

Shenzhen Certification Technology Service Co., Ltd 2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China.

TEST REPORT

FCC ID: 2AATL-F89ESSM23

Applicant : FN-LINK TECHNOLOGY LIMITED

Address : 5th Floor, A Building, Haoye Logistics Park, Shugang Channel, Bao'an

District, Shenzhen City, China

Equipment under Test (EUT):

Name : WIFI Module

Model : F89ESSM23-W1, F89ETSM23-W1

Standards: FCC PART 15, SUBPART C: 2012 (Section 15.247)

IC RSS-210 ISSUE 8 with amendment June 2010

Report No. : CST-TCB140212006

Date of Test : February 15-25, 2014

Date of Issue: February 26, 2014

Test Result : PASS *

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

Authorized Signature

(Mark Zhu) General Manager

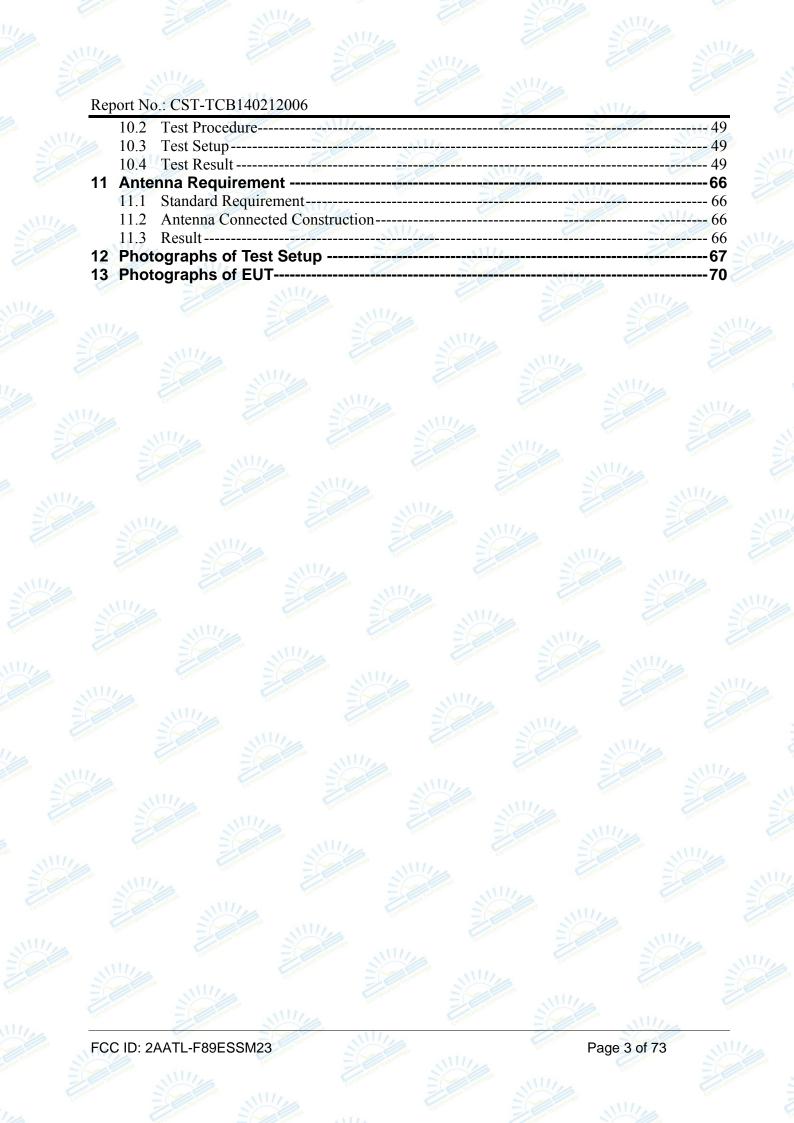
The manufacture should ensure that all the products in series production are in conformity with the product sample detailed in this report.

If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of Shenzhen Certification Technology Service Co., Ltd. Or test done by Shenzhen Certification Technology Service Co., Ltd. Approvals in connection with, distribution or use of the product described in this report must be approved by Shenzhen Certification Technology Service Co., Ltd. Approvals in writing.

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1 General Information

1.1 Description of Device (EUT)

Trade Name : FN-LÎNK

Innovation For Surfing

EUT : WIFI Module

Model No. F89ESSM23-W1, F89ETSM23-W1

All model's the function, software and electric circuit are the

DIFF. same, only with a product model named and appearance color

different, so all the test were performed on the model

F89ESSM23-W1.

