

11.3. LIMITS AND MEASUREMENT RESULT

15.209 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

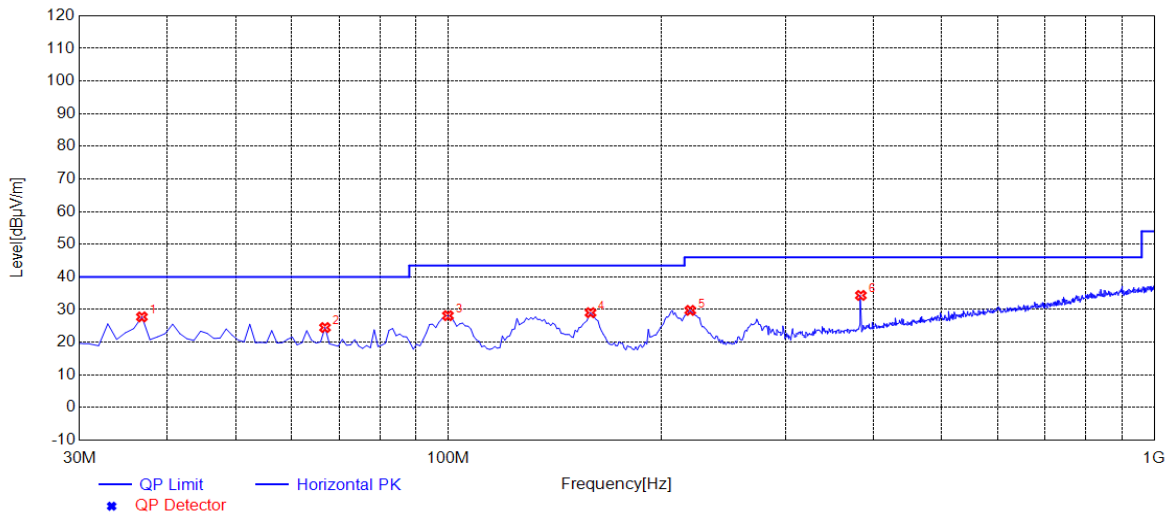
RADIATED EMISSION BELOW 30MHZ

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



RADIATED EMISSION BELOW 1GHZ-Antenna 3

EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

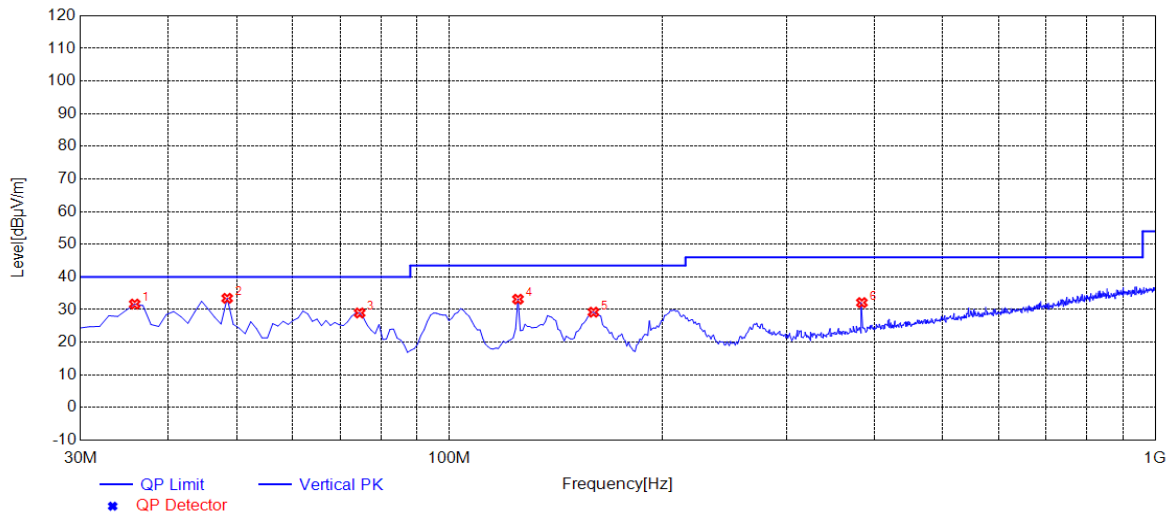


NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	36.7900	27.76	14.16	40.00	12.24	100	101	Horizontal
2	66.8600	24.50	12.76	40.00	15.50	200	66	Horizontal
3	99.8400	28.14	11.35	43.50	15.36	200	216	Horizontal
4	159.0100	29.05	14.94	43.50	14.45	200	236	Horizontal
5	220.1200	29.76	13.30	46.00	16.24	100	260	Horizontal
6	384.0500	34.35	19.23	46.00	11.65	100	267	Horizontal

RESULT: PASS



EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical



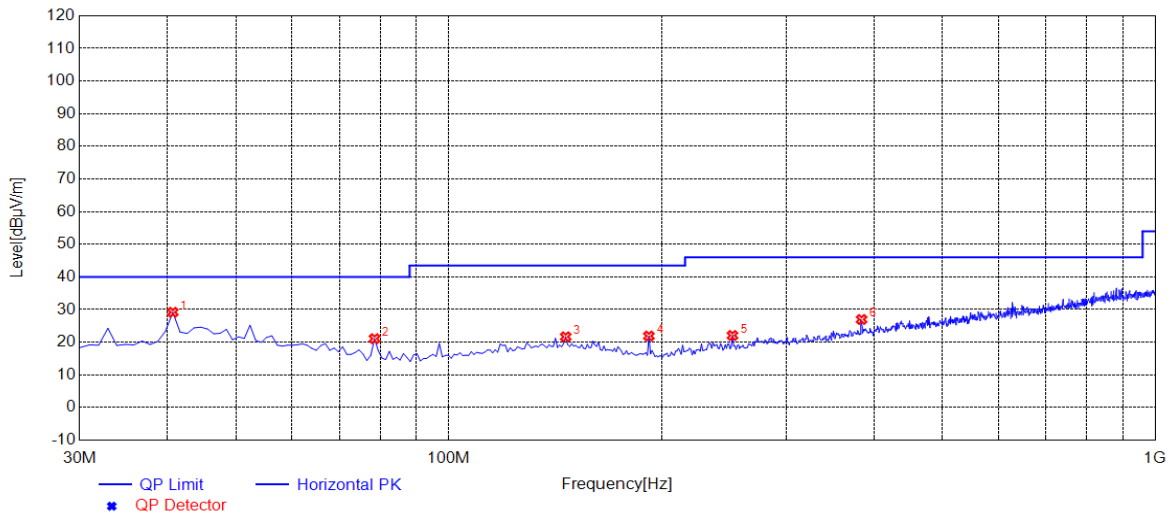
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.8200	31.70	13.93	40.00	8.30	100	110	Vertical
2	48.4300	33.46	14.71	40.00	6.54	100	303	Vertical
3	74.6200	28.97	11.27	40.00	11.03	100	151	Vertical
4	125.0600	33.18	13.81	43.50	10.32	100	61	Vertical
5	159.9800	29.22	14.94	43.50	14.28	100	6	Vertical
6	384.0500	32.14	19.23	46.00	13.86	100	200	Vertical

