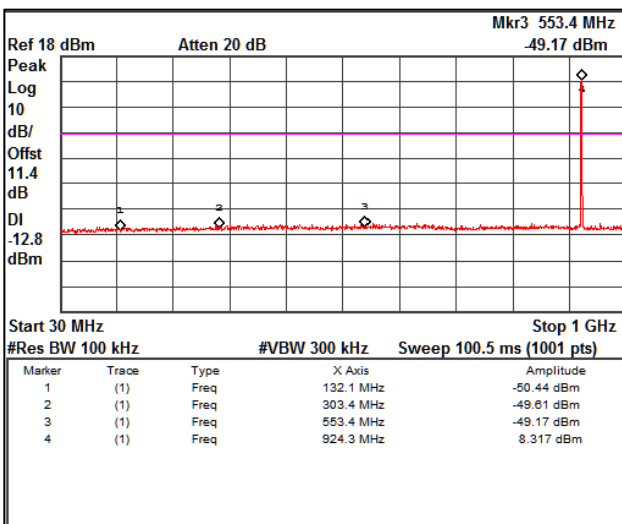
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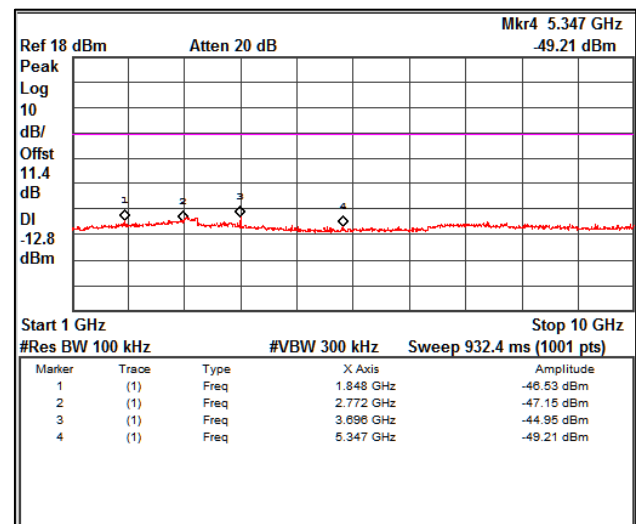
Channel Frequency 914MHz
Frequency Range 30MHz – 1GHz



Channel Frequency 914MHz
Frequency Range 1GHz – 10GHz



Channel Frequency 924MHz
Frequency Range 30MHz – 1GHz



Channel Frequency 906MHz
Frequency Range 1GHz – 10GHz

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7.4.3 Spurious Radiated Emissions & Restricted Bands of Operation

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (d) / (15.209 & 15.205) RSS-GEN issue 5 clause 8.9, 8.10
Test Method	ANSI C63.10
Measurement Location	Semi Anechoic Chamber 9kHz - 1 GHz Fully Anechoic Chamber 1 GHz - 40GHz
Measurement Bandwidth	100 kHz for frequency range < 1GHz 1 MHz for Frequency range >1GHz
Detector	Refer remarks below
Measuring Distance	3 m
Requirement	As per the limits mentioned in the below table
Test setup	Refer TEST METHODOLOGY

Table 6: Transmitter limits for Radiated emission

Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Distance of Measurement (m)
0.009 – 0.490	2400/F(kHz)	48.50 – 13.80	300*
0.490 – 1.705	24000/F(kHz)	33.80 – 23.00	30*
1.705 -30	30	29.54	30*
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Remark: * The limit shows in the table above of frequency range 0.009 – 0.490, 0.490 – 1.705 MHz and 1.705-30MHz is at 300-meter, 30 meter and 30-meter range respectively, which corresponds to 128.51 – 93.80, 73.80 – 62.96 and 69.54 dBμV/m at 3m range by extrapolation calculation and the measurement of loop antenna.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Conditions:

Temperature (Norm) = + 22.3 °C Voltage = 24VDC through DC power supply Relative humidity: 58%

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Test results:

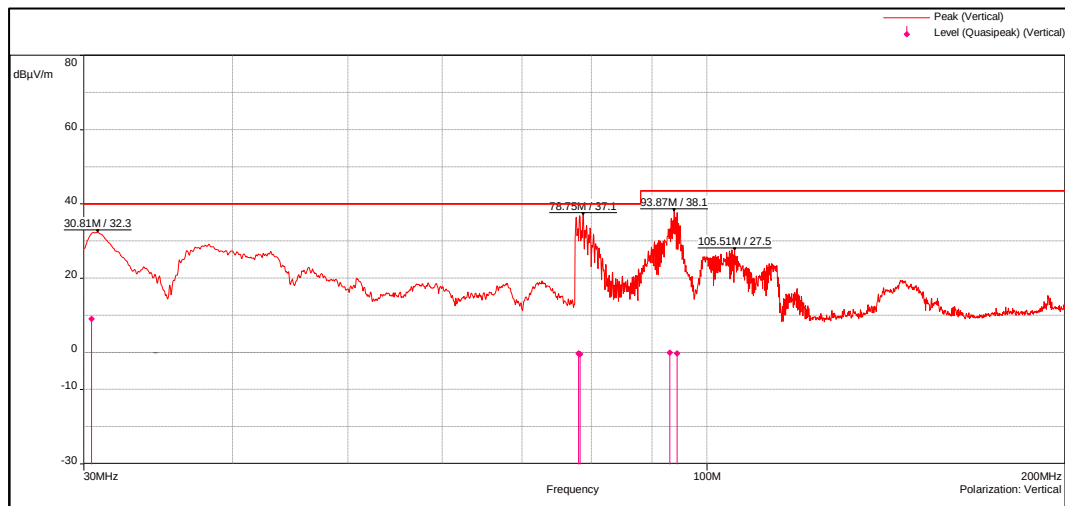
Note: All the losses are included during measurement and final values are mentioned in the test report. Refer TEST METHODOLOGY for more details

Test results for frequency range 9kHz – 30MHz

No emissions found in frequency range 9 kHz to 30 MHz, and measured levels are below 20dB from the limit line, hence not reported.

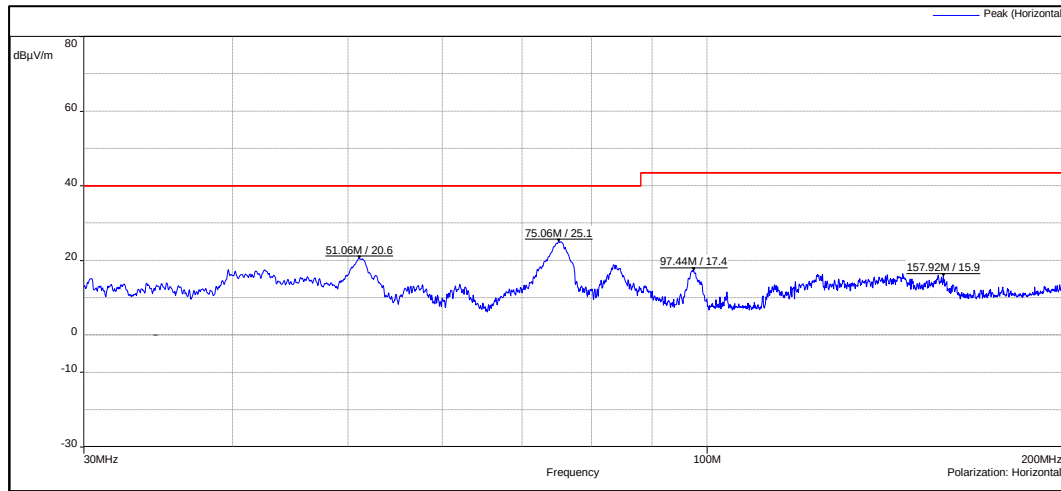
Table 7: Test results for frequency range 30MHz – 200MHz

Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
30.45(QP)	Vertical	9.03	40.00	-30.97
78.282(QP)		-0.49	40.00	-40.49
93.10(QP)		-0.03	43.50	-43.53
94.44(QP)		-0.26	43.50	-43.76
105.51(Pk)		27.50	43.50	-16.00
51.06(Pk)	Horizontal	20.60	40.00	-19.40
75.06(Pk)		25.10	43.50	-18.40
97.44(Pk)		17.40	46.00	-28.60
157.92(Pk)		15.90	46.00	-30.10



Channel Frequency 30MHz – 200MHz

Polarization Vertical



Channel Frequency 30MHz – 200MHz

Polarization Horizontal

Table 8: Test results for frequency range 200MHz – 1GHz

Channel Frequency: 906MHz

Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
214.40	Vertical	13.80	43.50	-29.70
287.99		15.50	46.00	-30.50
383.99		16.80	46.00	-29.20
464.39		19.40	46.00	-26.60
906.05*		100.00	46.00	54.00
203.66	Horizontal	29.80	43.50	-13.70
224.00		14.80	46.00	-31.20
287.99		19.60	46.00	-26.40
471.53		19.50	46.00	-26.50
905.87*		100.00	46.00	54.00

Channel Frequency: 914MHz

Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
287.99	Vertical	16.10	46.00	-29.90
429.20		30.10	46.00	-15.90
913.88*		100.00	46.00	54.00
215.36	Horizontal	26.60	43.50	-16.90
242.51		25.00	46.00	-21.00
284.54		22.40	46.00	-23.60
284.54		25.20	46.00	-20.80
913.88*		100.00	46.00	54.00

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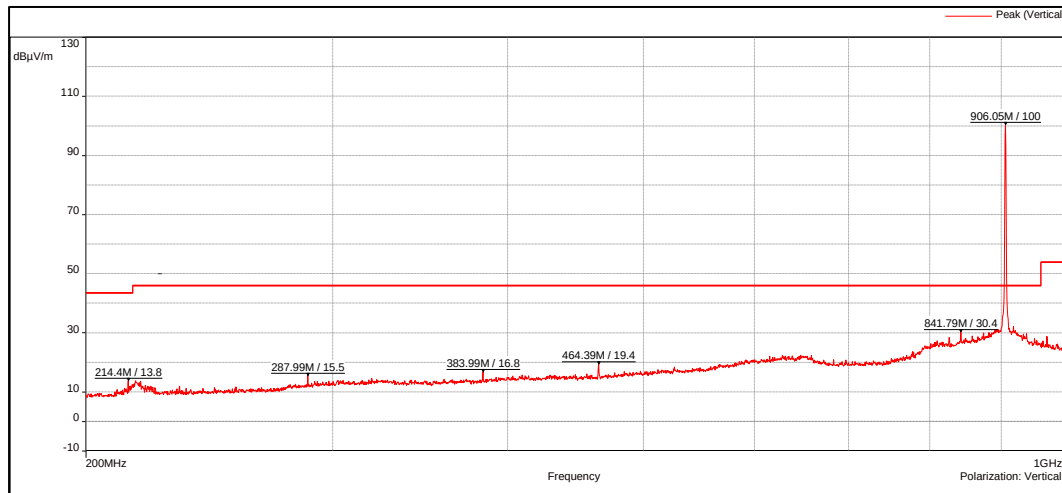
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Channel Frequency: 924MHz

Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
288.02	Vertical	16.20	43.50	-27.30
359.09		16.70	46.00	-29.30
630.23		22.90	46.00	-23.10
923.90*		100.00	46.00	54.00
224.00	Horizontal	14.30	43.50	-29.20
287.99		18.90	46.00	-27.10
413.24		24.90	46.00	-21.10
924.05*		98.50	46.00	52.50

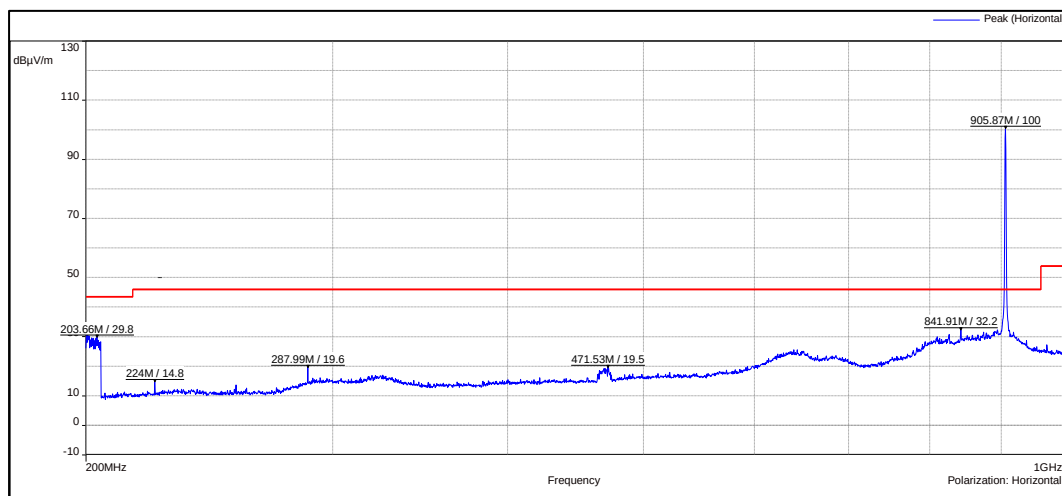
Note: -* Indicates the Nominal Frequency

Channel Frequency: 906MHz



Channel Frequency 200MHz – 1GHz

Polarization Vertical



Channel Frequency 200MHz – 1GHz

Polarization Horizontal

Prüfbericht - Nr.:

