TEST REPORT

Report Number: R13337971-E6

Applicant	:	Raspberry Pi (Trading) Ltd Maurice Wilkes Building Cowley Road Cambridge CB4 0DS United Kingdom
Model	:	RPI-RM0 (CM4)
FCC ID	:	2ABCB-RPIRM0
IC	:	20953-RPIRM0
EUT Description	:	Bluetooth and WiFi radio module
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C ISED RSS-247 ISSUE 2 ISED RSS-GEN ISSUE 5

Date Of Issue:
2020-10-23

Prepared by:
UL LLC
12 Laboratory Dr.
Research Triangle Park, NC 27709 U.S.A.
TEL: (919) 549-1400

NVLAP TESTING

NVLAP Lab code: 200246-0

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2020-10-09	Initial Issue	Niklas Haydon
V2	2020-10-23	Added conducted emissions (mains) data	Mike Antola

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TABLE OF CONTENTS

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Raspberry Pi (Trading) Ltd
Maurice Wilkes Building
Cowley Road
Cambridge
CB4 0DS
United Kingdom

EUT DESCRIPTION: Bluetooth and WiFi radio module

MODEL: RPI-RM0 (CM4)

SERIAL NUMBER: Non-serialized

SAMPLE RECEIVE DATE: 2020-08-28

DATE TESTED: 2020-09-10 to 2020-09-18

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Complies
ISED RSS-247 Issue 2	Complies
ISED RSS-GEN Issue 5	Complies

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

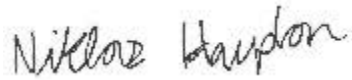
The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. government.

Approved & Released For
UL LLC By:

Brian T. Kiewra
Project Engineer
Consumer Technology Division
UL LLC

Prepared By:



Niklas Haydon
Operations Leader
Consumer Technology Division
UL LLC

2. TEST RESULTS SUMMARY

FCC Clause	ISED Clause	Requirement	Result	Comment
ANSI C63.10 Section 11.6.		Duty Cycle	Not performed in this report.	Refer to UL VS LTD report UL-RPT-RP13337971-1216A.
ANSI C63.10 Section 6.9.3.	RSS-GEN 6.7	99% OBW		
15.247 (a) (2)	RSS-247 5.2 (a)	6dB BW		
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power		
ANSI C63.10, Section 11.9.2.3.2.		Average power		
15.247 (e)	RSS-247 5.2 (b)	PSD		
15.247 (d)	RSS-247 5.5	Conducted Spurious Emissions		
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions	Compliant.	None.
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Compliant.	None.

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3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05, KDB 414788 D01 Radiated Test Site v01r01, RSS-GEN Issue 5, and RSS-247 Issue 2.

4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Drive, Research Triangle Park, North Carolina, USA and 2800 Perimeter Park Dr., Suite B, Morrisville, North Carolina, USA. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

12 Laboratory Dr.	2800 Suite Perimeter Park Dr.
☐ Chamber A RTP	☐ North Chamber
☒ Chamber C RTP	☒ South Chamber

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radio Frequency (Spectrum Analyzer)	141.2 Hz
Occupied Channel Bandwidth	1.82%
RF output power, conducted	1.3 dB (PK) 0.45 dB (AV)
Power Spectral Density, conducted	2.47 dB
Unwanted Emissions, conducted	1.94 dB
All emissions, radiated	4.88 dB
Conducted Emissions (0.150-30MHz) - LISN	3.40 dB
Temperature	2.26°C
Humidity	6.79%
DC Supply voltages	1.70%
Time	3.39%

Uncertainty figures are valid to a confidence level of 95%.

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5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

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6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is a Bluetooth and WiFi radio module. The PMN and HVIN = Raspberry Pi RM0.

6.2. POWER SETTINGS USED FOR TESTING

The power setting for the testing in this report were set default in the test firmware. Please refer to UL VS LTD report UL-RPT-RP13337971-1216A for measured power.

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an internal antenna with a maximum gain of 3.5dBi and an external antenna with a maximum gain of 2dBi.

Internal antenna = Antenna 1
External antenna = Antenna 2

6.4. SOFTWARE AND FIRMWARE

The EUT hardware during testing was v1.0.
The EUT software during testing was v1.0.

6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz and above 18GHz were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle, high channels and inner channels where required.

The fundamental of the EUT was investigated with in three orthogonal orientations X,Y,Z, for each antenna, it was determined that X orientation was worst-case orientation for Antenna 1 and Z orientation for Antenna 2; therefore, all final radiated testing was performed with antenna in the X orientation for Antenna 1 and Z orientation for Antenna 2.

Worst-case data rates as declared by the client were:

BLE: 1 Mbps

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Description	Manufacturer	Model	Serial Number
AC/DC Adapter	Raspberry Pi	KSA-15E-051300HK	3037350
Raspberry Pi Board	Raspberry Pi	Raspberry Pi 4 Model B	3157590

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	Mains	IEC	< 3M	Feeds AC/DC adapter
2	DC	1	DC plug	2-wire	< 3M	Powers EUT from AC/DC adapter

TEST SETUP

Test software exercised the radio card of the EUT.

SETUP DIAGRAM

Please refer to R13337971-EP2 for setup diagrams.

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7. MEASUREMENT METHOD

Emissions in restricted frequency bands: ANSI C63.10 Subclause -11.12.1 and 6.10.5

General Radiated Emissions: ANSI C63.10:2013 Sections 6.3 – 6.6

On Time and Duty Cycle: ANSI C63.10: 2013 Section 11.6

AC Power Line Conducted Emissions: ANSI C63.10:2013 Sections 6.2

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8. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (RTP – Chamber C)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	1-18 GHz				
AT0062	HORN Antenna	ETS-Lindgren	3117	2020-01-30	2021-01-30
	Gain-Loss Chains				
C-SAC02	Gain-loss string: 1-18GHz	Various	Various	2020-03-03	2021-03-03
C-SAC02 Path 7	Gain-loss string 1-7GHz	Various	Various	2020-04-03	2021-04-03
	Receiver & Software				
SA0018	Spectrum Analyzer	Agilent	PXA (N9030A)	2020-03-02	2021-03-02
SOFTEMI	EMI Software	UL	Version 9.5 (2020-07-07)	NA	NA
	Additional Equipment used				
HI0085	Temp/Humid/Pressure Meter	EXTECH	SD700	2020-04-20	2021-04-30

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - South Chamber)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	0.009-30MHz	**(Loop Ant.)**			
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2020-08-20	2021-08-20
	30-1000 MHz				
AT0081	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2019-11-20	2020-11-20
	18-40 GHz				
AT0076	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2019-11-07	2020-11-07
	Gain-Loss Chains				
S-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2020-07-10	2021-07-10
S-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2020-07-10	2021-07-10
S-SAC04	Gain-loss string: 18-40GHz	Various	Various	2020-07-07	2021-07-07
	Receiver & Software				
SA0025	Spectrum Analyzer	Agilent	N9030A	2020-03-17	2021-03-17
SOFTEMI	EMI Software	UL	Version 9.5 (2020-07-07)	NA	NA
	Additional Equipment used				
s/n 200037635	Environmental Meter	Fisher Scientific	06-662-4	2020-01-22	2022-01-22

Test Equipment Used - Line-Conducted Emissions – Voltage (Morrisville – Conducted 1)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL087	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3W06143-240	2020-03-26	2021-03-26
HI0091	Environmental Meter	Fisher Scientific	14-650-118	2020-06-26	2021-06-26
LISN003	LISN, 50-ohm/50-uH, 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50-25-2-01-550V	2020-08-18	2021-08-18
75141	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2020-08-18	2021-08-18
ATA222	Transient Limiter, 0.009-100MHz	Electro-Metrics	EM-7600	2020-03-26	2021-03-26
PS215	AC Power Source	Elgar	CW2501M (s/n 1523A02397)		
SOFTEMI	EMI Software	UL	Version 9.5 (2020-07-07)		
CDECABLE001	ANSI C63.4 1m extension cable.	UL	Per Annex B of ANSI C63.4	2020-08-08	2021-08-08

NOTES:

1. For equipment listed above that was calibrated during the testing period, please note the equipment was used for testing after calibration.
2. For equipment listed above that has a calibration due date during the testing period, the testing was completed before the equipment expiration date.

9. DUTY CYCLE

LIMITS

None, for reporting purposes only

TEST PROCEDURE

ANSI C63.10 Zero Span Method.

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Voltage Averaging Duty Cycle Correction Factor (dB)
2.4GHz Band					
BLE 1mbps	0.390	0.626	0.623	62.35%	4.10

Duty Cycle

10. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209
RSS-GEN, Section 8.9 and 8.10

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements in the 30-1000MHz range, 9kHz for peak and/or quasi-peak detection measurements in the 0.15-30MHz range and 200Hz for peak and/or quasi-peak detection measurements in the 9 to 150kHz range. Peak detection is used unless otherwise noted as quasi-peak.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 kHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements. Linear voltage averaging used for this project.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the low, middle, high channels and inner channels where required in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

3D antenna use - For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel).

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

KDB 414788 Open Field Site (OFS) and Chamber Correlation Justification

OFS and chamber correlation testing had been performed and chamber measured test result is the worse-case test result.

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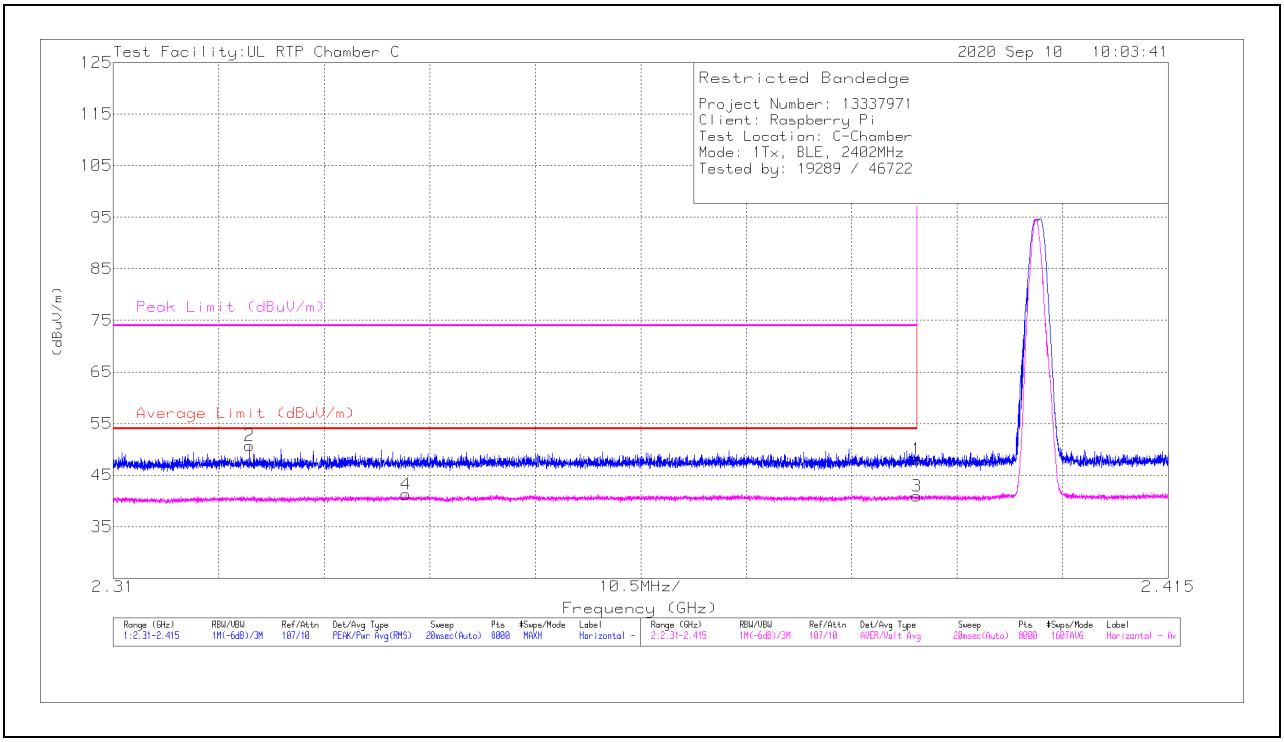
10.1. TRANSMITTER ABOVE 1 GHz

1TX Antenna 1 MODE

BANDEDGE (LOW CHANNEL, 2402 MHz)

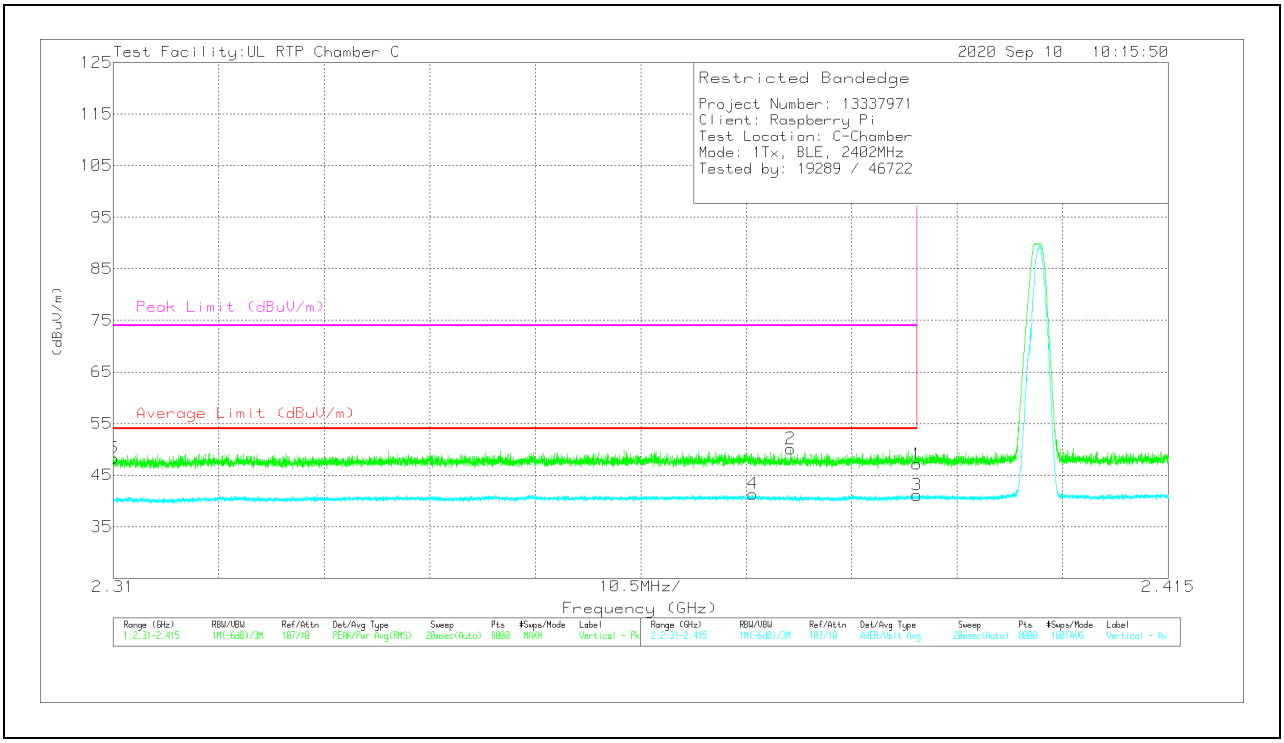
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	34.2	Pk	32.1	-18.2	0	48.1	-	-	74	-25.9	291	103	H
2	* ** 2.32357	37	Pk	31.9	-18.2	0	50.7	-	-	74	-23.3	291	103	H
3	* ** 2.39	22.92	ADV	32.1	-18.2	4.1	40.92	54	-13.08	-	-	291	103	H
4	* ** 2.33916	23.47	ADV	31.9	-18.2	4.1	41.27	54	-12.73	-	-	291	103	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	33.24	Pk	32.1	-18.2	0	47.14	-	-	74	-26.86	31	291	V
2	* ** 2.37742	36.52	Pk	32	-18.4	0	50.12	-	-	74	-23.88	31	291	V
5	* ** 2.31001	34.59	Pk	31.9	-18.2	0	48.29	-	-	74	-25.71	31	291	V
3	* ** 2.39	23.14	ADV	32.1	-18.2	4.1	41.14	54	-12.86	-	-	31	291	V
4	* ** 2.37367	23.46	ADV	32	-18.2	4.1	41.36	54	-12.64	-	-	31	291	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
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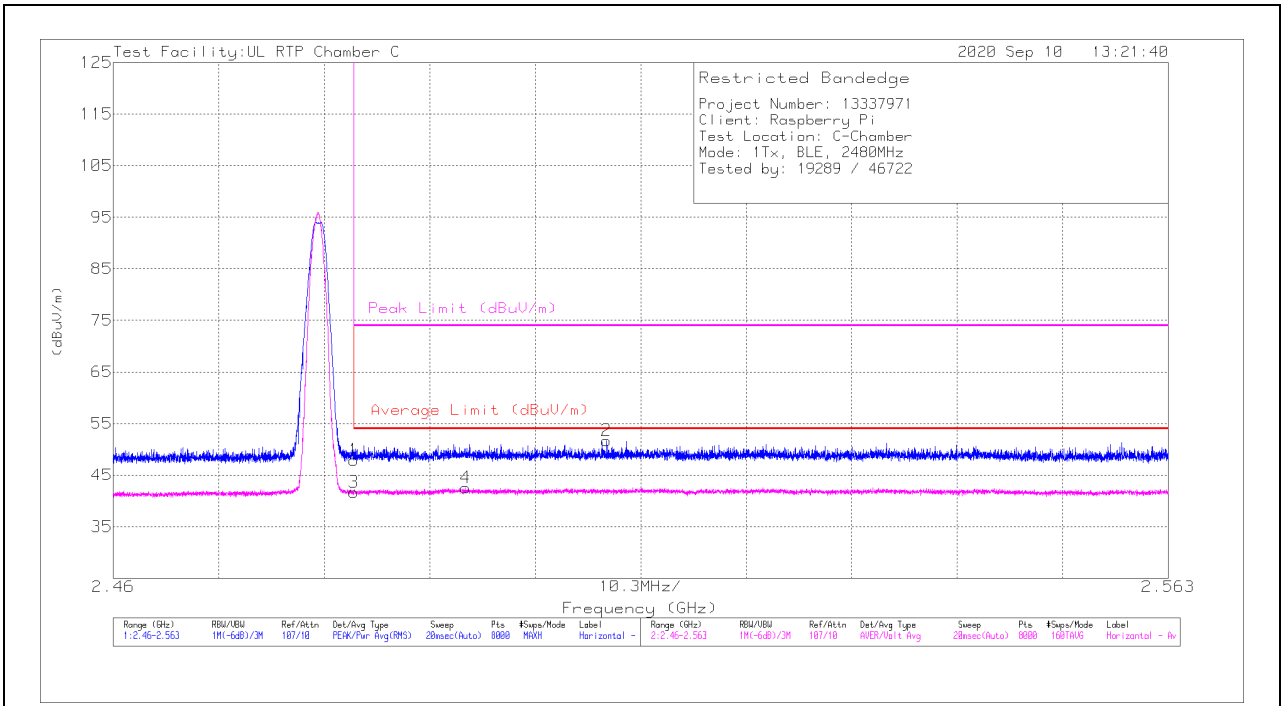
Pk - Peak detector
ADV - Linear Voltage Average