RESULT: PASS



RADIATED EMISSION BELOW 1GHZ-Antenna 1

EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

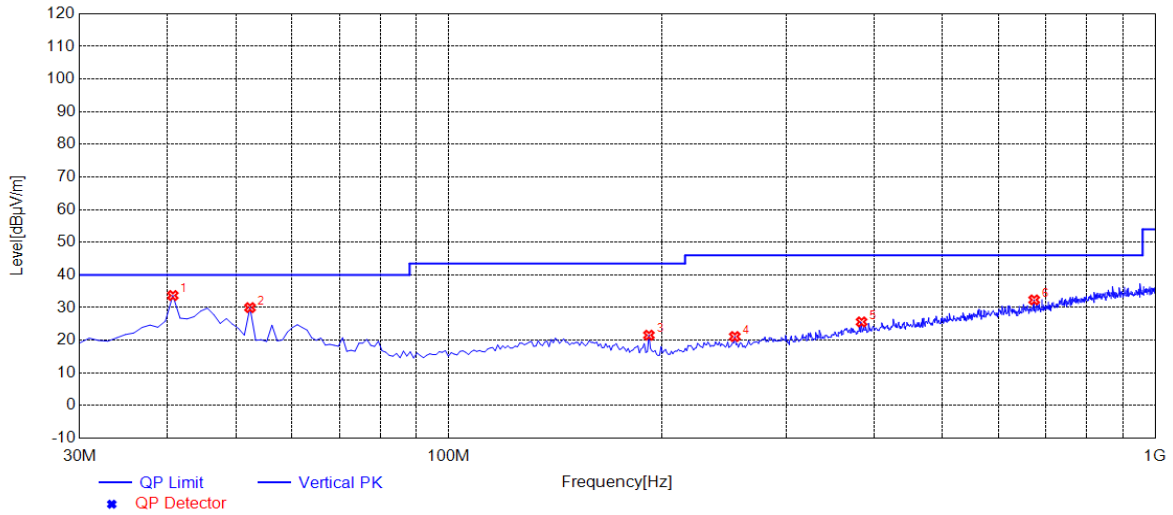


NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	40.6700	29.19	14.91	40.00	10.81	100	130	Horizontal
2	78.5000	21.10	10.46	40.00	18.90	100	350	Horizontal
3	146.4000	21.68	14.88	43.50	21.82	100	210	Horizontal
4	191.9900	21.91	12.43	43.50	21.59	100	90	Horizontal
5	252.1300	22.08	14.66	46.00	23.92	100	30	Horizontal
6	384.0500	26.99	19.23	46.00	19.01	100	140	Horizontal

RESULT: PASS



EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical



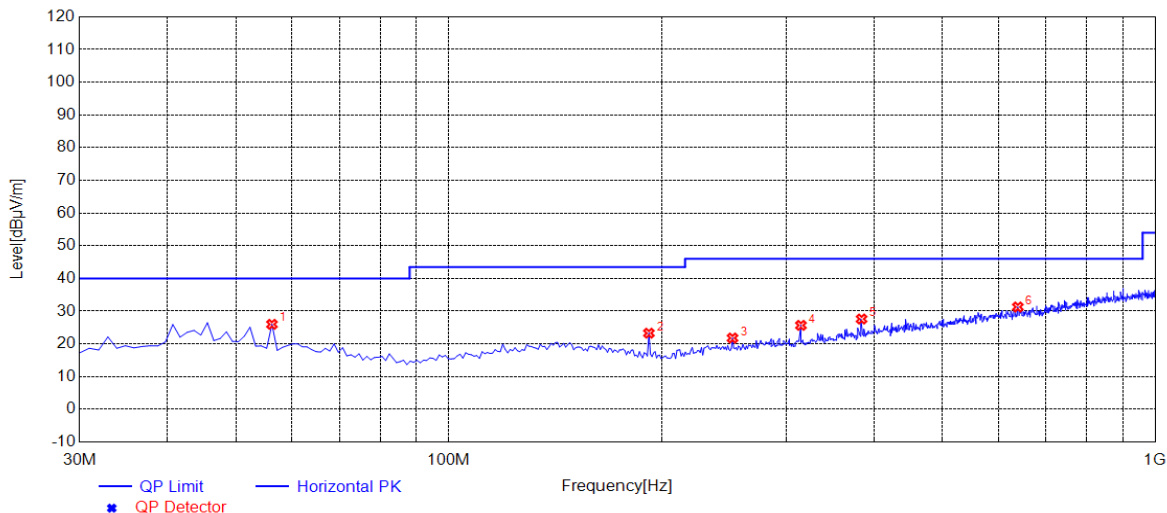
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	40.6700	33.71	14.91	40.00	6.29	100	190	Vertical
2	52.3100	29.99	14.49	40.00	10.01	100	230	Vertical
3	191.9900	21.55	12.43	43.50	21.95	100	140	Vertical
4	254.0700	21.13	14.63	46.00	24.87	100	140	Vertical
5	384.0500	25.62	19.23	46.00	20.38	100	260	Vertical
6	674.0800	32.36	25.54	46.00	13.64	100	180	Vertical

RESULT: PASS



RADIATED EMISSION BELOW 1GHZ-Antenna 2

EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

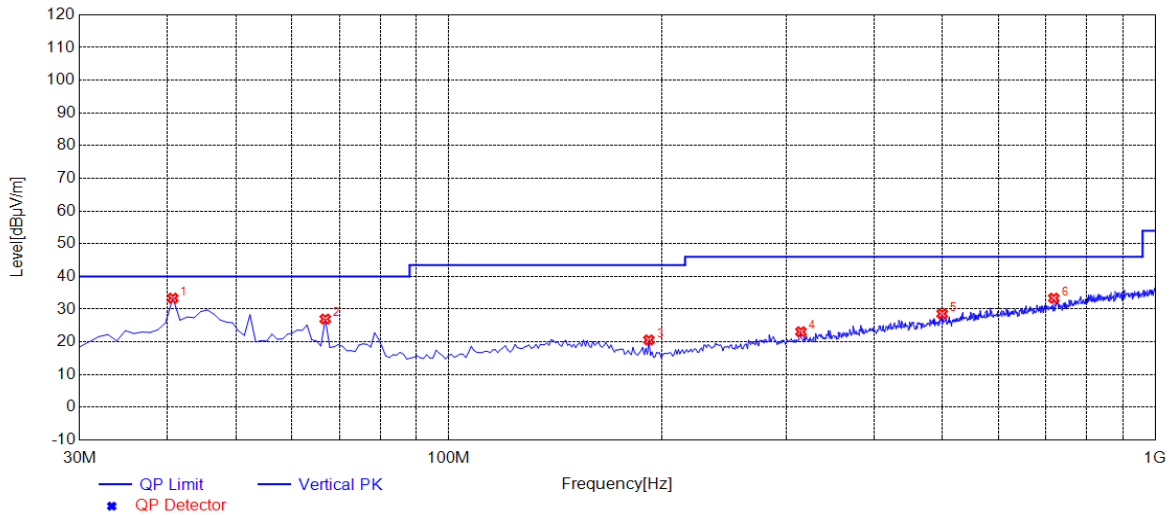


NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	56.1900	25.99	14.20	40.00	14.01	100	90	Horizontal
2	191.9900	23.28	12.43	43.50	20.22	100	20	Horizontal
3	252.1300	21.79	14.66	46.00	24.21	100	260	Horizontal
4	315.1800	25.67	16.48	46.00	20.33	100	350	Horizontal
5	384.0500	27.62	19.23	46.00	18.38	100	50	Horizontal
6	639.1600	31.29	24.94	46.00	14.71	100	310	Horizontal

RESULT: PASS



EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical



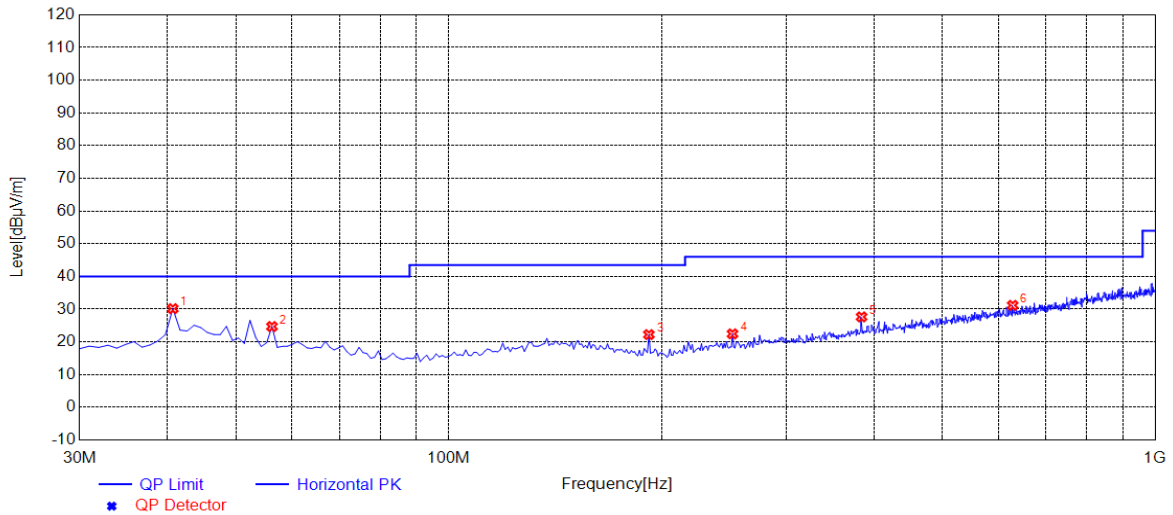
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	40.6700	33.38	14.91	40.00	6.62	100	20	Vertical
2	66.8600	27.00	12.76	40.00	13.00	100	320	Vertical
3	191.9900	20.61	12.43	43.50	22.89	100	230	Vertical
4	315.1800	23.12	16.48	46.00	22.88	100	0	Vertical
5	499.4800	28.60	22.17	46.00	17.40	100	100	Vertical
6	718.7000	33.38	26.42	46.00	12.62	100	160	Vertical