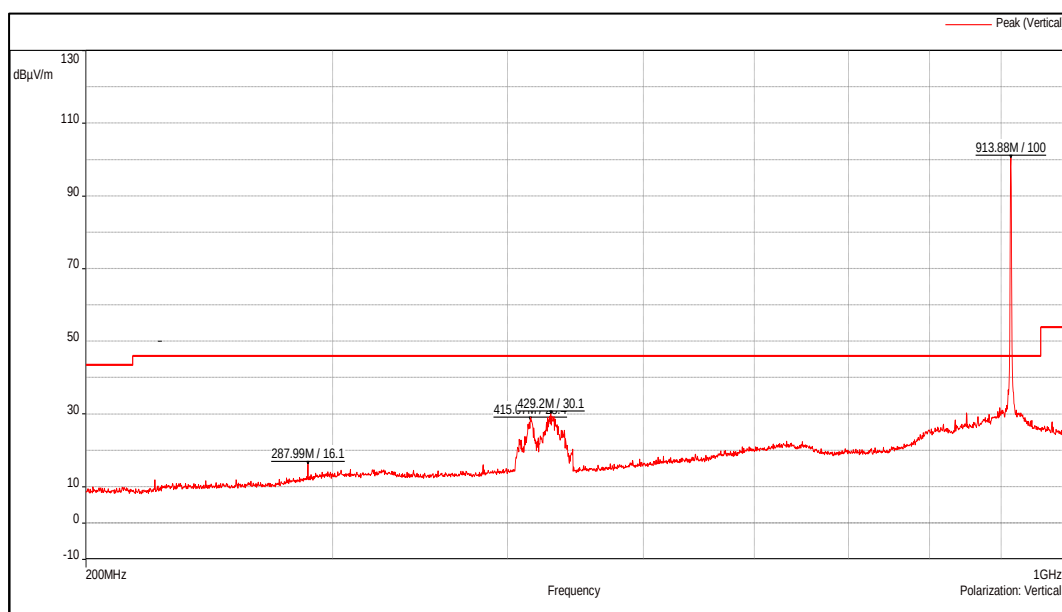
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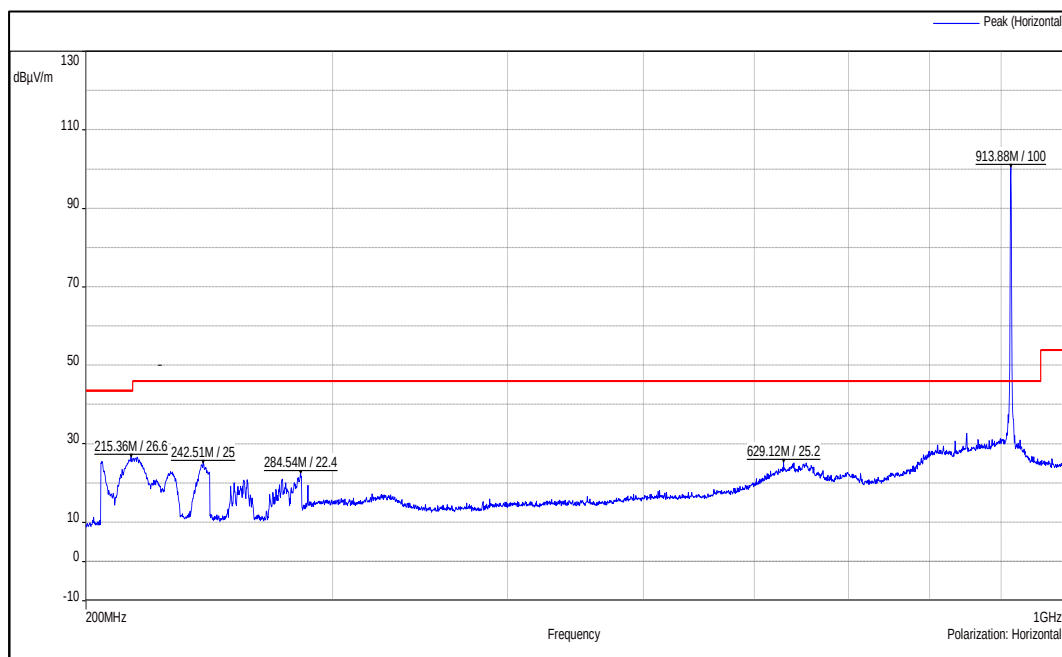
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Channel Frequency: 914MHz



Channel Frequency 200MHz – 1GHz

Polarization Vertical



Channel Frequency 200MHz – 1GHz

Polarization Horizontal

Prüfbericht - Nr.:

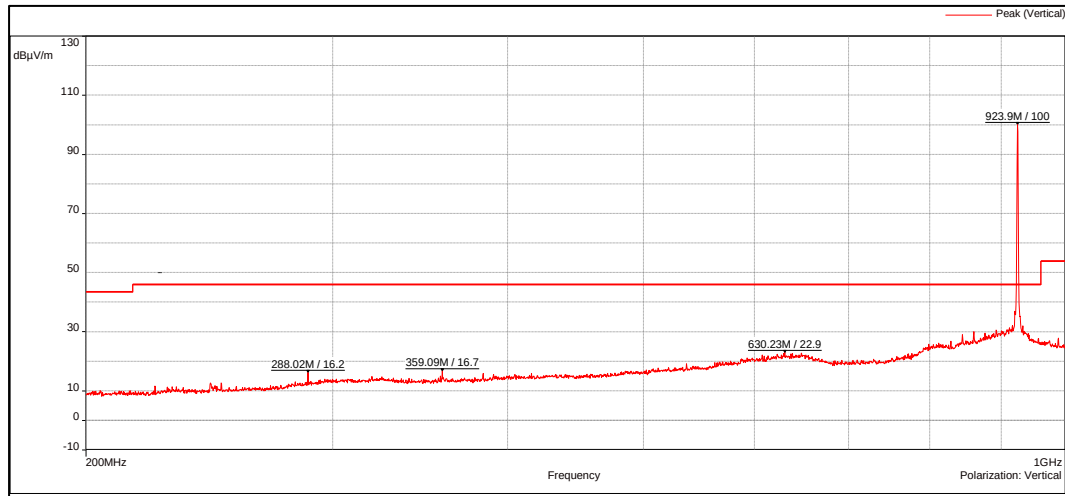
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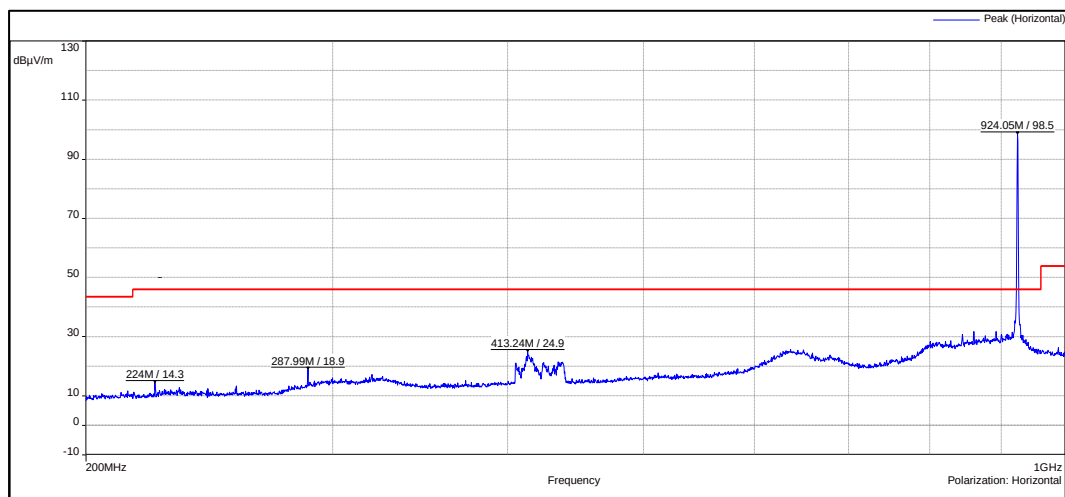
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Channel Frequency: 924MHz



Channel Frequency 200MHz – 1GHz

Polarization Vertical



Channel Frequency 200MHz – 1GHz

Polarization Horizontal

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Table 9: Test results for the frequencies above 1GHz:

Channel Frequency: 906MHz

Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
906	1812(Pk)	Vertical	43.09	74.00	-30.91
	1812(Av)		37.40	54.00	-16.60
	2718(Pk)		41.91	74.00	-32.09
	2718(Av)		31.99	54.00	-22.01
	3624(Pk)		48.05	74.00	-25.95
	3624(Av)		41.38	54.00	-12.62
	4530(Pk)		41.75	74.00	-32.25
	4530(Av)		29.91	54.00	-24.09
	5436(Pk)		43.24	74.00	-30.76
	5436(Av)		33.45	54.00	-20.55
	6342(Pk)		45.54	74.00	-28.46
	6342(Av)		30.59	54.00	-23.41
	7248(Pk)		47.39	74.00	-26.61
	7248(Av)		35.3	54.00	-18.70
	8154(Pk)		49.67	74.00	-24.33
	8154(Av)		37.01	54.00	-16.99
	1812(Pk)	Horizontal	44.55	74.00	-29.45
	1812(Av)		39.70	54.00	-14.30
	2718(Pk)		41.39	74.00	-32.61
	2718(Av)		30.40	54.00	-23.60
	3624(Pk)		47.65	74.00	-26.35
	3624(Av)		40.87	54.00	-13.13
	4530(Pk)		42.46	74.00	-31.54
	4530(Av)		29.07	54.00	-24.93
	5436(Pk)		42.84	74.00	-31.16
	5436(Av)		30.15	54.00	-23.85
	6342(Pk)		43.84	74.00	-30.16
	6342(Av)		30.54	54.00	-23.46
	7248(Pk)		47.34	74.00	-26.66
	7248(Av)		34.26	54.00	-19.74
	8154(Pk)		50.01	74.00	-23.99
	8154(Av)		37.00	54.00	-17.00

Pk: Peak Detector;
Av: Average Detect

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Channel Frequency: 914MHz

Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
914	1828(Pk)	Vertical	42.34	74.00	-31.66
	1828(Av)		36.11	54.00	-17.89
	2742(Pk)		42.63	74.00	-31.37
	2742(Av)		33.24	54.00	-20.76
	3656(Pk)		47.52	74.00	-26.48
	3656(Av)		40.30	54.00	-13.70
	4570(Pk)		41.91	74.00	-32.09
	4570(Av)		30.25	54.00	-23.75
	5484(Pk)		43.86	74.00	-30.14
	5484(Av)		34.70	54.00	-19.30
	6398(Pk)		43.71	74.00	-30.29
	6398(Av)		31.12	54.00	-22.88
	7312(Pk)		47.52	74.00	-26.48
	7312(Av)		35.77	54.00	-18.23
	8226(Pk)		49.46	74.00	-24.54
	8226(Av)		37.22	54.00	-16.78
	1828(Pk)	Horizontal	43.90	74.00	-30.10
	1828(Av)		38.80	54.00	-15.20
	2742(Pk)		42.07	74.00	-31.93
	2742(Av)		31.85	54.00	-22.15
	3656(Pk)		48.02	74.00	-25.98
	3656(Av)		41.22	54.00	-12.78
	4570(Pk)		41.97	74.00	-32.03
	4570(Av)		29.42	54.00	-24.58
	5484(Pk)		42.31	74.00	-31.69
	5484(Av)		30.33	54.00	-23.67
	6398(Pk)		43.66	74.00	-30.34
	6398(Av)		31.02	54.00	-22.98
	7312(Pk)		47.48	74.00	-26.52
	7312(Av)		34.60	54.00	-19.40
	8226(Pk)		49.82	74.00	-24.18
	8226(Av)		37.02	54.00	-16.98

Pk: Peak Detector;
Av: Average Detector

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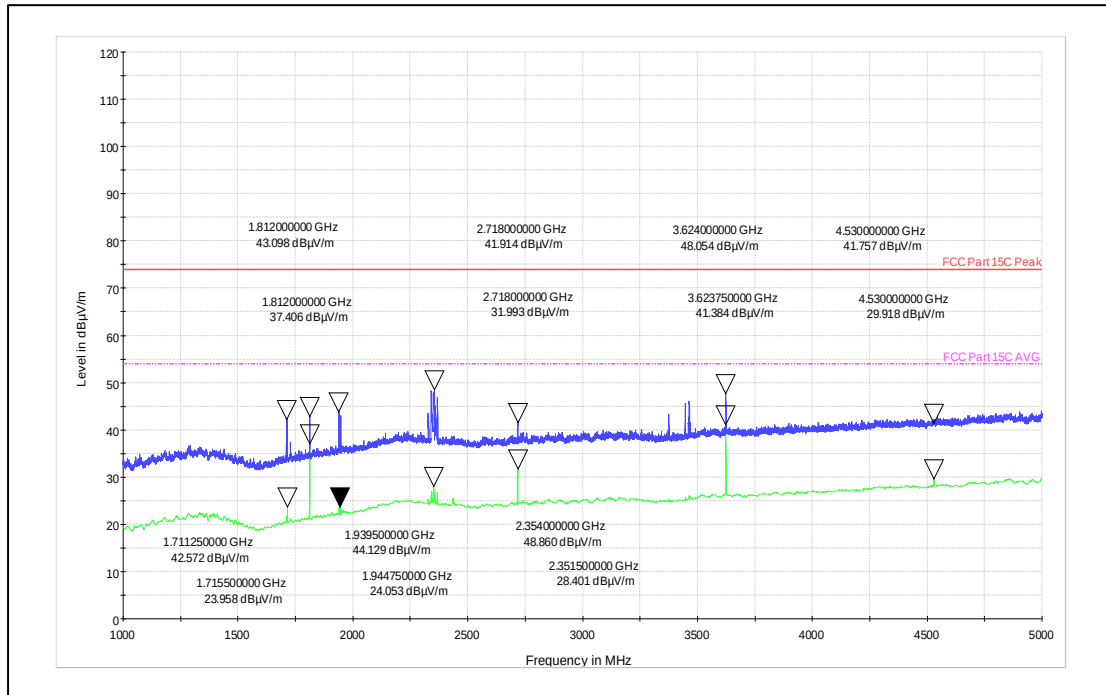
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Channel Frequency: 924MHz

Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
924	1848(Pk)	Vertical	40.11	74.00	-33.89
	1848(Av)		33.11	54.00	-20.89
	2772(Pk)		42.51	74.00	-31.49
	2772(Av)		33.82	54.00	-20.18
	3696(Pk)		47.36	74.00	-26.64
	3696(Av)		40.55	54.00	-13.45
	4620(Pk)		41.56	74.00	-32.44
	4620(Av)		30.43	54.00	-23.57
	5544(Pk)		43.49	74.00	-30.51
	5544(Av)		33.52	54.00	-20.48
	6468(Pk)		44.04	74.00	-29.96
	6468(Av)		31.36	54.00	-22.64
	7392(Pk)		47.87	74.00	-26.13
	7392(Av)		35.6	54.00	-18.40
	8316(Pk)		48.81	74.00	-25.19
	8316(Av)		35.91	54.00	-18.09
	1848(Pk)	Horizontal	41.92	74.00	-32.08
	1848(Av)		36.51	54.00	-17.49
	2772(Pk)		41.27	74.00	-32.73
	2772(Av)		32.35	54.00	-21.65
	3696(Pk)		48.29	74.00	-25.71
	3696(Av)		41.80	54.00	-12.20
	4620(Pk)		41.07	74.00	-32.93
	4620(Av)		28.98	54.00	-25.02
	5544(Pk)		42.27	74.00	-31.73
	5544(Av)		29.74	54.00	-24.26
	6468(Pk)		43.81	74.00	-30.19
	6468(Av)		31.23	54.00	-22.77
	7392(Pk)		47.47	74.00	-26.53
	7392(Av)		34.73	54.00	-19.27
	8316(Pk)		48.33	74.00	-25.67
	8316(Av)		35.83	54.00	-18.17

