Test Report

Verified code: 429535

Report No.:E20210916762301-2

Customer:	OnePlus Technology (Shenzhen) Co., Ltd.
Address:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, Guangdong, China
Sample Name:	Watch
Sample Model:	W301GB
Receive Sample Date:	Sep.18,2021
Test Date:	Sep.19,2021 ~ Oct.26,2021
Reference Document:	CFR 47, FCC Part 15 Subpart C RADIO FREQUENCY DEVICES:Subpart C—Intentional Radiators ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02
Test Result:	Pass

Prepared By: Yang Zhaoyun Reviewed By: Jiang Tao Approved By: Xiao Liang

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2021-11-30

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REVISION HISTORY

Report No.	Revisions	Effect Page	Revised By
E20200904990101-2-G2	Initial Issue	ALL	Xie Fang
E20210916762301-2	Updated	ALL	Yu Shanshan

Rev.01: E20210916762301-2

1. The hardware update is as follows: a.GPS 0.8V Power supply materials (buck changed from TPS62088YFP to SGM6033-ADJXG/TR) and the change of external resistance and capacitance material; b.The revision distinguishes PCB board ID device (resistance value) changes.All test data, EUT internal and external photos (model W301GB), test photos are all updated, and the rest remain unchanged.

2.The other information about product, please refer to initial report: E20200904990101-2-G2 (issue date: 2021-03-31)and this report

Statement

1. The report is invalid without "special seal for inspection and testing"; some copies are invalid; The report is invalid if it is altered or missing; The report is invalid without the signature of the person who prepared, reviewedand approved it.

2. The sample information is provided by the client and responsible for its authenticity; The content of the report is only valid for the samples sent this time.

3. When there are reports in both Chinese and English, the Chinese version will prevail when the language problems are inconsistent.

4. If there is any objection concerning the report, please inform us within 15 days from the date of receiving the report.

5. Without the agreement of the laboratory, the client is not authorized to use the test results for unapproved propaganda.

Table of Contents

---------- The following blanks ----------

1. TEST RESULT SUMMARY

Technical Requirements		
FCC 47 CFR Part 15 Subpart C 15.247 ANSI C63.10-2013 KDB 558074 D01 15.247 measurement guidance v05r02		
Limit / Severity	**Item**	**Result**
§15.203	Antenna Requirement	Pass
§15.207(a)	Conducted Emission	Pass
§15.247(d)	Radiated Spurious Emission	Pass
§15.247(b)(3)	Maximum Peak Output Power	Pass
§15.247(e)	Power Spectral Density	Pass
§15.247(a)(2)	6dB bandwidth	Pass
§15.247(d)	Conducted band edges and Spurious Emission	Pass
§15.205	Restricted bands of operation	Pass

The EUT has one antenna. The antenna is internal antenna.
The max gain of antenna is 1dBi.which accordance 15.203.is considered sufficient to comply with the provisions of this section.

2. GENERAL DESCRIPTION OF EUT

2.1. APPLICANT

Name:	OnePlus Technology (Shenzhen) Co., Ltd.
Address:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, Guangdong, China

2.2. MANUFACTURER

Name:	OnePlus Technology (Shenzhen) Co., Ltd.
Address:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, Guangdong, China

2.3. FACTORY

Name :	Longcheer Electronic (HuiZhou) Co., Ltd.
Address :	Building 1, No.28 (west) Hechang Six Road, Zhongkai High-Tech Zone, Huizhou, Guangdong,China.

2.4. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	Watch
Model No.:	W301GB
Adding Model:	/
Models discrepancy:	/
Trade Name:	ONEPLUS
FCC ID:	2ABZ2-W301GB
Power supply:	DC3.87V power supplied by bettery DC5V power supplied by adapter
Battery specification:	Rechargeable Li-ion Battery/XE202 Limited Charge Voltage: 4.45Vdc Rated Capacity: 402mAh/1.56Wh Nominal Voltage: 3.87Vdc Typical Capacity: 410mAh/1.59Wh
Frequency Range:	2402 ~ 2480MHz
Transmit Power:	GFSK for 1Mbps:11.90dBm GFSK for 2Mbps:11.89 dBm
Modulation type:	GFSK for 1Mbps GFSK for 2Mbps
Channel space:	2MHz
Antenna Specification:	Internal antenna 1dBi gain (Max.)
Temperature Range:	0℃~35℃

Hardware Version:	LTAM281
Software Version:	W301GB_11_A.01
Sample No:	E20210916762301-0002 E20210916762301-0003
Note:	/

2.5. CHANNELLIST

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	10	2422	20	2442	30	2462
01	2404	11	2424	21	2444	31	2464
02	2406	12	2426	22	2446	32	2466
03	2408	13	2428	23	2448	33	2468
04	2410	14	2430	24	2450	34	2470
05	2412	15	2432	25	2452	35	2472
06	2414	16	2434	26	2454	36	2474
07	2416	17	2436	27	2456	37	2476
08	2418	18	2438	28	2458	38	2478
09	2420	19	2440	29	2460	39	2480

2.6. TEST OPERATION MODE

Mode No.	Description of the modes
1	Bluetooth(BLE(1M+2M)) fixed frequency transmitting

2.7. LOCAL SUPPORTIVE

Name of Equipment	Manufacturer	Model	Serial Number	Note
Notebook	DELL	/	/	/
Adapter	APPLE	A1443	/	/
DC power	Long wei	PS-305DM	180704473	/
Cable				
AC cable (DC power)	/	/	/	UnShielded, 1.0m
DC cable (DC power)	/	/	/	UnShielded, 1.2m

Test software:

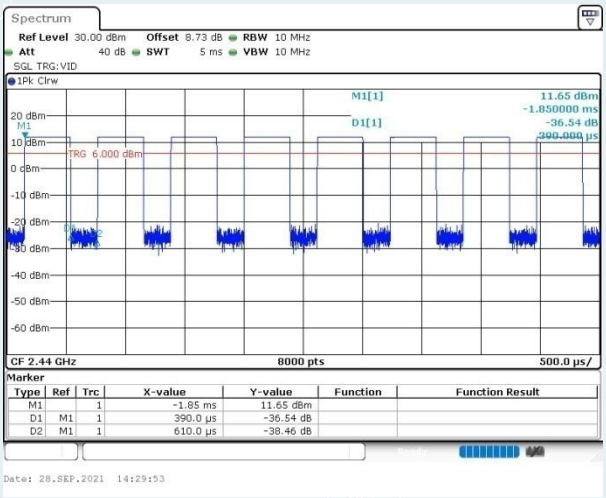
Software version	Test level
sscom5.13.1	/