BANDEDGE (HIGH CHANNEL, 2480 MHz)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	33.3	Pk	32.6	-18	0	47.9	-	-	74	-26.1	309	327	H
2	** 2.50813	36.89	Pk	32.7	-17.9	0	51.69	-	-	74	-22.31	309	327	H
3	* ** 2.4835	22.98	ADV	32.6	-18	4.1	41.68	54	-12.32	-	-	309	327	H
4	* ** 2.49442	23.55	ADV	32.7	-17.8	4.1	42.55	54	-11.45	-	-	309	327	H

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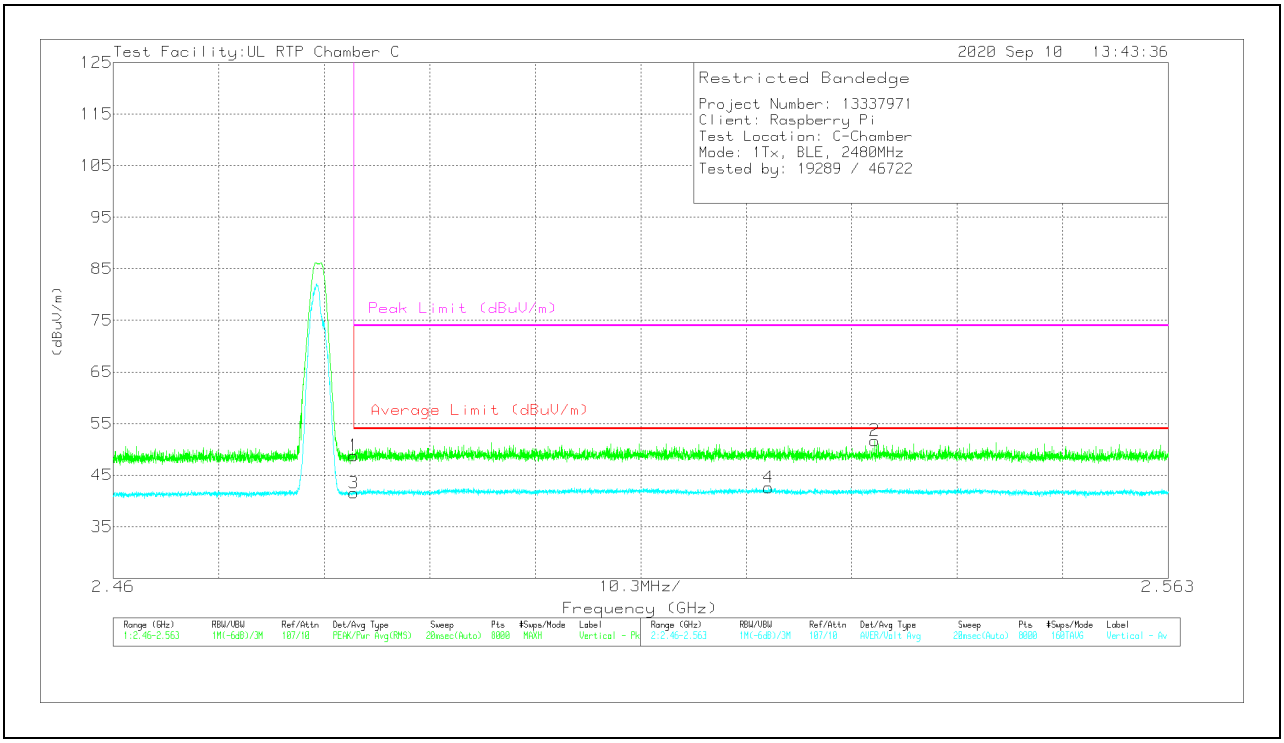
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

VERTICAL RESULT

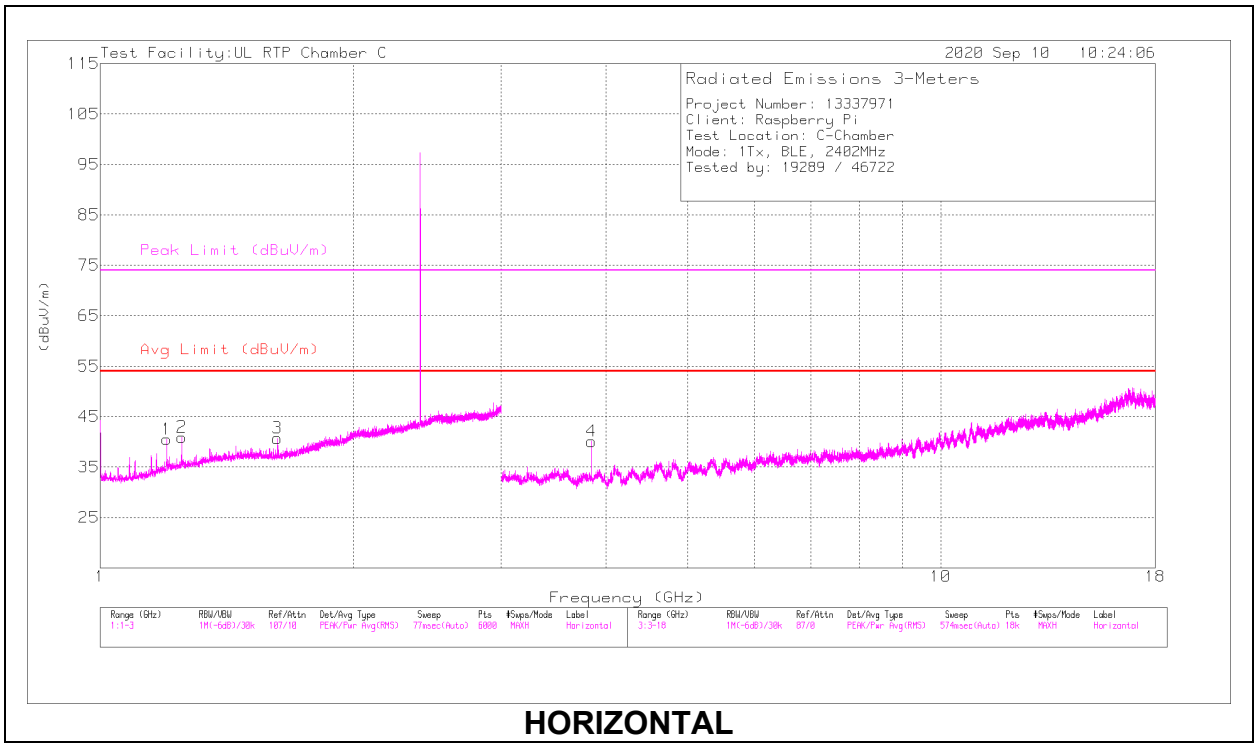


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	34.16	Pk	32.6	-18	0	48.76	-	-	74	-25.24	111	249	V
2	** 2.53434	36.8	Pk	32.6	-17.7	0	51.7	-	-	74	-22.3	111	249	V
3	* ** 2.4835	22.83	ADV	32.6	-18	4.1	41.53	54	-12.47	-	-	111	248	V
4	** 2.52396	23.59	ADV	32.6	-17.7	4.1	42.59	54	-11.41	-	-	111	248	V

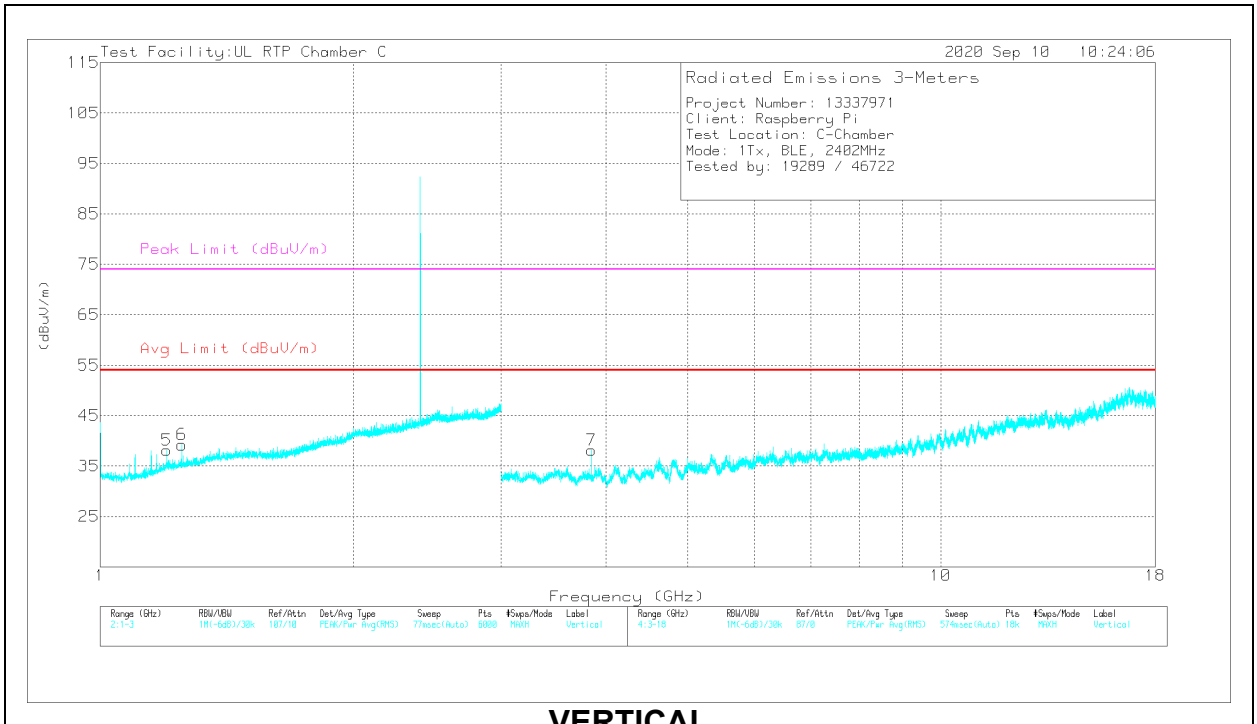
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL, 2402 MHz RESULTS



