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检测
TESTING
CNAS L0446



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Test Report

Verified code: 234758

Report No.:E20210914342601-7

Customer: Lumi United Technology Co., Ltd.

Address: 8th Floor, JinQi Wisdom Valley, Liuxian Ave, Taoyuan Residential District, Nanshan District, Shenzhen, China

Sample Name: Camera Hub G2H Pro

Sample Model: CH-C01

Receive Sample Date: Sep.15,2021

Test Date: Sep.16,2021 ~ Oct.29,2021

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

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GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2021-11-09

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1. TEST RESULT SUMMARY

Technical Requirements		
CFR 47, FCC Part 15 Subpart C (§15.247)		
Limit / Severity	Item	Result
§15.207	Conducted emission AC power port	Pass
§15.247(b)(3)	Conducted output power for DTS	Pass
§15.247(e)	Power spectral density	Pass
§15.247(a)(2)	6dB bandwidth	Pass
§15.247(d)	Spurious RF conducted emissions	Pass
§15.247(d)	Band edge	Pass
§15.247(d) & §15.209 & §15.205	Spurious radiated emissions for transmitter	Pass
§15.203	Antenna requirement	Pass

The EUT have two antennas. The one is 2.4G Wi-Fi antenna, the other is Zigbee antenna, they are internal antenna.

The max gain of antenna is 1.5dBi, which accordance 15.203is considered sufficient to comply with the provisions of this section.

2. GENERAL DESCRIPTION OF EUT


2.1 APPLICANT

Name: Lumi United Technology Co., Ltd.
Address: 8th Floor, JinQi Wisdom Valley, Liuxian Ave, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.2 MANUFACTURER

Name: Lumi United Technology Co., Ltd.
Address: 8th Floor, JinQi Wisdom Valley, Liuxian Ave, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.3 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment: Camera Hub G2H Pro
Model No.: CH-C01
Adding Model: /
Trade Name: Aqara
FCC ID: 2AKIT-CHC01
Power Supply: Input: 5V  1A
Adapter Specification: /
Frequency Range: 2405MHz~2475MHz
Transmit Power: 7.61dBm
Modulation type: OQPSK
Antenna Specification: Internal antenna 1.5dBi gain (Max.)
Temperature Range: -10°C~40°C
Hardware Version: X1
Software Version: V1.0.3_0006.0004
Sample No: E20210914342601-0005, E20210914342601-0008
Note: /

2.4 CHANNEL LIST

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2405	2	2410	3	2415	4	2420
5	2425	6	2430	7	2435	8	2440
9	2445	10	2450	11	2455	12	2460
13	2465	14	2470	15	2475	/	/

2.5 TEST OPERATION MODE

Test Item	Mode No.	Description of the modes
Conducted Emission	1	Zigbee TX mode
Radiated Emission	1	Zigbee TX mode

2.6 LOCAL SUPPORTIVE

Name of Equipment	Manufacturer	Model	Serial Number	Note
Notebook	LENOVO	TianYi 310-14ISK	MP18DLC6	/
/	/	/	/	/
Cable				
DC cable	/	/	/	UnShielded, 0.5m

Note :The notebook is just used to produce fixed frequency transmitting.

Test software:

Software version	Test level
QCOM_V1.0	default

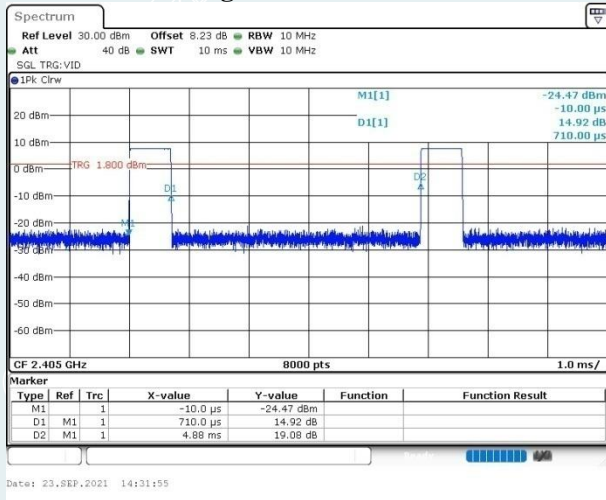
2.7 DUTY CYCLE

If duty cycle is $\geq 98\%$, duty factor is not required.

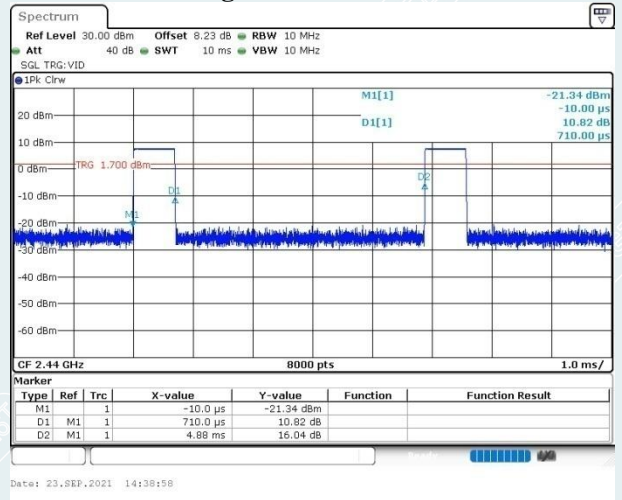
If duty cycle is $< 98\%$, duty factor shall be considered.

Frequency (MHz)	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	T [S]
2405	0.71	4.88	14.55	0.00071
2440	0.71	4.88	14.55	0.00071
2475	0.71	4.88	14.55	0.00071

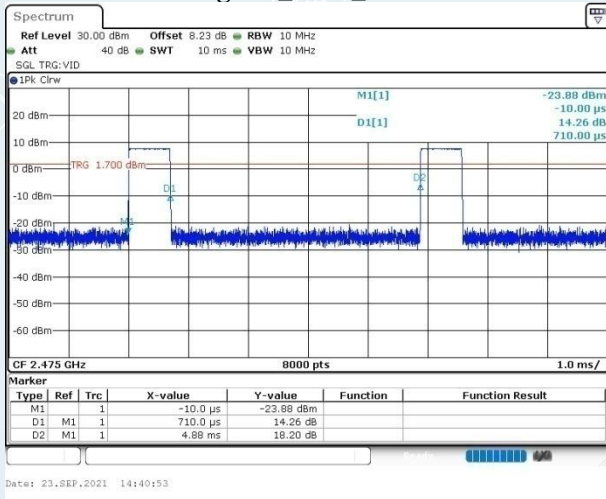
Zigbee_Ant1_2405



Zigbee_Ant1_2440



Zigbee_Ant1_2475



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.

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P.C. : 518000

Tel : 0755-61180008

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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
		18GHz~26.5GHz	3.65dB
	Vertical	9kHz~30MHz	4.46dB
		30MHz~1000MHz	4.3dB
		1GHz~18GHz	5.6dB
		18GHz~26.5GHz	3.65dB
Conduction Emission		9 kHz ~ 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 °C

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				
EZ-EMC	EZ	CCS-3A1-CE	/	/
EMI Receiver	R&S	ESCI	100783	2022-09-13
LISN(EUT)	R&S	ENV216	101543	2022-03-21
Radiated Spurious Emission&Restricted bands of operation				
Test S/W	EZ	CCS-2ANT		
Loop Antenna	TESEQ	HLA6121	52599	2022-04-21
Test Receiver	R&S	ESCI	100088	2021-11-14
Preamplifier	EMEC	EM330	/	2022-03-21
Bi-log Antenna	TESEQ	CBL6143A	32399	2021-11-25
Spectrum Analyzer	Agilent	N9010A	MY52221469	2022-04-16
Horn Antenna	Schwarzbeck	BBHA9120D	286	2022-03-04
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	BBHA 9170-497	2022-10-16
Amplifier	Tonscend	TAP01018048	AP20E8060075	2022-06-07
Amplifier	Tonscend	TAP184050	AP20E806071	2022-05-17
Test S/W	Tonscend	JS32-RE/2.5.1.5		
6 dB Bandwidth				
Spectrum Analyzer	R&S	FSV30	104381	2022-02-21
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

Note: The calibration interval of the above test instruments is 12 months.

5. CONDUCTED EMISSION MEASUREMENT

5.1 LIMITS

Frequency range	Limits (dB μ V)	
	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 C63.4:2014.

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:

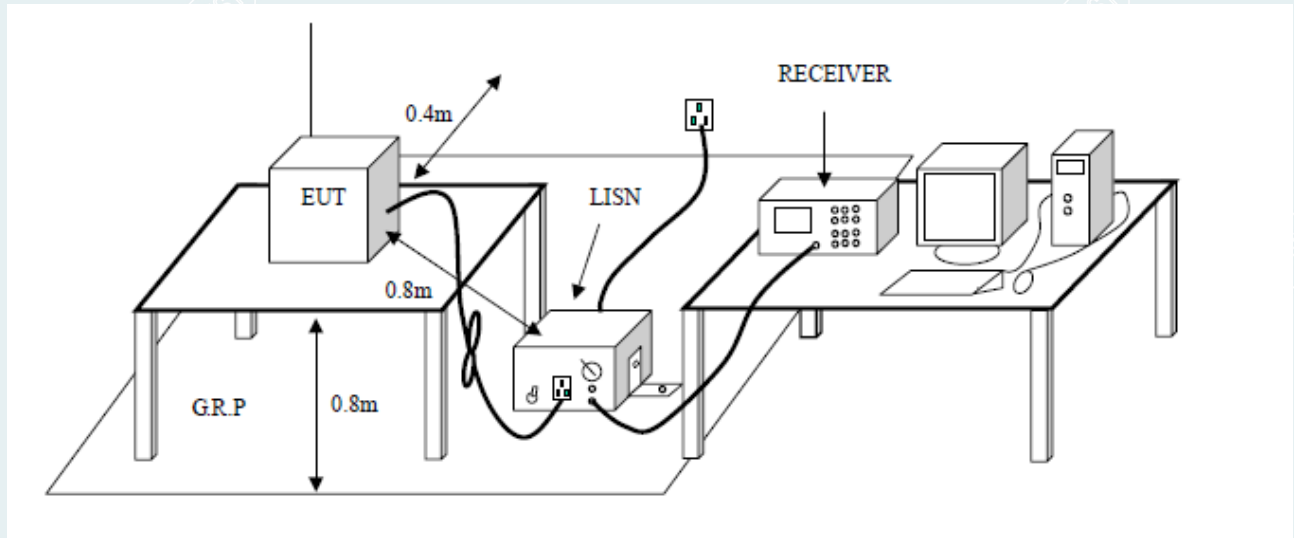
- Either the bottom or the rear of the EUT shall be at a controlled distance of 40 cm from a reference ground plane. This ground plane is normally the wall or floor of a shielded room. It may also be a grounded metal plane of at least 2 m by 2 m. This is physically accomplished as follows:
 - 1) place 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 2.4 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.4 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

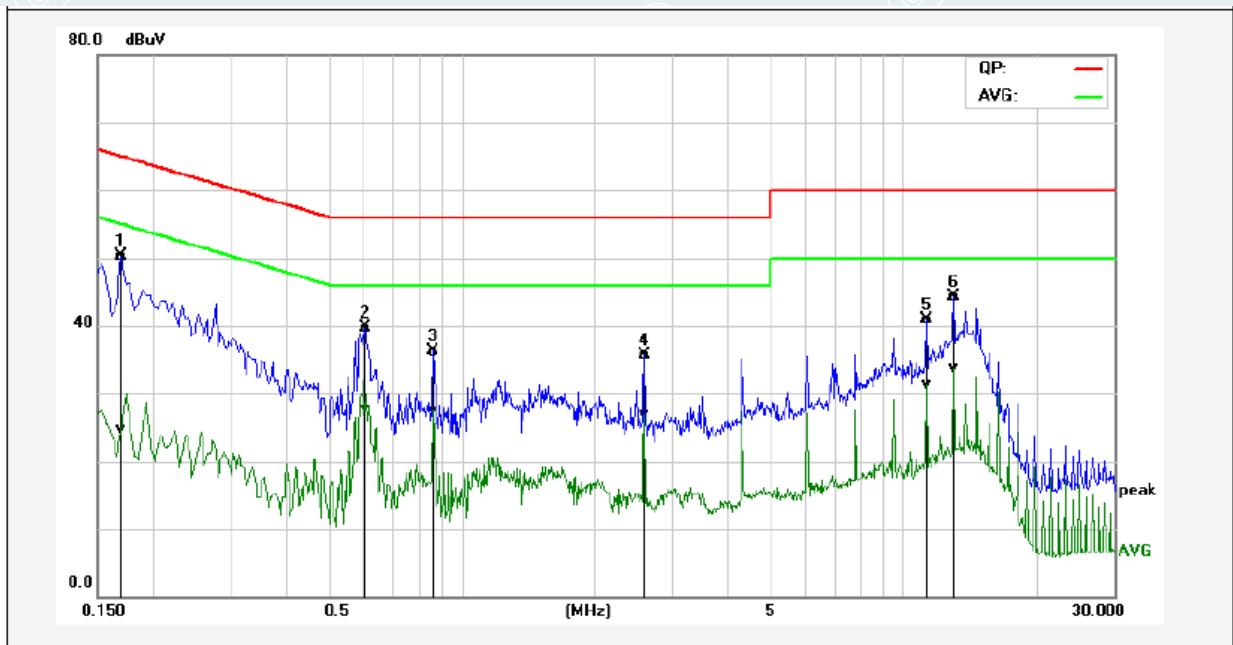
Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62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

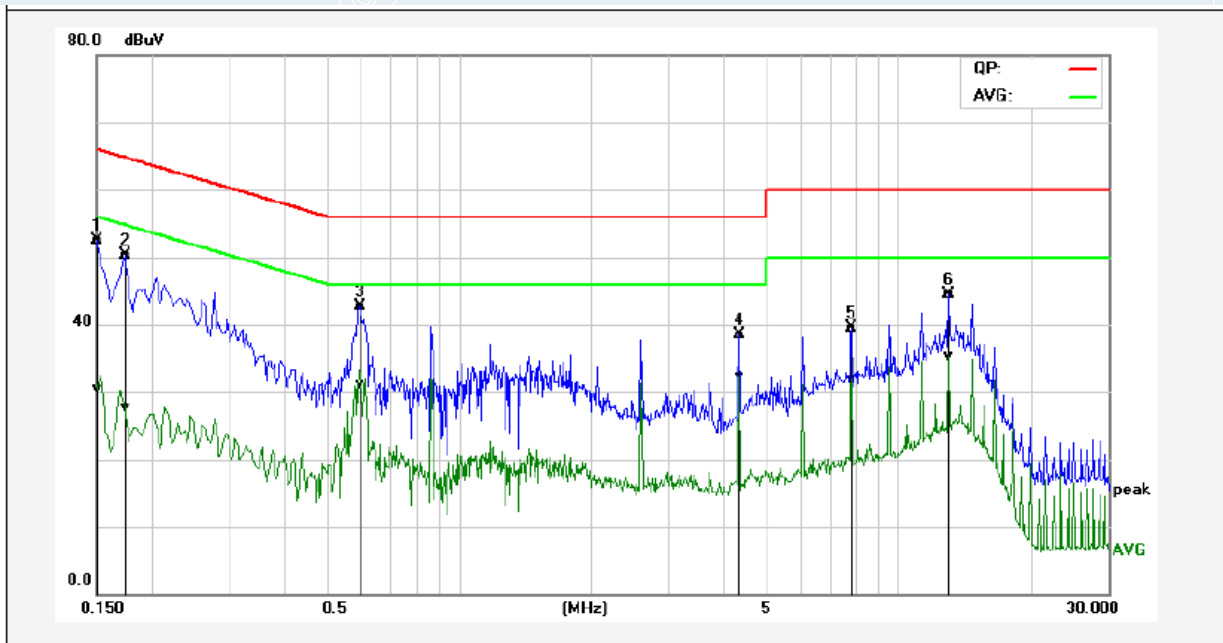
Recorded the worst case results in this report (2405MHz)

