

Prüfbericht-Nr.: <i>Test report no.:</i>	IN23BVW8 001	Auftrags-Nr.: <i>Order no.:</i>	146797959 0010	Seite 1 von 46 Page 1 of 46	
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	2133653	Auftragsdatum: <i>Order date:</i>	2023-06-07		
Auftraggeber: <i>Client:</i>	KoreLock, Inc 7100 E. Bellevue Ave., Ste. 203, Greenwood Village, CO 80111				
Prüfgegenstand: <i>Test item:</i>	KeyInCode 3500 Series Smart Lock				
Bezeichnung <i>Identification</i>	3500 Series Deadbolt Lock 3500 Series Lever Lock	Serien -Nr.: <i>Serial no.:</i>	Engineering Samples		
Auftrags-Inhalt: <i>Order content:</i>	Testing and issue of Test Report with Grant Certificate				
Prüfgrundlage: <i>Test specification:</i>	FCC Part 15 Subpart C 15.247,15.205 & 15.209				
Wareneingangsdatum: <i>Date of sample receipt:</i>	2023-06-07				
Prüfmuster-Nr.: <i>Test sample no:</i>	A003491436-001 & A003491436-003				
Prüfzeitraum: <i>Testing period:</i>	2023-07-03 - 2023-11-03				
Ort der Prüfung: <i>Place of testing:</i>	Wireless laboratory, Bangalore				
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (India) Pvt. Ltd. 27/B,2nd cross road, Electronic city Phase1, Bangalore-560100, India FCC Test Site Registration No: 496599 IC Test Site Registration No: 27711				
Prüfergebnis*: <i>Test result*:</i>	Pass				
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>				
Datum: <i>Date:</i>	Ausstellatum: <i>Issue date:</i>				
Stellung / Position:	M.V.Naveen Kumar Senior Engineer	Stellung / Position:	Lokesh Ramu Senior Manager		
Sonstiges / Other:	FCC ID: 2BBNS-KL550				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>				
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar	5 = mangelhaft N/T = nicht getestet
* 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	5 = poor N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>					

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

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TEST SUMMARY

Test Item	FCC Clause	Result
Maximum conducted output power	15.247 (b)(3)	Pass
Maximum Power Spectral Density	15.247(e)	N/T
DTS Bandwidth & Occupied Channel Bandwidth	15.247(a)(2)	N/T
Emissions in non-restricted frequency bands	15.247 (d)	N/T
Spurious Radiated Emissions and Restricted Bands of Operation	15.209 / 15.205	Pass
AC Power lines on conducted emission	15.207	N/A

Note:

N/T → Not Tested

N/A → Not Applicable

"The KeyInCode 3500 Series Smart Lock incorporates approved RF modules. Consequently, certain test cases have been excluded , and detailed information can be found in the module test report associated with the relevant FCC ID, listed below."

Product	Applicant	FCC ID	Report No	Issued By	Grant Date
2.4GHz Wi-Fi IoT Module	Espressif Systems (Shanghai) Co., Ltd.	2AC7Z-ESPS2MINI2	FR262713	Sporton International Inc.(Kunshan)	2022/10/12
Bluetooth 5.0 BLE Data Module	Laird Technologies	SQGBL654	FR813002	International Certification Corp	2018/06/29

Product Category: Electronics Testing

Test Discipline: EMC Test Facility

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REVISION HISTORY OF THIS REPORT

Report Number	Version	Description	Issue date
IN23BVW8 001	01	Initial issue of report	2024.02.02

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1 GENERAL REMARKS

1.1 Attachments

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

1. Test Setup photos
2. EUT External Photos
3. EUT Internal Photos
4. FCC Label and Label Location
5. Block Diagram
6. Specification of EUT
7. Schematic Diagrams
8. Bill of Material
9. User Manual
10. Maximum Permissible Exposure Information

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2 TEST SITES

2.1 Testing Facilities

1. TÜV Rheinland (India) Pvt.Ltd.,
27/B, 2nd Cross,
Electronic cityPhase1
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	30.07.2024	Yearly	Radiated Spurious Emission
Active loop antenna	Frankonia	LAX-10	LAX-10-800	-	02.03.2024	Yearly	
Balun & Biconical Antenna	Schwarzbeck mess-elektronik	BBA 9106+VH BB 9124	9124-1117	-	05.05.2024	Yearly	
Log-Periodic Antenna	Schwarzbeck mess-elektronik	VUSLP 9111B	9111B-111	-	06.05.2024	Yearly	
Horn Antenna	Schwarzbeck	BBHA 9120 D	02117	-	12.11.2023	Yearly	
Horn Antenna	ETS	116706	00107323	-	31.05.2024	Yearly	
EMI Test Receiver	Rohde & Schwarz	ESW44	101773	1.72.SP1	15.02.2024	Yearly	
10mtr Semi Anechoic Chamber	Frankonia	-	-	-	-	-	
Fully Anechoic Chamber	Albatross	-	-	-	-	-	Conducted Test Parameters
Spectrum Analyzer	Agilent	E4407B	US411927 72	A.14.07	21.12.2023	Yearly	
10dB Attenuator	H+S Electronics Pvt. Ltd	6810.17. A	770041	-	06.03.2024	Yearly	
Spectrum Analyzer	Rohde & Schwarz	FSU26	200767	4.71	19.09.2024	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	TS8997 System	WMS32	11.60.00

Note:

KeyInCode 3500 Series Smart Lock product having different models & all models are identical. Hence, we tested higher version of **3500 Series Deadbolt Lock**

3 GENERAL PRODUCT INFORMATION

3.1 Product Function and Intended Use

KoreLock, Inc. is an IoT technology company that provides turnkey embedded and app solutions that enable lock manufacturers and access control providers to build and sell connected locking devices. KoreLock's Smart Lock solutions are embedded in over 50,000 locking devices worldwide. KoreLock customers include lock manufacturers and access control software companies that would rather utilize a proven smart lock platform than the risk and expense of building on their own.

3.2 Ratings and System Details of Equipment under Test

Table 3: DUT Details provided by the supplier*

Radio Protocol	Wi-Fi(2.4GHz)	BLE
Operating Frequency Range	2412MHz to 2462MHz	2402MHz to 2480MHz
No. of Channels	11	40
Channel Spacing	5MHz	2MHz
Measured conducted power(dBm)	14.78dBm @ (b-mode 1Mbps 2462MHz)	7.37dBm@ 2Mbps 2440MHz
Modulation	802.11b: DSSS (DBPSK / DQPSK/ CCK) 802.11g/n: OFDM (BPSK/ QPSK/ 16QAM/ 64QAM	GFSK
Number of antennas	1	1
Antenna Gain	4.54dBi (Please refer the Antenna Data sheet)	-1.05dBi (Please refer Antenna Data sheet)
Antenna Type	Printed PCB monopole antenna – on-board	Printed PCB trace monopole antenna – on-board
Supply Voltage to Product	6VDC through AA Batteries	
Environmental conditions	Storage Temp: -40°C to 80°C	
	Operating Temp: -30°C to 66°C	
EUT Dimension(L x W x H) in Inch	3500 Series Deadbolt Lock : 7 x 8 x 7.437 3500 Series Lever Lock : 4.75 x 5 x 7.31	

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

3.3 Measurement Uncertainty:

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

Table 4: Measurement Uncertainty

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

4 TEST SET-UP AND OPERATION MODE

4.1 Principle of Configuration Selection

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

4.2 Test Operation and Test Software

Hardware Version: Version-2

Hardware Name: KL-PCB-550

Software Version: 5I_1.0.25

Software Name: Production

4.3 Special Accessories and Auxiliary Equipment

- None

4.4 Countermeasures to achieve EMC Compliance

- None

4.5 Simultaneous Operation

- This Device supports simultaneous operation.

4.6 List of frequencies

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 5: List of BLE centre frequencies

Channel used for BLE testing

Channel low: 2402MHz

Channel mid: 2440MHz

Channel high: 2480MHz

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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 6: List of Wi-Fi centre 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

Protocol: WLAN 802.11n_40MHz

Channel Low: 2422MHz
Channel Mid: 2437MHz
Channel High: 2452MHz

4.7 TUV Sample Identification

1. TUV Sample Identification number: A003491436-001 – Radiated test Sample
A003491436-003 - Conducted test Sample

5 Operational Description

KoreLock's printed circuit boards provide WiFi connectivity to the cloud, BLE communication with mobile apps, and full-featured access control functionality. KoreLock's patented WiFi technology allows users to control their lock from anywhere in the world. When in range, control the lock in real time over BLE. KoreLock's embedded firmware provides full-feature access control, including credentials, lock settings, schedules, and event history.

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 Balloon and Biconical Antenna, and measurement from 200 MHz to 1 GHz was performed by Log-Periodic Antenna.

