

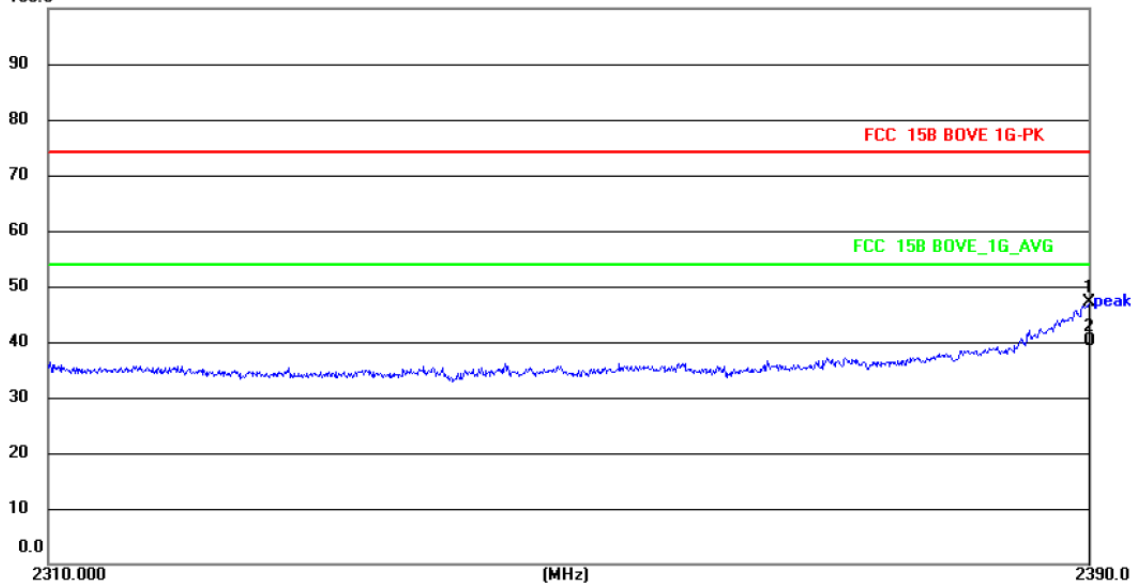
Radiated Emission Measurement

File :DAL5

Data :#144

Date: 2021/10/19

100.0 dBuV/m



Site 966 Chamber

Polarization: **Vertical**

Temperature: 26(C)

Limit: FCC 15B BOVE 1G-PK

Power: AC120V/60Hz

Humidity: 54 %

EUT: LED Bulb

Distance: 3m

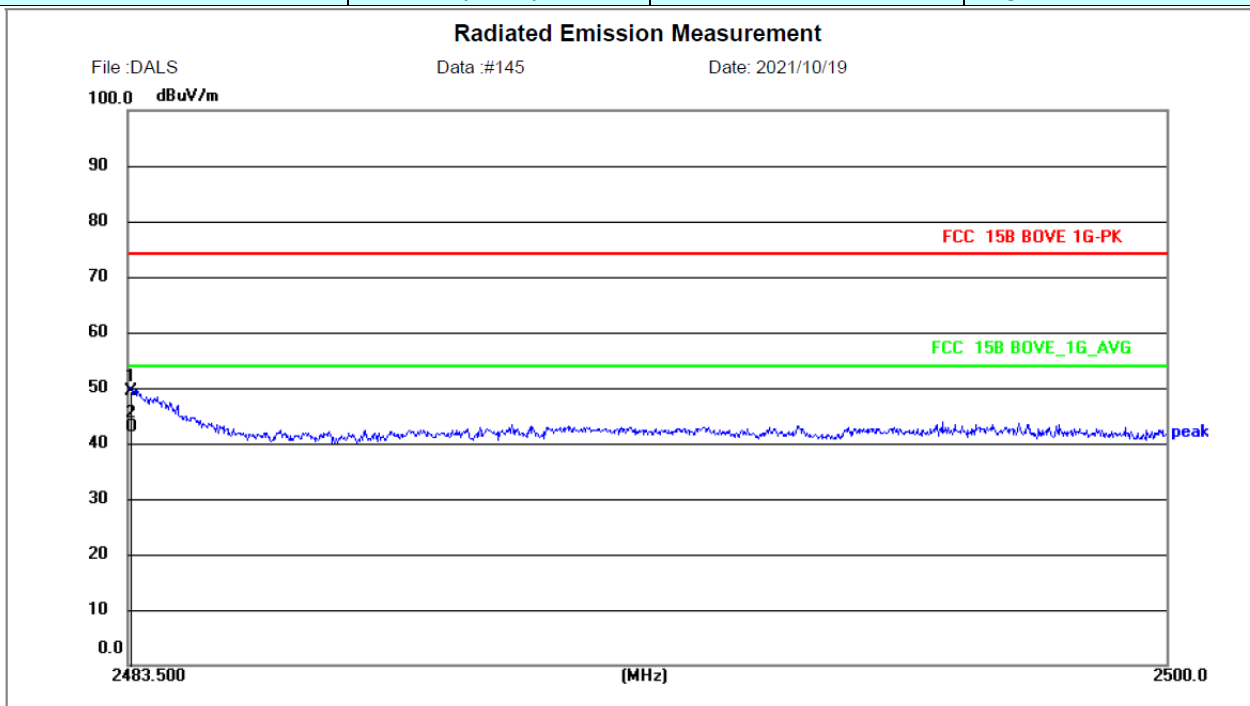
M/N: SM-BLBPAR20

Mode: WIFI 2422 MHz n(HT40)

Note: DAL5 Lighting Inc. Operator:Jason

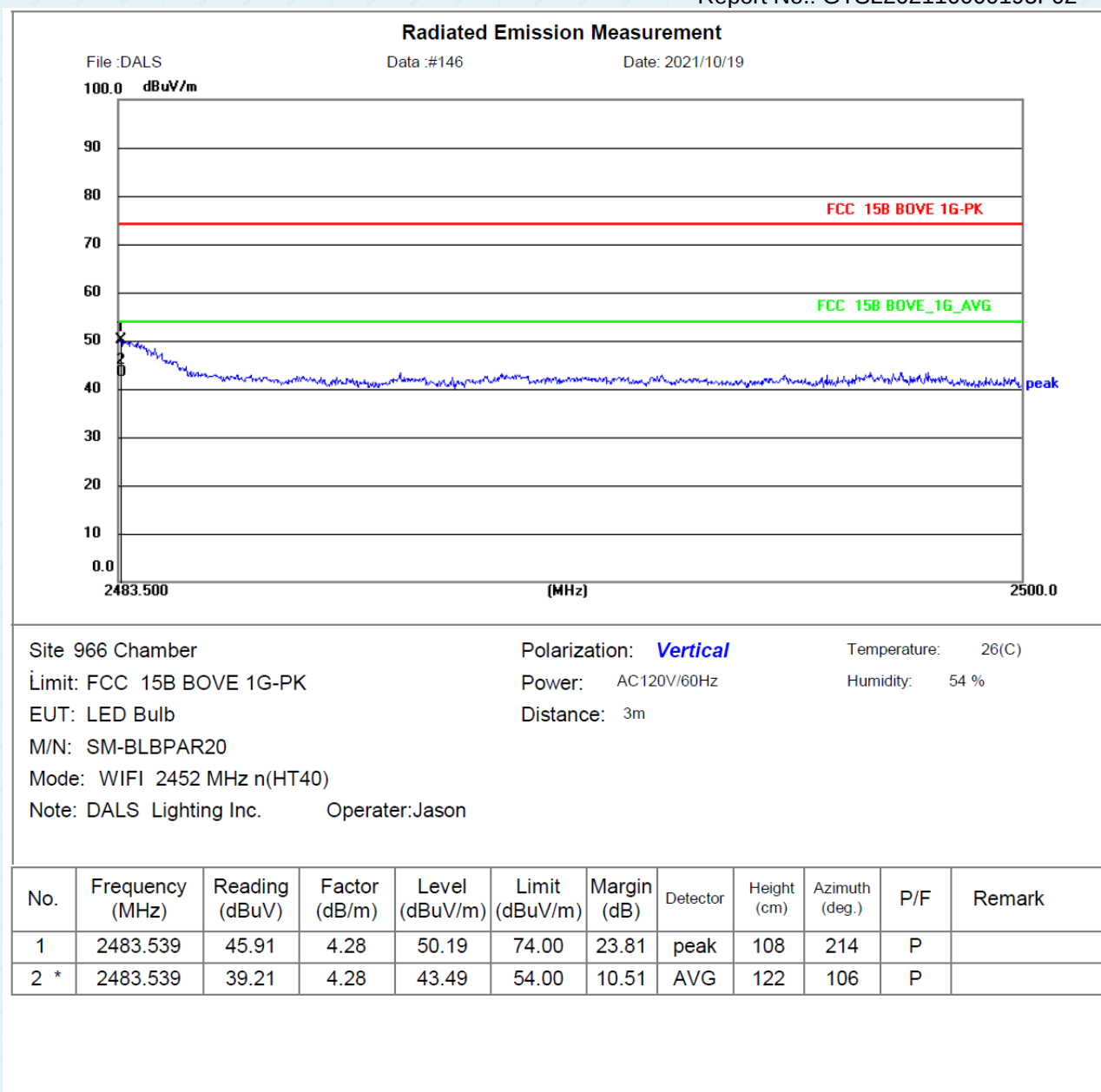
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2390.000	43.26	3.90	47.16	74.00	26.84	peak	127	242	P	
2 *	2390.000	36.17	3.90	40.07	54.00	13.93	AVG	115	206	P	

Test mode:	802.11n(HT40)	Test channel:	Highest
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Site 966 Chamber	Polarization: Horizontal	Temperature: 26(C)
Limit: FCC 15B BOVE 1G-PK	Power: AC120V/60Hz	Humidity: 54 %
EUT: LED Bulb	Distance: 3m	
M/N: SM-BLBP20		
Mode: WIFI 2452 MHz n(HT40)		
Note: DAL5 Lighting Inc.	Operator: Jason	

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.539	45.02	4.28	49.30	74.00	24.70	peak	119	54	P	
2 *	2483.539	38.65	4.28	42.93	54.00	11.07	AVG	126	103	P	

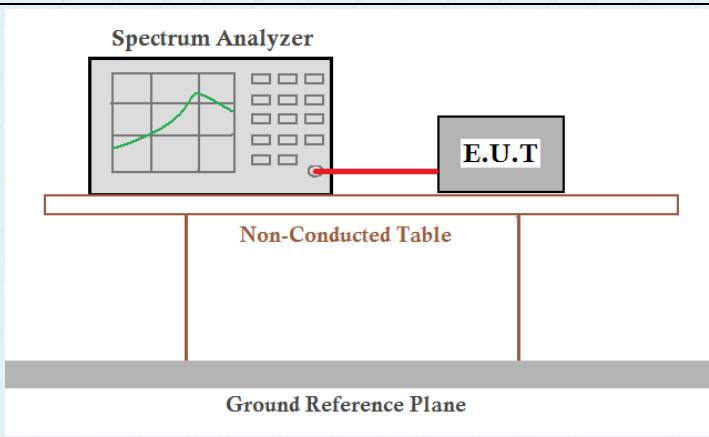


Remarks:

- The tests were performed on lowest and highest frequencies.
- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The emission levels of other frequencies are very lower than the limit and not show in test report.

