Prüfbericht-Nr.: *Test report no.:*	**IN23HOHV 001** **ULR-TC5688233000000095F**	**Auftrags-Nr.:** *Order no.*:	**0146716970 020**	
Kunden-Referenz-Nr.: *Client reference no.:*	2269507	**Auftragsdatum:** *Order date:*	2022.09.08	
Auftraggeber: *Client:*	Trimble Inc. 5475 Kellenburger Road , Building 2,Dayton, Ohio 45424, United States			
Prüfgegenstand: *Test item:*	GS920			
Bezeichnung *Identification*	GS920	**Serien -Nr.:** *Serial no.:* Engineering Sample		
Auftrags-Inhalt: *Order content*:	Testing and issue of Test Report and Grant Certificate			
Prüfgrundlage: *Test specification:*	FCC Part 15 Subpart C 15.247,15.205, 15.207 & 15.209 RSS 247 Issue 3, RSS Gen Issue 5			
Wareneingangsdatum: *Date of sample receipt:*	2022-11-11			
Prüfmuster-Nr.: *Test sample no:*	A003370833-001 A003370833-002 A003370833-003			
Prüfzeitraum: *Testing period:*	2022.11.12 - 2022.11.20			
Ort der Prüfung: *Place of testing:*	Wireless laboratory, Bangalore			
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (India) Pvt. Ltd. 27/B,2nd cross road, Electronic city Phase1, Banglore-560100, India FCC Test Site Registration No: 496599 IC Test Site Registration No: 27711 HVIN: MB119-00SD-A			
Prüfergebnis*: *Test result*:*	Pass			

geprüft von: *tested by:*		**genehmigt von:** *authorized by:*	
Datum: *Date:* 2022.11.22		**Ausstellatum:** *Issue date:* 2023.09.12	
Stellung / *Position:*	**Yogesh V** Senior Engineer	**Stellung** / *Position:*	**Madhu K N** Asst. Manager
Sonstiges / *Other:*	FCC ID: S9E-131488 IC: 5817A-131488		

Zustand des Prüfgegenstandes bei Anlieferung: **Prüfmuster vollständig und unbeschädigt**
Condition of the test item at delivery: ***Test item complete and undamaged***

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Prüfbericht - Nr.: *Test Report No.:*	**IN23HOHV 001** **ULR-TC5688233000000095F**	Seite 2 von 52 *Page 2 of 52*

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. *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.*
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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. *Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report.* *Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.*
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. *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.*

TEST SUMMARY

Test Item	FCC	ISED	Result
Maximum conducted (average) output power	FCC 15.247(b)(3)	RSS 247 Issue 3, Section 5.4 (d)	Pass
Maximum Power Spectral Density	FCC 15.247(e)	RSS 247 Issue 3, Section 5.2 (b)	Pass
Occupied bandwidth and 6dB Bandwidth	15.247 (a) (2)	RSS-247 issue 3 5.1 (c)	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 3 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

REVISION HISTORY OF THIS REPORT

Report Number	Version	Description	Issue date
IN23HOHV 001 ULR-TC5688233000000095F	01	Initial issue of report	2023.09.12

Table of Contents

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

2 TEST SITES

2.1 Testing Facilities

1. TÜV Rheinland (India) Pvt.Ltd.,
   27/B, 2nd Cross,
   ElectronicCityPhase1
   Bangalore – 560 100,
   India

2. TUV Rheinland (India) Pvt.Ltd.,
   108 , Beside ISBR Business School,
   Electronic city Phase I
   Bangalore - 560 100,
   India

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	101732	4.73 SP5	04.08.2023	Yearly	
EMI Receiver	Rohde & Schwarz	ESW 44	101733	1.72SP1	15.02.2024	Yearly	Radiated Spurious Emission
Horn Antenna	Schwarzbeck	HAX-18	HAX18-802	-	03.09.2023	Yearly	
Balun & Biconical Antenna	Schwarzbeck Mess-Elektronik	BBA 9106+VHBB 9124	9124-1117	-	05.05.2024	Yearly	
Log-Periodic Antenna	Schwarzbeck mess-elektronik	VUSLP 9111B	9111B-111	-	17.02.2024	Yearly	
Fully Anechoic Chamber	Albatross	-	-	-	-	-	
Signal Analyser	Rohde & Schwarz	FSV7	101644	FW 3.40	03.02.2024	Yearly	Antenna – Port Conducted Test (TS8997) system
Spectrum Analyzer	Agilent	E4407B	US41192772	A.14.06	21.12.2023	Yearly	

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

The GS920 system includes the cabin mounted GS920, compatible crane mounted sensors and an android/ ios tablet with Lifting works application. GS920 is designed to show the state of sensors that monitors the system where the equipment is installed on and provide the real time data to an android/ ios tablet to assist the operator.

3.2 Ratings and System Details of Equipment under Test

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

Protocol	Sub-GHz
Operating Frequency Range	902MHz to 928MHz
Channel Spacing	1MHz
Tx Transmitting Power	12 dBm
Maximum measured e.i.r.p	6.44 dBm
Modulation	2FSK
Data Rate	19.2Kbps
Number of antennas	1
Antenna Gain & Antenna Type	2dBi
Antenna Model	S1551AH-915S
Supply Voltage to Product	10V to 30V (Typical 12 V or 24 V)
Environmental conditions	-40°C to +85°C humidity range 0% to 100%
EUT Dimension(WxHxD)	52mm x 182mm x 251mm

***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	±5 %
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3 dB
Unwanted Emissions, conducted	±3 dB
All emissions, radiated	±6 dB
Temperature	±3 ℃
Supply Voltages	±3 %
Time	±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 : MB119-00SD-A

Software version : B0082_V2008B, B0082_V2008D

Software Name: B0082

Hardware Name: GS920

4.3 Special Accessories and Auxiliary Equipment

- None

4.4 Countermeasures to achieve EMC Compliance

- None

4.5 Simultaneous Transmission

This product supports Simultaneous operation.

Combinationations of Simultaneous Operations performed	**BLE**
	LoRa

Note: Simultaneous Operation was performed with the above mentioned combination and worst case test results are mentionrd in this report.

4.6 List of frequencies

Frequency Band (GHz)	**Channel No.**	**Frequency (MHz)**
Sub-GHz (902 MHz – 928 MHz)	**Low**	**903**
	:	:
	Mid	**916**
	:	:
	High	**927**

Table 5: List of SubGHz Center frequencies

Channel used for SubGHz testing

Channel Low : 903MHz

Channel Mid : 916MHz

Channel High : 927MHz

Note:
TUV Sample Identification number : A003370833-002 & A003370833-001– Radiated & Conducted test Sample

4.7 Report references

Note: Product **GS920** has multiple protocols. All the supported wireless protocols and their respective test results are issued in separate test reports, following table lists the report numbers.

Radio Protocol	Report Number
RF test report for BLE (2.4GHz)	ULR-TC5688233000000094F
RF test report for LoRa (902MHz – 928MHz) – This report	ULR-TC5688233000000095F

5 OPERATIONAL DESCRIPTION

The GS920 creates a two-way radio network with the sensors to bring required lift data to the operator.
The GS920 Sub-GHz module is a communication module that works on frequency channel 902MHz to 928 MHz and uses 2FSK modulation to communicate.
BLE in GS920 product is used to communicate with android/ ios tablet devices using 2.4GHz frequency band. This interface gives the real time information to the android/ ios tablet screen which we can use for monitoring and controlling.

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 mesurement 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

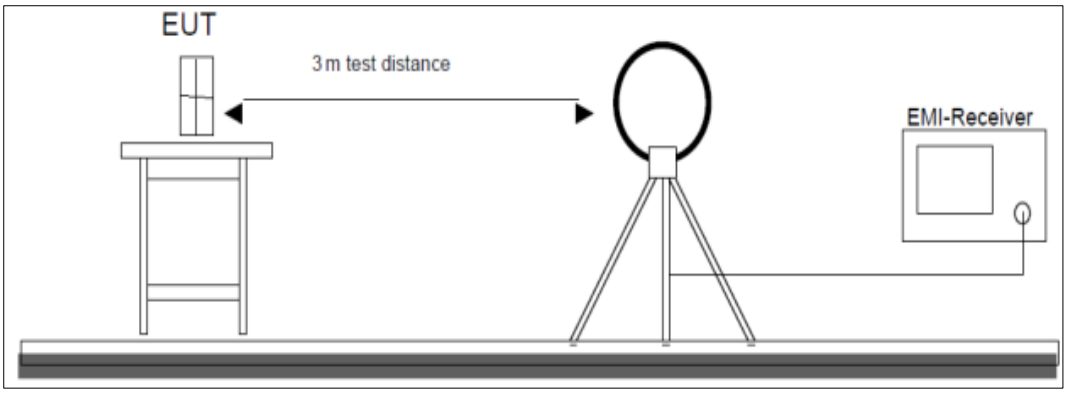


Figure 1: Frequency Range 9 kHz- 30 MHz

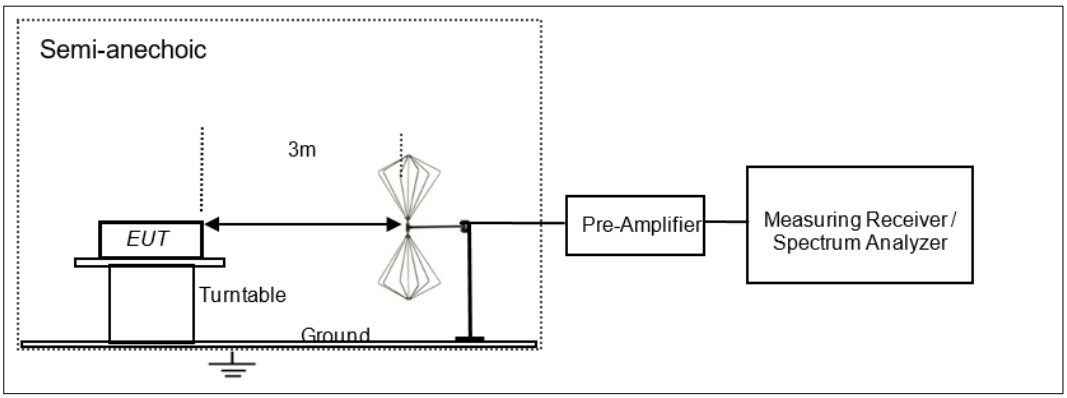


Figure 2: Frequency Range 30 MHz – 200 MHz

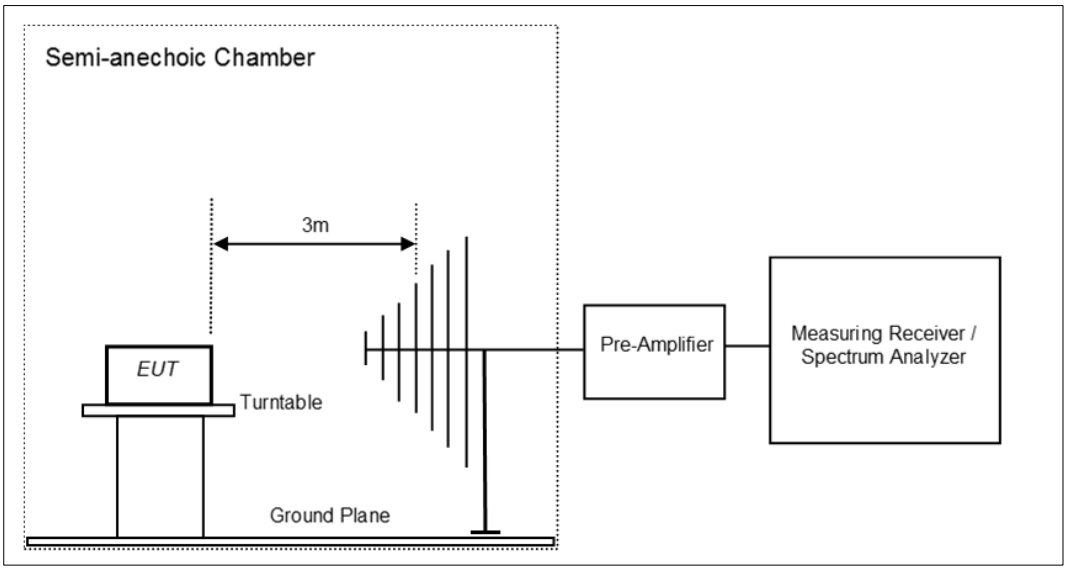


Figure 3: Frequency Range 200 MHz - 1GHz

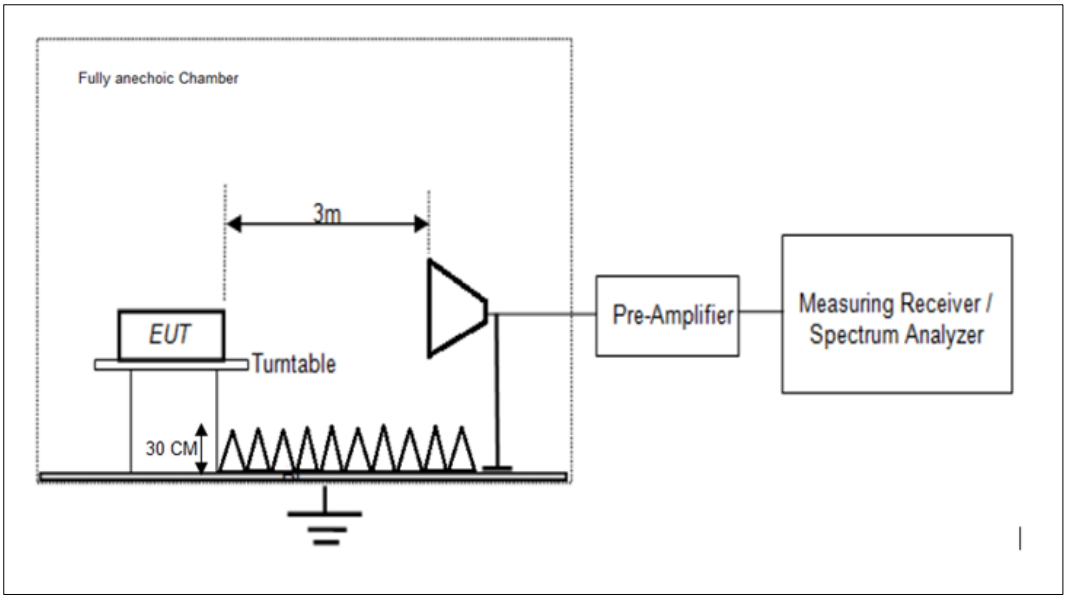


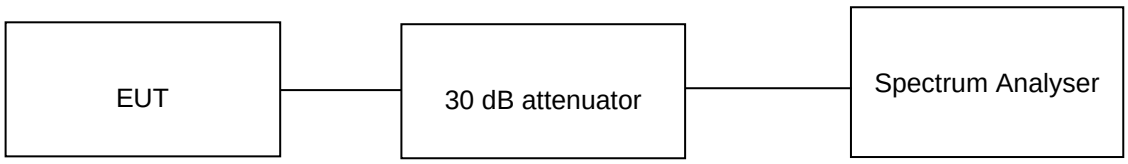
Figure 4: Frequency Range above 1 GHz

7 TEST RESULTS

7.1 Maximum Average Conducted Output Power

Result ***Pass***

Test Specification	FCC part 15 Subpart C 15.247 (b)(2) RSS-247 issue 3, section 5.4 (a)
Test Method	Subclause 11.9.2.2.4 of ANSI C63.10
Measurement Bandwidth	30kHz
Detector	Peak
Port of testing	Antenna port
Requirement	Power ≤ 1 W (30 dBm)



Test Condition

Normal Test Condition:

Temperature (Norm) = + 21.5 °C Voltage = 12V through AC to DC supply Relative humidity: 63%

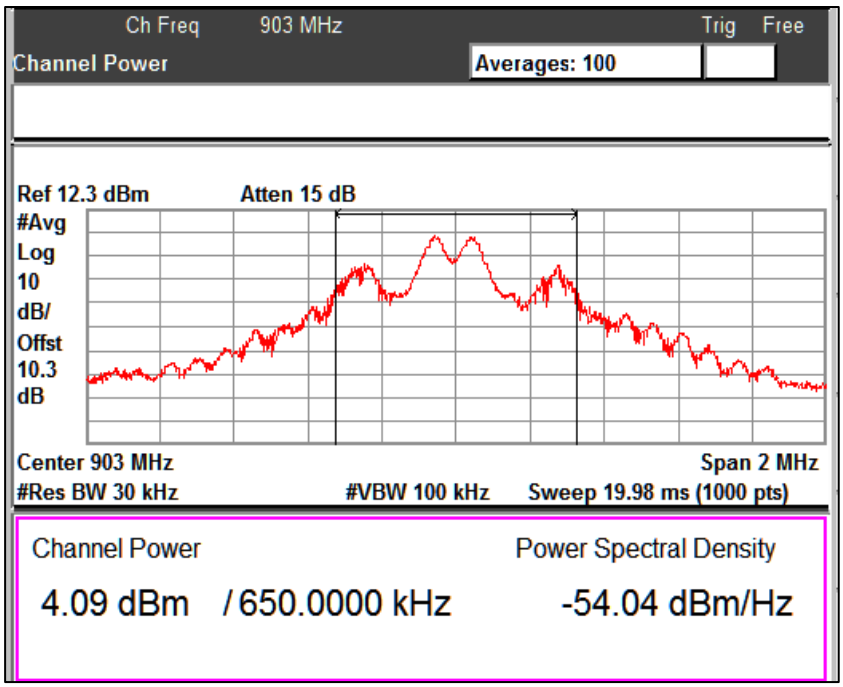
KDB Guidelines applied:

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

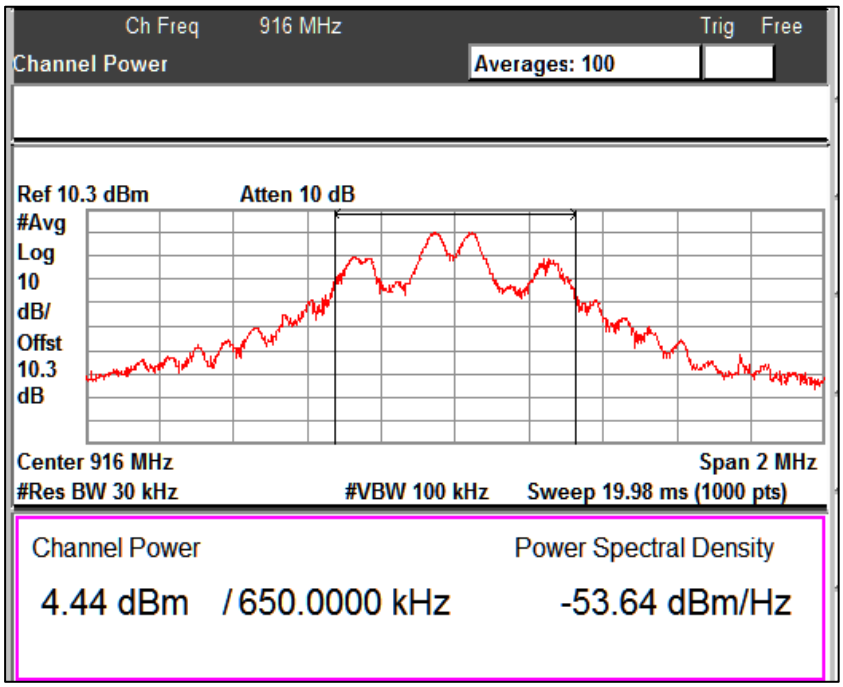
Test results:

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 (0.3dB)
3. This product do not support additional beamforming gain / directional gain, it uses single antenna and hence Directional gain of the single antenna is 2 dBi

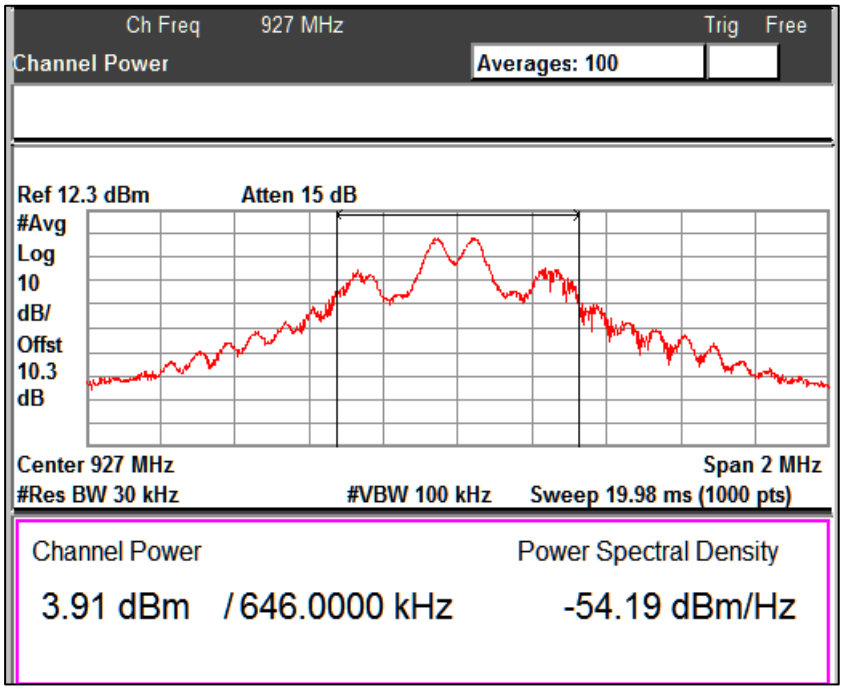
Channel Frequency (MHz)	Measured Average Power (dBm)	Maximum (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
903	4.09	6.09	30	36
916	4.44	6.44	30	36
927	3.91	5.91	30	36



Channel Frequency: 903MHz



Channel Frequency: 916MHz



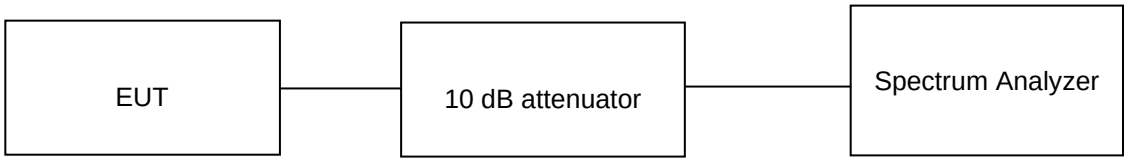
Channel Frequency: 927MHz

7.2 Maximum Power Spectral Density

Result ***Pass***

Test Specification	FCC part 15 Subpart C 15.247 (e) / RSS 247 Issue 3, Section 5.2 (b)
Test Method	Subclause 11.10.5 of ANSI C63.10
Measurement Bandwidth	100 kHz
Detector	Average sample detector mode
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

Test Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = + 21.5 °C Voltage = 12V through AC to DC supply Relative humidity: 63%

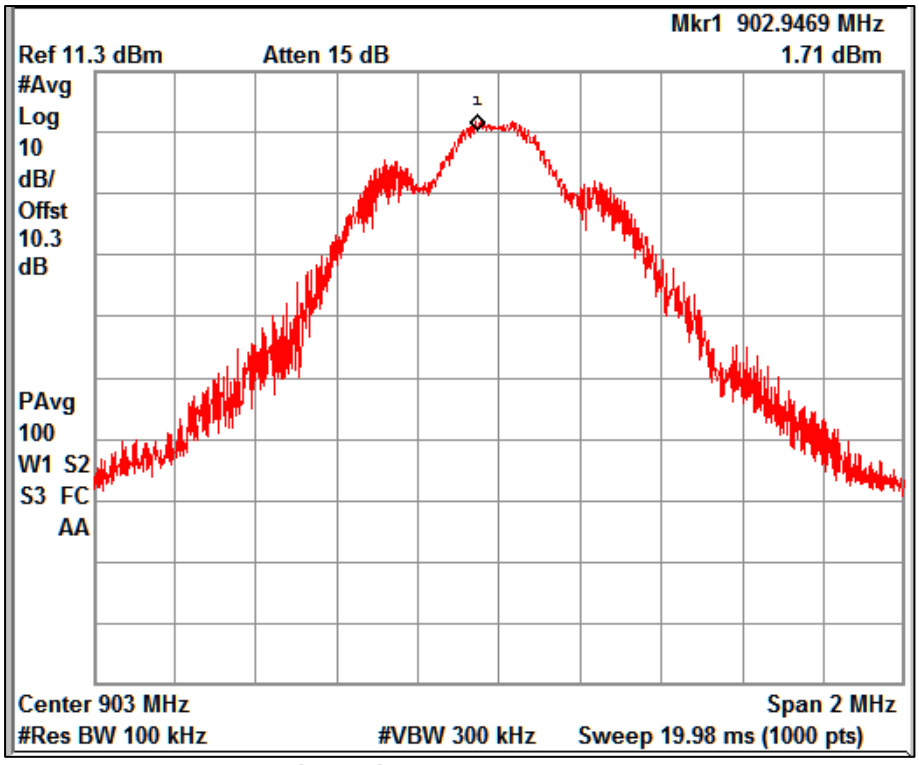
KDB Guidelines applied:

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

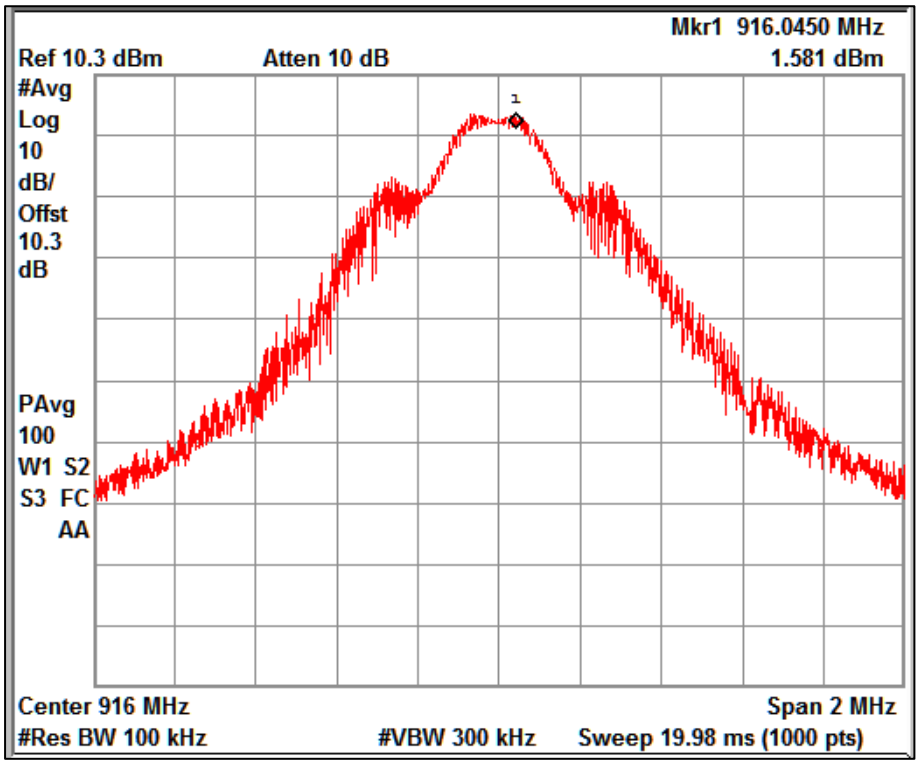
Test results:

Note:
1. All the losses are included during measurement and final values are mentioned in the test report.
2. Total Average PSD (dBm) = Measured Average PSD (dBm) + Attenuator factor (10dB) + Cable loss (0.5dB)
3. This product do not support additional beamforming gain / directional gain, it uses signal antenna and hence directional gain of the single antenna is 2 dBi

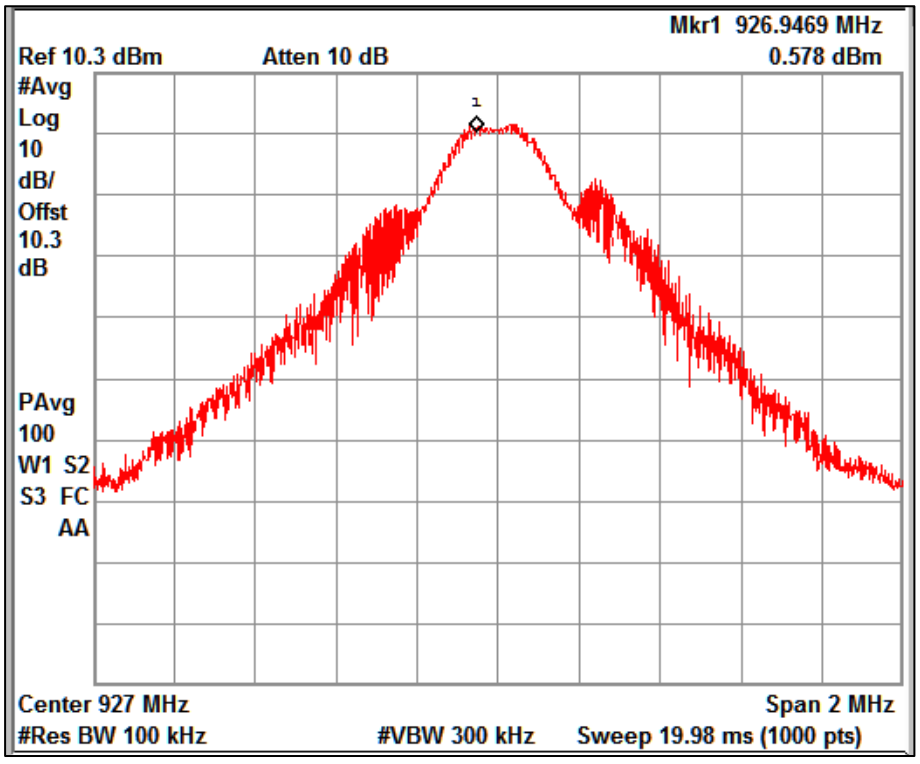
Channel Frequency (MHz)	Measured average PSD (dBm/100kHz)	PSD Limit (dBm/100kHz)
903	1.71	8
916	1.58	8
927	0.57	8



Channel Frequency: 903MHz



Channel Frequency: 916MHz



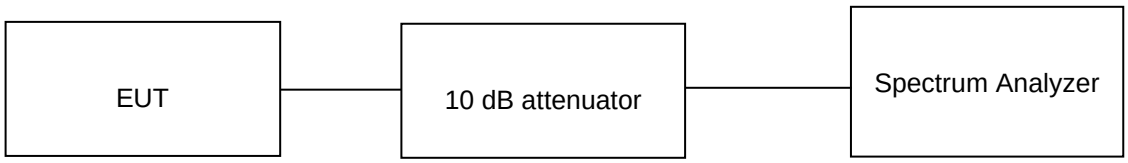
Channel Frequency: 927MHz

7.3 Occupied Bandwidth

Result ***Pass***

Test Specification	FCC part 15 Subpart C 15.247 (a) (i) RSS-247 issue 3, section 5.1 (c)
Test Method	Subclause 11.8.1 & 6.9.2 of ANSI C63.10
Measurement Bandwidth	100 kHz
Detector	Peak
Port of testing	Antenna port
Requirement	The minimum 20 dB bandwidth of the hopping channel is 250 kHz use at least 50 hopping frequencies.

Test Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = + 21.5 °C Voltage = 12V through AC to DC supply Relative humidity: 63%

KDB Guidelines applied:

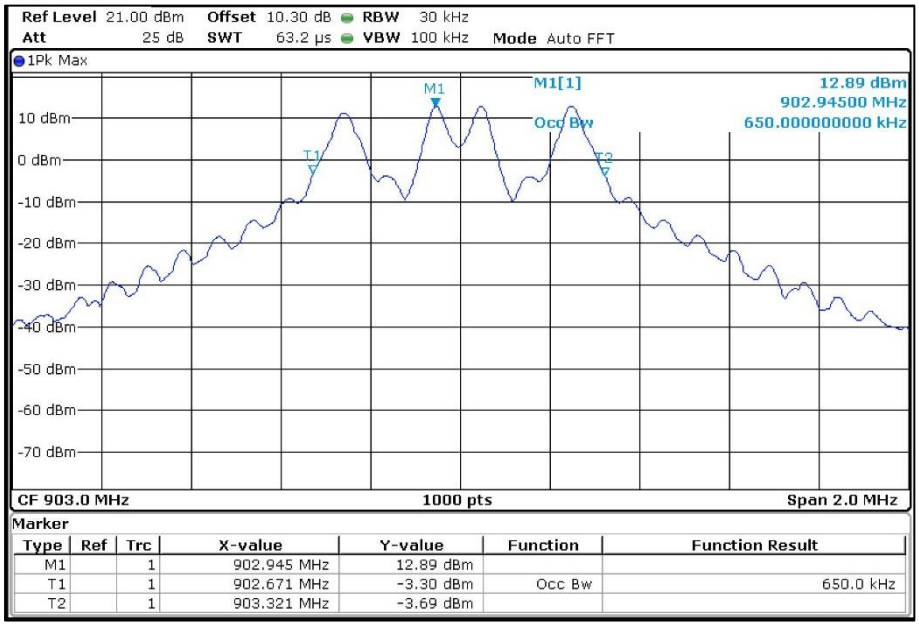
Measurements were made as per section 9(b) in KDB 558074 D01 15.247 Measurement Guidance v05r02.

