

FCC Report (NFC)

Applicant: Zhejiang Hanshow Technology Co., Ltd.
Address of Applicant: Bld. 33, No. 966 xiuyuan Rd., BeiKeJian Innovation Park, XiuZhou District, Jiaxing, Zhejiang, China
Manufacturer: Zhejiang Hanshow Technology Co., Ltd.
Address of Manufacturer: Bld. 33, No. 966 xiuyuan Rd., BeiKeJian Innovation Park, XiuZhou District, Jiaxing, Zhejiang, China

Equipment Under Test (EUT)

Product Name: Electronic shelf label
Model No.: Stellar-L3N@, Stellar-L3YN@, Stellar-LN@
Trade Mark: Hanshow
FCC ID: 2AHB5-L3N
Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.225:2017
Date of sample receipt: April 23, 2018
Date of Test: April 23, 2018-May 10, 2018
Date of report issued: May 10, 2018
Test Result : PASS *

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

Authorized Signature:



Robinson Lo
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 | May 10, 2018 | Original |
| | | |
| | | |
| | | |
| | | |

Prepared By:

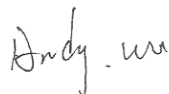


Date:

May 10, 2018

Project Engineer

Check By:



Date:

May 10, 2018

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 | Pass |
| Radiated Emission | 15.209 | Pass |
| 20dB Emission Bandwidth | 15.225 | Pass |
| Frequency Stability Measurement | 15.225 | Pass |

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

Remark: Test according to ANSI C63.10 2013 and ANSI C63.4: 2014.

4.1 Measurement Uncertainty

| Test Item | Frequency Range | Measurement Uncertainty | Notes |
|----------------------------------|-----------------|-------------------------|-------|
| Radiated Emission | 9kHz ~ 30MHz | ± 4.34dB | (1) |
| Radiated Emission | 30MHz ~ 1000MHz | ± 4.24dB | (1) |
| Radiated Emission | 1GHz ~ 26.5GHz | ± 4.68dB | (1) |
| AC Power Line Conducted Emission | 0.15MHz ~ 30MHz | ± 3.45dB | (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: | Electronic shelf label |
| Model No.: | Stellar-L3N@, Stellar-L3YN@, Stellar-LN@ |
| Test Model No: | Stellar-L3N@ |
| <i>Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are Screen color and model name for commercial purpose.</i> | |
| Quantity of tested samples | 1 |
| Serial No.: | N/A |
| Tested Sample(s) ID: | N/A |
| Hardware Version: | N/A |
| Software Version: | N/A |
| Operation Frequency: | 13.56MHz |
| Channel Number: | 1 |
| Modulation: | ASK |
| Antenna type: | PCB Antenna |
| Antenna gain: | 20dBi |
| Power supply: | DC 3V*2 by battery |

5.2 Test mode

| | |
|------------------|--|
| Transmitter mode | Keep the EUT in continuously transmitting. New battery is used during all test . |
|------------------|--|

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 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. Registration 381383, January 08, 2018.● Industry Canada (IC) —Registration No.: 9079A-2 The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016 |
|--|

5.4 Test Location

| |
|--|
| All tests were performed at: |
| Global United Technology Services Co., Ltd. Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960 |

