

Figure 118 - 2462 MHz (CH11), 802.11g, Core 0, 1 GHz to 25 GHz, Horizontal (rms), Orientation: X

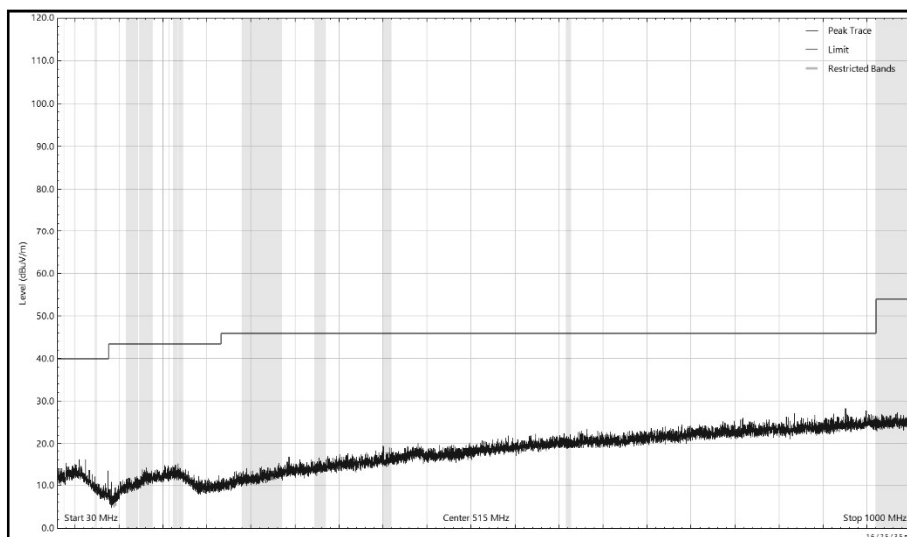


Figure 119 - 2462 MHz (CH11), 802.11g, Core 0, 30 MHz to 1 GHz, Vertical (Peak), Orientation: X

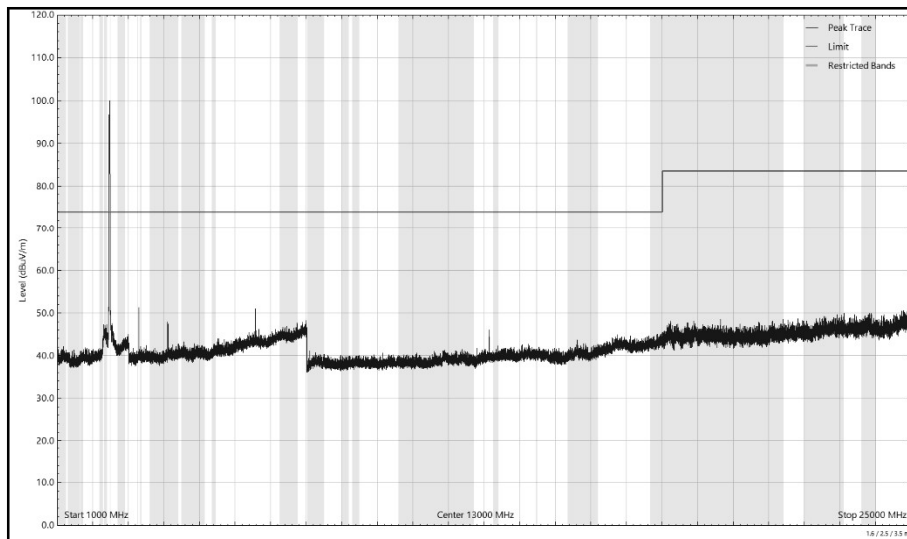


Figure 120 - 2462 MHz (CH11), 802.11g, Core 0, 1 GHz to 25 GHz, Vertical (Peak), Orientation: X

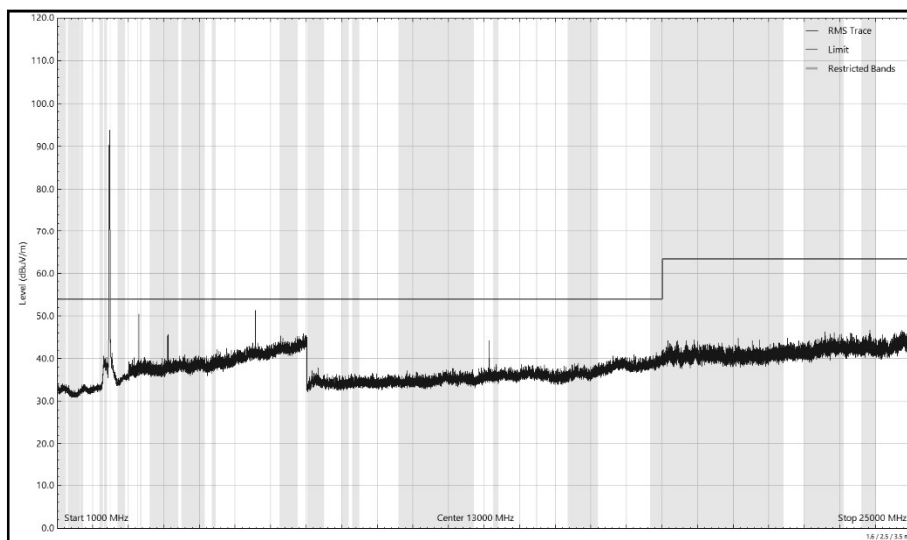


Figure 121 - 2462 MHz (CH11), 802.11g, Core 0, 1 GHz to 25 GHz, Vertical (rms), Orientation: X



Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 50 - 2462 MHz (CH11), 802.11g, Core 0, 30 MHz to 25 GHz, Orientation Y

*No emissions found within 10 dB of the limit.

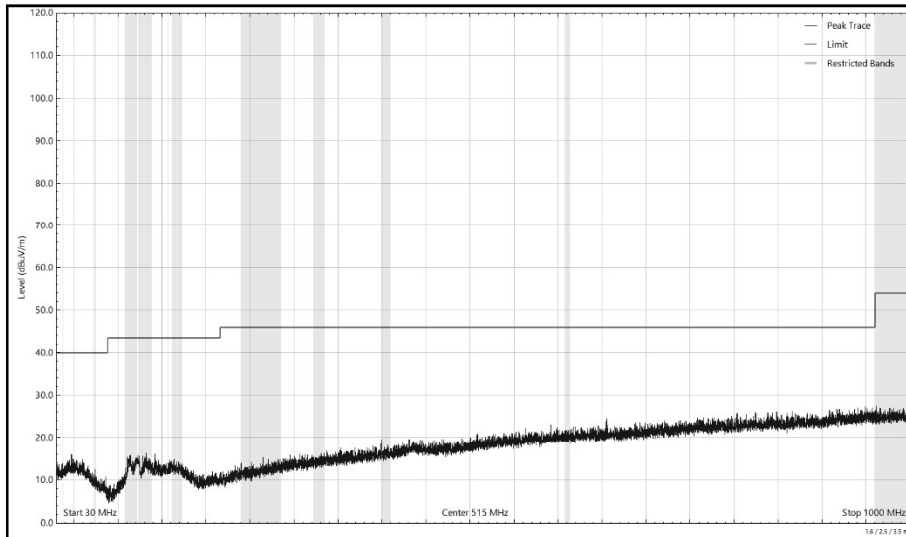


Figure 122 - 2462 MHz (CH11), 802.11g, Core 0, 30 MHz to 1 GHz, Horizontal (Peak), Orientation: Y

