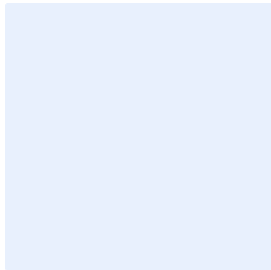


<b>Prüfbericht-Nr.:</b> <i>Test report no.:</i>	<b>IN24B1UR 001</b>	<b>Auftrags-Nr.:</b> <i>Order no.:</i>	<b>146886139 010</b>	Seite 1 von 61 Page 1 of 61
<b>Kunden-Referenz-Nr.:</b> <i>Client reference no.:</i>	2133653	<b>Auftragsdatum:</b> <i>Order date:</i>	2024-02-22	
<b>Auftraggeber:</b> <i>Client:</i>	KoreLock, Inc 7100 E. Bellevue Ave. Suite 203, Greenwood Village, CO, USA, 80111			
<b>Prüfgegenstand:</b> <i>Test item:</i>	KeyInCode 5200 Series Smart Lock			
<b>Bezeichnung</b> <i>Identification</i>	5200	<b>Serien -Nr.:</b> <i>Serial no.:</i>	Engineering Samples	
<b>Auftrags-Inhalt:</b> <i>Order content:</i>	Testing and issue of Test Report with Grant Certificate			
<b>Prüfgrundlage:</b> <i>Test specification:</i>	FCC Part 15 Subpart C 15.247,15.205, 15.207 & 15.209			
<b>Wareneingangsdatum:</b> <i>Date of sample receipt:</i>	2024-02-22			
<b>Prüfmuster-Nr.:</b> <i>Test sample no:</i>	A003662523-001 & A003662523-002			
<b>Prüfzeitraum:</b> <i>Testing period:</i>	2024-02-26 - 2024-03-11			
<b>Ort der Prüfung:</b> <i>Place of testing:</i>	Wireless laboratory, Bangalore			
<b>Prüflaboratorium:</b> <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			
<b>Prüfergebnis*:</b> <i>Test result*:</i>	Pass			
<b>geprüft von:</b> <i>tested by:</i>	<b>genehmigt von:</b> <i>authorized by:</i>			
<b>Datum:</b> <i>Date:</i> 2024-05-07	<b>Ausstellatum:</b> <i>Issue date:</i> 2024-05-07			
<b>Stellung / Position:</b>	<b>M.V.Naveen Kumar</b> Senior Engineer	<b>Stellung / Position:</b>	<b>Madhu K.N</b> Assistant Manager	
<b>Sonstiges / Other:</b>	FCC ID: 2BBNS-KL5200			
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> <i>Condition of the test item at delivery:</i>	<b>Prüfmuster vollständig und unbeschädigt</b> <i>Test item complete and undamaged</i>			
<b>* Legende:</b>	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend N/A = nicht anwendbar	4 = ausreichend N/T = nicht getestet
<b>* Legend:</b>	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient N/T = not tested
<p><b>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.</b> <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></p>				

v05

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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. 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>
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3	<p>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.</p> <p><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></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

**KeyInCode 5200 Series Smart Lock** product uses certified RF modules with **FCC ID: SQGBL654 & FCC ID: 2AC7Z-ESPS2MINI2U** , Hence the above mentioned test cases are excluded and which can be found in the module test report of respective FCC ID

Product	Applicant	FCC ID	Report No	Issued By	Grant Date
2.4GHz Wi-Fi IoT Module	ESPRESSIF SYSTEMS (SHANGHAI) CO., LTD	2AC7Z- ESPS2MINI2U	FR262716	Sportan International Inc.(Kunshan)	2023.07.31
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
IN24B1UR 001	01	Initial issue of report	2024-05-07

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# 1 GENERAL REMARKS

## 1.1 Attachments

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

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

## 2 TEST SITES

### 2.1 Testing Facilities

- |  |   |
|--|---|
| <p>1. TÜV Rheinland (India) Pvt.Ltd.,<br/>27/B, 2nd Cross,<br/>ElectronicCityPhase1<br/>Bangalore – 560 100,<br/>India</p> | <p>2. TUV Rheinland (India) Pvt.Ltd.,<br/>108 , Beside ISBR Business School,<br/>Electronic city Phase I<br/>Bangalore - 560 100,<br/>India</p> |
|--|---|

### 2.2 List of Test and Measurement Instruments

Table 1: List of test and measurement instruments

Equipment	Manufacturer	Model Name	Serial Number	Firmware Versions	Calibration Due Date	Periodicity	Test Facility
EMI Receiver	Rohde & Schwarz	ESW 44	101732	4.73 SP5	30.07.2024	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	-	-	-	-	-	Conducted Test Parameters
Spectrum Analyzer	Agilent	E4407B	US41192772	A.14.07	04.01.2025	Yearly	
10 dB RF Attenuator	Rohde & Schwarz	-	-	-	12.10.2024	Yearly	TS8997 System
Signal Analyzer	Rohde & Schwarz	FSV7	101644	3.30 SP1	09.02.2025	Yearly	
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	4.15.125.49	09.02.2025	Yearly	
RF and microwave Signal Generator	Rohde & Schwarz	SMB100A	108788	3.01.203.32	09.02.2025	Yearly	

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**Table 2: Instrument application Software versions**

<b>SL. No.</b>	<b>Test Type</b>	<b>Application software</b>	<b>Version</b>
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\*

<b>Radio Protocol</b>	Bluetooth Low Energy	Wi-Fi
<b>Operating Frequency Range</b>	2402MHz-2480MHz	2412MHz to 2462MHz
<b>No. of Channels</b>	40(Refer Table 5)	11 (Refer Table 6)
<b>Channel Spacing</b>	2MHz	5MHz
<b>Measured Conducted RF Output Power (dBm)</b>	7.40dBm@2440MHz(1Mbps)	18.03dBm@2412MHz(b-mode 1Mbps)
<b>Modulation</b>	GFSK	"802.11b: DSSS (DBPSK / DQPSK/ CCK) 802.11g/n: OFDM (BPSK/ QPSK/ 16QAM/ 64QAM"
<b>Number of antennas</b>	1	1
<b>Antenna Gain</b>	0 dBi	3.2 dBi
<b>Antenna Type</b>	Printed PCB antenna – on-board	FLEX CABLE Antenna (P/N: 1461530050)
<b>Supply Voltage to Product</b>	6VDC(4* 1.5V of AAA Batteries)	
<b>Environmental conditions</b>	-40°C to 80°C	
	-40°C to 80°C	
<b>EUT Dimension(L x W x H)</b>	7 x 2.75 x 2.75 in Inches	

\***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**

<b>Parameter</b>	<b>Uncertainty</b>
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3 dB
Unwanted Emissions, conducted	±3 dB
All emissions, radiated	±6 dB
Temperature	±3 °C
Supply Voltages	±3 %
Time	±5 %

## 4 TEST SET-UP AND OPERATION MODE

### 4.1 Principle of Configuration Selection

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

### 4.2 Test Operation and Test Software

Hardware Version: V\_2.1

Hardware Name: KL-PCB-5200

Software Version: 5200\_3.1.0

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)	<b>0</b>	<b>2402</b>
	1	2404
	2	2406
	3	2408
	:	:
	:	:
	18	2438
	<b>19</b>	<b>2440</b>
	20	2442
	:	:
	:	:
	36	2474
	37	2476
	38	2478
<b>39</b>	<b>2480</b>	

Table 5: List of BLE centre frequencies

#### Channel used for BLE testing

Channel low: 2402MHz

Channel mid: 2440MHz

Channel high: 2480MHz

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 BLE 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: A003662523-001 – Radiated test Sample  
A003662523-002 -- 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. 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