Test results:

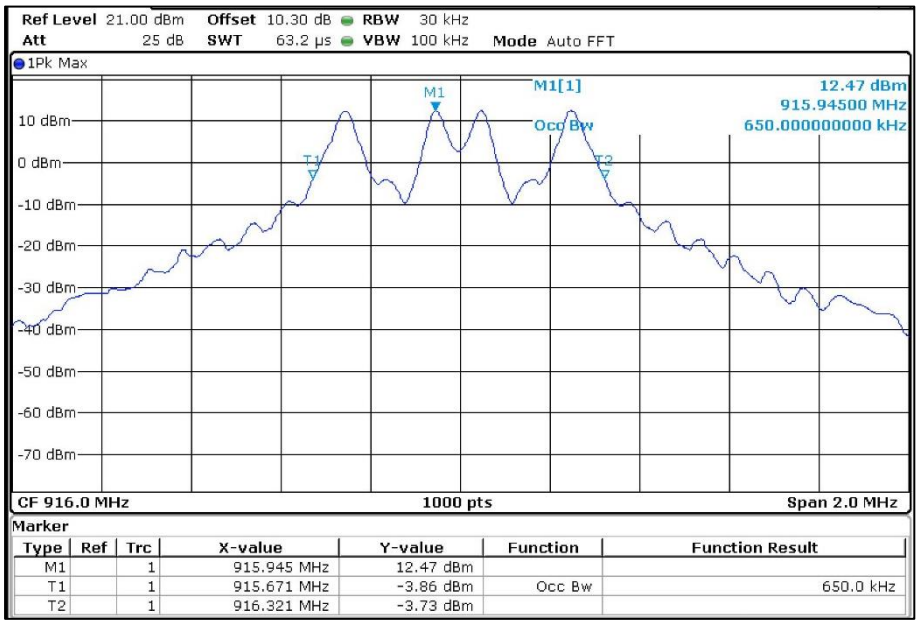
Note:
1. All the losses are included during measurement and final values are mentioned in the test report.
2. Total Peak Output power (dBm) = Measured Peak power (dBm) + Attenuator factor (10dB) + Cable loss (0.3dB)
3. This product do not support additional beamforming gain / directional gain, it uses single antenna and hence Directional gain of the single antenna is 2dBi.

Channel Frequency (MHz)	6 dB Bandwidth (kHz)	99% OBW (kHz)	Minimum Limit (kHz)
903	700.86	650.00	250
916	690.59	650.00	250
927	691.17	646.00	250

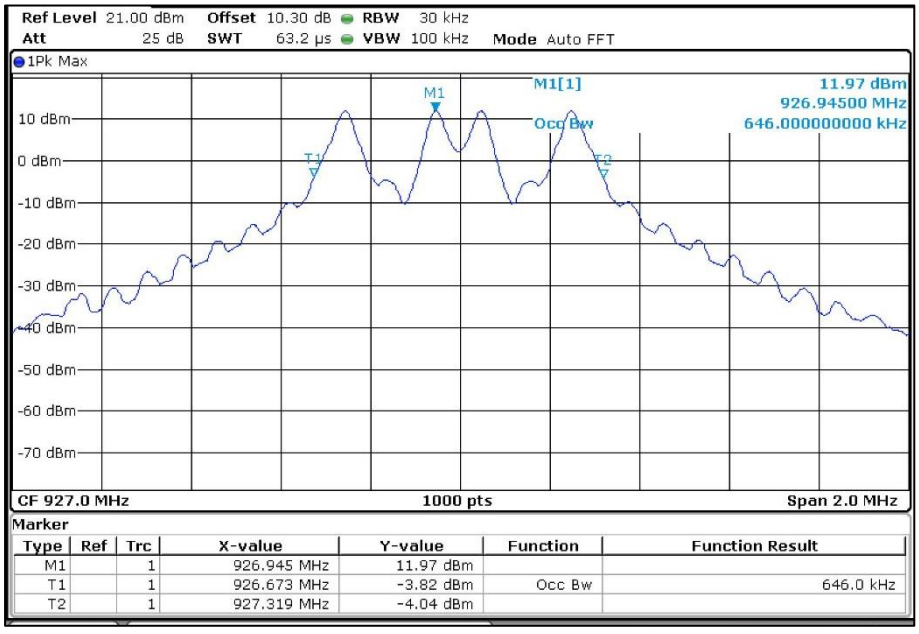
99% Band width



Channel Frequency: 903MHz

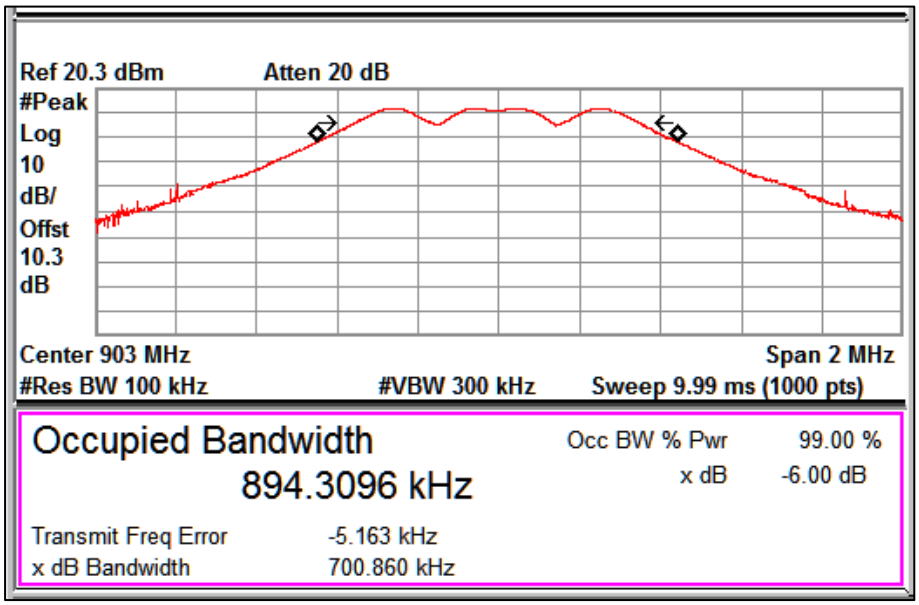


Channel Frequency: 916MHz

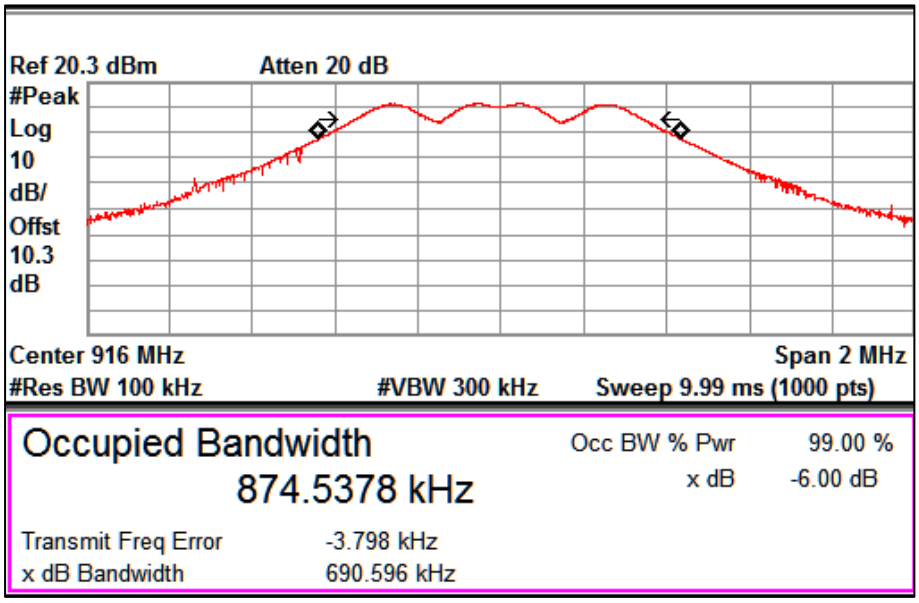


Channel Frequency: 927MHz

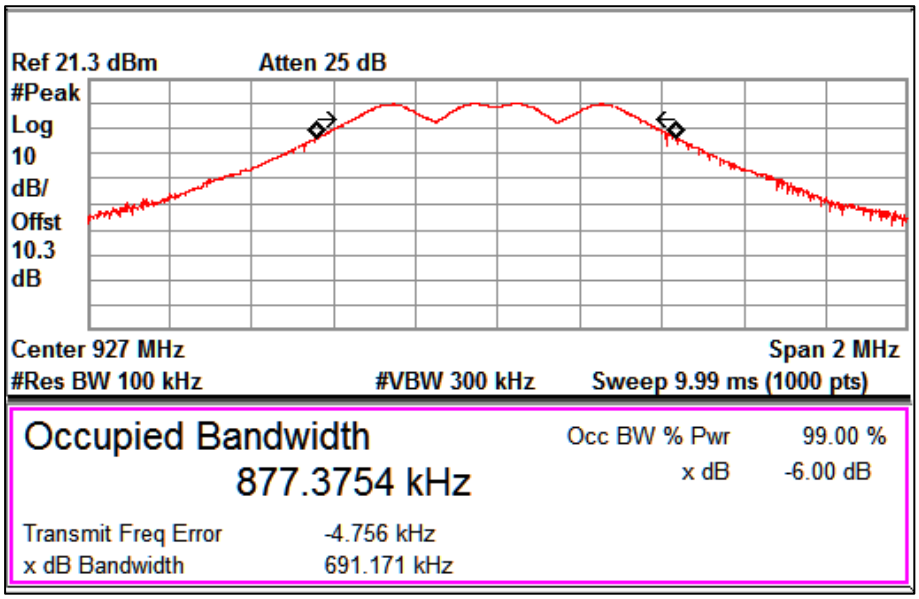
DTS Bandwidth



Channel Frequency: 903MHz



Channel Frequency: 916MHz



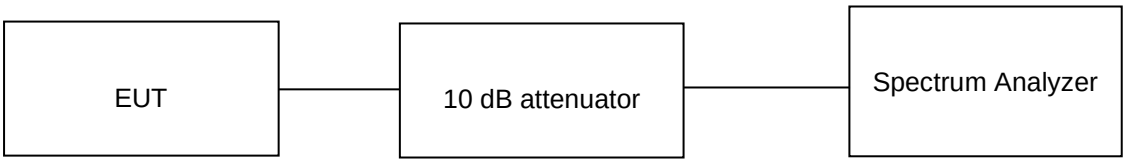
Channel Frequency: 927MHz

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, section 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) = + 21.5 °C Voltage = 12V through AC to DC supply Relative humidity: 63%

KDB Guidelines applied:

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

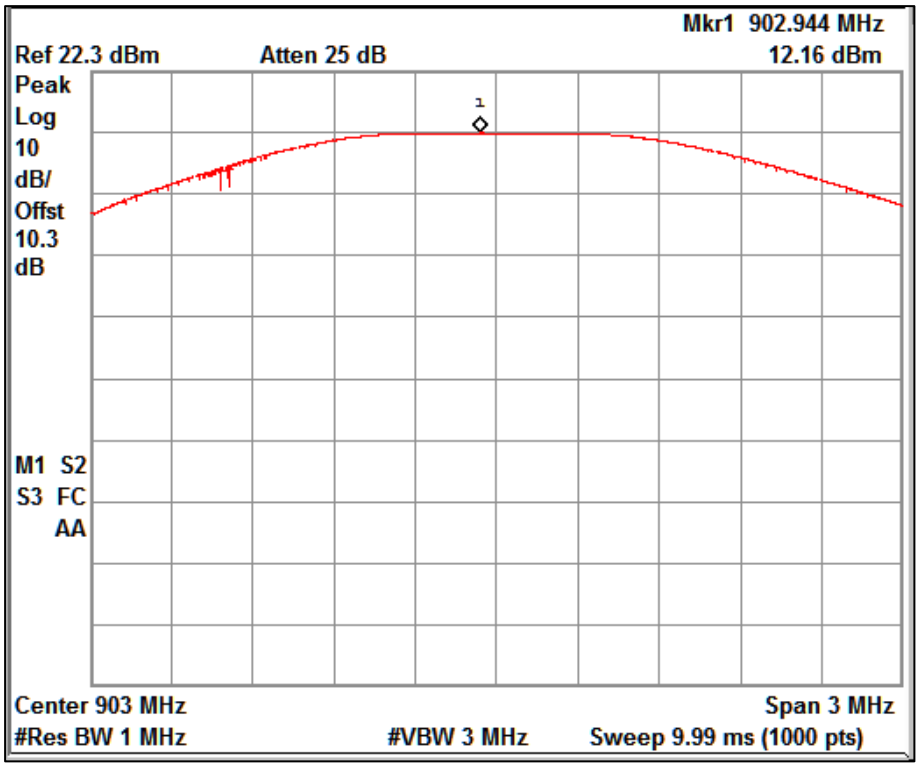
Test results:

Note:

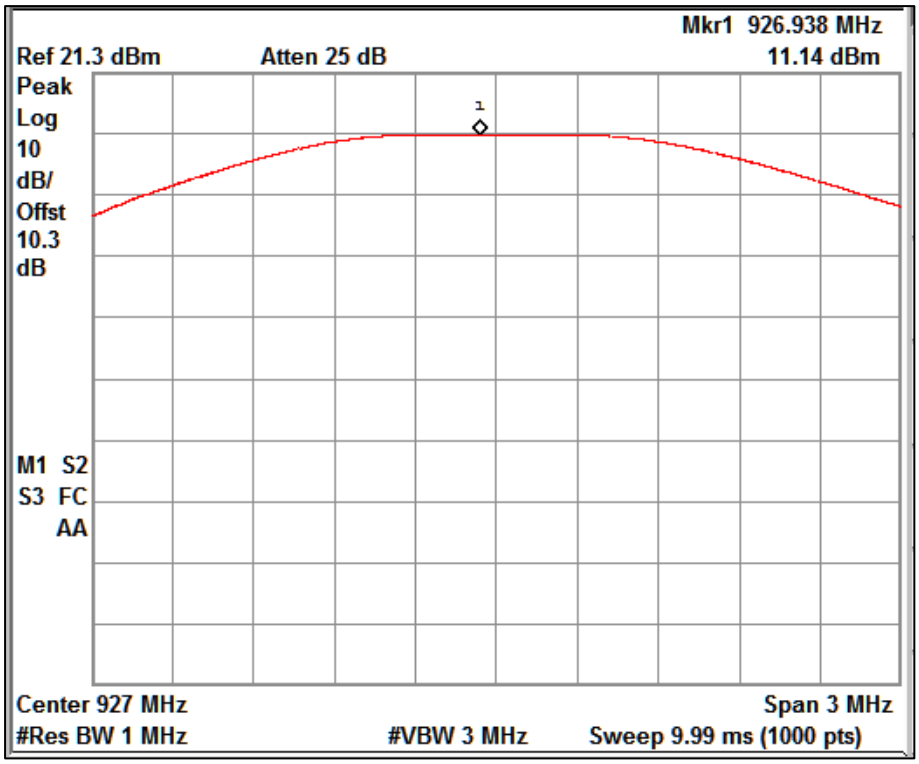
1. All the losses are included during measurement and final values are mentioned in the test report
2. Final Value (dBm) = Measured Value (dBm) + Attenuator factor (10dB) + Cable loss (0.3dB)
3. This product do not support additional beamforming gain / directional gain, it uses single antenna and hence Directional gain of the single antenna is 2dBi
4. Only worst-case results are reported

7.4.1 Band edge and reference plots

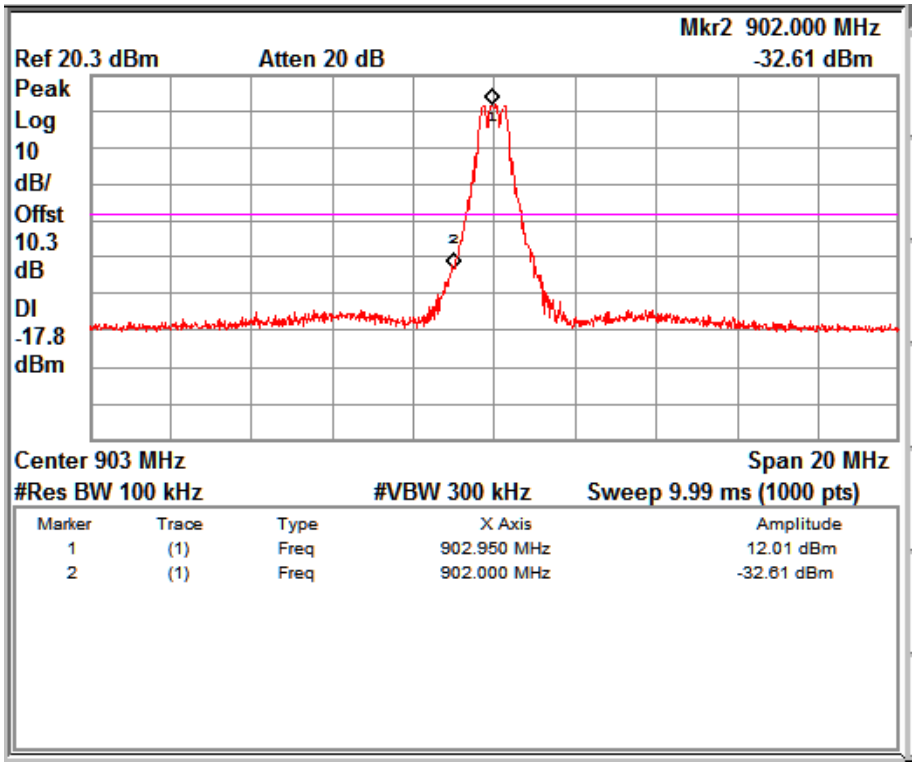
Channel Frequency (MHz)	Band edge Frequency (MHz)	Value at Band edge (A) (dBm)	Reference Value (B) (dBm)	A-B (dBc)	Minimum Limit (dBc)
903	902.00	-32.61	12.16	-44.77	-30
927	928.00	-33.37	11.14	-44.51	-30



