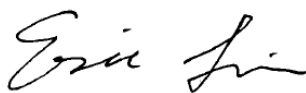


TEST REPORT

Application No.: KSCR2204000503AT
FCC ID: 2AH25T6820
IC: 22621-T6820
Applicant: Shanghai Sunmi Technology Co.,Ltd.
Address of Applicant: Room 505, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai, China
Manufacturer: Shanghai Sunmi Technology Co.,Ltd.
Address of Manufacturer: Room 505, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai, China
Equipment Under Test (EUT):
EUT Name: Smart POS system
Model No.: T6820
Standard(s) : 47 CFR Part 15, Subpart C 15.225
RSS-210 Issue 10 Amendment (April 2020)
RSS-Gen Issue 5 Amendment 2 (February 2021)
Date of Receipt: 2022-05-18
Date of Test: 2022-05-30 to 2022-06-16
Date of Issue: 2022-06-23

Test Result:	Pass*
---------------------	--------------

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



Eric Lin
EMC Laboratory Manager



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2022-06-23		Original

Authorized for issue by:				
		Damon Zhou		
		Damon_Zhou/Project Engineer		
		Eric Lin		
		Eric Lin/Reviewer		



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2 Test Summary

Radio Spectrum Technical Requirement				
Item	FCC Requirement	IC Requirement	Method	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.225	N/A	RSS-210 Issue 10 Amendment (April 2020)	Customer Declaration

Radio Spectrum Matter Part				
Item	FCC Requirement	IC Requirement	Method	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.225	RSS-210 Issue 10 Amendment (April 2020)	ANSI C63.10 (2013) Section 6.2	Pass
20dB Bandwidth	47 CFR Part 15, Subpart C 15.225	RSS-210 Issue 10 Amendment (April 2020)	ANSI C63.10 (2013) Section 6.9	Pass
Emission Mask	47 CFR Part 15, Subpart C 15.225	RSS-210 Issue 10 Amendment (April 2020)	ANSI C63.10 (2013) Section 6.4	Pass
Frequency tolerance	47 CFR Part 15, Subpart C 15.225	RSS-210 Issue 10 Amendment (April 2020)	ANSI C63.10 (2013) Section 6.8	Pass
Radiated Emissions(9kHz-30MHz)	47 CFR Part 15, Subpart C 15.225	RSS-210 Issue 10 Amendment (April 2020)	ANSI C63.10 (2013) Section 6.4&6.5	Pass
Radiated Emissions(30MHz-1GHz)	47 CFR Part 15, Subpart C 15.225	RSS-210 Issue 10 Amendment (April 2020)	ANSI C63.10 (2013) Section 6.4&6.5	Pass
99% Bandwidth	-	RSS-210 Issue 10 Amendment (April 2020)	RSS-Gen Section 6.7	Pass

Note:

Products are classified as Scanner version and non- Scanner version. they are the identical in electrical and electronic characters.

There are two different supplies. The differences of supply mainly include the following: LCM, Camera, loudspeaker, PCB, button cell, rear camera lens, scanner lens.

SKU1 stand for Scanner version with the first supplier.

SKU2 stand for Scanner version with the second supplier.

SKU3 stand for non- Scanner version the first supplier.

SKU4 stand for non- Scanner version the second supplier.

After Pre-scan test. Only SKU1 was tested since their differences.



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 7.2V by Rechargeable Li-ion Battery charged by Adapter Battery Model: LKPA Nominal voltage:7.2V Limited charge voltage:8.4V Rated capacity:2500mAh/18Wh Typical capacity:2600mAh/18.72Wh Adapter Model 1: UC13US INPUT:100-240V,50/60Hz,0.35A OUTPUT:5V,2A Adapter Model 2: UC11US INPUT:100-240V,50/60Hz,0.2A OUTPUT:5V,1A Adapter Model 3: TPA-46B050100UU INPUT:100-240V,50/60Hz,0.2A OUTPUT:5V,1A Adapter Model 4: TPA-23A050200UU01 INPUT:100-240V,50/60Hz,0.3A OUTPUT:5V,2A
Test Voltage:	DC 7.2V Remark: (Only AC 120V 60Hz by AC adapter for Conducted Emission test)
Operation Frequency:	13.56MHz
Modulation Type:	ASK
Number of Channel:	1
Firmware Version:	SP6228A_V11_20220501_sunmi
Serial Number:	1T247ESJQG004Q5

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
/	/	/	/
The EUT has been tested as an independent unit.			



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4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4×10^{-8}
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
8	RF Radiated Power	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
9	Radiated Spurious Emission Test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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4.4 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

Note:

- 1.SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal frequency, antenna gain, cable loss, etc) is provided by the applicant. (if applicable).
- 2.SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (if applicable).

4.5 Test Facility

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

- **CNAS (No. CNAS L4354)**

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 2541.01)**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

- **FCC (Designation Number: CN1172)**

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory.

Designation Number: CN1172.

- **ISED (CAB identifier: CN0072)**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 2324E

- **VCCI (Member No.: 1938)**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

4.6 Deviation from Standards

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4.7 Abnormalities from Standard Conditions

None



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5 Equipment List

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
Conducted Emission at Mains Terminals (150kHz-30MHz)						
1	EMI Test Receive	R&S	ESCI	KS301101	01/22/2022	01/21/2023
2	LISN	R&S	ENV216	KS301197	01/22/2022	01/21/2023
3	LISN	Schwarzbeck	NNLK 8129	KS301091	01/22/2022	01/21/2023
4	Pulse Limiter	R&S	ESH3-Z2	KUS1902E001	01/22/2022	01/21/2023
5	CE test Cable	Thermax	/	CZ301102	11/14/2021	11/13/2022
6	Test Software	Farad	EZ-EMC	/	N.C.R	N.C.R
RF Conducted Test						
1	Spectrum Analyzer	Keysight	N9020A	KUS1911E004-2	10/11/2021	10/10/2022
2	Spectrum Analyzer	Keysight	N9020A	KUS2001M001-2	09/17/2021	09/16/2022
3	Spectrum Analyzer	Keysight	N9030B	KSEM021-1	01/22/2022	01/21/2023
4	Signal Generator	R&S	SMW200A	KSEM020-1	10/12/2021	10/11/2022
5	Signal Generator	Agilent	N5182A	KUS2001M001-1	08/27/2021	08/26/2022
6	Radio Communication Test Station	Anritsu	MT8000A	KSEM001-1	09/23/2021	09/22/2022
7	Radio Communication Analyzer	Anritsu	MT8821C	KSEM002-1	04/01/2022	03/31/2023
8	Universal Radio Communication Tester	R&S	CMW500	KUS1911E004-1	10/12/2021	10/11/2022
9	Switcher	CCSRF	FY562	KUS2001M001-3	10/12/2021	10/11/2022
10	AC Power Source	EXTECH	6605	KS301178	N.C.R	N.C.R
11	DC Power Supply	Aglient	E3632A	KS301180	N.C.R	N.C.R
12	Conducted Test Cable	Thermax	RF01-RF04	CZ301111-CZ301120	01/16/2022	01/15/2023
13	Temp. / Humidity Chamber	TERCHY	MHK-120AK	KS301190	04/01/2021	03/31/2023
14	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-5	04/01/2021	03/31/2023
15	Software	BST	TST-PASS	/	N/A	N/A
RF Radiated Test						
1	Spectrum Analyzer	R&S	FSV40	KUS1806E003	10/11/2021	10/10/2022
2	Universal Radio Communication Tester	R&S	CMW500	KSEM009-1	04/01/2022	03/31/2023
3	Signal Generator	Agilent	E8257C	KS301066	10/18/2021	10/17/2022
4	Loop Antenna	COM-POWER	AL-130R	KUS1806E001	04/13/2021	04/12/2023
5	Bilog Antenna	TESEQ	CBL 6112D	KUS1806E005	06/29/2021	06/28/2023
6	Bilog Antenna	SCHWARZBECK	VULB9160	CZ301016	04/13/2021	04/12/2024
7	Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	KS301079	10/26/2020	10/25/2022
8	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	KS301186	02/22/2021	02/21/2023



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9	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	CZ301058	03/22/2022	03/21/2023
10	Amplifier(30MHz~18GHz)	PANSHAN TECHNOLOGY	LNA:1~18G	KSEM010-1	01/22/2022	01/21/2023
11	Amplifier(18~40GHz)	COM-POWER	PAM-840A	KUS1710E001	01/22/2022	01/21/2023
12	RE Test Cable	REBES MICROWAVE	/	CZ301097	11/14/2021	11/13/2022
13	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-4	01/04/2022	31/03/2023
14	Software	Faratronic	EZ_EMC-v 3A1	/	N/A	N/A



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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 loop antenna integrated on the main PCB and no consideration of replacement.