RESULT: PASS



RADIATED EMISSION BELOW 1GHZ-Antenna 4

EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

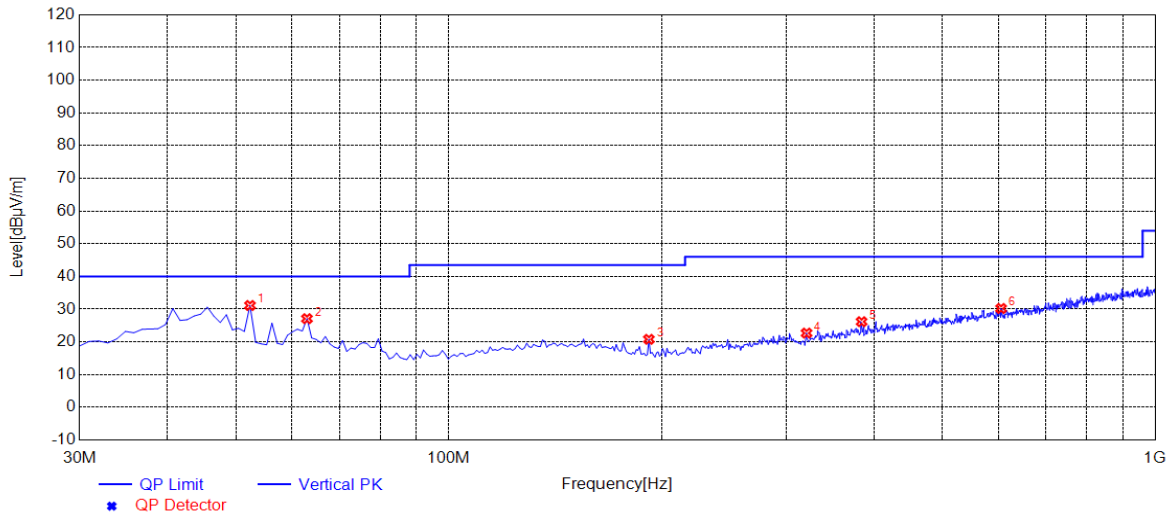


NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	40.6700	30.17	14.91	40.00	9.83	100	70	Horizontal
2	56.1900	24.70	14.20	40.00	15.30	100	60	Horizontal
3	191.9900	22.24	12.43	43.50	21.26	100	150	Horizontal
4	252.1300	22.46	14.66	46.00	23.54	100	230	Horizontal
5	384.0500	27.65	19.23	46.00	18.35	100	40	Horizontal
6	628.4900	31.18	24.83	46.00	14.82	100	170	Horizontal

RESULT: PASS



EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	52.3100	31.13	14.49	40.00	8.87	100	150	Vertical
2	62.9800	27.10	13.42	40.00	12.90	100	130	Vertical
3	191.9900	20.79	12.43	43.50	22.71	100	160	Vertical
4	321.0000	22.69	16.73	46.00	23.31	100	10	Vertical
5	384.0500	26.18	19.23	46.00	19.82	100	100	Vertical
6	605.2100	30.22	24.40	46.00	15.78	100	220	Vertical

RESULT: PASS

Note:

1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.
2. All test modes had been tested. The mode 1 is the worst case and recorded in the report.



RADIATED EMISSION ABOVE 1GHZ

EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4810.000	52.89	0.08	52.97	74	-21.03	peak
4810.000	42.46	0.08	42.54	54	-11.46	AVG
7215.000	45.27	2.21	47.48	74	-26.52	peak
7215.000	38.12	2.21	40.33	54	-13.67	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4810.000	51.49	0.08	51.57	74	-22.43	peak
4810.000	42.58	0.08	42.66	54	-11.34	AVG
7215.000	45.39	2.21	47.6	74	-26.4	peak
7215.000	35.44	2.21	37.65	54	-16.35	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4880.000	50.39	0.14	50.53	74	-23.47	peak
4880.000	42.87	0.14	43.01	54	-10.99	AVG
7320.000	45.16	2.36	47.52	74	-26.48	peak
7320.000	37.12	2.36	39.48	54	-14.52	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4880.000	50.29	0.14	50.43	74	-23.57	peak
4880.000	41.78	0.14	41.92	54	-12.08	AVG
7320.000	44.96	2.36	47.32	74	-26.68	peak
7320.000	37.52	2.36	39.88	54	-14.12	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4950.000	49.26	0.22	49.48	74	-24.52	peak
4950.000	40.37	0.22	40.59	54	-13.41	AVG
7425.000	44.38	2.64	47.02	74	-26.98	peak
7425.000	35.21	2.64	37.85	54	-16.15	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4950.000	50.34	0.22	50.56	74	-23.44	peak
4950.000	41.42	0.22	41.64	54	-12.36	AVG
7425.000	44.73	2.64	47.37	74	-26.63	peak
7425.000	36.95	2.64	39.59	54	-14.41	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4960.000	48.59	0.22	48.81	74	-25.19	peak
4960.000	40.27	0.22	40.49	54	-13.51	AVG
7440.000	44.12	2.64	46.76	74	-27.24	peak
7440.000	35.73	2.64	38.37	54	-15.63	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4960.000	49.61	0.22	49.83	74	-24.17	peak
4960.000	40.22	0.22	40.44	54	-13.56	AVG
7440.000	45.28	2.64	47.92	74	-26.08	peak
7440.000	37.13	2.64	39.77	54	-14.23	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

RESULT: PASS

Note:

Other emissions from 1G to 25 GHz are considered as ambient noise. No recording in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

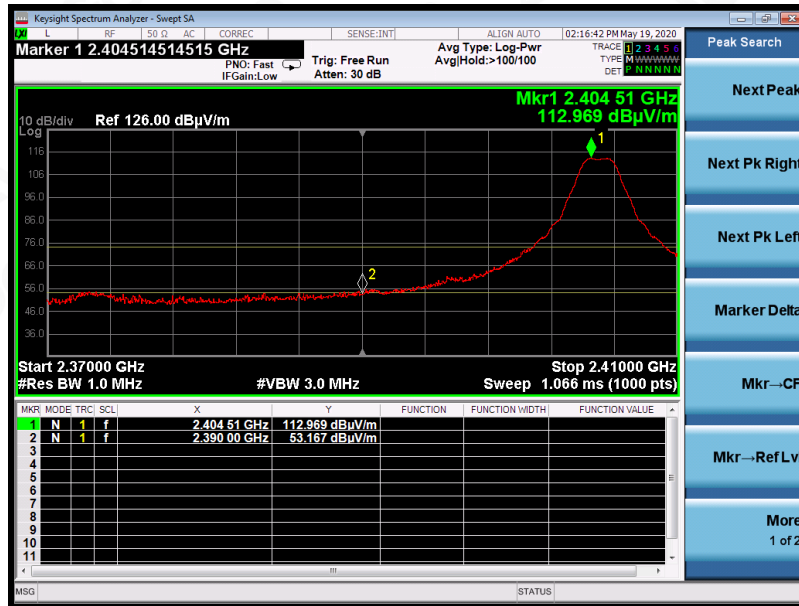
The “Factor” value can be calculated automatically by software of measurement system.



