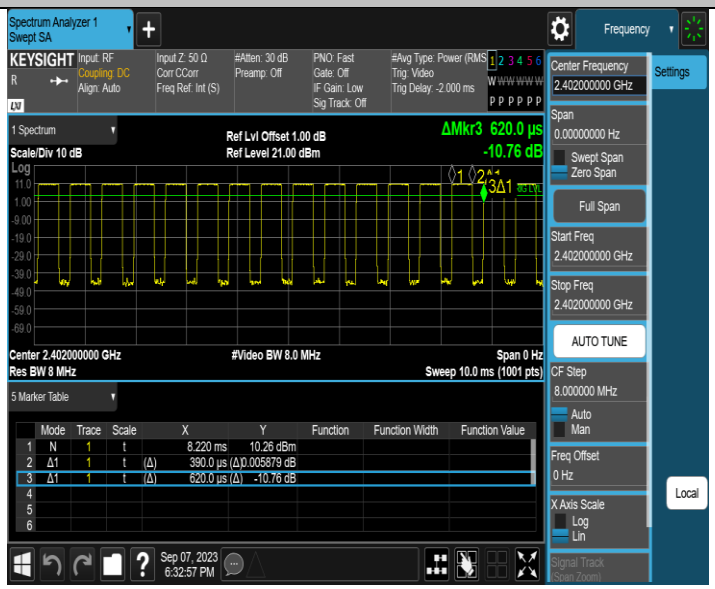
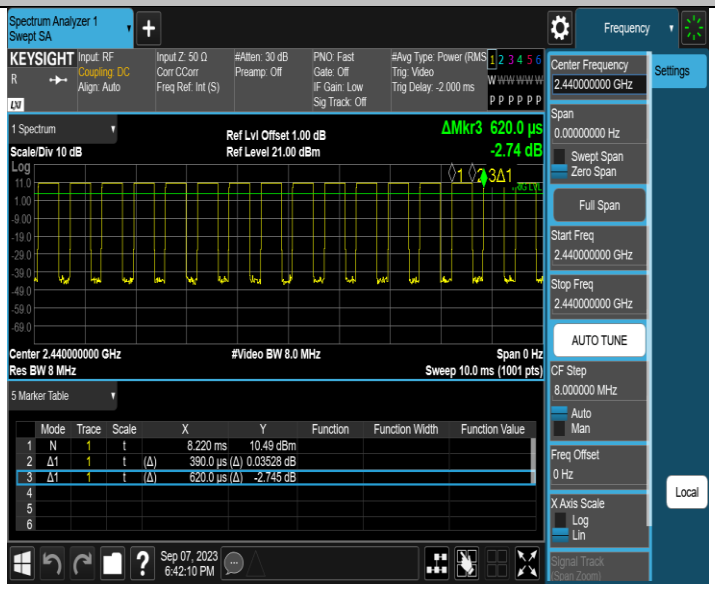
Appendix G: Duty Cycle

TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
BLE_1M	Ant1	2402	0.39	0.62	62.90	2.01
		2440	0.39	0.62	62.90	2.01
		2480	0.39	0.63	61.90	2.08
BLE_2M	Ant1	2402	0.20	0.62	32.26	4.91
		2440	0.21	0.63	33.33	4.77
		2480	0.21	0.63	33.33	4.77

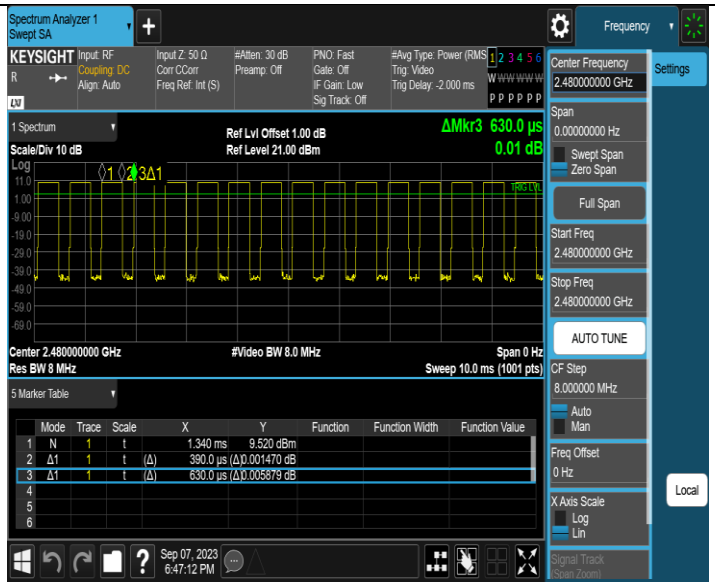
BLE_1M_Ant1_2402



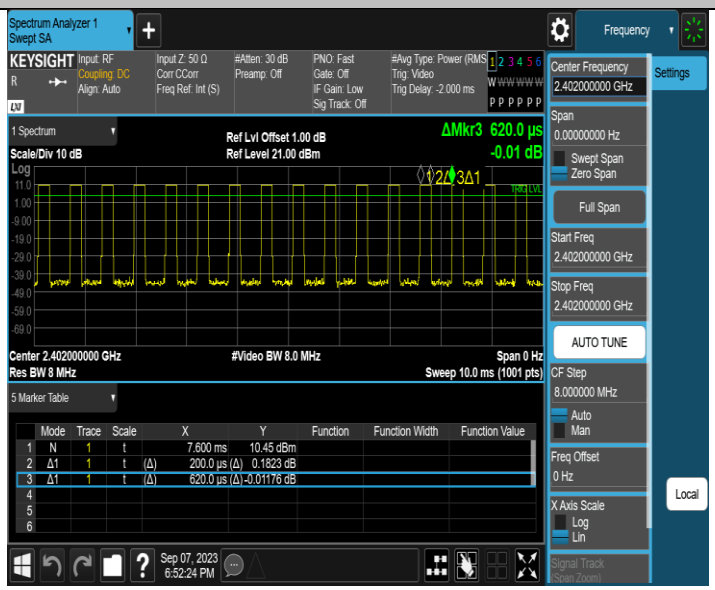
BLE_1M_Ant1_2440



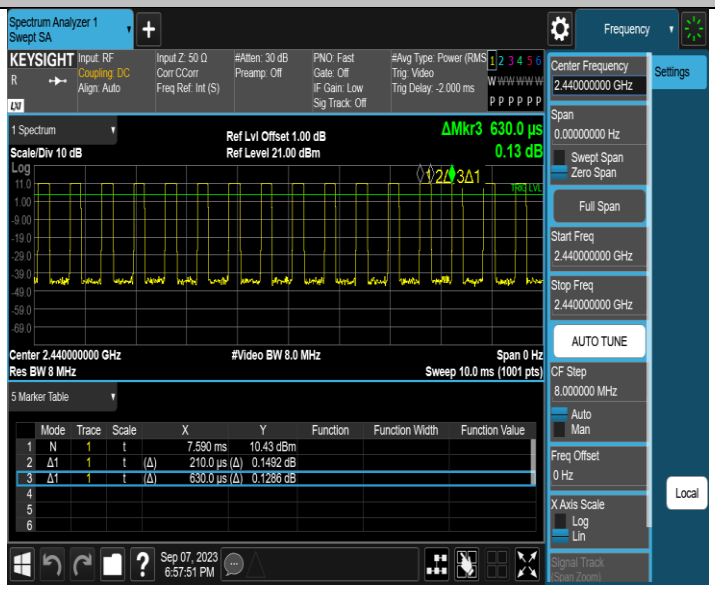
BLE_1M_Ant1_2480



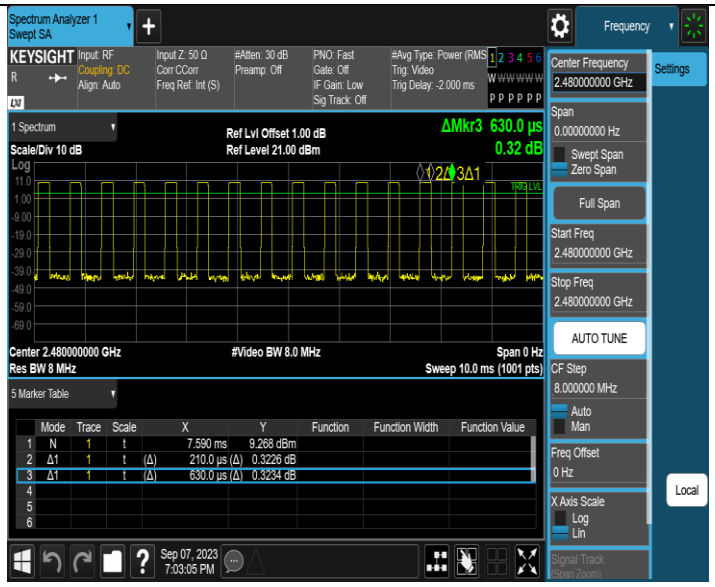
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440