Antenna location: Refer to Appendix (Internal Photos)



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7 Radio Spectrum Matter Test Results

7.1 20dB Bandwidth

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

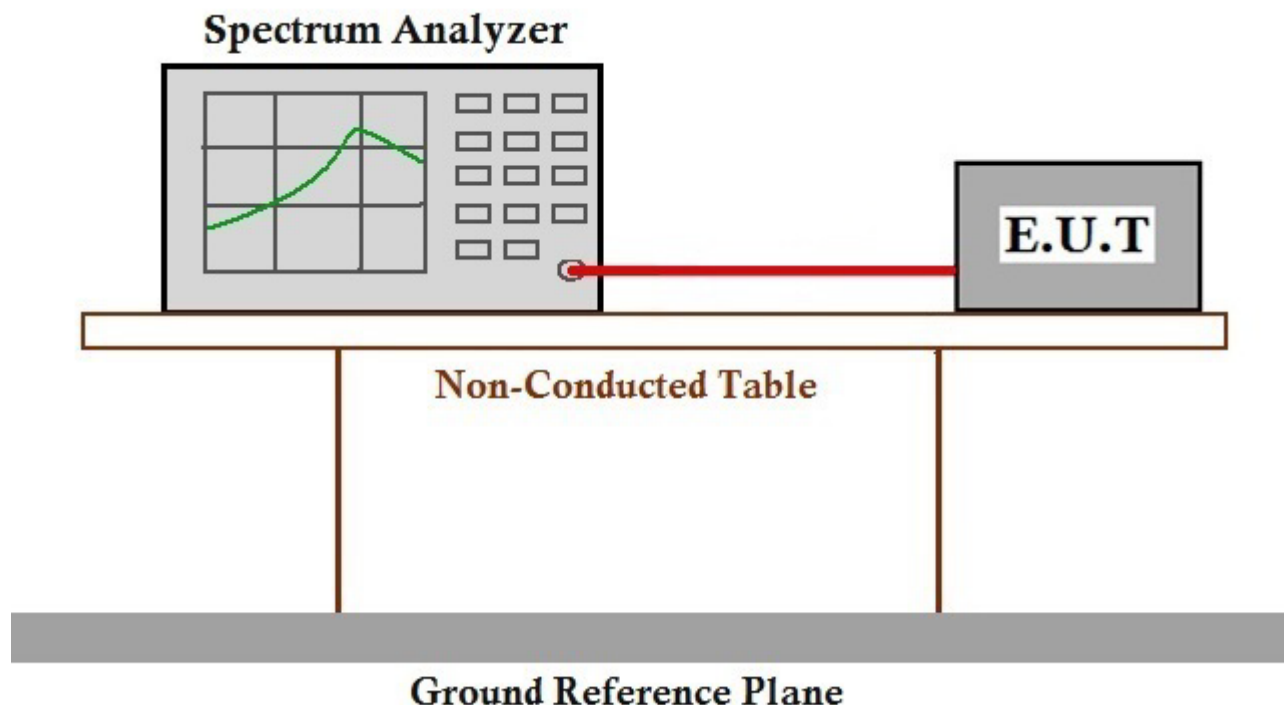
7.1.1 E.U.T. Operation

Operating Environment:
Temperature: 23.7 °C Humidity: 48.1 % RH Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode with modulation

7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data



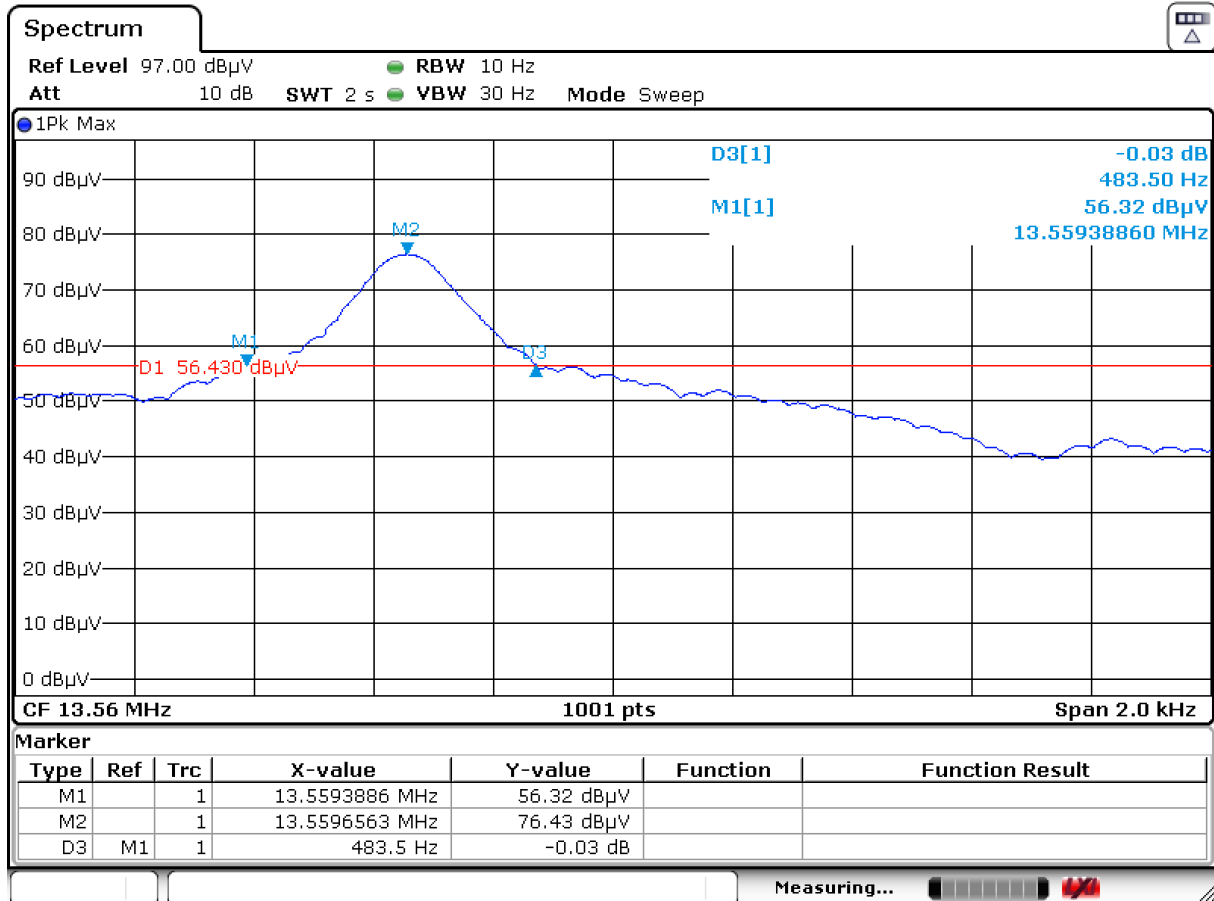
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20dB bandwidth (kHz)	F _L (MHz)	F _H (MHz)	Limit(MHz)	Result
0.4835	13.5594	13.5599	13.110 – 14.010	Pass

Test plot as follows:



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7.2 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

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

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.

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: °C Humidity: % RH Atmospheric Pressure: mbar

7.2.1 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode with modulation by adapter 1.
	01	TX mode with modulation by adapter 2.
	02	TX mode with modulation by adapter 3.
	03	TX mode with modulation by adapter 4.
Final	03	TX mode with modulation by adapter 1.



