11.3. LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note: All modes were tested For restricted band radiated emission,
the test records reported below are the worst result compared to other modes.

11.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequencies to 30MHz.

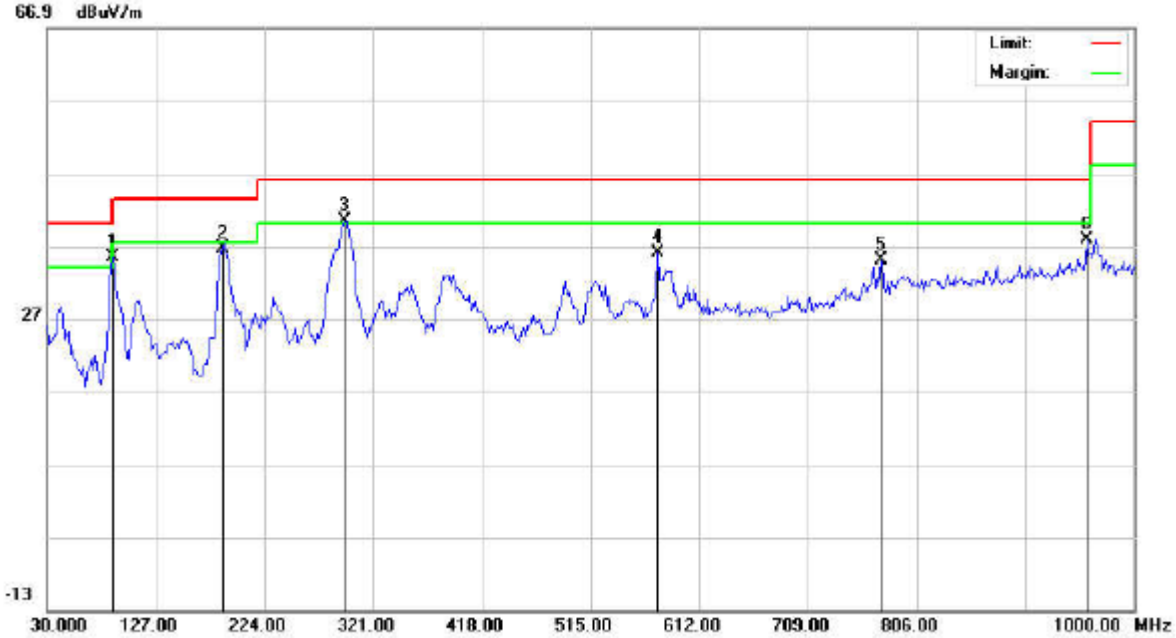
RADIATED EMISSION BELOW 1GHZ

EUT	Teton Router 750	**Model Name**	TR750
Temperature	25°C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a 5180MHz	**Antenna**	Horizontal

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1		89.8167	17.03	14.98	32.01	43.50	-11.49	peak			
2	!	186.8166	23.50	16.77	40.27	43.50	-3.23	peak			
3	*	296.7500	23.49	19.55	43.04	46.00	-2.96	peak			
4		375.9667	14.70	22.14	36.84	46.00	-9.16	peak			
5		796.2999	6.35	30.33	36.68	46.00	-9.32	peak			
6		957.9666	5.39	32.20	37.59	46.00	-8.41	peak			

RESULT: PASS

EUT	Teton Router 750	**Model Name**	TR750
Temperature	25°C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a 5180MHz	**Antenna**	Vertical



No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1		88.1999	20.37	14.97	35.34	43.50	-8.16	peak			
2		186.8166	19.93	16.77	36.70	43.50	-6.80	peak			
3	*	295.1333	20.92	19.58	40.50	46.00	-5.50	peak			
4		574.8167	9.58	26.46	36.04	46.00	-9.96	peak			
5		773.6666	5.11	29.81	34.92	46.00	-11.08	peak			
6		957.9666	5.56	32.20	37.76	46.00	-8.24	peak			

RESULT: PASS

Note: All test channels had been tested. The 802.11a at 5180MHz is the worst case and recorded in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Level.

The “Factor” value can be calculated automatically by software of measurement system.