7.7 Spurious Emission

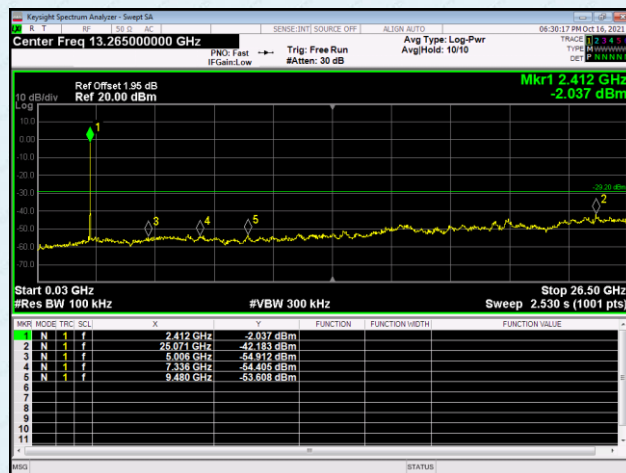
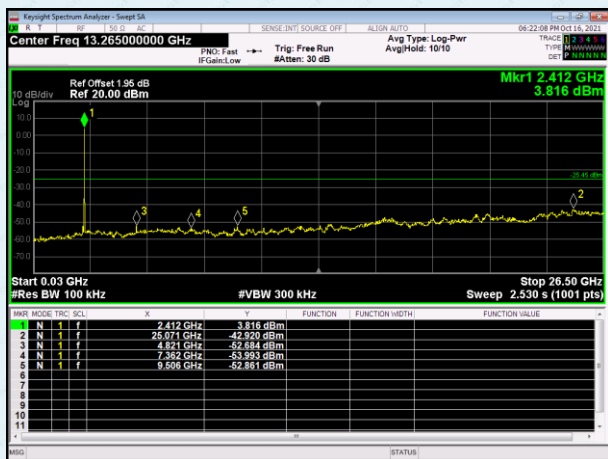
7.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d) RSS-247 Section 5.5
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02 ANSI C63.10:2013 & RSS-Gen
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Test plot as follows:

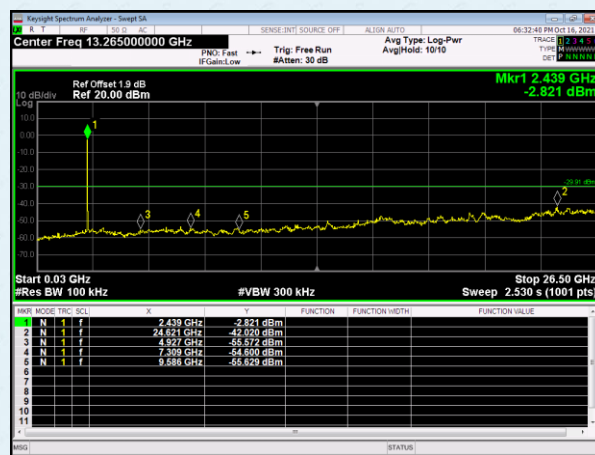
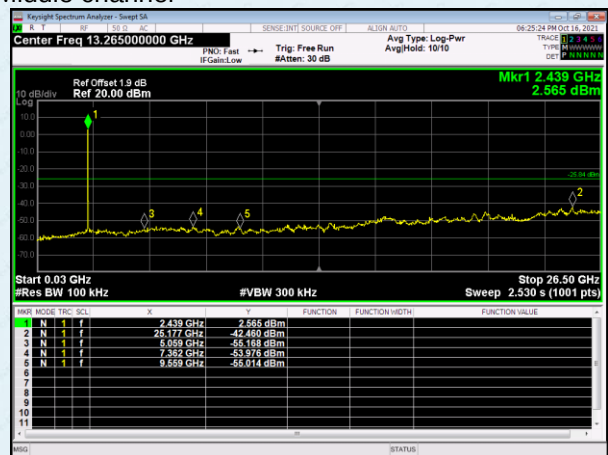
Test mode:	802.11b	Test mode:	802.11g
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Lowest channel



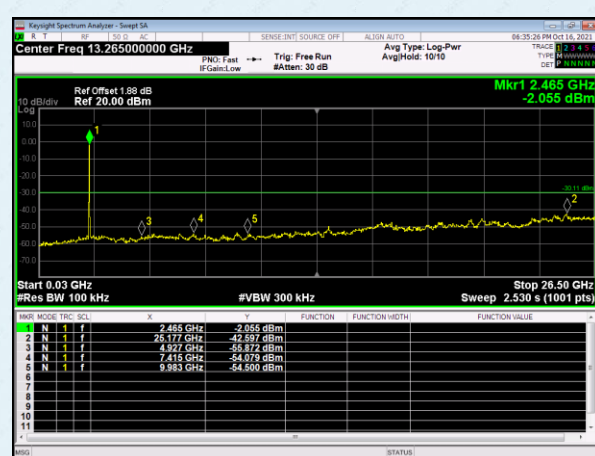
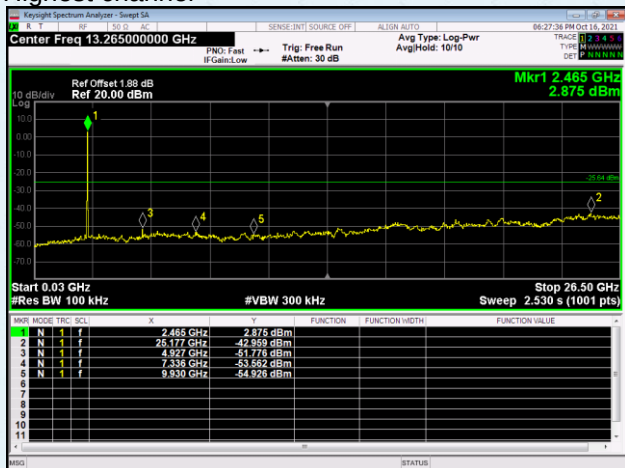
30MHz~26.5GHz

Middle channel



30MHz~26.5GHz

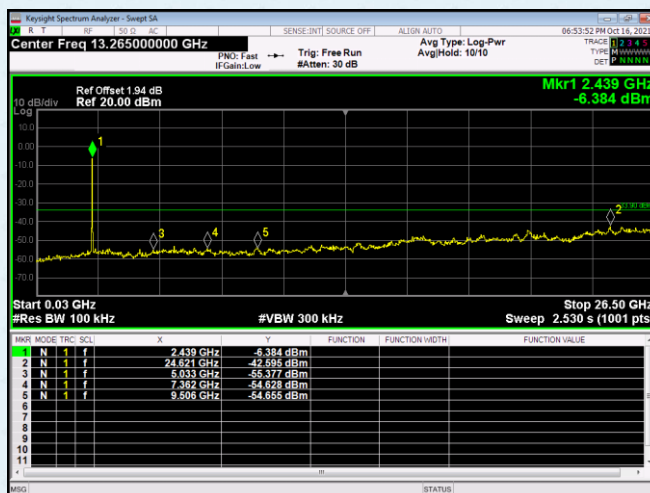
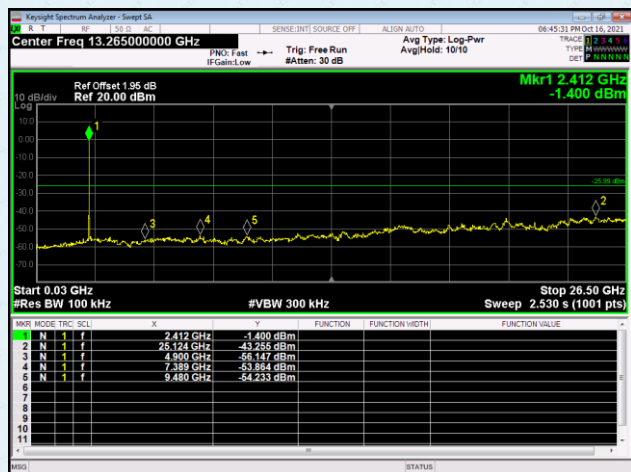
Highest channel



30MHz~26.5GHz

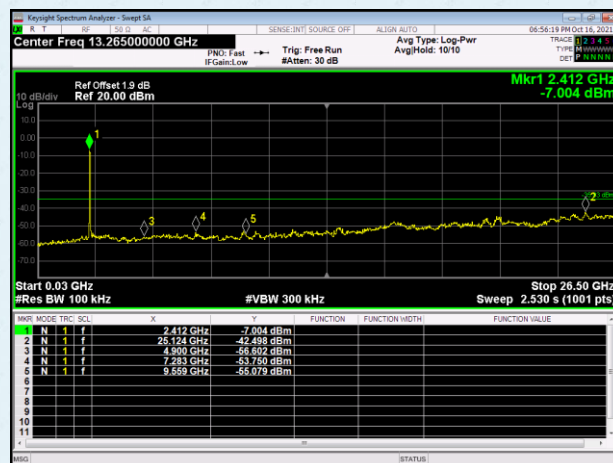
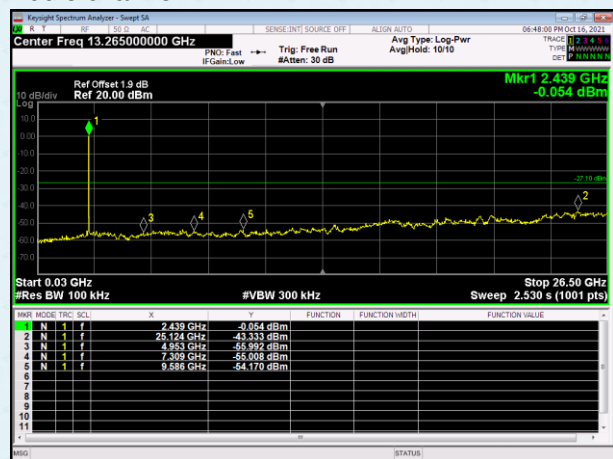
Test mode:	802.11n(HT20)	Test mode:	802.11n(HT40)
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Lowest channel



