

Prüfbericht – Produkte
Test Report - Products

Prüfbericht-Nr.: Test report no.:	ULR-TC568822300000062F	Auftrags-Nr.: Order no.:	146681475 0010	Seite 1 von 76 Page 1 of 76
Kunden-Referenz-Nr.: Client reference no.:	2130858	Auftragsdatum: Order date:	2022.05.03	
Auftraggeber: Client:	Cradlewise Incorporated 479 Jessie street, San Francisco CA, 94103			
Prüfgegenstand: Test item:	Cradlewise Smart Crib	Serien-Nr.: Serial No.:	2205-00001-LT1	
Bezeichnung: Identification.:	2V0			
Auftrags-Inhalt: Order content:	Testing and issue of Test report with Grant Certificate			
Prüfgrundlage: Test specification:	FCC Part 15 Subpart C 15.247, 15.207, 15.205 & 15.209			
Wareneingangsdatum: Date of sample receipt:	2022.05.18			
Prüfmuster-Nr Test sample no	A003263032-001 & A003263032-002			
Prüfzeitraum: Testing period:	2022.05.18 - 2022.05.29			
Ort der Prüfung: Place of testing:	Wireless laboratory, Bangalore			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland (India) Pvt.Ltd., 27/B, 2nd Cross, Electronic City Phase1 Bangalore -560 100, India FCC Test site registration number: 496599 ISED Test site registration number: 3466E-1			
Prüfergebnis*: Test result*:	Pass			
geprüft von: tested by:	genehmigt von: authorized by:			
Datum: Date: 2022.06.05	Ausstellatum: Issue date: 2022.08.09			
Stellung / Position:	M.V.Naveen Kumar Engineer	Stellung / Position:	Madhu K.N Senior Engineer	
Sonstiges / Other:	FCC ID: 2A6EK-SC-6275S-001			
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged			
* 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. 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.				



Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 2 von 76
Page 2 of 76

TEST SUMMARY

Test Item	Applicable Standard	Result
	FCC	
Maximum conducted (average) output power	FCC 15.247(b)(3)	Pass
Maximum Power Spectral Density	FCC 15.247(e)	*N/T
DTS Bandwidth	FCC 15.247(a)(2)	*N/T
Emissions in non-restricted frequency bands	FCC 15.247(d)	*N/T
Spurious Radiated Emissions and Restricted Bands of Operation	FCC 15.209 / FCC 15.205	Pass
Conducted Emissions on a.c Power Lines	FCC 15.207	Pass
Antenna Requirement	FCC 15.203	Pass

Note:

*N/T: Not tested – These test cases are not tested, the product uses certified RF module **WIFI+BT Combo Module** from **Askey Computer Corporation.**, with **FCC ID: H8N-AP6275S & IC : 1353A-AP6275S**. Issued by the **MRT Technology (Suzhou) Co., Ltd**

Product Category: Electronics Testing
Test Discipline: EMC Test Facility

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 3 von 76
Page 3 of 76

REVISION HISTORY OF THIS REPORT

Report Number	Version	Description	Issue date
ULR-TC568822300000062F	01	Initial issue of report	2022.08.09

Prüfbericht - Nr.:

Test Report No.:

ULR-TC568822300000062F

Seite 4 von 76

Page 4 of 76

Table of Contents

1	GENERAL REMARKS	5
1.1	Attachments	5
2	TEST SITES	6
2.1	Testing Facilities.....	6
2.2	List of Test and Measurement Instruments.....	6
3	GENERAL PRODUCT INFORMATION.....	8
3.1	Product Function and Intended Use.....	8
3.2	Ratings and System Details of Equipment under Test	8
3.3	Measurement Uncertainty:	9
4	TEST SET-UP AND OPERATION MODE.....	10
4.1	Principle of Configuration Selection	10
4.2	UUT Operation and Software	10
4.3	Special Accessories and Auxiliary Equipment	10
4.4	Simultaneous Transmission	10
4.5	Countermeasures to achieve EMC Compliance	10
4.6	List of frequencies	10
4.7	Report references.....	11
5	Operational Description	12
6	TEST METHODOLOGY	13
6.1	Conducted Spurious Emission Test on AC Power Line.....	13
6.1.1	Test Setup Configuration	13
6.2	Radiated Emission Test	14
6.2.1	Test Setup Configuration	14
7	TEST RESULTS FOR Wi-Fi.....	16
7.1	Maximum Average Conducted Output Power.....	16
7.2	Spurious Radiated Emissions & Restricted Bands of Operation	31
8	TEST RESULTS FOR BLUETOOTH LOW ENERGY.....	54
8.1	Maximum Peak Conducted Output Power	54
8.2	Spurious Radiated Emissions & Restricted Bands of Operation	59
9	Conducted Spurious Emission Test on AC Power Line	71
10	LIST OF TABLES.....	75
11	Power level used for testing	75

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 DIAGRAM
- 8: BILL OF MATERIAL
- 9: USER MANUAL
- 10: MAXIMUM PERMISSIBLE EXPOSURE INFORMATION

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 6 von 76
Page 6 of 76

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

Radiated Measurement site type :
Fully anechoic chamber (used for above 1 GHz
measurements)

Radiated Measurement site type :
Semi anechoic chamber (used for below 1 GHz
measurements)

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	19.08.2022	Yearly	Radiated Spurious Emission
EMI Receiver	Rohde & Schwarz	ESW 44	101733	1.72SP1	12.02.2023	Yearly	
Active loop antenna	Frankonia	LAX-18	LAX-10-800	-	31/01/2023	Yearly	
Balloon and Biconical Antenna	Schwarzbeck	VHBB-9124 / BBA-9106	1028	-	03/02/2023	Yearly	
Log - Periodical Antenna	Schwarzbeck	VUSLP-9111B	9111B-111	-	04/02/2023	Yearly	
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1944	-	03.07.2022	Yearly	
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA 9170-0904	-	06.07.2022	Yearly	
Semi Anechoic Chamber	Frankonia	-	-	-	-	-	
Fully Anechoic Chamber	Albatross	-	-	-	-	-	Antenna-Port Conducted test
Spectrum Analyser	Agilent Technologies	E4407B	US41192 772	A.14.06	15.12.2022	Yearly	
EMI Receiver	Rohde & Schwarz	ESR7	101133	3.48 SP3	14.07.2022	Yearly	Conducted AC Power line Test
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100811	-	29.07.2022	Yearly	
LISN	Rohde & Schwarz	ENV216	100022	-	07.10.2022	Yearly	

Prüfbericht - Nr.:

Test Report No.:

ULR-TC568822300000062F

Seite 7 von 76

Page 7 of 76

Table 2: Instrument application Software versions

SL. No.	Test Type	Application software	Version
1	Radiated spurious emission measurement in 10mtr-SAC	BAT EMC	3.20.0.17
2	Radiated spurious emission measurement in 3mtr-FAC	EMC 32	10.60.00

3 GENERAL PRODUCT INFORMATION

3.1 Product Function and Intended Use

Cradlewise smart crib is a self-soothing crib that automatically rocks the baby to sleep. It has an in-built baby monitor that senses the baby's wake-ups, and in response bounces and plays music. Cradlewise's baby monitor has an in-built night vision camera. It converts from a bassinet to a crib, so it can be used for up to 24-month-old baby

3.2 Ratings and System Details of Equipment under Test

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

Radio Protocol		Wi-Fi	BLE
Operating Frequency Range		2412MHz to 2462MHz	2402MHz to 2480MHz
No. of Channels		11 (Refer Table 5)	40 (Refer Table 6)
Channel Spacing		5MHz	2MHz
Transmitting Power Level		Refer clause 11	
Maximum Measured Power(dBm)		16.64 dBm (ax-mode MCS0 2462MHz)	-11.84 dBm(1Mbps 2440MHz)
Modulation		802.11b: DSSS, 802.11g/n: OFDM, 802.11ax: OFDMA	GFSK
Number of antennas		2	1
Antenna Gain		2.0dBi(Max Peak Gain)	2.0dBi (max peak gain)
Antenna Type		Molex 2042811100 balanced, dipole-type antenna	Molex 2042811100 balanced, dipole-type antenna
Supply Voltage to Product		12VDC Through AC/DC Adapter	
Environmental conditions	Storage	5°C to +60°C Relative Humidity 5% < to <95%	
	Operating	5°C to +40°C Relative Humidity 10%< to <90%	
EUT Dimension(L x W x H) in mm		1070mm x970mm x 638mm	

***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.

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 9 von 76
Page 9 of 76

Note: Product **Cradlewise Smart Crib** has multiple protocols. All the supported wireless protocols and their respective test results are issued in separate test reports, refer clause 4.7 Report references

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	$\pm 5 \%$

Note: The Listed Measurement Uncertainties are the worst-case uncertainty, for the respective test cases. Above Table is for reporting purpose only and not used in determining Final Pass/Fail verdict.

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 UUT Operation and Software

Hardware Version : 2V0

Software version : 3.00

Software Name: Cradlewise smart crib firmware

Hardware Name: Cradlewise smart crib

4.3 Special Accessories and Auxiliary Equipment

- None

4.4 Simultaneous Transmission

This product supports Simultaneous operation

4.5 Countermeasures to achieve EMC Compliance

- None

4.6 List of frequencies

Frequency Band (MHz)	Channel No.	Channel Frequency (MHz)
2412 – 2462	1	2412
	2	2417
	3	2422
	4	2427
	5	2432
	6	2437
	7	2442
	8	2447
	9	2452
	10	2457
	11	2462

Table 5: List of Wi-Fi center Frequencies

Channel used for Wi-Fi 2.4GHz testing

Protocol: WLAN 802.11b

Channel Low : 2412 MHz

Channel Mid : 2437 MHz

Channel High : 2462 MHz

Protocol: WLAN 802.11g

Channel Low : 2412 MHz

Channel Mid : 2437 MHz

Channel High : 2462 MHz

Protocol: WLAN 802.11n_20MHz

Channel Low : 2412 MHz

Channel Mid : 2437 MHz

Channel High : 2462 MHz

Frequency Band (GHz)	Channel No.	Frequency (MHz)
BLE (2.4-2.4835)	0	2402
	1	2404
	2	2406
	3	2408
	:	:
	:	:
	18	2438
	19	2440
	20	2442
	:	:
	:	:
	36	2474
	37	2476
	38	2478
	39	2480

Table 6: List of BLE Center frequencies

Channel used for BLE testing

Channel low : 2402MHz

Channel mid : 2440MHz

Channel High : 2480MHz

Note:

TUV Sample Identification number : A003263032-001 – Radiated test Sample
A003263032-002 – Conducted test Sample

4.7 Report references

Note: Product **Cradlewise Smart Crib** 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 Wi-Fi (2.4GHz) & BLE (2.4GHz) – (This report)	ULR-TC568822300000062F
RF test report for Wi-Fi (5GHz)	ULR-TC568822300000063F
RF test report for Bluetooth (2.4GHz)	ULR-TC568822300000064F

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 12 von 76
Page 12 of 76

5 Operational Description

The smart crib runs on 12V DC power supply supplied by an AC to DC adapter connected to 110V 60Hz AC supply. It relies on cameras and microphones to detect signs of the baby waking up. In response to these signs the cradle starts an up and down movement using a motor and starts playing white noise/music using a speaker. The product connects to the internet using Wi-Fi and allows caregivers to monitor the baby on their phones using an app. The night vision features allow unobtrusive monitoring at night too.

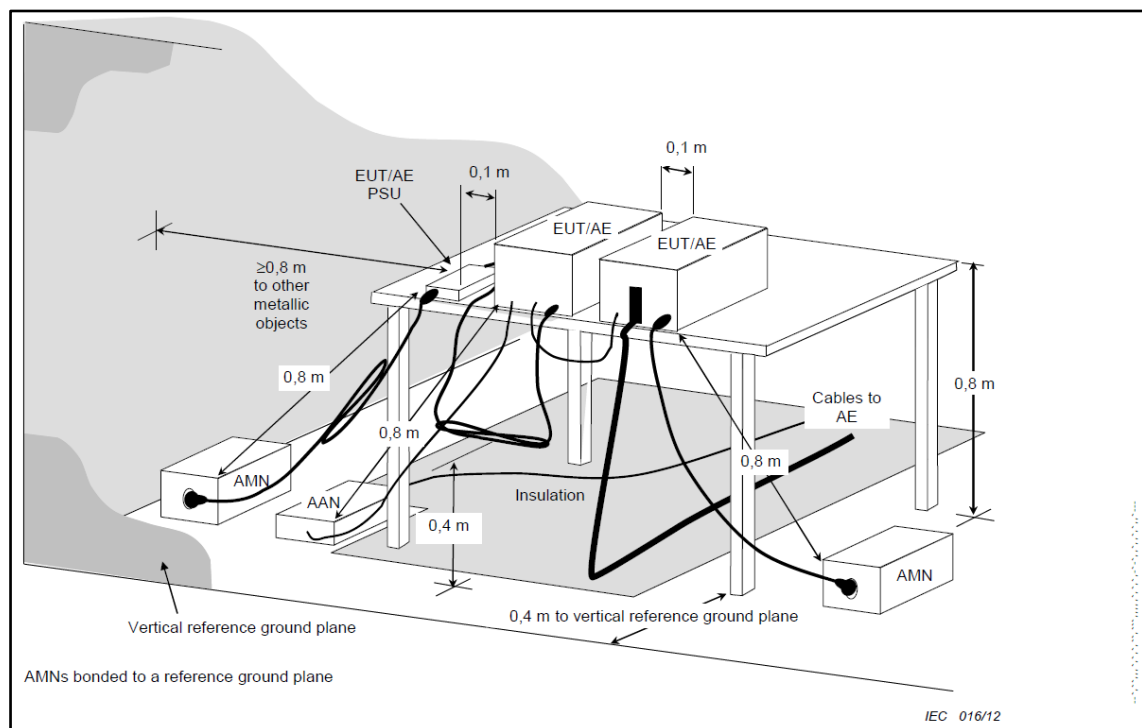
6 TEST METHODOLOGY

6.1 Conducted Spurious Emission Test on AC Power Line

Measured levels of ac power-line conducted emission across the 50Ω LISN port (to which the EUT is connected). All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer.

The device is placed on the test table, raised 80cm above the reference ground plane. The vertical conducting plane is located 40cm to the rear of the device. AC Conducted emission measurement is made over frequency range from 150kHz to 30MHz, this measurement was performed with EUT powered by 2 methods and both methods are tested individually, one with an AC adaptor with 110V AC 60Hz supply and second with Wireless charger with supply 110V AC 60Hz.

6.1.1 Test Setup Configuration



6.2 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

6.2.1 Test Setup Configuration

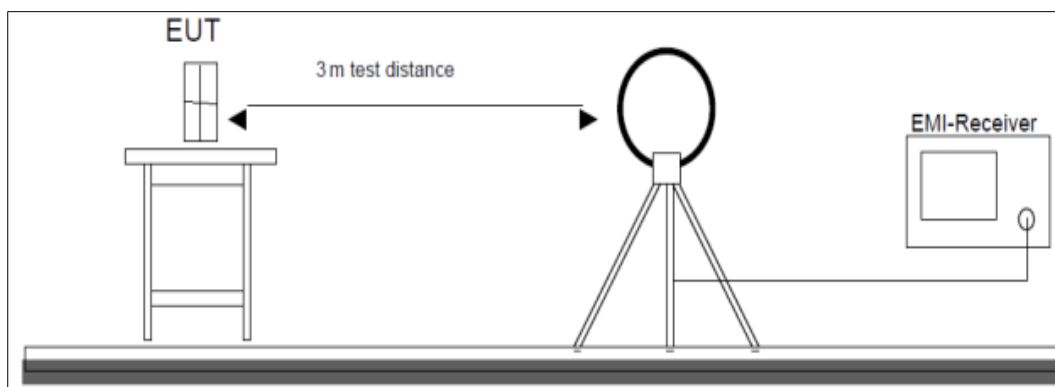


Figure 1: Frequency Range 9 kHz- 30 MHz

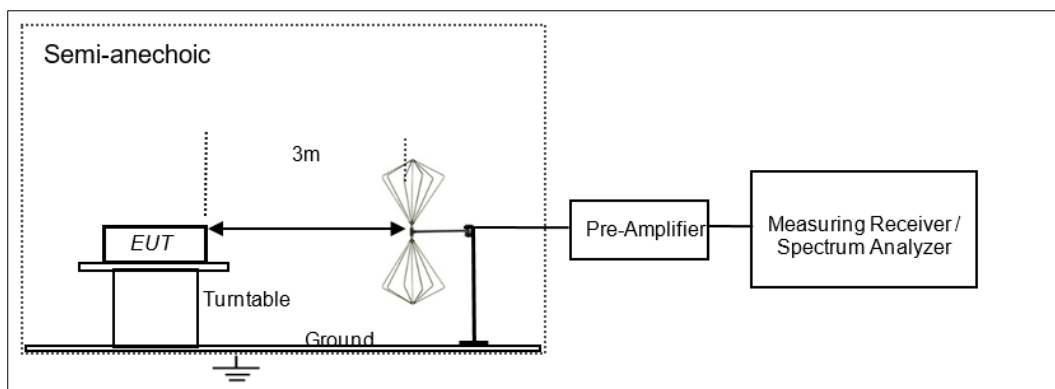


Figure 2: Frequency Range 30 MHz – 200 MHz

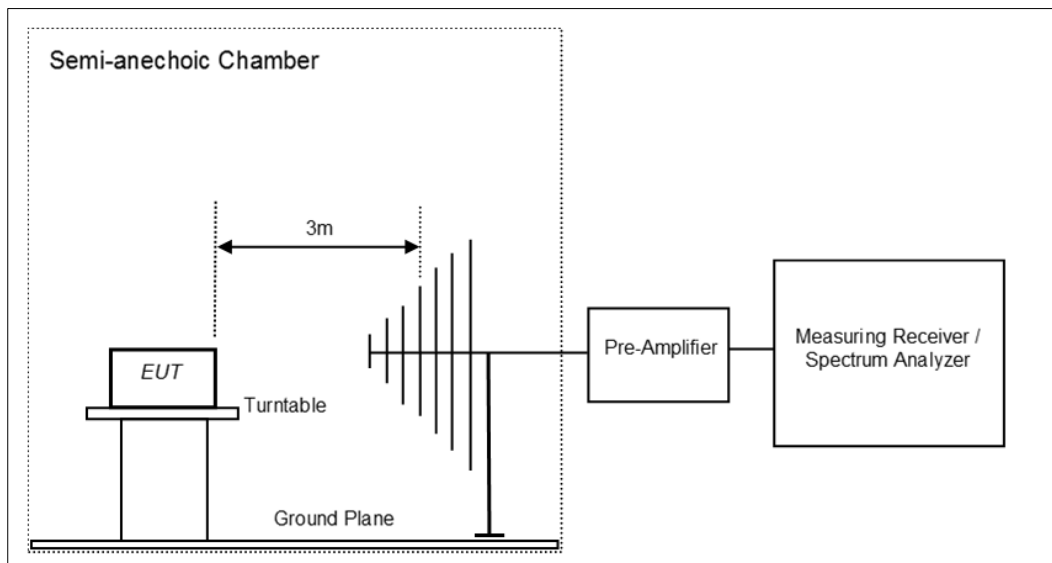


Figure 3: Frequency Range 200 MHz - 1GHz

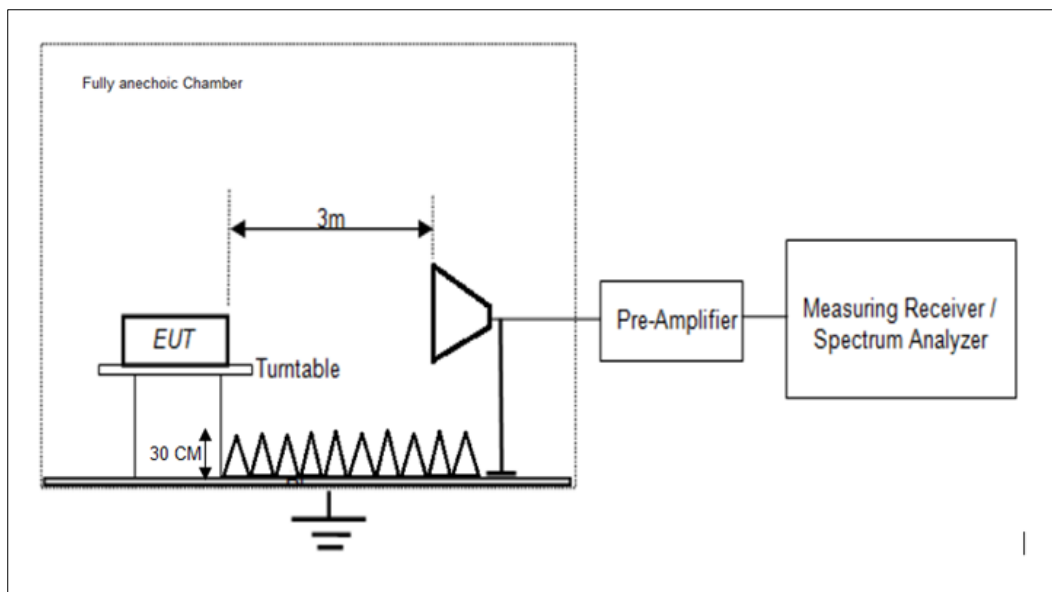


Figure 4: Frequency Range above 1 GHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 16 von 76
Page 16 of 76

7 TEST RESULTS FOR Wi-Fi

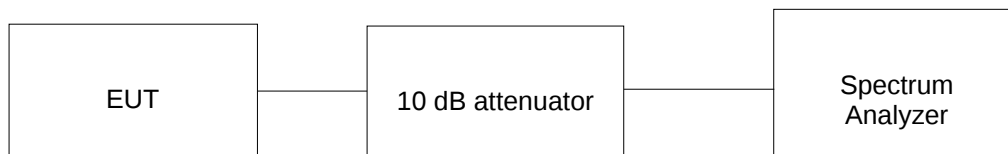
7.1 Maximum Average Conducted Output Power

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (b)(3)
Test Method	Subclause 11.9.2.2.4 of ANSI C63.10
Measurement Bandwidth	300 KHz
Detector	Average sample detector mode
Port of testing	Antenna port
Requirement	Power $\leq$ 1 W (30 dBm)

Test Method



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.3 °C Voltage = 12VDC Through AC/DC Adapter Relative humidity: 62%

KDB Guidelines applied:

Measurements were made as per section 8.3.2.2 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 17 von 76
Page 17 of 76

Test results:

Note:

1. All the losses are included during measurement and final values are mentioned in the test report.
2. Total Average Output power (dBm) = Measured Average power (dBm) + Attenuator factor (10dB) + Cable loss (0.6dB)
3. This product do not support additional beamforming gain / directional gain, it uses signal antenna and hence directional gain of the single antenna is 2.00 dBi

Modulation: 802.11b

Data rate (Mbps)	Channel Frequency (MHz)	Measured Average Power at Chain1 (dBm)	Measured Average Power at Chain2 (dBm)	Duty cycle correction factor (dB)	Final Average output power (dBm)	Power Limit (dBm)
1	2412	11.54	12.71	0.00	15.17	30
	2437	11.79	12.85	0.00	15.36	30
	2462	12.10	13.26	0.00	15.73	30
11	2412	11.56	12.41	0.5061	15.52	30
	2442	11.67	12.63	0.5061	15.69	30
	2462	12.14	13.04	0.5061	16.13	30

*Note: Duty Cycle Correction Factor Calculation

$10 \cdot \log(1/X)$ Where X is Duty Cycle is considered in below results

Duty cycle correction Factor is considered in Final Average Power

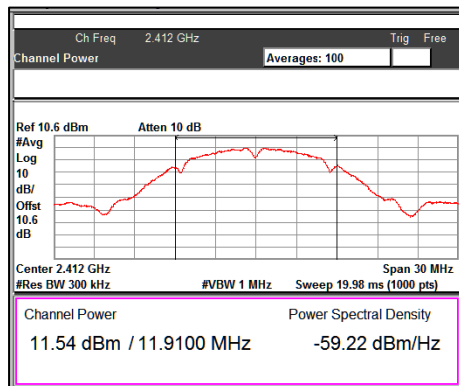
Total Average power (dBm): $10 \cdot \log\{10^{(\text{Ant0 of avg power}/10)} + 10^{(\text{Ant1 of avg power}/10)}\} + \text{Duty Correction Factor}$

Prüfbericht - Nr.:
Test Report No.:

