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Report Reference ID:	295103-1TRFWL
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Test specification:	Title 47 - Telecommunication Chapter I - Federal Communications Commission Subchapter A - General Part 15 - Radio Frequency Devices Subpart C - Intentional Radiators §15.247 - Operation within the bands 2400–2483.5 MHz
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Applicant:	URMET SPA Via Bologna, 188 – 10154 Torino (TO) – Italy
Apparatus:	Video door phone with wireless module WI FI
Model:	1717/32
FCC ID:	REA171732

Testing laboratory:	Nemko Spa Via del Carroccio, 4 I 20853 Biassono (Italy) Telephone: +039 039 2201201 Facsimile: +39 039 220 1221
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	Name and title	Date
Tested by:	Daniele Guarnone, Wireless/EMC Specialist 	2016-04-06
Reviewed by:	Paolo Barbieri Wireless/EMC Specialist 	

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Product: Video door phone with wireless module WIFI,1717/32

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 Nemko Spa Via del Carroccio, 4 I 20853 Biassono (Italy)	Section 1: Report summary	Product: Video door phone with wireless module WIFI,1717/32
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Section 1: Report summary

1.1 Test specification

Specifications	FCC Part 15 Subpart C, 15.247 Operation within the bands 2400–2483.5 MHz
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1.2 Statement of compliance

Compliance	In the configuration tested the EUT was found compliant Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> This report contains an assessment of apparatus against specifications based upon tests carried out on samples submitted at Nemko Canada Inc. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15; Subpart C. Radiated tests were conducted in accordance with ANSI C63.4-2003.
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1.3 Exclusions

Exclusions	None
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1.4 Registration number

Test site FCC ID number	481407
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1.5 Test report revision history

Revision #	Details of changes made to test report
TRF	Original report issued

1.6 Limits of responsibility

The date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025.
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Section 2: Summary of test results**Product:** Video door phone with wireless module WIFI,1717/32**Section 2: Summary of test results****2.1 FCC Part 15 Subpart C – Intentional Radiators, test results****General requirements for FCC Part 15**

Part	Test description	Verdict
§15.31(e)	Variation of power source	Pass
§15.31(m)	Number of operating frequencies	Pass
§15.203	Antenna requirement	Pass
§15.207(a)	Conducted limits	Pass

Specific requirements for FCC Part 15 Subpart C, 15.247

Part	Test description	Verdict
§15.247(a)(1)(i)	Frequency hopping systems operating in the 902–928 MHz band	N/A
§15.247(a)(1)(ii)	Frequency hopping systems operating in the 5725–5850 MHz band	N/A
§15.247(a)(1)(iii)	Frequency hopping systems operating in the 2400–2483.5 MHz band	N/A
§15.247(a)(2)	Minimum 6 dB bandwidth for systems using digital modulation techniques	Pass
§15.247(b)(1)	Maximum peak output power of frequency hopping systems operating in the 2400–2483.5 MHz band	N/A
§15.247(b)(2)	Maximum peak output power of Frequency hopping systems operating in the 902–928 MHz band	N/A
§15.247(b)(3)	Maximum peak output power of systems using digital modulation in the 2400–2483.5 MHz	Pass
§15.247(b)(4)	Maximum peak output power	Pass
§15.247(c)(1)	Fixed point-to-point operation with directional antenna gains greater than 6 dBi	N/A
§15.247(c)(2)	Transmitters operating in the 2400–2483.5 MHz band that emit multiple directional beams	N/A
§15.247(d)	Spurious emissions	Pass
§15.247(e)	Power spectral density for digitally modulated devices	Pass
§15.247(f)	Time of occupancy for hybrid systems	N/A

Notes: None

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Section 3: Equipment under test (EUT) and application details

3.1 Applicant details		
Applicant complete business name	Name:	URMET S.p.A.
	Federal Registration Number (FRN):	0022261259
	Grantee code	REA
Mailing address	Address:	Via Bologna, 188 – 10154 Torino (TO) – Italy
	City:	Torino (TO)
	Province/State:	TO
	Post code:	Italy

3.2 Modular equipment		
a) Single modular approval	Single modular approval	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
b) Limited single modular approval	Limited single modular approval	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

3.3 Product details		
FCC ID	Grantee code:	REA
	Product code:	171732
Equipment class	DTS – Digital Transmission system	
Description of product as it is marketed	Video door phone with wireless module WI FI	
	Model name/number:	1717/32
	Variant Model num:	1717/34
Serial number:		NA

3.4 Application purpose		
Type of application	<input checked="" type="checkbox"/> Original certification <input type="checkbox"/> Change in identification of presently authorized equipment Original FCC ID: <input type="text"/> Grant date: <input type="text"/> <input type="checkbox"/> Class II permissive change or modification of presently authorized equipment	

3.5 Composite/related equipment		
a) Composite equipment	The EUT is a composite device subject to an additional equipment authorization <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
b) Related equipment	The EUT is part of a system that operates with, or is marketed with, another device that requires an equipment authorization <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
c) Related FCC ID	If either of the above is "yes": <input type="checkbox"/> has been granted under the FCC ID(s) listed below: <input checked="" type="checkbox"/> is in the process of being filled under the FCC ID(s) listed below: FCC ID:REA171732 <input type="checkbox"/> is pending with the FCC ID(s) listed below: <input type="checkbox"/> has a mix of pending and granted statuses under the FCC ID(s) listed below: i FCC ID: FCC ID: REA171732 ii FCC ID:	

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3.6 Sample information

Receipt date:	2015-09-29
Nemko sample ID number:	179167

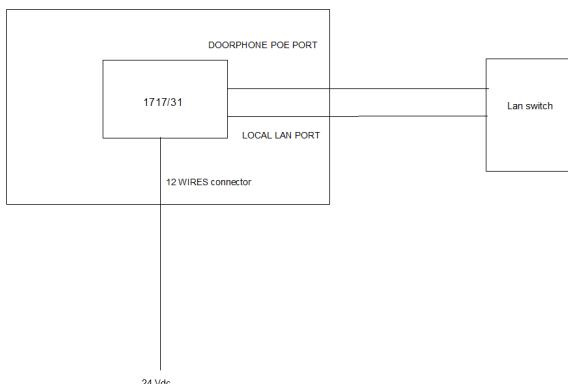
3.7 EUT technical specifications

Operating band:	2400 MHz ÷ 2483.5 MHz
Operating frequency:	2412 MHz ÷ 2462 MHz
Modulation type:	protocol 802.11b : protocol 802.11 g : protocol 802.11 n :
Occupied bandwidth:	802.11b: 8.57 MHz 802.11g: 16.427 MHz 802.11n: 17.709 MHz
Channel spacing:	5 MHz
Emission designator:	G1D, W7D
Antenna type:	Integral, 2.0dBi gain maximum Video door phone with wireless module WI FI Frequency Range 2400 MHz ÷ 2483.5 MHz (2.4 GHz ISM Band) Number of Channels 11
Power source:	24Vdc

3.8 Operation of the EUT during testing

Details:	Transmitting to maximum power at 2412 MHz, 2442 MHz, 2462 MHz with the following modulation: protocol 802.11 b protocol 802.11g protocol 802.11n
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3.9 EUT setup diagram





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Section 4: Engineering considerations **Product:** Video door phone with wireless module WIFI,1717/32

Section 4: Engineering considerations

4.1 Modifications incorporated in the EUT

Modifications	Modifications performed to the EUT during this assessment None <input checked="" type="checkbox"/> Yes <input type="checkbox"/> , performed by Client <input type="checkbox"/> or Nemko <input type="checkbox"/> Details:
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4.2 Deviations from laboratory tests procedures

Deviations	Deviations from laboratory test procedures None <input checked="" type="checkbox"/> Yes <input type="checkbox"/> - details are listed below:
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4.3 Technical judgment

Judgment	None
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Section 5: Test conditions

5.1 Power source and ambient temperatures	
Normal temperature, humidity and air pressure test conditions	Temperature: 15–30 °C Relative humidity: 20–75 % Air pressure: 86–106 kPa When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.
Power supply range:	The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages $\pm 5\%$, for which the equipment was designed.



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Section 6: Measurement uncertainty

Product: Video door phone with wireless module WIFI,1717/32

Section 6: Measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to CISPR 16-4-2 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements" and is documented in the Nemko Spa Technical Procedure WML1002. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.