TEST RESULT FOR RESTRICTED BANDS REQUIREMENTS

EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

PK



AV



RESULT: PASS

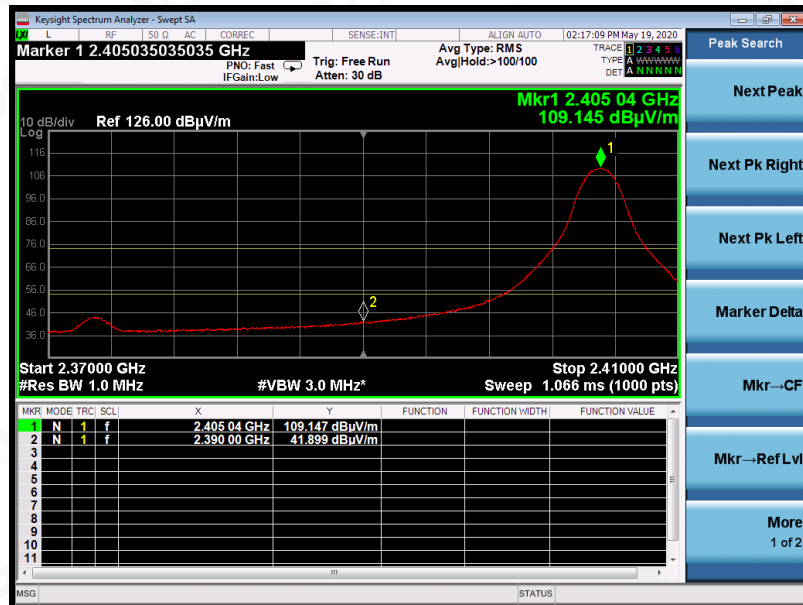


EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

PK



AV

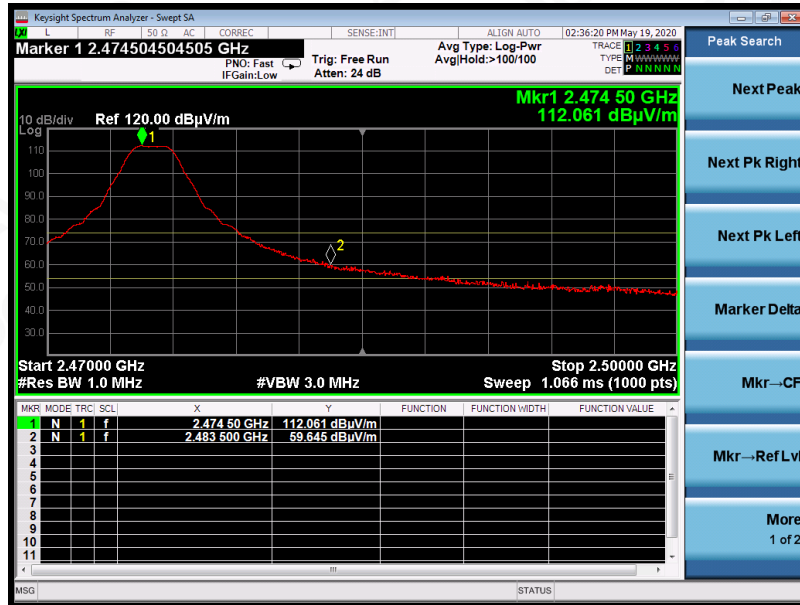


RESULT: PASS



EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

PK



AV

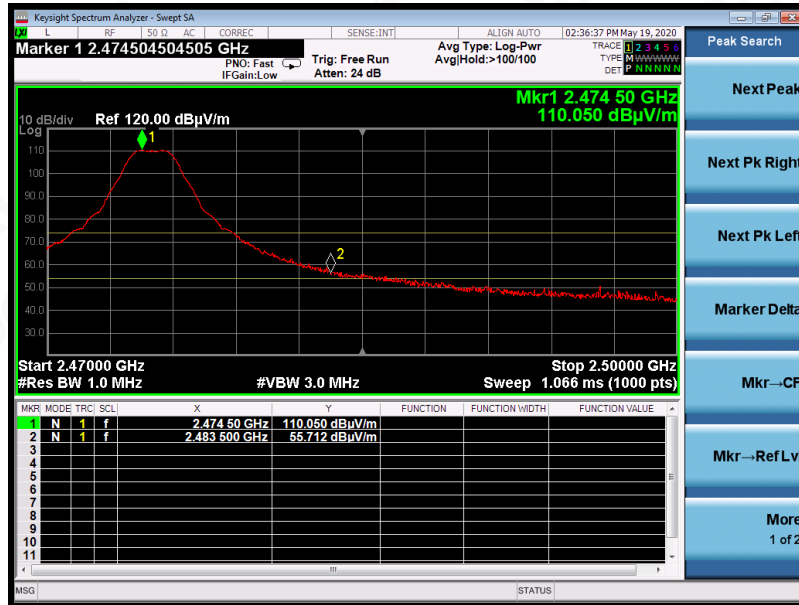


RESULT: PASS



EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical

PK



AV

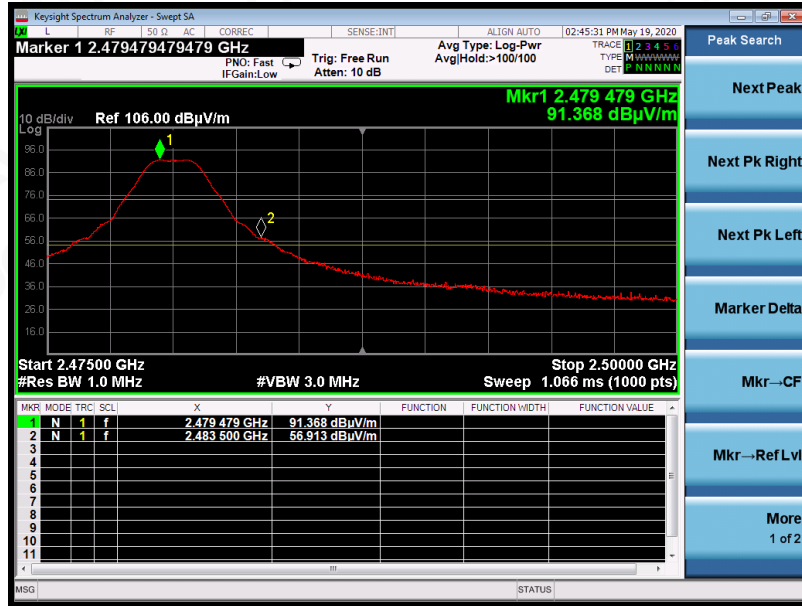


RESULT: PASS



EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Horizontal

PK



AV



RESULT: PASS



EUT	BMD-345	Model Name	BMD-345
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Vertical

PK



AV



RESULT: PASS

Note:

1. 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.
2. All external antennas had been tested. The external antenna 3 is the worst case and recorded in the report.



12. FCC LINE CONDUCTED EMISSION TEST

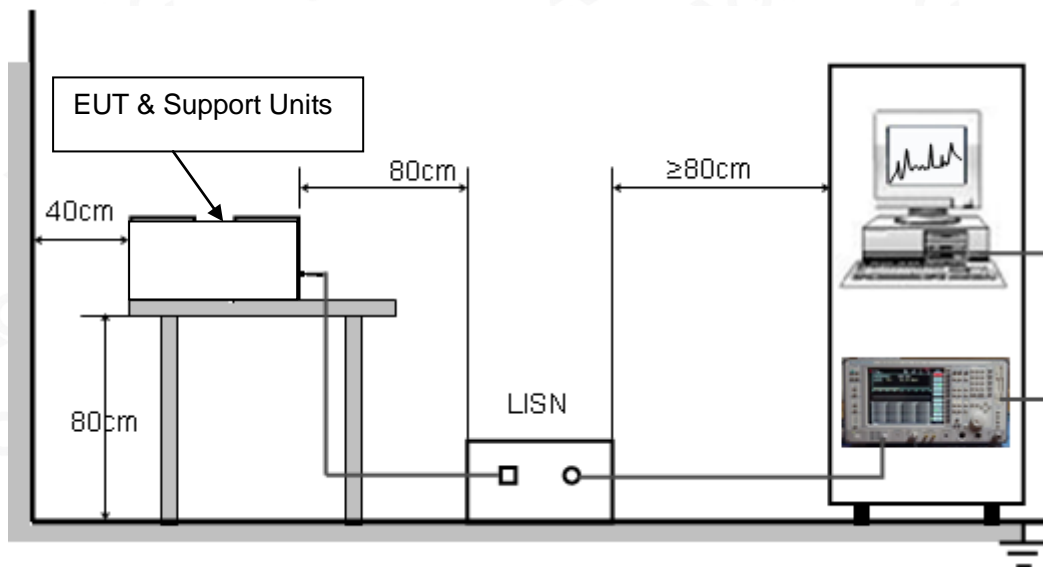
12.1. LIMITS OF LINE CONDUCTED EMISSION TEST

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 0.50 MHz.