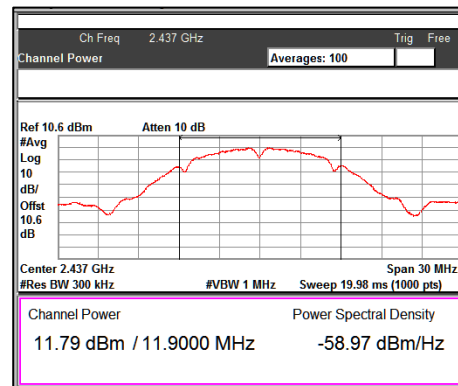
ULR-TC568822300000062F

Seite 18 von 76
Page 18 of 76

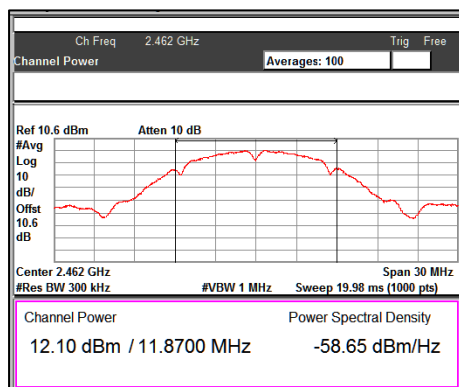
Data Rate: 1Mbps



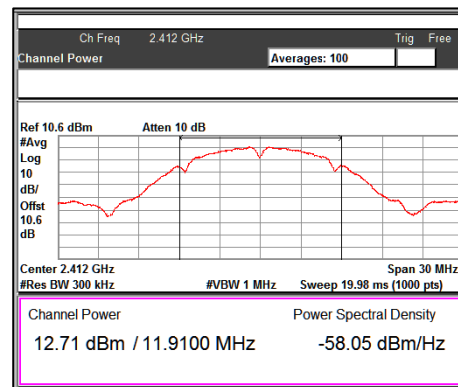
Channel frequency:2412MHz@Chain1



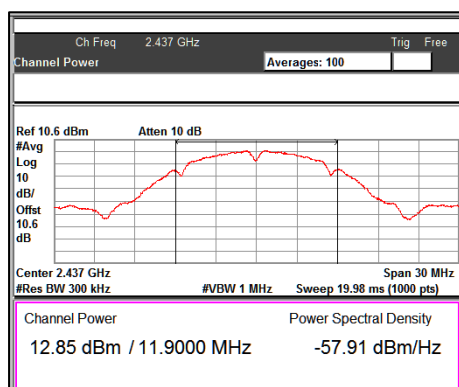
Channel frequency:2437MHz@Chain1



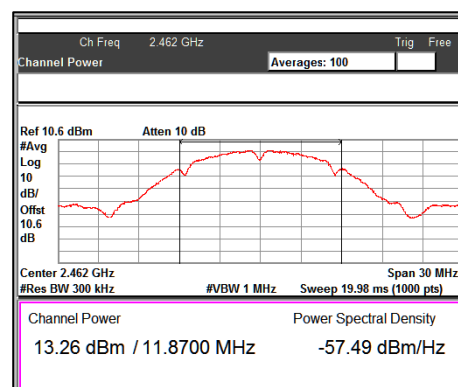
Channel frequency:2462MHz@Chain1



Channel frequency:2412MHz@Chain2



Channel frequency:2437MHz@Chain2



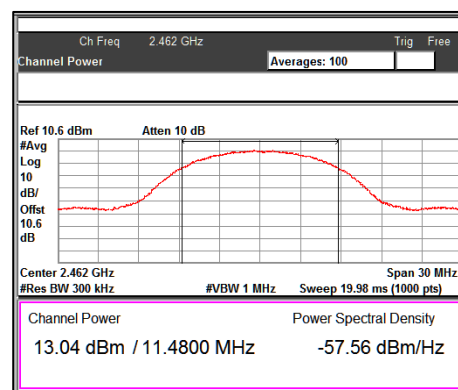
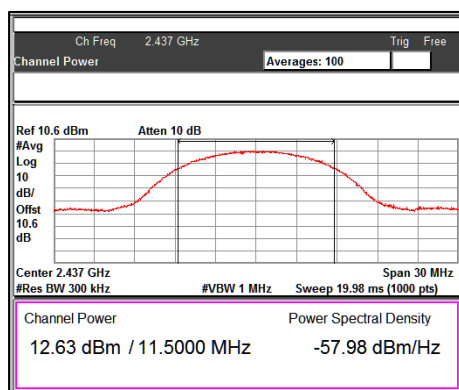
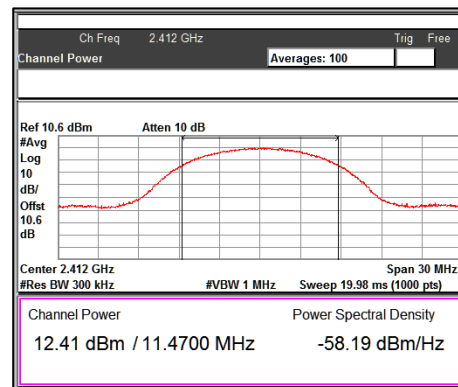
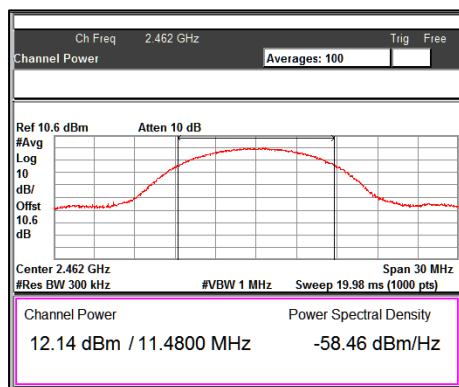
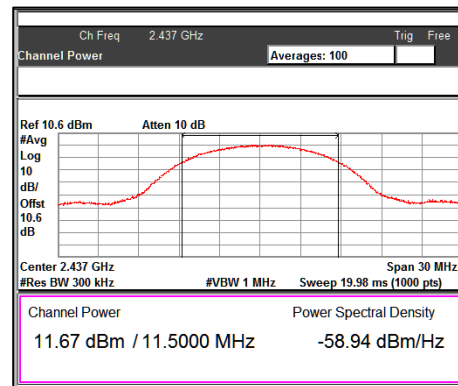
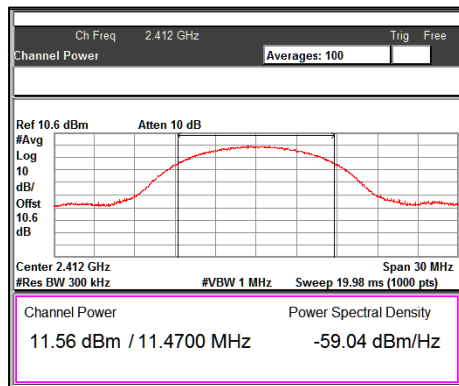
Channel frequency:2462MHz@Chain2

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 19 von 76
Page 19 of 76

Data Rate: 11Mbps



Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 20 von 76
Page 20 of 76

Modulation: 802.11g

Data rate (Mbps)	Channel Frequency (MHz)	Measured Average Power at Chain1 (dBm)	Measured Average Power at Chain2 (dBm)	Duty cycle correction factor (dB)	Final Average power (dBm)	Power Limit (dBm)
6	2412	12.16	13.35	0.13	15.94	30.00
	2437	12.28	13.47	0.13	16.06	30.00
	2462	12.37	13.74	0.13	16.25	30.00
24	2412	12.13	13.14	0.41	16.08	30.00
	2437	12.12	13.20	0.41	16.11	30.00
	2462	12.15	13.64	0.41	16.38	30.00
54	2412	11.66	12.84	0.86	16.16	30.00
	2437	11.50	12.73	0.86	16.03	30.00
	2462	11.85	13.17	0.86	16.43	30.00

*Note: Duty Cycle Correction Factor Calculation

10*LOG (1/X) Where X is Duty Cycle is considered in below results

Duty cycle correction Factor is considered in Final Average Power

Total Average power (dBm): $10 \cdot \log\{10^{(\text{Ant0 of avg power}/10)} + 10^{(\text{Ant1 of avg power}/10)}\}$

Prüfbericht - Nr.:

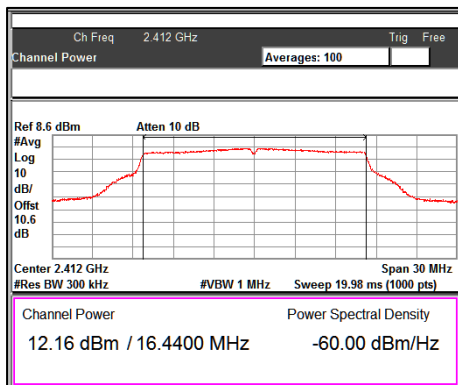
Test Report No.:

ULR-TC568822300000062F

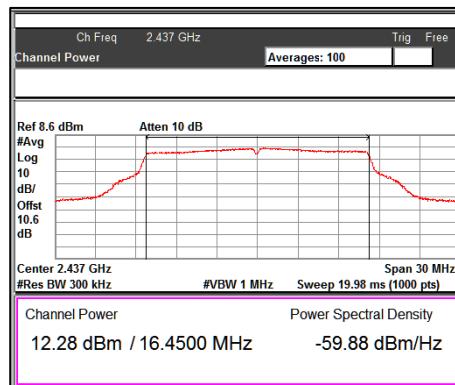
Seite 21 von 76

Page 21 of 76

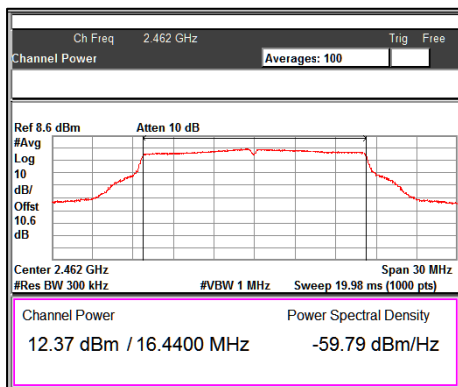
g-mode: 6Mbps



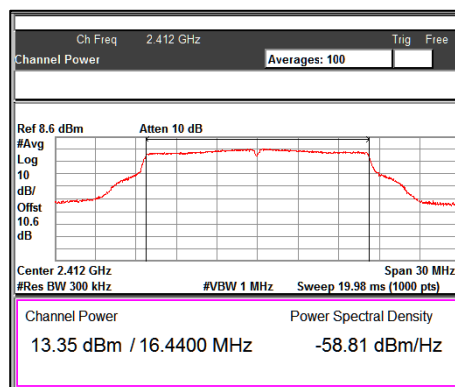
Channel frequency:2412MHz@Chain1



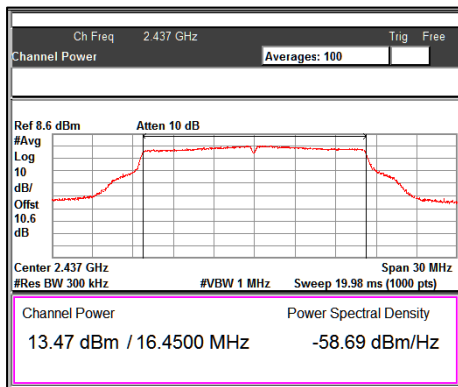
Channel frequency:2437MHz@Chain1



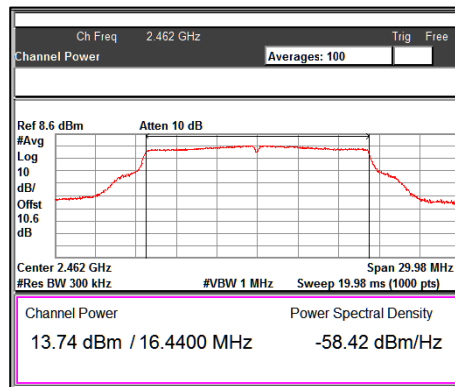
Channel frequency:2462MHz@Chain1



Channel frequency:2412MHz@Chain2

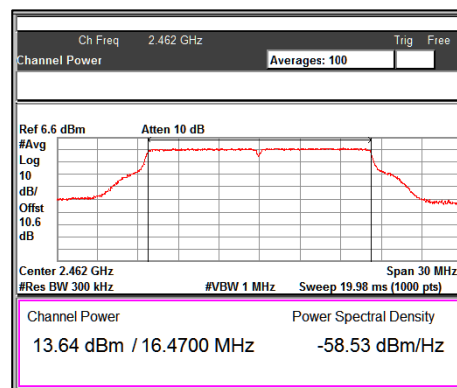
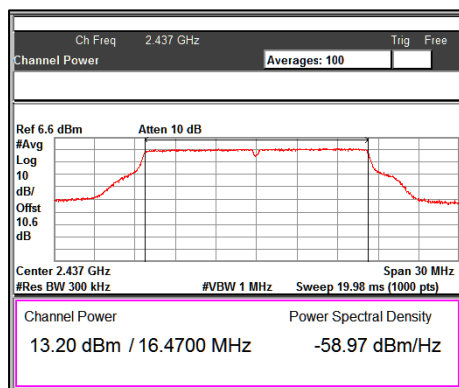
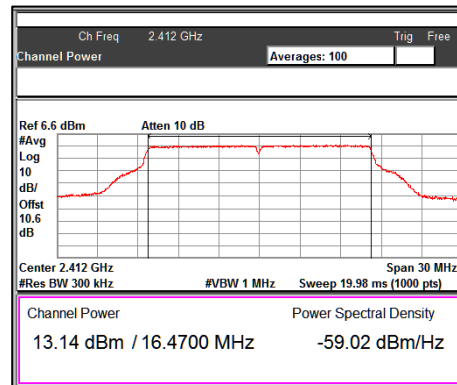
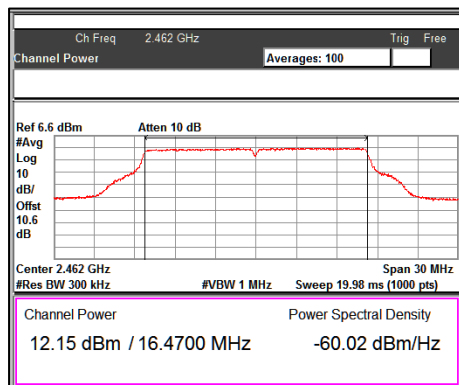
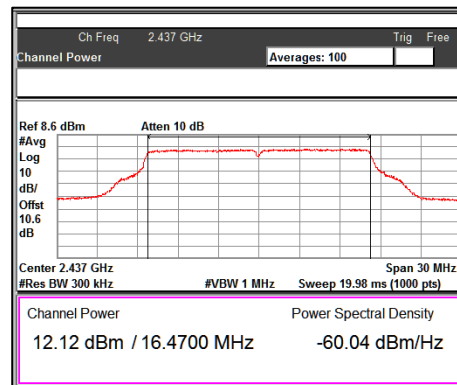
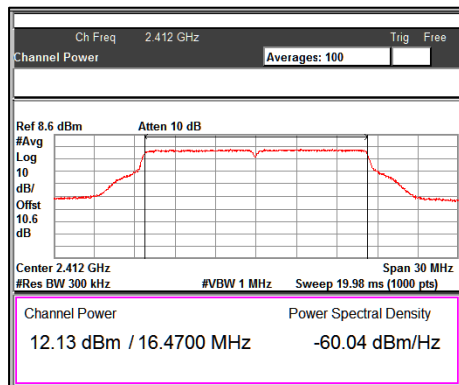


Channel frequency:2437MHz@Chain2

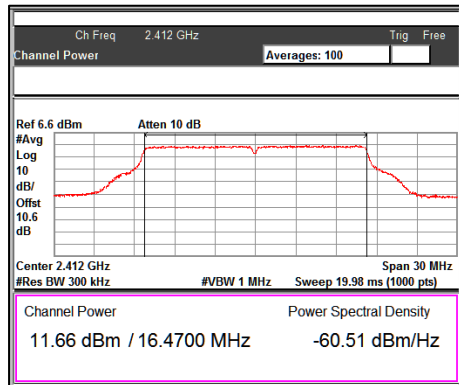


Channel frequency:2462MHz@Chain2

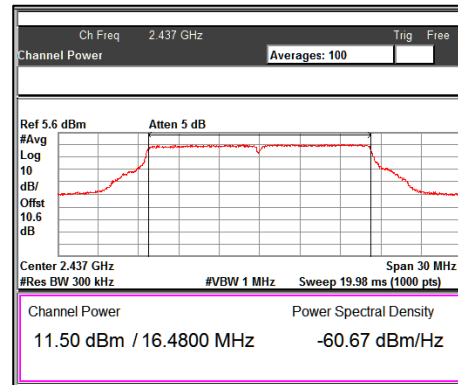
g-mode: 24Mbps



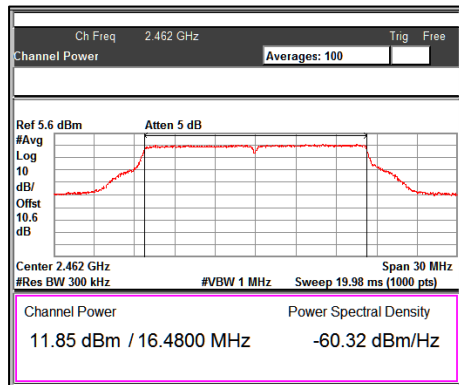
g-mode:54Mbps



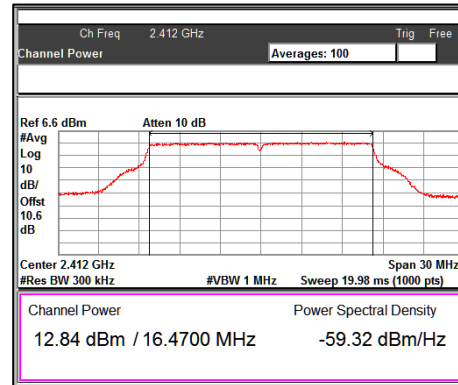
Channel frequency:2412MHz@Chain1



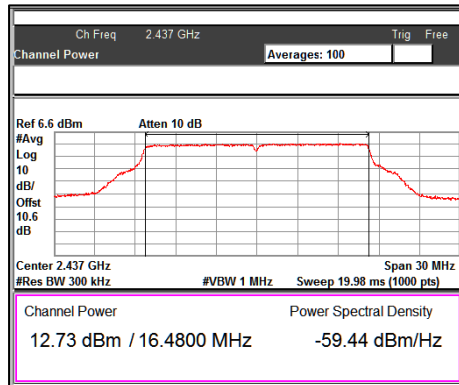
Channel frequency:2437MHz@Chain1



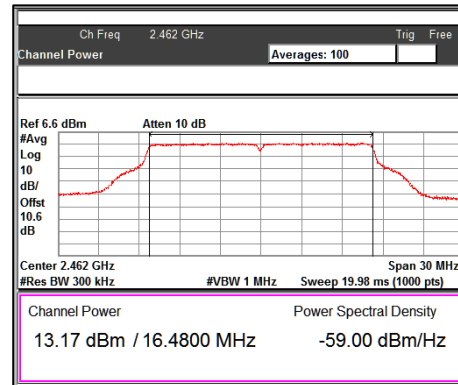
Channel frequency:2462MHz@Chain1



Channel frequency:2412MHz@Chain2



Channel frequency:2437MHz@Chain2



Channel frequency:2462MHz@Chain2

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 24 von 76
Page 24 of 76

Modulation: 802.11n_20MHz

Data rate (Mbps)	Channel Frequency (MHz)	Measured Average Power at Chain1 (dBm)	Measured Average Power at Chain2 (dBm)	Duty cycle correction factor (dB)	Final Average power (dBm)	Power Limit (dBm)
MCS0	2412	11.99	13.00	0.27	15.80	30.00
	2437	11.86	13.02	0.27	15.76	30.00
	2462	12.26	13.54	0.27	16.23	30.00
MCS4	2412	10.60	11.61	1.43	15.57	30.00
	2437	10.62	11.73	1.43	15.65	30.00
	2462	10.87	11.96	1.43	15.89	30.00
MCS7	2412	10.37	11.52	1.80	15.79	30.00
	2437	10.47	11.59	1.80	15.88	30.00
	2462	10.89	12.03	1.80	16.31	30.00

***Note:**

Duty Cycle Correction Factor Calculation

10*LOG (1/X) Where X is Duty Cycle is considered in below results

Duty cycle correction Factor is considered in Final Average Power

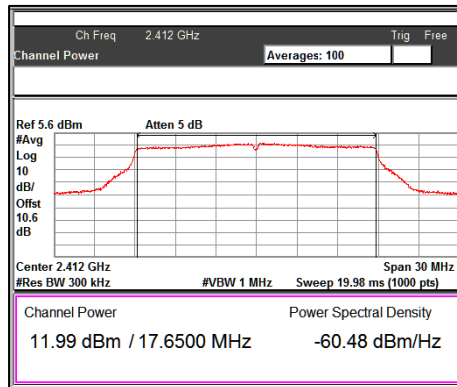
Total Average power (dBm): $10 \cdot \log\{10^{(\text{Ant0 of avg power}/10)} + 10^{(\text{Ant1 of avg power}/10)}\}$

Prüfbericht - Nr.:
Test Report No.:

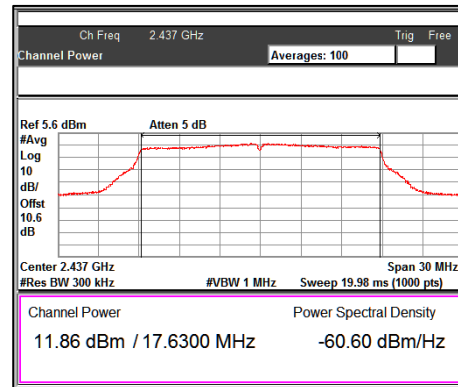
ULR-TC568822300000062F

Seite 25 von 76
Page 25 of 76

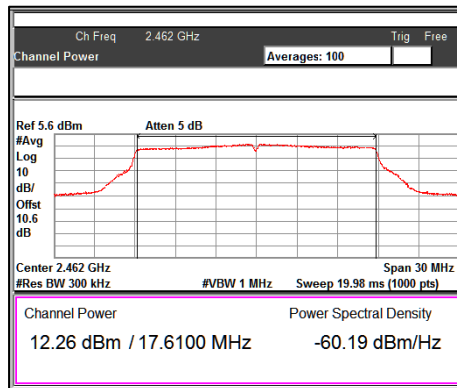
Data rate: n-mode 20MHz→MCS0



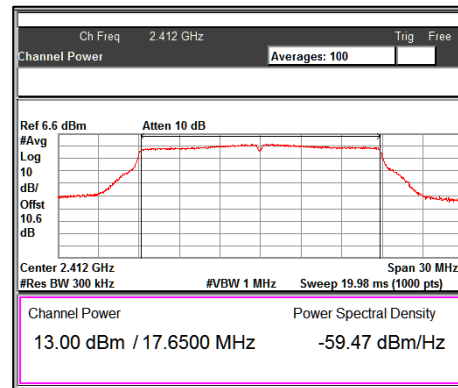
Channel frequency: 2412 MHz @ Chain1



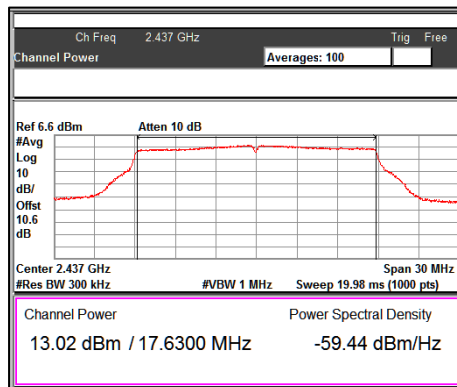
Channel frequency: 2437 MHz @ Chain1



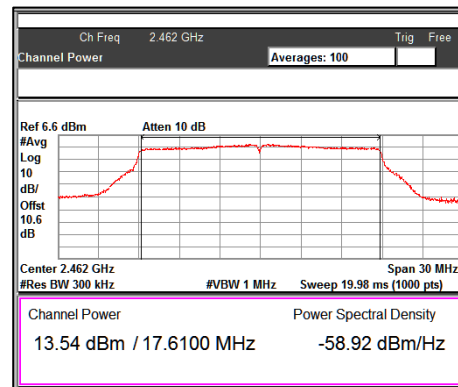
Channel frequency: 2462 MHz @ Chain1



Channel frequency: 2412 MHz @ Chain2



Channel frequency: 2437 MHz @ Chain2



Channel frequency: 2462 MHz @ Chain2

Prüfbericht - Nr.:

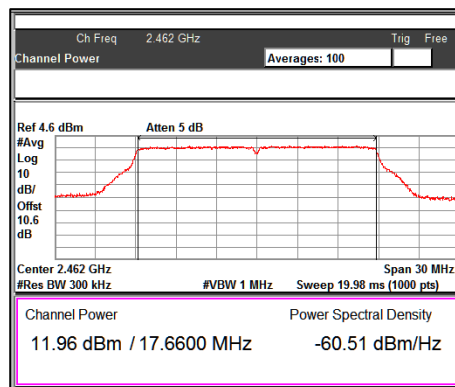
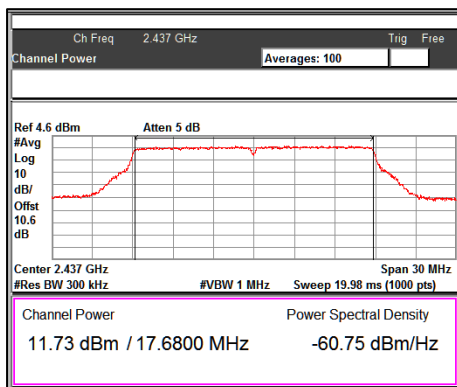
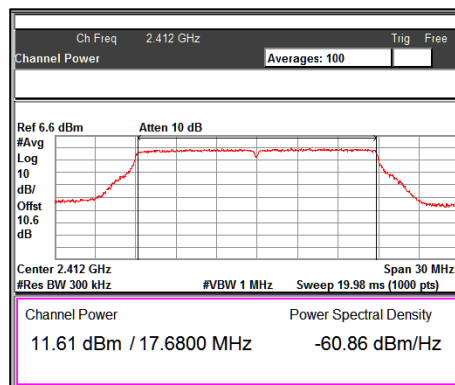
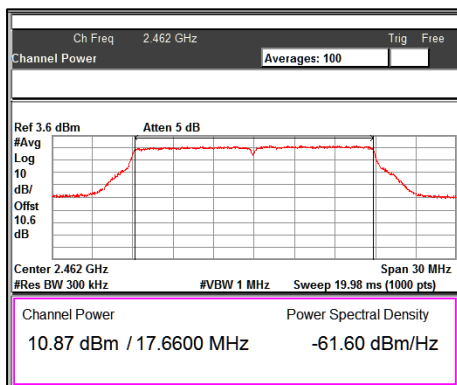
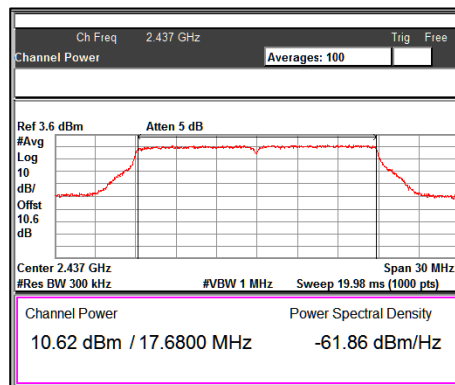
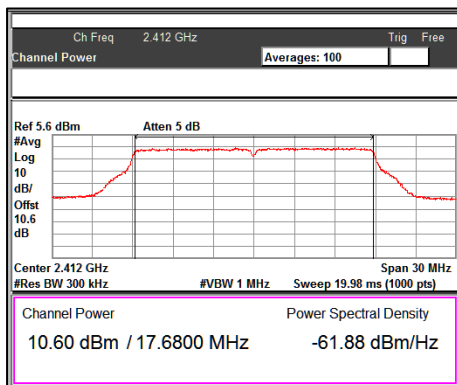
Test Report No.:

ULR-TC568822300000062F

Seite 26 von 76

Page 26 of 76

Data rate: n-mode 20MHz→MCS4

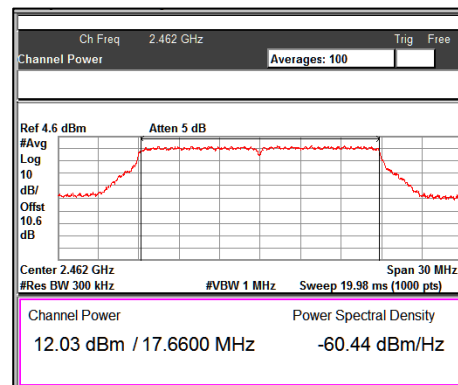
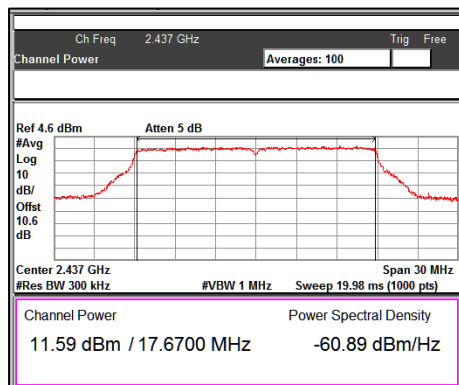
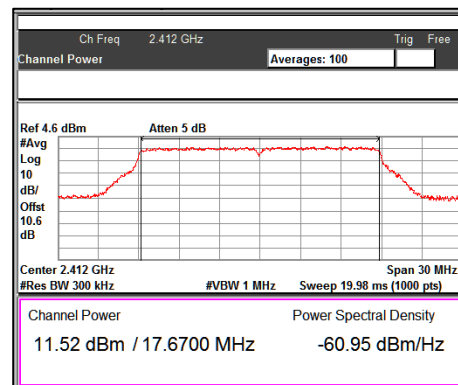
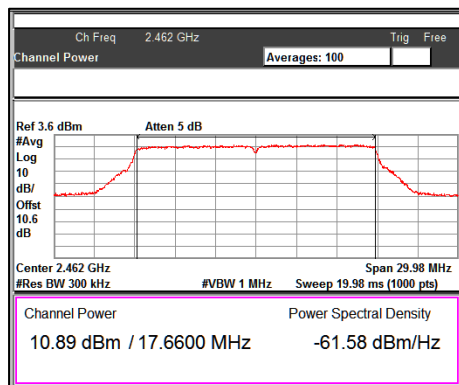
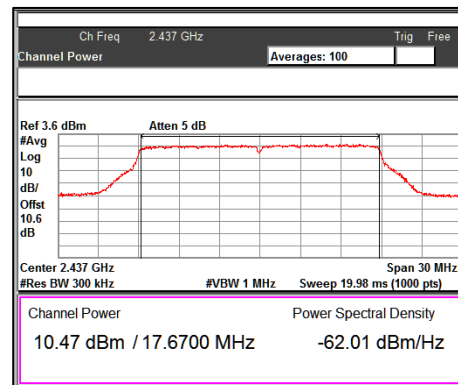
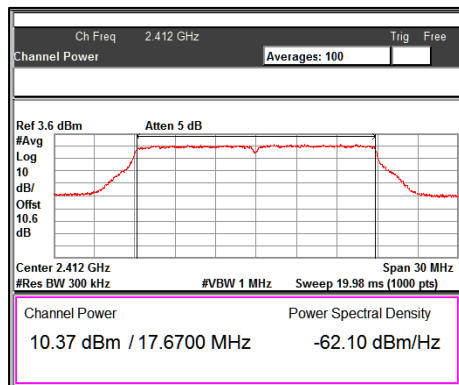


Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 27 von 76
Page 27 of 76

Data rate: n-mode 20MHz→MCS7



Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 28 von 76
Page 28 of 76

axmode: 20MHz

Data rate (Mbps)	Channel Frequency (MHz)	Measured Average Power at Chain1 (dBm)	Measured Average Power at Chain2 (dBm)	Duty cycle correction factor (dB)	Final Average power (dBm)	Power Limit (dBm)
MCS0	2412	11.96	12.90	0.66	16.13	30.00
	2437	11.74	13.04	0.66	16.11	30.00
	2462	12.18	13.63	0.66	16.64	30.00
MCS9	2412	9.63	10.78	0.36	13.61	30.00
	2437	9.61	10.80	0.36	13.62	30.00
	2462	9.76	11.10	0.36	13.85	30.00

***Note:**

Duty Cycle Correction Factor Calculation

$10 \cdot \log(1/X)$ Where X is Duty Cycle is considered in below results

Duty cycle correction Factor is considered in Final Average Power

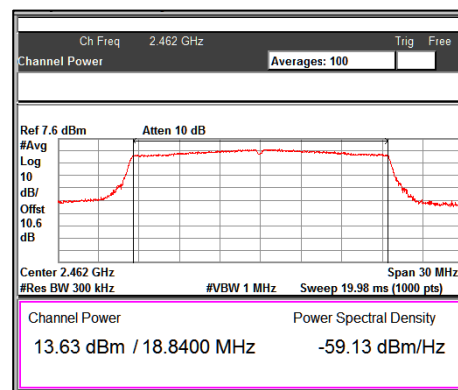
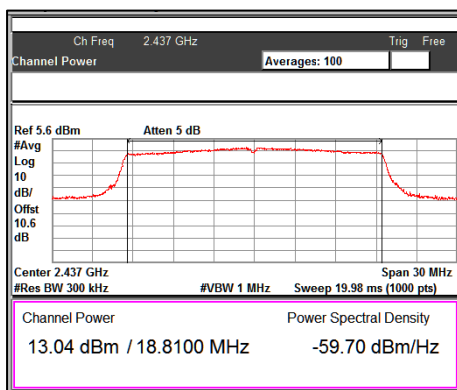
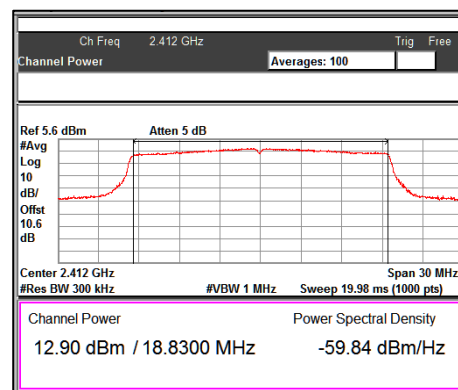
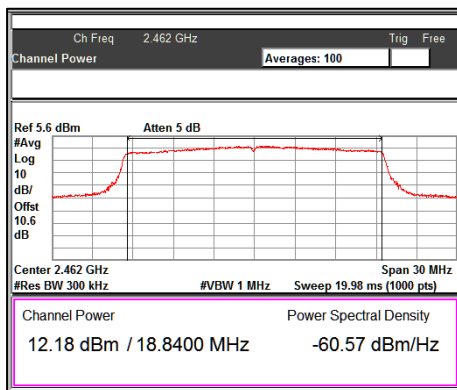
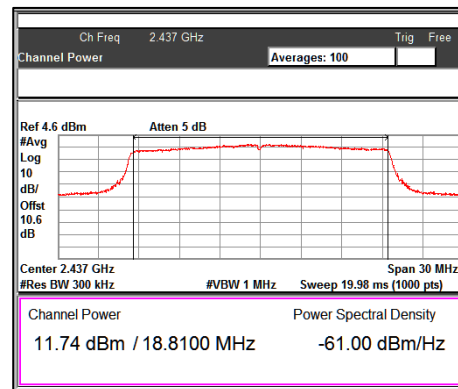
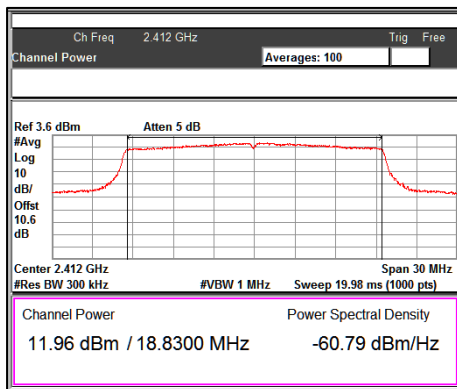
Total Average power (dBm): $10 \cdot \log\{10^{(\text{Ant0 of avg power}/10)} + 10^{(\text{Ant1 of avg power}/10)}\}$

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 29 von 76
Page 29 of 76

Data rate: axmode→ MCS0

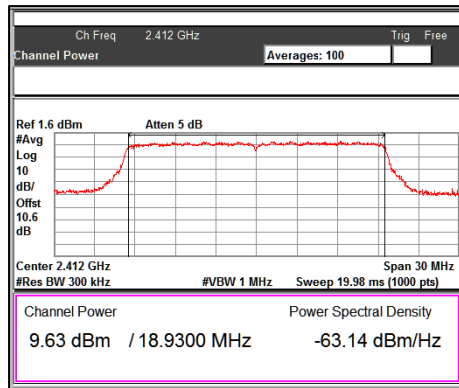


Prüfbericht - Nr.:
Test Report No.:

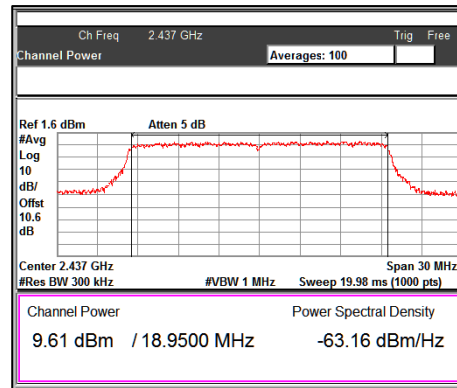
ULR-TC568822300000062F

Seite 30 von 76
Page 30 of 76

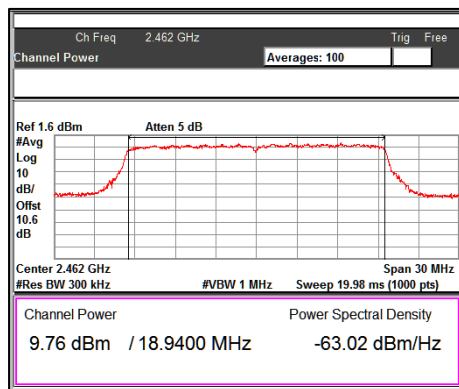
Data rate: axmode→ MCS9



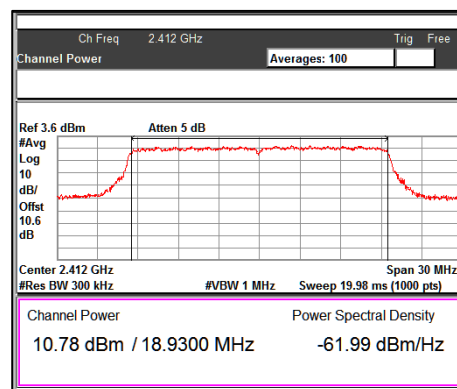
Channel frequency:2412MHz@Chain1



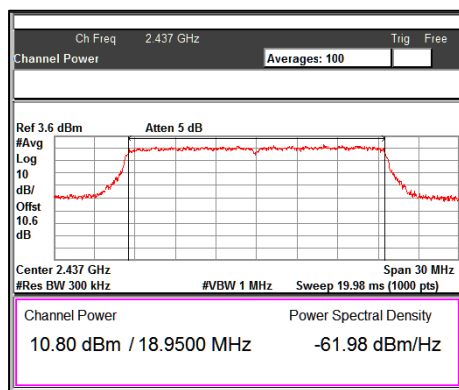
Channel frequency:2437MHz@Chain1



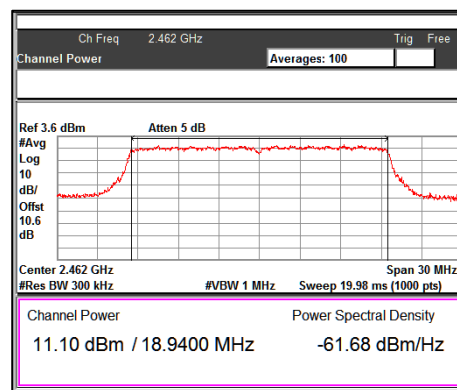
Channel frequency:2462MHz@Chain1



Channel frequency:2412MHz@Chain2



Channel frequency:2437MHz@Chain2



Channel frequency:2462MHz@Chain2

7.2 Spurious Radiated Emissions & Restricted Bands of Operation

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (d) / (15.209 & 15.205)
Test Method	ANSI C63.10.2013
Measurement Location	Semi Anechoic Chamber 30MHz - 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 Clause 7 TEST METHODOLOGY

Table 7: 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	54.00	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 69.54.00 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) = + 22.5 °C Voltage = 12VDC through AC/DC Adapter Relative humidity = 62 %

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 32 von 76
Page 32 of 76

Test results:

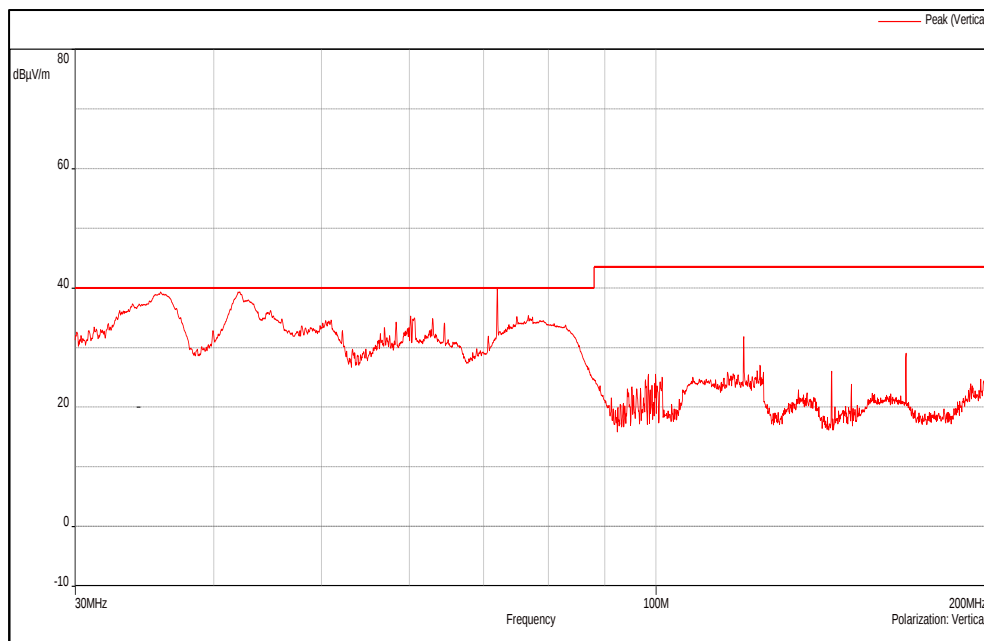
Note: All the losses are included during measurement and final values are mentioned in the test report. Refer Clause 7 TEST METHODOLOGY for more details

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

Test results for frequency range 30MHz – 1GHz

Antenna Polarization	Measured Frequency (MHz)	Measured Quasi Peak value (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Vertical	36.408	37.18	40.00	-2.82
	42.282	36.94	40.00	-3.06
	71.976	36.78	40.00	-3.22
	287.462	28.99	46.00	-17.01
	288.206	26.71	46.00	-19.29
	290.702	28.23	46.00	-17.77
	399.992	41.73	46.00	-4.27
	900.008	39.54	46.00	-6.46
Horizontal	78.564	32.93	40.00	-7.07
	287.618	35.33	46.00	-10.67
	291.134	32.65	46.00	-13.35
	296.102	34.54	46.00	-11.46
	399.956	42.21	46.00	-3.79
	528.014	33.67	46.00	-12.33
	599.978	39.16	46.00	-6.84
	899.966	44.48	46.00	-1.52



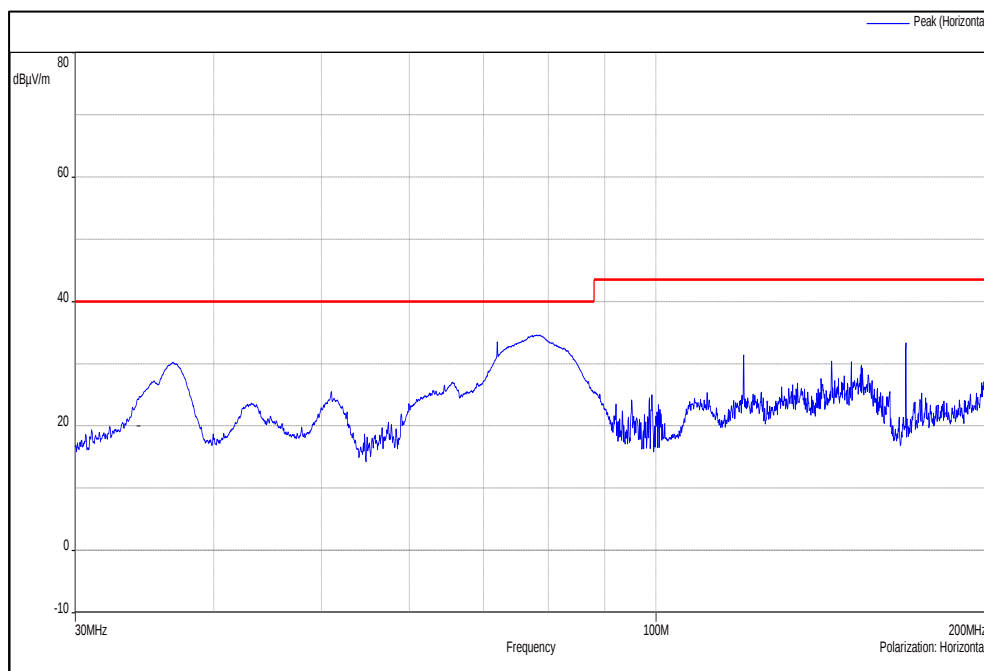
Channel Frequency 30MHz – 200MHz

Polarization Vertical

Prüfbericht - Nr.:
Test Report No.:

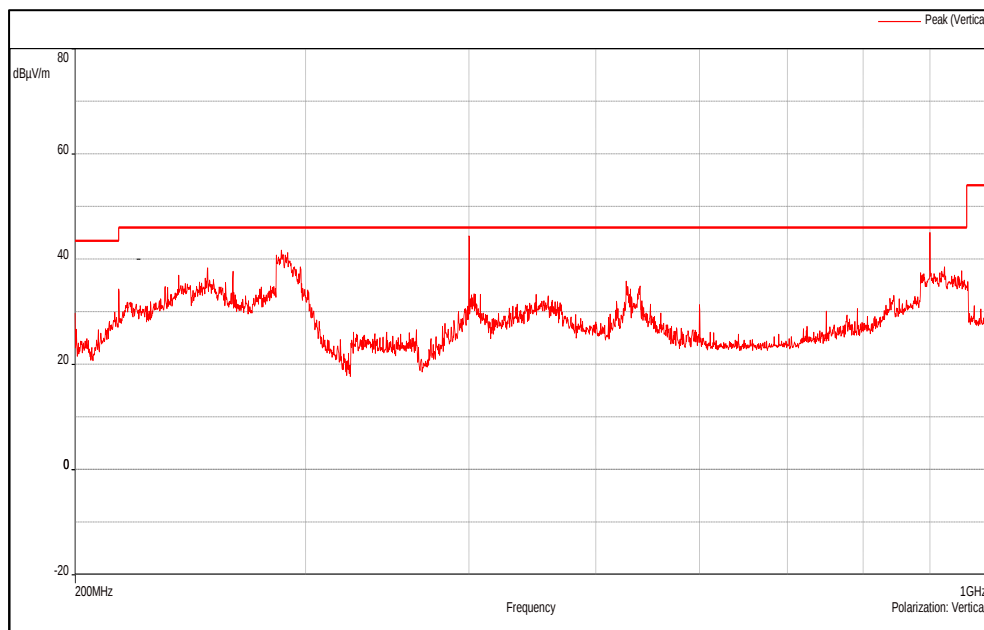
ULR-TC568822300000062F

Seite 33 von 76
Page 33 of 76



Channel Frequency 30MHz – 200MHz

Polarization Horizontal



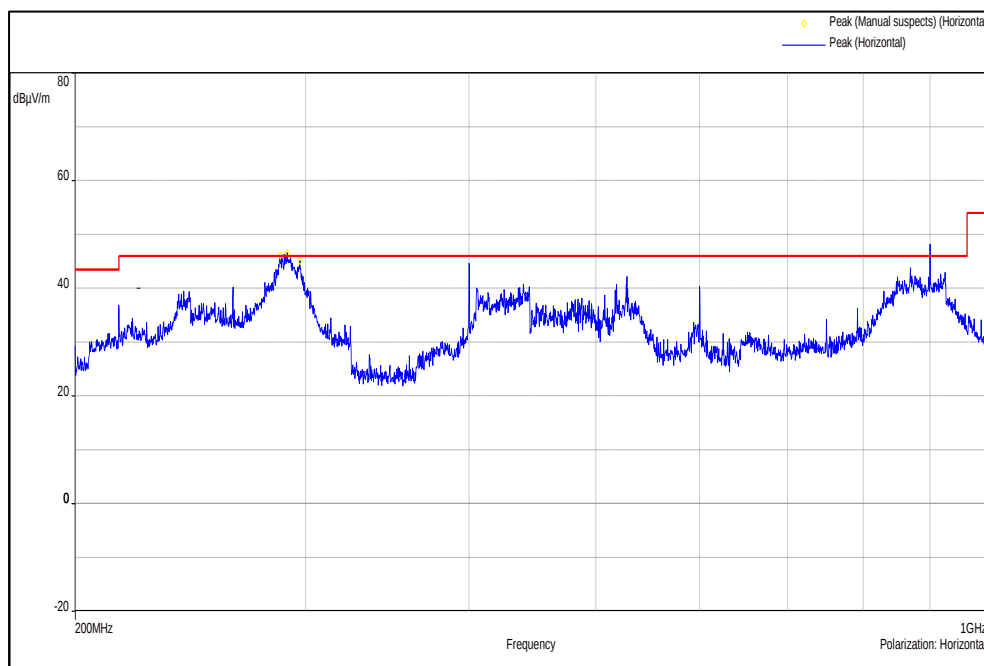
Channel Frequency 200MHz – 1GHz

Polarization Vertical

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 34 von 76
Page 34 of 76



Channel Frequency 200MHz – 1GHz

Polarization Horizontal

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 35 von 76
Page 35 of 76

Test results for the frequencies in the range 1 GHz to 26.5 GHz

Modulation: 802.11b

Data Rate: 1Mbps

Channel Frequency (MHz)	Frequency (MHz)	antenna Polarization	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2412	2412(Pk)	Vertical	92.99	-	-
	2412(Av)		89.53	-	-
	2390(Pk)		53.23	74.00*	-20.77
	2390(Av)		27.96	54.00*	-26.04
	4824(Pk)		50.83	74.00	-23.17
	4824(Av)		47.66	54.00	-6.34
	7236(Pk)		47.20	74.00	-26.80
	7236(Av)		36.29	54.00	-17.71
	2412(Pk)	Horizontal	102.81	-	-
	2412(Av)		100.12	-	-
	2390(Pk)		61.20	74.00*	-12.80
	2390(Av)		36.88	54.00*	-17.12
	4824(Pk)		50.07	74.00	-23.93
	4824(Av)		46.38	54.00	-7.62
	7236(Pk)		47.61	74.00	-26.39
	7236(Av)		37.63	54.00	-16.37
2437	2437(Pk)	Vertical	94.02	-	-
	2437(Av)		91.05	-	-
	4874(Pk)		49.40	74.00	-24.60
	4874(Av)		45.65	54.00	-8.35
	7311(Pk)		47.81	74.00	-26.19
	7311(Av)		36.76	54.00	-17.24
	2437(Pk)	Horizontal	99.74	-	-
	2437(Av)		97.12	-	-
	4874(Pk)		49.55	74.00	-24.45
	4874(Av)		45.18	54.00	-8.82
	7311(Pk)		47.02	74.00	-26.98
	7311(Av)		36.41	54.00	-17.59
2462	2462(Pk)	Vertical	92.37	-	-
	2462(Av)		89.28	-	-
	2483.5(Pk)		58.82	74.00*	-15.18
	2483.5(Av)		33.08	54.00*	-20.92
	4924(Pk)		47.59	74.00	-26.41
	4924(Av)		43.18	54.00	-10.82
	7386(Pk)		47.07	74.00	-26.93
	7386(Av)		35.70	54.00	-18.30
	2462(Pk)	Horizontal	103.94	-	-
	2462(Av)		101.15	-	-
	2483.5(Pk)		68.61	74.00*	-5.39
	2483.5(Av)		42.30	54.00*	-11.70
	4924(Pk)		51.54	74.00	-22.46
	4924(Av)		48.90	54.00	-5.10
	7386(Pk)		50.38	74.00	-23.62
	7386(Av)		35.09	54.00	-18.91

* : Indicate restricted band of operation §15.205
Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 36 von 76
Page 36 of 76

Modulation: 802.11b
Data Rate: 11Mbps

Channel Frequency (MHz)	Frequency (MHz)	Antenna Polarization	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2412	2412(Pk)	Vertical	100.00	-	-
	2412(Av)		91.05	-	-
	2390(Pk)		59.07	74.00*	-14.93
	2390(Av)		30.21	54.00*	-23.79
	4824(Pk)		52.27	74.00	-21.73
	4824(Av)		40.41	54.00	-13.59
	7236(Pk)		48.15	74.00	-25.85
	7236(Av)		35.89	54.00	-18.11
	2412(Pk)	Horizontal	104.02	-	-
	2412(Av)		95.28	-	-
	2390(Pk)		66.69	74.00*	-7.31
	2390(Av)		34.28	54.00*	-19.72
	4824(Pk)		56.85	74.00	-17.15
	4824(Av)		45.19	54.00	-8.81
	7236(Pk)		47.66	74.00	-26.34
	7236(Av)		35.72	54.00	-18.28
2437	2437(Pk)	Vertical	100.02	-	-
	2437(Av)		91.13	-	-
	4874(Pk)		49.06	74.00	-24.94
	4874(Av)		37.07	54.00	-16.93
	7311(Pk)		47.99	74.00	-26.01
	7311(Av)		35.24	54.00	-18.76
	2437(Pk)	Horizontal	105.44	-	-
	2437(Av)		96.47	-	-
	4874(Pk)		55.32	74.00	-18.68
	4874(Av)		43.60	54.00	-10.40
	7311(Pk)		47.81	74.00	-26.19
	7311(Av)		35.73	54.00	-18.27
2462	2462(Pk)	Vertical	100.74	-	-
	2462(Av)		91.94	-	-
	2483.5(Pk)		67.61	74.00*	-6.39
	2483.5(Av)		32.92	54.00*	-21.08
	4924(Pk)		49.21	74.00	-24.79
	4924(Av)		36.79	54.00	-17.21
	7386(Pk)		47.74	74.00	-26.26
	7386(Av)		35.74	54.00	-18.26
	2462(Pk)	Horizontal	106.51	-	-
	2462(Av)		97.70	-	-
	2483.5(Pk)		72.35	74.00*	-1.65
	2483.5(Av)		39.08	54.00*	-14.92
	4924(Pk)		52.96	74.00	-21.04
	4924(Av)		41.21	54.00	-12.79
	7386(Pk)		47.98	74.00	-26.02
	7386(Av)		35.70	54.00	-18.30

* : Indicate restricted band of operation §15.205
Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:

Test Report No.:

ULR-TC568822300000062F

Seite 37 von 76

Page 37 of 76

Modulation: 802.11g

Data Rate: 6Mbps

Channel Frequency (MHz)	Frequency (MHz)	Antenna Polarization	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2412	2412(Pk)	Vertical	100.07	-	-
	2412(Av)		90.15	-	-
	2390(Pk)		55.10	74.00*	-18.90
	2390(Av)		36.05	54.00*	-17.95
	4824(Pk)		49.32	74.00	-24.68
	4824(Av)		36.12	54.00	-17.88
	7236(Pk)		49.38	74.00	-24.62
	7236(Av)		36.27	54.00	-17.73
	2412(Pk)	Horizontal	106.42	-	-
	2412(Av)		96.36	-	-
	2390(Pk)		68.25	74.00*	-5.75
	2390(Av)		47.78	54.00*	-6.22
	4824(Pk)		55.49	74.00	-18.51
	4824(Av)		42.55	54.00	-11.45
	7236(Pk)		50.52	74.00	-23.48
	7236(Av)		36.95	54.00	-17.05
2437	2437(Pk)	Vertical	97.41	-	-
	2437(Av)		88.21	-	-
	4874(Pk)		48.59	74.00	-25.41
	4874(Av)		34.22	54.00	-19.78
	7311(Pk)		46.86	74.00	-27.14
	7311(Av)		35.54	54.00	-18.46
	2437(Pk)	Horizontal	106.23	-	-
	2437(Av)		96.16	-	-
	4874(Pk)		44.09	74.00	-29.91
	4874(Av)		31.55	54.00	-22.45
	7311(Pk)		46.78	74.00	-27.22
	7311(Av)		34.87	54.00	-19.13
2462	2462(Pk)	Vertical	99.53	-	-
	2462(Av)		90.10	-	-
	2483.5(Pk)		60.60	74.00*	-13.40
	2483.5(Av)		40.12	54.00*	-13.88
	4924(Pk)		48.75	74.00	-25.25
	4924(Av)		34.53	54.00	-19.47
	7386(Pk)		47.92	74.00	-26.08
	7386(Av)		35.75	54.00	-18.25
	2462(Pk)	Horizontal	107.20	-	-
	2462(Av)		97.00	-	-
	2483.5(Pk)		69.74	74.00*	-4.26
	2483.5(Av)		46.57	54.00*	-7.43
	4924(Pk)		53.28	74.00	-20.72
	4924(Av)		40.02	54.00	-13.98
	7386(Pk)		49.10	74.00	-24.90
	7386(Av)		36.44	54.00	-17.56

* : Indicate restricted band of operation §15.205

Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:

Test Report No.:

ULR-TC568822300000062F

Seite 38 von 76

Page 38 of 76

Modulation: 802.11g

Data Rate: 24Mbps

Channel Frequency (MHz)	Frequency (MHz)	Antenna Polarization	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2412	2412(Pk)	Vertical	97.66	-	-
	2412(Av)		86.76	-	-
	2390(Pk)		56.64	74.00*	-17.36
	2390(Av)		38.84	54.00*	-15.16
	4824(Pk)		47.42	74	-26.58
	4824(Av)		35.10	54	-18.90
	7236(Pk)		46.51	74	-27.49
	7236(Av)		35.02	54	-18.98
	2412(Pk)	Horizontal	105.84	-	-
	2412(Av)		95.11	-	-
	2390(Pk)		68.73	74.00*	-5.27
	2390(Av)		49.78	54.00*	-4.22
	4824(Pk)		48.31	74	-25.69
	4824(Av)		35.18	54	-18.82
	7236(Pk)		46.60	74	-27.40
	7236(Av)		35.14	54	-18.86
2437	2437(Pk)	Vertical	99.09	-	-
	2437(Av)		87.73	-	-
	4874(Pk)		47.25	74	-26.75
	4874(Av)		34.50	54	-19.50
	7311(Pk)		49.67	74	-24.33
	7311(Av)		36.25	54	-17.75
	2437(Pk)	Horizontal	103.62	-	-
	2437(Av)		93.03	-	-
	4874(Pk)		51.26	74	-22.74
	4874(Av)		40.22	54	-13.78
	7311(Pk)		47.93	74	-26.07
	7311(Av)		35.13	54	-18.87
2462	2462(Pk)	Vertical	100.10	-	-
	2462(Av)		89.36	-	-
	2483.5(Pk)		56.25	74.00*	-17.75
	2483.5(Av)		38.10	54.00*	-15.90
	4924(Pk)		48.46	74	-25.54
	4924(Av)		34.51	54	-19.49
	7386(Pk)		47.87	74	-26.13
	7386(Av)		35.65	54	-18.35
	2462(Pk)	Horizontal	107.78	-	-
	2462(Av)		96.82	-	-
	2483.5(Pk)		69.30	74.00*	-4.70
	2483.5(Av)		48.99	54.00*	-5.01
	4924(Pk)		49.79	74	-24.21
	4924(Av)		37.47	54	-16.53
	7386(Pk)		47.60	74	-26.40
	7386(Av)		35.21	54	-18.79

* : Indicate restricted band of operation §15.205

Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:

Test Report No.:

ULR-TC568822300000062F

Seite 39 von 76

Page 39 of 76

Modulation: 802.11g

Data Rate: 54Mbps

Channel Frequency (MHz)	Frequency (MHz)	Antenna Polarization	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2412	2412(Pk)	Vertical	99.39	-	-
	2412(Av)		87.45	-	-
	2390(Pk)		56.15	74.00*	-17.85
	2390(Av)		36.77	54.00*	-17.23
	4824(Pk)		47.30	74.00	-26.70
	4824(Av)		35.36	54.00	-18.64
	7236(Pk)		48.24	74.00	-25.76
	7236(Av)		36.42	54.00	-17.58
	2412(Pk)	Horizontal	106.67	-	-
	2412(Av)		95.07	-	-
	2390(Pk)		67.75	74.00*	-6.25
	2390(Av)		48.30	54.00*	-5.70
	4824(Pk)		53.29	74.00	-20.71
	4824(Av)		40.79	54.00	-13.21
	7236(Pk)		49.10	74.00	-24.90
	7236(Av)		36.24	54.00	-17.76
2437	2437(Pk)	Vertical	100.92	-	-
	2437(Av)		88.82	-	-
	4874(Pk)		46.58	74.00	-27.42
	4874(Av)		34.31	54.00	-19.69
	7311(Pk)		47.25	74.00	-26.75
	7311(Av)		35.19	54.00	-18.81
	2437(Pk)	Horizontal	106.03	-	-
	2437(Av)		95.11	-	-
	4874(Pk)		52.75	74.00	-21.25
	4874(Av)		39.56	54.00	-14.44
	7311(Pk)		46.57	74.00	-27.43
	7311(Av)		35.27	54.00	-18.73
2462	2462(Pk)	Vertical	102.76	-	-
	2462(Av)		90.92	-	-
	2483.5(Pk)		60.94	74.00*	-13.06
	2483.5(Av)		41.99	54.00*	-12.01
	4924(Pk)		46.99	74.00	-27.01
	4924(Av)		34.13	54.00	-19.87
	7386(Pk)		47.75	74.00	-26.25
	7386(Av)		35.53	54.00	-18.47
	2462(Pk)	Horizontal	107.39	-	-
	2462(Av)		96.15	-	-
	2483.5(Pk)		69.74	74.00*	-4.26
	2483.5(Av)		48.46	54.00*	-5.54
	4924(Pk)		51.71	74.00	-22.29
	4924(Av)		38.95	54.00	-15.05
	7386(Pk)		48.31	74.00	-25.69
	7386(Av)		35.38	54.00	-18.62

* : Indicate restricted band of operation §15.205

Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:

Test Report No.:

ULR-TC568822300000062F

Seite 40 von 76

Page 40 of 76

Modulation: 802.11n_HT20

Data Rate: MCS0

Channel Frequency (MHz)	Frequency (MHz)	Antenna Polarization	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2412	2412(Pk)	Vertical	97.73	-	-
	2412(Av)		87.84	-	-
	2390(Pk)		59.27	74.00*	-14.73
	2390(Av)		39.48	54.00*	-14.52
	4824(Pk)		49.93	74.00	-24.07
	4824(Av)		36.08	54.00	-17.92
	7236(Pk)		49.28	74.00	-24.72
	7236(Av)		36.24	54.00	-17.76
	2412(Pk)	Horizontal	106.92	-	-
	2412(Av)		96.13	-	-
	2390(Pk)		65.73	74.00*	-8.27
	2390(Av)		45.67	54.00*	-8.33
	4824(Pk)		56.47	74.00	-17.53
	4824(Av)		43.11	54.00	-10.89
	7236(Pk)		48.61	74.00	-25.39
	7236(Av)		36.27	54.00	-17.73
2437	2437(Pk)	Vertical	99.23	-	-
	2437(Av)		89.28	-	-
	4874(Pk)		48.39	74.00	-25.61
	4874(Av)		35.26	54.00	-18.74
	7311(Pk)		47.93	74.00	-26.07
	7311(Av)		35.72	54.00	-18.28
	2437(Pk)	Horizontal	105.47	-	-
	2437(Av)		95.27	-	-
	4874(Pk)		54.16	74.00	-19.84
	4874(Av)		40.93	54.00	-13.07
	7311(Pk)		47.60	74.00	-26.40
	7311(Av)		35.33	54.00	-18.67
2462	2462(Pk)	Vertical	98.01	-	-
	2462(Av)		87.94	-	-
	2483.5(Pk)		59.06	74.00*	-14.94
	2483.5(Av)		37.56	54.00*	-16.44
	4924(Pk)		46.58	74.00	-27.42
	4924(Av)		32.32	54.00	-21.68
	7386(Pk)		48.31	74.00	-25.69
	7386(Av)		35.82	54.00	-18.18
	2462(Pk)	Horizontal	103.50	-	-
	2462(Av)		93.06	-	-
	2483.5(Pk)		67.31	74.00*	-6.69
	2483.5(Av)		43.61	54.00*	-10.39
	4924(Pk)		50.42	74.00	-23.58
	4924(Av)		37.35	54.00	-16.65
	7386(Pk)		48.40	74.00	-25.60
	7386(Av)		35.50	54.00	-18.50

* : Indicate restricted band of operation §15.205

Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:

Test Report No.:

ULR-TC568822300000062F

Seite 41 von 76

Page 41 of 76

Modulation: 802.11n_HT20

Data Rate: MCS4

Channel Frequency (MHz)	Frequency (MHz)	Antenna Polarization	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2412	2412(Pk)	Vertical	97.13	-	-
	2412(Av)		84.88	-	-
	2390(Pk)		58.32	74.00*	-15.68
	2390(Av)		40.39	54.00*	-13.61
	4824(Pk)		47.70	74.00	-26.30
	4824(Av)		34.25	54.00	-19.75
	7236(Pk)		47.81	74.00	-26.19
	7236(Av)		34.88	54.00	-19.12
	2412(Pk)	Horizontal	105.17	-	-
	2412(Av)		92.76	-	-
	2390(Pk)		65.79	74.00*	-8.21
	2390(Av)		45.75	54.00*	-8.25
	4824(Pk)		51.76	74.00	-22.24
	4824(Av)		38.90	54.00	-15.10
	7236(Pk)		46.98	74.00	-27.02
	7236(Av)		34.74	54.00	-19.26
2437	2437(Pk)	Vertical	98.23	-	-
	2437(Av)		86.17	-	-
	4874(Pk)		46.14	74.00	-27.86
	4874(Av)		33.36	54.00	-20.64
	7311(Pk)		47.03	74.00	-26.97
	7311(Av)		34.69	54.00	-19.31
	2437(Pk)	Horizontal	104.86	-	-
	2437(Av)		92.74	-	-
	4874(Pk)		50.28	74.00	-23.72
	4874(Av)		39.96	54.00	-14.04
	7311(Pk)		47.37	74.00	-26.63
	7311(Av)		34.57	54.00	-19.43
2462	2462(Pk)	Vertical	97.56	-	-
	2462(Av)		85.67	-	-
	2483.5(Pk)		58.74	74.00*	-15.26
	2483.5(Av)		37.87	54.00*	-16.13
	4924(Pk)		46.77	74.00	-27.23
	4924(Av)		33.46	54.00	-20.54
	7386(Pk)		46.90	74.00	-27.10
	7386(Av)		34.60	54.00	-19.40
	2462(Pk)	Horizontal	105.85	-	-
	2462(Av)		94.10	-	-
	2483.5(Pk)		65.46	74.00*	-8.54
	2483.5(Av)		43.92	54.00*	-10.08
	4924(Pk)		51.84	74.00	-22.16
	4924(Av)		38.81	54.00	-15.19
	7386(Pk)		46.56	74.00	-27.44
	7386(Av)		34.67	54.00	-19.33

* : Indicate restricted band of operation §15.205

Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:

Test Report No.:

ULR-TC568822300000062F

Seite 42 von 76

Page 42 of 76

Modulation: 802.11n_HT20

Data Rate: MCS7

Channel Frequency (MHz)	Frequency (MHz)	Antenna Polarization	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2412	2412(Pk)	Vertical	98.63	-	-
	2412(Av)		85.46	-	-
	2390(Pk)		55.66	74.00*	-18.34
	2390(Av)		35.51	54.00*	-18.49
	4824(Pk)		48.21	74.00	-25.79
	4824(Av)		34.71	54.00	-19.29
	7236(Pk)		46.91	74.00	-27.09
	7236(Av)		35.09	54.00	-18.91
	2412(Pk)	Horizontal	106.66	-	-
	2412(Av)		92.62	-	-
	2390(Pk)		68.88	74.00*	-5.12
	2390(Av)		46.55	54.00*	-7.45
	4824(Pk)		53.89	74.00	-20.11
	4824(Av)		39.69	54.00	-14.31
	7236(Pk)		47.51	74.00	-26.49
	7236(Av)		35.53	54.00	-18.47
2437	2437(Pk)	Vertical	98.66	-	-
	2437(Av)		85.56	-	-
	4874(Pk)		46.71	74.00	-27.29
	4874(Av)		32.71	54.00	-21.29
	7311(Pk)		47.24	74.00	-26.76
	7311(Av)		34.75	54.00	-19.25
	2437(Pk)	Horizontal	106.43	-	-
	2437(Av)		92.72	-	-
	4874(Pk)		52.66	74.00	-21.34
	4874(Av)		38.25	54.00	-15.75
	7311(Pk)		47.23	74.00	-26.77
	7311(Av)		34.75	54.00	-19.25
2462	2462(Pk)	Vertical	98.68	-	-
	2462(Av)		85.78	-	-
	2483.5(Pk)		60.10	74.00*	-13.90
	2483.5(Av)		37.83	54.00*	-16.17
	4924(Pk)		47.67	74.00	-26.33
	4924(Av)		33.66	54.00	-20.34
	7386(Pk)		46.57	74.00	-27.43
	7386(Av)		34.73	54.00	-19.27
	2462(Pk)	Horizontal	107.00	-	-
	2462(Av)		93.35	-	-
	2483.5(Pk)		68.08	74.00*	-5.92
	2483.5(Av)		44.32	54.00*	-9.68
	4924(Pk)		50.52	74.00	-23.48
	4924(Av)		36.58	54.00	-17.42
	7386(Pk)		46.85	74.00	-27.15
	7386(Av)		34.62	54.00	-19.38

* : Indicate restricted band of operation §15.205

Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:

Test Report No.:

ULR-TC568822300000062F

Seite 43 von 76

Page 43 of 76

Modulation: 802.11ax-20MHz

Data Rate: MCS0

Channel Frequency (MHz)	Frequency (MHz)	Antenna Polarization	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2412	2412(Pk)	Vertical	100.67	-	-
	2412(Av)		87.39	-	-
	2390(Pk)		57.98	74.00*	-16.02
	2390(Av)		36.94	54.00*	-17.06
	4824(Pk)		48.55	74.00	-25.45
	4824(Av)		35.40	54.00	-18.60
	7236(Pk)		49.45	74.00	-24.55
	7236(Av)		36.11	54.00	-17.89
	2412(Pk)	Horizontal	108.98	-	-
	2412(Av)		95.91	-	-
	2390(Pk)		69.92	74.00*	-4.08
	2390(Av)		49.24	54.00*	-4.76
	4824(Pk)		53.10	74.00	-20.90
	4824(Av)		39.43	54.00	-14.57
	7236(Pk)		47.34	74.00	-26.66
	7236(Av)		34.75	54.00	-19.25
2437	2437(Pk)	Vertical	101.75	-	-
	2437(Av)		88.51	-	-
	4874(Pk)		48.96	74.00	-25.04
	4874(Av)		34.67	54.00	-19.33
	7311(Pk)		47.89	74.00	-26.11
	7311(Av)		35.35	54.00	-18.65
	2437(Pk)	Horizontal	108.44	-	-
	2437(Av)		95.48	-	-
	4874(Pk)		46.02	74.00	-27.98
	4874(Av)		32.20	54.00	-21.80
	7311(Pk)		47.06	74.00	-26.94
	7311(Av)		35.23	54.00	-18.77
2462	2462(Pk)	Vertical	102.84	-	-
	2462(Av)		89.19	-	-
	2483.5(Pk)		64.79	74.00*	-9.21
	2483.5(Av)		41.12	54.00*	-12.88
	4924(Pk)		46.43	74.00	-27.57
	4924(Av)		33.64	54.00	-20.36
	7386(Pk)		49.08	74.00	-24.92
	7386(Av)		36.06	54.00	-17.94
	2462(Pk)	Horizontal	109.60	-	-
	2462(Av)		96.22	-	-
	2483.5(Pk)		71.04	74.00*	-2.96
	2483.5(Av)		45.96	54.00*	-8.04
	4924(Pk)		52.60	74.00	-21.40
	4924(Av)		39.18	54.00	-14.82
	7386(Pk)		47.74	74.00	-26.26
	7386(Av)		34.87	54.00	-19.13