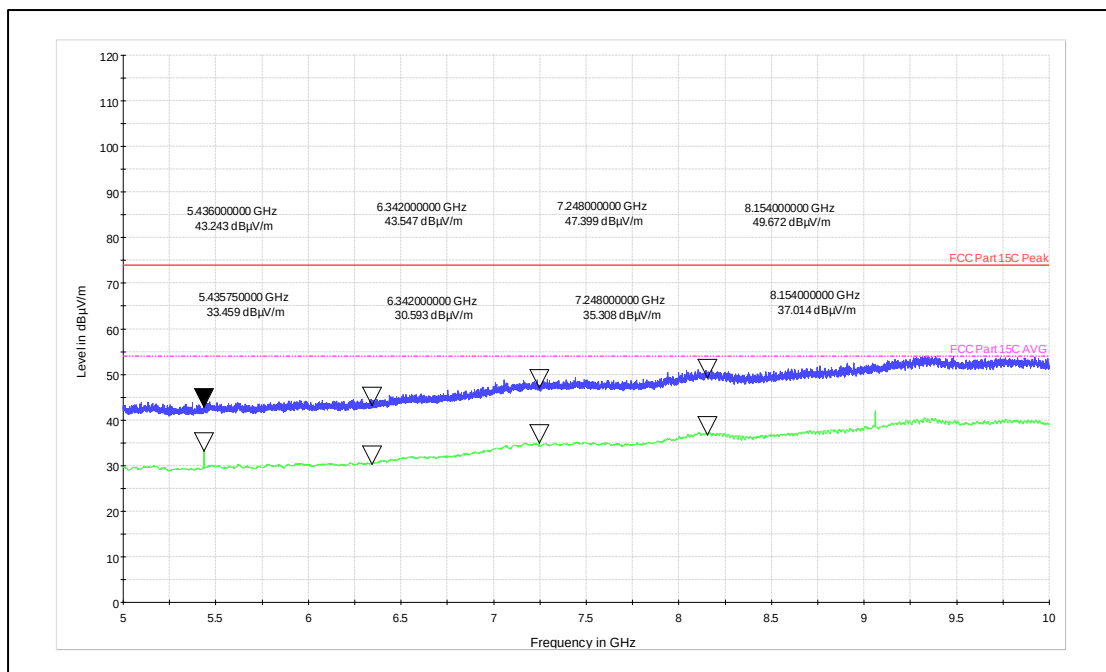
Pk: Peak Detector
Av: Average Detector

Channel Frequency 906MHz



Channel Frequency: 1GHz – 5GHz

Polarization: Vertical



Channel Frequency: 5GHz -10GHz

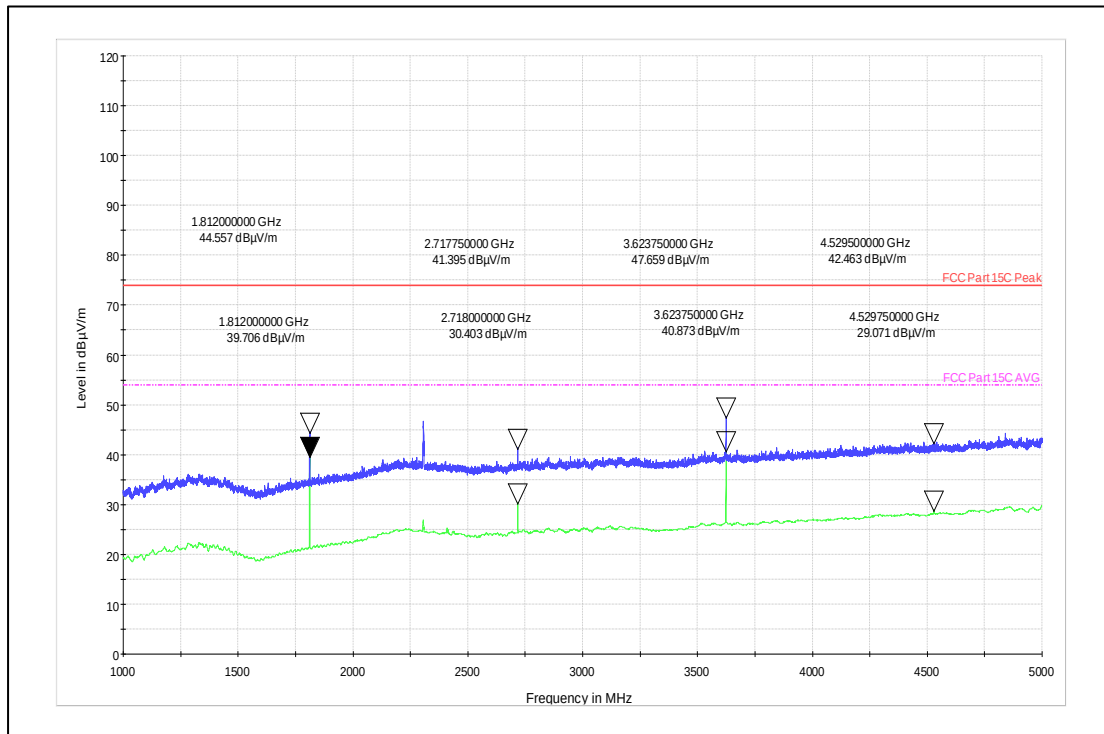
Polarization: Vertical

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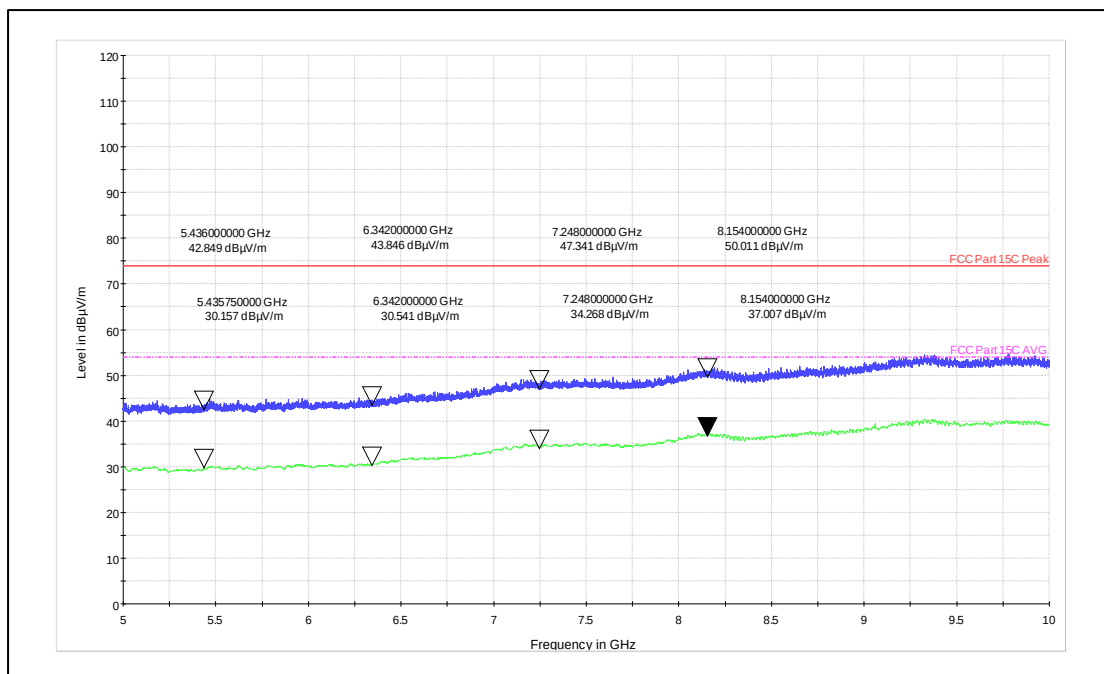
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Channel Frequency 906MHz