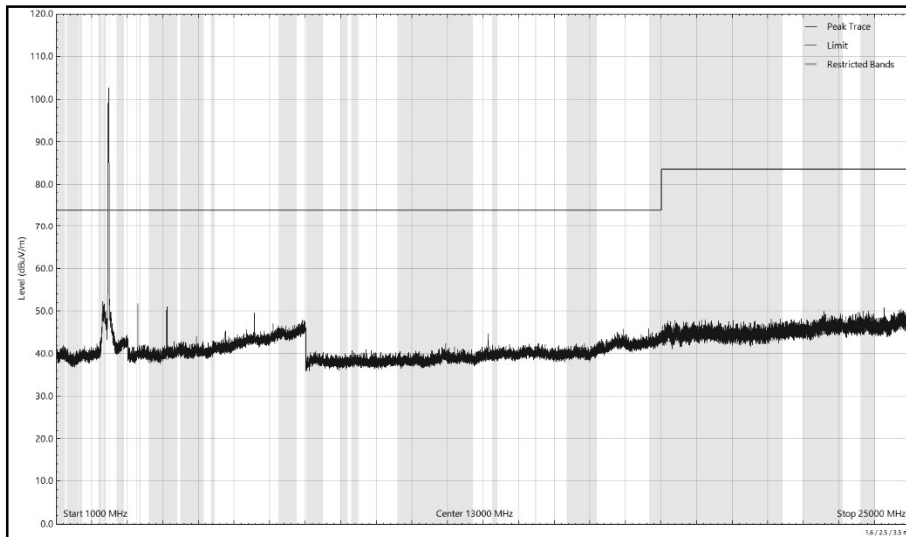


Figure 123 - 2462 MHz (CH11), 802.11g, Core 0, 1 GHz to 25 GHz, Horizontal (Peak), Orientation: Y

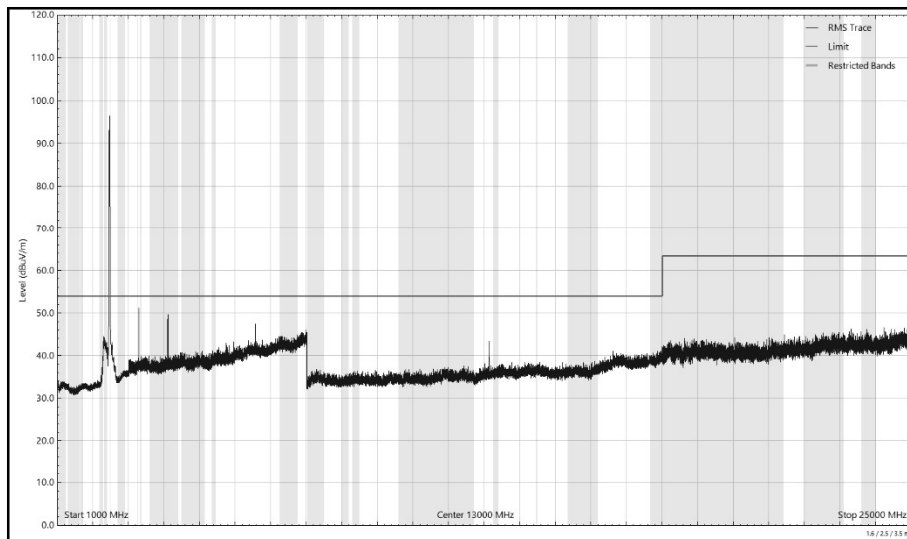


Figure 124 - 2462 MHz (CH11), 802.11g, Core 0, 1 GHz to 25 GHz, Horizontal (rms), Orientation: Y

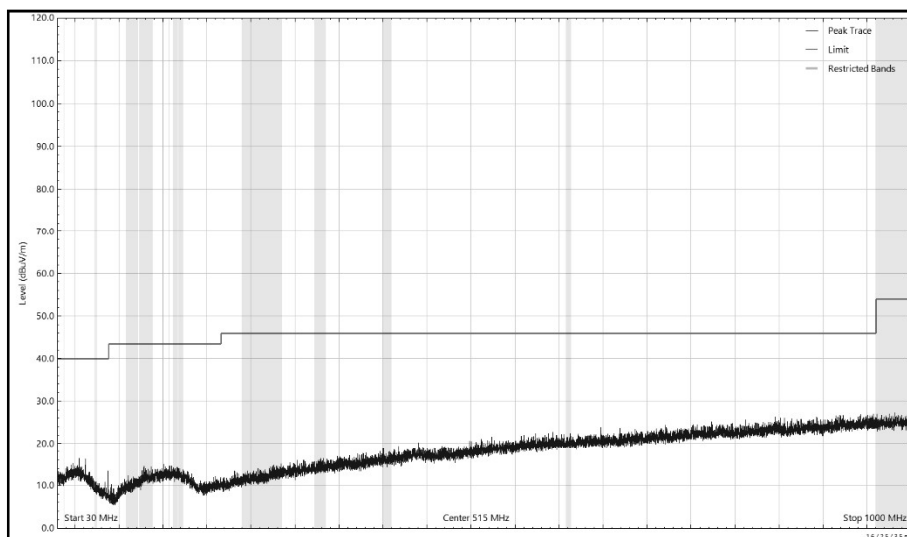


Figure 125 - 2462 MHz (CH11), 802.11g, Core 0, 30 MHz to 1 GHz, Vertical (Peak), Orientation: Y

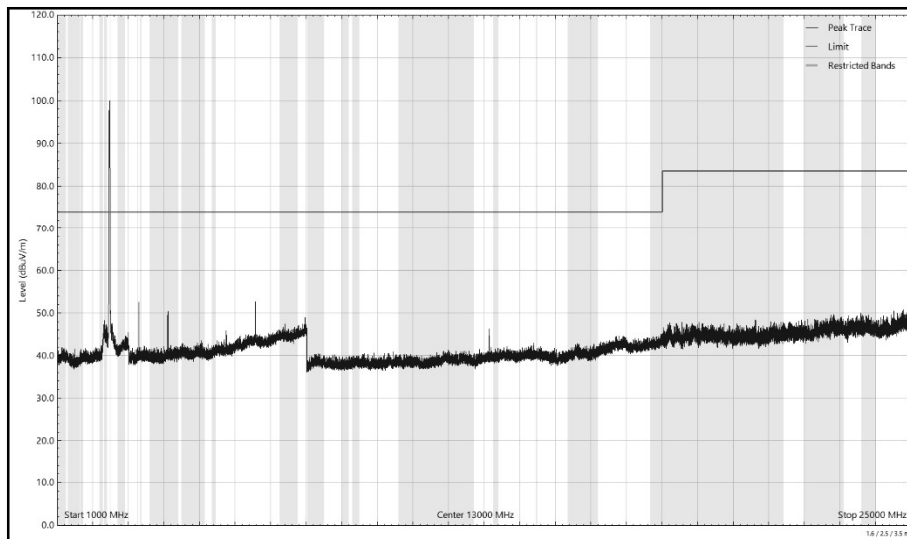


Figure 126 - 2462 MHz (CH11), 802.11g, Core 0, 1 GHz to 25 GHz, Vertical (Peak), Orientation: Y