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Section 7: Test equipment

Product: Video door phone with wireless module WIFI,1717/32

Section 7: Test equipment

7.1 Test equipment list

Equipment	Manufacturer	Model No.	Asset/Serial No.	Next cal.
Spectrum Analyzer 9 KHz ÷ 40 GHz	R&S	FSEK	848255/005	09/2016
Broadband preamplifier	Schwarzbeck	BBV 9718	9718-137	12/2016
Trilog Broadband Antenna	Schwarzbeck	VULB 9162	9162-025	2018/07
Semi-anechoic chamber	Nemko	10m semi-anechoic chamber	530	2016/09
Antenna mast	R&S	HCM	836 529/05	NCR
Controller	R&S	HCC	836 620/7	NCR
EMI receiver 9 kHz ÷ 3 GHz	R&S	ESCI	100888	2016/09
LISN 9 kHz ÷ 30 MHz	R&S	ESH2-Z5	872 460/041	2016/11
Climatic Chamber	ESPEC	ARS 1100	4100000067	2016/12
Loop antenna	R&S	HFH2-Z2	831247/011	2017/02
EMI receiver 20 Hz ÷ 8 GHz	R&S	ESU8	100202	2016/04
Bilog antenna 1 ÷18 GHz	Schwarzbeck	STLP 9148-123	123	09/2018
Double Ridged Waveguide Horn	RF SPIN	DRH40	061106a40	08/2016
Wide band Amplifier 18 GHz ÷ 40 GHz	MITEQ	AMF-5F-18004000-37-8P	128061	12/2016
High pass filter	Wainwright Instruments	WHNX6-2555-3500-26500-60CC	01	11/2016

Note: N/A = Not applicable, NCR = No cal required, COU = Cal on use

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Section 8: Testing data

8.1 Clause 15.31(e) Variation of power source

§ 15.31 Measurement standards.

- (e) For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85 % and 115 % of the nominal rated supply voltage. For battery-operated equipment, the equipment tests shall be performed using a new battery.

Special notes

None

Test data

Transmit output power was measured while supply voltage was varied from (85 % to 115 % of the nominal rated supply voltage). No change in transmit output power was observed.



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Section 8: Testing data**Product:** Video door phone with wireless module WIFI,1717/32

8.2 Clause 15.31(m) Number of operating frequencies

§ 15.31 Measurement standards.

(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz and less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

Special notes

The frequency range over which the device operates is greater than 10 MHz. The tests were performed on three operating channels (low, mid, high)

Test data

The frequency band is 2412 MHz (channel 1) to 2472 MHz (channel 13) MHz therefore number of operating frequencies is 3.

Low frequency / channel 1	2412 MHz
Mid frequency / channel 7	2442 MHz
High frequency / channel 11	2462 MHz

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8.3 Clause 15.203 Antenna requirement

§ 15.203 Antenna requirement.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

Special notes

None

Test data

- The EUT uses a non-detachable antenna to the intentional radiator.

Detailed photo of RF connector:

E.U.T didn't have antenna connector but integral antenna.



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Section 8: Testing data**Product:** Video door phone with wireless module WIFI,1717/32**Specification:** FCC Part 15.247

8.4 Clause 15.207(a) Conducted limits

§ 15.207 Conducted limits.

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*-Decreases with the logarithm of the frequency.

Special notes

None



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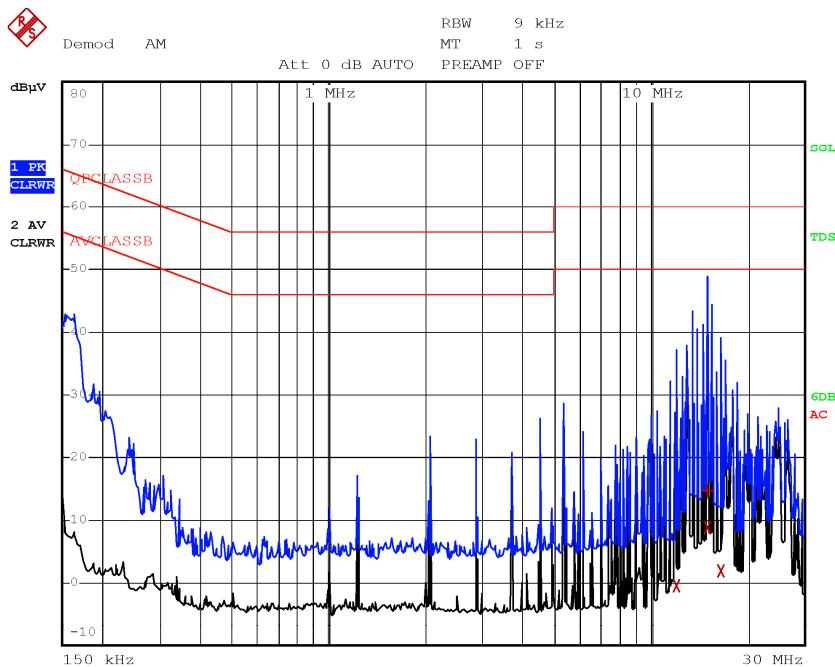
Section 8: Testing data

Product: Video door phone with wireless module WIFI,1717/32

Specification: FCC Part 15.247

Test data

Neutral line



Date: 7.OCT.2015 14:44:55

Frequency (MHz)	Level (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1.1820	4.0	56.0	-52.0	QP
1.2380	34.2	46.0	-11.8	AV
2.0660	34.9	46.0	-11.1	AV
3.9060	-0.1	56.0	-56.1	QP
15.0340	26.1	60.0	-33.9	QP
15.0340	21.2	50.0	-28.8	AV

The spectral scan has been corrected with transducer factors (i.e. cable loss, LISN factors, and attenuators) for determination of compliance.

A preview measurement was generated with the receiver in continuous scan mode. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Receiver/Spectrum analyzer settings:

0.15 MHz to 30 MHz

Preview measurements

Final measurement

Receiver: 9 kHz RBW, Peak and Average detector, max hold

Receiver: 9 kHz RBW, Quasi-peak and Average detector

Measurement time 100 ms



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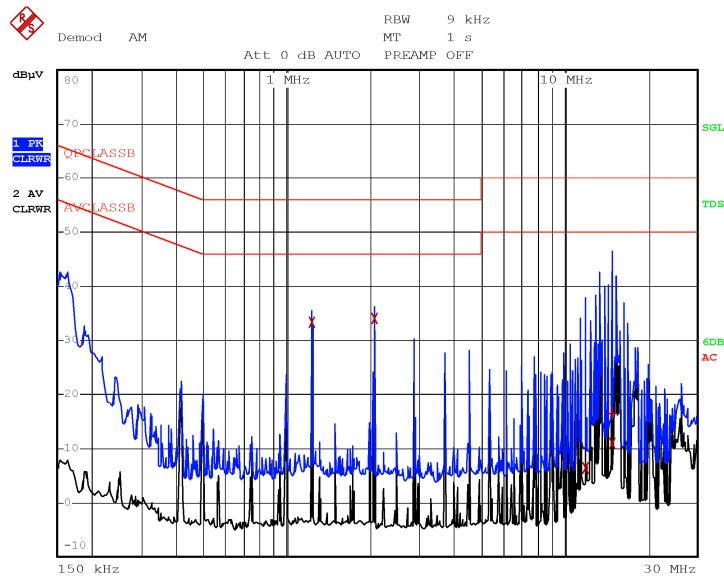
Section 8: Testing data

Product: Video door phone with wireless module WIFI,1717/32

Specification: FCC Part 15.247

Test data, continued

Phase line



Date: 7.OCT.2015 14:37:50

Frequency (MHz)	Level (dBµV)	Limit (dBµV)	Margin (dB)	Detector
0.3780	28.2	58.3	-30.1	QP
1.2060	7.3	56.0	-48.7	QP
1.4940	17.0	56.0	-39.0	QP
14.9420	14.1	60.0	-45.9	QP
14.9420	9.0	50.0	-41.0	AV
16.4380	2.1	50.0	-47.9	AV

The spectral scan has been corrected with transducer factors (i.e. cable loss, LISN factors, and attenuators) for determination of compliance.

