ACCREDITED
Certificate # 2861.01

GRGTEST

TEST REPORT

Verified code: 721361

Report No.:	**E202003304768-6**	**Application No.:**	**E202003304768**
Client:	Shenzhen Malide Technology Co., Ltd.		
Address:	Room 201,No.26A,Xin'E Industrial Zone, E'GongLing, Pinghu Street, Longgang District, Shenzhen, Guangdong Province		
Sample Description:	Solar Display		
Model:	MLD-R01		
Test Location:	**Guangzhou GRG Metrology & Test Co., Ltd.**		
Test Specification:	CFR 47 FCC Part 15 Subpart C 10-1-2019 Edition KDB 558074 DO1: DTS measurement guidance v0502 ANSI C63.10:2013		
Issue Date:	2020/06/23		
Test Result:	PASS		

Prepared By:	**Reviewed By:**	**Approved By:**
Test Engineer	Technical Manager	Manager
Wu Haoting	Wu Chengrong	GUANGZHOU GRG METROLOGY & TEST CO.,LTD. APPROVED(03)

Other Aspects:

Note:/

Abbreviations: *ok / P = passed; fail / F = failed; n.a. / N = not applicable;*

The test result in this test report refers exclusively to the presented test sample. This report shall not be reproduced except in full, without the written approval of GRGT.

DIRECTIONS OF TEST

1. This company carries out test task according to the national regulation of verifications which can be traced to National Primary Standards and BIPM.

2. The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

3. If there is any objection concerning the test, the client should inform the laboratory within 15 days from the date of receiving the test report.

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§15.247(a)(2)	6dB bandwidth	Pass	Page 28
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--	99% Occupied Bandwidth	N/A	--
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§15.247(a)(1)(iii)	Number of hopping frequencies	N/A	--
§15.247(a)(1)(iii)	Dwell Time	N/A	--
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§15.203	Antenna requirement	Pass	--

The EUT has one antenna. The antenna is integrated antenna.
The max gain of antenna is -4.51dBi .which accordance 15.203.is considered sufficient to comply with the provisions of this section

2. GENERAL DESCRIPTION OF EUT

2.1. APPLICANT

Name:	Shenzhen Malide Technology Co., Ltd
Address:	Room 201, No.26A, Xin'E Industrial Zone, E'GongLing, Pinghu Street, Longgang District, Shenzhen, Guangdong Province

2.2. MANUFACTURER

Name:	Shenzhen Malide Technology Co., Ltd
Address:	Room 201, No.26A, Xin'E Industrial Zone, E'GongLing, Pinghu Street, Longgang District, Shenzhen, Guangdong Province

2.3. FACTORY

Name :	Shenzhen Malide Technology Co., Ltd
Address :	Room 201, No.26A, Xin'E Industrial Zone, E'GongLing, Pinghu Street, Longgang District, Shenzhen, Guangdong Province

2.4. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	Solar display
Model No.:	MLD-R01
Adding Model:	MLD-R02
Model Differences:	All models above are identical in interior structure, electrical and components, and just the model names are different for marking requirement.
Trade Name:	Malide
FCC ID:	2AV7VMLD-R01
Power supply:	DC 3.7V, 500mAh Powered by a internal Li-ion rechargeable battery or DC 5.0V charging by Micro USB port.
Frequency Range:	2402 ~ 2480MHz
Transmit Power:	-15.46dBm
Modulation type:	GFSK for 1Mbps
Channel space:	2MHz
Antenna Specification:	Integrated antenna with -4.51dBi gain (Max)
Temperature Range:	-20 ℃ ~ +70 ℃
Hardware Version:	V2.0
Software Version:	V3.0
Note:	N/A

2.5. TEST OPERATION MODE

Test Item	Mode No.	Description of the modes
Conducted Emission	1	Continuously Transmitting
Radiated Emission	1	Continuously Transmitting

2.6. LOCAL SUPPORTIVE

Name of Equipment	Manufacturer	Model	Serial Number	Note
/	/	/	/	/
/	/	/	/	/
Cable				
/	/	/	/	/
/	/	/	/	/

2.7. TEST SOFTWARE:

Software version	Test level
SSCOM V5.13.1	Default

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 : Address: 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

A2LA	Certificate Number 2861.01

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	30MHz～1000MHz	4.3dB
		1GHz～18GHz	5.6dB
	Vertical	30MHz～1000MHz	4.3dB
		1GHz～18GHz	5.6dB
Conduction Emission		9 kHz ~ 150 kHz	2.8 dB
		150 kHz ~ 10 MHz	2.8 dB
		10 MHz ~ 30 MHz	2.2 dB

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
Radiated Spurious Emission& Restricted bands of operation				
EMI TEST Receiver	ROHDE&SCHWARZ	ESU26	EMC26-G260	2020-07-16
EXA signal analyzer	Agilent	N9010A	MY52221469	2021-05-16
Bilog Antenna	Schwarzbeck	VULB9160	VULB9160-3401	2020-11-27
Horn Antenna	Schwarzbeck	BBHA9120	D286	2020-11-27
Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170-497	2020-11-30
Amplifier	tonscend	TAP9E6343	AP20E806065	/
Amplifier	tonscend	TAP01018048	AP20E806075	/
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2		
6 dB Bandwidth				
EXA signal analyzer	Agilent	N9010A	MY52221469	2021-05-16
Peak Output Power				
Pulse Power Sentor	Agilent	MA2411B	1126150	2021-04-13
Power Meter	Anritsu	ML2495A	1204003	2021-04-13
Conducted band edges and Spurious Emission				
EXA signal analyzer	Agilent	N9010A	MY52221469	2021-05-16
Peak Output Spectral Density Measurement				
EXA signal analyzer	Agilent	N9010A	MY52221469	2021-05-16

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

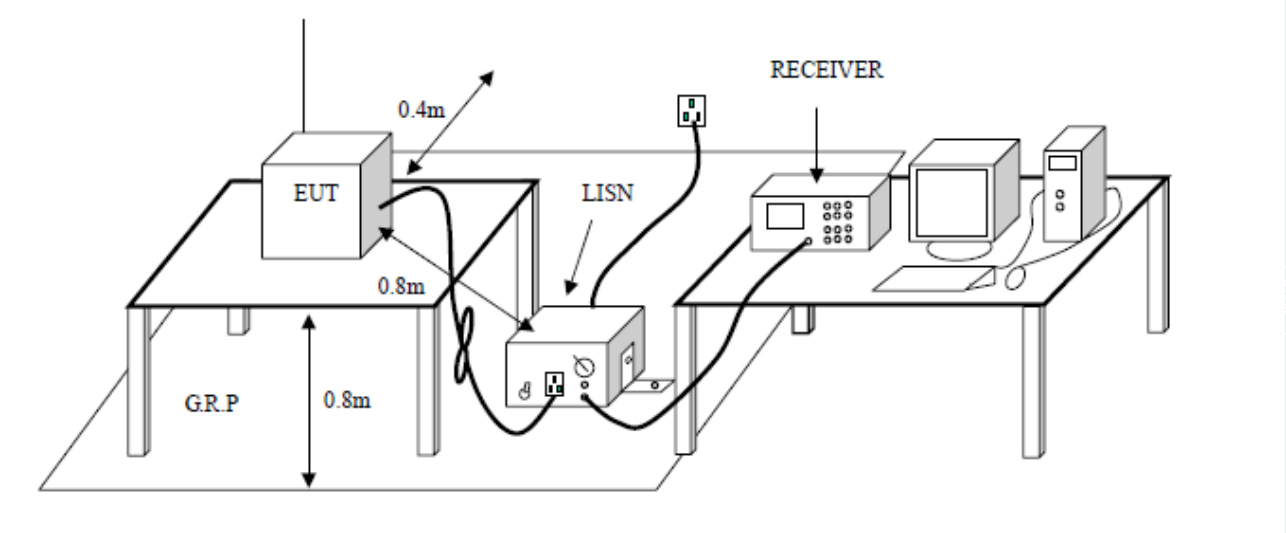
Procedure of Preliminary Test

Test procedures follow ANSI C63.4:2014.
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