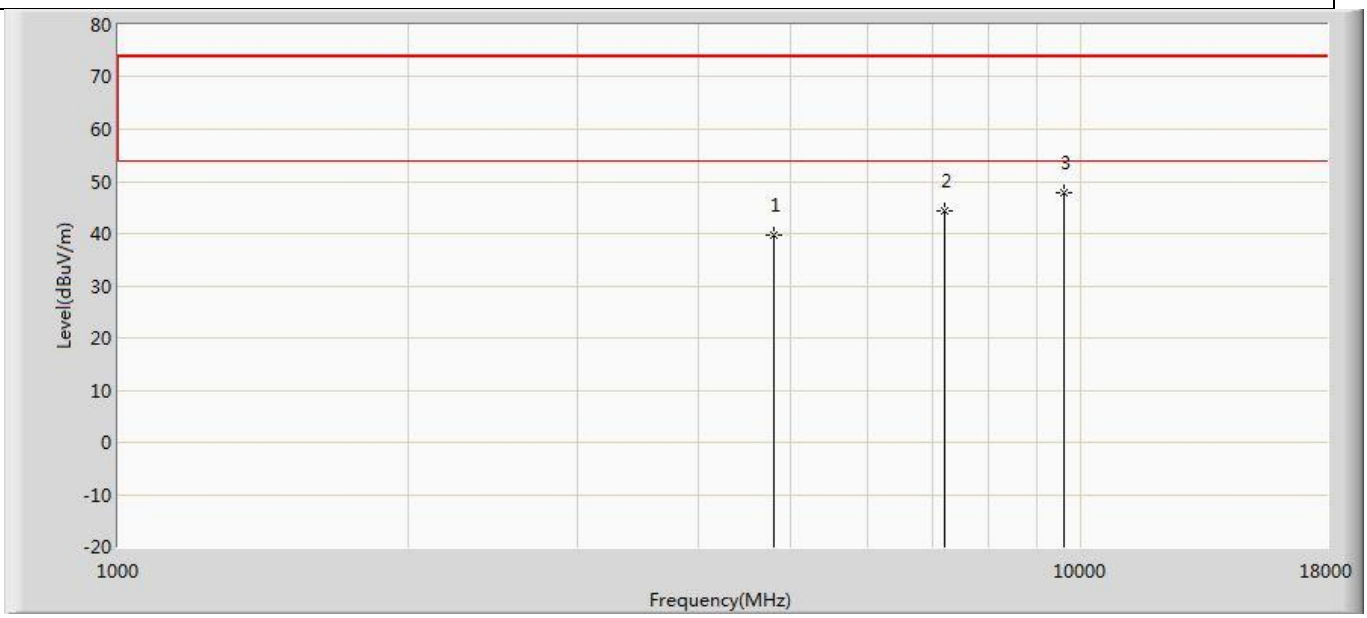


BLE_2M_Ant1_2480


Spectrum Analyzer 1
Swept SA
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corr CCorr
Freq Ref: Int (S)
#Atten: 30 dB
Preamp: Off
PNO: Fast
Gate: Off
IF Gain: Low
Sig Track: Off
#Avg Type: Power (RMS)
Trig: Video
Trig Delay: -2.000 ms
1 Spectrum
Scale/Div 10 dB
Ref Lvl Offset 1.00 dB
Ref Level 21.00 dBm
ΔMkr3 630.0 µs
0.32 dB
Center 2.480000000 GHz
Res BW 8 MHz
#Video BW 8.0 MHz
Span 0 Hz
Sweep 10.0 ms (1001 pts)
5 Marker Table
Mode Trace Scale X Y Function Function Width Function Value
1 N 1 t 7.590 ms 9.268 dBm
2 Δ1 1 t (Δ) 210.0 µs (Δ) 0.3226 dB
3 Δ1 1 t (Δ) 630.0 µs (Δ) 0.3234 dB
Sep 07, 2023
7:03:05 PM
Frequency
Settings
Center Frequency
2.480000000 GHz
Span
0.00000000 Hz
Swept Span
Zero Span
Full Span
Start Freq
2.480000000 GHz
Stop Freq
2.480000000 GHz
AUTO TUNE
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
X Axis Scale
Log
Lin
Local

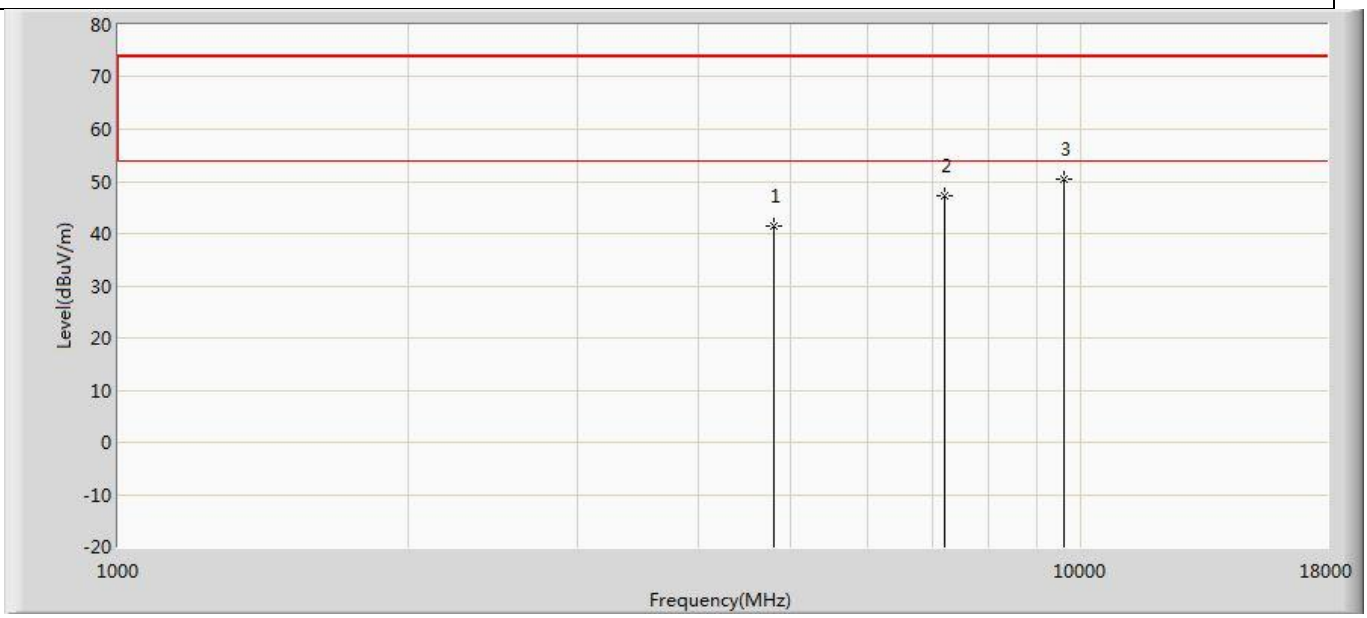
Appendix H: Emissions in Restricted Bands

Profile: 2360694R	Page No.: 13
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/18 - 18:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Horizontal
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 1：Transmit at 2402MHz by LE_1Mbps	



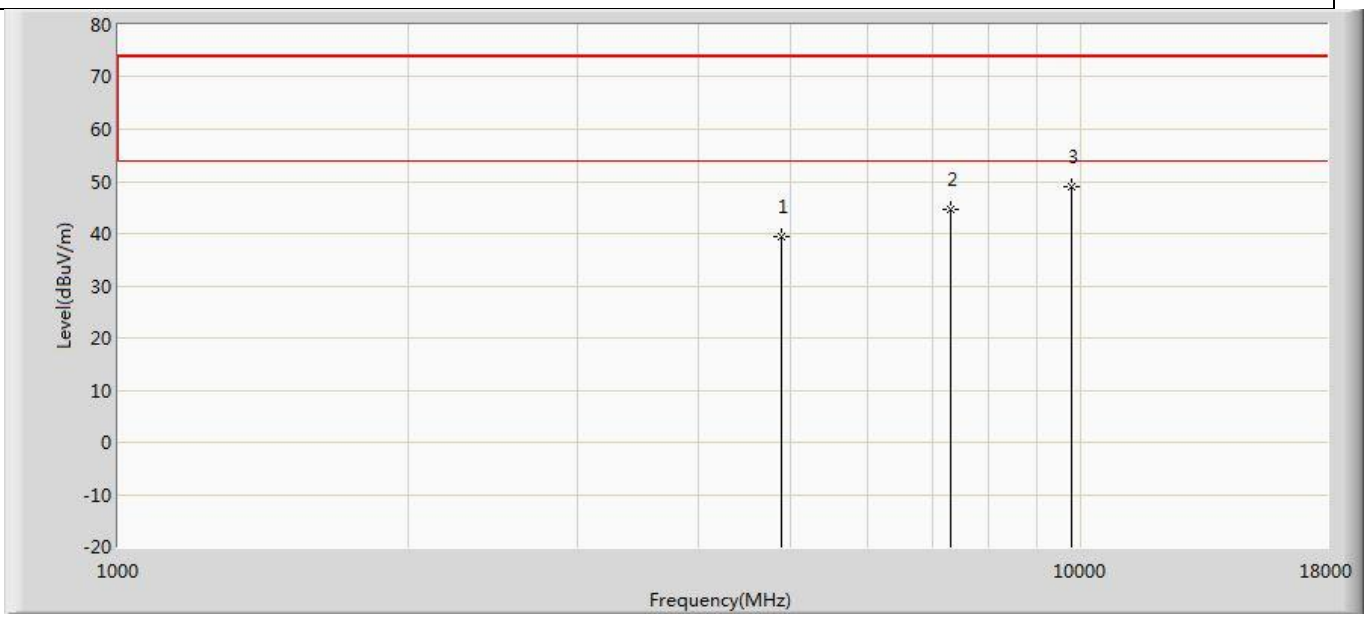
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	39.735	53.986	-34.265	74.000	-14.251	PK
2		7206.000	44.213	52.603	-29.787	74.000	-8.390	PK
3	*	9608.000	47.763	51.326	-26.237	74.000	-3.563	PK

Profile: 2360694R	Page No.: 14
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/18 - 18:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Vertical
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 1：Transmit at 2402MHz by LE_1Mbps	