HORIZONTAL



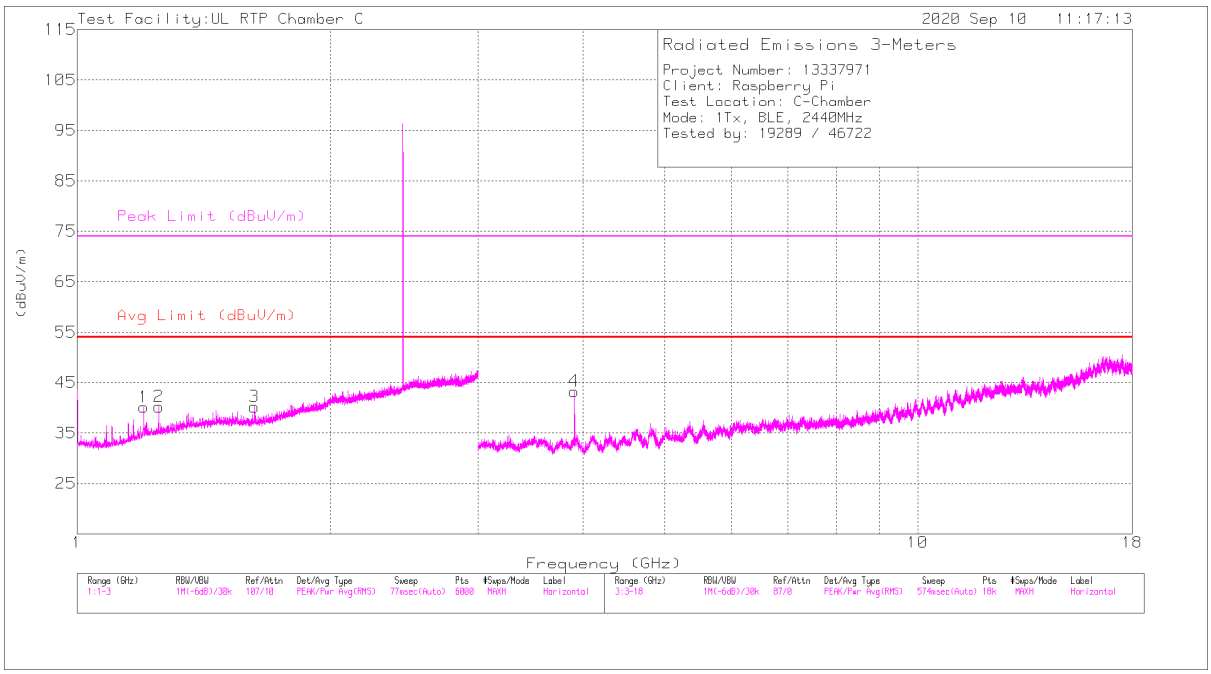
VERTICAL

RADIATED EMISSIONS

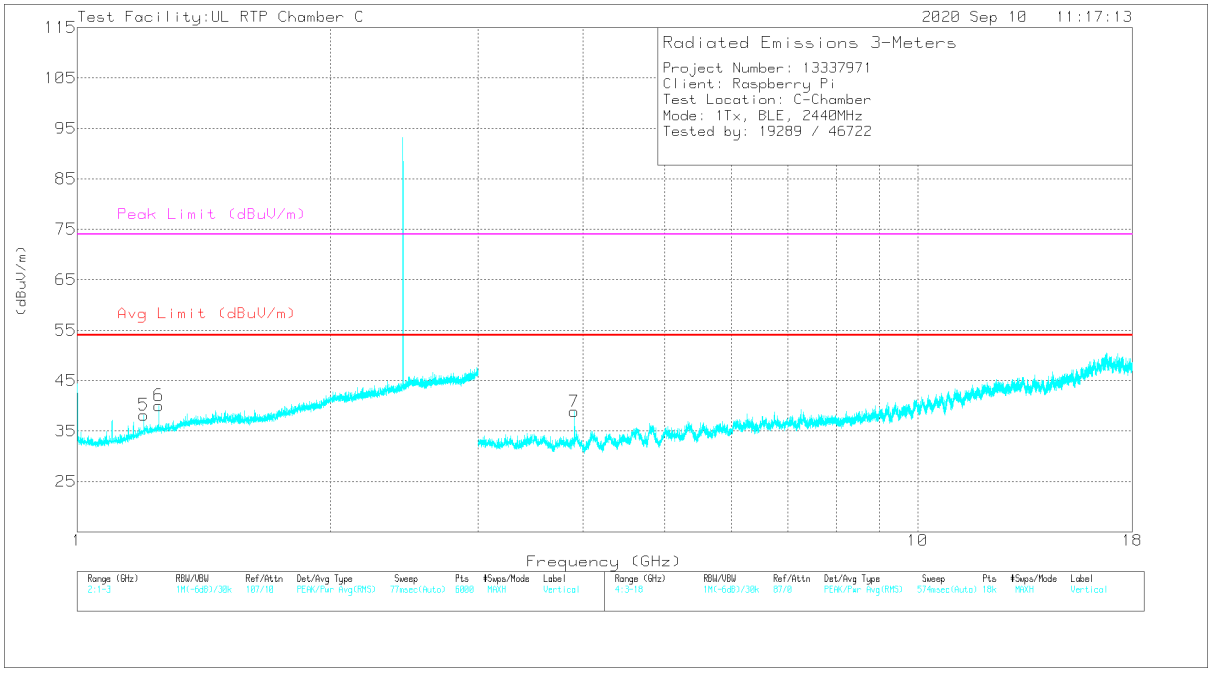
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.1999	37.52	PK2	28.1	-20.5	0	45.12	-	-	74	-28.88	194	205	H
	* ** 1.20007	29.21	ADV	28.1	-20.5	4.1	40.91	54	-13.09	-	-	194	205	H
2	* 1.24972	38.7	PK2	28.6	-20.4	0	46.9	-	-	74	-27.1	206	182	H
	* 1.24998	30.78	ADV	28.6	-20.4	4.1	43.08	54	-10.92	-	-	206	182	H
3	* ** 1.62518	36.66	PK2	28.5	-18.8	0	46.36	-	-	74	-27.64	99	129	H
	* ** 1.62499	26.09	ADV	28.5	-18.8	4.1	39.89	54	-14.11	-	-	99	129	H
5	* ** 1.20028	35.67	PK2	28.1	-20.5	0	43.27	-	-	74	-30.73	313	238	V
	* ** 1.20005	25.08	ADV	28.1	-20.5	4.1	36.78	54	-17.22	-	-	313	238	V
6	* 1.25006	37.55	PK2	28.6	-20.4	0	45.75	-	-	74	-28.25	100	360	V
	* 1.25004	28.77	ADV	28.6	-20.4	4.1	41.07	54	-12.93	-	-	100	360	V
4	* ** 3.84317	60.98	PK2	33.5	-49.2	0	45.28	-	-	74	-28.72	311	360	H
	* ** 3.84324	53.41	ADV	33.5	-49.2	4.1	41.81	54	-12.19	-	-	311	360	H
7	* ** 3.84326	59.96	PK2	33.5	-49.2	0	44.26	-	-	74	-29.74	347	274	V
	* ** 3.84324	52	ADV	33.5	-49.2	4.1	40.4	54	-13.6	-	-	347	274	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
ADV - Linear Voltage Average

MID CHANNEL, 2440 MHz RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.20021	38.7	PK2	28.1	-20.5	0	46.3	-	-	74	-27.7	200	147	H
	* ** 1.20004	30.49	ADV	28.1	-20.5	4.1	42.19	54	-11.81	-	-	200	147	H
2	* 1.25015	38.71	PK2	28.6	-20.4	0	46.91	-	-	74	-27.09	206	164	H
	* 1.25004	30.16	ADV	28.6	-20.4	4.1	42.46	54	-11.54	-	-	206	164	H
3	* ** 1.62503	37.26	PK2	28.5	-18.8	0	46.96	-	-	74	-27.04	202	323	H
	* ** 1.625	27.67	ADV	28.5	-18.8	4.1	41.47	54	-12.53	-	-	202	323	H
5	* ** 1.20012	36.24	PK2	28.1	-20.5	0	43.84	-	-	74	-30.16	210	318	V
	* ** 1.20004	25.94	ADV	28.1	-20.5	4.1	37.64	54	-16.36	-	-	210	318	V
6	* 1.25034	36.68	PK2	28.6	-20.4	0	44.88	-	-	74	-29.12	97	304	V
	* 1.25005	27.45	ADV	28.6	-20.4	4.1	39.75	54	-14.25	-	-	97	304	V
4	* ** 3.9039	61.71	PK2	33.5	-49.2	0	46.01	-	-	74	-27.99	179	308	H
	* ** 3.90401	54.03	ADV	33.5	-49.1	4.1	42.53	54	-11.47	-	-	179	308	H
7	* ** 3.90396	61.61	PK2	33.5	-49.1	0	46.01	-	-	74	-27.99	351	295	V
	* ** 3.90403	54.07	ADV	33.5	-49.1	4.1	42.57	54	-11.43	-	-	351	295	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
ADV - Linear Voltage Average

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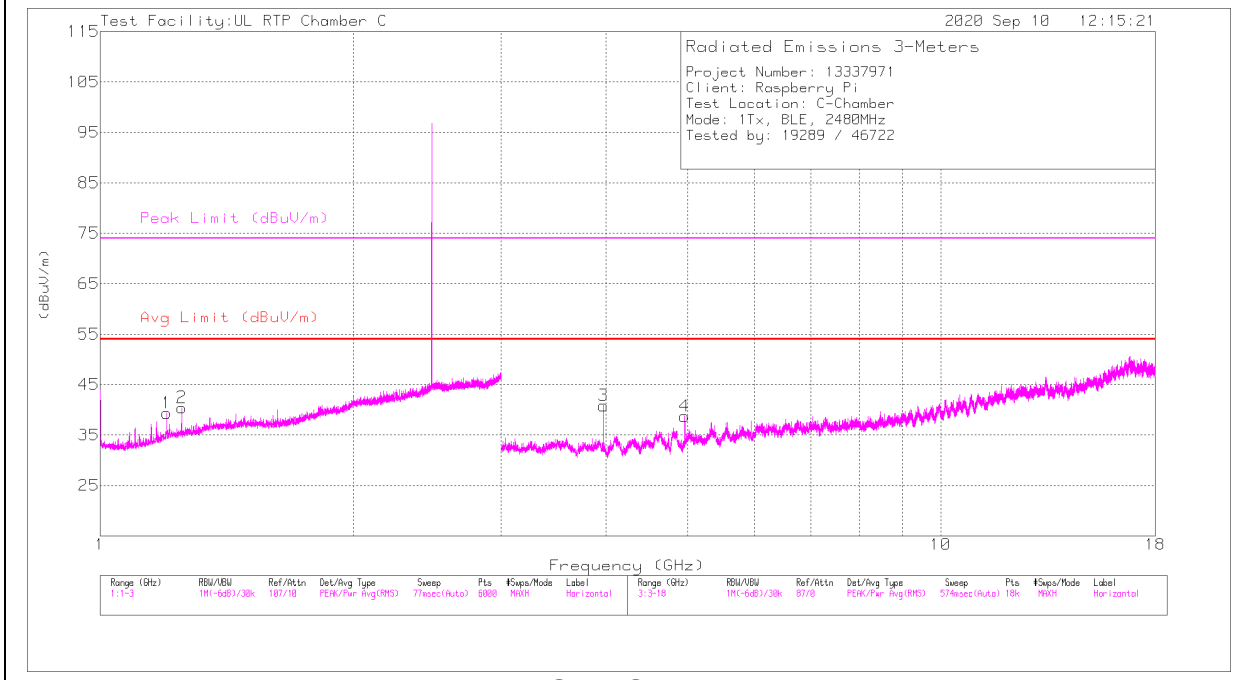
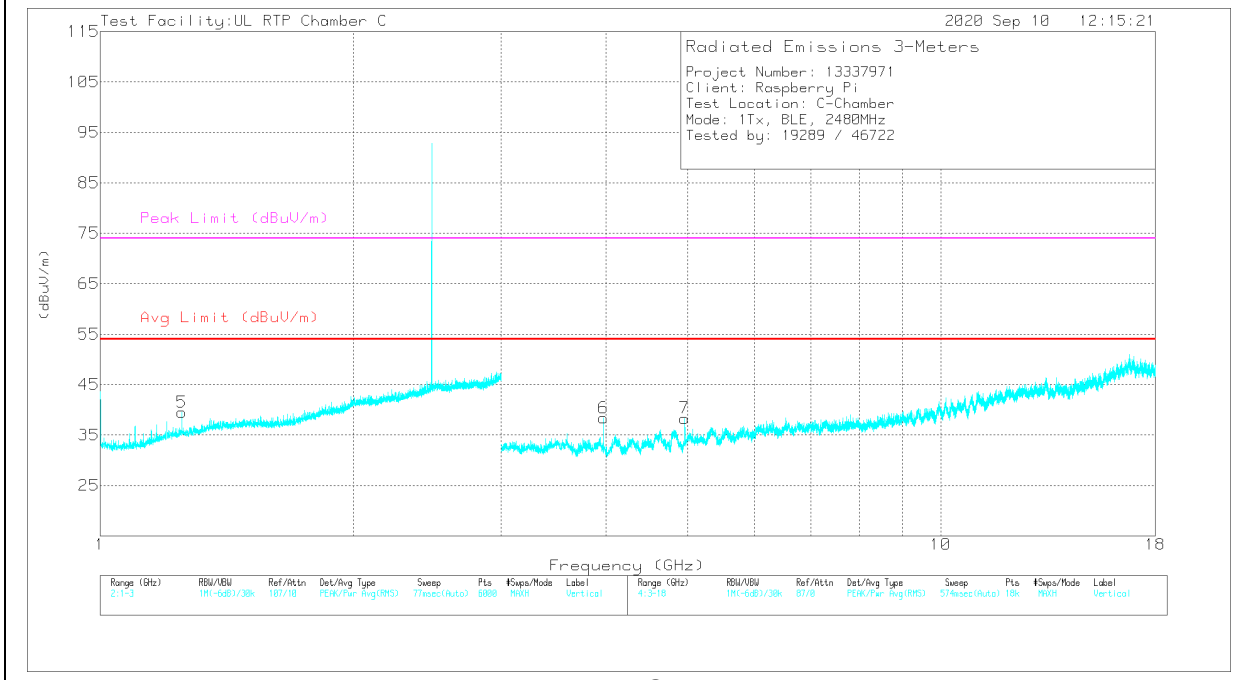
HIGH CHANNEL, 2480 MHz RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

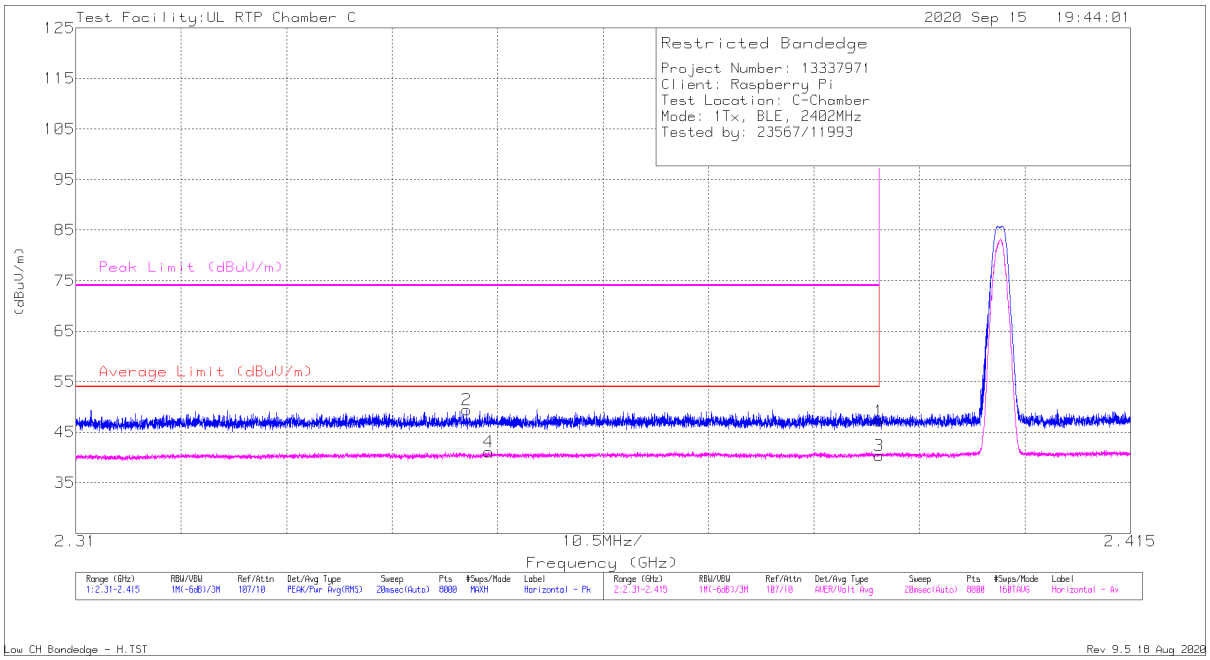
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.19998	38.03	PK2	28.1	-20.5	0	45.63	-	-	74	-28.37	201	139	H
	* ** 1.20006	29.99	ADV	28.1	-20.5	4.1	41.69	54	-12.31	-	-	201	139	H
2	* 1.25061	38.47	PK2	28.6	-20.5	0	46.57	-	-	74	-27.43	209	190	H
	* 1.25002	30.74	ADV	28.6	-20.4	4.1	43.04	54	-10.96	-	-	209	190	H
5	* 1.25014	37.09	PK2	28.6	-20.4	0	45.29	-	-	74	-28.71	71	317	V
	* 1.25002	27.29	ADV	28.6	-20.4	4.1	39.59	54	-14.41	-	-	71	317	V
3	* ** 3.96785	59.8	PK2	33.5	-48.2	0	45.1	-	-	74	-28.9	77	273	H
	* ** 3.96801	52.29	ADV	33.5	-48.3	4.1	41.59	54	-12.41	-	-	77	273	H
4	* ** 4.95958	59.35	PK2	34	-47.4	0	45.95	-	-	74	-28.05	171	273	H
	* ** 4.95998	47.87	ADV	34	-47.4	4.1	38.57	54	-15.43	-	-	171	273	H
6	* ** 3.96802	58.8	PK2	33.5	-48.3	0	44	-	-	74	-30	165	296	V
	* ** 3.96798	50.88	ADV	33.5	-48.3	4.1	40.18	54	-13.82	-	-	165	296	V
7	* ** 4.95966	56.1	PK2	34	-47.4	0	42.7	-	-	74	-31.3	285	196	V
	* ** 4.95974	44.6	ADV	34	-47.4	4.1	35.3	54	-18.7	-	-	285	196	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
ADV - Linear Voltage Average

1TX Antenna 2 MODE

BANDEDGE (LOW CHANNEL, 2402 MHz)