*: Indicate restricted band of operation §15.205

Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 44 von 76
Page 44 of 76

Modulation: 802.11ax-20MHz
Data Rate: MCS9

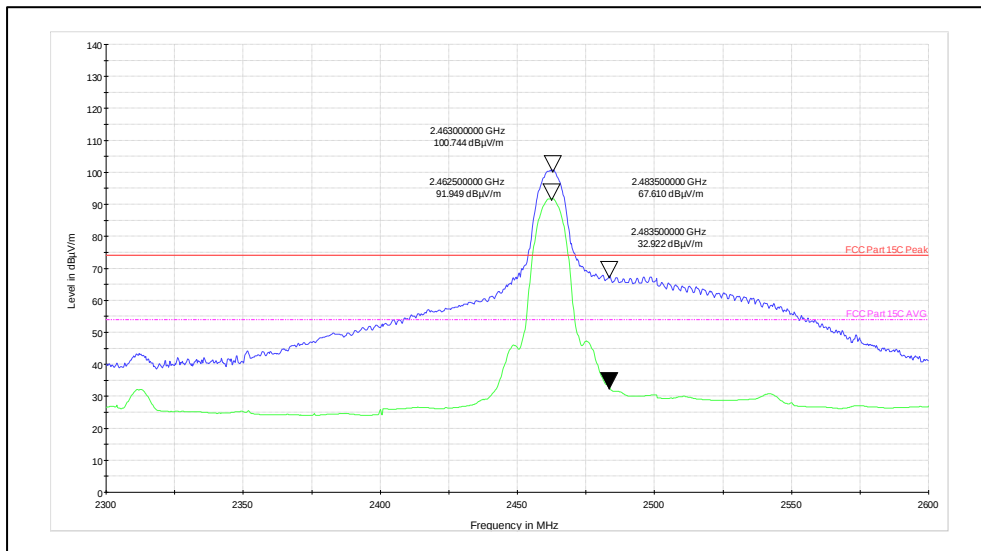
Channel Frequency (MHz)	Frequency (MHz)	Antenna Polarization	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2412	2412(Pk)	Vertical	99.39	-	-
	2412(Av)		82.35	-	-
	2390(Pk)		57.58	74.00	-16.42
	2390(Av)		34.72	54.00	-19.28
	4824(Pk)		48.86	74.00	-25.14
	4824(Av)		33.77	54.00	-20.23
	7236(Pk)		49.01	74.00	-24.99
	7236(Av)		35.20	54.00	-18.80
	2412(Pk)	Horizontal	107.00	-	-
	2412(Av)		91.00	-	-
	2390(Pk)		70.43	74.00	-3.57
	2390(Av)		46.13	54.00	-7.87
	4824(Pk)		52.78	74.00	-21.22
	4824(Av)		37.26	54.00	-16.74
	7236(Pk)		48.98	74.00	-25.02
	7236(Av)		35.35	54.00	-18.65
2437	2437(Pk)	Vertical	98.79	-	-
	2437(Av)		81.79	-	-
	4874(Pk)		46.37	74.00	-27.63
	4874(Av)		32.26	54.00	-21.74
	7311(Pk)		47.78	74.00	-26.22
	7311(Av)		34.98	54.00	-19.02
	2437(Pk)	Horizontal	107.11	-	-
	2437(Av)		90.90	-	-
	4874(Pk)		51.84	74.00	-22.16
	4874(Av)		36.55	54.00	-17.45
	7311(Pk)		47.10	74.00	-26.90
	7311(Av)		35.27	54.00	-18.73
2462	2462(Pk)	Vertical	101.15	-	-
	2462(Av)		84.85	-	-
	2483.5(Pk)		61.11	74.00	-12.89
	2483.5(Av)		37.90	54.00	-16.10
	4924(Pk)		46.84	74.00	-27.16
	4924(Av)		33.11	54.00	-20.89
	7386(Pk)		49.44	74.00	-24.56
	7386(Av)		34.91	54.00	-19.09
	2462(Pk)	Horizontal	107.14	-	-
	2462(Av)		90.74	-	-
	2483.5(Pk)		70.97	74.00	-3.03
	2483.5(Av)		45.76	54.00	-8.24
	4924(Pk)		51.91	74.00	-22.09
	4924(Av)		36.40	54.00	-17.60
	7386(Pk)		46.57	74.00	-27.43
	7386(Av)		34.72	54.00	-19.28

* : Indicate restricted band of operation §15.205
Pk: Peak Detector; Av: Average Detector

Test Plots

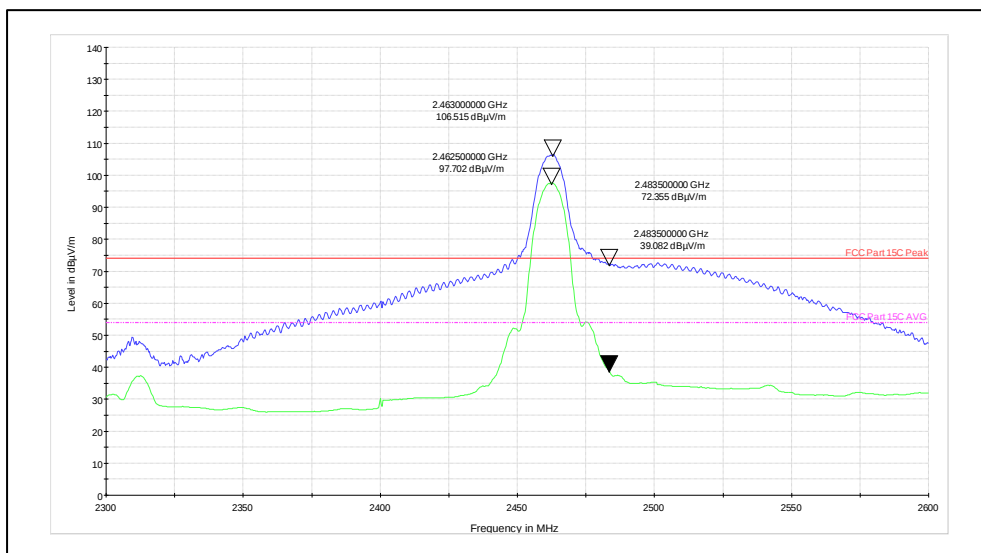
Data Rate: 11Mbps

Channel Frequency 2462MHz



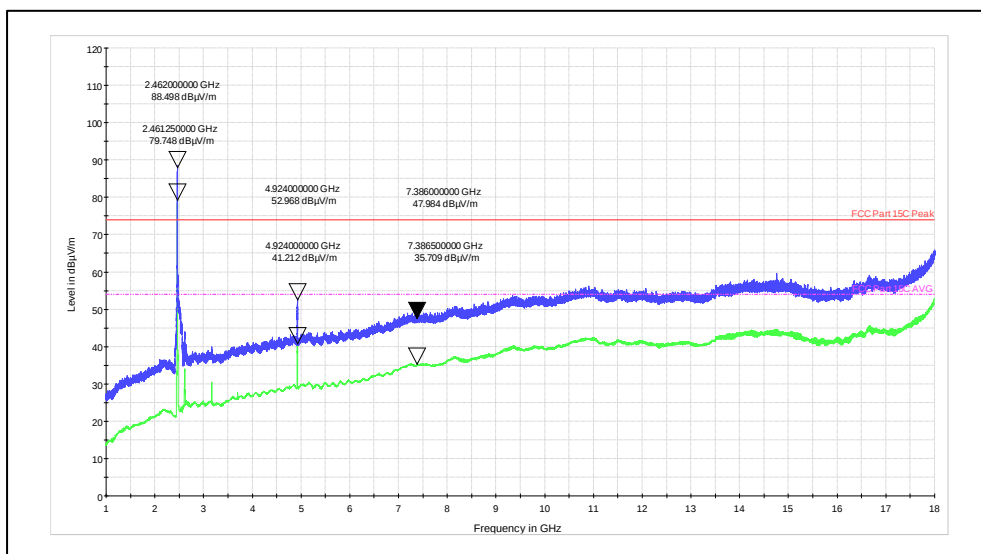
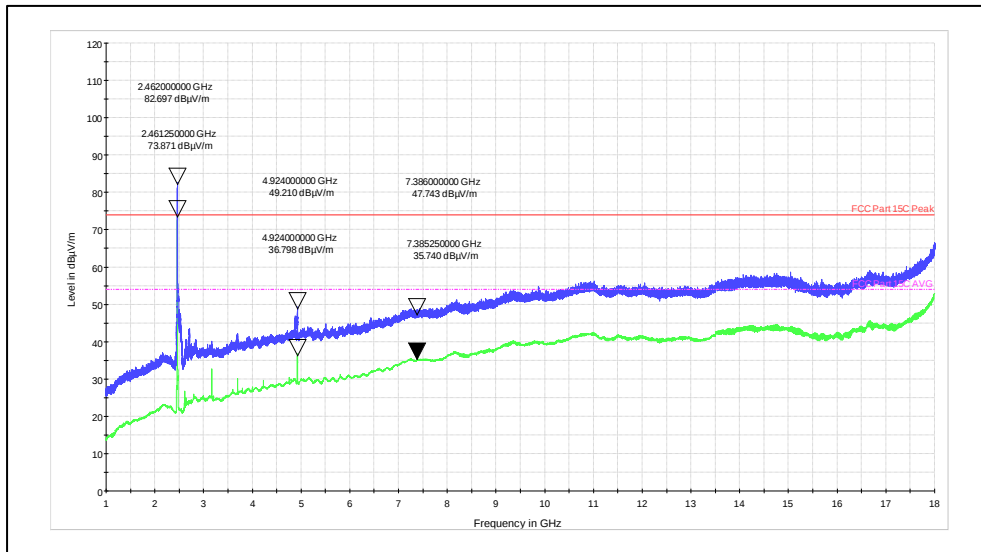
Channel Frequency: 2462MHz

Polarization: Vertical



Channel Frequency: 2462MHz

Polarization: Horizontal



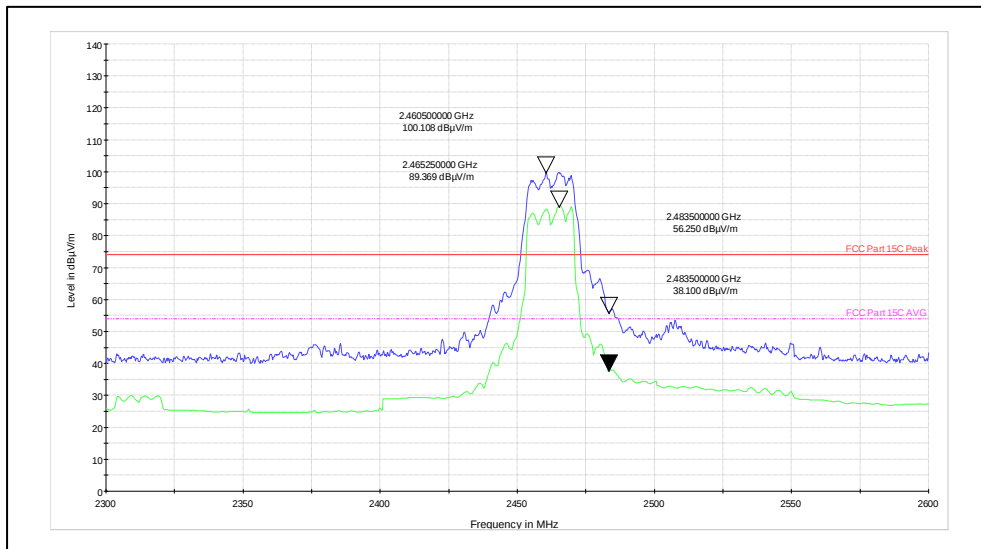
Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 47 von 76
Page 47 of 76

