

SZEMC-TRF-01 Rev. A/1 Report No.: SZCR240600239901

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# 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 TL300RFCC 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\*

Keny Xu EMC Laboratory Manager



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<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified above.



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

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



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#### **Test Summary** 2

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						
ltem	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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### **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

<b>,</b>	
Test Item	Measurement Uncertainty
Conducted Emissions at AC Power Line (150kHz-30MHz)	± 3.1dB
20dB Bandwidth	± 3%
Carrier Frequencies Separation	± 7.25 x 10-8
Radiated Emissions which fall in the restricted bands	± 6.0dB (Below 1GHz);± 4.6dB (Above 1GHz)
Radiated Spurious Emissions Below 1GHz	± 6.0dB for 3m; ± 5.0dB for 10m
Radiated Spurious Emissions Above 1GHz	± 4.6dB (1-18GHz);± 4.8dB (18- 40GHz)

#### Remark:

The U<sub>lab</sub> (lab Uncertainty) is less than U<sub>cispr/ETSI</sub> (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.



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#### 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

#### **Abnormalities from Standard Conditions**

None



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#### 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	CLAVIIO	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
		1			
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 equipmen	t				
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



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## 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



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

47 CFR Part 15, Subpart C 15.207 Test Requirement Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Evenue of emission (MUT)	Conducted limit(dBµV)					
Frequency of emission(MHz)	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 30	MHz				

#### 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.



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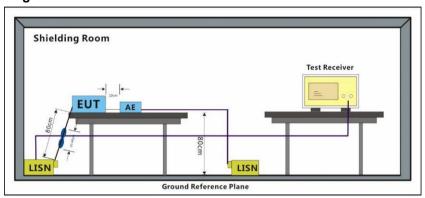


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#### 6.2.3 Test Setup Diagram



#### 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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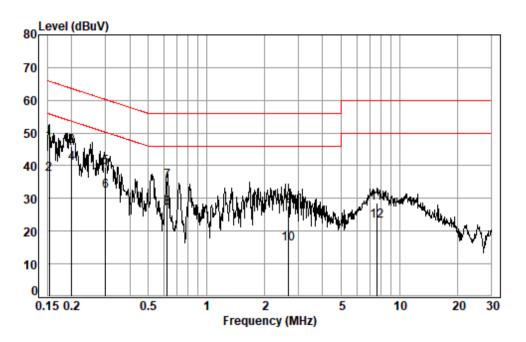


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Test Mode: 00: Line: Live line



: Shielding Room

Condition: Line Job No. : 02399AT

Test mode: 00

	mouc. oo							
		Cable	LISN	Read		Limit	0ver	
	Freq	Loss	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
4	0.4533	0.00	0.00	27 24	47 44	CE 02	10 71	OD
1	0.1532	0.02	9.88	37.21	47.11	65.82	-18.71	Ų٢
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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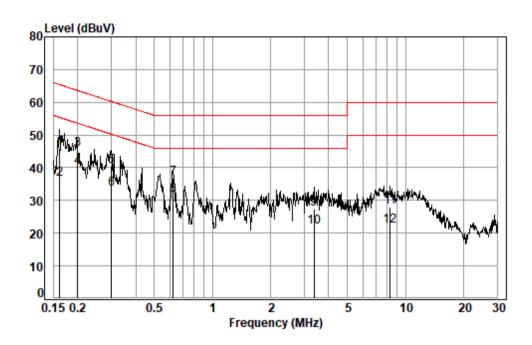


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Test Mode: 00: Line: Neutral Line



: Shielding Room

Condition: Neutral Job No. : 02399AT

Test mode: 00

		Cable	LISN	Read		Limit	0ver	
	Freq	Loss	Factor	Level	Level	Line	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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#### 6.3 20dB Bandwidth

**Test Requirement** 47 CFR Part 15, Subpart C 15.215 Test Method: ANSI C63.10 (2013) Section 6.9

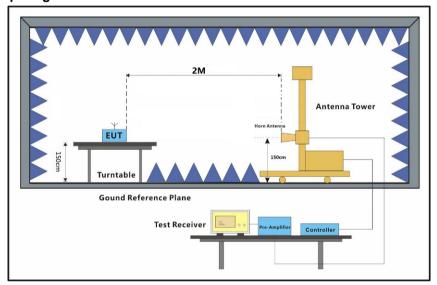
#### 6.3.1 E.U.T. Operation

Operating Environment:

Temperature: Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

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

#### 6.3.2 Test Setup Diagram



#### 6.3.3 Measurement Procedure and Data

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



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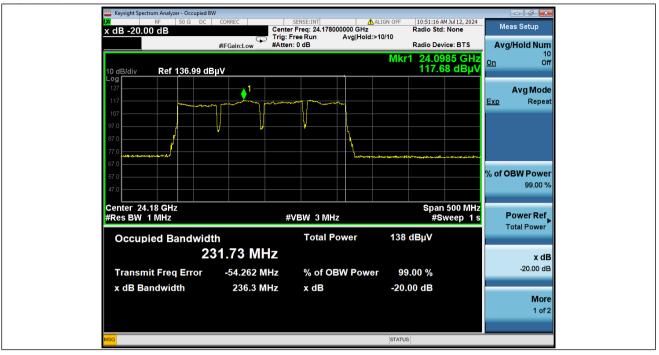


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#### **Test Data:**





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

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

<sup>\*</sup> Field strength limits are specified at a distance of 3 meters.

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

<sup>\* (</sup>Limit = 107.9588 + 20LOG(2/1) = 113.98 dBuV/m)

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

<sup>\*(</sup>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) (μΑ/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:

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

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



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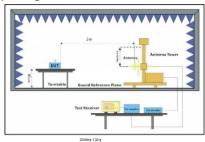
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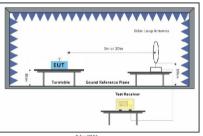


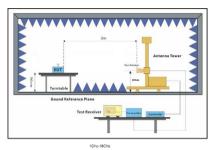
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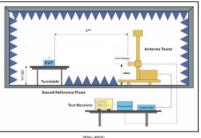
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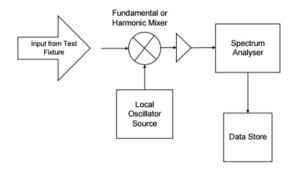
#### 6.4.2 Test Setup Diagram











Above 40GHz



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#### 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
- 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
- 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.
- i. 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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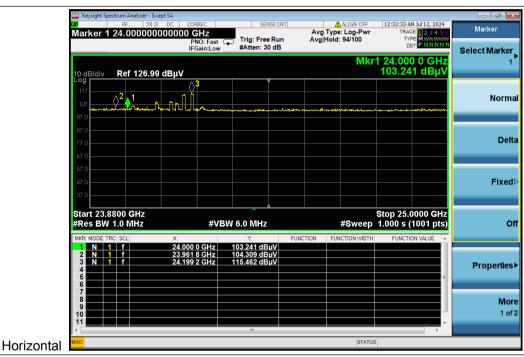


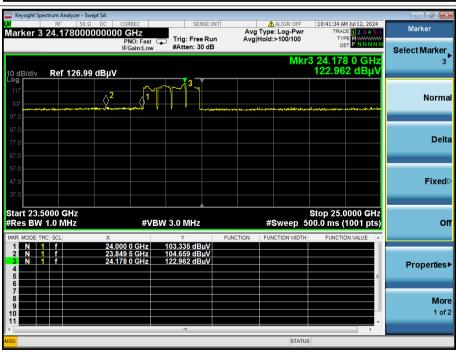
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#### Filed Strength of Fundamental

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







Vertical

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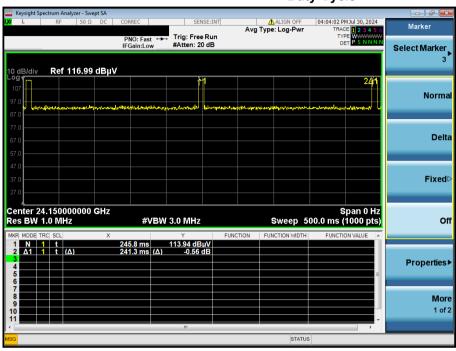
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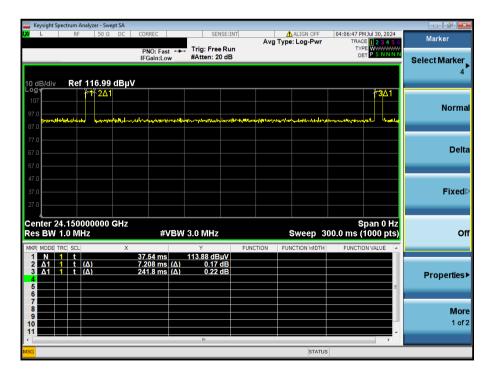
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Test Result of duty cycle & FMCW Desensitization factor