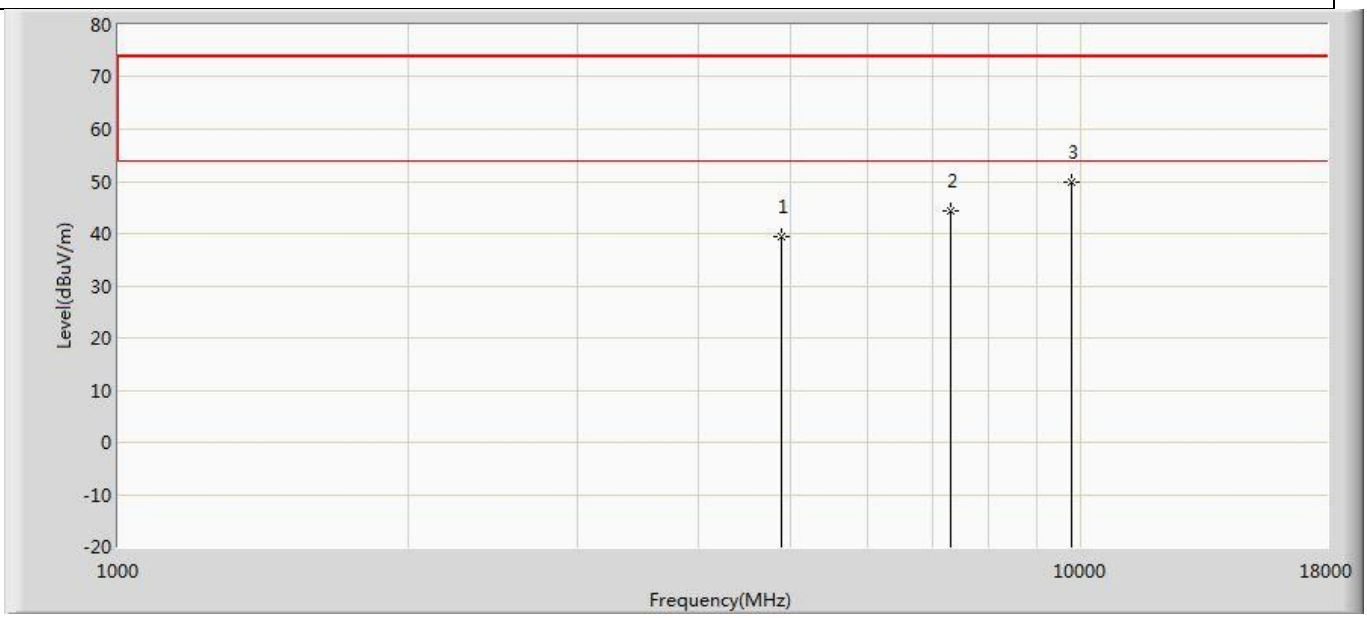
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	41.542	55.793	-32.458	74.000	-14.251	PK
2		7206.000	47.167	55.557	-26.833	74.000	-8.390	PK
3	*	9608.000	50.522	54.085	-23.478	74.000	-3.563	PK

Profile: 2360694R	Page No.: 15
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/18 - 18:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Horizontal
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 1：Transmit at 2440MHz by LE_1Mbps	



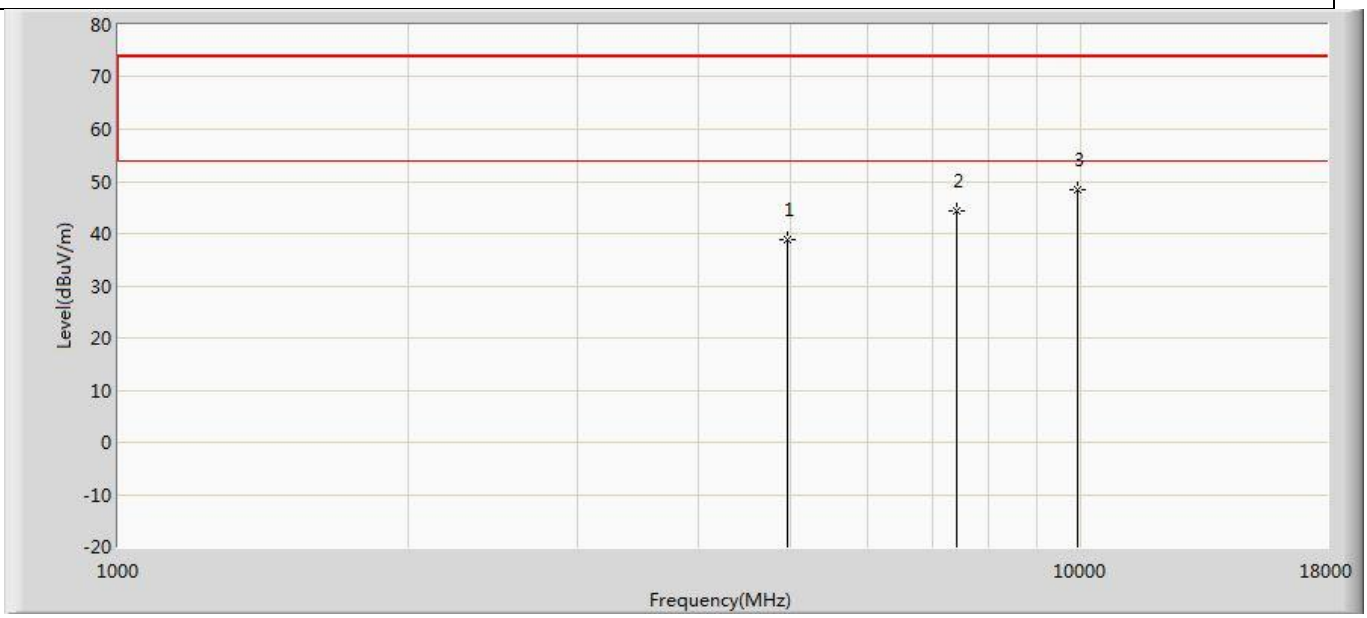
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4880.000	39.486	53.380	-34.514	74.000	-13.894	PK
2		7320.000	44.596	53.028	-29.404	74.000	-8.432	PK
3	*	9760.000	49.010	52.694	-24.990	74.000	-3.683	PK

Profile: 2360694R	Page No.: 16
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/18 - 18:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Vertical
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 1：Transmit at 2440MHz by LE_1Mbps	



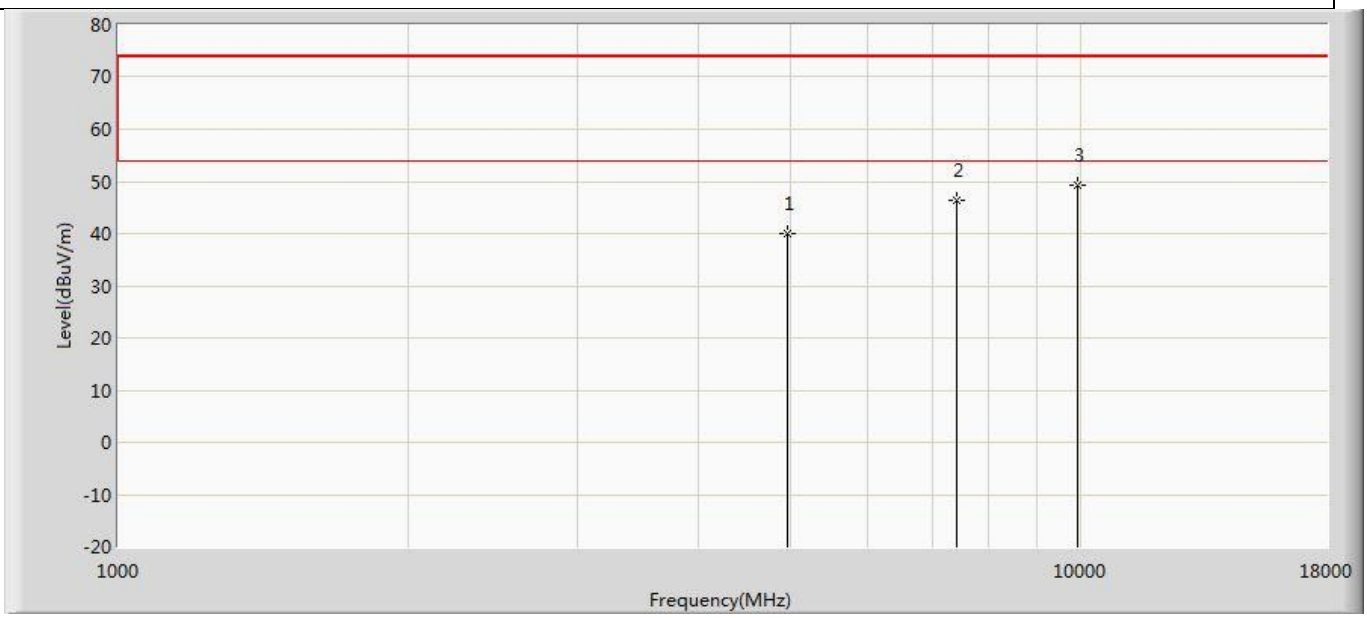
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4880.000	39.346	53.240	-34.654	74.000	-13.894	PK
2		7320.000	44.453	52.885	-29.547	74.000	-8.432	PK
3	*	9760.000	49.784	53.468	-24.216	74.000	-3.683	PK

Profile: 2360694R	Page No.: 17
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/18 - 18:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Horizontal
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 1：Transmit at 2480MHz by LE_1Mbps	