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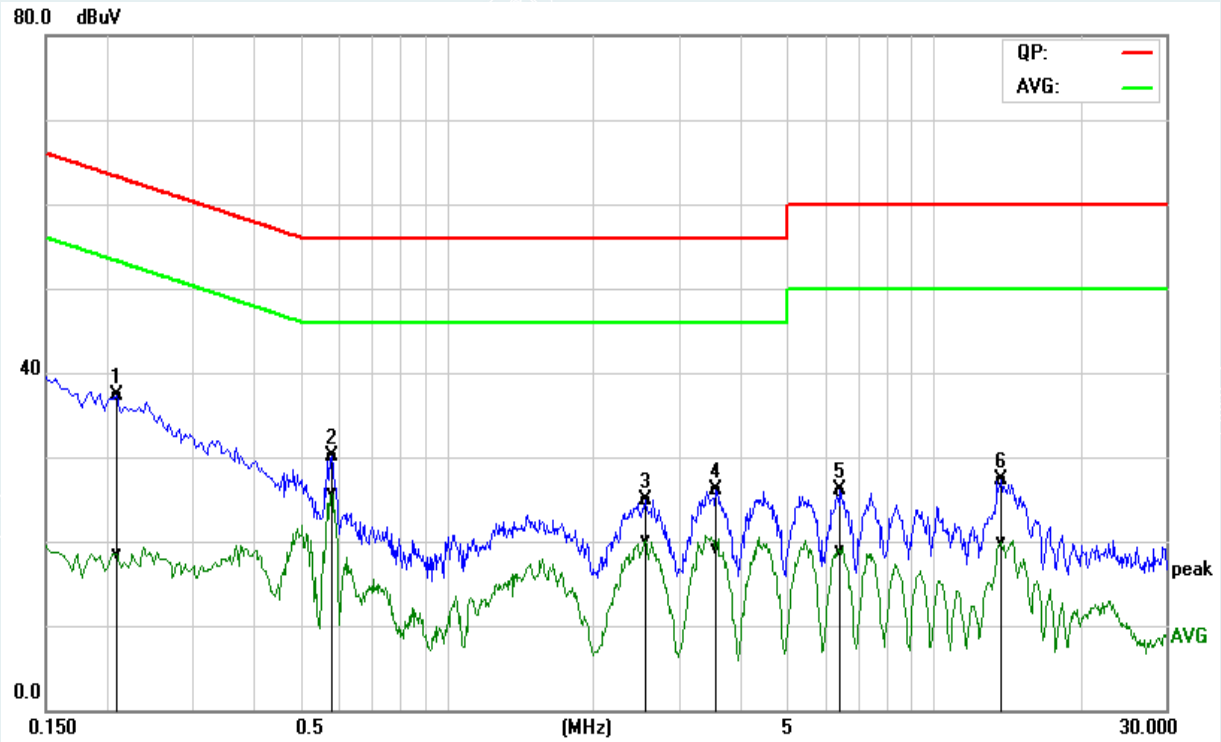
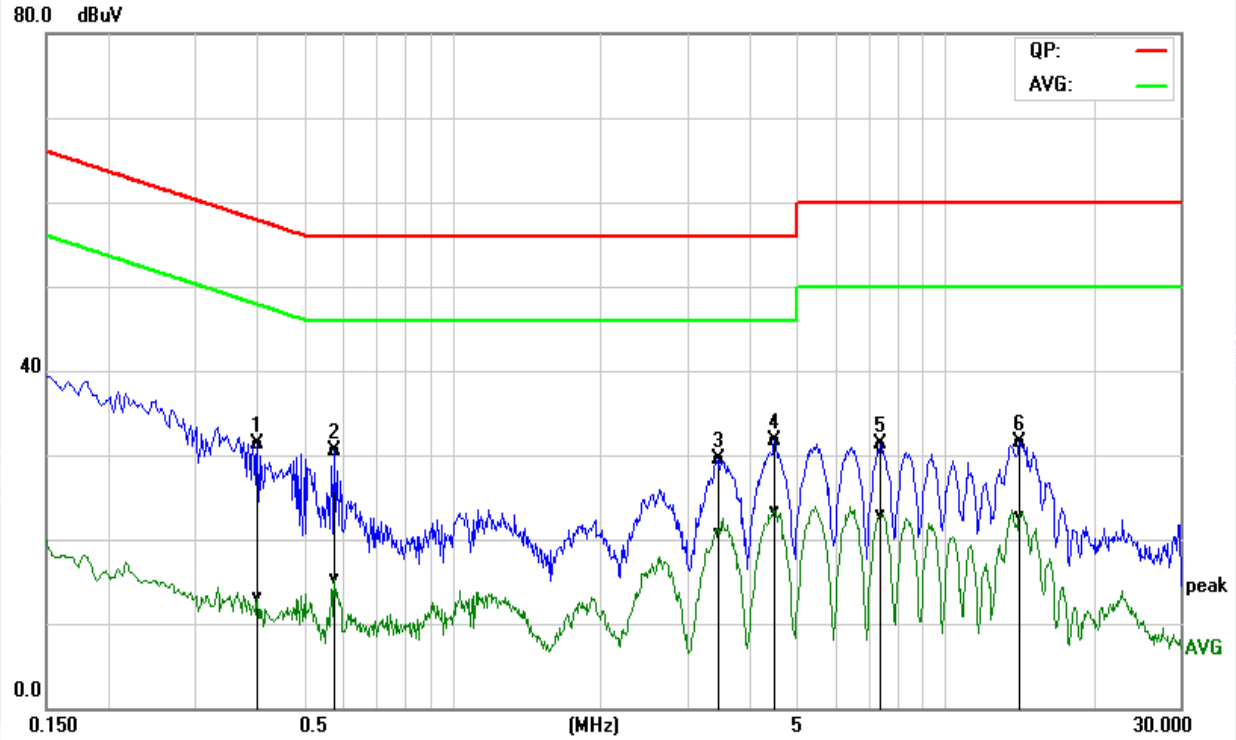


No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.2100	27.55	8.88	9.68	37.23	18.56	63.20	53.21	-25.97	-34.65	Pass
2*	0.5820	20.43	16.01	9.67	30.10	25.68	56.00	46.00	-25.90	-20.32	Pass
3	2.5620	15.25	10.42	9.75	25.00	20.17	56.00	46.00	-31.00	-25.83	Pass
4	3.5740	16.36	9.27	9.77	26.13	19.04	56.00	46.00	-29.87	-26.96	Pass
5	6.4380	16.19	9.19	9.81	26.00	19.00	60.00	50.00	-34.00	-31.00	Pass
6	13.8020	17.34	10.04	9.88	27.22	19.92	60.00	50.00	-32.78	-30.08	Pass

N



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.4020	21.63	3.35	9.67	31.30	13.02	57.81	47.81	-26.51	-34.79	Pass
2	0.5780	20.79	5.55	9.67	30.46	15.22	56.00	46.00	-25.54	-30.78	Pass
3	3.4700	19.72	11.01	9.76	29.48	20.77	56.00	46.00	-26.52	-25.23	Pass
4*	4.5060	21.97	13.49	9.79	31.76	23.28	56.00	46.00	-24.24	-22.72	Pass
5	7.3700	21.38	13.18	9.82	31.20	23.00	60.00	50.00	-28.80	-27.00	Pass
6	14.2020	21.67	12.79	9.89	31.56	22.68	60.00	50.00	-28.44	-27.32	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(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 lower limit shall apply at the transition frequencies.

6.2. TEST PROCEDURES (please refer to measurement standard)

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 315 °using 45 °steps.

--- The antenna height is 0.8 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 QPK 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 315 °using 45 °steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 3 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 position (±45°) 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 315 °using 45 °steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 2.5 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 position (±45°) 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: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (10 log(1/duty cycle)).