Antenna Type : Integral Antenna, max gain 0 dBi

IEEE 802.11b: 2412MHz-2462MHz

Operation Frequency : IEEE 802.11g: 2412MHz-2462MHz

IEEE 802.11n HT20: 2412-2462MHz IEEE 802.11n HT40:2422-2452MHz

Channel number : IEEE 802.11b,g.n/HT20: 11 Channels

IEEE 802.11n HT40: 7Channels

IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK)

Modulation type : IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)

IEEE 802.11n :OFDM(64QAM, 16QAM, QPSK, BPSK)

Power Supply : DC 3.3V Supply by PC with AC 120V/60Hz

Applicant : FN-LINK TECHNOLOGY LIMITED

Address : 5th Floor, A Building, Haoye Logistics Park, Shugang

Channel, Bao'an District, Shenzhen City, China

Manufacturer : FN-LINK TECHNOLOGY LIMITED

Address : 5th Floor, A Building, Haoye Logistics Park, Shugang

Channel, Bao'an District, Shenzhen City, China

1.2 Description of Test Facility

Shenzhen Certification Technology Service Co., Ltd.

2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China

FCC Registered No.:197647 IC Registered No.:8528B

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Report No.: CST-TCB140212006 2 EMC Equipment List

| Equipment | Manufacture | Model No. | Serial No. | Last cal. | Cal Interval |
|---------------------|--------------|-------------|----------------------|-------------|--------------|
| 3m Semi-Anechoic | ETS-LINDGREN | N/A | SEL0017 | Nov. 16, 13 | 1Year |
| Spectrum analyzer | Agilent | E4443A | MY46185649 | Oct. 30, 13 | 1Year |
| Receiver | R&S | ESCI | 100492 | Oct. 30, 13 | 1Year |
| Receiver | R&S | ESCI | 101165 | Oct. 30, 13 | 1Year |
| Bilog Antenna | SCHWARZBECK | VULB 9168 | 9168-438 | Mar.12, 13 | 1 Year |
| Horn Antenna | SCHWARZBECK | BBHA 9120 D | BBHA 9120 D(1201) | Mar.12, 13 | 1Year |
| ETS Horn Antenna | ETS | 3160 | SEL0076 | Oct.09, 13 | 1Year |
| Active Loop Antenna | Beijing Daze | ZN30900A | SEL0097 | Mar.12, 13 | 1Year |
| L.I.S.N. | SCHWARZBECK | NSLK8126 | 8126466 | Oct. 30, 13 | 1Year |
| Power Meter | Anritsu | ML2487A | 6K00001491 | Oct. 30, 13 | 1Year |
| Power sensor | Anritsu | ML2491A | 32516 | Oct. 30, 13 | 1Year |
| Pre-amplifier | SCHWARZBECK | BBV9743 | 9743-019 | Oct. 30, 13 | 1Year |
| Pre-amplifier | Quietek | AP-180C | CHM-0602012 | Oct. 30, 13 | 1Year |

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3 Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The test procedure used was ANSI Standard C63.4-2003 using a 50 u H LISN. Both Lines were observed. The bandwidth of the receiver was 10kHz with an appropriate sweep speed. The ambient temperature of the EUT was 25°C with a humidity of 58%.

RADIATION INTERFERENCE: The test procedure used was ANSI Standard C63.4-2003 using a ANRITSU spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a micro volt at the output of the antenna. The resolution bandwidth was 100kHz and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3MHz above 1 GHz. The ambient temperature of the EUT was 25°C with a humidity of 58%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer and cable loss. The antenna correction factors and cable loss are stated in terms of dB. The gain of the Pre-selector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes. The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSI Standard C63.4-2003 10.1.7 with the EUT 40 cm from the vertical ground wall.





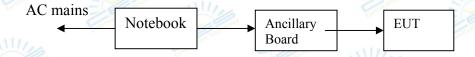
4 Summary of Measurement

4.1 Summary of test result

| Test Item | Test Requirement | Standards Paragraph | Result |
|---------------------|---|----------------------------------|------------|
| Spurious Emission | FCC PART 15 : 2012& IC RSS-210 | Section 15.247&15.209 & A8 | Compliance |
| Conduction Emission | FCC PART 15: 2012& IC RSS Gen | Section 15.207&7.2.4 | Compliance |
| Bandwidth Test | FCC PART 15:2012& IC RSS-210 IC RSS Gen | Section 15.247& A8 & 4.6.1 | Compliance |
| Peak Power | FCC PART 15:2012& IC RSS-210 | Section 15.247& A8 | Compliance |
| Power Density | FCC PART 15:2012& IC RSS-210 | Section 15.247& A8 | Compliance |
| Band Edge | FCC PART 15:2012& IC RSS-210 | Section 15.247& A8 | Compliance |
| Antenna Requirement | FCC PART 15 : 2012& IC RSS Gen | Section 15.203&7.1.4 | Compliance |

