



Prüfbericht-Nr.: <i>Test report no.:</i>	IN24AN5K 001	Auftrags-Nr.: <i>Order no.:</i>	146961665 010	Seite 1 von 65 <i>Page 1 of 65</i>
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	2133653	Auftragsdatum: <i>Order date:</i>	2024-09-12	
Auftraggeber: <i>Client:</i>	KoreLock, Inc 7100 E. Bellevue Ave. Suite 203, Greenwood Village, CO, USA, 80111			
Prüfgegenstand: <i>Test item:</i>	Smart Lock			
Bezeichnung <i>Identification</i>	PDQ series locks	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, 15.207 & 15.209			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-09-16			
Prüfmuster-Nr.: <i>Test sample no:</i>	A003819001-002 & A003819001-012			
Prüfzeitraum: <i>Testing period:</i>	2024-09-16 - 2024-09-20			
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			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i> 2025-01-17	Ausstellatum: <i>Issue date:</i> 2025-01-17			
Stellung / Position:	Likhithesh M.D Senior Engineer	Stellung / Position:	Madhu K.N Assistant Manager	
Sonstiges / Other:	FCC ID: 2BBNS-KLCP1 Contains FCC ID: 2AV6C-CRCM1101B1			
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 | <p>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.</p> <p>Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</p> <p><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></p> |
| 2 | <p>Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben.</p> <p><i>As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged.</i></p> |
| 3 | <p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben.</p> <p>Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</p> <p><i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i></p> <p><i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p> |
| 4 | <p>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.</p> <p><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></p> |

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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 Conducted emissions	15.207	N/A

Note:

N/T → Not Tested

Product Category: Electronics Testing

Test Discipline: EMC Test Facility

N/T: Not Tested – The product incorporates the certified “**Wi-Fi IoT Module**,” Model No. **ESP32-S2-MINI2**, manufactured by **Espressif Systems (Shanghai) Co., Ltd.** Test results for the module are detailed in Test Report No. **FR262713**, issued by **Sporton International Inc.**, located at No. 1098 Pengxi North Road, Kunshan Economic Development Zone, Jiangsu Province 215300, China, with **FCC ID 2AC7Z-ESPS2MINI2**.

N/T: Not Tested – The product incorporates the certified “**Bluetooth 5.0 BLE Data Module**,” Model No. **BL654**, manufactured by **Laird Technologies** Test results for the module are detailed in Test Report No. **FR813002**, issued by **International Certification Corp.**, located at W66N220 Commerce Court, Cedarburg, Wisconsin 53012, USA, with **FCC ID SQGBL654**.

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REVISION HISTORY OF THIS REPORT

Report Number	Version	Description	Issue date
IN24AN5K 001	01	Initial issue of report	2025-01-17

Note:

Smart Lock product having different models & all models are identical hence we tested **PDQ Series**.

Smart Lock Product list.

SL No.	Product Name	Model No	Lock Dimensions L x W x H (cm)	Variants
1	Smart Lock	KMS	13cm x 10cm x 14cm	Keypad Lock Without Keypad Lock
2		GTS	22cm x 20cm x 24cm	
3		6EWS	16cm x 18cm x 32cm	
4		MRS	20cm x 18cm x 34cm	
5		CLS	20cm x 17cm x 32cm	
6		SDS	16cm x 16cm x 15cm	

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1 GENERAL REMARKS

1.1 Attachments

All attachments are included as part of this test report but are issued as 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. RF Exposure

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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	26.01.2025	Yearly	Radiated Spurious Emission
Loop Antenna	Schwarzbeck	FMZB 1519 B	1519B-00111	-	28.10.2024	Yearly	
Baloon and Biconical Antenna	Schwarzbeck mess-elektronik	VHBB-9124 / BBA-9106	01028	-	08.02.2025	Yearly	
Log-Periodic Antenna	Schwarzbeck mess-elektronik	VUSLP-9111B	9111B-111	-	03.02.2025	Yearly	
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1944	-	28.10.2024	Yearly	
EMI Test Receiver	Rohde & Schwarz	ESW44	101773	1.72.SP1	26.01.2025	Yearly	
Semi Anechoic Chamber	Frankonia	-	-	-	-	-	
Fully Anechoic Chamber	Albatross	-	-	-	-	-	
Spectrum Analyzer	Agilent	E4407B	US41192 772	A.14.07	04.01.2025	Yearly	Conducted Test Parameters
10 dB RF Attenuator	Rohde & Schwarz	-	-	-	12.10.2024	Yearly	
Signal Analyzer	Rohde & Schwarz	FSV7	101644	3.30 SP1	09.02.2025	Yearly	TS8997 System
Open Switch & Control Unit	Rohde & Schwarz	OSP120 Incl. B157	OSP120-101323 & B157-100894	1.27.0.0	05.01.2025	Yearly	
Vector Signal Generator	Rohde & Schwarz	SMBV100A	260789	4.15.125.4 9	09.02.2025	Yearly	
RF and microwave Signal Generator	Rohde & Schwarz	SMB100A	108788	3.01.203.3 2	09.02.2025	Yearly	

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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	10.60.00

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: Ratings and System Details as declared by Client*

Radio Protocol	Bluetooth Low Energy	Wi-Fi
Operating Frequency Range	2402MHz-2480MHz	2412MHz to 2462MHz
No. of Channels	40(Refer Table 5)	11 (Refer Table 6)
Channel Spacing	2MHz	5MHz
Measured Conducted RF Output Power (dBm)	6.58dBm@2440MHz(2Mbps)	15.55dBm@2437MHz (g-mode 6Mbps)
Modulation	GFSK	"802.11b: DSSS (DBPSK / DQPSK/ CCK) 802.11g/n: OFDM (BPSK/ QPSK/ 16QAM/ 64QAM"
Number of antennas	1	1
Antenna Gain	0 dBi	4.54 dBi
Antenna Type	Printed PCB antenna – on-board	Printed PCB monopole antenna
Supply Voltage to Product	6VDC (4* 1.5V of AA Batteries)	
Environmental conditions	-40°C to +66°C	
	-40°C to +66°C	
EUT Dimension(L x W x H)	16cm x 18cm x 32cm	

***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.

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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: V_1.1

Hardware Name: KL-PCB-PDQ

Software Version: PDQ_NRF_4.1.4_ESP_3.1.2

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 (MHz)	Channel No.	Frequency (MHz)
BLE (2402 to 2480)	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 : 2422 MHz
Channel Mid : 2437 MHz
Channel High : 2452 MHz

4.7 TUV Sample Identification

1. TUV Sample Identification number: A003819001-002– Radiated test Sample
A003819001-012– Conducted test Sample

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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. PDQ lock embedded firmware provides full-feature access control, including NFC & RFID access control for lock-unlock activity, 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

