

TEST REPORT

Application No.: SZCR2406002399AT
Applicant: GIANT MANUFACTURING CO., LTD.
Address of Applicant: No. 999, Sec. 1, Dongda Rd., Xitun Dist., Taichung City, Taiwan, 40763
Manufacturer: GIANT MANUFACTURING CO., LTD.
Address of Manufacturer: No. 999, Sec. 1, Dongda Rd., Xitun Dist., Taichung City, Taiwan, 40763
Equipment Under Test (EUT):
EUT Name: Bicycle light
Model No.: Recon plus TL300R
FCC ID: ZL7-RECONTL300R
Trade Mark: GIANT
Standard(s) : 47 CFR Part 15, Subpart C 15.249
Date of Receipt: 2024-06-21
Date of Test: 2024-07-06 to 2024-07-30
Date of Issue: 2024-07-30

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.



Keny Xu
EMC Laboratory Manager



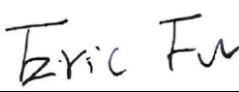
SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZEMC-TRF-01 Rev. A/1

Report No.: SZCR240600239901

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2024-07-30		Original

Authorized for issue by:				
				
		Leo Lai/Project Engineer		
				
		Eric Fu/Reviewer		



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2 Test Summary

Radio Spectrum Technical Requirement			
Item	FCC Requirement	Method	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.203	N/A	Pass

Radio Spectrum Matter Part			
Item	FCC Requirement	Method	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.249	47 CFR Part 15, Subpart C 15.207	Pass
20dB Emission bandwidth	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.9	Pass
Filed strength of fundamental	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.6	Pass
Radiation Spurious Emission	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.6	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.10	Pass



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3.7V which can be charged by USB port Battery: 3.7V, 2600mAh
Operation Frequency:	24GHz-24.25GHz
Modulation Type:	FMCW
Antenna Type:	Microstrip Antenna Arrays
Antenna Gain:	10dBi

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Adapter	Apple	A1443	REF. No.SEA05D11D
Type-C Cable	SGS	N/A	REF. No.SEA07B00

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at AC Power Line (150kHz-30MHz)	$\pm 3.1\text{dB}$
20dB Bandwidth	$\pm 3\%$
Carrier Frequencies Separation	$\pm 7.25 \times 10^{-8}$
Radiated Emissions which fall in the restricted bands	$\pm 6.0\text{dB}$ (Below 1GHz); $\pm 4.6\text{dB}$ (Above 1GHz)
Radiated Spurious Emissions Below 1GHz	$\pm 6.0\text{dB}$ for 3m; $\pm 5.0\text{dB}$ for 10m
Radiated Spurious Emissions Above 1GHz	$\pm 4.6\text{dB}$ (1-18GHz); $\pm 4.8\text{dB}$ (18-40GHz)

Remark:

The U_{lab} (lab Uncertainty) is less than $U_{\text{CISPR/ETSI}}$ (CISPR/ETSI Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI (Member No. 1937)

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1336

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2022-05-14	2025-05-13
EMI Test Receiver	Rohde&Schwarz	ESCI	SEM004-02	2024-03-14	2025-03-13
Measurement Software	AUDIX	e3 V8.2014-6-27a	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2024-07-06	2025-07-05
LISN	Rohde&Schwarz	ENV216	SEM007-01	2023-09-19	2024-09-18
LISN	ETS-LINDGREN	3816/2	SEM007-02	2024-03-14	2025-03-13

Radiated Spurious Emissions					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
966 Anechoic Chamber	CRT	N/A	SEM001-13	2022-10-15	2025-10-14
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120D	SEM003-32	2023-09-17	2025-09-16
Coaxial Cable	SGS	N/A	SEM035-01	2024-05-14	2025-05-13
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Low Noise Amplifier	CLAVIO	BDLNA-0118-352810	SEM005-05	2024-03-28	2025-03-27
MXA Signal Analyzer	Keysight	N9020A	SEM004-23	2024-03-16	2025-03-15
Waveguide(40-60GHz)	REBES	SWG-19025-FB	06303-01	2023-02-19	2025-02-18
Waveguide(50-75GHz)	REBES	SWG-15025-FB	01525-09	2023-02-19	2025-02-18
Waveguide(75-110GHz)	REBES	SWG-10025-FB	01509-01	2023-02-19	2025-02-18
Waveguide(110-170GHz)	REBES	SWG-06025-FB	06302-01	2023-02-19	2025-02-18
Waveguide Harmonic Mixer(40-60GHz)	REBES	STH-19SF-S1	06937-01	2023-02-19	2025-02-18
Waveguide Harmonic Mixer(50-75GHz)	KEYSIGHT	M1970V	MY51390966	2023-02-19	2025-02-18
Waveguide Harmonic Mixer(75-110GHz)	KEYSIGHT	M1970W	MY51430883	2023-02-19	2025-02-18
Waveguide Harmonic Mixer(110-170GHz)	REBES	STH-06SF-S1	06110-01	2023-02-19	2025-02-18
Signal Analyzer	Rohde & Schwarz	FSV40	SEM008-04	2024-03-14	2025-03-13



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RF Conducted Test					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	SAEMC	MSR733	SEM001-09	2022-05-14	2025-05-13
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2023-10-19	2024-10-18
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-17	2024-03-27	2025-03-26
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM030-01	2024-07-06	2025-07-05
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2024-03-27	2025-03-26
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2024-03-19	2025-03-18
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2023-09-19	2024-09-18
Waveguide(40-60GHz)	REBES	SWG-19025-FB	06303-01	2023-02-19	2025-02-18
Waveguide(50-75GHz)	REBES	SWG-15025-FB	01525-09	2023-02-19	2025-02-18
Waveguide(75-110GHz)	REBES	SWG-10025-FB	01509-01	2023-02-19	2025-02-18
Waveguide(110-170GHz)	REBES	SWG-06025-FB	06302-01	2023-02-19	2025-02-18
Waveguide Harmonic Mixer(40-60GHz)	REBES	STH-19SF-S1	06937-01	2023-02-19	2025-02-18
Waveguide Harmonic Mixer(50-75GHz)	KEYSIGHT	M1970V	MY51390966	2023-02-19	2025-02-18
Waveguide Harmonic Mixer(75-110GHz)	KEYSIGHT	M1970W	MY51430883	2023-02-19	2025-02-18
Waveguide Harmonic Mixer(110-170GHz)	REBES	STH-06SF-S1	06110-01	2023-02-19	2025-02-18
Signal Analyzer	Rohde & Schwarz	FSV40	SEM008-04	2024-03-14	2025-03-13

General used equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	deli	8838	SEM002-32	2023-07-28	2024-07-27
Humidity/ Temperature Indicator	deli	8838	SEM002-33	2023-07-28	2024-07-27
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2024-03-18	2025-03-17

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

6.1.2 Conclusion

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 10dBi.

Antenna location: Refer to internal photos



6.2 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

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

*Decreases with the logarithm of the frequency.

Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.8 °C

Humidity: 53.2 % RH

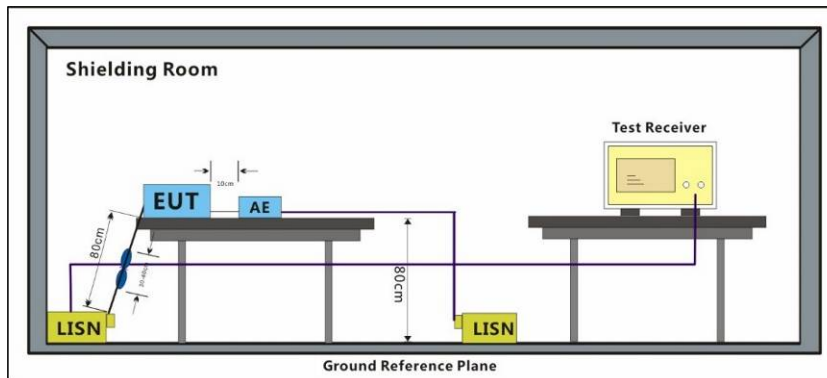
Atmospheric Pressure: 1020 mbar

6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode _ Keep the EUT in continuously transmitting mode.



6.2.3 Test Setup Diagram



6.2.4 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: Level=Read Level+ Cable Loss+ LISN Factor



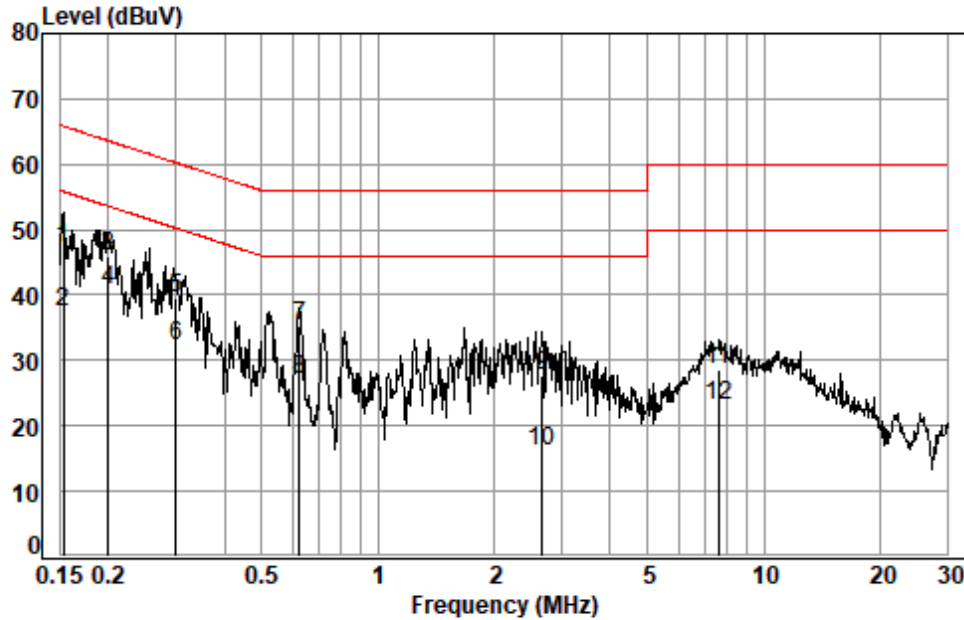
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Test Mode: 00; Line: Live line