12.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



12.3. 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 DC 3.6V power from control board which received AC120V/60Hz power 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.

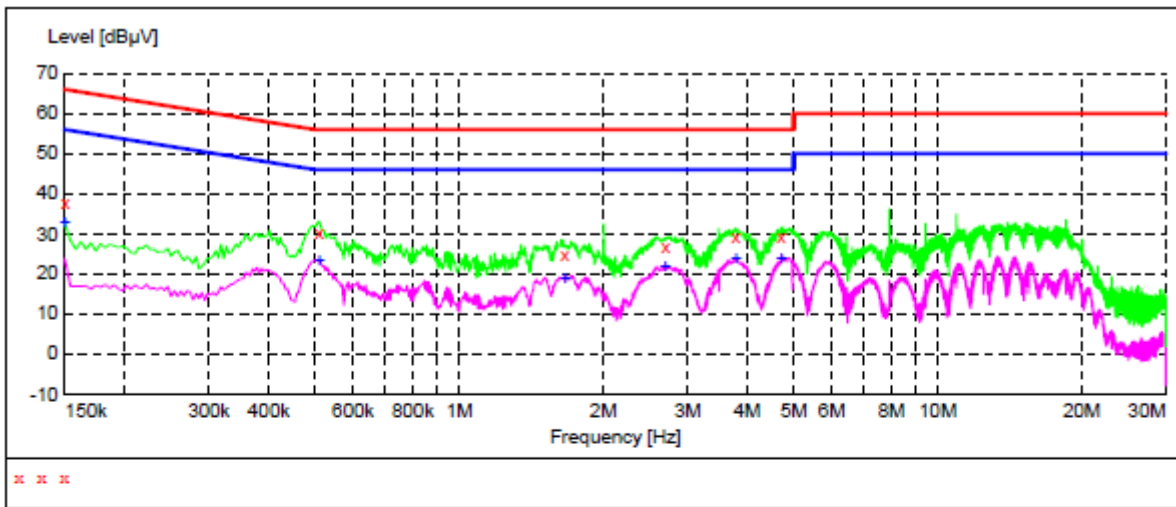
12.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

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.



12.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

Line Conducted Emission Test Line 1-L



MEASUREMENT RESULT

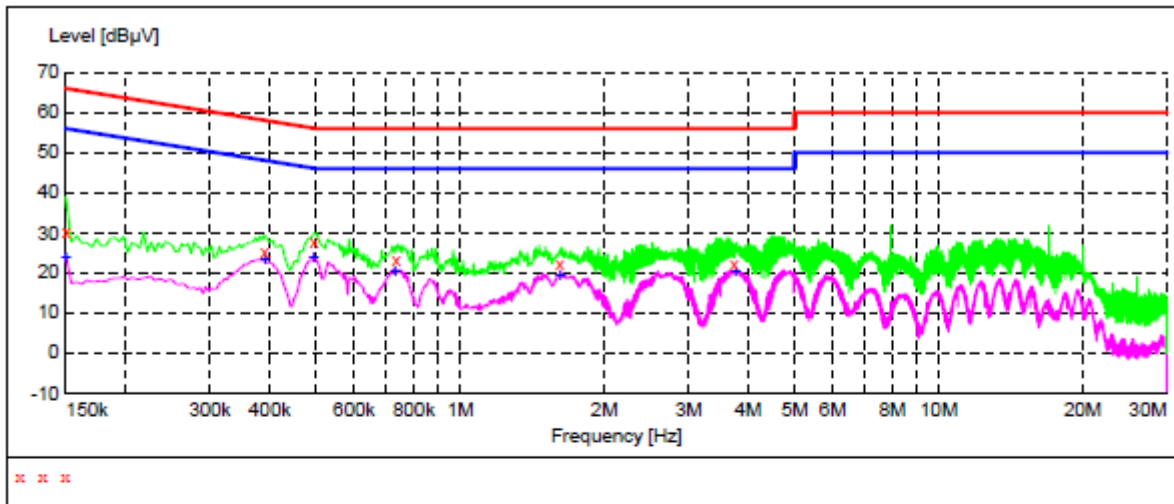
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000	37.90	11.3	66	28.1	QP	L1
0.510000	30.20	11.3	56	25.8	QP	L1
1.662000	24.50	11.3	56	31.5	QP	L1
2.698000	26.90	11.4	56	29.1	QP	L1
3.786000	29.30	11.4	56	26.7	QP	L1
4.710000	29.10	11.4	56	26.9	QP	L1

MEASUREMENT RESULT

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000	33.00	11.3	56	23.0	AV	L1
0.510000	23.40	11.3	46	22.6	AV	L1
1.662000	18.80	11.3	46	27.2	AV	L1
2.698000	21.50	11.4	46	24.5	AV	L1
3.786000	23.80	11.4	46	22.2	AV	L1
4.710000	23.60	11.4	46	22.4	AV	L1



Line Conducted Emission Test Line 2-N



MEASUREMENT RESULT

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000	30.40	11.3	66	35.6	QP	N
0.390000	25.40	11.3	58	32.7	QP	N
0.494000	27.60	11.3	56	28.5	QP	N
0.734000	23.40	11.3	56	32.6	QP	N
1.614000	22.00	11.3	56	34.0	QP	N
3.738000	22.00	11.4	56	34.0	QP	N

MEASUREMENT RESULT

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000	23.50	11.3	56	32.5	AV	N
0.390000	23.00	11.3	48	25.1	AV	N
0.494000	23.90	11.3	46	22.2	AV	N
0.730000	20.40	11.3	46	25.6	AV	N
1.614000	19.40	11.3	46	26.6	AV	N
3.758000	20.10	11.4	46	25.9	AV	N

RESULT: PASS

Note: All the test modes had been tested, the mode 1 was the worst case. Only the data of the worst case would be record in this test report.