6 Test Instruments list

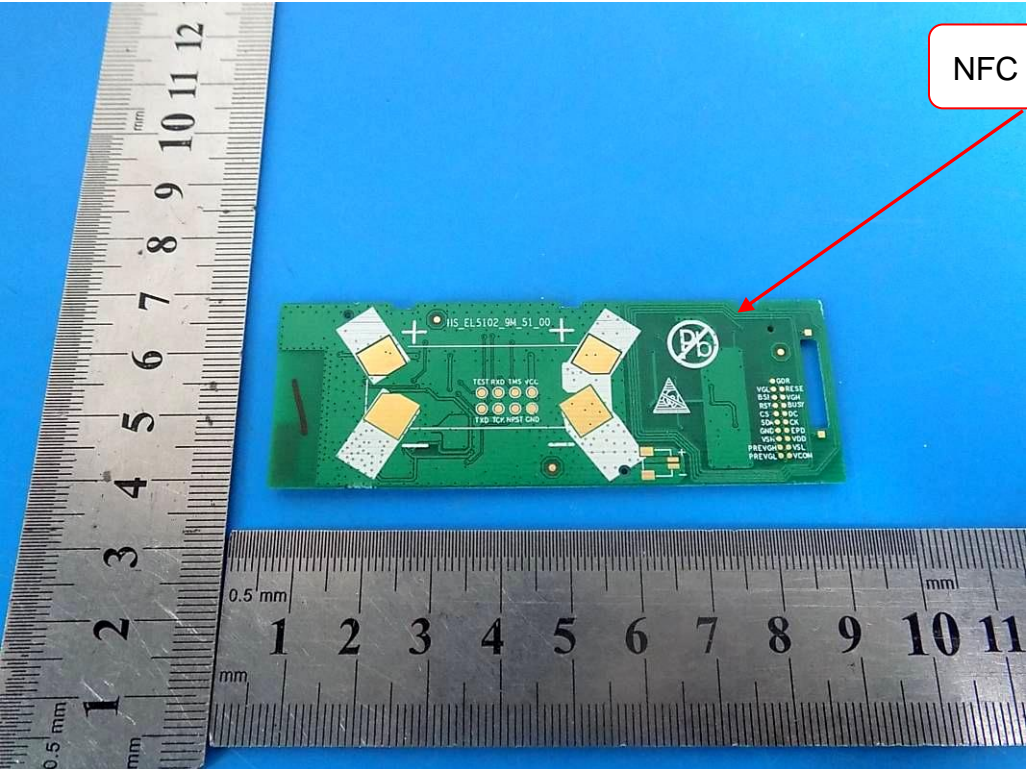
| Radiated Emission: | | | | | | |
|--------------------|-------------------------------|--------------------------------|-----------------------------|---------------|---------------------|-------------------------|
| Item | Test Equipment | Manufacturer | Model No. | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1 | 3m Semi- Anechoic Chamber | ZhongYu Electron | 9.2(L)*6.2(W)* 6.4(H) | GTS250 | July 03 2015 | July 02 2020 |
| 2 | Control Room | ZhongYu Electron | 6.2(L)*2.5(W)* 2.4(H) | GTS251 | N/A | N/A |
| 3 | Spectrum Analyzer | Agilent | N9020A | GTS533 | June 29 2017 | June 28 2018 |
| 4 | EMI Test Receiver | Rohde & Schwarz | ESU26 | GTS203 | June 29 2017 | June 28 2018 |
| 5 | BiConiLog Antenna | SCHWARZBECK MESS-ELEKTRONIK | VULB9163 | GTS214 | June 29 2017 | June 28 2018 |
| 6 | Double -ridged waveguide horn | SCHWARZBECK MESS-ELEKTRONIK | 9120D-829 | GTS208 | June 29 2017 | June 28 2018 |
| 7 | Horn Antenna | ETS-LINDGREN | 3160 | GTS217 | June 29 2017 | June 28 2018 |
| 8 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |
| 9 | Coaxial Cable | GTS | N/A | GTS213 | June 29 2017 | June 28 2018 |
| 10 | Coaxial Cable | GTS | N/A | GTS211 | June 29 2017 | June 28 2018 |
| 11 | Coaxial cable | GTS | N/A | GTS210 | June 29 2017 | June 28 2018 |
| 12 | Coaxial Cable | GTS | N/A | GTS212 | June 29 2017 | June 28 2018 |
| 13 | Amplifier(100kHz-3GHz) | HP | 8347A | GTS204 | June 29 2017 | June 28 2018 |
| 14 | Amplifier(2GHz-20GHz) | HP | 8349B | GTS206 | June 29 2017 | June 28 2018 |
| 15 | Amplifier (18-26GHz) | Rohde & Schwarz | AFS33-18002 650-30-8P-44 | GTS218 | June 29 2017 | June 28 2018 |
| 16 | Band filter | Amindeon | 82346 | GTS219 | June 29 2017 | June 28 2018 |
| 17 | Power Meter | Anritsu | ML2495A | GTS540 | June 29 2017 | June 28 2018 |
| 18 | Power Sensor | Anritsu | MA2411B | GTS541 | June 29 2017 | June 28 2018 |

| 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 | May.16 2014 | May.15 2019 |
| 2 | EMI Test Receiver | R&S | ESCI 7 | GTS552 | June. 29 2017 | June. 28 2018 |
| 3 | Coaxial Switch | ANRITSU CORP | MP59B | GTS225 | June. 29 2017 | June. 28 2018 |
| 4 | Artificial Mains Network | SCHWARZBECK MESS | NSLK8127 | GTS226 | June. 29 2017 | June. 28 2018 |
| 5 | Coaxial Cable | GTS | N/A | GTS227 | N/A | N/A |
| 6 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |
| 7 | Thermo meter | KTJ | TA328 | GTS233 | June. 29 2017 | June. 28 2018 |

| General used equipment: | | | | | | |
|-------------------------|----------------|--------------|-----------|---------------|---------------------|-------------------------|
| Item | Test Equipment | Manufacturer | Model No. | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1 | Barometer | ChangChun | DYM3 | GTS257 | June 29 2017 | June 28 2018 |