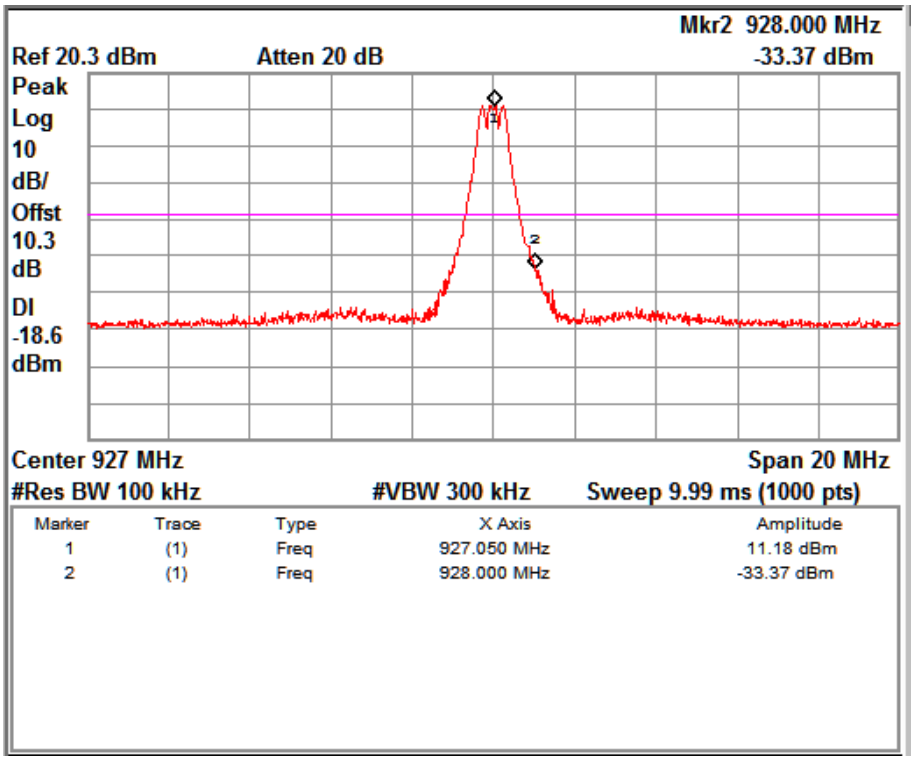
Reference plot for 903MHz



Reference plot for 927MHz

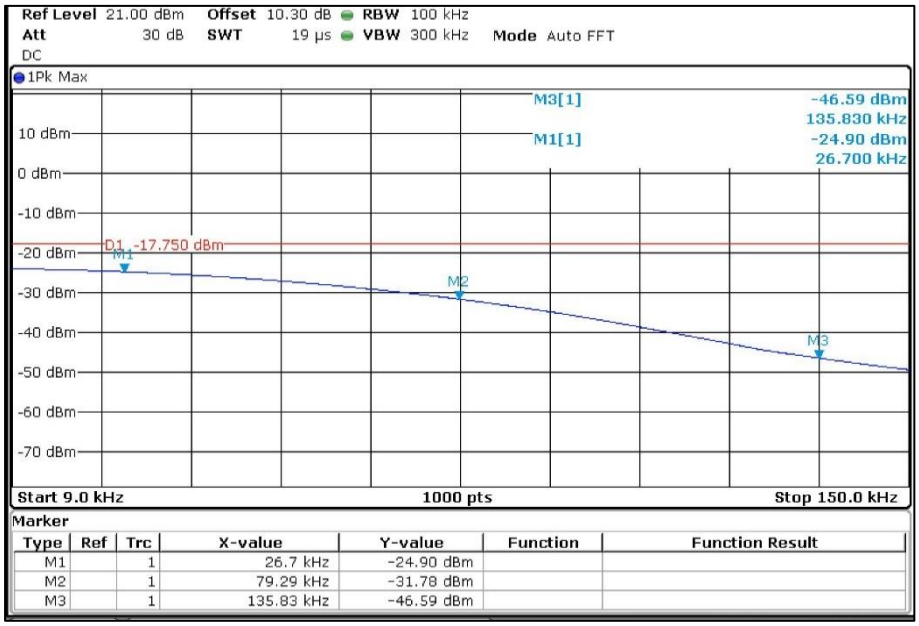


Band edge Channel Frequency 903MHz

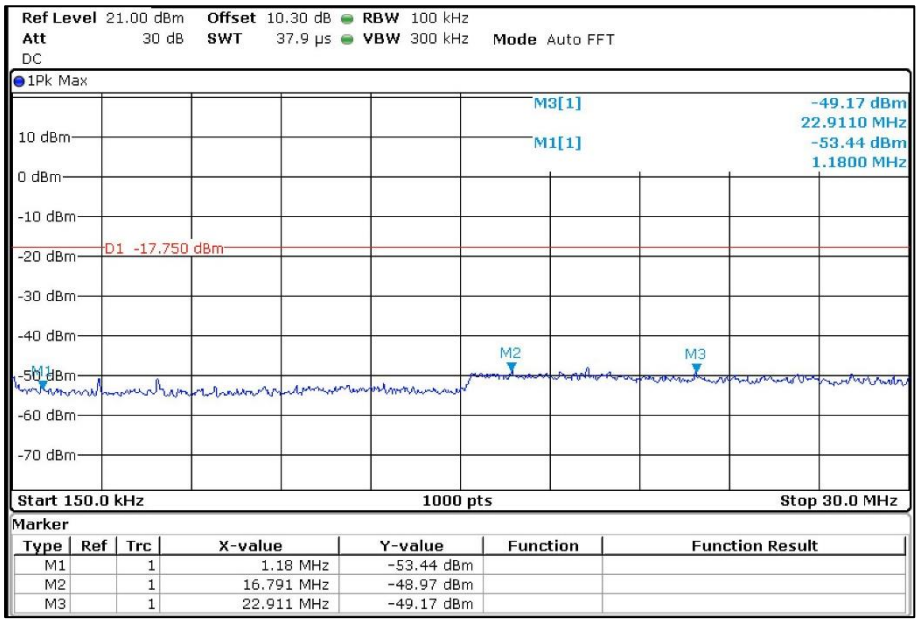


Band edge Channel Frequency 927MHz

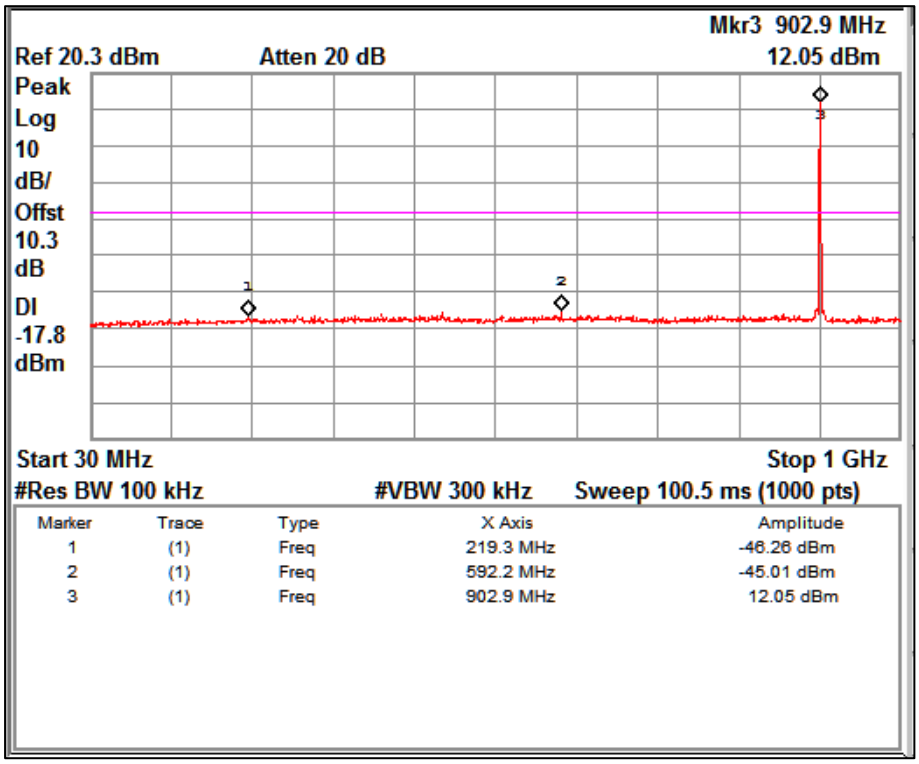
7.4.2 Out-Of-Band Emissions



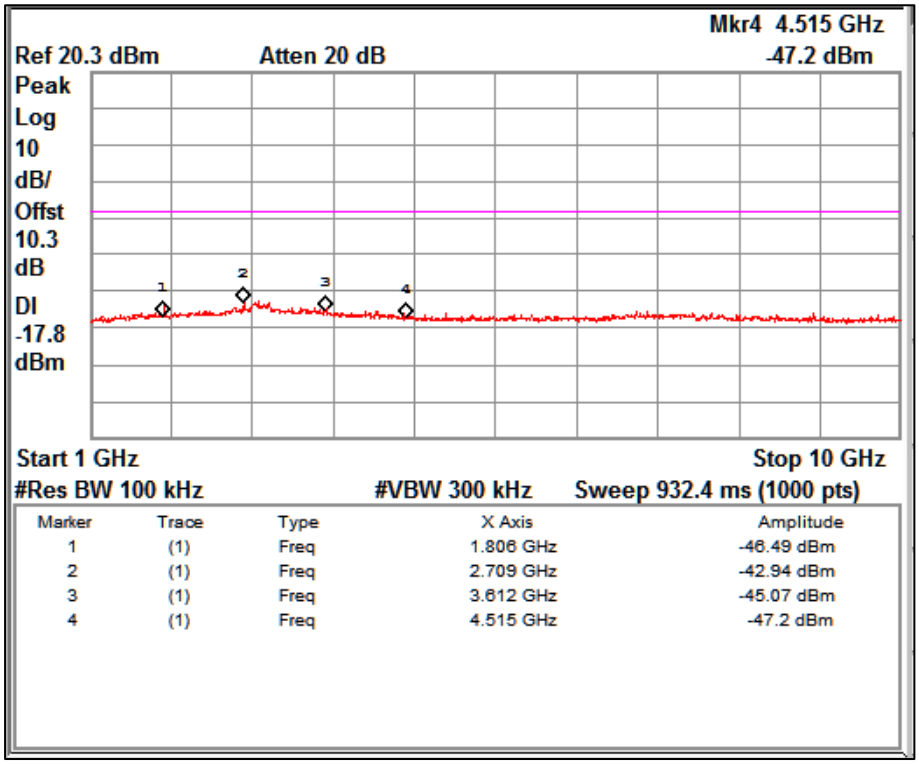
Channel Frequency 903MHz **Frequency Range 9KHz – 150KHz**



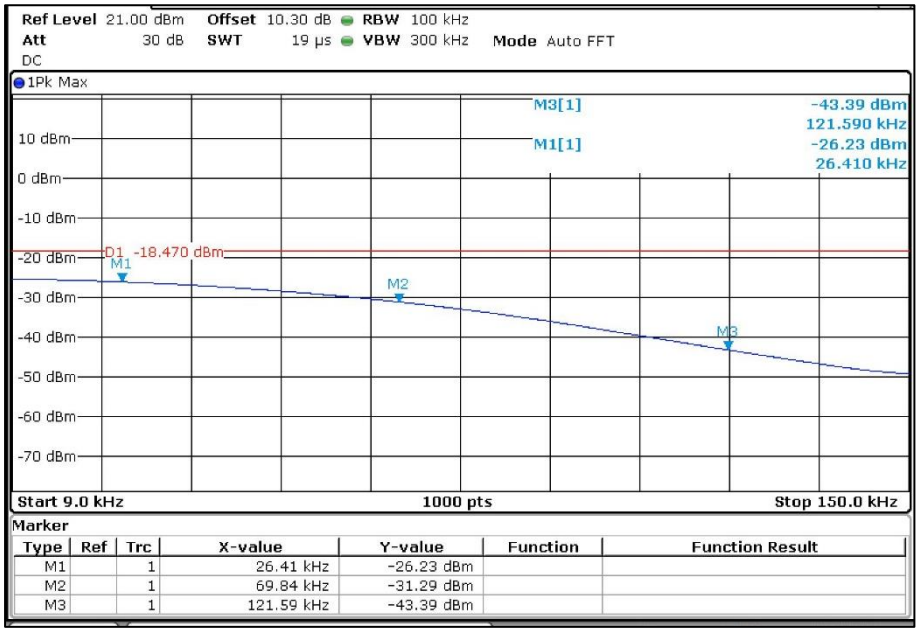
Channel Frequency 903MHz **Frequency Range 150KHz – 30MHz**



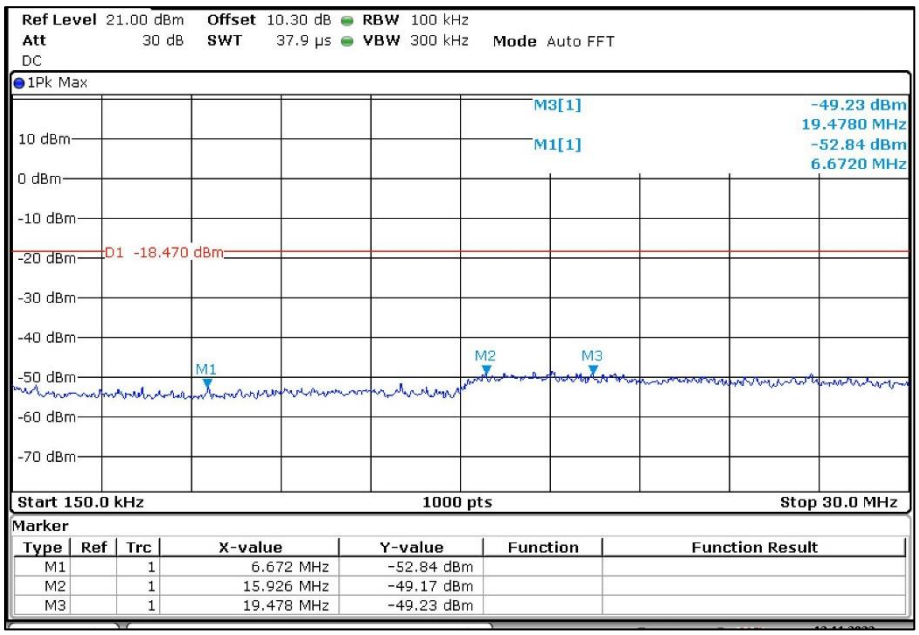
Channel Frequency 903MHz **Frequency Range 30MHz – 1GHz**