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

6.1.1 Test Setup Configuration

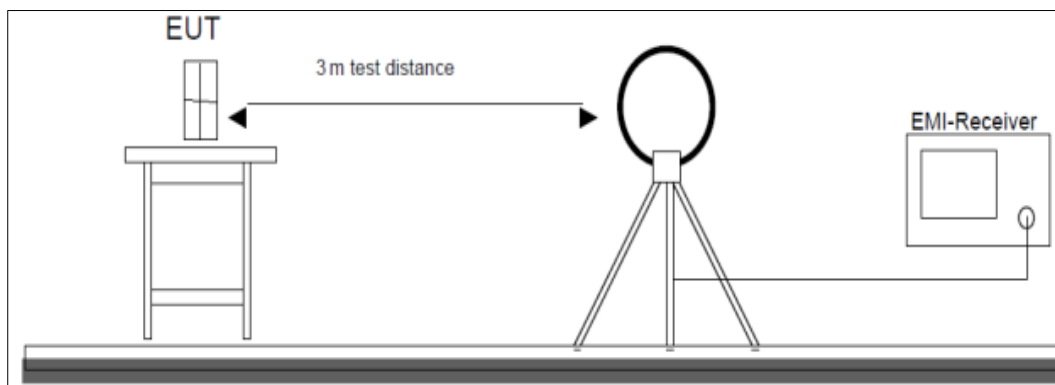


Figure 1: Frequency Range 9 kHz- 30 MHz

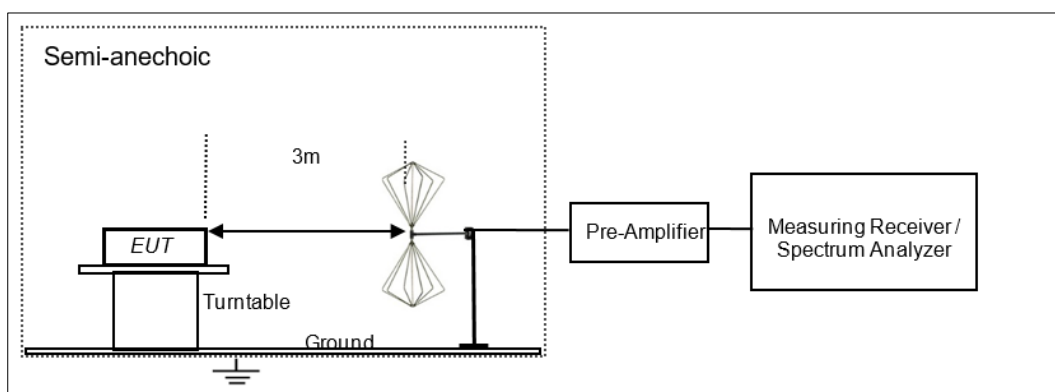


Figure 2: Frequency Range 30 MHz – 200 MHz

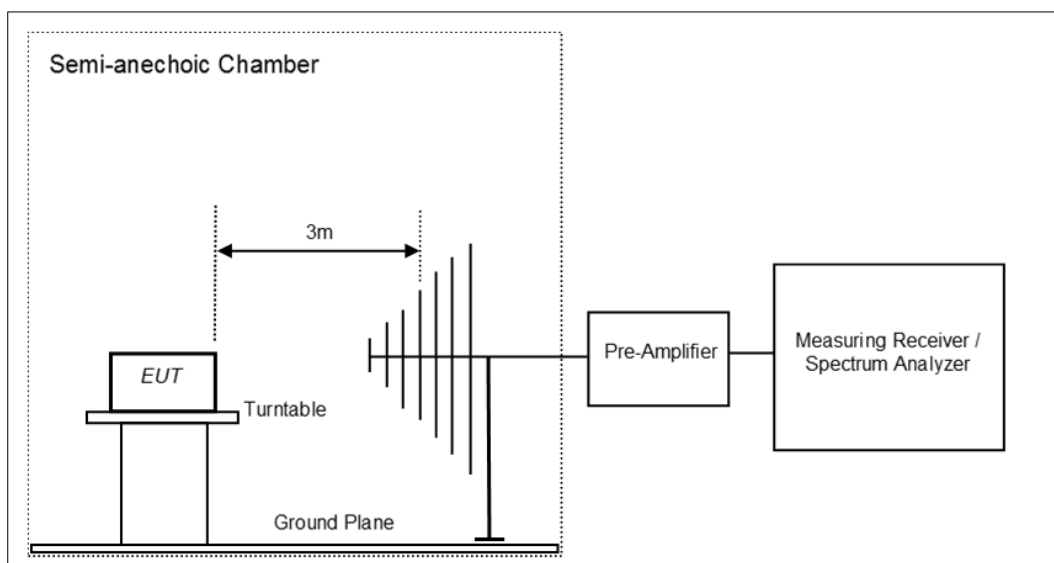


Figure 3: Frequency Range 200 MHz - 1GHz

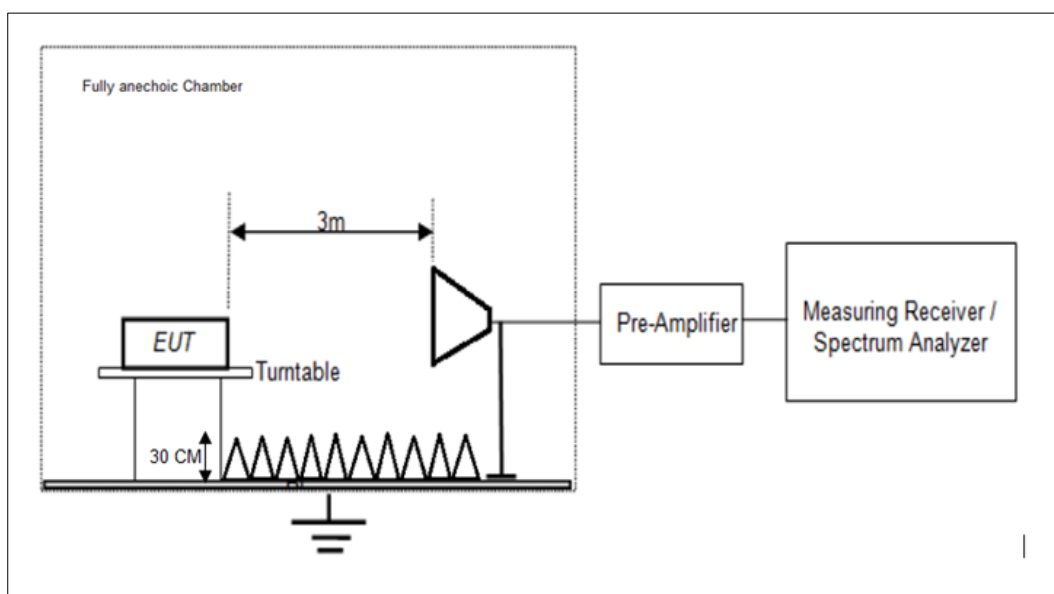


Figure 4: Frequency Range above 1 GHz

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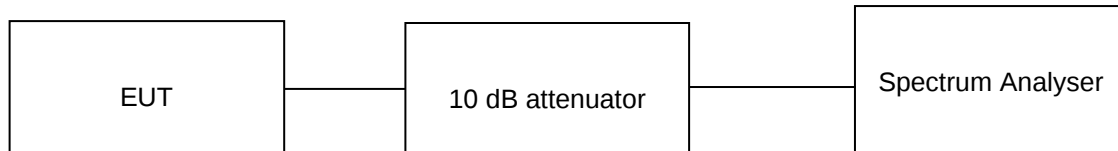
7 TEST RESULTS FOR BLE

7.1 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) = + 22.1 °C

Voltage = 6VDC AA Batteries

Relative humidity: 65%

KDB Guidelines applied:

Measurements were made as per section 8.3.1 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

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Test results:

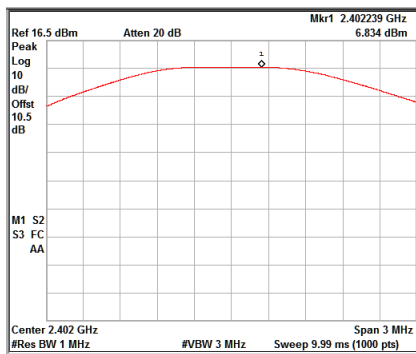
Note:

1. All the losses are included during measurement and final values are mentioned in the test report
2. Total Peak Output power (dBm) = Measured Peak power (dBm) + Attenuator factor (10dB) + Cable loss (0.5dB)
3. This product do not support additional beamforming gain / directional gain, it uses single antenna and the Directional gain of the single antenna is -1.05 dBi

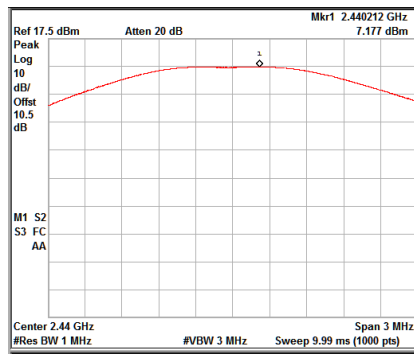
Data Rate	Channel Frequency (MHz)	Measured Peak Power (dBm)	Power Limit (dBm)	Margin (dB)
125kbps	2402	6.83	30	-23.17
	2440	7.17	30	-22.83
	2480	6.97	30	-23.03
500kbps	2402	6.88	30	-23.12
	2440	7.18	30	-22.82
	2480	6.99	30	-23.01
1Mbps	2402	6.99	30	-23.01
	2440	7.25	30	-22.75
	2480	7.23	30	-22.77
2Mbps	2402	7.20	30	-22.80
	2440	7.37	30	-22.63
	2480	7.29	30	-22.71

Test Plots:

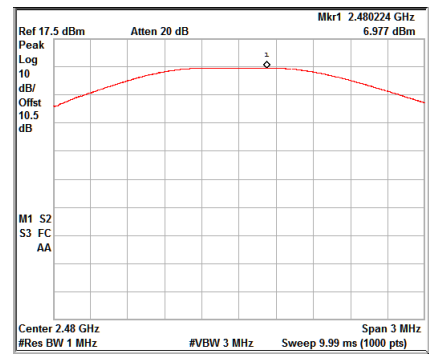
Data Rate: 125kbps



Channel Frequency: 2402MHz

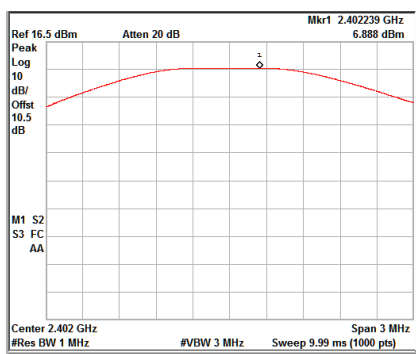


Channel Frequency: 2440MHz

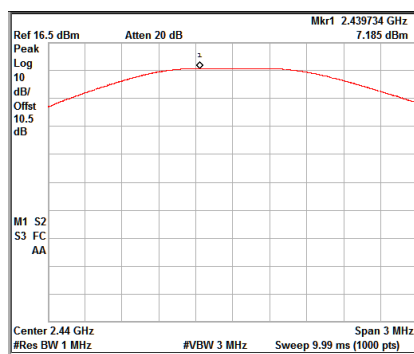


Channel Frequency: 2480MHz

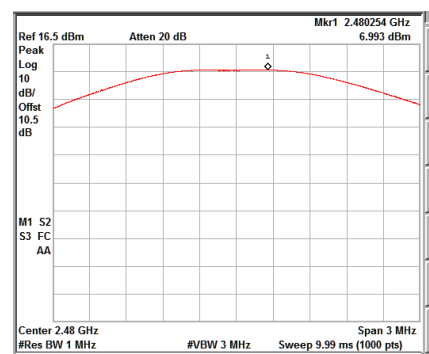
Data Rate: 500kbps



Channel Frequency: 2402MHz



Channel Frequency: 2440MHz



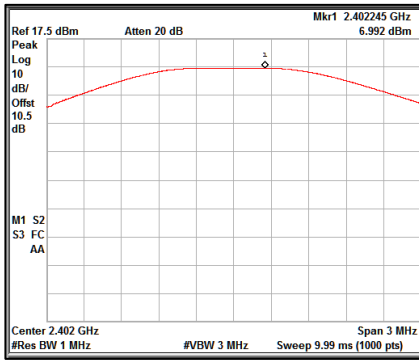
Channel Frequency: 2480MHz

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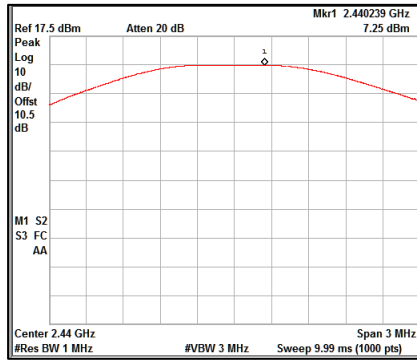
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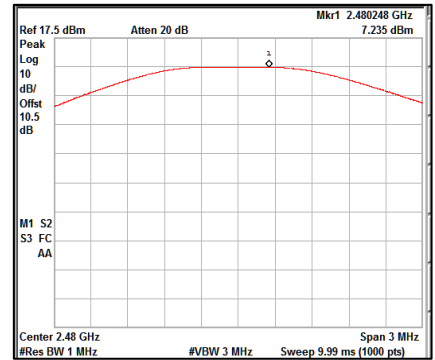
Data Rate: 1Mbps



Channel Frequency: 2402MHz

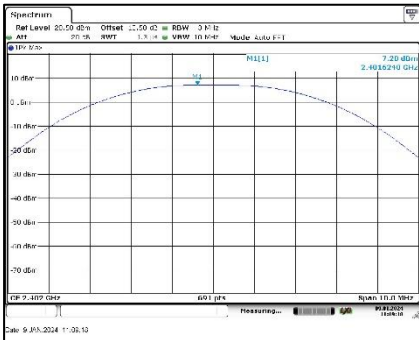


Channel Frequency: 2440MHz

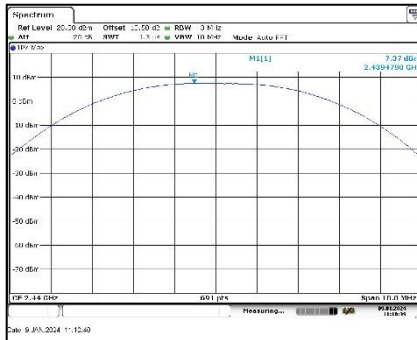


Channel Frequency: 2480MHz

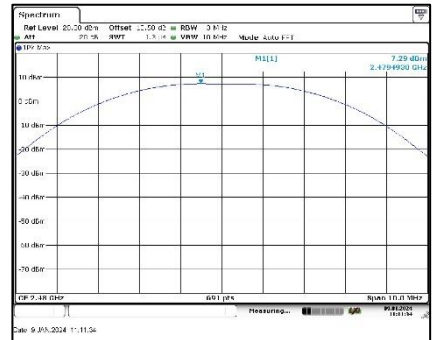
Data Rate: 2Mbps



Channel Frequency: 2402MHz



Channel Frequency: 2440MHz



Channel Frequency: 2480MHz

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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
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 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	54.0	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) = + 21.5 °C

Voltage = 6VDC through AA Batteries

Relative humidity: 63%

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Test results:

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

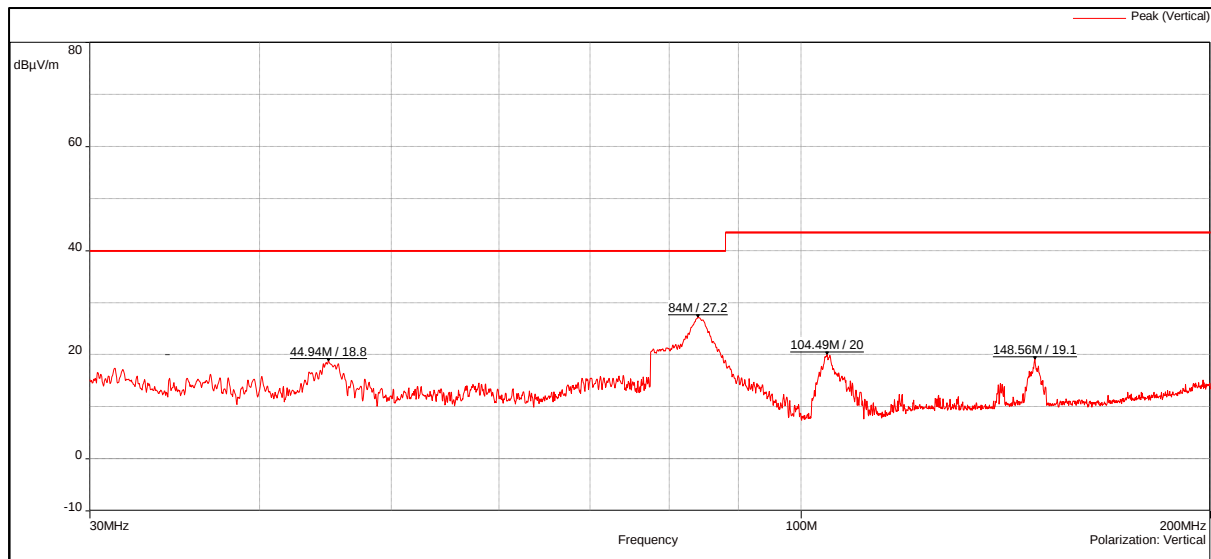
Test results for frequency range 9 kHz – 30 MHz

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 8: Test results for frequency range 30MHz – 200MHz