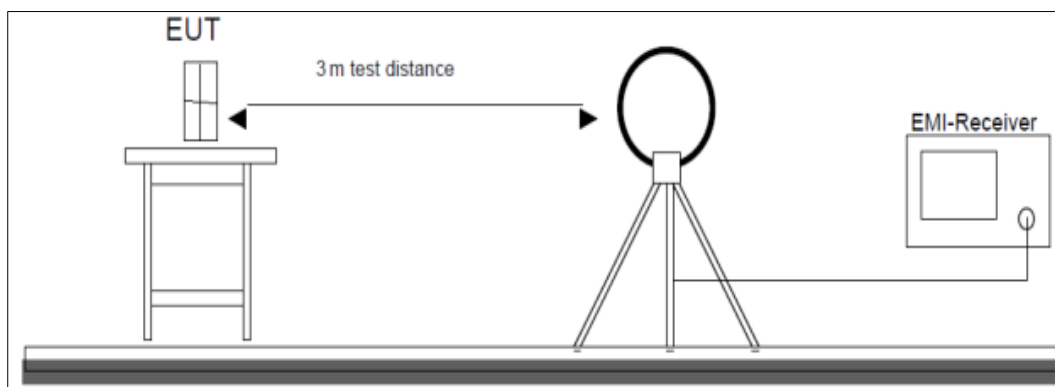


Figure 1: Frequency Range 9 kHz- 30 MHz

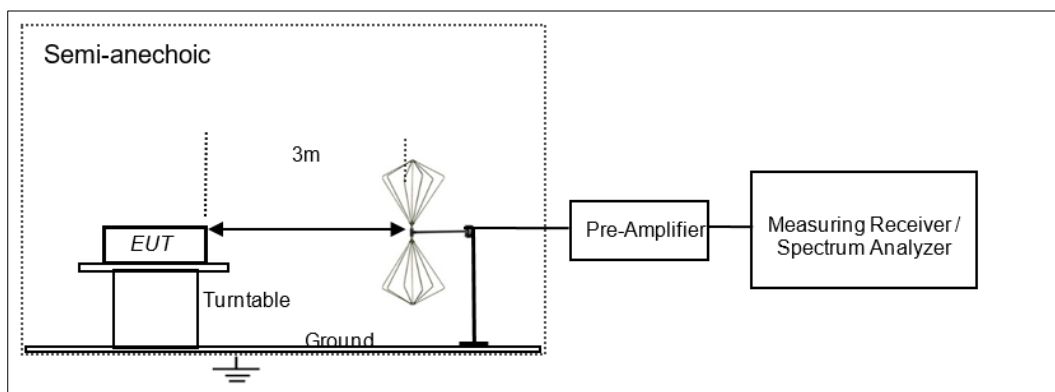


Figure 2: Frequency Range 30 MHz – 200 MHz

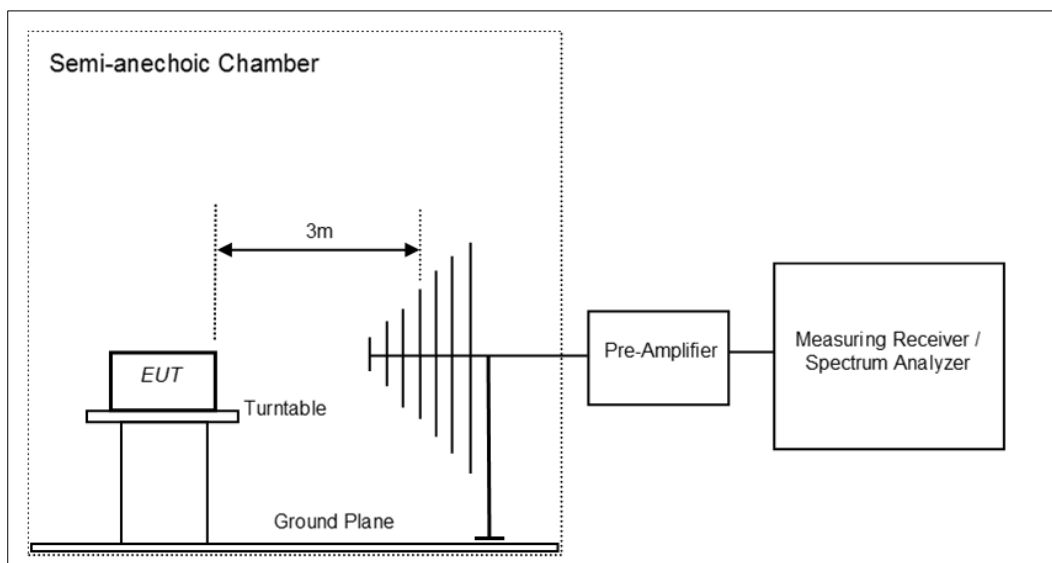


Figure 3: Frequency Range 200 MHz - 1GHz

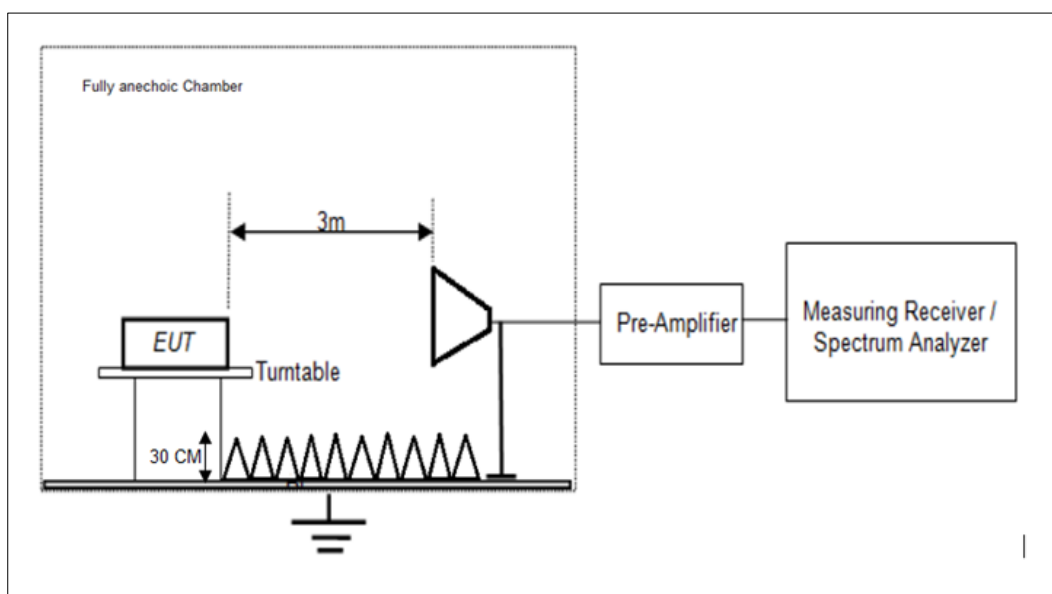


Figure 4: Frequency Range above 1 GHz

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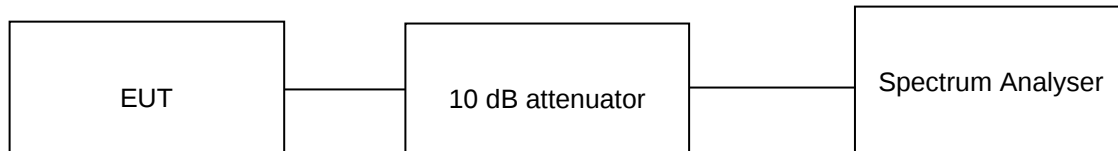
7 TEST RESULTS FOR BLE

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 for 1Mbps 3MHz for 2Mbps
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 (4* 1.5V of 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)+U.FL Cable Loss(0.5dB).
3. This product does not support additional beamforming gain / directional gain, it uses single antenna and hence Directional gain of the single antenna is 0 dBi.

Data rate	Measured Frequency (MHz)	Measured Conducted RF Output (dBm)	Power Limit (dBm)	Margin (dB)
125kbps	2402	6.21	30.00	-22.82
	2440	6.57	30.00	-22.61
	2480	6.41	30.00	-22.65
500kbps	2402	6.50	30.00	-22.88
	2440	6.44	30.00	-22.63
	2480	6.45	30.00	-22.64
1Mbps	2402	6.26	30.00	-22.90
	2440	6.46	30.00	-22.60
	2480	6.47	30.00	-22.64
2Mbps	2402	6.32	30.00	-23.51
	2440	6.58	30.00	-23.07
	2480	6.56	30.00	-22.92

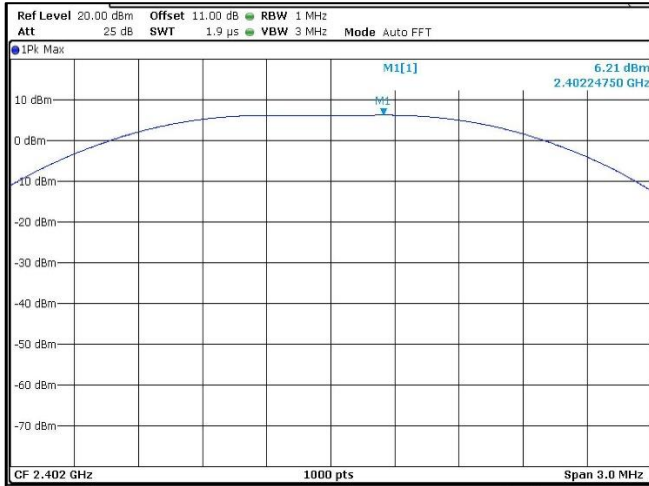
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Test Plots:

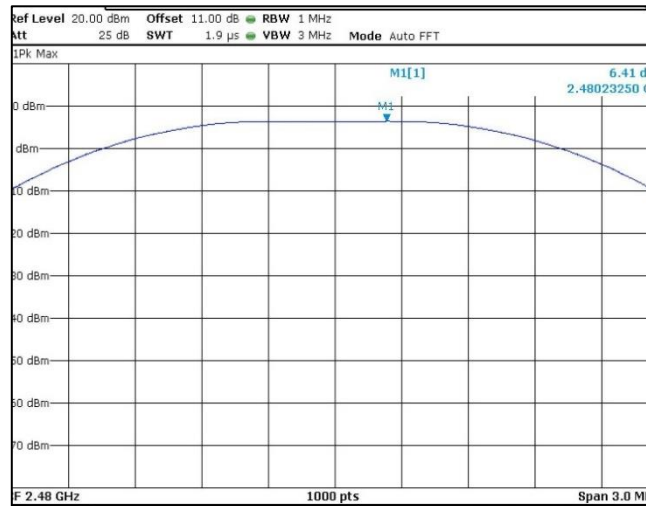
Data Rate: 125kbps



Channel Frequency: 2402MHz



Channel Frequency: 2440MHz



Channel Frequency: 2480MHz

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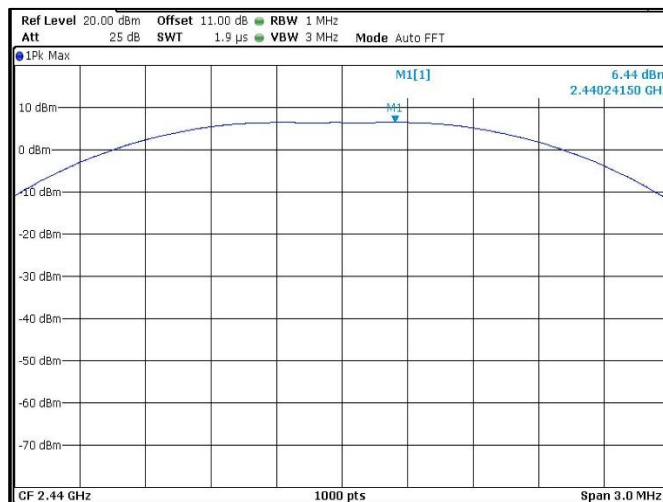
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Data Rate: 500kbps



Channel Frequency: 2402MHz



Channel Frequency: 2440MHz



Channel Frequency: 2480MHz

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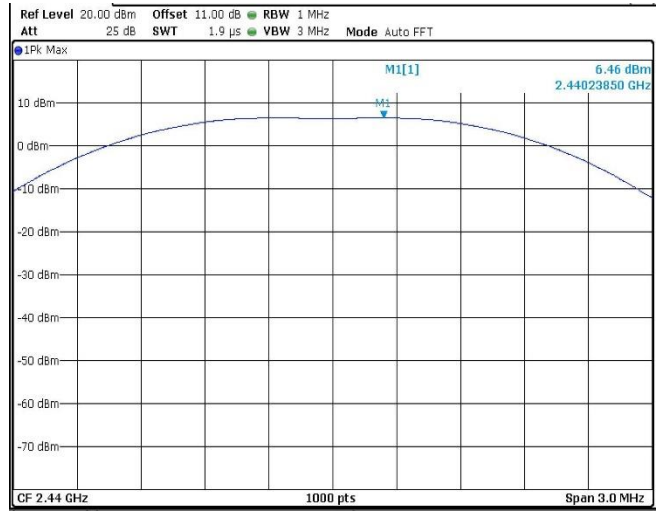
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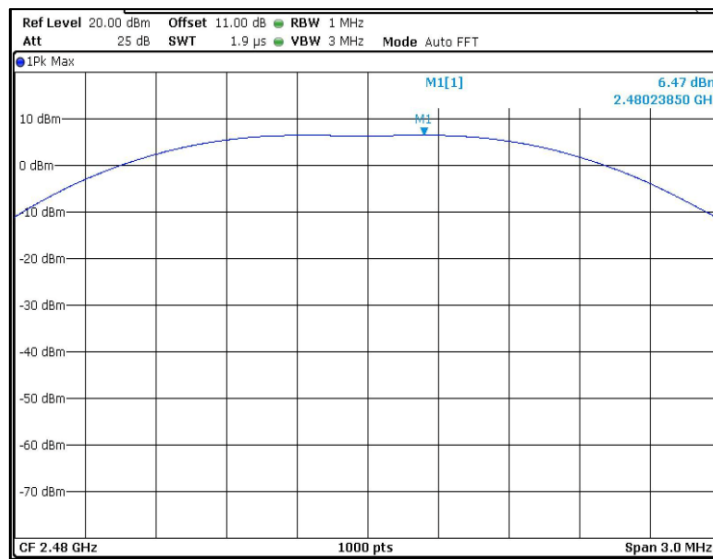
Data Rate: 1Mbps



Channel Frequency: 2402MHz



Channel Frequency: 2440MHz



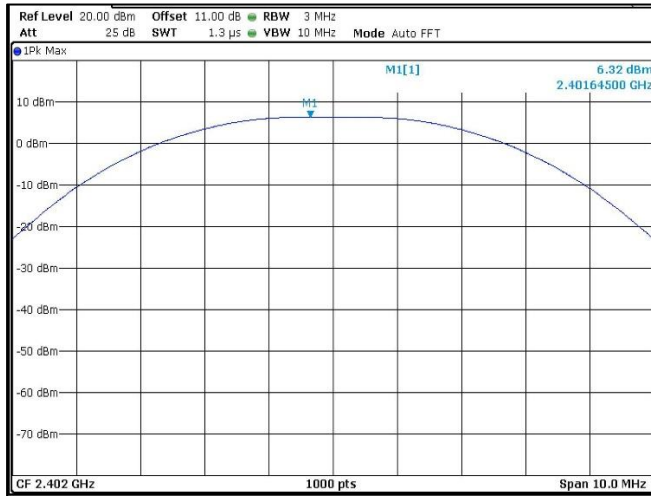
Channel Frequency: 2480MHz

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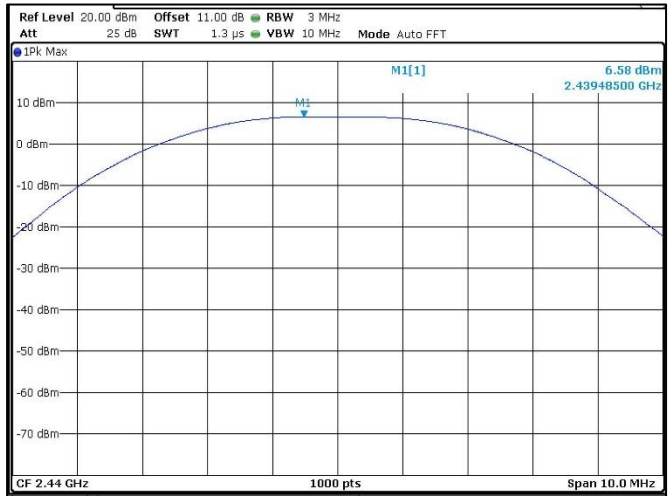
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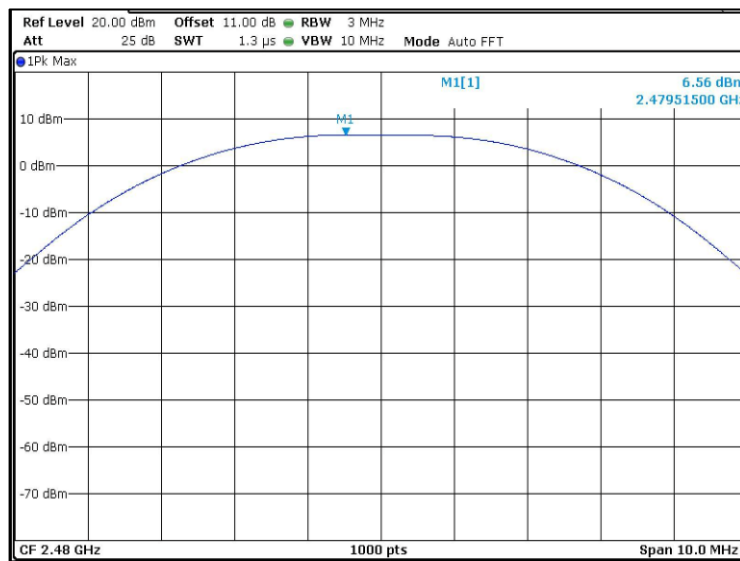
Data Rate: 2Mbps



Channel Frequency: 2402MHz



Channel Frequency: 2440MHz



Channel Frequency: 2480MHz

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 (4* 1.5V of 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.