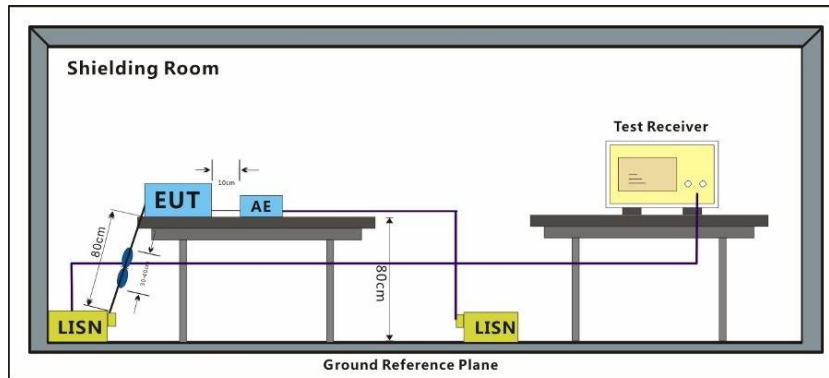
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7.2.2 Test Setup Diagram



7.2.3 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 + 50hm 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



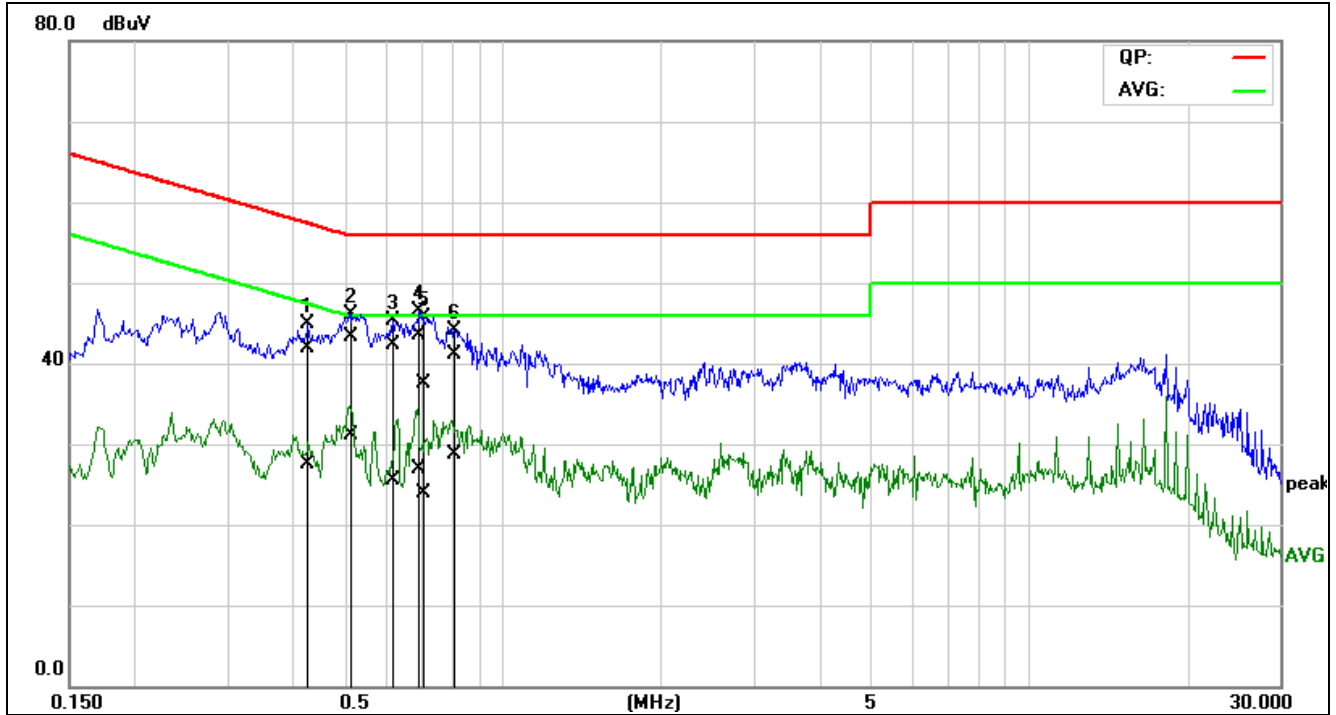
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Test Mode: 03; Line: Live line



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.4260	22.31	7.98	19.54	41.85	27.52	57.33	47.33	-15.48	-19.81	Pass
2	0.5180	23.80	11.49	19.56	43.36	31.05	56.00	46.00	-12.64	-14.95	Pass
3	0.6180	22.67	5.84	19.57	42.24	25.41	56.00	46.00	-13.76	-20.59	Pass
4*	0.6940	24.00	7.39	19.57	43.57	26.96	56.00	46.00	-12.43	-19.04	Pass
5	0.7100	18.01	4.27	19.57	37.58	23.84	56.00	46.00	-18.42	-22.16	Pass
6	0.8100	21.47	9.17	19.58	41.05	28.75	56.00	46.00	-14.95	-17.25	Pass



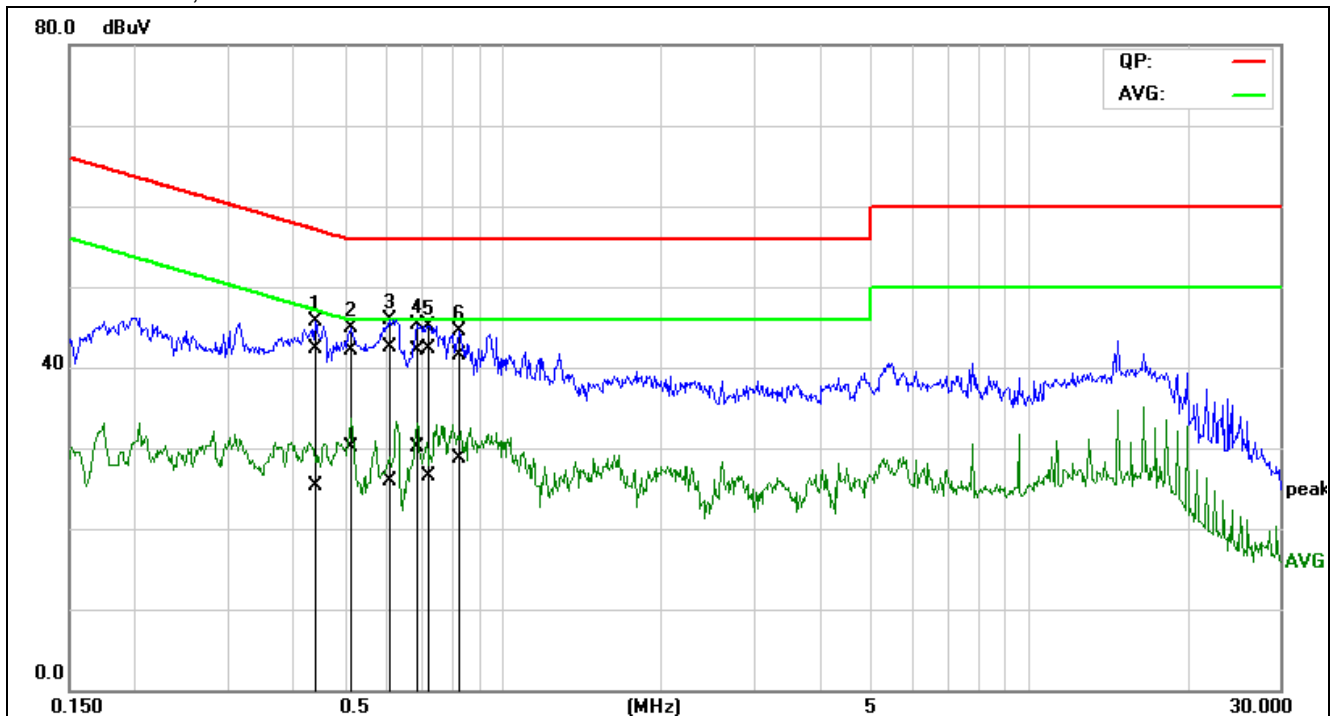
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Test Mode: 03; Line: Neutral Line