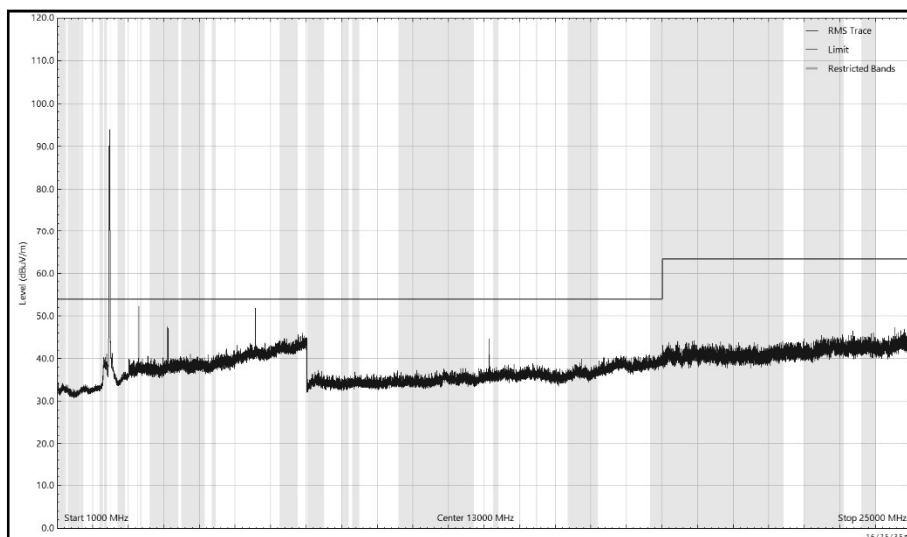


Figure 127 - 2462 MHz (CH11), 802.11g, Core 0, 1 GHz to 25 GHz, Vertical (rms), Orientation: Y



Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 51 - 2462 MHz (CH11), 802.11g, Core 0, 30 MHz to 25 GHz, Orientation Z

*No emissions found within 10 dB of the limit.

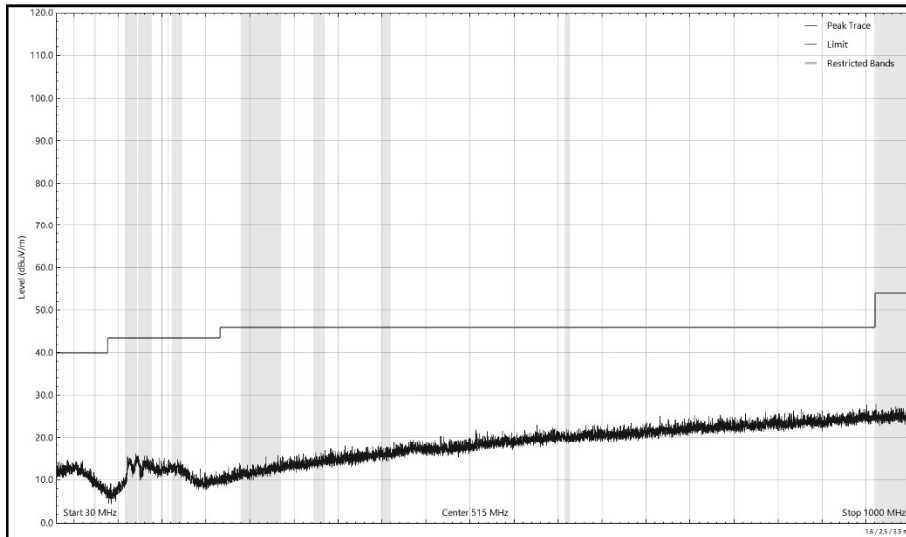


Figure 128 - 2462 MHz (CH11), 802.11g, Core 0, 30 MHz to 1 GHz, Horizontal (Peak), Orientation: Z

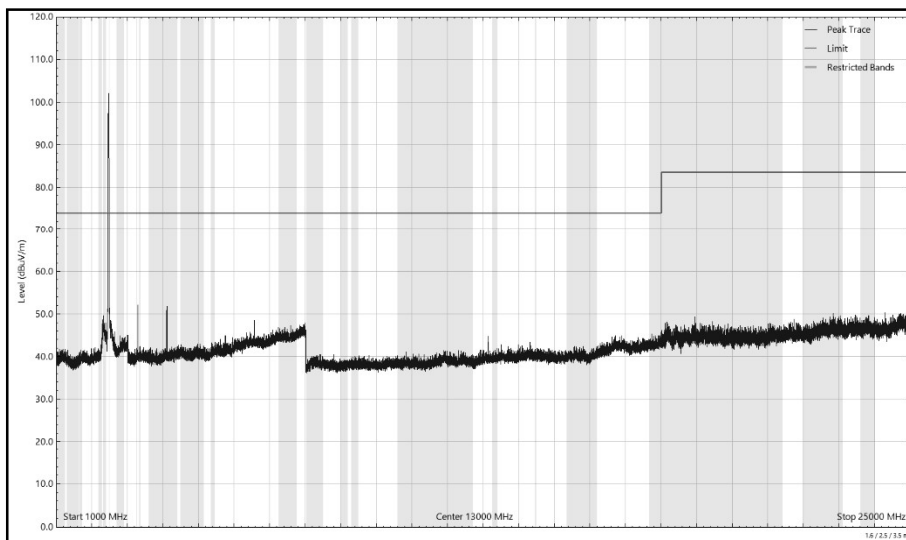


Figure 129 - 2462 MHz (CH11), 802.11g, Core 0, 1 GHz to 25 GHz, Horizontal (Peak), Orientation: Z

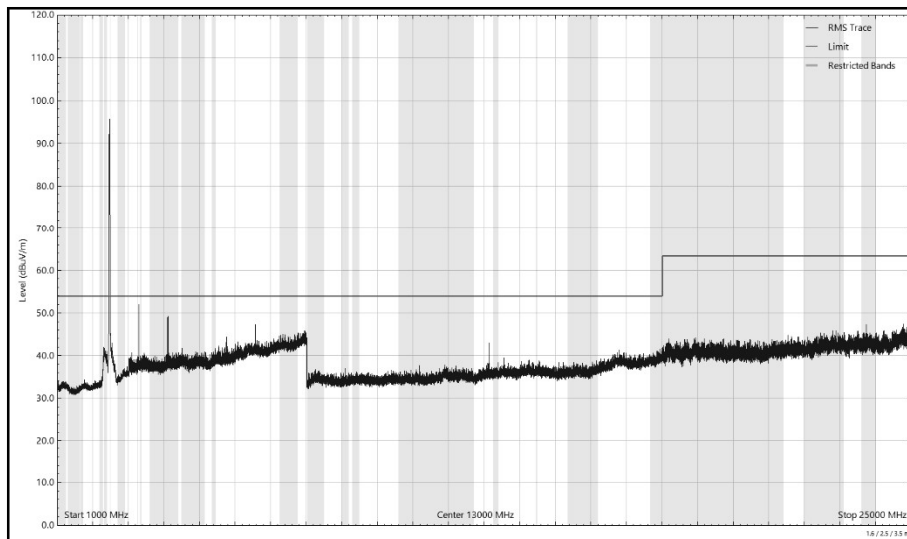


Figure 130 - 2462 MHz (CH11), 802.11g, Core 0, 1 GHz to 25 GHz, Horizontal (rms), Orientation: Z