A preview measurement was generated with the receiver in continuous scan mode. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Receiver/Spectrum analyzer settings:

0.15 MHz to 30 MHz

Preview measurements

Receiver: 9 kHz RBW, Peak and Average detector, max hold

Final measurement

Receiver: 9 kHz RBW, Quasi-peak and Average detector

Measurement time 100 ms

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	Specification: FCC Part 15.247	

8.5 Clause 15.247(a)(2) Minimum 6 dB bandwidth for systems using digital modulation techniques

§ 15.247 Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.

- (a) Operation under the provisions of this Section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:
 - (2) Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
 - 1. Test method according 11.8.1 Option 1 of ANSI C63.10-2013.

Special notes

None



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Section 8: Testing data

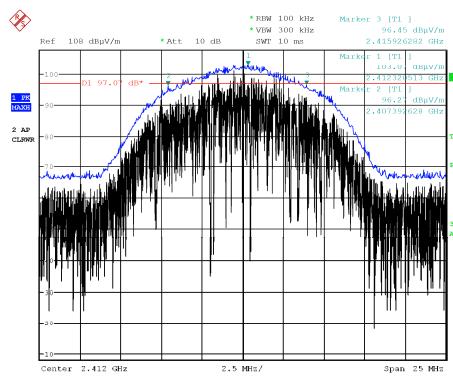
Product: Video door phone with wireless module WIFI,1717/32

Specification: FCC Part 15.247

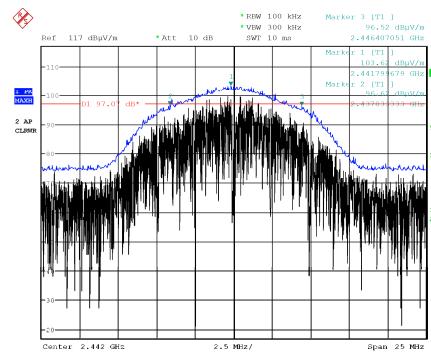
Test data

Radiated measurement protocol 802.11b

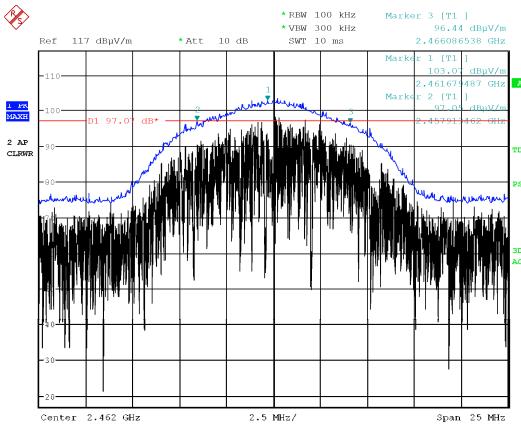
Low channel 6 dB bandwidth



Mid channel 6 dB bandwidth



High channel



Frequency (MHz)	6 dB bandwidth (MHz)	Limit (MHz)	Margin (MHz)
2412	8.53	> 0.5	8.03
2442	8.57	> 0.5	8.27
2462	8.17	> 0.5	7.35

– The peak detector was used
– The span was wider than RBW.



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Section 8: Testing data

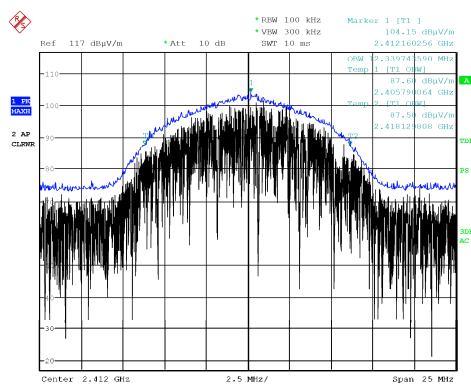
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Specification: FCC Part 15.247

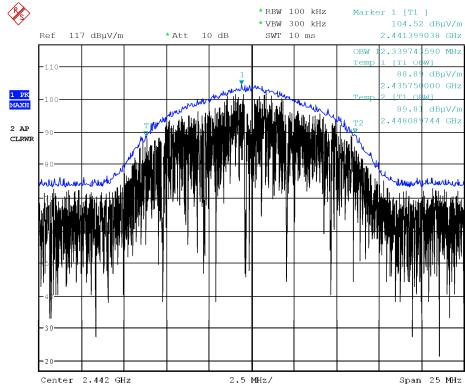
Test data

Radiated measurement protocol 802.11b

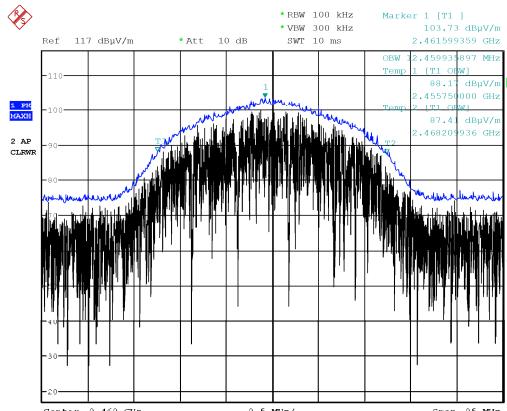
Low channel 99% bandwidth



Mid channel 99% bandwidth



High channel 99% bandwidth



Frequency (MHz)	99% bandwidth (MHz)	Limit (MHz)	Margin (MHz)
2412	12.30	> 0.5	11.80
2442	12.30	> 0.5	11.80
2462	12.46	> 0.5	11.96

- The peak detector was used
- The span was wider than RBW.



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Section 8: Testing data

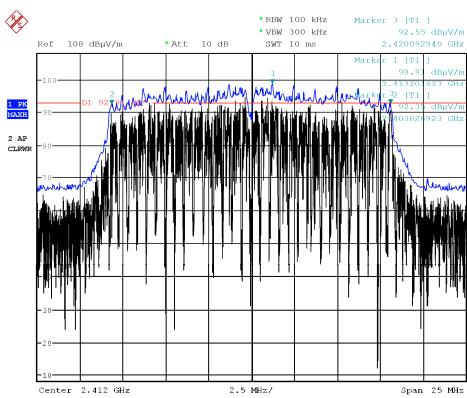
Product: Video door phone with wireless module WIFI,1717/32

Specification: FCC Part 15.247

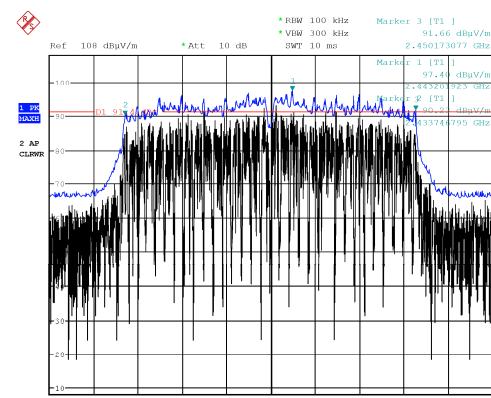
Test data

Radiated measurement protocol 802.11g

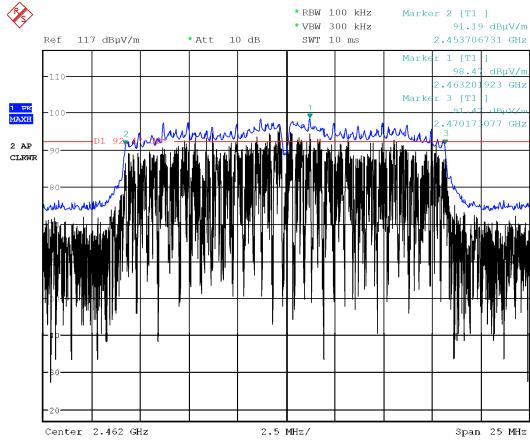
Low channel 6 dB bandwidth



Mid channel 6 dB bandwidth



High channel 6 dB bandwidth



Frequency (MHz)	6 dB bandwidth (MHz)	Limit (MHz)	Margin (MHz)
2412	16.266	> 0.5	15.766
2442	16.427	> 0.5	15.927
2462	16.467	> 0.5	15.967

- The peak detector was used
- The span was wider than RBW.