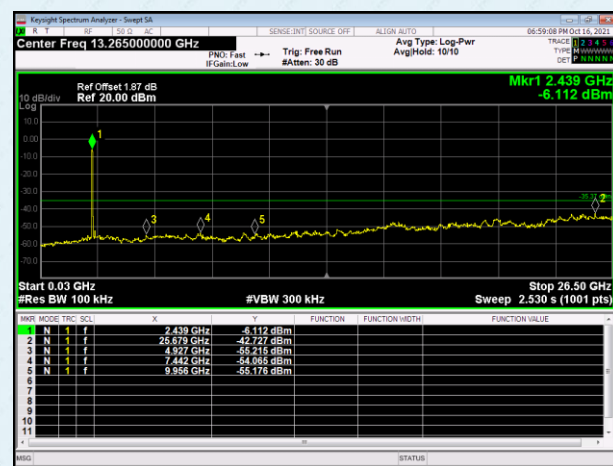
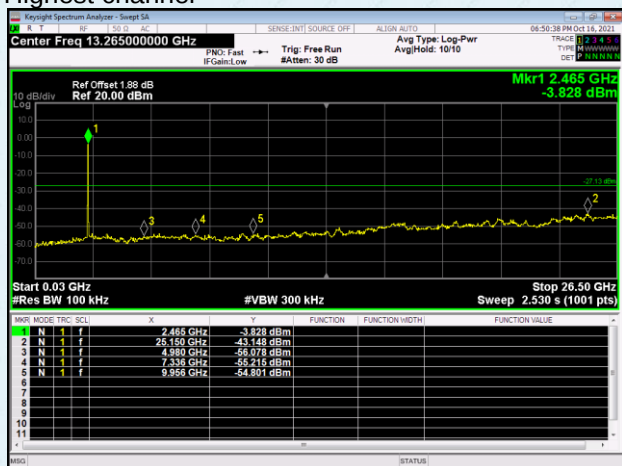
30MHz~26.5GHz

Middle channel



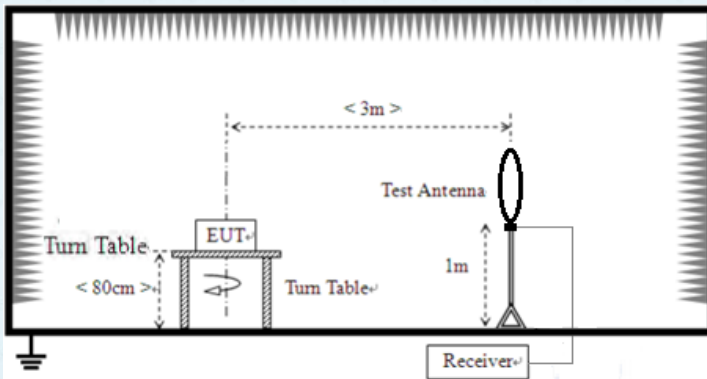
30MHz~26.5GHz

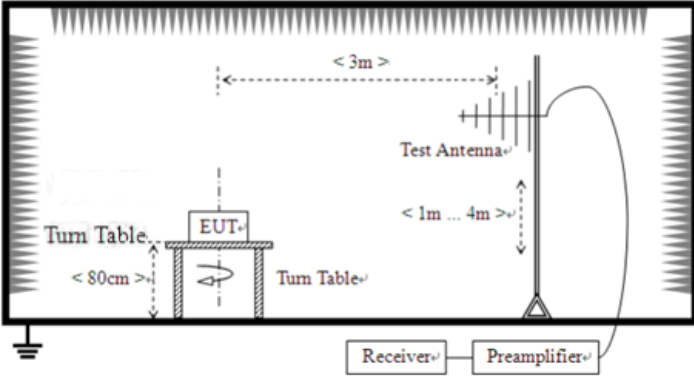
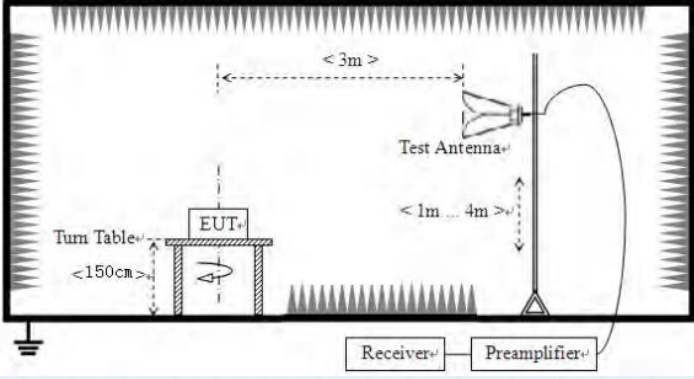
Highest channel



30MHz~26.5GHz

7.7.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 RSS-247 Section 3.3 & RSS-Gen Section 8.9				
Test Method:	ANSI C63.10: 2013 & RSS-Gen				
Test Frequency Range:	9kHz to 26.5GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Peak		1MHz	10Hz	Average	
Limit:	Frequency	Limit (uV/m)	Value	Measurement Distance	
	0.009MHz-0.490MHz	2400/F(KHz)	QP	300m	
	0.490MHz-1.705MHz	24000/F(KHz)	QP	300m	
	1.705MHz-30MHz	30	QP	30m	
	30MHz-88MHz	100	QP	3m	
	88MHz-216MHz	150	QP		
	216MHz-960MHz	200	QP		
	960MHz-1GHz	500	QP		
	Above 1GHz	500	Average		
5000		Peak			
Test setup:	For radiated emissions from 9kHz to 30MHz				
					
	For radiated emissions from 30MHz to 1GHz				

	 For radiated emissions above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details

Test environment:	Temp.:	26 °C	Humid.:	54%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Remarks:

1. Only the worst case Main Antenna test data.
2. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

Measurement data:

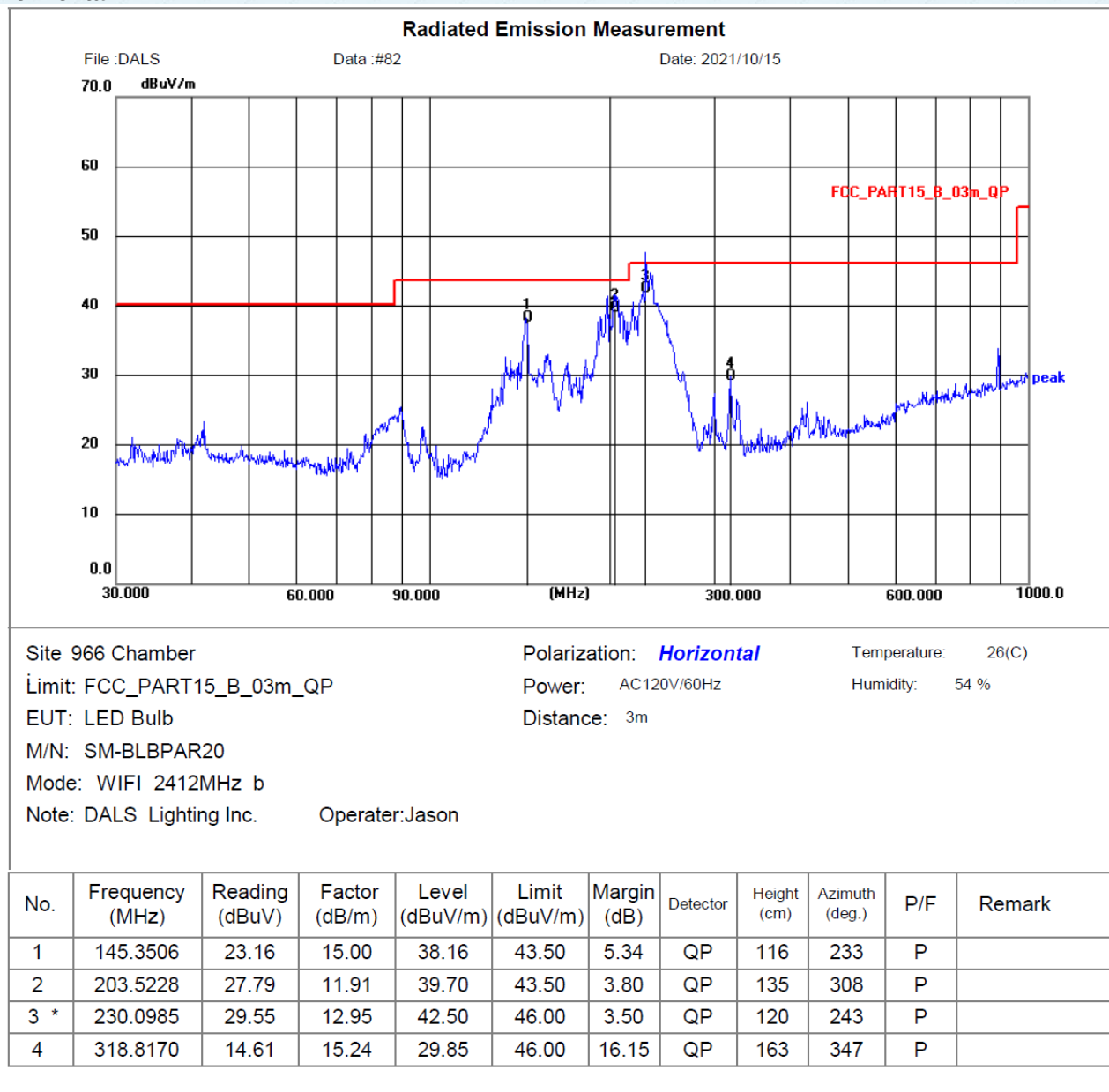
■ **9kHz~30MHz**

The emission from 9 kHz-30MHz and 18-26.5GHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

Below 1GHz

Pre-scan all test modes, found worst case at 802.11b 2412MHz, and so only show the test result of 802.11b 2412MHz