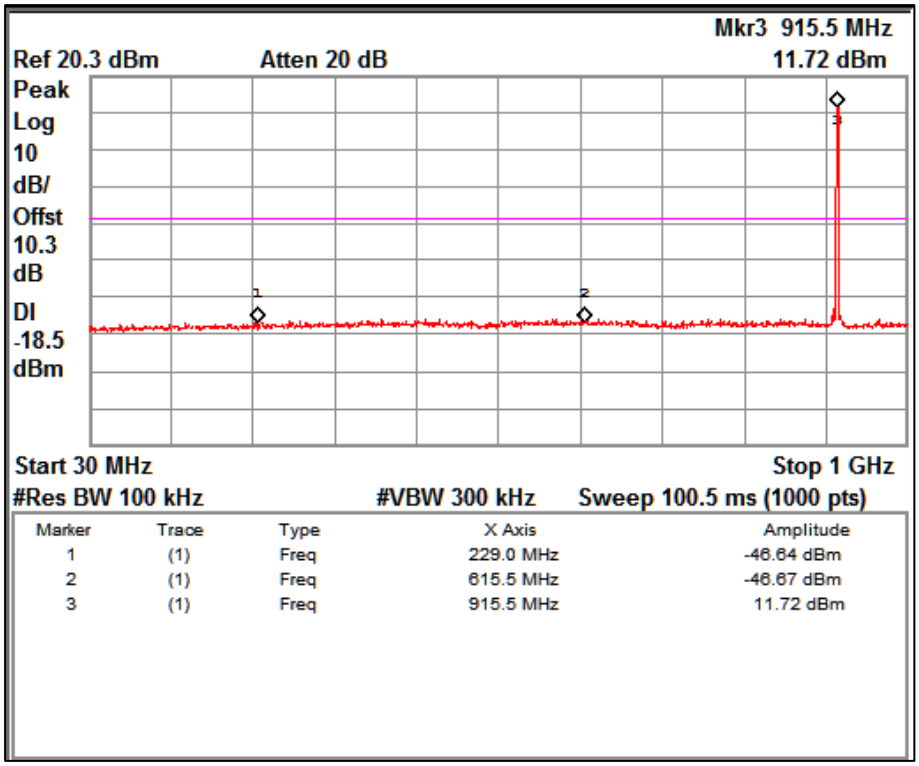
Channel Frequency 903MHz **Frequency Range 1GHz – 10GHz**



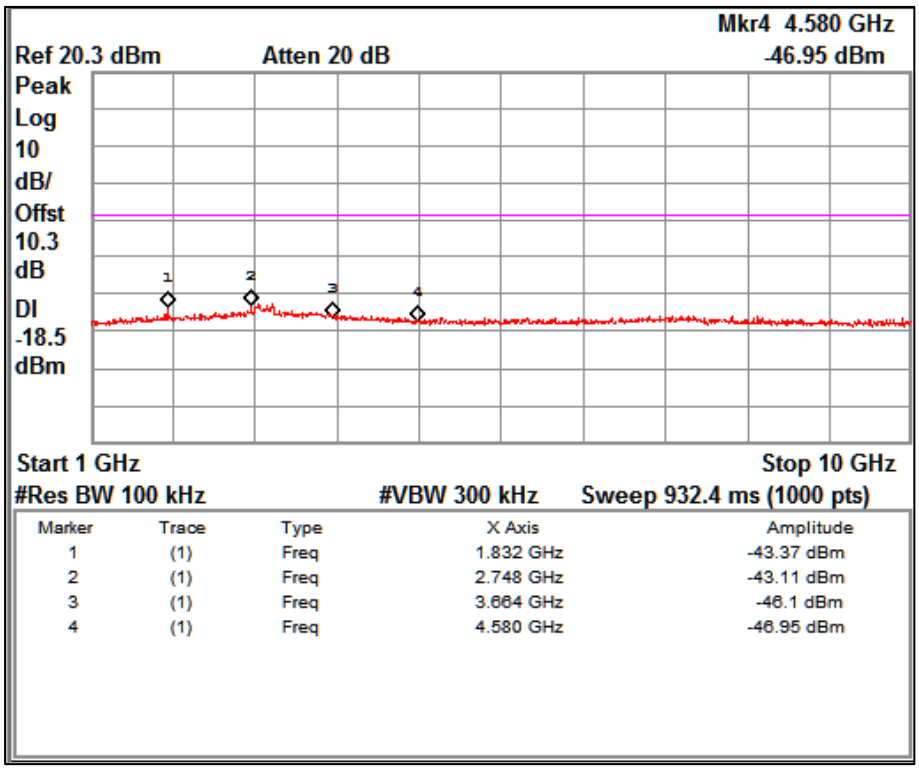
Channel Frequency 916MHz **Frequency Range 9KHz – 150KHz**



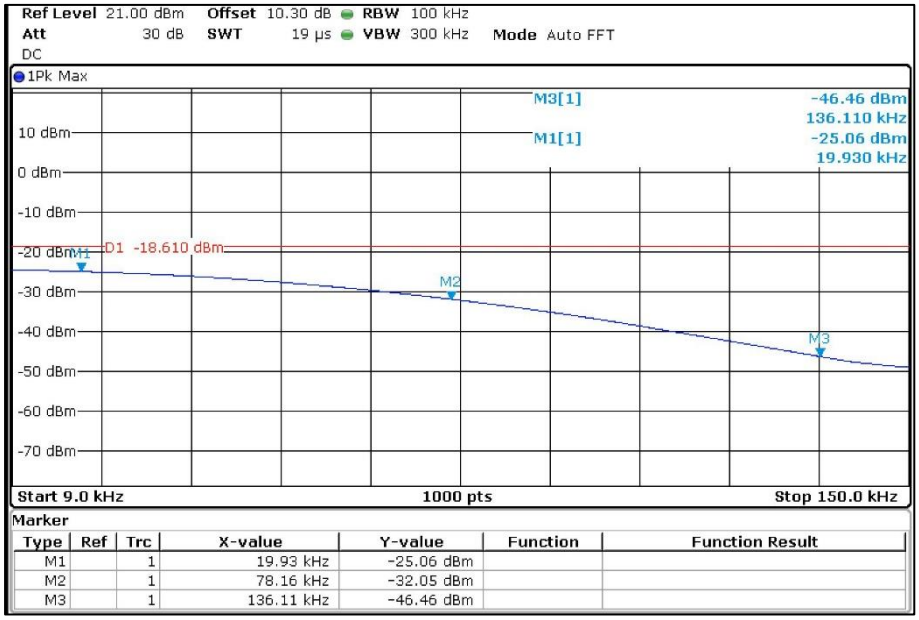
Channel Frequency 916MHz **Frequency Range 150KHz – 30MHz**



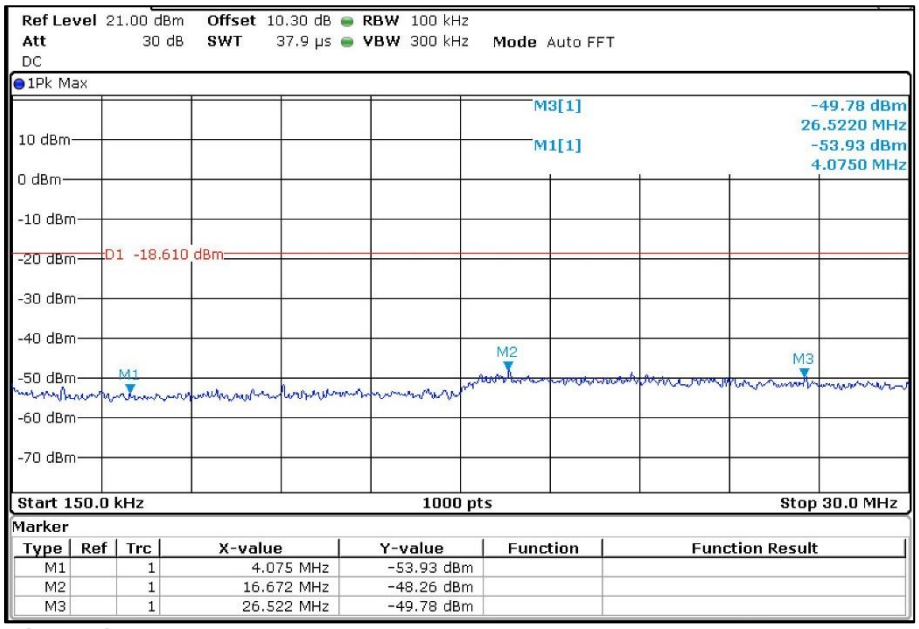
Channel Frequency 916MHz **Frequency Range 30MHz – 1GHz**



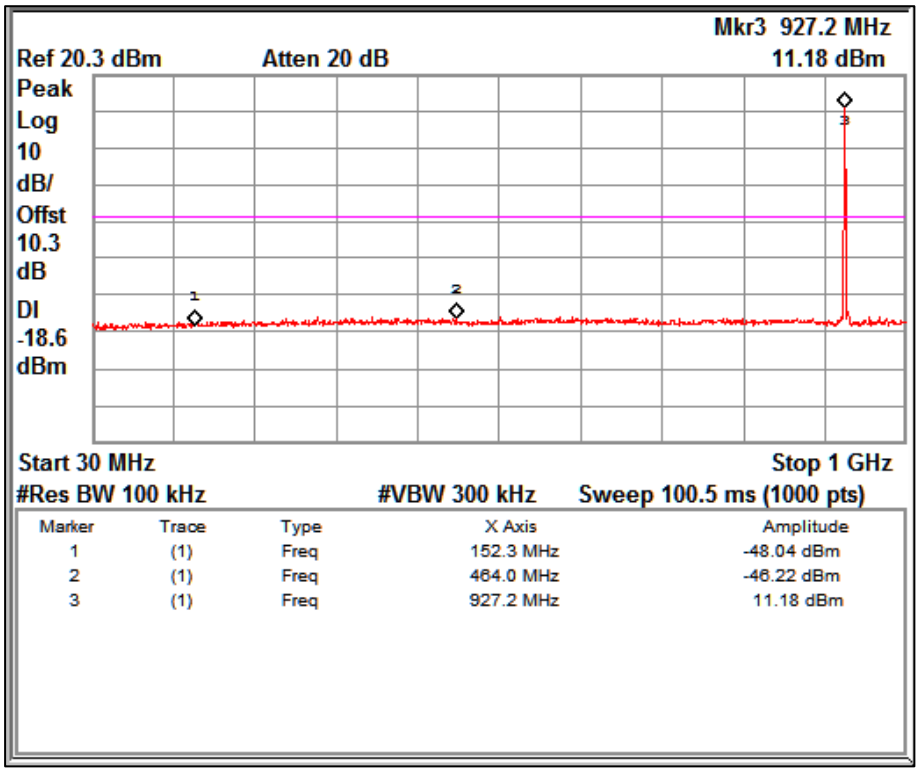
Channel Frequency 916MHz **Frequency Range 1GHz – 10GHz**



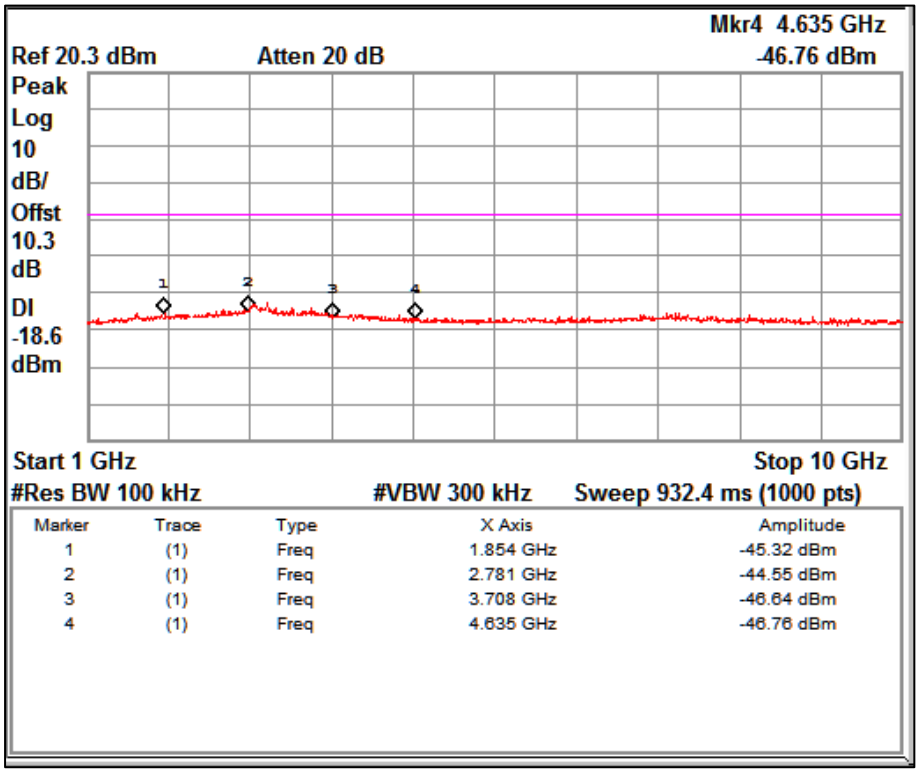
Channel Frequency 927MHz **Frequency Range 9KHz – 150KHz**



Channel Frequency 927MHz **Frequency Range 150KHz – 30MHz**



Channel Frequency 927MHz **Frequency Range 30MHz – 1GHz**



Channel Frequency 927MHz **Frequency Range 1GHz – 10GHz**

7.5 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) = + 23.2 °C Voltage = 12V through AC to DC supply Relative humidity: 64%

Test results:

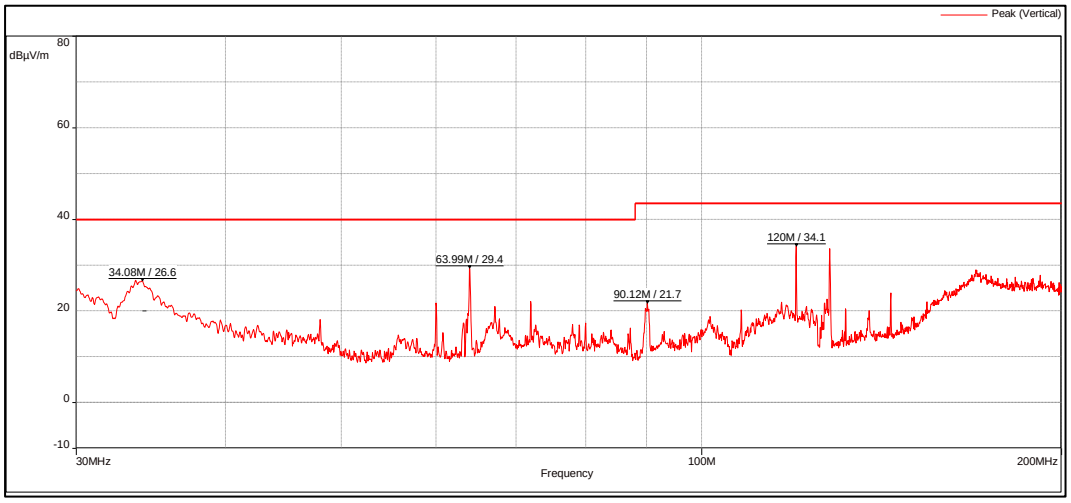
Note: All the losses are included during measurement and final values are mentioned in the test report. Refer TEST METHODOLOGY for more details.