RADIATED EMISSION ABOVE 1GHZ

EUT	Teton Router 750	**Model Name**	TR750
Temperature	25°C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a 5180MHz	**Antenna**	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10360.042	45.43	7.12	52.55	74.00	-21.45	peak
10360.042	41.23	7.12	48.35	54.00	-5.65	AVG
15540.063	35.81	9.84	45.65	74.00	-28.35	peak
15540.063	32.58	9.84	42.42	54.00	-11.58	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10360.042	47.58	7.12	54.70	74.00	-19.30	peak
10360.042	40.99	7.12	48.11	54.00	-5.89	AVG
15540.063	37.14	9.84	46.98	74.00	-27.02	peak
15540.063	34.18	9.84	44.02	54.00	-9.98	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Teton Router 750	**Model Name**	TR750
Temperature	25°C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a 5240MHz	**Antenna**	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10480.042	43.63	7.12	50.75	74.00	-23.26	peak
10480.042	39.72	7.12	46.84	54.00	-7.16	AVG
15720.063	40.00	9.84	49.84	74.00	-24.16	peak
15720.063	37.21	9.84	47.05	54.00	-6.95	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10480.042	44.59	7.12	51.71	74.00	-22.29	peak
10480.042	41.49	7.12	48.61	54.00	-5.39	AVG
15720.063	39.67	9.84	49.51	74.00	-24.49	peak
15720.063	36.61	9.84	46.45	54.00	-7.55	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Note: All the case had been tested. The 802.11a modulation is the worst case and recorded in the test report. Other frequencies radiation emission from 1GHz to 40GHz at least have 20dB margin and not recorded in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Level.

The “Factor” value can be calculated automatically by software of measurement system.

12. BAND EDGE EMISSION

12.1. MEASUREMENT PROCEDURE

1. The EUT operates at transmitting mode. The operate channel is tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.

2. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=1MHz, VBW=3MHz / Sweep=AUTO

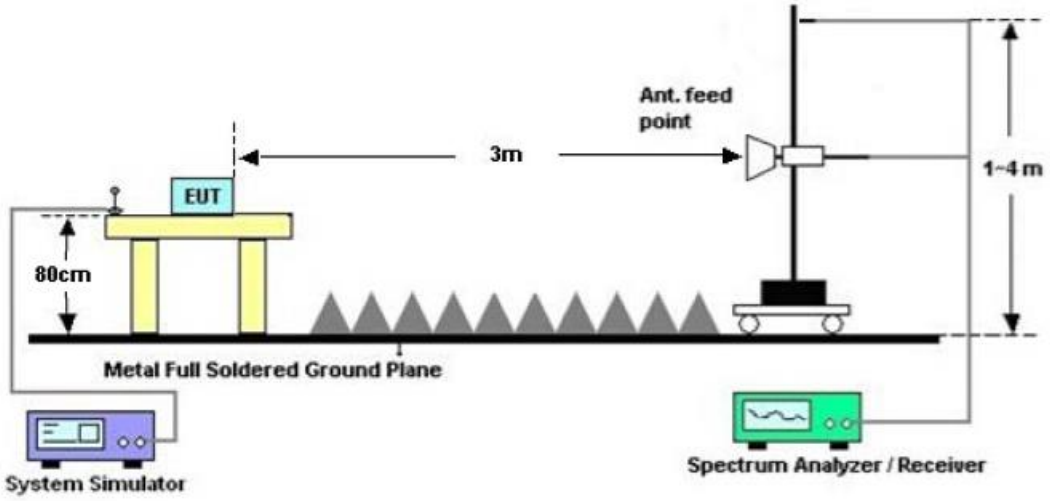
(b) AVERAGE: RBW=1MHz ; VBW=1/on time(1KHz) / Sweep=AUTO

3. Other procedures refer to clause 11.2.

Note:

1. Factor=Antenna Factor + Cable loss - Amplifier gain. Field Strength=Factor + Reading level
2. The factor had been edited in the “Input Correction” of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB(μV) to represent the Amplitude. Use the F dB(μV/m) to represent the Field Strength. So A=F.
3. Only the data of band edge emission at the restricted band 4.5GHz-5.15GHz record in the report. Other restricted band 5.35GHz-5.46GHz and 7.25GHz-7.77GHz were considered as ambient noise. No recording in the test report.