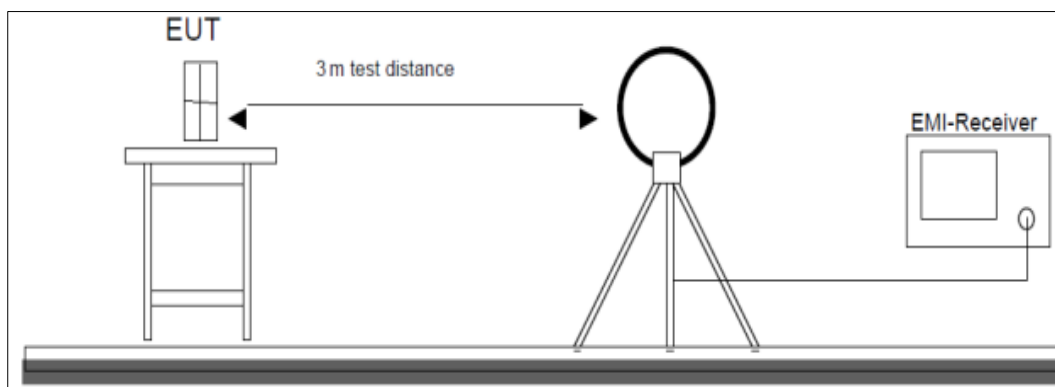


Figure 1: Frequency Range 9 kHz- 30 MHz

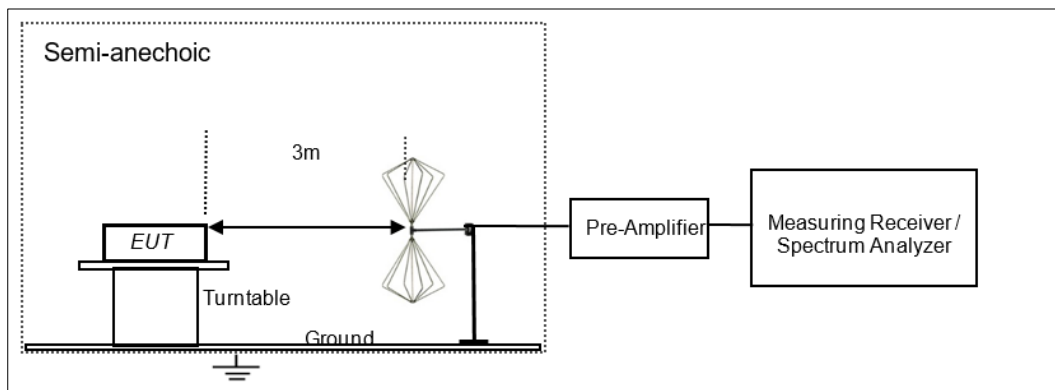


Figure 2: Frequency Range 30 MHz – 200 MHz

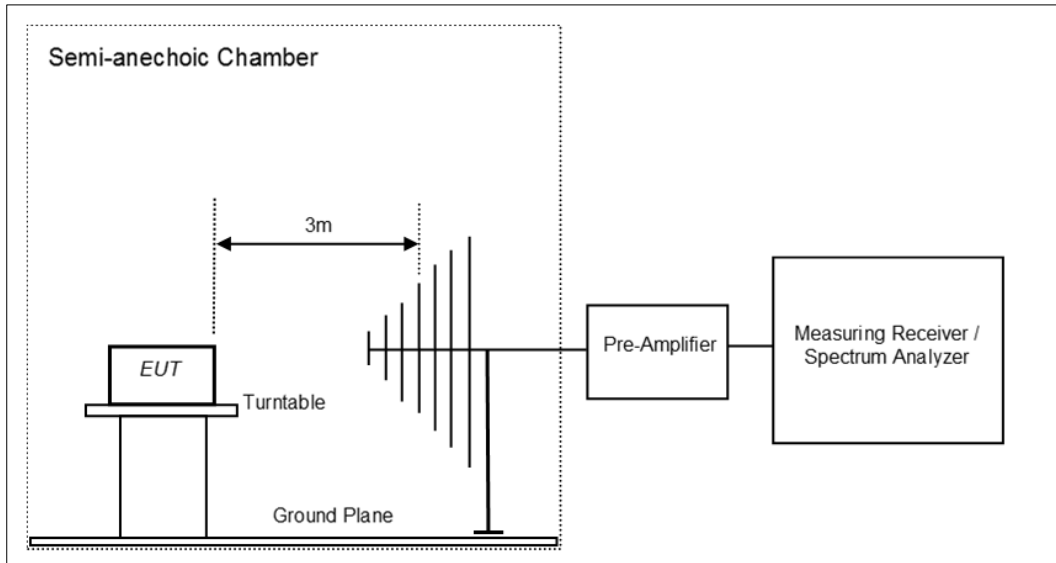


Figure 3: Frequency Range 200 MHz - 1GHz

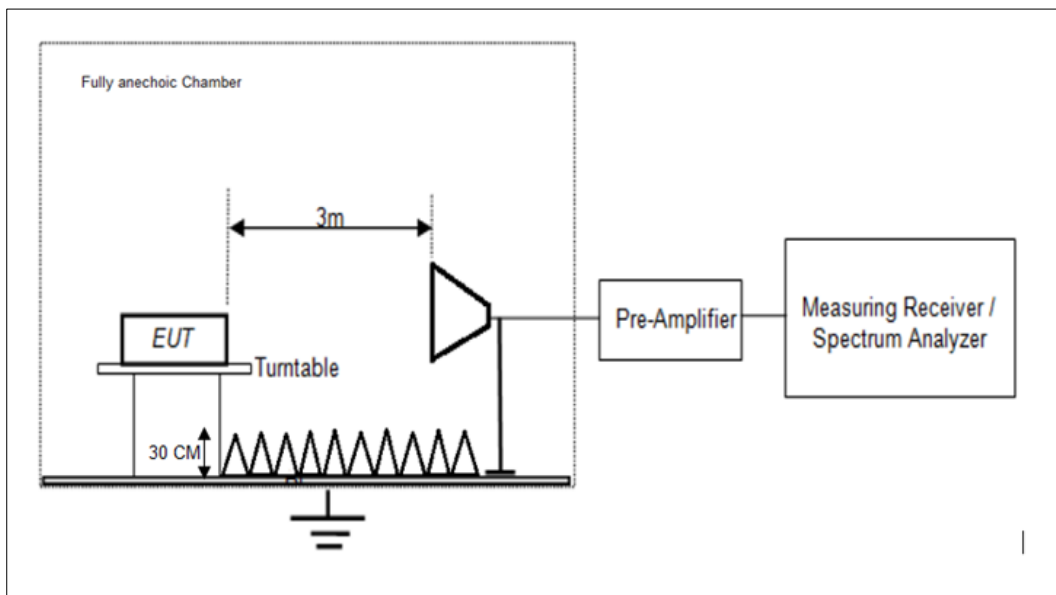


Figure 4: Frequency Range above 1 GHz

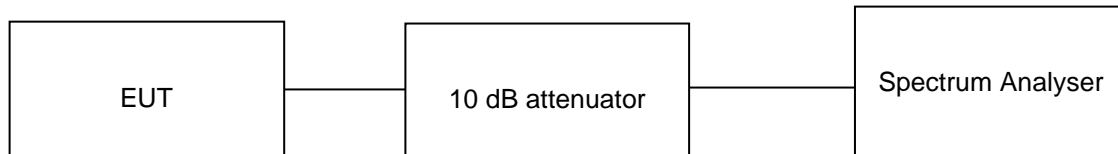
## 7 TEST RESULTS FOR BLE

### 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 AAA 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.



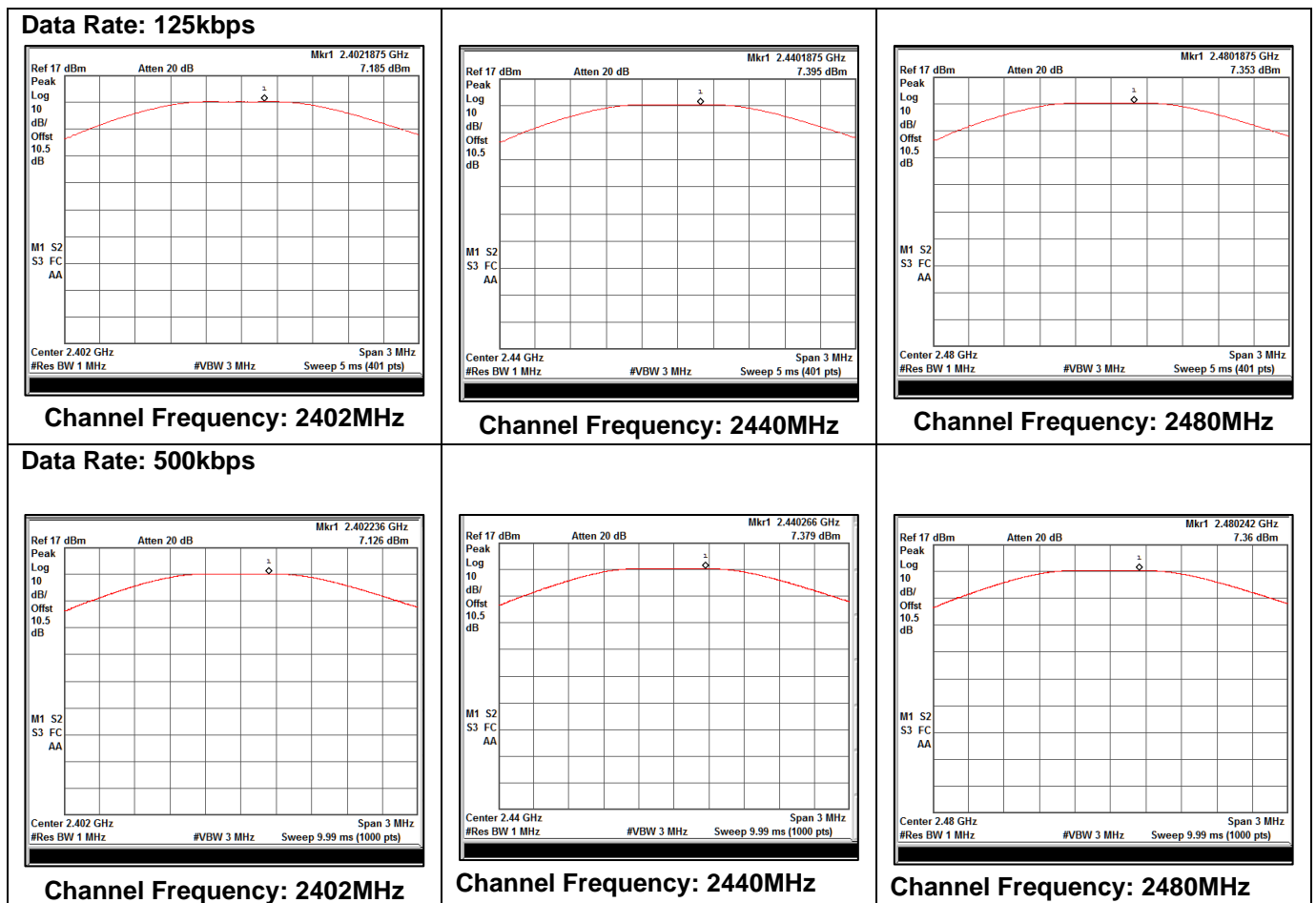
**Test results:**

**Note:**

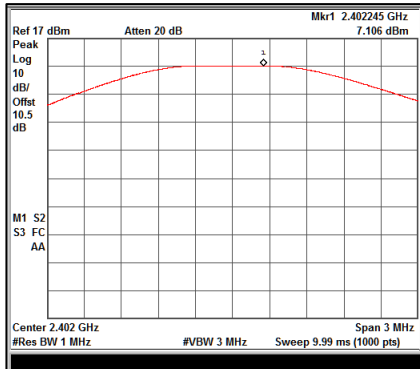
1. All the losses are included during measurement and final values are mentioned in the test report
2. Total Peak Output power (dBm) = Measured Peak power (dBm) + Attenuator factor (10dB) + Cable loss (0.5dB)
3. This product do not support additional beamforming gain / directional gain, it uses single antenna and 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	7.18	30.00	-22.82
	2440	7.39	30.00	-22.61
	2480	7.35	30.00	-22.65
500kbps	2402	7.12	30.00	-22.88
	2440	7.37	30.00	-22.63
	2480	7.36	30.00	-22.64
1Mbps	2402	7.10	30.00	-22.90
	<b>2440</b>	<b>7.40</b>	<b>30.00</b>	<b>-22.60</b>
2Mbps	2402	6.49	30.00	-23.51
	2440	6.93	30.00	-23.07
	2480	7.08	30.00	-22.92