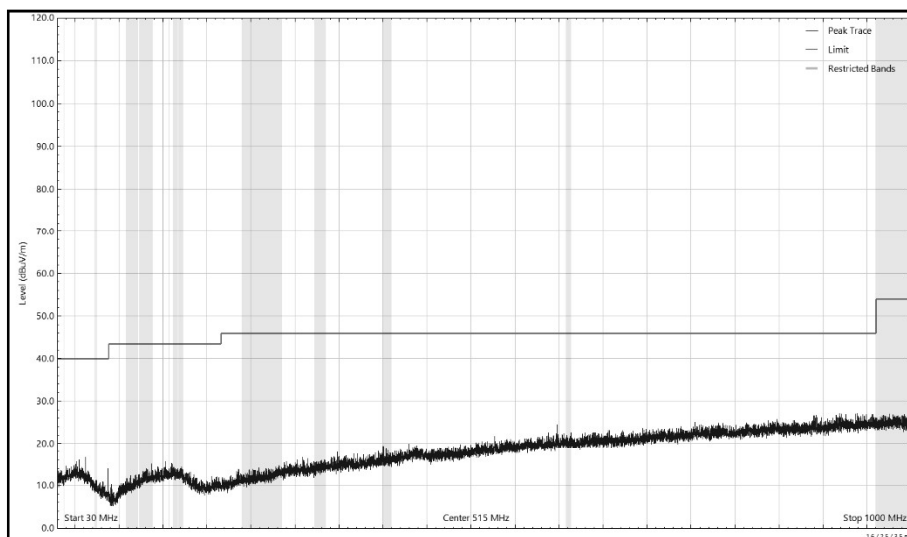


Figure 131 - 2462 MHz (CH11), 802.11g, Core 0, 30 MHz to 1 GHz, Vertical (Peak), Orientation: Z

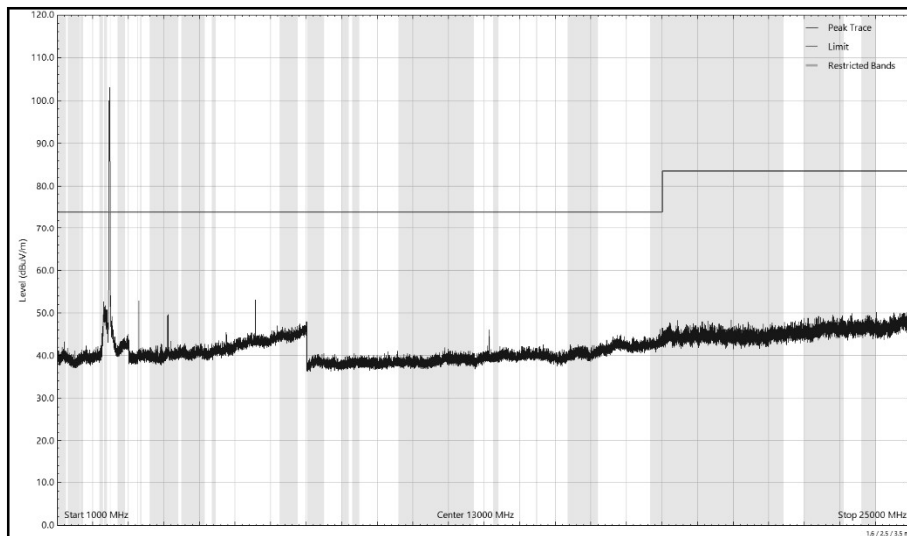


Figure 132 - 2462 MHz (CH11), 802.11g, Core 0, 1 GHz to 25 GHz, Vertical (Peak), Orientation: Z

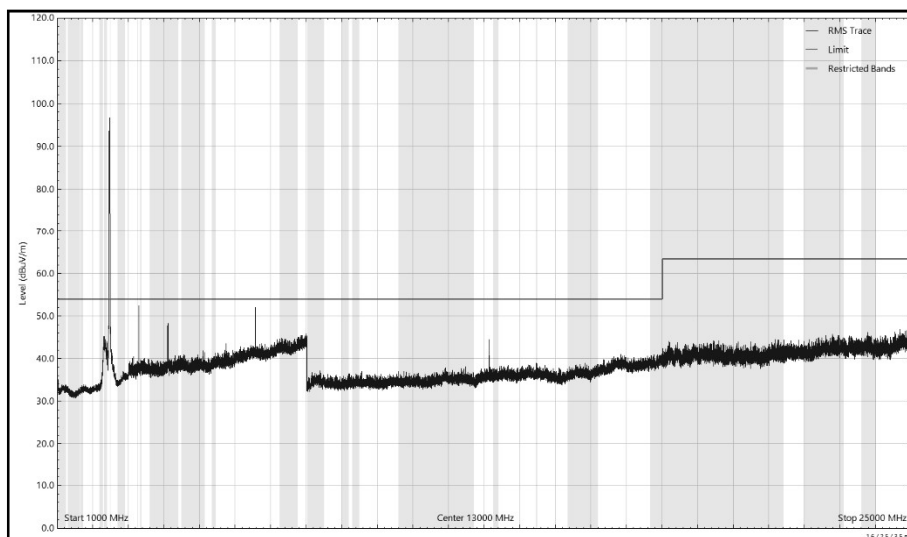


Figure 133 - 2462 MHz (CH11), 802.11g, Core 0, 1 GHz to 25 GHz, Vertical (rms), Orientation: Z



FCC 47 CFR Part 15, Limit Clause 15.247 (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)

ISED RSS-247, Limit Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

In addition, radiated emissions which fall in the restricted bands, as defined in RSS-GEN, clause 8.10, must also comply with the radiated emission limits specified in RSS-GEN clause 8.9.