EUT Name	Camera Hub G2H Pro	Model	CH-C01
Environmental Conditions	23.7°C/43%RH	Test Mode	Mode 1
Tested By	ZengXianglong	Line	L
Tested Date	2021/09/27	Test Voltage	AC120V/60Hz



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*	0.1700	40.66	15.17	9.61	50.27	24.78	64.96	54.96	-14.69	-30.18	Pass
2	0.6060	30.09	18.06	9.66	39.75	27.72	56.00	46.00	-16.25	-18.28	Pass
3	0.8660	26.54	17.91	9.66	36.20	27.57	56.00	46.00	-19.80	-18.43	Pass
4	2.5980	26.10	17.22	9.67	35.77	26.89	56.00	46.00	-20.23	-19.11	Pass
5	11.2620	30.95	21.36	9.92	40.87	31.28	60.00	50.00	-19.13	-18.72	Pass
6	12.9940	34.41	23.77	9.94	44.35	33.71	60.00	50.00	-15.65	-16.29	Pass

EUT Name	Camera Hub G2H Pro	Model	CH-C01
Environmental Conditions	23.7°C/43%RH	Test Mode	Mode 1
Tested By	ZengXianglong	Line	N
Tested Date	2021/09/27	Test Voltage	AC120V/60Hz



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	0.1500	42.83	20.99	9.60	52.43	30.59	65.99	56.00	-13.56	-25.41	Pass
2	0.1740	40.68	18.14	9.61	50.29	27.75	64.76	54.77	-14.47	-27.02	Pass
3*	0.5980	33.12	21.54	9.65	42.77	31.19	56.00	46.00	-13.23	-14.81	Pass
4	4.3420	28.88	22.53	9.72	38.60	32.25	56.00	46.00	-17.40	-13.75	Pass
5	7.8140	29.76	22.03	9.83	39.59	31.86	60.00	50.00	-20.41	-18.14	Pass
6	13.0219	34.53	25.44	9.94	44.47	35.38	60.00	50.00	-15.53	-14.62	Pass

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($\mu\text{V}/\text{m}$)	Measurement distance(m)	Quasi-peak($\text{dB}\mu\text{V}/\text{m}$)@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.
- (3) Above 18G test distance is 1m, so the Peak Limit= $74+20*\log(3/1)=83.54$ (dB $\mu\text{V}/\text{m}$).
The Avg Limit= $54+20*\log(3/1)=63.54$ (dB $\mu\text{V}/\text{m}$).

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.

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 Maximum Emissions Measurements above 1000MHz.
- (b).If the EUT is configured to transmit with duty cycle $\geq 98\%$, set $VBW \leq RBW/100$ (i.e.,10kHz) but not less than 10 Hz.
- (c). If the EUT duty cycle is $< 98\%$, set $VBW \geq 1/T$, Where T is defined in section 2.7).

6.3 TEST SETUP

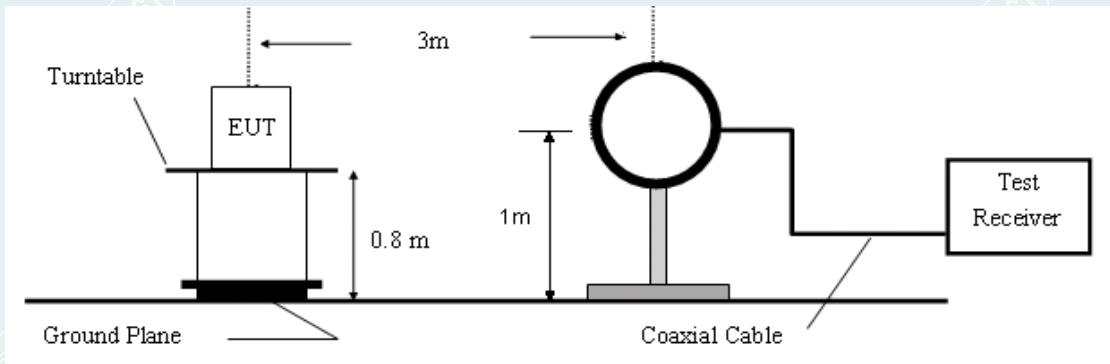


Figure 1. 9 kHz to 30MHz radiated emissions test configuration

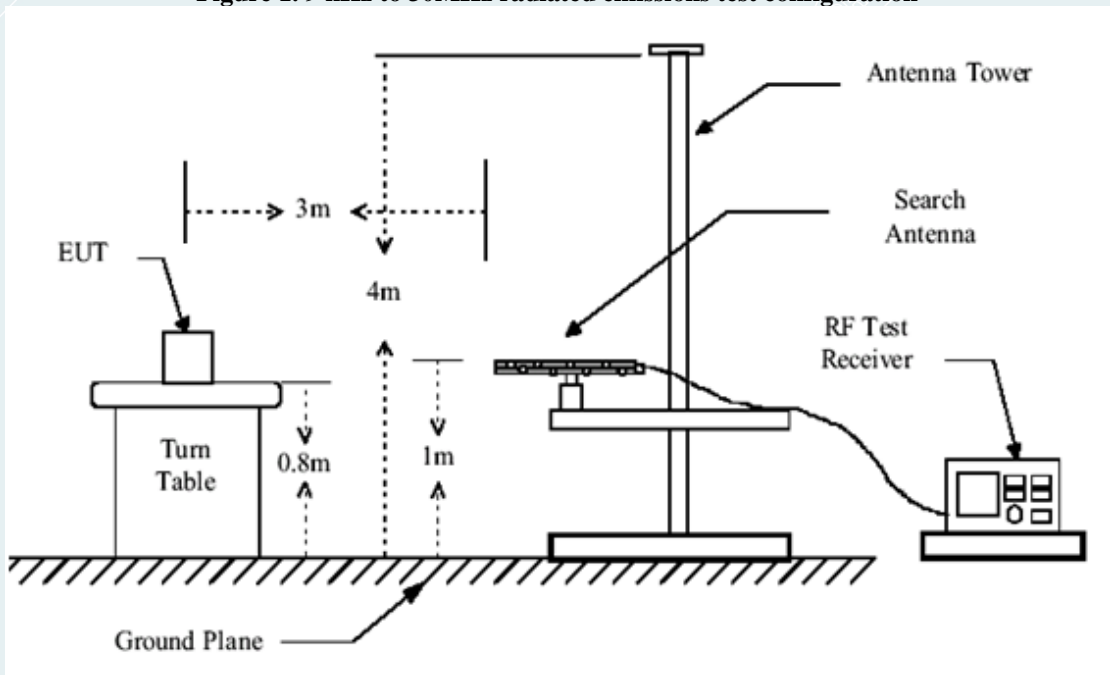


Figure 2. 30MHz to 1GHz radiated emissions test configuration

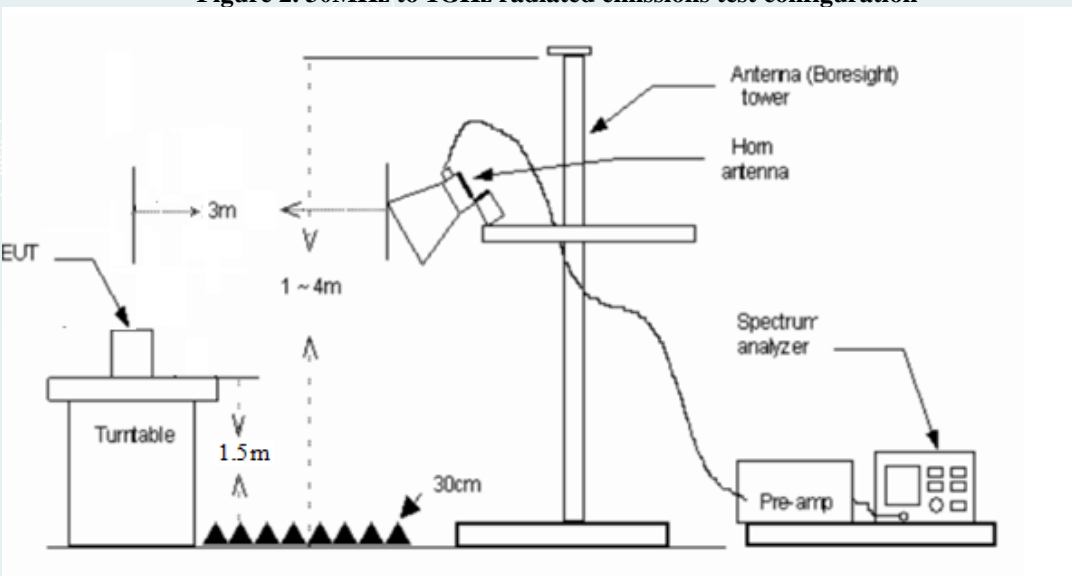


Figure 3. Above 1GHz-18GHz radiated emissions test configuration

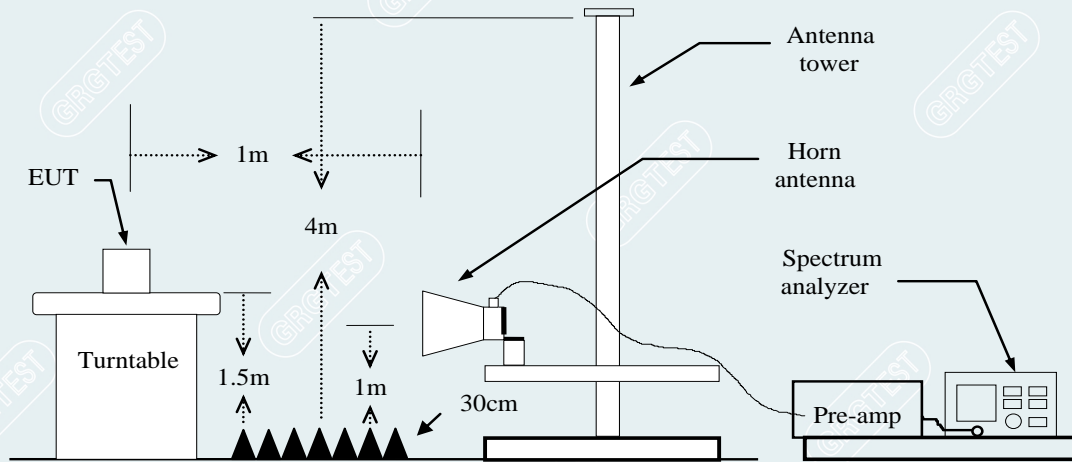


Figure 4. Above 18GHz-26.5GHz radiated emissions test configuration

6.4 DATA SAMPLE

30MHz to 1GHz

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

Above 1GHz-18GHz

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark	Pole
	(MHz)	(dBuV/m)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)		
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

Above 18 GHz

No.	Frequency	Reading	Factor	Level	Limit	Margin	Remark	Pole
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)		
xxx	xxx	68.86	57.66	-11.20	83.54	25.88	peak	Vertical
xxx	xxx	68.89	-11.20	57.69	63.54	5.85	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

30MHz to 1GHz

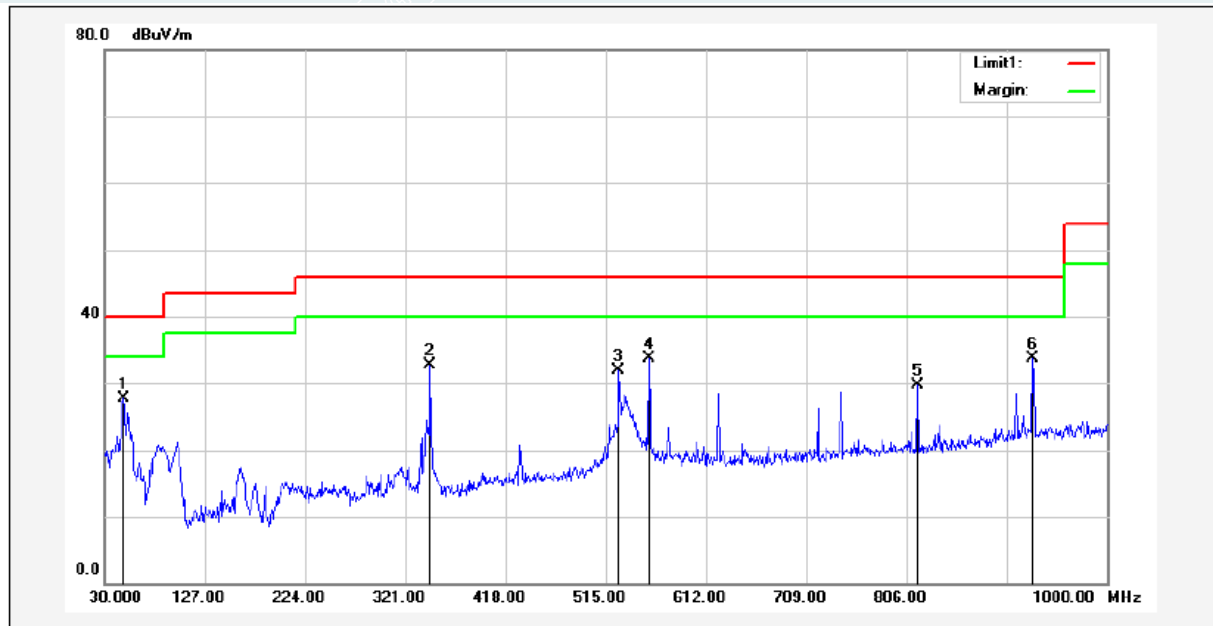
Mode: Mode 1

Lowest Frequency (2405MHz)

