

TEST REPORT

Applicant: Xiamen Topstar Co., Ltd.
Address of Applicant: No.696 Meixi Road, Tongan District Xiamen City, Fujian Province, P.R.China
Manufacturer: Xiamen Topstar Co., Ltd.
Address of Manufacturer: No.696 Meixi Road, Tongan District Xiamen City, Fujian Province, P.R.China
Factory: Xiamen Topstar Lighting Co., Ltd
Address of Factory: 676 Meixi Avenue, Tong'an District, Xiamen, China
Equipment Under Test (EUT)
Product Name: Electric Vehicle supply equipment
Model No.: See section 5.1
FCC ID: 2A9FM-TSEA240VT1
Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.225
Date of sample receipt: April 09, 2024
Date of Test: April 10-19, 2024
Date of report issued: April 19, 2024
Test Result : PASS

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



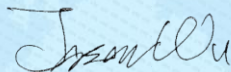
Robinson Luo
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	April 19, 2024	Original

Prepared By:

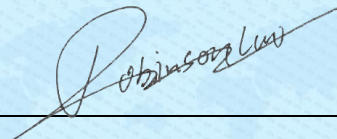


Date:

April 19, 2024

Project Engineer

Check By:



Date:

April 19, 2024

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna Requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Field Strength of Fundamental Emissions and Mask Measurement	15.225(a)(b)(c)	Pass
Radiated Emission	15.225(d)&15.209	Pass
20dB Emission Bandwidth	15.225&15.215	Pass
Frequency Stability Measurement	15.225(e)	Pass

Remark:

1. Pass: The EUT complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	Electric Vehicle supply equipment
Model No.:	TSEA240V/80AUS-ZRGCP-C, TSEA240V/80AUS-ZRGC-C, TSEA240V/80AUS-ZRCP-H, TSEA240V/80AUS-ZRCP-C, TSEA240V/80AUS-ZRC-H, TSEA240V/80AUS-ZRC-C, TSEA240V/48AUS-ZRGCP-C, TSEA240V/48AUS-ZRGC-C, TSEA240V/48AUS-ZRCP-H, TSEA240V/48AUS-ZRCP-C, TSEA240V/48AUS-ZRC-H, TSEA240V/48AUS-ZRC-C, TSEA240V/40AUS-ZRGCP-C, TSEA240V/40AUS-ZRGC-C, TSEA240V/40AUS-ZRCP-H, TSEA240V/40AUS-ZRCP-C, TSEA240V/40AUS-ZRC-H, TSEA240V/40AUS-ZRC-C, TSEA240V/32AUS-ZRGCP-C, TSEA240V/32AUS-ZRGC-C, TSEA240V/32AUS-ZRCP-H, TSEA240V/32AUS-ZRCP-C, TSEA240V/32AUS-ZRC-H, TSEA240V/32AUS-ZRC-C
Test Model No:	TSEA240V/80AUS-ZRGCP-C, TSEA240V/48AUS-ZRGCP-C
<p>Remark: The EUT is Electric Vehicle AC Charger with RF ID and PLC Function, it supports WIFI, Bluetooth and LTE function, the wireless module FCC ID is XMR202008EC25AFXD and 2AC7Z-ESP32WROOM32U.the wireless module IC is 10224A-022EC25AFXD and 21098-ESPWROOM32U used in those models except for output current.</p> <p>Home Edition model: TSEA240V/80AUS-ZRCP-H:208-240VAC, 60Hz, 80A TSEA240V/48AUS-ZRCP-H:208-240VAC, 60Hz, 48A TSEA240V/40AUS-ZRCP-H:208-240VAC, 60Hz, 40A TSEA240V/32AUS-ZRCP-H:208-240VAC, 60Hz, 32A with WIFI, BLE, RF ID and PLC; TSEA240V/80AUS-ZRC-H:208-240VAC, 60Hz, 80A TSEA240V/48AUS-ZRC-H:208-240VAC, 60Hz, 48A TSEA240V/40AUS-ZRC-H:208-240VAC, 60Hz, 40A TSEA240V/32AUS-ZRC-H:208-240VAC, 60Hz, 32A with WIFI, BLE and RF ID;</p> <p>Business Edition model: TSEA240V/80AUS-ZRGCP-C:208-240VAC, 60Hz, 80A TSEA240V/48AUS-ZRGCP-C:208-240VAC, 60Hz, 48A TSEA240V/40AUS-ZRGCP-C:208-240VAC, 60Hz, 40A TSEA240V/32AUS-ZRGCP-C:208-240VAC, 60Hz, 32A with WIFI, BLE, RF ID, PLC and 4G; TSEA240V/80AUS-ZRGC-C:208-240VAC, 60Hz, 80A TSEA240V/48AUS-ZRGC-C:208-240VAC, 60Hz, 48A TSEA240V/40AUS-ZRGC-C:208-240VAC, 60Hz, 40A TSEA240V/32AUS-ZRGC-C:208-240VAC, 60Hz, 32A with WIFI, BLE, RF ID and 4G; TSEA240V/80AUS-ZRCP-C:208-240VAC, 60Hz, 80A TSEA240V/48AUS-ZRCP-C:208-240VAC, 60Hz, 48A TSEA240V/40AUS-ZRCP-C:208-240VAC, 60Hz, 40A TSEA240V/32AUS-ZRCP-C:208-240VAC, 60Hz, 32A with WIFI, BLE RF ID and PLC; TSEA240V/80AUS-ZRC-C:208-240VAC, 60Hz, 80A TSEA240V/48AUS-ZRC-C:208-240VAC, 60Hz, 48A TSEA240V/40AUS-ZRC-C:208-240VAC, 60Hz, 40A TSEA240V/32AUS-ZRC-C:208-240VAC, 60Hz, 32A with WIFI, BLE and RF ID;</p> <p>Because the 80A and other current models use different relays Both NEMA plug (for 40A Max models) and hardwired (for all models) are optional for the input installation. So choose TSEA240V/80AUS-ZRGCP-C and TSEA240V/48AUS-ZRCP-H to test as representative</p>	

S/N:	N24030003
Test sample(s) ID:	GTS2024040138-1
Sample(s) Status	Engineered sample
Operation Frequency:	13.56MHz
Channel Number:	1
Modulation:	ASK
Antenna type:	PCB Antenna
Antenna gain:	2dBi(Declared by applicant)
Power supply:	AC 208-240V, 60Hz

Remark:

1. Antenna gain information provided by the customer
2. The relevant information of the sample is provided by the entrusting company, and the laboratory is not responsible for its authenticity.

5.2 Test mode

Transmitter mode	Keep the EUT in continuously transmitting.		
Pre-test mode.			
GTS has verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:			
Axis	X	Y	Z
Field Strength(dBuV/m)	45.36	45.40	44.98
Final Test Mode:			
According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup”: Y axis (see the test setup photo)			

5.3 Test Facility

<p>The test facility is recognized, certified, or accredited by the following organizations:</p> <ul style="list-style-type: none"> ● FCC —Registration No.: 381383 Designation Number: CN5029 Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. ● ISED —Registration No.: 9079A CAB identifier: CN0091 The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of ISED for radio equipment testing. ● NVLAP (LAB CODE:600179-0) Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.4 Test Location

All tests were performed at:
<p>Global United Technology Services Co., Ltd. Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960</p>