7 Test results and Measurement Data

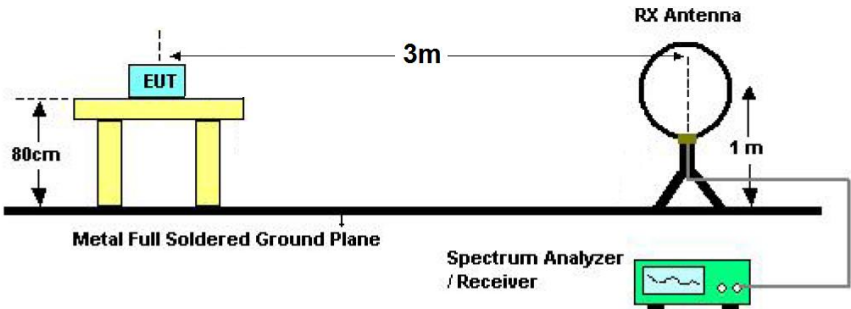
7.1 Antenna requirement:

| | |
|---|-----------------------------|
| Standard requirement: | FCC Part15 C Section 15.203 |
| <p>15.203 requirement:</p> <p>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.</p> | |
| <p>E.U.T Antenna:</p> | |
| <p><i>The antenna is Internal Antenna the best case gain of the antenna is 20dBi</i></p>  | |

7.2 Conducted Emissions

| Test Requirement: | FCC Part15 C Section 15.207 | | | | | | | | | | | | | | |
|-----------------------|--|-----------------------|--------------|--|------------|---------|----------|-----------|-----------|-------|----|----|------|----|----|
| Test Method: | ANSI C63.10:2013 | | | | | | | | | | | | | | |
| Test Frequency Range: | 150KHz to 30MHz | | | | | | | | | | | | | | |
| Class / Severity: | Class B | | | | | | | | | | | | | | |
| Receiver setup: | RBW=9KHz, VBW=30KHz, Sweep time=auto | | | | | | | | | | | | | | |
| Limit: | <table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table> <p>* Decreases with the logarithm of the frequency.</p> | 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 |
| 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 | | | | | | | | | | | | | |
| 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 5.3 for details | | | | | | | | | | | | | | |
| Test results: | EUT power supply by battery, so the test not applicable. | | | | | | | | | | | | | | |

7.3 Field Strength of Fundamental Emissions and Mask Measurement

| | | | |
|-------------------|--|--|-------------------------------|
| Test Requirement: | FCC Part15 C Section 15.225 and 15.209 | | |
| Test Method: | ANSI C63.10:2013 | | |
| Test site: | Measurement Distance: 3m | | |
| Receiver setup: | RBW=1KHz, VBW=3KHz, Sweep time=Auto | | |
| Limit: | Frequency (MHz) | Field Strength (microvolts/meter) at 30m | Field Strength (dBuV/m) at 3m |
| | 13.553~13.567 | 15848 | 124 (QP) |
| Mark limit: | Frequency (MHz) | Field Strength (microvolts/meter) at 30m | Field Strength (dBuV/m) at 3m |
| | 1.705~13.110 | 30 | 69.5 |
| | 13.110~13.410 | 106 | 80.5 |
| | 13.410~13.553 | 334 | 90.5 |
| | 13.553~13.567 | 15848 | 124.0 |
| | 13.567~13.710 | 334 | 90.5 |
| | 13.710~14.010 | 106 | 80.5 |
| | 14.010~30.000 | 30 | 69.5 |
| Test setup: |  | | |
| Test Procedure: | <ol style="list-style-type: none"> 1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8meter above ground. The phase center of the loop receiving antenna mounted antenna tower was placed 3 meters far away from the turntable. 2. Power on the EUT, the turntable was rotated by 360 degrees to determine the position of the highest radiation. 3. The height of the receiving antenna was fixed at one meter above ground to find the maximum emissions field strength. 4. For Fundamental emissions, use the receiver to measure QP reading. 5. When the radiated emissions limits are expressed in terms of the average value of the emissions and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field | | |

| | |
|-------------------|--|
| | <p>strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.</p> <p>6. Compliance with the spectrum mask is tested using a spectrum analyzer with RB set to a 1KHz for the band 13.553~13.567MHz.</p> |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Pass |