APPENDIX A: PHOTOGRAPHS OF TEST SETUP

RADIATED EMISSION TEST SETUP BELOW 1GHZ



RADIATED EMISSION TEST SETUP ABOVE 1GHZ

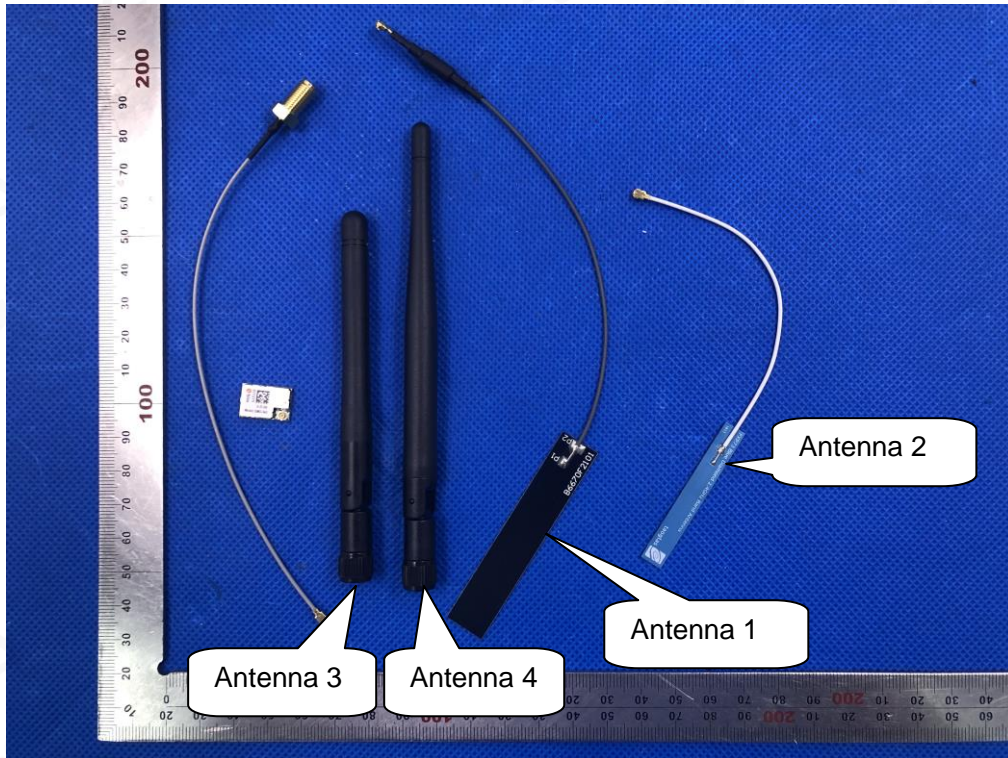


CONDUCTED EMISSION TEST SETUP

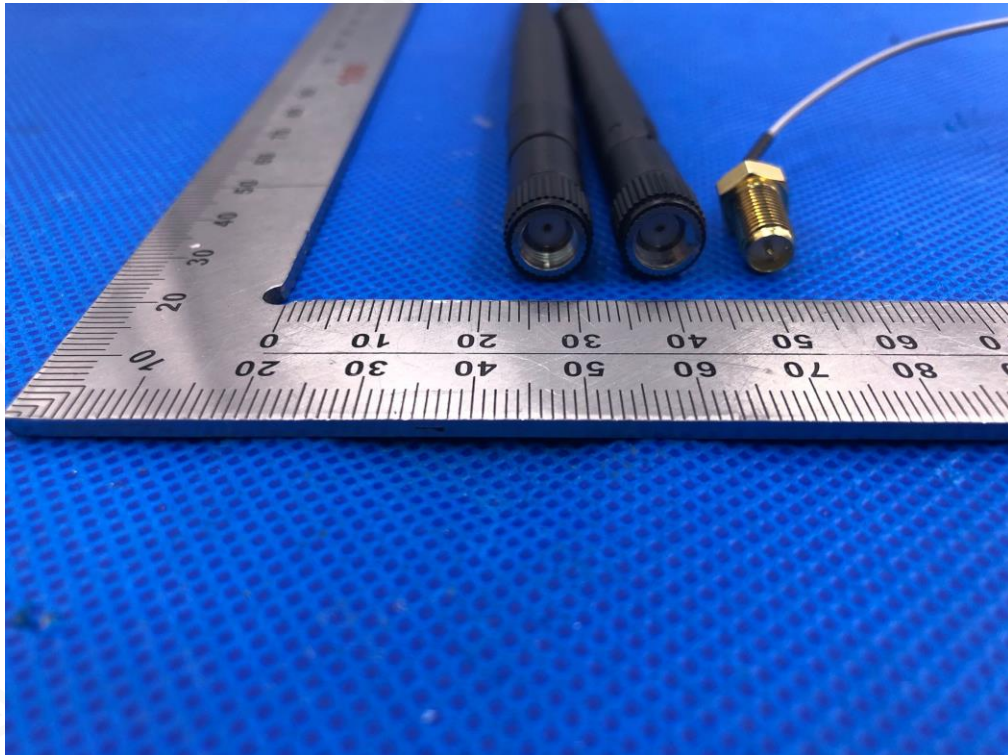


APPENDIX B: PHOTOGRAPHS OF EUT

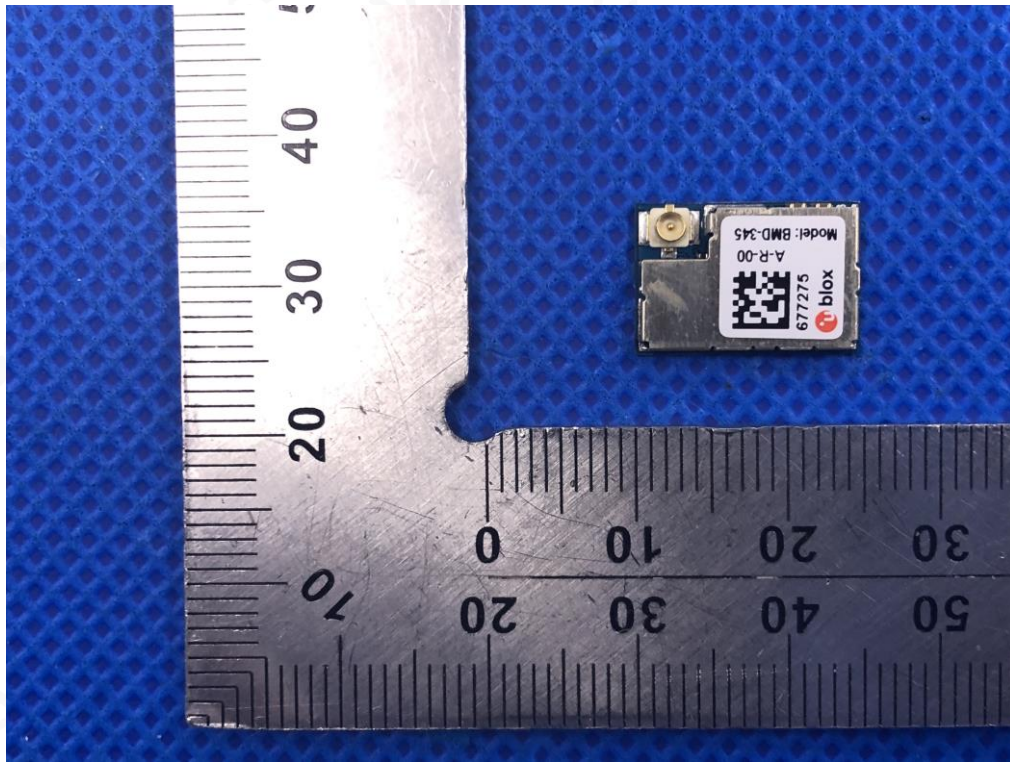
ALL VIEW OF EUT



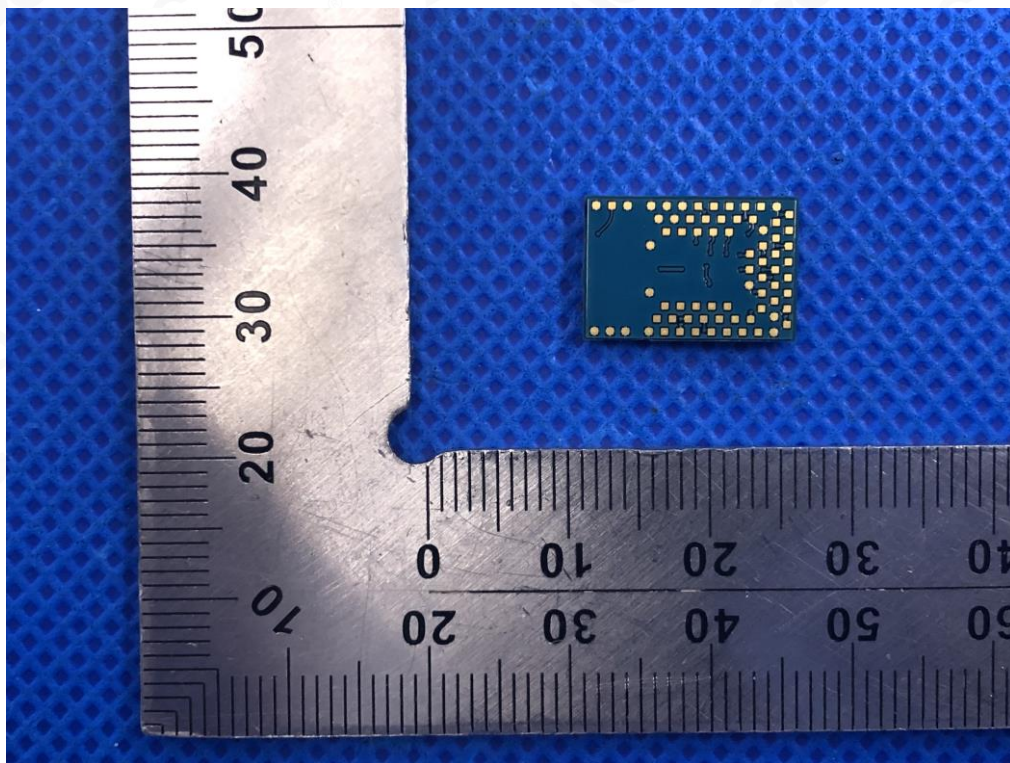
VIEW OF EUT(PORT)