Polarity

Date: 2021-10-08

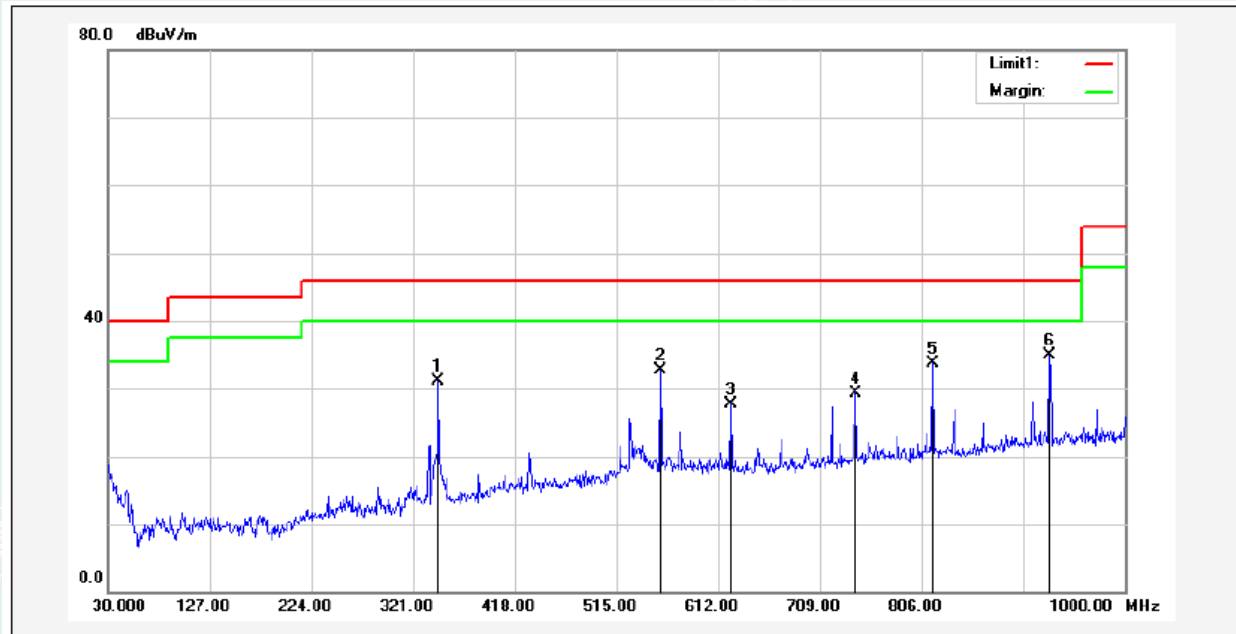
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	48.4300	52.89	-25.24	27.65	40.00	-12.35	112	100	QP
2	345.2500	55.79	-23.02	32.77	46.00	-13.23	27	100	QP
3	527.6100	49.88	-17.95	31.93	46.00	-14.07	193	100	QP
4	556.7100	50.73	-17.10	33.63	46.00	-12.37	169	100	QP
5	816.6700	44.42	-14.72	29.70	46.00	-16.30	264	100	QP
6*	928.2200	47.38	-13.70	33.68	46.00	-12.32	360	129	QP

Mode: Mode 1
 Lowest Frequency (2405MHz)
 Polarity

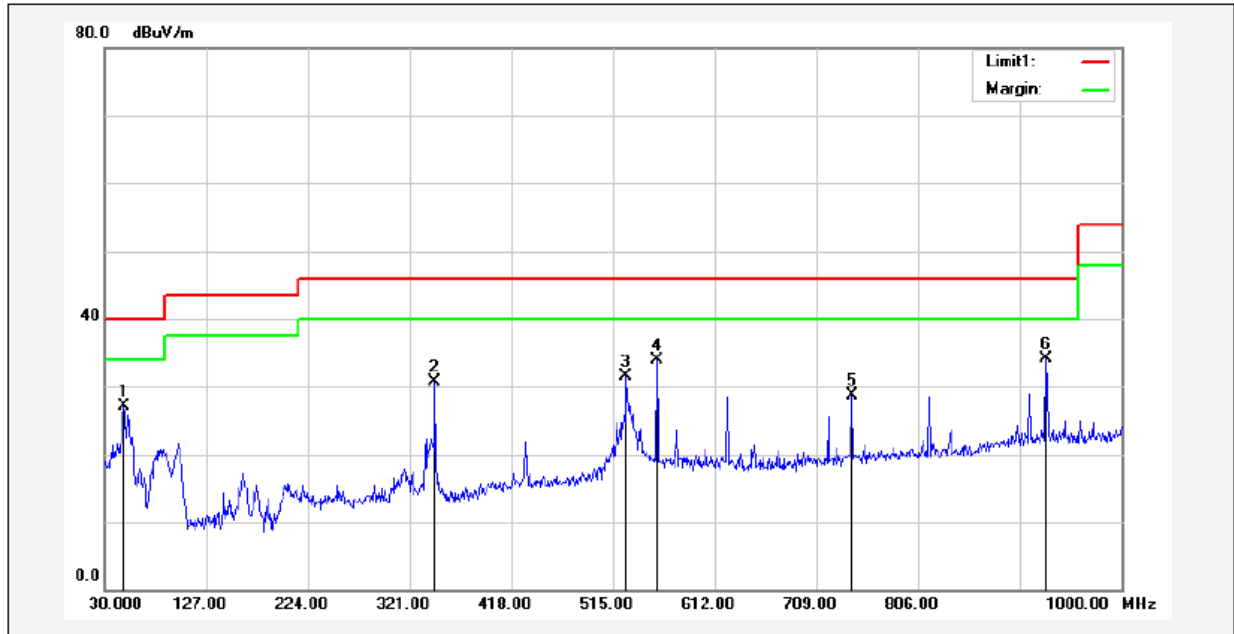
Date: 2021-10-08
 Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	345.2500	54.12	-23.02	31.10	46.00	-14.90	82	100	QP
2	556.7100	49.80	-17.10	32.70	46.00	-13.30	360	157	QP
3	624.6100	44.46	-16.84	27.62	46.00	-18.38	360	138	QP
4	742.9500	44.74	-15.34	29.40	46.00	-16.60	211	100	QP
5	816.6700	48.39	-14.72	33.67	46.00	-12.33	148	100	QP
6*	928.2200	48.65	-13.70	34.95	46.00	-11.05	35	100	QP

Mode: Mode 1
 Middle Frequency (2440MHz)
 Polarity

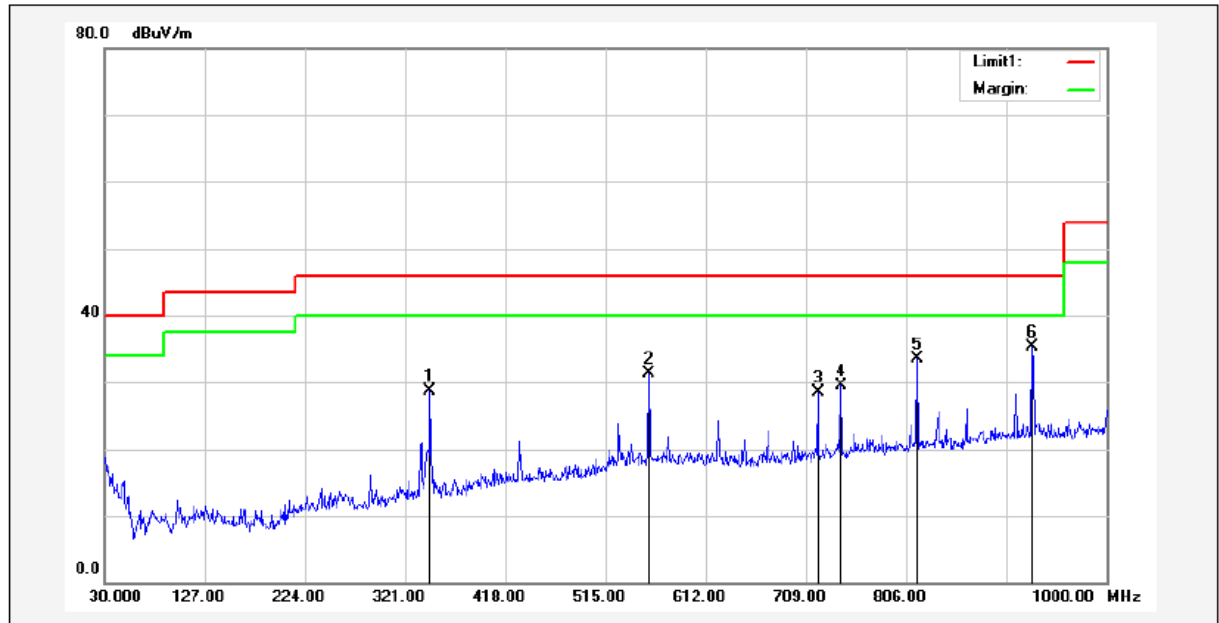
Date: 2021-10-08
 Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	48.4300	52.31	-25.24	27.07	40.00	-12.93	264	100	QP
2	345.2500	53.80	-23.02	30.78	46.00	-15.22	11	100	QP
3	527.6100	49.36	-17.95	31.41	46.00	-14.59	230	100	QP
4	556.7100	51.06	-17.10	33.96	46.00	-12.04	191	100	QP
5	742.9500	44.09	-15.34	28.75	46.00	-17.25	256	100	QP
6*	928.2200	47.78	-13.70	34.08	46.00	-11.92	17	100	QP

Mode: Mode 1
 Middle Frequency (2440MHz)
 Polarity

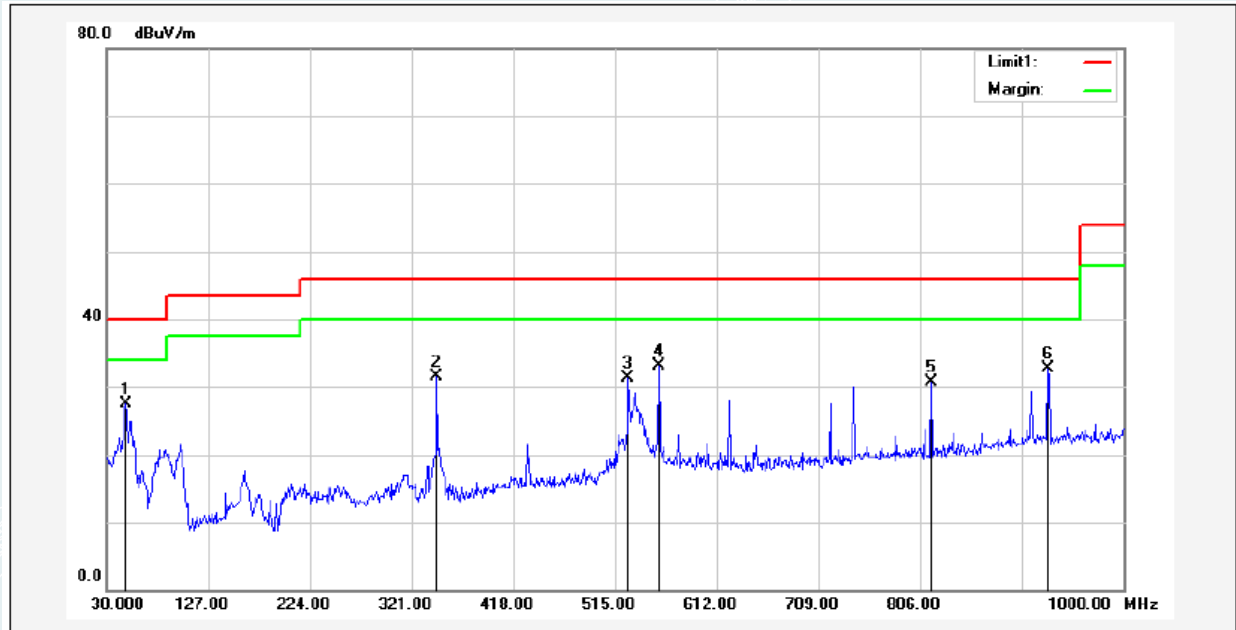
Date: 2021-10-08
 Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	345.2500	51.70	-23.02	28.68	46.00	-17.32	95	100	QP
2	556.7100	48.38	-17.10	31.28	46.00	-14.72	71	200	QP
3	720.6400	44.26	-15.82	28.44	46.00	-17.56	230	100	QP
4	742.9500	44.78	-15.34	29.44	46.00	-16.56	217	100	QP
5	816.6700	48.21	-14.72	33.49	46.00	-12.51	151	100	QP
6*	928.2200	49.07	-13.70	35.37	46.00	-10.63	66	100	QP

Mode:Mode 1
 Highest Frequency (2475MHz)
 Polarity

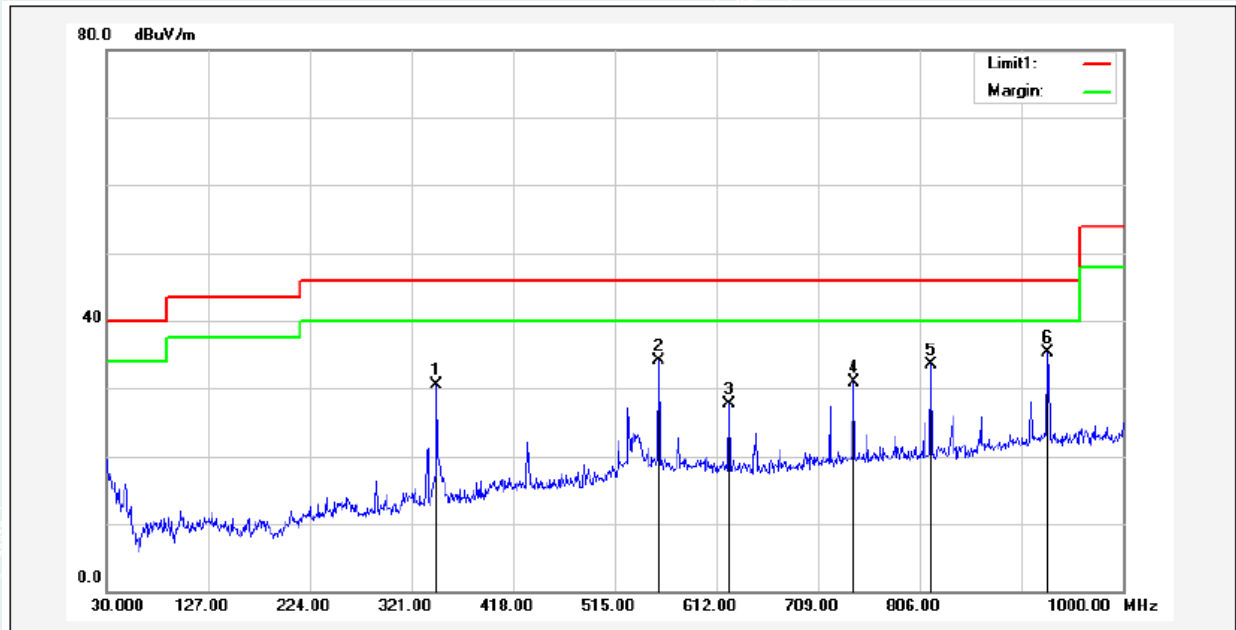
Date: 2021-10-08
 Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1*	48.4300	52.80	-25.24	27.56	40.00	-12.44	90	100	QP
2	345.2500	54.57	-23.02	31.55	46.00	-14.45	42	100	QP
3	527.6100	49.21	-17.95	31.26	46.00	-14.74	201	100	QP
4	556.7100	50.23	-17.10	33.13	46.00	-12.87	196	100	QP
5	816.6700	45.33	-14.72	30.61	46.00	-15.39	231	100	QP
6	928.2200	46.34	-13.70	32.64	46.00	-13.36	358	100	QP

Mode: Mode 1
 Highest Frequency (2475MHz)
 Polarity

Date: 2021-10-08
 Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	345.2500	53.57	-23.02	30.55	46.00	-15.45	76	200	QP
2	556.7100	51.11	-17.10	34.01	46.00	-11.99	360	152	QP
3	624.6100	44.58	-16.84	27.74	46.00	-18.26	360	138	QP
4	742.9500	46.24	-15.34	30.90	46.00	-15.10	227	100	QP
5	816.6700	48.15	-14.72	33.43	46.00	-12.57	145	100	QP
6*	928.2200	48.93	-13.70	35.23	46.00	-10.77	53	100	QP

Remark:

- 1 No emission found between lowest internal used/generated frequency to 30MHz.
- 2 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.
- 3 The IF bandwidth of Receiver between 30MHz to 1GHz was 120 kHz.