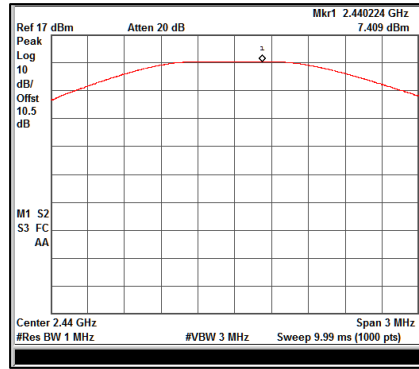
**Test Plots:**



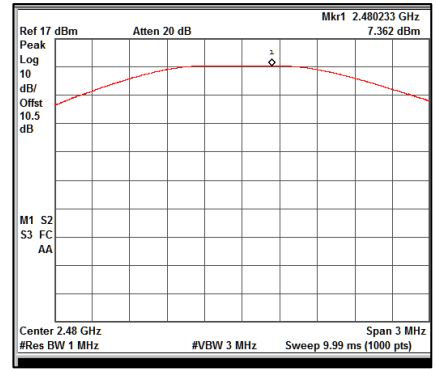
**Data Rate: 1Mbps**



**Channel Frequency: 2402MHz**

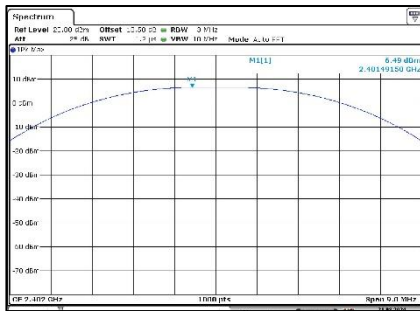


**Channel Frequency: 2440MHz**

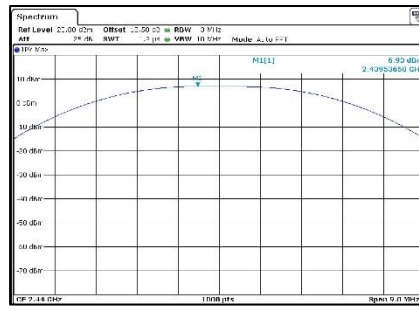


**Channel Frequency: 2480MHz**

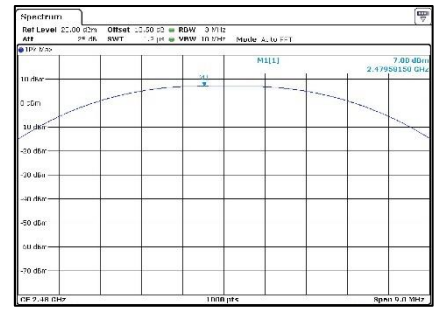
**Data Rate: 2Mbps**



**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(4\* 1.5V of AAA Batteries)

Relative humidity: 63%

**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

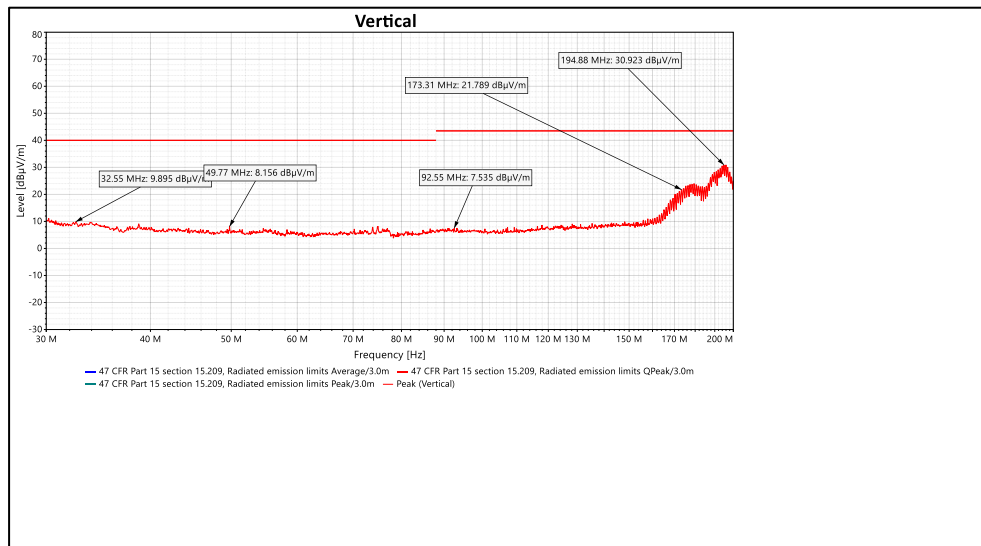
**Test results for frequency range 9 kHz – 30 MHz**

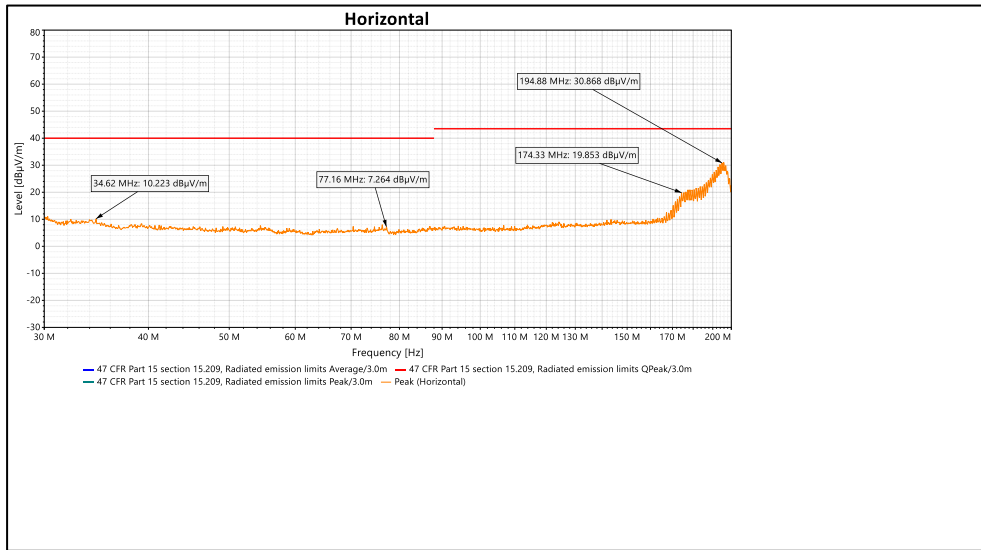
No emissions found in frequency range 9 kHz to 30 MHz, and measured levels are below 20dB from the limit line, hence not reported.

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

Antenna Polarization	Measured Frequency (MHz)	Measured emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Vertical	32.55	9.89	40.00	-30.11
	49.77	8.15	40.00	-31.85
	92.55	7.53	43.50	-35.97
	173.31	21.78	43.60	-21.82
	194.88	30.92	43.60	-12.68
Horizontal	34.62	10.22	40.00	-29.78
	77.16	7.26	40.00	-32.74
	174.33	19.85	43.50	-23.65
	194.88	30.86	43.50	-12.64

**Test Plots:**

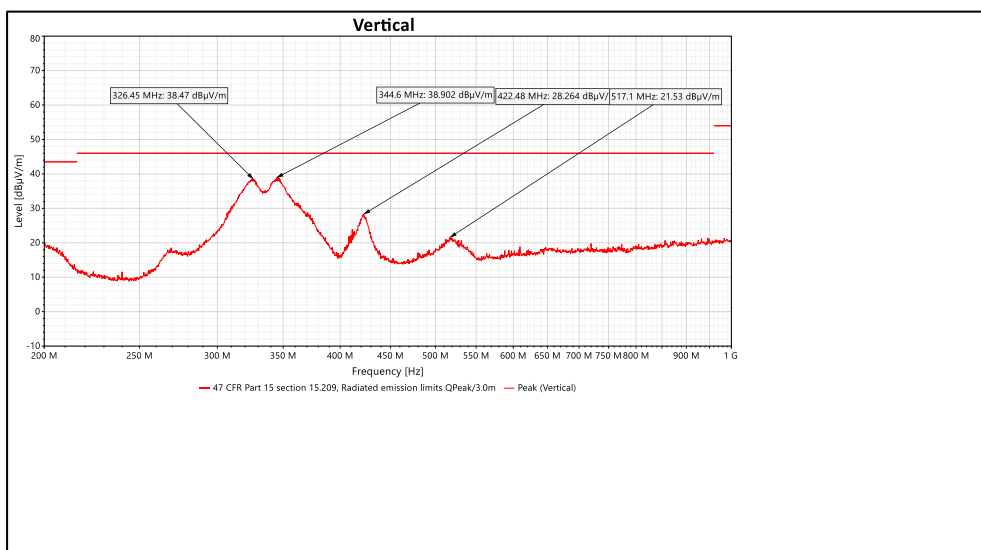


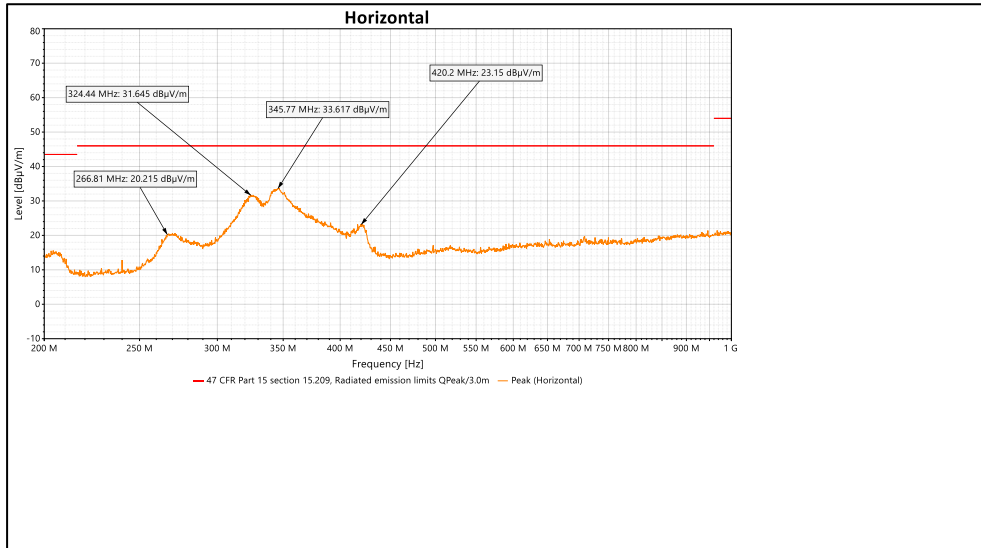


**Table 9: Test results for frequency range 200MHz – 1GHz**

Antenna Polarization	Measured Frequency (MHz)	Measured emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Vertical	326.45	38.47	46.00	-7.53
	344.60	38.90	46.00	-7.10
	422.48	28.26	46.00	-17.74
	517.10	21.53	46.00	-24.47
Horizontal	266.81	20.21	46.00	-25.79
	324.44	31.64	46.00	-14.36
	345.77	33.61	46.00	-12.39
	420.20	23.15	46.00	-22.85