2.8. DUTY CYCLE

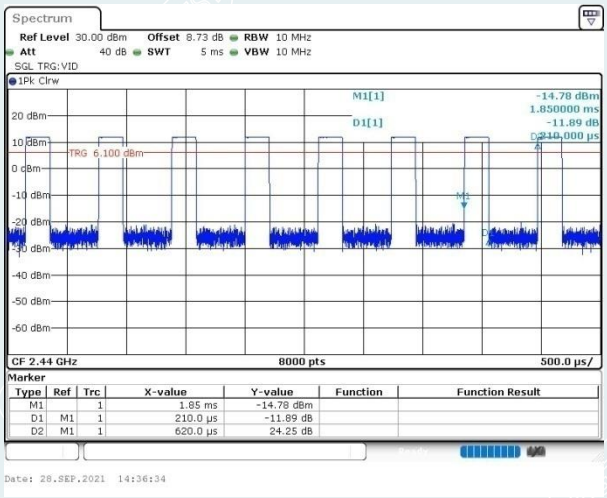
1. If duty cycle is ≥98 %, duty factor is not required.
2. If duty cycle is < 98 %, duty factor shall be considered.

TestMode	Antenna	Frequency	ON Time [ms]	Period [ms]	DC [%]	T [s]
BLE_1M	Ant1	2440	0.39	0.61	63.93	0.00039
BLE_2M	Ant1	2440	0.21	0.62	33.87	0.00021

BLE_1M _2440



BLE_2M_2440



3. LABORATORY AND ACCREDITATIONS

3.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co., Ltd.

Add	:	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China
P.C.	:	518000
Tel	:	0755-61180008
Fax	:	0755-61180008

3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	A2LA(Certificate #2861.01)
China	CNAS(L0446)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	ISED (Company Number: 24897，CAB identifier:CN0069)
USA	FCC (Registration Number: 759402，Designation Number:CN1198)

Copies of granted accreditation certificates are available for downloading from our web site, http://www.grgtest.com

3.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement		Frequency	Uncertainty
Radiated Emission	Horizontal	9kHz～30MHz	4.46dB
		30MHz～1000MHz	4.3dB
		1GHz～18GHz	5.6dB
	Vertical	9kHz～30MHz	4.46dB
		30MHz～1000MHz	4.3dB
		1GHz～18GHz	5.6dB
Conduction Emission		9kHz～150kHz	2.8 dB
		150kHz～10MHz	2.8 dB
		10MHz～30MHz	2.2 dB

Measurement	Uncertainty
RF frequency	6.0×10^{-6}
RF power conducted	0.78 dB
Occupied channel bandwidth	0.4 dB
Unwanted emission, conducted	0.68 dB
Humidity	6 %
Temperature	2℃

This uncertainty represents an expanded uncertainty factor of k=2.

4. LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Conducted Emissions				
EMI TEST RECEIVER	R&S	ESCI	100783	2022-09-13
LISN(EUT)	R&S	ENV216	101543	2022-02-25
Test S/W	EZ	CCS-3A1-CE		
Radiated Spurious Emission&Restricted bands of operation				
Test S/W	EZ	CCS-2ANT	/	/
Test Receiver	R&S	ESCI	100088	2022-10-31
Preamplifier	EMEC	EM330	/	2022-03-21
Loop Antenna	TESEQ	HLA6121	52599	2022-04-21
Bi-log Antenna	TESEQ	CBL6143A	32399	2021-11-25
Spectrum Analyzer	Agilent	N9010A	MY52221469	2022-04-16
Horn Antenna	Schwarzbeck	BBHA9120D(1201)	02143	2021-12-27
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170-497	2022-10-16
Amplifier	Tonscend	TAP01018048	AP20E8060075	2022-05-09
Amplifier	Tonscend	TAP184050	AP20E806071	2022-05-17
Test S/W	Tonscend	JS36-RSE/2.5.1.5		
6dB Bandwidth				
Spectrum Analyzer	R&S	FSV30	104381	2022-02-21
Maximum Peak Output Power				
Pulse power sensor	Agilent	MA2411B	1126150	2022-03-21
Power meter	Anritsu	ML2495A	1204003	2022-03-21
Conducted band edges and Spurious Emission				
Spectrum Analyzer	R&S	FSV30	104381	2022-02-21
Power Spectral Density				
Spectrum Analyzer	R&S	FSV30	104381	2022-02-21

5. CONDUCTED EMISSION MEASUREMENT

5.1 LIMITS

Frequency range	Limits (dBμV)	
	Quasi-peak	Average
150kHz ～ 0.5MHz	66～56	56～46
0.5 MHz ～ 5 MHz	56	46
5 MHz ～ 30 MHz	60	50

NOTE: (1) The lower limit shall apply at the transition frequencies.
(2) The limit decreases in line with the logarithm of the frequency in the range of 150 kHz to 0.5MHz.