12.2. TEST SET-UP



12.3. TEST RESULT

EUT	Teton Router 750	**Model Name**	TR750
Temperature	25°C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a 5180MHz	**Antenna**	Horizontal

PK Value

AV Value

EUT	Teton Router 750	Model Name	TR750
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a 5180MHz	Antenna	Vertical

PK Value

AV Value

EUT	Teton Router 750	**Model Name**	TR750
Temperature	25°C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11n40 5190MHz	**Antenna**	Horizontal

PK Value

AV Value

EUT	Teton Router 750	**Model Name**	TR750
Temperature	25°C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11n40 5190MHz	**Antenna**	Vertical

PK Value

AV Value

EUT	Teton Router 750	Model Name	TR750
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11ac80 5210MHz	Antenna	Horizontal

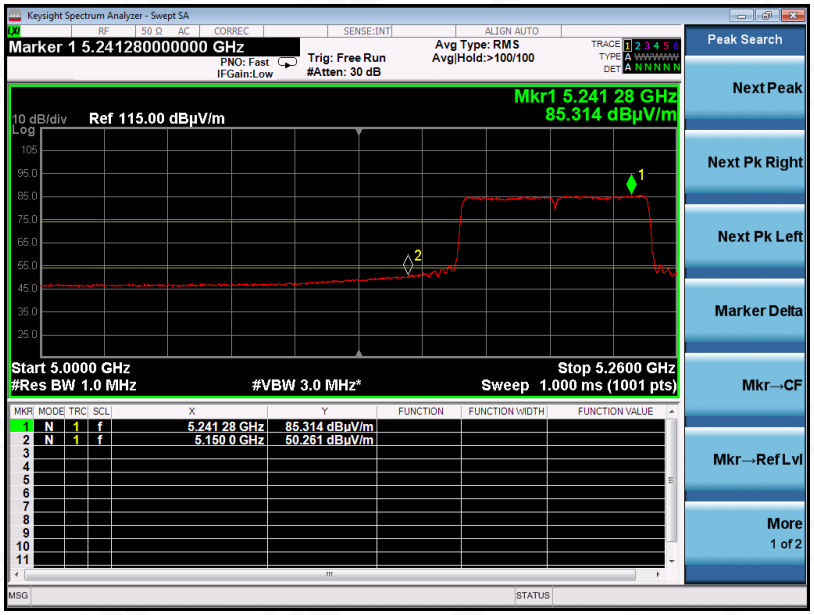
PK Value

AV Value

EUT	Teton Router 750	**Model Name**	TR750
Temperature	25°C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11ac80 5210MHz	**Antenna**	Vertical

PK Value

AV Value



RESULT: PASS

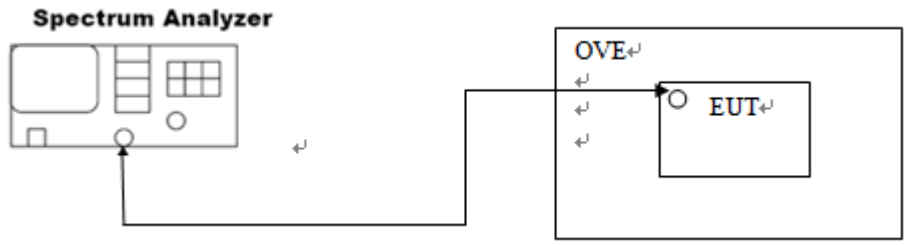
Note: All the 20MHz bandwidth modulation had been tested, the 802.11a was the worst case and record in his test report. All the 40MHz bandwidth modulation had been tested, the 802.11N40 was the worst case and record in his test report.

13. FREQUENCY STABILITY

13.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the operation frequency.
3. Set SPA Centre Frequency = Operation Frequency. SPAN=enough to measure the emission is maintained within the band
4. Set SPA Trace 1 Max hold, then View.
5. Extreme temperature rule is 0°C~35°C(conditions of normal operation as specified in the users manual).