2.4.8 Test Location and Test Equipment Used

This test was carried out in RF Chamber 11.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
True RMS Multimeter	Fluke	179	4006	12	29-Mar-2023
Quad Power Supply	Rohde & Schwarz	HMP4040	4955	-	O/P Mon
Pre-Amplifier (8 GHz to 18 GHz)	Wright Technologies	PS06-0061/PS06-0060	4971	6	19-Nov-2022
EMI Test Receiver	Rohde & Schwarz	ESW44	5084	12	17-May-2023
Cable (18 GHz)	Rosenberger	LU7-071-1000	5103	12	17-Nov-2022
Emissions Software	TUV SUD	EmX V3.1.4	5125	-	Software
Screened Room (11)	Rainforf	Rainford	5136	36	24-Nov-2024
Mast	Maturo	TAM 4.0-P	5158	-	TU
Mast and Turntable Controller	Maturo	Maturo NCD	5159	-	TU
Turntable	Maturo	TT 15WF	5160	-	TU
Antenna (DRG 1-10.5GHz)	Schwarzbeck	BBHA9120B	5215	12	28-May-2023
DRG Horn Antenna (7.5-18GHz)	Schwarzbeck	HWRD750	5216	12	29-May-2023
Antenna (DRG, 15 GHz to 40 GHz)	Schwarzbeck	BBHA 9170	5217	12	25-Jan-2023
Pre-Amplifier (18 GHz to 40 GHz)	Schwarzbeck	BBV 9721	5218	12	25-Jan-2023
3 GHz High pass filter	Wainwright	WHKX12-2580-3000-18000-80SS	5220	12	23-Mar-2023
Preamplifier (30dB 1GHz to 18GHz)	Schwarzbeck	BBV 9718 C	5261	12	08-Apr-2023
2m SMA Cable	Junkosha	MWX221-02000AMSAMS/A	5518	12	12-Apr-2023
8m N Type Cable	Junkosha	MWX221-08000NMSNMS/B	5522	12	24-Mar-2023
7 GHz High pass Filter	Wainwright	WHKX12-5850-6800-18000-80SS	5550	12	19-May-2023
Cable (K Type 2m)	Junkosha	MWX241-01000KMSKMS/B	5934	12	14-May-2023
TRILOG Super Broadband Test Antenna	Schwarzbeck	VULB 9168	5942	24	03-Feb-2024

Table 52

TU - Traceability Unscheduled
 O/P Mon – Output Monitored using calibrated equipment



2.5 Authorised Band Edges

2.5.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (d)
ISED RSS-247, Clause 5.5

2.5.2 Equipment Under Test and Modification State

RA4G2WIFI, S/N: Not serialised (Storix ID 651117-02) - Modification State 0

2.5.3 Date of Test

18-June-2022 to 23-June-2022

2.5.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.10.4.

2.5.5 Environmental Conditions

Ambient Temperature	18.6 - 19.8 °C
Relative Humidity	42.2 - 56.2 %

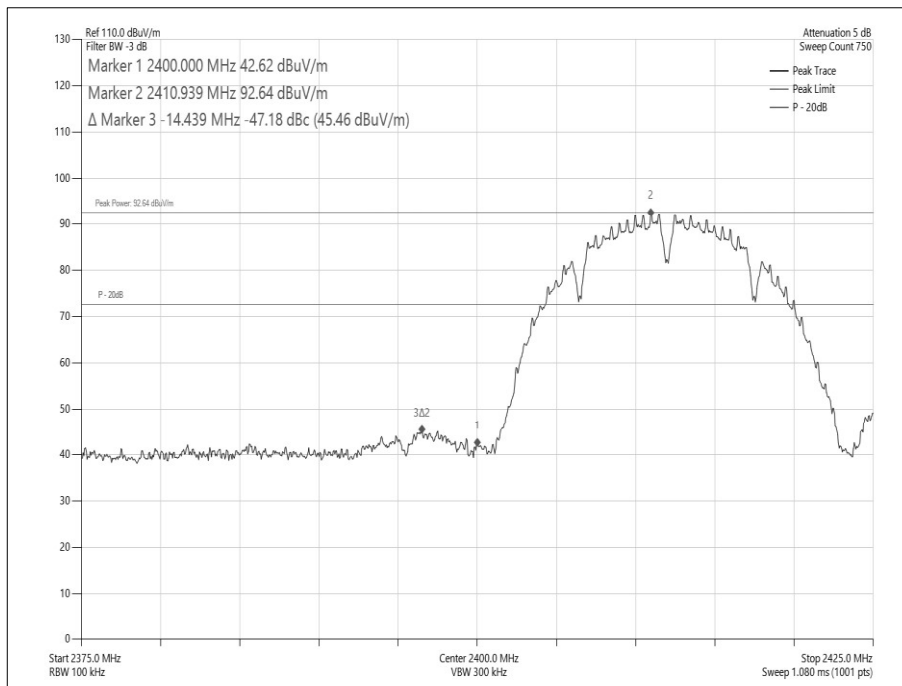


2.5.6 Test Results

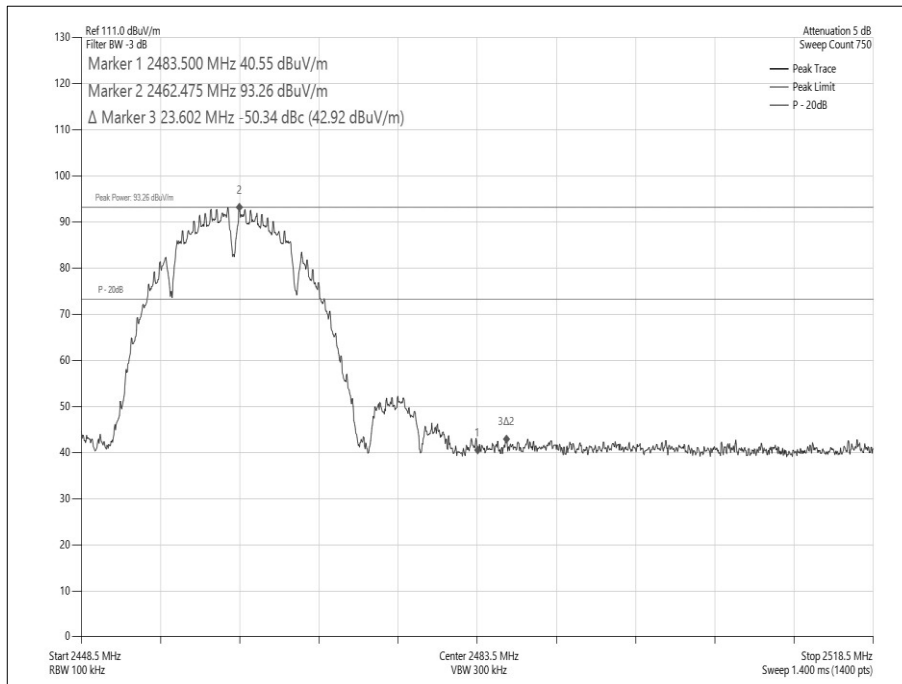
2.4 GHz WLAN

Mode	Data Rate/MCS	Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBc)
Data Rate/MCS with the Highest Power	1 Mbps-802-11b	2412	2400	45.46
Data Rate/MCS with the Highest Power	1 Mbps-802-11b	2462	2483.5	42.92
Data Rate/MCS with the Highest Power	6 Mbps-802-11g	2412	2400	55.55
Data Rate/MCS with the Highest Power	6 Mbps-802-11g	2462	2483.5	43.12
Data Rate/MCS with the Highest Power	MCS0-HT-20	2412	2400	54.03
Data Rate/MCS with the Highest Power	MCS0-HT-20	2462	2483.5	42.78