5.2 TEST PROCEDURES

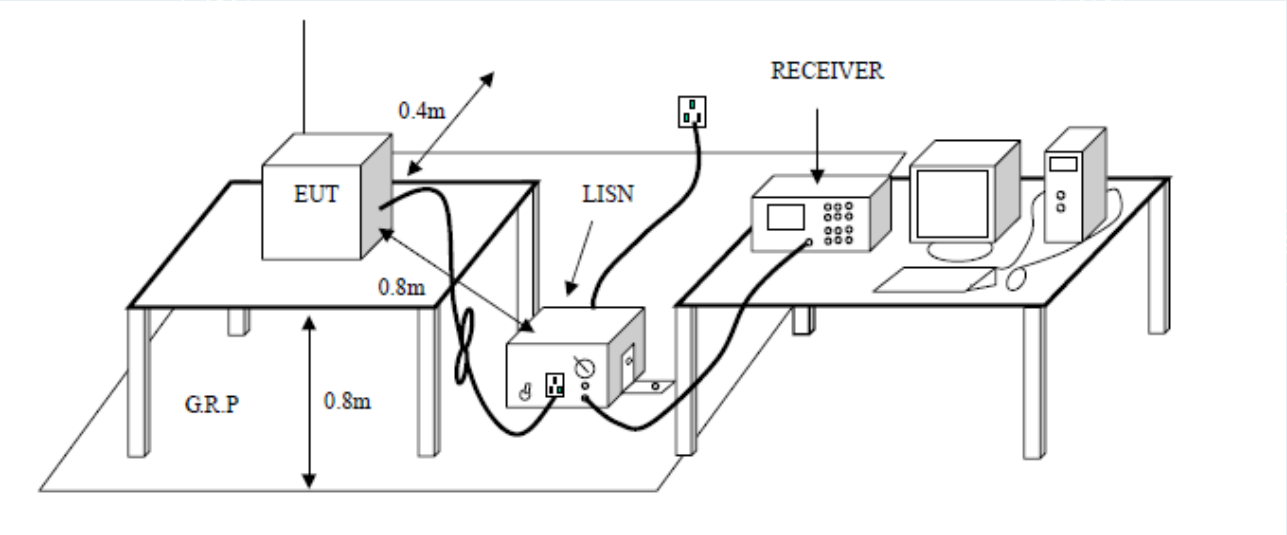
Procedure of Preliminary Test

Test procedures follow ANSI C63.10:2013.
For measurement of the disturbance voltage the equipment under test (EUT) is connected to the power supply mains and any other extended network via one or more artificial network(s). An EUT, whether intended to be grounded or not, and which is to be used on a table is configured as follows:
– Either the bottom or the rear of the EUT shall be at a controlled distance of 40 cm from a reference ground plane. This ground plane is normally the wall or floor of a shielded room. It may also be a grounded metal plane of at least 2 m by 2 m. This is physically accomplished as follows:
1) place the EUT on a table of non-conducting material which is at least 80 cm high. Place the EUT so that it is 40 cm from the wall of the shielded room, or
2) place the EUT on a table of non-conducting material which is 40 cm high so that the bottom of the EUT is 40 cm above the ground plane;
– All other conductive surfaces of the EUT shall be at least 80 cm from the reference ground plane;
– The EUT are placed on the floor that one side of the housings is 40 cm from the vertical reference ground plane and other metallic parts;
– Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 cm to 40 cm long, hanging approximately in the middle between the ground plane and the table.
– I/O cables that are connected to a peripheral shall be bundled in the centre. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.
The test mode(s) described in Item 2.5 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.5 producing the highest emission level.The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

Procedure of Final Test

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, 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. The test data of the worst-case condition(s) was recorded.

5.3 TEST SETUP



5.4 DATA SAMPLE

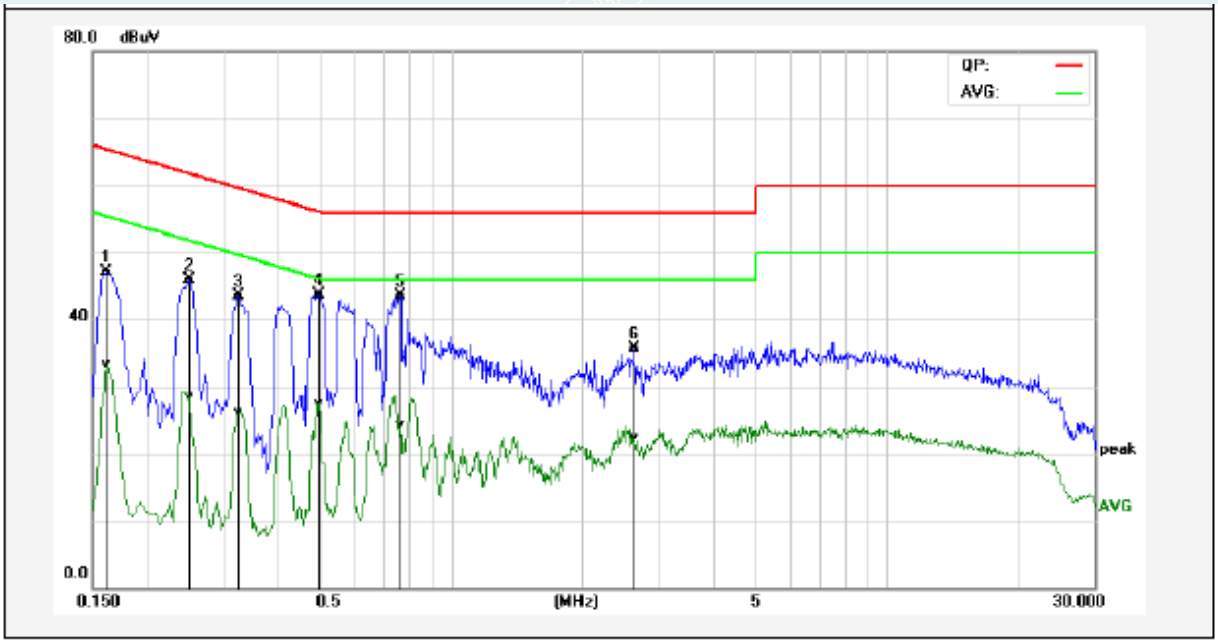
Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

Factor = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Reading/ Average Reading + Factor
Limit =Limit stated in standard
Margin = Result (dBuV) – Limit (dBuV)

5.5 TEST RESULTS

EUT Name	Watch	Model	W301GB
Environmental Conditions	21.1℃/50%RH	Test Mode	BLE 1M 2480 MHz
Tested By	Zhong Fuping	Line	L
Tested Date	2021/10/19	Test Voltage	AC120V/60Hz

(The chart below shows the highest readings taken from the final data.)