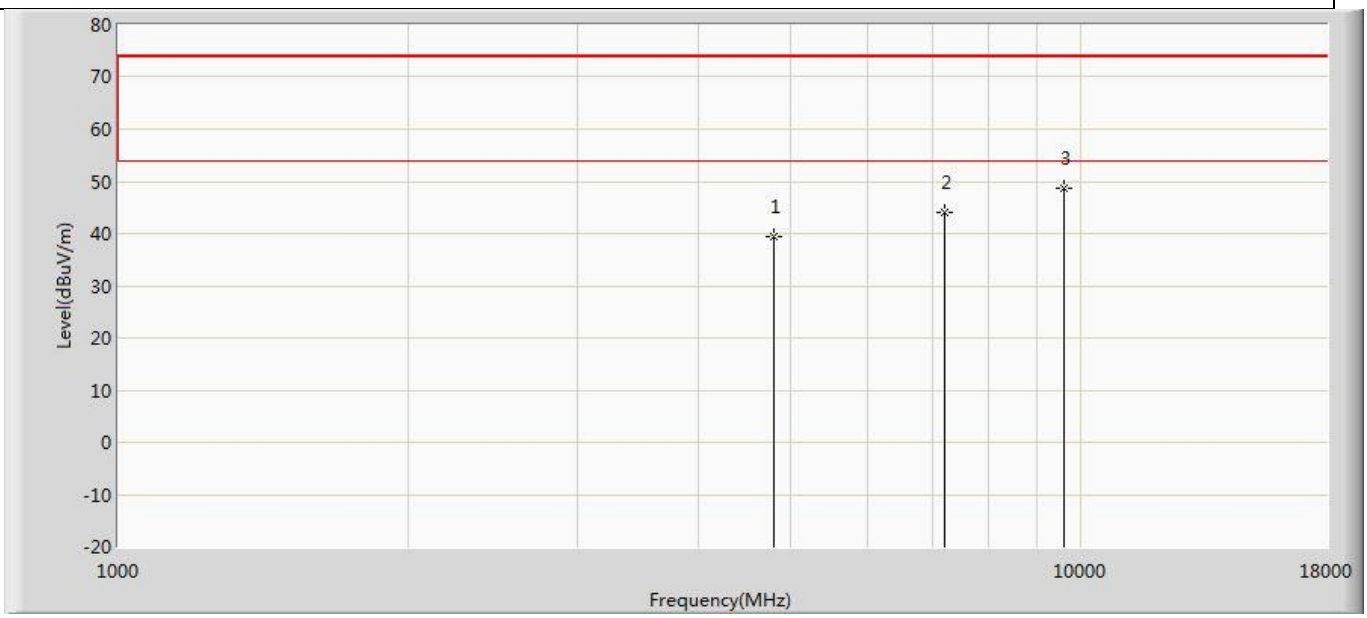
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4960.000	38.955	52.800	-35.045	74.000	-13.845	PK
2		7440.000	44.213	52.244	-29.787	74.000	-8.031	PK
3	*	9920.000	48.465	51.637	-25.535	74.000	-3.172	PK

Profile: 2360694R	Page No.: 18
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/18 - 18:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Vertical
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 1：Transmit at 2480MHz by LE_1Mbps	



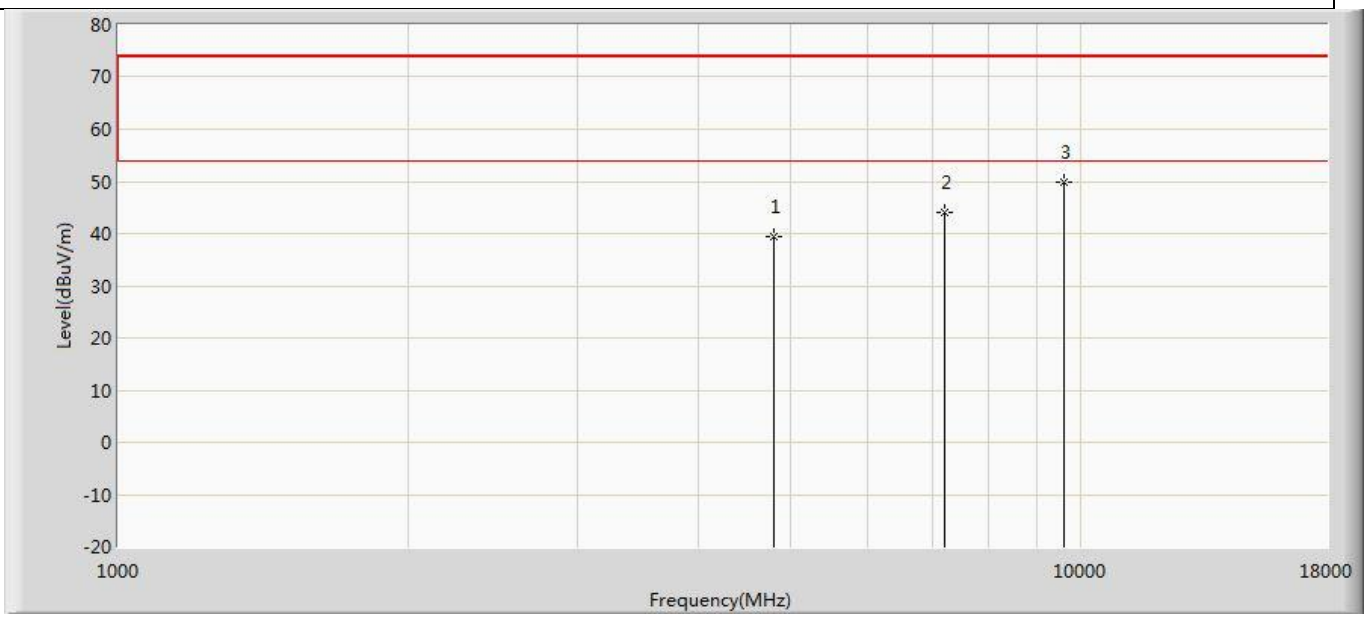
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4960.000	39.864	53.709	-34.136	74.000	-13.845	PK
2		7440.000	46.293	54.324	-27.707	74.000	-8.031	PK
3	*	9920.000	49.141	52.313	-24.859	74.000	-3.172	PK

Profile: 2360694R	Page No.: 19
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/18 - 18:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Horizontal
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 2：Transmit at 2402MHz by LE_2Mbps	



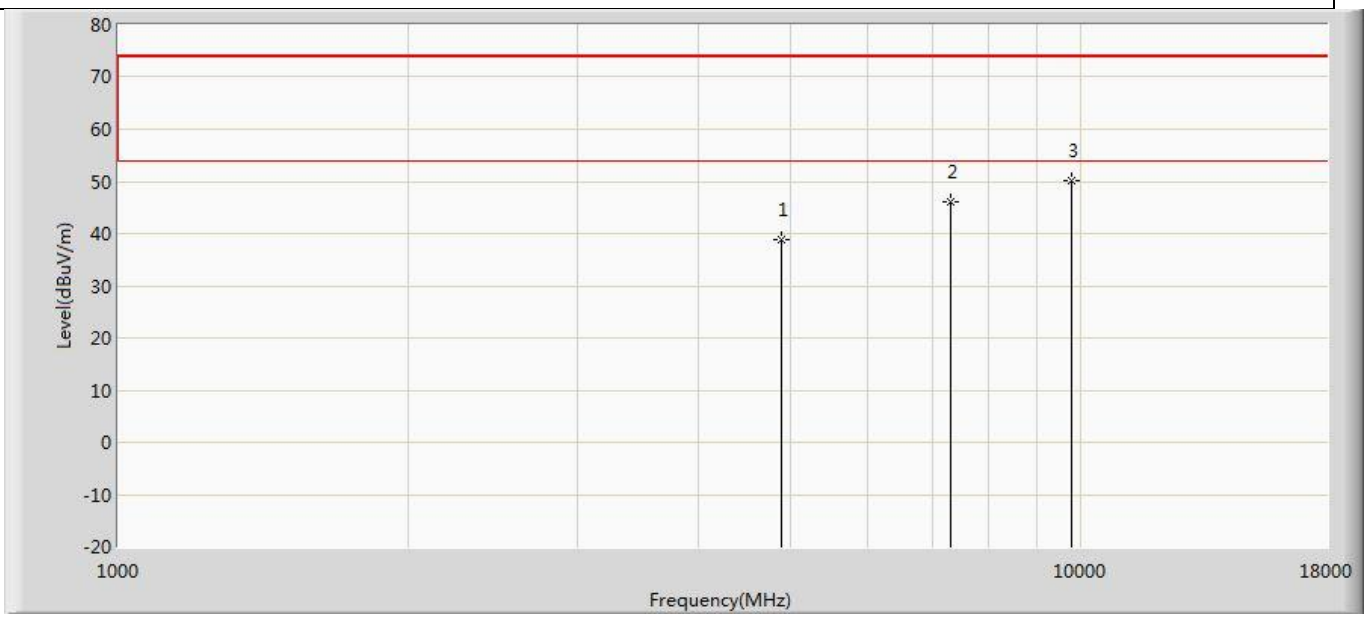
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	39.506	53.757	-34.494	74.000	-14.251	PK
2		7206.000	43.931	52.321	-30.069	74.000	-8.390	PK
3	*	9608.000	48.808	52.371	-25.192	74.000	-3.563	PK

Profile: 2360694R	Page No.: 20
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/18 - 18:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Vertical
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 2：Transmit at 2402MHz by LE_2Mbps	