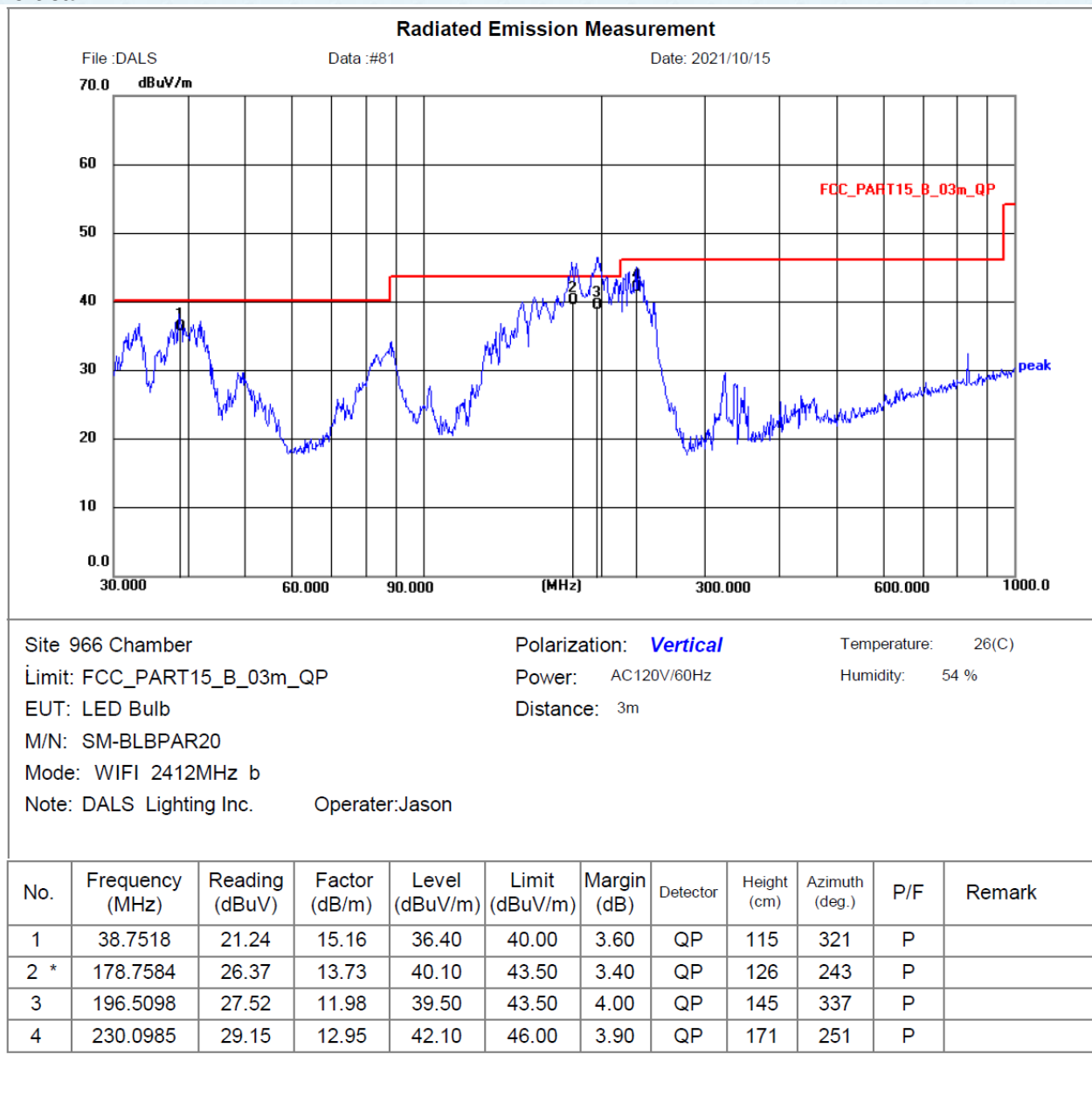
Horizontal:



Remark:

- 1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2 The emission levels of other frequencies are very lower than the limit and not show in test report.

Vertical:



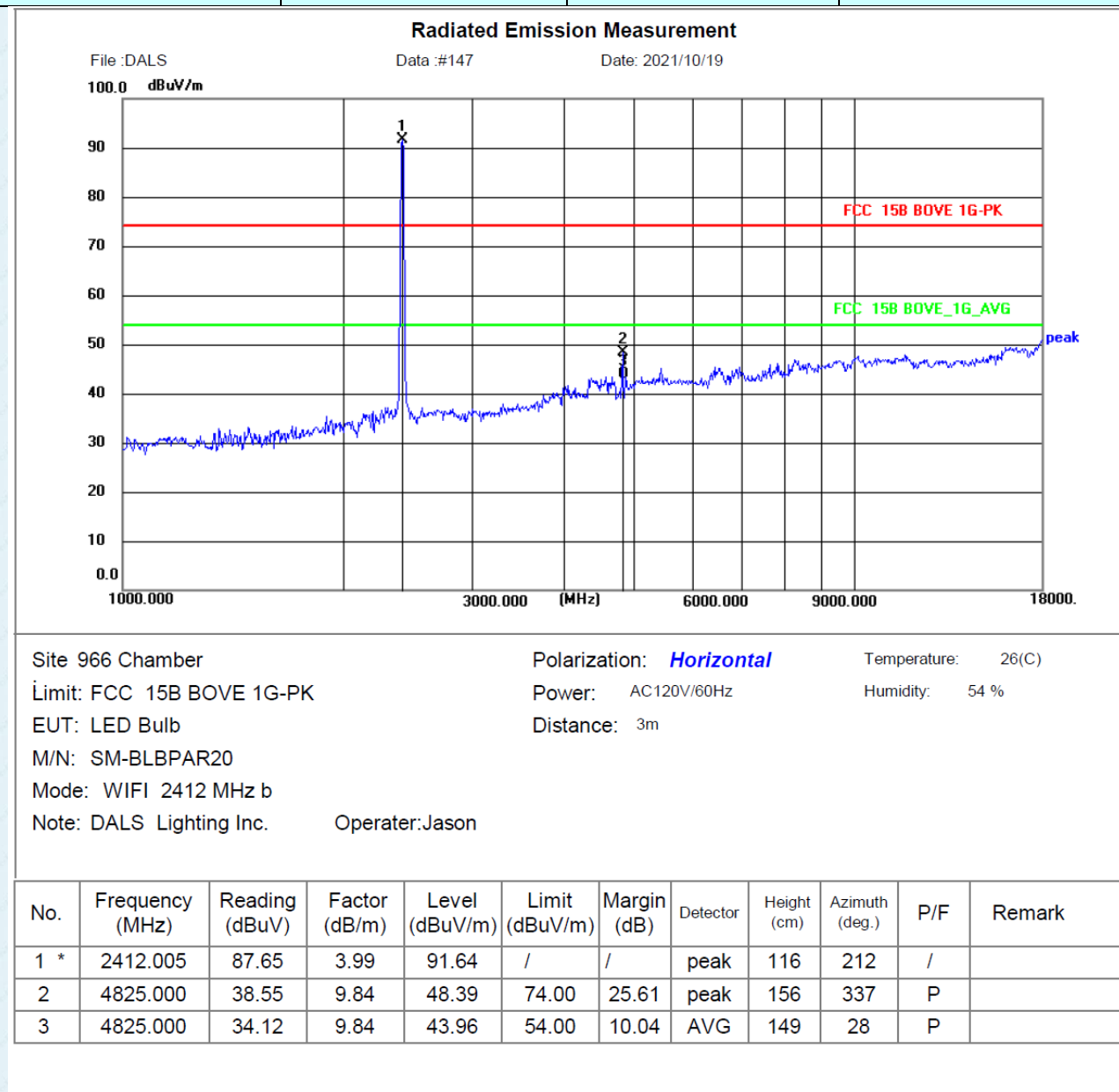
Remark:

- 1 Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2 The emission levels of other frequencies are very lower than the limit and not show in test report.

Above 1GHz

Pre-scan all test modes, found worst case at 802.11b, and so only show the test result of 802.11b.

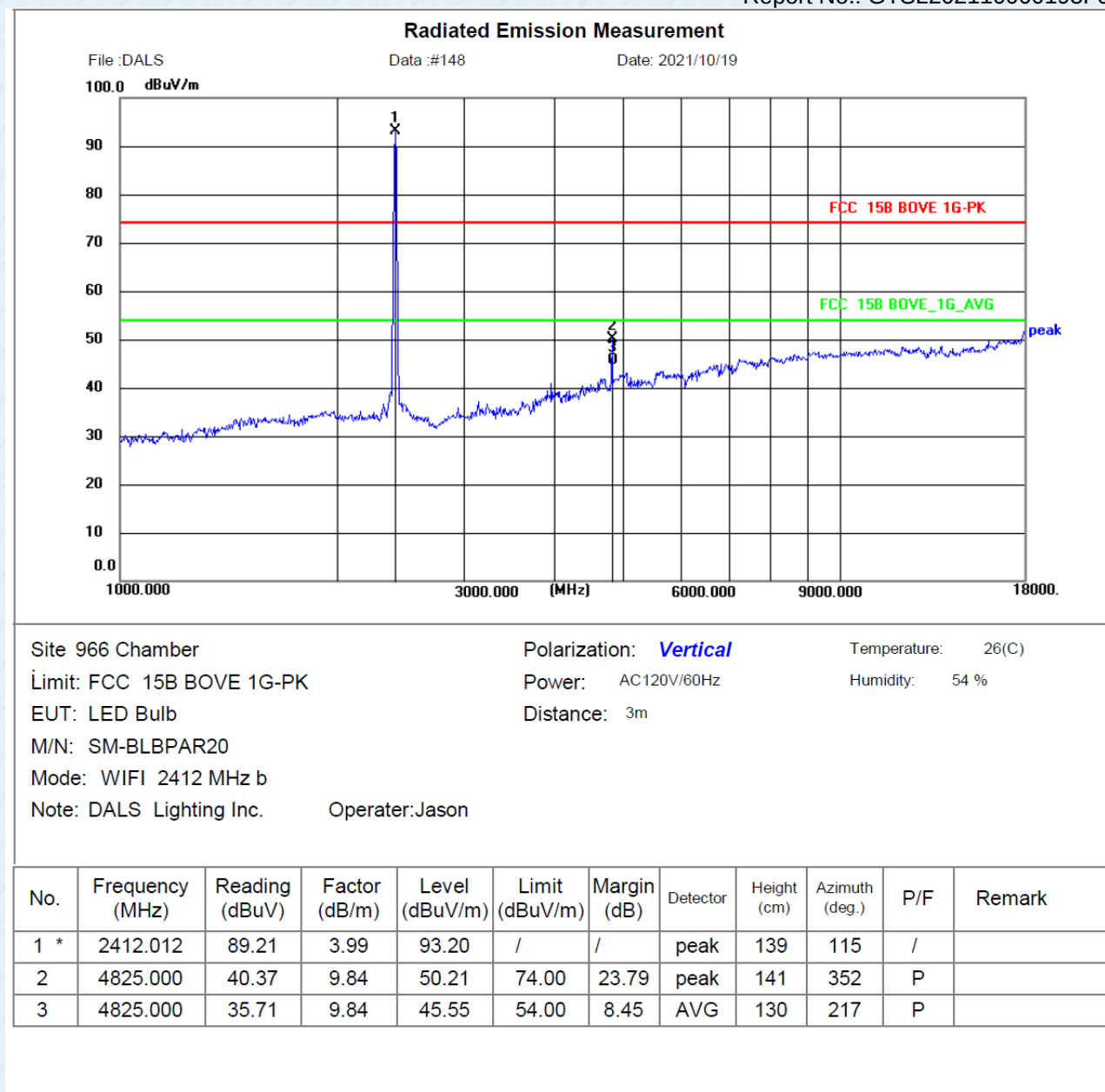
Test mode:	802.11b	Test channel:	Lowest
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Remark:

- Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The emission levels of other frequencies are very lower than the limit and not show in test report

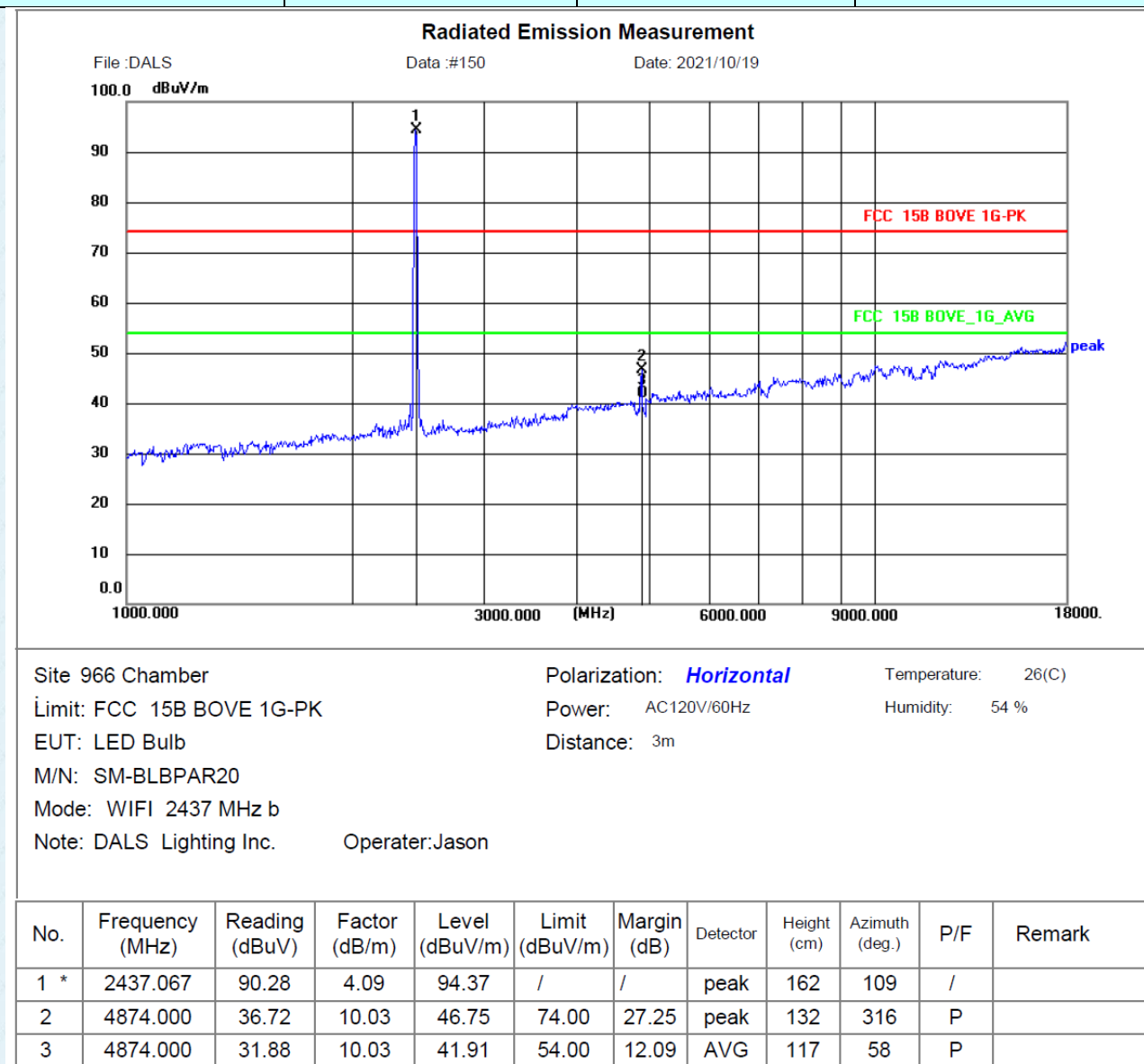
Test mode:	802.11b	Test channel:	Lowest
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Remark:

- 1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2 The emission levels of other frequencies are very lower than the limit and not show in test report.

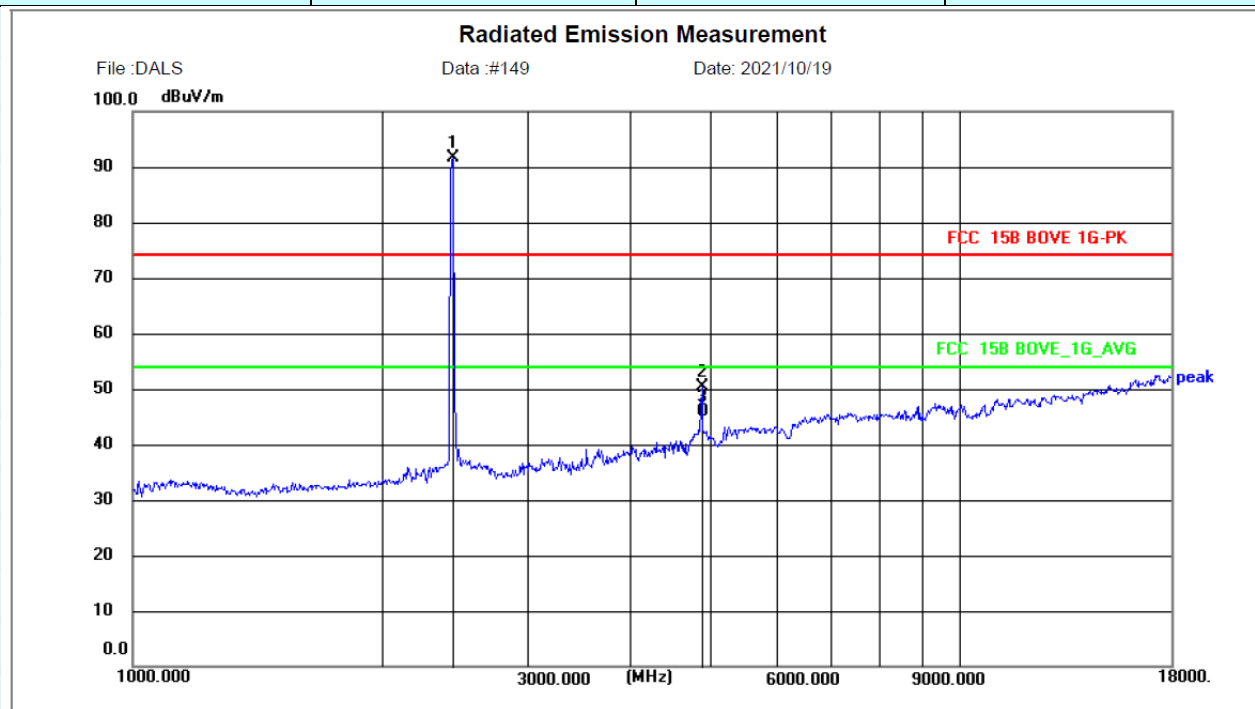
Test mode:	802.11b	Test channel:	Middle
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Remark:

- 1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2 The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode:	802.11b	Test channel:	Middle
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Site 966 Chamber

Polarization: **Vertical**

Temperature: 26(C)

Limit: FCC 15B BOVE 1G-PK

Power: AC120V/60Hz

Humidity: 54 %

EUT: LED Bulb

Distance: 3m

M/N: SM-BLBP20

Mode: WIFI 2437 MHz b

Note: DAL5 Lighting Inc.

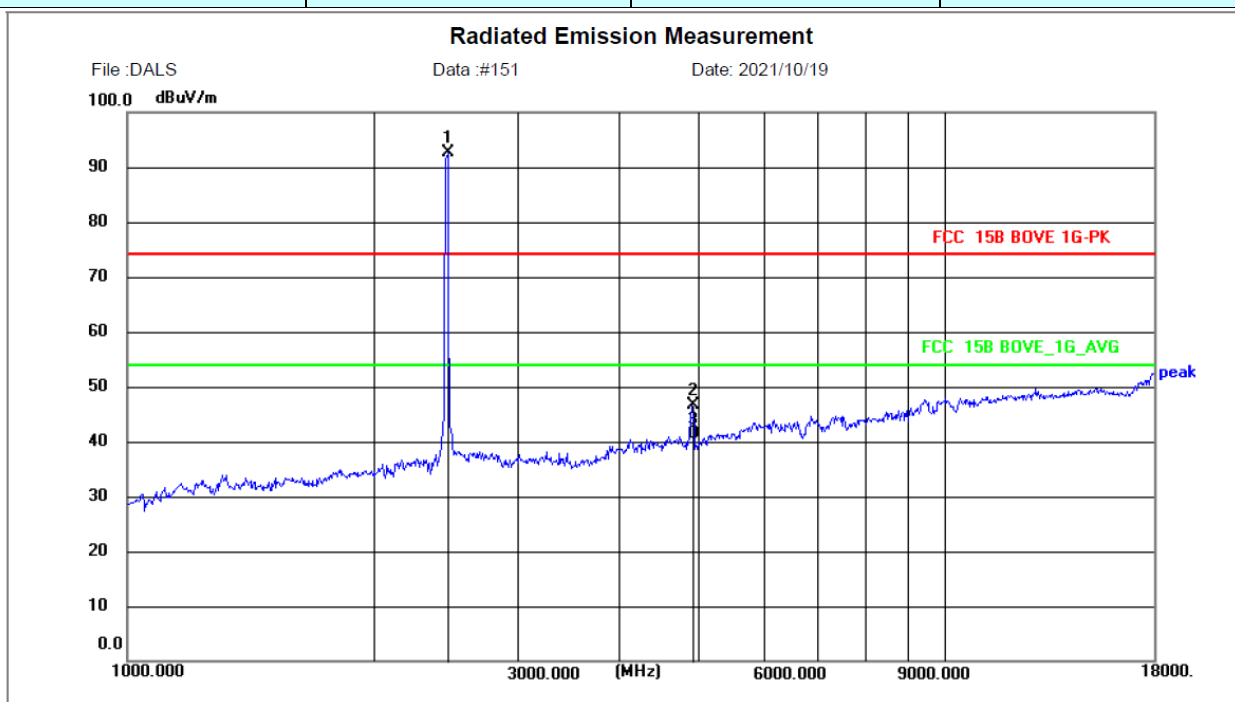
Operator: Jason

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	2437.024	87.52	4.09	91.61	/	/	peak	152	165	/	
2	4876.000	40.34	10.05	50.39	74.00	23.61	peak	148	317	P	
3	4876.000	35.76	10.05	45.81	54.00	8.19	AVG	134	331	P	