Site : Shielding Room
Condition: Line
Job No. : 02399AT
Test mode: 00

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1532	0.02	9.88	37.21	47.11	65.82	-18.71	QP
2	0.1532	0.02	9.88	27.46	37.36	55.82	-18.46	Average
3 *	0.2007	0.02	9.93	35.85	45.80	63.58	-17.78	QP
4 *	0.2007	0.02	9.93	30.81	40.76	53.58	-12.82	Average
5	0.3003	0.03	10.01	29.42	39.46	60.24	-20.78	QP
6	0.3003	0.03	10.01	22.09	32.13	50.24	-18.11	Average
7	0.6271	0.04	9.98	25.37	35.39	56.00	-20.61	QP
8	0.6271	0.04	9.98	17.04	27.06	46.00	-18.94	Average
9	2.6641	0.07	10.03	17.60	27.70	56.00	-28.30	QP
10	2.6641	0.07	10.03	5.98	16.08	46.00	-29.92	Average
11	7.6464	0.13	10.13	18.23	28.49	60.00	-31.51	QP
12	7.6464	0.13	10.13	12.78	23.04	50.00	-26.96	Average



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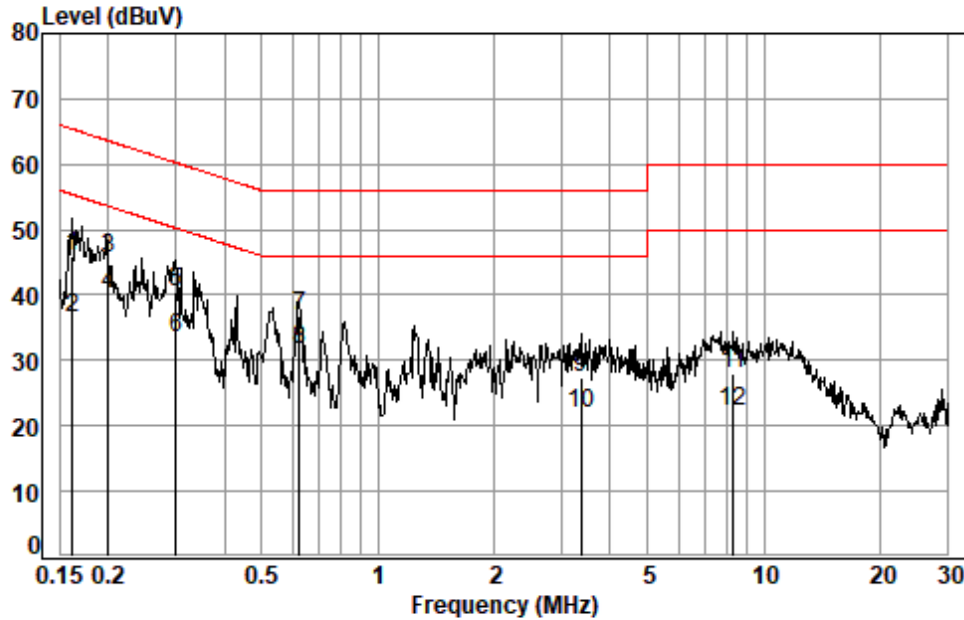
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Test Mode: 00; Line: Neutral Line



Site : Shielding Room
Condition: Neutral
Job No. : 02399AT
Test mode: 00

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1615	0.02	9.89	36.01	45.92	65.38	-19.46	QP
2	0.1615	0.02	9.89	26.63	36.54	55.38	-18.84	Average
3 *	0.2007	0.02	9.92	35.78	45.72	63.58	-17.86	QP
4 *	0.2007	0.02	9.92	30.21	40.15	53.58	-13.43	Average
5	0.3003	0.03	9.91	30.45	40.39	60.24	-19.85	QP
6	0.3003	0.03	9.91	23.47	33.41	50.24	-16.83	Average
7	0.6271	0.04	9.97	26.85	36.86	56.00	-19.14	QP
8	0.6271	0.04	9.97	21.67	31.68	46.00	-14.32	Average
9	3.3635	0.08	9.98	17.29	27.35	56.00	-28.65	QP
10	3.3635	0.08	9.98	11.90	21.96	46.00	-24.04	Average
11	8.3228	0.14	10.18	17.62	27.94	60.00	-32.06	QP
12	8.3228	0.14	10.18	11.83	22.15	50.00	-27.85	Average



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Shenzhen Branch (Shenzhen EEC Laboratory)

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6.3 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215

Test Method: ANSI C63.10 (2013) Section 6.9

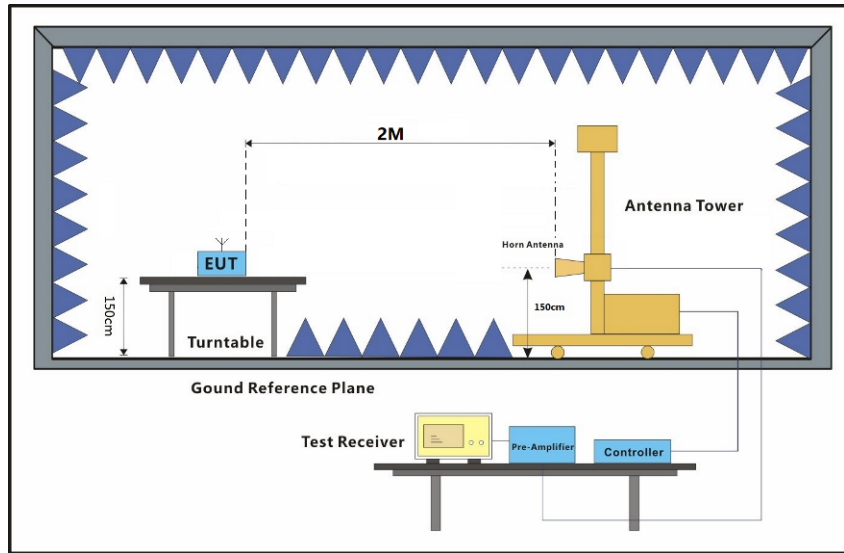
6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test Mode: 00: TX mode _ Keep the EUT in continuously transmitting mode.

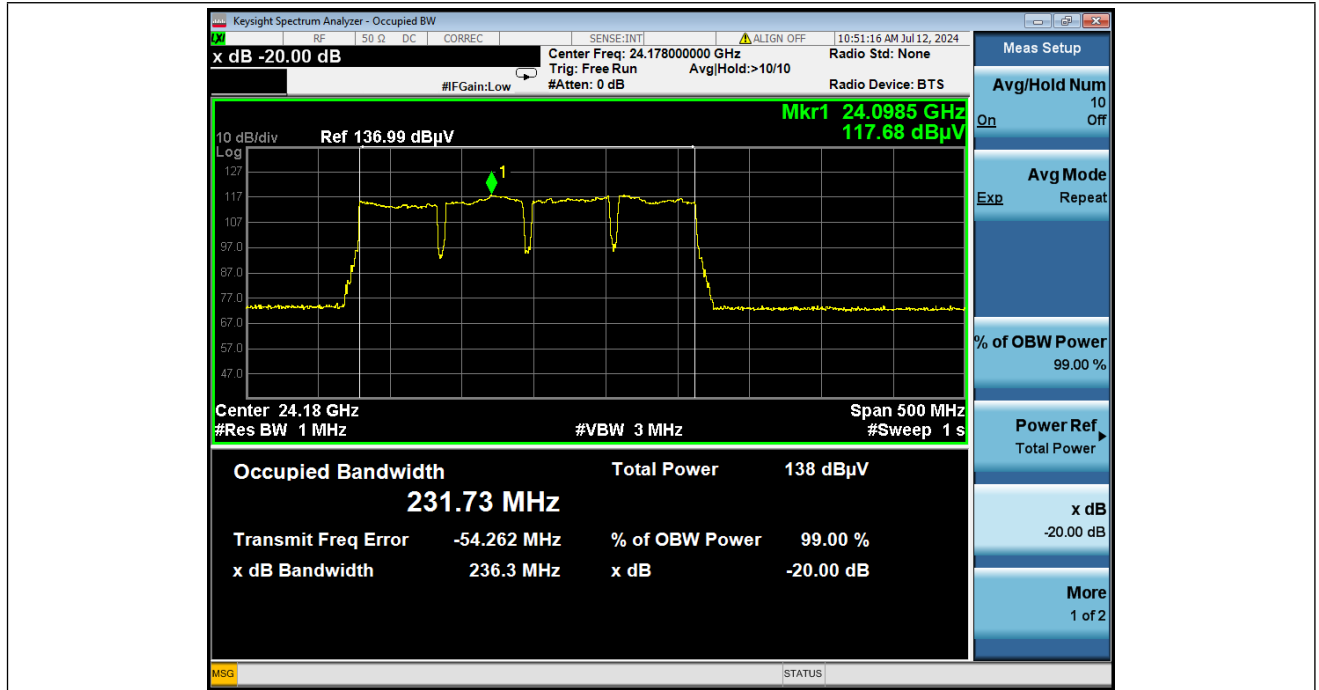
6.3.2 Test Setup Diagram



6.3.3 Measurement Procedure and Data

- 1) Place the EUT on the table and set it in the transmitting mode
- 2) SA set RBW=1%~5% OBW, VBW=3RBW and Detector=Peak
- 3) Measure and record the result of 20dB bandwidth

Test Data:



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6.4 Filed Strength of Fundamental and Radiation Spurious Emission

Test Requirement 47 CFR Part 15, Subpart C 15.249(a)

Test Method: ANSI C63.10 (2013) Section 6.6

Limit:

- (1) The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency (MHz)	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
2400-2483.5	50	500
5725-5875	50	500
24000-24250	250	2500

* Field strength limits are specified at a distance of 3 meters.