Channel Frequency: 1GHz – 5GHz

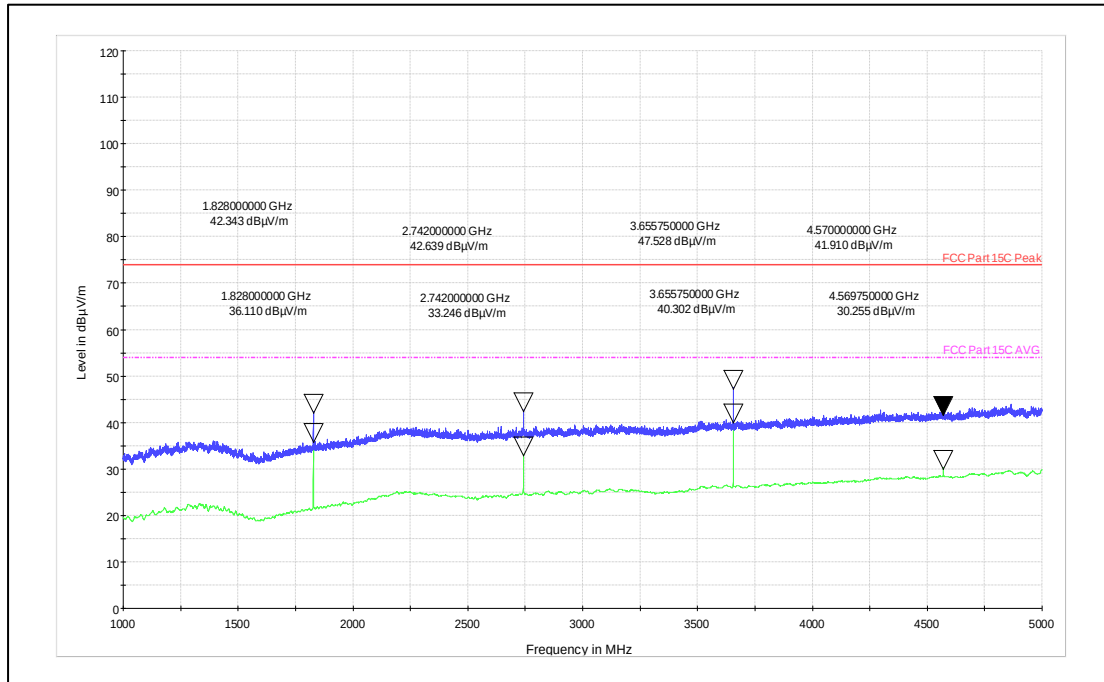
Polarization: Horizontal



Channel Frequency: 5GHz -10GHz

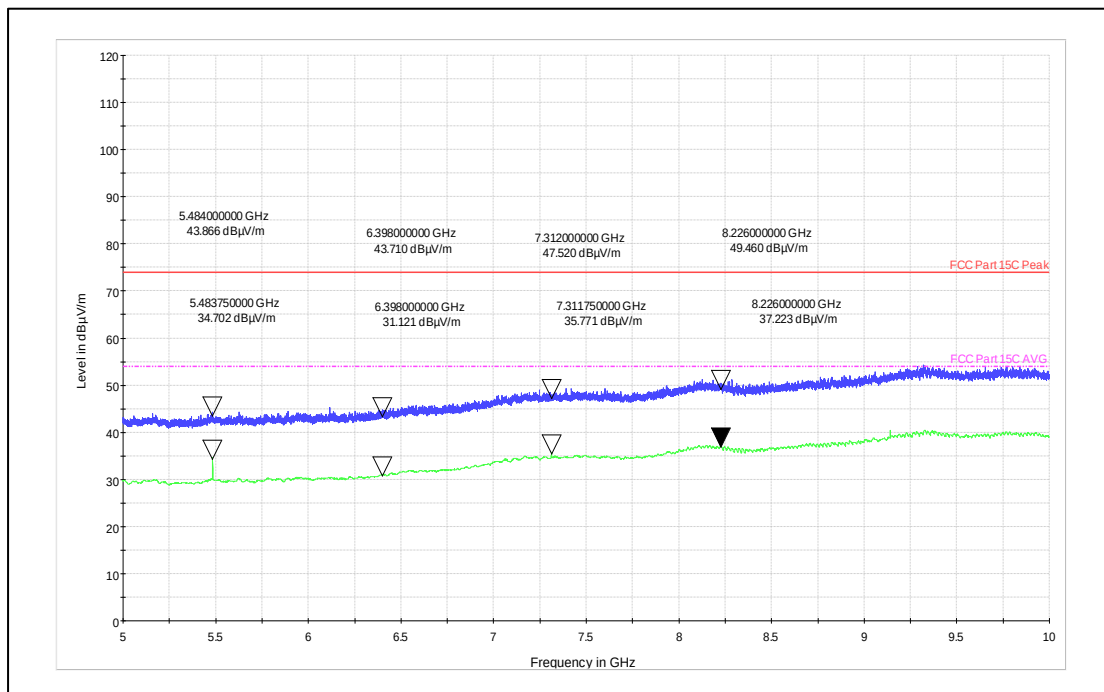
Polarization: Horizontal

Channel Frequency 914MHz



Channel Frequency: 1GHz -5GHz

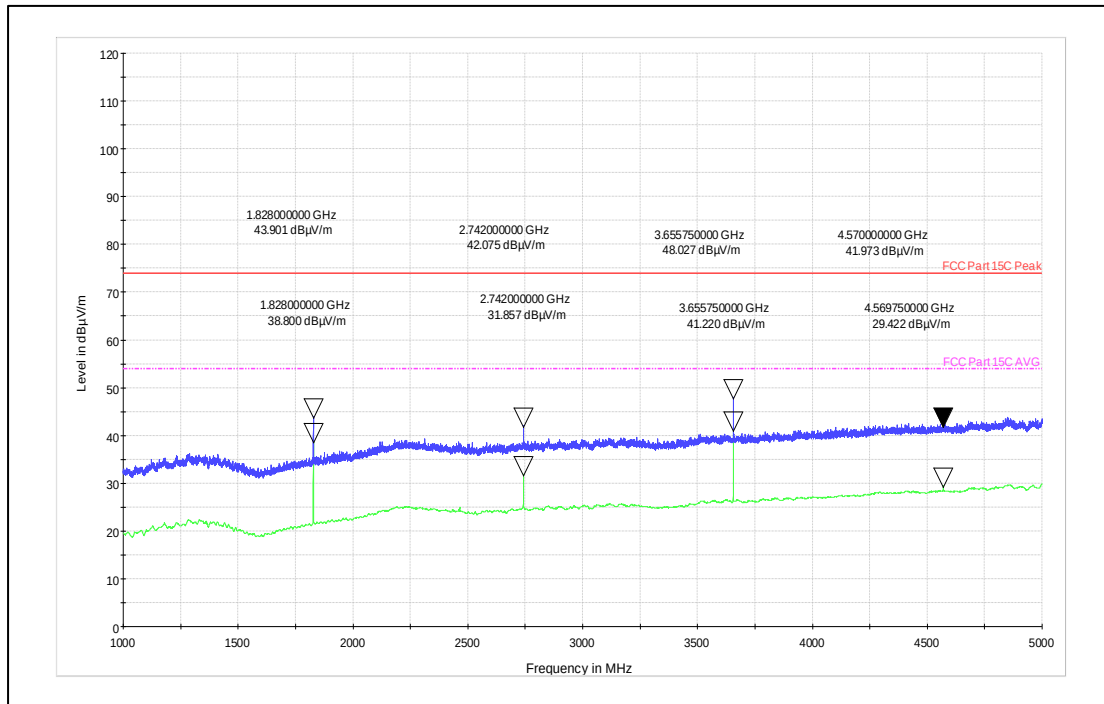
Polarization: Vertical



Channel Frequency: 5GHz -10GHz

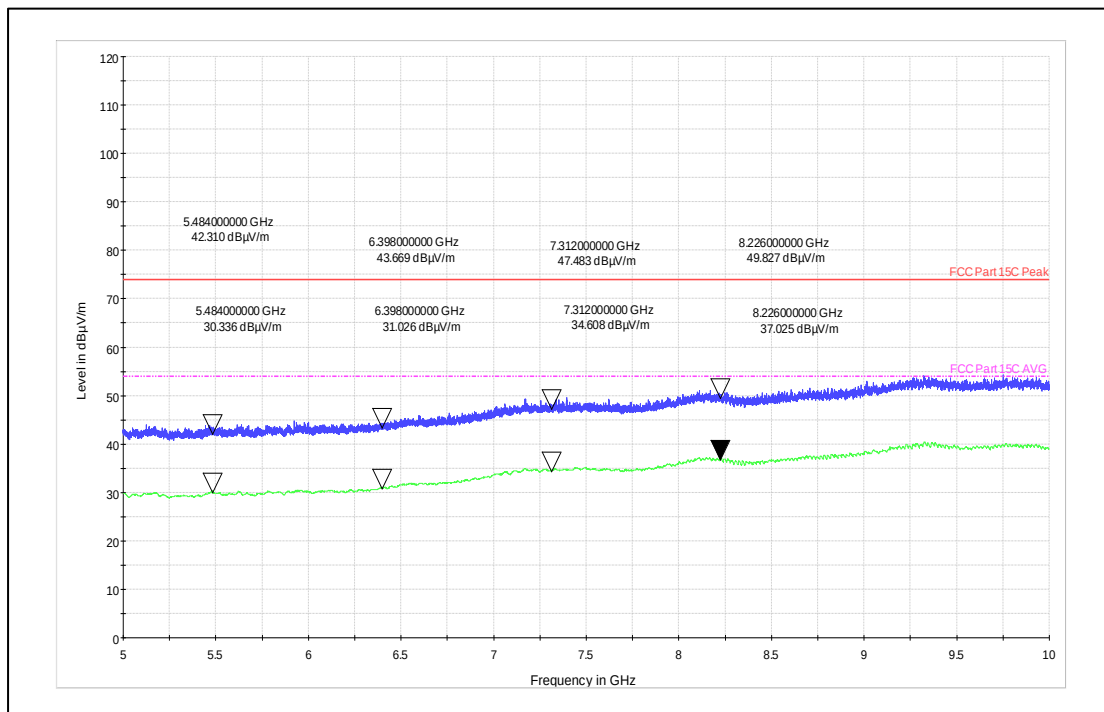