#### **Duty Cycle**







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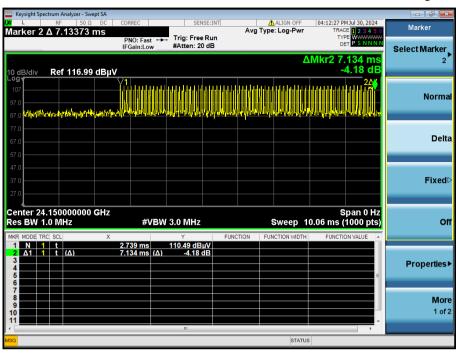
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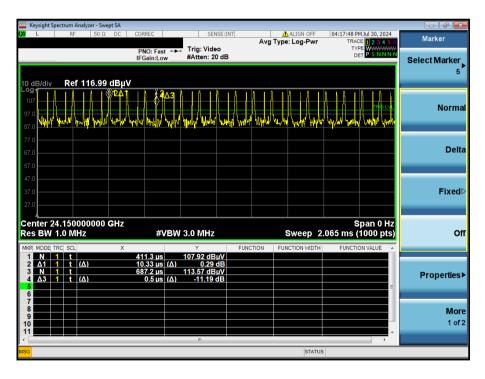


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**Duty Cycle** 

Chirp Witdh(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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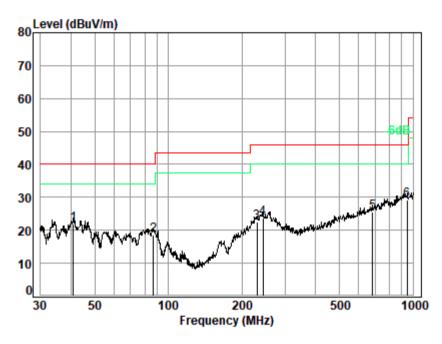
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**Radiation Spurious Emission** 30MHz-1GHz Vertical



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

Test Mode: 00

	nouc. oo								
		Ant	Cable	Preamp	Read		Limit	0ver	
	Freq	Factor	Loss	Factor	Level	Level	Line	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 a	948.76	28.23	4.22	26.42	23.30	29.33	46.00	-16.67	OP



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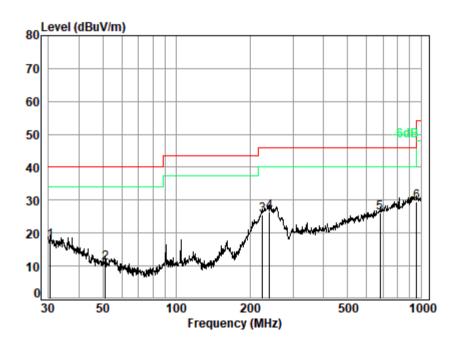
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#### 30MHz-1GHz Horizontal



Site : chamber

Condition: 3m HORIZONTAL

: 02399AT Job No.

Test Mode: 00

		Ant	Cable	Preamp	Read		Limit	0ver	
	Freq	Factor	Loss	Factor	Level	Level	Line	Limit	Remark
	MHz	dB/m	dB	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 a	958.79	28.10	4.24	26.34	23.41	29.41	46.00	-16.59	OP



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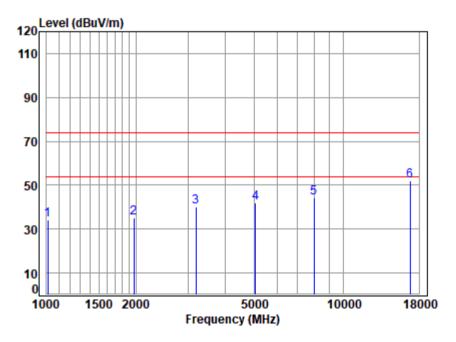
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#### 1-18GHz Vertical



Site : chamber Condition: 3m VERTICAL Job No : 02399AT/02400AT

Mode : 00

	Freq	Cable Loss		Preamp Factor					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	p16793.680	14.20	42.89	62.11	56.92	51.90	74.00	-22.10	Peak