Fundamental Limit Conversion			
Average (mV/m) at 3M	Average (dBuV/m) at 3M	Average (dBuV/m) at 1M	Peak (dBuV/m) at 1M
250	107.9588	113.98	133.98

*(Limit = 107.9588 + 20LOG(2/1) = 113.98 dBuV/m)

Harmonic Limit Conversion			
Average (uV/m) at 3M	Average (dBuV/m) at 3M	Average (dBuV/m) at 2M	Peak (dBuV/m) at 2M
2500	67.9588	73.98	93.98

*(Limit=67.9588+20LOG(2/1)=73.98 dBuV/m)

- (2) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits (follow the table), whichever is the lesser attenuation.

Below 30MHz

Frequency	Field Strength (μA/m)	Magnetic field strength (H-Field) (μA/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30



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Above 30MHz

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Frequency	Field Strength microvolts/m at specific distance	
	Peak	AVG
18-40GHz	83.52dBuV/m@1m	63.52dBuV/m@1m
Above 40GHz	83.52dBuV/m @1m	63.52dBuV/m @1m

6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test Mode: 00: TX mode _ Keep the EUT in continuously transmitting mode.



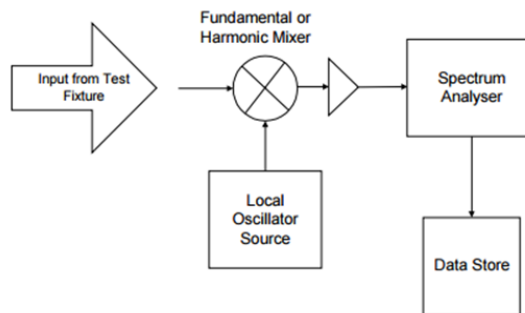
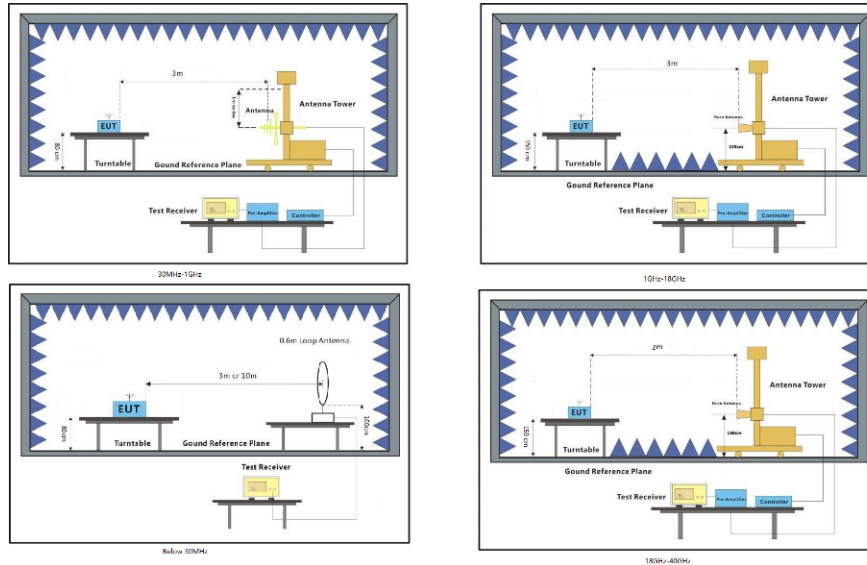
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6.4.2 Test Setup Diagram



Above 40GHz



6.4.3 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For 1-18GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For 18-40GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 2 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 40GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 2 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



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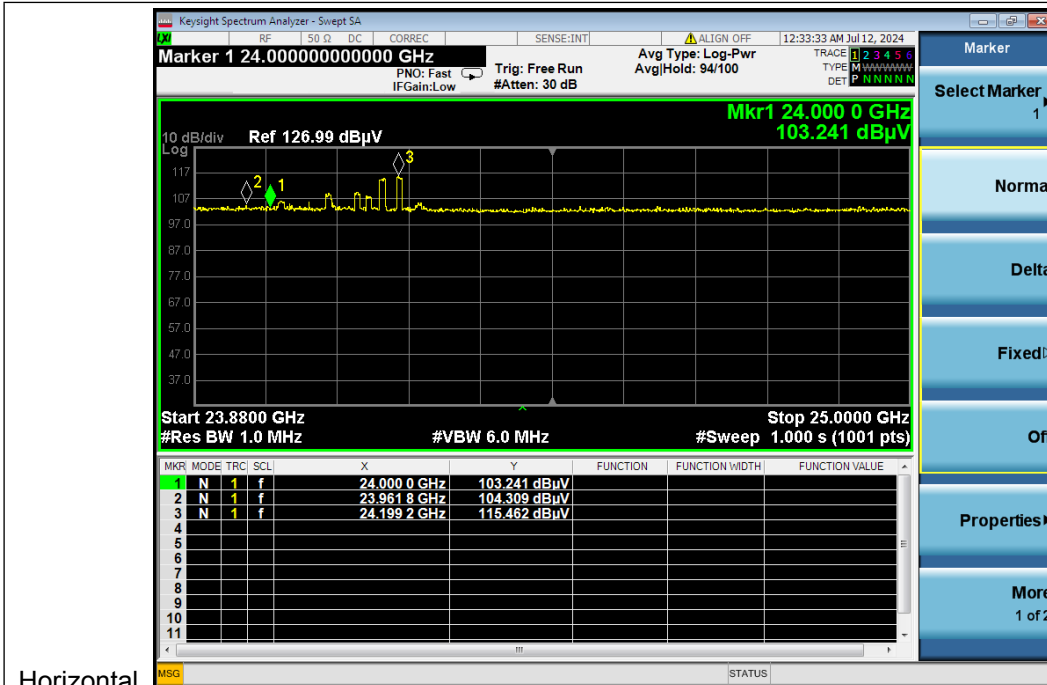
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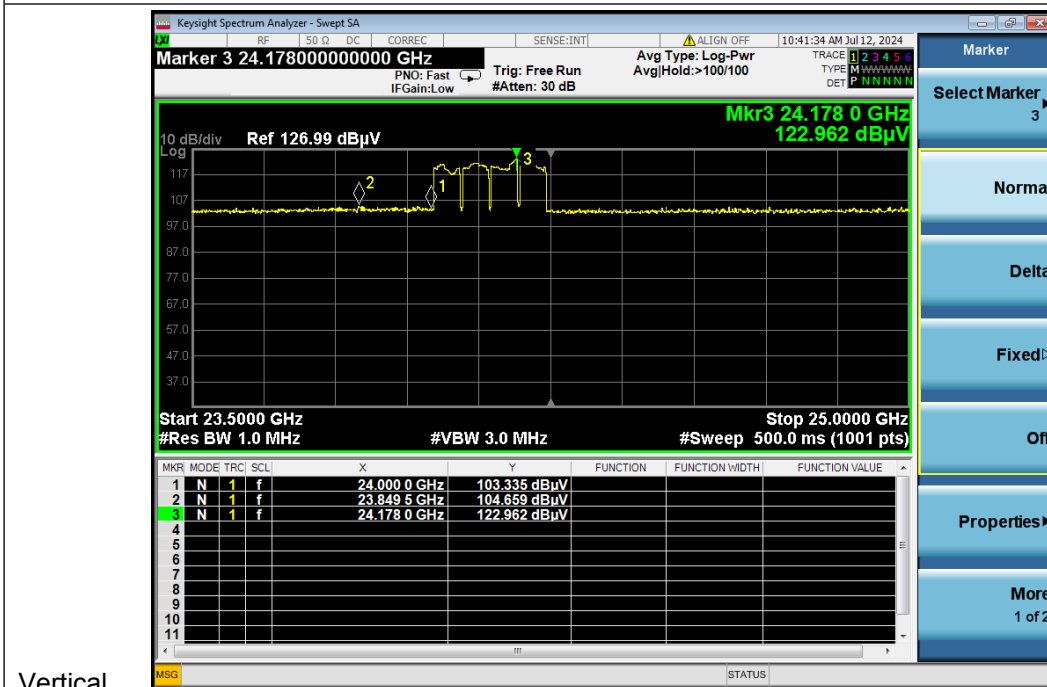
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Filed Strength of Fundamental

Frequency (GHz)	Distance(m)	Polarity	dBuV/m	Limit	Result	Remark
24.000	1	Horizontal	103.241	133.98	Pass	Peak
24.178	1	Vertical	122.962	133.98	Pass	Peak