**Test Plots:**





**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	78.09	-	-
	2402(Av)		76.91	-	-
	2390(Pk)		37.76	74.00*	-36.24
	2390(Av)		23.87	54.00*	-30.13
	4804(Pk)		47.25	74.00	-26.75
	4804(Av)		38.63	54.00	-15.37
	7206(Pk)		46.43	74.00	-27.57
	7206(Av)		34.71	54.00	-19.29
	2402(Pk)	Horizontal	85.76	-	-
	2402(Av)		84.63	-	-
	2390(Pk)		37.28	74.00*	-36.72
	2390(Av)		24.14	54.00*	-29.86
	4804(Pk)		45.32	74.00	-28.68
	4804(Av)		35.96	54.00	-18.04
	7206(Pk)		50.46	74.00	-23.54
	7206(Av)		39.95	54.00	-14.05
2440	2440(Pk)	Vertical	75.14	-	-
	2440(Av)		73.95	-	-
	4880(Pk)		46.86	74.00	-27.14
	4880(Av)		37.87	54.00	-16.13
	7320(Pk)		47.34	74.00	-26.66
	7320(Av)		34.96	54.00	-19.04
	2440(Pk)	Horizontal	84.54	-	-
	2440(Av)		83.38	-	-
	4880(Pk)		46.38	74.00	-27.62
	4880(Av)		38.12	54.00	-15.88
	7320(Pk)		47.39	74.00	-26.61
	7320(Av)		35.51	54.00	-18.49
2480	2480(Pk)	Vertical	72.79	-	-
	2480(Av)		71.58	-	-
	2483.5(Pk)		36.16	74.00*	-37.84
	2483.5(Av)		23.70	54.00*	-30.30
	4960(Pk)		44.88	74.00	-29.12
	4960(Av)		34.83	54.00	-19.17
	7440(Pk)		48.29	74.00	-25.71
	7440(Av)		36.38	54.00	-17.62
	2480(Pk)	Horizontal	81.40	-	-
	2480(Av)		80.23	-	-
	2483.5(Pk)		36.72	74.00*	-37.28
	2483.5(Av)		24.58	54.00*	-29.42
	4960(Pk)		44.90	74.00	-29.10
	4960(Av)		34.79	54.00	-19.21
	7440(Pk)		47.07	74.00	-26.93
	7440(Av)		36.77	54.00	-17.23

\_ → Fundamental Frequency

\* → Restricted Band edges

Pk: Peak Detector; Av: Average Detector

Data Rate: 500kbps

Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2402	2402(Pk)	Vertical	77.85	-	-
	2402(Av)		76.76	-	-
	2390(Pk)		36.54	74.00*	-37.46
	2390(Av)		23.86	54.00*	-30.14
	4804(Pk)		46.33	74.00	-27.67
	4804(Av)		39.01	54.00	-14.99
	7206(Pk)		46.78	74.00	-27.22
	7206(Av)		35.49	54.00	-18.51
	2402(Pk)	Horizontal	85.64	-	-
	2402(Av)		84.63	-	-
	2390(Pk)		36.27	74.00*	-37.73
	2390(Av)		24.10	54.00*	-29.90
	4804(Pk)		47.59	74.00	-26.41
	4804(Av)		40.41	54.00	-13.59
	7206(Pk)		49.27	74.00	-24.73
	7206(Av)		38.07	54.00	-15.93
2440	2440(Pk)	Vertical	74.59	-	-
	2440(Av)		73.52	-	-
	4880(Pk)		46.82	74.00*	-27.18
	4880(Av)		38.11	54.00*	-15.89
	7320(Pk)		47.28	74.00	-26.72
	7320(Av)		35.60	54.00	-18.40
	2440(Pk)	Horizontal	84.53	-	-
	2440(Av)		83.49	-	-
	4880(Pk)		46.29	74.00*	-27.71
	4880(Av)		38.00	54.00*	-16.00
	7320(Pk)		47.00	74.00	-27.00
	7320(Av)		35.73	54.00	-18.27
2480	2480(Pk)	Vertical	72.82	-	-
	2480(Av)		71.71	-	-
	2483.5(Pk)		36.92	74.00*	-37.08
	2483.5(Av)		23.67	54.00*	-30.33
	4960(Pk)		44.79	74.00	-29.21
	4960(Av)		35.16	54.00	-18.84
	7440(Pk)		47.40	74.00	-26.60
	7440(Av)		36.32	54.00	-17.68
	2480(Pk)	Horizontal	81.35	-	-
	2480(Av)		80.30	-	-
	2483.5(Pk)		37.01	74.00*	-36.99
	2483.5(Av)		24.55	54.00*	-29.45
	4960(Pk)		45.16	74.00	-28.84
	4960(Av)		35.02	54.00	-18.98
	7440(Pk)		47.31	74.00	-26.69
	7440(Av)		34.91	54.00	-19.09

\_ → Fundamental Frequency

\* → Restricted Band edges

Pk: Peak Detector; Av: Average Detector



Data Rate: 1Mbps

Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2402	2402(Pk)	Vertical	74.97	-	-
	2402(Av)		73.67	-	-
	2390(Pk)		37.01	74.00*	-36.99
	2390(Av)		24.04	54.00*	-29.96
	4804(Pk)		44.44	74.00	-29.56
	4804(Av)		35.36	54.00	-18.64
	7206(Pk)		46.77	74.00	-27.23
	7206(Av)		34.44	54.00	-19.56
	2402(Pk)	Horizontal	79.87	-	-
	2402(Av)		78.66	-	-
	2390(Pk)		37.04	74.00*	-36.96
	2390(Av)		24.11	54.00*	-29.89
	4804(Pk)		45.89	74.00	-28.11
	4804(Av)		36.83	54.00	-17.17
	7206(Pk)		49.08	74.00	-24.92
	7206(Av)		37.90	54.00	-16.10
2440	2440(Pk)	Vertical	70.28	-	-
	2440(Av)		69.18	-	-
	4880(Pk)		43.52	74.00	-30.48
	4880(Av)		33.48	54.00	-20.52
	7320(Pk)		46.12	74.00	-27.88
	7320(Av)		35.23	54.00	-18.77
	2440(Pk)	Horizontal	79.21	-	-
	2440(Av)		78.17	-	-
	4880(Pk)		43.57	74.00	-30.43
	4880(Av)		33.12	54.00	-20.88
	7320(Pk)		47.08	74.00	-26.92
	7320(Av)		35.42	54.00	-18.58
2480	2480(Pk)	Vertical	67.30	-	-
	2480(Av)		66.14	-	-
	2483.5(Pk)		36.10	74.00*	-37.90
	2483.5(Av)		23.25	54.00*	-30.75
	4960(Pk)		43.27	74.00	-30.73
	4960(Av)		32.15	54.00	-21.85
	7440(Pk)		47.23	74.00	-26.77
	7440(Av)		35.69	54.00	-18.31
	2480(Pk)	Horizontal	75.09	-	-
	2480(Av)		73.99	-	-
	2483.5(Pk)		35.55	74.00*	-38.45
	2483.5(Av)		23.32	54.00*	-30.68
	4960(Pk)		43.87	74.00	-30.13
	4960(Av)		32.94	54.00	-21.06
	7440(Pk)		48.10	74.00	-25.90
	7440(Av)		35.90	54.00	-18.10

\_ → Fundamental Frequency

\* → Restricted Band edges

Pk: Peak Detector; Av: Average Detector

**Prüfbericht - Nr.:**  
Test Report No.:

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Page 26 of 61

Data Rate: 2Mbps

Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2402	2402(Pk)	Vertical	78.33	-	-
	2402(Av)		75.57	-	-
	2390(Pk)		37.71	74.00*	-36.29
	2390(Av)		24.02	54.00*	-29.98
	4804(Pk)		46.36	74.00	-27.64
	4804(Av)		36.52	54.00	-17.48
	7206(Pk)		47.52	74.00	-26.48
	7206(Av)		34.48	54.00	-19.52
	2402(Pk)	Horizontal	86.12	-	-
	2402(Av)		83.43	-	-
	2390(Pk)		37.00	74.00*	-37.00
	2390(Av)		24.62	54.00*	-29.38
	4804(Pk)		44.89	74.00	-29.11
	4804(Av)		34.37	54.00	-19.63
	7206(Pk)		46.55	74.00	-27.45
	7206(Av)		36.80	54.00	-17.20
2440	2440(Pk)	Vertical	75.13	-	-
	2440(Av)		72.62	-	-
	4880(Pk)		46.26	74.00	-27.74
	4880(Av)		35.91	54.00	-18.09
	7320(Pk)		47.56	74.00	-26.44
	7320(Av)		34.75	54.00	-19.25
	2440(Pk)	Horizontal	84.57	-	-
	2440(Av)		82.08	-	-
	4880(Pk)		45.24	74.00	-28.76
	4880(Av)		35.00	54.00	-19.00
	7320(Pk)		46.81	74.00	-27.19
	7320(Av)		36.24	54.00	-17.76
2480	2480(Pk)	Vertical	72.71	-	-
	2480(Av)		70.03	-	-
	2483.5(Pk)		37.10	74.00*	-36.90
	2483.5(Av)		24.01	54.00*	-29.99
	4960(Pk)		44.44	74.00	-29.56
	4960(Av)		33.83	54.00	-20.17
	7440(Pk)		47.59	74.00	-26.41
	7440(Av)		37.15	54.00	-16.85
	2480(Pk)	Horizontal	81.36	-	-
	2480(Av)		78.69	-	-
	2483.5(Pk)		38.85	74.00*	-35.15
	2483.5(Av)		26.48	54.00*	-27.52
	4960(Pk)		45.16	74.00	-28.84
	4960(Av)		34.34	54.00	-19.66
	7440(Pk)		47.36	74.00	-26.64
	7440(Av)		35.86	54.00	-18.14

