5.10. Conducted Emissions

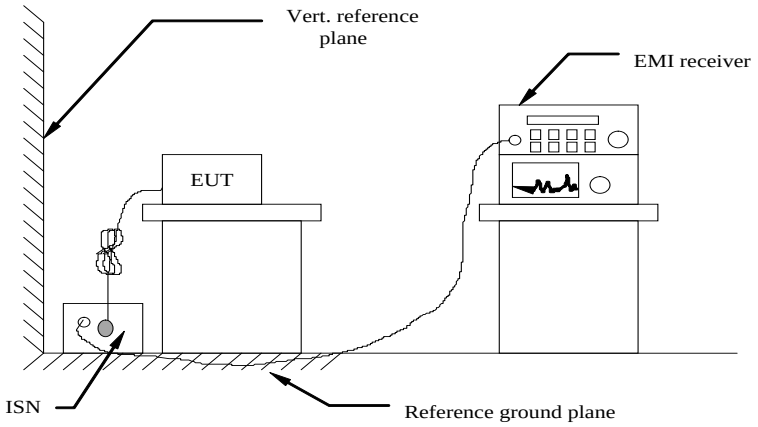
The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm / 50 u Henry as specified by section 5.1 of ANSI C63.4-2014. Cables and peripherals were moved to find the maximum emission levels for each frequency.

Limit

FCC part 15.107(a)

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

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. 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 C63.4-2014.
2 Support equipment, if needed, was placed as per ANSI C63.4-2014.
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4-2014.
4 If a EUT received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5 All support equipments received AC power from a second LISN, if any
6 The EUT 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.

TEST MODE:

Please reference to the section 3.4

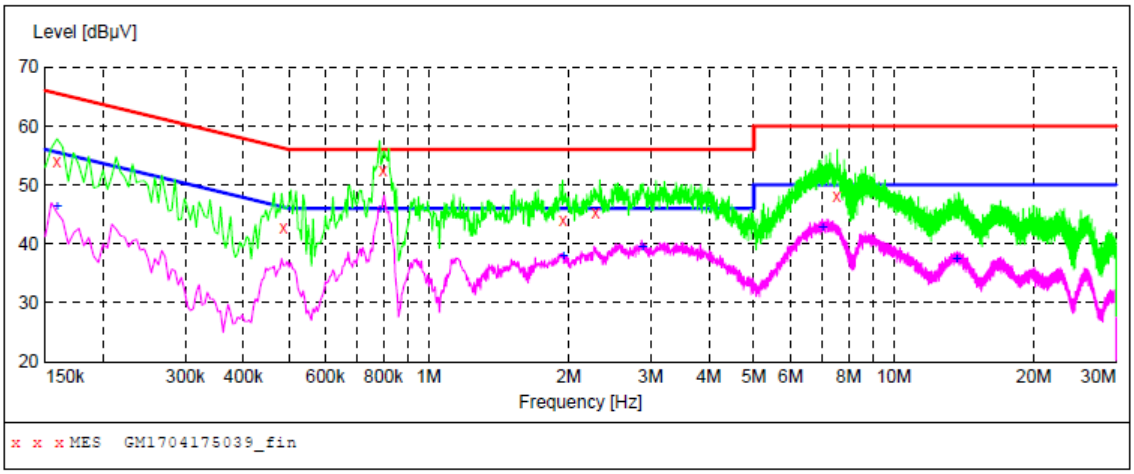
TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Note:

Have pre-tested RX1 to RX3 mode, record the worst case mode RX3 on the report.