Note: The EUT has been tested as an independent unit. And Continual Transmitting in maximum power (The Notebook be used during Test)

4.2 Test connection



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4.3 Assistant equipment used for test

| Description 1 | | Notebook | - Jon Technon | 31111/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1 |
|---------------|--------------|--------------|---------------|---|
| Manufacturer | 3 | Dell | Certific | - January Communication |
| Model No. | Certiff Ston | ASPIRE M1830 | .1177 | 600 |

| Description 1 | | Ancillary Board | 11 |
|---------------|--|----------------------------|------|
| Manufacturer | The state of the s | FN-LINK TECHNOLOGY LIMITED | |
| Model No. | : | Test board | Cel. |

4.4 Test mode

| Tested mode, channe | el, and data rate inforr | nation | Carilloano |
|-----------------------|-------------------------------|-------------|-----------------|
| Mode | data rate (Mpbs)(see Note) | Channel | Frequency (MHz) |
| in do su | 311/2.1 | Low :CH1 | 2412 |
| IEEE 802.11b | index 1 | Middle: CH6 | 2437 |
| | Integrior 1 | High: CH11 | 2462 |
| 201 | 6 | Low :CH1 | 2412 |
| IEEE 802.11g | 6 | Middle: CH6 | 2437 |
| Ton rechnon | 6 | High: CH11 | 2462 |
| IEEE 900 11 | 6.5 | Low:CH1 | 2412 |
| IEEE 802.11 n/HT20 | 6.5 | Middle: CH6 | 2437 |
| П/П120 | 6.5 | High: CH11 | 2462 |
| IEEE 802.11 | 13.5 | Low:CH1 | 2422 |
| n/HT40 | 13.5 | Middle:CH4 | 2437 |
| П/П 140 | 13.5 | High:CH7 | 2452 |

Note: According exploratory test, EUT will have maximum output power in those data rate. so those data rate were used for all test.

4.5 Channel list

| and the same of th | E II | PEE 002 111 / | 1 IEEE 002 11 | /LIT20 | 11/2 | |
|--|--|---------------|---------------|---------------|-----------|--|
| Contilla | For IEEE 802.11b/g and IEEE 802.11n/HT20 | | | | | |
| Channel | Frequency | Channel | Frequency | Channel | Frequency | |
| .31177 | (MHz) | Salon Technol | (MHz) | Cortilication | (MHz) | |
| CH1 | 2412 | CH5 | 2432 | CH9 | 2452 | |
| CH2 | 2417 | CH6 | 2437 | CH10 | 2457 | |
| CH3 | 2422 | CH7 | 2442 | CH11 | 2462 | |
| CH4 | 2427 | CH8 | 2447 | Hiralion | 2000 | |

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| | | 107 | | 110 | |
|---------|-----------------|-------------|-----------------|-----------|-----------------|
| .11// | | For IEEE 80 | 2.11n/HT40 | Continue | = |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| CH1 | 2422 | CH5 | 2442 | E | 111/2 |
| CH2 | 2427 | CH6/ | 2447 | Litteaton | |
| CH3 | 2432 | CH7 | 2452 | / | allon rech |
| CH4 | 2437 | / | | <u> </u> | Certifi |

4.6 Test Conditions

| Temperature range | 21-25℃ | Cer |
|-------------------|-----------|-------|
| Humidity range | 40-75% | 1111/ |
| Pressure range | 86-106kPa | = |

4.7 Measurement Uncertainty (95% confidence levels, k=2)

| Item | MU | Remark |
|---|---------|------------------|
| Uncertainty for Power point Conducted Emissions Test | 2.42dB | Zime tu fina agu |
| Uncertainty for Radiation Emission test in 3m | 2.13 dB | Polarize: V |
| chamber (below 30MHz) | 2.57dB | Polarize: H |
| Uncertainty for Radiation Emission test in 3m | 3.54dB | Polarize: V |
| chamber (30MHz to 1GHz) | 4.1dB | Polarize: H |
| Uncertainty for Radiation Emission test in 3m | 2.08dB | Polarize: H |
| chamber (1GHz to 25GHz) | 2.56dB | Polarize: V |
| Uncertainty for radio frequency | 1×10-9 | |
| Uncertainty for conducted RF Power | 0.65dB | Centilli |
| Uncertainty for temperature | 0.2℃ | 6. |
| Uncertainty for humidity | 1% | 111/1/ |
| Uncertainty for DC and low frequency voltages | 0.06% | |
| | | |