13.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



13.3. MEASUREMENT RESULTS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
802.11a	0℃	5180	within the band	PASS
	10℃	5180	within the band	PASS
	20℃	5180	within the band	PASS
	30℃	5180	within the band	PASS
	35℃	5180	within the band	PASS
	0℃	5240	within the band	PASS
	10℃	5240	within the band	PASS
	20℃	5240	within the band	PASS
	30℃	5240	within the band	PASS
	35℃	5240	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
802.11n20	0℃	5180	within the band	PASS
	10℃	5180	within the band	PASS
	20℃	5180	within the band	PASS
	30℃	5180	within the band	PASS
	35℃	5180	within the band	PASS
	0℃	5240	within the band	PASS
	10℃	5240	within the band	PASS
	20℃	5240	within the band	PASS
	30℃	5240	within the band	PASS
	35℃	5240	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
802.11ac20	0℃	5180	within the band	PASS
	10℃	5180	within the band	PASS
	20℃	5180	within the band	PASS
	30℃	5180	within the band	PASS
	35℃	5180	within the band	PASS
	0℃	5240	within the band	PASS
	10℃	5240	within the band	PASS
	20℃	5240	within the band	PASS
	30℃	5240	within the band	PASS
	35℃	5240	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
802.11n40	0℃	5190	within the band	PASS
	10℃	5190	within the band	PASS
	20℃	5190	within the band	PASS
	30℃	5190	within the band	PASS
	35℃	5190	within the band	PASS
	0℃	5230	within the band	PASS
	10℃	5230	within the band	PASS
	20℃	5230	within the band	PASS
	30℃	5230	within the band	PASS
	35℃	5230	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
802.11ac40	0℃	5190	within the band	PASS
	10℃	5190	within the band	PASS
	20℃	5190	within the band	PASS
	30℃	5190	within the band	PASS
	35℃	5190	within the band	PASS
	0℃	5230	within the band	PASS
	10℃	5230	within the band	PASS
	20℃	5230	within the band	PASS
	30℃	5230	within the band	PASS
	35℃	5230	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
802.11ac80	0℃	5210	within the band	PASS
	10℃	5210	within the band	PASS
	20℃	5210	within the band	PASS
	30℃	5210	within the band	PASS
	35℃	5210	within the band	PASS

14. FCC LINE CONDUCTED EMISSION TEST

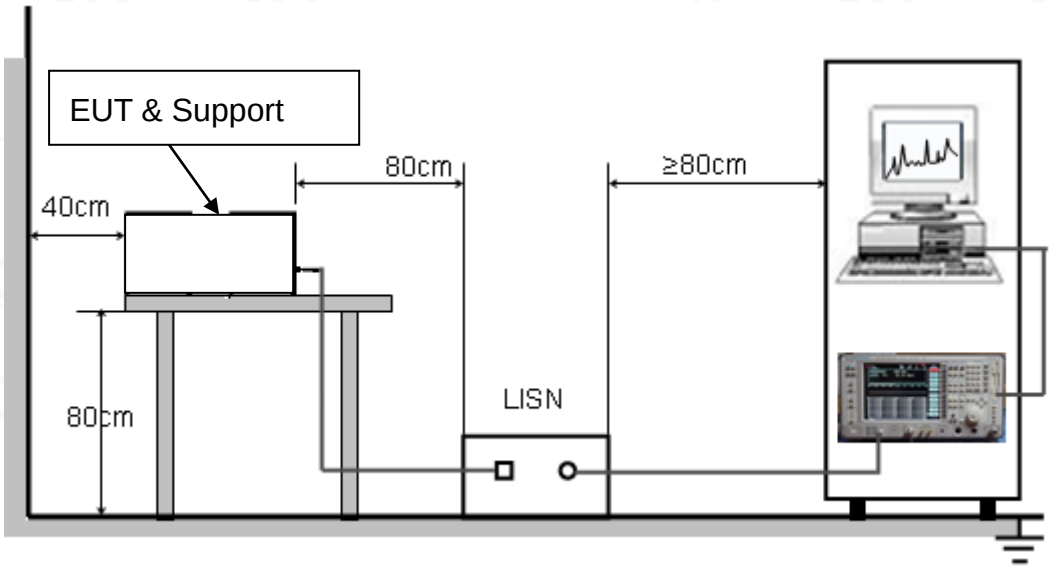
14.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.