6.3. TEST SETUP

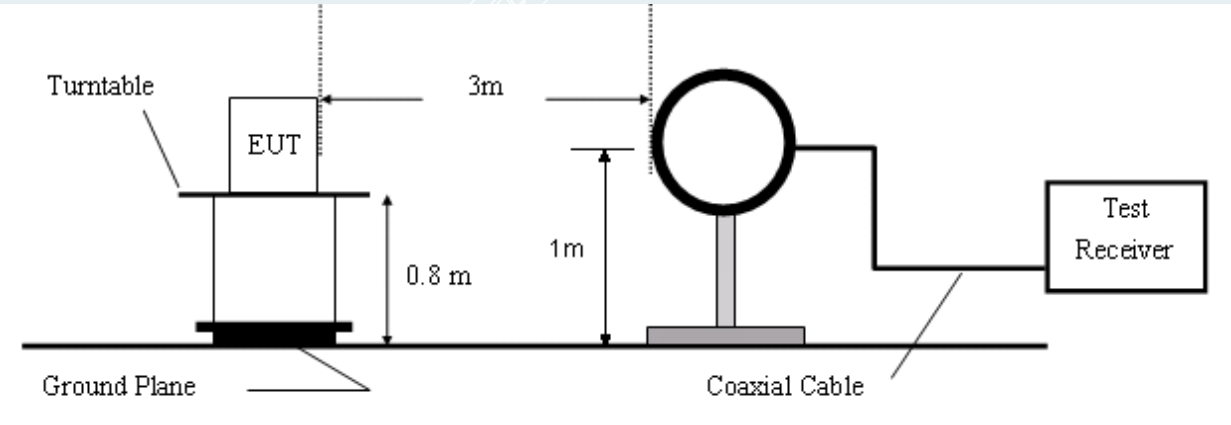


Figure 1. 9KHz to 30MHz radiated emissions test configuration

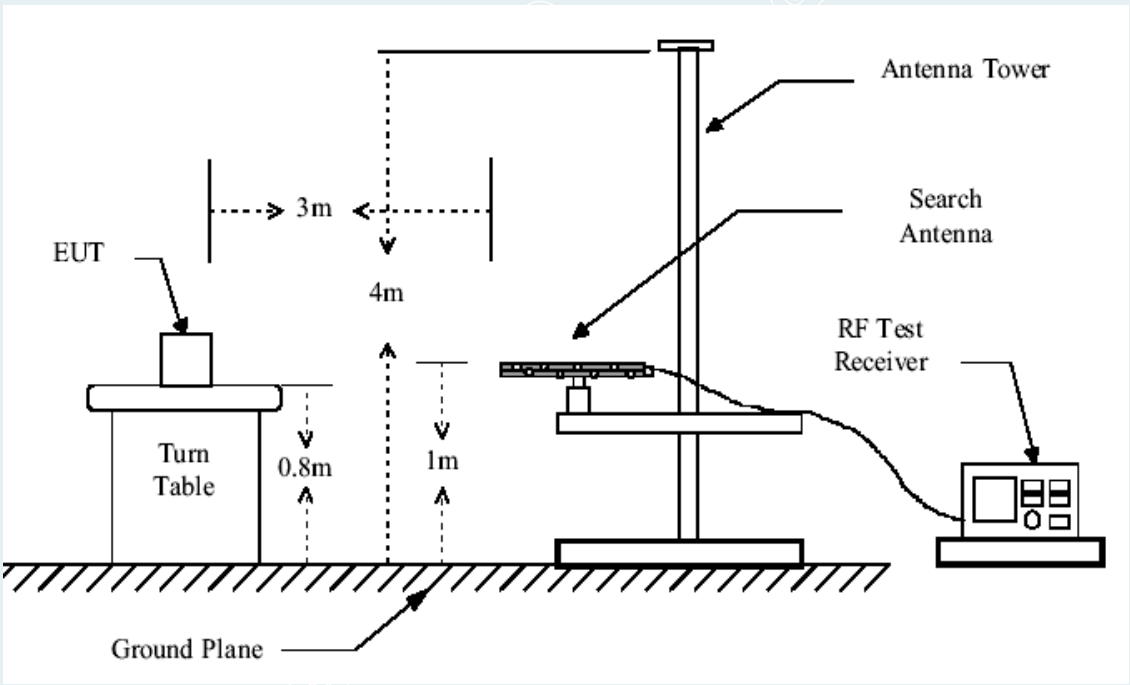


Figure 2. 30MHz to 1GHz radiated emissions test configuration

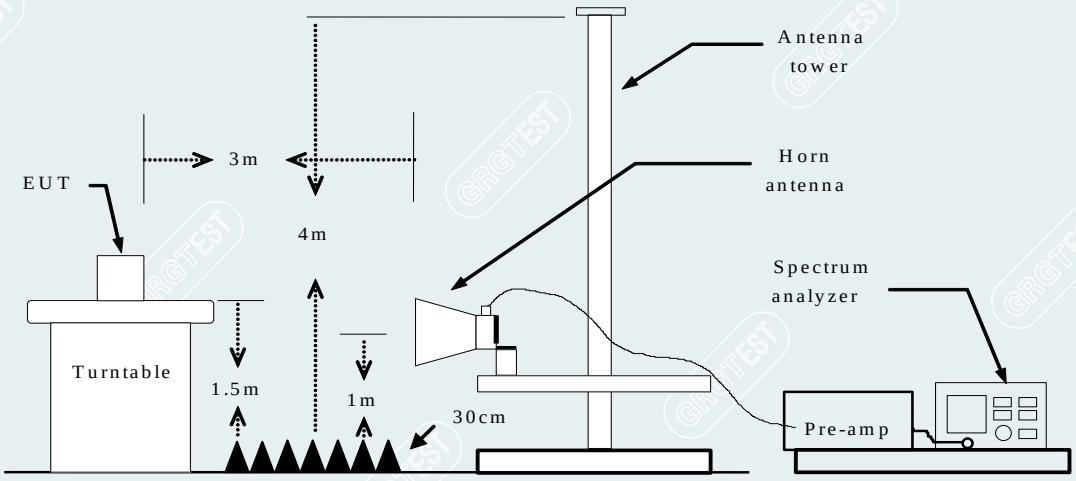


Figure 3. Above 1GHz radiated emissions test configuration

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 1 GHz

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

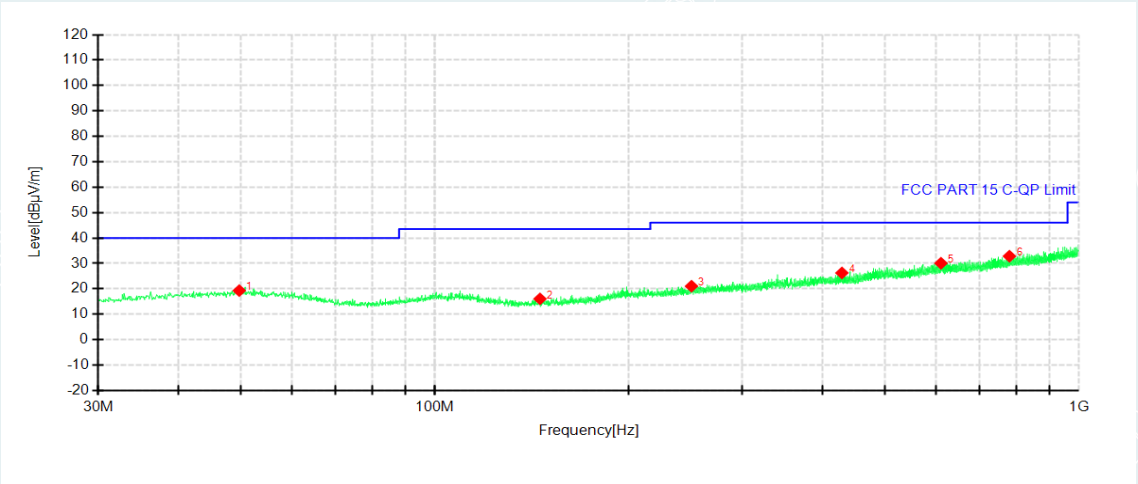
AVG = Average Reading

6.5. TEST RESULTS

30MHz to 1GHz:

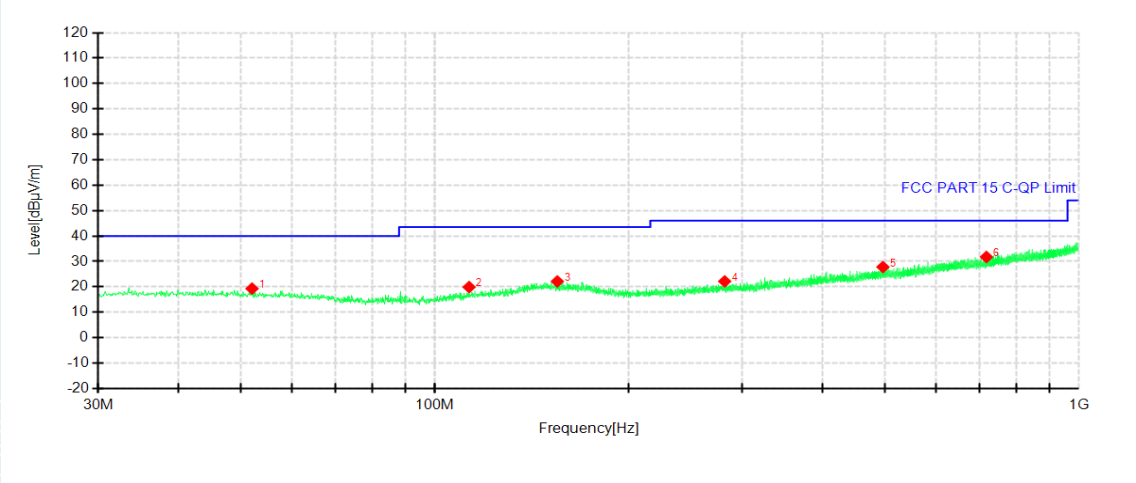
Mode: TX

Lowest channel (2402MHz)



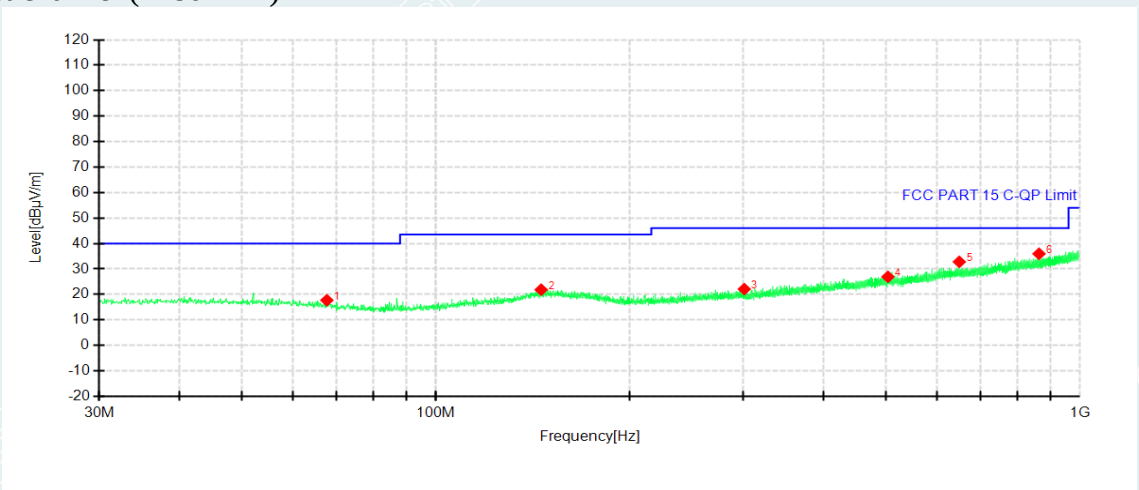
Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
49.6910	47.94	19.32	-28.62	40.00	20.68	150	261	Horizontal
145.6240	48.44	16.05	-32.39	43.50	27.45	150	349	Horizontal
250.2870	48.33	21.05	-27.28	46.00	24.95	150	109	Horizontal
428.5730	48.75	26.26	-22.49	46.00	19.74	150	250	Horizontal
610.6420	48.51	30.09	-18.42	46.00	15.91	150	51	Horizontal
780.0040	49.25	32.86	-16.39	46.00	13.14	150	44	Horizontal

Mode: TX
Lowest channel (2402MHz)



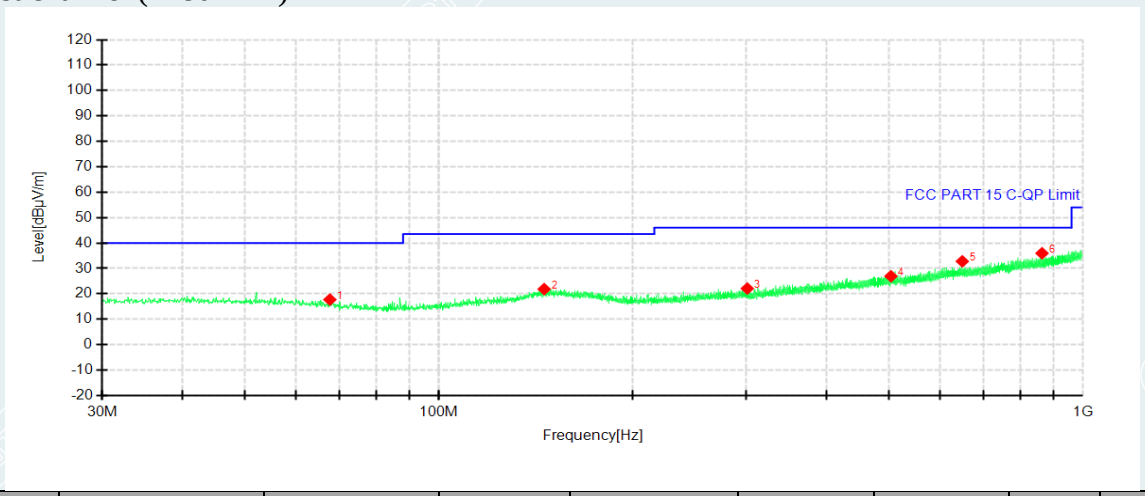
Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
52.0190	49.41	19.30	-30.11	40.00	20.70	150	157	Vertical
113.0320	49.92	19.91	-30.01	43.50	23.59	150	305	Vertical
154.9360	48.60	22.14	-26.46	43.50	21.36	150	309	Vertical
281.8120	49.18	22.16	-27.02	46.00	23.84	150	49	Vertical
496.2790	49.08	27.79	-21.29	46.00	18.21	150	233	Vertical
718.5060	48.75	31.75	-17.00	46.00	14.25	150	328	Vertical

Mode: TX
Lowest channel (2480MHz)



Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
46.9750	48.63	19.70	-28.93	40.00	20.30	150	277	Horizontal
92.8560	48.57	17.56	-31.01	43.50	25.94	150	150	Horizontal
188.4010	48.67	19.19	-29.48	43.50	24.31	150	158	Horizontal
352.9130	49.69	25.19	-24.50	46.00	20.81	150	158	Horizontal
597.0620	48.51	29.64	-18.87	46.00	16.36	150	334	Horizontal
752.1650	49.32	32.86	-16.46	46.00	13.14	150	124	Horizontal

Mode: TX
Highest channel (2480MHz)



Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
67.7330	49.03	17.72	-31.31	40.00	22.28	150	130	Vertical
145.7210	48.52	21.86	-26.66	43.50	21.64	150	72	Vertical
301.2120	48.71	22.09	-26.62	46.00	23.91	150	30	Vertical
503.4570	48.08	26.93	-21.15	46.00	19.07	150	305	Vertical
649.7330	50.53	32.80	-17.73	46.00	13.2	150	168	Vertical
863.9090	50.21	35.97	-14.24	46.00	10.03	150	198	Vertical

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 (BT LE (High Channel))
3 Radiated emissions measured in frequency range from 9 kHz to 1GHz were made with an instrument using Quasi-peak detector mode.
4 Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5 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

Lowest channel (2402MHz)

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1152.8000	34.60	-23.98	74.00	39.40	PK	Vertical
2	1331.0000	34.06	-23.34	74.00	39.94	PK	Vertical
3	1662.0000	31.43	-22.27	74.00	42.57	PK	Vertical
4	1880.6000	35.11	-21.57	74.00	38.89	PK	Vertical
6	2674.2000	37.15	-18.14	74.00	36.85	PK	Vertical
7	4803.0000	60.49	-10.33	74.00	13.51	PK	Vertical
8	4803.0000	51.20	-10.33	54.00	2.80	AV	Vertical
9	7204.5000	60.99	-2.14	74.00	13.01	PK	Vertical
10	7204.5000	50.38	-2.14	54.00	3.62	AV	Vertical
11	9585.0000	46.31	2.85	74.00	27.69	PK	Vertical
12	11220.0000	49.24	7.01	74.00	24.76	PK	Vertical
13	14016.0000	50.37	10.95	74.00	23.63	PK	Vertical
14	15081.0000	49.35	10.18	74.00	24.65	PK	Vertical

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1267.6000	33.64	-23.60	74.00	40.36	PK	Horizontal
2	1520.2000	36.83	-22.64	74.00	37.17	PK	Horizontal
3	1754.8000	37.63	-21.65	74.00	36.37	PK	Horizontal
4	1976.2000	33.76	-20.72	74.00	40.24	PK	Horizontal
7	2673.8000	36.80	-18.14	74.00	37.20	PK	Horizontal
8	4260.0000	39.22	-12.23	74.00	34.78	PK	Horizontal
9	4803.0000	55.90	-10.33	74.00	18.10	PK	Horizontal
10	4803.0000	46.56	-10.33	54.00	7.44	AV	Horizontal
11	7206.0000	59.67	-2.16	74.00	14.33	PK	Horizontal
12	7206.0000	50.01	-2.16	54.00	3.99	AV	Horizontal
13	10714.5000	48.11	5.73	74.00	25.89	PK	Horizontal
14	13917.0000	50.28	10.41	74.00	23.72	PK	Horizontal
15	15043.5000	49.67	10.43	74.00	24.33	PK	Horizontal

Remark:

1 Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2 Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

3 Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 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.