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Section 8: Testing data

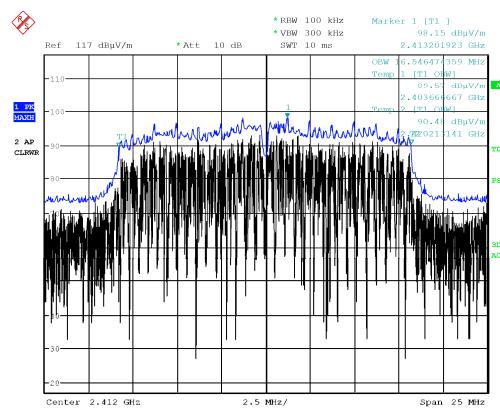
Product: Video door phone with wireless module WIFI,1717/32

Specification: FCC Part 15.247

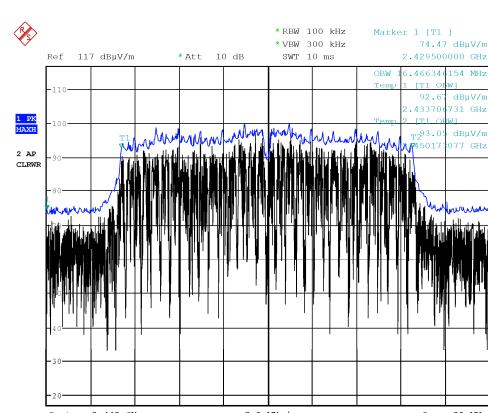
Test data

Radiated measurement protocol 802.11g

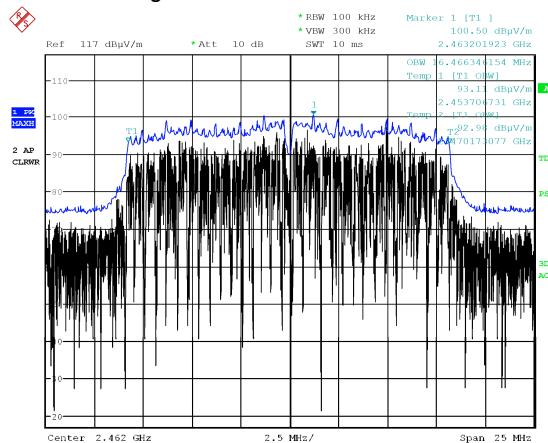
Low channel 99% bandwidth



Mid channel 99% bandwidth



High channel 99% bandwidth



Frequency (MHz)	99% bandwidth (MHz)	Limit (MHz)	Margin (MHz)
2412	16.55	> 0.5	16.05
2442	16.51	> 0.5	16.01
2462	16.47	> 0.5	15.97

- The peak detector was used
- The span was wider than RBW.



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Section 8: Testing data

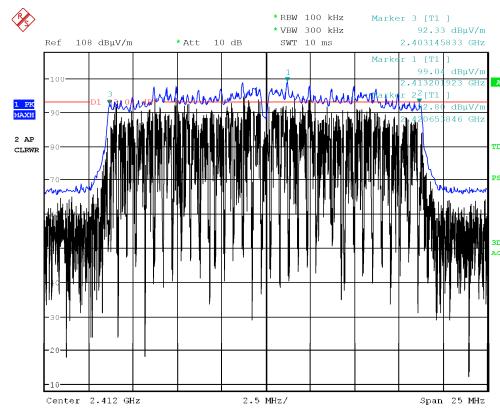
Product: Video door phone with wireless module WIFI,1717/32

Specification: FCC Part 15.247

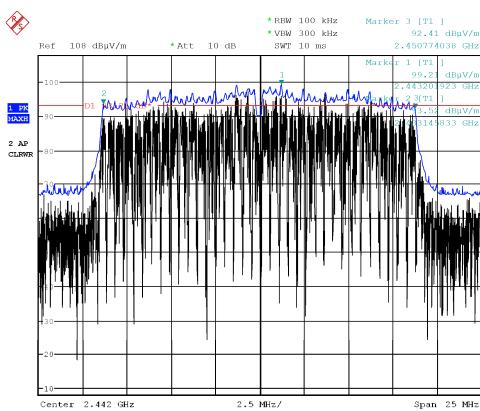
Test data

Radiated measurement protocol 802.11n

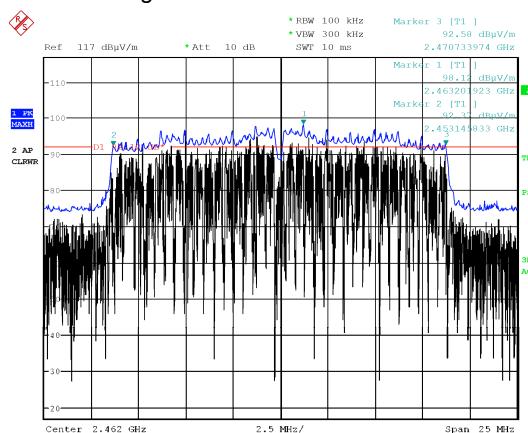
Low channel 6 dB bandwidth



Mid channel 6 dB bandwidth



High channel 6 dB bandwidth



Frequency (MHz)	6 dB bandwidth (MHz)	Limit (MHz)	Margin (MHz)
2412	17.508	> 0.5	17.008
2442	17.629	> 0.5	17.129
2462	17.588	> 0.5	17.088

- The peak detector was used
- The span was wider than RBW.



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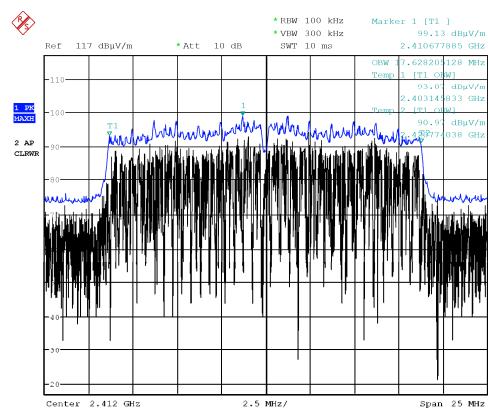
Product: Video door phone with wireless module WIFI,1717/32

Specification: FCC Part 15.247

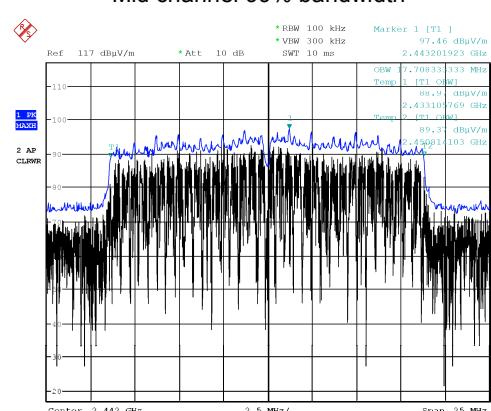
Test data

Radiated measurement protocol 802.11n

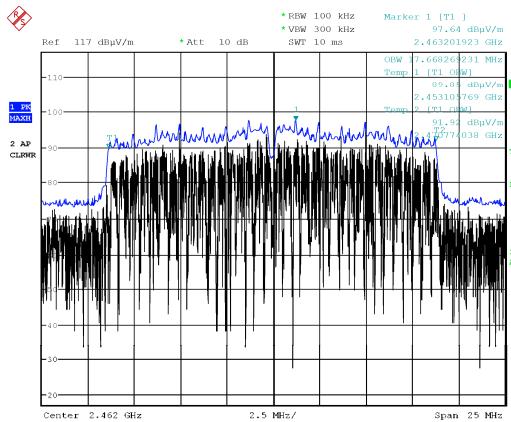
Low channel 99% bandwidth



Mid channel 99% bandwidth



High channel 99% bandwidth



Frequency (MHz)	99% bandwidth (MHz)	Limit (MHz)	Margin (MHz)
2412	17.628	> 0.5	17.128
2442	17.708	> 0.5	17.208
2462	17.668	> 0.5	17.168

- The peak detector was used
- The span was wider than RBW.

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	Specification: FCC Part 15.247	

8.6 Clause 15.247(b) Maximum peak conducted output power

§ 15.247 Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

- (1) For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.
- (2) For frequency hopping systems operating in the 902–928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.
- (3) For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
- (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
 - (i) Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.
 - (ii) Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.
 - (iii) Fixed, point-to-point operation, as used in paragraphs (b)(3)(i) and (b)(3)(ii) of this section, excludes the use of point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread spectrum intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operator and the installer of this responsibility.