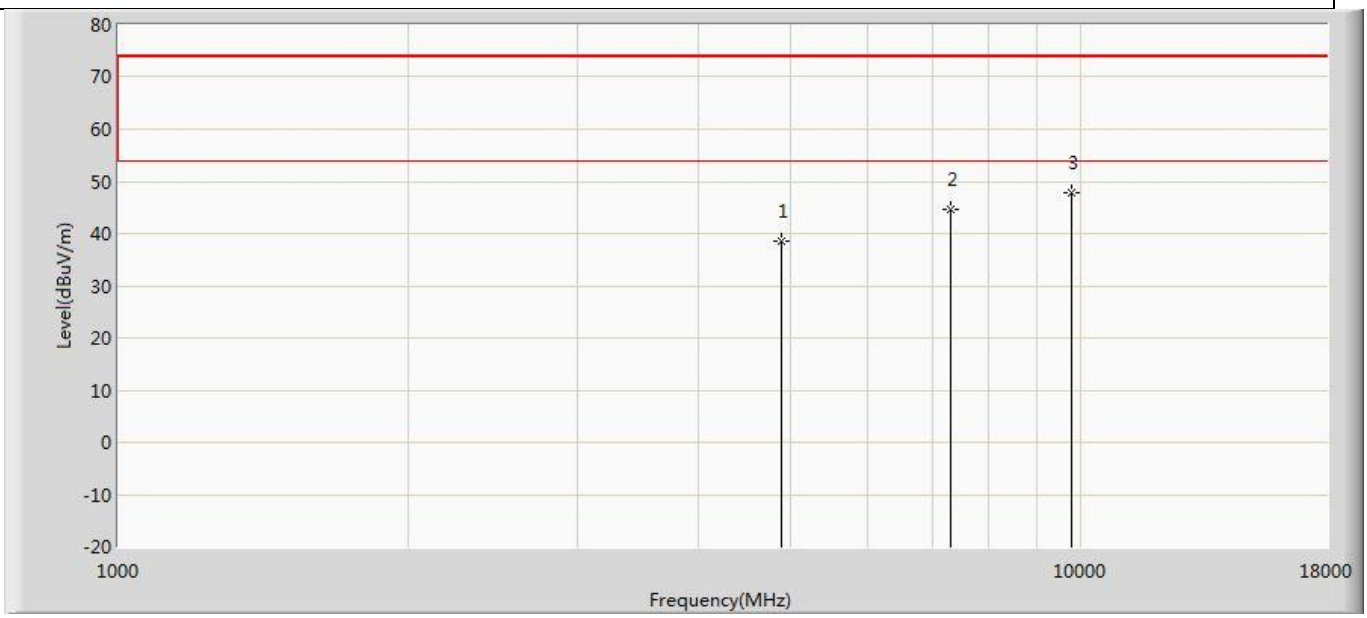
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	39.389	53.640	-34.611	74.000	-14.251	PK
2		7206.000	44.094	52.484	-29.906	74.000	-8.390	PK
3	*	9608.000	49.718	53.281	-24.282	74.000	-3.563	PK

Profile: 2360694R	Page No.: 21
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/18 - 18:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Horizontal
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 2：Transmit at 2440MHz by LE_2Mbps	



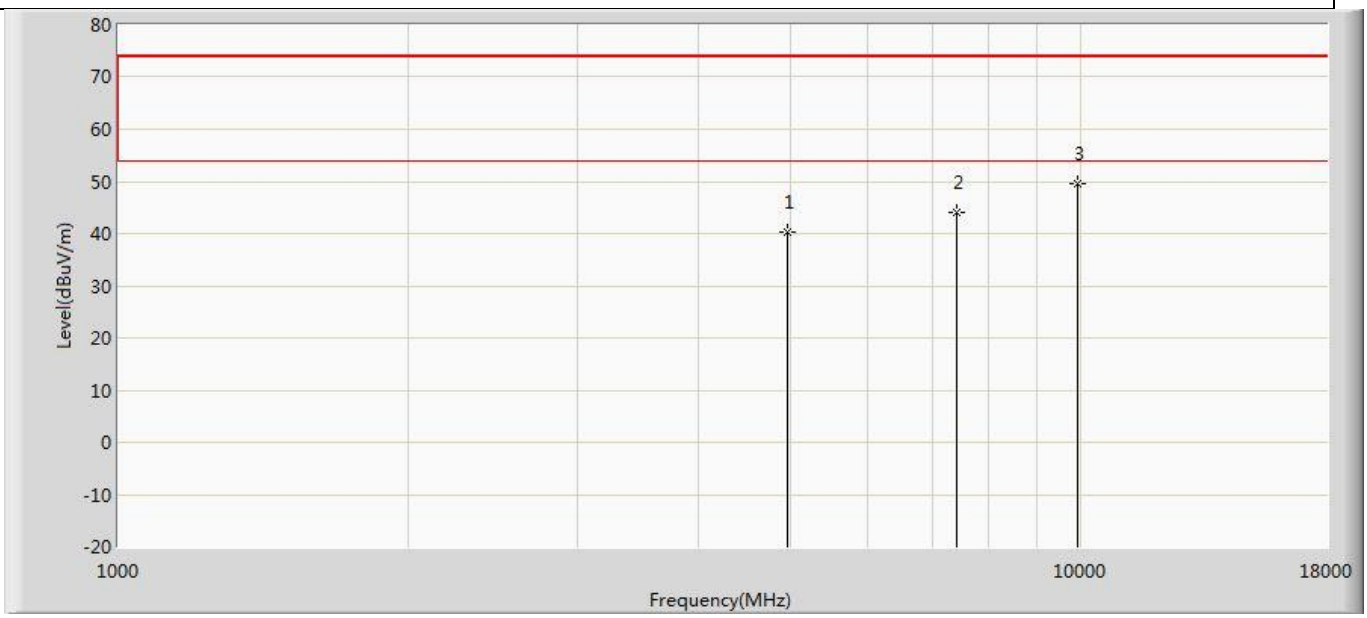
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4880.000	38.746	52.640	-35.254	74.000	-13.894	PK
2		7320.000	46.076	54.508	-27.924	74.000	-8.432	PK
3	*	9760.000	50.036	53.720	-23.964	74.000	-3.683	PK

Profile: 2360694R	Page No.: 22
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/18 - 18:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Vertical
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 2：Transmit at 2440MHz by LE_2Mbps	



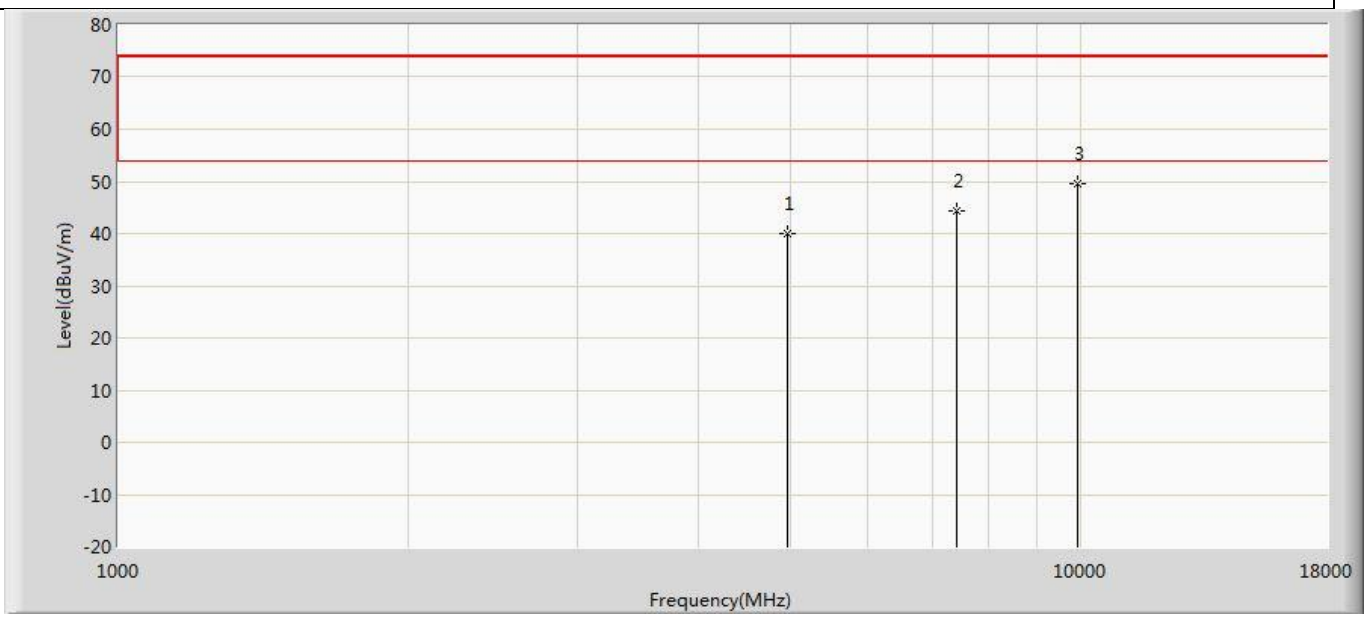
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4880.000	38.447	52.341	-35.553	74.000	-13.894	PK
2		7320.000	44.775	53.207	-29.225	74.000	-8.432	PK
3	*	9760.000	47.688	51.372	-26.312	74.000	-3.683	PK

Profile: 2360694R	Page No.: 23
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/18 - 18:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Horizontal
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 2：Transmit at 2480MHz by LE_2Mbps	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4960.000	40.356	54.201	-33.644	74.000	-13.845	PK
2		7440.000	44.081	52.112	-29.919	74.000	-8.031	PK
3	*	9920.000	49.707	52.879	-24.293	74.000	-3.172	PK

Profile: 2360694R	Page No.: 24
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/18 - 18:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Vertical
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 2：Transmit at 2480MHz by LE_2Mbps	