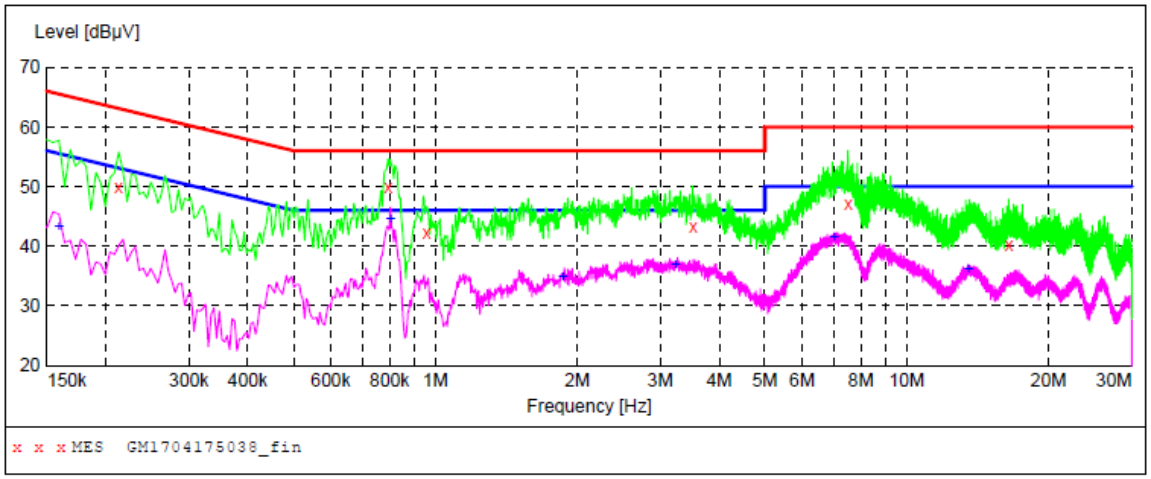
Test mode:	RX3	Polarization	L1



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.159000	53.90	10.4	66	11.6	QP	L1	GND
0.487500	42.70	10.2	56	13.5	QP	L1	GND
0.798000	52.40	10.2	56	3.6	QP	L1	GND
1.945500	44.10	10.2	56	11.9	QP	L1	GND
2.287500	45.30	10.2	56	10.7	QP	L1	GND
7.534500	48.10	10.4	60	11.9	QP	L1	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.159000	46.30	10.4	56	9.2	AV	L1	GND
0.784500	42.90	10.2	46	3.1	AV	L1	GND
1.950000	37.90	10.2	46	8.1	AV	L1	GND
2.881500	39.50	10.2	46	6.5	AV	L1	GND
7.021500	42.80	10.3	50	7.2	AV	L1	GND
13.645500	37.40	10.5	50	12.6	AV	L1	GND

Test mode:	RX3	Polarization	N



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.213000	50.00	10.3	63	13.1	QP	N	GND
0.793500	49.80	10.2	56	6.2	QP	N	GND
0.960000	42.20	10.2	56	13.8	QP	N	GND
3.529500	43.20	10.3	56	12.8	QP	N	GND
7.521000	47.00	10.4	60	13.0	QP	N	GND
16.498500	40.30	10.5	60	19.7	QP	N	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.159000	43.30	10.4	56	12.2	AV	N	GND
0.802500	42.50	10.2	46	3.5	AV	N	GND
1.864500	34.90	10.2	46	11.1	AV	N	GND
3.228000	36.90	10.2	46	9.1	AV	N	GND
7.012500	41.40	10.3	50	8.6	AV	N	GND
13.515000	36.00	10.5	50	14.0	AV	N	GND

5.11. Radiated Emission

LIMIT

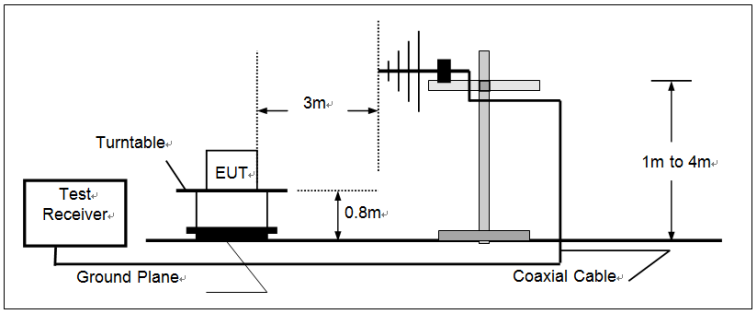
For unintentional device, according to § 15.109(a) except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