Special notes

None



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Product: Video door phone with wireless module WIFI,1717/32

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Test data, continued

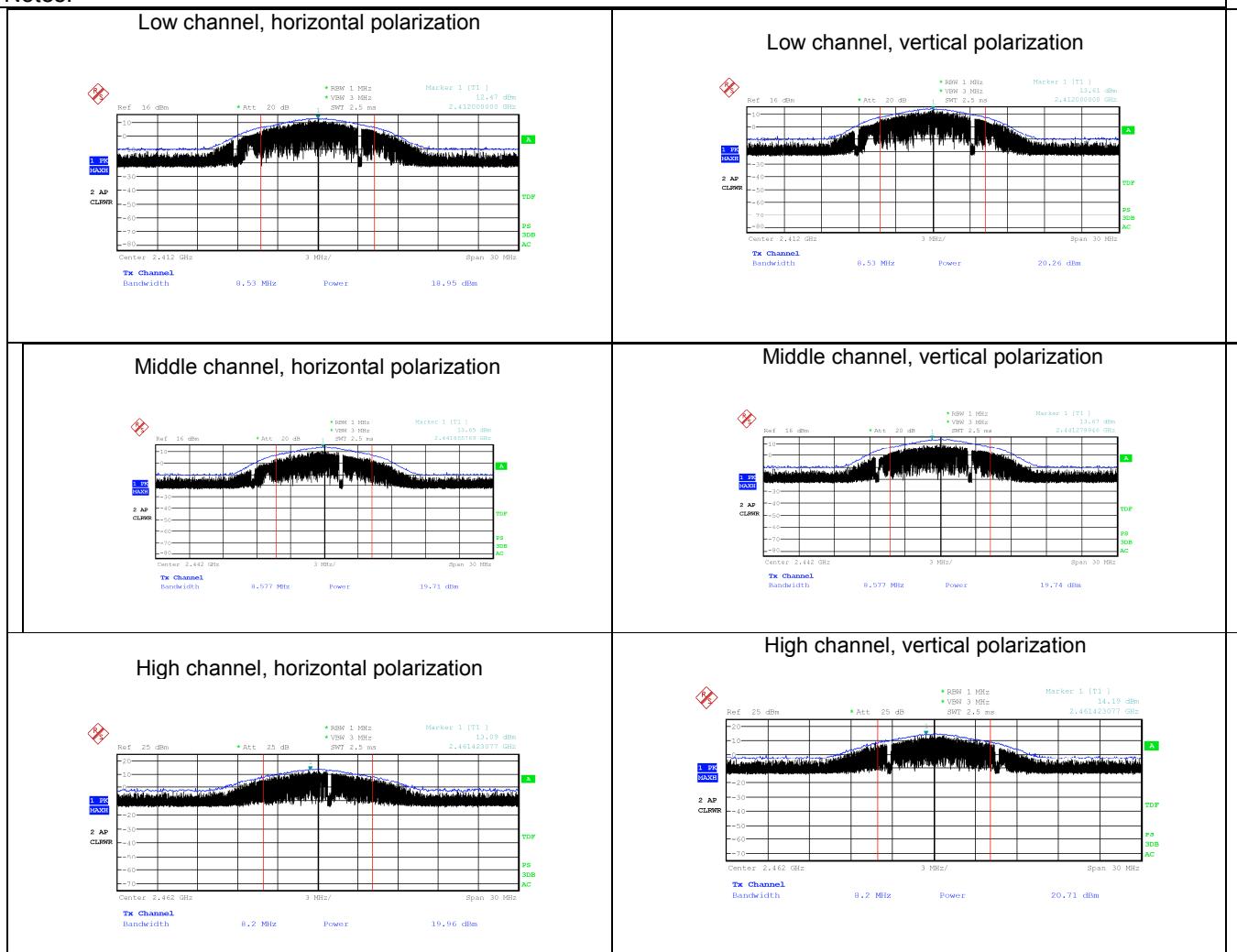
Section (3) Results, continued protocol 802.11b

Radiated measurements

Radiated measurements were performed:

- The EUT was measured on three orthogonal axis.
- All measurements were performed at a distance of 3 m.
- All measurements were performed:
 - using a peak detector
 -
 - eirp

Notes:





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Section 8: Testing data**Product:** Video door phone with wireless module WIFI,1717/32**Specification:** FCC Part 15.247**Test data, continued**

Section (3) Results, continued protocol 802.11b

Radiated measurements

Radiated measurements were performed:

- The EUT was measured on three orthogonal axis.
- All measurements were performed at a distance of 3 m.
- All measurements were performed:
 - using a peak detector w

Notes:

protocol 802.11b:

Horizontal polarization

Frequency (MHz)	Eirp dBm	PR dBm	LP dB	Gr dBi	LC dB	Pmeas dBm
2412	18.95	-30.74	49.69	8.28	7.82	-30.28
2442	19.71	-30.09	49.8	8.2	7.88	-29.77
2462	19.96	-29.91	49.87	8.15	7.94	-29.70

Frequency (MHz)	Eirp dBm	Antenna gain di	Output power (dBm)	Limit dBm	--	--
2412	18.95	2	16.95	30	--	--
2442	19.71	2	17.71	30	--	--
2462	19.96	2	17.96	30	--	--

Vertical polarization

Frequency (MHz)	Eirp dBm	PR dBm	LP dB	Gr dBi	LC dB	Pmeas dBm
2412	20.26	-29.43	49.69	8.28	7.82	-28.97
2442	19.74	-30.06	49.8	8.2	7.88	-29.74
2462	20.7	-29.17	49.87	8.15	7.94	-28.96

Frequency (MHz)	Eirp dBm	Antenna gain di	Output power (dBm)	Limit dBm	--	--
2412	20.26	2	18.26	30	--	--
2442	19.74	2	17.74	30	--	--
2462	20.7	2	18.7	30	--	--



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Section 8: Testing data

Product: Video door phone with wireless module WIFI,1717/32

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Test data, continued

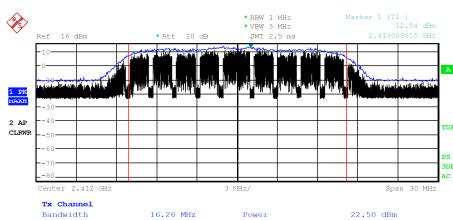
Section (3) Results, continued protocol 802.11g

Radiated measurements

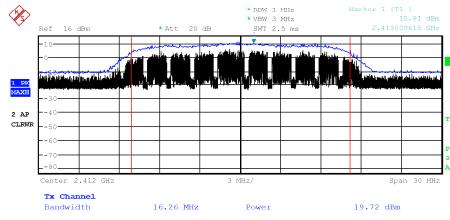
Radiated measurements were performed:

- The EUT was measured on three orthogonal axis.
- All measurements were performed at a distance of 3 m.
- All measurements were performed:
 - using a **peak eirp**

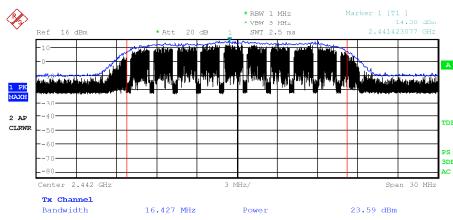
Low channel, horizontal polarization



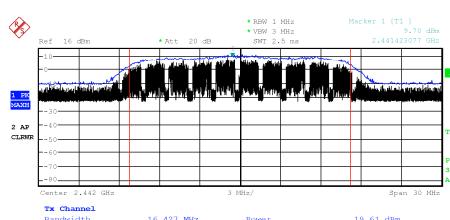
Low channel, vertical polarization



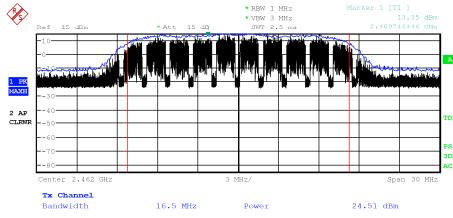
Middle channel, horizontal polarization



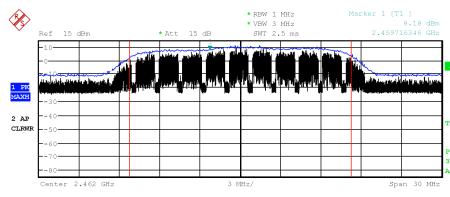
Middle channel, vertical polarization



High channel, horizontal polarization



High channel, vertical polarization





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Specification: FCC Part 15.247