1GHz-18GHz:

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: Mode 1

Lowest Frequency (2405MHz)

Date:2021-09-29

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1598.0000	73.92	51.00	-22.92	74.00	23.00	100	357	Horizontal
2	2191.8000	65.98	45.14	-20.84	74.00	28.86	100	185	Horizontal
3	2992.6000	64.63	46.94	-17.69	74.00	27.06	100	257	Horizontal
4	3187.5000	61.60	45.49	-16.11	74.00	28.51	100	159	Horizontal
5	5988.0000	53.24	45.65	-7.59	74.00	28.35	100	81	Horizontal
6	7216.5000	51.97	48.66	-3.31	74.00	25.34	100	187	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dB μ V/m]	AV Value [dB μ V/m]	AV Limit [dB μ V/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1594.3086	-22.91	52.67	29.76	54.00	24.24	100	189	Horizontal
2	7213.5773	-3.30	39.52	36.22	54.00	17.78	128	170	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1595.6000	76.07	53.16	-22.91	74.00	20.84	200	120	Vertical
2	2987.2000	67.24	49.52	-17.72	74.00	24.48	100	63	Vertical
3	3985.5000	58.86	44.25	-14.61	74.00	29.75	100	65	Vertical
4	4984.5000	57.13	47.29	-9.84	74.00	26.71	100	141	Vertical
5	5998.5000	58.07	50.57	-7.50	74.00	23.43	100	106	Vertical
6	7213.5000	52.36	49.09	-3.27	74.00	24.91	100	0	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dB μ V/m]	AV Value [dB μ V/m]	AV Limit [dB μ V/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1594.8182	-22.92	54.62	31.70	54.00	22.30	128	142	Vertical
2	2987.2299	-17.72	45.45	27.73	54.00	26.27	189	96	Vertical
3	5999.9396	-7.50	45.69	38.19	54.00	15.81	174	102	Vertical
4	7213.5361	-3.28	44.69	41.41	54.00	12.59	132	1	Vertical

Mode: Mode 1
Middle Frequency (2440MHz)

Date:2021-10-13

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1000.0000	63.93	38.77	-25.16	74.00	35.23	100	17	Horizontal
2	1008.2500	57.87	32.72	-25.15	54.00	21.28	200	343	Horizontal
3	1595.0000	77.10	54.19	-22.91	74.00	19.81	100	254	Horizontal
4	1600.2500	53.94	31.02	-22.92	54.00	22.98	100	152	Horizontal
5	1994.2500	51.34	29.75	-21.59	54.00	24.25	100	207	Horizontal
6	1999.0000	66.80	45.24	-21.56	74.00	28.76	100	311	Horizontal
7	2991.7500	62.81	45.11	-17.70	74.00	28.89	100	263	Horizontal
8	3202.5000	43.72	27.85	-15.87	54.00	26.15	100	238	Horizontal
9	7314.3750	58.22	53.97	-4.25	74.00	20.03	100	238	Horizontal
10	7316.2500	48.41	44.18	-4.23	54.00	9.82	100	238	Horizontal
11	13728.7500	41.64	49.53	7.89	74.00	24.47	100	37	Horizontal
12	13925.6250	29.36	38.44	9.08	54.00	15.56	200	223	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1081.5000	58.91	33.96	-24.95	54.00	20.04	200	343	Vertical
2	1100.0000	76.00	51.12	-24.88	74.00	22.88	200	319	Vertical
3	1225.5000	54.58	30.24	-24.34	54.00	23.76	200	160	Vertical
4	1428.2500	75.76	52.46	-23.30	74.00	21.54	200	152	Vertical
5	1596.0000	73.14	50.23	-22.91	74.00	23.77	100	169	Vertical
6	1600.2500	54.10	31.18	-22.92	54.00	22.82	200	41	Vertical
7	2880.2500	52.35	34.48	-17.87	54.00	19.52	100	311	Vertical
8	2994.7500	65.93	48.25	-17.68	74.00	25.75	100	328	Vertical
9	4875.0000	55.06	45.22	-9.84	74.00	28.78	200	143	Vertical
10	4876.8750	44.52	34.66	-9.86	54.00	19.34	200	143	Vertical
11	7314.3750	58.65	54.40	-4.25	74.00	19.60	100	286	Vertical
12	7316.2500	48.05	43.82	-4.23	54.00	10.18	200	287	Vertical

Mode: Mode 1
Highest Frequency (2475MHz)

Date:2021-09-29

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1356.8000	65.06	41.35	-23.71	74.00	32.65	200	75	Horizontal
2	1595.2000	73.58	50.67	-22.91	74.00	23.33	100	353	Horizontal
3	1798.0000	66.23	44.15	-22.08	74.00	29.85	100	41	Horizontal
4	2987.4000	64.30	46.58	-17.72	74.00	27.42	100	272	Horizontal
5	3987.0000	58.46	43.84	-14.62	74.00	30.16	100	197	Horizontal
6	5995.5000	53.57	46.04	-7.53	74.00	27.96	100	87	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dB μ V/m]	AV Value [dB μ V/m]	AV Limit [dB μ V/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1594.7214	-22.92	50.20	27.28	54.00	26.72	149	203	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1594.2000	72.53	49.62	-22.91	74.00	24.38	200	297	Vertical
2	1769.2000	72.79	50.50	-22.29	74.00	23.50	100	340	Vertical
3	2986.8000	68.22	50.50	-17.72	74.00	23.50	100	64	Vertical
4	4995.0000	56.63	46.86	-9.77	74.00	27.14	100	154	Vertical
5	6000.0000	56.27	48.78	-7.49	74.00	25.22	100	105	Vertical
6	7423.5000	51.03	47.44	-3.59	74.00	26.56	100	88	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dB μ V/m]	AV Value [dB μ V/m]	AV Limit [dB μ V/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1594.1522	-22.91	52.66	29.75	54.00	24.25	120	124	Vertical
2	1773.5876	-22.30	48.44	26.14	54.00	27.86	161	96	Vertical
3	2986.9941	-17.72	45.19	27.47	54.00	26.53	185	96	Vertical
4	5999.9700	-7.49	45.03	37.54	54.00	16.46	177	101	Vertical

18GHz-26.5GHz:

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.

Recorded the worst case results in this report (2475MHz)

Mode: Mode 1

Highest Frequency (2475MHz)

Date: 2021-10-12

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18101.1500	55.52	43.89	-11.63	83.50	39.61	100	4	Horizontal
2	19695.7500	60.43	49.56	-10.87	83.50	33.94	100	150	Horizontal
3	21244.0250	56.06	45.82	-10.24	83.50	37.68	100	107	Horizontal
4	23217.7250	54.15	45.32	-8.83	83.50	38.18	100	203	Horizontal
5	25233.0750	53.43	45.78	-7.65	83.50	37.72	100	246	Horizontal
6	26301.9500	53.51	45.82	-7.69	83.50	37.68	100	107	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18224.8250	56.29	44.70	-11.59	83.50	38.80	100	50	Vertical
2	20537.6750	56.39	45.92	-10.47	83.50	37.58	100	129	Vertical
3	21150.9500	55.61	45.32	-10.29	83.50	38.18	100	58	Vertical
4	23276.3750	55.10	46.29	-8.81	83.50	37.21	100	85	Vertical
5	25211.8250	53.80	46.16	-7.64	83.50	37.34	100	76	Vertical
6	26280.2750	53.82	46.08	-7.74	83.50	37.42	100	330	Vertical

7. 6dB BANDWIDTH

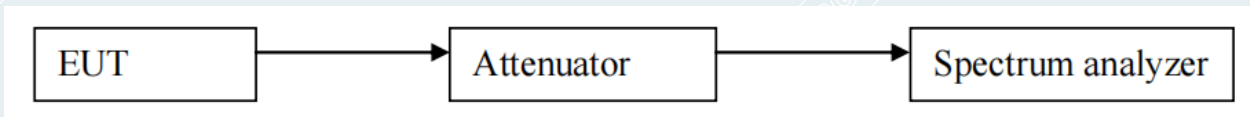
7.1.LIMITS

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) $\geq 3 \times$ 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.

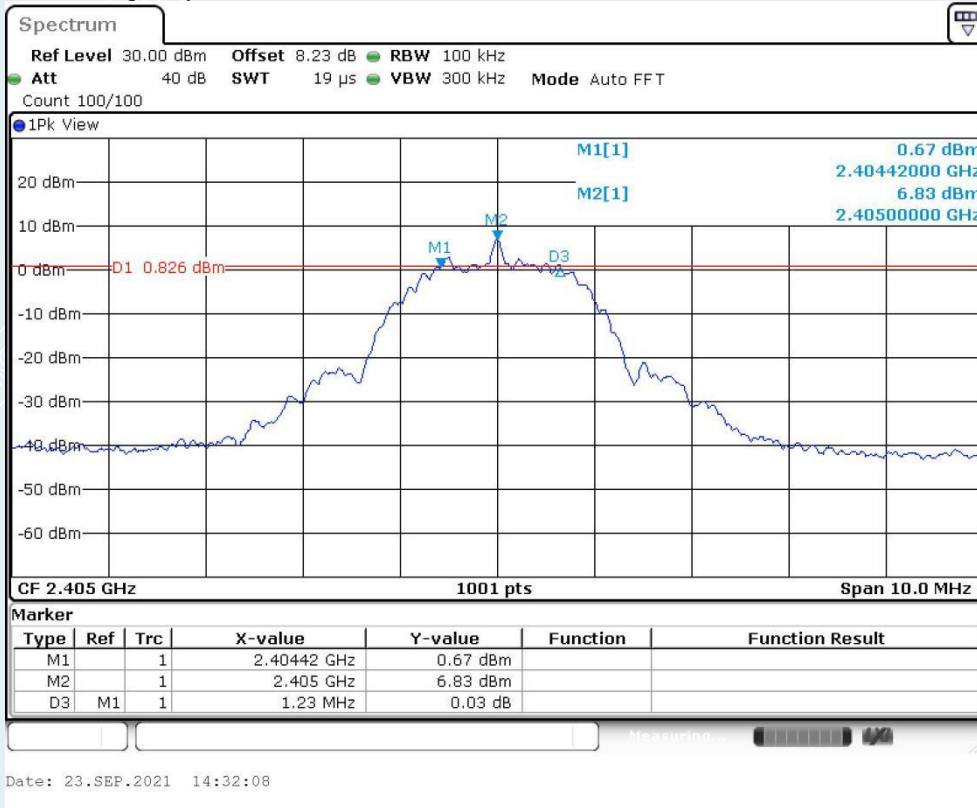
7.3.TEST SETUP



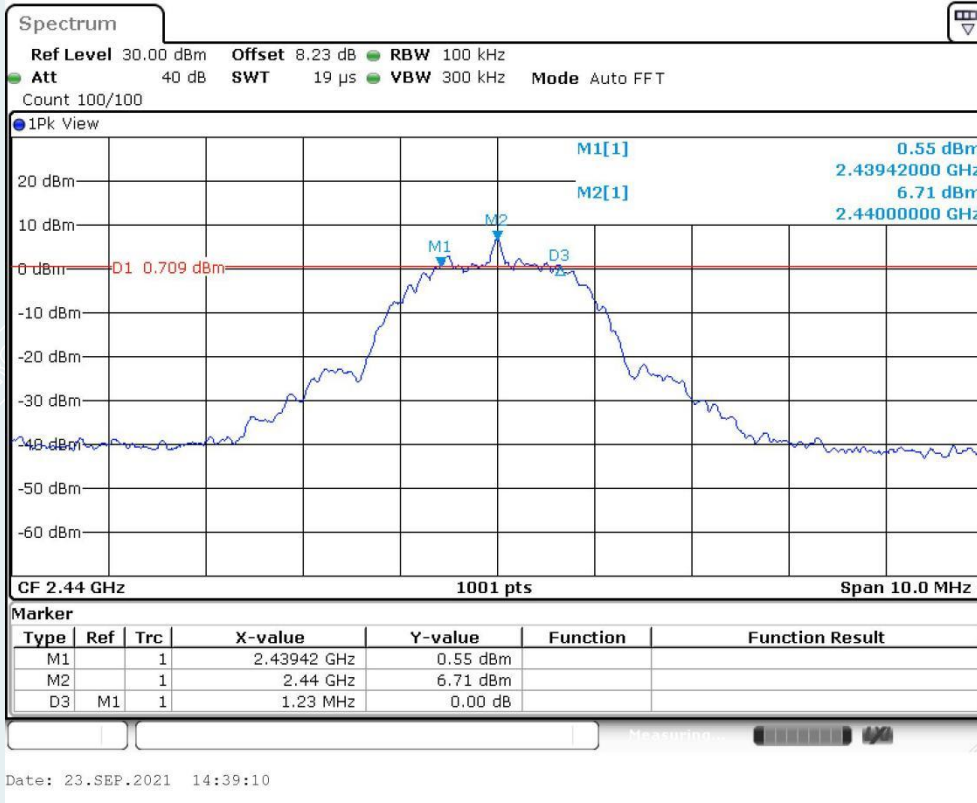
7.4.TEST RESULTS

Channel	Frequency (MHz)	Bandwidth [kHz]	Limit[kHz]	Verdict
Lowest	2405	1230	≥ 500	PASS
Middle	2440	1230		PASS
Highest	2475	1230		PASS