Measurement data:

| Freq. (MHz) | Position H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limits 3m (dBuV/m) | |
|-------------|--------------|-----------------------|----------------|-------------|--------------------|--------------------|--|
| 13.560 | H | Peak | 104.13 | -13.94 | 90.19 | 104 | |
| 13.560 | H | AV | 90.31 | -13.94 | 76.37 | 84 | |
| 13.110 | H | Peak | 42.87 | -13.94 | 28.93 | 69.5 | |
| 13.410 | H | Peak | 44.07 | -13.94 | 30.13 | 80.5 | |
| 13.553 | H | Peak | 42.31 | -13.94 | 28.37 | 90.5 | |
| 13.567 | H | Peak | 46.34 | -13.93 | 32.41 | 90.5 | |
| 13.710 | H | Peak | 43.59 | -13.93 | 29.66 | 80.5 | |
| 14.010 | H | Peak | 44.85 | -13.93 | 30.92 | 69.5 | |
| Freq. (MHz) | Position H/V | Detector Mode (PK/QP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limits 3m (dBuV/m) | |
| 13.560 | V | Peak | 95.51 | -13.94 | 81.57 | 104 | |
| 13.560 | V | AV | 87.48 | -13.94 | 73.54 | 84 | |
| 13.110 | V | Peak | 42.99 | -13.94 | 29.05 | 69.5 | |
| 13.410 | V | Peak | 45.60 | -13.94 | 31.66 | 80.5 | |
| 13.553 | V | Peak | 43.90 | -13.94 | 29.96 | 90.5 | |
| 13.567 | V | Peak | 43.79 | -13.93 | 29.86 | 90.5 | |
| 13.710 | V | Peak | 43.76 | -13.93 | 29.83 | 80.5 | |
| 14.010 | V | Peak | 44.75 | -13.93 | 30.82 | 69.5 | |

Note:

1: 30m to 3m correction factor calculation:

$$40 * \log(30m/3m) = 40$$

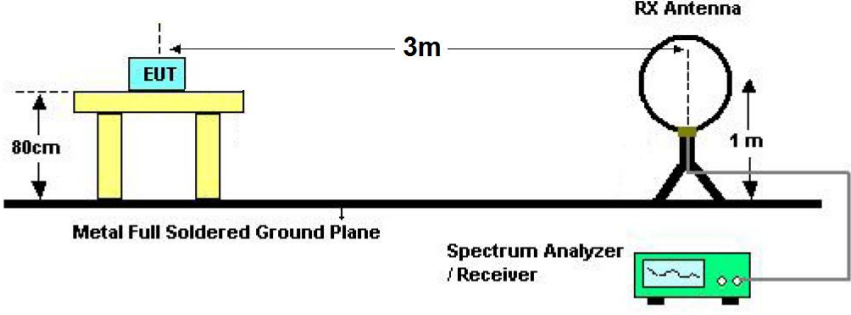
2: --Means other frequency and mode comply with standard requirements and at least have 20dB margin.