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.4420	22.81	5.78	19.55	42.36	25.33	57.02	47.02	-14.66	-21.69	Pass
2	0.5180	22.45	10.49	19.56	42.01	30.05	56.00	46.00	-13.99	-15.95	Pass
3*	0.6100	22.97	6.38	19.57	42.54	25.95	56.00	46.00	-13.46	-20.05	Pass
4	0.6863	22.54	10.48	19.57	42.11	30.05	56.00	46.00	-13.89	-15.95	Pass
5	0.7220	22.79	6.90	19.57	42.36	26.47	56.00	46.00	-13.64	-19.53	Pass
6	0.8300	22.00	9.11	19.58	41.58	28.69	56.00	46.00	-14.42	-17.31	Pass



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7.3 Emission Mask

Test Requirement 47 CFR Part 15, Subpart C 15.225(a)&(b)&(C)
 Test Method: ANSI C63.10 (2013) Section 6.4

Limit:

- (a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

Below 30MHz

The limit at 30m test distance is below:

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

where

FS_{limit} is the calculation of field strength at the limit distance, expressed in dBμV/m
 FS_{max} is the measured field strength, expressed in dBμV/m
 d_{measure} is the distance of the measurement point from the EUT
 d_{limit} is the reference distance or the distance of the $\lambda/2\pi$ point

The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 84dBμV/m at 30 meters.

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23.7 °C Humidity: 47.5 % RH Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode with modulation



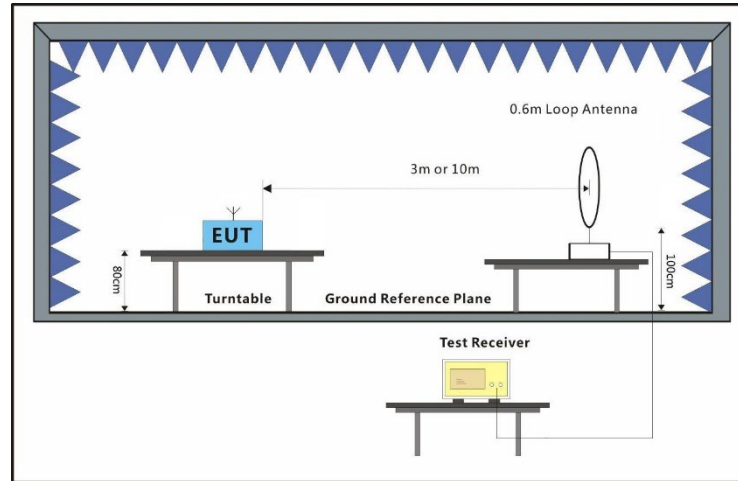
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7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

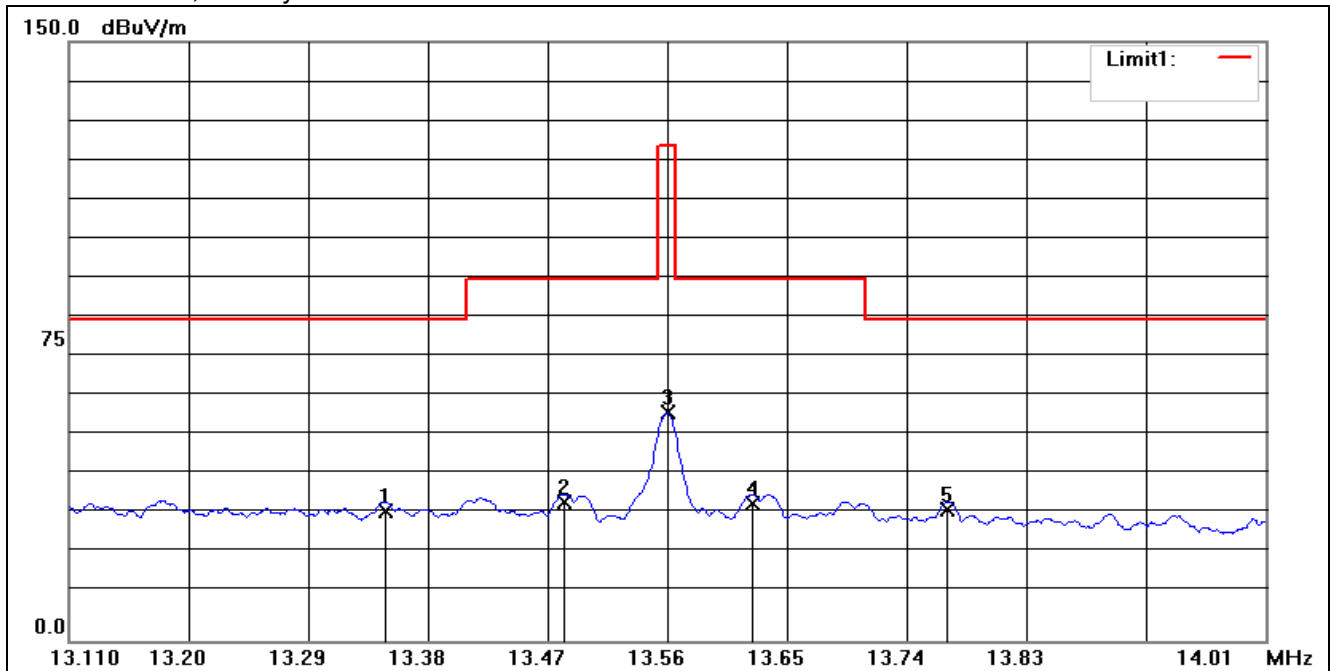


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Test Mode: 04; Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	13.3475	19.42	13.02	32.44	80.50	-48.06	QP
2	13.4825	21.70	13.01	34.71	90.50	-55.79	QP
3	13.5600	44.01	13.00	57.01	124.00	-66.99	peak
4	13.6240	21.43	12.99	34.42	90.50	-56.08	QP
5	13.7705	19.67	12.98	32.65	80.50	-47.85	QP



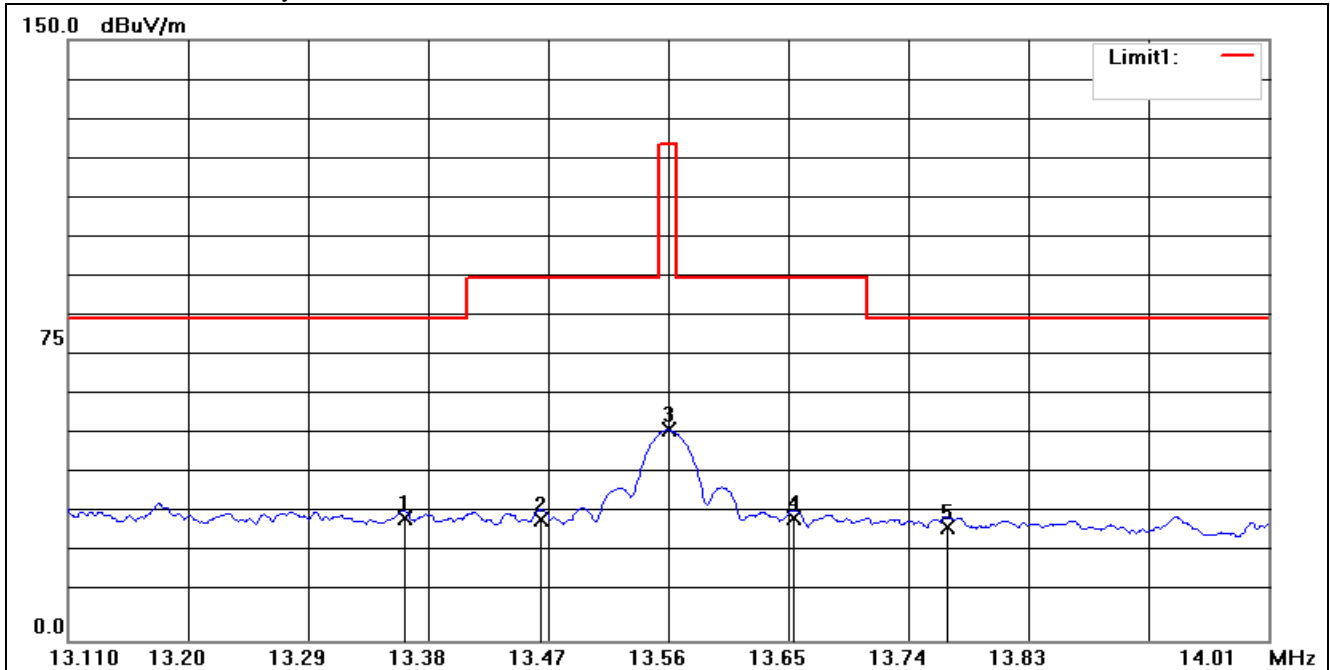
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Test Mode: 04; Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	13.3620	17.42	13.02	30.44	80.50	-50.06	QP
2	13.4646	17.15	13.01	30.16	90.50	-60.34	QP
3	13.5600	39.62	13.00	52.62	124.00	-71.38	peak
4	13.6545	17.57	12.99	30.56	90.50	-59.94	QP
5	13.7688	15.21	12.98	28.19	80.50	-52.31	QP