Horizontal



Vertical



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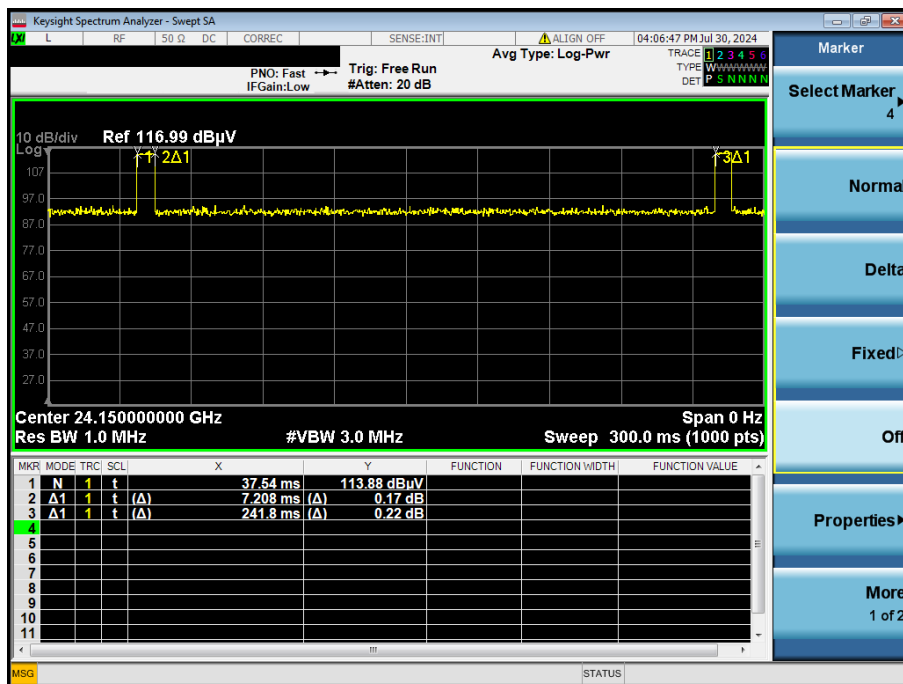
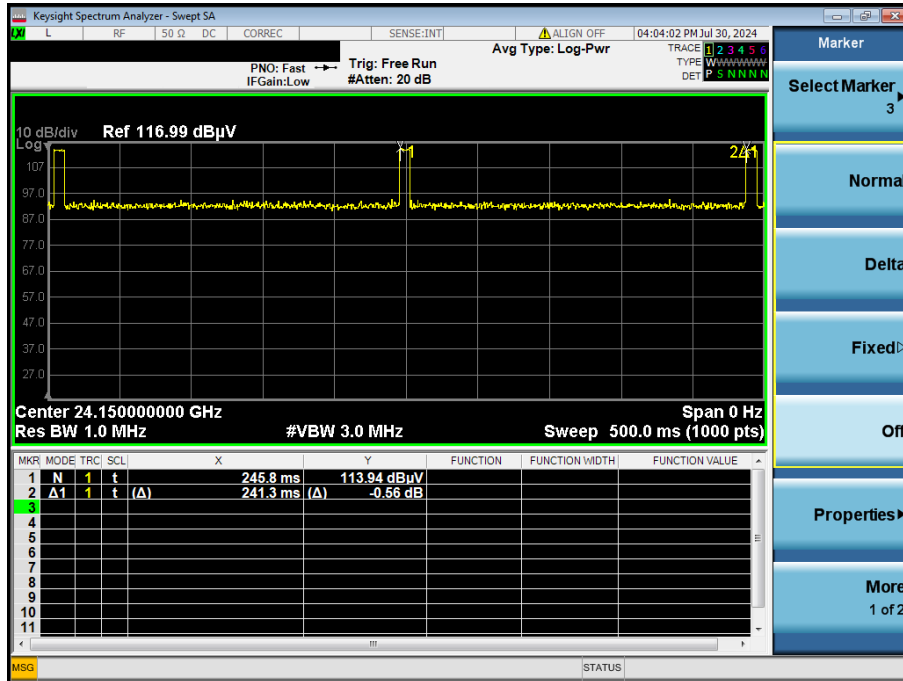
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Test Result of duty cycle & FMCW Desensitization factor

Duty Cycle

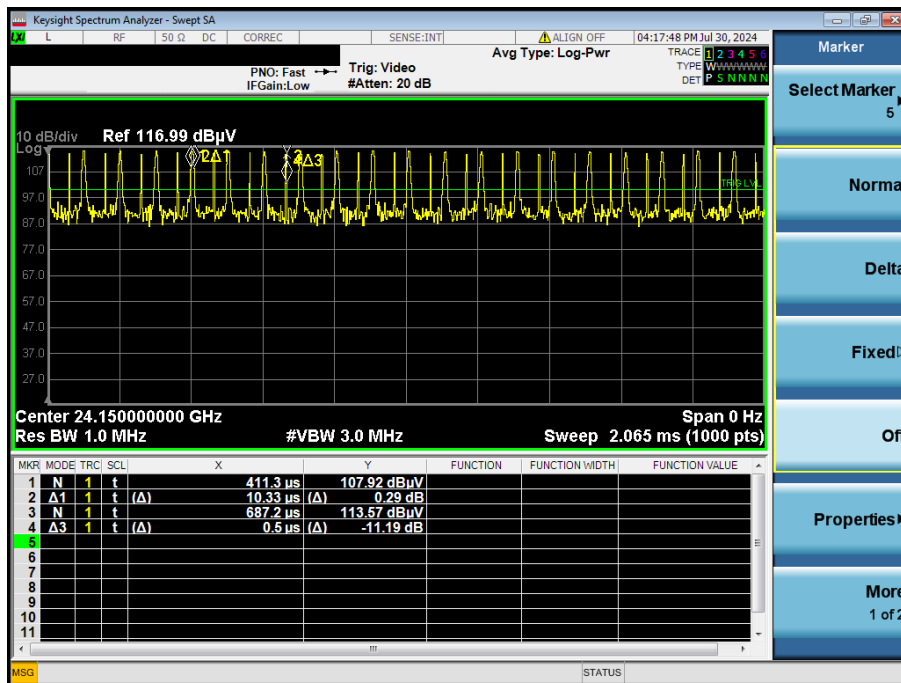
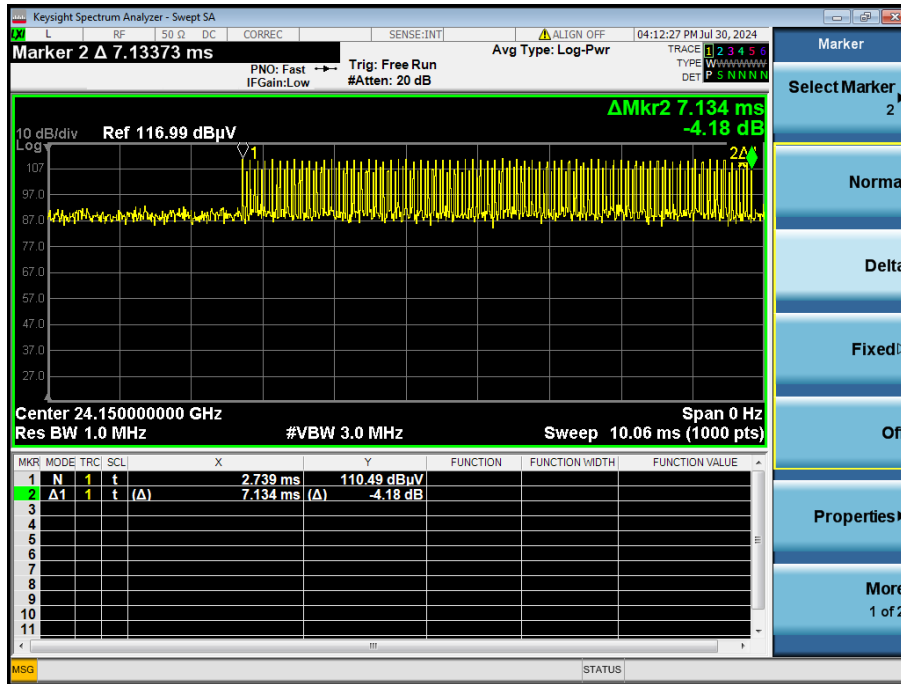


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Duty Cycle

Chirp Width(us)	Chirp Period(us)	Chirp Number	Burst Period (ms)	Tx ON(ms)
10.83	91.97	69	7.134	0.747

Transmission Time = Chirp Width * Chirp number in Burst Period

= (10.33us+0.5us) * 69 = 10.83us*69 = 747.27us

TX ON Time Ratio (%) =(747.27us /100ms)*100% = 0.747%

Duty Factor = 20*log(0.747%) = -42.5

Frequency (GHz)	Distance(m)	Polarity	dBuV/m Peak	Duty Factor	dBuV/m AV	Limit	Result
24.000	1	Horizontal	103.241	-42.5	60.741	113.98	Pass
24.178	1	Vertical	122.962	-42.5	80.462	113.98	Pass



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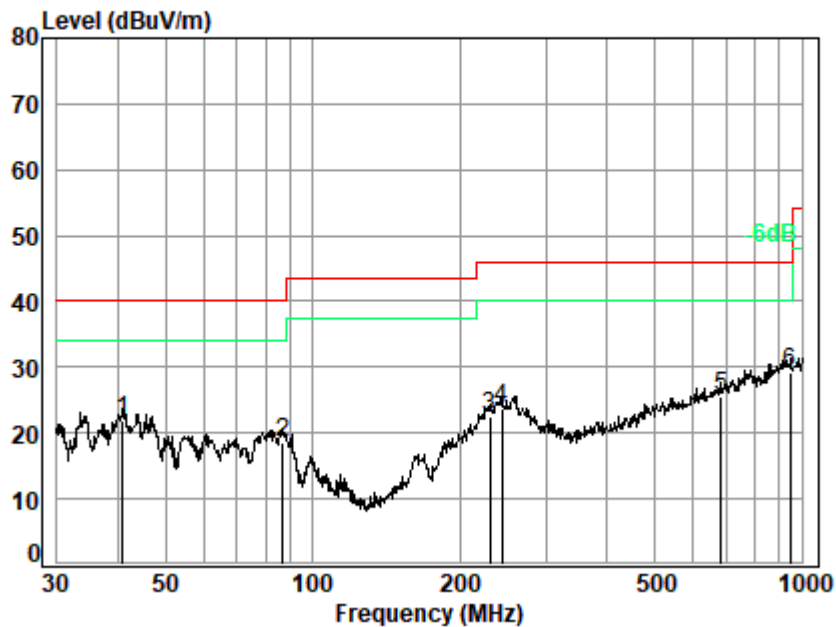
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Radiation Spurious Emission

30MHz-1GHz Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : 02399AT
Test Mode: 00

	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	40.84	15.98	0.76	27.76	32.88	21.86	40.00	-18.14	QP
2	86.81	11.28	1.11	27.63	33.80	18.56	40.00	-21.44	QP
3	230.10	16.46	1.86	27.04	31.18	22.46	46.00	-23.54	QP
4	243.38	17.09	1.92	26.99	31.60	23.62	46.00	-22.38	QP
5	684.75	25.75	3.46	27.76	24.19	25.64	46.00	-20.36	QP
6 q	948.76	28.23	4.22	26.42	23.30	29.33	46.00	-16.67	QP