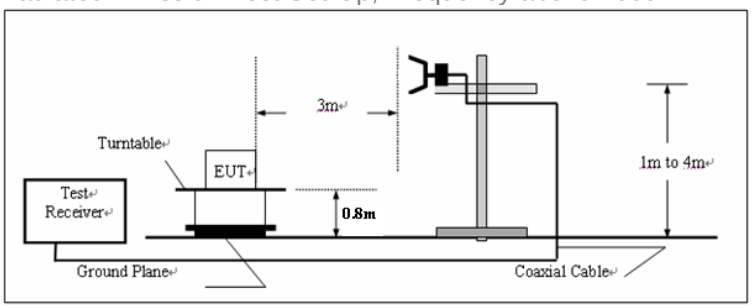
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

TEST CONFIGURATION

(A) Radiated Emission Test Set-Up, Frequency below 1000MHz



(B) Radiated Emission Test Set-Up, Frequency above 1000MHz



TEST PROCEDURE

1 The EUT was placed on a turn table which is 0.8m above ground plane.
2 Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3 And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4 Repeat above procedures until all frequency measurements have been completed.

TEST MODE:

Please reference to the section 3.4

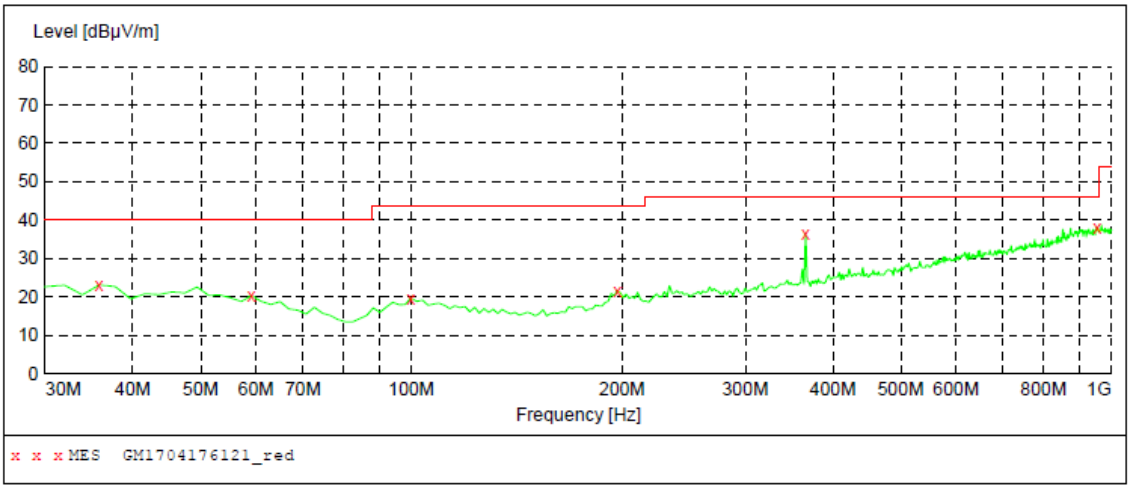
TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