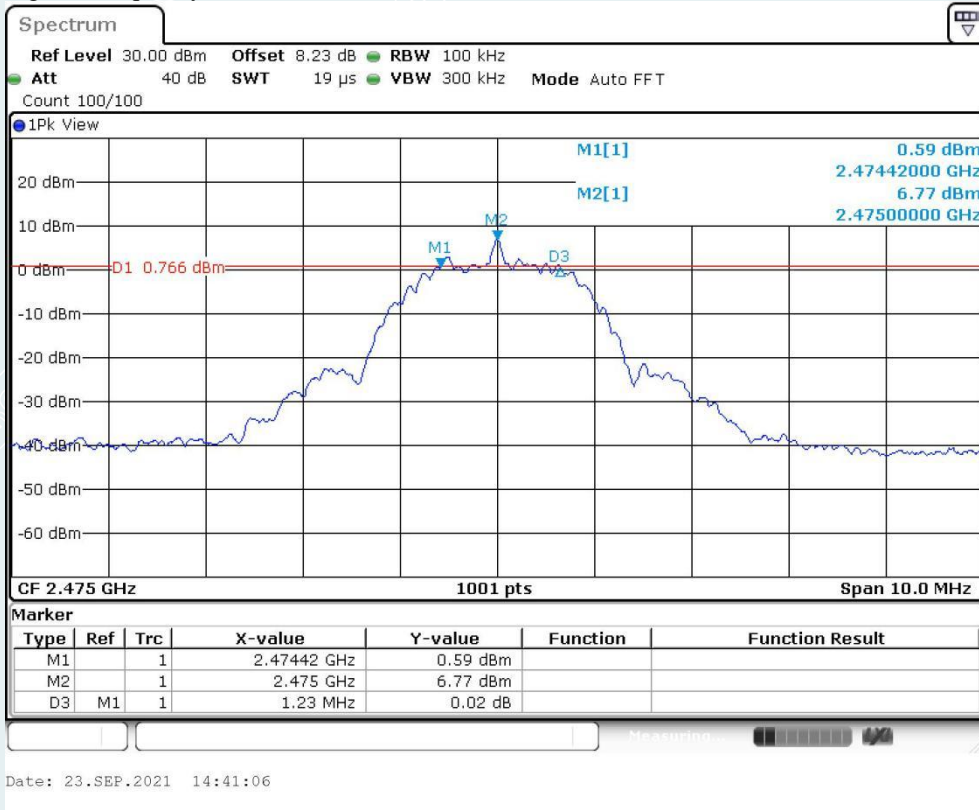
Lowest Frequency (2405MHz)



Middle Frequency (2440 MHz)



Highest Frequency (2475MHz)



8. MAXIMUM PEAK OUTPUT POWER

8.1.LIMITS

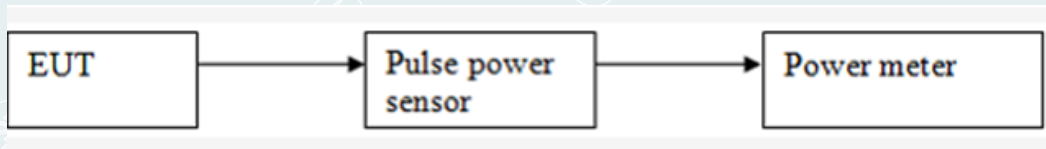
The maximum Peak output power measurement is 1W

8.2.TEST PROCEDURES

PKSA1 Peak power meter method

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

8.3.TEST SETUP



8.4.TEST RESULTS

Channel	Frequency (MHz)	Measured Channel Power (dBm)	Limit	Peak/ Average	Result
Lowest	2405	7.61	1W (30dBm)	Peak	Pass
Middle	2440	7.58			Pass
Highest	2475	7.61			Pass

9. POWER SPECTRAL DENSITY

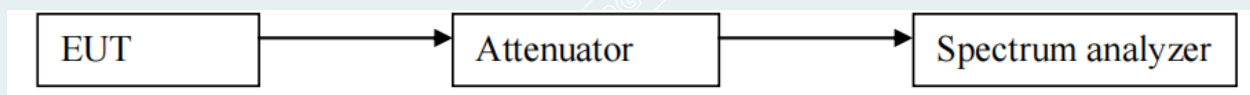
9.1. LIMITS

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

9.2. 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) Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- 3) The following procedure shall be used if maximum peak conducted output power was used to determine compliance, and it is optional if the maximum conducted (average) output power was used to determine compliance:
 - a) Set analyzer center frequency to DTS channel center frequency.
 - b) Set the span to 2.0 times the DTS bandwidth.
 - c) Set the RBW to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
 - d) Set the VBW $\geq [3 \times \text{RBW}]$.
 - e) Detector = peak
 - f) Sweep time = auto couple.
 - g) Trace mode = max hold.
 - h) Allow trace to fully stabilize.
 - i) Use the peak marker function to determine the maximum amplitude level within the RBW.
 - j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.
- 4) Repeat above procedures until all frequencies measured were complete.

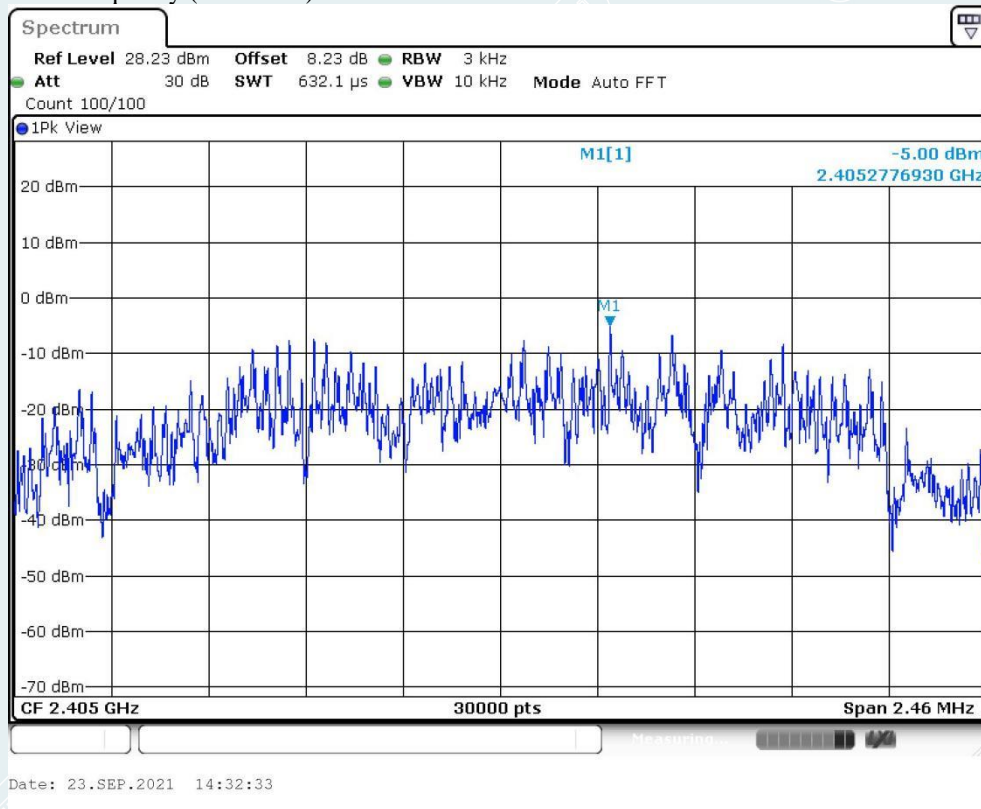
9.3. TEST SETUP



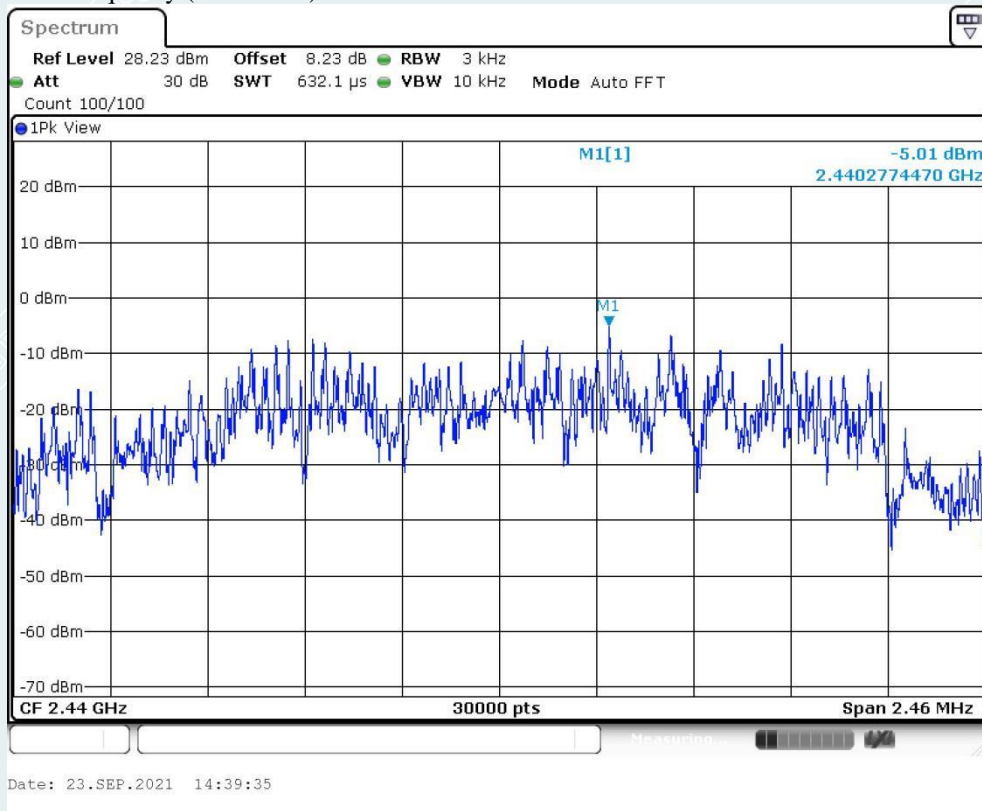
9.4. TEST RESULTS

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	2405	-5.00	8.00	Pass
Middle	2440	-5.01	8.00	Pass
Highest	2475	-5.02	8.00	Pass

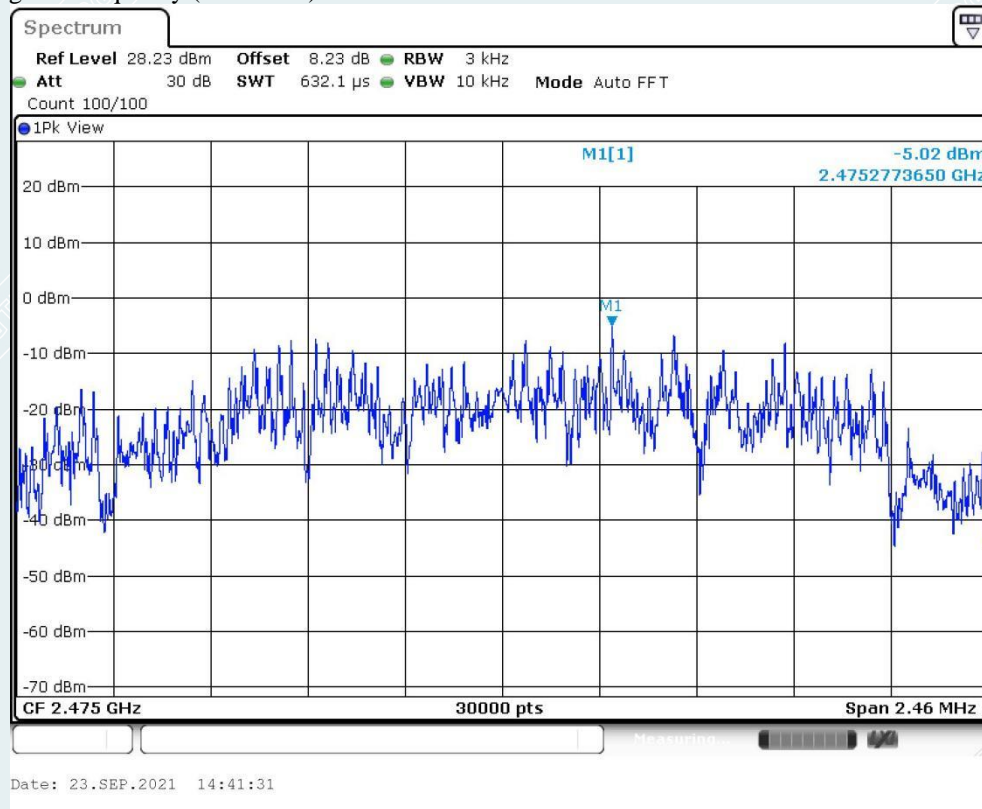
Lowest Frequency (2405MHz)



Middle Frequency (2440 MHz)



Highest Frequency (2475MHz)



10. CONDUCTED BAND EDGES AND SPURIOUS EMISSIONS

10.1. LIMITS

(d) 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.

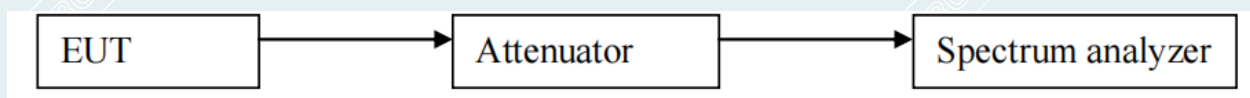
10.2. TEST PROCEDURES

Test procedures follow KDB 558074 D01 DTS Measurement Guidance.

Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.

- 1) Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.
- 2) Set the spectrum analyzer: RBW =100kHz; VBW =300kHz; Sweep = auto; Detector Function = Peak; Trace = Max hold.
- 3) Measure and record the results in the test report.
- 4) The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- 5) Measurements are made from 30MHz to 26.5GHz with the transmitter set to the lowest, middle, and highest channels.