During the below 1GHz Spurious Radiated Emissions operation all the radios listed below are enabled:

BLE(Front and Back side modules), Wi-Fi module, NFC, and RFID.

PDQ 6EWS W/O keypad

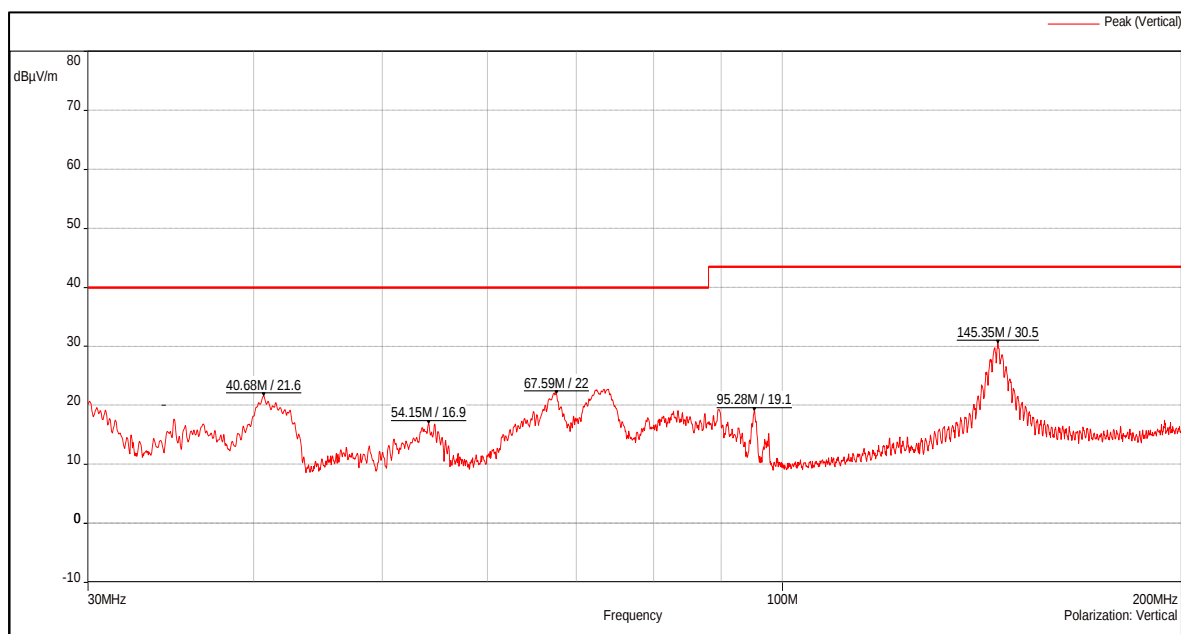
Test results for frequency range 9kHz – 30MHz

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

Table 8: 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	40.68	21.60	40.00	-18.40
	54.15	16.90	40.00	-23.10
	67.59	22.00	40.00	-18.00
	95.28	19.10	43.50	-24.40
	145.35	30.50	43.50	-13.00
Horizontal	36.69	34.90	40.00	-5.10
	50.97	27.80	40.00	-12.20
	58.71	24.70	40.00	-15.30
	75.18	20.60	40.00	-19.40
	117.6	16.80	43.50	-26.70
	145.35	34.30	43.50	-9.20

Test Plots:



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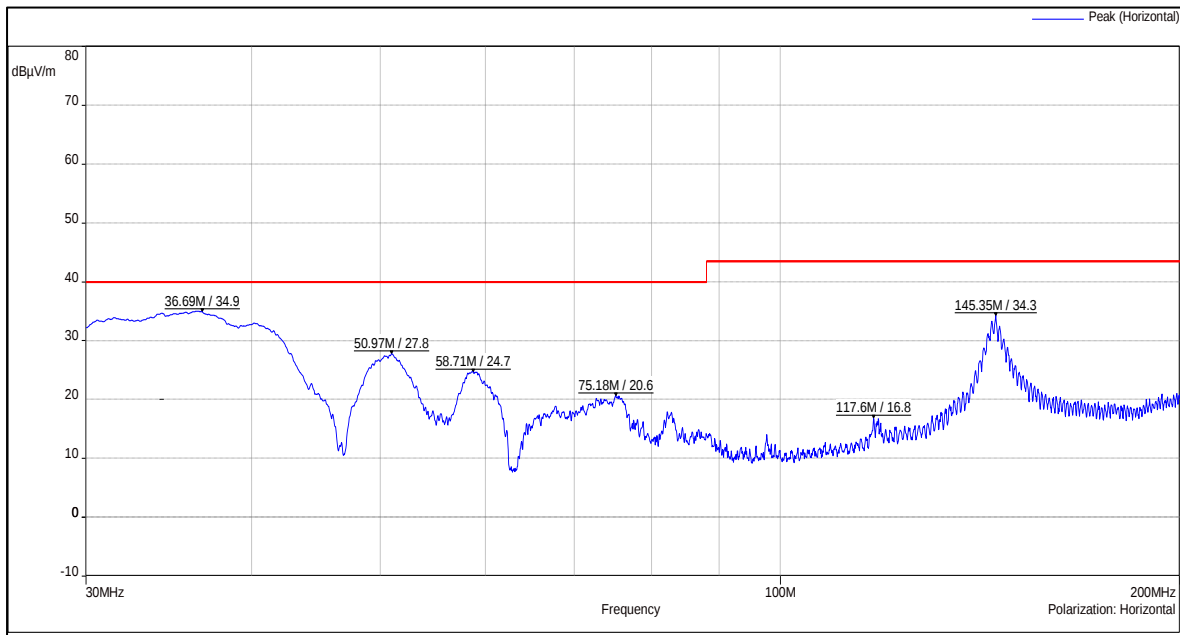
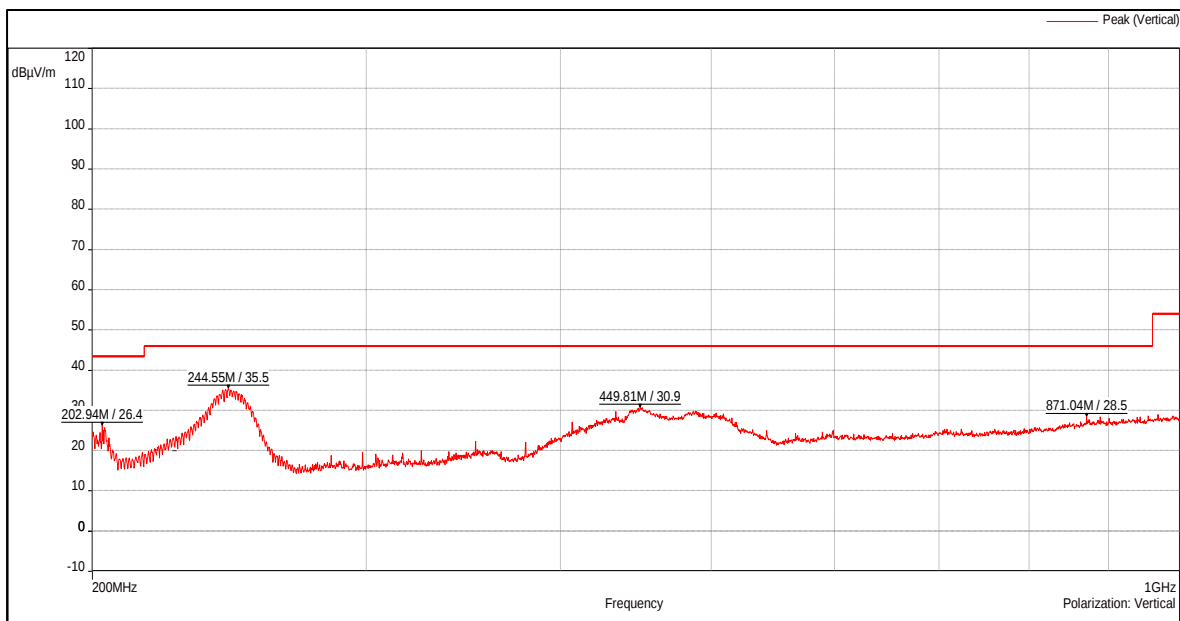


Table 9: Test results for frequency range 200MHz – 1GHz

Antenna Polarization	Measured Frequency (MHz)	Measured emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Vertical	202.94	26.40	43.50	-17.10
	244.55	35.50	46.00	-10.50
	449.81	30.90	46.00	-15.10
	871.04	28.50	46.00	-17.50
Horizontal	201.68	26.10	43.50	-17.40
	244.13	40.00	46.00	-6.00
	454.67	27.70	46.00	-18.30
	698.27	30.30	46.00	-15.70

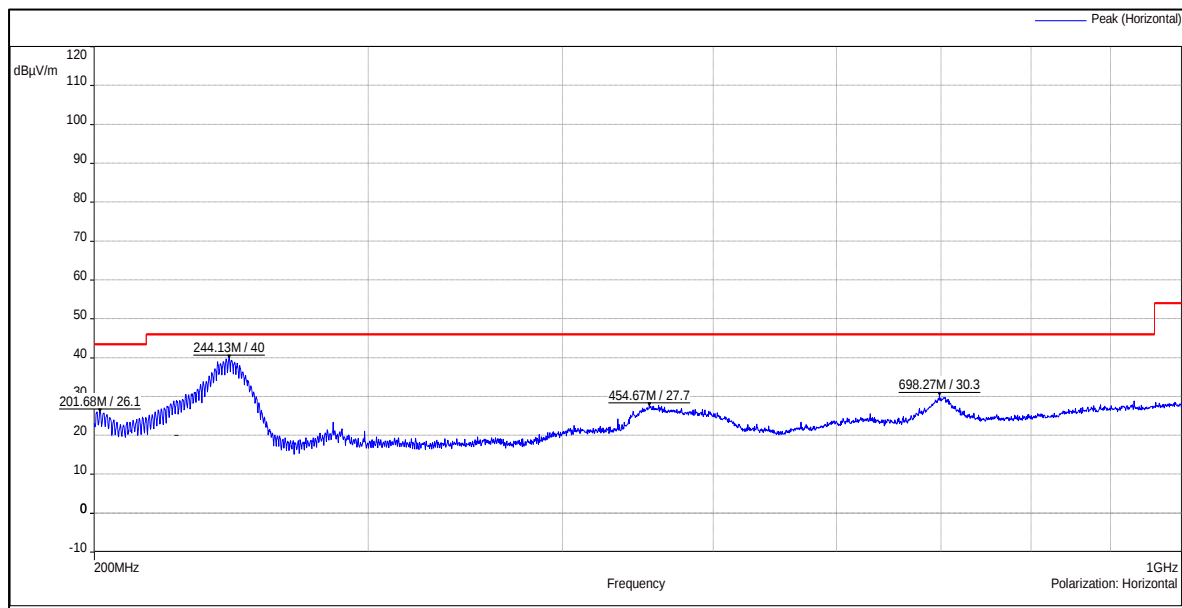
Test Plots:



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PDQ 6EWS With keypad

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

Antenna Polarization	Measured Frequency (MHz)	Measured emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Vertical	41.34	18.10	40.00	-21.90
	67.47	22.50	40.00	-17.50
	83.67	25.40	40.00	-14.60
	146.07	34.60	43.50	-8.90
Horizontal	51.18	16.70	40.00	-23.30
	77.64	23.90	40.00	-16.10
	144.33	21.80	43.50	-21.70
	157.17	28.40	43.50	-15.10

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Test Plots:

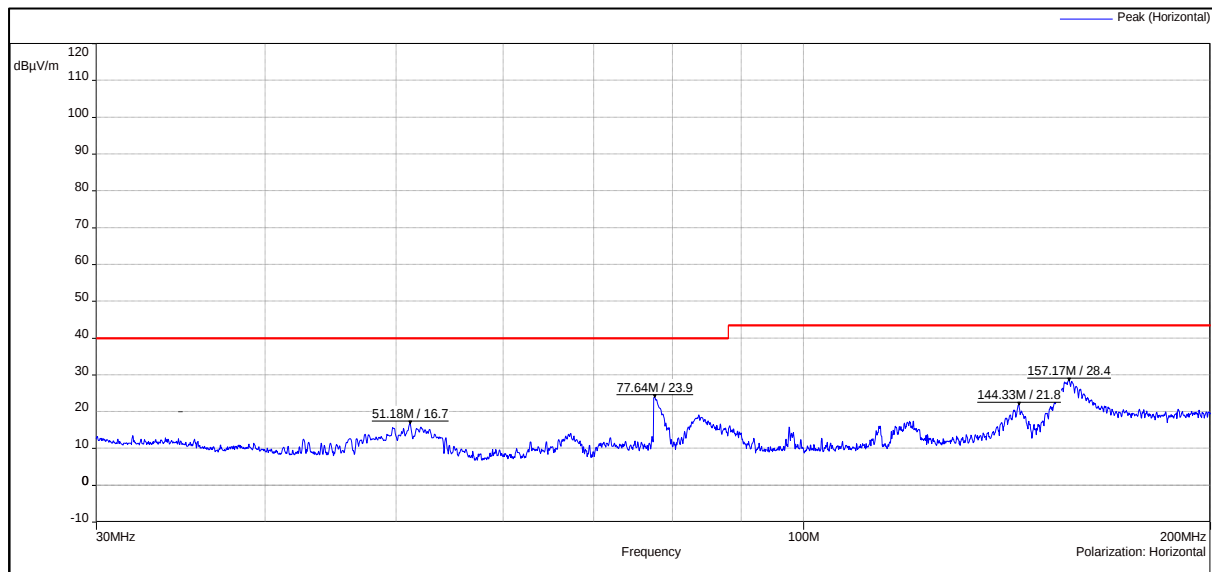
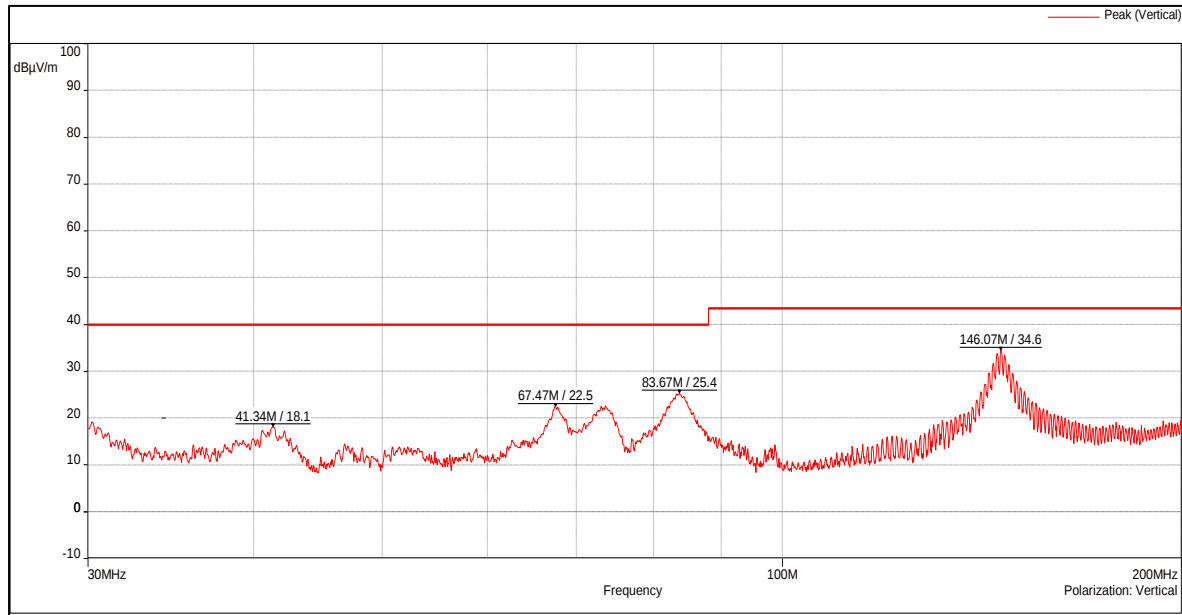


Table 11: Test results for frequency range 200MHz – 1GHz

Antenna Polarization	Measured Frequency (MHz)	Measured emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Vertical	239.99	24.40	46.00	-21.60
	349.28	19.30	46.00	-26.70
	454.04	33.80	46.00	-12.20
	915.71	28.00	46.00	-18.00
Horizontal	210.77	29.10	43.50	-14.40
	450.38	29.70	46.00	-16.30
	725.12	35.00	46.00	-11.00

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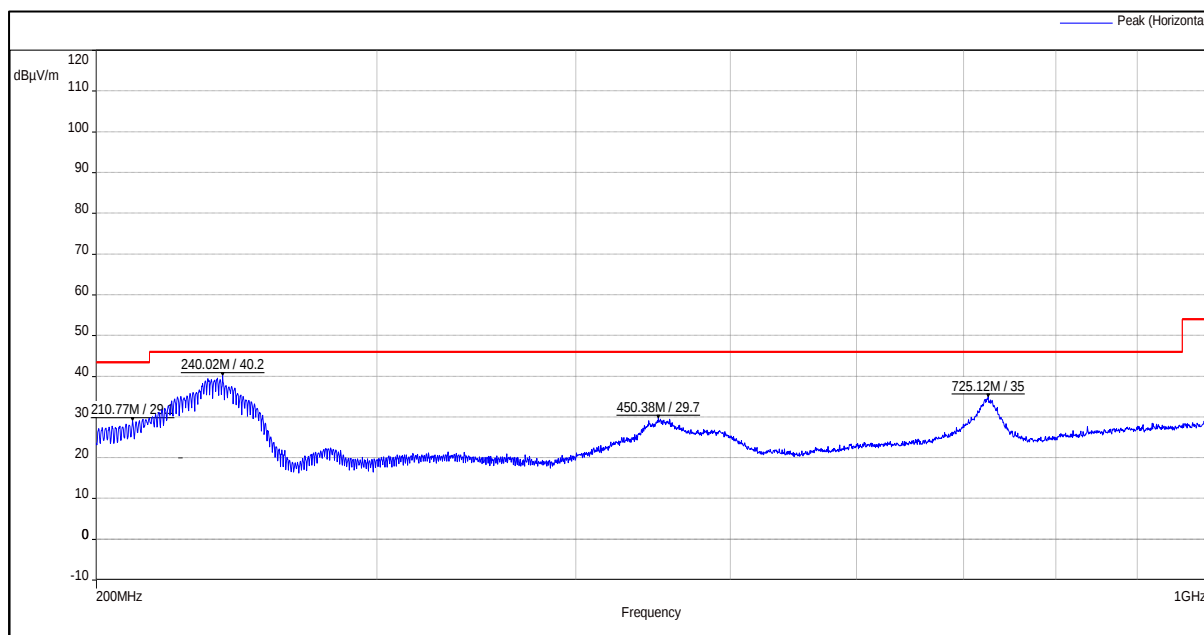
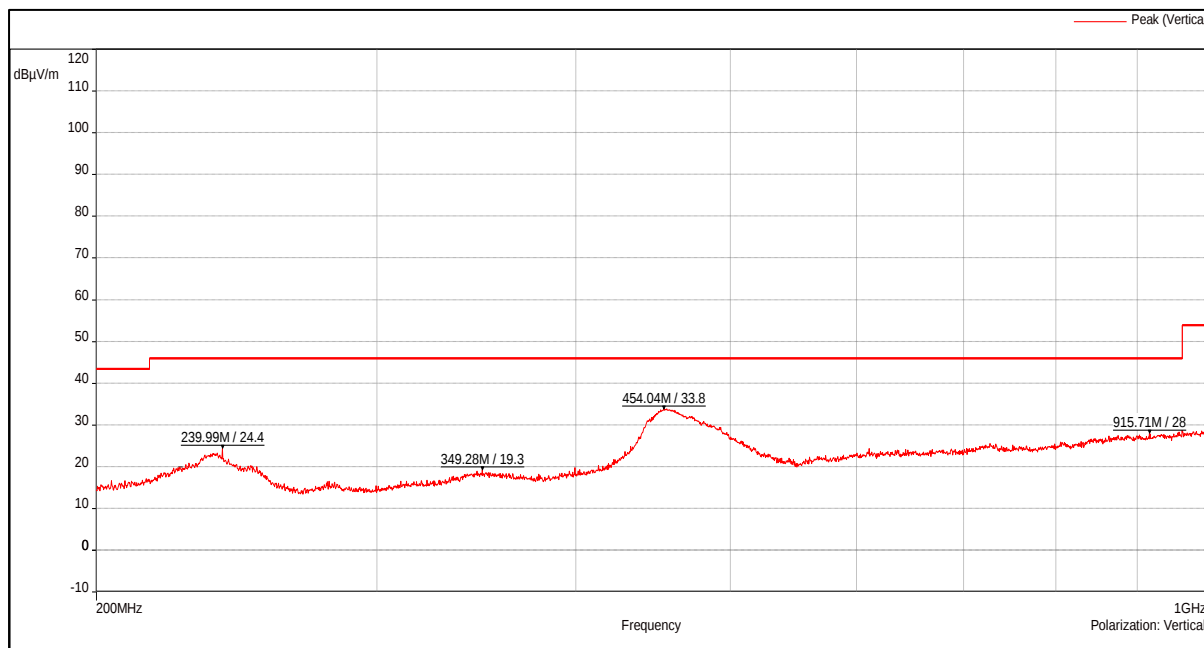
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Table 12: Test results for the frequencies above 1GHz:

Data Rate: 1Mbps

Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2402	2402(Pk)	Vertical	100.57	-	-
	2402(Av)		99.54	-	-
	2390(Pk)		43.88	74.00*	-30.12
	2390(Av)		28.81	54.00*	-25.19
	4804(Pk)		47.55	74.00	-26.45
	4804(Av)		39.62	54.00	-14.38
	7206(Pk)		49.97	74.00	-24.03
	7206(Av)		38.72	54.00	-15.28
	2402(Pk)	Horizontal	94.67	-	-
	2402(Av)		93.63	-	-
	2390(Pk)		39.81	74.00*	-34.19
	2390(Av)		25.90	54.00*	-28.10
	4804(Pk)		49.08	74.00	-24.92
	4804(Av)		42.17	54.00	-11.83
	7206(Pk)		50.18	74.00	-23.82
	7206(Av)		39.43	54.00	-14.57
2440	2440(Pk)	Vertical	98.74	-	-
	2440(Av)		97.63	-	-
	4880(Pk)		45.49	74.00	-28.51
	4880(Av)		37.17	54.00	-16.83
	7320(Pk)		49.79	74.00	-24.21
	7320(Av)		38.33	54.00	-15.67
	2440(Pk)	Horizontal	93.59	-	-
	2440(Av)		92.57	-	-
	4880(Pk)		48.47	74.00	-25.53
	4880(Av)		40.98	54.00	-13.02
	7320(Pk)		50.91	74.00	-23.09
	7320(Av)		40.72	54.00	-13.28
2480	2480(Pk)	Vertical	96.38	-	-
	2480(Av)		95.36	-	-
	2483.5(Pk)		47.22	74.00*	-26.78
	2483.5(Av)		34.04	54.00*	-19.96
	4960(Pk)		45.26	74.00	-28.74
	4960(Av)		35.30	54.00	-18.70
	7440(Pk)		49.82	74.00	-24.18
	7440(Av)		39.06	54.00	-14.94
	2480(Pk)	Horizontal	93.42	-	-
	2480(Av)		92.39	-	-
	2483.5(Pk)		44.96	74.00*	-29.04
	2483.5(Av)		31.47	54.00*	-22.53
	4960(Pk)		47.71	74.00	-26.29
	4960(Av)		39.76	54.00	-14.24
	7440(Pk)		50.75	74.00	-23.25
	7440(Av)		39.92	54.00	-14.08