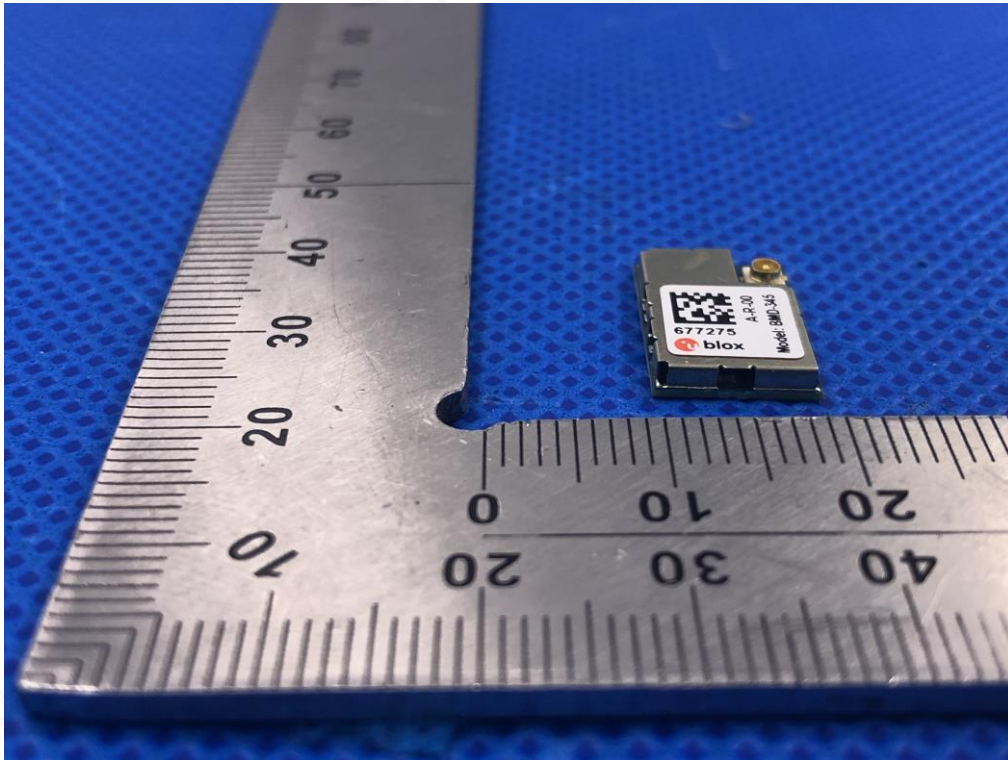
TOP VIEW OF EUT



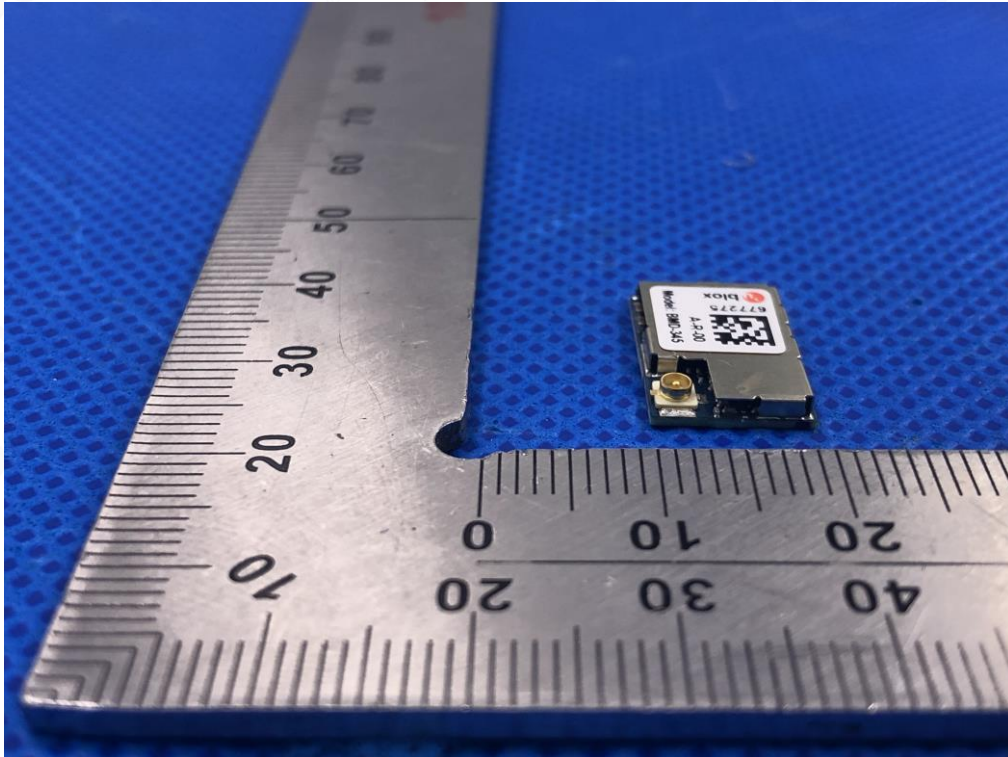
BOTTOM VIEW OF EUT



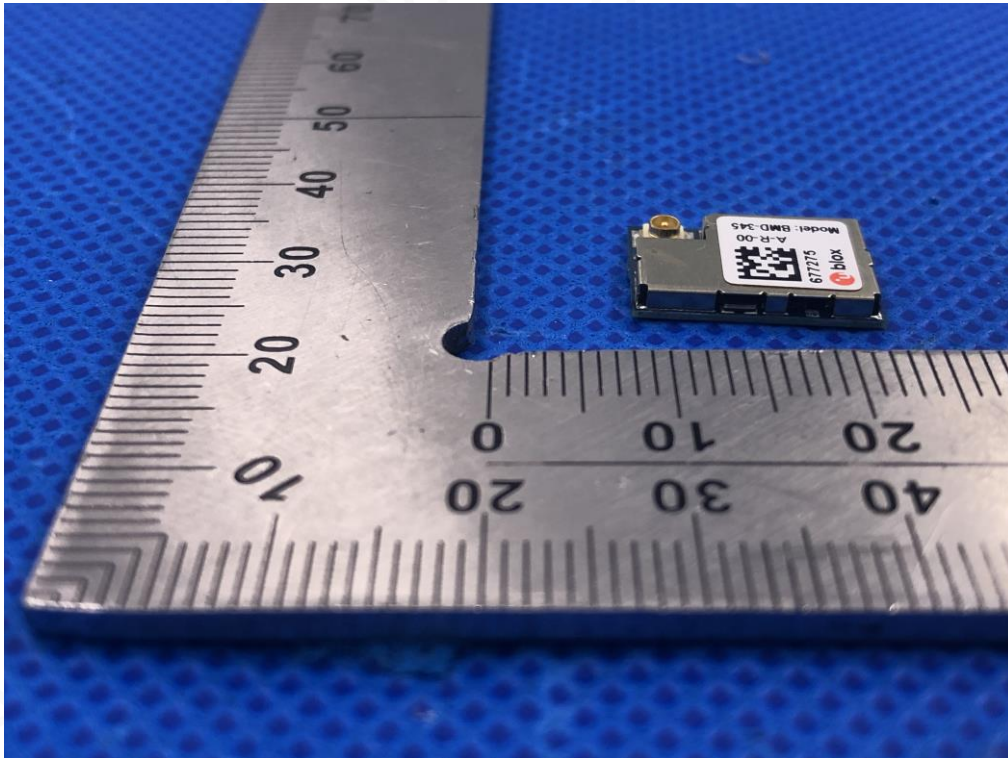
FRONT VIEW OF EUT



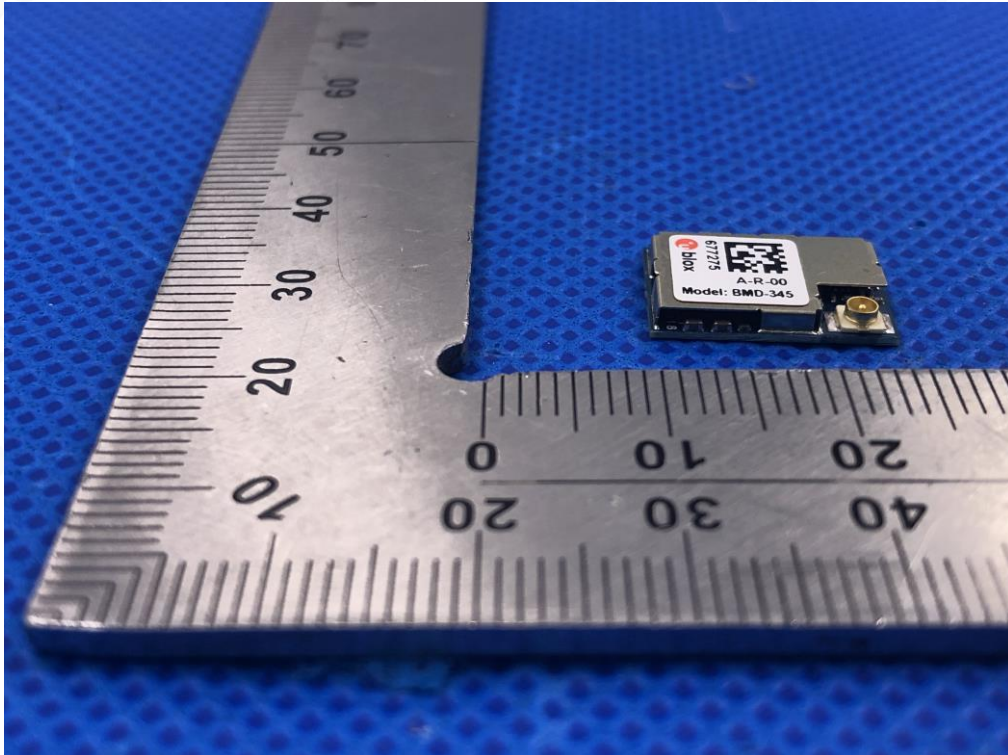