\_ → Fundamental Frequency

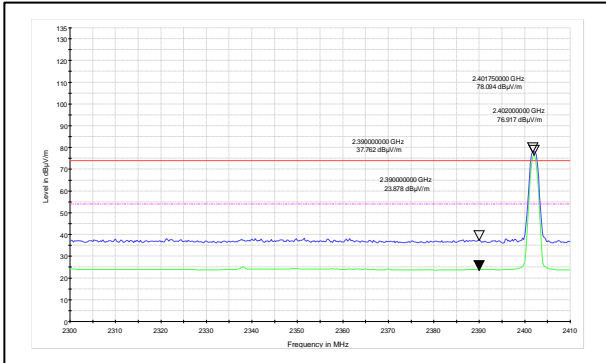
\*→ Restricted Band edges

Pk: Peak Detector; Av: Average Detector

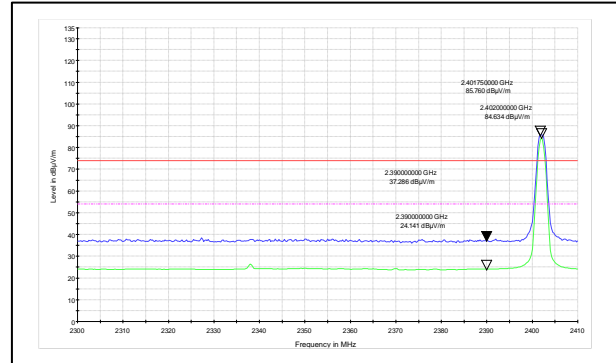
**Test Plots:**

**Restricted Bands of Operation:**

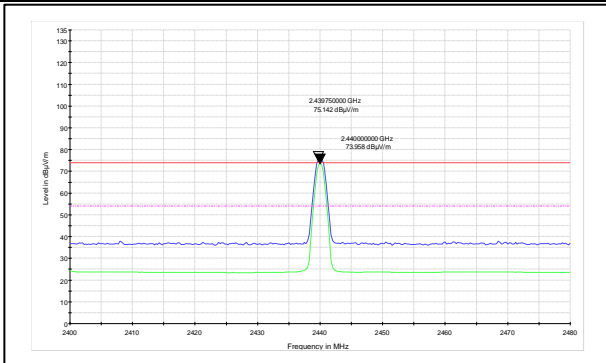
**Data Rate: 125kbps**



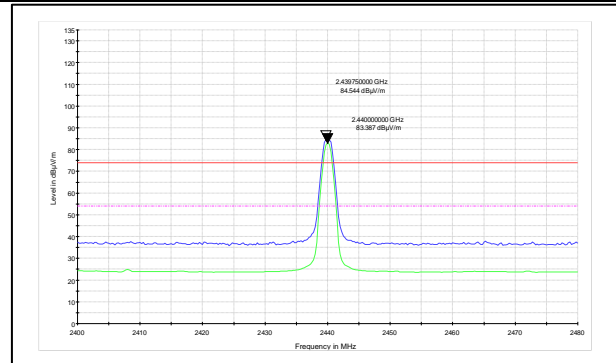
**Channel Frequency: 2402MHz Polarization: Vertical**



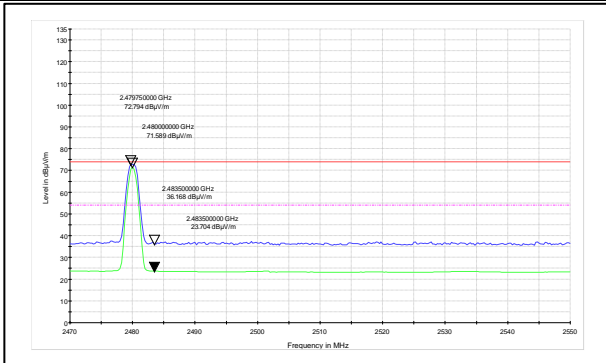
**Channel Frequency: 2402MHz Polarization: Horizontal**



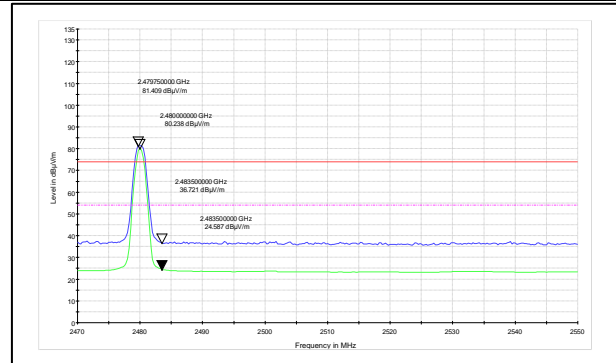
**Channel Frequency: 2440MHz Polarization: Vertical**



**Channel Frequency: 2440MHz Polarization: Horizontal**

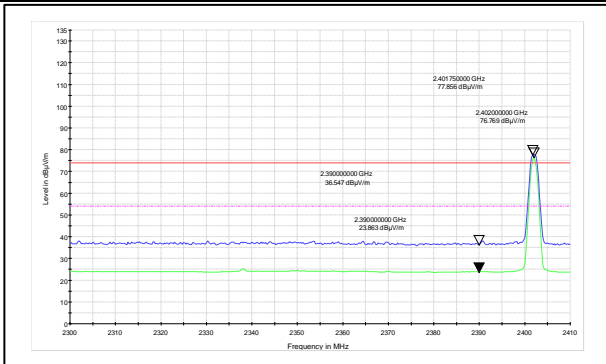


**Channel Frequency: 2480MHz Polarization: Vertical**

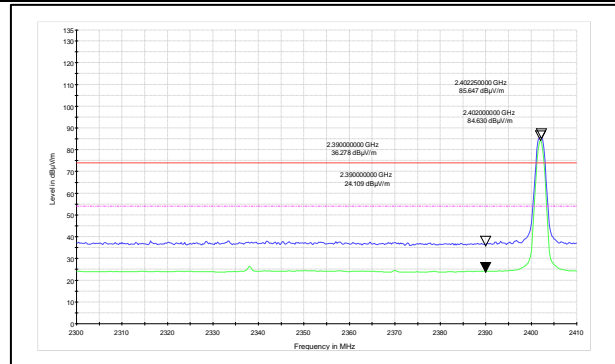


**Channel Frequency: 2480MHz Polarization: Horizontal**

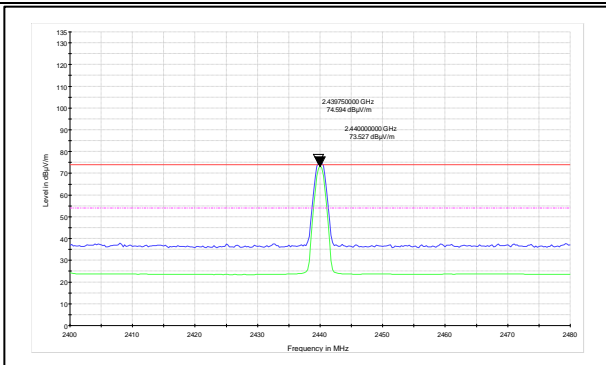
Data Rate: 500kbps



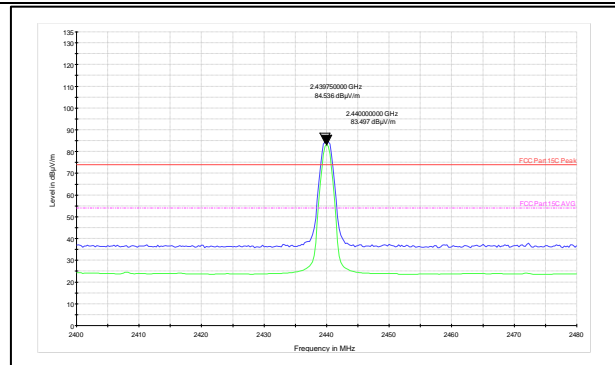
Channel Frequency: 2402MHz Polarization: Vertical



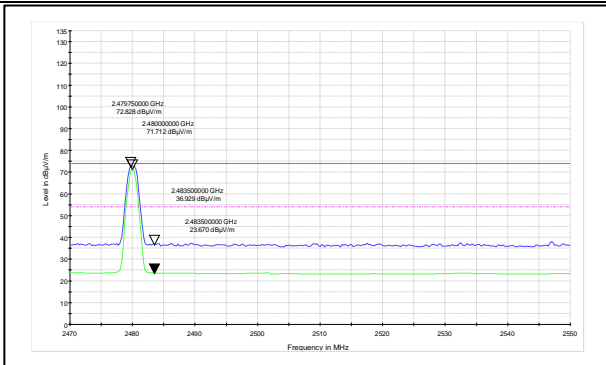
Channel Frequency: 2402MHz Polarization: Horizontal