14.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



14.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hzpower by a LISN.
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

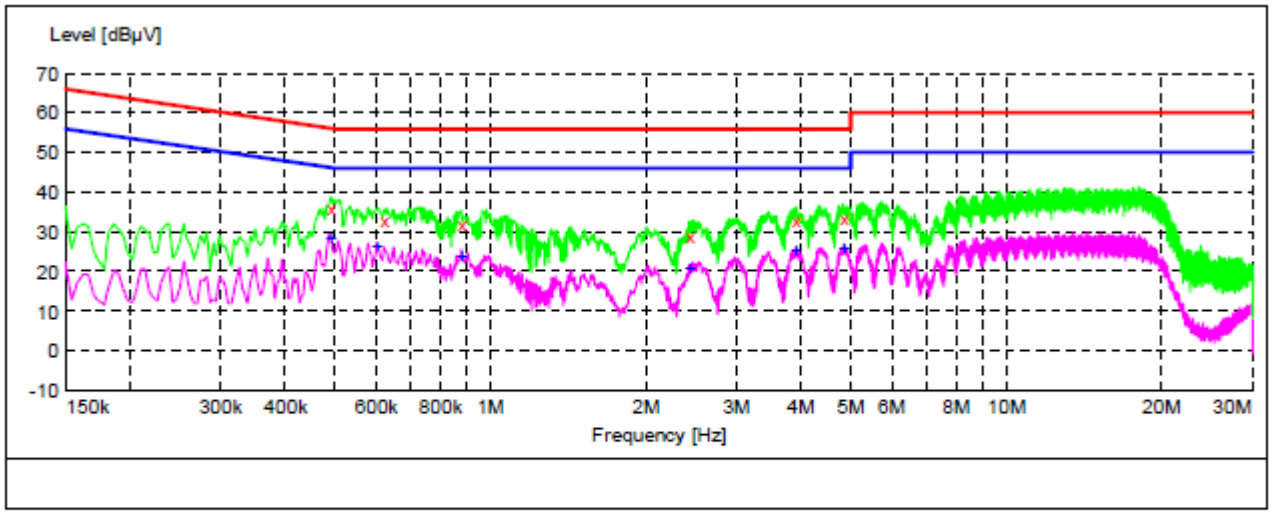
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

14.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

14.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST-L



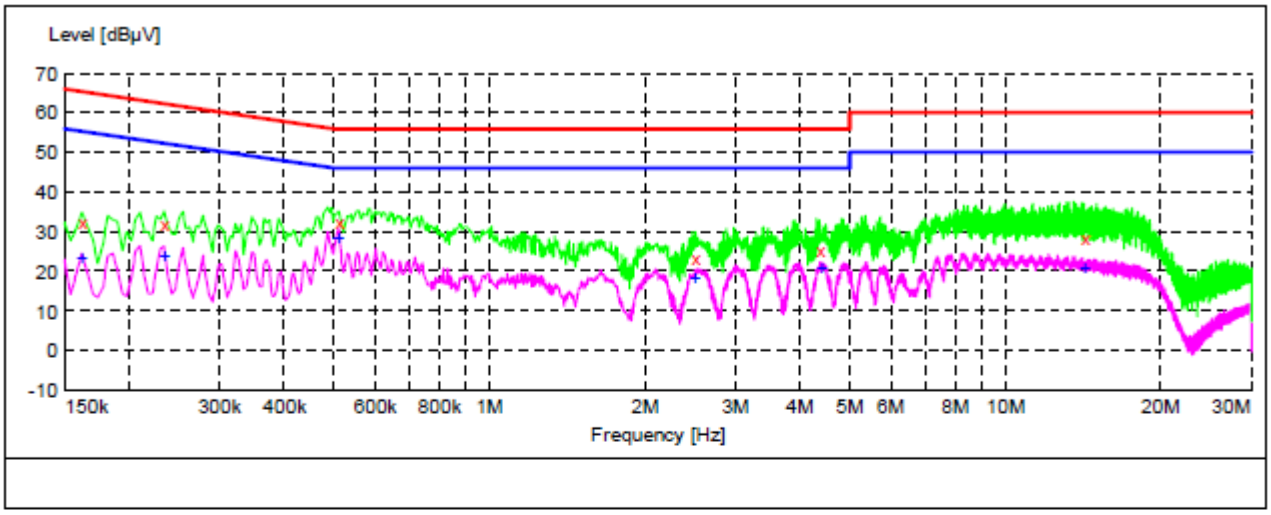
MEASUREMENT RESULT: "TEST_fin"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.490000	36.20	10.3	56	20.0	QP	L1	FLO
0.622000	33.10	10.3	56	22.9	QP	L1	FLO
0.878000	32.00	10.4	56	24.0	QP	L1	FLO
2.438000	29.10	10.4	56	26.9	QP	L1	FLO
3.906000	33.00	10.4	56	23.0	QP	L1	FLO
4.834000	33.80	10.4	56	22.2	QP	L1	FLO