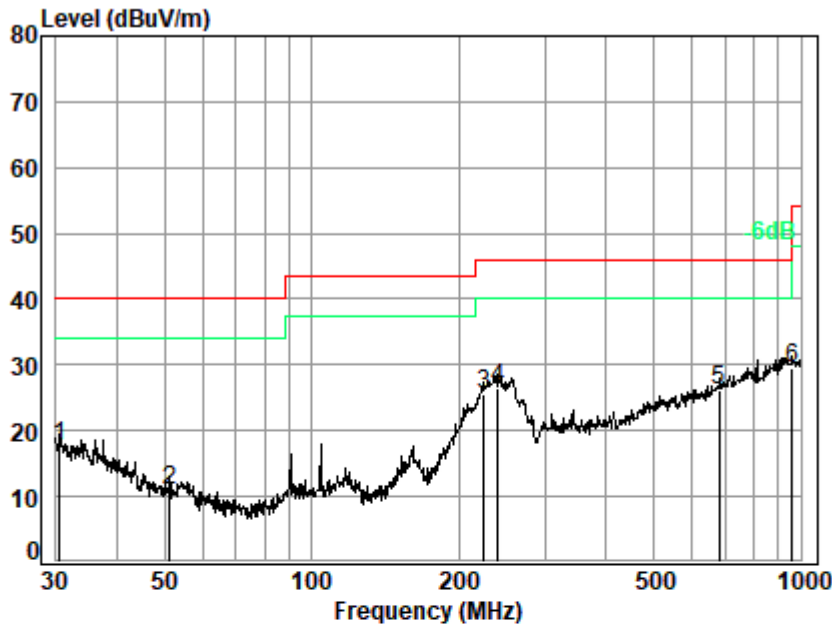
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30MHz-1GHz Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : 02399AT
Test Mode: 00

	Ant Freq	Cable Factor	Preamp Loss	Read Level	Limit Level	Over Line	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.53	20.95	0.65	27.79	23.72	17.53	40.00 -22.47 QP
2	51.30	12.56	0.84	27.73	25.42	11.09	40.00 -28.91 QP
3	224.52	15.67	1.84	27.07	34.97	25.41	46.00 -20.59 QP
4	240.83	17.08	1.91	27.00	34.52	26.51	46.00 -19.49 QP
5	682.35	25.80	3.46	27.77	24.59	26.08	46.00 -19.92 QP
6 q	958.79	28.10	4.24	26.34	23.41	29.41	46.00 -16.59 QP



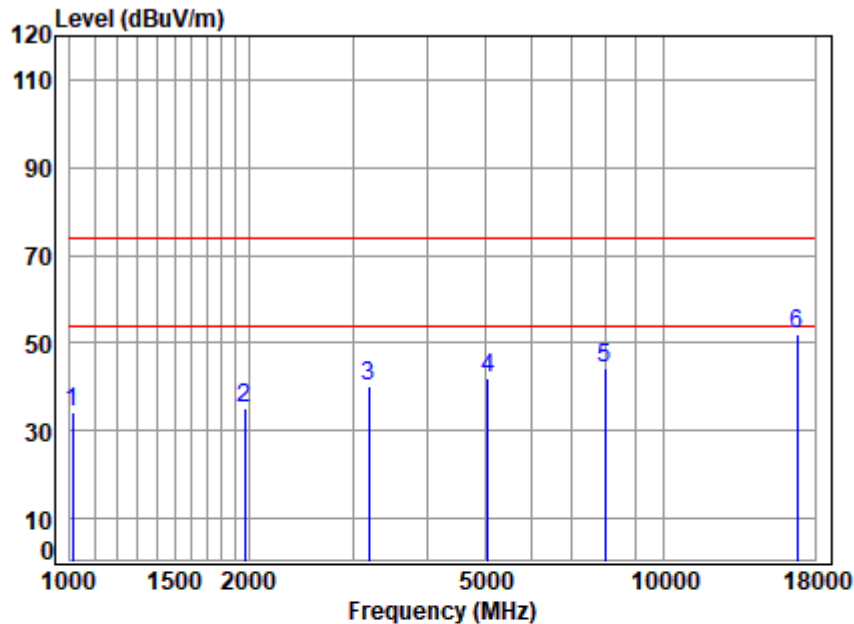
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1-18GHz Vertical



Site : chamber

Condition: 3m VERTICAL

Job No : 02399AT/02400AT

Mode : 00

	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1011.629	5.92	25.93	61.48	63.74	34.11	74.00	-39.89	Peak
2	1972.373	5.05	28.30	61.78	63.71	35.28	74.00	-38.72	Peak
3	3186.869	6.08	32.79	61.37	62.46	39.96	74.00	-34.04	Peak
4	5060.668	7.72	34.08	62.09	62.19	41.90	74.00	-32.10	Peak
5	7989.893	9.01	36.40	61.64	60.71	44.48	74.00	-29.52	Peak
6	16793.680	14.20	42.89	62.11	56.92	51.90	74.00	-22.10	Peak



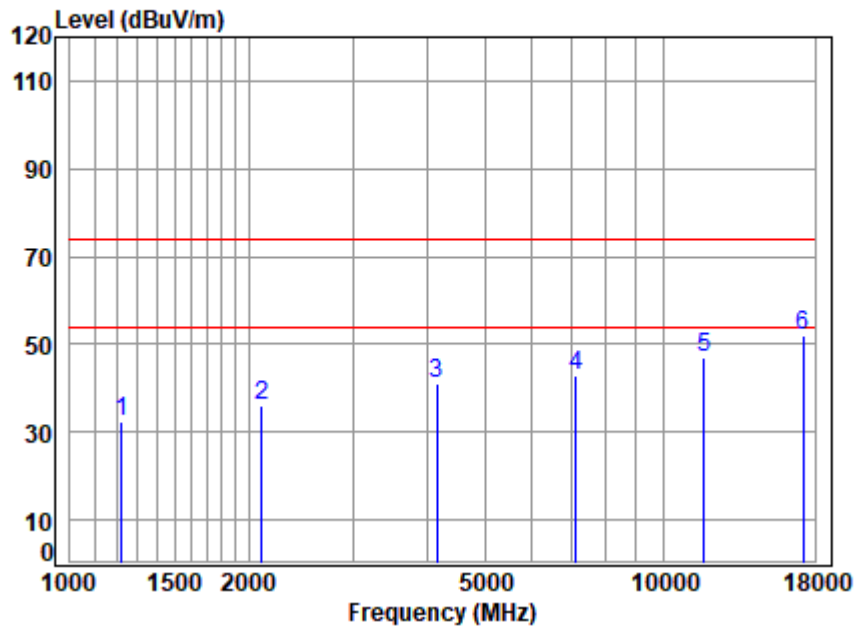
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1-18GHz Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 02399AT/02400AT
Mode : 00

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1220.714	5.43	24.69	61.56	63.78	32.34	74.00	-41.66	Peak
2	2107.950	5.15	28.70	61.74	64.01	36.12	74.00	-37.88	Peak
3	4145.664	6.88	33.73	61.31	61.55	40.85	74.00	-33.15	Peak
4	7138.144	8.56	35.80	62.08	60.51	42.79	74.00	-31.21	Peak
5	11735.250	12.09	37.90	62.67	59.73	47.05	74.00	-26.95	Peak
6	17186.530	14.41	43.01	61.70	56.12	51.84	74.00	-22.16	Peak



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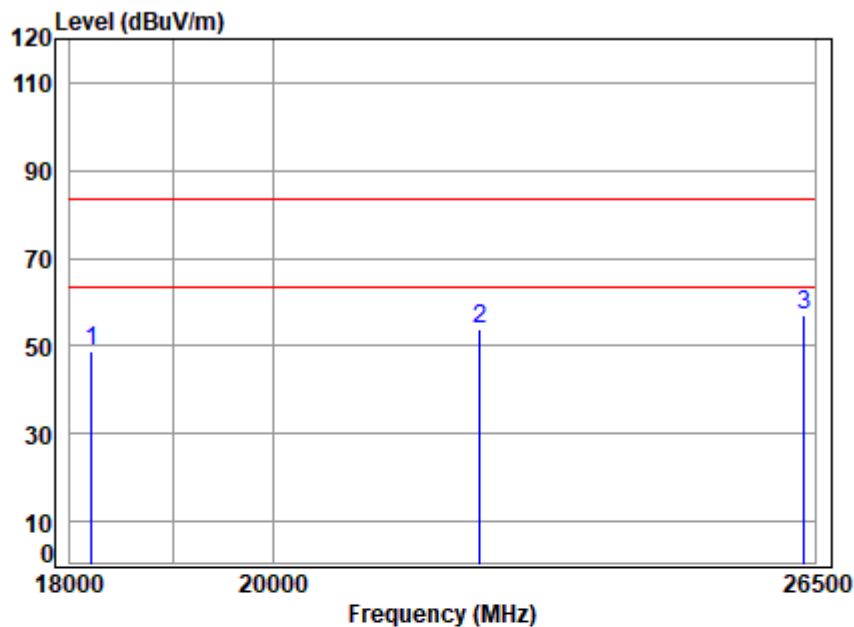
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18-26.5GHz Vertical



Site : chamber
 Condition: 1m Vertical
 Job No : 02399AT/02400AT
 Mode : 00
 Note :

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	18195.990	3.26	36.80	37.73	46.59	48.92	83.54	-34.62	Peak
2	22275.420	4.15	39.11	36.76	47.24	53.74	83.54	-29.80	Peak
3	26356.890	4.12	40.09	35.64	48.52	57.09	83.54	-26.45	Peak