Mode: TX
Mid channel (2440MHz)

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1257.8000	33.19	-23.64	74.00	40.81	PK	Vertical
2	1423.0000	34.15	-22.93	74.00	39.85	PK	Vertical
3	1552.2000	36.64	-22.63	74.00	37.36	PK	Vertical
4	1749.4000	38.14	-21.69	74.00	35.86	PK	Vertical
6	1965.4000	33.52	-20.85	74.00	40.48	PK	Vertical
7	4173.0000	40.02	-11.51	74.00	33.98	PK	Vertical
8	4878.0000	59.44	-9.08	74.00	14.56	PK	Vertical
9	4878.0000	49.18	-9.08	54.00	4.82	AV	Vertical
10	7318.5000	60.63	-2.92	74.00	13.37	PK	Vertical
11	7318.5000	50.05	-2.92	54.00	3.95	AV	Vertical
12	10117.5000	49.05	3.99	74.00	24.95	PK	Vertical
13	13402.5000	49.73	9.48	74.00	24.27	PK	Vertical
14	14955.0000	50.27	10.52	74.00	23.73	PK	Vertical

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1154.6000	34.29	-23.98	74.00	39.71	PK	Horizontal
2	1524.2000	39.55	-22.64	74.00	34.45	PK	Horizontal
3	1746.0000	36.72	-21.71	74.00	37.28	PK	Horizontal
4	2280.6000	35.15	-19.87	74.00	38.85	PK	Horizontal
7	2665.4000	37.34	-18.18	74.00	36.66	PK	Horizontal
8	4098.0000	38.31	-11.97	74.00	35.69	PK	Horizontal
9	4878.0000	57.66	-9.08	74.00	16.34	PK	Horizontal
10	4878.0000	48.08	-9.08	54.00	5.92	AV	Horizontal
11	7318.5000	60.87	-2.92	74.00	13.13	PK	Horizontal
12	7318.5000	50.06	-2.92	54.00	3.94	AV	Horizontal
13	8989.5000	45.41	0.89	74.00	28.59	PK	Horizontal
14	11653.5000	49.06	7.45	74.00	24.94	PK	Horizontal
15	14596.5000	51.58	11.99	74.00	22.42	PK	Horizontal

Remark:

1 Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2 Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3 Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4 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.

Mode: TX
Highest channel (2480MHz)

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1267.8000	33.71	-23.60	74.00	40.29	PK	Vertical
2	1437.4000	33.91	-22.88	74.00	40.09	PK	Vertical
3	1539.0000	37.97	-22.63	74.00	36.03	PK	Vertical
4	1754.2000	33.55	-21.65	74.00	40.45	PK	Vertical
6	1978.6000	34.41	-20.69	74.00	39.59	PK	Vertical
7	4959.0000	60.58	-8.50	74.00	13.42	PK	Vertical
8	4959.0000	50.14	-8.50	54.00	3.86	AV	Vertical
9	7440.0000	58.18	-1.90	74.00	15.82	PK	Vertical
10	7440.0000	49.08	-1.90	54.00	4.92	AV	Vertical
11	8665.5000	45.93	0.01	74.00	28.07	PK	Vertical
12	11259.0000	49.07	7.37	74.00	24.93	PK	Vertical
13	13432.5000	50.54	9.51	74.00	23.46	PK	Vertical
14	14643.0000	51.85	11.64	74.00	22.15	PK	Vertical

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1145.6000	34.18	-24.00	74.00	39.82	PK	Horizontal
2	1352.2000	34.07	-23.24	74.00	39.93	PK	Horizontal
3	1450.4000	38.06	-22.83	74.00	35.94	PK	Horizontal
4	1450.4000	38.06	-22.83	74.00	35.94	PK	Horizontal
6	1752.6000	40.81	-21.67	74.00	33.19	PK	Horizontal
7	4959.0000	59.98	-8.50	74.00	14.02	PK	Horizontal
8	4959.0000	50.96	-8.50	54.00	3.04	AV	Horizontal
9	6153.0000	41.49	-6.44	74.00	32.51	PK	Horizontal
10	7438.5000	57.57	-1.90	74.00	16.43	PK	Horizontal
11	7438.5000	48.38	-1.90	54.00	5.62	AV	Horizontal
12	9856.5000	47.20	3.13	74.00	26.80	PK	Horizontal
13	11574.0000	49.02	7.31	74.00	24.98	PK	Horizontal
14	14667.0000	52.07	11.44	74.00	21.93	PK	Horizontal

Remark:

1 Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2 Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3 Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4 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

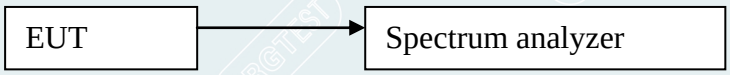
7.1. LIMITS

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.

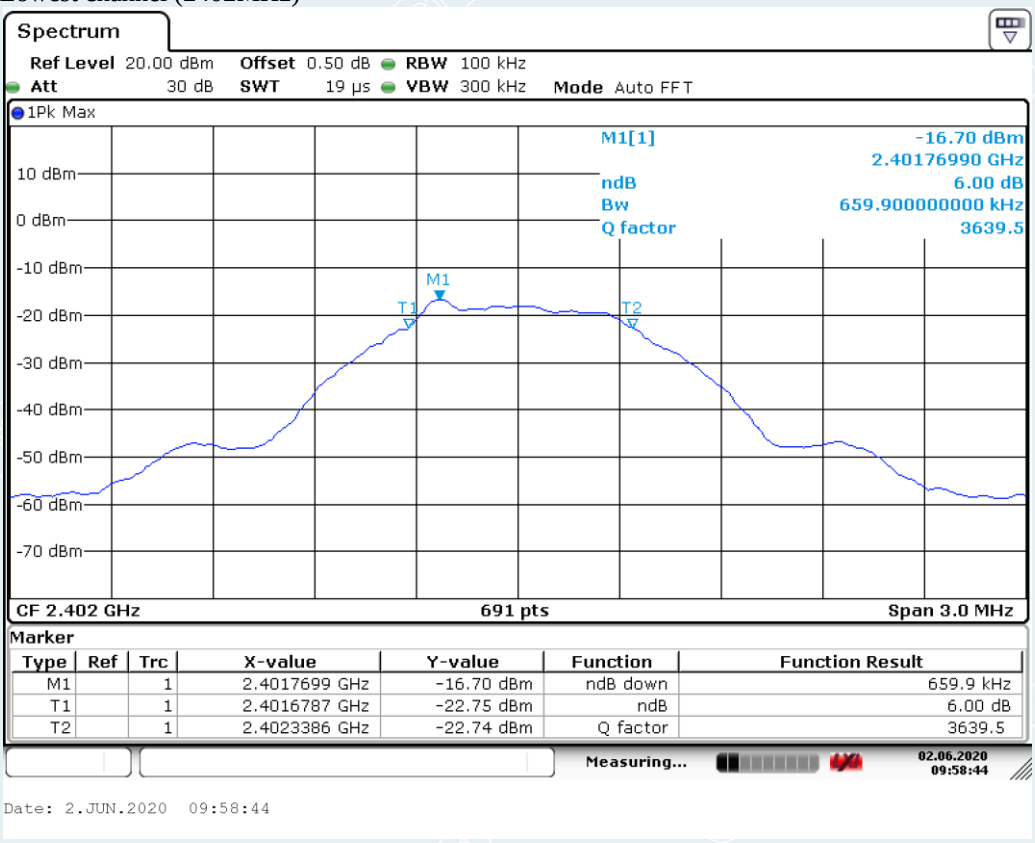
7.3. TEST SETUP



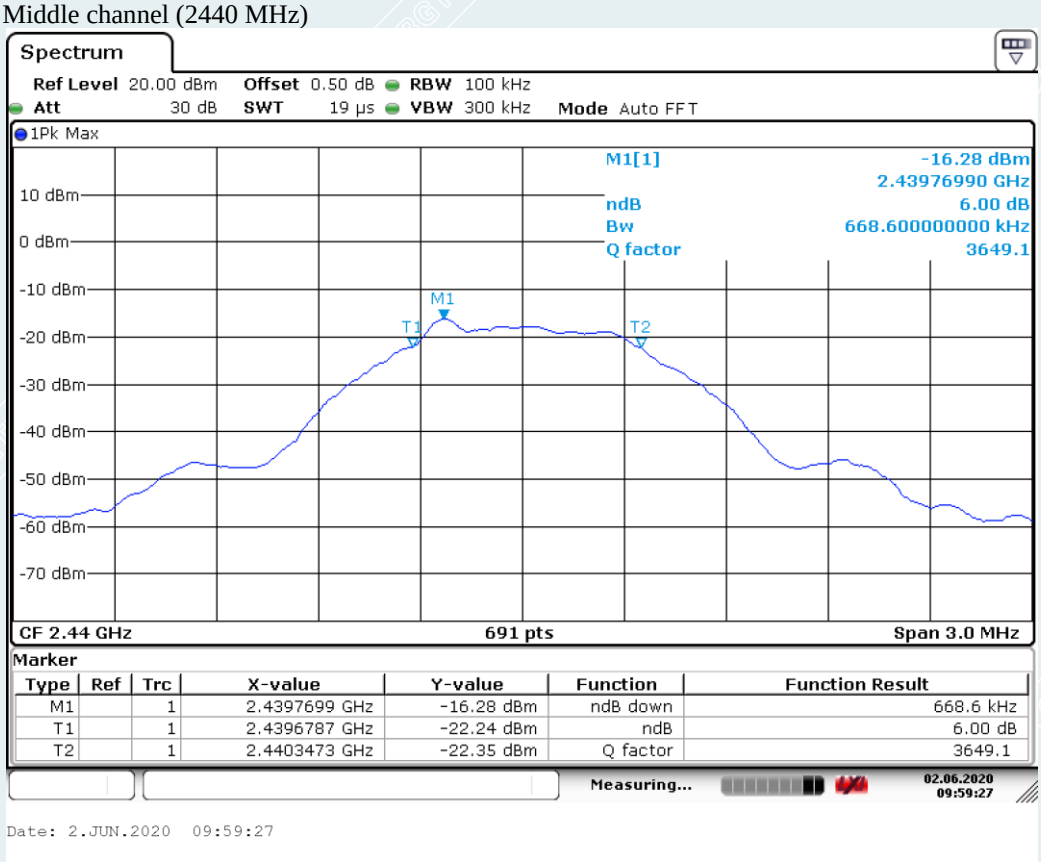
7.4. TEST RESULTS

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Lowest	2402	659.9	>500	PASS
Middle	2440	668.6		PASS
Highest	2480	690.3		PASS