MEASUREMENT RESULT: "TEST_fin2"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.490000	28.50	10.3	46	17.7	AV	L1	FLO
0.602000	26.60	10.3	46	19.4	AV	L1	FLO
0.878000	23.90	10.4	46	22.1	AV	L1	FLO
2.438000	21.10	10.4	46	24.9	AV	L1	FLO
3.906000	25.50	10.4	46	20.5	AV	L1	FLO
4.838000	26.00	10.4	46	20.0	AV	L1	FLO

LINE CONDUCTED EMISSION TEST-N



MEASUREMENT RESULT: "TEST_fin"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.162000	32.40	10.3	65	33.0	QP	N	FLO
0.234000	31.80	10.3	62	30.5	QP	N	FLO
0.510000	32.40	10.3	56	23.6	QP	N	FLO
2.498000	23.20	10.4	56	32.8	QP	N	FLO
4.374000	25.60	10.4	56	30.4	QP	N	FLO
14.270000	28.60	10.9	60	31.4	QP	N	FLO

MEASUREMENT RESULT: "TEST_fin2"

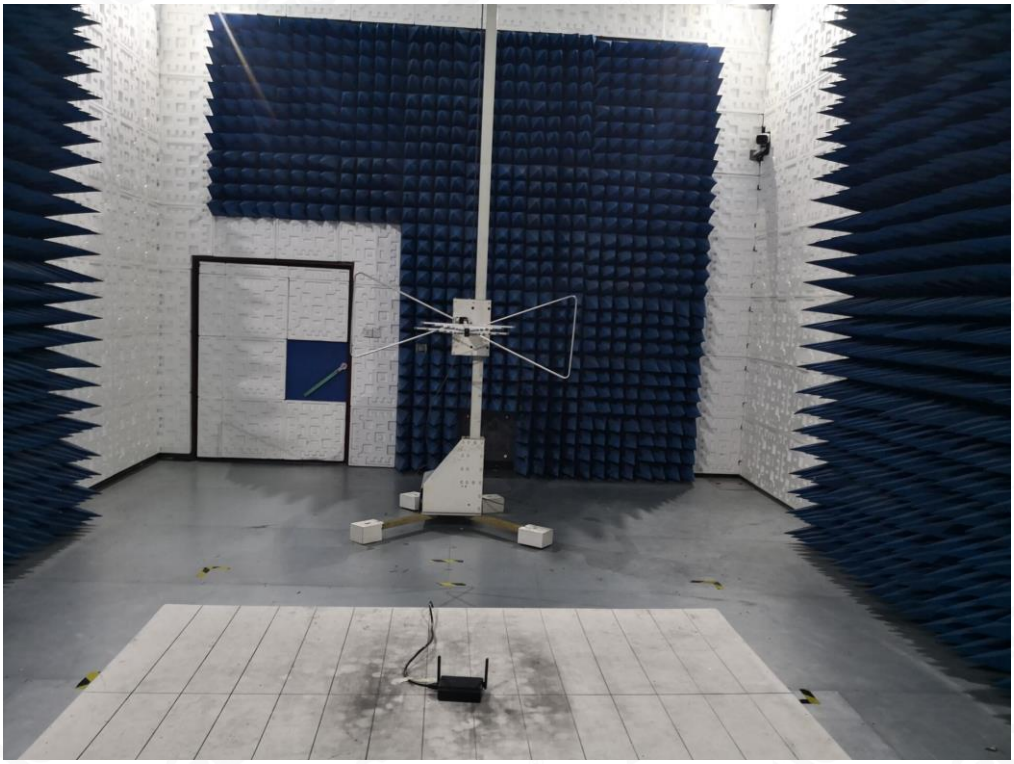
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.162000	23.40	10.3	55	32.0	AV	N	FLO
0.234000	24.00	10.3	52	28.3	AV	N	FLO
0.510000	28.70	10.3	46	17.3	AV	N	FLO
2.498000	18.40	10.4	46	27.6	AV	N	FLO
4.406000	20.70	10.4	46	25.3	AV	N	FLO
14.270000	21.00	10.9	50	29.0	AV	N	FLO

RESULT: PASS

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP

FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ



FCC RADIATED EMISSION TEST SETUP ABOVE 1GHZ

----END OF REPORT----