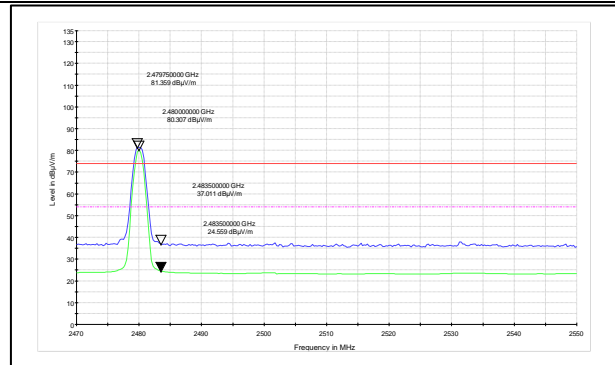
Channel Frequency: 2440MHz Polarization: Vertical



Channel Frequency: 2440MHz Polarization: Horizontal

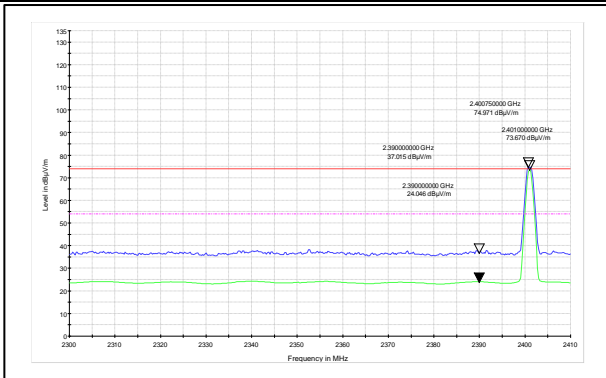


Channel Frequency: 2480MHz Polarization: Vertical

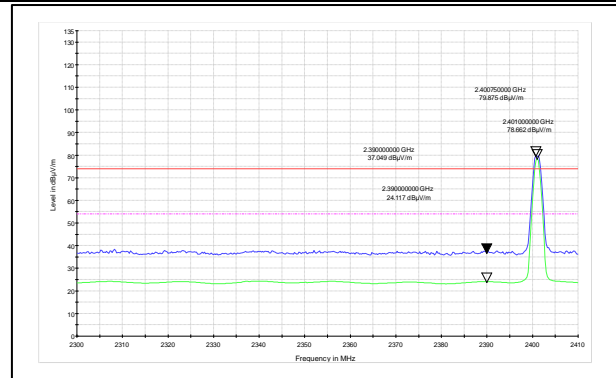


Channel Frequency: 2480MHz Polarization: Horizontal

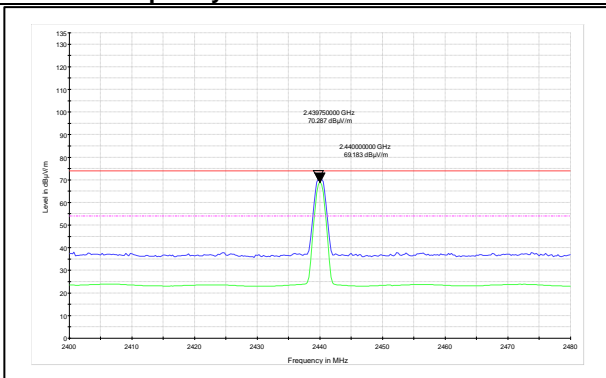
Data rate: 1Mbps



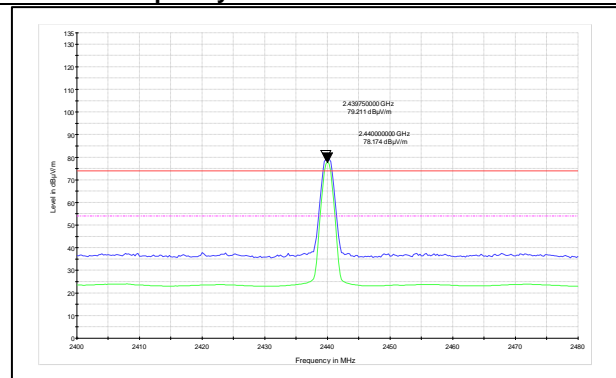
**Channel Frequency: 2402MHz Polarization: Vertical**



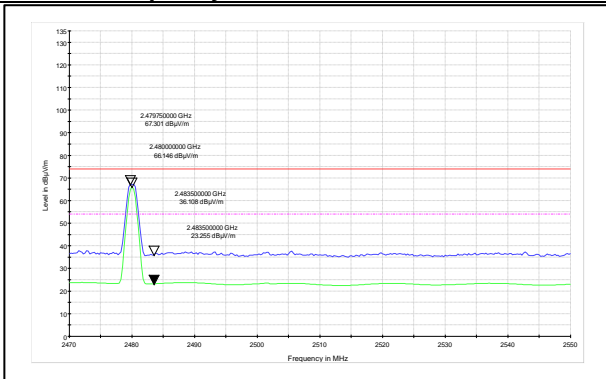
**Channel Frequency: 2402MHz Polarization: Horizontal**



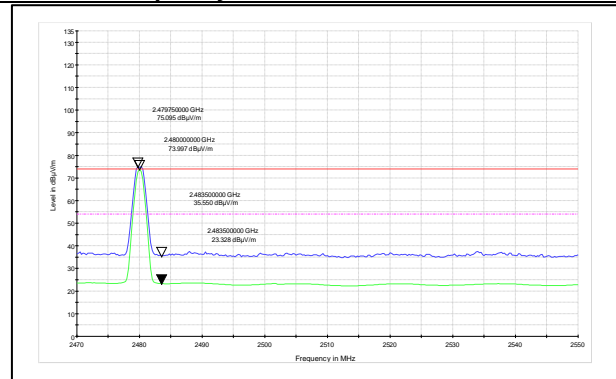
**Channel Frequency: 2440MHz Polarization: Vertical**



**Channel Frequency: 2440MHz Polarization: Horizontal**

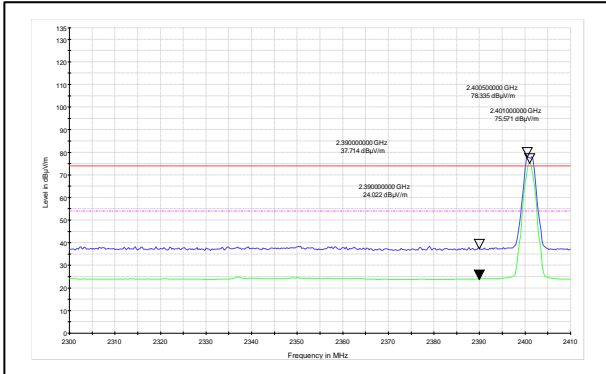


**Channel Frequency: 2480MHz Polarization: Vertical**

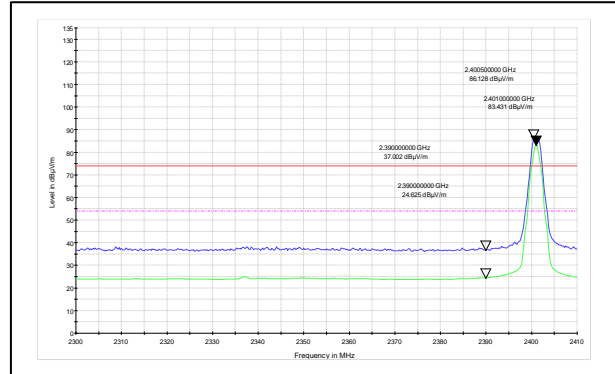


**Channel Frequency: 2480MHz Polarization: Horizontal**

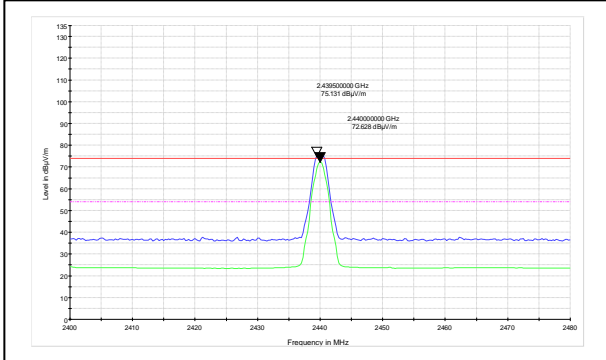
**Data Rate: 2Mbps**



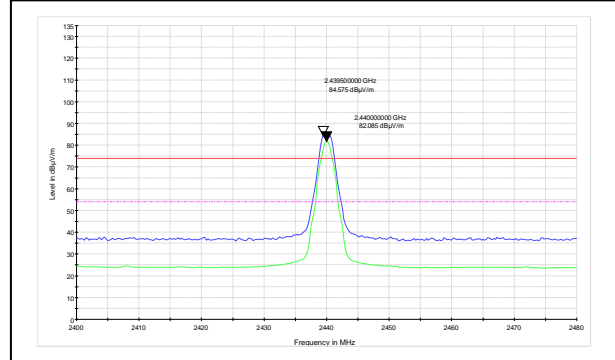
**Channel Frequency: 2402MHz Polarization: Vertical**



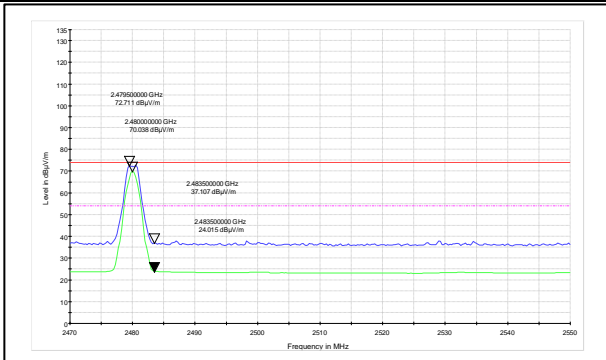
**Channel Frequency: 2402MHz Polarization: Horizontal**



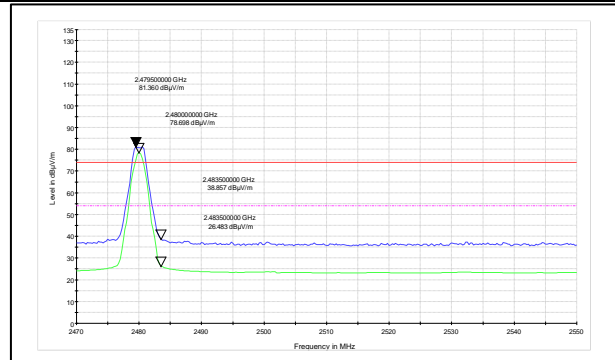
**Channel Frequency: 2440MHz Polarization: Vertical**