_ → 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	100.62	-	-
	2402(Av)		98.00	-	-
	2390(Pk)		44.70	74.00*	-29.30
	2390(Av)		31.88	54.00*	-22.12
	4804(Pk)		45.77	74.00	-28.23
	4804(Av)		35.91	54.00	-18.09
	7206(Pk)		38.85	74.00	-35.15
	7206(Av)		48.31	54.00	-5.69
	2402(Pk)	Horizontal	96.07	-	-
	2402(Av)		93.49	-	-
	2390(Pk)		41.18	74.00*	-32.82
	2390(Av)		28.96	54.00*	-25.04
	4804(Pk)		48.13	74.00	-25.87
	4804(Av)		38.43	54.00	-15.57
	7206(Pk)		50.83	74.00	-23.17
	7206(Av)		39.98	54.00	-14.02
2440	2440(Pk)	Vertical	98.87	-	-
	2440(Av)		96.26	-	-
	4880(Pk)		44.97	74.00	-29.03
	4880(Av)		33.83	54.00	-20.17
	7320(Pk)		50.58	74.00	-23.42
	7320(Av)		38.99	54.00	-15.01
	2440(Pk)	Horizontal	93.59	-	-
	2440(Av)		91.07	-	-
	4880(Pk)		47.32	74.00	-26.68
	4880(Av)		38.00	54.00	-16.00
	7320(Pk)		50.87	74.00	-23.13
	7320(Av)		39.25	54.00	-14.75
2480	2480(Pk)	Vertical	96.25	-	-
	2480(Av)		93.75	-	-
	2483.5(Pk)		51.09	74.00*	-22.91
	2483.5(Av)		39.28	54.00*	-14.72
	4960(Pk)		44.00	74.00	-30.00
	4960(Av)		33.36	54.00	-20.64
	7440(Pk)		47.77	74.00	-26.23
	7440(Av)		37.00	54.00	-17.00
	2480(Pk)	Horizontal	92.62	-	-
	2480(Av)		90.10	-	-
	2483.5(Pk)		47.35	74.00*	-26.65
	2483.5(Av)		35.89	54.00*	-18.11
	4960(Pk)		47.66	74.00	-26.34
	4960(Av)		37.90	54.00	-16.10
	7440(Pk)		52.50	74.00	-21.50
	7440(Av)		41.53	54.00	-12.47

_ → Fundamental Frequency

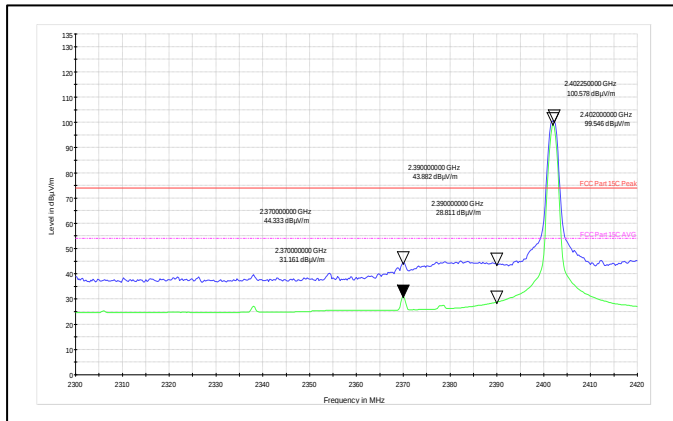
*→ Restricted Band edges

Pk: Peak Detector; Av: Average Detector

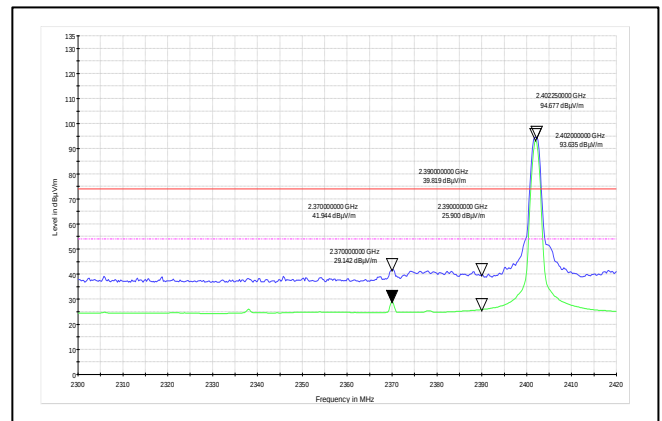
Test Plots:

Restricted Bands of Operation:

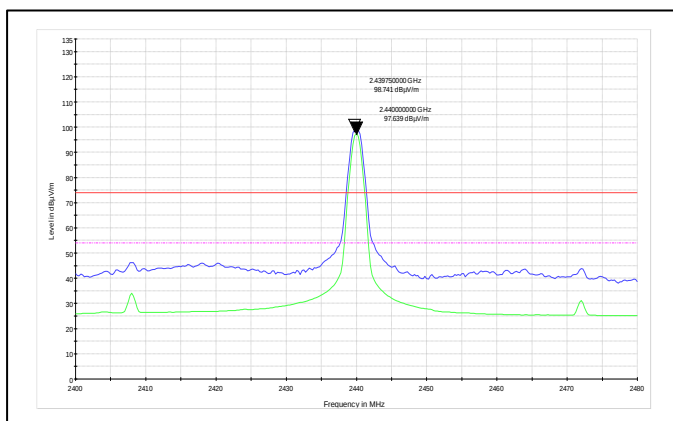
Data rate: 1Mbps



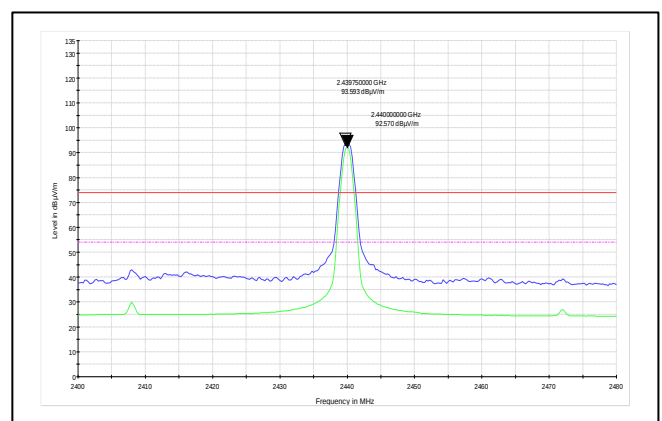
Channel Frequency: 2402MHz Polarization: Vertical



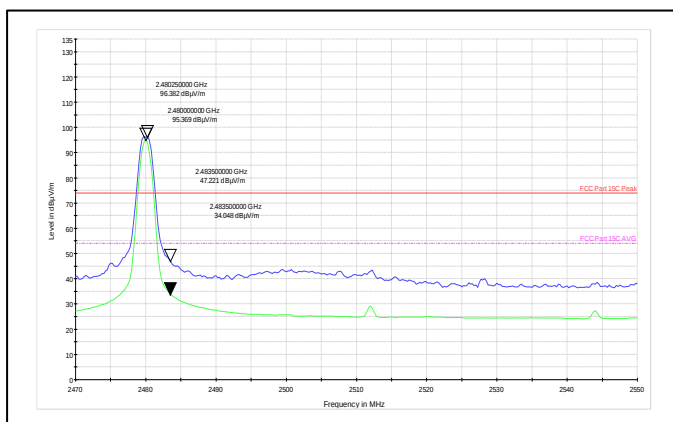
Channel Frequency: 2402MHz Polarization: Horizontal



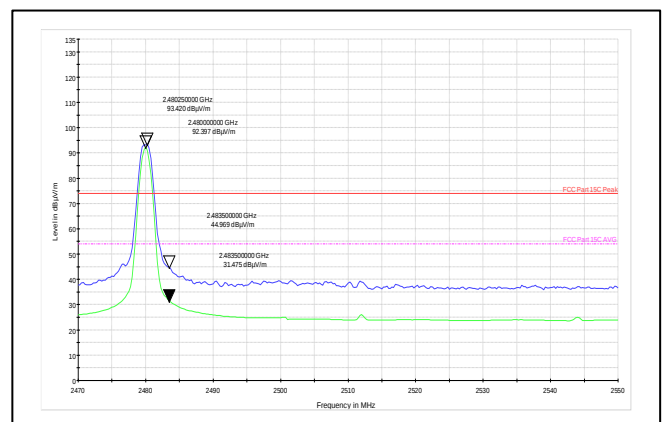
Channel Frequency: 2440MHz Polarization: Vertical



Channel Frequency: 2440MHz Polarization: Horizontal

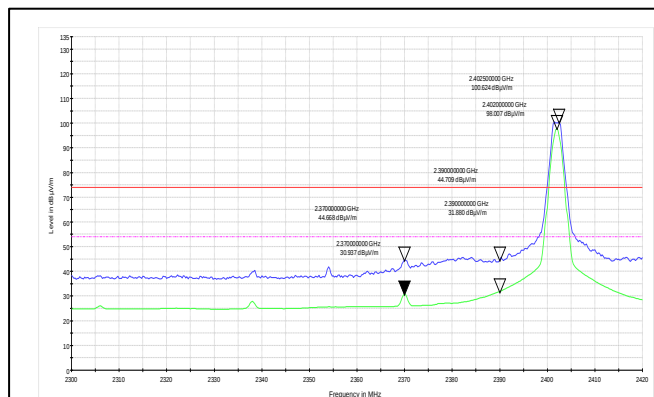


Channel Frequency: 2480MHz Polarization: Vertical

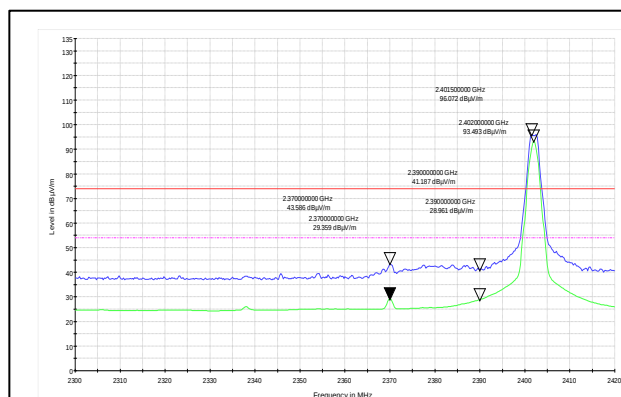


Channel Frequency: 2480MHz Polarization: Horizontal

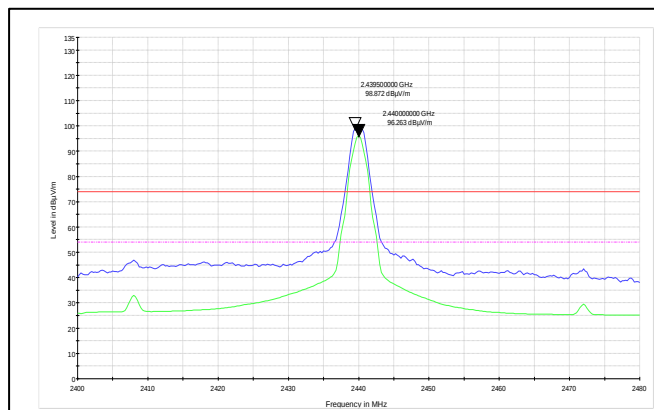
Data Rate: 2Mbps



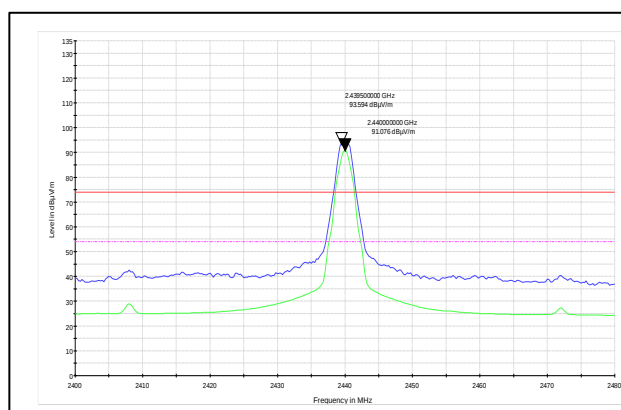
Channel Frequency: 2402MHz Polarization: Vertical