Test results for frequency range 9kHz – 30MHz

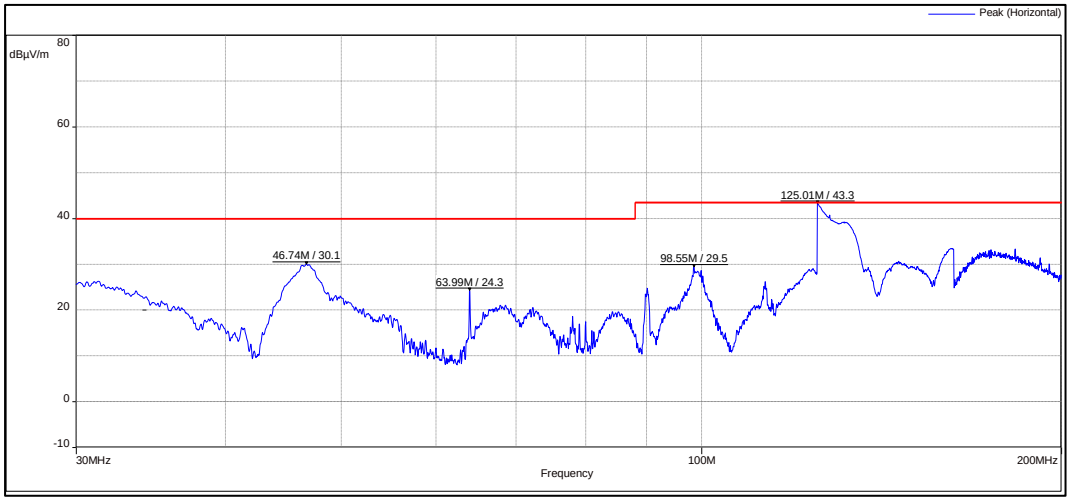
No emissions found in frequency range 9 kHz to 30 MHz, and measured levels are below 20dB from the limit line, hence not reported

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

Antenna Polarization	Frequency (MHz)	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Vertical	34.08(PK)	26.60	40	-13.40
	63.99(PK)	29.40	40	-10.60
	90.12(PK)	21.70	43.5	-21.80
	120.00(PK)	34.10	43.5	-9.40
Horizontal	46.74(PK)	30.10	40	-9.90
	63.99(Pk)	24.30	40	-15.70
	98.55(PK)	29.50	43.5	-14.00
	125.01(PK)	39.30	43.5	-4.20



Channel Frequency 30MHz – 200MHz **Polarization Vertical**



Channel Frequency 30MHz – 200MHz **Polarization Horizontal**

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

Channel Frequency: 903MHz

Antenna Polarization	Frequency (MHz)	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Vertical	511.98(QP)	36.28	46	-9.72
	559.97(QP)	31.93	46	-14.07
	582.91(QP)	29.87	46	-16.13
	902.75(PK)	107.00	-	*
Horizontal	240.02(PK)	33.80	46	-12.20
	384.00(QP)	36.52	46	-9.48
	640.01(PK)	32.30	46	-13.70
	903.05(PK)	97.60	-	*

Channel Frequency: 916MHz

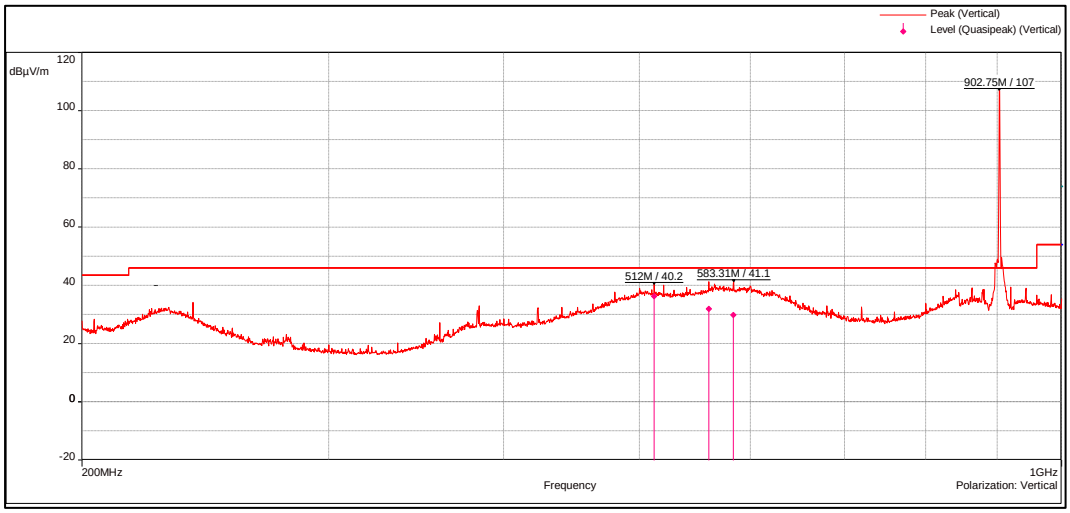
Antenna Polarization	Frequency (MHz)	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Vertical	240.02(PK)	31.6	46	-14.4
	520.16(QP)	38.52	46	-7.48
	592.05(QP)	33.22	46	-12.78
	827.52(QP)	21.68	46	-24.32
	916.25(PK)	104	-	*
Horizontal	240.02(PK)	35.3	46	-10.7
	384.02(PK)	38.1	46	-7.9
	520.01(PK)	36.1	46	-9.9
	898.22(QP)	21.7	46	-24.3
	915.74(PK)	96.9	-	*

Channel Frequency: 927MHz

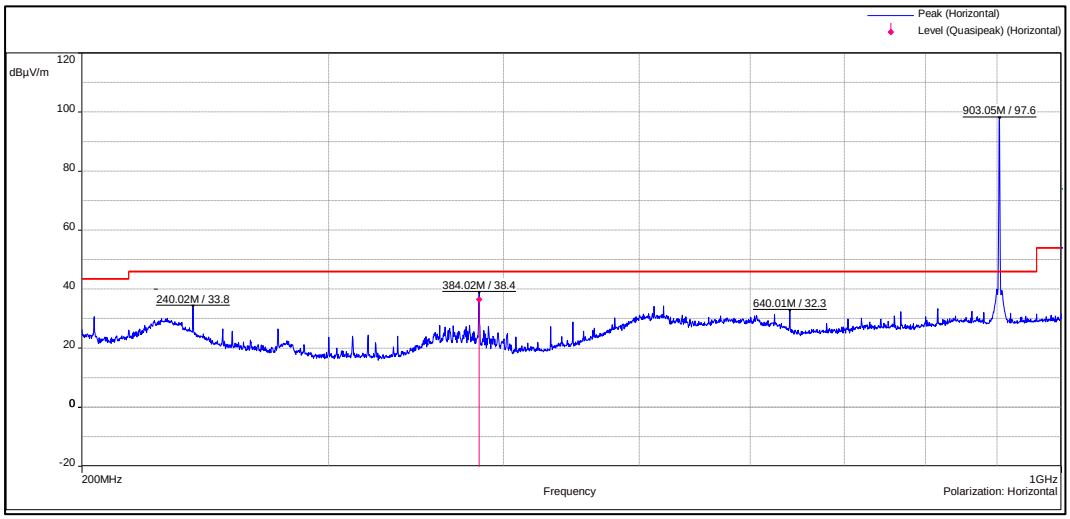
Antenna Polarization	Frequency (MHz)	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Vertical	239.99(PK)	32.5	46	-13.5
	519.98(QP)	13.77	46	-32.23
	887.088(QP)	20.8	46	-25.2
	927.05(PK)	96.9	-	*
Horizontal	239.99(PK)	33	46	-13
	384.02(PK)	37.9	46	-8.1
	768.02(PK)	33	46	-13
	927.02(PK)	97.2	-	*

Note: -* Indicates the Nominal Frequency of a device

Channel Frequency: 903MHz

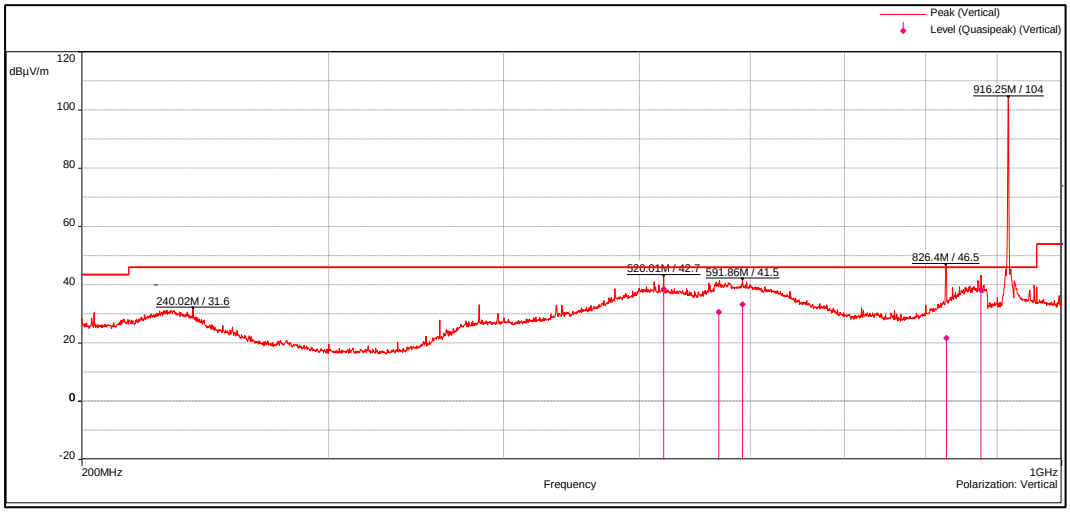


Channel Frequency 200MHz – 1GHz **Polarization Vertical**

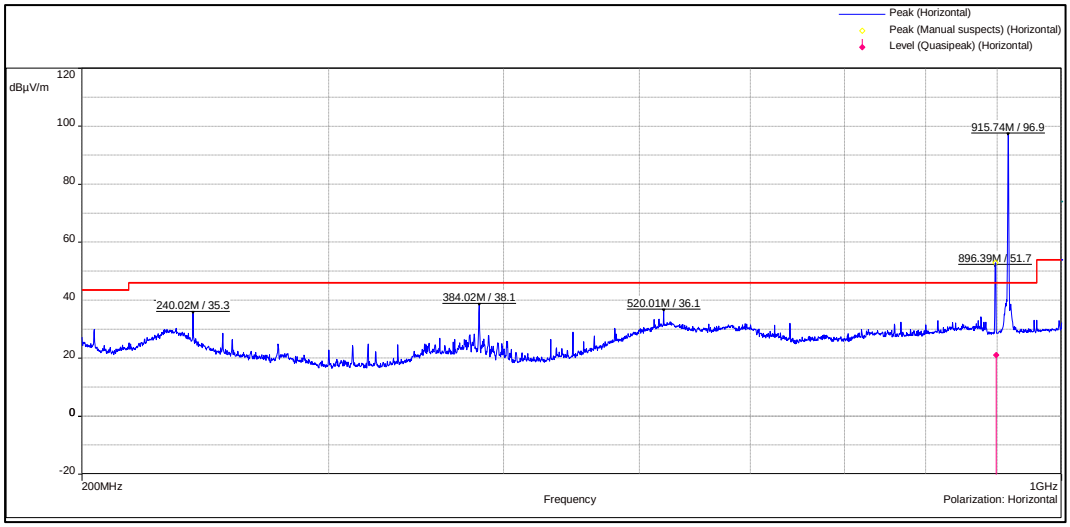


Channel Frequency 200MHz – 1GHz **Polarization Horizontal**

Channel Frequency: 916MHz

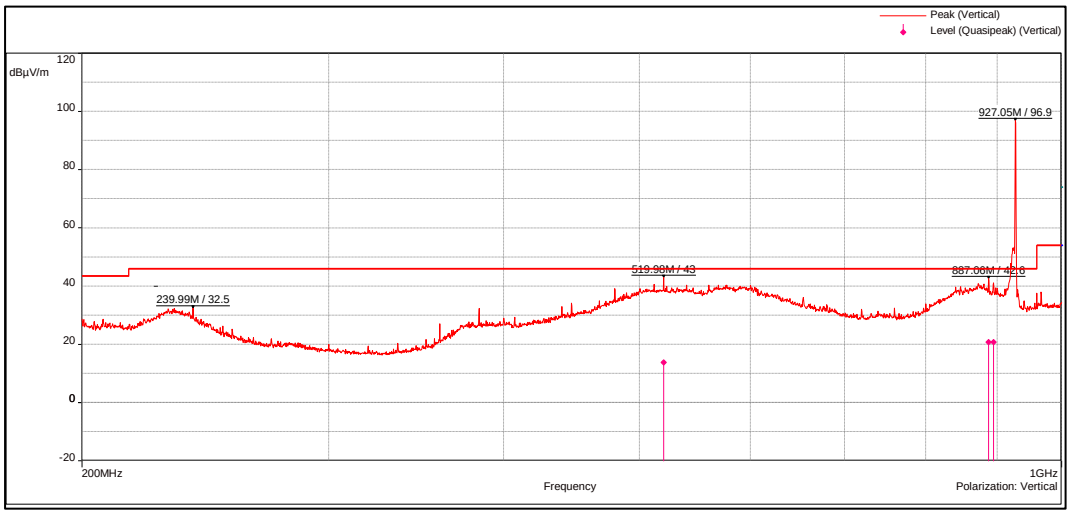


Channel Frequency 200MHz – 1GHz **Polarization Vertical**

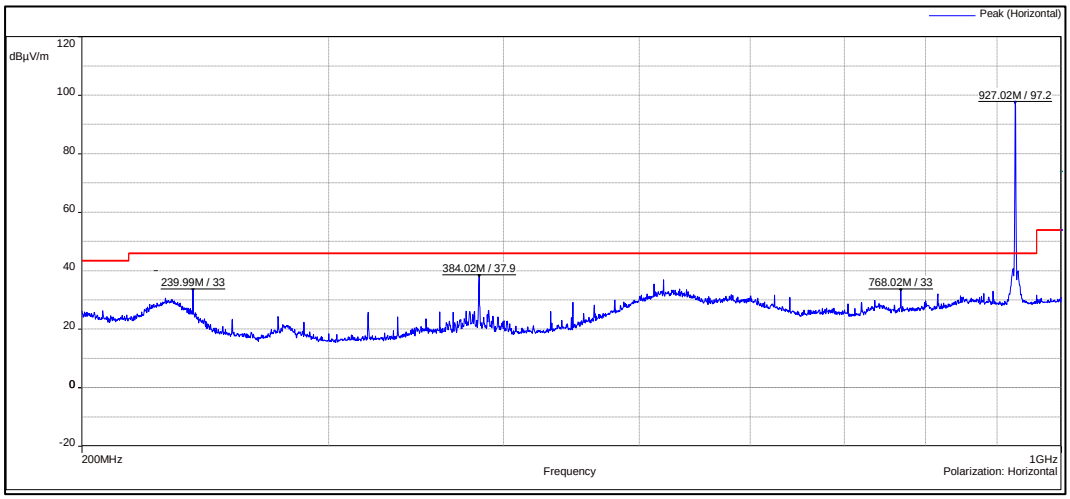


Channel Frequency 200MHz – 1GHz **Polarization Horizontal**

Channel Frequency: 927MHz



Channel Frequency 200MHz – 1GHz **Polarization Vertical**



Channel Frequency 200MHz – 1GHz **Polarization Horizontal**

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

Channel Frequency: 903MHz

Channel frequency (MHz)	Polarization	Measured frequency (MHz)	Measured Emission (dbµV/m)	Limit (dBm)	Margin (dB)
903	Vertical	1806(Pk)	41.34	74	-32.66
		1806(Av)	37.23	54	-16.77
		2709(Pk)	46.96	74	-27.04
		2709(Av)	50.28	54	-3.72
		3612(Pk)	40.72	74	-33.28
		3612(Av)	29.89	54	-24.11
	Horizontal	1806(Pk)	40.41	74	-33.59
		1806(Av)	35.80	54	-18.20
		2709(Pk)	43.95	74	-30.05
		2709(Av)	39.29	54	-14.71
		3612(Pk)	29.36	74	-44.64
		3612(Av)	40.73	54	-13.27

Pk: Peak Detector;
Av: Average Detect

Channel Frequency: 916MHz

Channel frequency (MHz)	Polarization	Measured frequency (MHz)	Measured Emission (dbµV/m)	Limit (dBm)	Margin (dB)
916	Vertical	1832(Pk)	40.42	74	-33.58
		1832(Av)	35.06	54	-18.94
		2748(Pk)	49.05	74	-24.95
		2748(Av)	46.36	54	-7.64
		3664(Pk)	40.26	74	-33.74
		3664(Av)	28.40	54	-25.60
	Horizontal	1832(Pk)	40.49	74	-33.51
		1832(Av)	34.23	54	-19.77
		2748(Pk)	43.32	74	-30.68
		2748(Av)	36.44	54	-17.56
		3664(Pk)	40.34	74	-33.66
		3664(Av)	28.85	54	-25.15