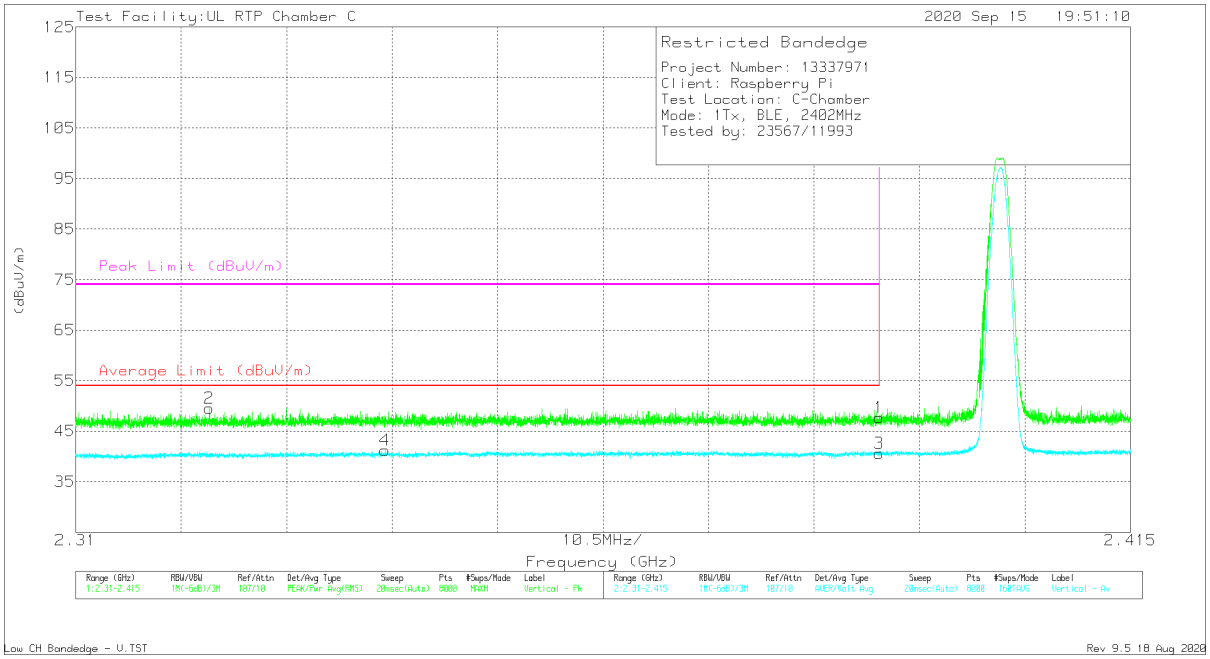
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	33.26	Pk	32.1	-18.2	0	47.16	-	-	74	-26.84	221	103	H
2	* ** 2.34891	35.85	Pk	31.9	-18.3	0	49.45	-	-	74	-24.55	221	103	H
3	* ** 2.39	22.34	ADV	32.1	-18.2	4.1	40.34	54	-13.66	-	-	221	103	H
4	* ** 2.35109	23.36	ADV	31.9	-18.2	4.1	41.16	54	-12.84	-	-	221	103	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.39	33.82	Pk	32.1	-18.2	0	47.72	-	-	74	-26.28	134	101	V
2	* ** 2.32327	35.9	Pk	31.9	-18.2	0	49.6	-	-	74	-24.4	134	101	V
3	* ** 2.39	22.62	ADV	32.1	-18.2	4.1	40.62	54	-13.38	-	-	134	101	V
4	* ** 2.34078	23.39	ADV	31.9	-18.2	4.1	41.19	54	-12.81	-	-	134	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

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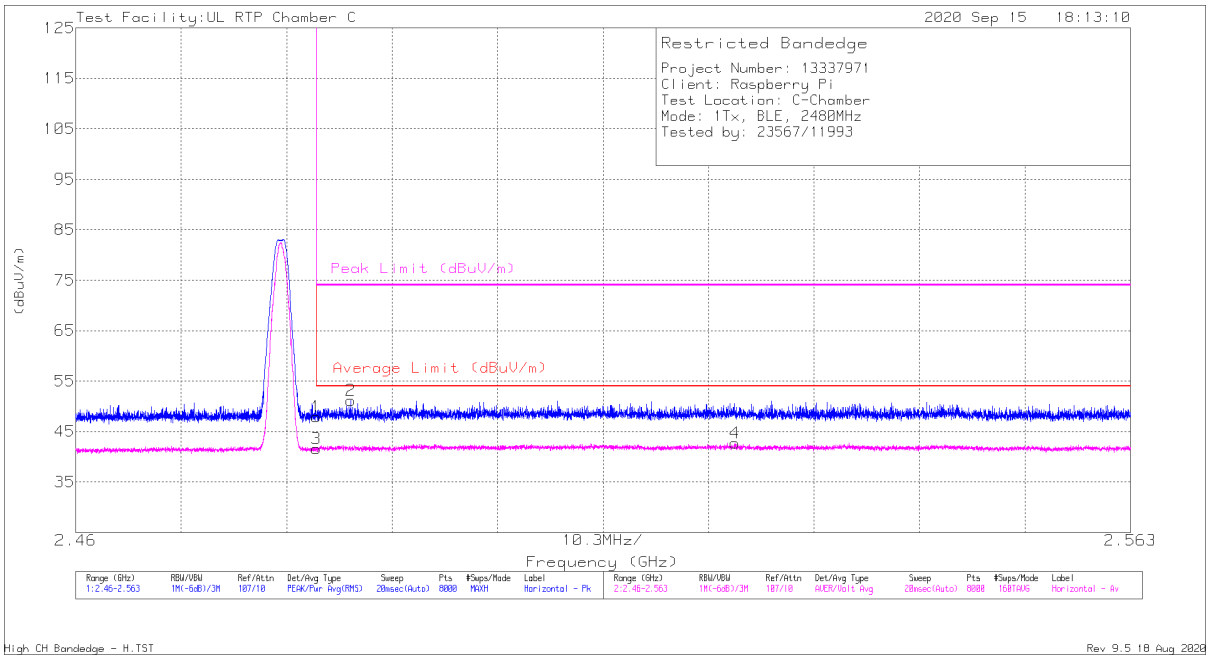
BANDEDGE (HIGH CHANNEL, 2480 MHz)

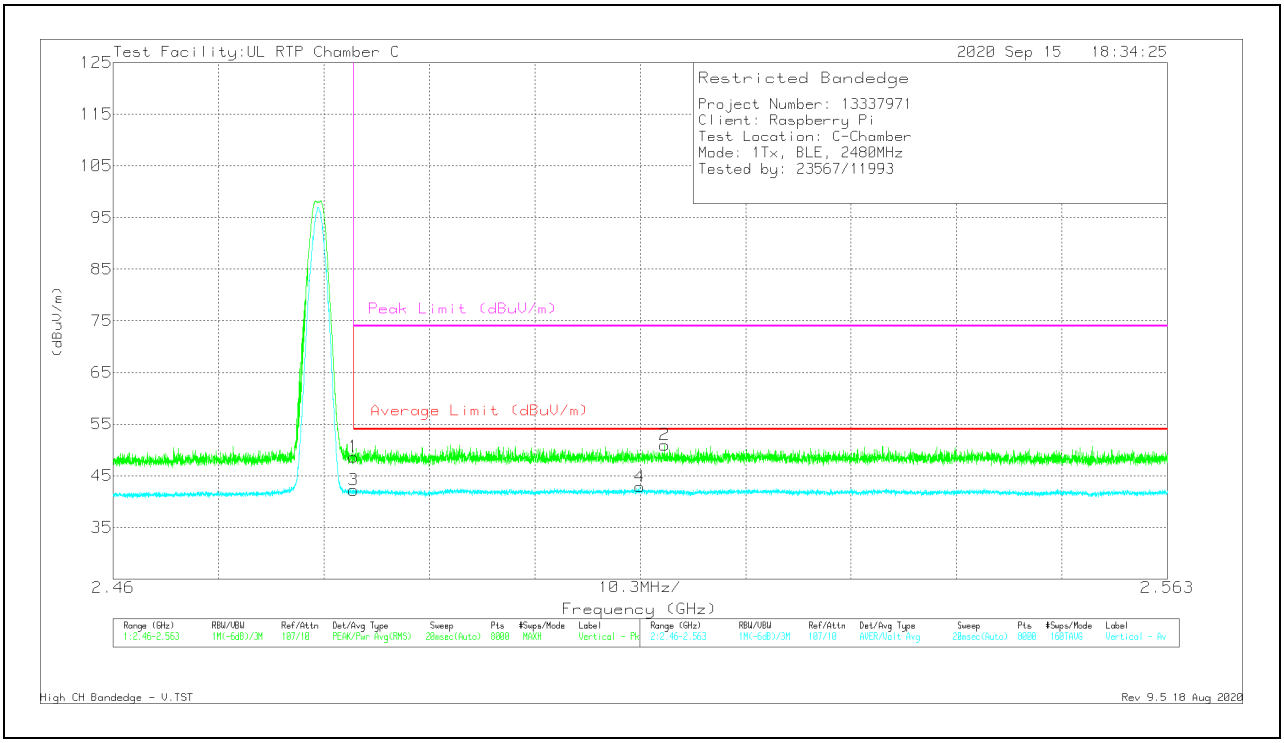
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	33.28	Pk	32.6	-18	0	47.88	-	-	74	-26.12	264	235	H
2	* ** 2.48687	36.46	Pk	32.6	-17.9	0	51.16	-	-	74	-22.84	264	235	H
3	* ** 2.4835	22.95	ADV	32.6	-18	4.1	41.65	54	-12.35	-	-	264	235	H
4	** 2.5244	23.75	ADV	32.6	-17.7	4.1	42.75	54	-11.25	-	-	264	235	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

VERTICAL RESULT

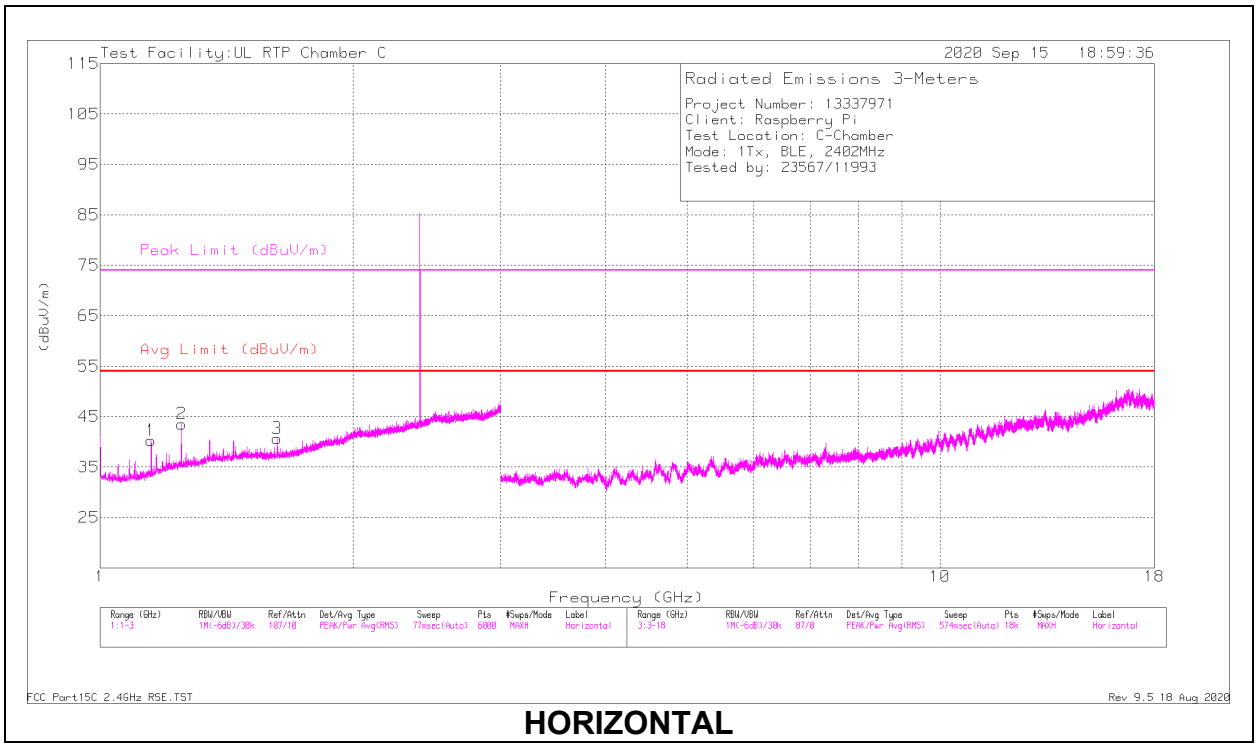


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	34.06	Pk	32.6	-18	0	48.66	-	-	74	-25.34	202	101	V
2	** 2.51388	36.18	Pk	32.7	-17.9	0	50.98	-	-	74	-23.02	202	101	V
3	* ** 2.4835	23.54	ADV	32.6	-18	4.1	42.24	54	-11.76	-	-	202	101	V
4	** 2.51144	23.89	ADV	32.7	-17.8	4.1	42.89	54	-11.11	-	-	202	101	V

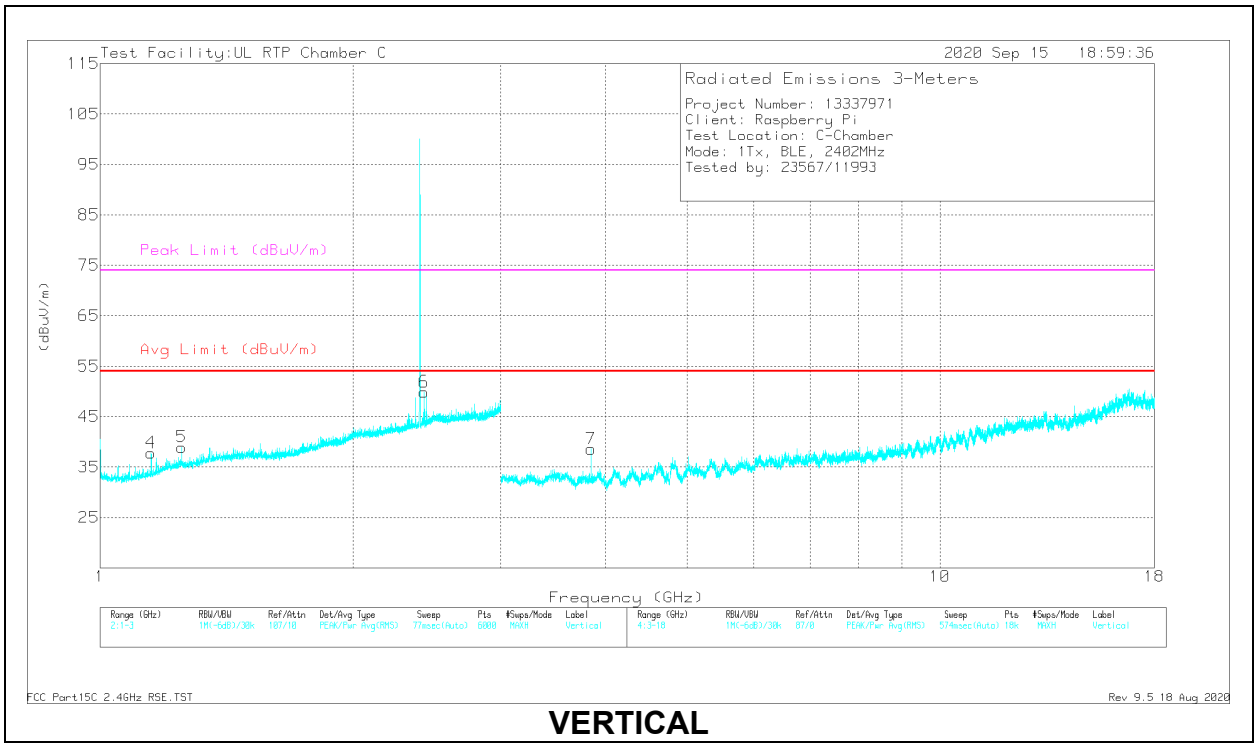
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL, 2402 MHz RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.15019	37.28	PK2	27.4	-20.7	0	43.98	-	-	74	-30.02	189	102	H
	* ** 1.14999	29.95	ADV	27.4	-20.7	4.1	40.75	54	-13.25	-	-	189	102	H
2	* 1.25005	39.34	PK2	28.6	-20.4	0	47.54	-	-	74	-26.46	198	103	H
	* 1.25001	32.95	ADV	28.6	-20.4	4.1	45.25	54	-8.75	-	-	198	103	H
3	* ** 1.62554	36.84	PK2	28.5	-18.9	0	46.44	-	-	74	-27.56	194	288	H
	* ** 1.62505	25.88	ADV	28.5	-18.8	4.1	39.68	54	-14.32	-	-	194	288	H
4	* ** 1.14994	36.1	PK2	27.4	-20.7	0	42.8	-	-	74	-31.2	248	136	V
	* ** 1.15003	27.11	ADV	27.4	-20.7	4.1	37.91	54	-16.09	-	-	248	136	V
5	* 1.2496	35.97	PK2	28.6	-20.4	0	44.17	-	-	74	-29.83	232	156	V
	* 1.24998	25.24	ADV	28.6	-20.4	4.1	37.54	54	-16.46	-	-	232	156	V
7	* ** 3.84324	58.95	PK2	33.5	-49.2	0	43.25	-	-	74	-30.75	41	101	V
	* ** 3.84319	50.01	ADV	33.5	-49.2	4.1	38.41	54	-15.59	-	-	41	101	V
6	2.42891	35.87	Pk	32.2	-18.2	0	49.87	-	-	-	-	0-360	200	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk – Peak detector
PK2 - Maximum Peak
ADV - Linear Voltage Average