Test data, continued

Section (3) Results, continued protocol 802.11g

Radiated measurements

Radiated measurements were performed:

- The EUT was measured on three orthogonal axis.
- All measurements were performed at a distance of 3 m.
- All measurements were performed:
 - using a **peak eirp**

protocol 802.11n:

Horizontal polarization

Frequency (MHz)	Eirp dBm	PR dBm	LP dB	Gr dBi	LC dB	Pmeas dBm
2412	22.5	-27.19	49.69	8.28	7.82	-26.73
2442	23.59	-26.21	49.8	8.2	7.88	-25.89
2462	24.51	-25.36	49.87	8.15	7.94	-25.15

Frequency (MHz)	Eirp dBm	Antenna gain di	Output power (dBm)	Limit dBm	--	--
2412	22.5	2	20.5	30	--	--
2442	23.59	2	21.59	30	--	--
2462	24.51	2	22.51	30	--	--

Vertical polarization

Frequency (MHz)	Eirp dBm	PR dBm	LP dB	Gr dBi	LC dB	Pmeas dBm
2412	19.72	-29.97	49.69	8.28	7.82	-29.51
2442	19.61	-30.19	49.8	8.2	7.88	-29.87
2462	19.72	-30.15	49.87	8.15	7.94	-29.94

Frequency (MHz)	Eirp dBm	Antenna gain di	Output power (dBm)	Limit dBm	--	--
2412	19.72	2	17.72	30	--	--
2442	19.61	2	17.61	30	--	--
2462	19.72	2	17.72	30	--	--

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Test data, continued

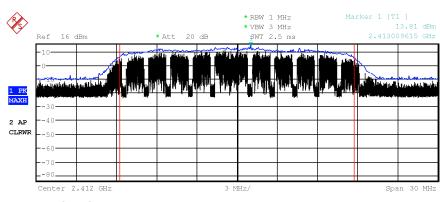
Section (3) Results, continued protocol 802.11n

Radiated measurements

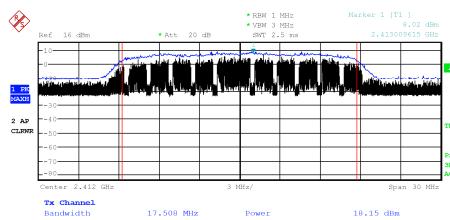
Radiated measurements were performed:

- The EUT was measured on three orthogonal axis.
- All measurements were performed at a distance of 3 m.
- All measurements were performed:
 - using a **peak eirp**

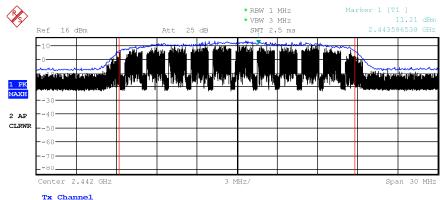
Low channel, horizontal polarization



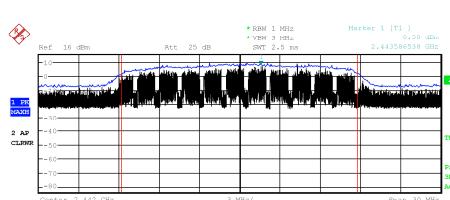
Low channel, vertical polarization



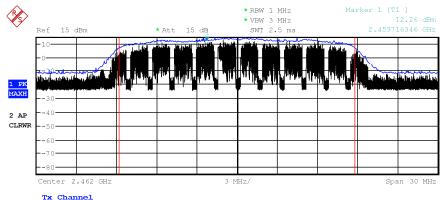
Middle channel, horizontal polarization



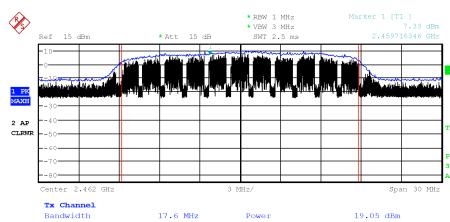
Middle channel, vertical polarization



High channel, horizontal polarization



High channel, vertical polarization





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Test data, continued

Section (3) Results, continued protocol 802.11n

Radiated measurements

Radiated measurements were performed:

- The EUT was measured on three orthogonal axis.
- All measurements were performed at a distance of 3 m.
- All measurements were performed:
 - using a **peak eirp**

protocol 802.11n:

Horizontal polarization

Frequency (MHz)	Eirp dBm	PR dBm	LP dB	Gr dBi	LC dB	Pmeas dBm
2412	22.38	-27.31	49.69	8.28	7.82	-26.85
2442	22.16	-27.64	49.8	8.20	7.88	-27.32
2462	23.8	-26.07	49.87	8.15	7.94	-25.86

Frequency (MHz)	Eirp dBm	Antenna gain di	Output power (dBm)	Limit dBm	--	--
2412	22.38	2	20.38	30	--	--
2442	22.16	2	20.16	30	--	--
2462	23.8	2	21.8	30	--	--

Vertical polarization

Frequency (MHz)	Eirp dBm	PR dBm	LP dB	Gr dBi	LC dB	Pmeas dBm
2412	18.15	-31.54	49.69	8.28	7.82	-31.08
2442	18.55	-31.25	49.8	8.2	7.88	-30.93
2462	19.05	-30.82	49.87	8.15	7.94	-30.61

Frequency (MHz)	Eirp dBm	Antenna gain di	Output power (dBm)	Limit dBm	--	--
2412	18.15	2	16.15	30	--	--
2442	18.55	2	16.55	30	--	--
2462	19.05	2	17.05	30	--	--

When the DUT power is measured using a radiated test configuration, the EIRP may be directly determined using the power (logarithmic) approach as follows in Equation (G.7):

$$\text{EIRP} = \text{PR} + \text{LP}$$

where

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EIRP is the equivalent (or effective) isotropically radiated power (in same units as PR)

PR is the adjusted received power level, in dBW, dBm, or psd

LP is the basic free-space propagation path loss, in dB

where

EIRP is the equivalent (or effective) isotropically radiated power (in same units as PR)

PR is the adjusted received power level, in dBW, dBm, or psd

LP is the basic free-space propagation path loss, in dB

The received power level is the measured power adjusted for measurement antenna gain, connecting cable loss, and any external signal amplification or attenuation used in the test configuration. Mathematically, as in Equation (G.8):

$$PR = P_{meas} - GR + LC + Latten - Gamp \quad (G.8)$$

where

P_{meas} is the measured power level, in dBW, dBm, or psd

GR is the gain of the receive (measurement) antenna, in dBi

LC is the signal loss in the measurement cable, in dB

$Latten$ is the value of external attenuation (if used), in dB

$Gamp$ is the value of external amplification (if used), in dB

The free-space propagation path loss is determined from Equation (G.9):

$$LP = 20\log F + 20\log d - 27.5$$

$$Latten = Gamp = 0$$

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8.7 Clause 15.247(d) Spurious emissions

§ 15.247 Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).



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Special notes

§15.209 – Radiated emission limits

Frequency (MHz)	Field strength		Measurement distance (m)
	(μ V/m)	(dB μ V/m)	
0.009–0.490	2400/F	67.6–20log(F)	300
0.490–1.705	24000/F	87.6–20log(F)	30
1.705–30.0	30	29.5	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

Notes:

- F = fundamental frequency in kHz
- In the emission table above, the tighter limit applies at the band edges.
- For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

§15.205 – Restricted bands of operation

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	Above 38.6
13.36–13.41			

- The spectrum was searched from 30 MHz to the 10th harmonic.
- The EUT was measured on three orthogonal axis.
- All measurements were performed at a distance of 3 m.
- All measurements were performed:
 - within 30–1000 MHz range: using a quasi-peak detector with 120 kHz/300 kHz RBW/VBW,
 - above 1 GHz: using peak detector with 1 MHz/3 MHz RBW/VBW for peak results

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Test data

Duty cycle/average factor calculations

§15.35(c) When the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds.