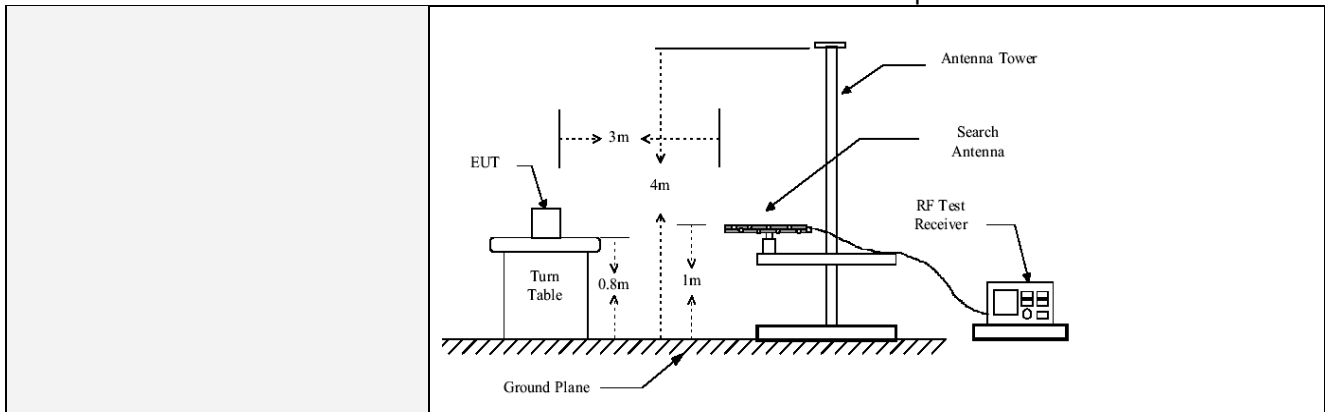
3: Correct Factor=Cable Loss+ Antenna Factor- Amplifier Gain

$$\text{Measurement Result} = \text{Reading} + \text{Correct Factor}$$

$$\text{Margin} = \text{Measurement Result} - \text{Limit}$$

7.4 Radiated Emission

| | | | |
|--|--|-----------------------------------|-------------------------------|
| Test Requirement: | FCC Part15 C Section 15.209 | | |
| Test Method: | ANSI C63.10: 2013 | | |
| Test Frequency Range: | 9KHz to 1000MHz | | |
| Test site: | Measurement Distance: 3m | | |
| Receiver setup: | Frequency (MHz) | RBW(KHz) | Detector |
| | 0.009~0.15 | 0.2 | QP |
| | 0.15~30 | 9 | QP |
| | 30~1000 | 120 | QP |
| Limit: | The Field strength of any emissions which appear outside of 13.553~13.567MHz band shall not exceed the general radiated emissions limits | | |
| | Frequency (MHz) | Field strength (micorvolts/meter) | Measurement distance (meters) |
| | 0.009~0.490 | 2400/F(KHz) | 300 |
| | 0.490~1.705 | 24000/F(KHz) | 30 |
| | 1.705~30 | 30 | 30 |
| | 30~88 | 100 | 3 |
| | 88~216 | 150 | 3 |
| | 216~960 | 200 | 3 |
| | 960~1000 | 500 | 3 |
| | Test setup: | Below 30MHz | |
|  <p>The diagram illustrates the test setup for frequencies below 30 MHz. It shows an Equipment Under Test (EUT) on a stand 80 cm high, placed on a metal full soldered ground plane. An RX Antenna is positioned 3 m away from the EUT and 1 m high. A Spectrum Analyzer / Receiver is connected to the antenna.</p> | | | |
| | Above 30MHz | | |



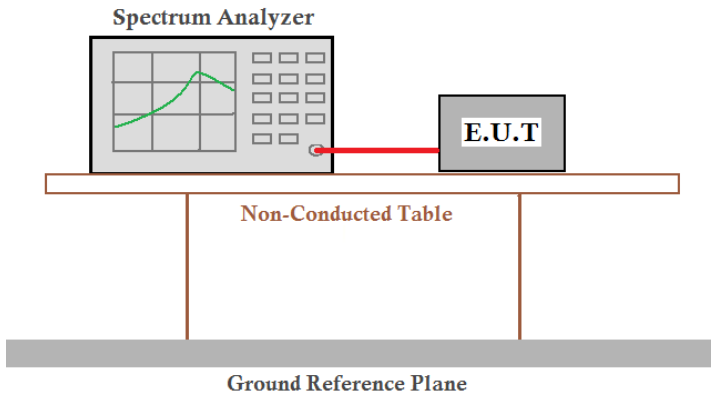
| | |
|------------------------|---|
| <p>Test Procedure:</p> | <ol style="list-style-type: none"> 1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8meter above ground. The phase center of the loop receiving antenna mounted antenna tower was placed 3 meters far away from the turntable. 2. Power on the EUT, the turntable was rotated by 360 degrees to determine the position of the highest radiation. 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization. 4. For each suspected emissions, the antenna tower was scan (from 1M to 4M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading. 5. Set the test-receiver system to Peak or CISPR quasi-peak detect function with specified bandwidth under maximum hold mode. 6. When the radiated emissions limits are expressed in terms of the average value of the emissions and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. 7. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. |
|------------------------|---|

| | |
|--------------------------|---|
| <p>Test Instruments:</p> | <p>Refer to section 6.0 for details</p> |
| <p>Test mode:</p> | <p>Refer to section 5.3 for details</p> |
| <p>Test results:</p> | <p>Pass</p> |