Antenna Polarization	Measured Frequency (MHz)	Measured emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Vertical	44.94	18.80	40.00	-21.20
	84.00	27.20	40.00	-12.80
	104.49	20.00	43.50	-23.50
	148.56	19.10	43.50	-24.40
Horizontal	49.80	10.60	40.00	-29.40
	88.62	16.30	43.50	-27.20
	95.25	22.80	43.50	-20.70
	103.71	12.60	43.50	-30.90

Test Plots:



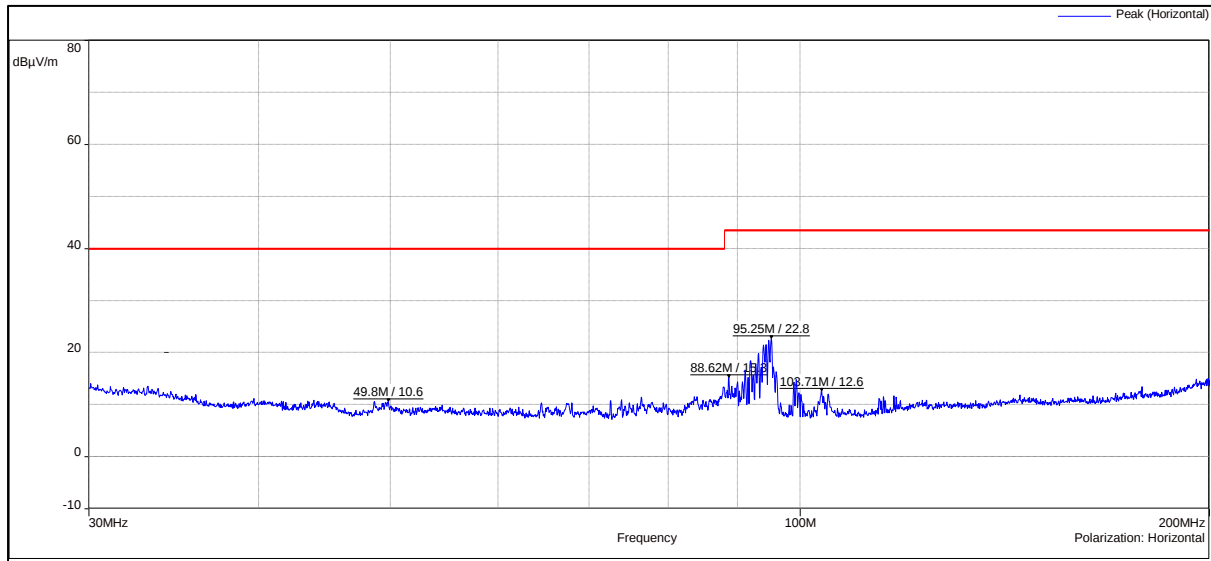
Frequency range: 30MHz to 200MHz

Polarization: Vertical

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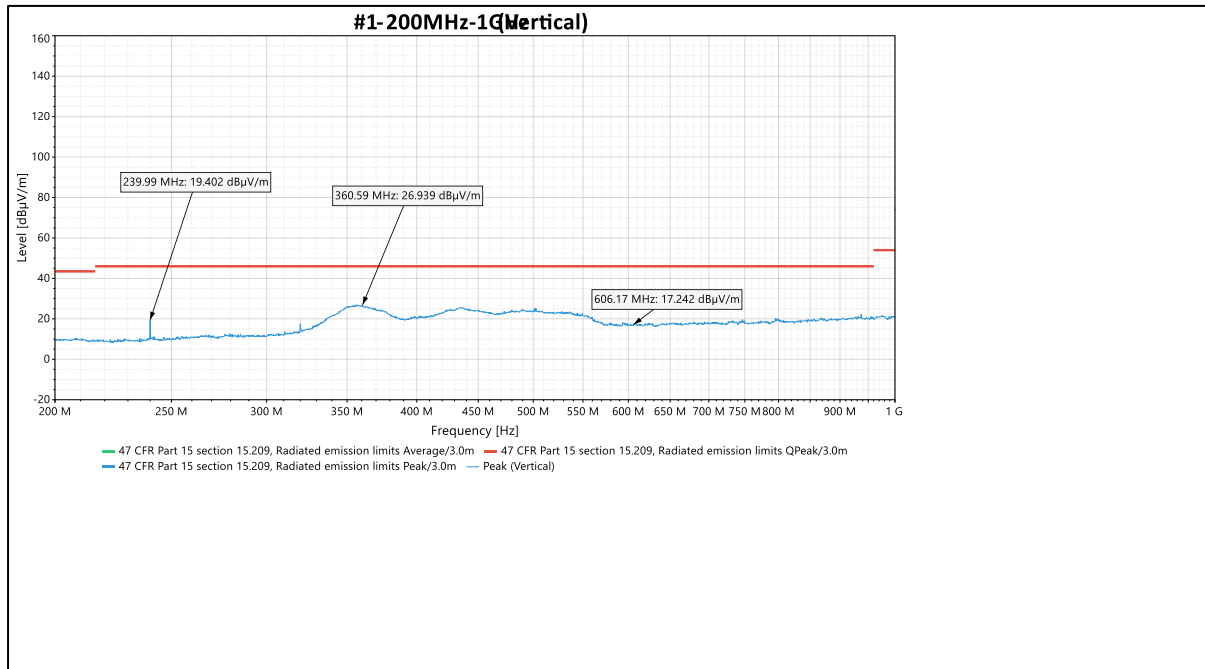
Frequency range: 30MHz to 200MHz

Polarization: Horizontal

Table 9: Test results for frequency range 200MHz – 1GHz

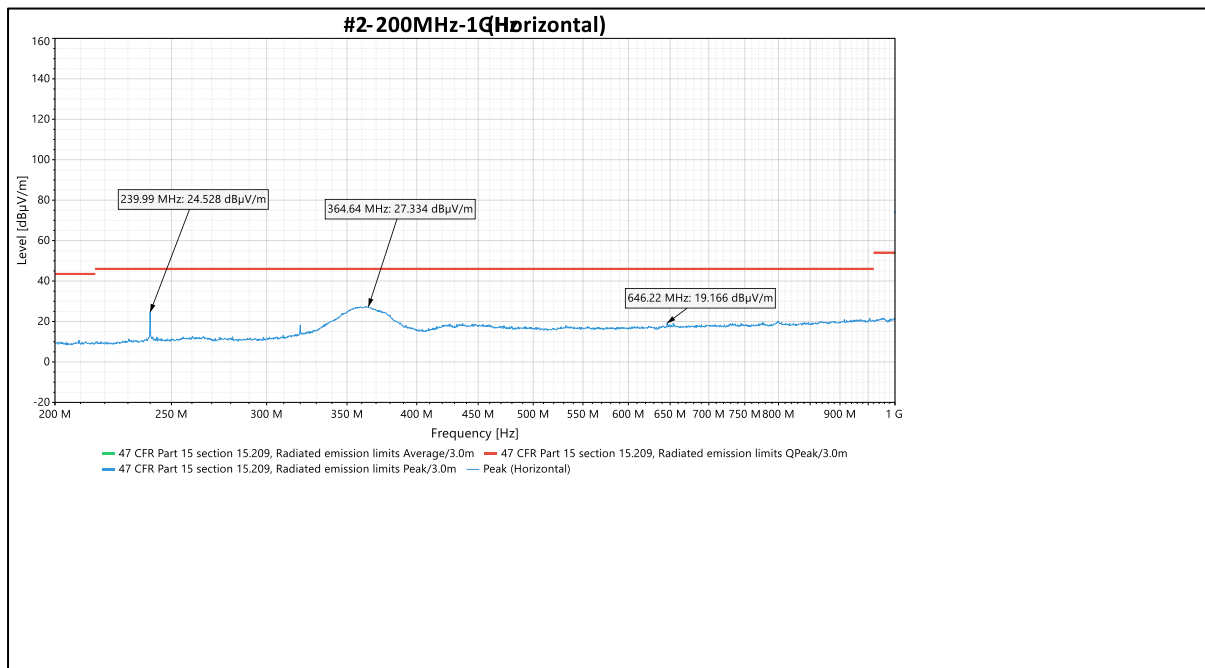
Antenna Polarization	Measured Frequency (MHz)	Measured emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Vertical	239.99	19.40	46.00	-26.60
	360.59	26.93	46.00	-19.07
	606.17	17.24	46.00	-28.76
Horizontal	239.99	24.52	46.00	-21.48
	364.64	27.33	46.00	-18.67
	646.22	19.16	46.00	-26.84

Test Plots:



Frequency range: 200MHz to 1GHz

Polarization: Vertical



Frequency range: 200MHz to 1GHz

Polarization: Horizontal

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Table 10: Test results for the frequencies above 1GHz:

Data Rate: 125kbps

Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2402	2402(Pk)	Vertical	93.75	-	-
	2402(Av)		91.58	-	-
	2390(Pk)		48.69	74.00*	-25.31
	2390(Av)		26.59	54.00*	-27.41
	4804(Pk)		42.65	74.00	-31.35
	4804(Av)		31.60	54.00	-22.40
	7206(Pk)		48.32	74.00	-25.68
	7206(Av)		36.79	54.00	-17.21
	2402(Pk)	Horizontal	92.14	-	-
	2402(Av)		90.69	-	-
	2390(Pk)		42.67	74.00*	-31.33
	2390(Av)		25.70	54.00*	-28.30
	4804(Pk)		43.75	74.00	-30.25
	4804(Av)		32.37	54.00	-21.63
	7206(Pk)		48.50	74.00	-25.50
	7206(Av)		37.74	54.00	-16.26
2440	2440(Pk)	Vertical	93.65	-	-
	2440(Av)		92.53	-	-
	4880(Pk)		41.95	74.00	-32.05
	4880(Av)		30.73	54.00	-23.27
	7320(Pk)		50.20	74.00	-23.80
	7320(Av)		39.25	54.00	-14.75
	2440(Pk)	Horizontal	94.34	-	-
	2440(Av)		92.26	-	-
	4880(Pk)		41.96	74.00	-32.04
	4880(Av)		30.17	54.00	-23.83
	7320(Pk)		47.18	74.00	-26.82
	7320(Av)		35.10	54.00	-18.90
2480	2480(Pk)	Vertical	91.96	-	-
	2480(Av)		90.82	-	-
	2483.5(Pk)		47.92	74.00*	-26.08
	2483.5(Av)		30.58	54.00*	-23.42
	4960(Pk)		45.06	74.00	-28.94
	4960(Av)		34.71	54.00	-19.29
	7440(Pk)		47.65	74.00	-26.35
	7440(Av)		37.13	54.00	-16.87
	2480(Pk)	Horizontal	93.29	-	-
	2480(Av)		91.67	-	-
	2483.5(Pk)		48.23	74.00*	-25.77
	2483.5(Av)		31.27	54.00*	-22.73
	4960(Pk)		45.03	74.00	-28.97
	4960(Av)		34.46	54.00	-19.54
	7440(Pk)		47.89	74.00	-26.11
	7440(Av)		36.75	54.00	-17.25

_ → Fundamental Frequency

*→ Restricted Band edges

Pk: Peak Detector; Av: Average Detector

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Data Rate: 500kbps

Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2402	2402(Pk)	Vertical	93.73	-	-
	2402(Av)		91.64	-	-
	2390(Pk)		48.60	74.00*	-25.40
	2390(Av)		26.58	54.00*	-27.42
	4804(Pk)		41.62	74.00	-32.38
	4804(Av)		30.15	54.00	-23.85
	7206(Pk)		49.32	74.00	-24.68
	7206(Av)		38.21	54.00	-15.79
	2402(Pk)	Horizontal	92.62	-	-
	2402(Av)		91.00	-	-
	2390(Pk)		44.62	74.00*	-29.38
	2390(Av)		25.85	54.00*	-28.15
	4804(Pk)		42.36	74.00	-31.64
	4804(Av)		31.17	54.00	-22.83
	7206(Pk)		49.05	74.00	-24.95
	7206(Av)		38.00	54.00	-16.00
2440	2440(Pk)	Vertical	93.68	-	-
	2440(Av)		92.67	-	-
	4880(Pk)		42.26	74.00	-31.74
	4880(Av)		30.62	54.00	-23.38
	7320(Pk)		47.52	74.00	-26.48
	7320(Av)		36.28	54.00	-17.72
	2440(Pk)	Horizontal	94.33	-	-
	2440(Av)		92.36	-	-
	4880(Pk)		42.95	74.00	-31.05
	4880(Av)		33.49	54.00	-20.51
	7320(Pk)		48.05	74.00	-25.95
	7320(Av)		37.12	54.00	-16.88
2480	2480(Pk)	Vertical	91.98	-	-
	2480(Av)		90.94	-	-
	2483.5(Pk)		48.44	74.00*	-25.56
	2483.5(Av)		30.50	54.00*	-23.50
	4960(Pk)		42.81	74.00	-31.19
	4960(Av)		31.88	54.00	-22.12
	7440(Pk)		50.12	74.00	-23.88
	7440(Av)		38.42	54.00	-15.58
	2480(Pk)	Horizontal	93.31	-	-
	2480(Av)		91.77	-	-
	2483.5(Pk)		48.17	74.00*	-25.83
	2483.5(Av)		31.21	54.00*	-22.79
	4960(Pk)		44.42	74.00	-29.58
	4960(Av)		34.50	54.00	-19.50
	7440(Pk)		47.56	74.00	-26.44
	7440(Av)		36.74	54.00	-17.26