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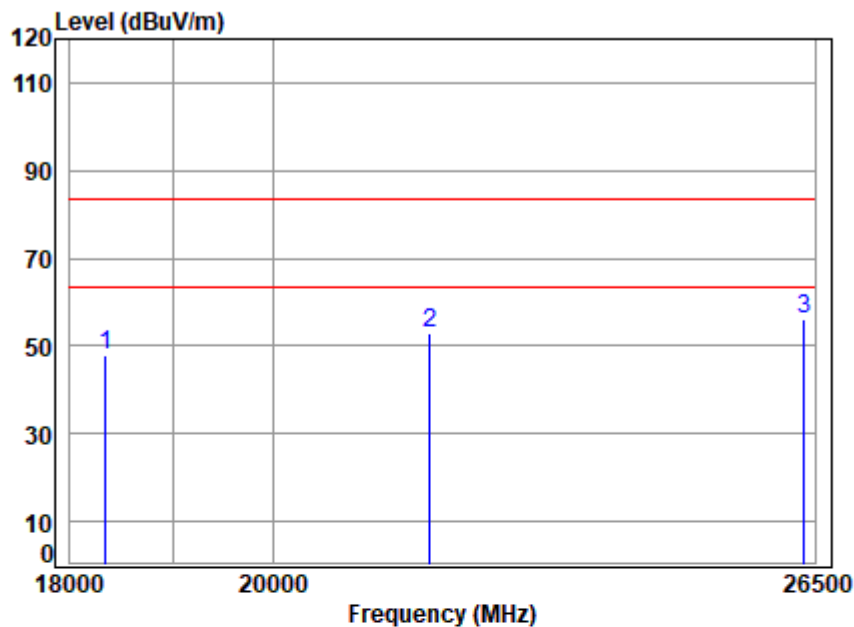
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18-26.5GHz Horizontal



Site : chamber
 Condition: 1m Horizontal
 Job No : 02399AT/02400AT
 Mode : 00
 Note :

	Cable	Ant	Preamp	Read		Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 18337.290	3.23	36.80	37.78	45.83	48.08	83.54	-35.46	Peak
2 21688.810	4.56	39.19	36.92	46.16	52.99	83.54	-30.55	Peak
3 p26346.700	4.12	40.08	35.64	47.54	56.10	83.54	-27.44	Peak



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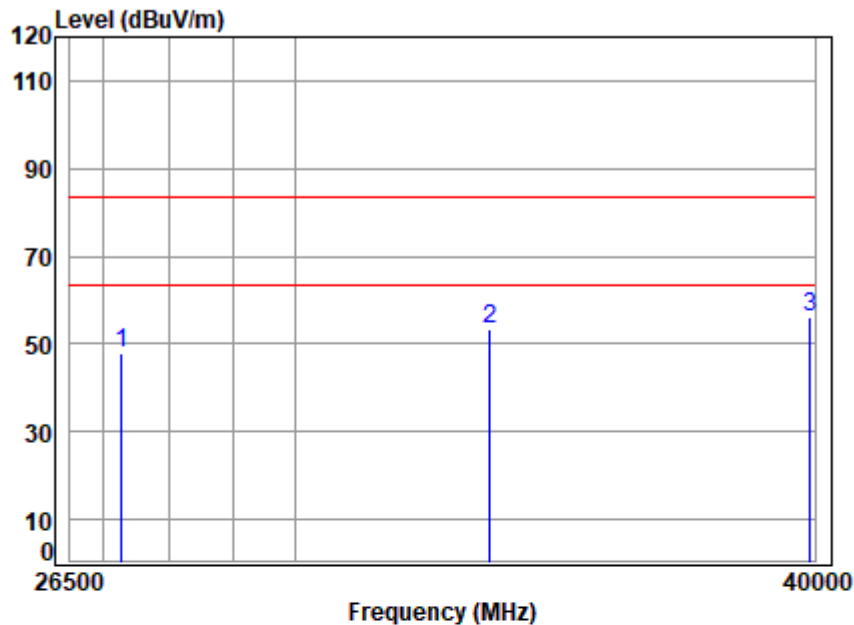
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Report No.: SZCR240600239901

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26.5-40GHz Vertical



Site : chamber
Condition: 1m Vertical
Job No : 02399AT/02400AT
Mode : 00
Note :

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	27274.880	4.39	39.87	53.83	57.65	48.08	83.54	-35.46	Peak
2	33426.970	6.21	42.19	46.01	50.80	53.19	83.54	-30.35	Peak
3	39901.300	5.10	43.34	36.47	44.29	56.26	83.54	-27.28	Peak



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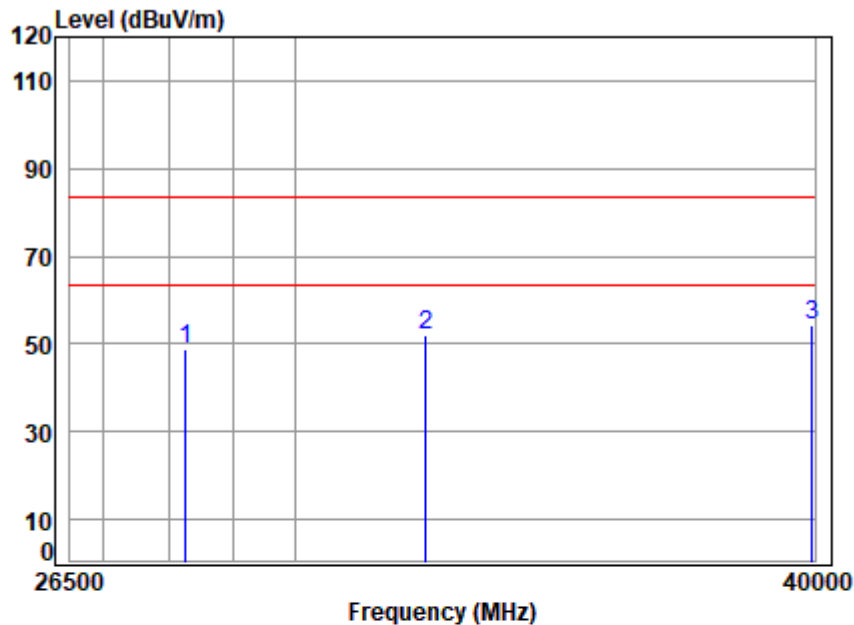
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26.5-40GHz Horizontal



Site : chamber
 Condition: 1m Horizontal
 Job No : 02399AT/02400AT
 Mode : 00
 Note :

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	28234.710	4.56	39.99	54.41	58.86	49.00	83.54	-34.54	Peak
2	32250.780	6.07	41.85	48.12	52.14	51.94	83.54	-31.60	Peak
3	39934.180	5.13	43.39	36.41	42.14	54.25	83.54	-29.29	Peak



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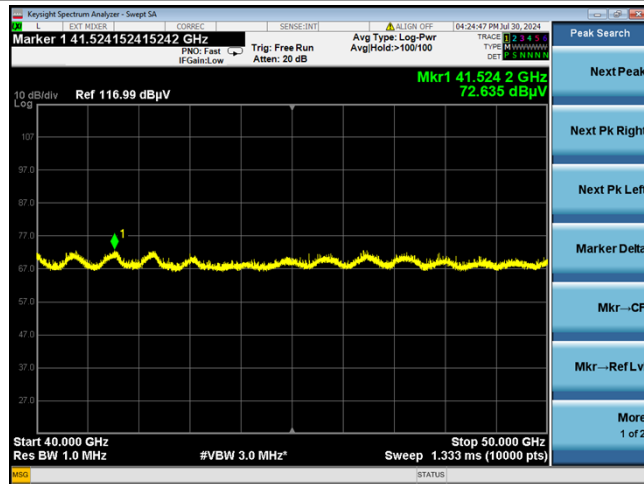
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40-50GHz