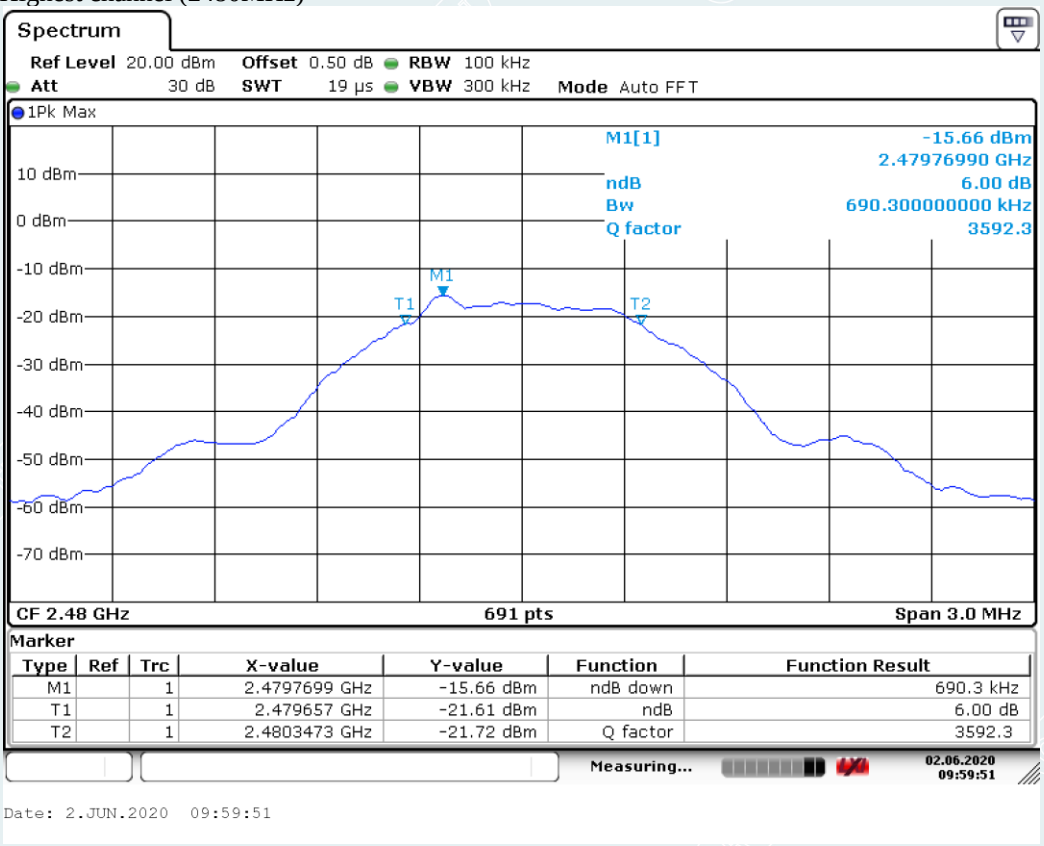
Lowest channel (2402MHz)



Middle channel (2440 MHz)



Highest channel (2480MHz)



8. MAXIMUM PEAK OUTPUT POWER

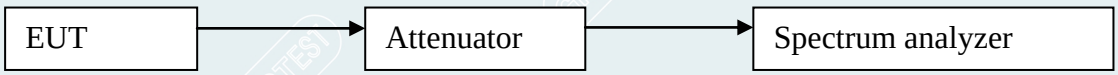
8.1.LIMITS

The maximum Peak output power measurement is 1W

8.2.TEST PROCEDURES

1) Place the EUT on a bench and set it in transmitting mode.
2) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an EMI Test Receiver.
3) The spectrum analyzer resolution bandwidth that is ≤EBW. So we test the Maximum Conducted Output Power ——Integrated band power method.
4) Set the analyzer span≥ 1.5 x DTS bandwidth. Set the RBW = 1 MHz. Set the VBW ≥ 3 MHz. Sweep time = auto couple. Detector = peak. Allow trace to fully stabilize.

8.3.TEST SETUP



8.4.TEST RESULTS

Channel	Frequency (MHz)	Measured Channel Power (dBm)	Limit	Peak/ Average	Result
Lowest	2402	-16.57	1W (30dBm)	Peak	Pass
Middle	2440	-16.21			Pass
Highest	2480	-15.46			Pass

9. POWER SPECTRAL DENSITY

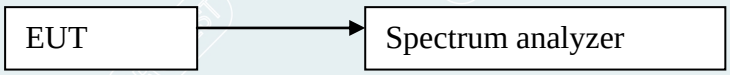
9.1. LIMITS

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) Set the analyzer span to 1.5 times the DTS bandwidth. Set the RBW = 3 kHz. Set the VBW ≥3 RBW. Detector = peak. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
4) Repeat above procedures until all frequencies measured were complete.

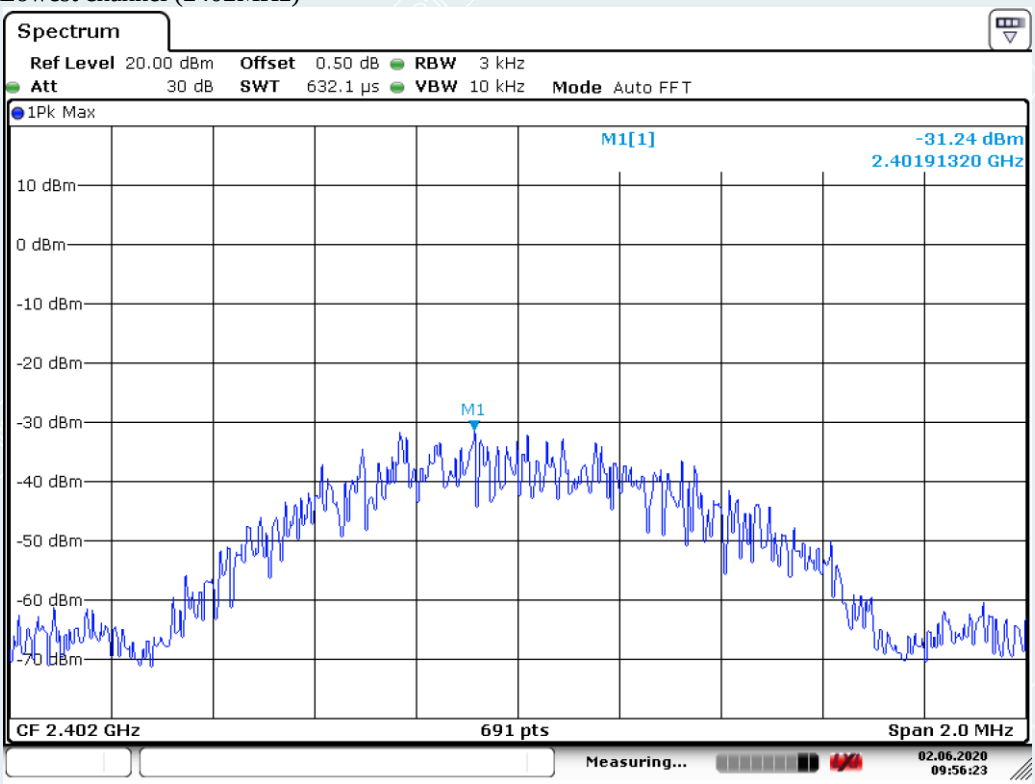
9.3. TEST SETUP



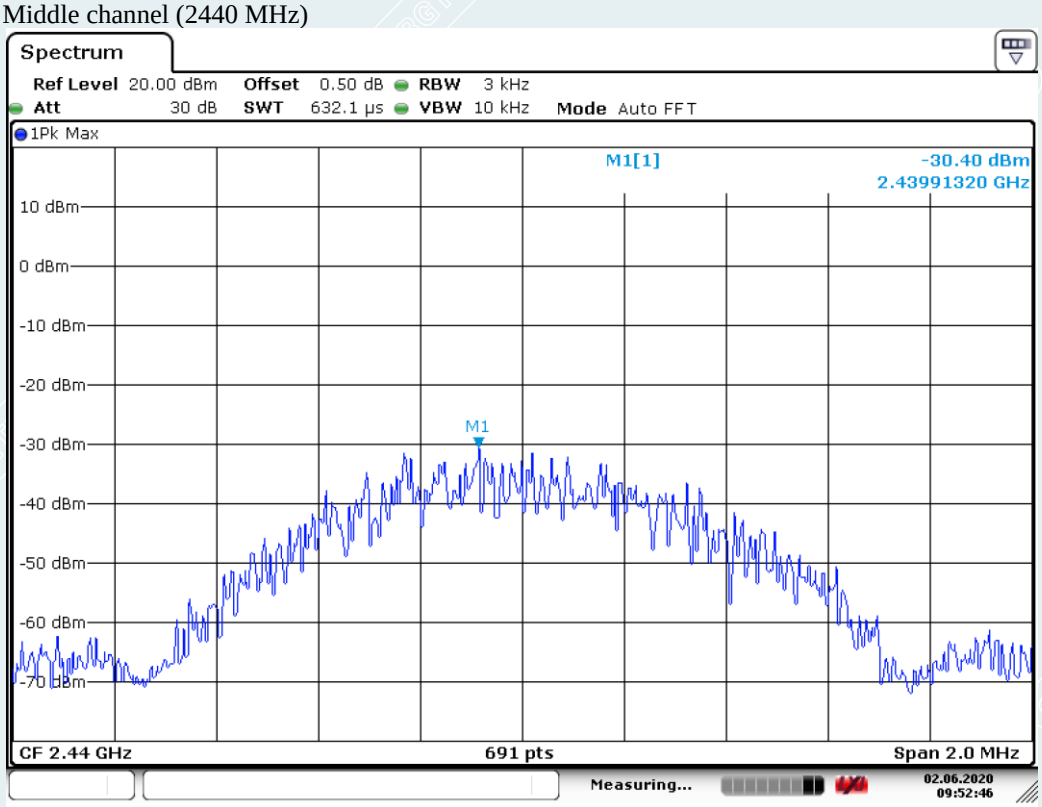
9.4. TEST RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm/3kHz)	Test Result
Lowest	2402	-31.24	8	PASS
Middle	2440	-30.40		PASS
Highest	2480	-29.69		PASS