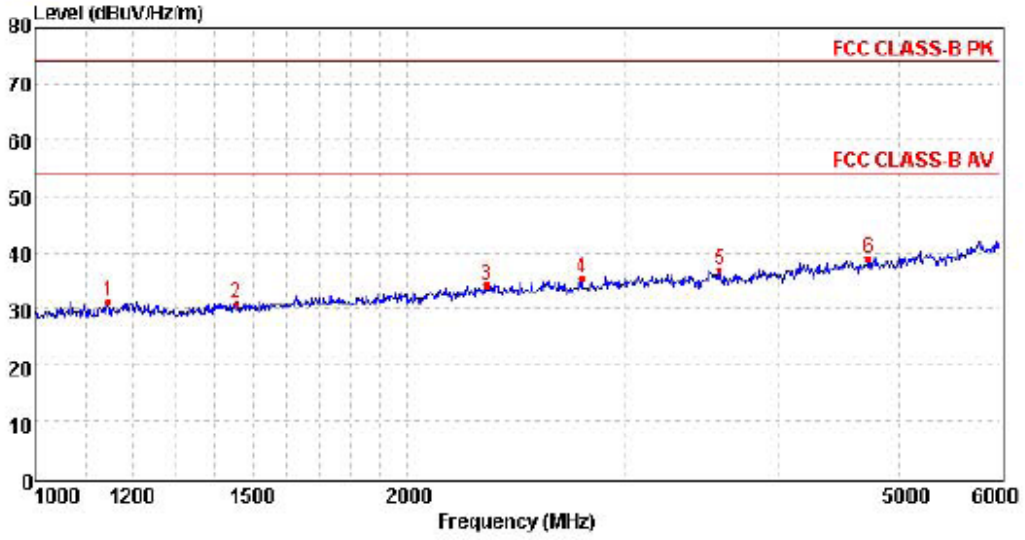
Note:

1. The EUT shall be scanned from 30 MHz to the 5th harmonic of the highest oscillator frequency in the digital devices or 1 GHz whichever is higher.
2. Have pre-tested RX1 to RX3mode, record the worst case mode RX1 on the report.

Test Mode:	RX3	Polarity:	Horizontal

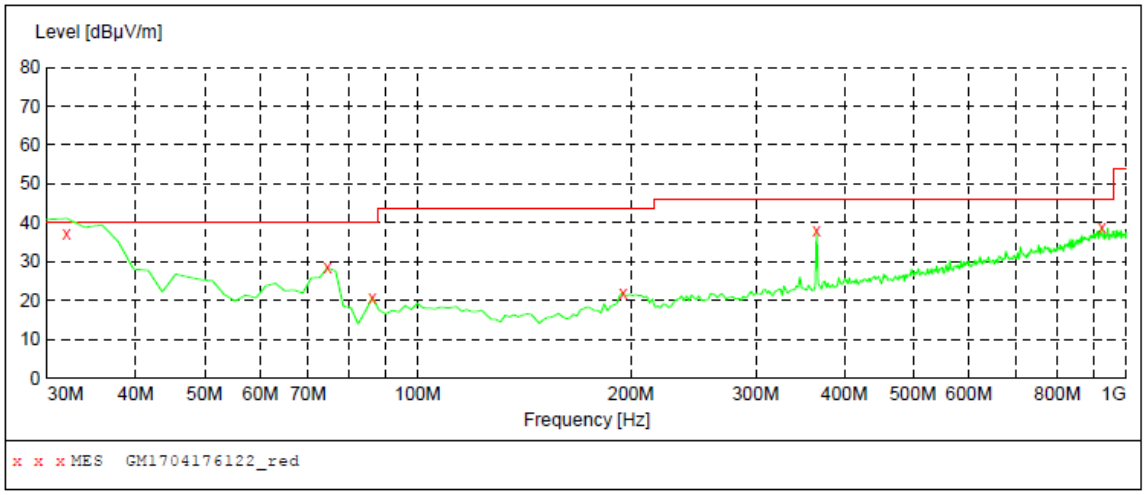


Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
35.820000	23.10	-11.7	40.0	16.9	QP	300.0	83.00	HORIZONTAL
59.100000	20.30	-9.8	40.0	19.7	QP	300.0	245.00	HORIZONTAL
99.840000	19.60	-10.6	43.5	23.9	QP	300.0	111.00	HORIZONTAL
196.840000	21.60	-9.8	43.5	21.9	QP	300.0	360.00	HORIZONTAL
365.620000	36.40	-5.5	46.0	9.6	QP	100.0	265.00	HORIZONTAL
953.440000	38.10	7.3	46.0	7.9	QP	100.0	276.00	HORIZONTAL