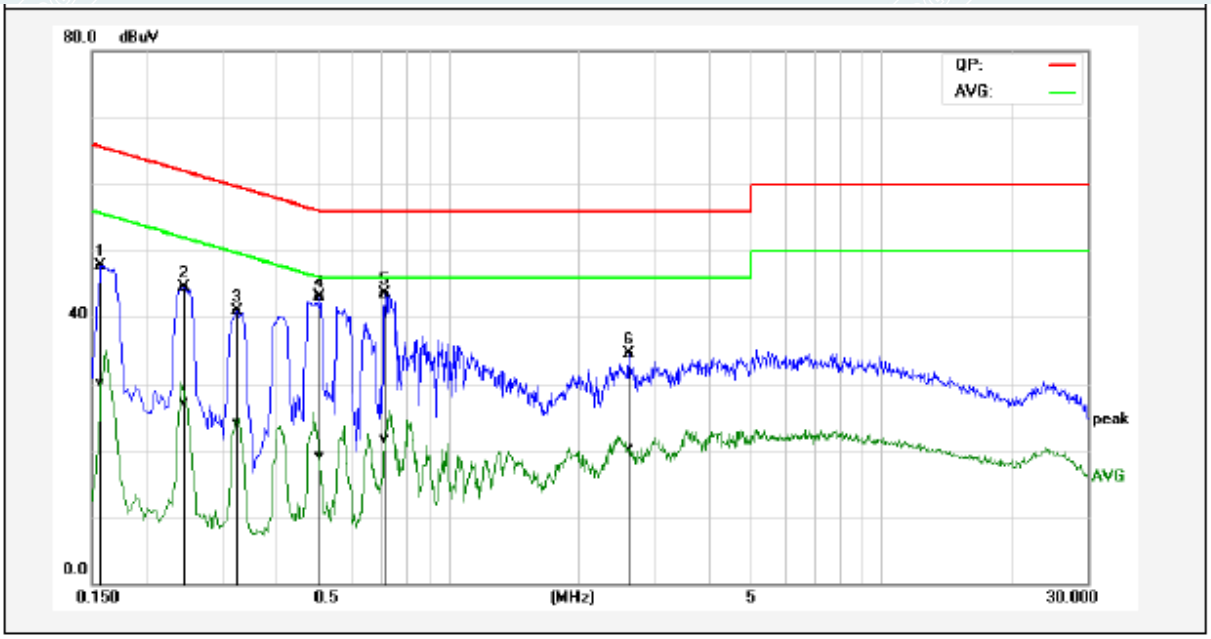
No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1620	37.55	23.72	9.61	47.16	33.33	65.36	55.36	-18.20	-22.03	Pass
2	0.2500	36.27	18.87	9.63	45.90	28.50	61.75	51.76	-15.85	-23.26	Pass
3	0.3260	33.80	16.44	9.64	43.44	26.08	59.55	49.55	-16.11	-23.47	Pass
4*	0.4980	34.01	17.89	9.67	43.68	27.56	56.03	46.03	-12.35	-18.47	Pass
5	0.7660	33.92	14.66	9.66	43.58	24.32	56.00	46.00	-12.42	-21.68	Pass
6	2.6420	25.95	12.69	9.67	35.62	22.36	56.00	46.00	-20.38	-23.64	Pass

REMARKS: *L = Live Line*

Pre-scan all mode and recorded the worst case results in this report (TX-High Channel(1Mbps))

EUT Name	Watch	Model	W301GB
Environmental Conditions	21.1℃/50%RH	Test Mode	BLE 1M 2480 MHz
Tested By	Zhong Fuping	Line	N
Tested Date	2021/10/19	Test Voltage	AC120V/60Hz

(The chart below shows the highest readings taken from the final data.)



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1580	38.12	20.43	9.60	47.72	30.03	65.56	55.57	-17.84	-25.54	Pass
2	0.2460	34.80	17.62	9.63	44.43	27.25	61.89	51.89	-17.46	-24.64	Pass
3	0.3260	31.24	14.53	9.64	40.88	24.17	59.55	49.55	-18.67	-25.38	Pass
4	0.5060	33.49	9.45	9.66	43.15	19.11	56.00	46.00	-12.85	-26.89	Pass
5*	0.7140	33.90	11.98	9.66	43.56	21.64	56.00	46.00	-12.44	-24.36	Pass
6	2.6180	24.79	10.56	9.67	34.46	20.23	56.00	46.00	-21.54	-25.77	Pass

REMARKS: *N = Neutral Line.*

Pre-scan all mode and recorded the worst case results in this report (TX-High Channel(1Mbps))

6. RADIATED SPURIOUS EMISSIONS

6.1 LIMITS

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

Frequency (MHz)	Quasi-peak(μV/m)	Measurement distance(m)	Quasi-peak(dBμV/m)@distance 3m
0.009-0.490	2400/F(kHz)	300	53.8~88.5
0.490-1.705	24000/F(kHz)	30	43~53.8
1.705-30.0	30	30	49.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

NOTE:

(1) The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

(2) The lower limit shall apply at the transition frequencies.

6.2 TEST PROCEDURES

1) Sequence of testing 9 kHz to 30 MHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 360 °.

--- The antenna height is 1.0 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

--- Identified emissions during the pre measurement the software maximizes by rotating the turntable position (0 °to 360 °) and by rotating the elevation axes (0 °to 360 °).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QP detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 360 °.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 4 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable rotates from 0 °to 360 °and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded.

Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 18 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 360 °.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 4 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable rotates from 0 °to 360 °and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18 GHz
Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

Pre measurement:

--- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement:

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

NOTE:
(a).The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for Unwanted Maxinum Emissions Measurements above 1000MHz.
(b).If the EUT is configured to transmit with duty cycle ≥98%，set VBW≤RBW/100 (i.e.,10kHz) but not less than 10 Hz.
(c). If the EUT duty cycle is ＜98%，set VBW≥1/T, Where T is defined in section 2.8.