Remark:

- 1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2 The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode:	802.11b	Test channel:	Highest
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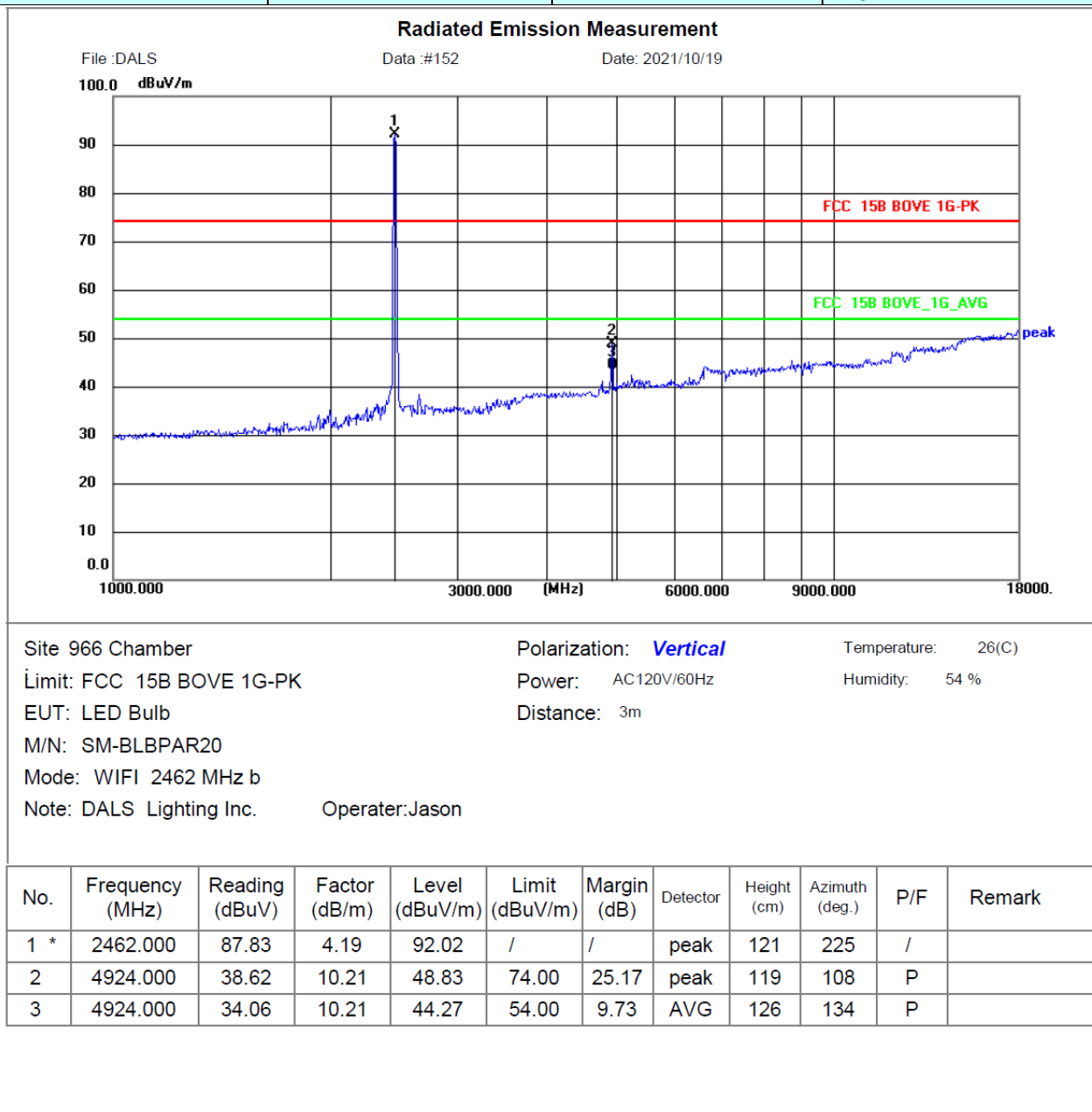
Site 966 Chamber	Polarization: Horizontal	Temperature: 26(C)
Limit: FCC 15B BOVE 1G-PK	Power: AC120V/60Hz	Humidity: 54 %
EUT: LED Bulb	Distance: 3m	
M/N: SM-BLBP20		
Mode: WIFI 2462 MHz b		
Note: DAL5 Lighting Inc.	Operator: Jason	

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	2462.167	88.52	4.19	92.71	/	/	peak	146	229	/	
2	4915.667	36.43	10.18	46.61	74.00	27.39	peak	151	102	P	
3	4915.667	31.29	10.18	41.47	54.00	12.53	AVG	138	59	P	

Remark:

- Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode:	802.11b	Test channel:	Highest
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Remark:

- Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode:	802.11b	Test channel:	Lowest
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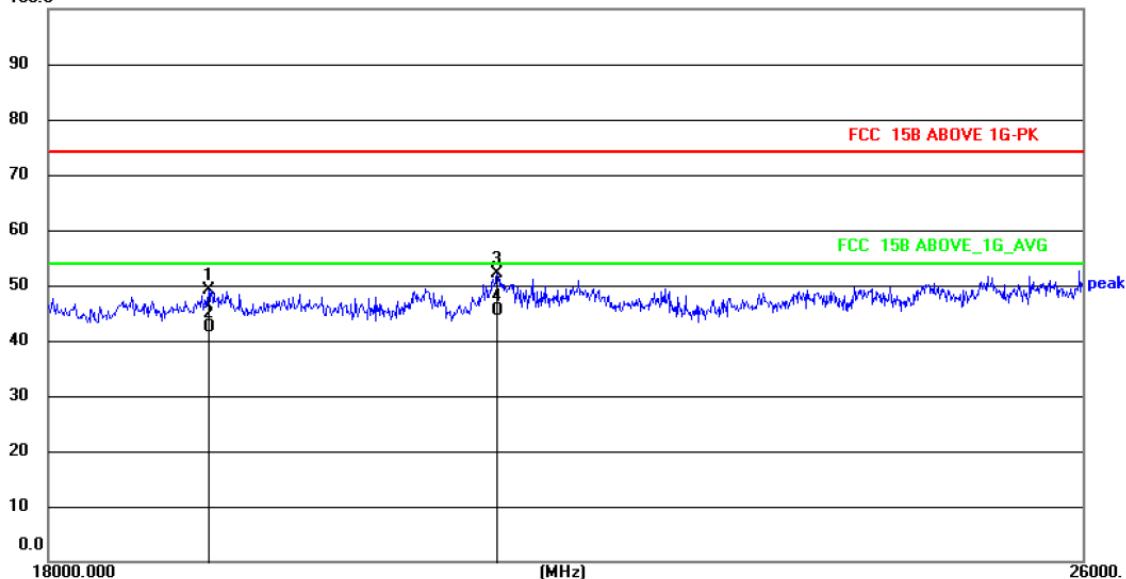
Radiated Emission Measurement

File :DALS

Data :#91

Date: 2021/10/15

100.0 dBuV/m



Site 966 Chamber

Polarization: **Horizontal**

Temperature: 26(C)

Limit: FCC 15B ABOVE 1G-PK

Power: AC120V/60Hz

Humidity: 54 %

EUT: LED Bulb

Distance: 3m

M/N: SM-BLBP20

Mode: WIFI 2412MHz b

Note: DALS Lighting Inc.

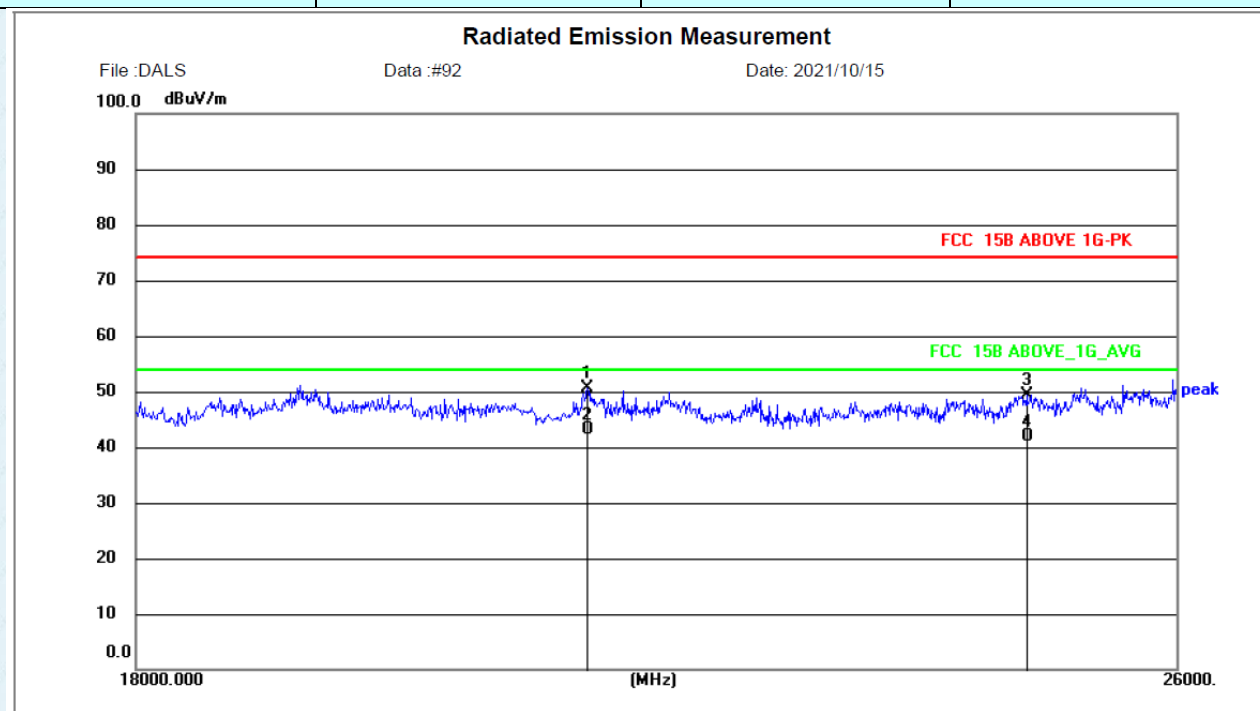
Operator: Jason

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	19056.000	26.43	22.78	49.21	74.00	24.79	peak	108	214	P	
2	19056.000	19.52	22.78	42.30	54.00	11.70	AVG	126	235	P	
3	21120.000	29.23	22.84	52.07	74.00	21.93	peak	133	240	P	
4 *	21120.000	22.65	22.84	45.49	54.00	8.51	AVG	156	312	P	

Remark:

- 1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2 The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode:	802.11b	Test channel:	Lowest
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Site 966 Chamber

Polarization: **Vertical**

Temperature: 26(C)

Limit: FCC 15B ABOVE 1G-PK

Power: AC120V/60Hz

Humidity: 54 %

EUT: LED Bulb

Distance: 3m

M/N: SM-BLBP20

Mode: WIFI 2412MHz b

Note: DALS Lighting Inc.