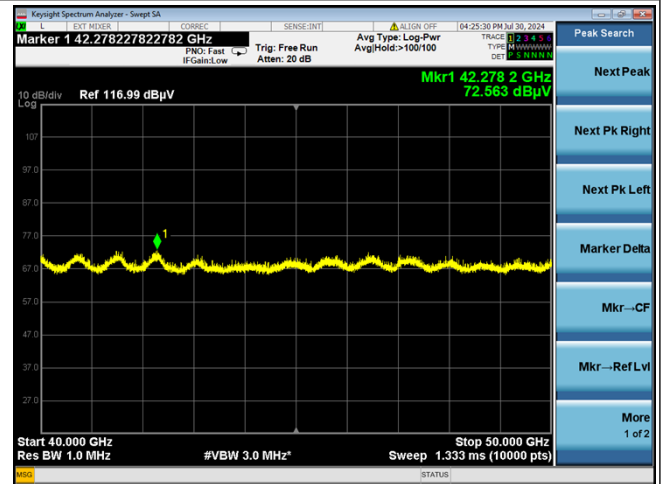
Vertical

Peak

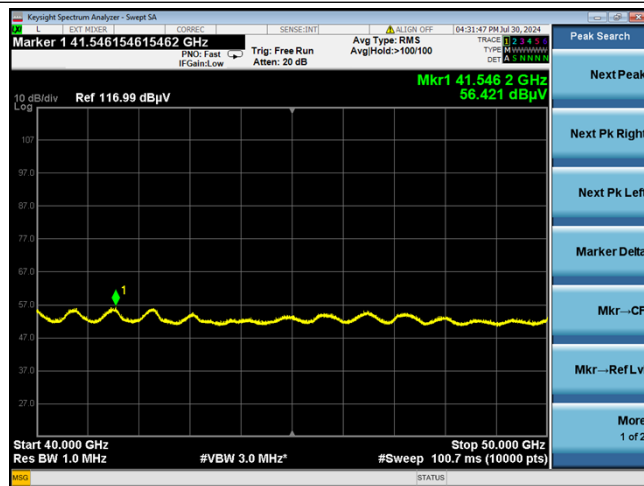


Horizontal

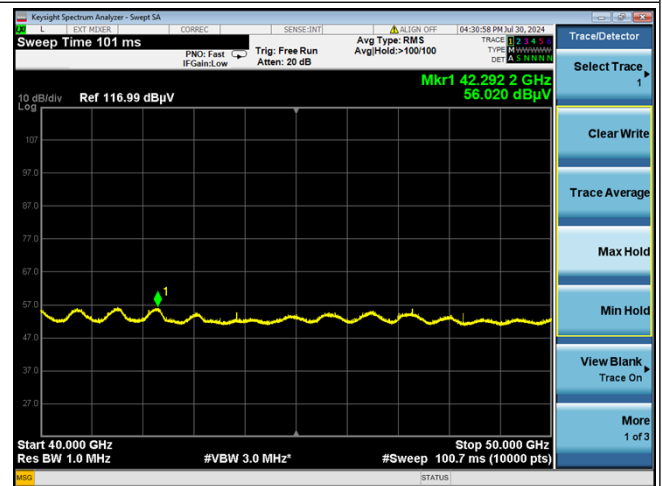
Peak



Average



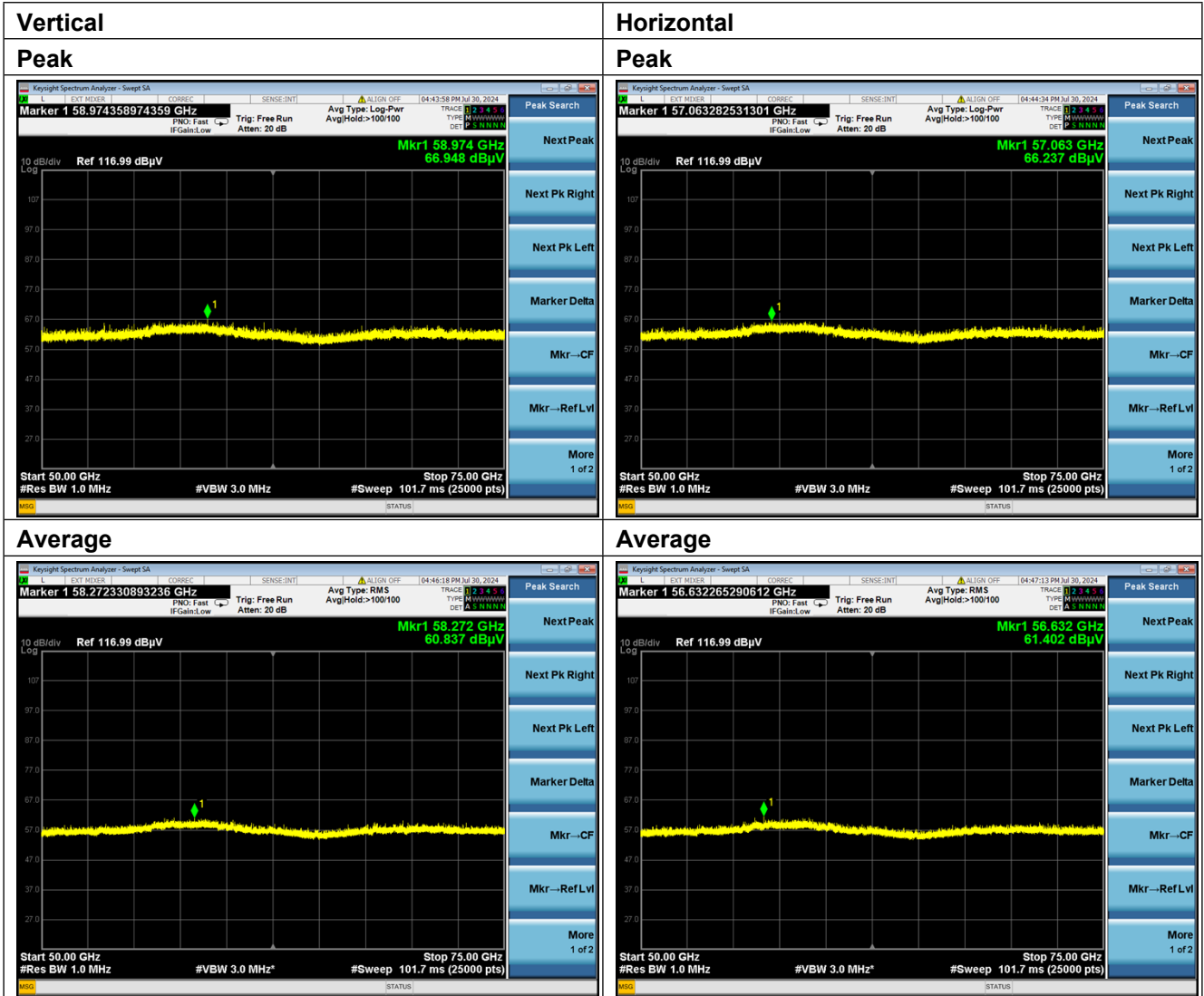
Average



Frequency (GHz)	Distance (M)	Value (dBuV/m)	Limit (dBuV/m)	Peak/Average	Polarization	Result
41.5242	1	72.635	83.52	PK	V	PASS
41.5462	1	56.421	63.52	AV	V	PASS
42.2782	1	72.563	83.52	PK	H	PASS
42.2922	1	56.020	63.52	AV	H	PASS



50-75GHz

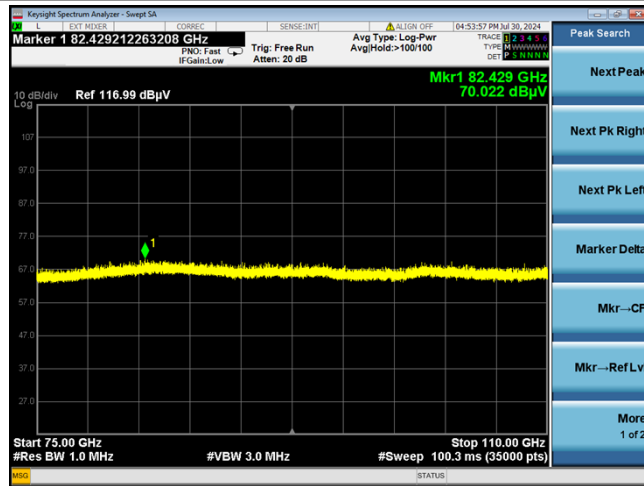


Frequency (GHz)	Distance (M)	Value (dBuV/m)	Limit (dBuV/m)	Peak/Average	Polarization	Result
58.974	1	66.948	83.52	PK	V	PASS
58.272	1	60.837	63.52	AV	V	PASS
57.063	1	66.237	83.52	PK	H	PASS
56.632	1	61.402	63.52	AV	H	PASS

75-110GHz

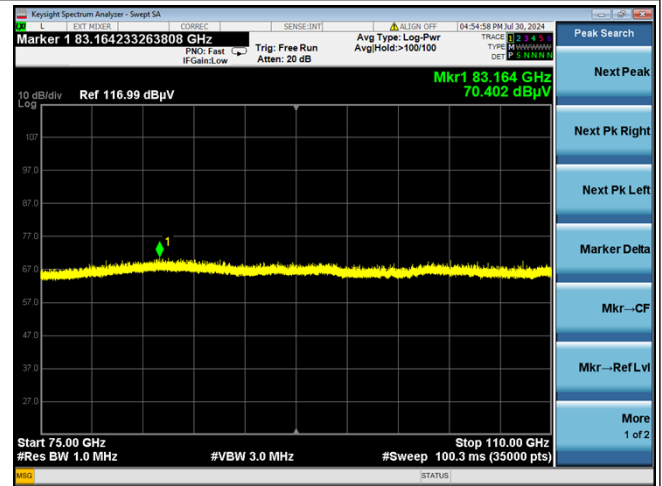
Vertical

Peak

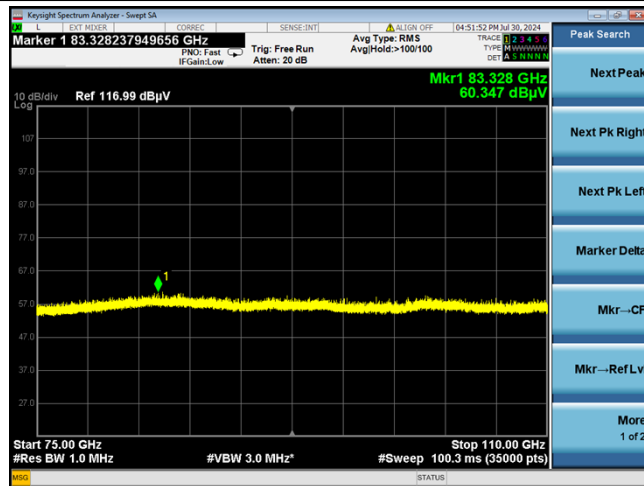


Horizontal

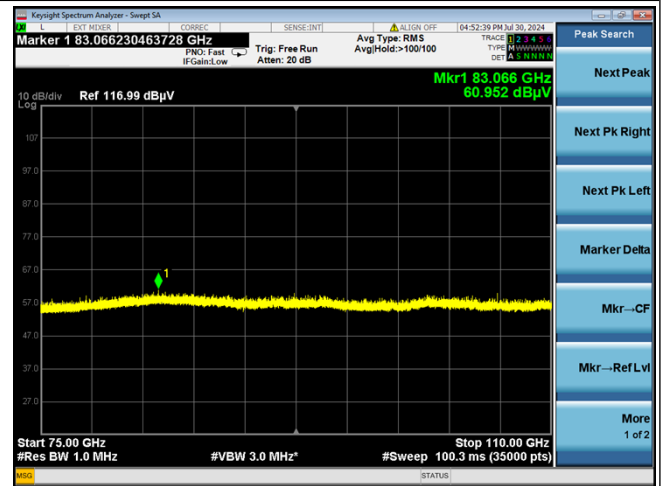
Peak



Average



Average



Frequency (GHz)	Distance (M)	Value (dBuV/m)	Limit (dBuV/m)	Peak/Average	Polarization	Result
82.429	1	70.022	83.52	PK	V	PASS
83.328	1	60.347	63.52	AV	V	PASS
83.164	1	70.402	83.52	PK	H	PASS
83.066	1	60.952	63.52	AV	H	PASS



6.5 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.10.5

Limit:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

Remark: For measurement distance 1m, the field strength doesn't exceed 63.52 dBuV/m

6.5.1 E.U.T. Operation

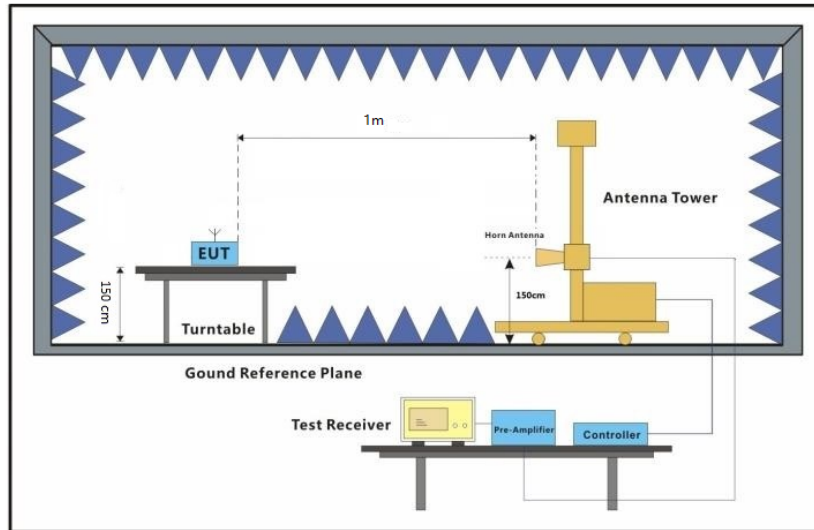
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test Mode: 00: TX mode _ Keep the EUT in continuously transmitting mode.