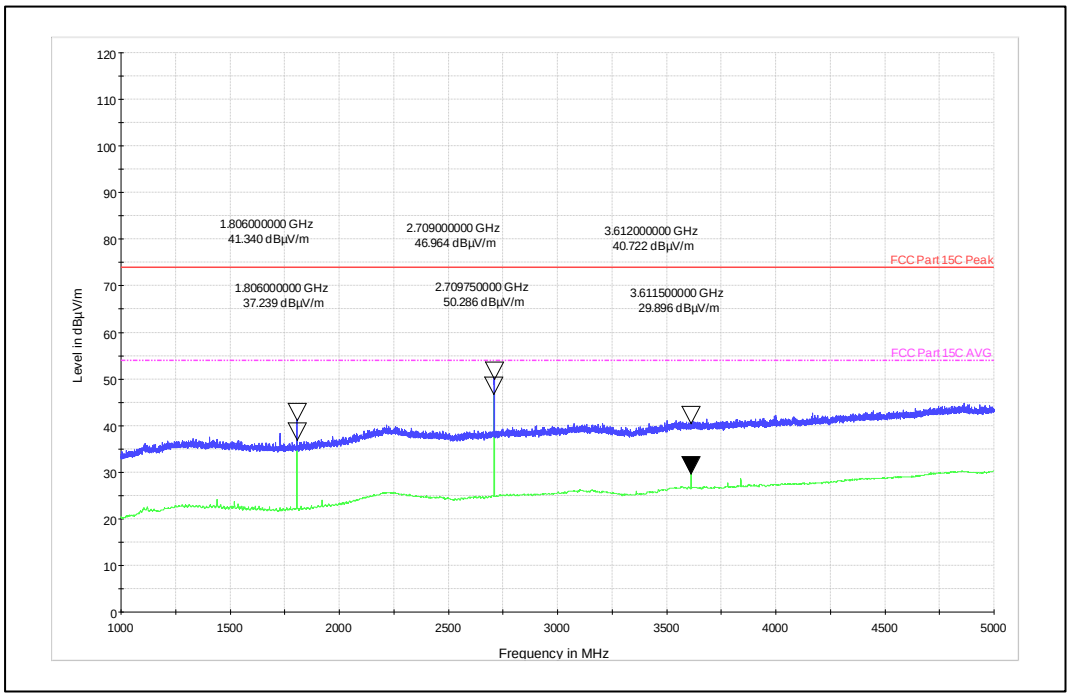
Pk: Peak Detector;
Av: Average Detector

Channel Frequency: 927MHz

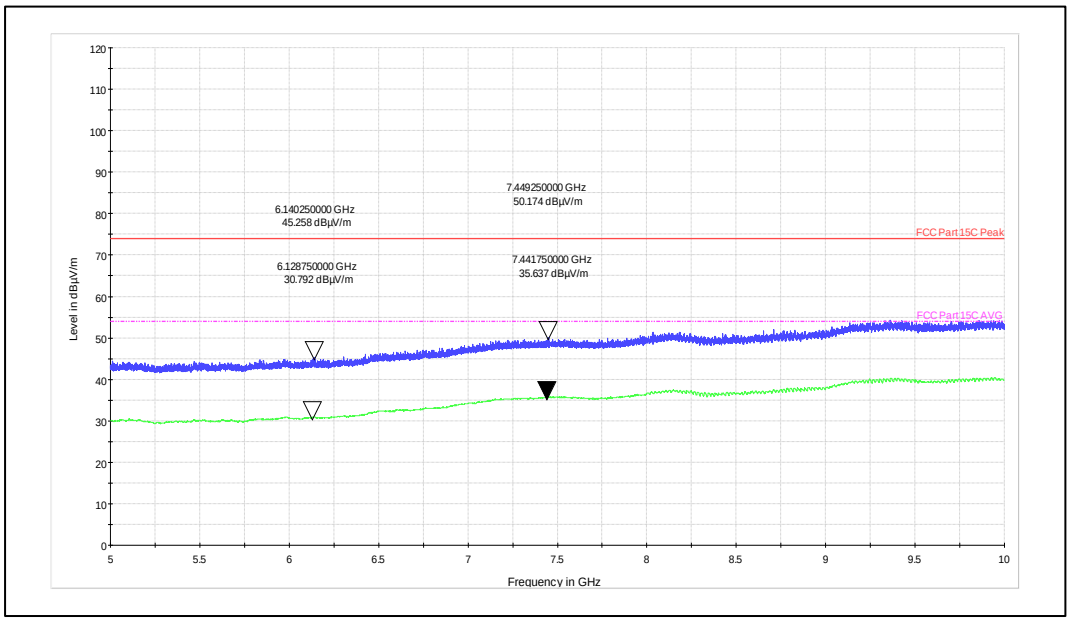
Channel frequency (MHz)	Polarization	Measured frequency (MHz)	Measured Emission (dbµV/m)	Limit (dBm)	Margin (dB)
927	Vertical	1854(Pk)	40.75	74	-33.25
		1854(Pk)	35.40	54	-18.60
		2781(Av)	43.91	74	-30.09
		2781(Av)	46.90	54	-7.10
		3708(Pk)	39.94	74	-34.06
		3708(Av)	28.66	54	-25.34
	Horizontal	1854(Pk)	39.97	74	-34.03
		1854(Pk)	30.68	54	-23.32
		2781(Av)	42.50	74	-31.50
		2781(Av)	36.77	54	-17.23
		3708(Pk)	41.21	74	-32.79
		3708(Av)	29.17	54	-24.83

Pk: Peak Detector;
Av: Average Detector

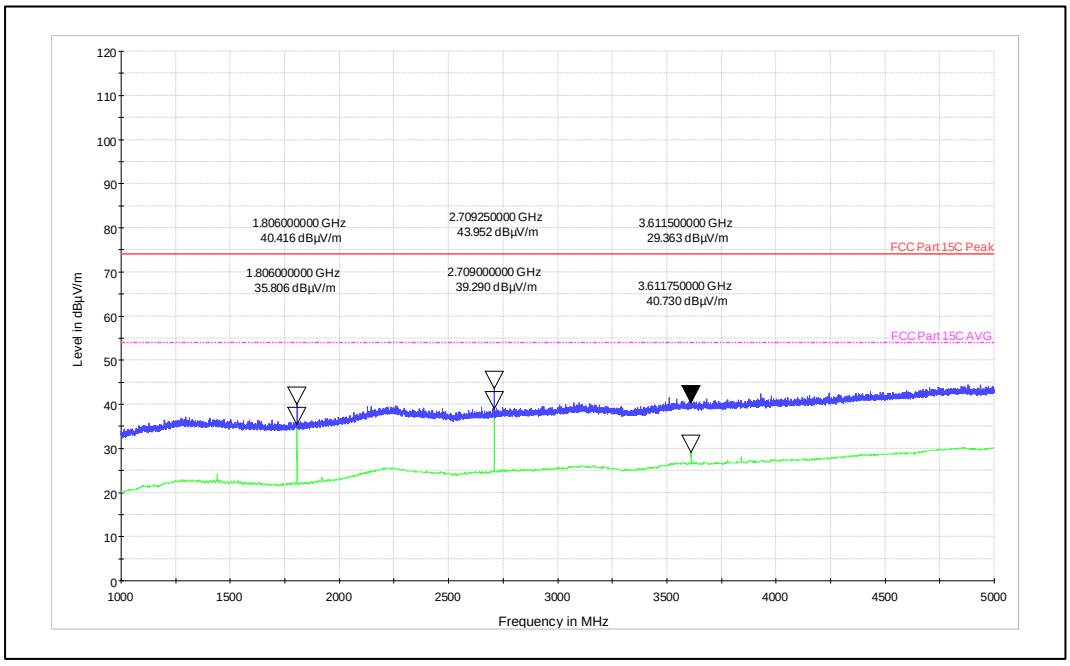
Channel Frequency 903MHz



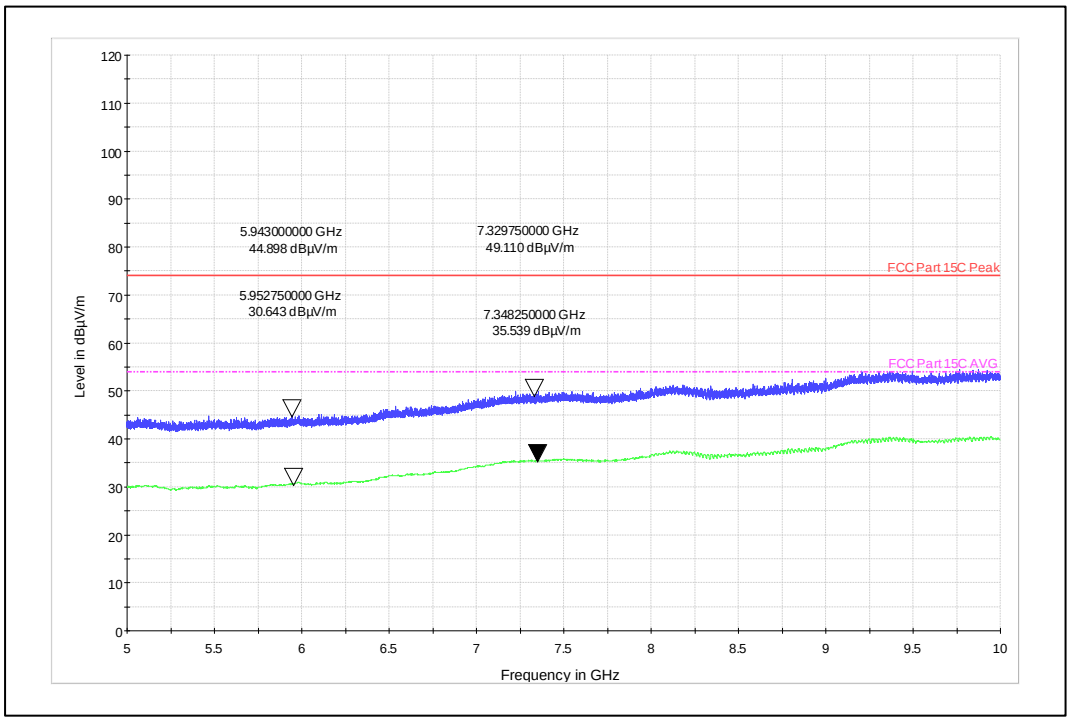
Channel Frequency: 1GHz – 5GHz **Polarization: Vertical**



Channel Frequency: 5GHz -10GHz **Polarization: Vertical**

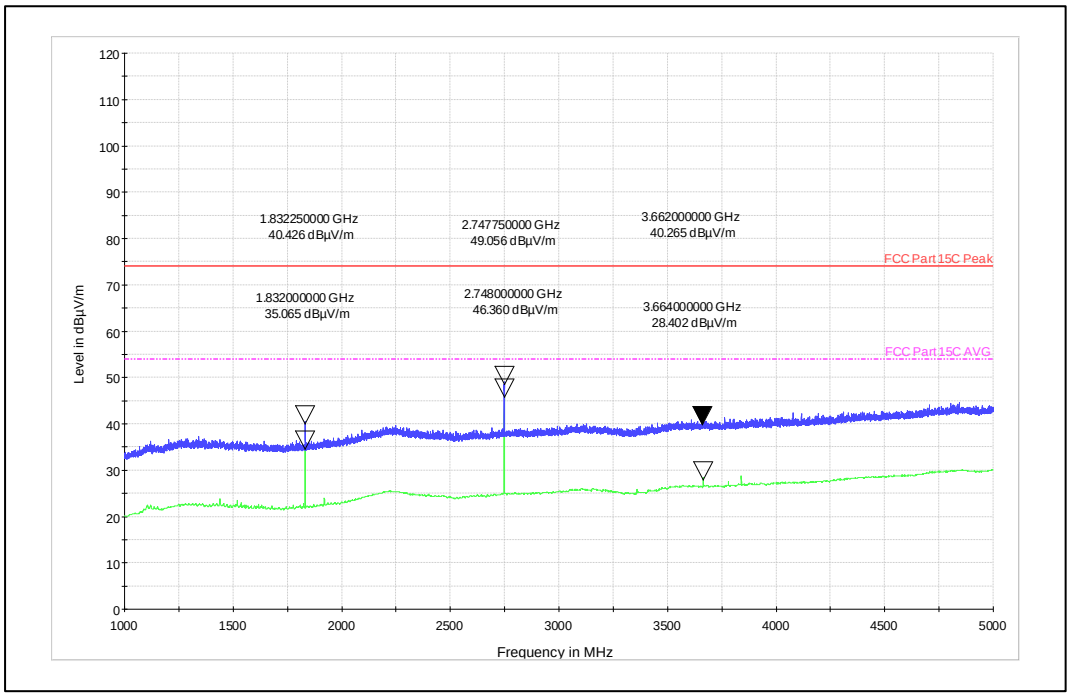


Channel Frequency: 1GHz – 5GHz **Polarization: Horizontal**

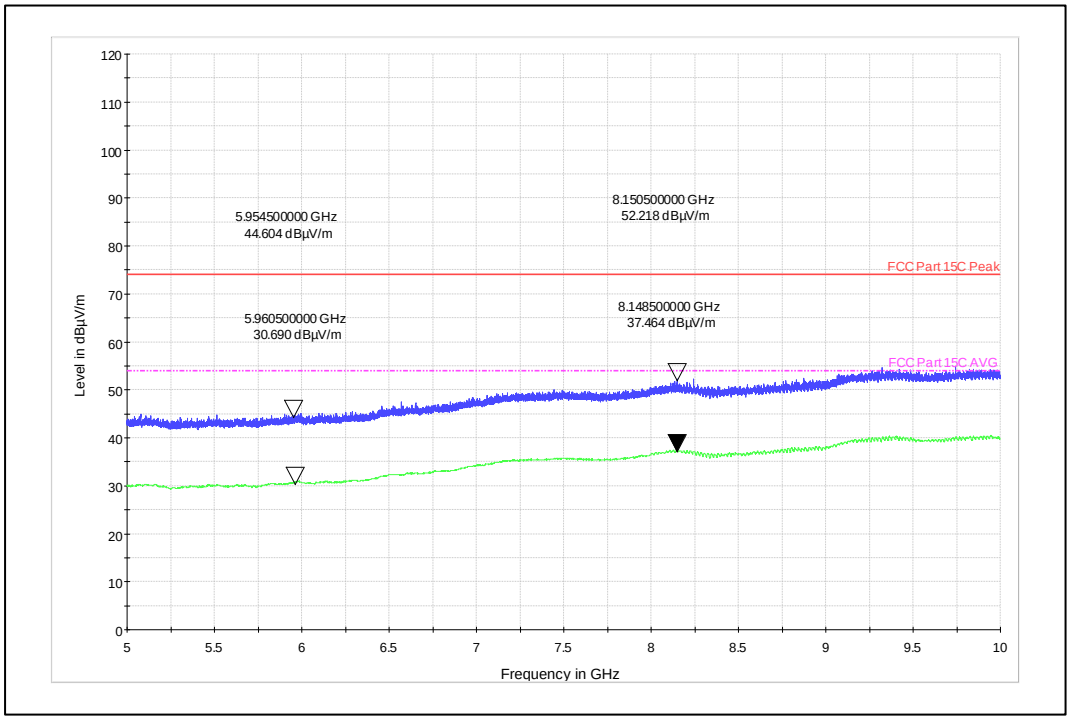


Channel Frequency: 5GHz -10GHz **Polarization: Horizontal**

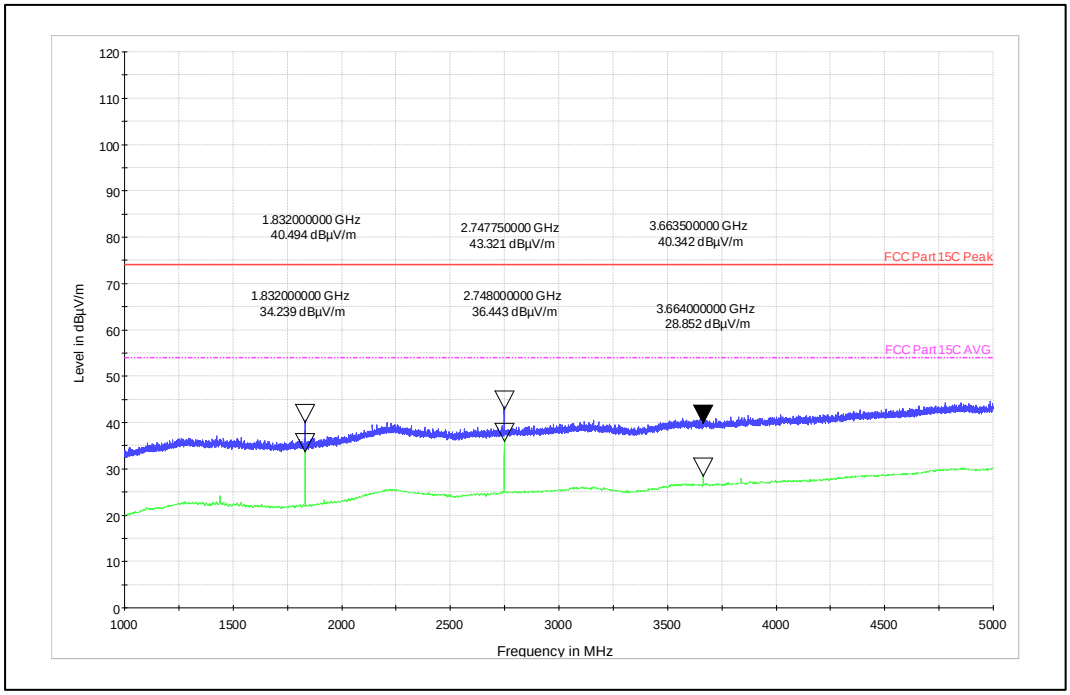
Channel Frequency 916MHz



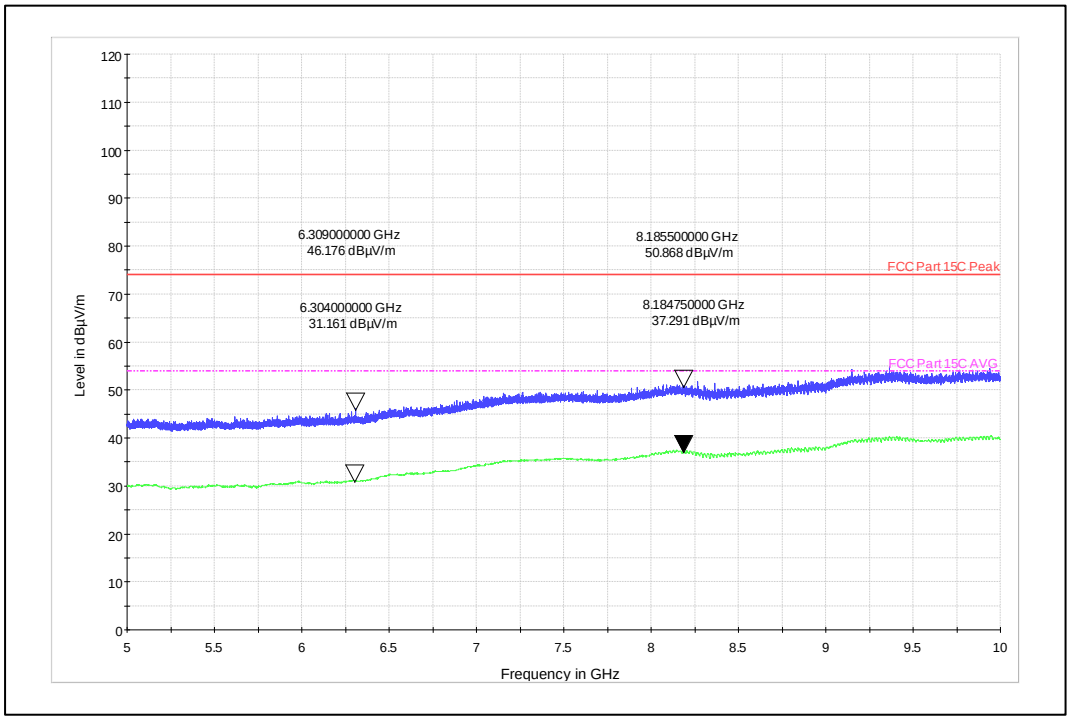
Channel Frequency: 1GHz -5GHz **Polarization: vertical**