6.3 TEST SETUP

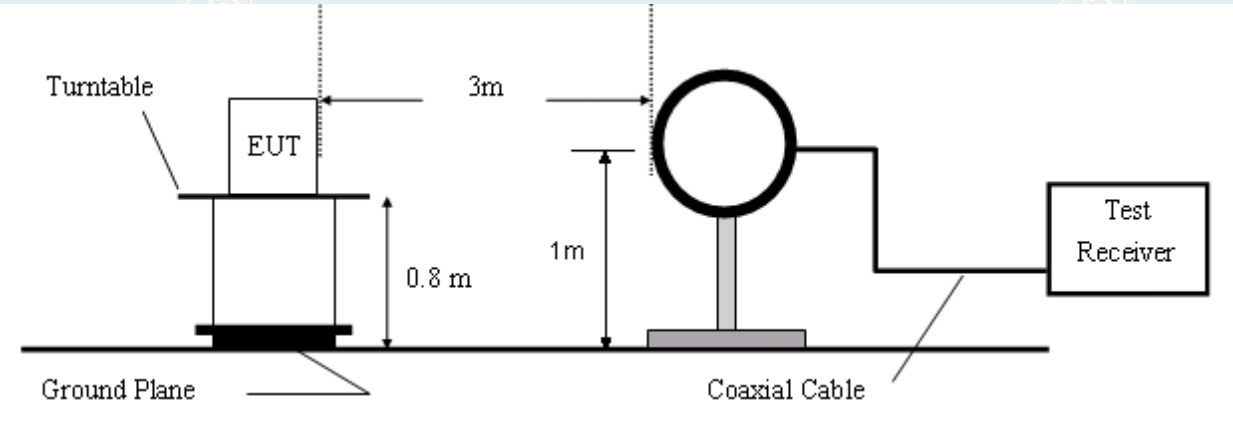


Figure 1. 9kHz to 30MHz radiated emissions test configuration

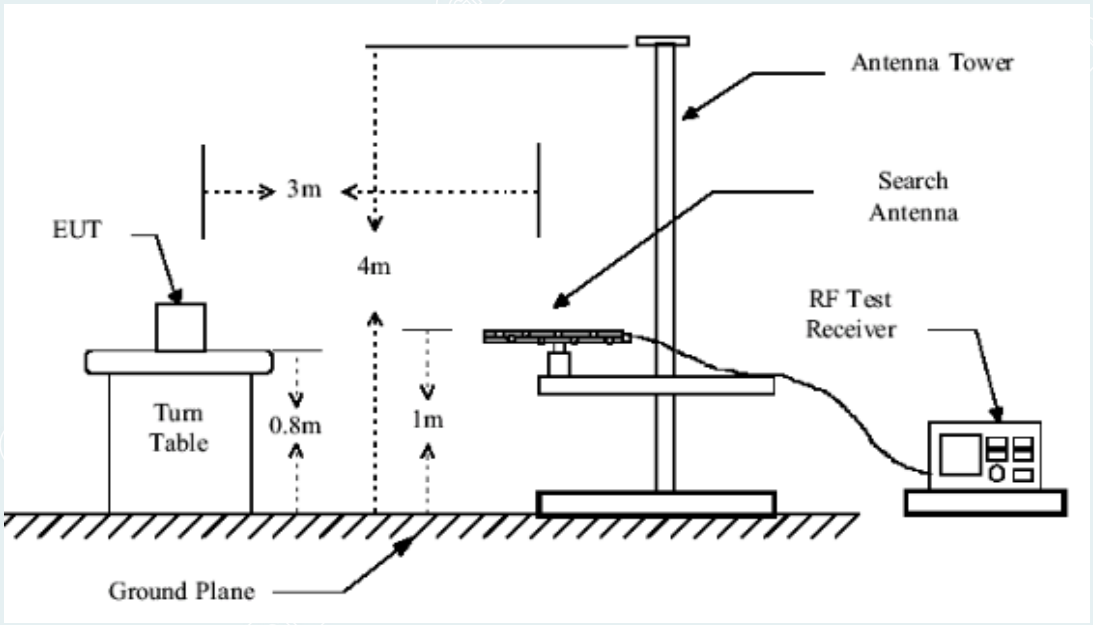


Figure 2. 30MHz to 1GHz radiated emissions test configuration

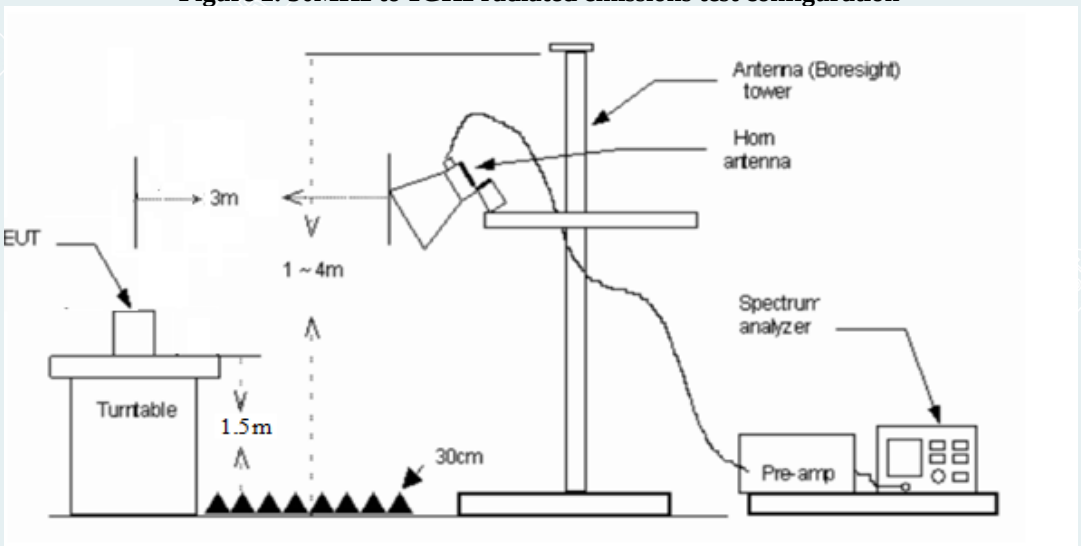


Figure 3. 1GH to 18GHz radiated emissions test configuration

6.4 DATA SAMPLE

30MHz to 1GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	37.06	-15.48	21.58	40.00	-18.42	QP	Vertical