Operator: Jason

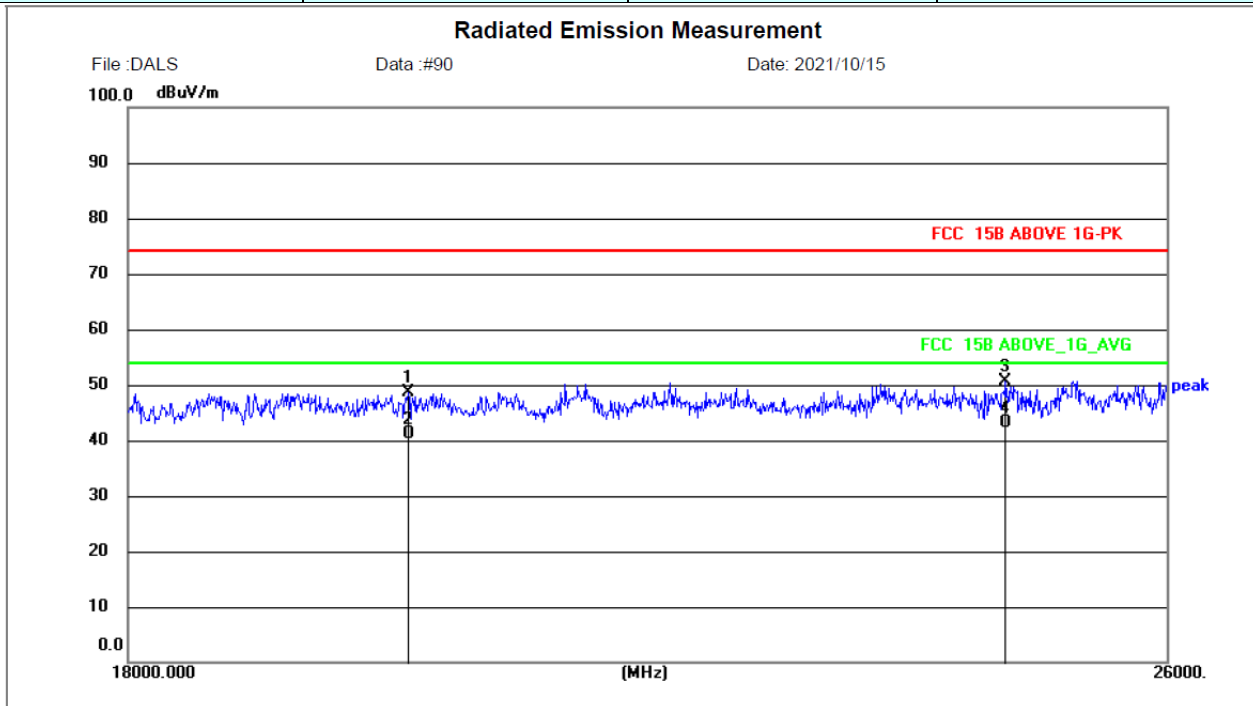
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	21120.000	27.73	22.84	50.57	74.00	23.43	peak	140	245	P	
2 *	21120.000	20.41	22.84	43.25	54.00	10.75	AVG	156	236	P	
3	24664.000	28.87	20.58	49.45	74.00	24.55	peak	128	211	P	
4	24664.000	21.40	20.58	41.98	54.00	12.02	AVG	115	251	P	

Remark:

1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2 The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode:	802.11b	Test channel:	Middle
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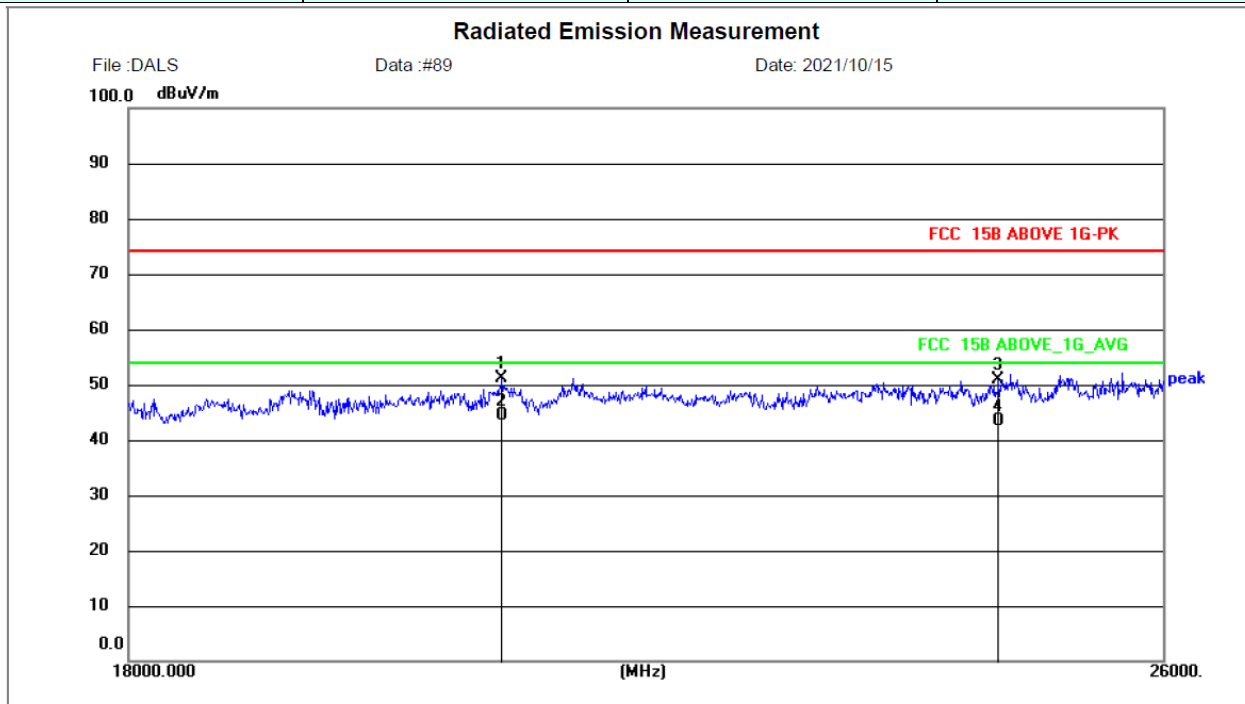
Site 966 Chamber Polarization: **Horizontal** Temperature: 26(C)
Limit: FCC 15B ABOVE 1G-PK Power: AC120V/60Hz Humidity: 54 %
EUT: LED Bulb Distance: 3m
M/N: SM-BLBP20
Mode: WIFI 2437MHz b
Note: DALS Lighting Inc. Operater:Jason

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	19880.000	25.67	22.85	48.52	74.00	25.48	peak	122	254	P	
2	19880.000	18.36	22.85	41.21	54.00	12.79	AVG	136	241	P	
3	24568.000	29.91	20.61	50.52	74.00	23.48	peak	115	147	P	
4 *	24568.000	22.41	20.61	43.02	54.00	10.98	AVG	136	255	P	

Remark:

- 1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2 The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode:	802.11b	Test channel:	Middle
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Site 966 Chamber

Polarization: **Vertical**

Temperature: 26(C)

Limit: FCC 15B ABOVE 1G-PK

Power: AC120V/60Hz

Humidity: 54 %

EUT: LED Bulb

Distance: 3m

M/N: SM-BLBP20

Mode: WIFI 2437MHz b

Note: DAL5 Lighting Inc.

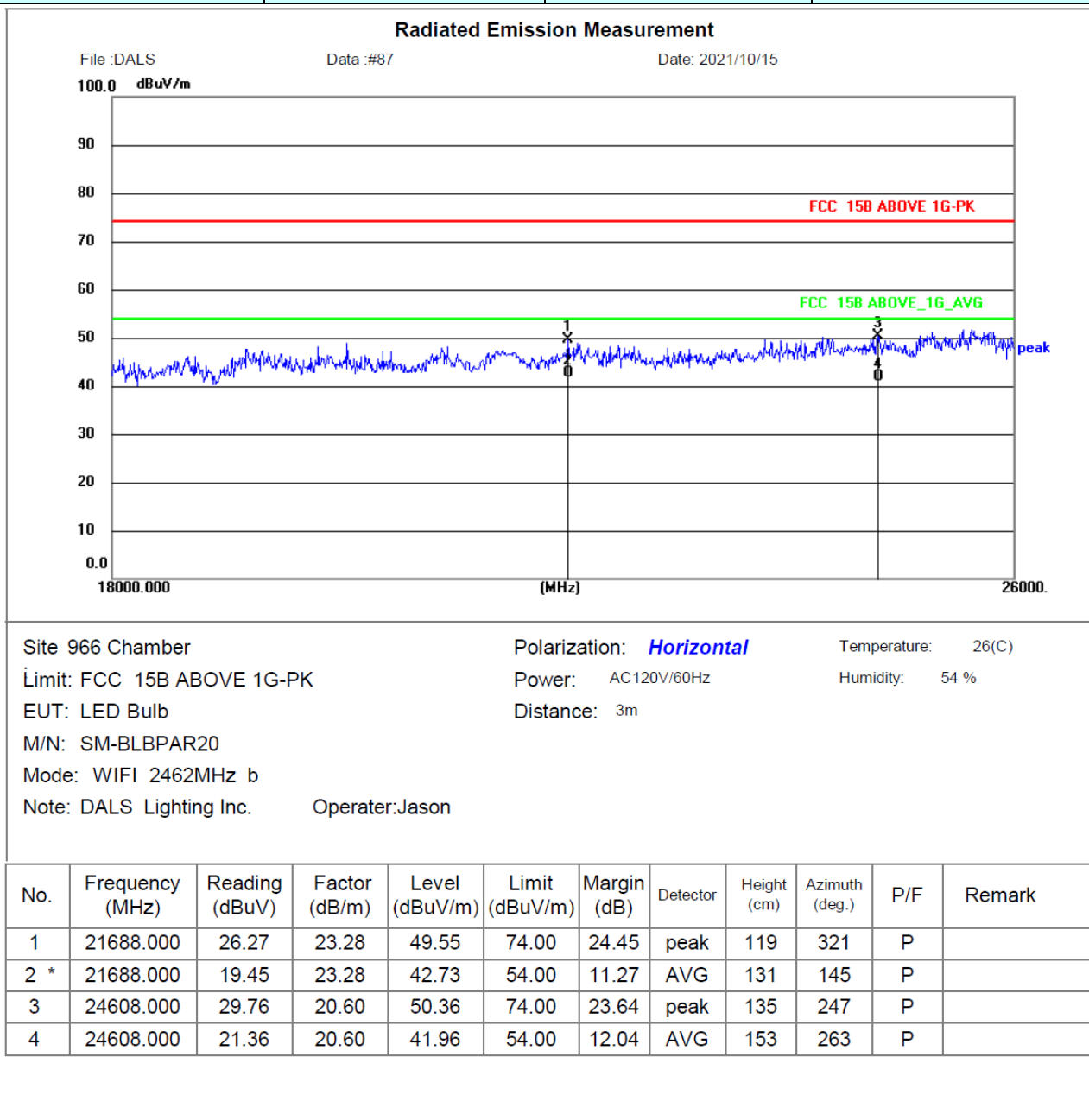
Operator: Jason

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	20560.000	28.33	22.80	51.13	74.00	22.87	peak	125	263	P	
2 *	20560.000	21.65	22.80	44.45	54.00	9.55	AVG	141	239	P	
3	24528.000	30.33	20.66	50.99	74.00	23.01	peak	175	245	P	
4	24528.000	22.69	20.66	43.35	54.00	10.65	AVG	132	124	P	