10.3. TEST SETUP



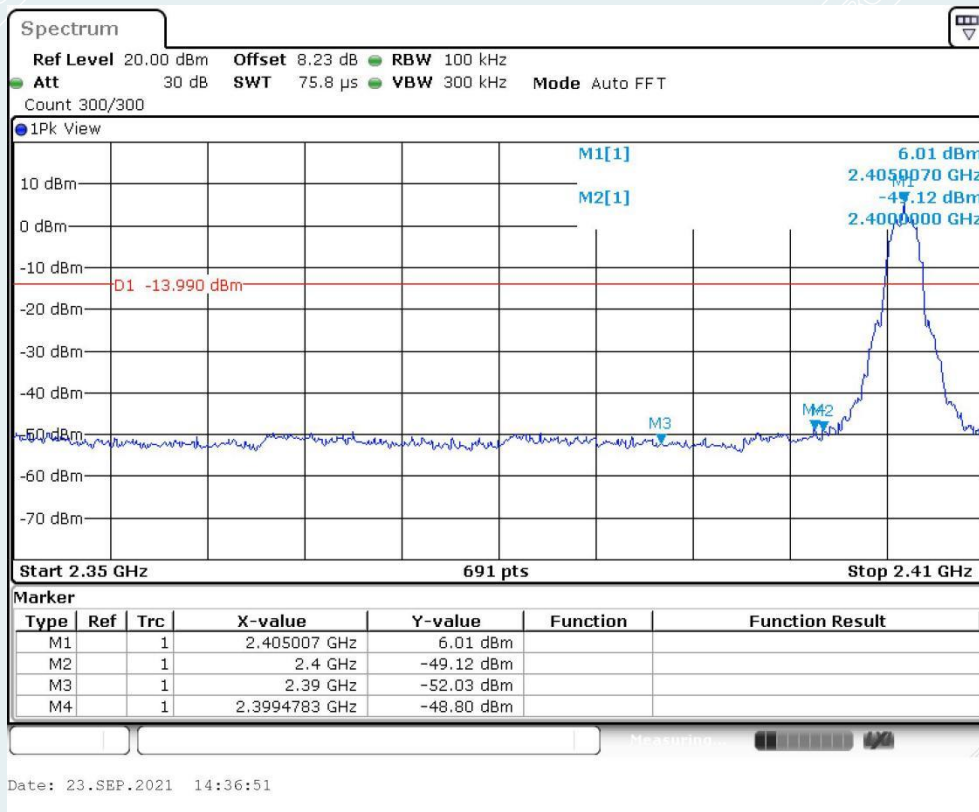
10.4. TEST RESULTS

Band edge

Channel	Frequency (MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
Lowest	2405	6.01	-48.8	≤-13.99	PASS
Highest	2475	5.88	-47.92	≤-14.12	PASS

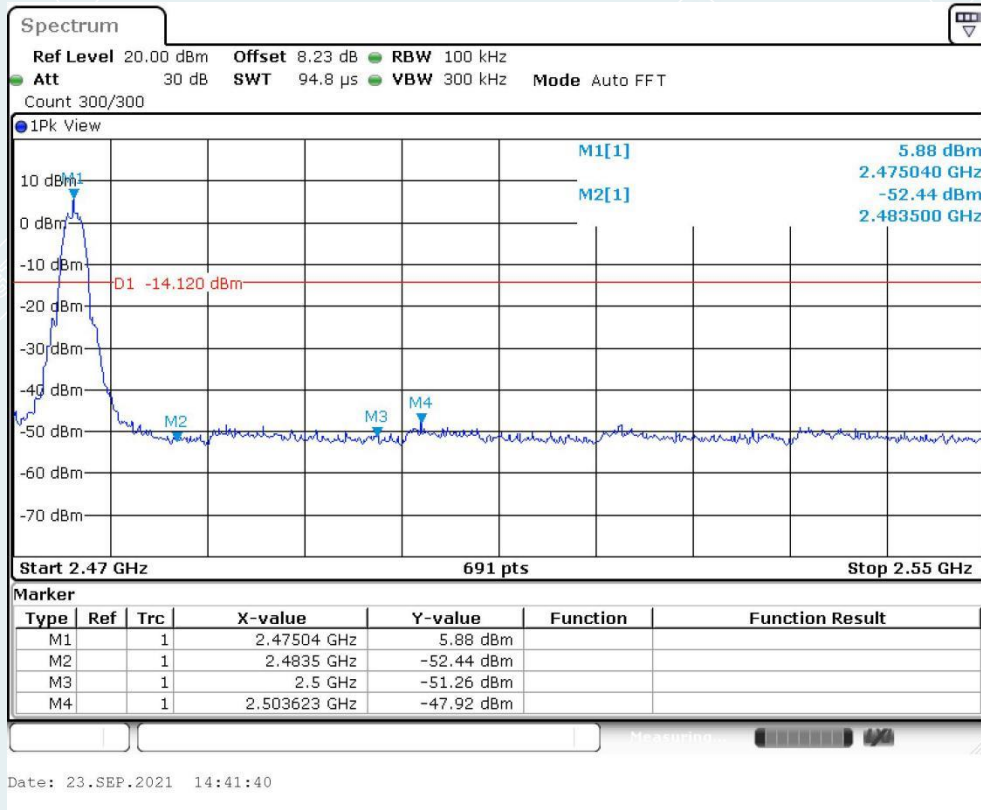
Lowest Frequency (2405MHz)

2.35GHz-2.405GHz



Highest Frequency (2475MHz)

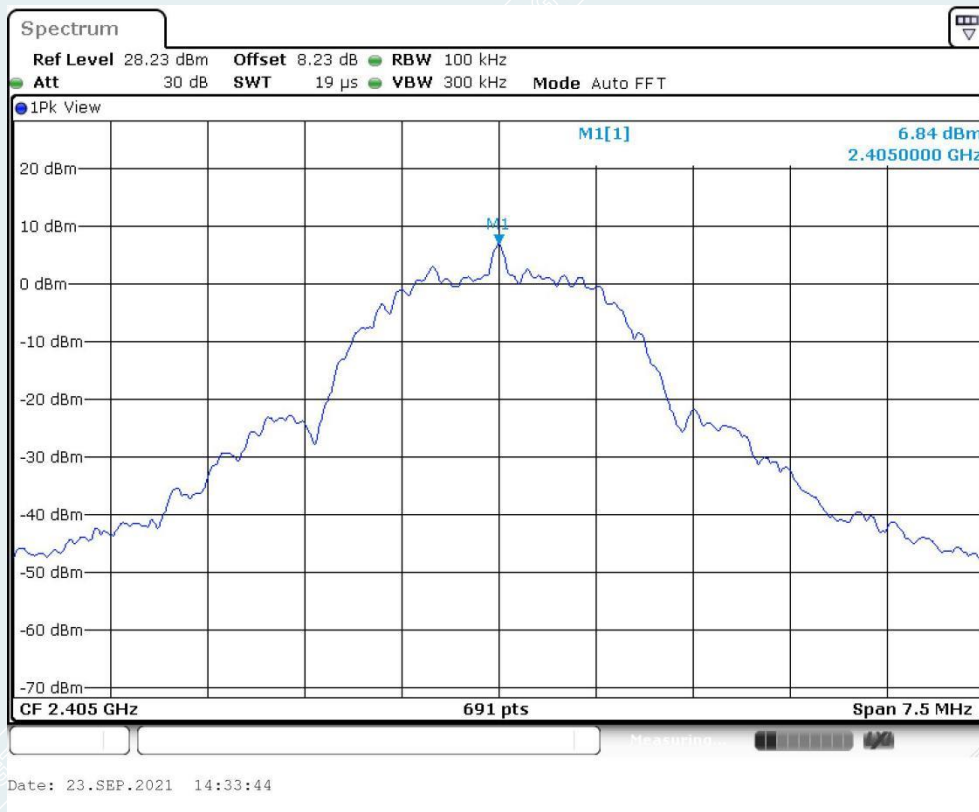
2.47GHz-2.55GHz



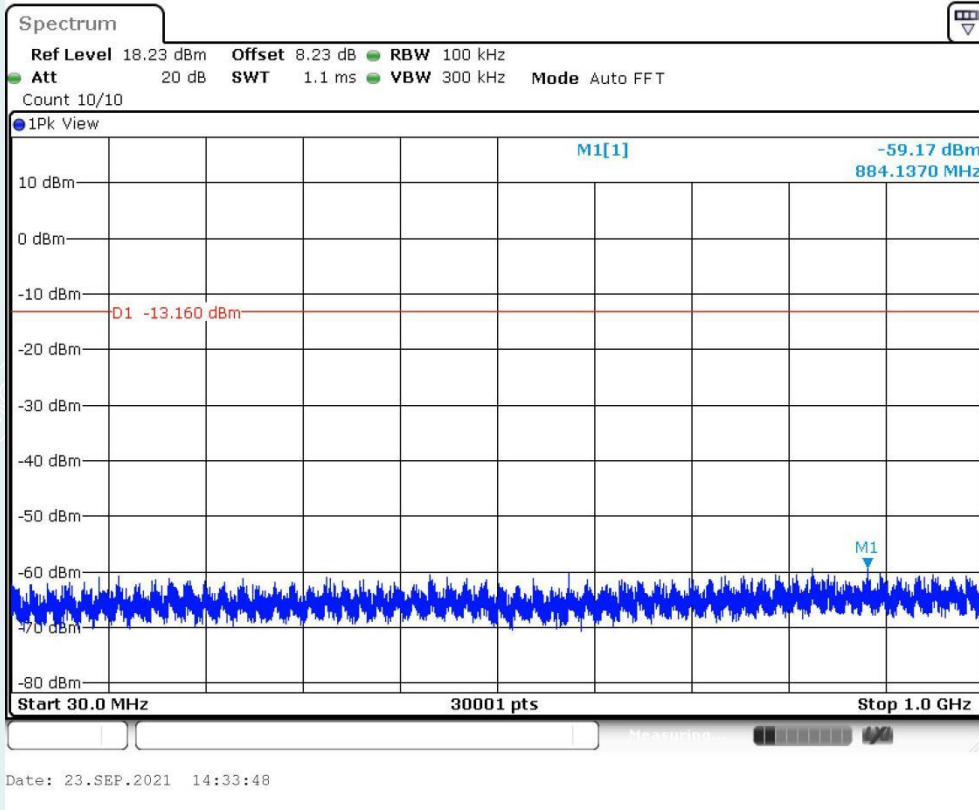
Conducted Spurious Emission

Frequency (MHz)	Freq Range [MHz]	Ref Level [dBm]	Result[dBm]	Limit[dBm]	Verdict
2405	Reference	6.84	6.84	---	PASS
	30~1000	6.84	-59.17	≤-13.16	PASS
	1000~26500	6.84	-52.94	≤-13.16	PASS
2440	Reference	6.64	6.64	---	PASS
	30~1000	6.64	-57.50	≤-13.36	PASS
	1000~26500	6.64	-52.52	≤-13.36	PASS
2475	Reference	6.75	6.75	---	PASS
	30~1000	6.75	-58.35	≤-13.25	PASS
	1000~26500	6.75	-50.95	≤-13.25	PASS

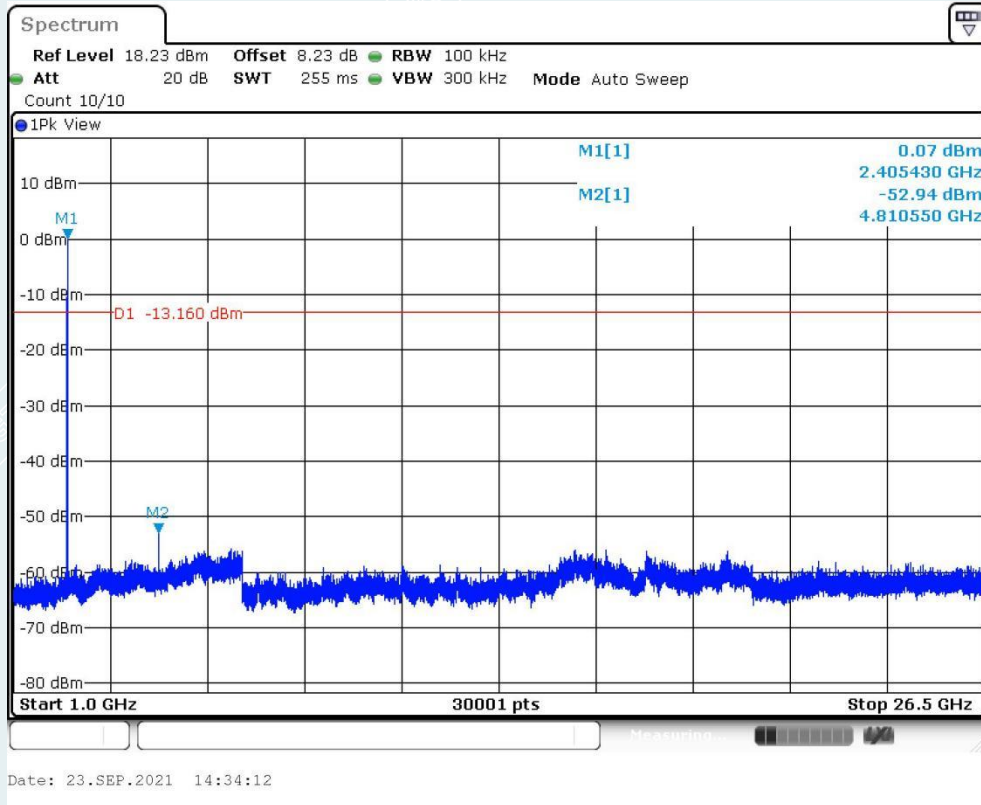
Lowest Frequency (2405MHz)