5.5 Description of Support Units

None

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	June 23, 2021	June 22, 2024
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	April 13, 2024	April 12, 2025
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 19, 2023	March 18, 2025
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	April 17, 2023	April 16, 2025
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	April 14, 2023	April 13, 2024
8	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 13, 2023	Nov.12, 2024
9	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	April 13, 2024	April 12, 2025
10	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	April 13, 2024	April 12, 2025
11	Horn Antenna (18-26.5GHz)	/	UG-598A/U	GTS664	Oct. 29, 2023	Oct. 28, 2024
12	Horn Antenna (26.5-40GHz)	A.H Systems	SAS-573	GTS665	Oct. 29, 2023	Oct. 28, 2024
13	FSV·Signal Analyzer (10Hz-40GHz)	Keysight	FSV-40-N	GTS666	March 12, 2024	March 11, 2025
14	Amplifier	/	LNA-1000-30S	GTS650	April 13, 2024	April 12, 2025
15	CDNE M2+M3-16A	HCT	30MHz-300MHz	GTS692	Nov. 08, 2023	Nov.07, 2024
16	Wideband Amplifier	/	WDA-01004000-15P35	GTS602	April 13, 2024	April 12, 2025
17	Thermo meter	JINCHUANG	GSP-8A	GTS643	April 18, 2024	April 17, 2025
18	RE cable 1	GTS	N/A	GTS675	July 31. 2023	July 30, 2024
19	RE cable 2	GTS	N/A	GTS676	July 31. 2023	July 30, 2024
20	RE cable 3	GTS	N/A	GTS677	July 31. 2023	July 30, 2024
21	RE cable 4	GTS	N/A	GTS678	July 31. 2023	July 30, 2024
22	RE cable 5	GTS	N/A	GTS679	July 31. 2023	July 30, 2024
23	RE cable 6	GTS	N/A	GTS680	July 31. 2023	July 30, 2024
24	RE cable 7	GTS	N/A	GTS681	July 31. 2023	July 30, 2024
25	RE cable 8	GTS	N/A	GTS682	July 31. 2023	July 30, 2024

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	April 13, 2024	April 12, 2025
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 13, 2024	April 12, 2025
3	PSA Series Spectrum Analyzer	Agilent	E4440A	GTS536	April 13, 2024	April 12, 2025
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	April 13, 2024	April 12, 2025
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	April 13, 2024	April 12, 2025
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	April 13, 2024	April 12, 2025
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	April 13, 2024	April 12, 2025
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	April 13, 2024	April 12, 2025
9	Thermo meter	JINCHUANG	GSP-8A	GTS641	April 18, 2024	April 17, 2025

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	July 12, 2022	July 11, 2027
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 13, 2024	April 12, 2025
3	LISN	ROHDE & SCHWARZ	ENV216	GTS226	April 13, 2024	April 12, 2025
4	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
6	Thermo meter	JINCHUANG	GSP-8A	GTS642	April 18, 2024	April 17, 2025
7	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	April 13, 2024	April 12, 2025
8	ISN	SCHWARZBECK	NTFM 8158	GTS565	April 13, 2024	April 12, 2025
9	High voltage probe	SCHWARZBECK	TK9420	GTS537	April 13, 2024	April 12, 2025
10	Antenna end assembly	Weinschel	1870A	GTS560	April 13, 2024	April 12, 2025
11	LISN	SCHWARZBECK	NSLK 8127	GTS711	April 13, 2024	April 12, 2025

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Barometer	KUMAO	SF132	GTS647	April 18, 2024	April 17, 2025

7 Test results and Measurement Data

7.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203
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 PCB antenna, reference to the appendix II for details	

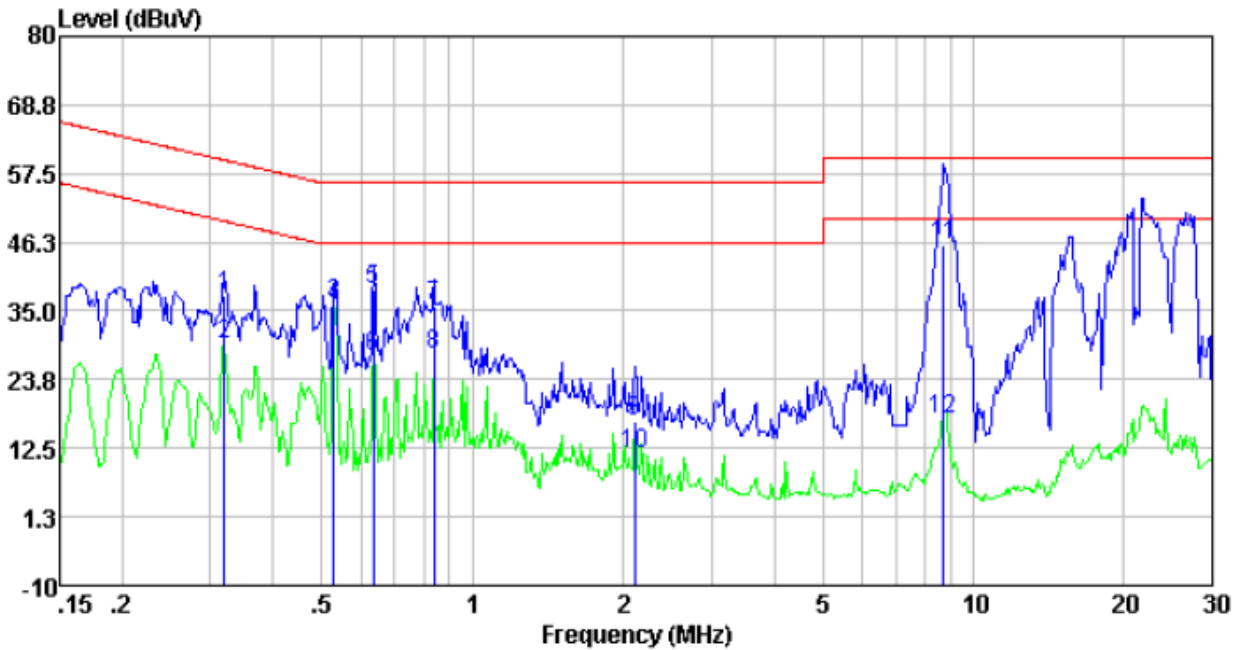
7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207					
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	150KHz to 30MHz					
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto					
Limit:	Frequency range (MHz)		Limit (dBuV)			
			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.						
Test setup:	<p>Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>					
Test procedure:	<ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement. 					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 240V, 60Hz					
Test results:	Pass					

Measurement data:

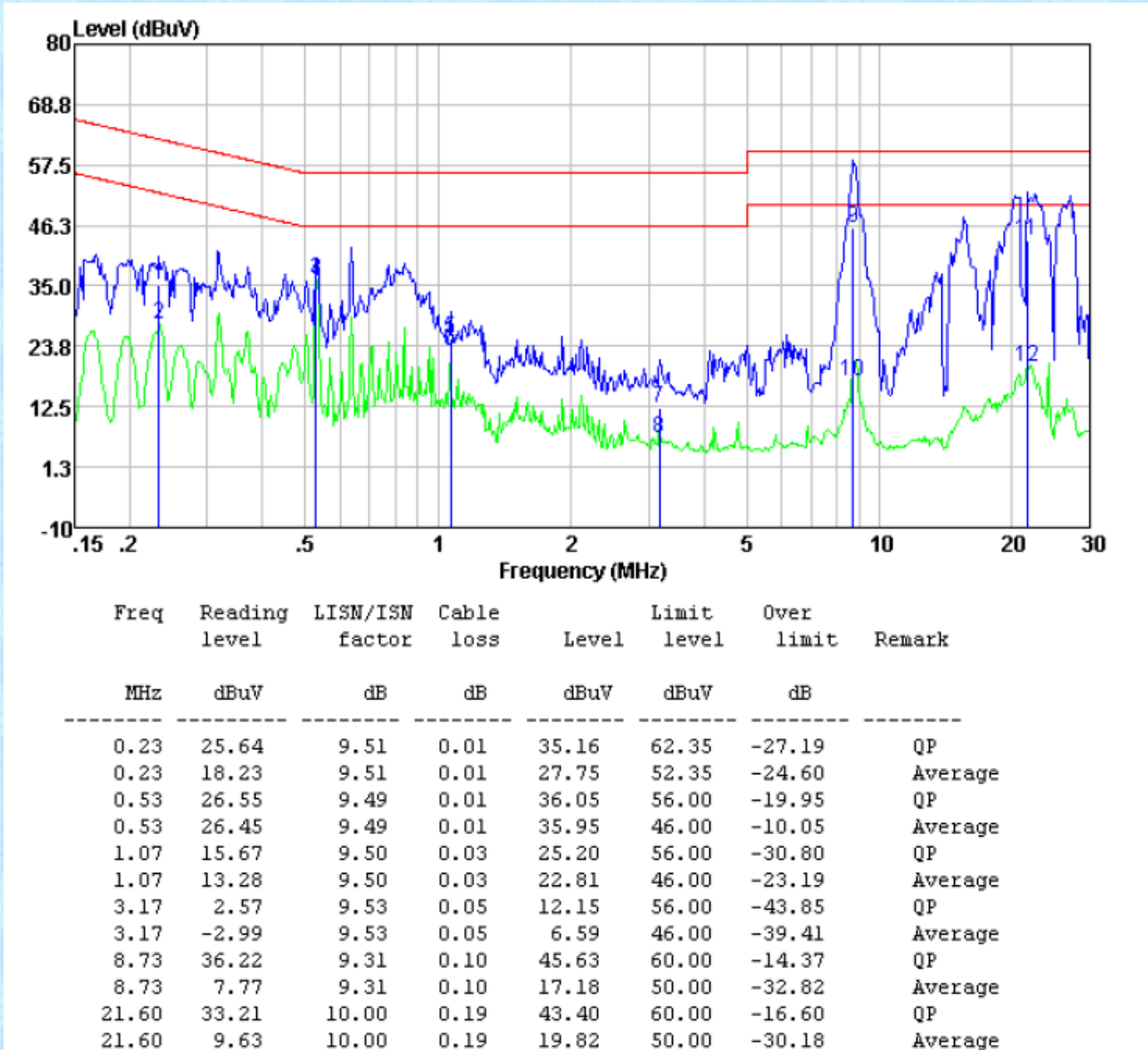
Model: TSEA240V/80AUS-ZRGECP-C

Line:



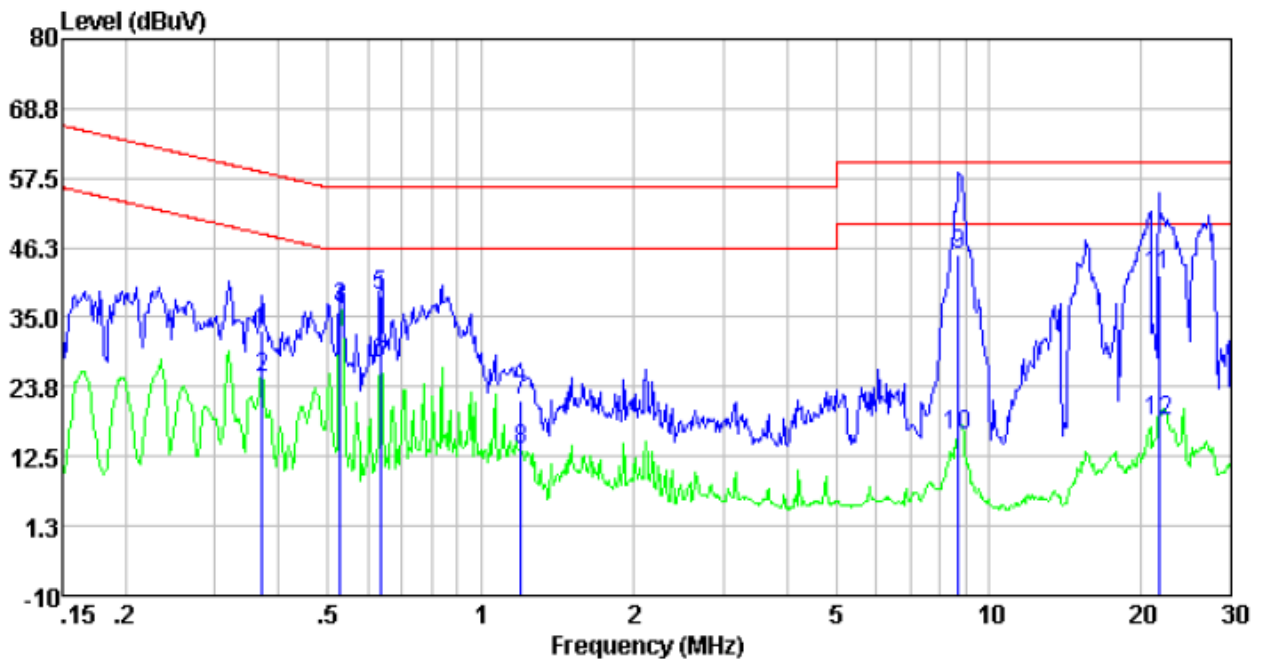
Freq	Reading level	LISN/ISN factor	Cable loss	Level	Limit level	Over limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.32	28.06	9.49	0.01	37.56	59.71	-22.15	QP
0.32	20.18	9.49	0.01	29.68	49.71	-20.03	Average
0.53	26.68	9.49	0.01	36.18	56.00	-19.82	QP
0.53	26.48	9.49	0.01	35.98	46.00	-10.02	Average
0.63	28.87	9.50	0.02	38.39	56.00	-17.61	QP
0.63	18.10	9.50	0.02	27.62	46.00	-18.38	Average
0.84	26.37	9.49	0.03	35.89	56.00	-20.11	QP
0.84	18.17	9.49	0.03	27.69	46.00	-18.31	Average
2.11	7.32	9.60	0.05	16.97	56.00	-39.03	QP
2.11	1.85	9.60	0.05	11.50	46.00	-34.50	Average
8.73	36.51	9.31	0.10	45.92	60.00	-14.08	QP
8.73	7.80	9.31	0.10	17.21	50.00	-32.79	Average

Neutral:



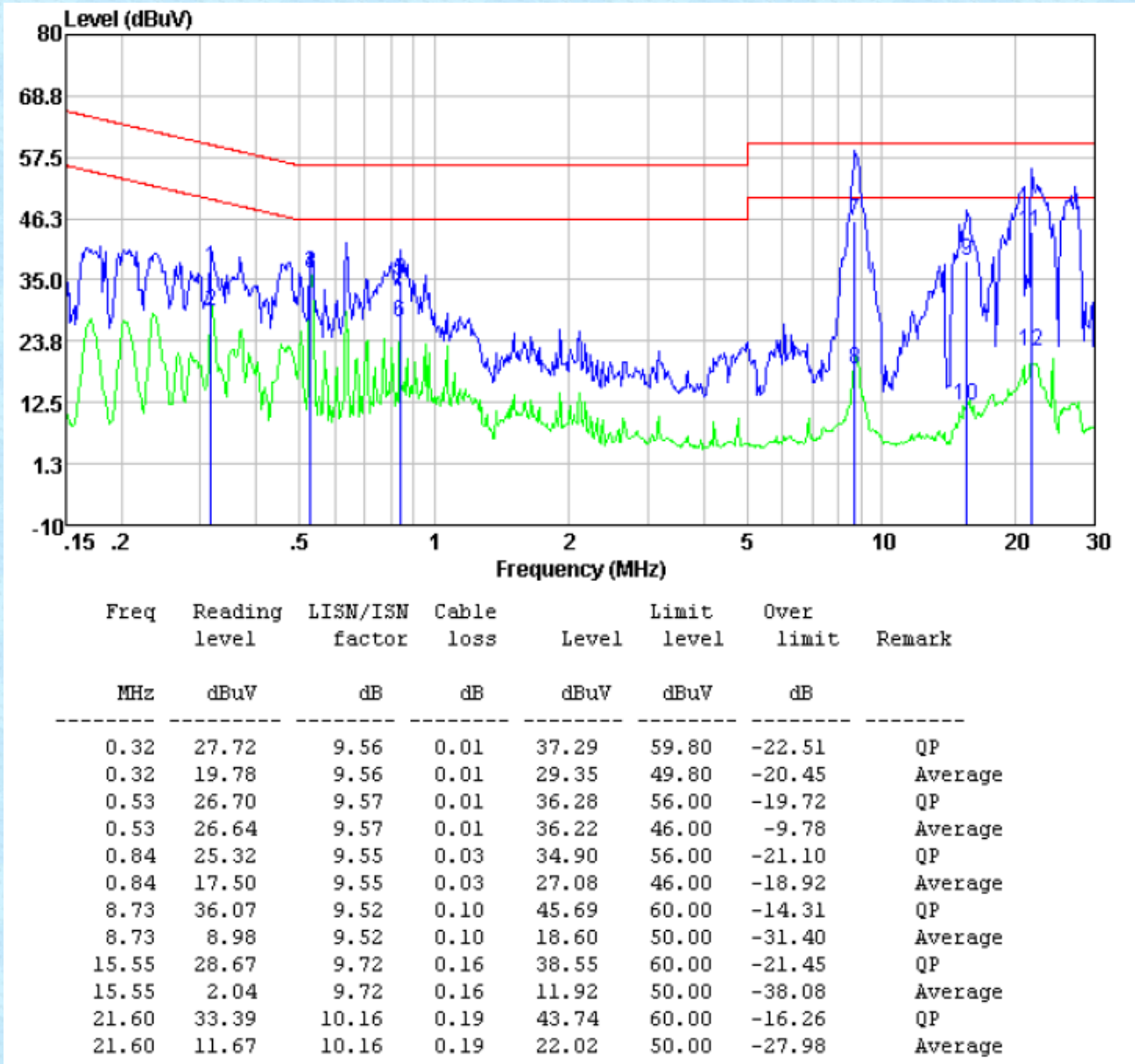
Model: TSEA240V/48AUS-ZRGECP-C

Line:



Freq	Reading level	LISN/ISN factor	Cable loss	Level	Limit level	Over limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.37	23.39	9.49	0.01	32.89	58.47	-25.58	QP
0.37	15.70	9.49	0.01	25.20	48.47	-23.27	Average
0.53	27.00	9.49	0.01	36.50	56.00	-19.50	QP
0.53	26.76	9.49	0.01	36.26	46.00	-9.74	Average
0.63	28.84	9.50	0.02	38.36	56.00	-17.64	QP
0.63	18.07	9.50	0.02	27.59	46.00	-18.41	Average
1.20	12.07	9.52	0.03	21.62	56.00	-34.38	QP
1.20	3.93	9.52	0.03	13.48	46.00	-32.52	Average
8.73	35.82	9.31	0.10	45.23	60.00	-14.77	QP
8.73	6.48	9.31	0.10	15.89	50.00	-34.11	Average
21.60	31.66	10.00	0.19	41.85	60.00	-18.15	QP
21.60	8.07	10.00	0.19	18.26	50.00	-31.74	Average

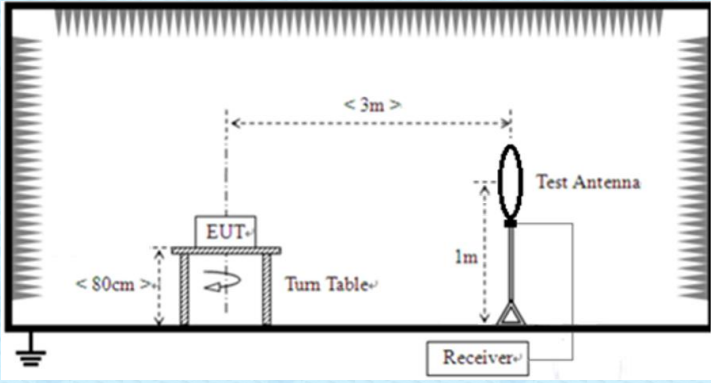
Neutral:



Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
Final Level = Receiver Read level + LISN Factor + Cable Loss

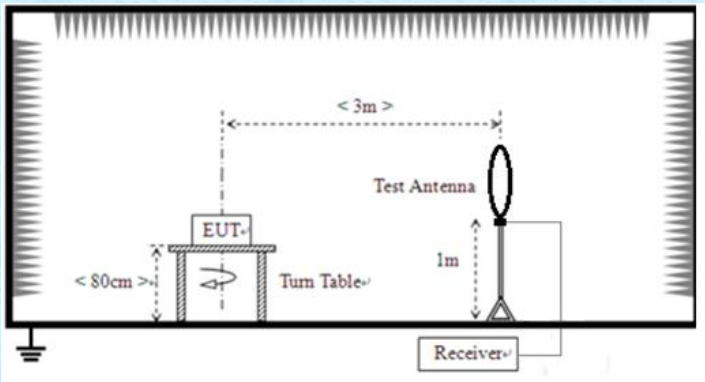
7.3 Field Strength of Fundamental Emissions and Mask Measurement

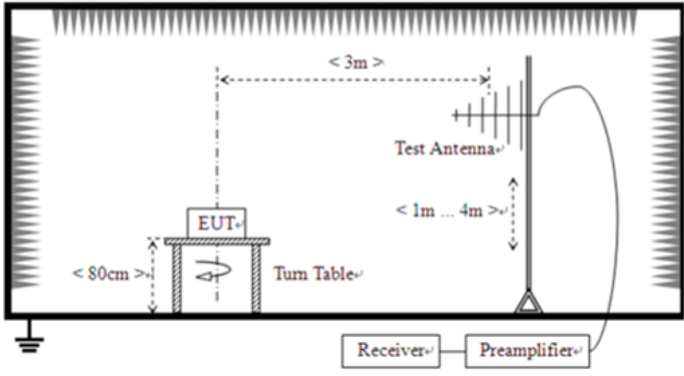
Test Requirement:	FCC Part15 C Section 15.225(a)(b)(c)																		
Test Method:	ANSI C63.10:2013 & ANSI C63.4: 2014																		
Test site:	Measurement Distance: 3m																		
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=Auto																		
limit:	FCC Part 15.225 & 15.209																		
	<table border="1"> <thead> <tr> <th>Frequencies(MHz)</th> <th>Limit at 30m(dBuV/m)</th> <th>Limit at 3m(dBuV/m)</th> </tr> </thead> <tbody> <tr> <td>13.110-13.410</td> <td>40.50</td> <td>80.50</td> </tr> <tr> <td>13.410-13.553</td> <td>50.50</td> <td>90.50</td> </tr> <tr> <td>13.553-13.567</td> <td>84.00</td> <td>124.00</td> </tr> <tr> <td>13.567-13.710</td> <td>50.50</td> <td>90.50</td> </tr> <tr> <td>13.710-14.010</td> <td>40.50</td> <td>80.50</td> </tr> </tbody> </table>	Frequencies(MHz)	Limit at 30m(dBuV/m)	Limit at 3m(dBuV/m)	13.110-13.410	40.50	80.50	13.410-13.553	50.50	90.50	13.553-13.567	84.00	124.00	13.567-13.710	50.50	90.50	13.710-14.010	40.50	80.50
	Frequencies(MHz)	Limit at 30m(dBuV/m)	Limit at 3m(dBuV/m)																
	13.110-13.410	40.50	80.50																
	13.410-13.553	50.50	90.50																
	13.553-13.567	84.00	124.00																
13.567-13.710	50.50	90.50																	
13.710-14.010	40.50	80.50																	
Test setup:	 <p>The diagram illustrates the test setup. An Equipment Under Test (EUT) is placed on a turn table. A test antenna is positioned at a distance of 3m from the EUT. The antenna is mounted on a stand that is 1m high. A receiver is connected to the antenna. The distance from the EUT to the antenna is labeled as <math>\langle 3m \rangle</math>. The distance from the EUT to the antenna is also labeled as <math>\langle 80cm \rangle</math>. The antenna is labeled as 'Test Antenna' and the receiver is labeled as 'Receiver'.</p>																		
Test Instruments:	Refer to section 6.0 for details																		
Test mode:	Refer to section 5.2 for details																		
Test results:	Pass																		