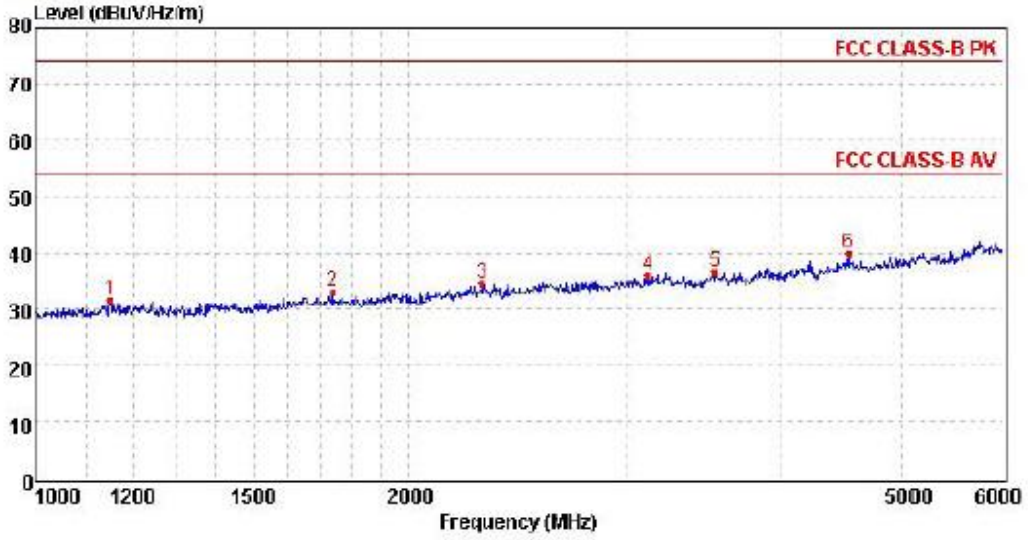


Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	1147.94	38.88	24.37	4.54	36.60	31.19	74.00	-42.81	Peak
2	1454.23	37.72	24.66	5.15	36.53	31.00	74.00	-43.00	Peak
3	2317.14	38.02	27.29	6.63	37.67	34.27	74.00	-39.73	Peak
4	2766.88	38.13	28.23	7.29	38.27	35.38	74.00	-38.62	Peak
5	3574.91	38.20	28.84	8.23	38.31	36.96	74.00	-37.04	Peak
6	4710.87	35.44	31.03	9.50	37.08	38.89	74.00	-35.11	Peak

Test Mode:	RX3	Polarity:	Vertical



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
31.940000	35.90	-13.2	40.0	4.1	QP	100.0	148.00	VERTICAL
74.620000	28.40	-14.8	40.0	11.6	QP	100.0	171.00	VERTICAL
86.260000	20.60	-14.1	40.0	19.4	QP	100.0	241.00	VERTICAL
194.900000	21.90	-10.1	43.5	21.6	QP	100.0	296.00	VERTICAL
365.620000	37.90	-5.5	46.0	8.1	QP	100.0	188.00	VERTICAL
924.340000	38.70	7.0	46.0	7.3	QP	100.0	119.00	VERTICAL



Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	1150.00	39.11	24.37	4.55	36.60	31.43	74.00	-42.57	Peak
2	1736.48	38.84	25.41	5.84	37.01	33.08	74.00	-40.92	Peak
3	2292.37	38.24	27.20	6.59	37.60	34.43	74.00	-39.57	Peak
4	3119.80	37.92	28.55	7.62	38.21	35.88	74.00	-38.12	Peak
5	3530.36	38.14	28.75	8.16	38.37	36.68	74.00	-37.32	Peak
6	4520.68	36.85	30.92	9.33	37.36	39.74	74.00	-34.26	Peak

6. Test Setup Photos of the EUT

Transmitter Radiated Spurious Emission:

Radiated Emission:

Conducted Emission:

Frequency stability:

7. External and Internal Photos of the EUT

Reference to the test report No.: TRE1704000101

--------End of Report---------