6.5.2 Test Setup Diagram



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6.5.3 Measurement Procedure and Data

- 1) The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 1 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 3) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 4) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 5) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- 6) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- 7) Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



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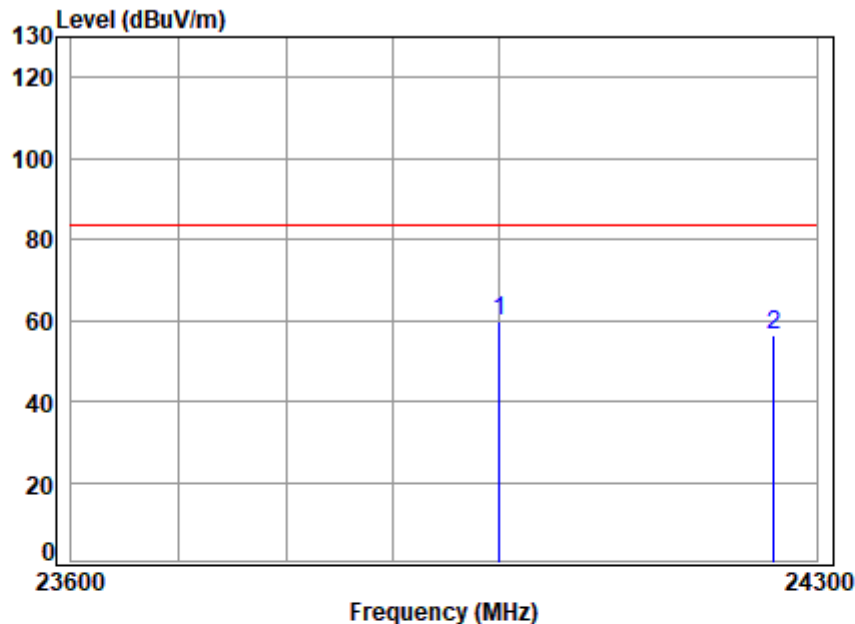
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Test Data:

Polarization: Horizontal;



Site : chamber
Condition: 1m Horizontal
Job No : 02399AT/02400AT
Mode : 00

	Cable	Ant	Preamp	Read		Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 p24000.000	7.44	37.90	36.78	51.26	59.82	83.54	-23.72	Peak
2 24259.550	7.50	38.08	36.61	47.46	56.43	83.54	-27.11	Peak



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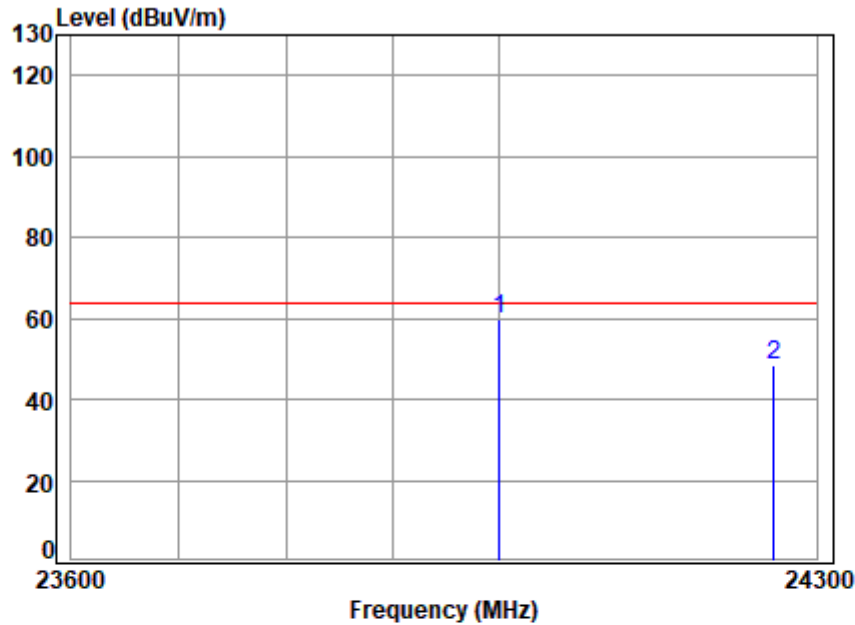
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Site : chamber
Condition: 1m Horizontal
Job No : 02399AT/02400AT
Mode : 00

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	24000.000	7.44	37.90	36.78	51.46	60.02	63.54	-3.52	Average
2	24259.550	7.50	38.08	36.61	39.45	48.42	63.54	-15.12	Average



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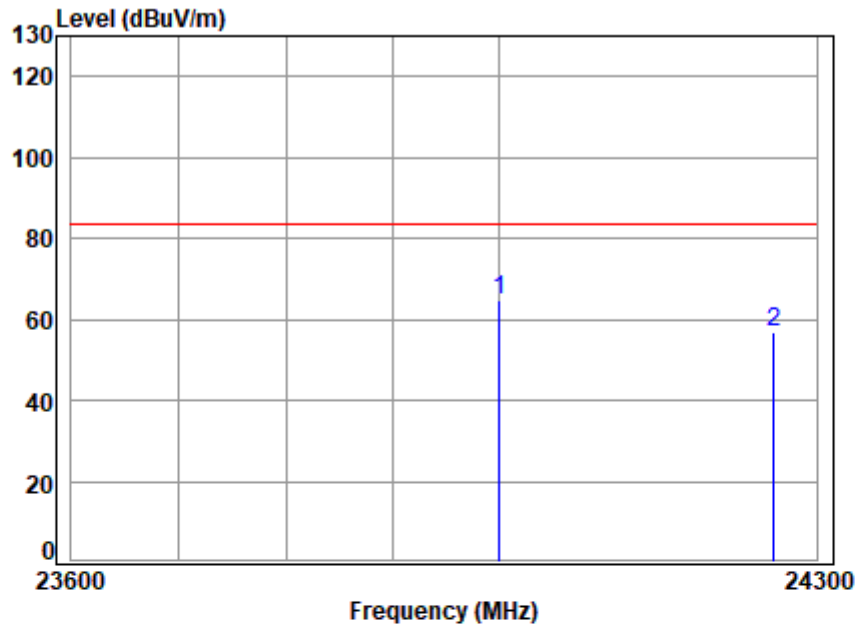
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Polarization: Vertical;



Site : chamber

Condition: 1m Vertical

Job No : 02399AT/02400AT

Mode : 00

	Cable	Ant	Preamp	Read		Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 p24000.000	7.44	37.90	36.78	56.38	64.94	83.54	-18.60	Peak
2 24259.550	7.50	38.08	36.61	47.98	56.95	83.54	-26.59	Peak

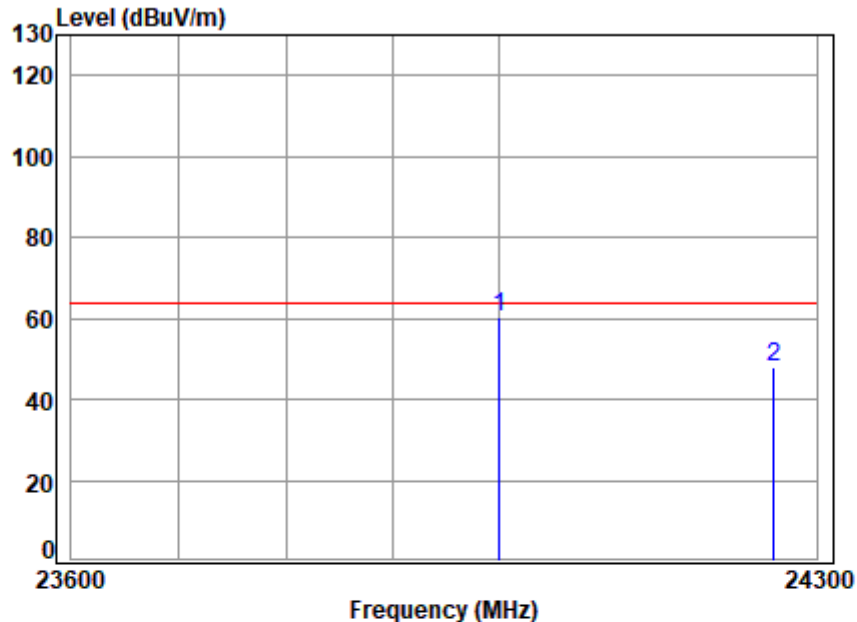


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Site : chamber
Condition: 1m Vertical
Job No : 02399AT/02400AT
Mode : 00

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	24000.000	7.44	37.90	36.78	51.92	60.48	63.54	-3.06	Average
2	24259.550	7.50	38.08	36.61	38.90	47.87	63.54	-15.67	Average



7 Test Setup Photo

Refer to Appendix - Test Setup Photo for SZCR2406002399AT.

8 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos.

- End of the Report -