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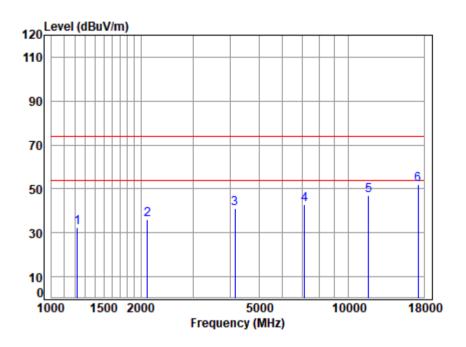
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#### 1-18GHz Horizontal



Site : chamber

Condition: 3m HORIZONTAL : 02399AT/02400AT Job No

Mode

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
_	4000 744	- 43			62.70	20.24	74.00		
1	1220.714	5.43	24.69	61.56	63./8	32.34	/4.00	-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	p17186.530	14.41	43.01	61.70	56.12	51.84	74.00	-22.16	Peak



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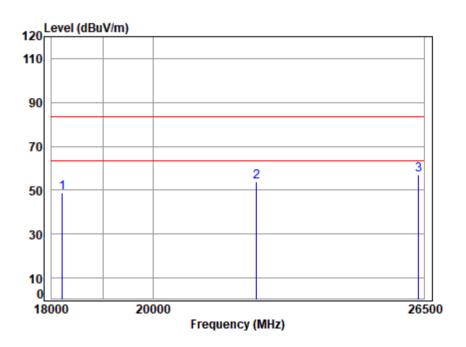
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18-26.5GHz Vertical



Site : chamber

Condition: 1m Vertical : 02399AT/02400AT

Mode : 00

Note

Cable Ant Preamp Read Limit 0ver Loss Factor Factor Level Level Line Limit Remark Freq dBuV dBuV/m dBuV/m dB dB/m 18195.990 3.26 36.80 37.73 46.59 48.92 83.54 -34.62 Peak 4.15 36.76 47.24 53.74 83.54 -29.80 Peak 22275.420 39.11 3 p26356.890 4.12 40.09 35.64 48.52 57.09 83.54 -26.45 Peak



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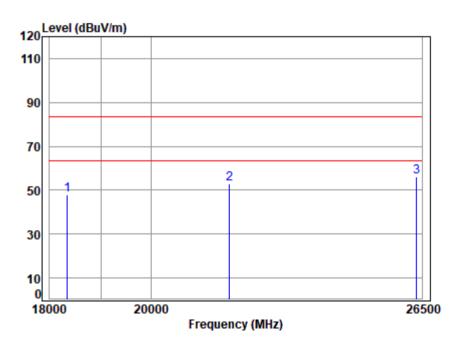
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#### 18-26.5GHz Horizontal



Site : chamber

Condition: 1m Horizontal : 02399AT/02400AT

Mode : 00 Note

	Freq			Preamp Factor					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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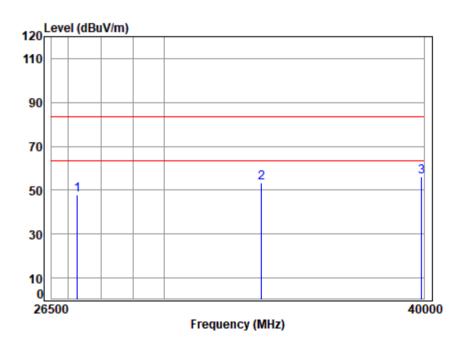
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26.5-40GHz Vertical



Site : chamber

Condition: 1m Vertical Job No : 02399AT/02400AT

Mode : 00

Note

	Freq			Preamp Factor					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	p39901.300	5.10	43.34	36.47	44.29	56.26	83.54	-27.28	Peak



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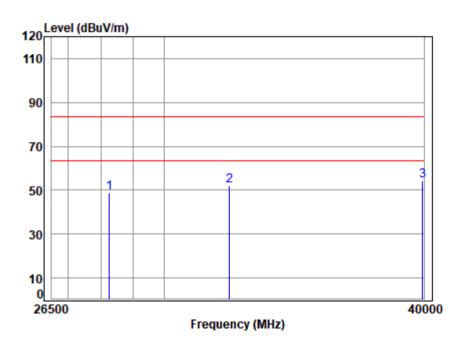
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#### 26.5-40GHz Horizontal