**Channel Frequency: 2440MHz Polarization: Horizontal**



**Channel Frequency: 2480MHz Polarization: Vertical**

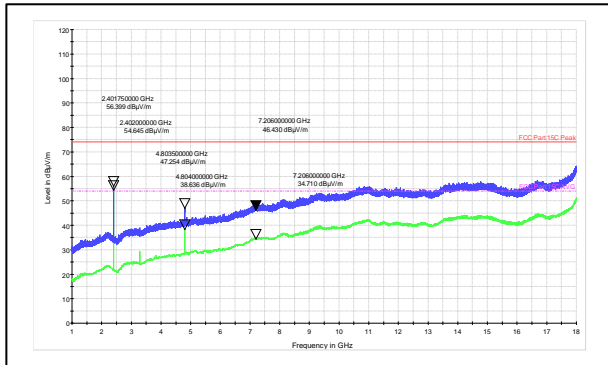


**Channel Frequency: 2480MHz Polarization: Horizontal**

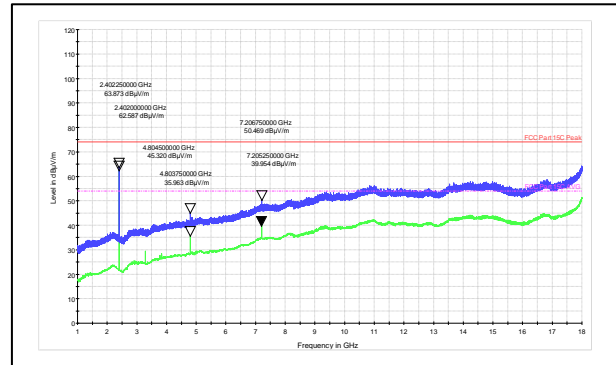
Test Plots for Spurious Radiated emission:

Data Rate: 125kpbs

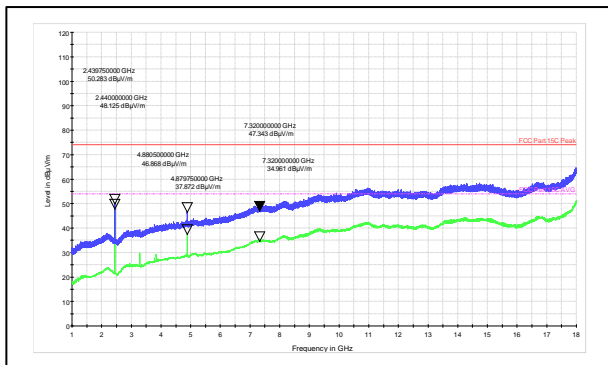
Frequency Range: 1GHz to 18GHz



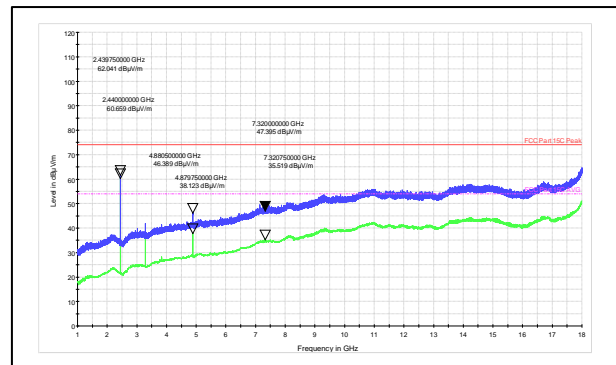
Channel Frequency: 2402MHz Polarization: Vertical



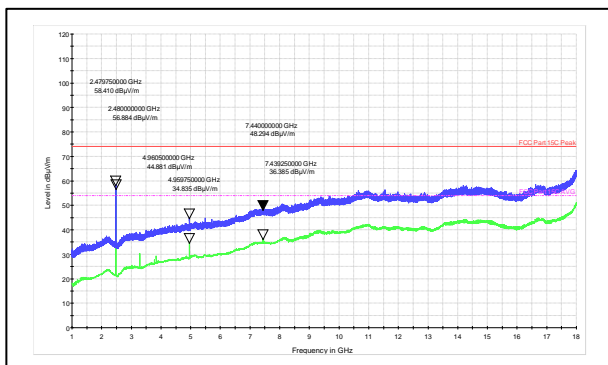
Channel Frequency: 2402MHz Polarization: Horizontal



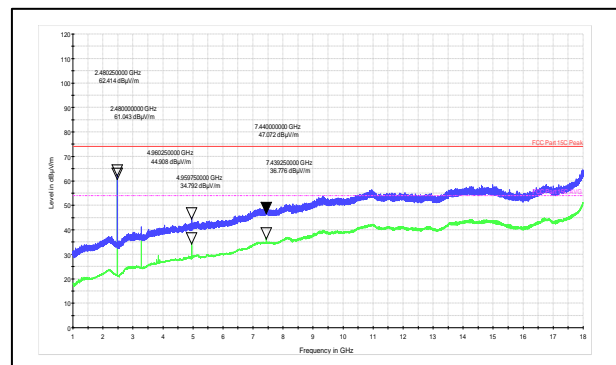
Channel Frequency: 2440MHz Polarization: Vertical



Channel Frequency: 2440MHz Polarization: Horizontal



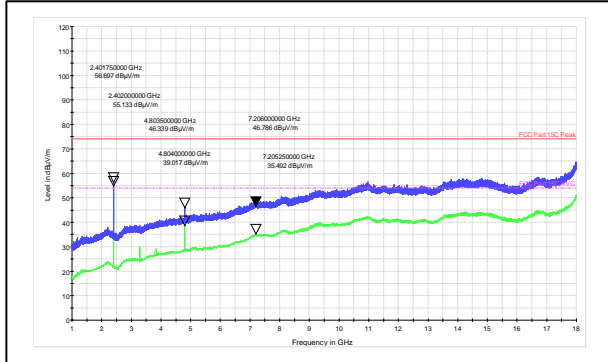
Channel Frequency: 2480MHz Polarization: Vertical



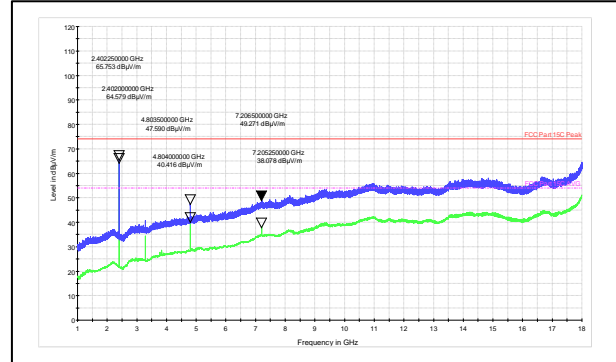
Channel Frequency: 2480MHz Polarization: Horizontal

Data Rate: 500kbps

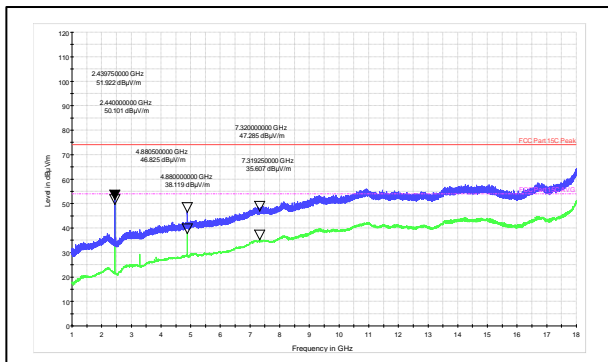
Frequency Range: 1GHz to 18GHz



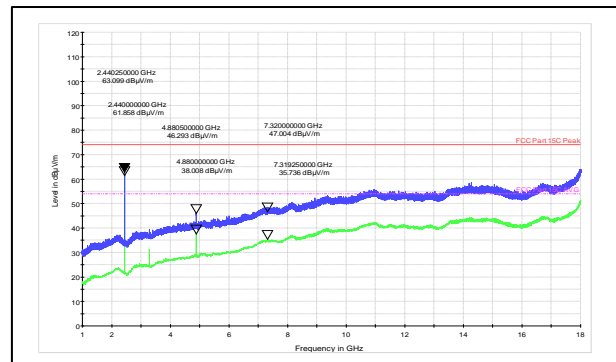
**Channel Frequency: 2402MHz Polarization: Vertical**



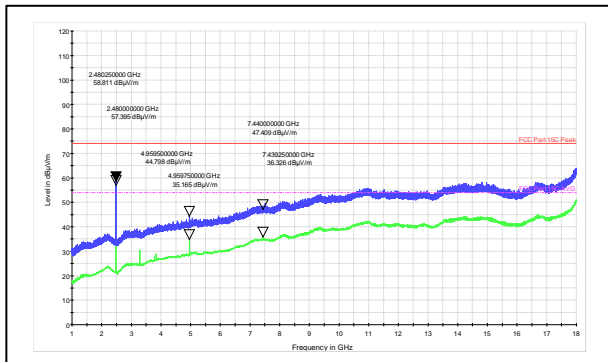
**Channel Frequency: 2402MHz Polarization: Horizontal**



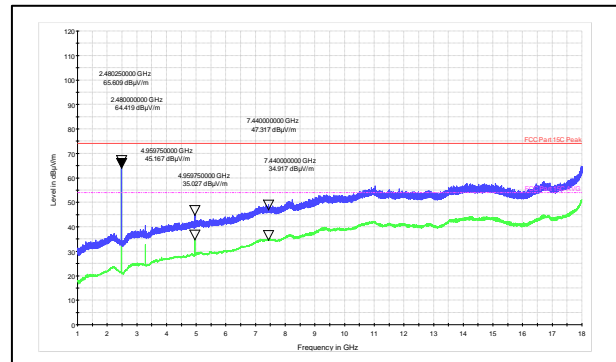
**Channel Frequency: 2440MHz Polarization: Vertical**