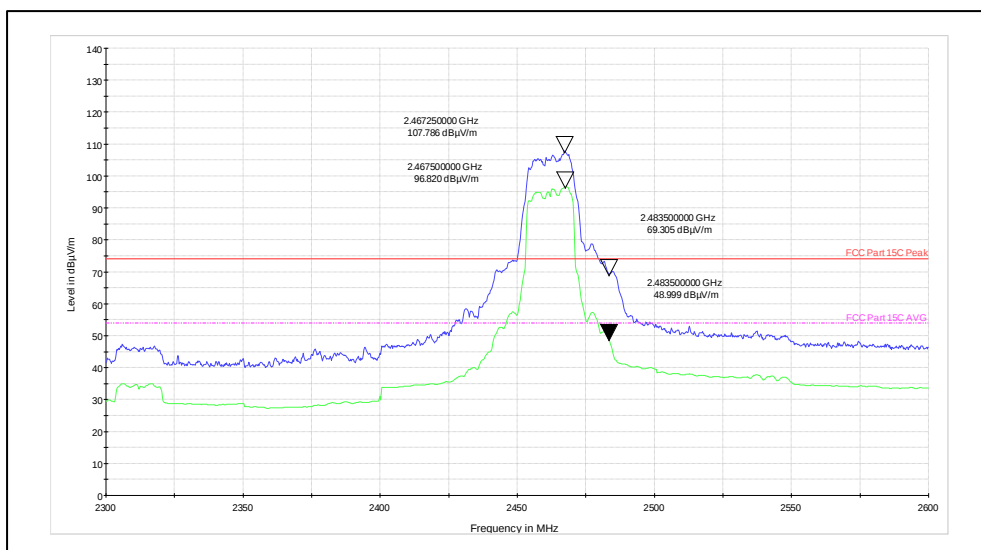
Data Rate: 24Mbps

Channel Frequency 2462MHz



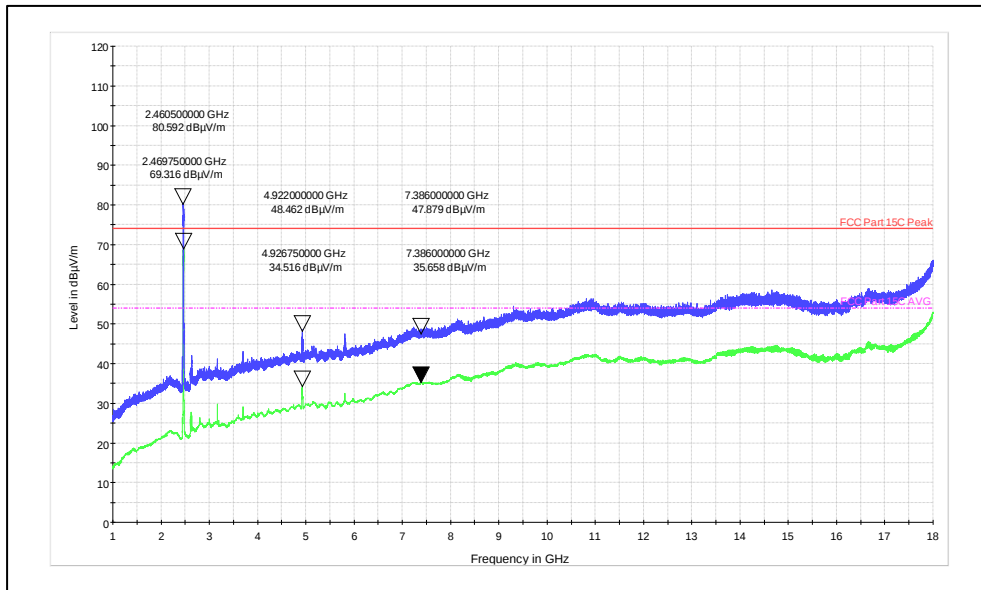
Channel Frequency: 2462MHz

Polarization: Vertical



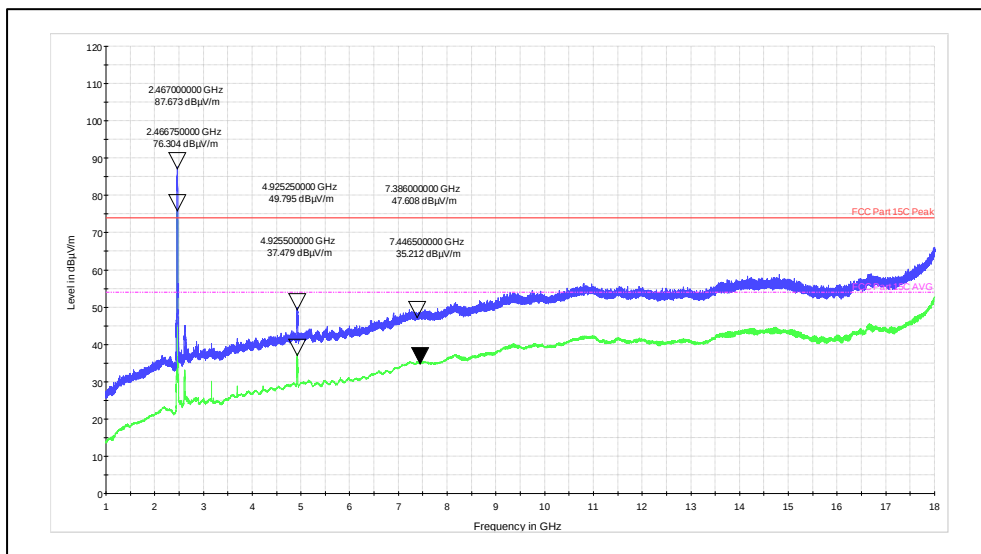
Channel Frequency: 2462MHz

Polarization: Horizontal



Channel Frequency: 1 – 18 GHz

Polarization: Vertical

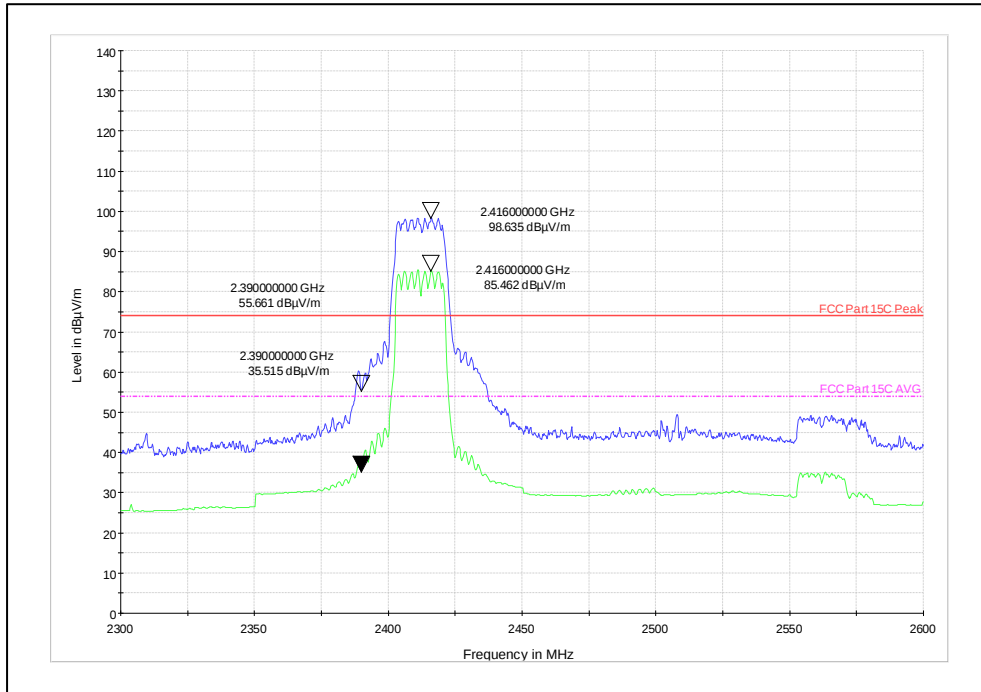


Channel Frequency: 1 – 18GHz

Polarization: Horizontal

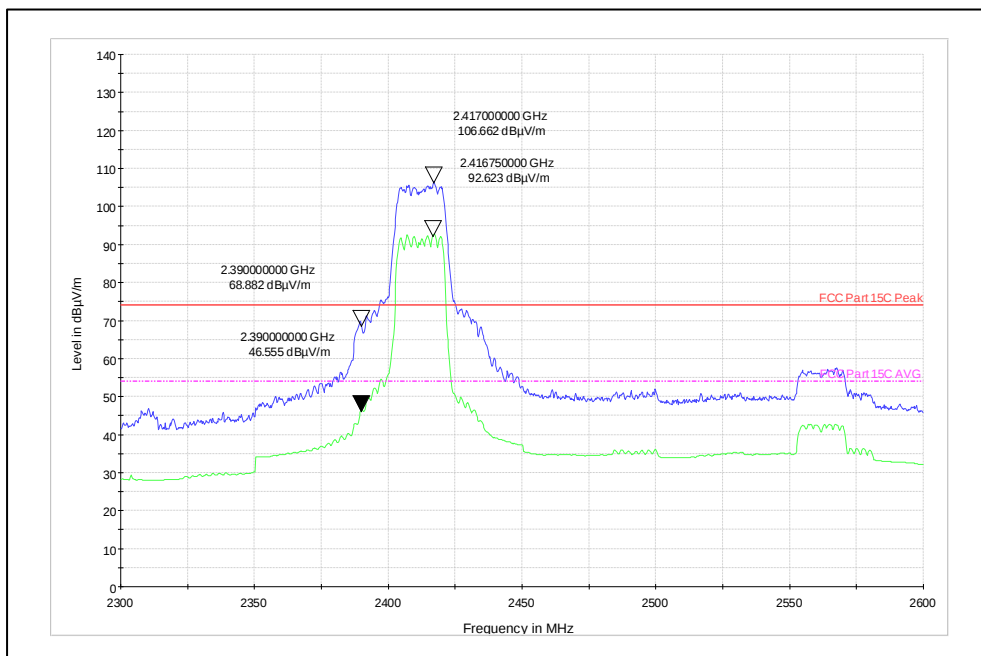
Data Rate: MCS7_n Mode 20MHz

Channel Frequency 2412MHz



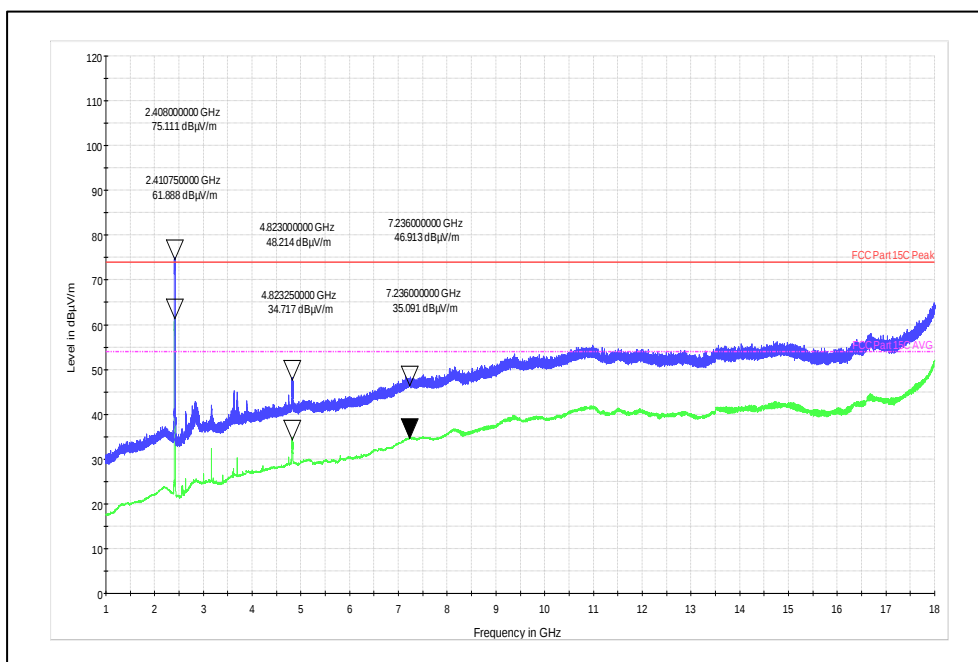
Channel Frequency: 2412MHz

Polarization: Vertical



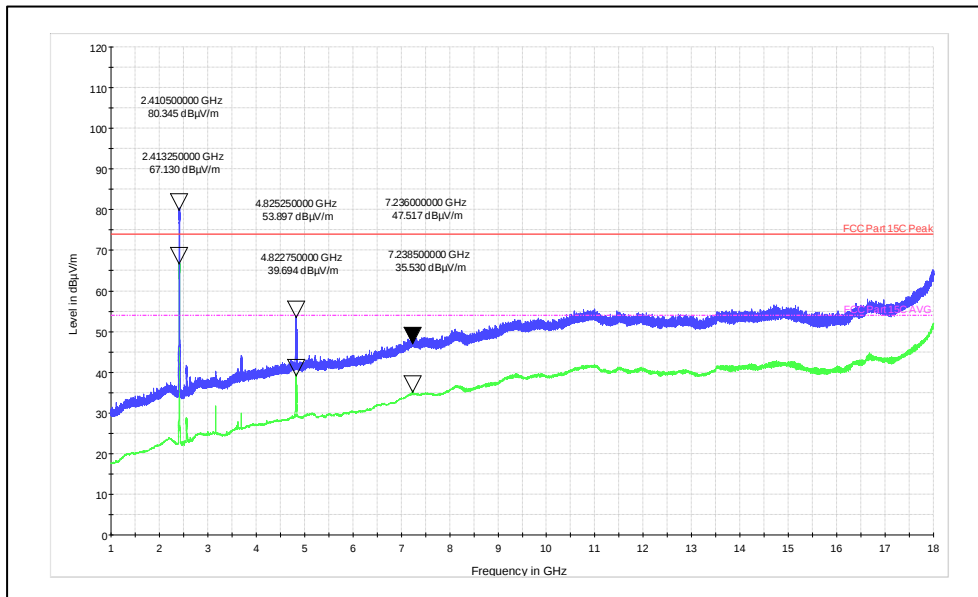
Channel Frequency: 2412MHz

Polarization: Horizontal



Channel Frequency: 1 – 18 GHz

Polarization: Vertical



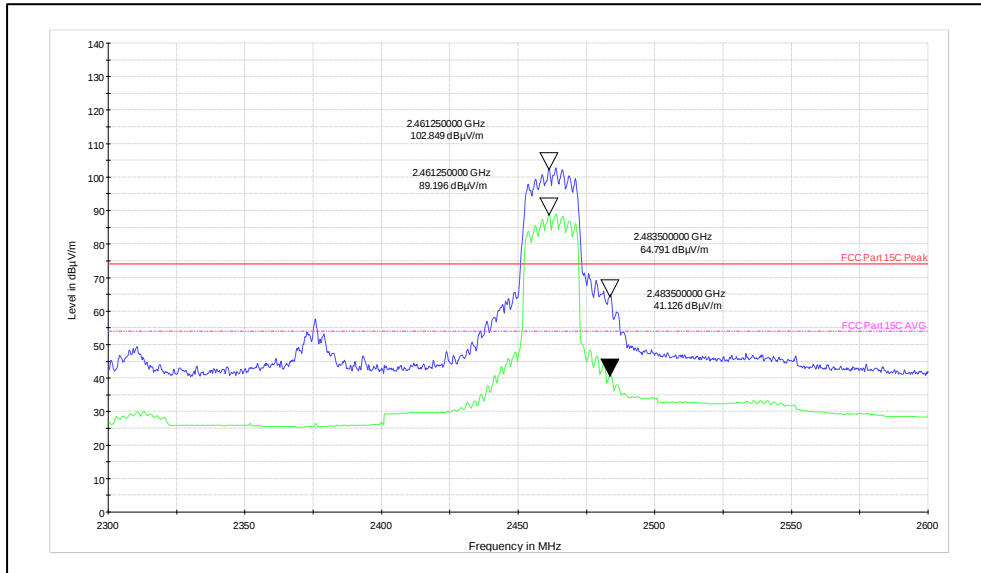
Channel Frequency: 1 – 18 GHz

Polarization: Horizontal

AX-HE20MHz Mode

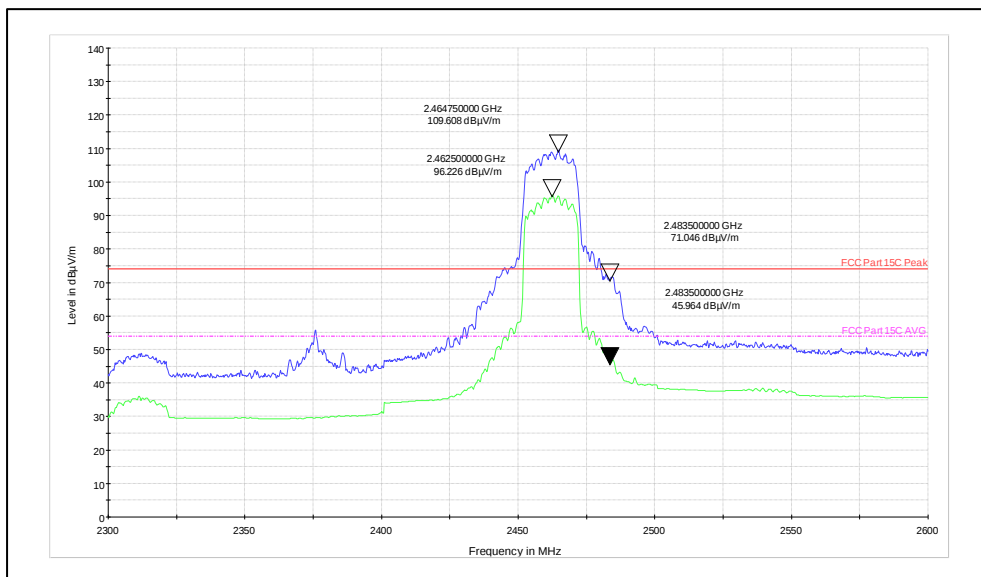
Data rate: MCS0

Channel Frequency 2462MHz



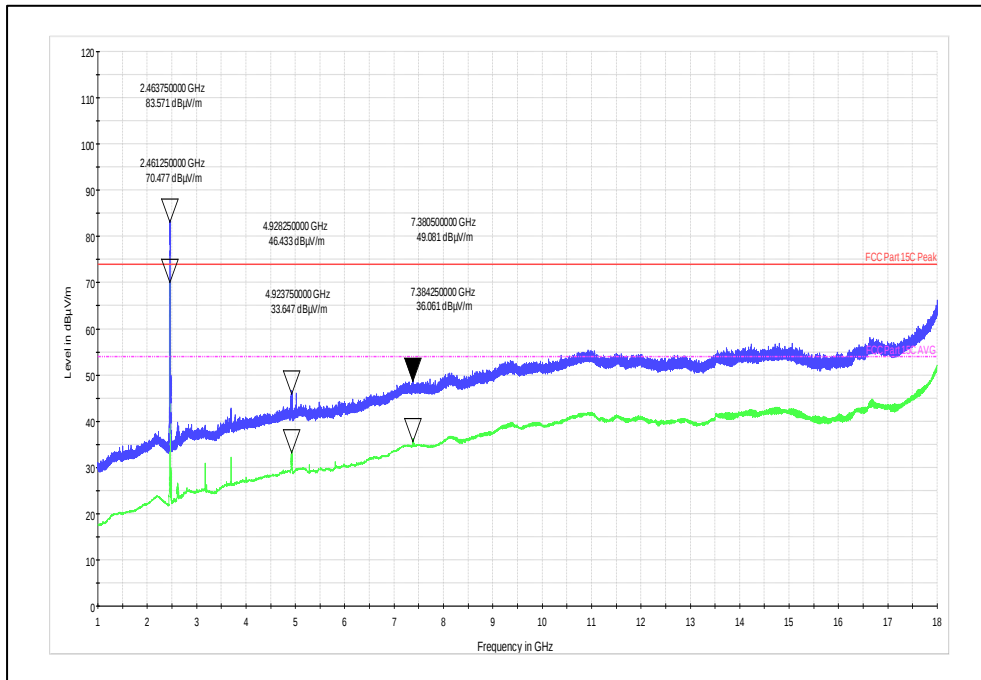
Channel Frequency: 2462MHz

Polarization: Vertical



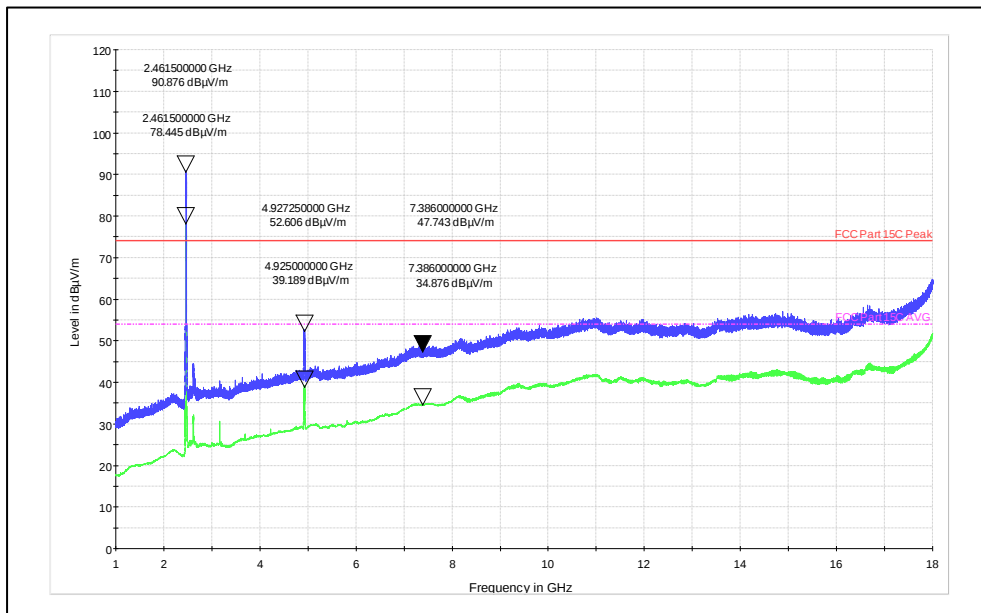
Channel Frequency: 2462MHz

Polarization: Horizontal



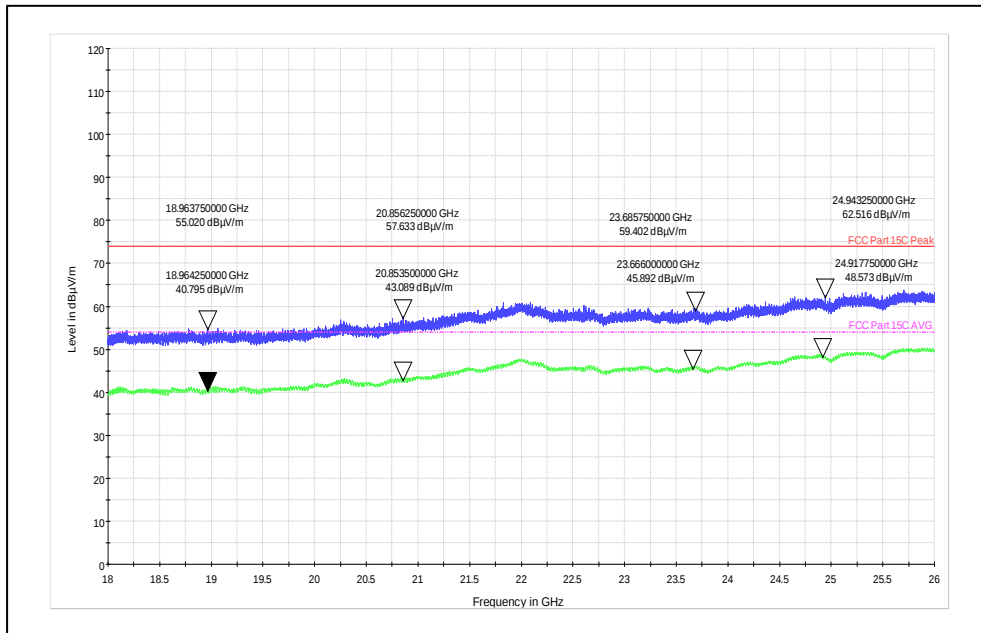
Frequency range: 1 – 18 GHz

Polarization: Vertical



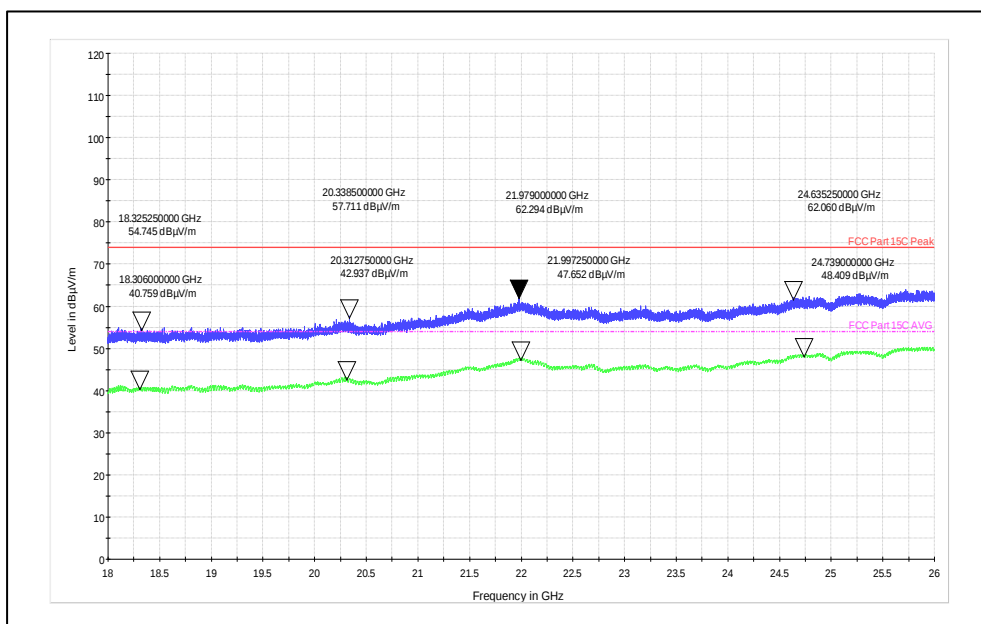
Frequency range: 1 – 18 GHz

Polarization: Horizontal



Frequency range: 18GHz to 26GHz

Polarization: Vertical



Frequency range: 18GHz to 26GHz

Polarization: Horizontal

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 54 von 76
Page 54 of 76

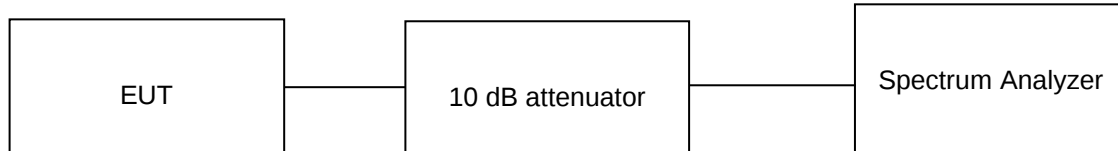
8 TEST RESULTS FOR BLUETOOTH LOW ENERGY

8.1 Maximum Peak Conducted Output Power

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (b)(3)
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) = + 25 °C Voltage = 12VDC through AC/DC Adapter Relative humidity: 62%

KDB Guidelines applied:

Measurements were made as per section 8.3.1 in KDB 558074.00 D01 15.247 Measurement Guidance v05r02.

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

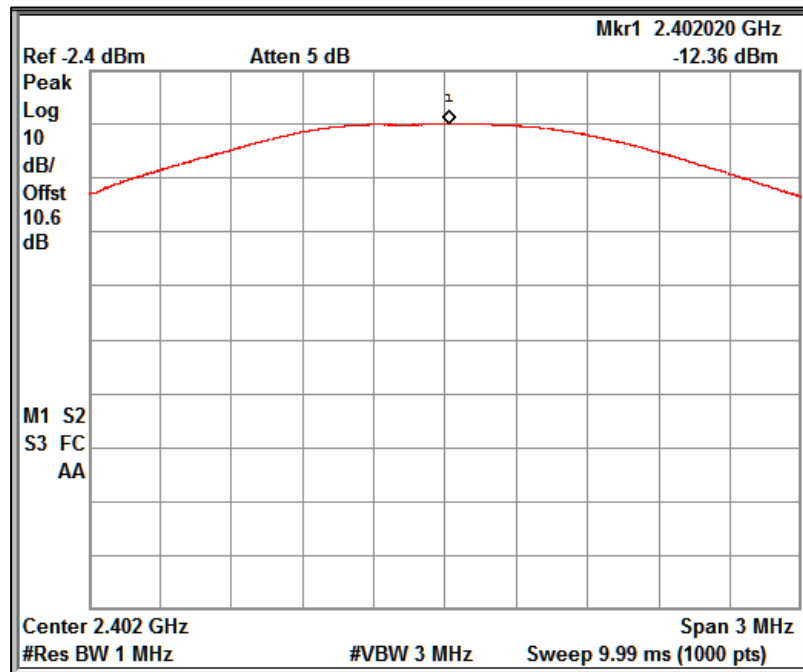
Seite 55 von 76
Page 55 of 76

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 (0.6dB)
3. This product do not support additional beamforming gain / directional gain, it uses signal antenna and hence directional gain of the single antenna is 2.00 dBi

Data Rate	Channel Frequency (MHz)	Measured Peak Power (dBm)	Power Limit (dBm)
1Mbps	2402	-12.36	30.00
	2440	-11.84	30.00
	2480	-12.03	30.00
2Mbps	2402	-12.95	30.00
	2440	-12.55	30.00
	2480	-12.78	30.00



Channel Frequency: 2402MHz

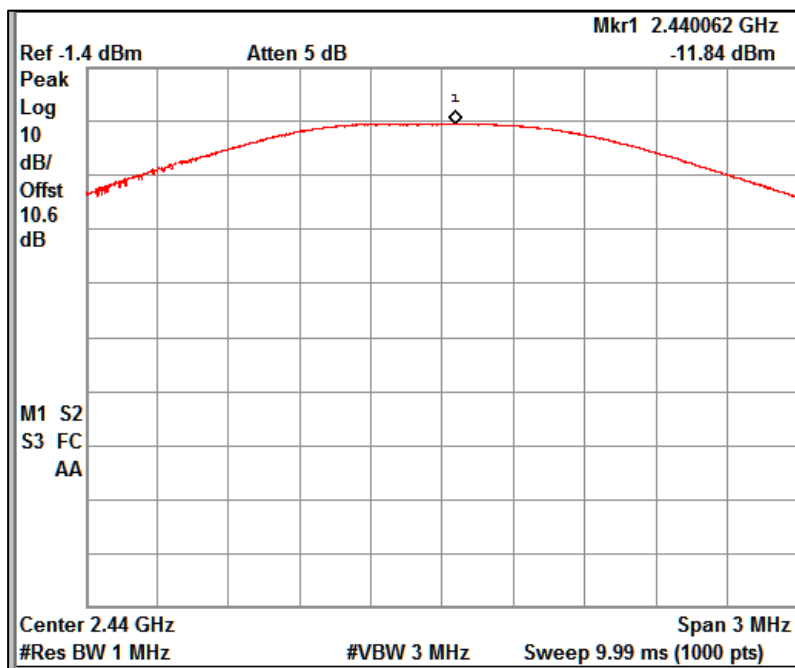
Prüfbericht - Nr.:

Test Report No.:

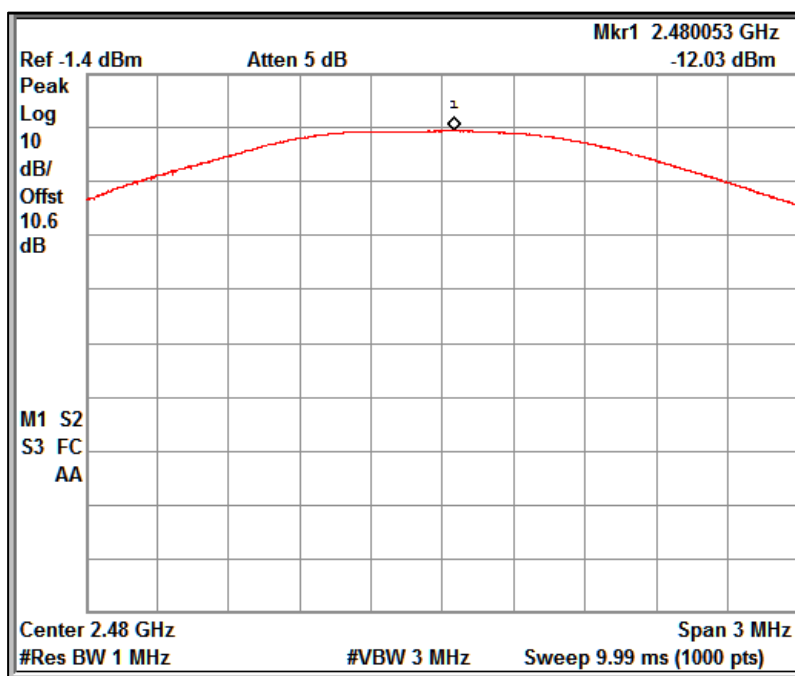
ULR-TC568822300000062F

Seite 56 von 76

Page 56 of 76



Channel Frequency: 2440MHz



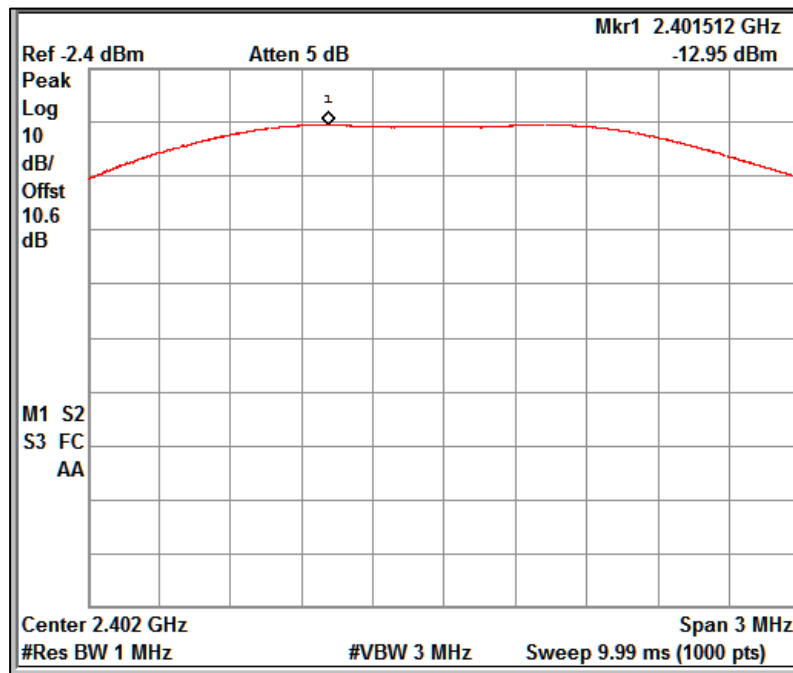
Channel Frequency: 2480MHz

Prüfbericht - Nr.:
Test Report No.:

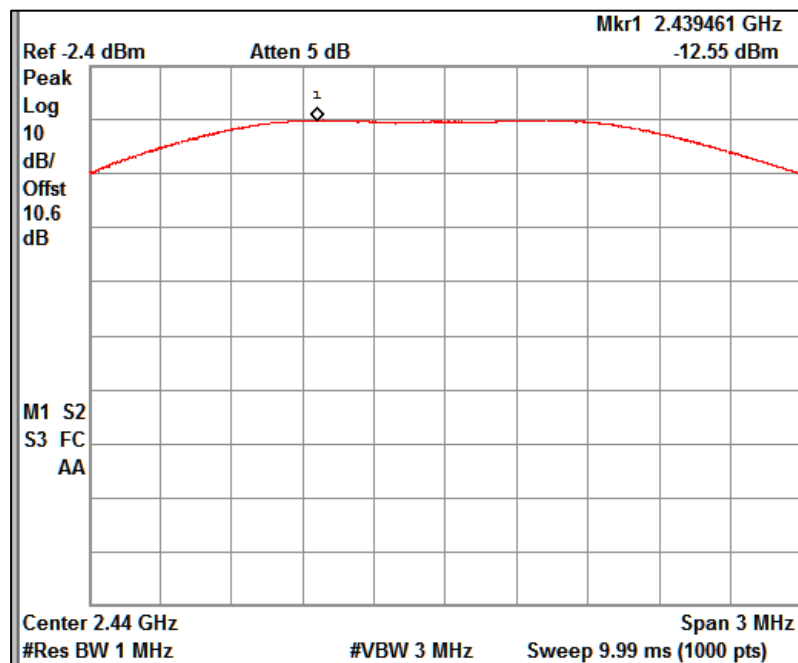
ULR-TC568822300000062F

Seite 57 von 76
Page 57 of 76

Data Rate: 2Mbps



Channel Frequency: 2402MHz



Channel Frequency: 2440MHz

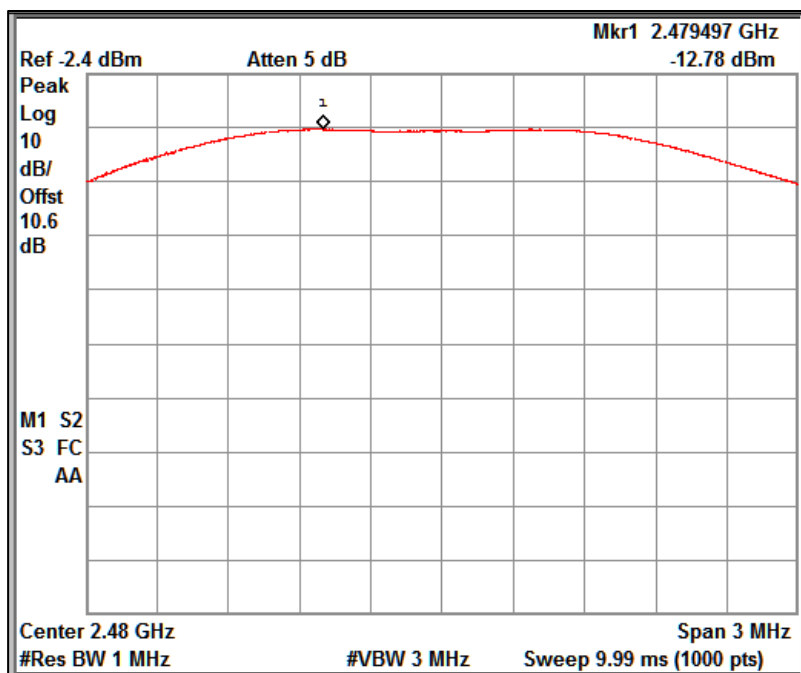
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568822300000062F