Polarization: Vertical

Channel Frequency 914MHz



Channel Frequency: 1GHz -5GHz

Polarization: Horizontal



Channel Frequency: 5GHz -10GHz

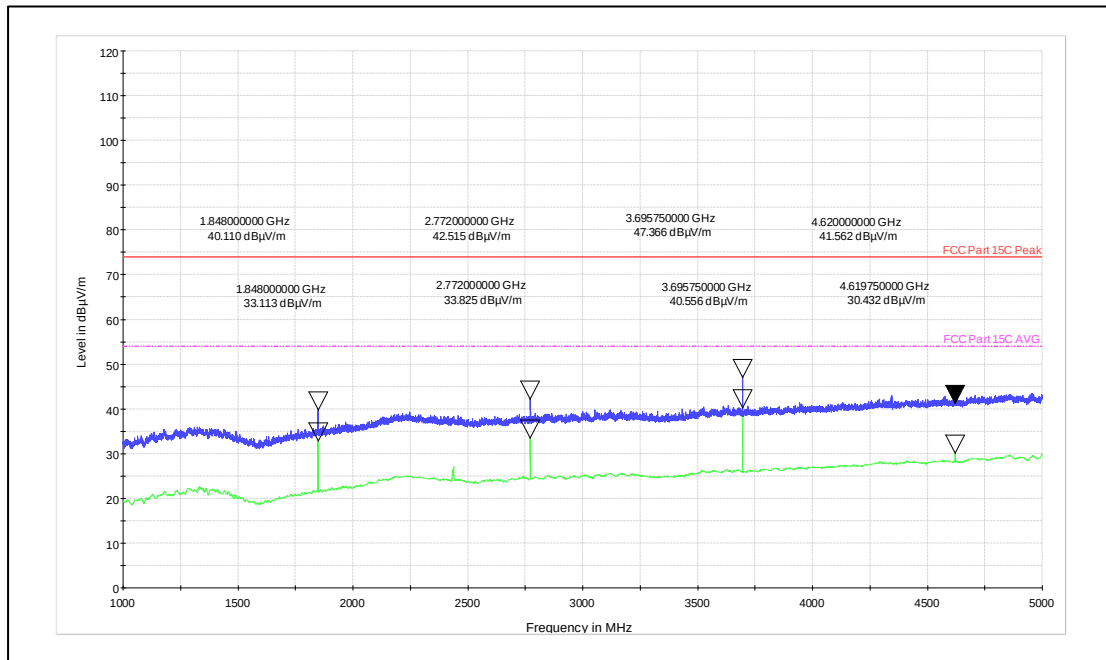
Polarization: Horizontal

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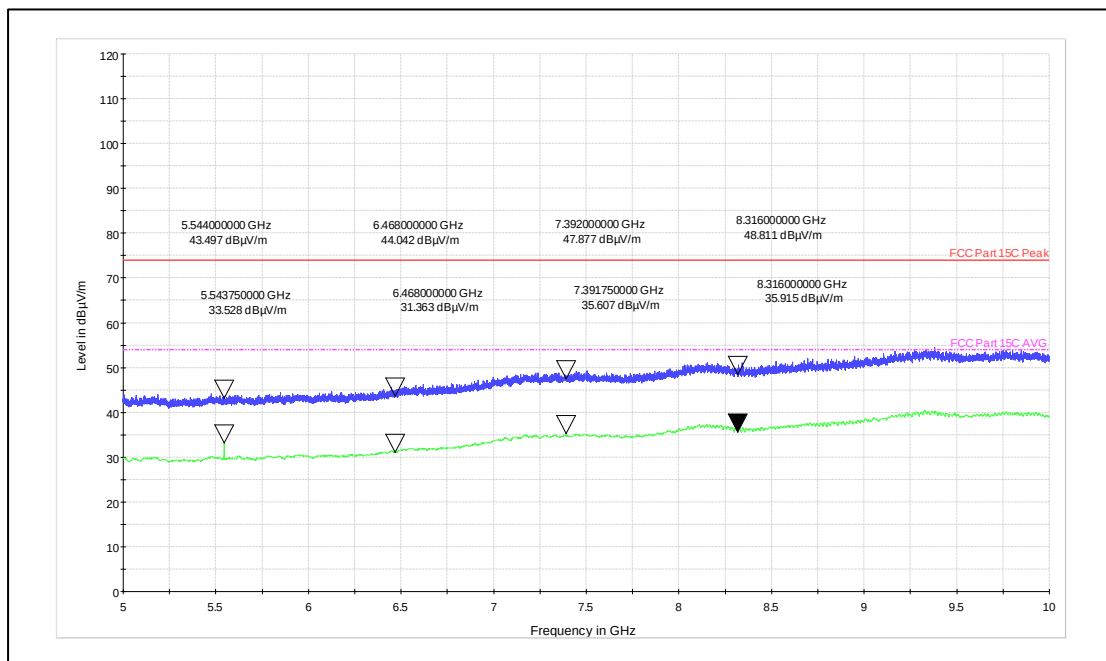
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Channel Frequency 924MHz



Channel Frequency: 1GHz -5GHz