Measurement data:

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | QP Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|-----------------|-------------------|-----------------------|-----------------|--------------------|-------------------|---------------------|-----------------|--------------|
| 35.62 | 36.22 | 11.20 | 0.62 | 30.07 | 17.97 | 40.00 | -22.03 | Vertical |
| 51.84 | 31.53 | 12.20 | 0.79 | 29.98 | 14.54 | 40.00 | -25.46 | Vertical |
| 98.14 | 27.16 | 11.73 | 1.18 | 29.71 | 10.36 | 43.50 | -33.14 | Vertical |
| 219.85 | 25.38 | 10.88 | 1.96 | 29.39 | 8.83 | 46.00 | -37.17 | Vertical |
| 382.59 | 24.75 | 15.15 | 2.77 | 29.58 | 13.09 | 46.00 | -32.91 | Vertical |
| 793.40 | 24.34 | 21.21 | 4.43 | 29.20 | 20.78 | 46.00 | -25.22 | Vertical |
| 39.72 | 33.47 | 12.30 | 0.66 | 30.04 | 16.39 | 40.00 | -23.61 | Horizontal |
| 89.59 | 29.03 | 10.60 | 1.11 | 29.75 | 10.99 | 43.50 | -32.51 | Horizontal |
| 147.92 | 30.75 | 7.50 | 1.56 | 29.42 | 10.39 | 43.50 | -33.11 | Horizontal |
| 302.48 | 23.92 | 13.56 | 2.37 | 29.98 | 9.87 | 46.00 | -36.13 | Horizontal |
| 485.61 | 25.42 | 17.20 | 3.24 | 29.33 | 16.53 | 46.00 | -29.47 | Horizontal |
| 897.00 | 23.44 | 22.17 | 4.83 | 29.10 | 21.34 | 46.00 | -24.66 | Horizontal |

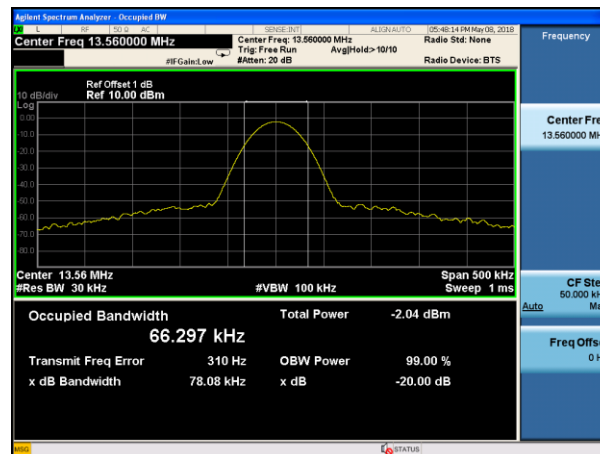
7.5 20dB Emission Bandwidth

| | |
|-------------------|--|
| Test Requirement: | FCC Part15 C Section 15.225 and 15.215 |
| Test Method: | ANSI C63.10:2013 |
| Limit: | N/A |
| Test setup: |  <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p> |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Pass |

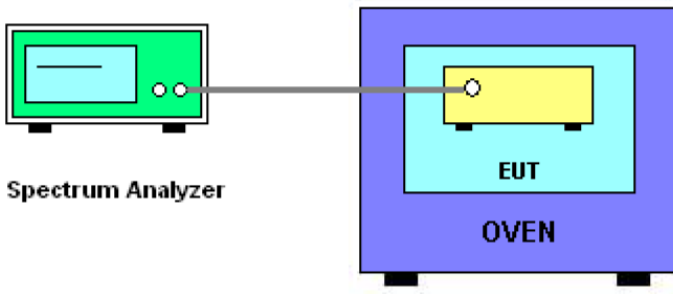
Measurement Data

| Frequency (MHz) | 20dB Bandwidth (KHz) | 99% OBW (KHz) | Frequency range (MHz) fL>13.553MHz | Frequency range (MHz) fH<13.567MHz | Result |
|-----------------|----------------------|---------------|---------------------------------------|---------------------------------------|--------|
| 13.56MHz | 78.08 | 66.297 | 13.555 | 13.561 | Pass |