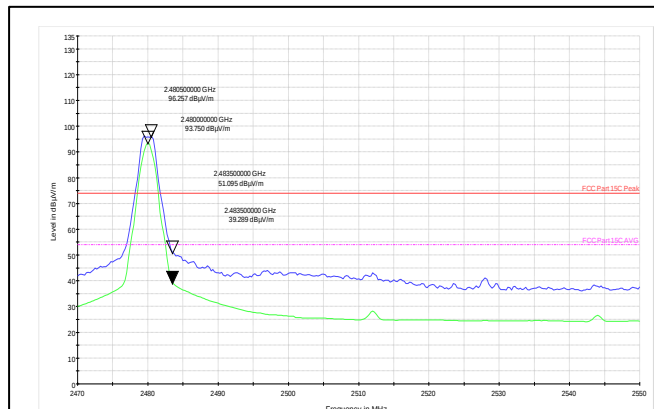
Channel Frequency: 2402MHz Polarization: Horizontal



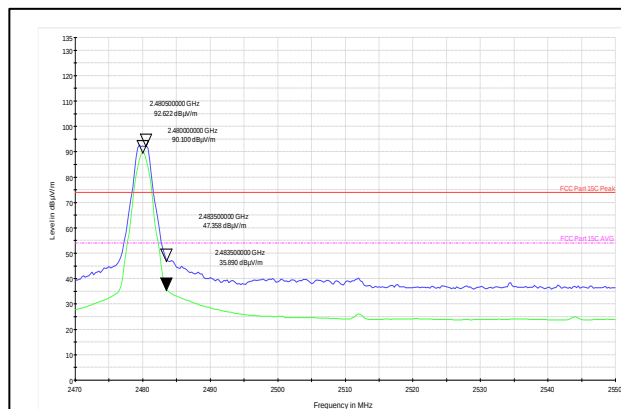
Channel Frequency: 2440MHz Polarization: Vertical



Channel Frequency: 2440MHz Polarization: Horizontal



Channel Frequency: 2480MHz Polarization: Vertical

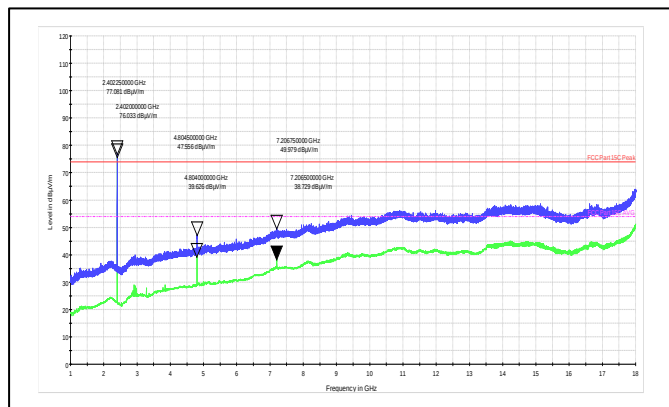


Channel Frequency: 2480MHz Polarization: Horizontal

Test Plots for Spurious Radiated emission:

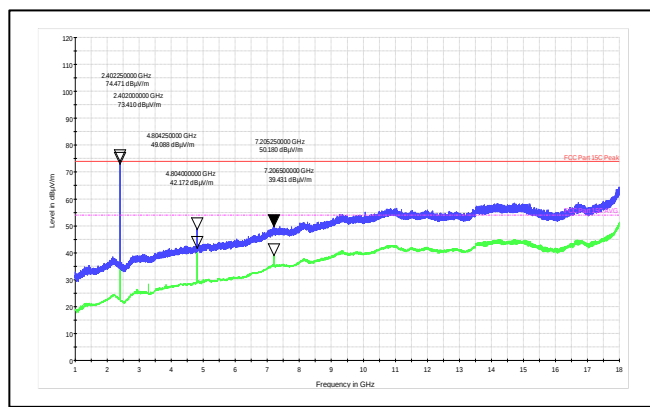
Data Rate: 1Mbps

Frequency Range: 1GHz to 18GHz



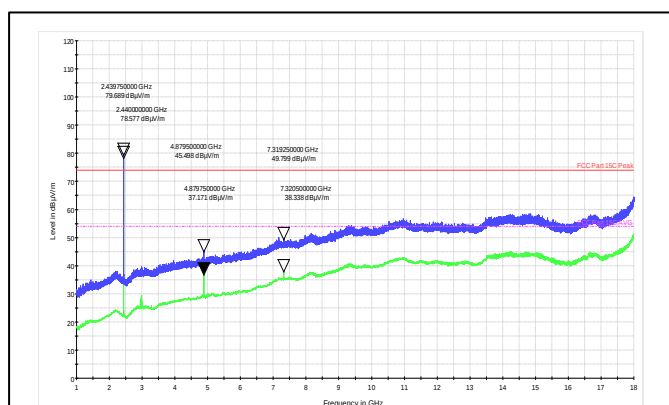
Channel Frequency: 2402MHz

Polarization: Vertical



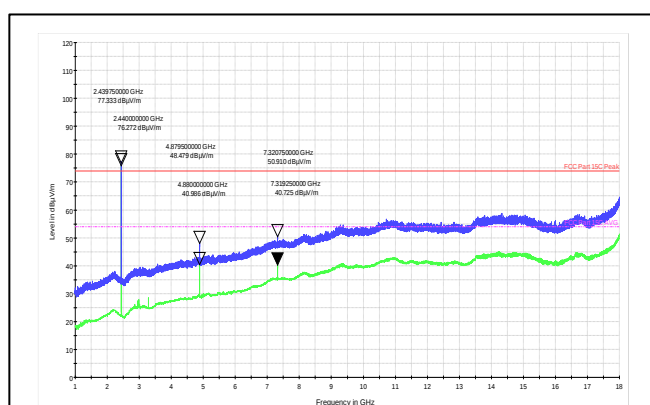
Channel Frequency: 2402MHz

Polarization: Horizontal



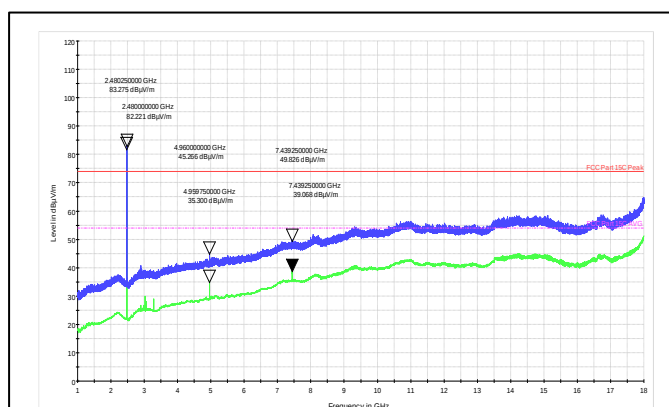
Channel Frequency: 2440MHz

Polarization: Vertical



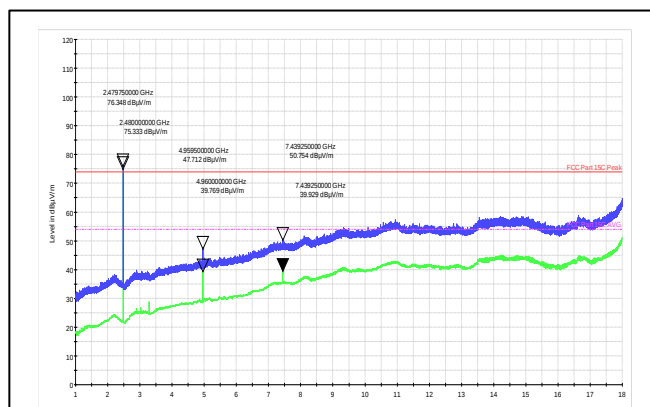
Channel Frequency: 2440MHz

Polarization: Horizontal



Channel Frequency: 2480MHz

Polarization: Vertical



Channel Frequency: 2480MHz

Polarization: Horizontal

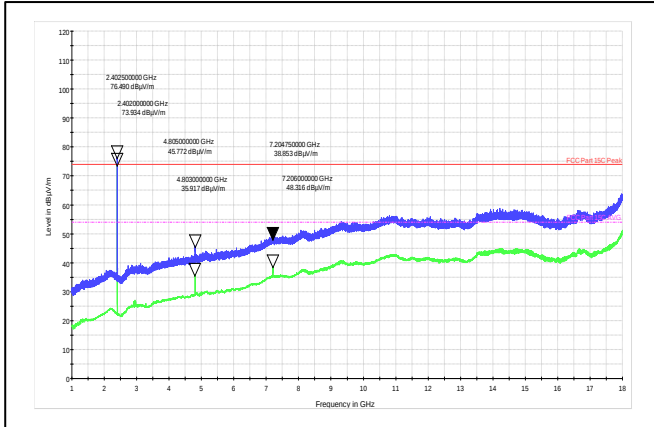
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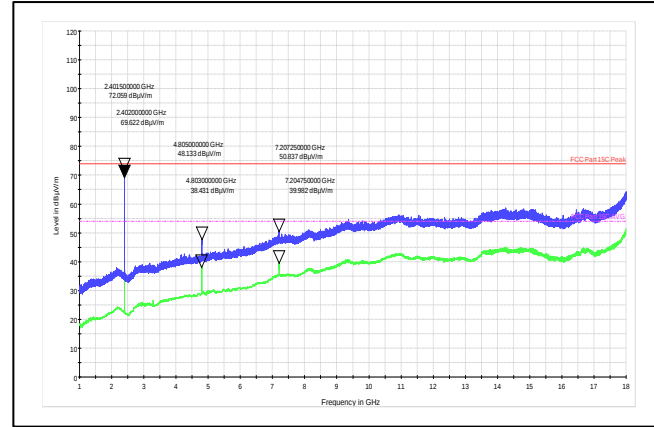
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Data Rate: 2Mbps

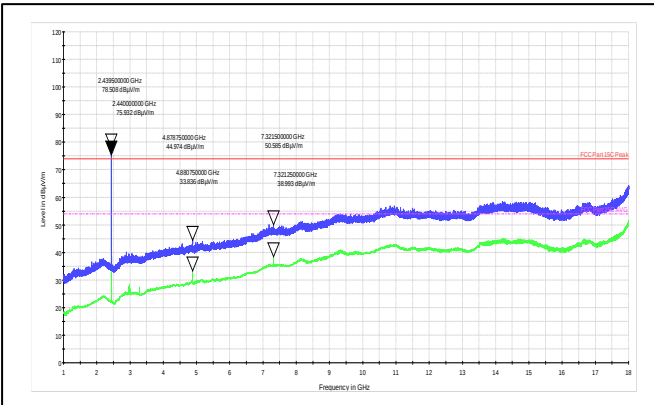
Frequency Range: 1GHz to 18GHz



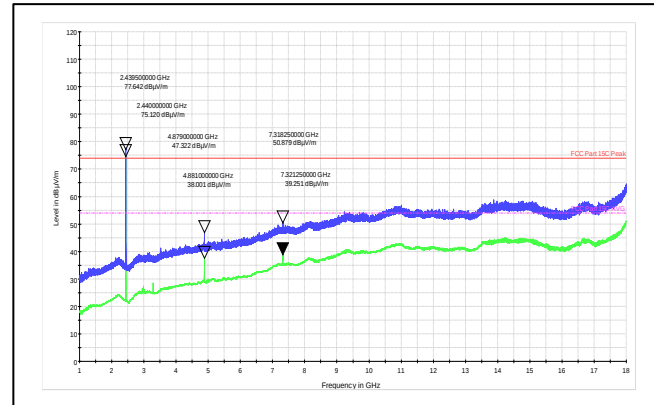
Channel Frequency: 2402MHz Polarization: Vertical



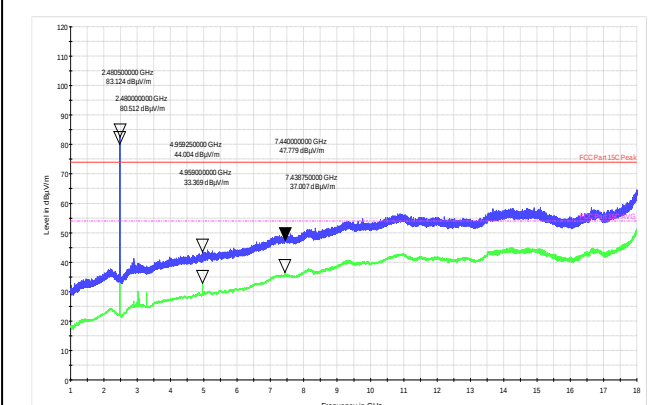
Channel Frequency: 2402MHz Polarization: Horizontal