Duty cycle/average factor calculations: duty cycle =100%

$$\text{Duty cycle / average factor} = 20 \times \log_{10} \left(\frac{T_{x_{100ms}}}{100ms} \right) = \text{not applicable}$$



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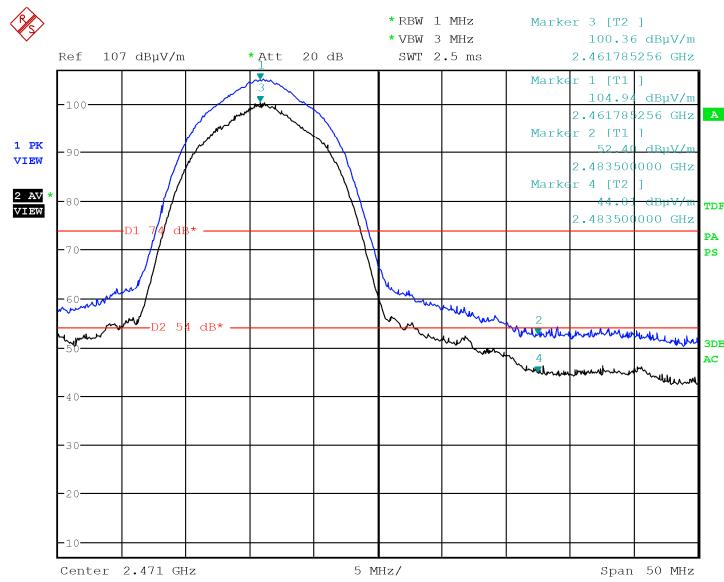
Section 8: Testing data

Product: Video door phone with wireless module WIFI,1717/32

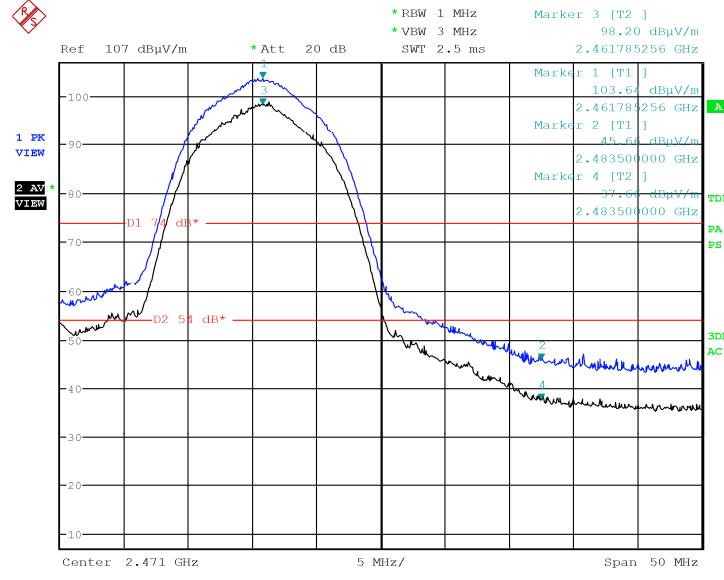
Specification: FCC Part 15.247

Test data, continued

6.10.5 Restricted-band band-edge measurements protocol 802.11b, vertical



6.10.5 Restricted-band band-edge measurements protocol 802.11b, horizontal





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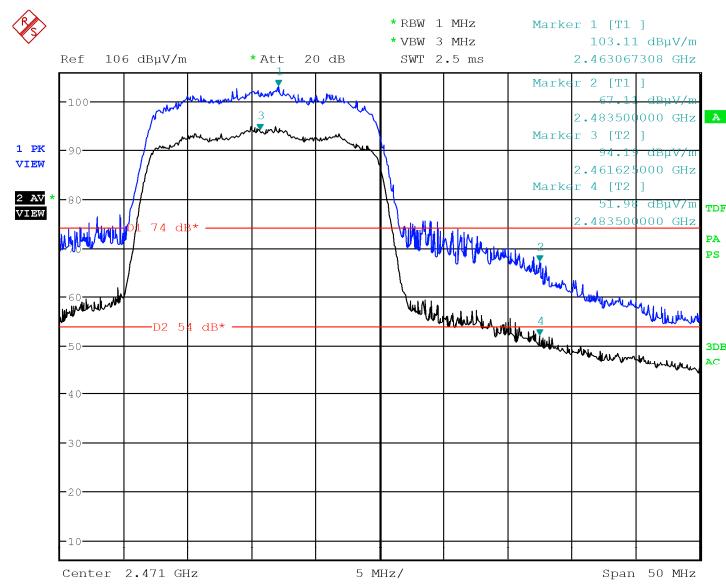
Section 8: Testing data

Product: Video door phone with wireless module WIFI,1717/32

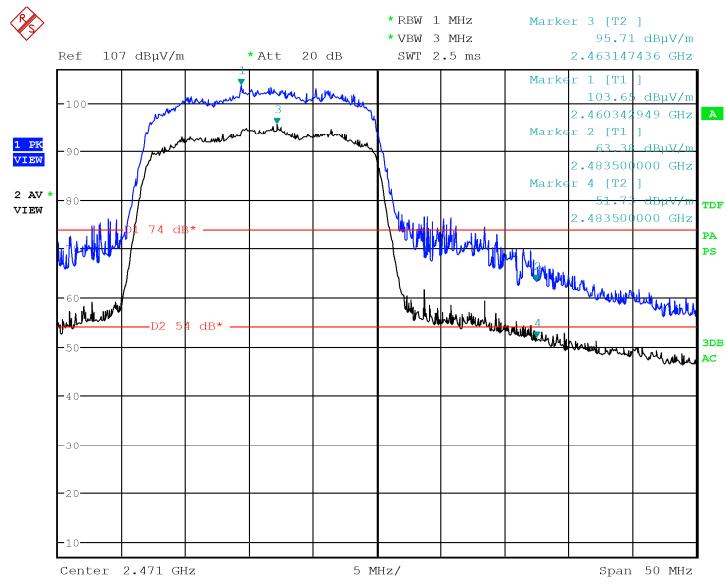
Specification: FCC Part 15.247

Test data, continued

6.10.5 Restricted-band band-edge measurements protocol 802.11n, vertical



6.10.5 Restricted-band band-edge measurements protocol 802.11n, horizontal





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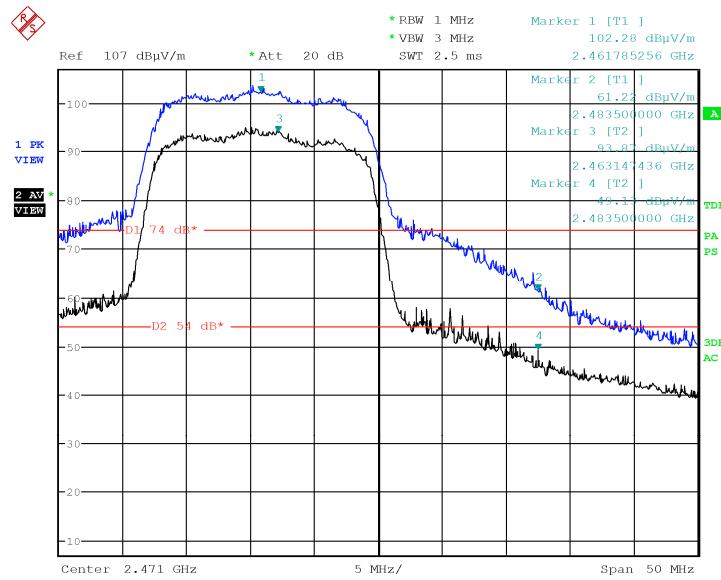
Section 8: Testing data