_ → Fundamental Frequency

*→ Restricted Band edges

Pk: Peak Detector; Av: Average Detector

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Data Rate: 1Mbps

Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2402	2402(Pk)	Vertical	92.39	-	-
	2402(Av)		90.42	-	-
	2390(Pk)		44.73	74.00*	-29.27
	2390(Av)		25.86	54.00*	-28.14
	4804(Pk)		42.11	74.00	-31.89
	4804(Av)		31.02	54.00	-22.98
	7206(Pk)		47.92	74.00	-26.08
	7206(Av)		36.99	54.00	-17.01
	2402(Pk)	Horizontal	91.19	-	-
	2402(Av)		89.98	-	-
	2390(Pk)		41.19	74.00*	-32.81
	2390(Av)		25.45	54.00*	-28.55
	4804(Pk)		43.40	74.00	-30.60
	4804(Av)		32.82	54.00	-21.18
	7206(Pk)		49.88	74.00	-24.12
	7206(Av)		38.36	54.00	-15.64
2440	2440(Pk)	Vertical	94.39	-	-
	2440(Av)		92.93	-	-
	4880(Pk)		43.40	74.00	-30.60
	4880(Av)		31.47	54.00	-22.53
	7320(Pk)		48.36	74.00	-25.64
	7320(Av)		38.06	54.00	-15.94
	2440(Pk)	Horizontal	92.21	-	-
	2440(Av)		91.22	-	-
	4880(Pk)		41.83	74.00	-32.17
	4880(Av)		30.82	54.00	-23.18
	7320(Pk)		49.68	74.00	-24.32
	7320(Av)		38.43	54.00	-15.57
2480	2480(Pk)	Vertical	92.10	-	-
	2480(Av)		91.03	-	-
	2483.5(Pk)		50.22	74.00*	-23.78
	2483.5(Av)		30.66	54.00*	-23.34
	4960(Pk)		40.95	74.00	-33.05
	4960(Av)		28.73	54.00	-25.27
	7440(Pk)		48.33	74.00	-25.67
	7440(Av)		38.12	54.00	-15.88
	2480(Pk)	Horizontal	92.85	-	-
	2480(Av)		91.46	-	-
	2483.5(Pk)		47.25	74.00*	-26.75
	2483.5(Av)		30.86	54.00*	-23.14
	4960(Pk)		44.55	74.00	-29.45
	4960(Av)		33.95	54.00	-20.05
	7440(Pk)		49.50	74.00	-24.50
	7440(Av)		37.66	54.00	-16.34

_ → Fundamental Frequency

*→ Restricted Band edges

Pk: Peak Detector; Av: Average Detector

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Data Rate: 2Mbps

Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2402	2402(Pk)	Vertical	90.43	-	-
	2402(Av)		87.57	-	-
	2390(Pk)		48.34	74.00*	-25.66
	2390(Av)		26.43	54.00*	-27.57
	4804(Pk)		41.64	74.00	-32.36
	4804(Av)		29.66	54.00	-24.34
	7206(Pk)		47.50	74.00	-26.50
	7206(Av)		35.64	54.00	-18.36
	2402(Pk)	Horizontal	93.60	-	-
	2402(Av)		91.08	-	-
	2390(Pk)		44.39	74.00*	-29.61
	2390(Av)		28.08	54.00*	-25.92
	4804(Pk)		42.71	74.00	-31.29
	4804(Av)		32.26	54.00	-21.74
	7206(Pk)		48.15	74.00	-25.85
	7206(Av)		39.24	54.00	-14.76
2440	2440(Pk)	Vertical	91.24	-	-
	2440(Av)		88.65	-	-
	4880(Pk)		42.99	74.00	-31.01
	4880(Av)		30.97	54.00	-23.03
	7320(Pk)		48.18	74.00	-25.82
	7320(Av)		37.94	54.00	-16.06
	2440(Pk)	Horizontal	92.84	-	-
	2440(Av)		90.23	-	-
	4880(Pk)		42.39	74.00	-31.61
	4880(Av)		31.03	54.00	-22.97
	7320(Pk)		48.21	74.00	-25.79
	7320(Av)		37.60	54.00	-16.40
2480	2480(Pk)	Vertical	90.99	-	-
	2480(Av)		88.52	-	-
	2483.5(Pk)		54.61	74.00*	-19.39
	2483.5(Av)		33.90	54.00*	-20.10
	4960(Pk)		44.15	74.00	-29.85
	4960(Av)		33.05	54.00	-20.95
	7440(Pk)		47.25	74.00	-26.75
	7440(Av)		37.52	54.00	-16.48
	2480(Pk)	Horizontal	91.20	-	-
	2480(Av)		88.55	-	-
	2483.5(Pk)		49.39	74.00*	-24.61
	2483.5(Av)		33.91	54.00*	-20.09
	4960(Pk)		44.84	74.00	-29.16
	4960(Av)		33.08	54.00	-20.92
	7440(Pk)		46.78	74.00	-27.22
	7440(Av)		35.36	54.00	-18.64

_ → Fundamental Frequency

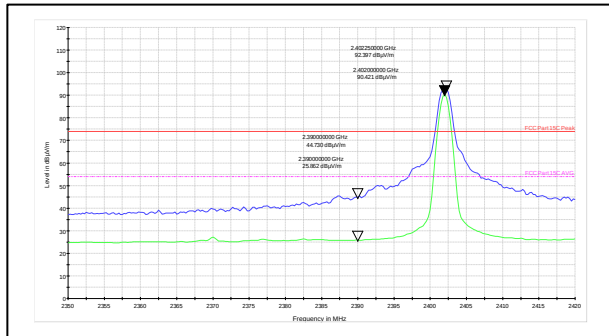
*→ Restricted Band edges

Pk: Peak Detector; Av: Average Detector

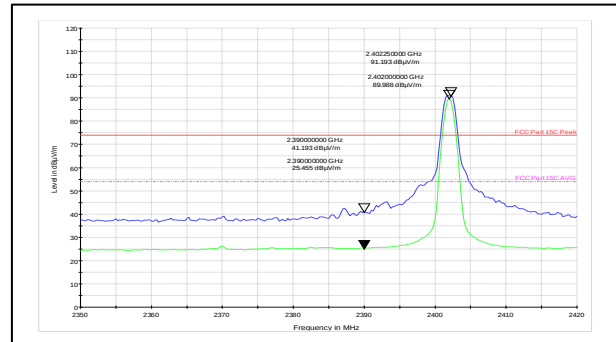
Test Plots:

Data rate: 1Mbps

Channel frequency: 2402MHz

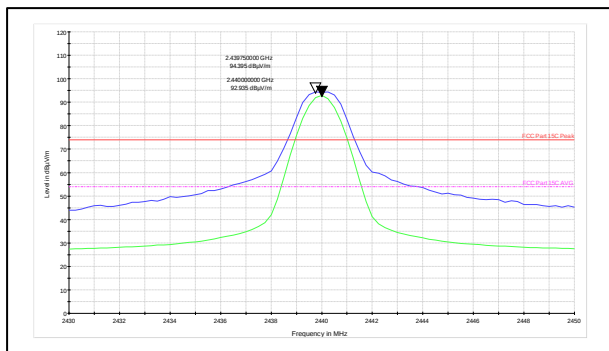


Antenna Polarization: Vertical

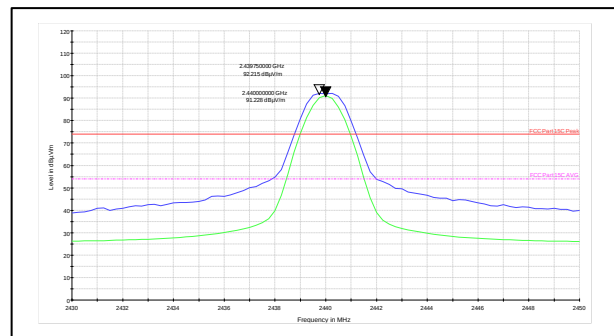


Antenna Polarization: Horizontal

Channel frequency: 2440MHz

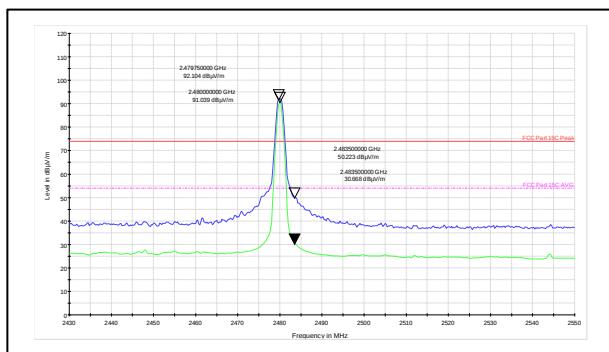


Antenna Polarization: Vertical

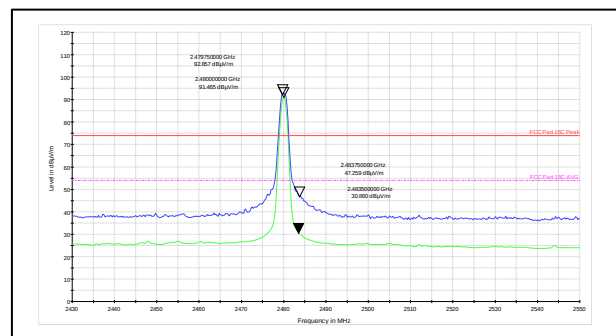


Antenna Polarization: Horizontal

Channel frequency: 2480MHz



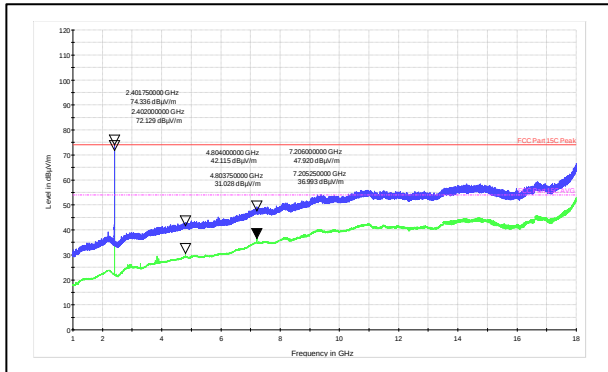
Antenna Polarization: Vertical



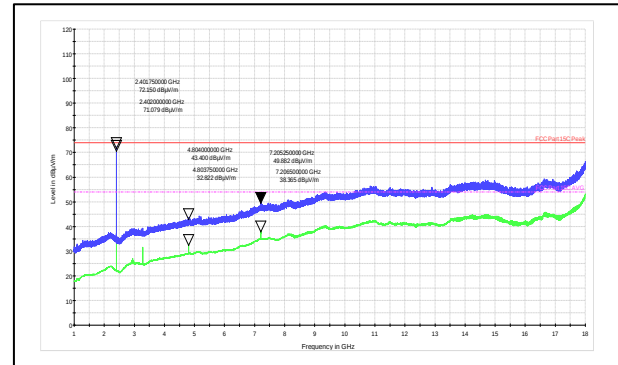
Antenna Polarization: Horizontal

Test Plots: Frequency Range from 1 GHz to 26 GHz

Channel Frequency: 2402MHz

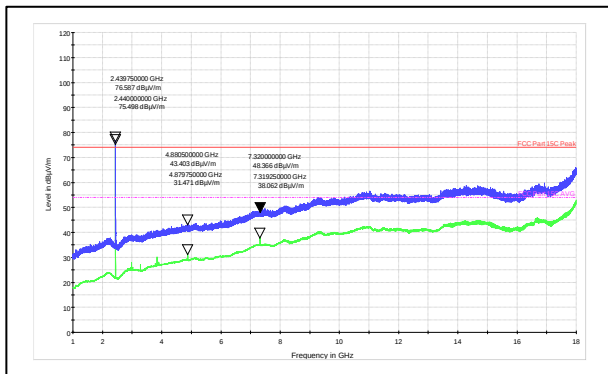


Polarization: Vertical

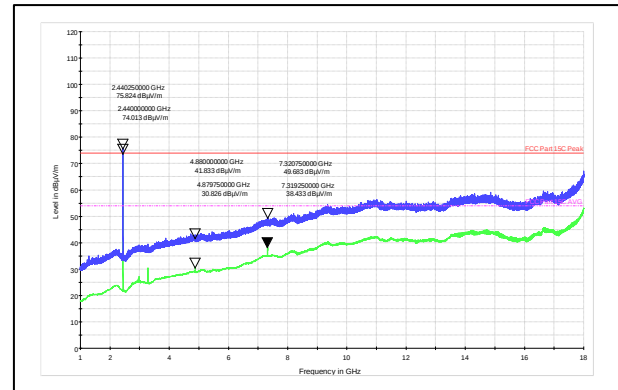


Polarization: Horizontal

Channel Frequency: 2440MHz

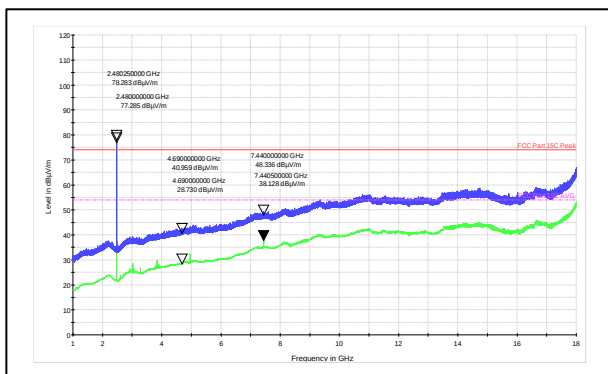


Polarization: Vertical

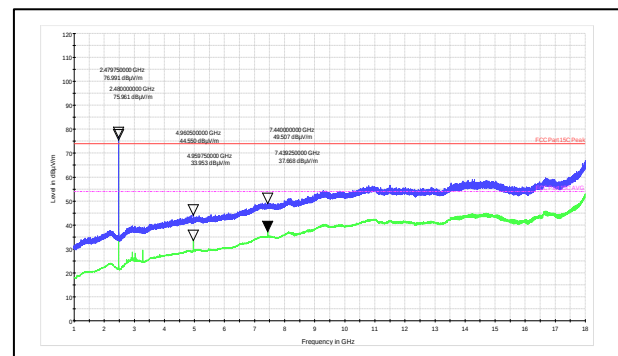


Polarization: Horizontal

Channel Frequency: 2480MHz



Polarization: Vertical



Polarization: Horizontal

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Simultaneous Operation:

Channel Frequency (MHz)	Antenna Polarization	Measured Frequency (MHz)	Measured emission (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
2402 & 2412	Vertical	2390(Pk)	69.83	74.00*	-4.17
		2390(Av)	50.26	54.00*	-3.74
		2402(Pk)	85.24	-	-
		2402(Av)	83.67	-	-
		2412(Pk)	102.18	-	-
		2412(Av)	93.38	-	-
		4804(Pk)	40.07	74.00	-33.93
		4804(Av)	28.20	54.00	-25.80
		4824(Pk)	47.47	74.00	-26.53
		4824(Av)	32.73	54.00	-21.27
		7206(Pk)	47.67	74.00	-26.33
		7206(Av)	34.88	54.00	-19.12
		7236(Pk)	47.27	74.00	-26.73
		7236(Av)	35.01	54.00	-18.99
	Horizontal	2390(Pk)	67.46	74.00*	-6.54
		2390(Av)	49.66	54.00*	-4.34
		2402(Pk)	85.63	-	-
		2402(Av)	82.33	-	-
		2412(Pk)	100.10	-	-
		2412(Av)	90.19	-	-
		4804(Pk)	40.68	74.00	-33.32
		4804(Av)	28.28	54.00	-25.72
		4824(Pk)	50.18	74.00	-23.82
		4824(Av)	35.21	54.00	-18.79
		7206(Pk)	48.60	74.00	-25.40
		7206(Av)	34.93	54.00	-19.07
		7236(Pk)	47.08	74.00	-26.92
		7236(Av)	34.95	54.00	-19.05

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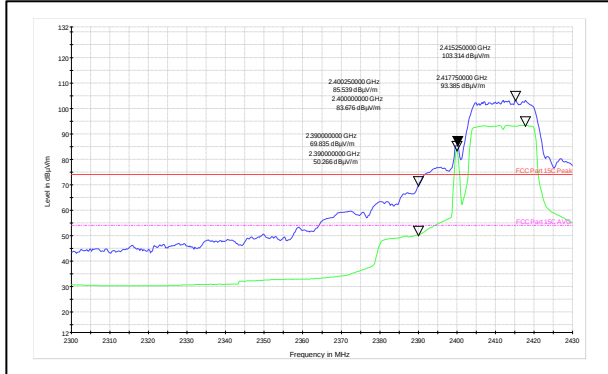
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Channel Frequency (MHz)	Antenna Polarization	Measured Frequency (MHz)	Measured emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2480 & 2462	Vertical	2462(Pk)	101.75	-	-
		2462(Av)	91.53	-	-
		2480(Pk)	92.02	-	-
		2480(Av)	90.88	-	-
		2483.5(Pk)	67.44	74.00*	-6.56
		2483.5(Av)	45.39	54.00*	-8.61
		4924(Pk)	50.07	74.00	-23.93
		4924(Av)	35.37	54.00	-18.63
		4960(Pk)	41.81	74.00	-32.19
		4960(Av)	31.11	54.00	-22.89
		7386(Pk)	46.52	74.00	-27.48
		7386(Av)	34.72	54.00	-19.28
		7440(Pk)	48.30	74.00	-25.70
		7440(Av)	35.51	54.00	-18.49
	Horizontal	2462(Pk)	98.67	-	-
		2462(Av)	88.66	-	-
		2480(Pk)	90.88	-	-
		2480(Av)	88.90	-	-
		2483.5(Pk)	64.58	74.00*	-9.42
		2483.5(Av)	43.51	54.00*	-10.49
		4924(Pk)	49.65	74.00	-24.35
		4924(Av)	35.62	54.00	-18.38
		4960(Pk)	42.41	74.00	-31.59
		4960(Av)	32.25	54.00	-21.75
		7386(Pk)	46.99	74.00	-27.01
		7386(Av)	34.74	54.00	-19.26
		7440(Pk)	52.44	74.00	-21.56
		7440(Av)	42.43	54.00	-11.57

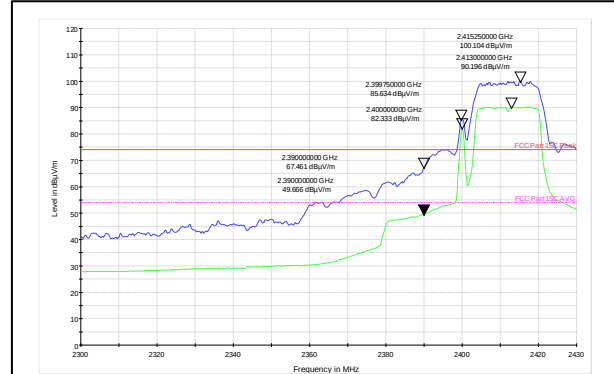
*→ Indicates the Restricted Band edge
 - → Indicates Fundamental frequency
 (Pk) → Peak Detector
 (Av) → Average Detector

Test Plots:

Channel Frequency: 2402MHz for BLE & 2412MHz for Wi-Fi

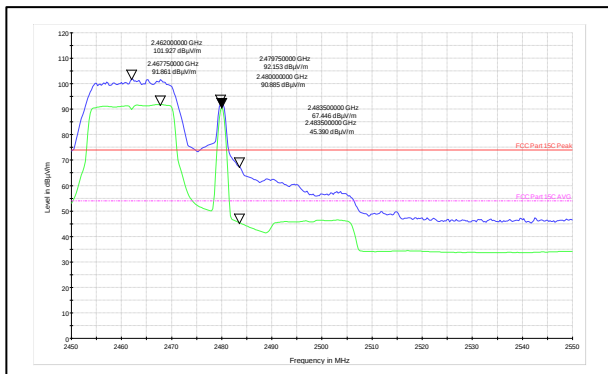


Antenna Polarization: Vertical

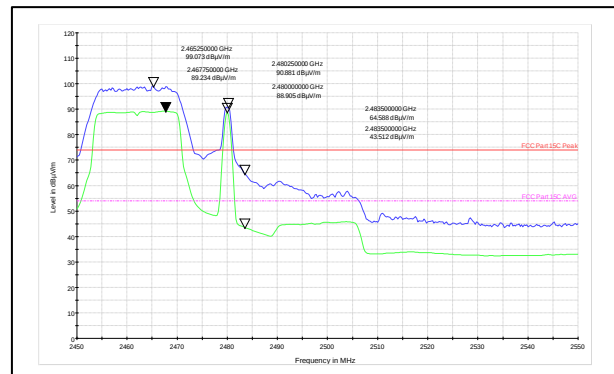


Antenna Polarization: Horizontal

Channel Frequency: 2480MHz for BLE & 2462MHz for Wi-Fi



Antenna Polarization: Vertical



Antenna Polarization: Horizontal

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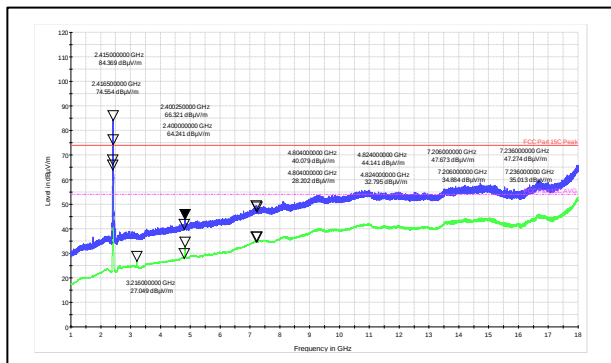
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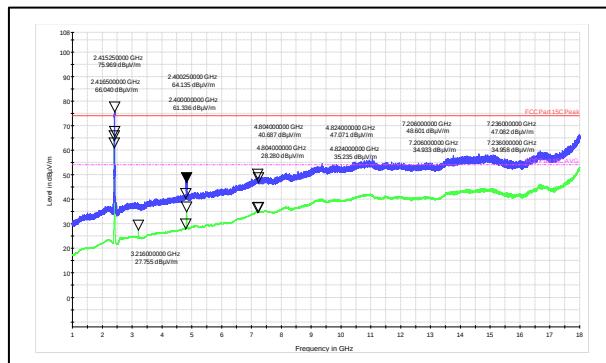
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Frequency range 1GHz to 18GHz:

Channel Frequency: 2412MHz & 2402MHz

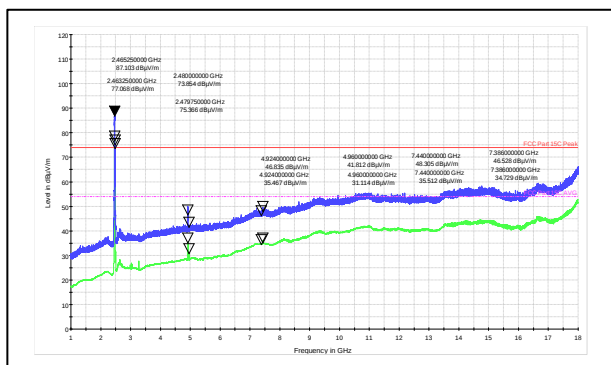


Antenna Polarization: Vertical

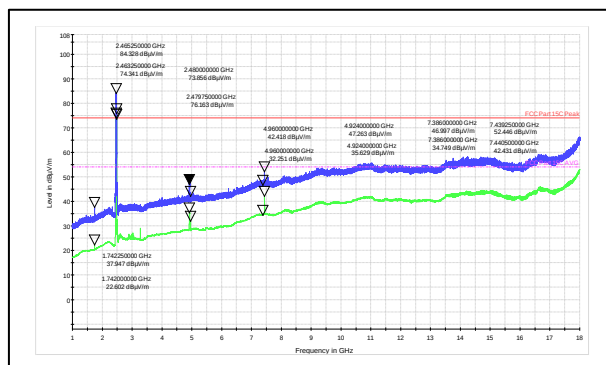


Antenna Polarization: Horizontal

Channel Frequency: 2462MHz & 2480MHz



Antenna Polarization: Vertical



Antenna Polarization: Horizontal

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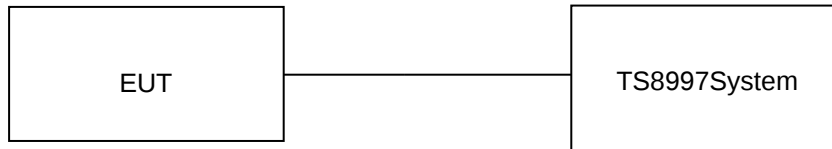
8 Test Results for Wi-Fi

8.1 Maximum Conducted Output Power

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (b)(3)
Test Method	Subclause 11.9.2.3.2 of ANSI C63.10
Detector	Gated RMS
Port of testing	Antenna port
Requirement	Power $\leq$ 1 W (30 dBm)



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.1 °C Voltage = 6VDC through AA Batteries Relative humidity: 65%

KDB Guidelines applied:

Measurements were made as per section 8.3.2.3 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

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Test results:

Note:

1. All the losses are included during measurement and final values are mentioned in the test report
2. This product do not support additional beamforming gain / directional gain, it uses single antenna and the Directional gain of the single antenna is 4.54 dBi

Bandwidth (MHz)	Mode	Data Rate (Mbps)	Channel frequency (MHz)	Measured Gated RMS Power (dBm)	Limit (dBm)	Margin (dB)
20	b	1	2412	12.32	30.00	-17.68
			2437	13.58	30.00	-16.42
			2462	14.78	30.00	-15.22
	g	6	2412	11.35	30.00	-18.65
			2437	12.46	30.00	-17.54
			2462	13.57	30.00	-16.43
	n	MCS0	2412	11.11	30.00	-18.89
			2437	12.32	30.00	-17.68
			2462	13.39	30.00	-16.61
40	n	MCS0	2422	9.74	30.00	-20.26
			2437	11.08	30.00	-18.92
			2452	11.70	30.00	-18.30