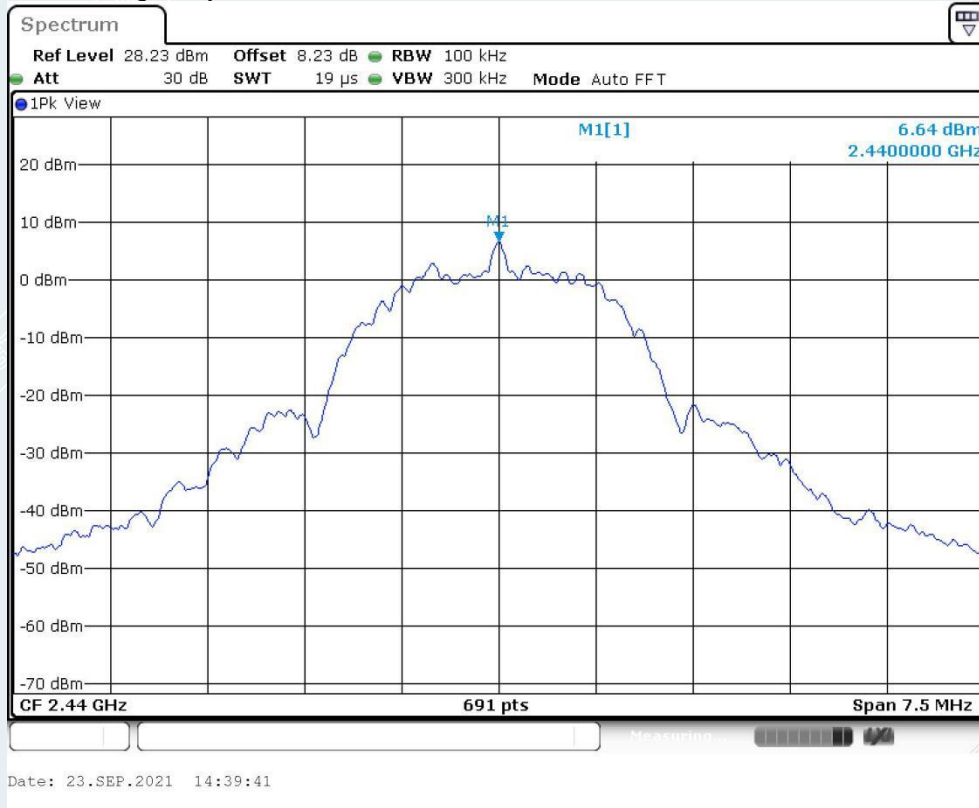
0.03GHz-1GHz



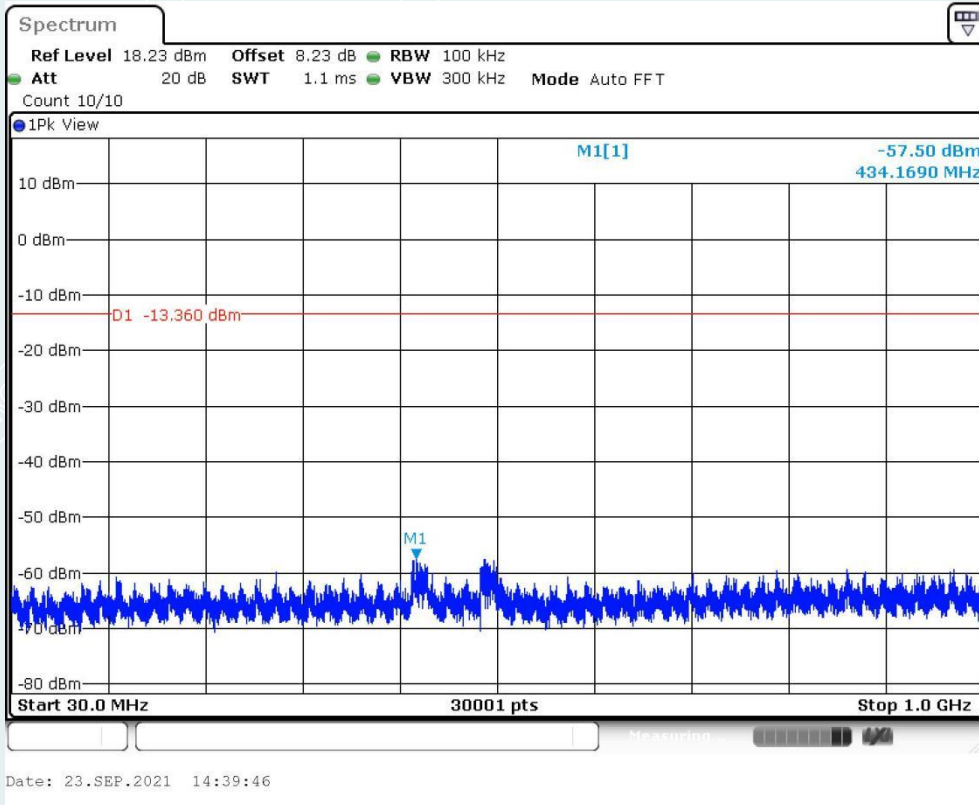
1GHz-26.5GHz



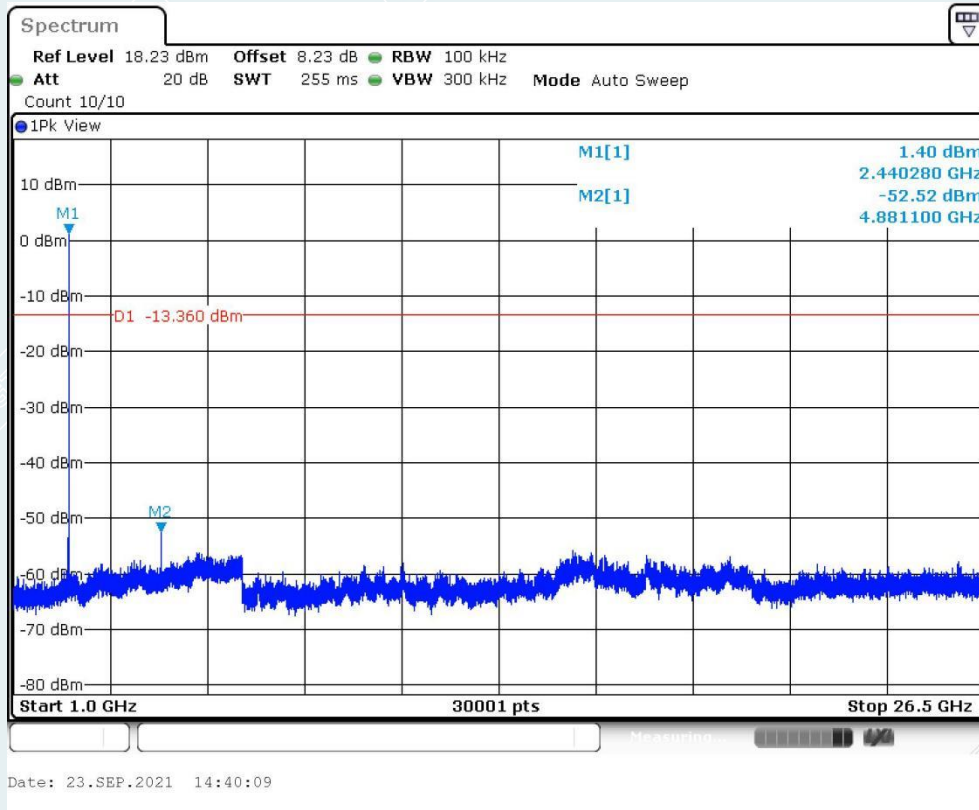
Middle Frequency (2440MHz)



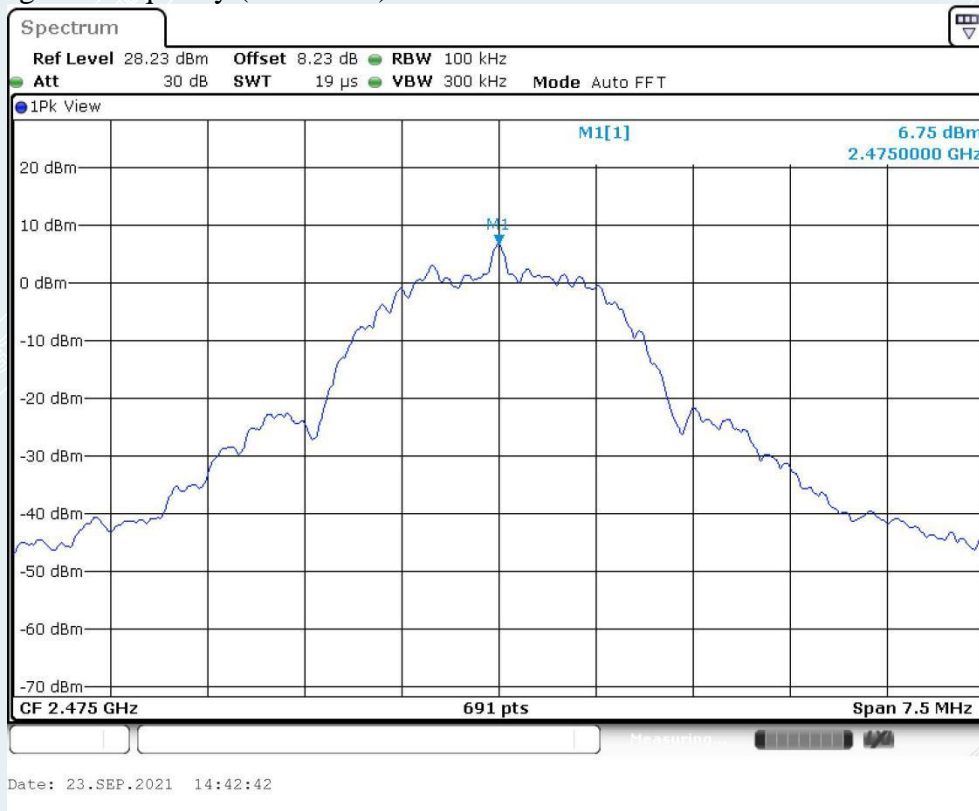
0.03GHz-1GHz



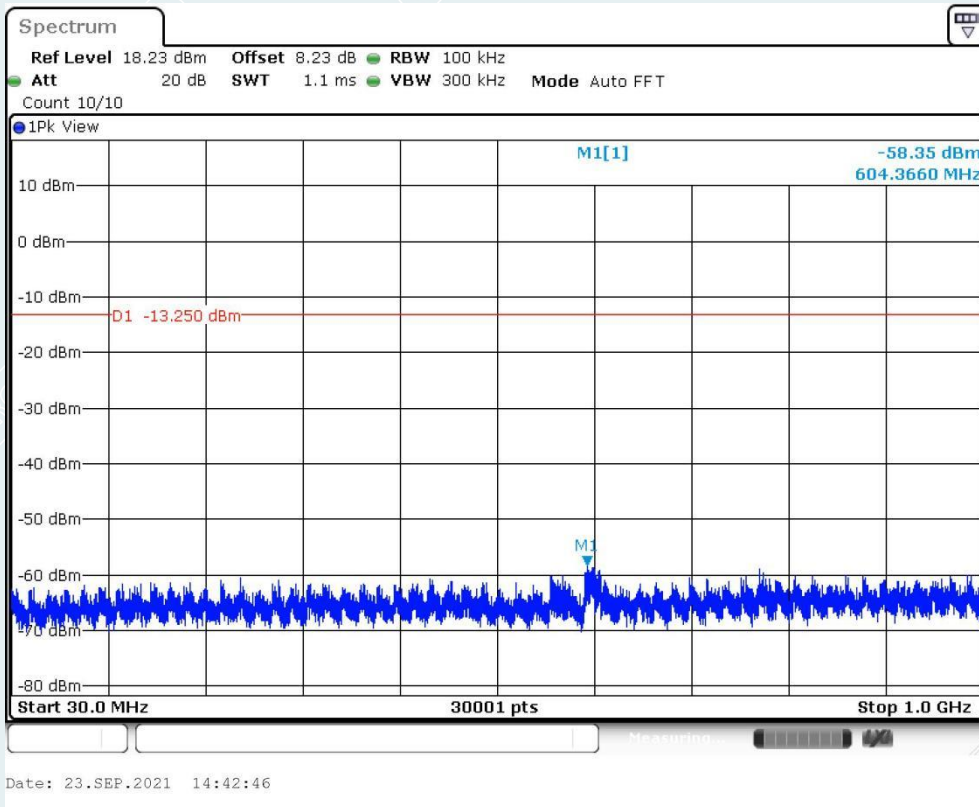
1GHz-26.5GHz



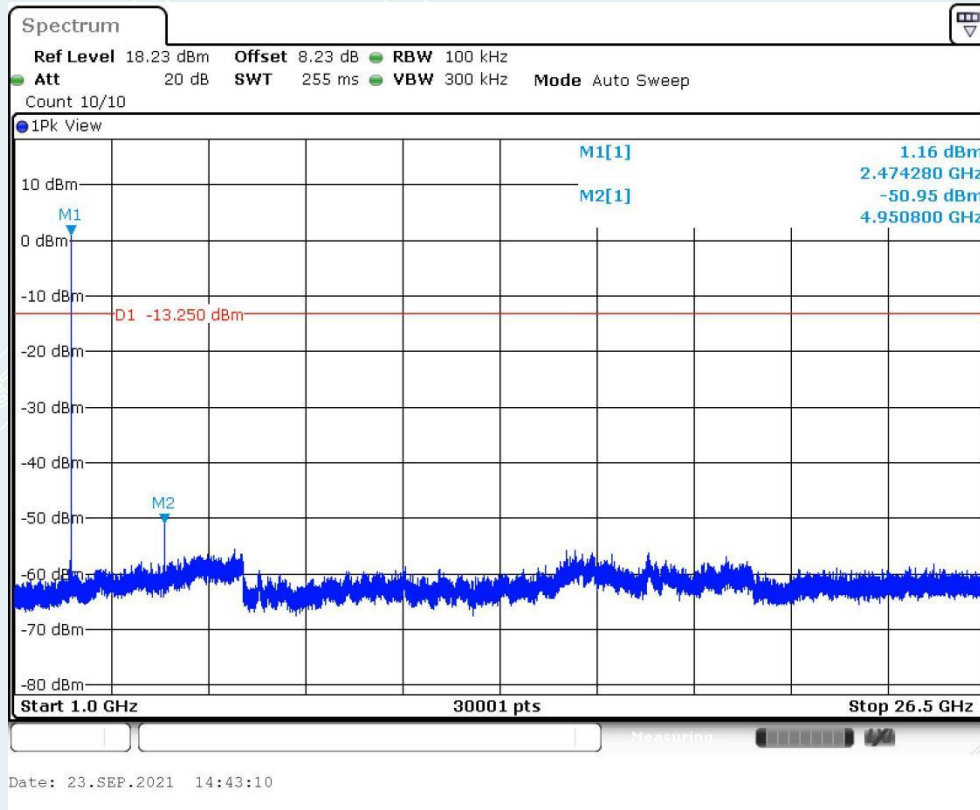
Highest Frequency (2475MHz)



0.03GHz-1GHz



1GHz-26.5GHz



11. RESTRICTED BANDS OF OPERATION

11.1. LIMITS

Section 15.247(d) In addition, Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 -	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.69525	960 - 1240	7.25 - 7.75
4.125 - 4.128	16.80425 -	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	16.80475	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	25.5 - 25.67	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	37.5 - 38.25	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	73 - 74.6	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	74.8 - 75.2	2200 - 2300	14.47 - 14.5
8.291 - 8.294	108 - 121.94	2310 - 2390	15.35 - 16.2
8.362 - 8.366	123 - 138	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	149.9 - 150.05	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.52475 -	3260 - 3267	23.6 - 24.0
12.29 - 12.293	156.52525	3332 - 3339	31.2 - 31.8
12.51975 -	156.7 - 156.9	3345.8 - 3358	36.43 - 36.5
12.52025	162.0125 - 167.17	3600 - 4400	
12.57675 -	167.72 - 173.2		
12.57725	240 - 285		
13.36 - 13.41	322 - 335.4		

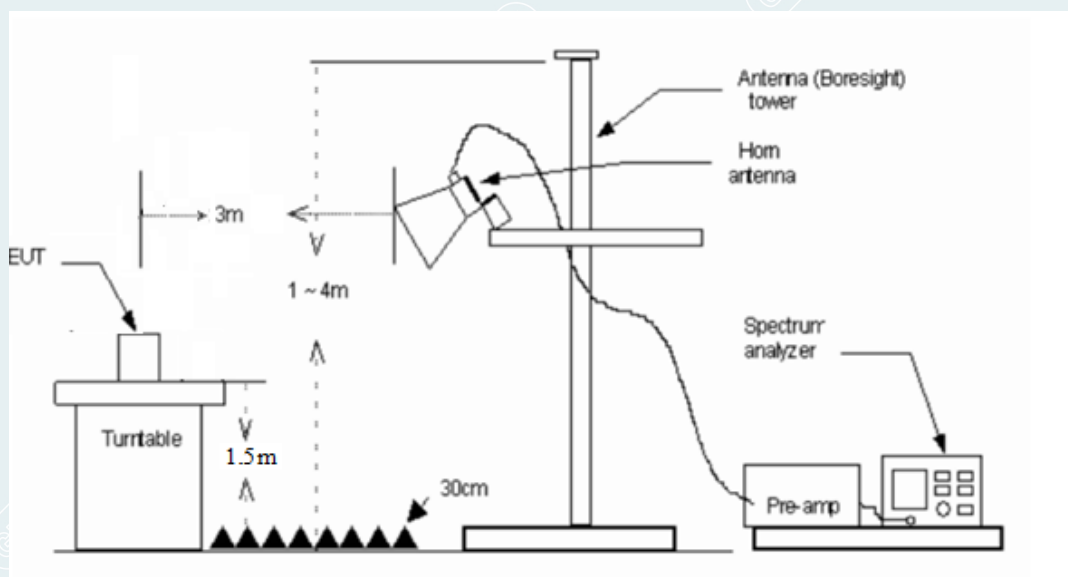
Frequency (MHz)	Quasi-peak($\mu\text{V}/\text{m}$)	Measurement distance(m)	Quasi-peak($\text{dB}\mu\text{V}/\text{m}$)@distance 3m
0.009-0.490	2400/F(kHz)	300	53.8~88.5
0.490-1.705	24000/F(kHz)	30	43~53.8
1.705-30.0	30	30	49.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

11.2. TEST PROCEDURES

Test procedures follow KDB 558074 D01 DTS Measurement Guidance.