Above 1GHz-18GHz

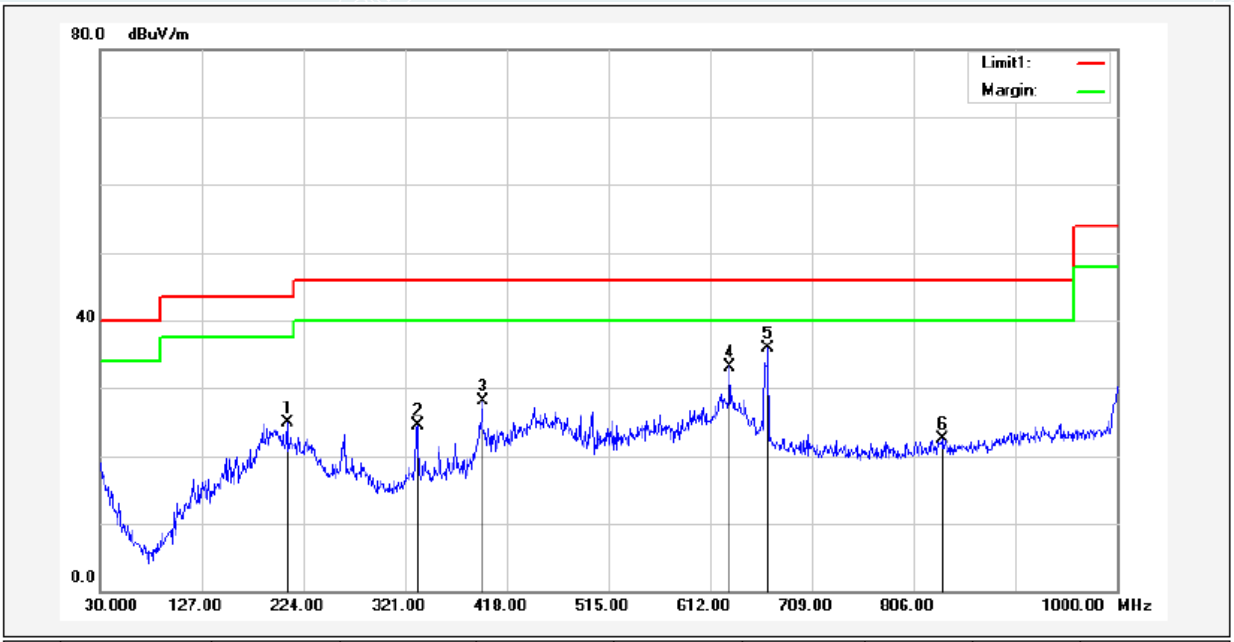
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	65.45	-11.12	54.33	74.00	-19.67	Peak	Vertical
xxx	xxx	63.00	-11.12	51.88	54.00	-2.12	AVG	Vertical

Frequency (MHz)	= Emission frequency in MHz
Ant.Pol. (H/V)	= Antenna polarization
Reading (dBuV)	= Uncorrected Analyzer / Receiver reading
Correction Factor (dB/m)	= Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m)	= Reading (dBuV) + Correction Factor (dB/m)
Limit (dBuV/m)	= Limit stated in standard
Margin (dB)	= Remark Result (dBuV/m) – Limit (dBuV/m)
Peak	= Peak Reading
QP	= Quasi-peak Reading
AVG	= Average Reading

6.5 TEST RESULTS

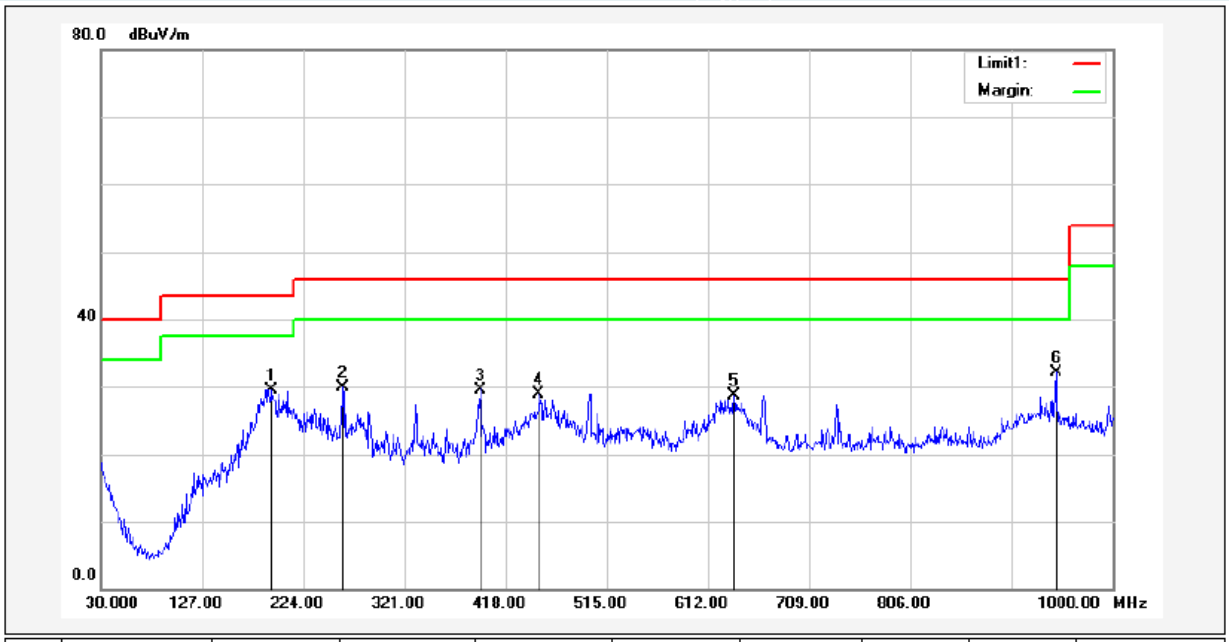
9kHz to 1GHz

Mode: TX/1Mbps
Highest Frequency (2480MHz) Date: 2021/10/20
Polarity : Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	208.4800	51.11	-26.27	24.84	43.50	-18.66	360	239	QP
2	332.6400	47.86	-23.29	24.57	46.00	-21.43	0	161	QP
3	394.7200	48.94	-20.91	28.03	46.00	-17.97	1	100	QP
4	630.4300	50.02	-16.82	33.20	46.00	-12.80	193	100	QP
5*	667.2900	52.44	-16.60	35.84	46.00	-10.16	359	100	QP
6	833.1600	37.16	-14.70	22.46	46.00	-23.54	46	200	QP