Measurement data:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
13.56	24.32	20.57	0.51	45.40	124	-78.60	PK

7.4 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.225(d) and 15.209																												
Test Method:	ANSI C63.10: 2013 & ANSI C63.4: 2014																												
Test Frequency Range:	9KHz to 1000MHz																												
Test site:	Measurement Distance: 3m																												
Receiver setup:	Frequency	Detector	RBW	VBW	Remark																								
	9kHz-150kHz	Quasi-peak	200Hz	300Hz	Quasi-peak Value																								
	150kHz-30MHz	Quasi-peak	9kHz	10kHz	Quasi-peak Value																								
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value																								
FCC Limit:	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>Field strength (microvolts/meter)</th> <th>Measurement distance (meters)</th> </tr> </thead> <tbody> <tr> <td>0.009-0.490</td> <td>2400/F(kHz)</td> <td>300</td> </tr> <tr> <td>0.490-1.705</td> <td>24000/F(kHz)</td> <td>30</td> </tr> <tr> <td>1.705-30.0</td> <td>30</td> <td>30</td> </tr> <tr> <td>30-88</td> <td>100**</td> <td>3</td> </tr> <tr> <td>88-216</td> <td>150**</td> <td>3</td> </tr> <tr> <td>216-960</td> <td>200**</td> <td>3</td> </tr> <tr> <td>Above 960</td> <td>500</td> <td>3</td> </tr> </tbody> </table> <p>The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p>					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
	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																											
Test setup:	<p>Below 30MHz</p>  <p>Above 30MHz</p>																												

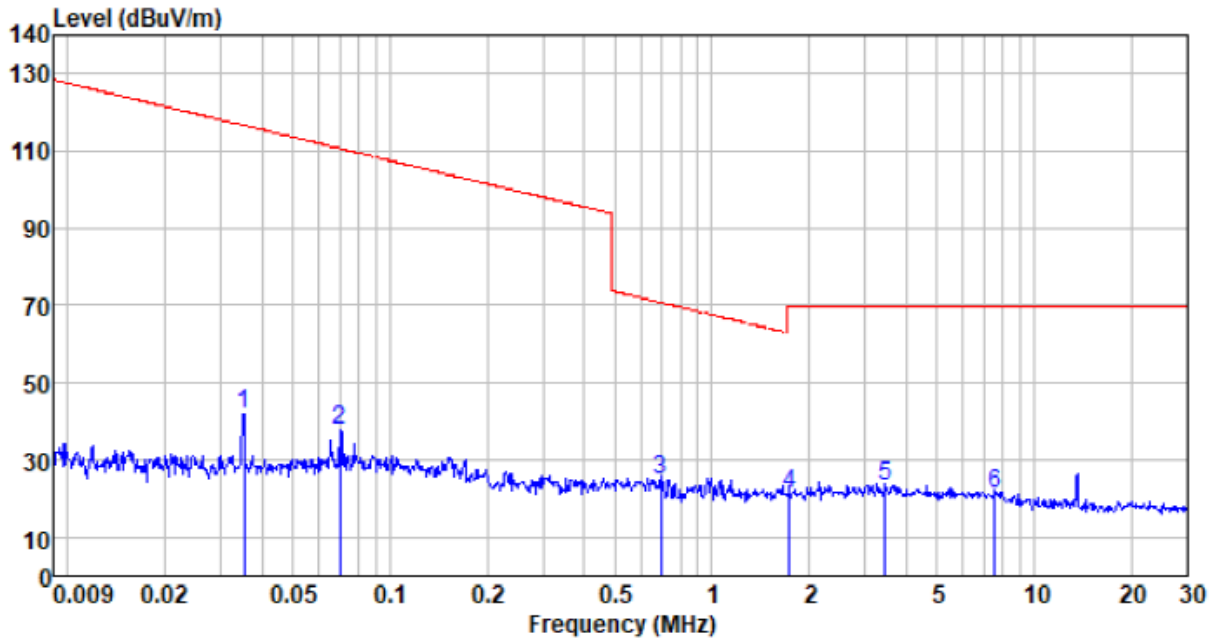
					
Test Instruments:	Refer to section 6.0 for details				
Test mode:	Refer to section 5.2 for details				
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.: 1012mbar
Test voltage:	AC 120V				
Test results:	Pass				

Measurement data:

■ 9kHz~30MHz

the radiation emission more than 20dB below the limit.