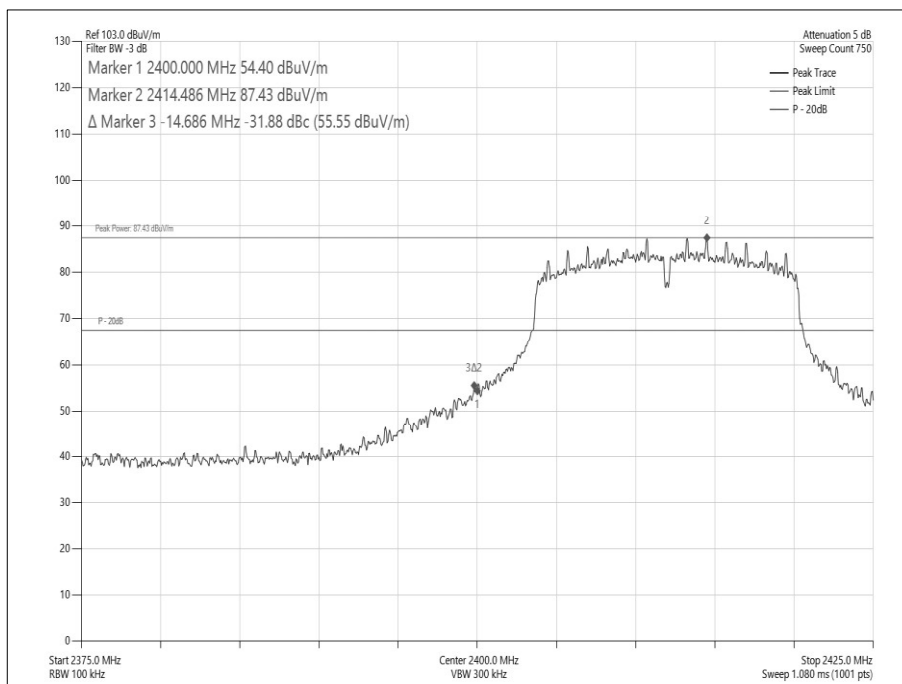
Table 53



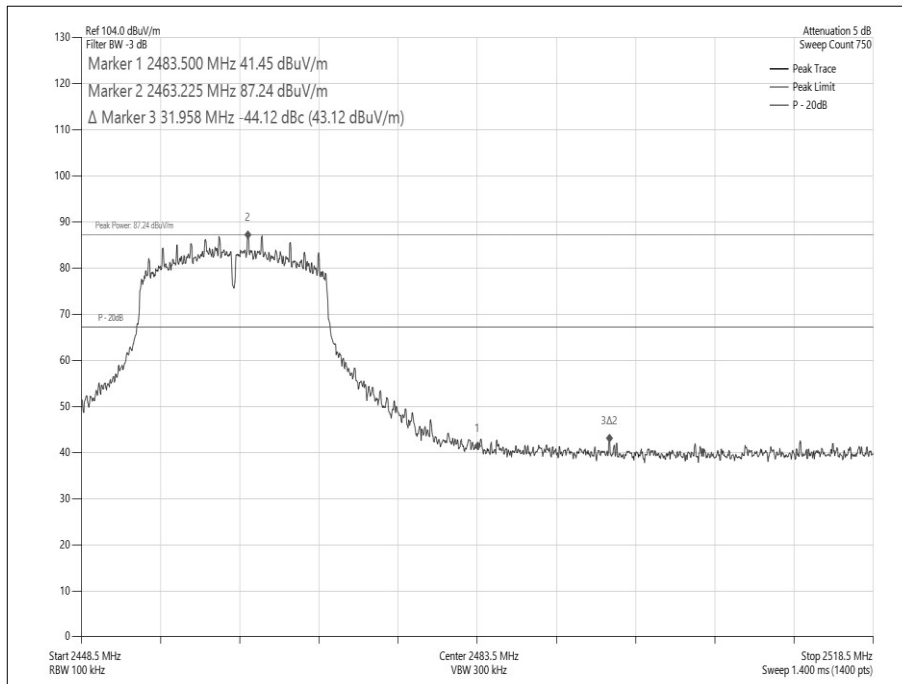
**Figure 134 - Data Rate/MCS with the Highest Power - 1 Mbps-802-11b
 2412 MHz - Band Edge Frequency 2390 MHz**



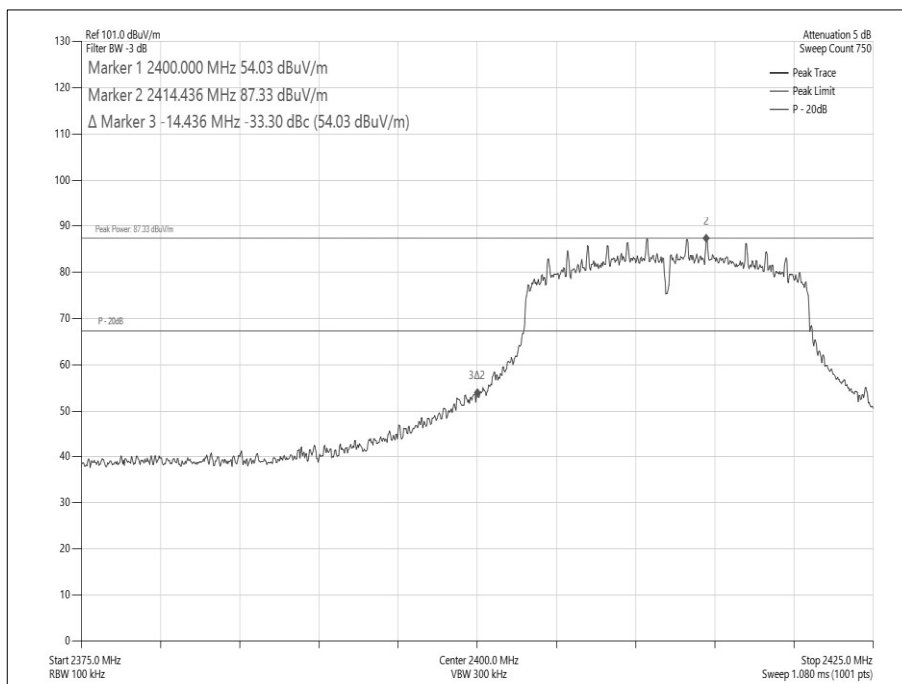
**Figure 135 - Data Rate/MCS with the Highest Power - 1 Mbps-802-11b
2462 MHz - Band Edge Frequency 2483.5 MHz**



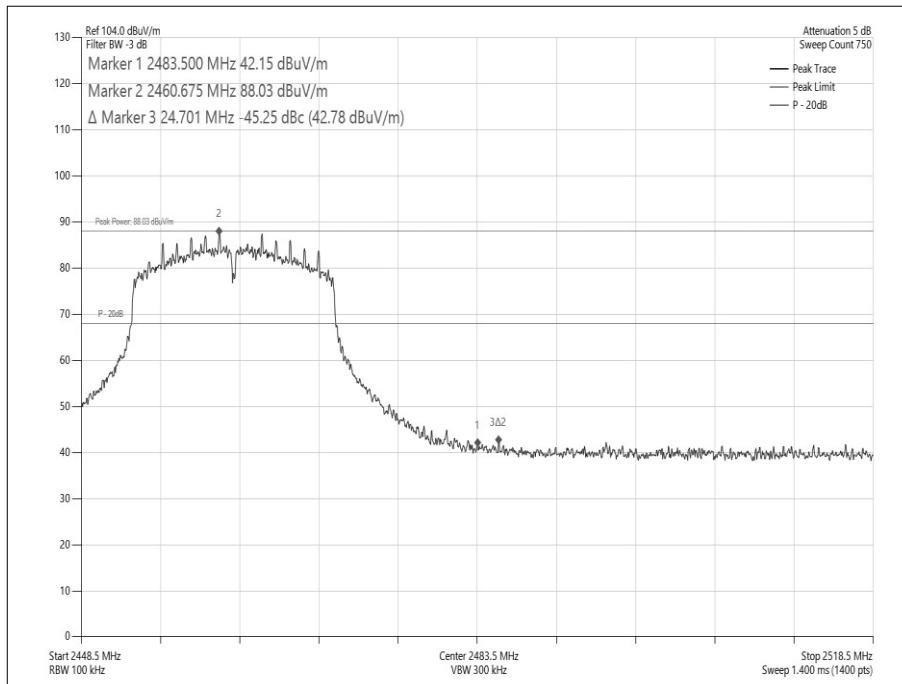
**Figure 136 - Data Rate/MCS with the Highest Power - 6 Mbps-802-11g
2412 MHz - Band Edge Frequency 2390 MHz**