Seite 58 von 76

Page 58 of 76



Channel Frequency: 2480MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 59 von 76
Page 59 of 76

8.2 Spurious Radiated Emissions & Restricted Bands of Operation

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (d) / (15.209 & 15.205)
Test Method	ANSI C63.10.2013
Measurement Location	Semi Anechoic Chamber 30MHz - 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 8: 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	29.54.00	30*
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.00.0	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 69.54.00 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) = + 22.6 °C Voltage = 12VDC through AC/DC Adaptor Relative humidity = 62 %

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 60 von 76
Page 60 of 76

Test results:

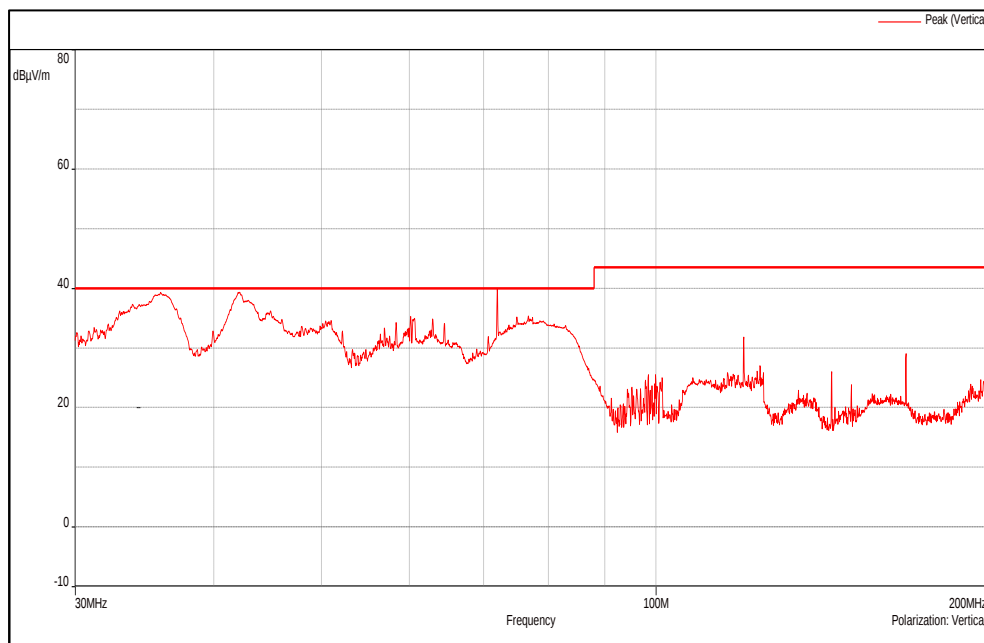
Note: All the losses are included during measurement and final values are mentioned in the test report. Refer TEST METHODOLOGY for more details

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

Test results for frequency range 30MHz – 1GHz

Antenna Polarization	Measured Frequency (MHz)	Measured Quasi peak value (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Vertical	36.408	37.18	40.00	-2.82
	42.282	36.94	40.00	-3.06
	71.976	36.78	40.00	-3.22
	287.462	28.99	46.00	-17.01
	288.206	26.71	46.00	-19.29
	290.702	28.23	46.00	-17.77
	399.992	41.73	46.00	-4.27
	900.008	39.54	46.00	-6.46
Horizontal	78.564	32.93	40.00	-7.07
	287.618	35.33	46.00	-10.67
	291.134	32.65	46.00	-13.35
	296.102	34.54	46.00	-11.46
	399.956	42.21	46.00	-3.79
	528.014	33.67	46.00	-12.33
	599.978	39.16	46.00	-6.84
	899.966	44.48	46.00	-1.52



Channel Frequency 30MHz – 200MHz

Polarization Vertical

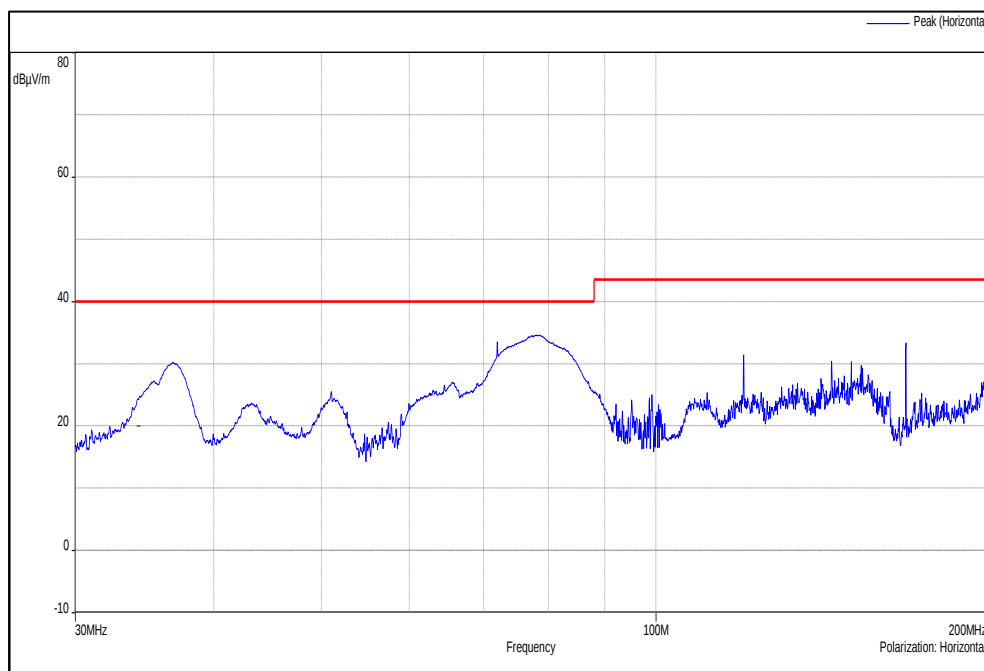
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568822300000062F

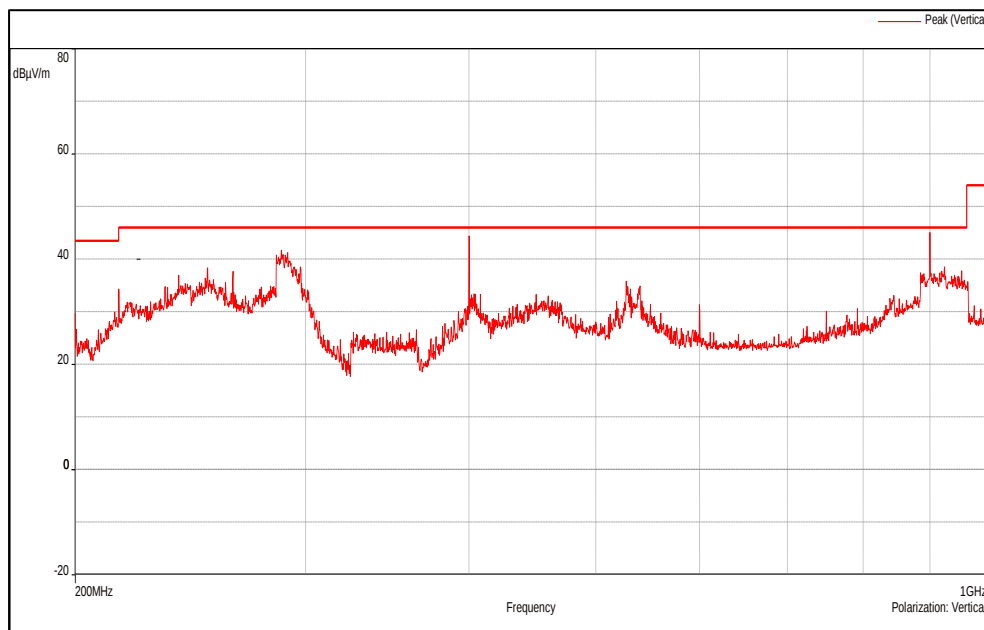
Seite 61 von 76

Page 61 of 76



Channel Frequency 30MHz – 200MHz

Polarization Horizontal



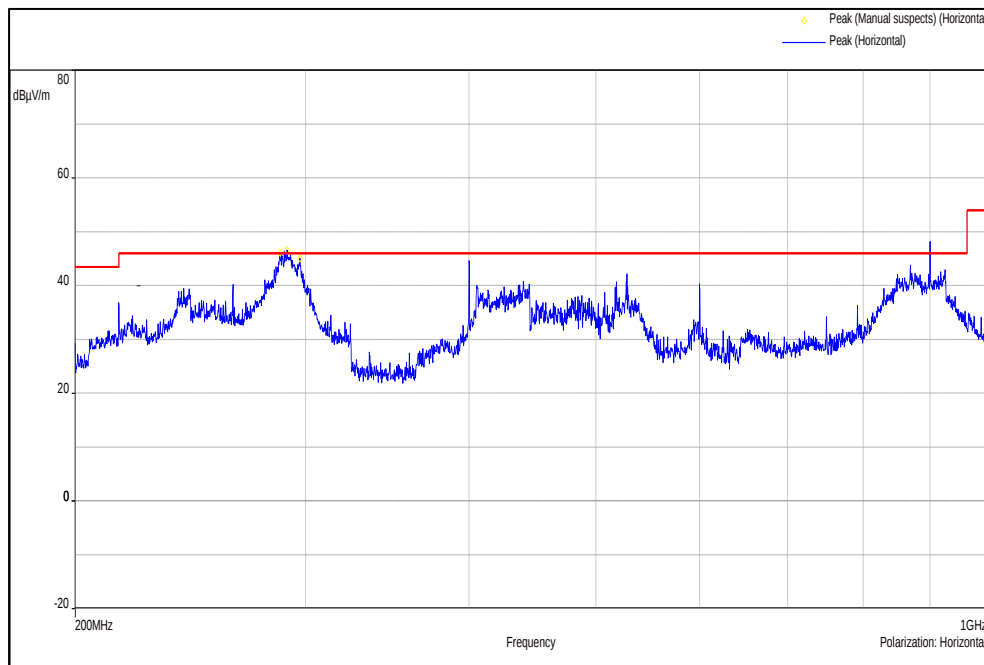
Channel Frequency 200MHz – 1GHz

Polarization Vertical

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 62 von 76
Page 62 of 76



Channel Frequency 200MHz – 1GHz

Polarization Horizontal

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 63 von 76
Page 63 of 76

Test results for the frequencies above 1GHz

Data Rate: 1Mbps

Channel Frequency (MHz)	Frequency (MHz)	Antenna Polarization	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2402	2402(Pk)	Vertical	77.15	-	-
	2402(Av)		71.43	-	-
	2390(Pk)		39.55	74.00*	-34.45
	2390(Av)		23.23	54.00*	-30.77
	4804(Pk)		45.04	74.00	-28.96
	4804(Av)		32.93	54.00	-21.07
	7206(Pk)		46.68	74.00	-27.32
	7206(Av)		34.72	54.00	-19.28
	2402(Pk)	Horizontal	78.40	-	-
	2402(Av)		72.67	-	-
	2390(Pk)		38.20	74.00*	-35.80
	2390(Av)		23.23	54.00*	-30.77
	4804(Pk)		44.63	74.00	-29.37
	4804(Av)		33.49	54.00	-20.51
	7206(Pk)		46.39	74.00	-27.61
	7206(Av)		34.63	54.00	-19.37
2440	2440(Pk)	Vertical	74.32	-	-
	2440(Av)		68.59	-	-
	4880(Pk)		43.57	74.00	-30.43
	4880(Av)		31.42	54.00	-22.58
	7320(Pk)		46.80	74.00	-27.20
	7320(Av)		34.80	54.00	-19.20
	2440(Pk)	Horizontal	75.44	-	-
	2440(Av)		69.67	-	-
	4880(Pk)		41.79	74.00	-32.21
	4880(Av)		29.78	54.00	-24.22
	7320(Pk)		47.07	74.00	-26.93
	7320(Av)		34.84	54.00	-19.16
2480	2480(Pk)	Vertical	75.65	-	-
	2480(Av)		69.88	-	-
	2483.5(Pk)		42.57	74.00*	-31.43
	2483.5(Av)		24.19	54.00*	-29.81
	4960(Pk)		42.43	74.00	-31.57
	4960(Av)		30.24	54.00	-23.76
	7440(Pk)		47.20	74.00	-26.80
	7440(Av)		35.21	54.00	-18.79
	2480(Pk)	Horizontal	77.13	-	-
	2480(Av)		71.38	-	-
	2483.5(Pk)		39.52	74.00*	-34.48
	2483.5(Av)		23.85	54.00*	-30.15
	4960(Pk)		46.76	74.00	-27.24
	4960(Av)		32.42	54.00	-21.58
	7440(Pk)		47.25	74.00	-26.75
	7440(Av)		35.18	54.00	-18.82

* : Indicate restricted band of operation §15.205
Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 64 von 76
Page 64 of 76

Data Rate: 2Mbps

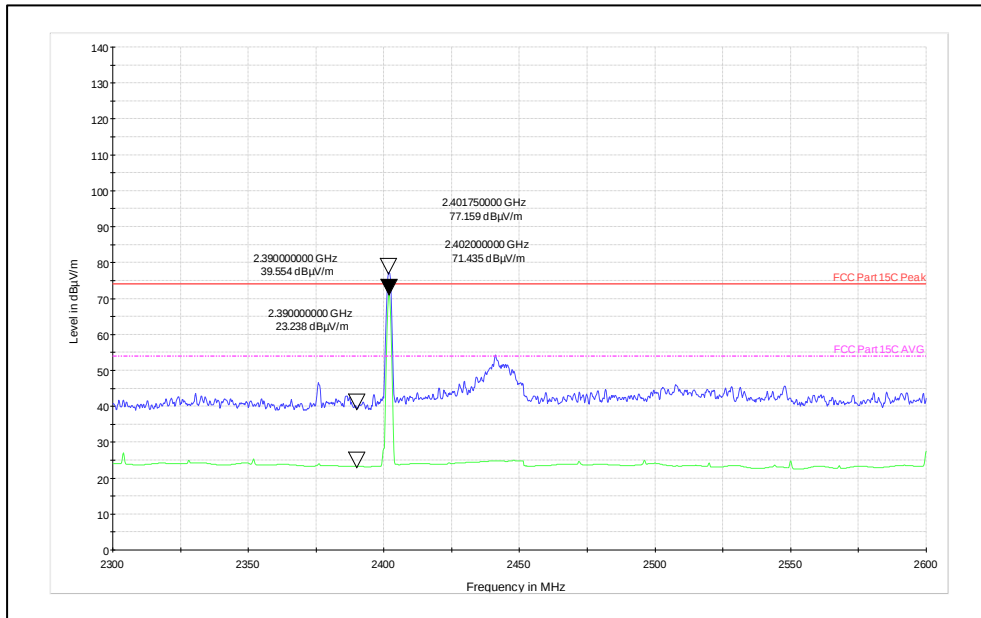
Channel Frequency (MHz)	Frequency (MHz)	Antenna Polarization	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2402	2402(Pk)	Vertical	76.92	-	-
	2402(Av)		63.80	-	-
	2390(Pk)		44.96	74.00*	-29.04
	2390(Av)		23.33	54.00*	-30.67
	4804(Pk)		42.59	74.00	-31.41
	4804(Av)		30.07	54.00	-23.93
	7206(Pk)		47.06	74.00	-26.94
	7206(Av)		35.29	54.00	-18.71
	2402(Pk)	Horizontal	78.94	-	-
	2402(Av)		65.81	-	-
	2390(Pk)		39.05	74.00*	-34.95
	2390(Av)		23.23	54.00*	-30.77
	4804(Pk)		42.15	74.00	-31.85
	4804(Av)		29.39	54.00	-24.61
	7206(Pk)		48.12	74.00	-25.88
	7206(Av)		35.26	54.00	-18.74
2440	2440(Pk)	Vertical	73.69	-	-
	2440(Av)		60.57	-	-
	4880(Pk)		42.86	74.00	-31.14
	4880(Av)		30.28	54.00	-23.72
	7320(Pk)		46.69	74.00	-27.31
	7320(Av)		34.83	54.00	-19.17
	2440(Pk)	Horizontal	75.87	-	-
	2440(Av)		62.79	-	-
	4880(Pk)		41.21	74.00	-32.79
	4880(Av)		29.28	54.00	-24.72
	7320(Pk)		46.53	74.00	-27.47
	7320(Av)		34.74	54.00	-19.26
2480	2480(Pk)	Vertical	74.46	-	-
	2480(Av)		61.38	-	-
	2483.5(Pk)		41.73	74.00*	-32.27
	2483.5(Av)		23.76	54.00*	-30.24
	4960(Pk)		41.77	74.00	-32.23
	4960(Av)		29.35	54.00	-24.65
	7440(Pk)		47.12	74.00	-26.88
	7440(Av)		35.21	54.00	-18.79
	2480(Pk)	Horizontal	77.14	-	-
	2480(Av)		64.05	-	-
	2483.5(Pk)		38.37	74.00*	-35.63
	2483.5(Av)		23.75	54.00*	-30.25
	4960(Pk)		43.04	74.00	-30.96
	4960(Av)		30.12	54.00	-23.88
	7440(Pk)		46.95	74.00	-27.05
	7440(Av)		35.19	54.00	-18.81

* : Indicate restricted band of operation §15.205
Pk: Peak Detector; Av: Average Detector