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The emission levels of other frequencies are very lower than the limit and not show in test report.

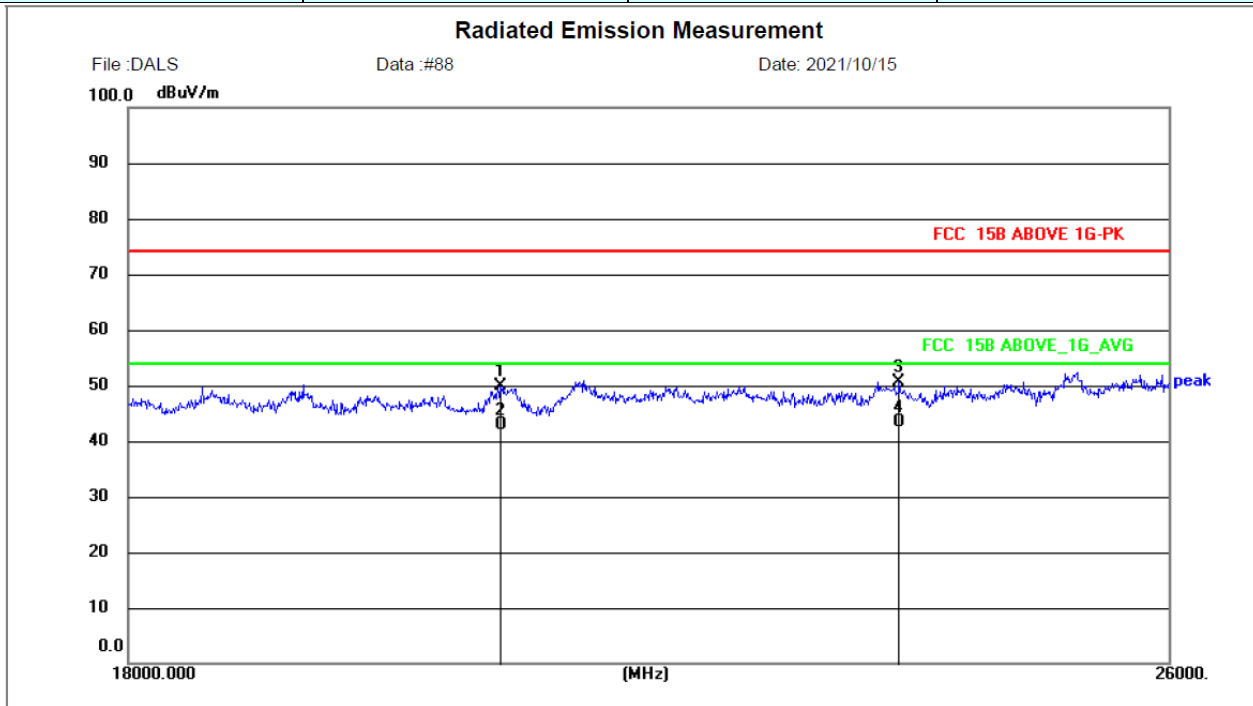
Test mode:	802.11b	Test channel:	Highest
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Remark:

- 1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2 The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode:	802.11b	Test channel:	Highest
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Site 966 Chamber

Polarization: **Vertical**

Temperature: 26(C)

Limit: FCC 15B ABOVE 1G-PK

Power: AC120V/60Hz

Humidity: 54 %

EUT: LED Bulb

Distance: 3m

M/N: SM-BLBP20

Mode: WIFI 2462MHz b

Note: DALS Lighting Inc.

Operater:Jason

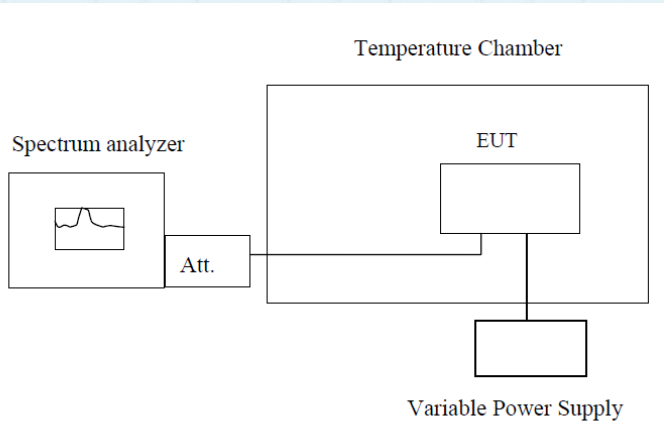
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	20536.000	27.18	22.81	49.99	74.00	24.01	peak	162	245	P	
2	20536.000	20.15	22.81	42.96	54.00	11.04	AVG	119	219	P	
3	23640.000	28.89	21.86	50.75	74.00	23.25	peak	127	125	P	
4 *	23640.000	21.63	21.86	43.49	54.00	10.51	AVG	113	203	P	

Remark:

1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2 The emission levels of other frequencies are very lower than the limit and not show in test report.

7.8 Frequency stability

Test Requirement:	RSS-Gen Section 6.11& Section 8.11
Test Method:	ANSI C63.10: 2013 & RSS-Gen
Limit:	Manufactures of devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified
Test Procedure:	The EUT was setup to ANSI C63.10, 2013; tested to 2.1055 for compliance to RSS-Gen requirements.
Test setup:	 Note : Measurement setup for testing on Antenna connector
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Remark: Set the EUT transmits at un-modulation mode to test frequency stability.

Measurement data:

Frequency stability versus Temp.						
Power Supply: AC 120V/60Hz						
Temp. (°C)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)	Pass /Fail
-30	2412	2411.998	2412.001	2412.002	2412.001	Pass
	2422	2422.002	2422.002	2422.001	2422.000	Pass
	2437	2436.998	2436.997	2436.997	2436.997	Pass
	2452	2452.001	2452.001	2452.000	2451.999	Pass
	2462	2462.001	2462.000	2462.001	2462.002	Pass
-20	2412	2411.999	2412.000	2412.000	2412.001	Pass
	2422	2422.001	2422.003	2422.001	2421.995	Pass
	2437	2436.997	2436.996	2436.996	2436.996	Pass
	2452	2452.001	2452.003	2451.995	2452.000	Pass
	2462	2462.000	2462.000	2462.002	2462.003	Pass
-10	2412	2412.001	2411.998	2412.001	2411.996	Pass
	2422	2422.002	2422.000	2422.000	2422.002	Pass
	2437	2436.998	2436.997	2436.999	2437.001	Pass
	2452	2452.002	2452.001	2452.002	2452.000	Pass
	2462	2462.001	2462.003	2462.003	2462.004	Pass
0	2412	2412.002	2411.998	2412.001	2412.001	Pass
	2400	2422.001	2422.002	2421.997	2422.003	Pass
	2437	2436.997	2436.999	2436.996	2436.995	Pass
	2452	2452.000	2452.001	2452.000	2452.002	Pass
	2462	2462.002	2462.000	2462.002	2462.001	Pass
10	2412	2412.001	2411.997	2412.003	2412.000	Pass
	2422	2422.002	2422.000	2422.000	2422.002	Pass
	2437	2436.998	2436.999	2436.997	2437.003	Pass
	2452	2452.003	2452.002	2452.000	2452.000	Pass
	2462	2462.003	2462.001	2462.002	2462.001	Pass
20	2412	2411.996	2412.002	2412.002	2412.004	Pass
	2400	2422.002	2422.000	2422.001	2422.000	Pass
	2437	2436.999	2436.999	2436.998	2436.997	Pass
	2452	2452.001	2452.001	2451.996	2452.000	Pass
	2462	2462.002	2462.000	2462.002	2462.003	Pass
30	2412	2412.003	2411.998	2412.000	2412.002	Pass
	2422	2422.001	2422.000	2421.994	2422.001	Pass
	2437	2436.998	2436.999	2436.997	2437.000	Pass
	2452	2452.000	2452.002	2452.000	2452.002	Pass
	2462	2462.002	2462.000	2462.001	2462.001	Pass
40	2412	2411.997	2412.003	2412.002	2412.003	Pass
	2422	2422.001	2422.000	2422.000	2422.001	Pass
	2437	2436.999	2436.997	2436.998	2436.997	Pass
	2452	2452.001	2452.002	2452.001	2452.002	Pass
	2462	2462.000	2462.003	2461.997	2462.000	Pass
50	2412	2411.998	2412.001	2412.002	2412.001	Pass
	2422	2422.000	2422.000	2422.001	2422.002	Pass
	2437	2436.999	2436.996	2436.995	2436.998	Pass
	2452	2452.001	2451.995	2452.002	2452.000	Pass
	2462	2462.002	2462.000	2462.000	2462.001	Pass

Frequency stability versus Voltage						
Temperature: 25°C						
Power Supply	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)	Pass /Fail
AC 120V/60Hz	2412	2412.001	2411.996	2412.001	2412.001	Pass
	2422	2422.000	2422.003	2421.999	2422.002	Pass
	2437	2437.002	2436.998	2436.999	2436.997	Pass
	2452	2452.001	2452.001	2452.000	2452.000	Pass
	2462	2461.998	2461.998	2462.002	2462.002	Pass

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

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