Site : chamber

Condition: 1m Horizontal : 02399AT/02400AT

Mode : 00 Note

	Freq			Preamp Factor					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	p39934.180	5.13	43.39	36.41	42.14	54.25	83.54	-29.29	Peak



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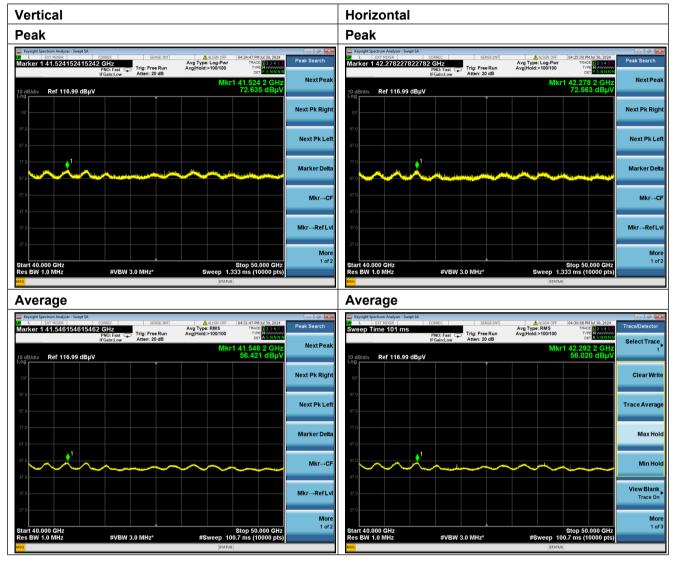


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#### 40-50GHz



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	Н	PASS
42.2922	1	56.020	63.52	AV	Н	PASS



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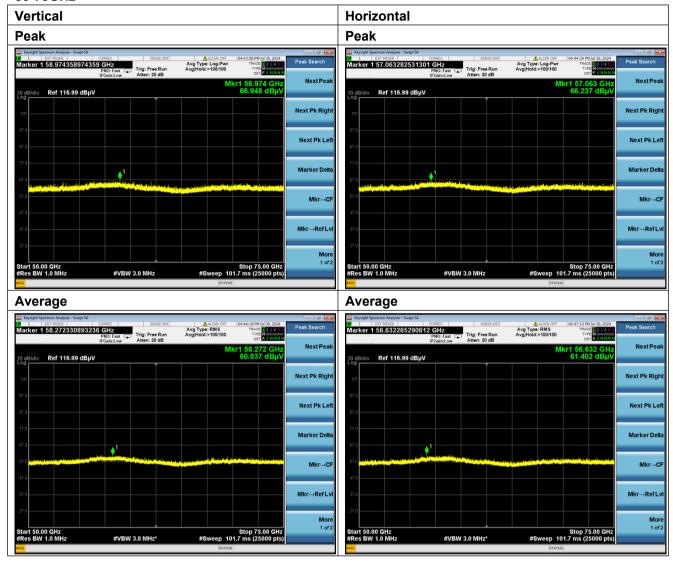


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#### 50-75GHz



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	Н	PASS
56.632	1	61.402	63.52	AV	Н	PASS



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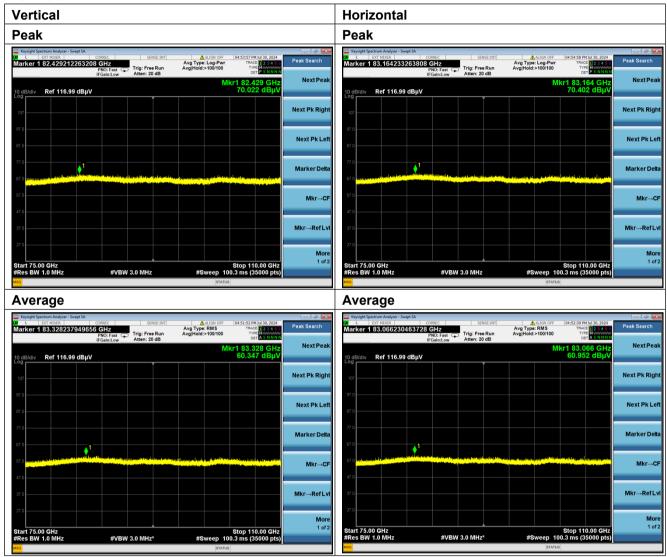