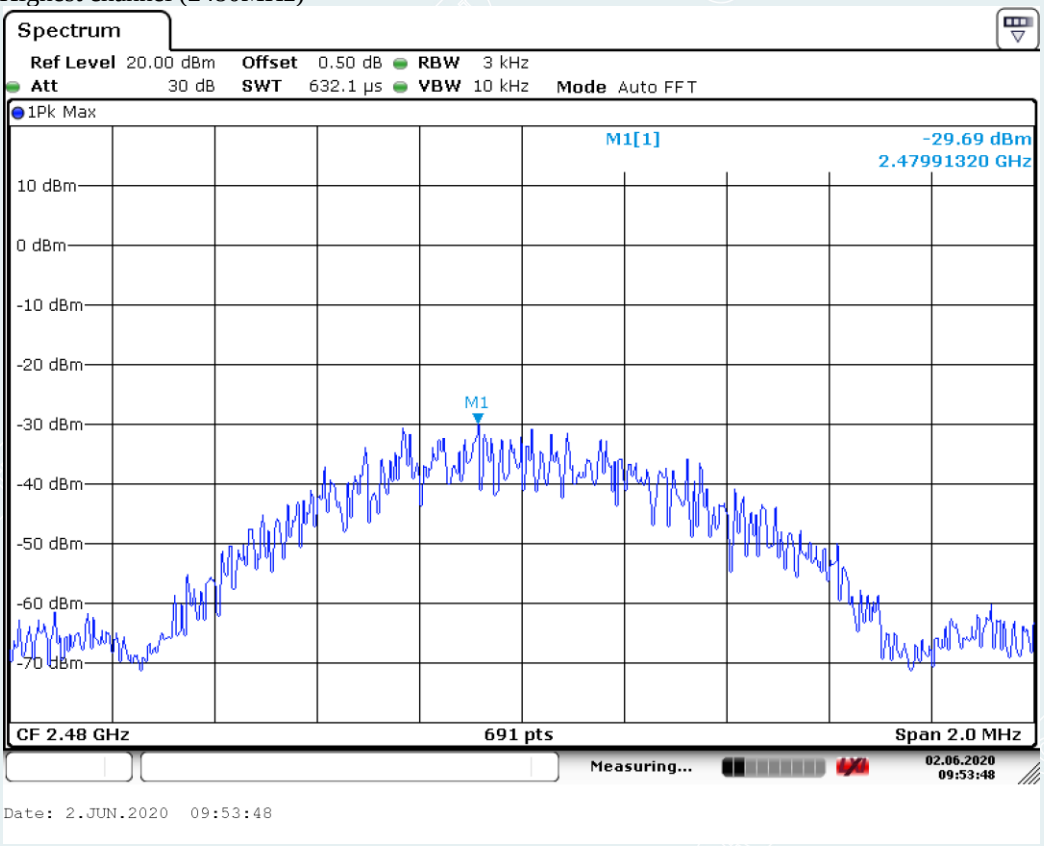
Lowest channel (2402MHz)



Middle channel (2440 MHz)



Highest channel (2480MHz)



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 v03r01.

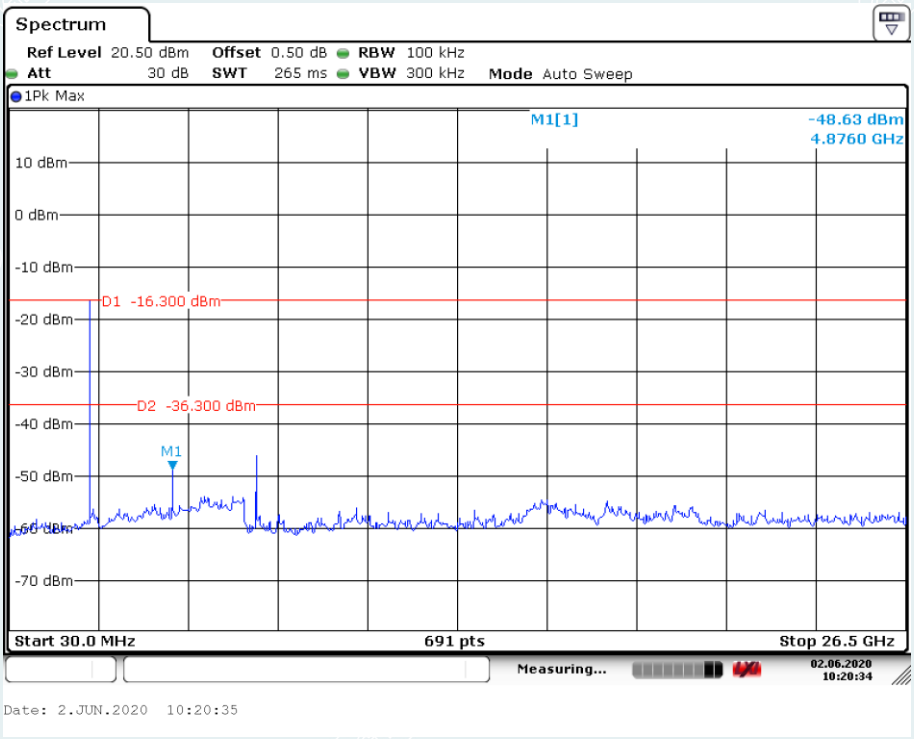
Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.

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, Span = 10MHz to 26GHz; 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.

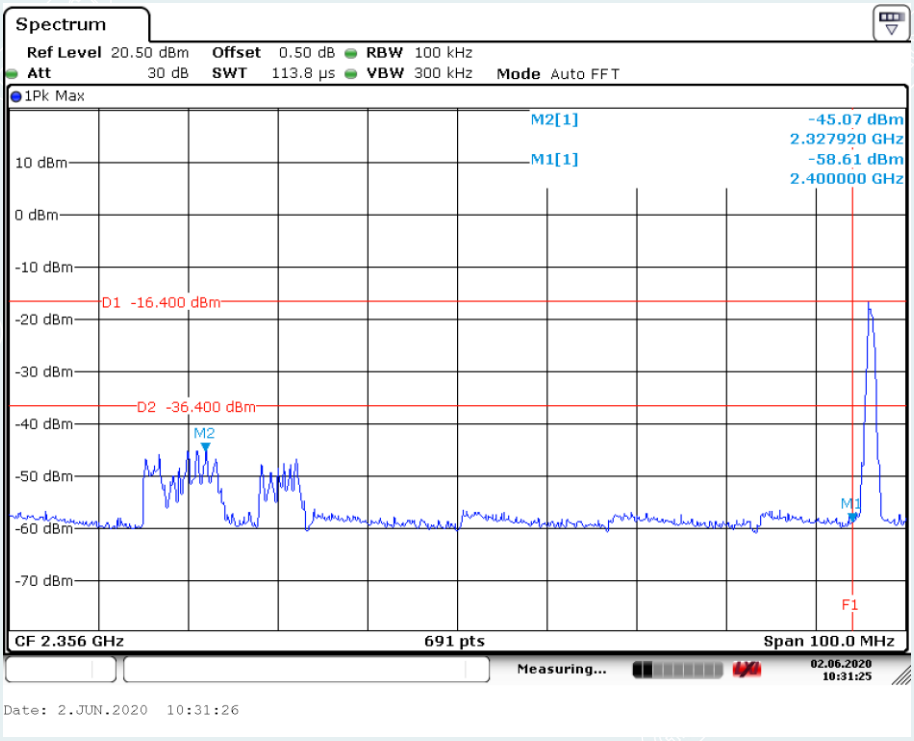
10.3. TEST SETUP

10.4. TEST RESULTS

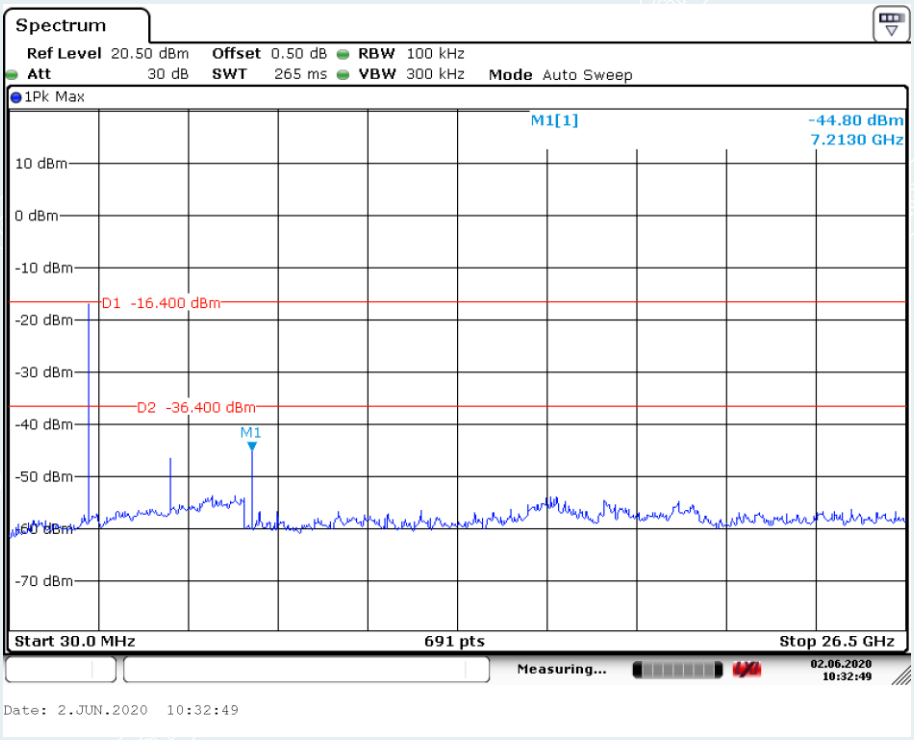
Lowest channel (2402MHz)
0.03GHz-26.5GHz