Test Plots

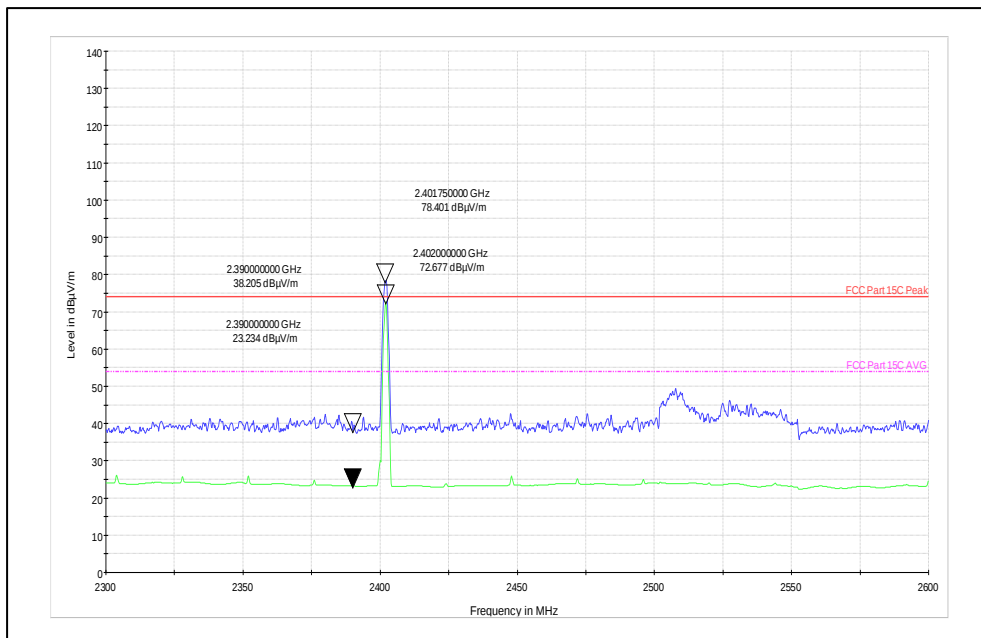
Data Rate: 1Mbps

Channel Frequency 2402MHz



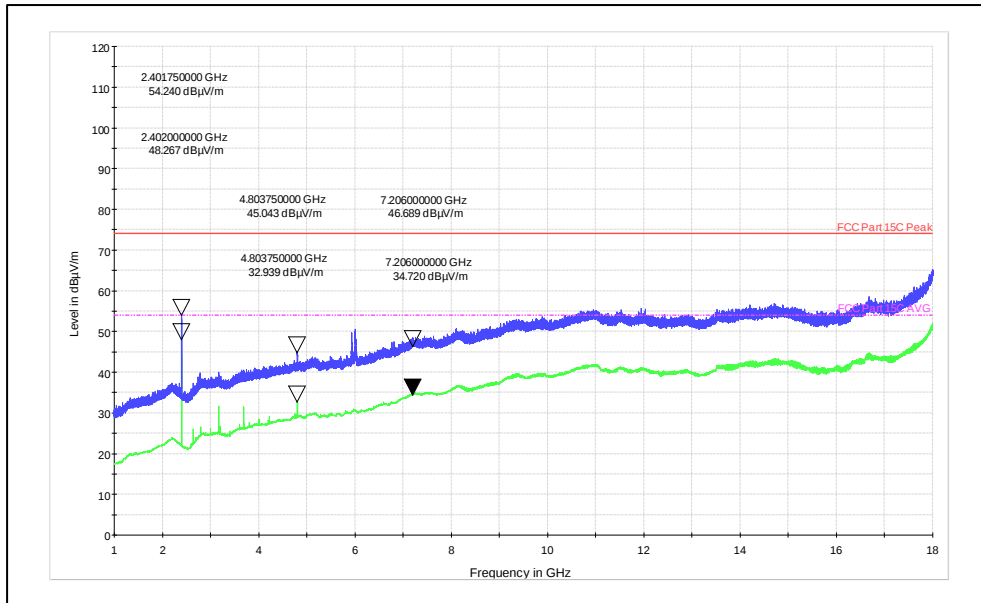
Channel Frequency: 2402MHz

Polarization: Vertical



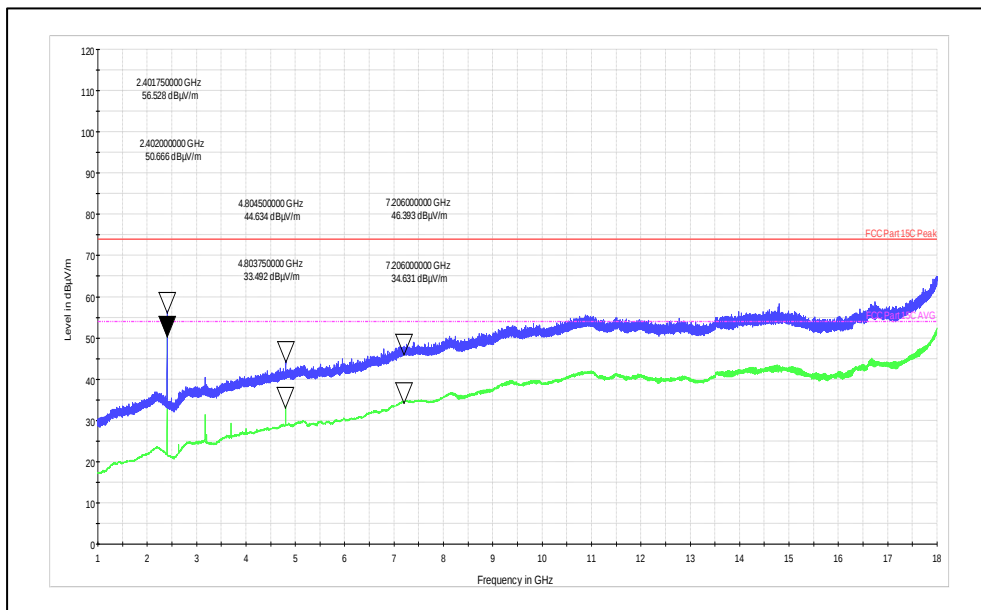
Channel Frequency: 2402MHz

Polarization: Horizontal



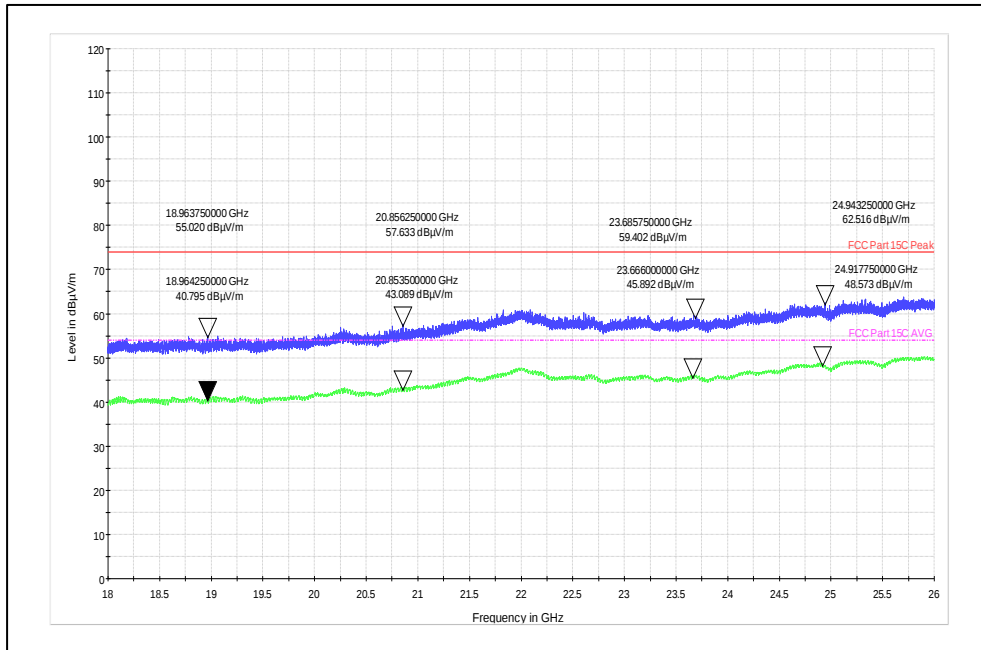
Channel Frequency: 1 - 18 GHz

Polarization: Vertical



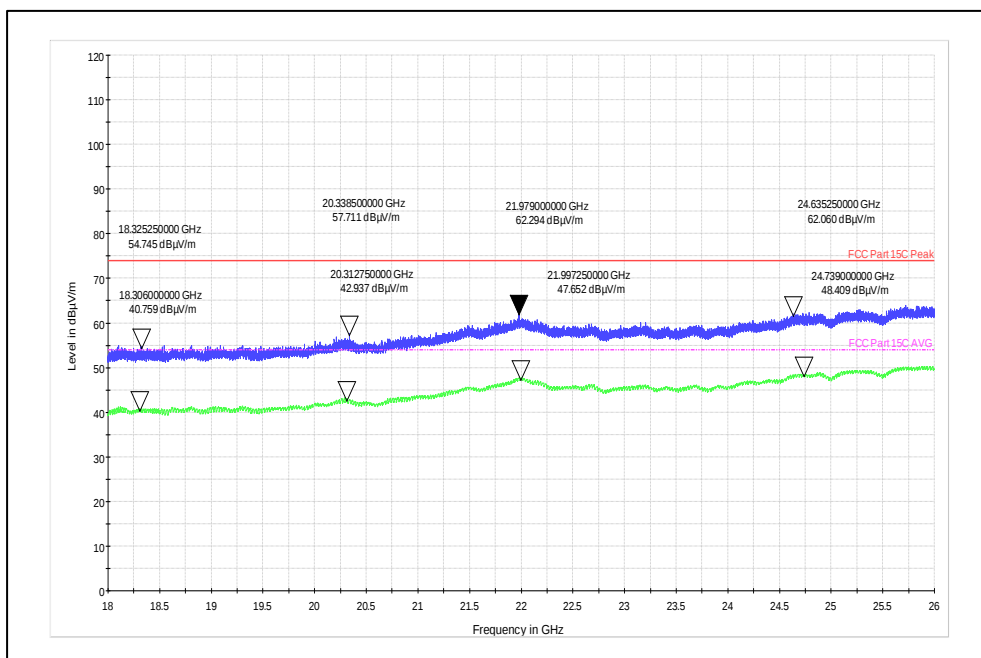
Channel Frequency: 1 - 18 GHz

Polarization: Horizontal



Channel Frequency: 18 - 26 GHz

Polarization: Vertical



Channel Frequency: 18 - 26 GHz

Polarization: Horizontal

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 68 von 76
Page 68 of 76

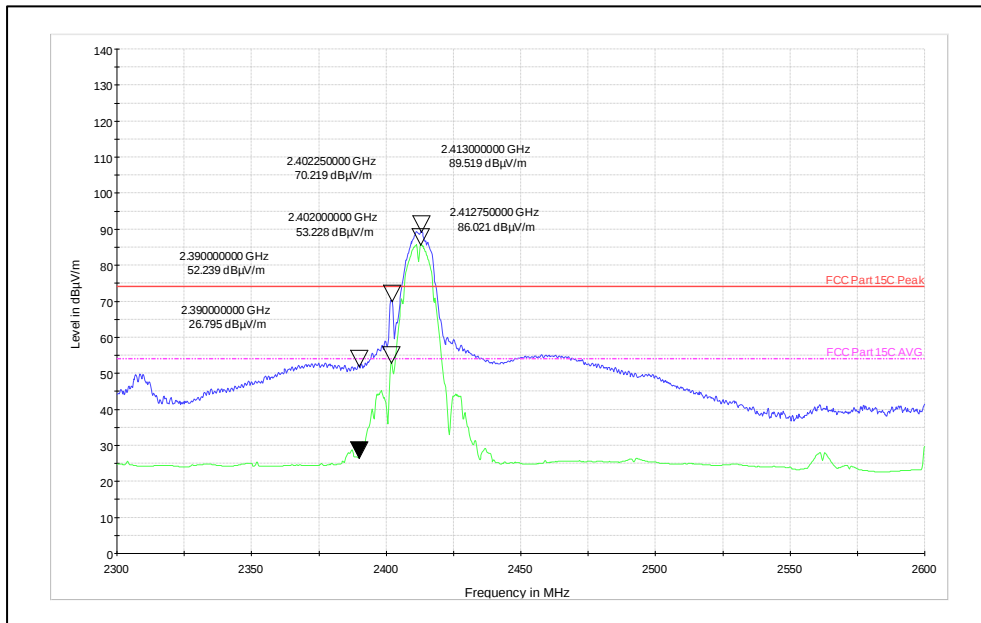
Simultaneous Operation:

Combination of Wi-Fi 2.4GHz & BLE

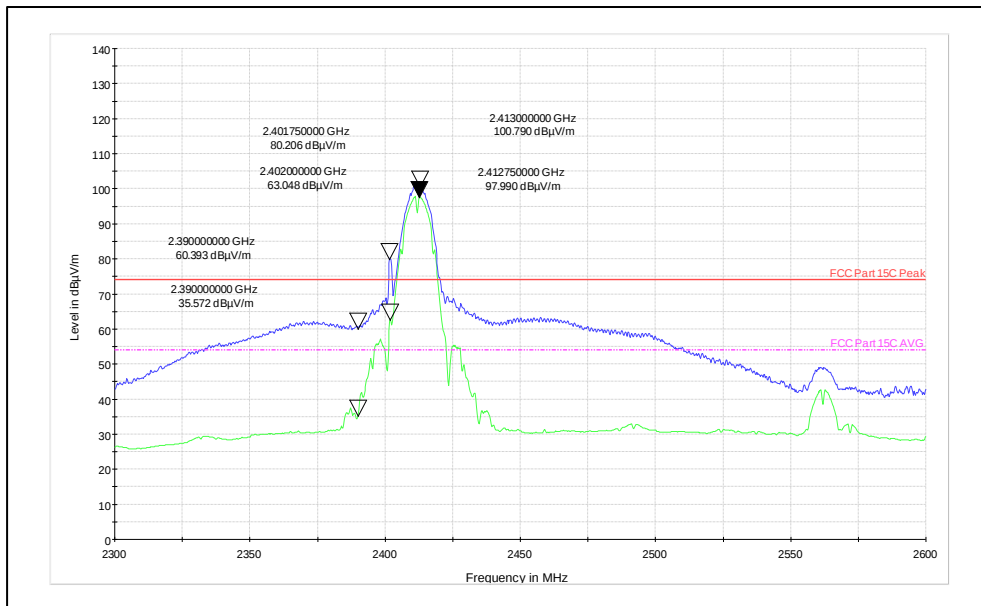
Antenna Polarization	Frequency (MHz)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Vertical	2402(Pk)	70.21	-	-
	2402(Av)	53.22	-	-
	2412(Pk)	89.51	-	-
	2412(Av)	86.02	-	-
	2390(Pk)	52.23	74*	-21.77
	2390(Av)	26.79	54*	-27.21
	4804(Pk)	40.72	74	-33.28
	4804(Av)	28.61	54	-25.39
	4824(Pk)	47.56	74	-26.44
	4824(Av)	42.38	54	-11.62
	7206(Pk)	46.94	74	-27.06
	7206(Av)	34.96	54	-19.04
	7236(Pk)	46.91	74	-27.09
	7236(Av)	36.06	54	-17.94
Horizontal	2402(Pk)	80.20	-	-
	2402(Av)	63.04	-	-
	2412(Pk)	100.79	-	-
	2412(Av)	97.99	-	-
	2390(Pk)	60.39	74*	-13.61
	2390(Av)	35.57	54*	-18.43
	4804(Pk)	41.06	74	-32.94
	4804(Av)	29.32	54	-24.68
	4824(Pk)	48.39	74	-25.61
	4824(Av)	44.12	54	-9.88
	7206(Pk)	47.34	74	-26.66
	7206(Av)	34.95	54	-19.05
	7236(Pk)	48.16	74	-25.84
	7236(Av)	37.04	54	-16.96

* : Indicate restricted band of operation §15.205
Pk: Peak Detector; Av: Average Detector

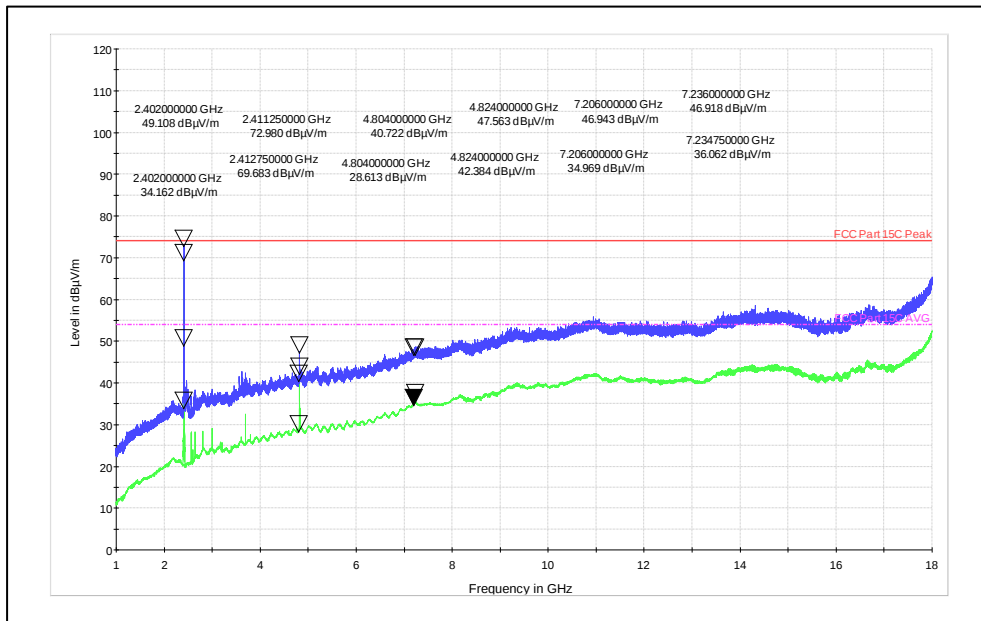
Test Plots:



Polarization: Vertical

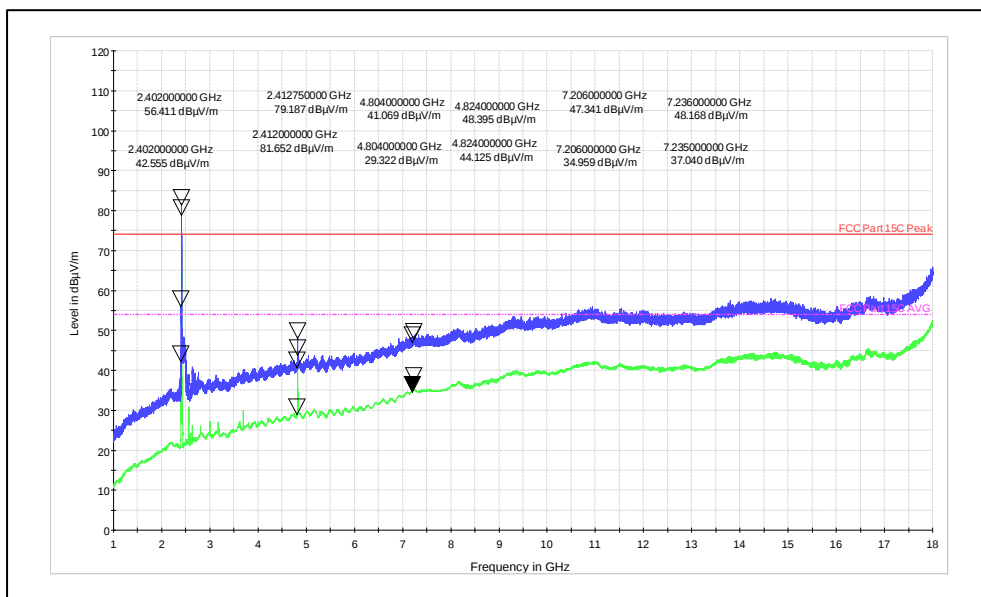


Polarization: Horizontal



Frequency range: 1GHz-18GHz

Polarization: Vertical



Frequency range: 1GHz-18GHz

Polarization: Horizontal

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 71 von 76
Page 71 of 76

9 Conducted Spurious Emission Test on AC Power Line

Result

Pass

Test Specification : FCC Part 15 Section 15.207
Test Method : ANSI C 63.10-2013
Testing Location : Screened room
Measurement Bandwidth : 9kHz
Frequency Range : 150kHz – 30MHz
Supply Voltage : 110VAC,60Hz
Test Method : Refer TEST METHODOLOGY

***Note: The product has tested with AC to DC adapter**

Limits of section 15.207

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak (dBμV)	Average (dBμV)
0.15-0.5	66-56*	56-46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency

Test Conditions:

Normal Temperature = +24°C Voltage (V norm) = 110V AC (Through AC to DC Adapter) Relative Humidity = 64%

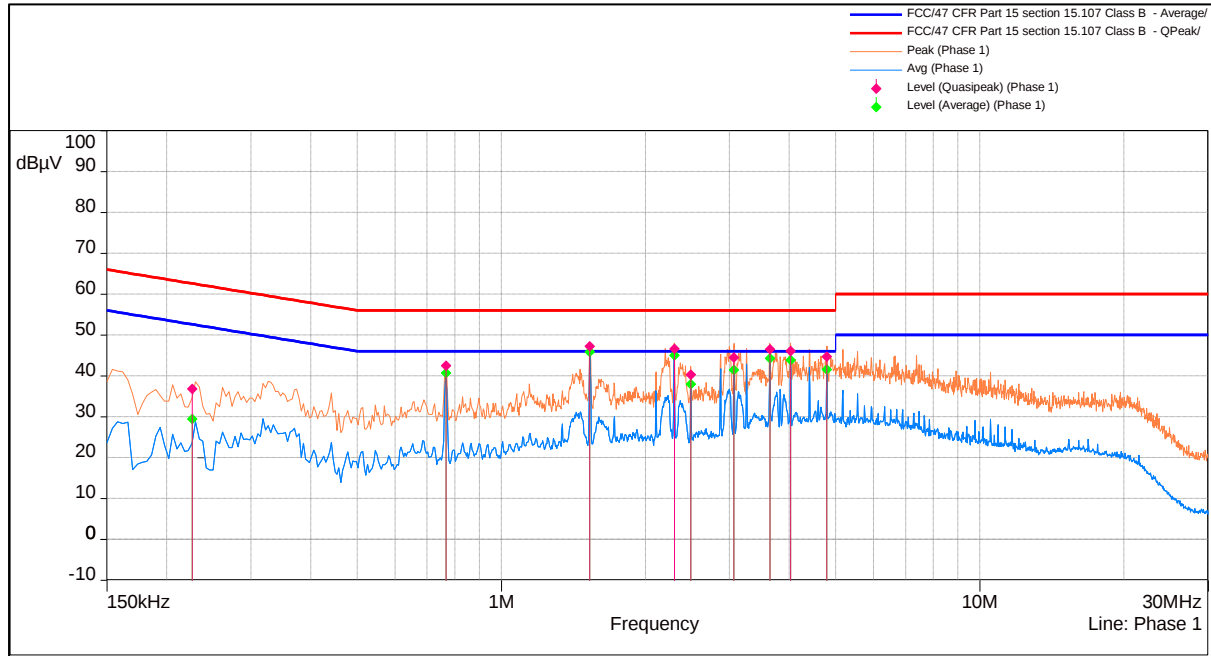
Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

Seite 72 von 76
Page 72 of 76

Test result:

Power: 110V 60Hz_LINE



Line Graph

Quasipeak:-

Frequency (MHz)	Correction (dB)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Comments
1.53175	19.69	47.25	56	-8.75	Pass
2.2998	19.69	46.63	56	-9.37	Pass
3.63845	19.7	46.53	56	-9.47	Pass
4.02155	19.71	46.1	56	-9.9	Pass
4.7873	19.7	44.72	56	-11.28	Pass
3.0624	19.7	44.48	56	-11.52	Pass
0.76645	19.66	42.49	56	-13.51	Pass
2.48955	19.69	40.37	56	-15.63	Pass
0.2273	19.56	36.83	62.6	-25.77	Pass

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568822300000062F

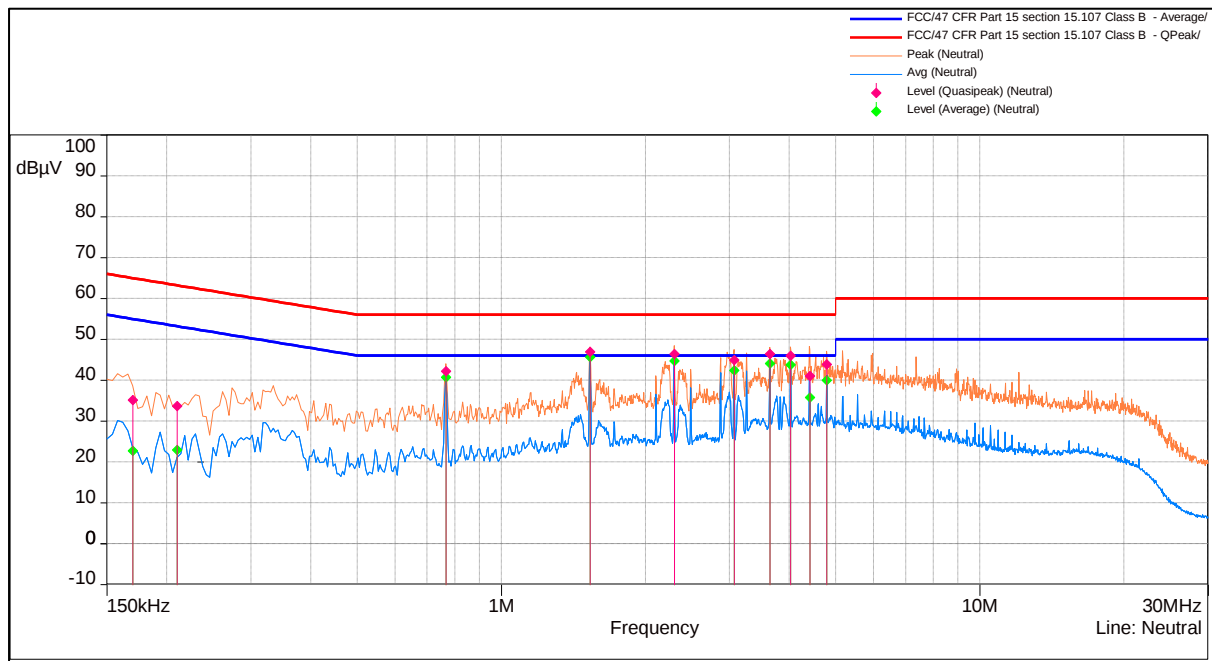
Seite 73 von 76
Page 73 of 76

Average:-

Frequency (MHz)	Correction (dB)	Level (dBµV)	Limit (dBµV)	Margin (dB)	Comments
1.53175	19.69	45.9	46	-0.1	Pass
2.2998	19.69	45.04	46	-0.96	Pass
3.63845	19.7	44.32	46	-1.68	Pass
4.02155	19.71	43.9	46	-2.1	Pass
4.7873	19.7	41.57	46	-4.43	Pass
3.0624	19.7	41.5	46	-4.5	Pass
0.76645	19.66	40.76	46	-5.24	Pass
2.48955	19.69	37.99	46	-8.01	Pass
0.2273	19.56	29.46	52.6	-23.13	Pass

Line Table

Power: 110V60Hz_NEUTRAL



Neutral Graph

Prüfbericht - Nr.:

Test Report No.:

ULR-TC568822300000062F

Seite 74 von 76

Page 74 of 76

Quasipeak:-

Frequency (MHz)	Correction (dB)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Comments
1.5331	19.7	46.96	56	-9.04	Pass
2.29665	19.69	46.4	56	-9.6	Pass
3.6398	19.71	46.4	56	-9.6	Pass
4.0229	19.71	45.98	56	-10.02	Pass
3.0651	19.7	44.94	56	-11.06	Pass
4.7855	19.71	43.87	56	-12.13	Pass
0.76645	19.67	42.19	56	-13.81	Pass
4.4105	19.71	41.11	56	-14.89	Pass
0.20975	19.55	33.68	63.21	-29.52	Pass
0.17195	19.55	35.16	64.96	-29.8	Pass

Average:-

Frequency (MHz)	Correction (dB)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Comments
1.5331	19.7	45.72	46	-0.28	Pass
2.29665	19.69	44.75	46	-1.25	Pass
3.6398	19.71	44.15	46	-1.85	Pass
4.0229	19.71	43.82	46	-2.18	Pass
3.0651	19.7	42.39	46	-3.61	Pass
0.76645	19.67	40.71	46	-5.29	Pass
4.7855	19.71	40	46	-6	Pass
4.4105	19.71	35.75	46	-10.25	Pass
0.20975	19.55	22.99	53.21	-30.22	Pass
0.17195	19.55	22.79	54.96	-32.17	Pass

Neutral Table

10 LIST OF TABLES

Table 1: List of test and measurement instruments	6
Table 2: Instrument application Software versions	7
Table 3: Ratings and System Details as declared by Client*	8
Table 4: Measurement Uncertainty	9
Table 5: List of Wi-Fi center Frequencies	10
Table 6: List of BLE Center frequencies	11
Table 7: Transmitter limits for Radiated emission	31
Table 8: Transmitter limits for Radiated emission	59

11 Power level used for testing

Wi-Fi 2.4GHz

802.11b_1Mbps	
Channel Frequency (MHz)	Power level index
2412	15
2437	15
2462	15
802.11b_11Mbps	
Channel Frequency (MHz)	Power level index
2412	15
2437	15
2462	15
802.11g_6Mbps	
Channel Frequency (MHz)	Power level index
2412	15
2437	15
2462	15
802.11g_54Mbps	
Channel Frequency (MHz)	Power level index
2412	15
2437	15
2462	15

802.11n_HT 20_MCS0	
Channel Frequency (MHz)	Power level
2412	15
2437	15
2462	15
802.11n_HT 20_MCS4	
Channel Frequency (MHz)	Power level
2412	14
2437	14
2462	14
802.11n_HT 20_MCS7	
Channel Frequency (MHz)	Power level
2412	15
2437	15
2462	15

Prüfbericht - Nr.:

Test Report No.:

ULR-TC568822300000062F

Seite 76 von 76

Page 76 of 76

802.11ax_HE 20_MCS0	
Channel Frequency (MHz)	Power level index
2412	15
2437	15
2462	15
802.11ax_HE 20_MCS9	
Channel Frequency (MHz)	Power level index
2412	15
2437	15
2462	15

BLE 2.4GHz	
1Mbps	
Channel Frequency (MHz)	Power level index
2402	0
2440	0
2480	0
2Mbps	
Channel Frequency (MHz)	Power level index
2402	0
2440	0
2480	0

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