Mode: TX/1Mbps
Highest Frequency (2480MHz) Date: 2021/10/20
Polarity : Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	193.9300	56.99	-27.39	29.60	43.50	-13.90	108	100	QP
2	261.8300	54.68	-24.84	29.84	46.00	-16.16	71	100	QP
3	393.7500	50.57	-20.97	29.60	46.00	-16.40	89	100	QP
4	450.0100	48.93	-19.99	28.94	46.00	-17.06	109	200	QP
5	637.2200	45.44	-16.81	28.63	46.00	-17.37	293	300	QP
6*	945.6800	45.75	-13.62	32.13	46.00	-13.87	71	100	QP

Remark:

1 No emission found between lowest internal used/generated frequency to 30MHz.
2 Pre-scan all mode and recorded the worst case results in this report (TX-High Channel(1Mbps))
3 Data of measurement within this frequency range in the table above the reading of PK detector are more 6dB than QP limit, therefore it's unnecessary to performed QP scan.
4 The IF bandwidth of Receiver between 30MHz to 1GHz was 120 kHz.

Above 1GHz:
According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Mode: TX/1Mbps
Lowest Frequenc (2402MHz) Date: 2021/10/21

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1046.2558	57.24	32.16	-25.08	74.00	41.84	200	1	Horizontal
2	1468.8086	56.46	33.40	-23.06	74.00	40.60	100	8	Horizontal
3	3603.8255	53.52	39.22	-14.30	74.00	34.78	200	306	Horizontal
4	7234.2793	48.55	45.04	-3.51	74.00	28.96	200	13	Horizontal
5	13746.9684	42.92	50.60	7.68	74.00	23.40	100	26	Horizontal
6	17906.2383	40.43	57.02	16.59	74.00	16.98	100	93	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	17875.4396	16.58	29.69	46.27	54.00	7.73	103	127	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1015.5019	57.36	32.23	-25.13	74.00	41.77	100	357	Vertical
2	1438.0548	56.48	33.24	-23.24	74.00	40.76	200	357	Vertical
3	1765.8457	60.87	38.55	-22.32	74.00	35.45	200	176	Vertical
4	4353.9192	51.50	39.15	-12.35	74.00	34.85	200	359	Vertical
5	10124.0155	43.98	46.35	2.37	74.00	27.65	200	134	Vertical
6	13840.7301	42.78	50.95	8.17	74.00	23.05	200	184	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1766.8875	-22.32	56.48	34.16	54.00	19.84	100	20	Vertical

Mode: TX/1Mbps
Middle Frequenc (2440MHz) Date: 2021/10/21

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1008.2510	56.89	31.74	-25.15	74.00	42.26	200	242	Horizontal
2	1290.5363	57.83	33.84	-23.99	74.00	40.16	200	250	Horizontal
3	5919.7400	50.79	43.03	-7.76	74.00	30.97	100	167	Horizontal
4	12201.7752	45.15	49.32	4.17	74.00	24.68	100	175	Horizontal
5	14296.4121	41.03	50.19	9.16	74.00	23.81	200	51	Horizontal
6	17981.2477	40.07	56.69	16.62	74.00	17.31	200	35	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	17903.4407	16.62	29.64	46.26	54.00	7.74	111	4	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1762.5953	66.86	44.52	-22.34	74.00	29.48	200	185	Vertical
2	1898.1123	59.28	37.40	-21.88	74.00	36.60	200	202	Vertical
3	3729.4662	53.89	39.19	-14.70	74.00	34.81	100	346	Vertical
4	12198.0248	47.79	52.00	4.21	74.00	22.00	100	174	Vertical
5	13724.4656	42.40	50.34	7.94	74.00	23.66	100	338	Vertical
6	17866.8584	39.83	56.47	16.64	74.00	17.53	100	206	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	12199.0006	4.21	39.93	44.14	54.00	9.86	112	171	Vertical

Mode: TX/1Mbps
Highest Frequency (2480MHz) Date: 2021/10/21

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1192.7741	57.11	32.57	-24.54	74.00	41.43	200	333	Horizontal
2	1763.8455	56.28	33.95	-22.33	74.00	40.05	100	70	Horizontal
3	4427.0534	51.99	39.48	-12.51	74.00	34.52	100	1	Horizontal
4	7217.4022	48.84	45.52	-3.32	74.00	28.48	100	53	Horizontal
5	13925.1156	42.00	51.08	9.08	74.00	22.92	100	118	Horizontal
6	17909.9887	39.89	56.43	16.54	74.00	17.57	200	93	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	17826.5282	16.54	29.39	45.93	54.00	8.07	122	237	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1107.5134	57.25	32.41	-24.84	74.00	41.59	200	119	Vertical
2	1757.3447	64.98	42.60	-22.38	74.00	31.40	100	14	Vertical
3	5522.1903	49.86	40.65	-9.21	74.00	33.35	200	167	Vertical
4	10810.3513	43.33	47.18	3.85	74.00	26.82	200	199	Vertical
5	13895.1119	41.32	50.34	9.02	74.00	23.66	100	25	Vertical
6	17979.3724	40.14	56.72	16.58	74.00	17.28	200	191	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	17995.3254	16.58	29.51	46.09	54.00	7.91	129	75	Vertical

Mode: TX/2Mbps
Lowest Frequenc (2402MHz) Date: 2021/10/21

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1438.5548	56.16	32.92	-23.24	74.00	41.08	100	67	Horizontal
2	1897.3622	56.00	34.12	-21.88	74.00	39.88	100	264	Horizontal
3	4417.6772	51.75	39.14	-12.61	74.00	34.86	100	357	Horizontal
4	7193.0241	48.77	45.63	-3.14	74.00	28.37	100	185	Horizontal
5	10800.9751	44.70	48.53	3.83	74.00	25.47	200	242	Horizontal
6	14099.5124	40.41	50.05	9.64	74.00	23.95	200	352	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1154.7693	57.30	32.72	-24.58	74.00	41.28	200	13	Vertical
2	1731.5914	64.06	41.65	-22.41	74.00	32.35	100	0	Vertical
3	3198.7748	52.81	36.95	-15.86	74.00	37.05	100	48	Vertical
4	3793.2242	52.93	38.63	-14.30	74.00	35.37	100	1	Vertical
5	5338.4173	49.85	40.29	-9.56	74.00	33.71	100	97	Vertical
6	10159.6450	43.48	46.40	2.92	74.00	27.60	200	242	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	10205.9730	2.92	34.41	37.33	54.00	16.67	155	88	Vertical