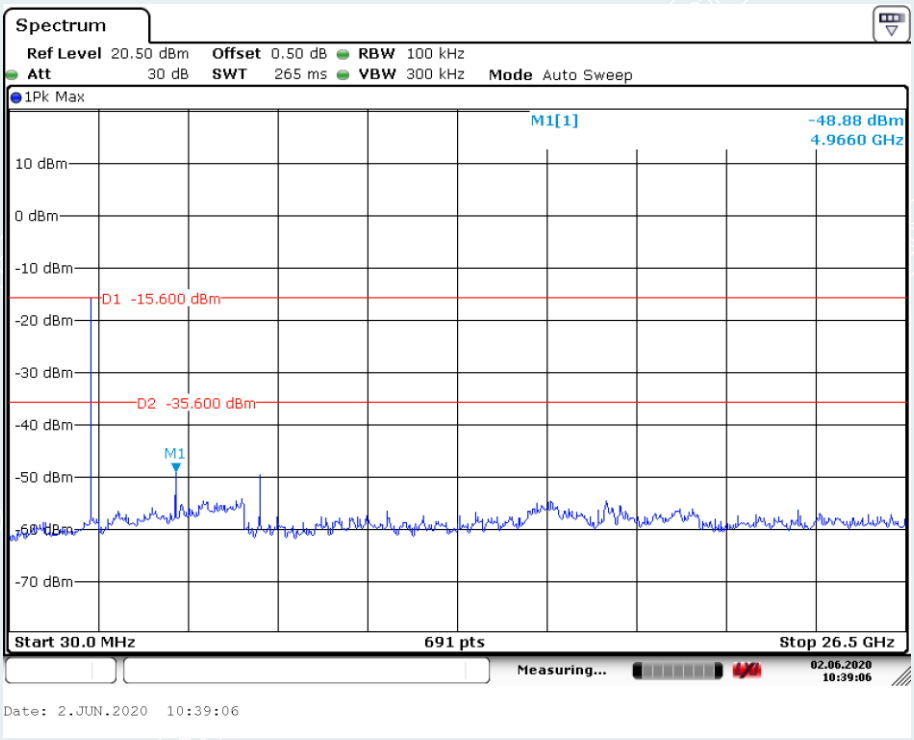
2.31GHz-2.41GHz



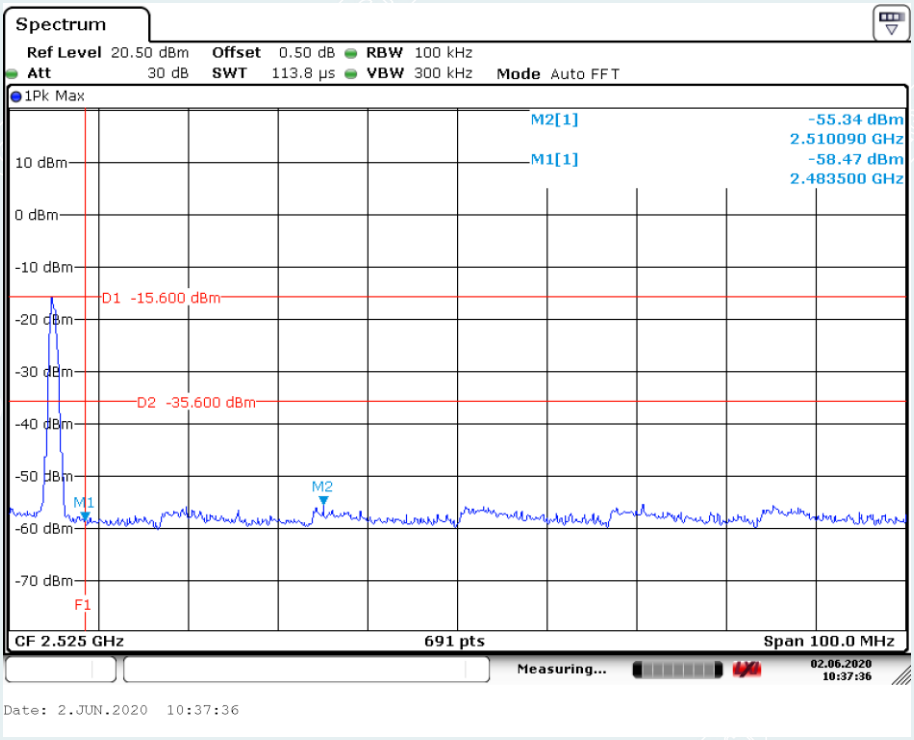
Middle channel (2440 MHz)
0.03GHz-26.5GHz



Highest channel (2480MHz)
0.01GHz-26.5GHz



2.475GHz-2.5GHz



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)).

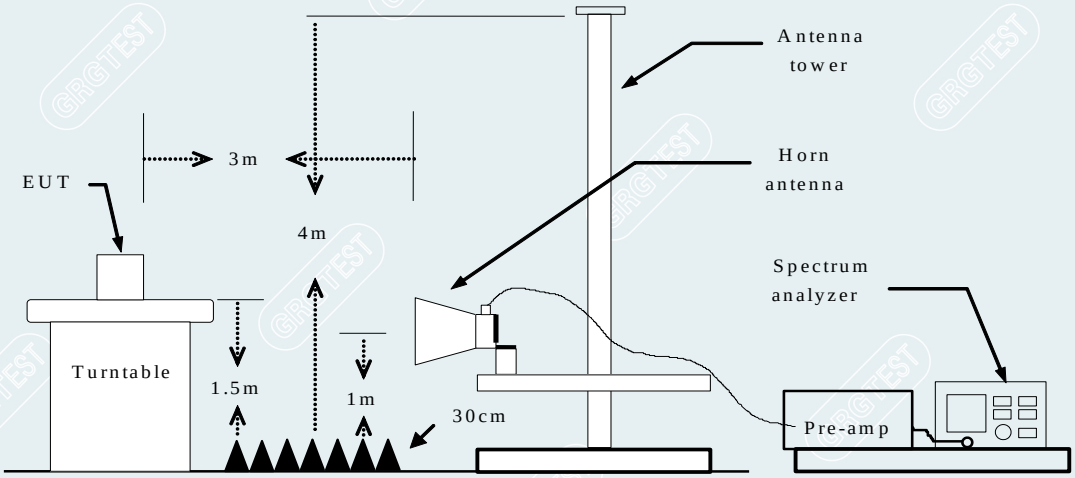
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 -	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.69525	960 - 1240	7.25 - 7.75
4.125 - 4.128	16.80425 -	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	16.80475	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	25.5 - 25.67	1645.5 - 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		

11.2.TEST PROCEDURES

Test procedures follow KDB 558074 D01 DTS Meas Guidance v03r01.

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.

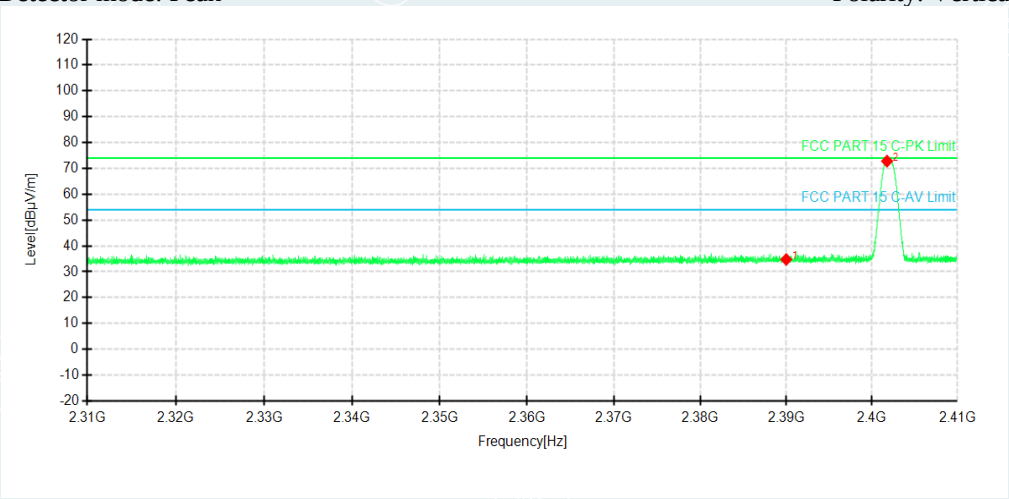
11.3.TEST SETUP



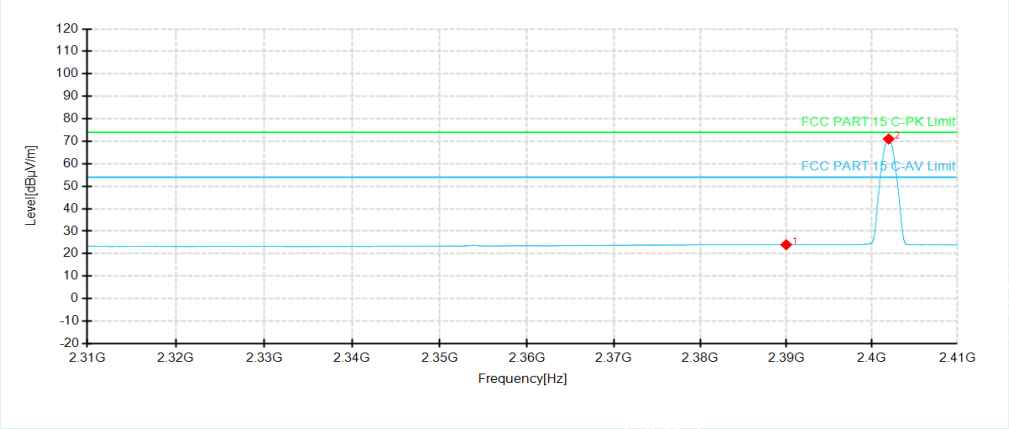
11.4.TEST RESULTS

Lowest Channel

Detector mode: Peak Polarity: Vertical



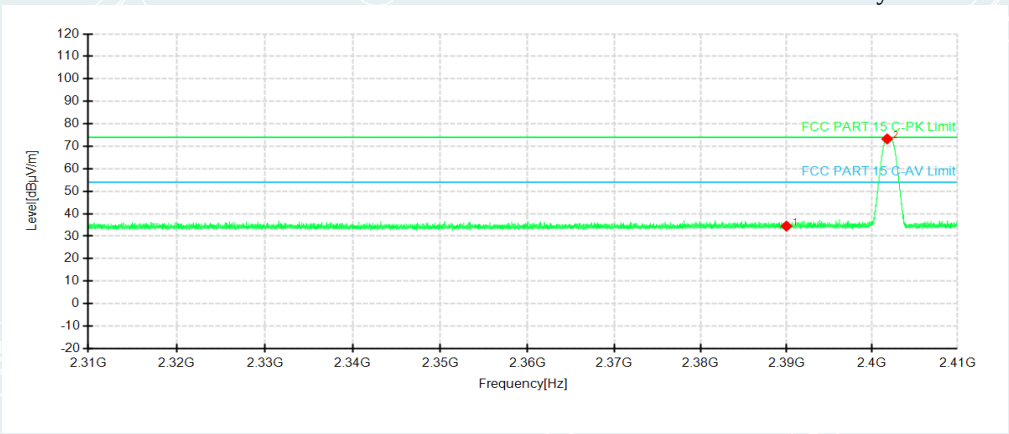
Detector mode: Average Polarity: Vertical