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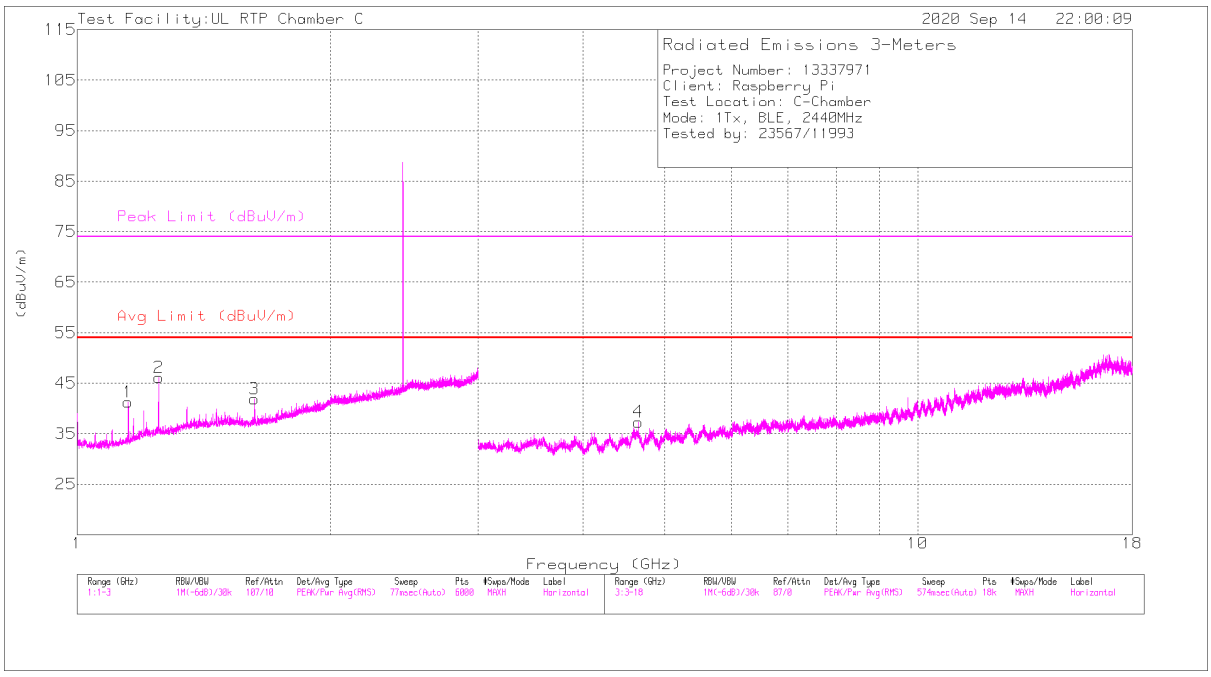
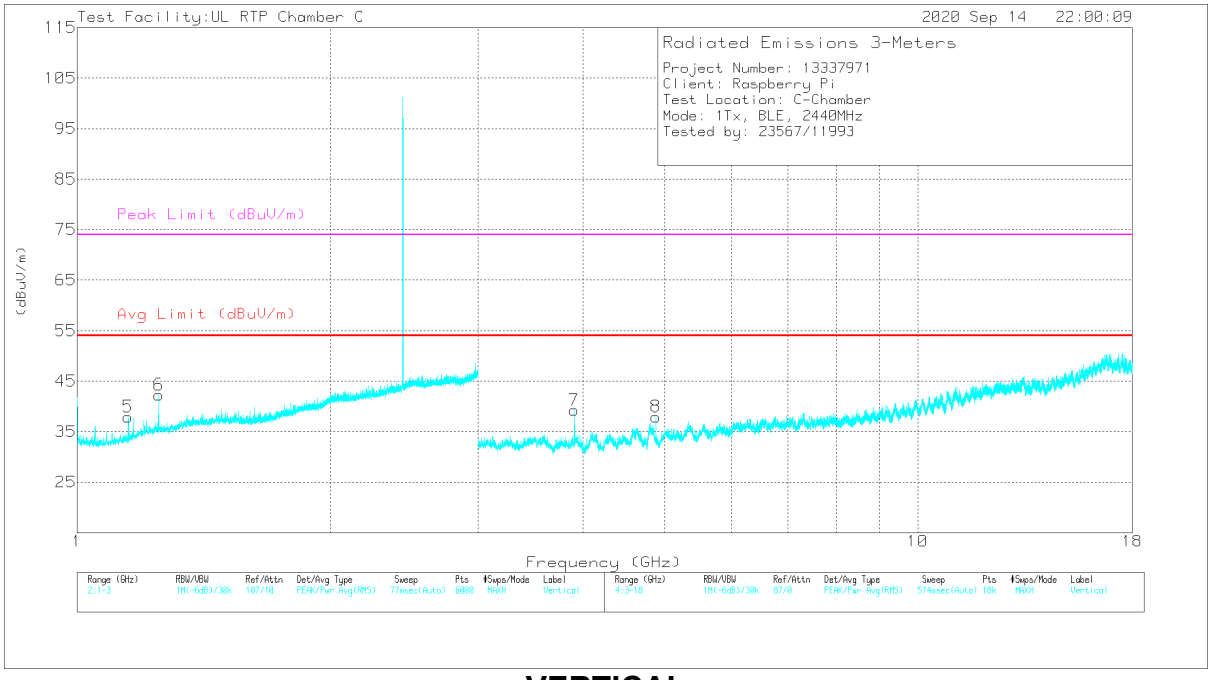
MID CHANNEL, 2440 MHz RESULTS



HORIZONTAL



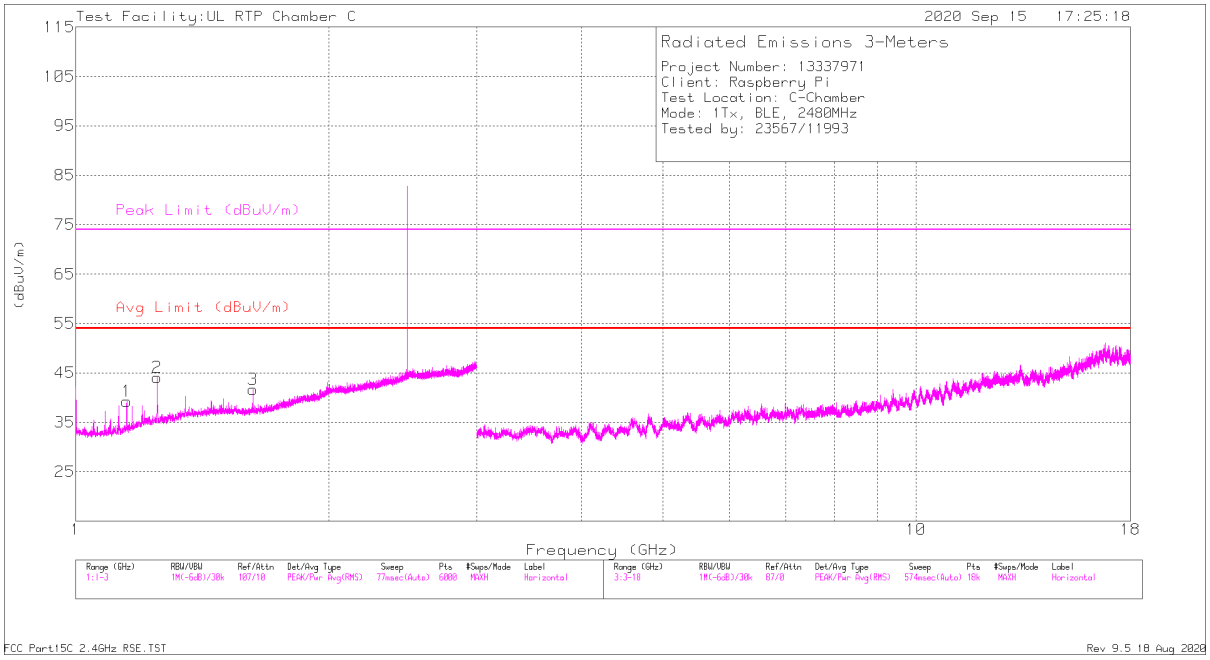
VERTICAL

RADIATED EMISSIONS

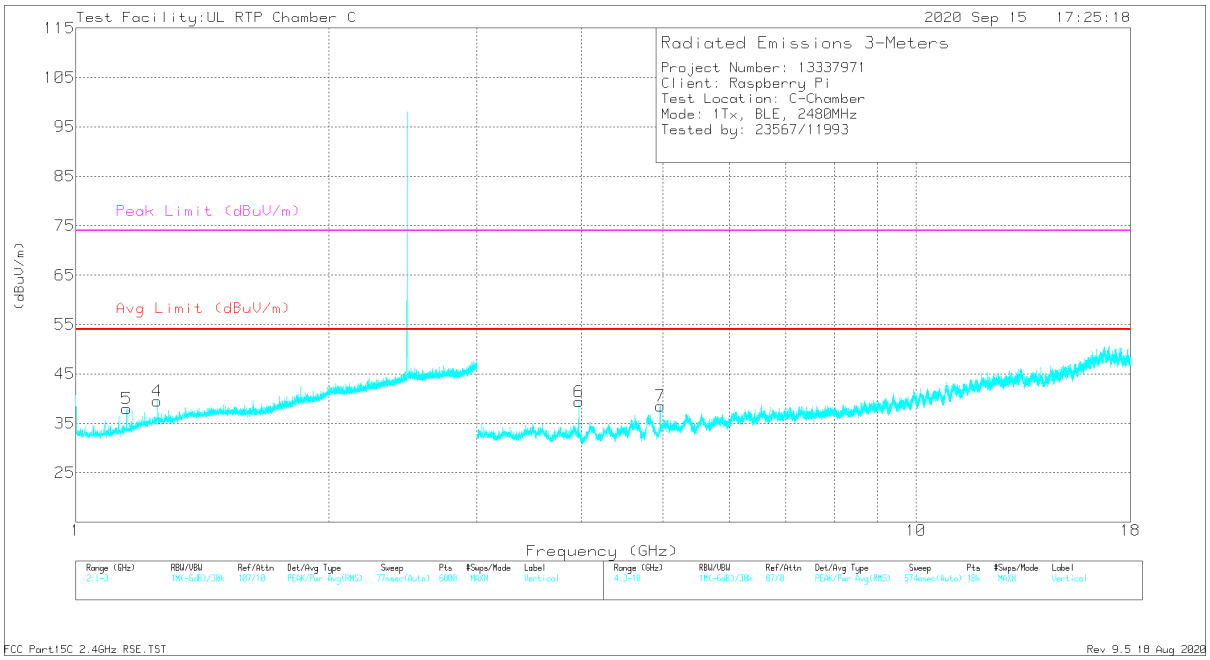
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.15021	38.49	PK2	27.4	-20.7	0	45.19	-	-	74	-28.81	188	102	H
	* ** 1.15	32.07	ADV	27.4	-20.7	4.1	42.87	54	-11.13	-	-	188	102	H
2	* 1.24993	41.88	PK2	28.6	-20.4	0	50.08	-	-	74	-23.92	191	101	H
	* 1.25006	36.51	ADV	28.6	-20.4	4.1	48.81	54	-5.19	-	-	191	101	H
3	* ** 1.62501	37.9	PK2	28.5	-18.8	0	47.6	-	-	74	-26.4	202	102	H
	* ** 1.62499	28.62	ADV	28.5	-18.8	4.1	42.42	54	-11.58	-	-	202	102	H
5	* ** 1.14985	36.41	PK2	27.4	-20.7	0	43.11	-	-	74	-30.89	91	242	V
	* ** 1.15001	27.52	ADV	27.4	-20.7	4.1	38.32	54	-15.68	-	-	91	242	V
6	* 1.24994	38.83	PK2	28.6	-20.4	0	47.03	-	-	74	-26.97	244	101	V
	* 1.25006	32.55	ADV	28.6	-20.4	4.1	44.85	54	-9.15	-	-	244	101	V
4	* ** 4.6523	56.49	PK2	34.1	-47.4	0	43.19	-	-	74	-30.81	326	400	H
	* ** 4.65358	42.99	ADV	34.1	-47.5	4.1	33.69	54	-20.31	-	-	326	400	H
7	* ** 3.90397	60.17	PK2	33.5	-49.1	0	44.57	-	-	74	-29.43	47	101	V
	* ** 3.904	51.69	ADV	33.5	-49.1	4.1	40.19	54	-13.81	-	-	47	101	V
8	* ** 4.87953	57.04	PK2	34	-48.5	0	42.54	-	-	74	-31.46	224	237	V
	* ** 4.87983	45.61	ADV	34	-48.4	4.1	35.31	54	-18.69	-	-	224	237	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
ADV - Linear Voltage Average

HIGH CHANNEL, 2480 MHz RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0062 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.15	37.27	PK2	27.4	-20.7	0	43.97	-	-	74	-30.03	189	107	H
	* ** 1.15003	29.58	ADV	27.4	-20.7	4.1	40.38	54	-13.62	-	-	189	107	H
2	* 1.2502	39.47	PK2	28.6	-20.4	0	47.67	-	-	74	-26.33	199	101	H
	* 1.25	33.32	ADV	28.6	-20.4	4.1	45.62	54	-8.38	-	-	199	101	H
3	* ** 1.62493	37.18	PK2	28.5	-18.8	0	46.88	-	-	74	-27.12	201	180	H
	* ** 1.62504	28.31	ADV	28.5	-18.8	4.1	42.11	54	-11.89	-	-	201	180	H
4	* 1.25022	36.4	PK2	28.6	-20.4	0	44.6	-	-	74	-29.4	235	103	V
	* 1.25007	26.47	ADV	28.6	-20.4	4.1	38.77	54	-15.23	-	-	235	103	V
5	* ** 1.15024	36.5	PK2	27.4	-20.7	0	43.2	-	-	74	-30.8	250	102	V
	* ** 1.15005	28.03	ADV	27.4	-20.7	4.1	38.83	54	-15.17	-	-	250	102	V
6	* ** 3.96801	57.61	PK2	33.5	-48.3	0	42.81	-	-	74	-31.19	342	101	V
	* ** 3.96799	49.22	ADV	33.5	-48.3	4.1	38.52	54	-15.48	-	-	342	101	V
7	* ** 4.95946	57.52	PK2	34	-47.4	0	44.12	-	-	74	-29.88	240	101	V
	* ** 4.95985	45.77	ADV	34	-47.4	4.1	36.47	54	-17.53	-	-	240	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
PK2 - Maximum Peak
ADV - Linear Voltage Average

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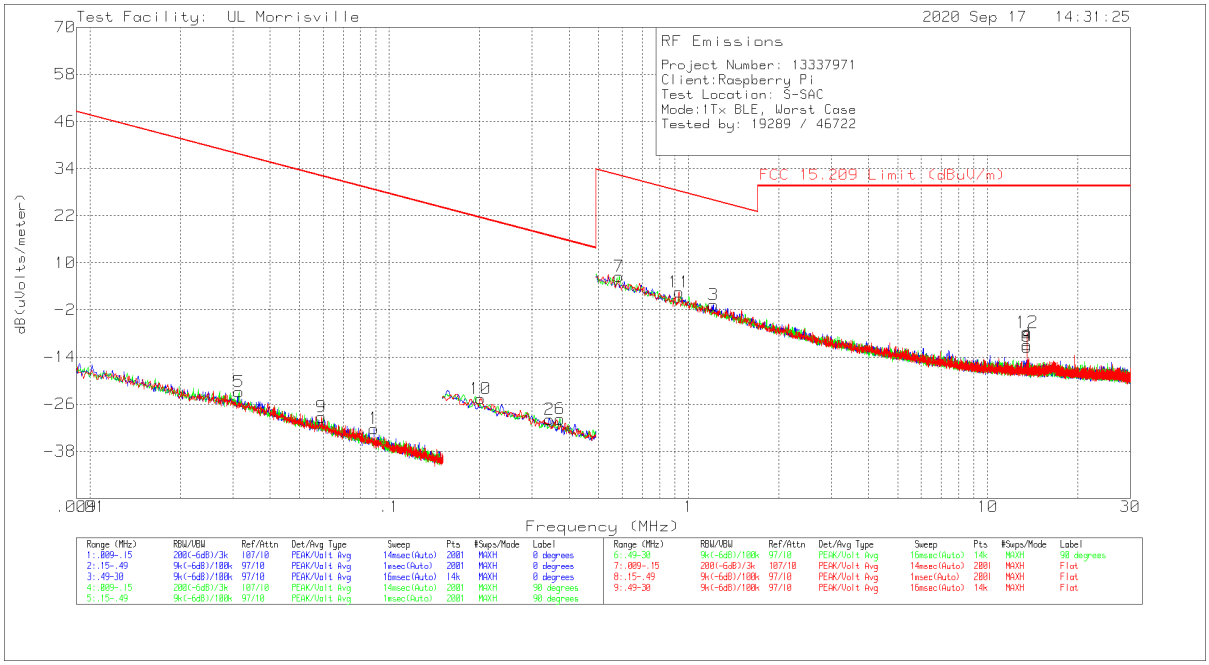
10.2. WORST CASE BELOW 30MHZ

Note: All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (test distance / specification distance).