BACK VIEW OF EUT



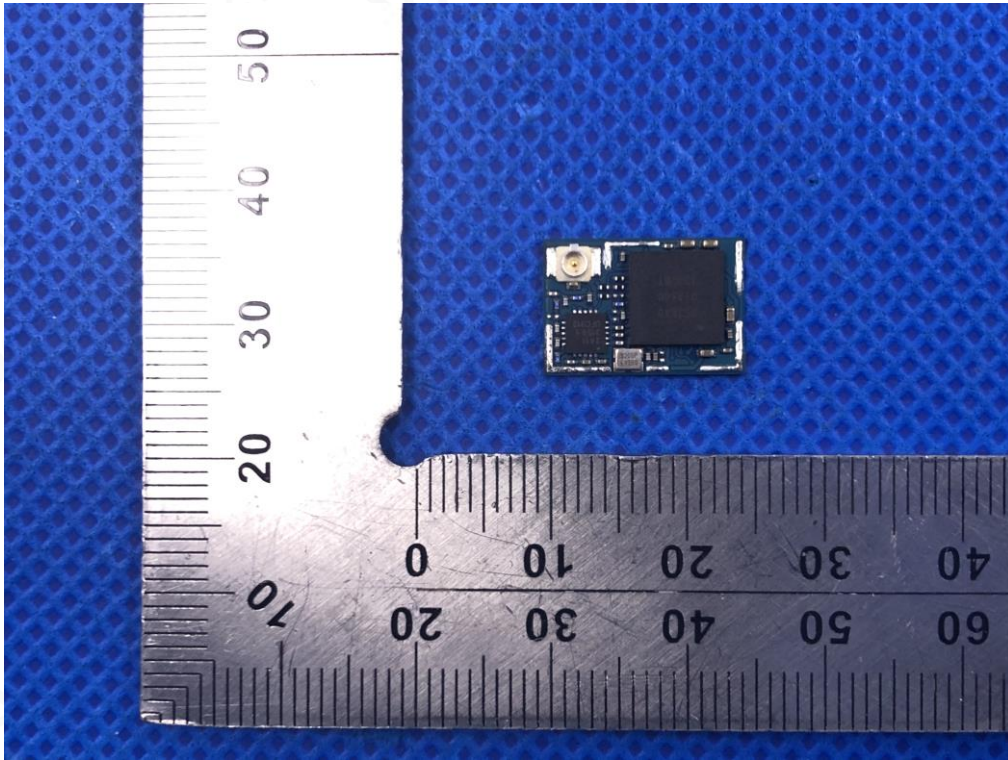
LEFT VIEW OF EUT



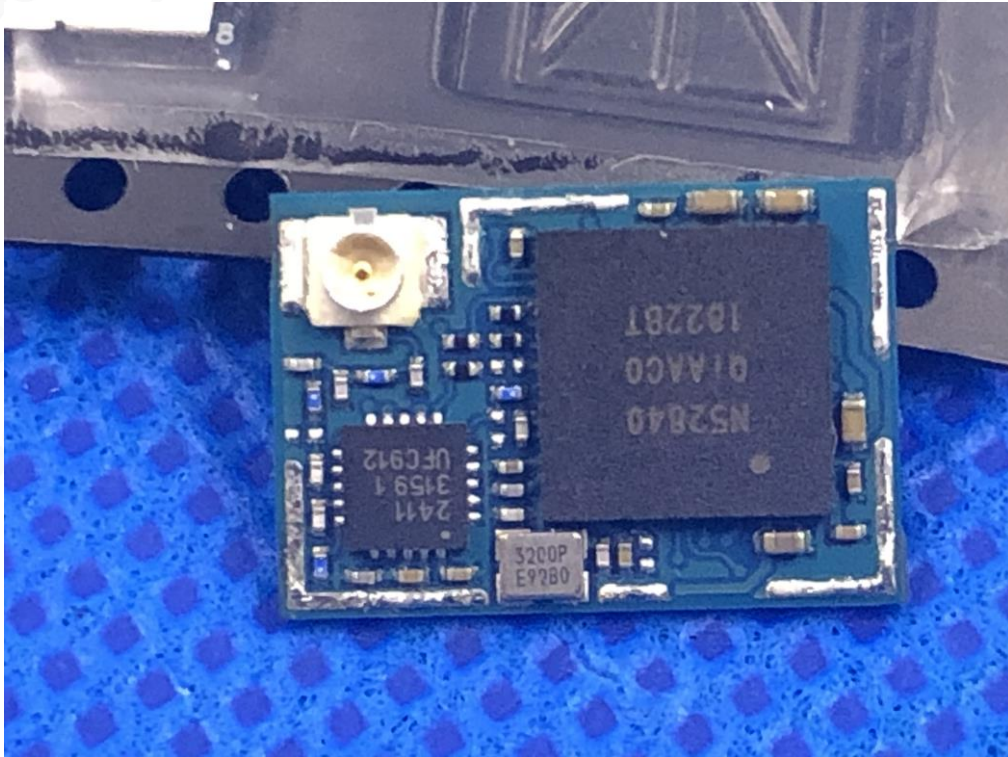
RIGHT VIEW OF EUT



INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



----END OF REPORT----