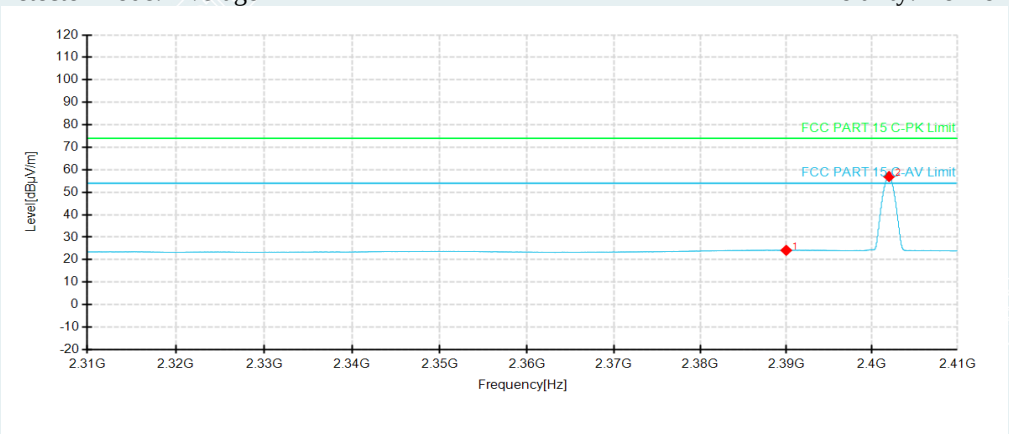
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Remark	Pole
1	2390.0000	34.76	-19.42	74.00	39.24	Peak	Vertical
2	2390.0000	23.97	-19.42	54.00	30.03	Average	Vertical

Lowest Channel

Detector mode: Peak Polarity: Horizontal



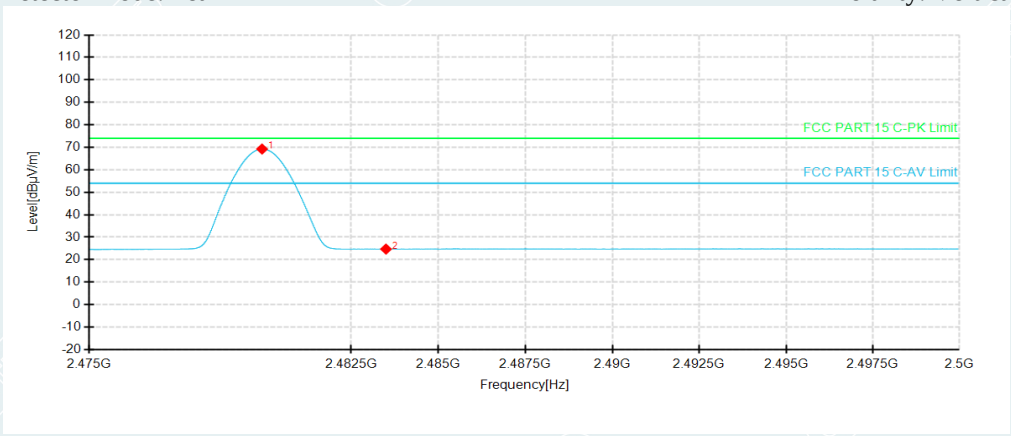
Detector mode: Average Polarity: Horizontal



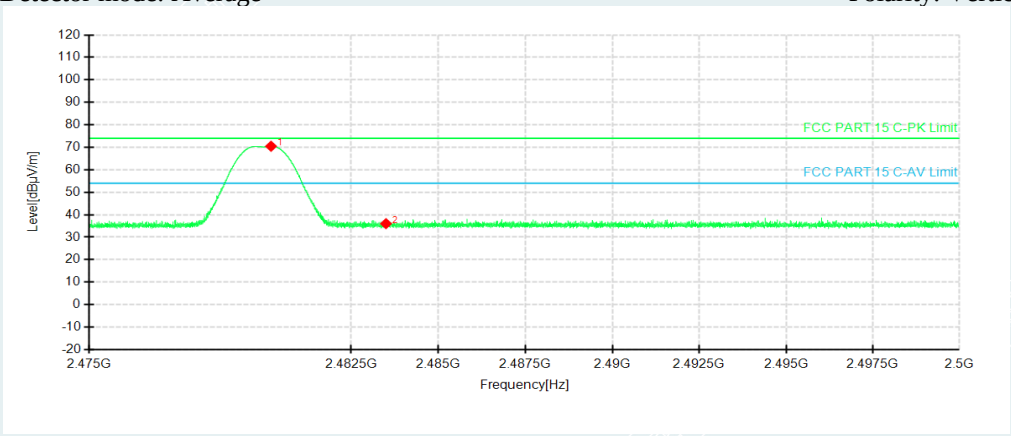
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Remark	Pole
1	2390.0000	34.47	-19.42	74.00	39.53	Peak	Horizontal
2	2390.0000	24.16	-19.42	54.00	29.84	Average	Horizontal

Highest channel

Detector mode: Peak Polarity: Vertical



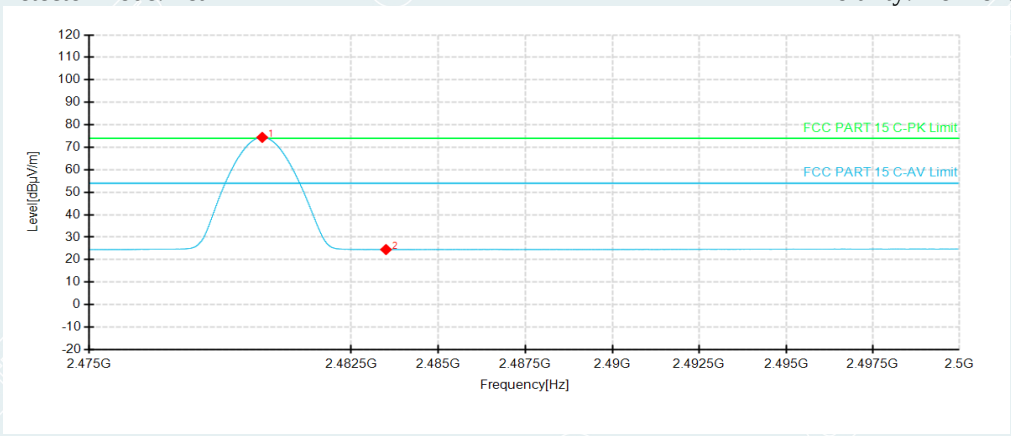
Detector mode: Average Polarity: Vertical



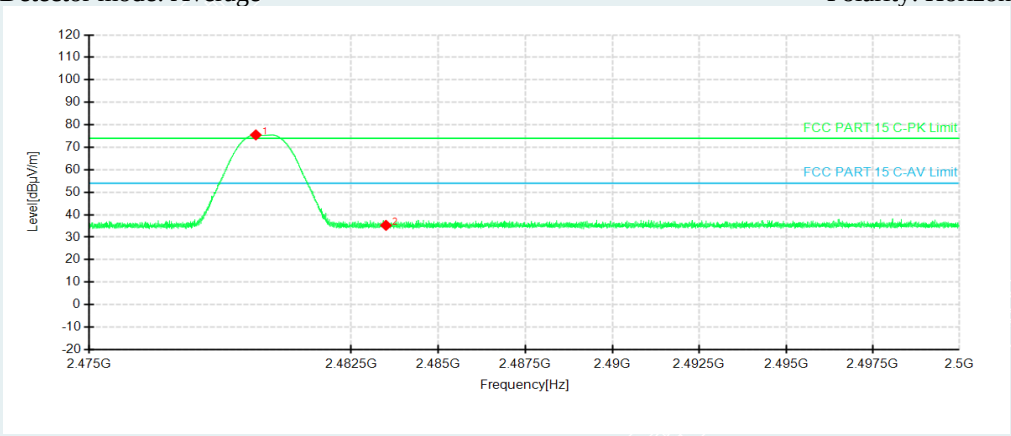
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Remark	Pole
1	2483.5000	24.71	-18.72	54.00	29.29	Peak	Vertical
2	2483.5000	36.02	-18.72	74.00	37.98	Average	Vertical

Highest channel

Detector mode: Peak Polarity: Horizontal



Detector mode: Average Polarity: Horizontal

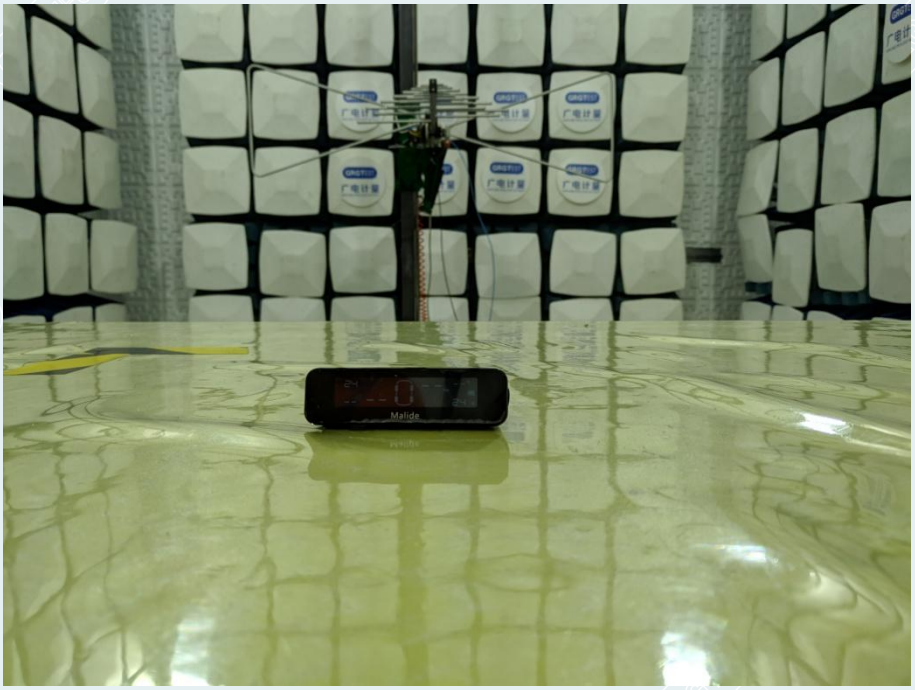


NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Remark	Pole
1	2483.5000	24.50	-18.72	54.00	29.50	Peak	Horizontal
2	2483.5000	35.27	-18.72	74.00	38.73	Average	Horizontal

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

APPENDIX A: PHOTOGRAPH OF THE TEST ARRANGEMENT

RSE（Below 1GHz）



RSE（Above 1GHz）

Conducted Emission 0.15MHz – 30MHz

APPENDIX B: MODEL DIFFERENCES STATEMENT

Shenzhen Malide Technology CO.,LTD

Statement

Product Name: Solar Display

Model No.: MLD-R01, MLD-R02

We(SHenzhen Malide Technology CO.,LTD, Address: 201, Building A, No.26, Xinge Industrial Zone, Egongling Community, Pinghu Street, Longgang District, Shenzhen,China) hereby state that all models above are identical in interior structure, electrical circuits and components, and just the model names are different for marking requirement.

Signature:

Name / title: CEO

Tel: 0755-28688016

Email: liyuntong@malide-sz.com

Date: 2020.06.16

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