The below 30 MHz limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω. For example, the measurement frequency 31.44 kHz resulted in a level of -22.88 dBuV/m, which is equivalent to -22.88-51.5= -74.38 dBuA/m, which has the same margin, -60.54 dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION) – Antenna 1



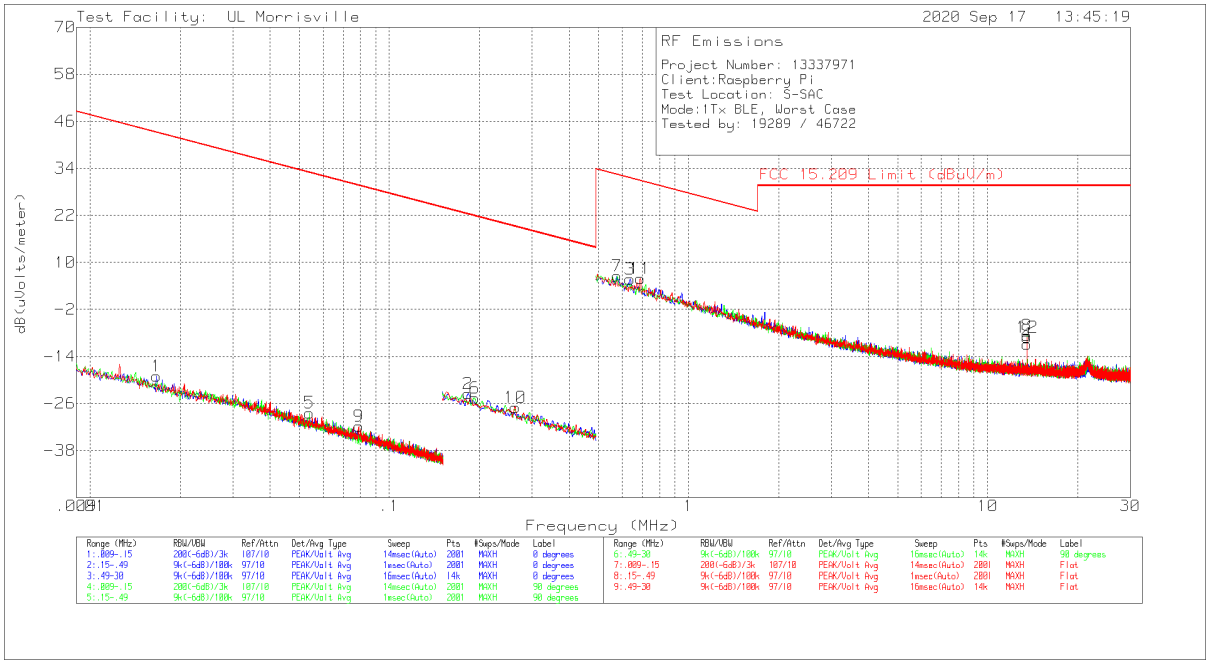
ANTENNA- THREE ORIENTATIONS

Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.209 QP/Avg Limit (dBuV/m)	FCC 15.209 Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
5	.03144	43.82	Pk	13.2	.1	-80	-22.88	37.66	57.66	-60.54	0-360
9	.05934	39.08	Pk	11.5	.1	-80	-29.32	32.14	52.14	-61.46	0-360
1	.08888	36.46	Pk	11.2	.1	-80	-32.24	28.63	48.63	-60.87	0-360
10	.20185	44.47	Pk	10.8	.1	-80	-24.63	21.5	41.5	-46.13	0-360
2	.34363	39.32	Pk	10.7	.1	-80	-29.88	16.88	36.88	-46.76	0-360
6	.37219	39.5	Pk	10.6	.1	-80	-29.8	16.19	36.19	-45.99	0-360
7	.58697	35.63	Pk	10.8	.1	-40	6.53	32.23	-	-25.7	0-360
11	.93057	31.4	Pk	10.9	.2	-40	2.5	28.23	-	-25.73	0-360
3	1.21094	28.07	Pk	11	.2	-40	-.73	25.94	-	-26.67	0-360
4	13.5596	18.05	Pk	10.4	.7	-40	-10.85	29.54	-	-40.39	0-360
8	13.5596	17.48	Pk	10.4	.7	-40	-11.42	29.54	-	-40.96	0-360
12	13.5596	21.11	Pk	10.4	.7	-40	-7.79	29.54	-	-37.33	0-360

Pk - Peak detector

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION) – Antenna 2



ANTENNA- THREE ORIENTATIONS

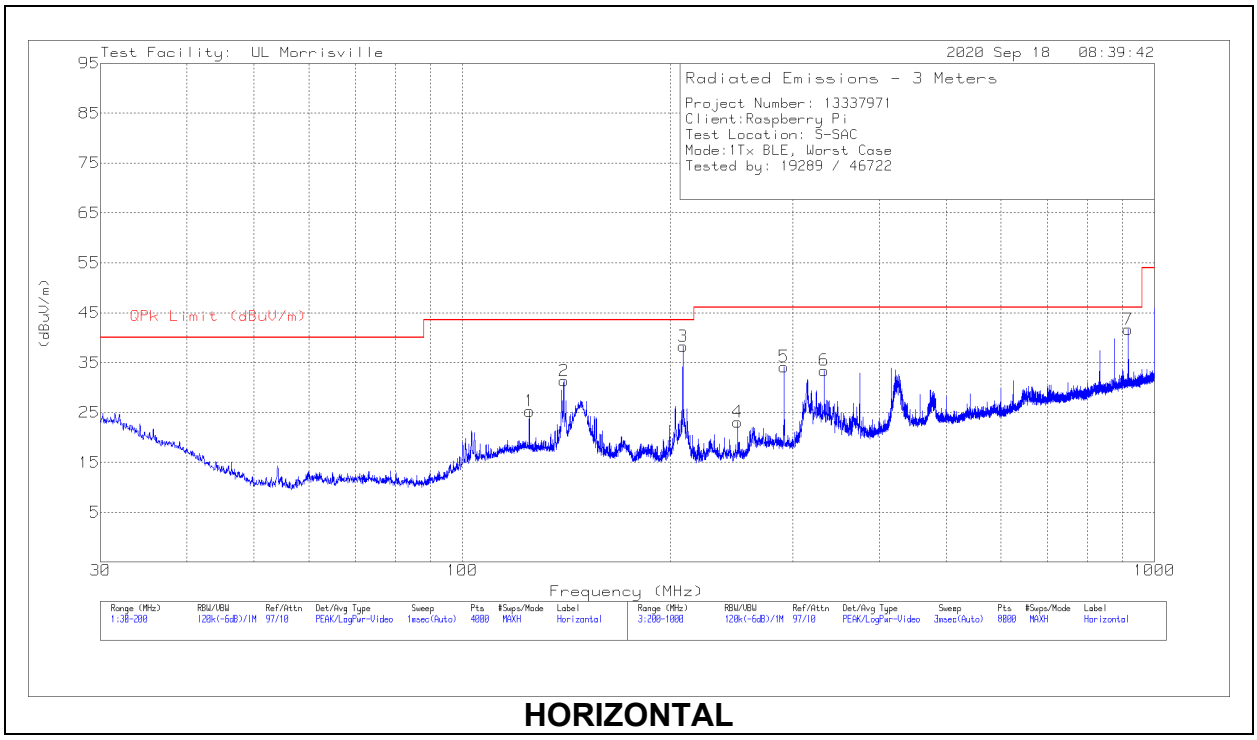
Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.209 QP/Avg Limit (dBuV/m)	FCC 15.209 Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.01667	45.73	Pk	15.1	.1	-80	-19.07	43.17	63.17	-62.24	0-360
5	.05401	40.01	Pk	11.5	.1	-80	-28.39	32.95	52.95	-61.34	0-360
9	.07901	37.01	Pk	11.1	.1	-80	-31.79	29.65	49.65	-61.44	0-360
2	.18358	45.59	Pk	10.8	.1	-80	-23.51	22.33	42.33	-45.84	0-360
6	.19284	44.44	Pk	10.8	.1	-80	-24.66	21.9	41.9	-46.56	0-360
10	.26373	42.14	Pk	10.7	.1	-80	-27.06	19.18	39.18	-46.24	0-360
7	.57854	35.62	Pk	10.8	.1	-40	6.52	32.36	-	-25.84	0-360
3	.63756	34.69	Pk	10.8	.2	-40	5.69	31.51	-	-25.82	0-360
11	.69026	34.86	Pk	10.8	.2	-40	5.86	30.82	-	-24.96	0-360
8	13.5596	20.22	Pk	10.4	.7	-40	-8.68	29.54	-	-38.22	0-360
12	13.5596	19.72	Pk	10.4	.7	-40	-9.18	29.54	-	-38.72	0-360
4	13.56065	18.08	Pk	10.4	.7	-40	-10.82	29.54	-	-40.36	0-360