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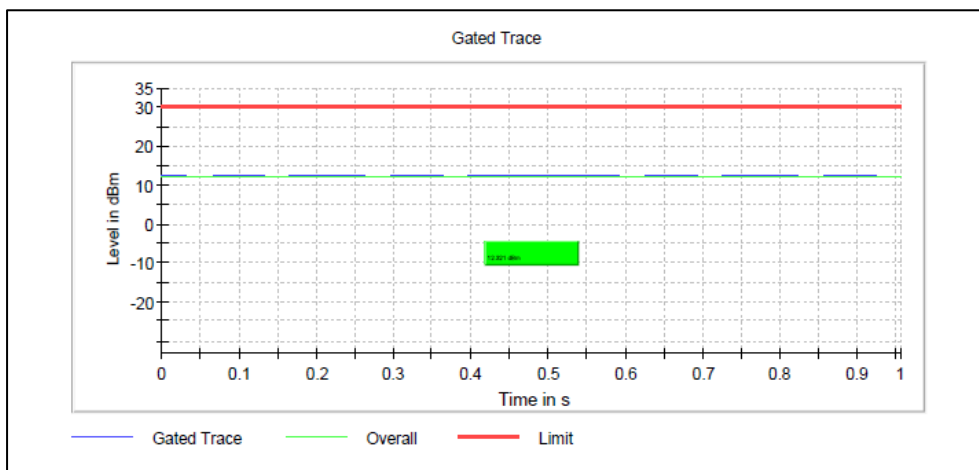
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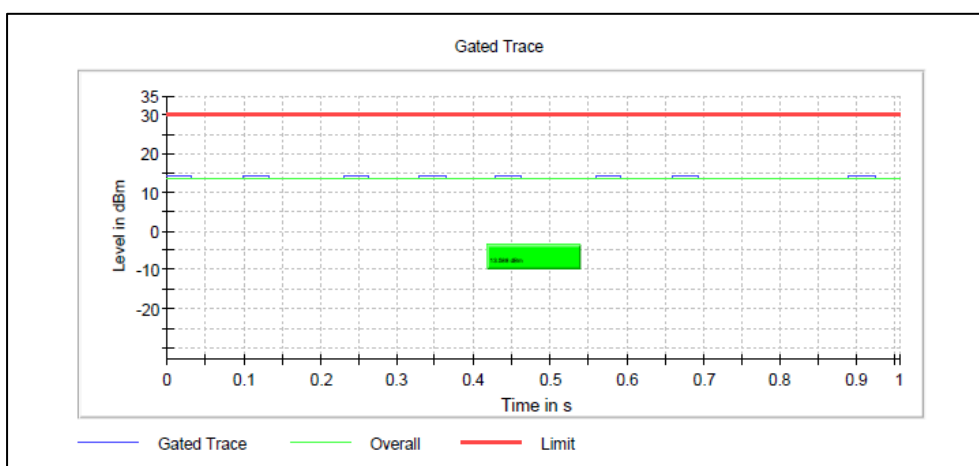
Test Plots:

Mode: 802.11g

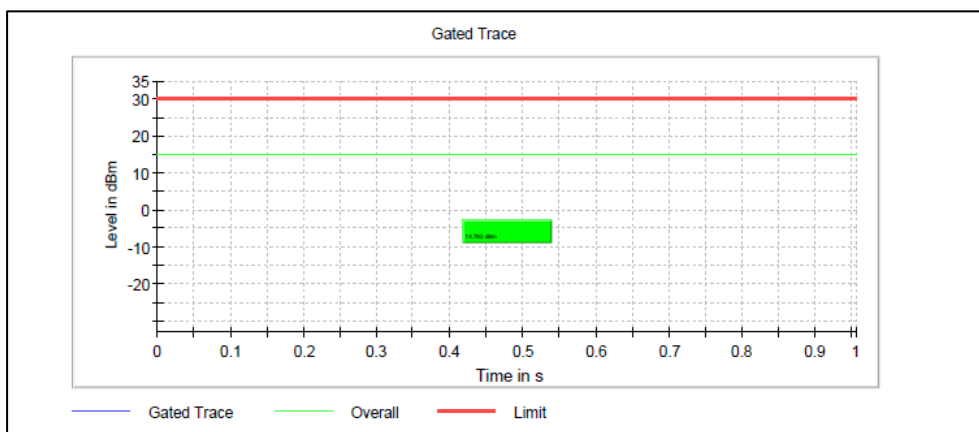
Data Rate: 1Mbps



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz



Channel Frequency: 2462MHz

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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 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 11: 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) = + 21.5 °C

Voltage = 6VDC through AA Batteries

Relative humidity: 63%

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Test results:

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

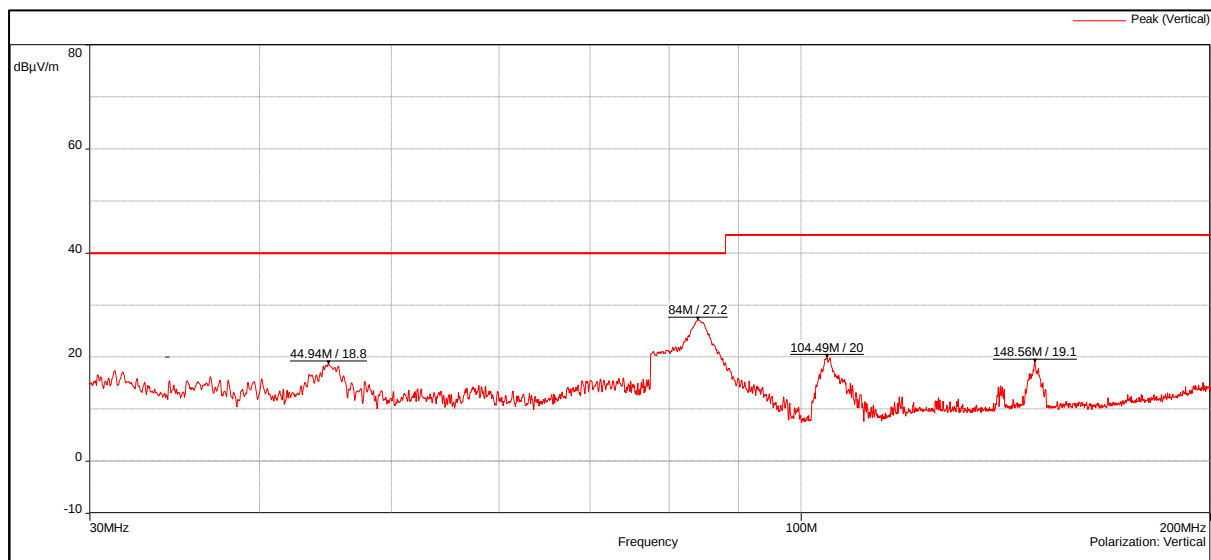
Test results for frequency range 9 kHz – 30 MHz

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 12: Test results for frequency range 30MHz – 200MHz

Antenna Polarization	Measured Frequency (MHz)	Measured emission (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Vertical	44.94	18.80	40.00	-21.20
	84.00	27.20	40.00	-12.80
	104.49	20.00	43.50	-23.50
	148.56	19.10	43.50	-24.40
Horizontal	49.80	10.60	40.00	-29.40
	88.62	16.30	43.50	-27.20
	95.25	22.80	43.50	-20.70
	103.71	12.60	43.50	-30.90

Test Plots:



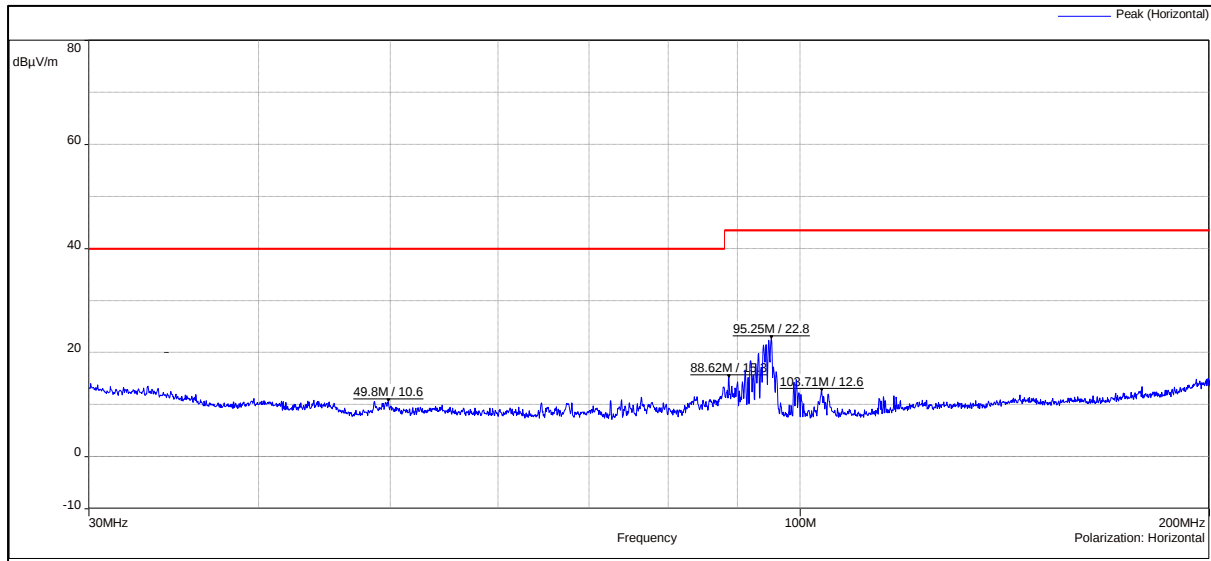
Frequency range: 30MHz to 200MHz

Polarization: Vertical

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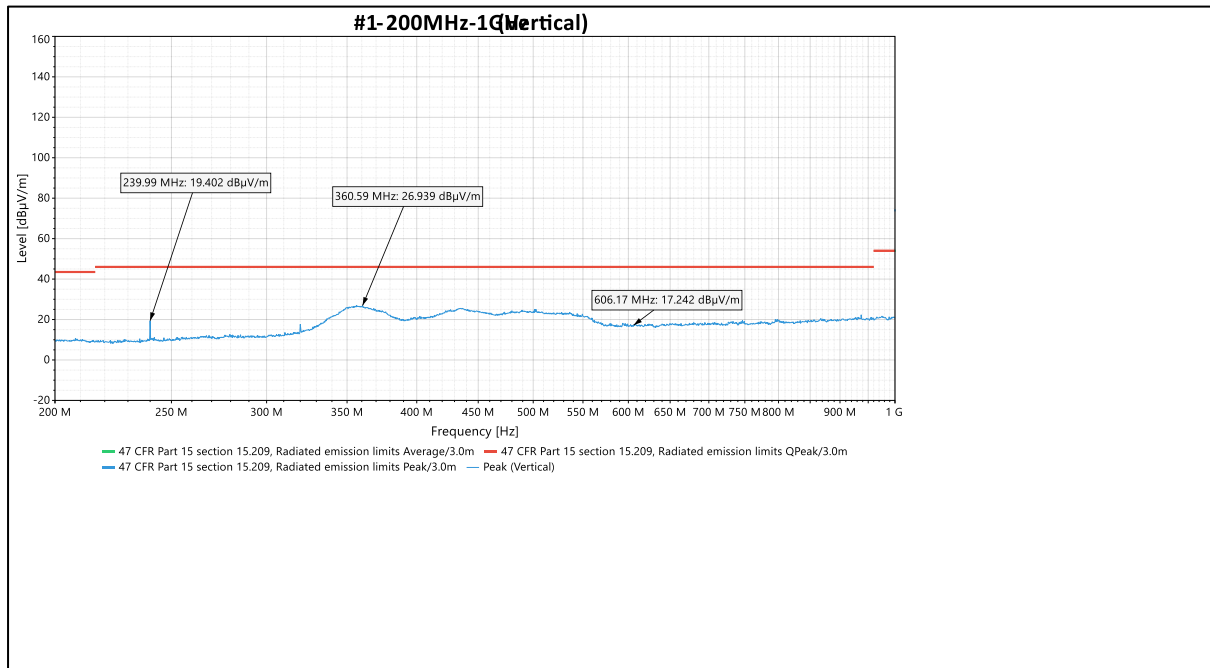
Frequency range: 30MHz to 200MHz