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#### 75-110GHz



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	Н	PASS
83.066	1	60.952	63.52	AV	Н	PASS



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#### 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 filed strength doesn't exceed 63.52 dBuV/m

#### 6.5.1 E.U.T. Operation

Operating Environment:

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

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



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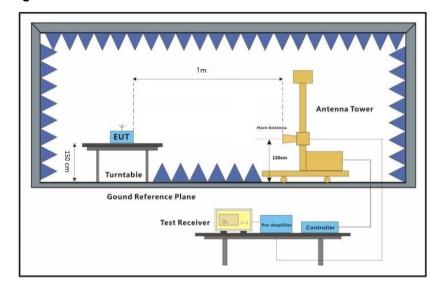
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#### 6.5.2 Test Setup Diagram





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#### 6.5.3 Measurement Procedure and Data

- The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 1 meter fullyanechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum 2) value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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, guasi-peak or average method as specified and then reported in a data sheet.
- 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.
- 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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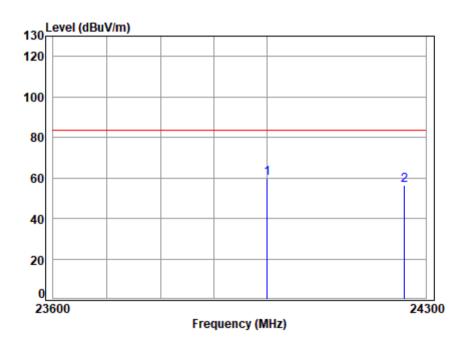


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**Test Data:** 

Polarization: Horizontal:



Site : chamber

Condition: 1m Horizontal : 02399AT/02400AT Job No

Mode : 00

	Cable	Ant	Preamp	Read		Limit	0ver	
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								



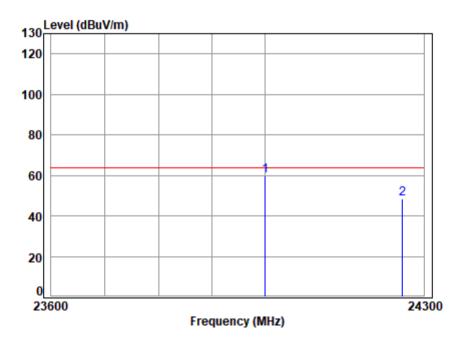
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Site : chamber

Condition: 1m Horizontal : 02399AT/02400AT

Mode : 00

> 1 2

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
24000.000 24259.550								_



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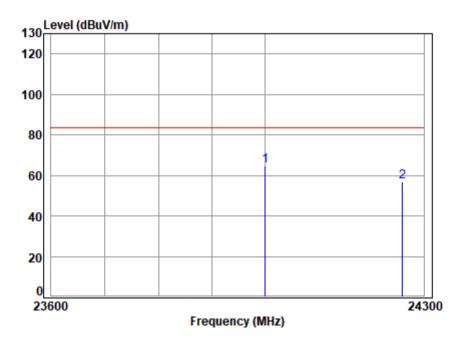
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Polarization: Vertical:



Site : chamber

Job No : 02399AT/02400AT

Condition: 1m Vertical

Mode : 00

> Cable Ant Preamp Read Limit 0ver Frea 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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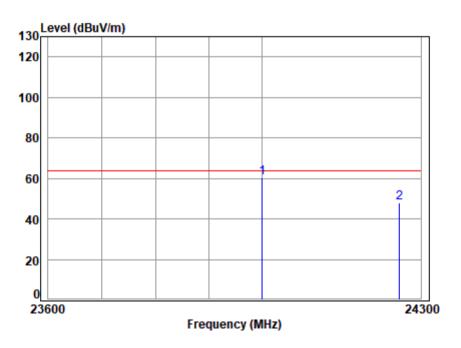
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Site : chamber

Condition: 1m Vertical

: 02399AT/02400AT

Mode : 00

> 1 2

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
24000.000 24259.550								Average Average



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## **Test Setup Photo**

Refer to Appendix - Test Setup Photo for SZCR2406002399AT.

#### **EUT Constructional Details (EUT Photos)** 8

Refer to External and Internal Photos.

- End of the Report -



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