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7.4 Frequency tolerance

Test Requirement 47 CFR Part 15, Subpart C 15.225(e)

Test Method: ANSI C63.10 (2013) Section 6.8

Limit: $\pm 0.01\%$ (1.3560kHz)

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23.7 °C

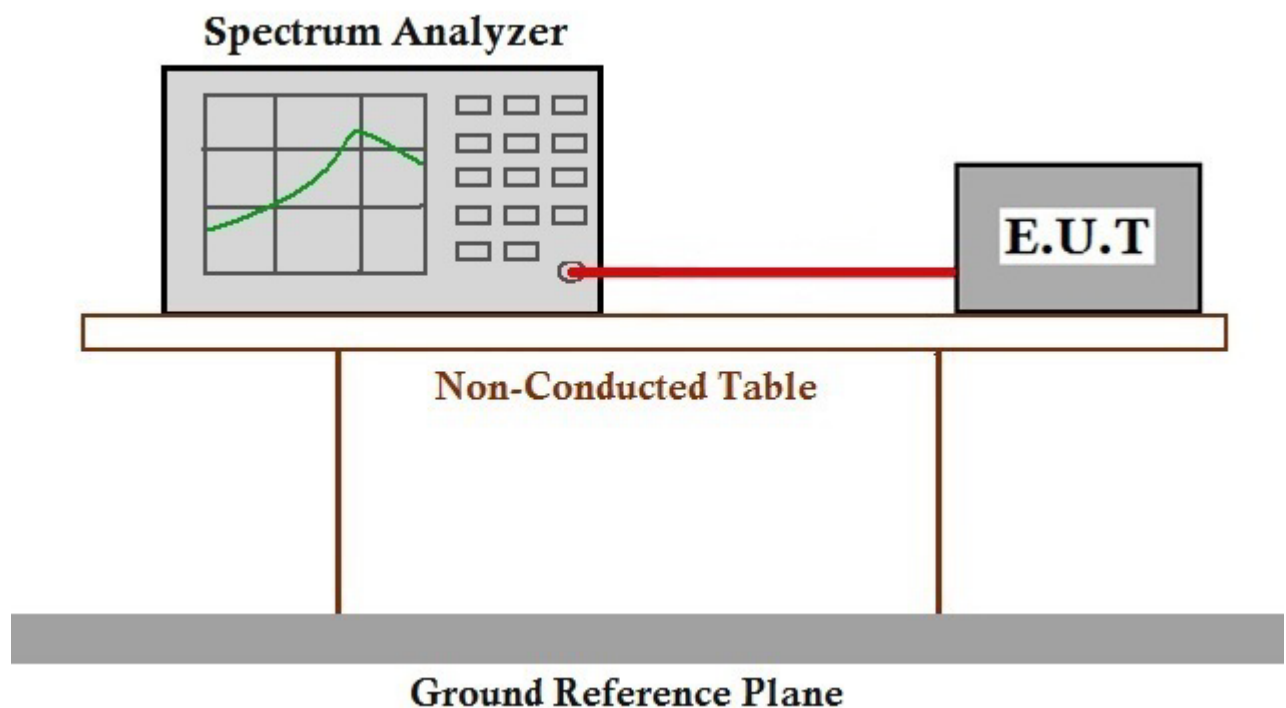
Humidity: 47.6 % RH

Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode with modulation

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

The EUT was placed in an environmental test chamber and powered such that control element received normal voltage and the transmitter provided maximum RF output.



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Nominal Operation Frequency: 13.56MHz

Test Conditions		Test Result (MHz)	Deviation (kHz)	Limit (kHz)	Result
Temp (°C)	Volt (V DC)				
T _{nom} (-10)	V _{nom} (7.2)	13.55991	-0.09		Pass
T _{nom} (0)	V _{nom} (7.2)	13.55996	-0.04		Pass
T _{nom} (10)	V _{nom} (7.2)	13.56003	0.03		Pass
T _{nom} (20)	V _{nom} (7.2)	13.56006	0.06		Pass
T _{nom} (30)	V _{nom} (7.2)	13.56011	0.11		Pass
T _{nom} (40)	V _{nom} (7.2)	13.56023	0.23		Pass
T _{nom} (50)	V _{nom} (7.2)	13.56015	0.15		Pass
T _{nom} (20)	V _{min} (6.12)	13.56008	0.08		Pass
	V _{max} (8.28)	13.56012	0.12		Pass

Note: Deviation (kHz) = (Test Result-13.56MHz)*1000



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7.5 Radiated Emissions (30MHz-1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.225(d) & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4&6.5

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
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 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.

7.5.1 E.U.T. Operation

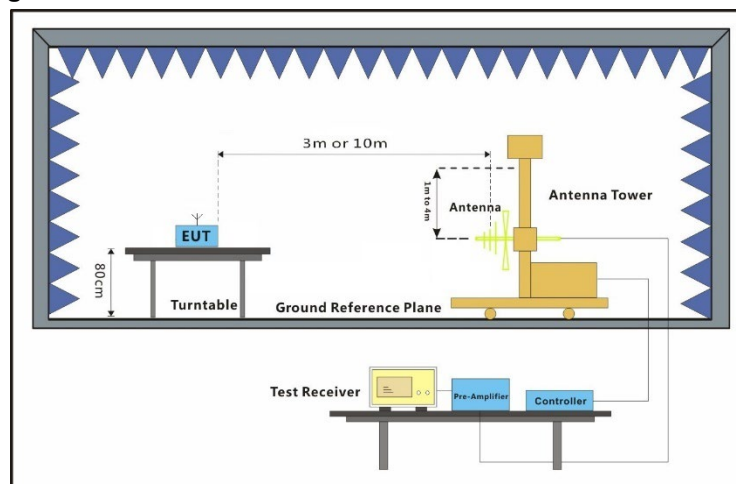
Operating Environment:

Temperature: 23.7 °C Humidity: 48.5 % RH Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode with modulation

7.5.3 Test Setup Diagram



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7.5.4 Measurement Procedure and Data

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. 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. d. 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. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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. g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report. Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