Mode: TX/2Mbps
Middle Frequenc (2440MHz) Date: 2021/10/21

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1373.7967	56.41	32.79	-23.62	74.00	41.21	200	316	Horizontal
2	1898.3623	57.37	35.49	-21.88	74.00	38.51	100	259	Horizontal
3	3639.4549	53.05	38.43	-14.62	74.00	35.57	100	1	Horizontal
4	5863.4829	48.73	41.06	-7.67	74.00	32.94	200	331	Horizontal
5	8940.7426	47.27	47.18	-0.09	74.00	26.82	100	199	Horizontal
6	13362.5453	41.80	49.80	8.00	74.00	24.20	200	331	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1240.0300	56.83	32.60	-24.23	74.00	41.40	200	267	Vertical
2	1480.5601	56.21	33.22	-22.99	74.00	40.78	100	259	Vertical
3	2041.1301	56.21	34.73	-21.48	74.00	39.27	200	243	Vertical
4	7202.4003	49.00	45.85	-3.15	74.00	28.15	200	265	Vertical
5	12199.9000	46.33	50.51	4.18	74.00	23.49	200	135	Vertical
6	17902.4878	40.08	56.71	16.63	74.00	17.29	100	125	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	17819.5993	16.63	29.93	46.56	54.00	7.44	126	175	Vertical

Mode: TX/2Mbps
Highest Frequency (2480MHz) Date: 2021/10/21

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1064.0080	57.16	32.14	-25.02	74.00	41.86	200	112	Horizontal
2	1751.0939	63.98	41.55	-22.43	74.00	32.45	100	30	Horizontal
3	4712.0890	49.54	39.96	-9.58	74.00	34.04	200	322	Horizontal
4	7206.1508	48.44	45.25	-3.19	74.00	28.75	100	12	Horizontal
5	9229.5287	45.72	46.37	0.65	74.00	27.63	100	248	Horizontal
6	13900.7376	41.64	50.75	9.11	74.00	23.25	200	110	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1226.2783	57.08	32.74	-24.34	74.00	41.26	100	4	Vertical
2	1749.5937	65.91	43.47	-22.44	74.00	30.53	100	347	Vertical
3	4612.7016	50.33	39.51	-10.82	74.00	34.49	100	93	Vertical
4	5852.2315	49.01	41.34	-7.67	74.00	32.66	200	152	Vertical
5	10825.3532	43.81	47.69	3.88	74.00	26.31	200	119	Vertical
6	17257.4072	39.08	51.80	12.72	74.00	22.20	100	27	Vertical

Remark:

1 Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2 The amplitude of 18GHz to 26.5GHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
4 Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
5 Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

7. 6dB BANDWIDTH

7.1 LIMITS

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

7.2 TEST PROCEDURES

1) Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer**.**
2) Set resolution bandwidth (RBW) = 100kHz.Set the video bandwidth (VBW) ≥ 3 x RBW. Detector = Peak. Trace mode = max hold. Sweep = auto couple. Allow the trace to stabilize, record 6dB bandwidth value.
3) Repeat above procedures until all frequencies measured were complete.

7.3 TEST SETUP

7.4 TEST RESULTS

For 1Mbps

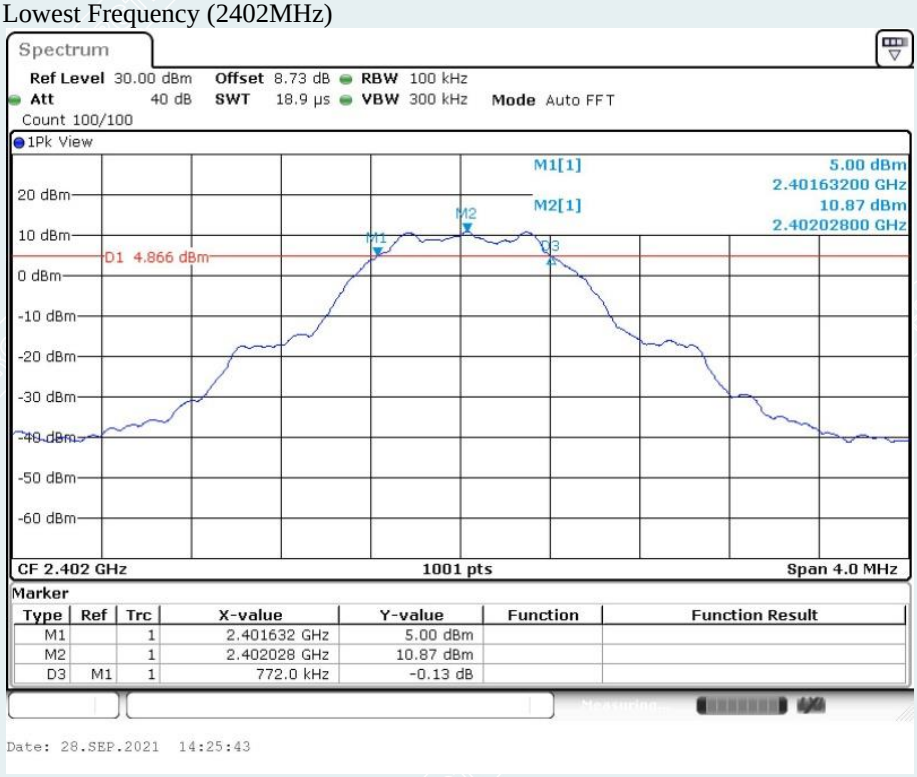
Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Lowest	2402	772	≥500	PASS
Middle	2440	780		PASS
Highest	2480	784		PASS

For 2Mbps

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Lowest	2402	1078	≥500	PASS
Middle	2440	1078		PASS
Highest	2480	1085		PASS

For 1Mbps

Lowest Frequency (2402MHz)



Middle Frequency (2440 MHz)