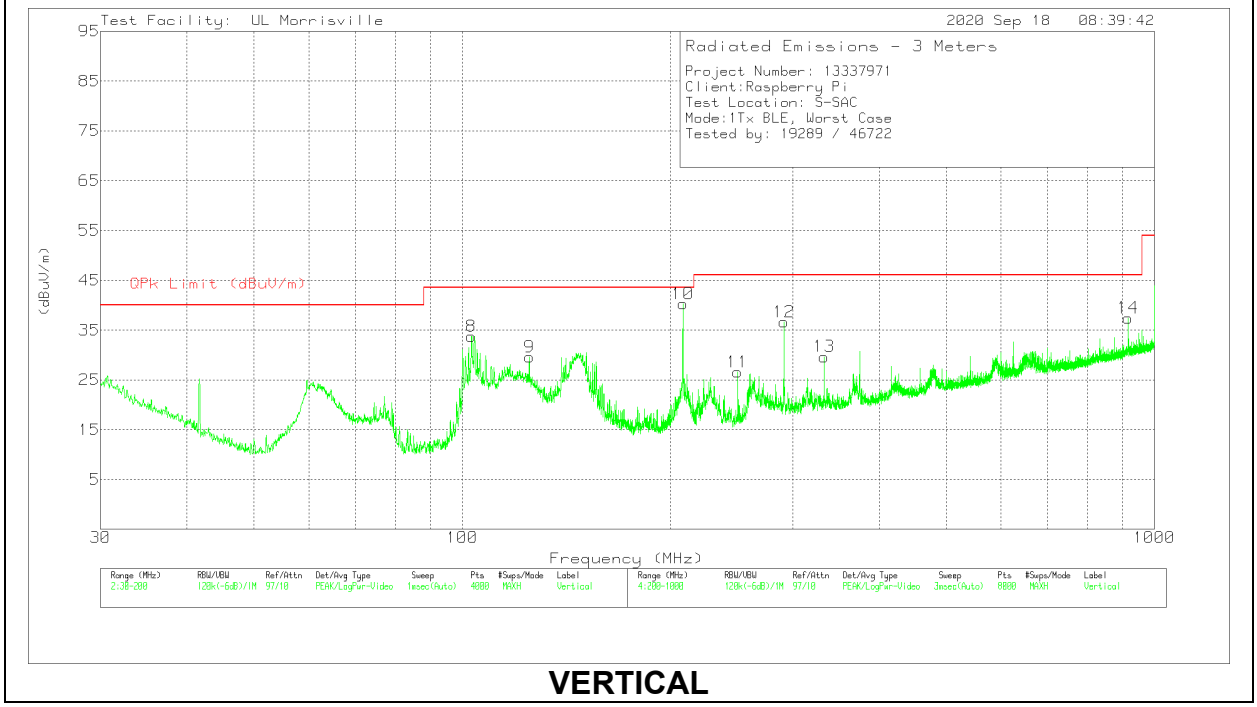
Pk - Peak detector

10.3. WORST CASE BELOW 1 GHZ

Antenna 1



HORIZONTAL



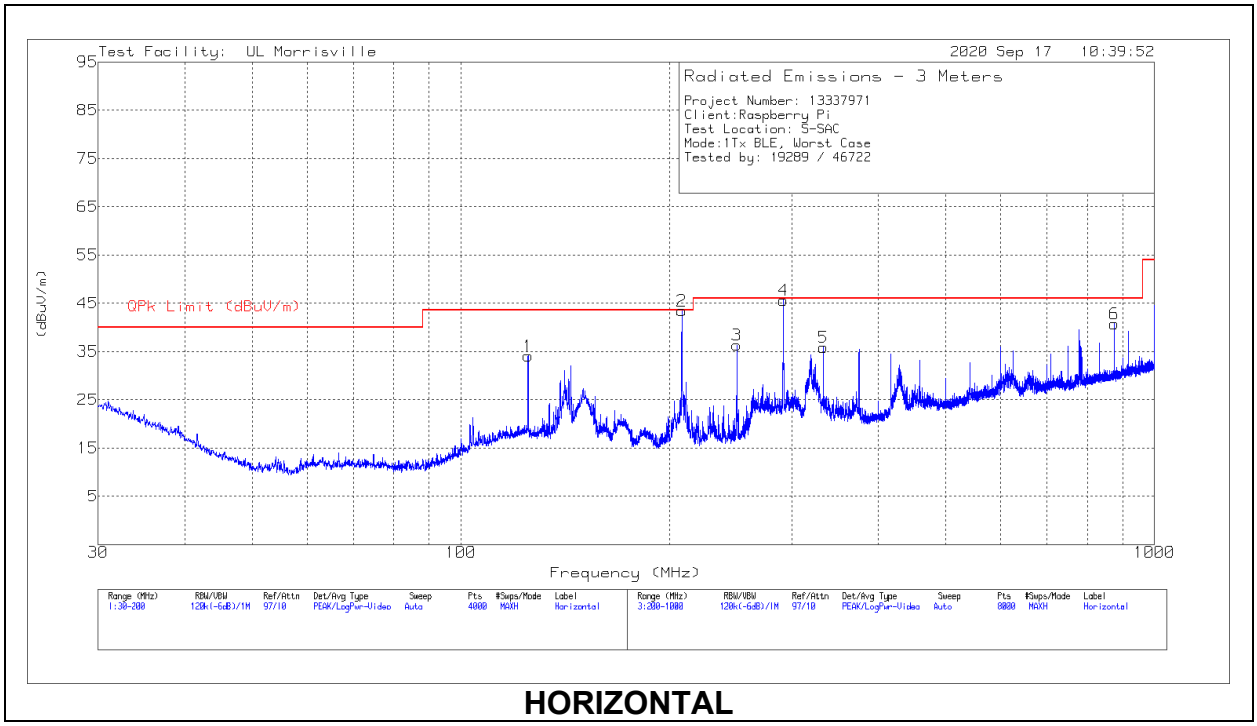
VERTICAL

Below 1GHz DATA

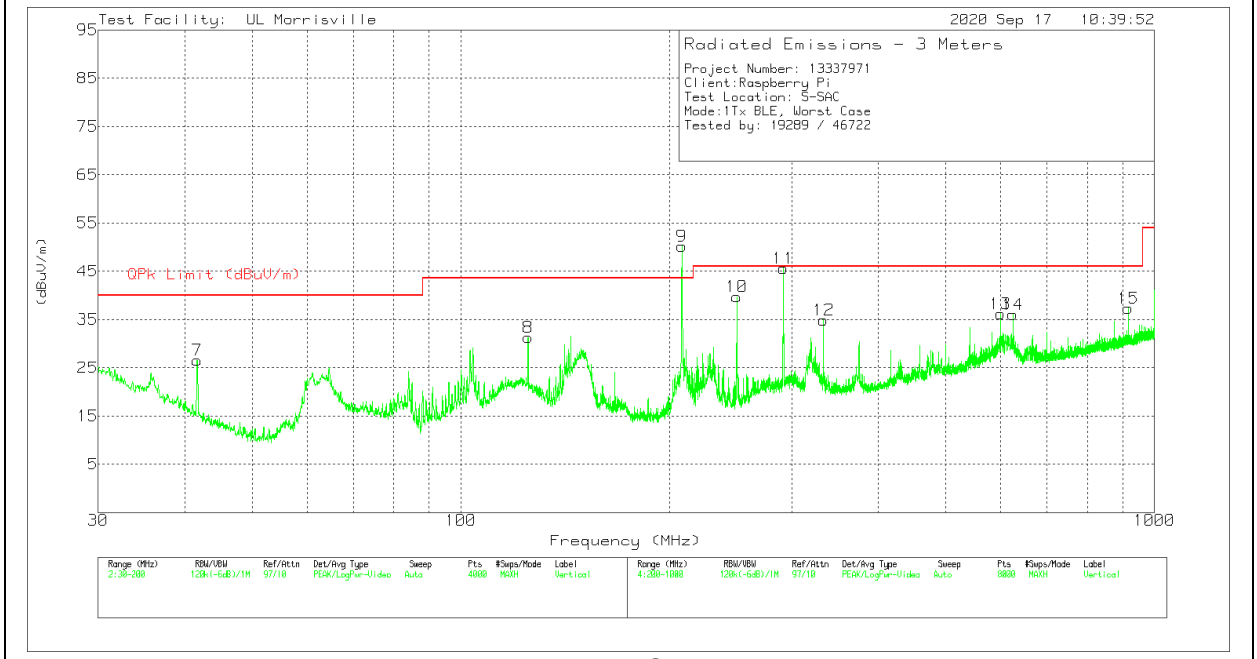
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0081 AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 125.0121	35.48	Pk	20.1	-30.3	25.28	43.52	-18.24	0-360	200	H
9	* ** 125.0121	39.8	Pk	20.1	-30.3	29.6	43.52	-13.92	0-360	101	V
4	* ** 250.0065	34.62	Pk	17.6	-29.1	23.12	46.02	-22.9	0-360	101	H
6	* ** 333.3173	42.04	Pk	20.1	-28.7	33.44	46.02	-12.58	0-360	101	H
11	* ** 250.0065	38.05	Pk	17.6	-29.1	26.55	46.02	-19.47	0-360	199	V
13	* ** 333.3173	38.27	Pk	20.1	-28.7	29.67	46.02	-16.35	0-360	199	V
8	103.0977	47.01	Pk	17.2	-30.5	33.71	-	-	0-360	101	V
2	140.1885	42.18	Pk	19.2	-30	31.38	-	-	0-360	200	H
3	208.3011	51.06	Pk	16.6	-29.4	38.26	-	-	0-360	200	H
10	208.3011	53.09	Pk	16.6	-29.4	40.29	-	-	0-360	101	V
5	291.7119	43.67	Pk	19.3	-28.8	34.17	-	-	0-360	101	H
12	291.7119	46.15	Pk	19.3	-28.8	36.65	-	-	0-360	199	V
7	916.6932	38.53	Pk	28.5	-25.4	41.63	-	-	0-360	101	H
14	916.6932	34.35	Pk	28.5	-25.4	37.45	-	-	0-360	199	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

Antenna 2



HORIZONTAL



VERTICAL

Below 1GHz DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0081 AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 125.0121	44.25	Pk	20.1	-30.3	34.05	43.52	-9.47	0-360	200	H
8	* ** 125.0121	41.47	Pk	20.1	-30.3	31.27	43.52	-12.25	0-360	101	V
3	* ** 250.0065	47.81	Pk	17.6	-29.1	36.31	46.02	-9.71	0-360	101	H
5	* ** 333.3173	44.44	Pk	20.1	-28.7	35.84	46.02	-10.18	0-360	101	H
6	** 875.0209	37.64	Qp	28	-26	39.64	46.02	-6.38	319	180	H
10	* ** 250.0065	51.19	Pk	17.6	-29.1	39.69	46.02	-6.33	0-360	101	V
12	* ** 333.3173	43.46	Pk	20.1	-28.7	34.86	46.02	-11.16	0-360	200	V
7	41.6905	39.01	Pk	18.8	-31.3	26.51	-	-	0-360	101	V
2	208.3011	56.21	Pk	16.6	-29.4	43.41	-	-	0-360	101	H
9	208.3011	62.99	Pk	16.6	-29.4	50.19	-	-	0-360	101	V
4	291.7119	55.14	Pk	19.3	-28.8	45.64	-	-	0-360	101	H
11	291.7119	55.14	Pk	19.3	-28.8	45.64	-	-	0-360	200	V
13	600.052	39.28	Pk	24.4	-27.5	36.18	-	-	0-360	101	V
14	625.0553	37.82	Pk	25.4	-27.2	36.02	-	-	0-360	101	V
15	916.6932	34.22	Pk	28.5	-25.4	37.32	-	-	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
Qp - Quasi-Peak detector

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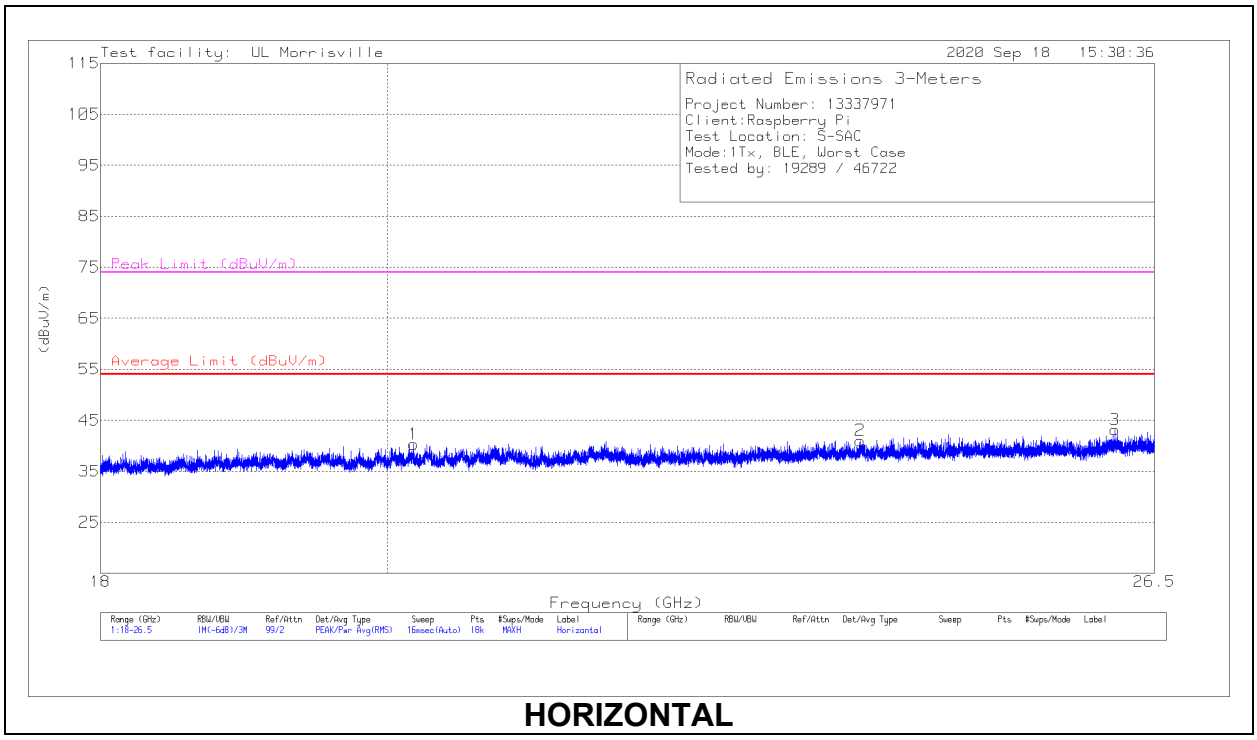
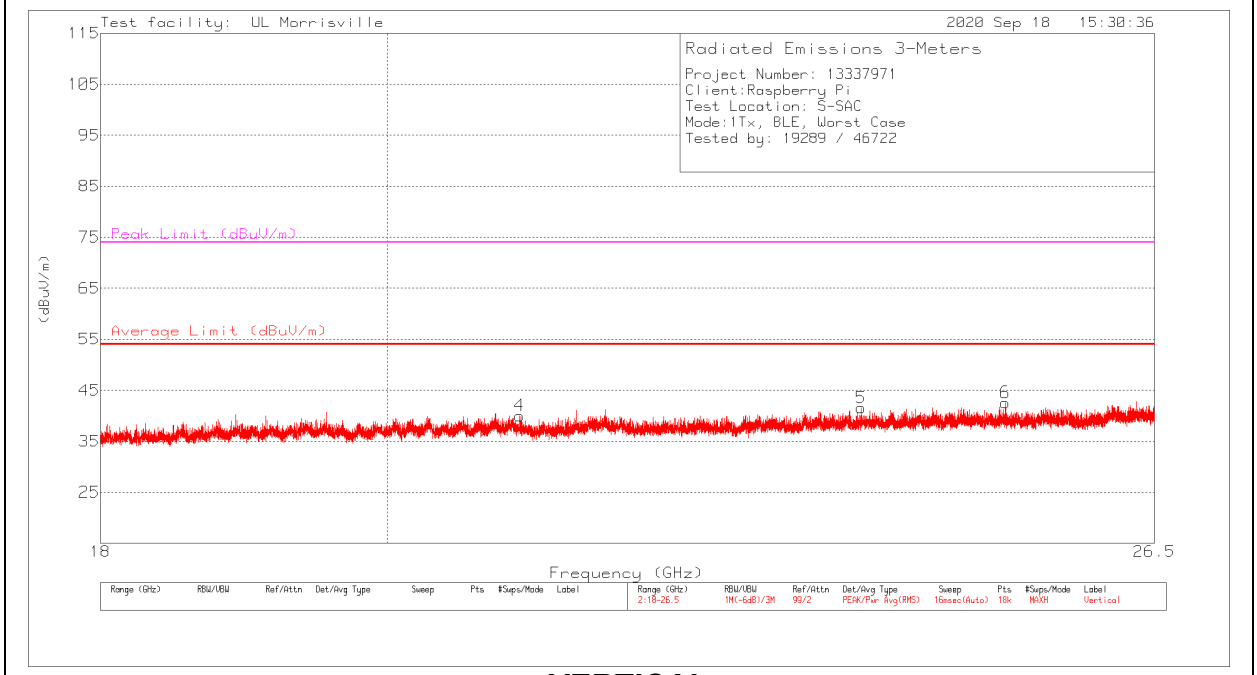
10.4. WORST CASE 18-26 GHZ

Antenna 1



HORIZONTAL



VERTICAL

18 – 26GHz DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0076 AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 20.19218	46.4	Pk	32.8	-38.9	40.3	54	-13.7	74	-33.7	0-360	101	H
2	* ** 23.78787	45.62	Pk	34	-38.6	41.02	54	-12.98	74	-32.98	0-360	150	H
4	* ** 20.99452	46.03	Pk	33.3	-39.3	40.03	54	-13.97	74	-33.97	0-360	200	V
5	* ** 23.79401	46.09	Pk	34	-38.5	41.59	54	-12.41	74	-32.41	0-360	150	V
6	25.0908	46.19	Pk	34.4	-38	42.59	54	-11.41	74	-31.41	0-360	300	V
3	26.1203	45.79	Pk	34.9	-37.5	43.19	54	-10.81	74	-30.81	0-360	101	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

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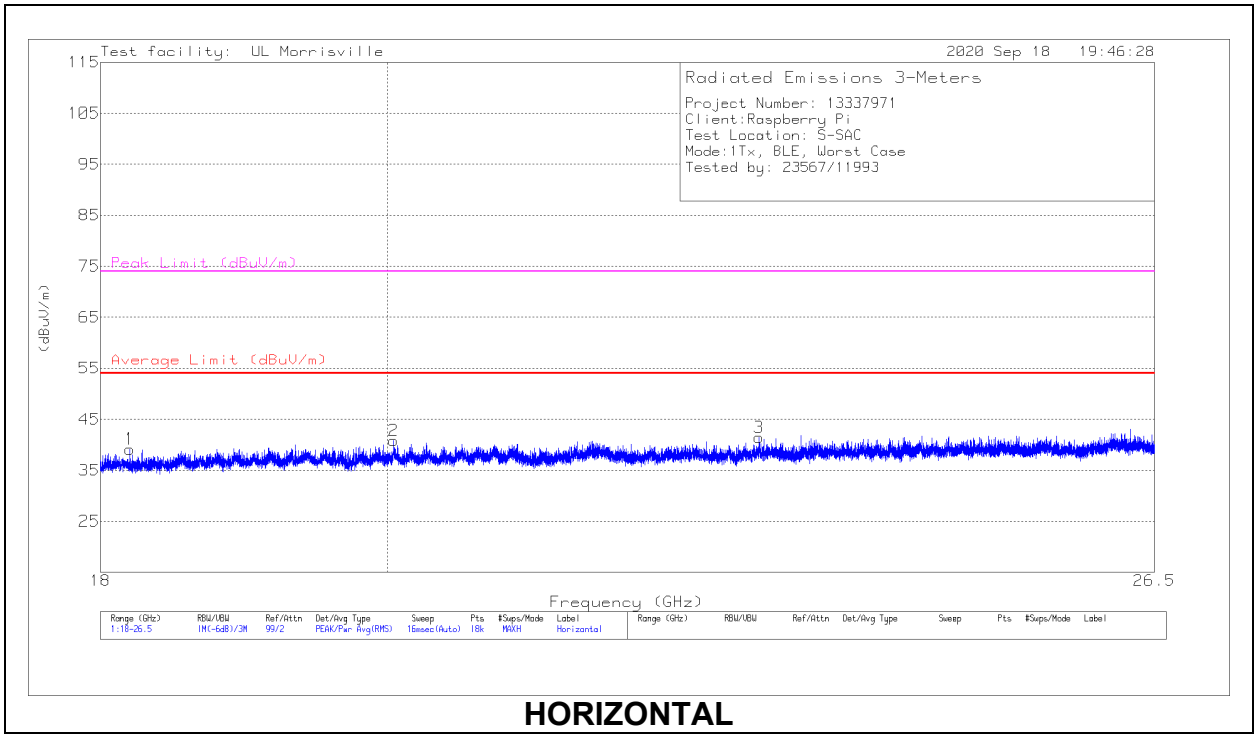
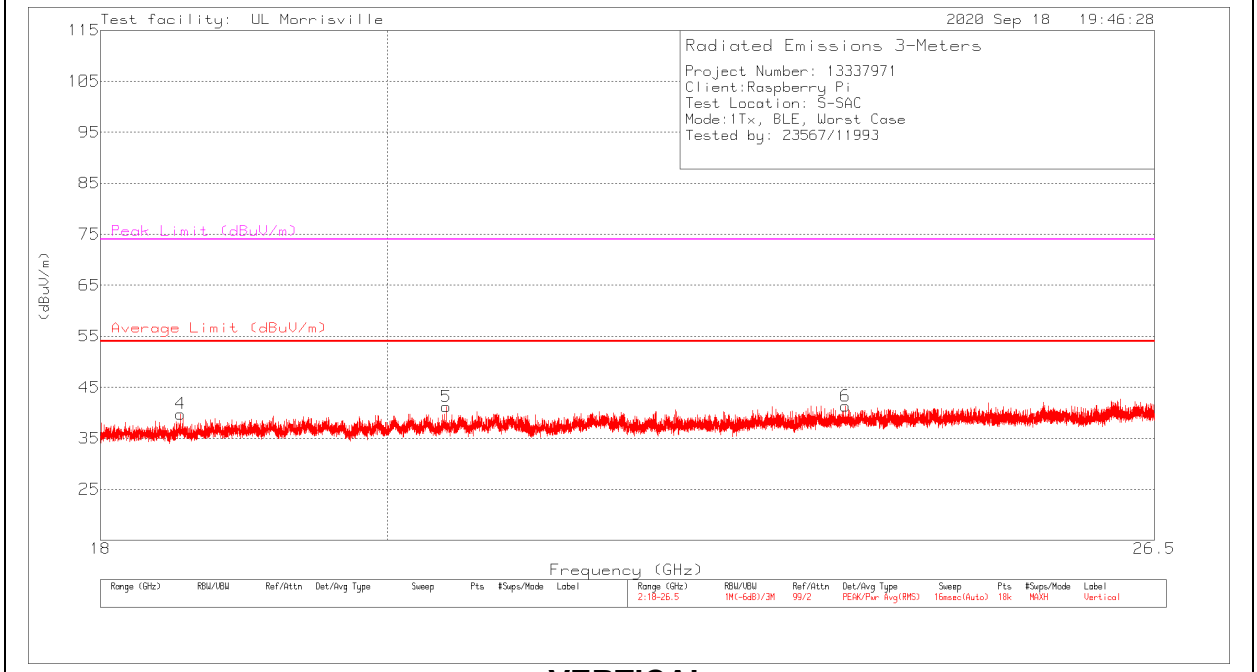
Antenna 2