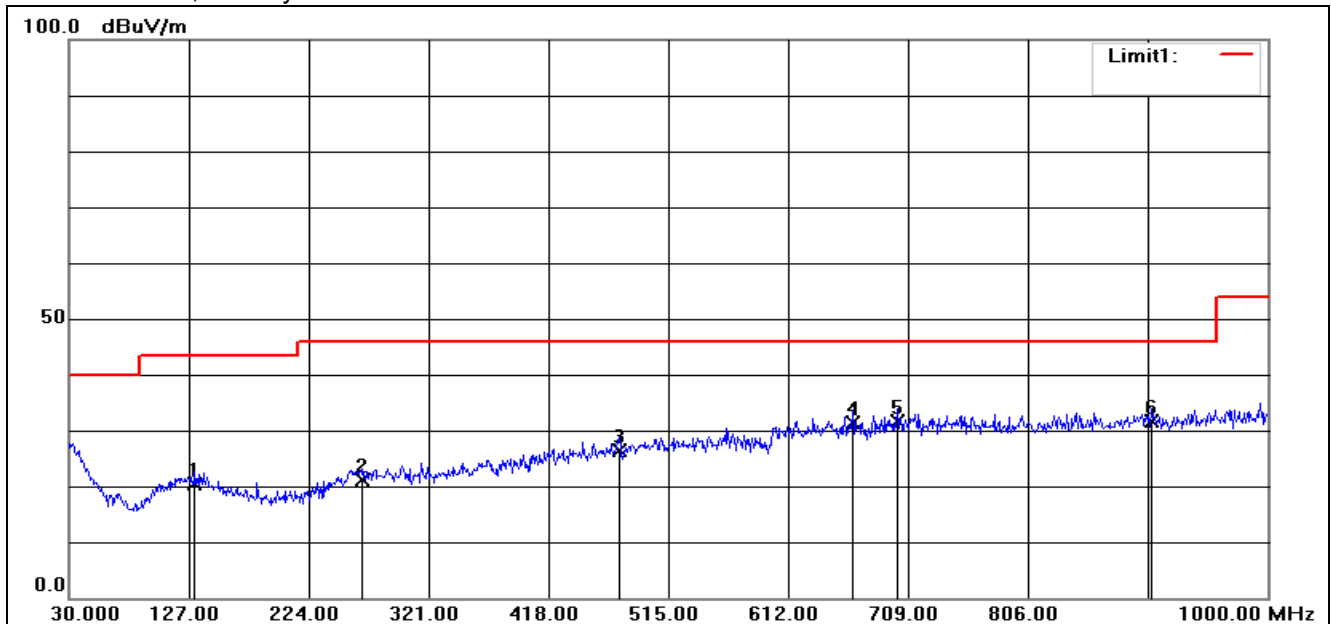


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Test Mode: 04; Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	131.8500	1.13	19.30	20.43	43.50	-23.07	QP
2	266.6800	0.23	20.82	21.05	46.00	-24.95	QP
3	475.2300	1.38	25.09	26.47	46.00	-19.53	QP
4	664.3800	4.15	27.26	31.41	46.00	-14.59	QP
5	700.2700	29.20	2.48	31.68	46.00	-14.32	QP



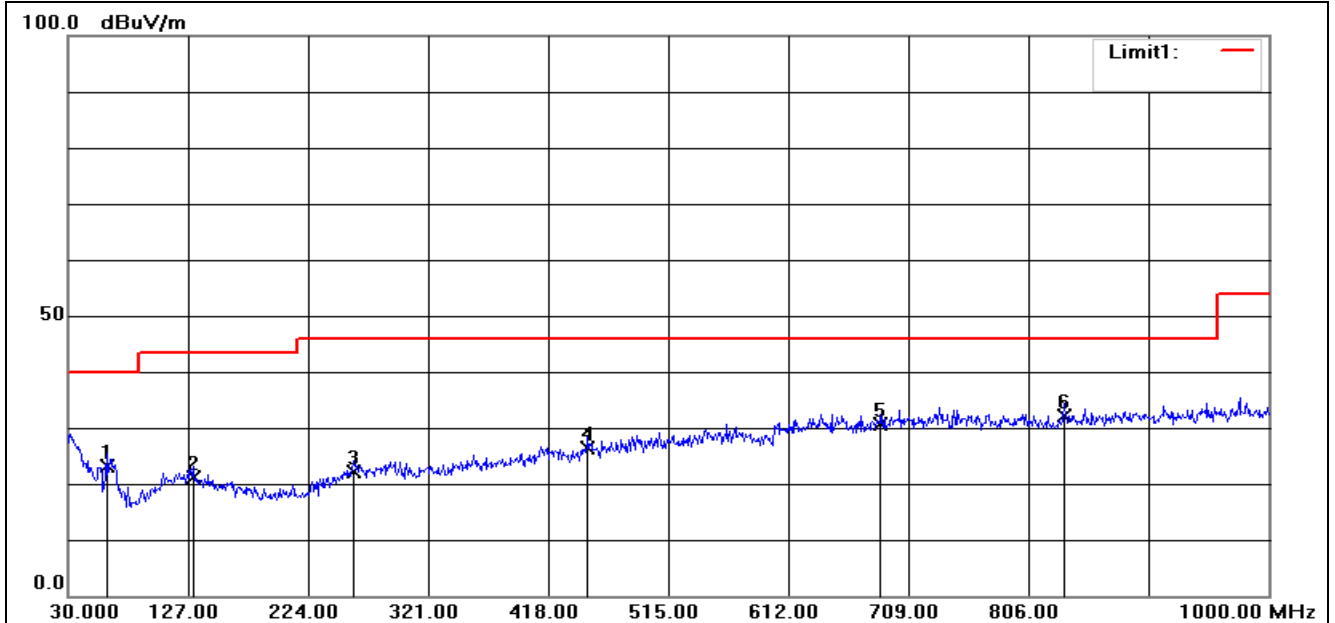
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Test Mode: 04; Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	61.0400	8.32	14.74	23.06	40.00	-16.94	QP
2	130.8800	1.74	19.35	21.09	43.50	-22.41	QP
3	260.8600	1.15	20.97	22.12	46.00	-23.88	QP
4	450.0100	2.02	24.25	26.27	46.00	-19.73	QP
5	686.6900	28.06	2.45	30.51	46.00	-15.49	QP



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7.6 Radiated Emissions (9kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.225(d) & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4&6.5

Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Limit (dBuV/m)	Detector	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	-	300
0.490-1.705	24000/F(kHz)	-	-	30
1.705-30	30	-	-	30

Below 30MHz

If field strength is measured at only a single point, then that point shall be at the radial from the EUT that produces the maximum emission at the frequency being measured, as described in 5.4. If that point is closer to the EUT than $\lambda/2\pi$ and the limit distance is greater than $\lambda/2\pi$, the measurement shall be extrapolated to the limit distance by conservatively presuming that the field strength decreases at a 40 dB/decade of distance rate to the $\lambda/2\pi$ distance, and at a 20 dB/decade of distance rate beyond $\lambda/2\pi$. This shall be accomplished using Equation (2):

$$FS_{(10m)} = FS_{(30/300m)} + 40\log\{d_{(near\ field)}/d_{(10m)}\} + 20\log\{d_{(30/300m)}/d_{(near\ field)}\} \quad (2)$$

If the single point measured is at a distance greater than $\lambda/2\pi$, then extrapolation to the limit distance shall be calculated using Equation (3):

$$FS_{(10m)} = FS_{(30/300m)} + 20\log\{d_{(30/300m)}/d_{(10m)}\} \quad (3)$$

If both the single point and the limit distance are equal to or closer to the EUT than $\lambda/2\pi$, then extrapolation to the limit distance shall be calculated using Equation (4):

$$FS_{(10m)} = FS_{(30/300m)} + 40\log\{d_{(30/300m)}/d_{(10m)}\} \quad (4)$$

Remark:

$$d_{near\ field} = 47.77 / f_{MHz}$$

where f_{MHz} is the frequency of the emission being measured in MHz.