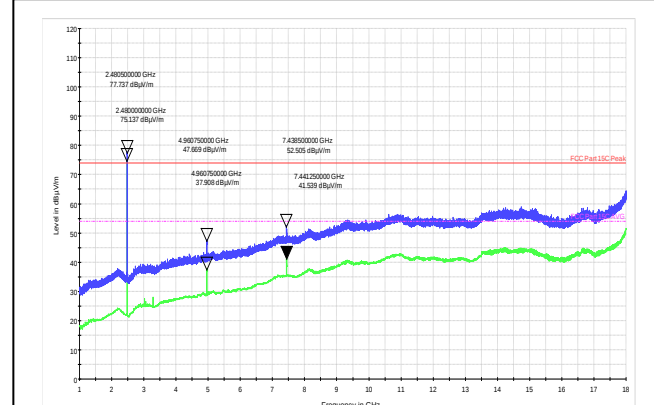
Channel Frequency: 2440MHz Polarization: Vertical



Channel Frequency: 2440MHz Polarization: Horizontal



Channel Frequency: 2480MHz Polarization: Vertical



Channel Frequency: 2480MHz Polarization: Horizontal

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Simultaneous Operation:

Combination for Simultaneous mode Wi-Fi n-mode & BLE 1Mbps

Antenna Polarization	Channel Frequency (MHz)	Measured Frequency (MHz)	Measured emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Vertical	2402	2390(Pk)	51.11	74.00*	-22.89
		2390(Av)	35.74	54.00*	-18.26
		2402(Pk)	77.82	-	-
		2402(Av)	74.56	-	-
		4804(Pk)	45.96	74.00	-28.04
		4804(Av)	34.77	54.00	-19.23
		7206(Pk)	47.89	74.00	-26.11
		7206(Av)	35.36	54.00	-18.64
	2412	2390(Pk)	51.11	74.00*	-22.89
		2390(Av)	35.74	54.00*	-18.26
		2412(Pk)	101.59	-	-
		2412(Av)	93.98	-	-
		4824(Pk)	52.83	74.00	-21.17
		4824(Av)	47.46	54.00	-6.54
		7236(Pk)	46.90	74.00	-27.10
		7236(Av)	34.87	54.00	-19.13
Horizontal	2402	2390(Pk)	62.45	74.00*	-11.55
		2390(Av)	50.61	54.00*	-3.39
		2402(Pk)	83.60	-	-
		2402(Av)	80.05	-	-
		4804(Pk)	46.53	74.00	-27.47
		4804(Av)	36.56	54.00	-17.44
		7206(Pk)	47.09	74.00	-26.91
		7206(Av)	37.37	54.00	-16.63
	2412	2390(Pk)	62.45	74.00*	-11.55
		2390(Av)	50.61	54.00*	-3.39
		2412(Pk)	112.74	-	-
		2412(Av)	105.07	-	-
		4824(Pk)	55.96	74.00	-18.04
		4824(Av)	50.97	54.00	-3.03
		7236(Pk)	46.80	74.00	-27.20
		7236(Av)	34.70	54.00	-19.30

_ → Fundamental Frequency

*→ Restricted Band edges

Pk: Peak Detector; Av: Average Detector

Note: All three combinations were tested simultaneously, and only the worst-case data has been reported.

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Antenna Polarization	Channel Frequency (MHz)	Measured Frequency (MHz)	Measured emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Vertical	2480	2483.5(Pk)	52.16	74.00*	-21.84
		2483.5(Av)	37.67	54.00*	-16.33
		2480(Pk)	72.41	-	-
		2480(Av)	69.55	-	-
		4960(Pk)	43.12	74.00	-30.88
		4960(Av)	30.92	54.00	-23.08
		7440(Pk)	47.04	74.00	-26.96
		7440(Av)	35.05	54.00	-18.95
	2462	2483.5(Pk)	52.16	74.00*	-21.84
		2483.5(Av)	37.67	54.00*	-16.33
		2462(Pk)	102.45	-	-
		2462(Av)	94.22	-	-
		4924(Pk)	51.17	74.00	-22.83
		4924(Av)	45.57	54.00	-8.43
		7386(Pk)	46.86	74.00	-27.14
		7386(Av)	34.62	54.00	-19.38
Horizontal	2480	2483.5(Pk)	63.31	74.00*	-10.69
		2483.5(Av)	50.72	54.00*	-3.28
		2480(Pk)	80.24	-	-
		2480(Av)	77.36	-	-
		4960(Pk)	45.19	74.00	-28.81
		4960(Av)	34.07	54.00	-19.93
		7440(Pk)	47.70	74.00	-26.30
		7440(Av)	34.94	54.00	-19.06
	2462	2483.5(Pk)	63.31	74.00*	-10.69
		2483.5(Av)	50.72	54.00*	-3.28
		2462(Pk)	113.12	-	-
		2462(Av)	105.40	-	-
		4924(Pk)	49.36	74.00	-24.64
		4924(Av)	45.19	54.00	-8.81
		7386(Pk)	46.52	74.00	-27.48
		7386(Av)	34.18	54.00	-19.82

_ → Fundamental Frequency

*→ Restricted Band edges

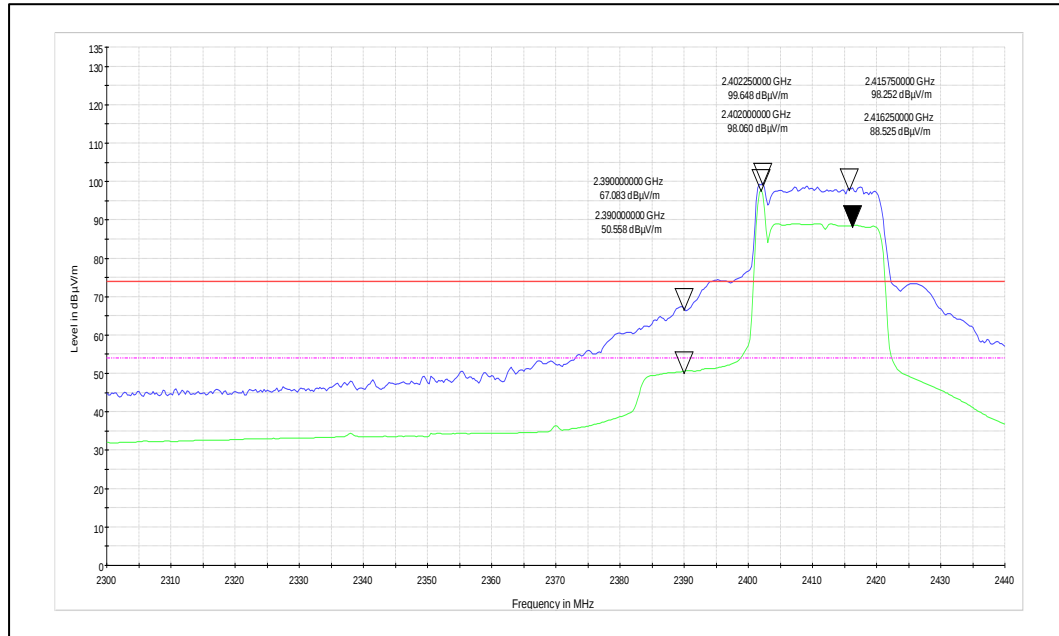
Pk: Peak Detector; Av: Average Detector

Note: All three combinations were tested simultaneously, and only the worst-case data has been reported.

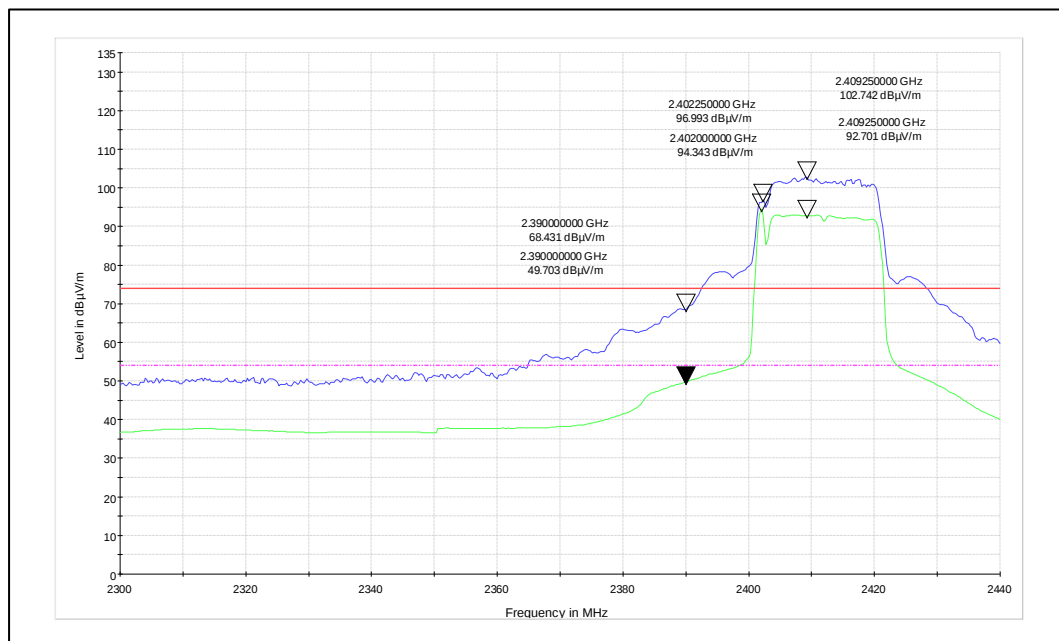
Test Plots:

Combination for Simultaneous mode Wi-Fi n-mode & BLE 1Mbps

Channel Frequency: 2402MHz for BLE & 2412MHz for Wi-Fi 2.4GHz

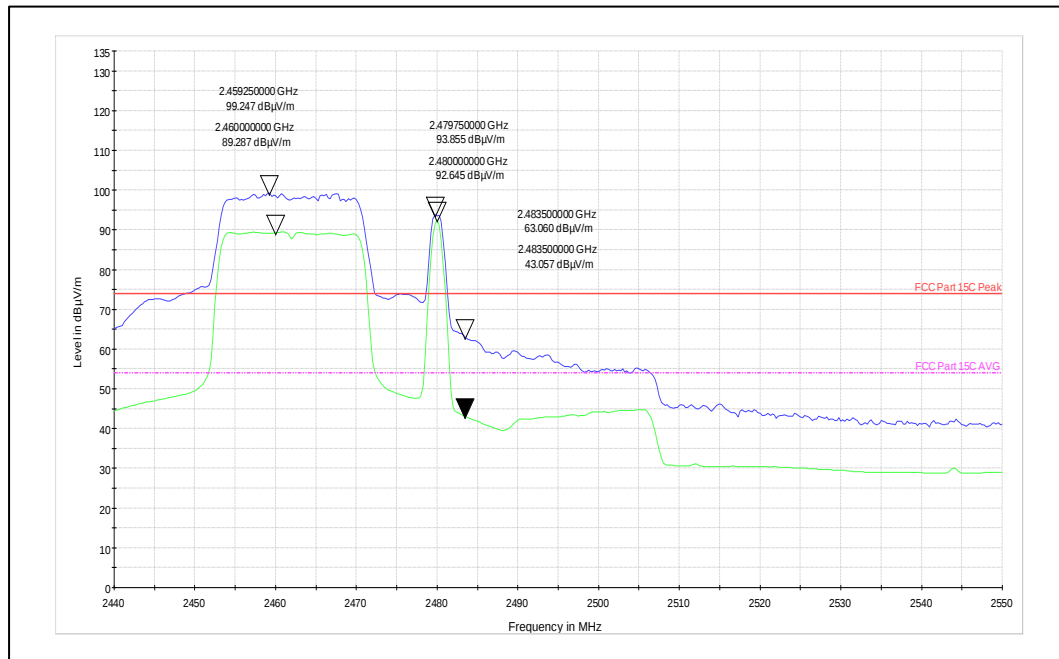


Antenna Polarization: Vertical

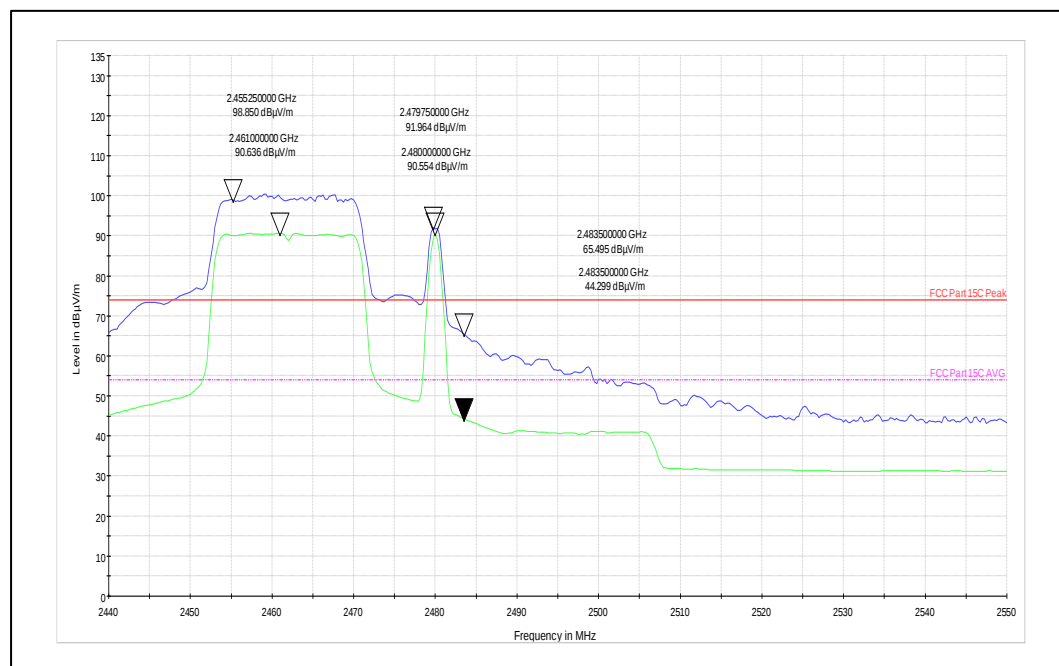


Antenna Polarization: Horizontal

Channel Frequency: 2480MHz for BLE & 2462MHz for Wi-Fi 2.4GHz

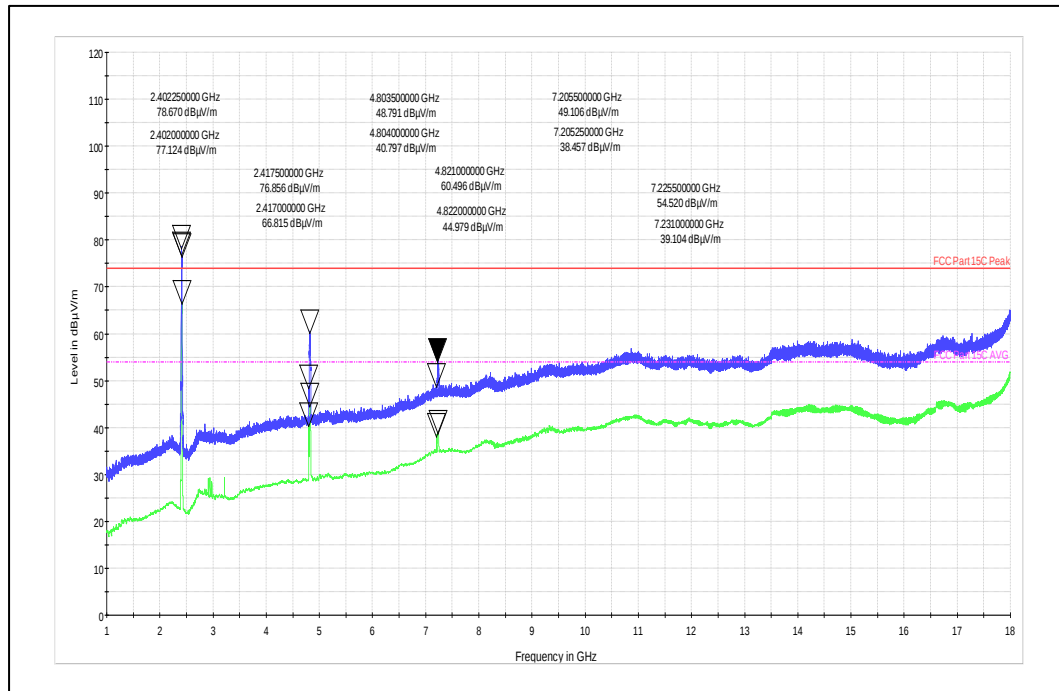


Antenna Polarization: Vertical

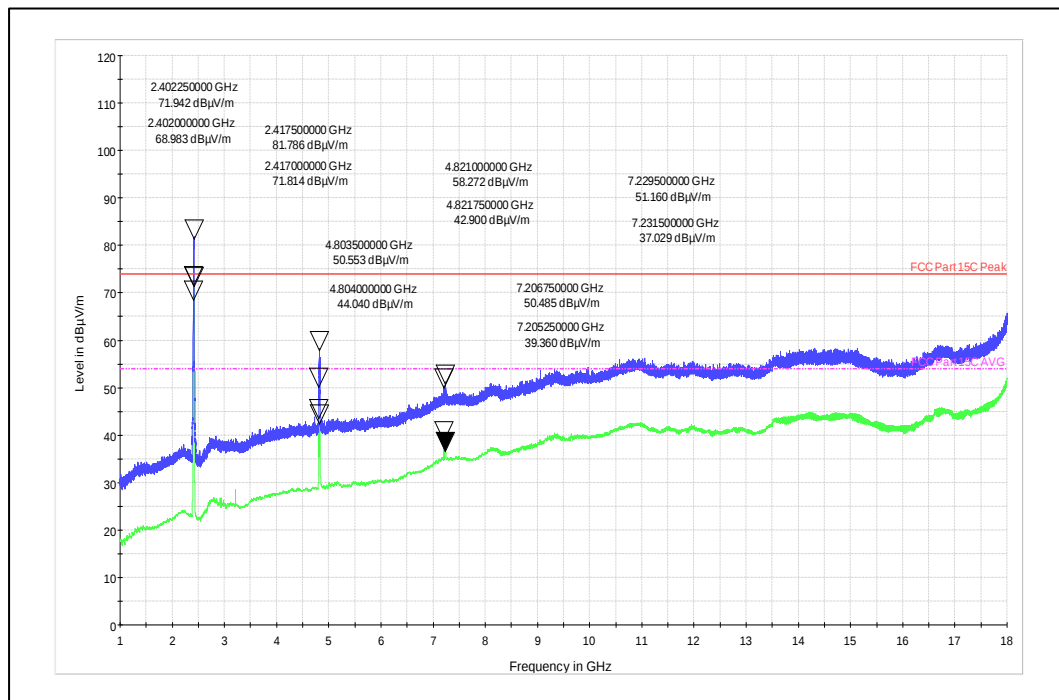


Antenna Polarization: Horizontal

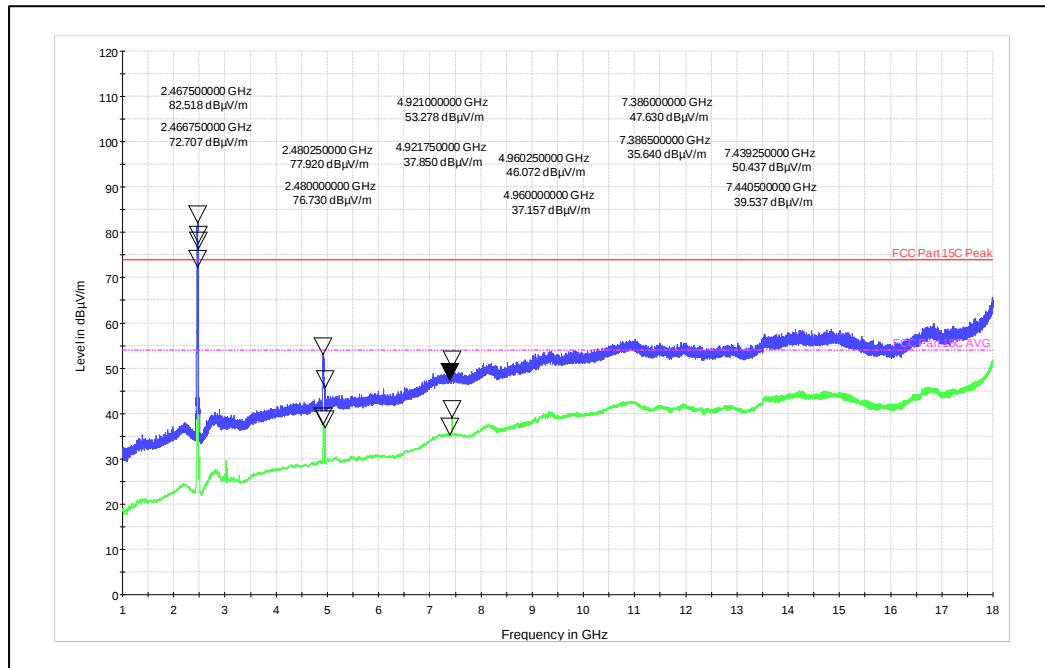
Frequency range 1GHz to 18GHz:



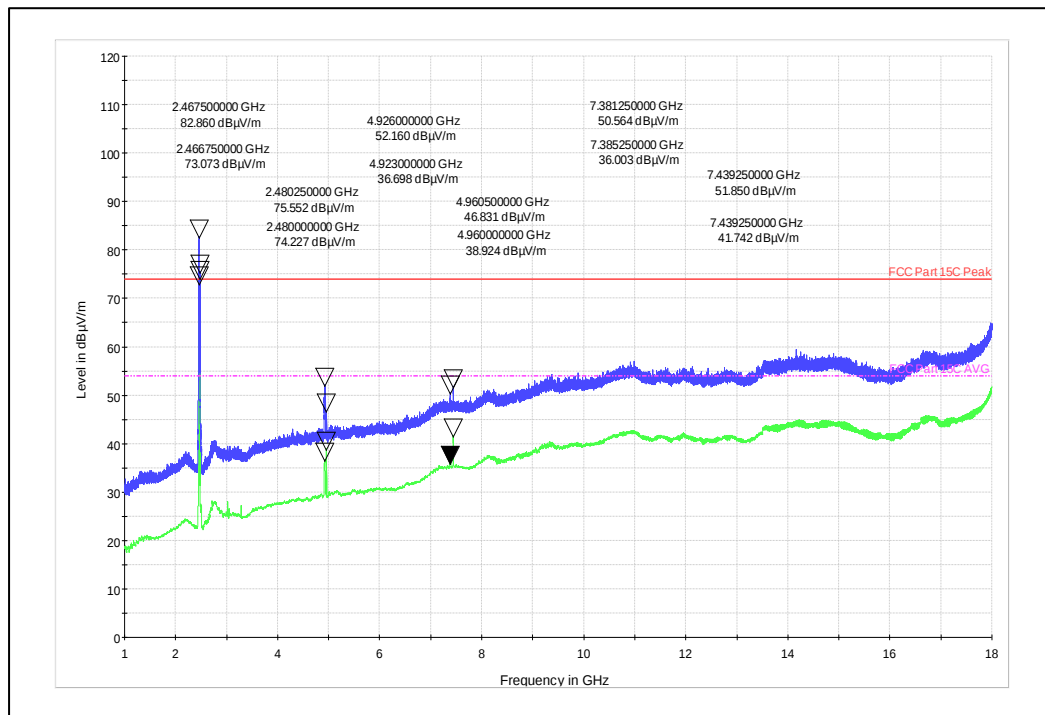
Antenna Polarization: Vertical



Antenna Polarization: Horizontal



Antenna Polarization: Vertical



Antenna Polarization: Horizontal

Prüfbericht - Nr.:
Test Report No.:

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8 TEST RESULTS FOR Wi-Fi 2.4GHz

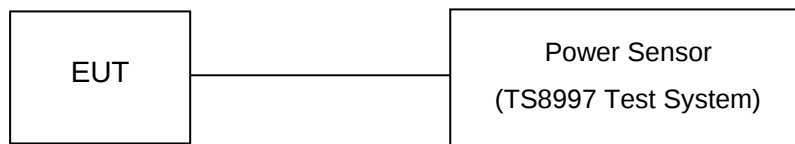
8.1 Maximum Conducted Output Power

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 Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.1 °C Voltage = 6VDC (4* 1.5V of 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.