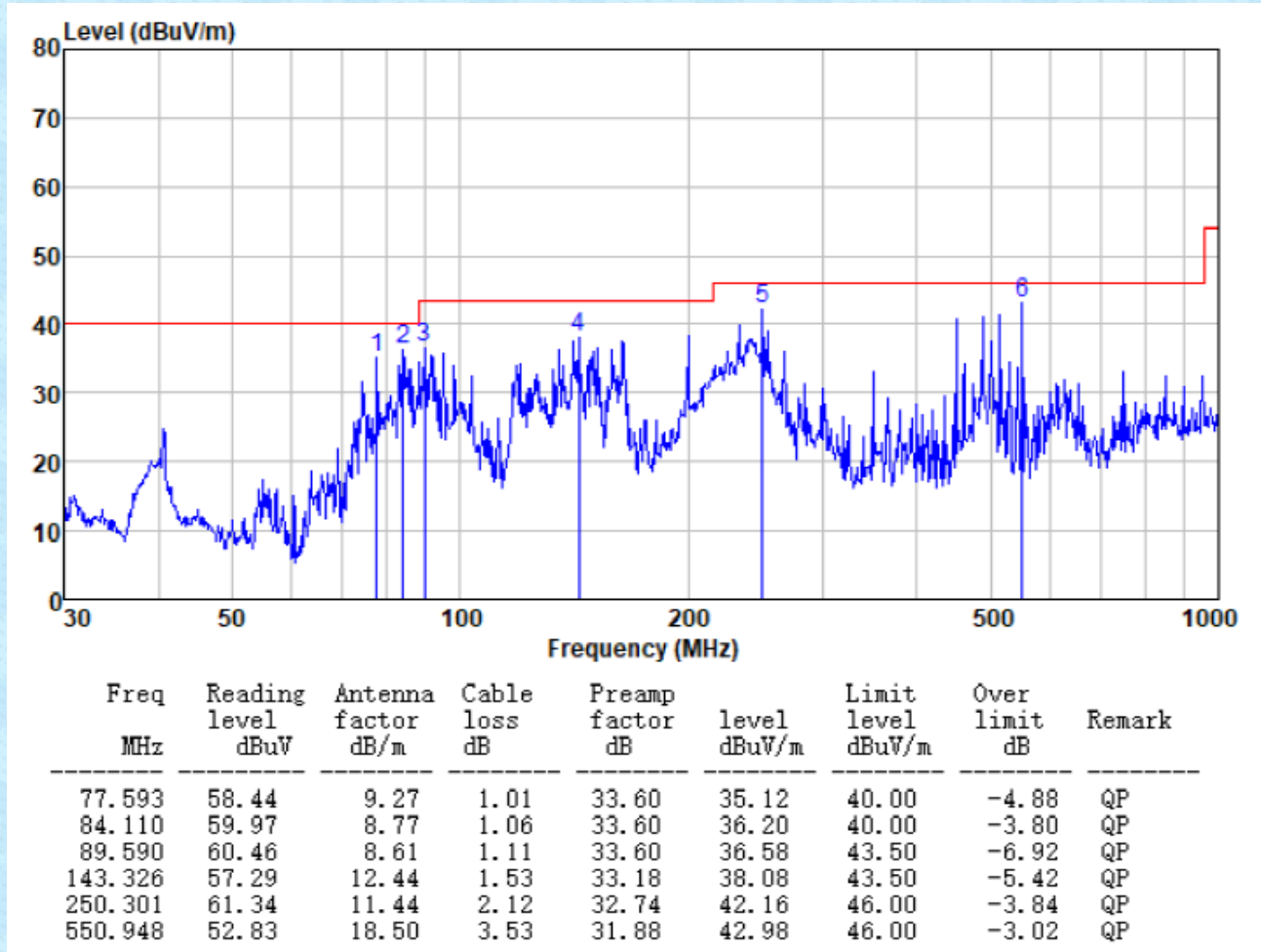
Model: TSEA240V/80AUS-ZRGECP-C



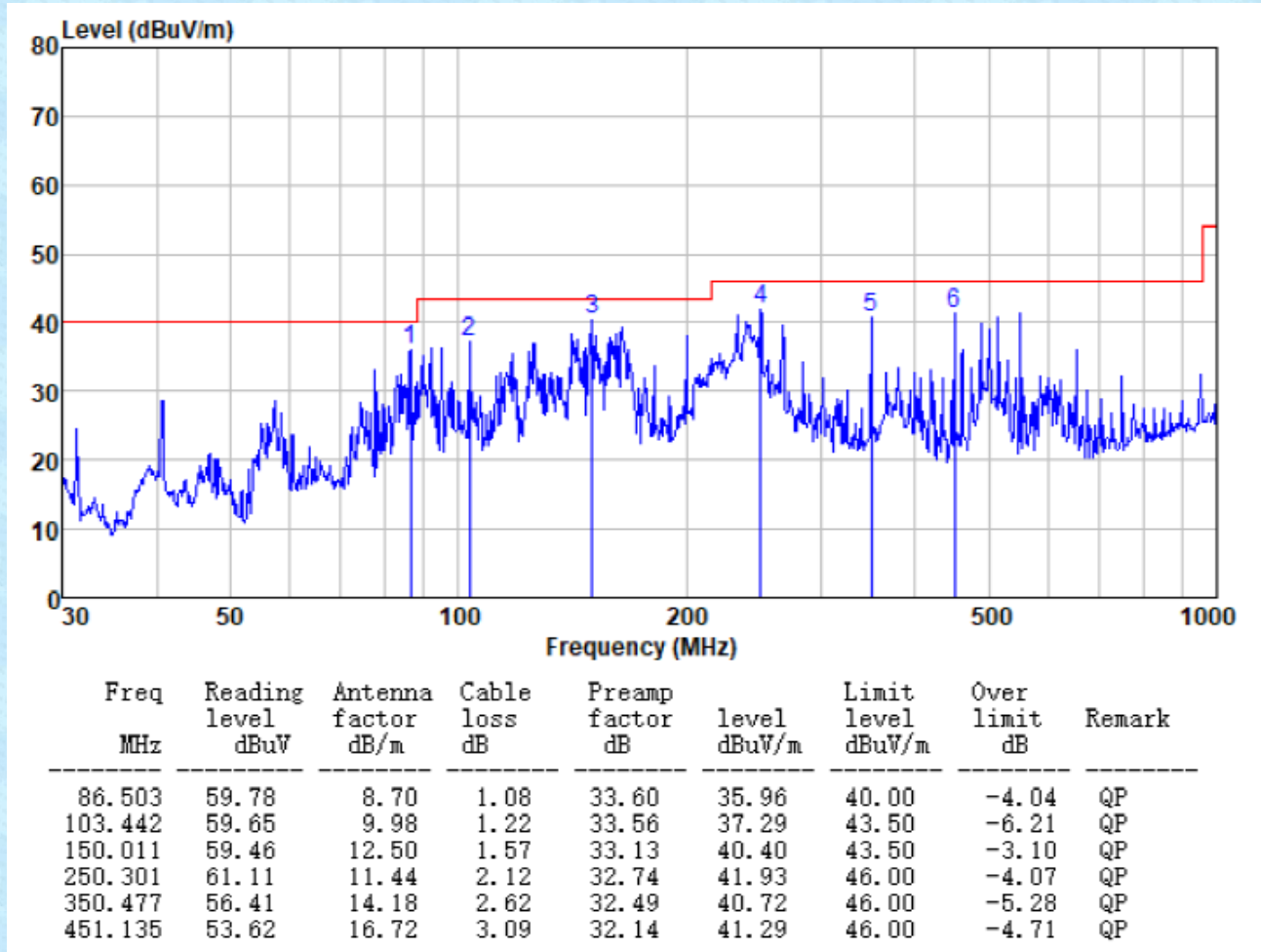
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
0.035	20.77	21.00	0.09	0.00	41.86	116.68	-74.82	Peak
0.070	17.04	20.70	0.14	0.00	37.88	110.69	-72.81	Peak
0.696	3.88	20.45	0.30	0.00	24.63	70.75	-46.12	QP
1.740	0.23	20.70	0.36	0.00	21.29	69.54	-48.25	QP
3.440	1.63	20.95	0.41	0.00	22.99	69.54	-46.55	QP
7.555	0.03	20.67	0.46	0.00	21.16	69.54	-48.38	QP