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor



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$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

where

FS_{limit} is the calculation of field strength at the limit distance, expressed in dB μ V/m
 FS_{max} is the measured field strength, expressed in dB μ V/m
 d_{measure} is the distance of the measurement point from the EUT
 d_{limit} is the reference distance or the distance of the $\lambda/2\pi$ point

7.6.1 E.U.T. Operation

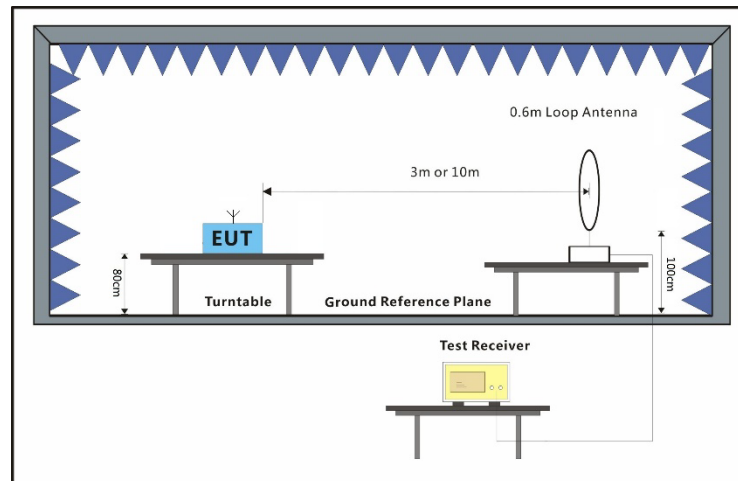
Operating Environment:

Temperature: 23.7 °C Humidity: 48.5 % RH Atmospheric Pressure: 1010 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode with modulation

7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.



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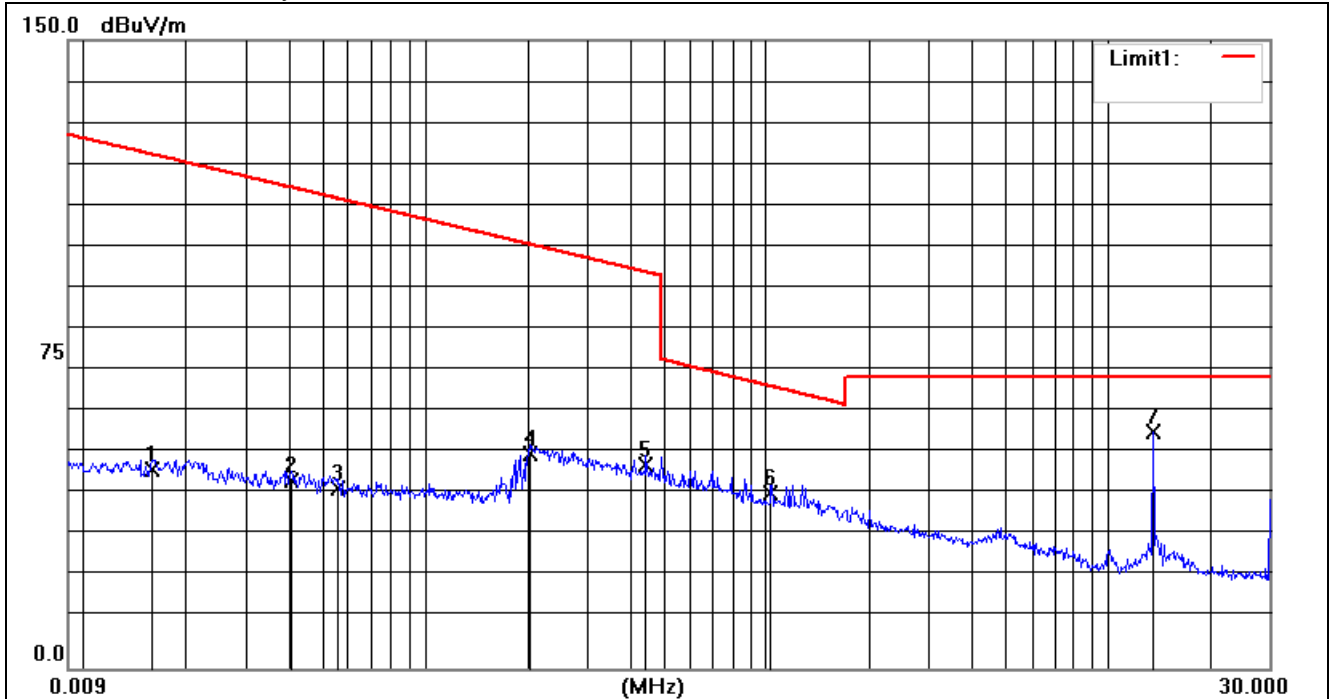
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Test Mode: 04; Polarity: Horizontal



Item	Freq.	Read Level	Correct Factor	Result Level@3 m	Result Level@SPE C	Limit Line@SPE C	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.0160	31.40	15.93	47.33	-32.67	42.65	-75.32	QP
2	0.0407	29.23	15.66	44.89	-35.11	34.78	-69.89	QP
3	0.0558	27.57	15.49	43.06	-36.94	32.12	-69.06	QP
4	0.2040	36.78	14.44	51.22	-28.78	21.19	-49.97	QP
5	0.4420	34.31	14.42	48.73	-31.27	14.67	-45.94	QP
6	1.0320	27.29	14.36	41.65	1.65	27.35	-25.70	QP
7	13.5600	43.52	13.09	56.61	16.61	84.00	-67.39	Peak



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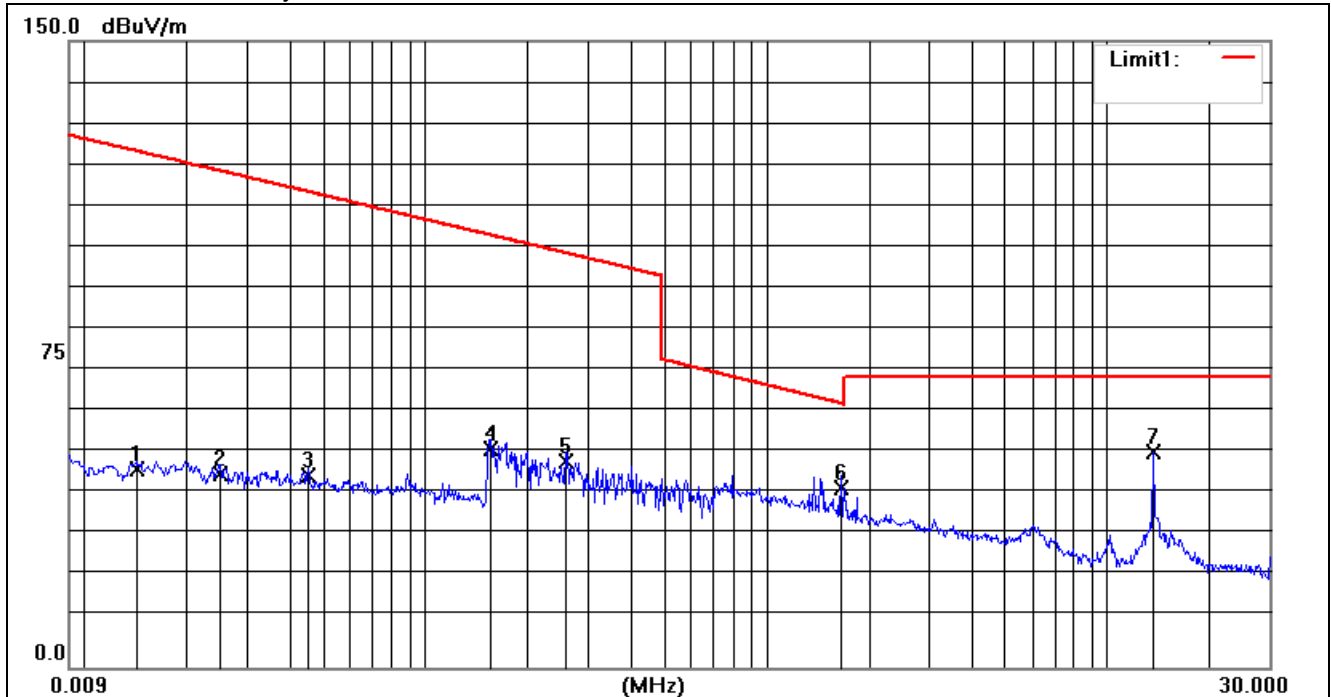
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Test Mode: 04; Polarity: Vertical