Channel Frequency: 5GHz -10GHz **Polarization: vertical**

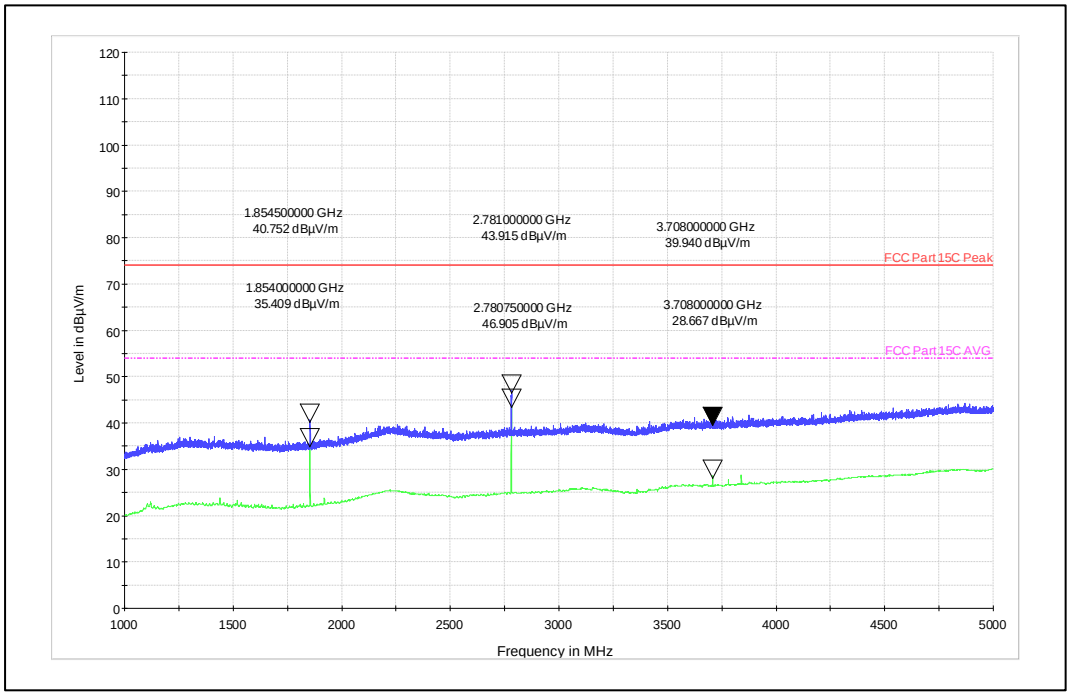


Channel Frequency: 1GHz -5GHz **Polarization: Horizontal**

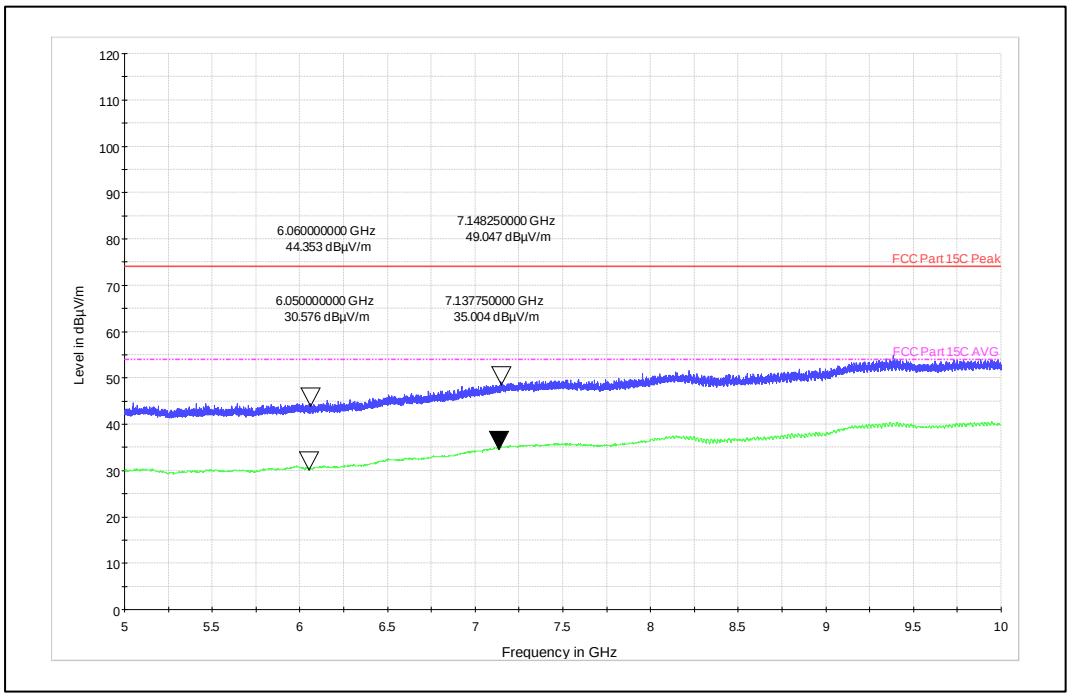


Channel Frequency: 5GHz -10GHz **Polarization: Horizontal**

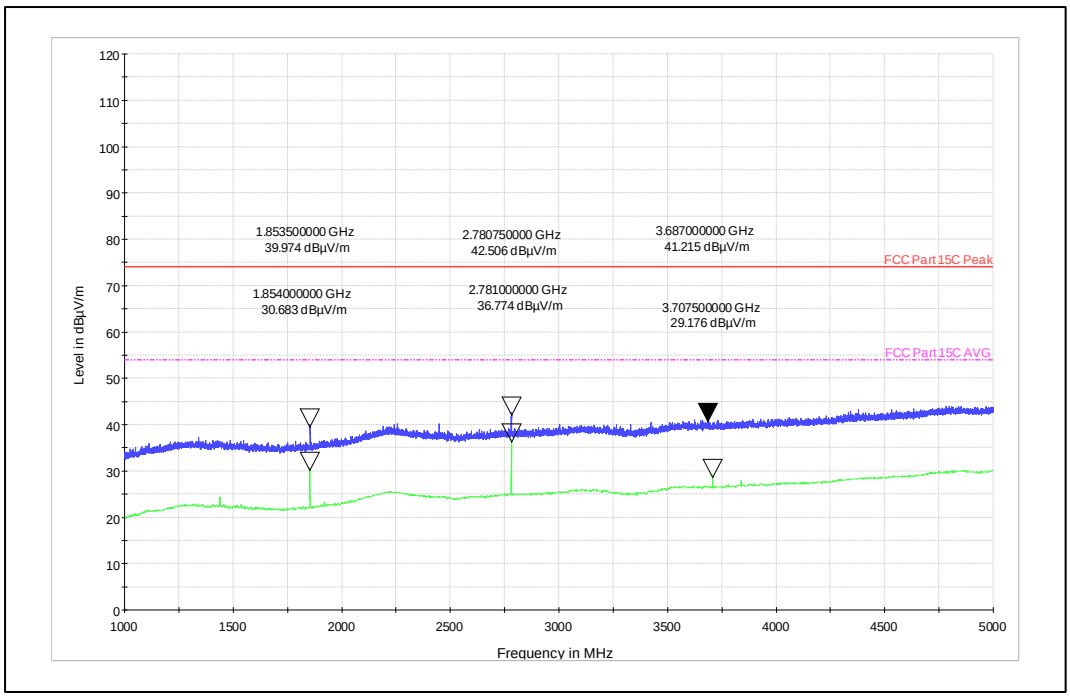
Channel Frequency 927MHz



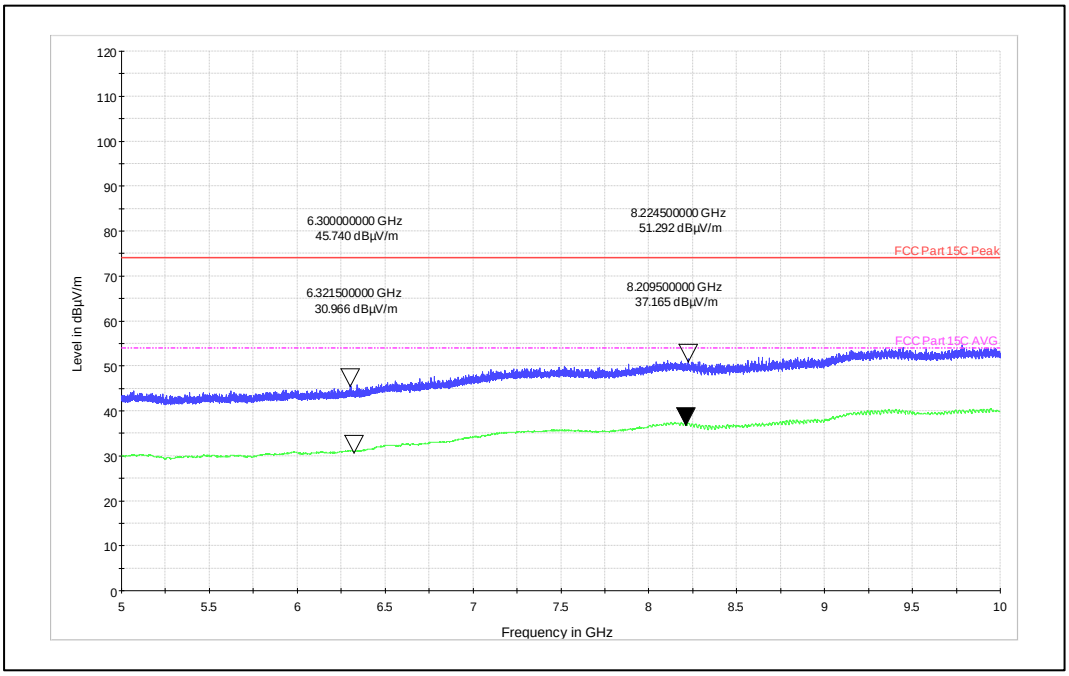
Channel Frequency: 1GHz -5GHz **Polarization: vertical**



Channel Frequency: 5GHz -10GHz **Polarization: vertical**



Channel Frequency: 1GHz -5GHz **Polarization: Horizontal**



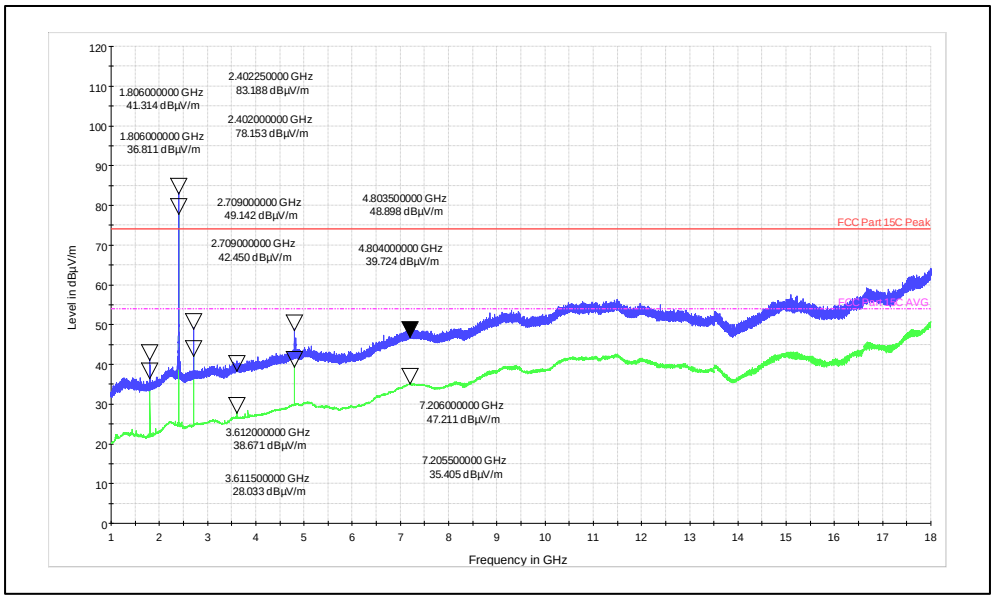
Channel Frequency: 5GHz -10GHz **Polarization: Horizontal**

7.5.1 RSE Test Results of Simultaneous Operation with BLE and LoRa:

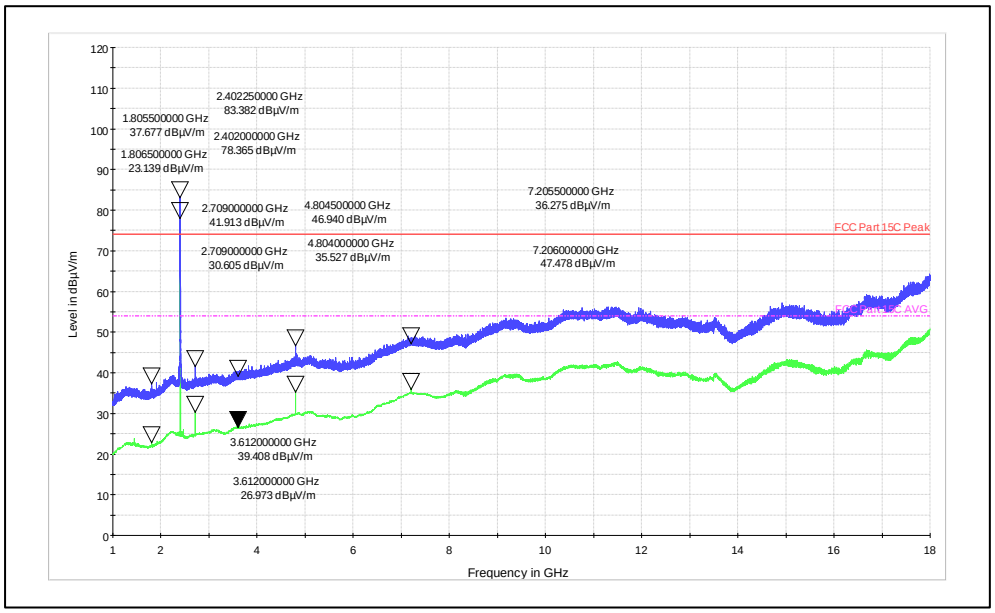
Note: Simultaneous Operation was performed As specified under the section 4.5 Simultaneous Transmission and worst-case test results are mentioned below.

Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2402MHz & 903MHz	1806(Pk)	Vertical	37.67	74	-36.33
	1806(Av)		23.13	54	-30.87
	2709(Pk)		41.91	74	-32.09
	2709(Av)		30.60	54	-23.40
	3612(Pk)		39.40	74	-34.60
	3612(Av)		26.97	54	-27.03
	4804(Pk)		46.94	74	-27.06
	4804(Av)		35.52	54	-18.48
	7206(Pk)		36.27	74	-37.73
	7206(Av)		47.47	54	-6.53
	1806(Pk)	Horizontal	41.31	74	-32.69
	1806(Av)		36.81	54	-17.19
	2709(Pk)		49.14	74	-24.86
	2709(Av)		42.45	54	-11.55
	3612(Pk)		38.67	74	-35.33
	3612(Av)		28.03	54	-25.97
	4804(Pk)		48.98	74	-25.02
	4804(Av)		39.72	54	-14.28
	7206(Pk)		47.21	74	-26.79
	7206(Av)		35.40	54	-18.60

Test Plots



Channel Frequency: 1 – 18 GHz Polarization: Vertical



Channel Frequency: 1 – 18 GHz Polarization: Horizontal

8 LIST OF TABLES

9 LIST OF FIGURES

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