**Figure 137 - Data Rate/MCS with the Highest Power - 6 Mbps-802-11g
 2462 MHz - Band Edge Frequency 2483.5 MHz**



**Figure 138 - Data Rate/MCS with the Highest Power - MCS0-HT-20
 2412 MHz - Band Edge Frequency 2390 MHz**



**Figure 139 - Data Rate/MCS with the Highest Power - MCS0-HT-20
2462 MHz - Band Edge Frequency 2483.5 MHz**

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

ISED RSS-247, Limit Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.



2.5.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 12.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
True RMS Multimeter	Fluke	179	4006	12	29-Mar-2023
Cable (SMA to SMA, 2 m)	Rhophase	3PS-1801A-2000-3PS	4113	12	27-Jan-2023
Quad Power Supply	Rohde & Schwarz	HMP4040	4955	-	O/P Mon
Emissions Software	TUV SUD	EmX V3.1.1	5125	-	Software
Cable (N-Type to N-Type, 8 m)	Teledyne	PR90-088-8MTR	5212	12	06-Sep-2022
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	23-Sep-2022
Antenna (DRG, 1 GHz to 10 GHz)	Schwarzbeck	BBHA9120B	5611	12	15-Oct-2022
Turntable & Mast Controller	Maturo Gmbh	NCD/498/2799.01	5612	-	TU
Tilt Antenna Mast	Maturo Gmbh	TAM 4.0-P	5613	-	TU
Turntable	Maturo Gmbh	Turntable 1.5 SI-2t	5614	-	TU
Screened Room (12)	MVG	EMC-3	5621	36	11-Aug-2023
EMI Test Receiver	Rohde & Schwarz	ESW44	5912	12	17-Feb-2023

Table 54

TU - Traceability Unscheduled



2.6 Power Spectral Density

2.6.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (e)
ISED RSS-247, Clause 5.2
ISED RSS-GEN, Clause, 6.12

2.6.2 Equipment Under Test and Modification State

RA4G2WIFI, S/N: Not serialised (Storix ID 651117-01) - Modification State 0

2.6.3 Date of Test

24-July-2022

2.6.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.10.5.

2.6.5 Environmental Conditions

Ambient Temperature	23.3 °C
Relative Humidity	60.2 %



2.6.6 Test Results

2.4 GHz WLAN

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	-		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11b	Duty Cycle (%):	94.7
Data Rate:	1 Mbps	DCCF (dB):	0.24
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Port A)	Active Chain(s):	0

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	Σ		
2412	100.0	-4.43	-	-	-	-	8.00	-12.43
2437	100.0	-3.94	-	-	-	-	8.00	-11.94
2462	100.0	-3.95	-	-	-	-	8.00	-11.95

Table 55 - Maximum Power Spectral Density Results



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	-		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11g	Duty Cycle (%):	88.4
Data Rate:	6 Mbps	DCCF (dB):	0.54
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Port A)	Active Chain(s):	0

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	Σ		
2412	100.0	-11.45	-	-	-	-	8.00	-19.45
2437	100.0	-6.33	-	-	-	-	8.00	-14.33
2462	100.0	-10.53	-	-	-	-	8.00	-18.53

Table 56 - Maximum Power Spectral Density Results



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	-		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11n HT20	Duty Cycle (%):	87.9
Modulation Coding Scheme:	MCS0	DCCF (dB):	0.56
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Port A)	Active Chain(s):	0

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	Σ		
2412	100.0	-11.52	-	-	-	-	8.00	-19.52
2437	100.0	-8.25	-	-	-	-	8.00	-16.25
2462	100.0	-11.11	-	-	-	-	8.00	-19.11

Table 57 - Maximum Power Spectral Density Results

FCC 47 CFR Part 15, Limit Clause 15.247 (e)

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

ISED RSS-247, Limit Clause 5.2(b)

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission



2.6.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Multimeter	Fluke	79 Series III	0611	12	21-Dec-2022
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	30-Jul-2022
Hygrometer	Rotronic	I-1000	3220	12	05-Nov-2022
Signal Analyser	Keysight Technologies	N9020B	5919	24	13-Mar-2024
Signal Conditioning Unit	TUV SUD	SCU003	5932	12	10-May-2023
DC Power Module 60V 20A 300W	Keysight Technologies	N6754A	5970	-	O/P Mon
Modular Power System mainframe	Keysight Technologies	N6701C	6151	-	O/P Mon