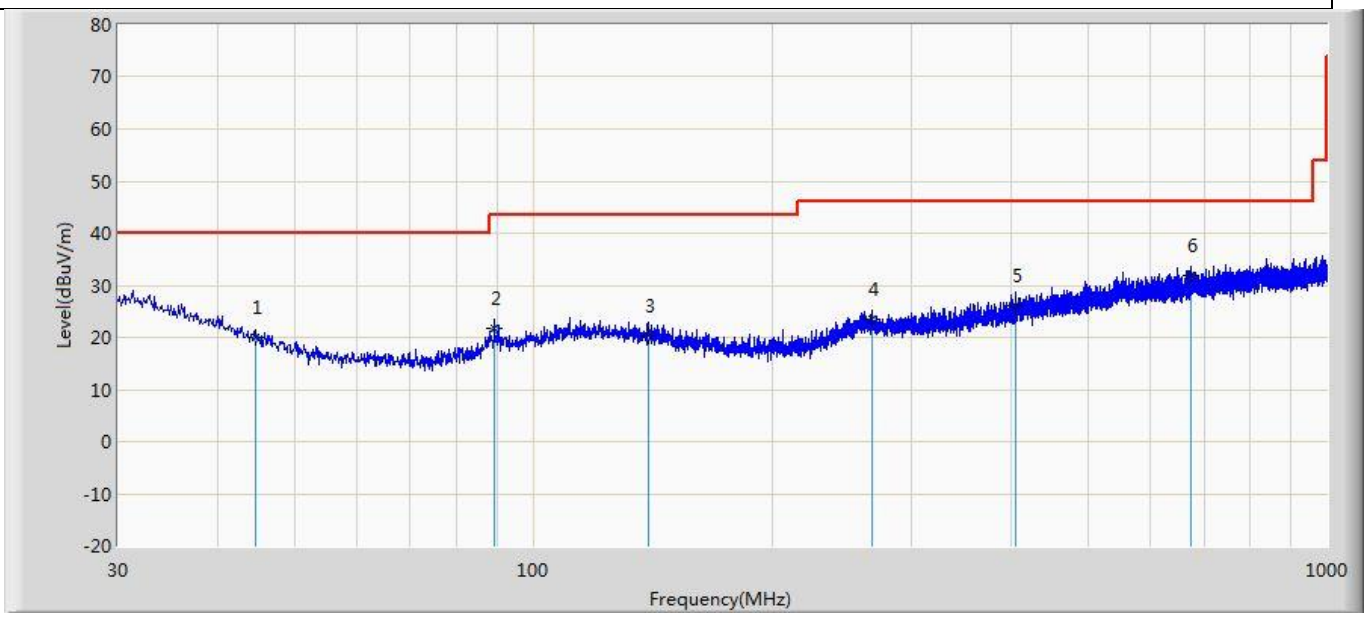


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4960.000	40.063	53.908	-33.937	74.000	-13.845	PK
2		7440.000	44.319	52.350	-29.681	74.000	-8.031	PK
3	*	9920.000	49.545	52.717	-24.455	74.000	-3.172	PK

Note:
1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, worst case are at least 20dB below the limits, therefore no data appear in the report.
3. The test frequency range, 18GHz~26GHz test result on peak is lower than average limit, all is the noise base, therefore no data appear in the report.
4. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

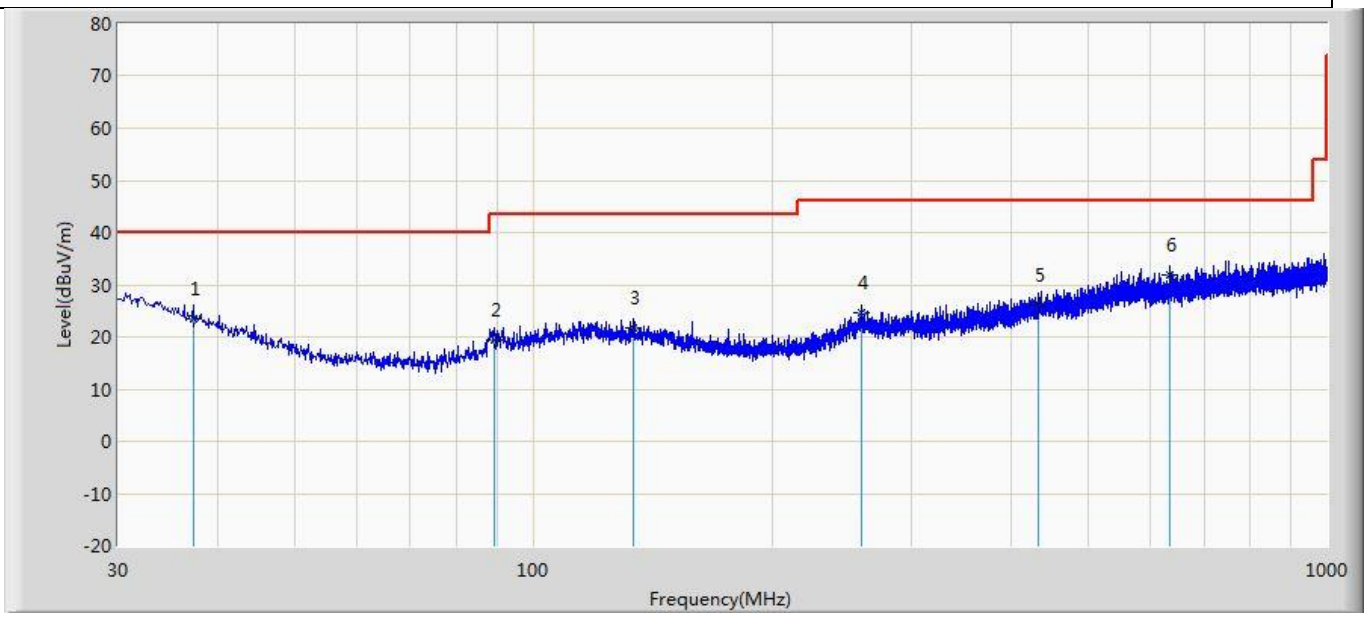
The worst case of Radiated Emission below 1GHz :

Profile: 2360694R	Page No.: 19
Engineer: Pengchengyang	
Site: AC2	Time: 2023/09/15 - 13:36
Limit: FCC_Part 15.209_RE (3m)	Margin: 0
Probe: CBL6112B_2933(30-1000MHz)	Polarity: Horizontal
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 1: Transmit at 2402MHz by LE_1MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		44.792	19.922	2.535	-20.078	40.000	17.387	QP
2		89.412	21.861	6.040	-21.639	43.500	15.821	QP
3		139.610	20.290	2.056	-23.210	43.500	18.234	QP
4		267.771	23.411	2.754	-22.589	46.000	20.657	QP
5		404.541	26.070	2.292	-19.930	46.000	23.778	QP
6	*	674.929	31.955	3.703	-14.045	46.000	28.252	QP

Profile: 2360694R	Page No.: 20
Engineer: Pengchengyang	
Site: AC2	Time: 2023/09/15 - 13:37
Limit: FCC_Part 15.209_RE (3m)	Margin: 0
Probe: CBL6112B_2933(30-1000MHz)	Polarity: Vertical
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 1: Transmit at 2402MHz by LE_1MHz	

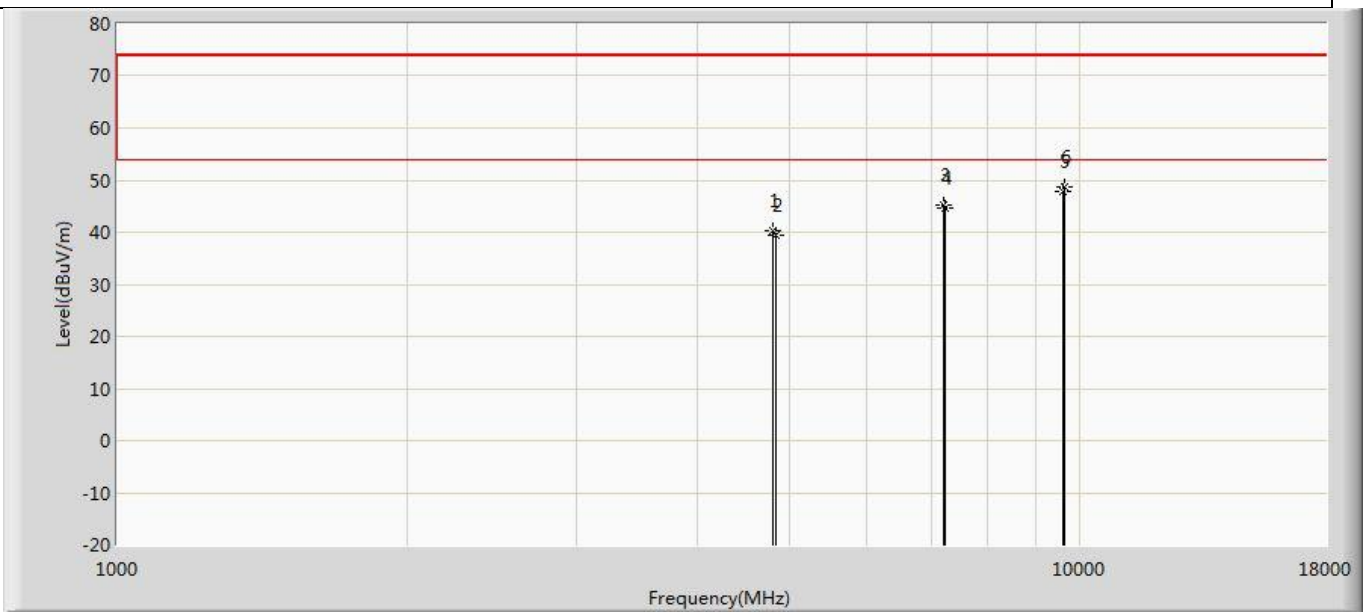


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		37.275	23.469	2.001	-16.531	40.000	21.468	QP
2		89.534	19.458	3.612	-24.042	43.500	15.846	QP
3		133.911	21.740	3.166	-21.760	43.500	18.573	QP
4		258.799	24.611	3.543	-21.389	46.000	21.068	QP
5		432.550	26.135	1.625	-19.865	46.000	24.510	QP
6	*	633.340	31.870	4.063	-14.130	46.000	27.807	QP