Item	Freq.	Read Level	Correct Factor	Result Level@3m	Result Level@SPE C	Limit Line@SPE C	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.0142	31.57	15.95	47.52	-32.48	43.66	-76.14	QP
2	0.0250	30.54	15.83	46.37	-33.63	38.89	-72.52	QP
3	0.0450	30.19	15.61	45.80	-34.2	33.93	-68.13	QP
4	0.1540	37.71	14.45	52.16	-27.84	23.56	-51.40	QP
5	0.2575	34.88	14.44	49.32	-30.68	19.23	-49.91	QP
6	1.6533	28.57	14.30	42.87	2.87	23.27	-20.40	QP
7	13.5600	38.41	13.09	51.50	11.50	84.00	-72.50	Peak



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7.7 99% Bandwidth

Test Requirement RSS-Gen section 6.7

Test Method: RSS-Gen Section 6.7

7.7.1 E.U.T. Operation

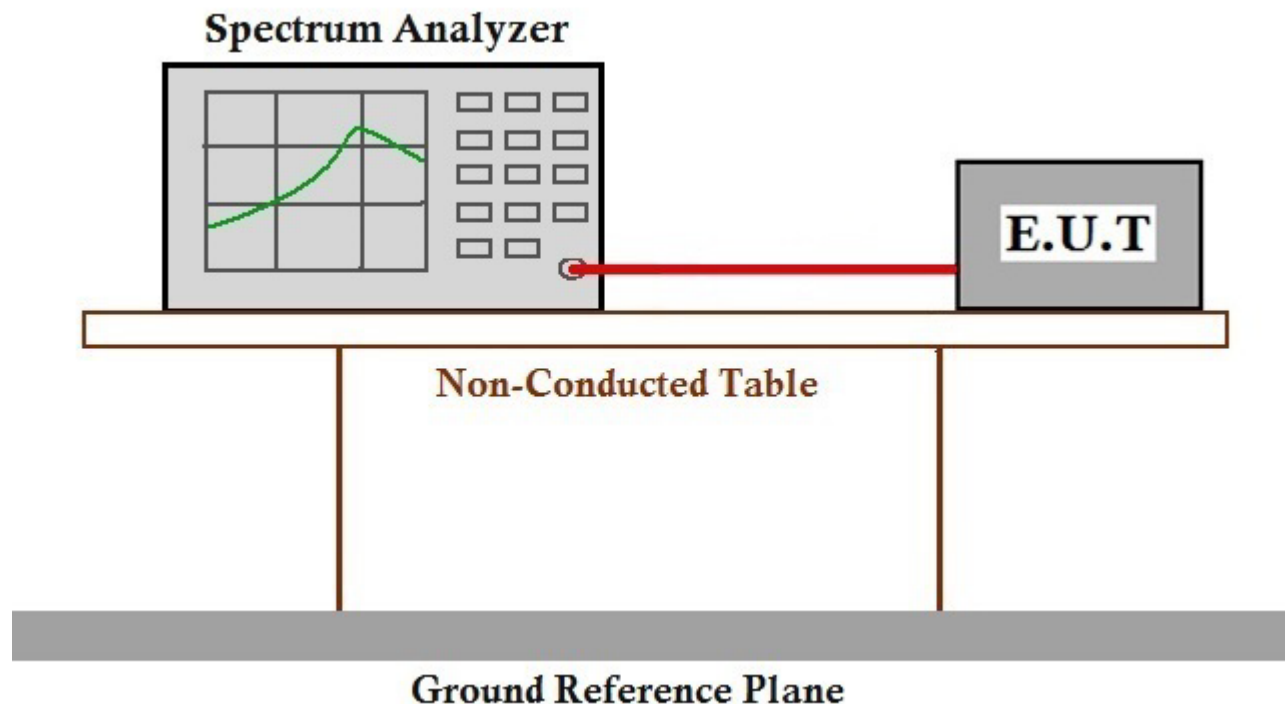
Operating Environment:

Temperature: 23.7 °C Humidity: 48.5 % RH Atmospheric Pressure: 1010 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode with modulation

7.7.3 Test Setup Diagram



7.7.4 Measurement Procedure and Data



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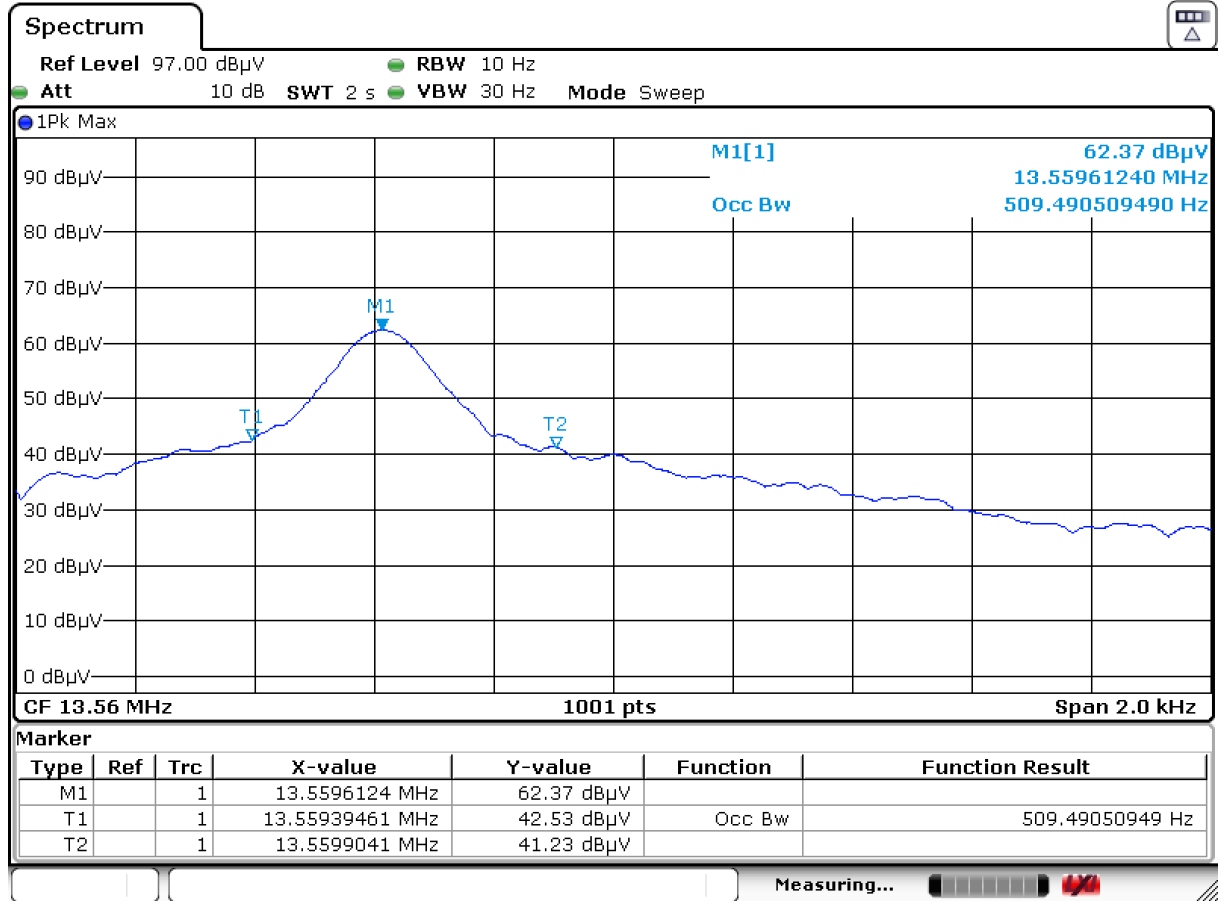
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99% bandwidth (kHz)	F _L (MHz)	F _H (MHz)	Limit(MHz)	Result
0.5095	13.5594	13.5599	13.110 – 14.010	Pass

Test plot as follows:



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8 Test Setup Photo

Refer to Appendix - Test Setup Photo for KSCR2204000503AT

9 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for KSCR2204000503AT

- End of the Report -



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