Table 58

O/P Mon – Output Monitored using calibrated equipment

3 Photographs

3.1 Test Setup Photographs

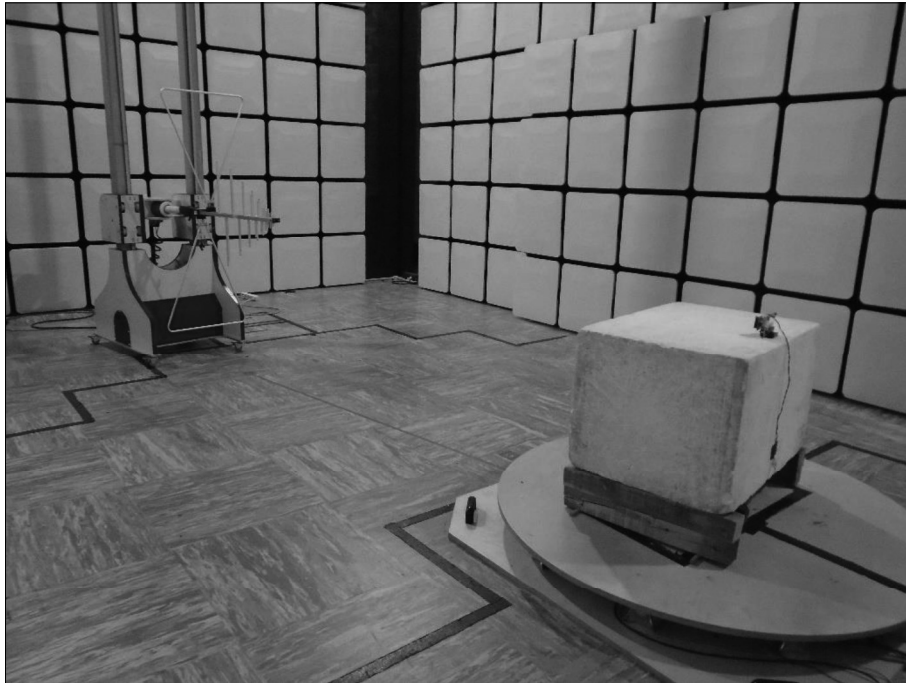


Figure 140 - Test Setup - 30 MHz to 1 GHz

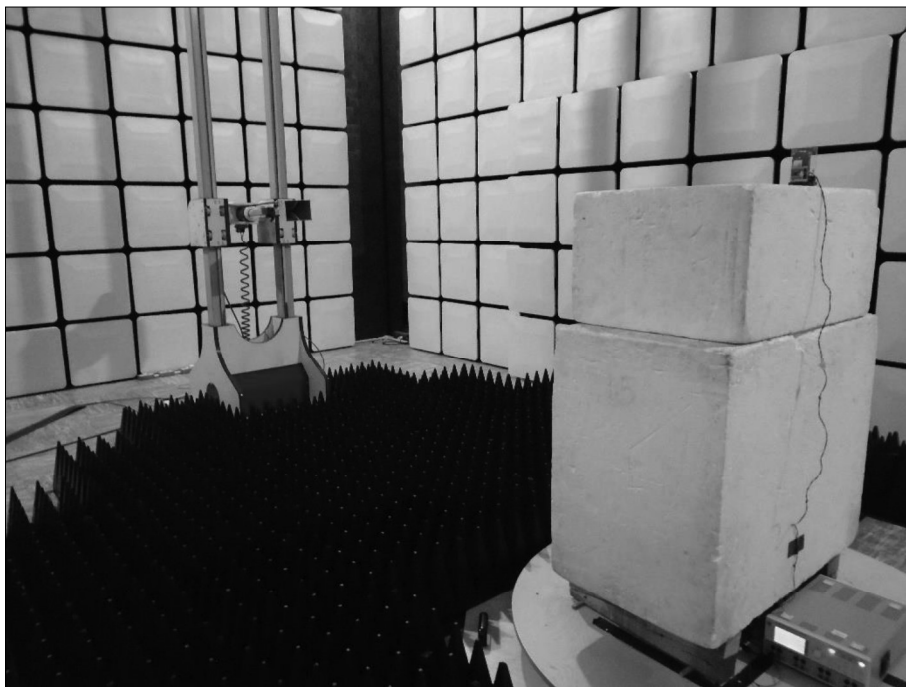


Figure 141 - Test Setup - 1 GHz to 8 GHz

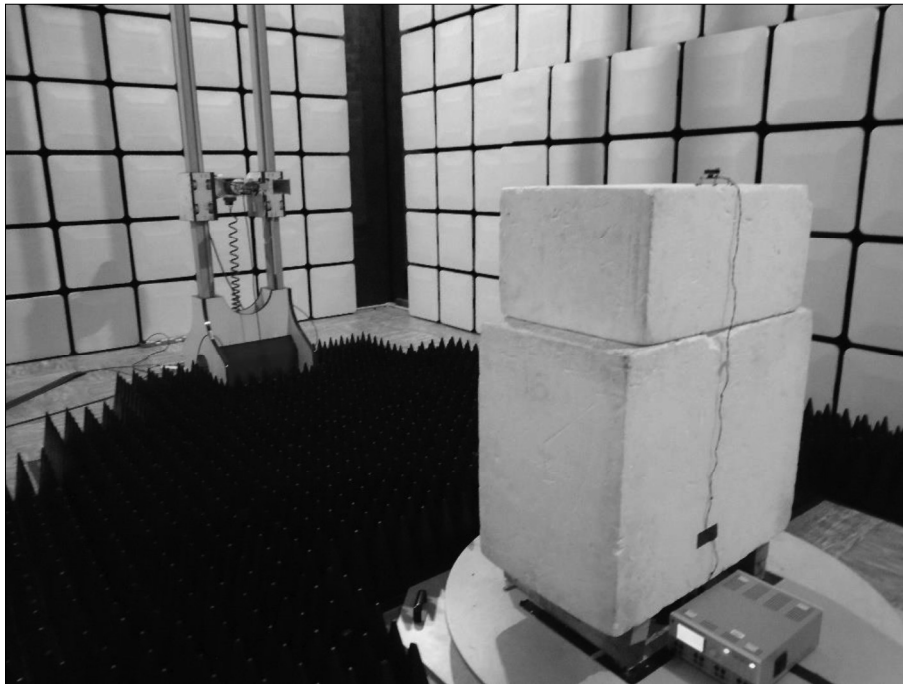


Figure 142 - Test Setup - 8 GHz to 18 GHz

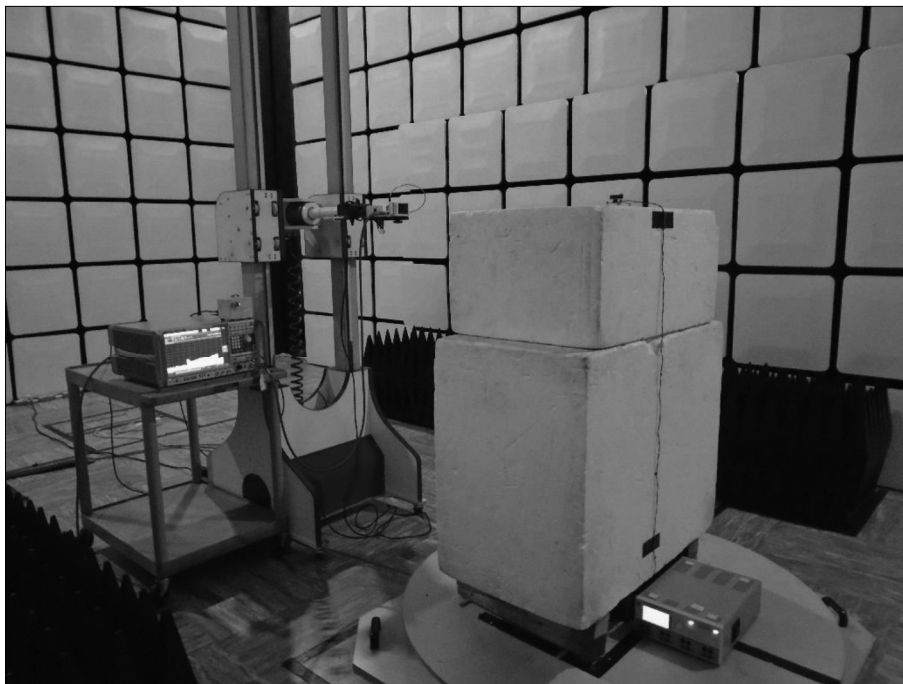


Figure 143 - Test Setup - 18 GHz to 25 GHz



4 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Restricted Band Edges	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Emission Bandwidth	± 545.66 kHz
Maximum Conducted Output Power	± 1.38 dB
Spurious Radiated Emissions	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Authorised Band Edges	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Power Spectral Density	± 1.49 dB

Table 59

Measurement Uncertainty Decision Rule – Accuracy Method

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2007, Clause 4.4.3 and 4.5.1. (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8.