HORIZONTAL



VERTICAL

18 – 26GHz DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0076 AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 18.19457	46.36	Pk	32.4	-39.6	39.16	54	-14.84	74	-34.84	0-360	150	H
2	* ** 20.04531	46.62	Pk	32.9	-38.7	40.82	54	-13.18	74	-33.18	0-360	249	H
3	* ** 22.92082	46.67	Pk	33.8	-39	41.47	54	-12.53	74	-32.53	0-360	199	H
4	* ** 18.53647	46.79	Pk	32.6	-39.6	39.79	54	-14.21	74	-34.21	0-360	250	V
5	* ** 20.43444	46.81	Pk	33.2	-38.8	41.21	54	-12.79	74	-32.79	0-360	150	V
6	* ** 23.65895	45.94	Pk	34	-38.6	41.34	54	-12.66	74	-32.66	0-360	250	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

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11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)
RSS-Gen 8.8

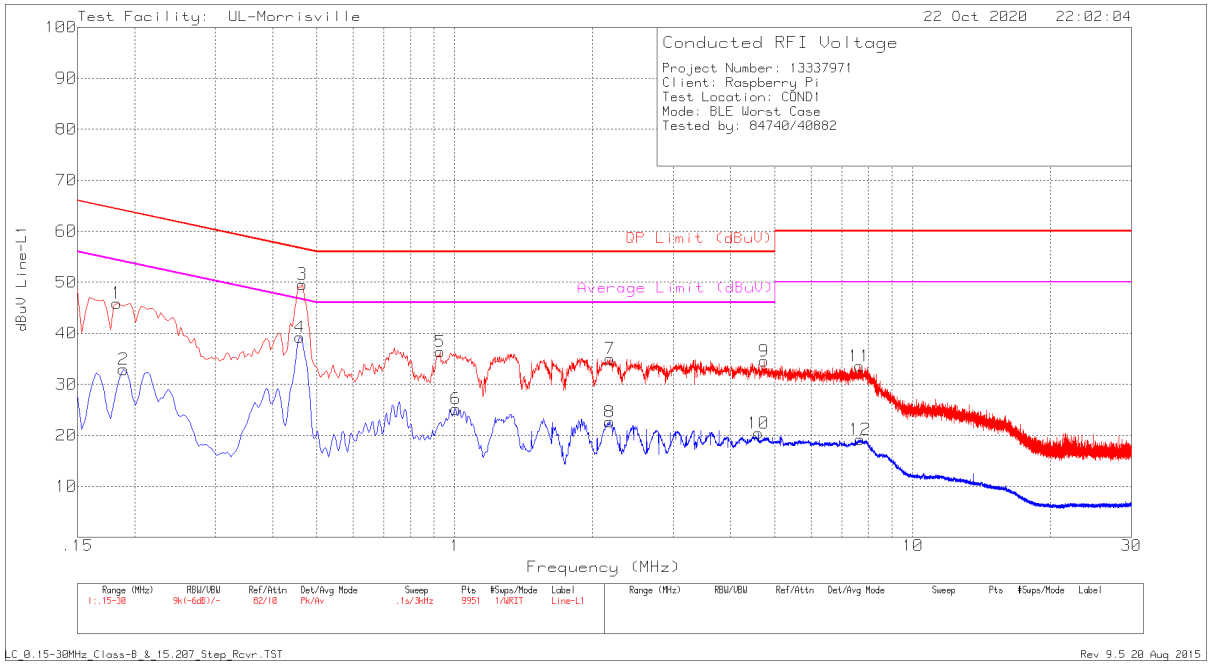
Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

RESULTS

11.1. ANTENNA 1

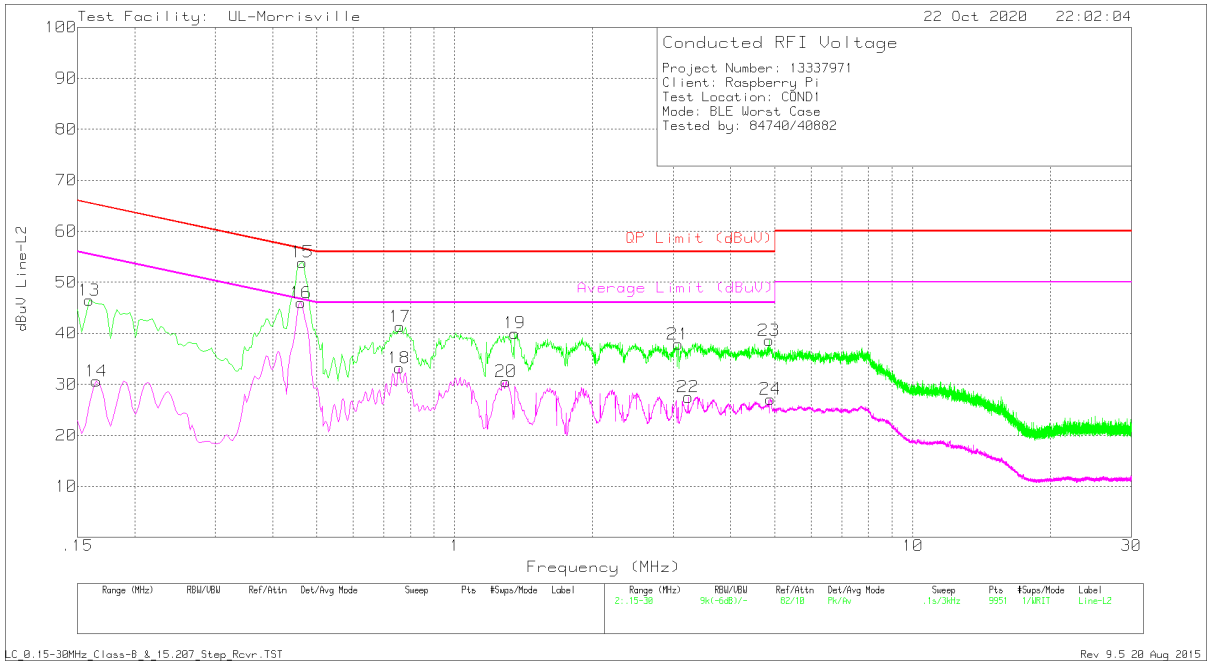
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.183	36.02	Pk	.2	9.7	45.92	64.35	-18.43	-	-
2	.189	23.02	Av	.2	9.7	32.92	-	-	54.08	-21.16
3	.465	39.71	Pk	.1	9.8	49.61	56.6	-6.99	-	-
4	.459	29.33	Av	.1	9.8	39.23	-	-	46.71	-7.48
5	.93	26.6	Pk	0	9.8	36.4	56	-19.6	-	-
6	1.005	15.37	Av	0	9.8	25.17	-	-	46	-20.83
7	2.181	25.21	Pk	0	9.8	35.01	56	-20.99	-	-
8	2.178	12.83	Av	0	9.8	22.63	-	-	46	-23.37
9	4.737	24.64	Pk	0	9.9	34.54	56	-21.46	-	-
10	4.602	10.51	Av	0	9.9	20.41	-	-	46	-25.59
11	7.65	23.45	Pk	.1	10	33.55	60	-26.45	-	-
12	7.662	9.06	Av	.1	10	19.16	-	-	50	-30.84

Pk - Peak detector
Av - Average detection

LINE 2 RESULTS

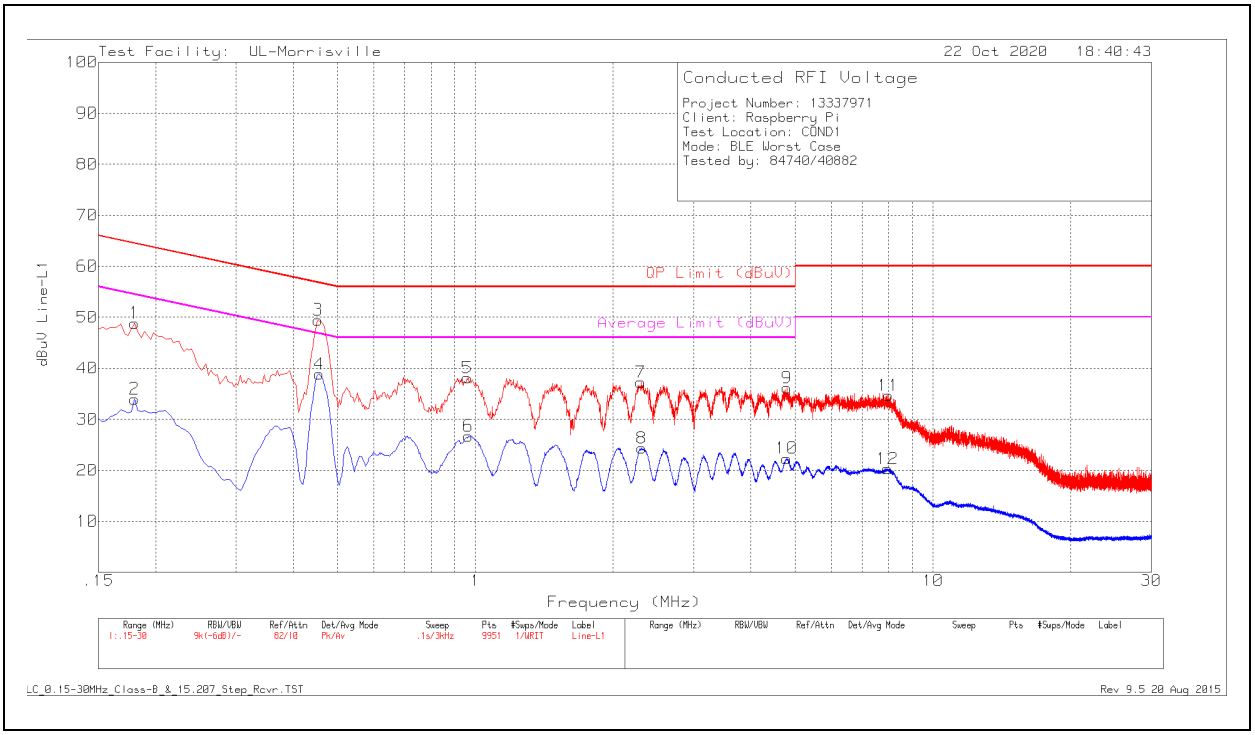


Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
13	.159	36.58	Pk	.2	9.7	46.48	65.52	-19.04	-	-
14	.165	20.69	Av	.2	9.7	30.59	-	-	55.21	-24.62
15	.46532	41.57	Qp	.1	9.8	51.47	56.6	-5.13	-	-
16	.46362	35.84	Ca	.1	9.8	45.74	-	-	46.63	-.89
17	.759	31.53	Pk	0	9.8	41.33	56	-14.67	-	-
18	.756	23.4	Av	0	9.8	33.2	-	-	46	-12.8
19	1.35	30.23	Pk	0	9.8	40.03	56	-15.97	-	-
20	1.293	20.76	Av	0	9.8	30.56	-	-	46	-15.44
21	3.072	28.1	Pk	0	9.8	37.9	56	-18.1	-	-
22	3.231	17.7	Av	0	9.8	27.5	-	-	46	-18.5
23	4.851	28.59	Pk	.1	9.9	38.59	56	-17.41	-	-
24	4.887	17.11	Av	.1	9.9	27.11	-	-	46	-18.89

Pk - Peak detector
Av - Average detection
Qp – Quasi-peak detection
Ca – CISPR average detection

11.2. ANTENNA 2

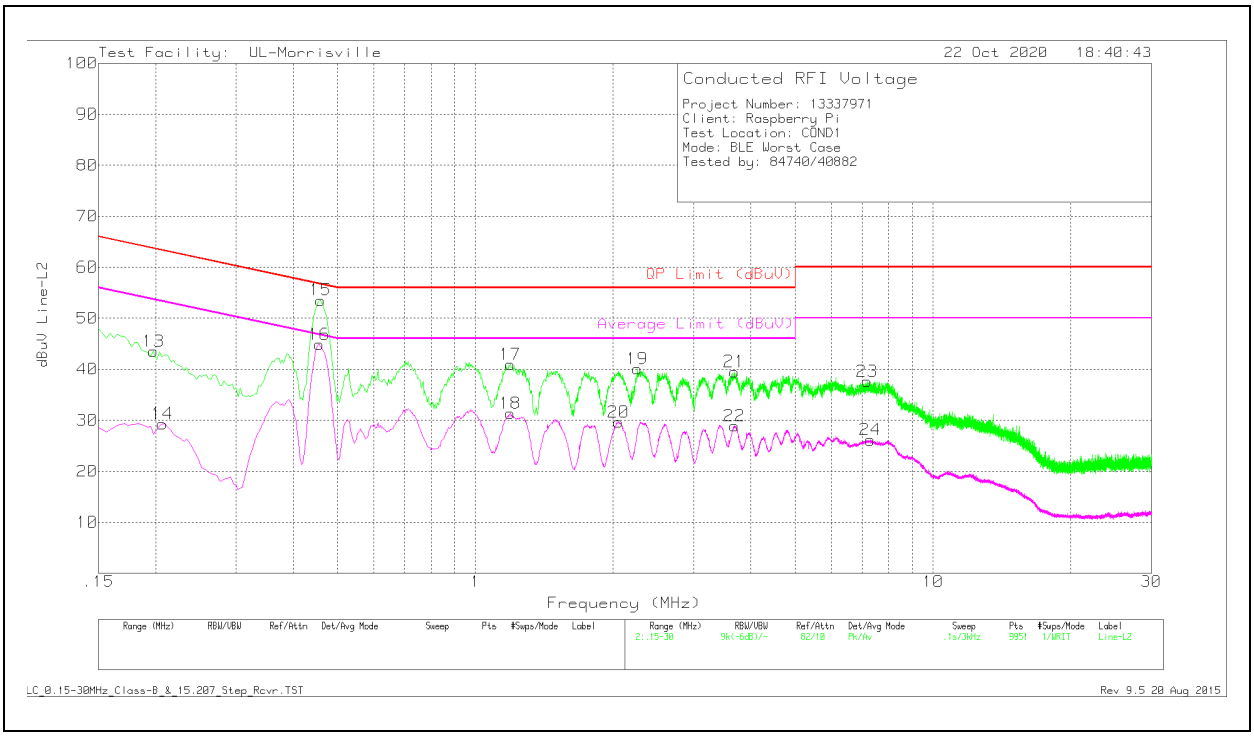
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.18	38.97	Pk	.2	9.7	48.87	64.49	-15.62	-	-
2	.18	24.09	Av	.2	9.7	33.99	-	-	54.49	-20.5
3	.453	39.58	Pk	.1	9.8	49.48	56.82	-7.34	-	-
4	.456	28.93	Av	.1	9.8	38.83	-	-	46.77	-7.94
5	.96	28.32	Pk	0	9.8	38.12	56	-17.88	-	-
6	.966	16.94	Av	0	9.8	26.74	-	-	46	-19.26
7	2.298	27.49	Pk	0	9.8	37.29	56	-18.71	-	-
8	2.307	14.52	Av	0	9.8	24.32	-	-	46	-21.68
9	4.8	26.27	Pk	0	9.9	36.17	56	-19.83	-	-
10	4.788	12.43	Av	0	9.9	22.33	-	-	46	-23.67
11	7.998	24.55	Pk	.1	10	34.65	60	-25.35	-	-
12	7.95	10.19	Av	.1	10	20.29	-	-	50	-29.71

Pk - Peak detector
Av - Average detection

LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
13	.198	33.66	Pk	.2	9.7	43.56	63.69	-20.13	-	-
14	.207	19.41	Av	.2	9.7	29.31	-	-	53.32	-24.01
15	.45763	40.49	Qp	.1	9.8	50.39	56.74	-6.35	-	-
16	.45547	35.41	Ca	.1	9.8	45.31	-	-	46.77	-1.46
17	1.191	31.14	Pk	0	9.8	40.94	56	-15.06	-	-
18	1.191	21.57	Av	0	9.8	31.37	-	-	46	-14.63
19	2.259	30.28	Pk	0	9.8	40.08	56	-15.92	-	-
20	2.055	19.86	Av	0	9.8	29.66	-	-	46	-16.34
21	3.681	29.63	Pk	0	9.9	39.53	56	-16.47	-	-
22	3.684	18.97	Av	0	9.9	28.87	-	-	46	-17.13
23	7.176	27.6	Pk	.1	9.9	37.6	60	-22.4	-	-
24	7.293	16.15	Av	.1	9.9	26.15	-	-	50	-23.85

Pk - Peak detector
Av - Average detection
Qp – Quasi-peak detection
Ca – CISPR average detection

12. SETUP PHOTOS

Please refer to R13337971-EP2 for setup photos.

END OF TEST REPORT

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