Note:
1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp)

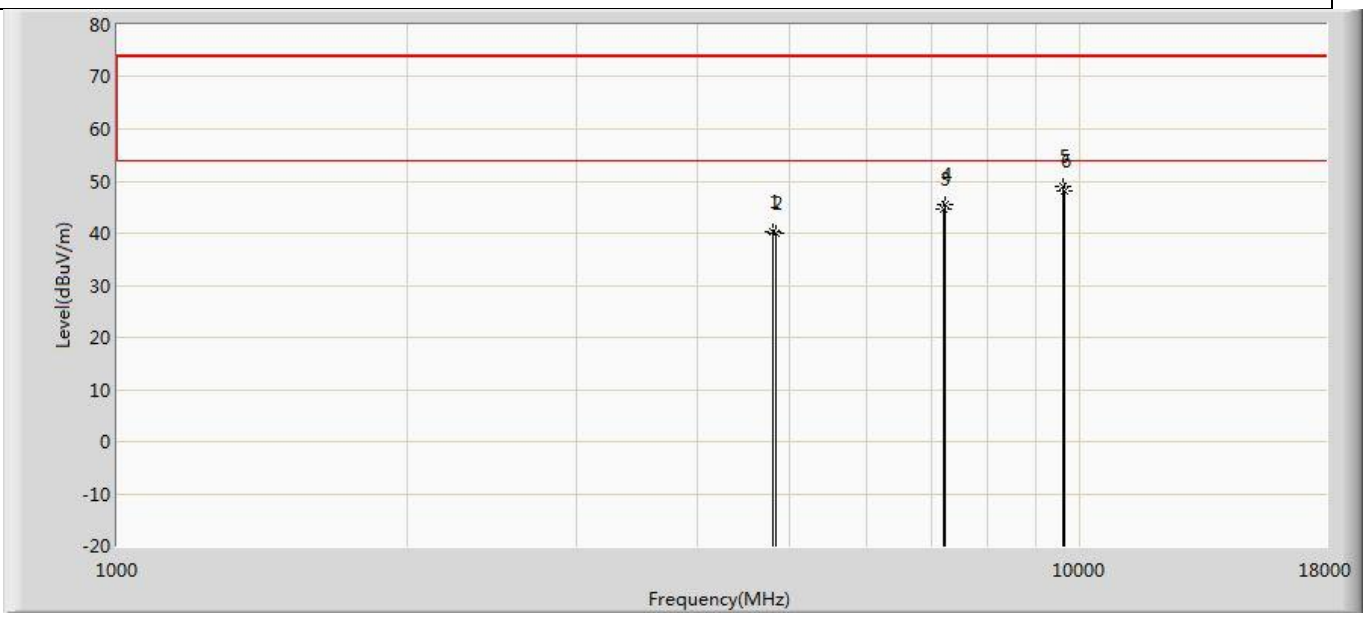
The worst case of Simultaneous Radiated Emission:

Profile: 2360694R	Page No.: 5
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/19 - 09:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Horizontal
EUT: POS	Power: AC 120V/60Hz
Note: Mode 1：Transmit at 2402MHz by Bluetooth & 2412MHz by 802.11b	



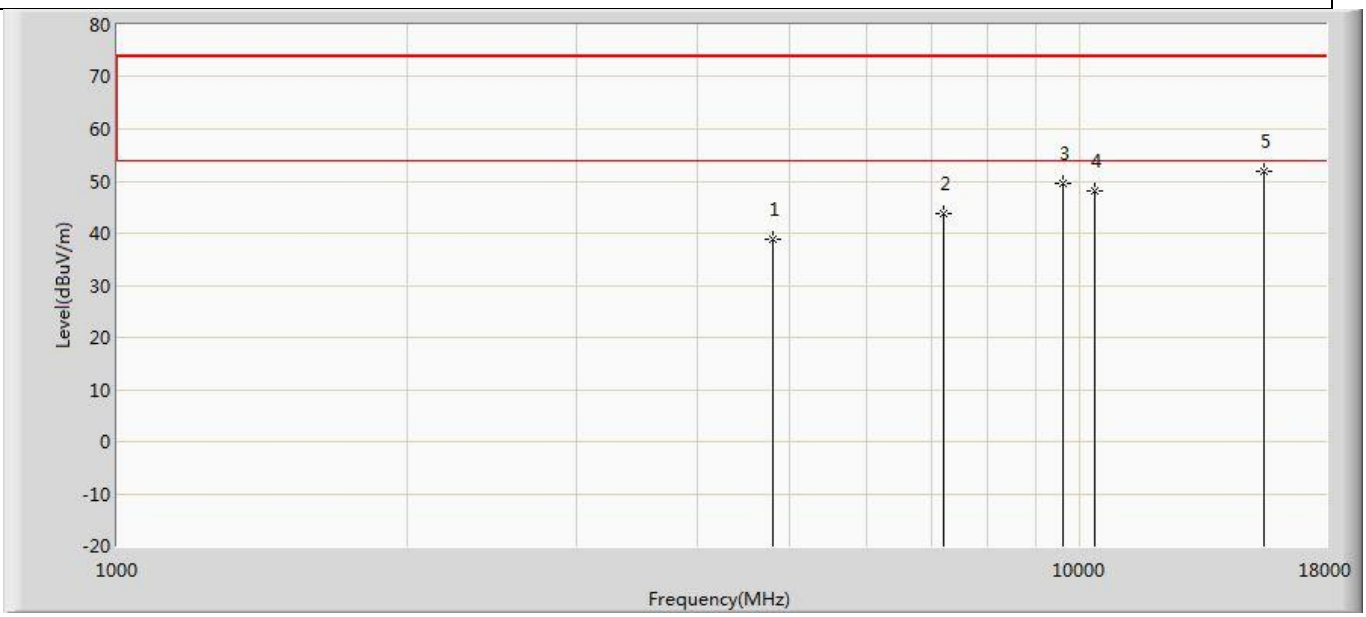
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	40.325	54.576	-33.675	74.000	-14.251	PK
2		4824.000	39.506	53.746	-34.494	74.000	-14.240	PK
3		7206.000	45.322	53.712	-28.678	74.000	-8.390	PK
4		7236.000	44.505	52.968	-29.495	74.000	-8.463	PK
5		9608.000	47.823	51.386	-26.177	74.000	-3.563	PK
6	*	9648.000	48.724	52.250	-25.276	74.000	-3.527	PK

Profile: 2360694R	Page No.: 6
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/19 - 09:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Vertical
EUT: POS	Power: AC 120V/60Hz
Note: Mode 1：Transmit at 2402MHz by Bluetooth & 2412MHz by 802.11b	



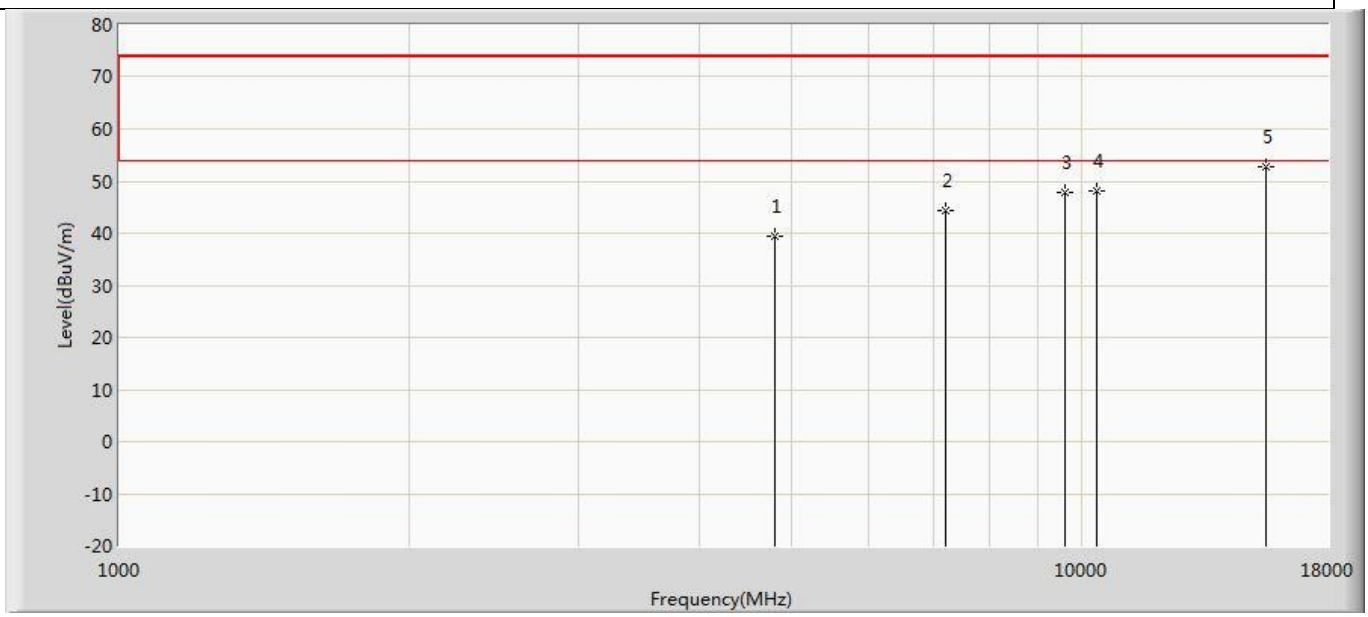
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	40.380	54.631	-33.620	74.000	-14.251	PK
2		4824.000	39.990	54.230	-34.010	74.000	-14.240	PK
3		7206.000	44.689	53.079	-29.311	74.000	-8.390	PK
4		7236.000	45.504	53.967	-28.496	74.000	-8.463	PK
5	*	9608.000	48.994	52.557	-25.006	74.000	-3.563	PK
6		9648.000	48.077	51.603	-25.923	74.000	-3.527	PK