■ 30MHz~1GHz

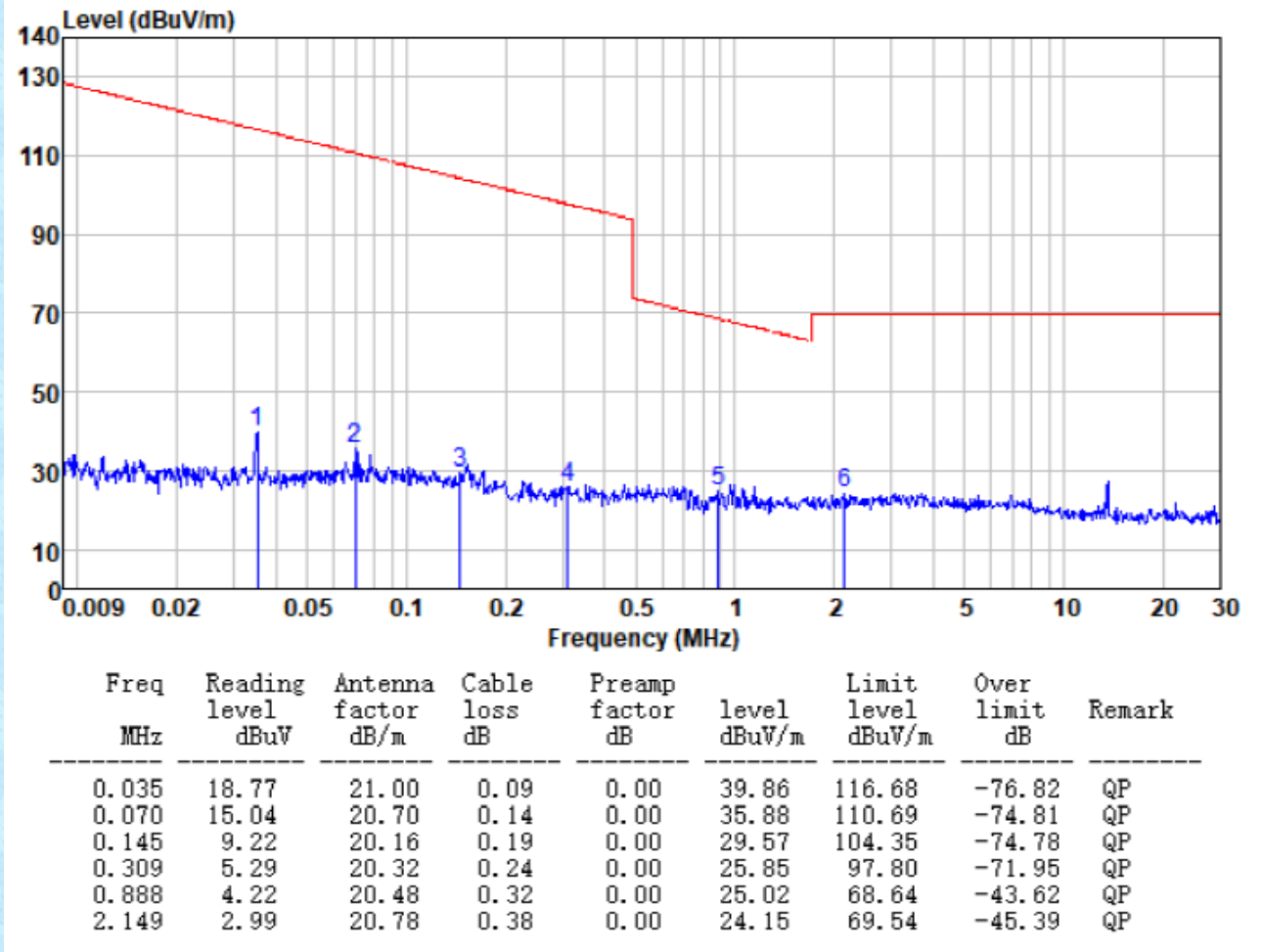
Horizontal:



Vertical:

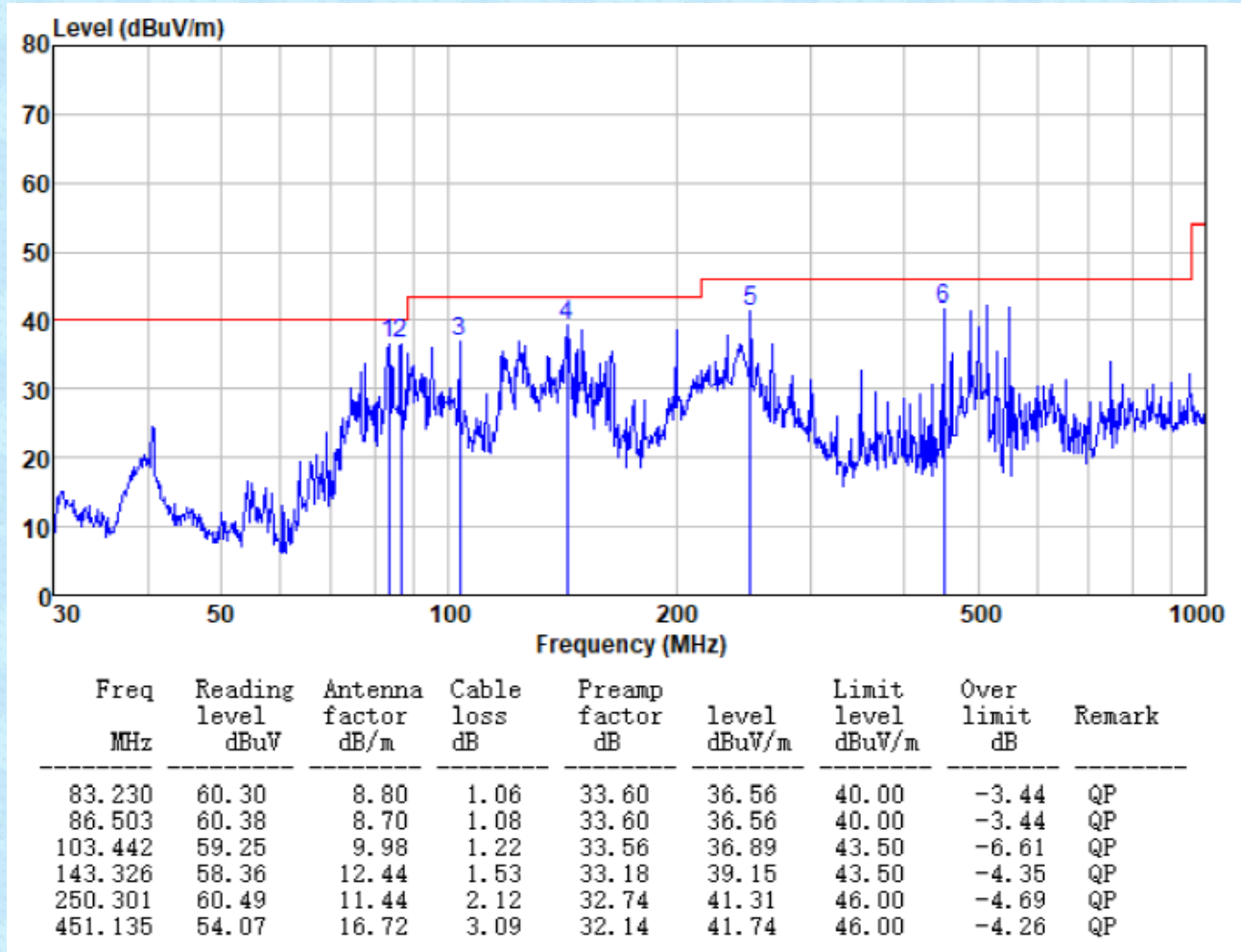


Model: TSEA240V/48AUS-ZRGECP-C

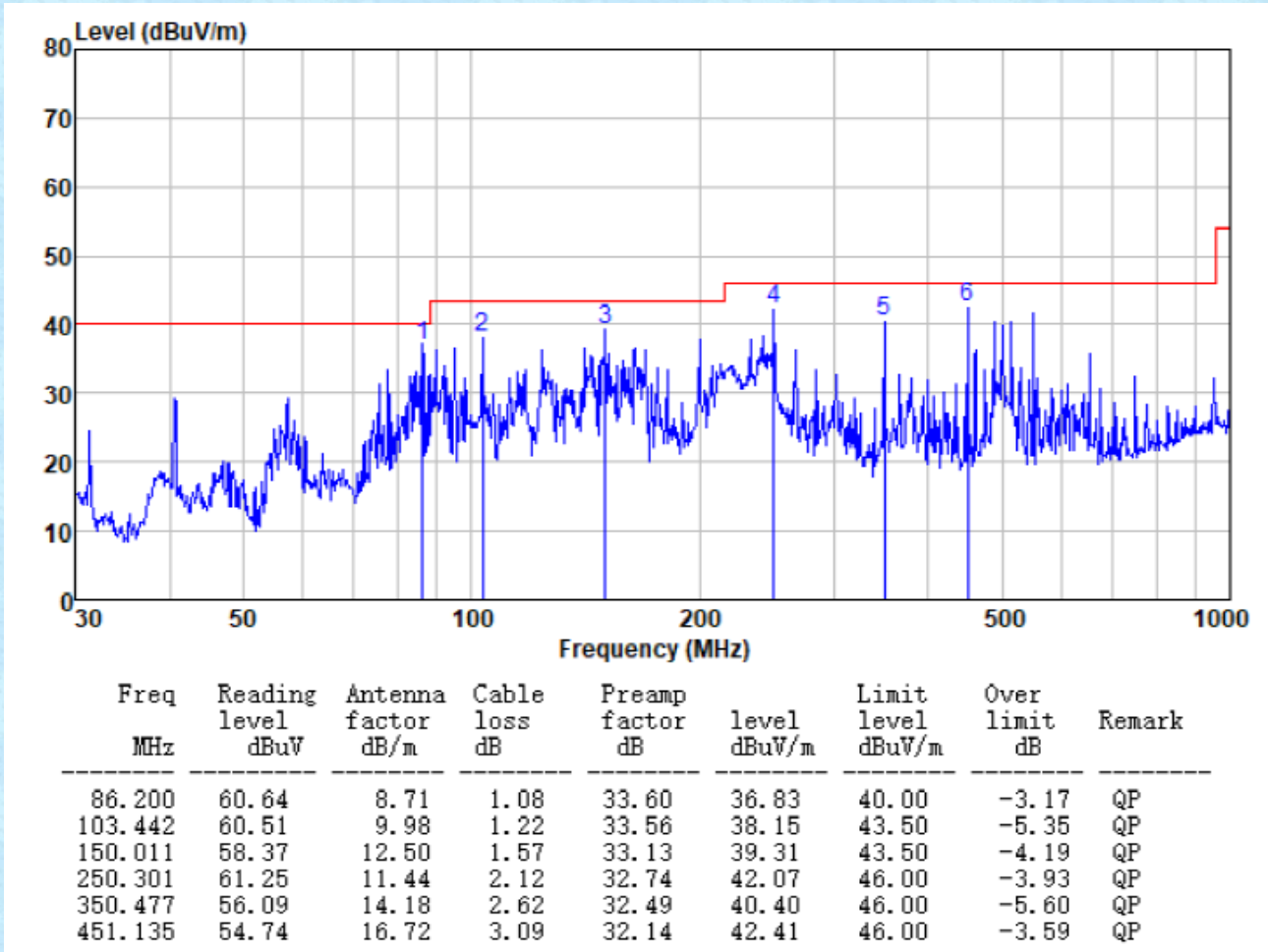


■ 30MHz~1GHz

Horizontal:



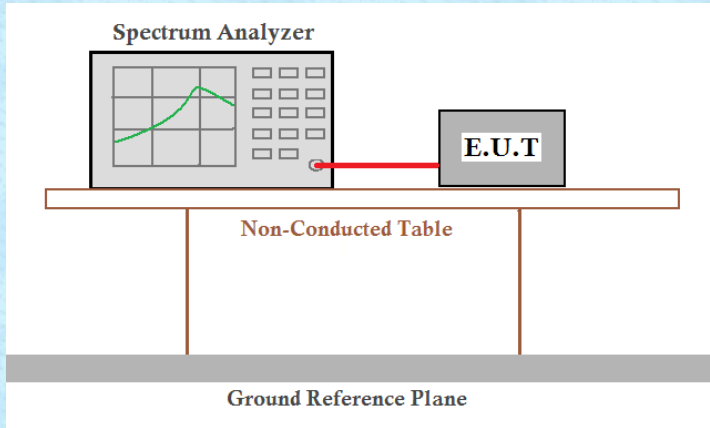
Vertical:



Remarks:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor

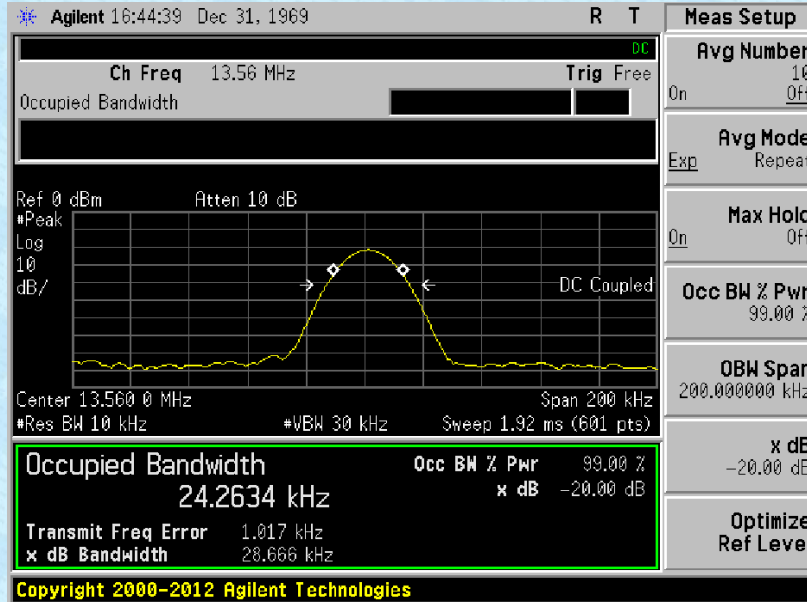
7.5 Channel Bandwidth

Test Requirement:	FCC Part15 C Section 15.225 and 15.215
Test Method:	ANSI C63.10:2013
Limit:	N/A
Test Procedure:	<ol style="list-style-type: none"> 1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set the EUT to proper test channel. 3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points. 4. Read 20dB bandwidth & 99%bandwidth.
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

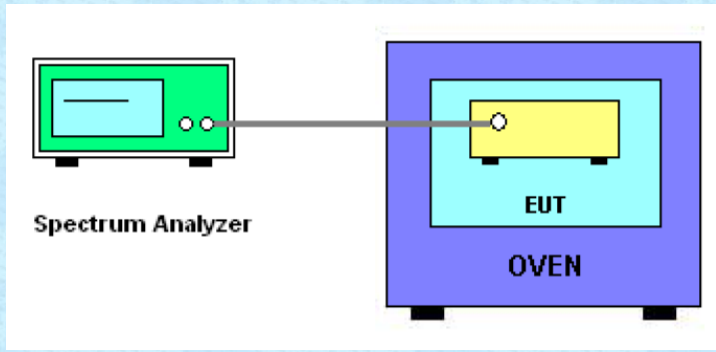
Measurement Data

Test frequency (MHz)	20dB bandwidth(KHz)	Result
13.56	28.666	Pass

Test plot as follows:



7.6 Frequency Stability Measurement

Test Requirement:	FCC Part15 C Section 15.225 (e)
Test Method:	ANSI C63.10: 2013
Receiver setup:	RBW=1KHz, VBW=1KHz, Sweep time=Auto
Limit:	<p>The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage,</p> <p>for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.</p> <p>For battery operated equipment, the equipment tests shall be performed using a new battery.</p>
Test setup:	 <p>The diagram illustrates the test setup. On the left is a green Spectrum Analyzer. A cable connects its output to the input of a yellow EUT (Equipment Under Test) which is housed inside a blue Oven. The labels 'Spectrum Analyzer', 'EUT', and 'OVEN' are placed below their respective components.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

Reference Frequency: 13.56MHz					
Power supplied (Vac)	Temperature (°C)	Frequency error		Limit	Result
		Hz	%		
240	-20	91	0.0003	+/- 0.01%	Pass
	-10	82	0.0004		
	0	80	0.0005		
	10	57	0.0004		
	20	47	0.0005		
	30	56	0.0005		
	40	45	0.0004		
	50	79	0.0005		

Reference Frequency: 13.56MHz					
Temperature (°C)	Power supplied (Vac)	Frequency error		Limit	Result
		Hz	Ppm		
20	90	184	0.0012	+/- 0.01%	Pass
	110	121	0.0008		

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

----- End -----