**Channel Frequency: 2440MHz Polarization: Horizontal**



**Channel Frequency: 2480MHz Polarization: Vertical**

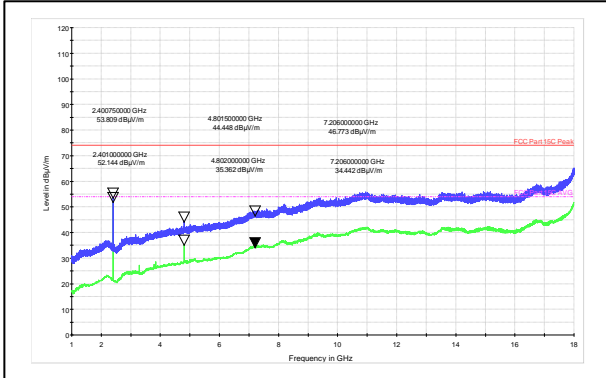


**Channel Frequency: 2480MHz Polarization: Horizontal**

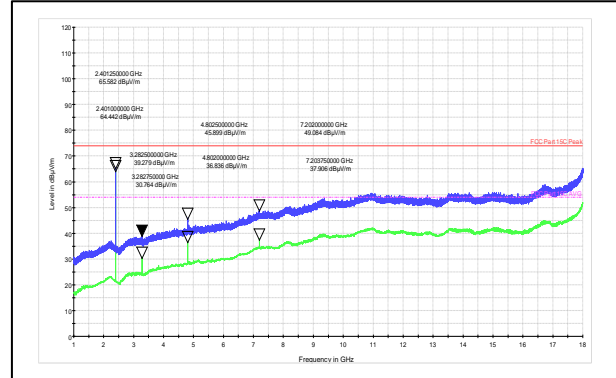


Data Rate: 1Mbps

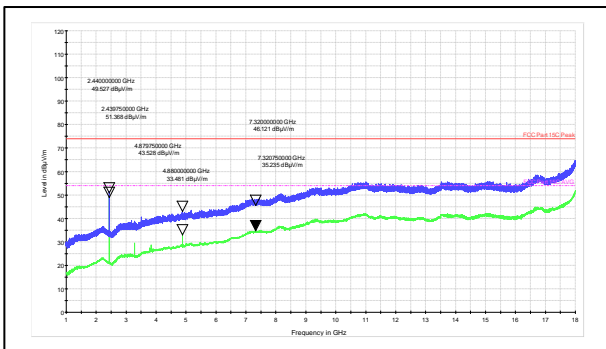
Frequency Range: 1GHz to 18GHz



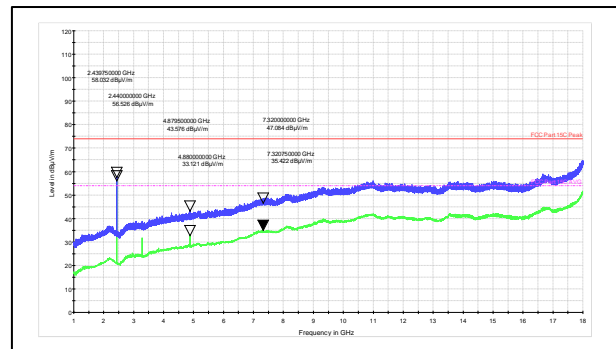
Channel Frequency: 2402MHz Polarization: Vertical



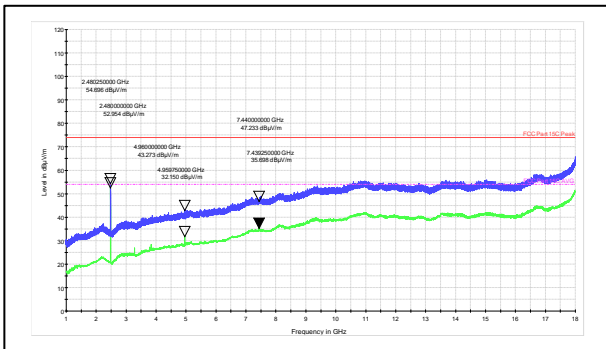
Channel Frequency: 2402MHz Polarization: Horizontal



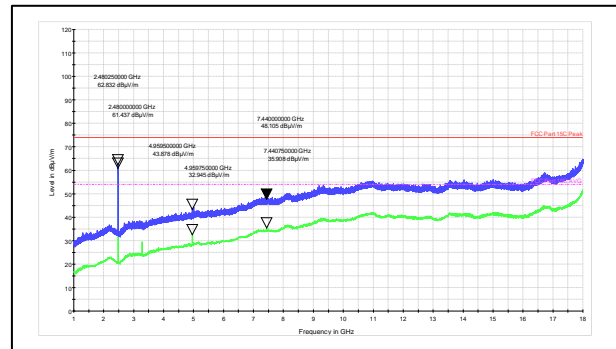
Channel Frequency: 2440MHz Polarization: Vertical



Channel Frequency: 2440MHz Polarization: Horizontal



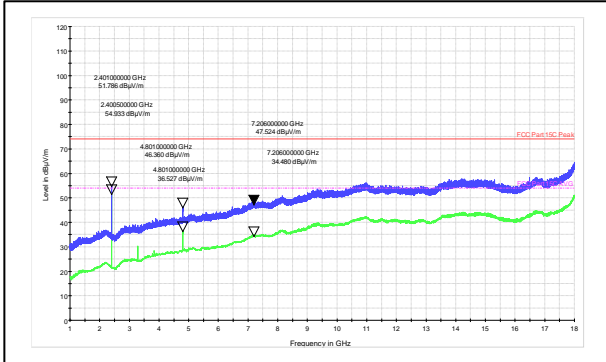
Channel Frequency: 2480MHz Polarization: Vertical



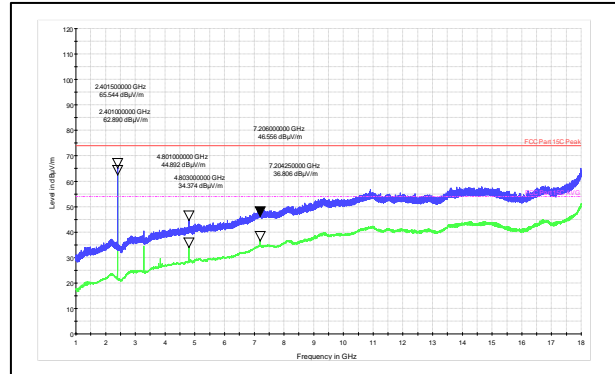
Channel Frequency: 2480MHz Polarization: Horizontal

Data Rate: 2Mbps

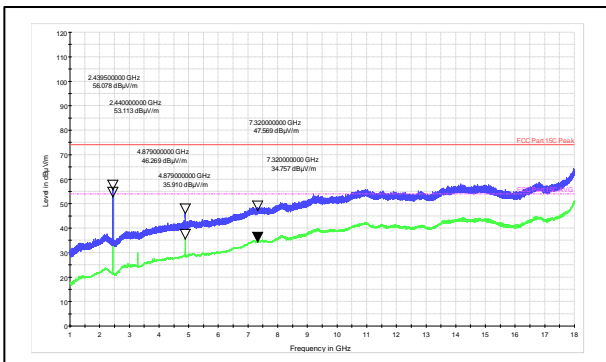
Frequency Range: 1GHz to 18GHz



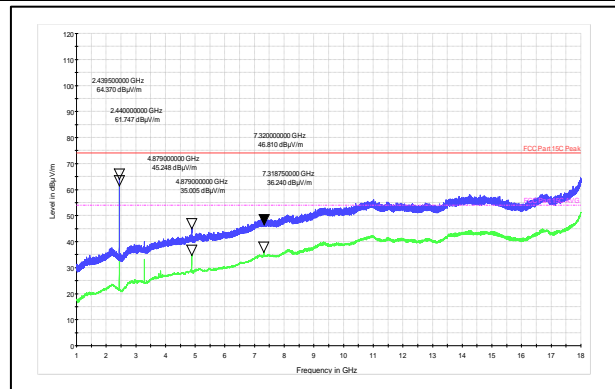
Channel Frequency: 2402MHz Polarization: Vertical



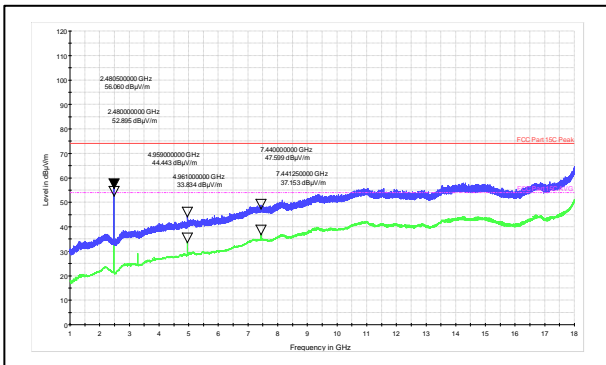
Channel Frequency: 2402MHz Polarization: Horizontal



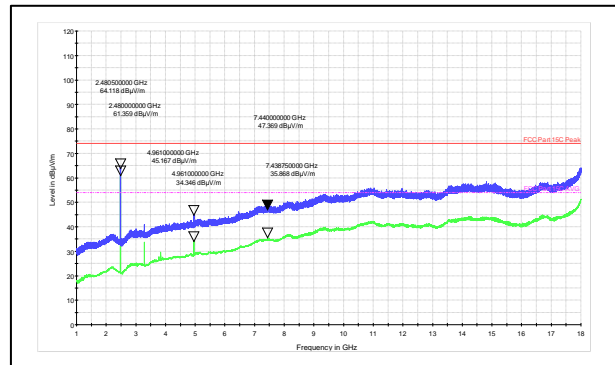
Channel Frequency: 2440MHz Polarization: Vertical



Channel Frequency: 2440MHz Polarization: Horizontal



Channel Frequency: 2480MHz Polarization: Vertical



Channel Frequency: 2480MHz Polarization: Horizontal

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**Simultaneous Operation:**

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
Horizontal	2402	7236(Pk)	46.90	74.00	-27.10
		7236(Av)	34.87	54.00	-19.13
		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
	2412	7206(Pk)	47.09	74.00	-26.91
		7206(Av)	37.37	54.00	-16.63
		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