Test plot as follows:



7.6 Frequency Stability Measurement

| | |
|-------------------|--|
| Test Requirement: | FCC Part15 C Section 15.225 |
| 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 antenna port to the antenna port of a yellow EUT (Equipment Under Test) located inside a blue Oven. The labels 'Spectrum Analyzer', 'EUT', and 'OVEN' are placed below their respective components.</p> |
| Test Procedure: | <ol style="list-style-type: none"> 1. The transmitter output (antenna port) was connected to the spectrum analyzer. 2. EUT have transmitted absence of modulation signal and fixed channelize 3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth. 4. Set RBW=1KHz, VBW=1KHz with peak detector and maxhold settings. 5. fc is declaring of channel frequency. Then the frequency error formula is $(f_c - f) / f_c \times 10^6$ ppm and the limit is less than ± 100ppm. 6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value 7. Extreme temperature rule is -20°C ~50°C |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Pass |

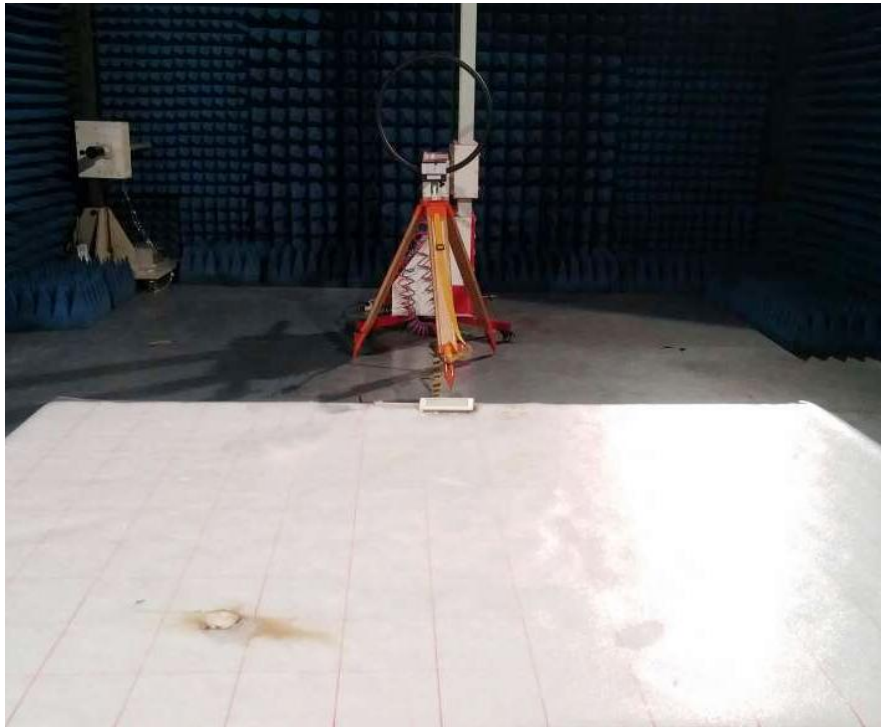
Measurement data:

| Reference Frequency: 13.56MHz | | | | | |
|-------------------------------|------------------|-----------------|---------|-----------|--------|
| Power supplied (Vdc) | Temperature (°C) | Frequency error | | Limit | Result |
| | | Hz | ppm (%) | | |
| 6.0 | -20 | 51 | 0.00037 | +/- 0.01% | Pass |
| | -10 | 51 | 0.00037 | | |
| | 0 | 59 | 0.00044 | | |
| | 10 | 53 | 0.00039 | | |
| | 20 | 51 | 0.00038 | | |
| | 30 | 53 | 0.00039 | | |
| | 40 | 63 | 0.00046 | | |
| | 50 | 69 | 0.00051 | | |

| Reference Frequency: 13.56MHz | | | | | |
|-------------------------------|----------------------|-----------------|---------|-----------|--------|
| Temperature (°C) | Power supplied (Vdc) | Frequency error | | Limit | Result |
| | | Hz | ppm (%) | | |
| 20 | 5.1 | 41 | 0.00031 | +/- 0.01% | Pass |
| | 6.0 | 51 | 0.00038 | | |
| | 6.9 | 71 | 0.00053 | | |

8 Test Setup Photo

Radiated Emission



EUT Constructional Details

Reference to the test report No. GTS201805000126F01

----- End -----