Polarization: Horizontal

Table 13: Test results for frequency range 200MHz – 1GHz

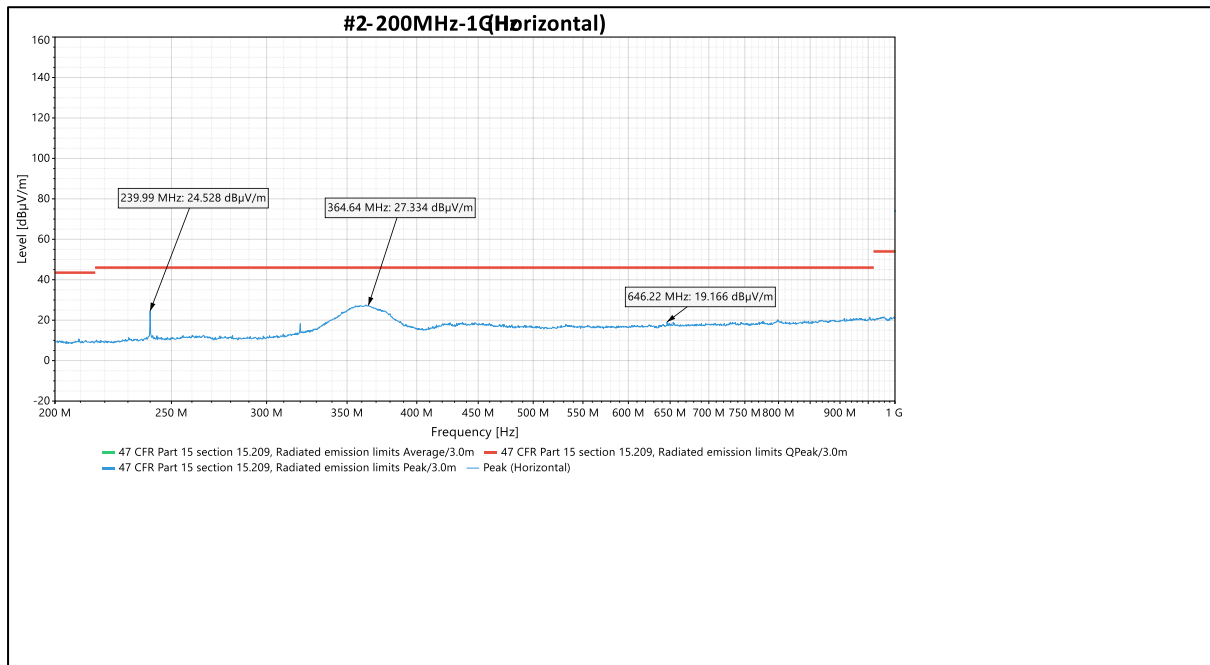
Antenna Polarization	Measured Frequency (MHz)	Measured emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Vertical	239.99	19.40	46.00	-26.60
	360.59	26.93	46.00	-19.07
	606.17	17.24	46.00	-28.76
Horizontal	239.99	24.52	46.00	-21.48
	364.64	27.33	46.00	-18.67
	646.22	19.16	46.00	-26.84

Test Plots:



Frequency range: 200MHz to 1GHz

Polarization: Vertical



Frequency range: 200MHz to 1GHz

Polarization: Horizontal

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Table 14: Test results for frequency range 1GHz to 26GHz

Mode: 802.11b

Data Rate: 1Mbps

Data Rate	Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1Mbps	2412	2412(Pk)	Vertical	104.02	-	-
		2412(Av)		96.22	-	-
		2390(Pk)		55.27	74.00*	-18.73
		2390(Av)		37.10	54.00*	-16.90
		4824(Pk)		50.40	74.00	-23.60
		4824(Av)		44.17	54.00	-9.83
		7236(Pk)		47.16	74.00	-26.84
		7236(Av)		34.89	54.00	-19.11
		2412(Pk)	Horizontal	102.39	-	-
		2412(Av)		94.60	-	-
		2390(Pk)		53.85	74.00*	-20.15
		2390(Av)		35.70	54.00*	-18.30
		4824(Pk)		51.73	74.00	-22.27
		4824(Av)		46.07	54.00	-7.93
		7236(Pk)		47.07	74.00	-26.93
		7236(Av)		34.94	54.00	-19.06
	2437	2437(Pk)	Vertical	105.13	-	-
		2437(Av)		97.32	-	-
		4874(Pk)		51.22	74.00	-22.78
		4874(Av))		45.35	54.00	-8.65
		7311(Pk)		46.78	74.00	-27.22
		7311(Av))		34.75	54.00	-19.25
		2437(Pk)	Horizontal	103.08	-	-
		2437(Av)		95.51	-	-
		4874(Pk)		50.34	74.00	-23.66
		4874(Av))		44.13	54.00	-9.87
		7311(Pk)		47.00	74.00	-27.00
		7311(Av))		34.74	54.00	-19.26
	2462	2462(Pk)	Vertical	103.91	-	-
		2462(Av)		96.08	-	-
		2483.5(Pk)		57.04	74.00*	-16.96
		2483.5(Av)		37.90	54.00*	-16.10
		4924(Pk)		50.90	74.00	-23.10
		4924(Av)		45.00	54.00	-9.00
		7386(Pk)		47.36	74.00	-26.64
		7386(Av)		34.92	54.00	-19.08
		2462(Pk)	Horizontal	102.35	-	-
		2462(Av)		94.45	-	-
		2483.5(Pk)		54.67	74.00*	-19.33
		2483.5(Av)		35.89	54.00*	-18.11
		4924(Pk)		51.19	74.00	-22.81
		4924(Av)		45.64	54.00	-8.36
		7386(Pk)		46.56	74.00	-27.44
		7386(Av)		35.00	54.00	-19.00

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Mode: 802.11g

Data Rate: 6Mbps

Data Rate	Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
6Mbps	2412	2412(Pk)	Vertical	102.02	-	-
		2412(Av)		92.12	-	-
		2390(Pk)		70.27	74.00*	-3.73
		2390(Av)		50.76	54.00*	-3.24
		4824(Pk)		46.82	74.00	-27.18
		4824(Av)		33.07	54.00	-20.93
		7236(Pk)		47.73	74.00	-26.27
		7236(Av)		35.04	54.00	-18.96
		2412(Pk)	Horizontal	99.24	-	-
		2412(Av)		89.35	-	-
		2390(Pk)		66.72	74.00*	-7.28
		2390(Av)		46.15	54.00*	-7.85
		4824(Pk)		48.12	74.00	-25.88
		4824(Av)		34.50	54.00	-19.50
		7236(Pk)		47.03	74.00	-26.97
		7236(Av)		35.00	54.00	-19.00
	2437	2437(Pk)	Vertical	102.15	-	-
		2437(Av)		92.23	-	-
		4874(Pk)		48.63	74.00	-25.37
		4874(Av)		34.84	54.00	-19.16
		7311(Pk)		46.60	74.00	-27.40
		7311(Av)		34.89	54.00	-19.11
		2437(Pk)	Horizontal	100.45	-	-
		2437(Av)		90.39	-	-
		4874(Pk)		49.93	74.00	-24.07
		4874(Av)		34.72	54.00	-19.28
		7311(Pk)		47.61	74.00	-26.39
		7311(Av)		34.82	54.00	-19.18
	2462	2462(Pk)	Vertical	100.88	-	-
		2462(Av)		90.13	-	-
		2483.5(Pk)		66.60	74.00*	-7.40
		2483.5(Av)		44.83	54.00*	-9.17
		4924(Pk)		48.19	74.00	-25.81
		4924(Av)		33.97	54.00	-20.03
		7386(Pk)		46.91	74.00	-27.09
		7386(Av)		34.98	54.00	-19.02
		2462(Pk)	Horizontal	99.25	-	-
		2462(Av)		89.36	-	-
		2483.5(Pk)		64.23	74.00*	-9.77
		2483.5(Av)		42.47	54.00*	-11.53
		4924(Pk)		47.96	74.00	-26.04
		4924(Av)		34.32	54.00	-19.68
		7386(Pk)		47.76	74.00	-26.24
		7386(Av)		35.03	54.00	-18.97

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Mode: 802.11n-20MHz

Data Rate: MCS0

Data Rate	Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
MCS0	2412	2412(Pk)	Vertical	101.21	-	-
		2412(Av)		91.07	-	-
		2390(Pk)		68.56	74.00*	-5.44
		2390(Av)		49.01	54.00*	-4.99
		4824(Pk)		47.42	74.00	-26.58
		4824(Av)		33.79	54.00	-20.21
		7236(Pk)		47.20	74.00	-26.80
		7236(Av)		34.95	54.00	-19.05
		2412(Pk)	Horizontal	98.95	-	-
		2412(Av)		88.84	-	-
		2390(Pk)		66.24	74.00*	-7.76
		2390(Av)		46.86	54.00*	-7.14
		4824(Pk)		49.08	74.00	-24.92
		4824(Av)		35.15	54.00	-18.85
		7236(Pk)		46.84	74.00	-27.16
		7236(Av)		35.06	54.00	-18.94
	2437	2437(Pk)	Vertical	101.66	-	-
		2437(Av)		91.64	-	-
		4874(Pk)		47.49	74.00	-26.51
		4874(Av)		33.53	54.00	-20.47
		7311(Pk)		47.40	74.00	-26.60
		7311(Av)		34.81	54.00	-19.19
		2437(Pk)	Horizontal	99.82	-	-
		2437(Av)		89.74	-	-
		4874(Pk)		49.40	74.00	-24.60
		4874(Av)		35.90	54.00	-18.10
		7311(Pk)		46.84	74.00	-27.16
		7311(Av)		34.79	54.00	-19.21
	2462	2462(Pk)	Vertical	99.59	-	-
		2462(Av)		90.74	-	-
		2483.5(Pk)		67.80	74.00*	-6.20
		2483.5(Av)		46.76	54.00*	-7.24
		4924(Pk)		47.40	74.00	-26.60
		4924(Av)		33.63	54.00	-20.37
		7386(Pk)		47.00	74.00	-27.00
		7386(Av)		34.98	54.00	-19.02
		2462(Pk)	Horizontal	99.07	-	-
		2462(Av)		88.98	-	-
		2483.5(Pk)		65.21	74.00*	-8.79
		2483.5(Av)		44.29	54.00*	-9.71
		4924(Pk)		47.91	74.00	-26.09
		4924(Av)		33.24	54.00	-20.76
		7386(Pk)		47.75	74.00	-26.25
		7386(Av)		35.02	54.00	-18.98

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Mode: 802.11n-40MHz

Data Rate: MCS0

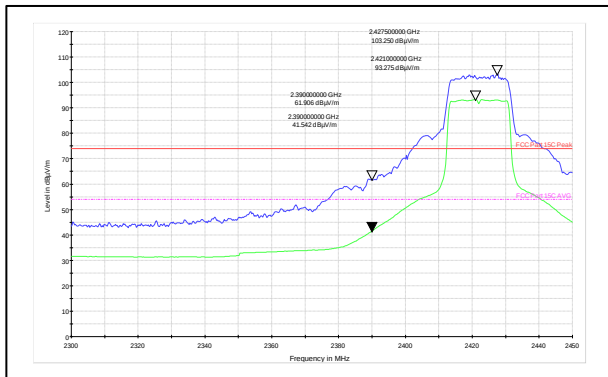
Data Rate	Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
MCS0	2422	2422(Pk)	Vertical	103.25	-	-
		2422(Av)		93.27	-	-
		2390(Pk)		61.90	74.00*	-12.10
		2390(Av)		41.54	54.00*	-12.46
		4844(Pk)		44.66	74.00	-29.34
		4844(Av)		31.67	54.00	-22.33
		7266(Pk)		46.99	74.00	-27.01
		7266(Av)		35.02	54.00	-18.98
		2422(Pk)	Horizontal	99.56	-	-
		2422(Av)		89.58	-	-
		2390(Pk)		58.88	74.00*	-15.12
		2390(Av)		38.03	54.00*	-15.97
		4844(Pk)		47.70	74.00	-26.30
		4844(Av)		34.33	54.00	-19.67
		7266(Pk)		47.21	74.00	-26.79
		7266(Av)		35.04	54.00	-18.96
	2437	2437(Pk)	Vertical	98.94	-	-
		2437(Av)		88.80	-	-
		4874(Pk)		45.39	74.00	-28.61
		4874(Av))		32.57	54.00	-21.43
		7311(Pk)		47.41	74.00	-26.59
		7311(Av))		34.88	54.00	-19.12
		2437(Pk)	Horizontal	96.26	-	-
		2437(Av)		86.11	-	-
		4874(Pk)		46.17	74.00	-27.83
		4874(Av))		33.24	54.00	-20.76
		7311(Pk)		47.71	74.00	-26.29
		7311(Av))		34.85	54.00	-19.15
	2452	2452(Pk)	Vertical	99.40	-	-
		2452(Av)		89.07	-	-
		2483.5(Pk)		71.66	74.00*	-2.34
		2483.5(Av)		51.97	54.00*	-2.03
		4904(Pk)		44.67	74.00	-29.33
		4904(Av)		31.49	54.00	-22.51
		7356(Pk)		46.89	74.00	-27.11
		7356(Av)		34.95	54.00	-19.05
		2452(Pk)	Horizontal	96.45	-	-
		2452(Av)		87.29	-	-
		2483.5(Pk)		69.49	74.00*	-4.51
		2483.5(Av)		49.80	54.00*	-4.20
		4904(Pk)		45.24	74.00	-28.76
		4904(Av)		32.04	54.00	-21.96
		7356(Pk)		47.33	74.00	-26.67
		7356(Av)		34.99	54.00	-19.01

Test Plots:

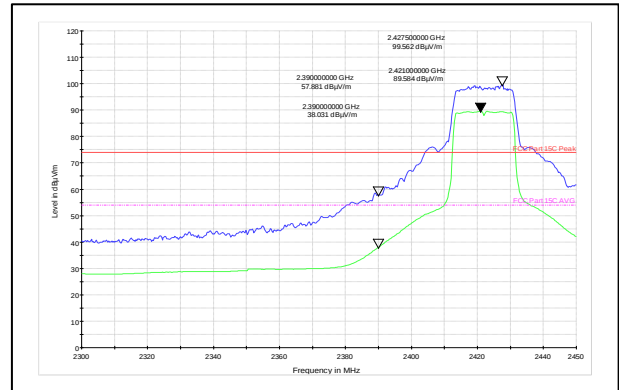
Mode: 802.11n-40MHz

Data Rate: MCS0

Channel Frequency: 2422MHz

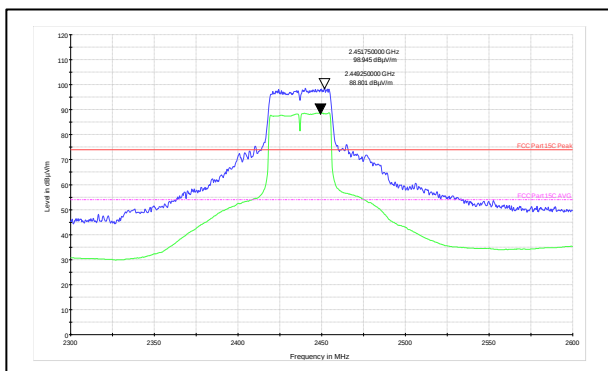


Polarization: Vertical

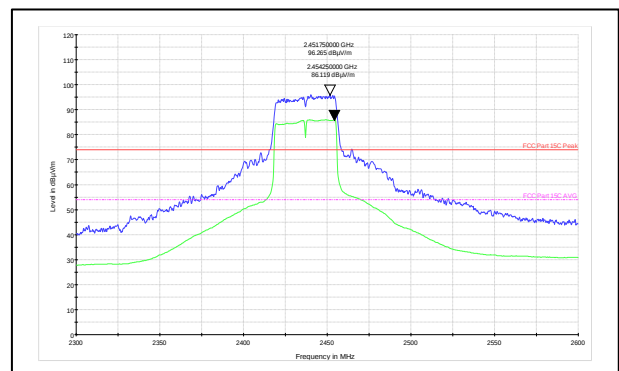


Polarization: Horizontal

Channel Frequency: 2437MHz

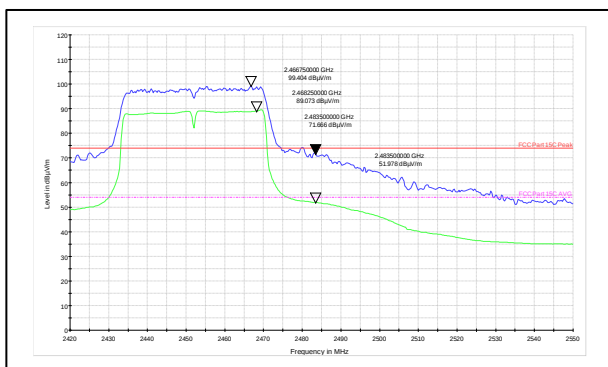


Polarization: Vertical

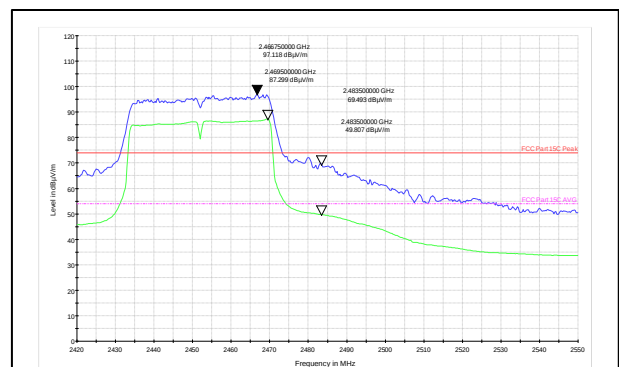


Polarization: Horizontal

Channel Frequency: 2452MHz



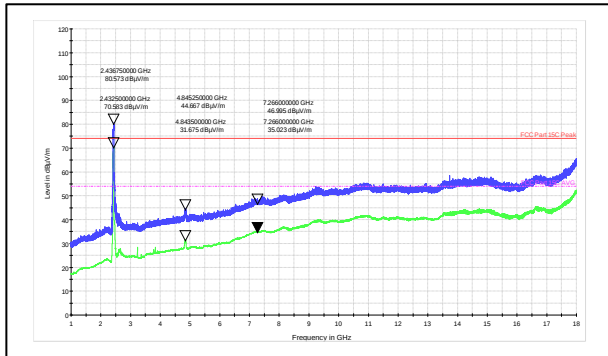
Polarization: Vertical



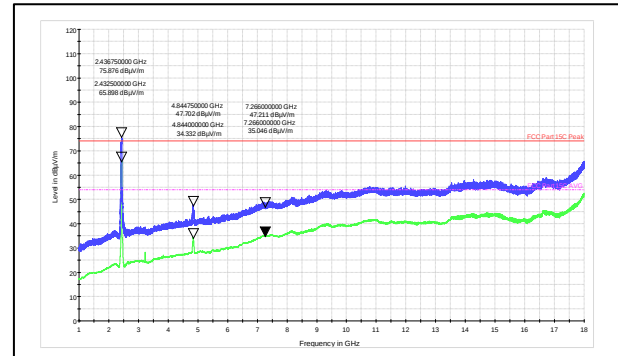
Polarization: Horizontal

Test Plots: Frequency range from 1GHz to 18 GHz

Channel Frequency: 2422MHz

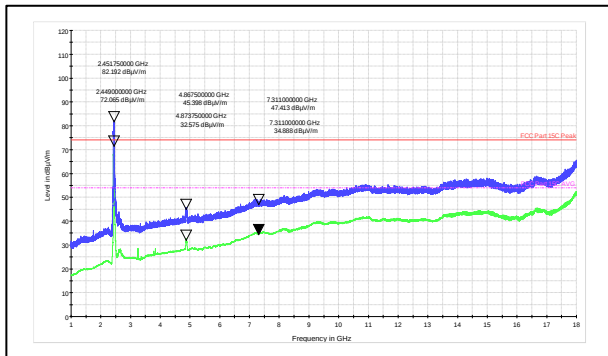


Polarization: Vertical

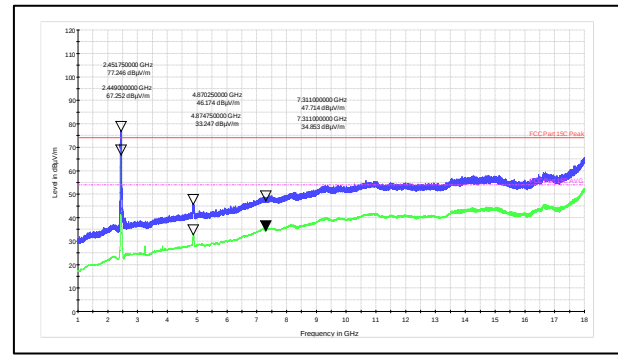


Polarization: Horizontal

Channel Frequency: 2437MHz

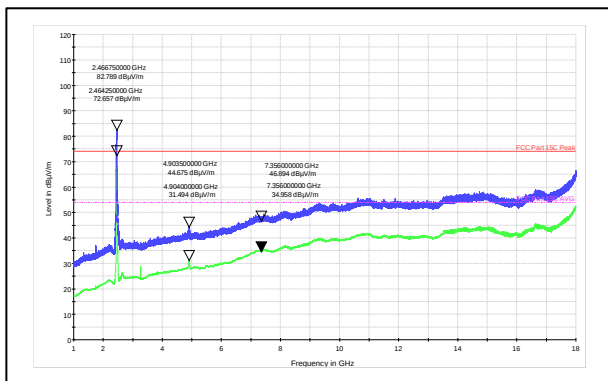


Polarization: Vertical

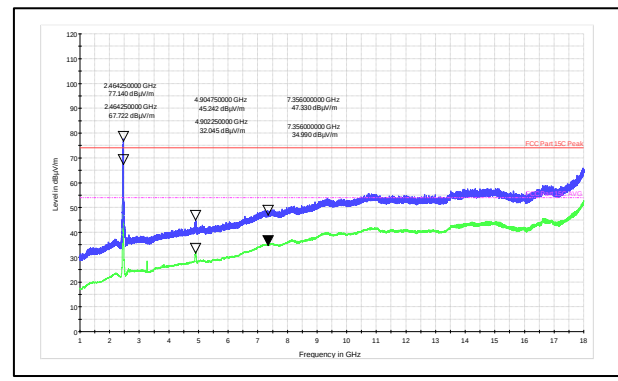


Polarization: Horizontal

Channel Frequency: 2452MHz



Polarization: Vertical



Polarization: Horizontal

Prüfbericht - Nr.:

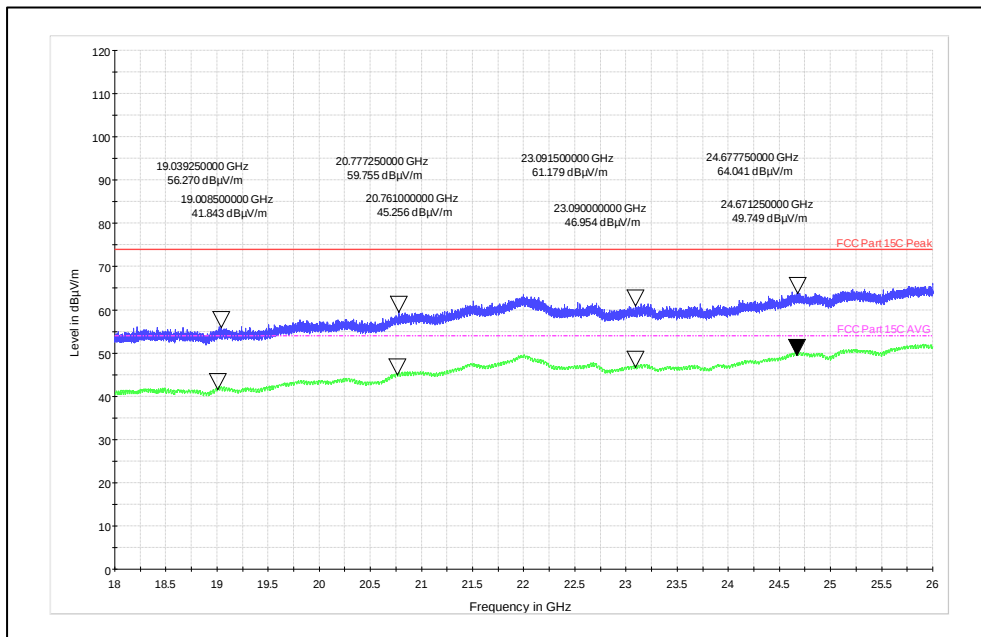
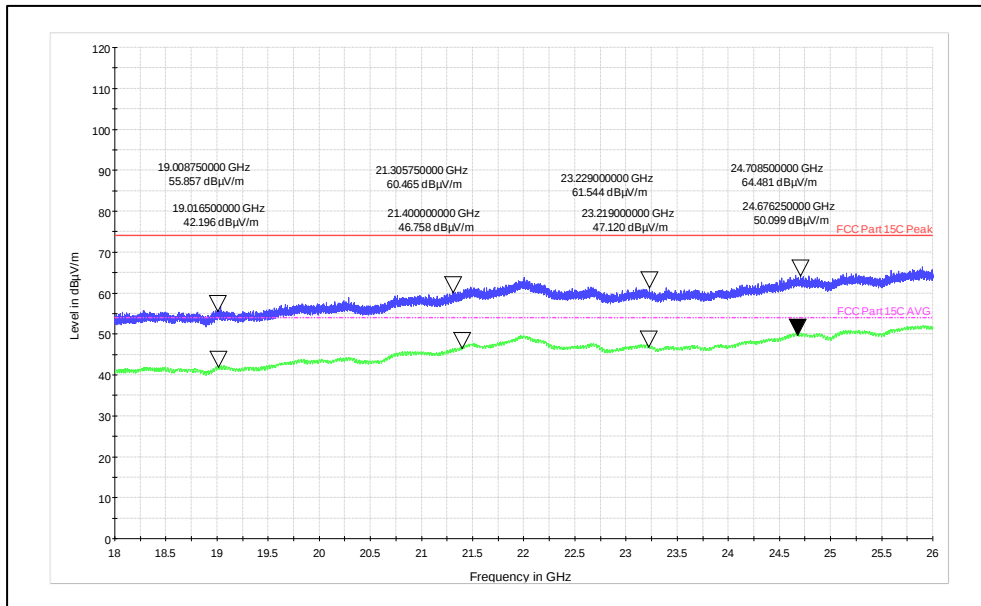
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Test Plots: Frequency range from 18GHz to 26GHz



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11 Power Table

Protocol	Mode	Data Rate	Channel Frequency (MHz)	Power levels
Wi-Fi	b	1	2412	19
			2437	19
			2462	19
	g	6	2412	17.5
			2437	17.5
			2462	17.5
	n-20	MCS0	2412	17.5
			2437	17.5
			2462	17.5
	n-40	MCS0	2422	16.5
			2437	16.5
			2452	16.5
BLE	-	125kBps, 500kBps, 1Mbps, 2Mbps	2402, 2440, 2480	8

End of test report