- 1) The EUT is placed on a turntable, which is 1.5m above the ground plane.
- 2) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
- 4) 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=1MHz / Sweep=AUTO
 - b) AVERAGE: RBW=1MHz / VBW=1/T / Sweep=AUTO
- 5) Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

11.3. TEST SETUP



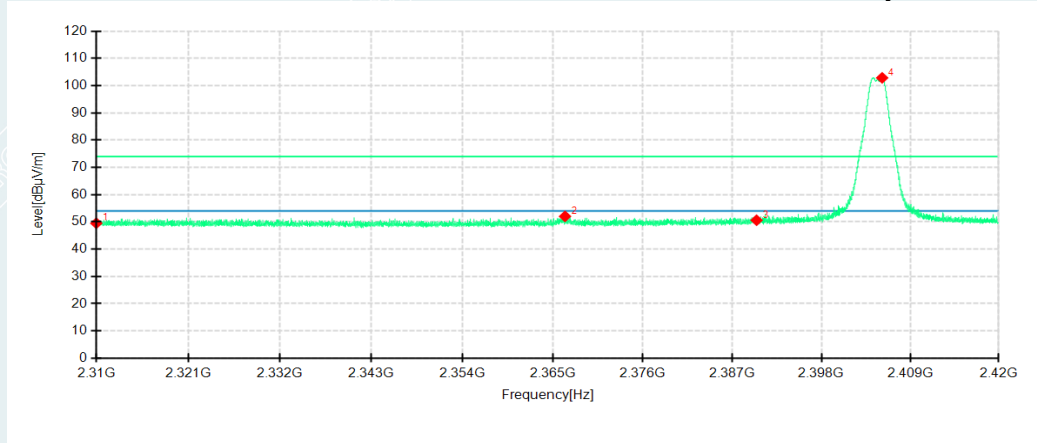
11.4. TEST RESULTS

Lowest Channel

Frequency 2405MHz

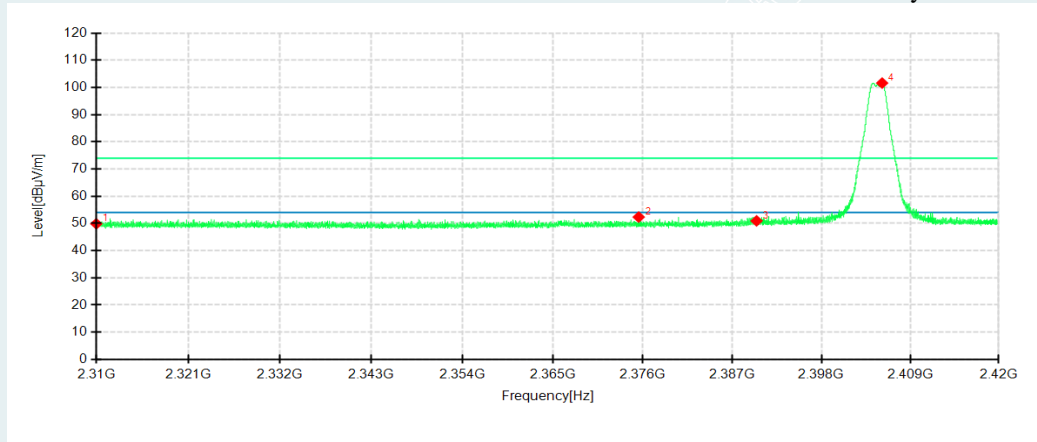
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



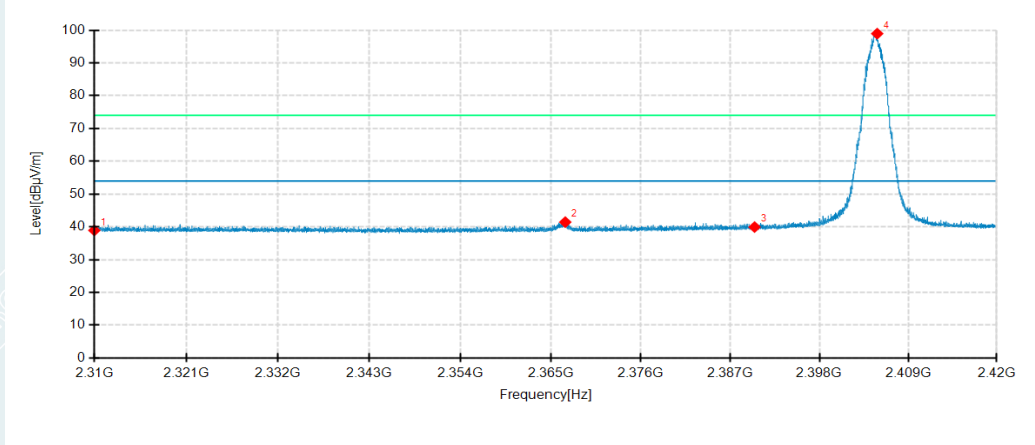
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2310.0000	46.02	49.50	3.48	74.00	24.50	200	160	Horizontal	/
2	2366.5070	48.62	52.03	3.41	74.00	21.97	100	298	Horizontal	/
3	2390.0000	46.80	50.61	3.81	74.00	23.39	100	323	Horizontal	/
4	2405.5240	98.82	102.83	4.01	74.00	-28.83	100	167	Horizontal	No limit
1	2310.0000	46.37	49.85	3.48	74.00	24.15	200	324	Vertical	/
2	2375.5160	48.77	52.33	3.56	74.00	21.67	200	167	Vertical	/
3	2390.0000	47.12	50.93	3.81	74.00	23.07	200	167	Vertical	/
4	2405.5240	97.58	101.59	4.01	74.00	-27.59	100	53	Vertical	No limit

Lowest Channel

Frequency 2405MHz

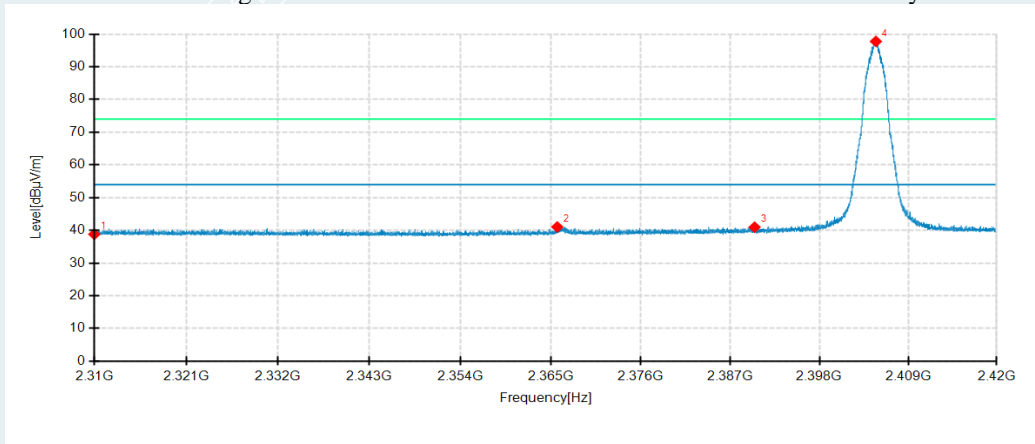
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



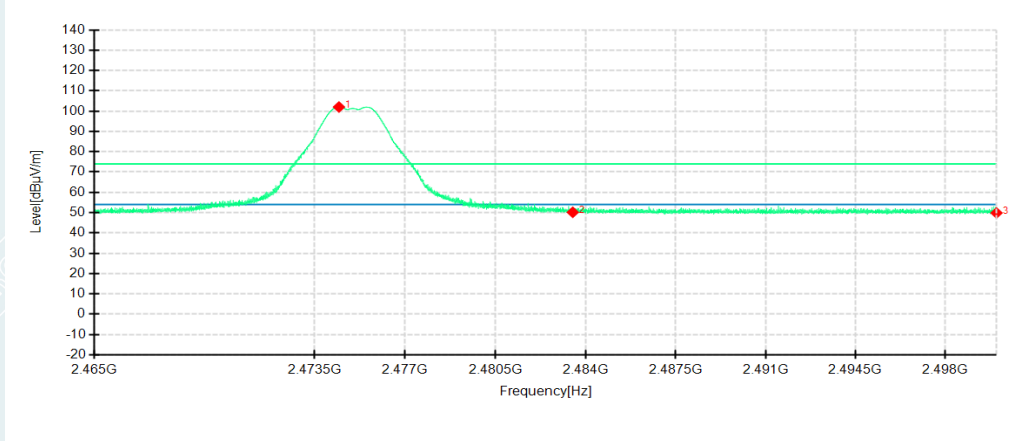
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2310.0000	35.44	38.92	3.48	54.00	15.08	100	167	Horizontal	/
2	2366.7820	38.02	41.44	3.42	54.00	12.56	100	200	Horizontal	/
3	2390.0000	36.13	39.94	3.81	54.00	14.06	100	167	Horizontal	/
4	2405.1610	94.91	98.92	4.01	54.00	-44.92	100	167	Horizontal	No limit
1	2310.0000	35.31	38.79	3.48	54.00	15.21	200	167	Vertical	/
2	2365.8140	37.63	41.03	3.40	54.00	12.97	100	45	Vertical	/
3	2390.0000	37.15	40.96	3.81	54.00	13.04	100	193	Vertical	/
4	2404.9960	93.75	97.75	4.00	54.00	-43.75	100	62	Vertical	No limit

Highest Channel

Frequency 2475MHz

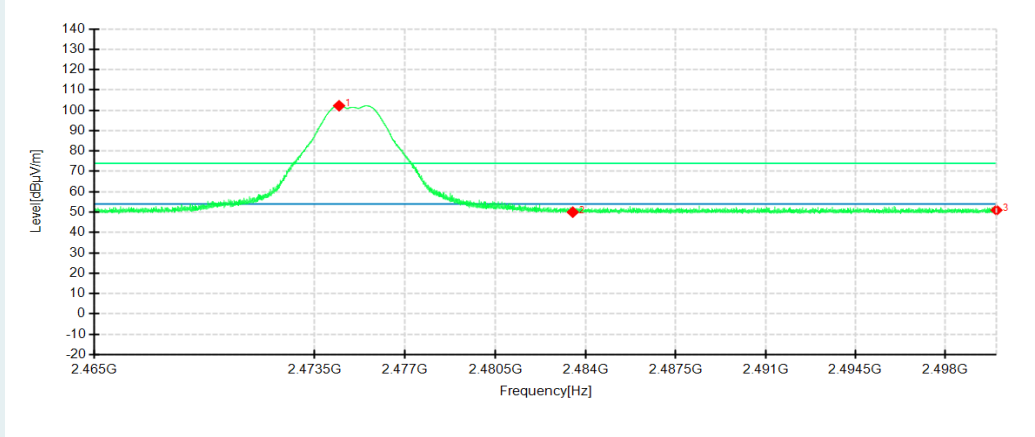
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



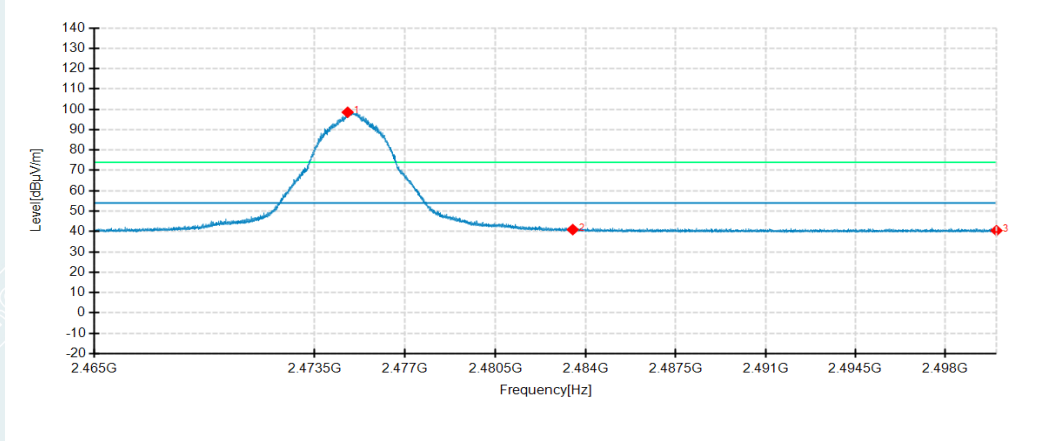
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2474.4430	97.71	102.01	4.30	74.00	-28.01	100	167	Horizontal	No limit
2	2483.5000	45.84	50.17	4.33	74.00	23.83	100	167	Horizontal	/
3	2500.0000	45.48	49.86	4.38	74.00	24.14	100	184	Horizontal	
1	2474.4465	97.96	102.26	4.30	74.00	-28.26	100	61	Vertical	No limit
2	2483.5000	45.63	49.96	4.33	74.00	24.04	100	110	Vertical	/
3	2500.0000	46.59	50.97	4.38	74.00	23.03	100	61	Vertical	/

Highest Channel

Frequency 2475MHz

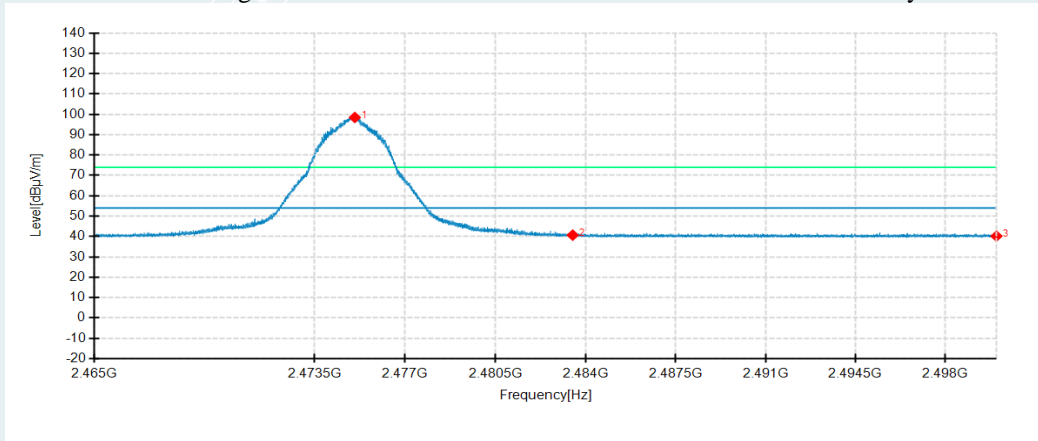
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2474.7790	94.27	98.57	4.30	54.00	-44.57	100	167	Horizontal	No limit
2	2483.5000	36.59	40.92	4.33	54.00	13.08	100	208	Horizontal	/
3	2500.0000	36.05	40.43	4.38	54.00	13.57	200	1	Horizontal	/
1	2475.0555	94.14	98.45	4.31	54.00	-44.45	100	62	Vertical	No limit
2	2483.5000	36.32	40.65	4.33	54.00	13.35	100	62	Vertical	/
3	2500.0000	35.79	40.17	4.38	54.00	13.83	100	193	Vertical	/

Remark: Max field strength in 3m distance. No any other emission which falls in restricted bands can be detected and be reported.

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