Profile: 2360694R	Page No.: 7
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/19 - 09:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Horizontal
EUT: POS	Power: AC 120V/60Hz
Note: Mode 2：Transmit at 2402MHz by Bluetooth & 5180MHz by 802.11a	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	38.774	53.025	-35.226	74.000	-14.251	PK
2		7206.000	43.828	52.218	-30.172	74.000	-8.390	PK
3		9608.000	49.581	53.144	-24.419	74.000	-3.563	PK
4		10360.000	48.182	51.211	-25.818	74.000	-3.029	PK
5	*	15540.000	51.870	49.395	-22.130	74.000	2.475	PK

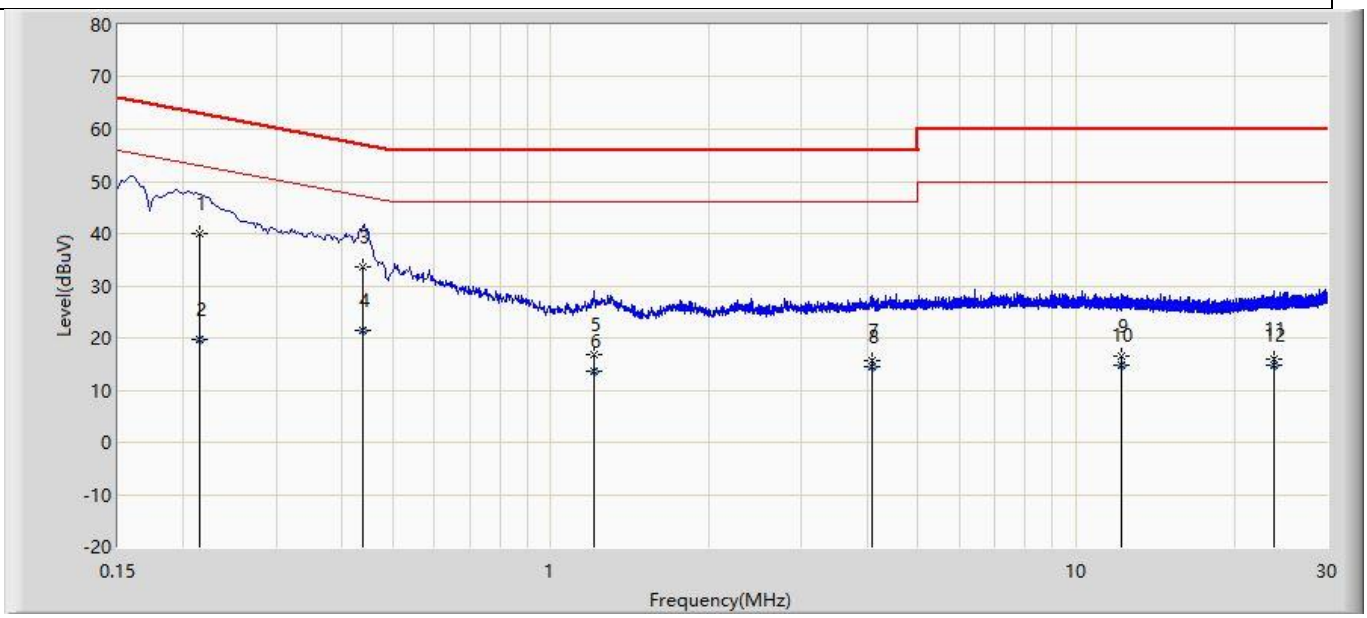
Profile: 2360694R	Page No.: 8
Engineer: Pengchengyang	
Site: AC5	Time: 2023/09/19 - 09:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00123988(1-18GHz)	Polarity: Vertical
EUT: POS	Power: AC 120V/60Hz
Note: Mode 2：Transmit at 2402MHz by Bluetooth & 5180MHz by 802.11a	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	39.471	53.722	-34.529	74.000	-14.251	PK
2		7206.000	44.329	52.719	-29.671	74.000	-8.390	PK
3		9608.000	47.781	51.344	-26.219	74.000	-3.563	PK
4		10360.000	48.066	51.095	-25.934	74.000	-3.029	PK
5	*	15540.000	52.663	50.188	-21.337	74.000	2.475	PK

Appendix I: AC Power Line Conducted Emission

Profile: 2360694R	Page No.: 215
Engineer: Pengchengyang	
Site: TR1	Time: 2023/10/13 - 09:48
Limit: FCC_Part 15.207	Margin: 0
Probe: ENV216_101189(0.009-30MHz)	Polarity: Line
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 1：Transmit at 2402MHz by LE_1Mbps	

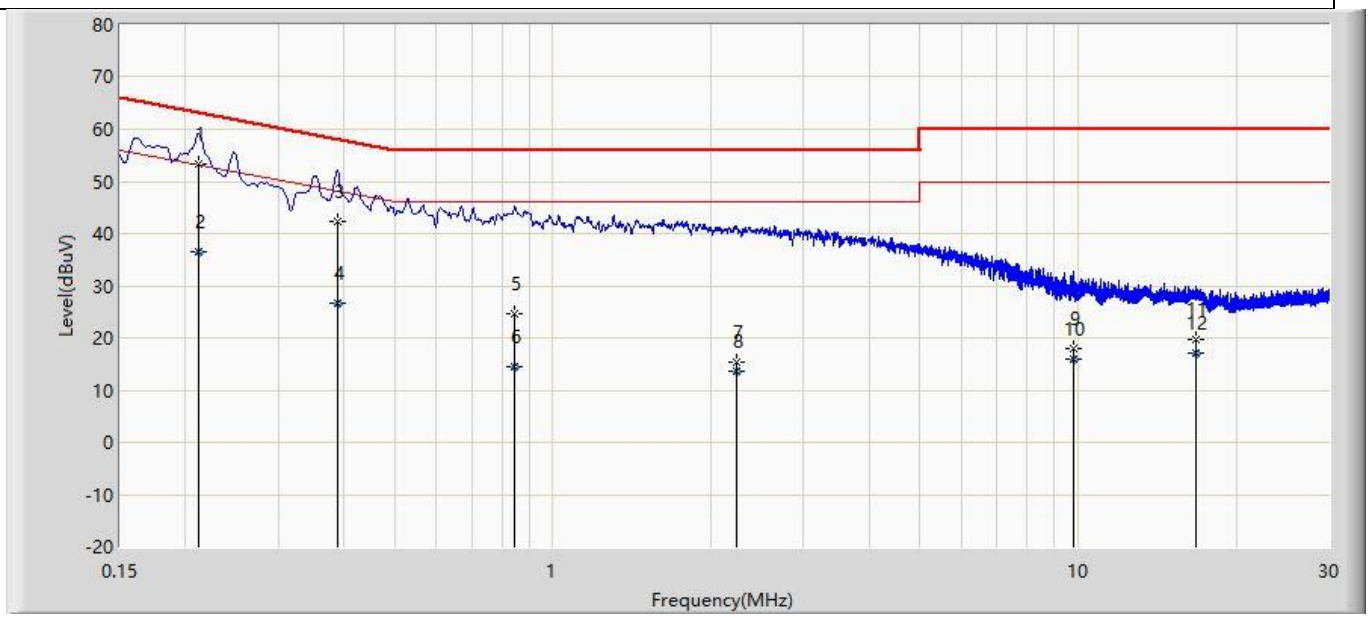


No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1	*	0.215	39.991	10.404	-23.009	63.000	29.587	QP
2		0.215	19.781	-9.806	-33.219	53.000	29.587	AV
3		0.440	33.605	4.005	-23.452	57.057	29.600	QP
4		0.440	21.403	-8.198	-25.654	47.057	29.600	AV
5		1.210	16.722	-12.909	-39.278	56.000	29.631	QP
6		1.210	13.586	-16.045	-32.414	46.000	29.631	AV
7		4.074	15.609	-14.092	-40.391	56.000	29.701	QP
8		4.074	14.380	-15.321	-31.620	46.000	29.701	AV
9		12.210	16.440	-13.414	-43.560	60.000	29.854	QP
10		12.210	14.925	-14.929	-35.075	50.000	29.854	AV
11		23.867	16.028	-14.028	-43.972	60.000	30.055	QP
12		23.867	14.907	-15.148	-35.093	50.000	30.055	AV

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp)

Profile: 2360694R	Page No.: 216
Engineer: Pengchengyang	
Site: TR1	Time: 2023/10/13 - 09:49
Limit: FCC_Part 15.207	Margin: 0
Probe: ENV216_101189(0.009-30MHz)	Polarity: Neutral
EUT: POS	Power: 120 Vac / 60 Hz
Note: Mode 1：Transmit at 2402MHz by LE_1Mbps	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1	*	0.211	53.218	23.622	-9.957	63.176	29.596	QP
2		0.211	36.628	7.032	-16.548	53.176	29.596	AV
3		0.389	42.456	12.847	-15.639	58.096	29.610	QP
4		0.389	26.723	-2.886	-21.372	48.096	29.610	AV
5		0.845	24.673	-4.954	-31.327	56.000	29.627	QP
6		0.845	14.462	-15.165	-31.538	46.000	29.627	AV
7		2.238	15.361	-14.301	-40.639	56.000	29.662	QP
8		2.238	13.691	-15.972	-32.309	46.000	29.662	AV
9		9.791	17.855	-11.986	-42.145	60.000	29.841	QP
10		9.791	16.004	-13.837	-33.996	50.000	29.841	AV
11		16.715	19.771	-10.181	-40.229	60.000	29.952	QP
12		16.715	17.155	-12.797	-32.845	50.000	29.952	AV

Note:
1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp)

The End