Product: Video door phone with wireless module WIFI,1717/32

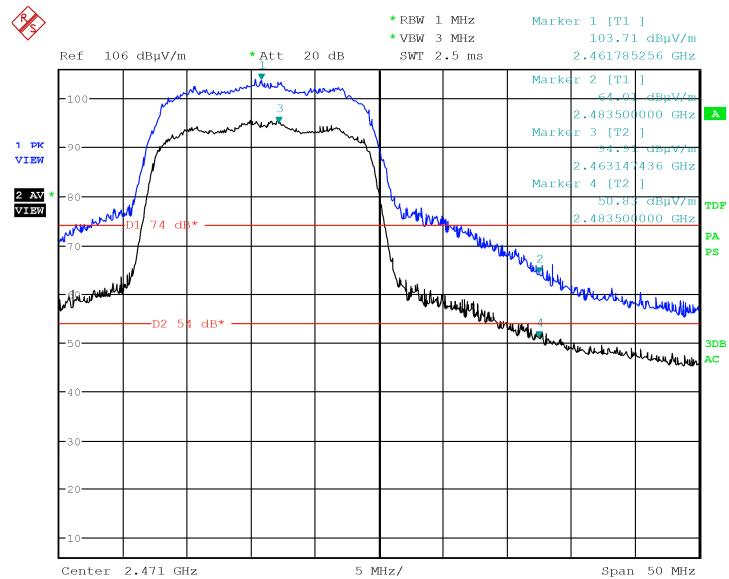
Specification: FCC Part 15.247

Test data, continued

6.10.5 Restricted-band band-edge measurements protocol 802.11g, horizontal



6.10.5 Restricted-band band-edge measurements protocol 802.11g, vertical





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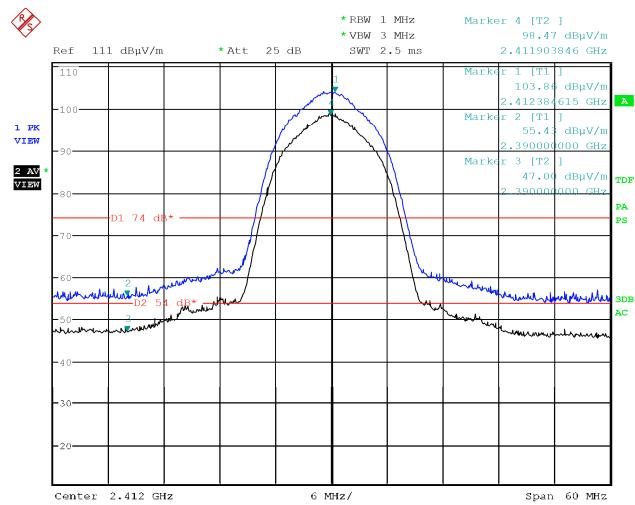
Section 8: Testing data

Product: Video door phone with wireless module WIFI,1717/32

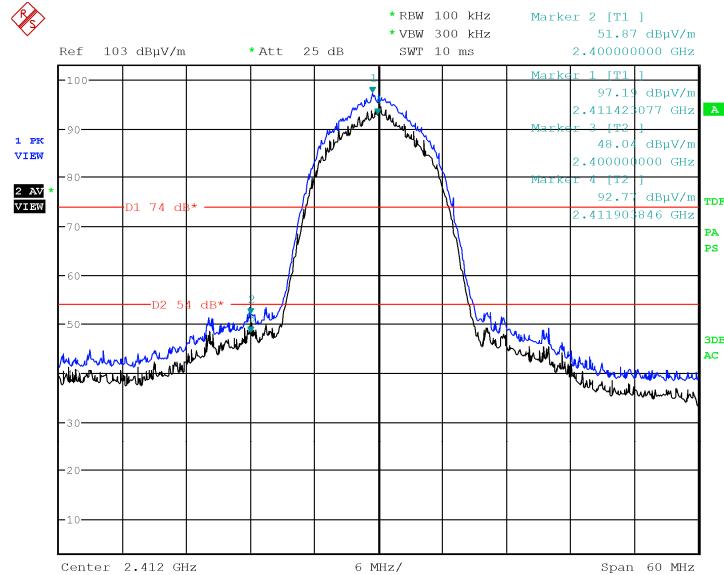
Specification: FCC Part 15.247

Test data, continued

6.10.5 Restricted-band band-edge measurements protocol 802.11b, horizontal



6.10.4 Authorized-band band-edge measurements (relative method)





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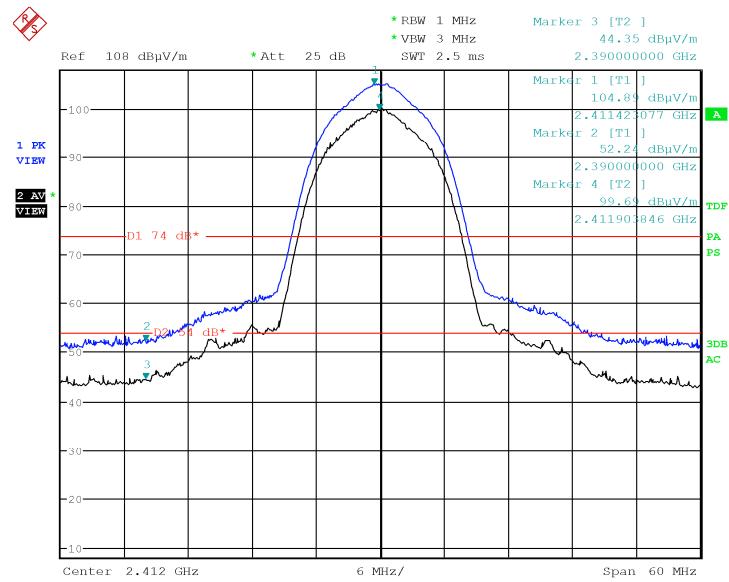
Section 8: Testing data

Product: Video door phone with wireless module WIFI,1717/32

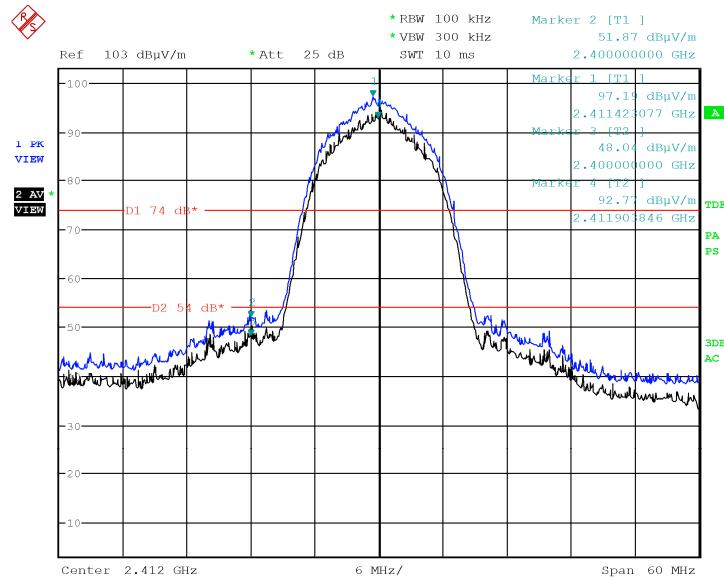
Specification: FCC Part 15.247

Test data, continued

6.10.5 Restricted-band band-edge measurements protocol 802.11b, vertical



6.10.4 Authorized-band band-edge measurements (relative method)





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I 20853 Biassono (Italy)

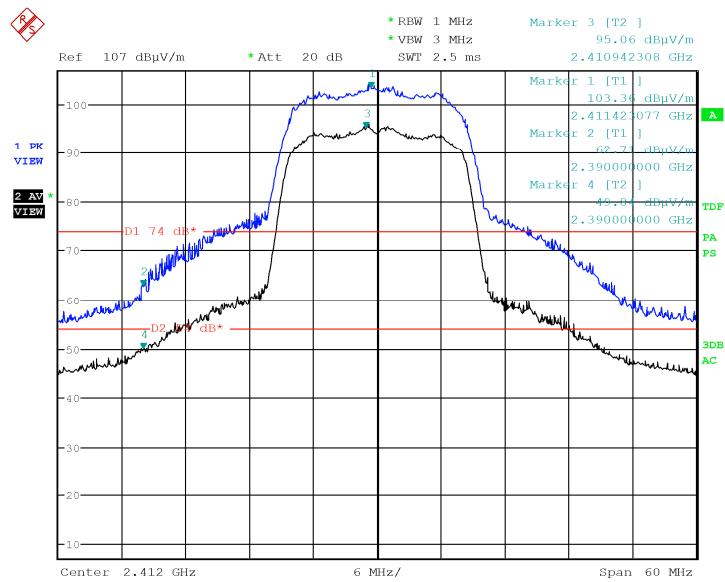
Section 8: Testing data

Product: Video door phone with wireless module WIFI,1717/32

Specification: FCC Part 15.247

Test data, continued

6.10.5 Restricted-band band-edge measurements protocol 802.11g, vertical



6.10.4 Authorized-band band-edge measurements (relative method)