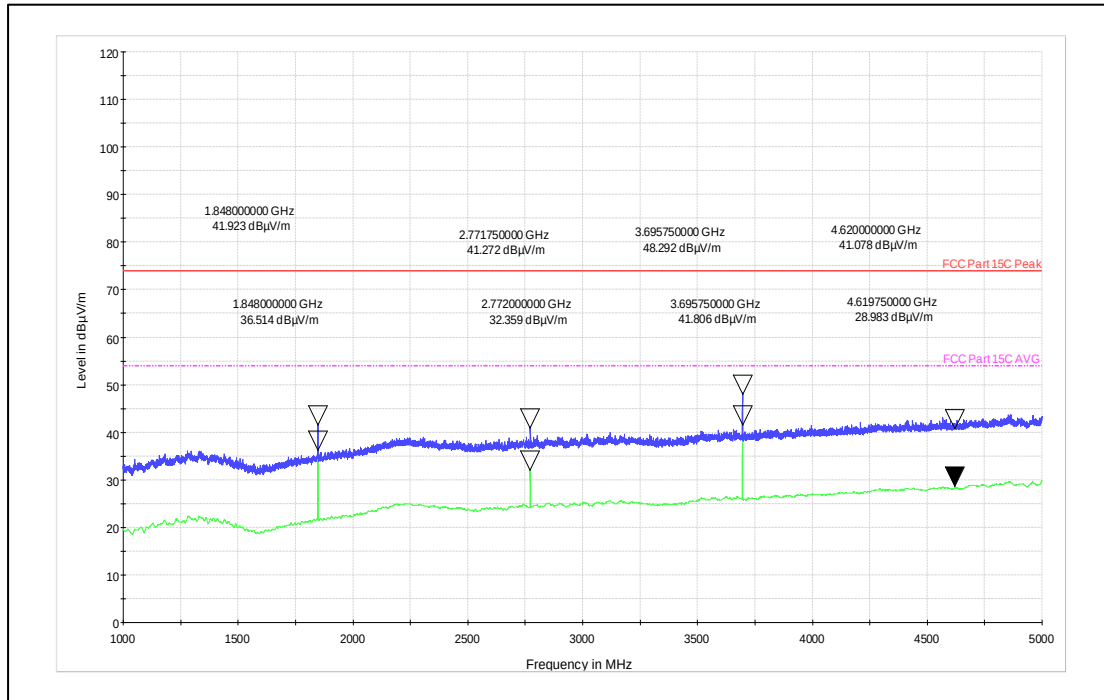
Polarization: Vertical



Channel Frequency: 5GHz -10GHz

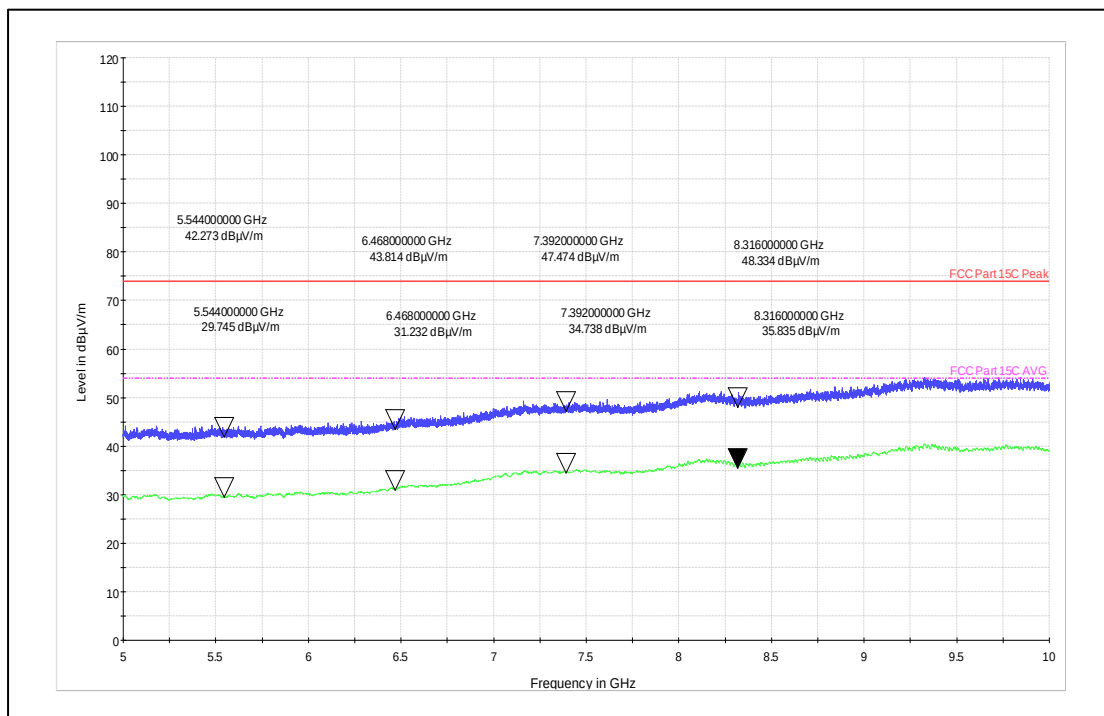
Polarization: Vertical

Channel Frequency 914MHz



Channel Frequency: 1GHz -5GHz

Polarization: Horizontal



Channel Frequency: 5GHz -10GHz

Polarization: Horizontal

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*****End of test report*****