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5 Spurious Emission

5.1 Radiation Emission

5.1.1 Radiation Emission Limits(15.209)

| | Frequencies (MHz) | Field Strength (micorvolts/meter) | Measurement Distance (meters) |
|---|----------------------|--------------------------------------|----------------------------------|
| | 0.009~0.490 | 2400/F(KHz) | 300 |
| | 0.490~1.705 | 24000/F(KHz) | 30 |
| | 1.705~30.0 | 30 | 30 |
| | 30~88 | 100 | 3 |
| 3 | 88~216 | 150 | 3 |
| | 216~960 | 200 | 3 |
| | Above 960 | 500 | 3 |

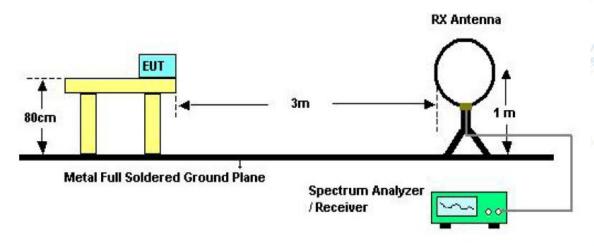
Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

NOTE:

- a) The tighter limit applies at the band edges.
- b) Emission Level(dB uV/m)=20log Emission Level(Uv/m)

5.1.2 Test Setup

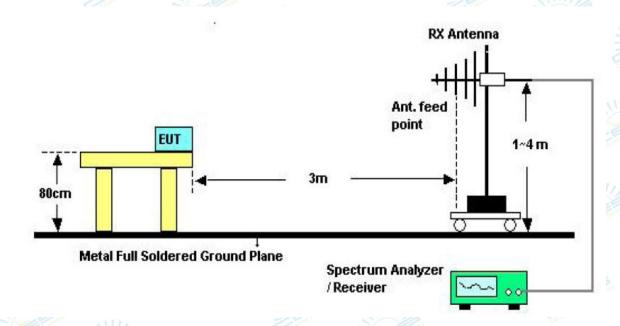
See the next page



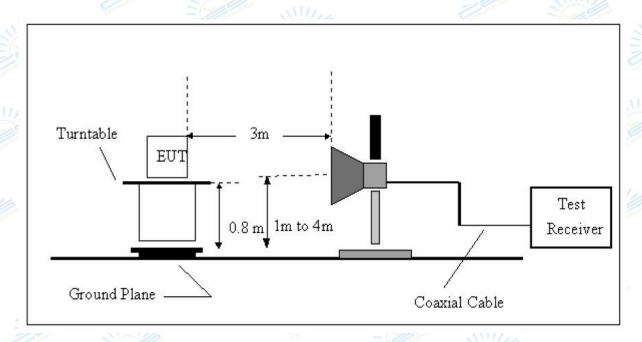
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Below 30MHz Test Setup



Above 30MHz Test Setup



Above 1GHz Test Setup

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5.1.3 Test Procedure

- a) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1GHz, The EUT was placed on a rotating 0.8 m high above ground, The table was rotated 360 degrees to determine the position of the highest radiation
- b) The Test antenna shall vary between 1m and 4m,Both Horizontal and Vertical antenna are set of make measurement.
- c) The initial step in collecting conducted emission data is a spectrum analyzer Peak detector mode pre-scanning the measurement frequency range. Significant Peaks are then marked. and then Qusia Peak Detector mode premeasured
- d) If Peak value comply with QP limit Below 1GHz. The EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.
- e) For the actual test configuration, please see the test setup photo.

5.1.4 Test Equipment Setting For emission test Result

| 9KHz~150KHz | RBW 200Hz | VBW1KHz |
|--------------|------------|------------|
| 150KHz~30MHz | RBW 9KHz | VBW 30KHz |
| 30MHZ~1GHz | RBW 120KHz | VBW 300KHz |
| Above 1GHz | RBW 1MHz | VBW 3MHz |

5.1.5 Test Condition

Continual Transmitting in maximum power.

5.1.6 Test Result

We have scanned the 9KHz from 25GHz to the EUT.

Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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Website: http://www.cessz.com/Email: Service@cessz.com/

| 20 | | 2 may have been been been been been been been be | Maria de La Caración | | 5 | A CONTRACTOR OF THE CONTRACTOR | Mangley |
|----|-------|---|---|---|---|--------------------------------|---------|
| 30 | | | | | | 6 | |
| 40 | | | | | | | |
| 50 | 10.00 | | | _ | | | |
| 60 | × 1 | | | - | | FCC PAR | T 15 |
| 70 | | | | | | | |

Condition : FCC PART 15 B
EUT : WIFI Module
Model No : F89ESSM23-W1
Test Mode : Link mode
Power : DC 3.3V

Fower : DC 3.3\
Test Engineer : Simple
Remark :

Temp : 24.2°C Hum : 54%

| num | |
|--------|------------------|
| Item | Margin Remark |
| | dBuV |
| | |
| 1 | -26.44 QP |
| 2 | -29.35 QP |
| 3 | -30.08 QP |
| 4 | -32.26 QP |
| 5 | -28.07 QP |
| 6 | -22.43 QP |
| 4 5 | -32.26 -28.07 |

POL: HORIZONTAL

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

-1-

FCC ID: 2AATL-F89ESSM23

1111/













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Website: http://www.cessz.com/Email: Service@cessz.com/

| 70 | | | | | | | | | | | |
|----------|-------------------------|----|---|-----------|---|------------------|---------------|-------------------------|---------|------|------|
| 70 | | | | | | | | | | | |
| 60 | | | | | | | | | | | |
| | | | | | | | | | FCC | PART | 15 |
| 50 | | | | | | | | | | | |
| 40 | | | | | | • | | <u> </u> | <u></u> | | |
| 30 | | | | | | | | | | | |
| 20 | | | | | | Hadilad Liberton | | 1 | 5 | 6 | Lyb. |
| الهدارين | puncupantana da di gran | Q2 | 2 | و الماريد | 3 | Mayour | and have been | Million Million Comment | Mr. | | |

Condition EUT POL: VERTICAL

: FCC PART 15 B : WIFI Module : F89ESSM23-W1 : Link mode : DC 3.3V Model No Test Mode Power Test Engineer Remark 24.2℃ 54%

| er cerre | | 720 | | | | | | | |
|----------|--------|---------------|-------------------|------------------|---------------|-------|-------|--------|--------|
| Item | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit | Margin | Remark |
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dBuV | |
| | | | | | | | | | |
| 1 | 57.19 | 26.71 | 12.91 | 27.36 | 0.14 | 12.40 | 40.00 | -27.60 | QP |
| 2 | 110.96 | 26.42 | 11.32 | 26.86 | 0.41 | 11.29 | 43.50 | -32.21 | QP |
| 3 | 160.91 | 24.02 | 14.14 | 26.91 | 0.46 | 11.71 | 43.50 | -31.79 | QP |
| 4 | 329.04 | 25.86 | 13.49 | 24.24 | 0.70 | 15.81 | 46.00 | -30.19 | QP |
| 5 | 535.71 | 24.87 | 17.13 | 24.68 | 1.03 | 18.35 | 46.00 | -27.65 | QP |
| 6 | 711.67 | 26.78 | 19.79 | 25.73 | 0.84 | 21.68 | 46.00 | -24.32 | OP |

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

FCC ID: 2AATL-F89ESSM23







Report No.: CST-TCB140212006
From 1G-25GHz

IEEE 802.11b

| FIT | WIEL Madula | Model Nome | F89ESSM23-W1 |
|-------------|-------------|-------------------|-----------------|
| EUT | WIFI Module | Model Name | F89E35W123-W1 |
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Low | | 31111 |

| Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|---------------------|----------|
| | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` , | (dBuV/m) | | Kellali |
| 1120 | V | 52.00 | | -11.24 | 40.76 | | 74.00 | 54.00 | -13.24 | Peak |
| 1745 | V | 52.04 | Certi | -9.53 | 42.51 | 11 | 74.00 | 54.00 | -11.49 | Peak |
| 2289 | V | 51.44 | | -8.07 | 43.37 | = | 74.00 | 54.00 | _s -10.63 | Peak |
| 4824 | V | 40.83 | 7/11/ | 0.64 | 41.47 | cariffic | 74.00 | 54.00 | -12.53 | Peak |
| N/A | O | | Honri | in a | 1111/ | | | Cariffica | = | Chnology |

| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|-------------------|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Low | | 31111 |

| 610 | Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|-----|----------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|----------------|---------|
| | | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` , | (dBuV/m) | | Kemark |
| | 1295 | Н | 50.68 | | -10.96 | 39.72 | - | 74.00 | 54.00 | -14.28 | Peak |
| 35 | 1932 | Н | 49.05 | | -8.86 | 40.19 | ueo | 74.00 | 54.00 | -13.81 | Peak |
| | 2913 | notogy H | 46.98 | | -5.95 | 41.03 | | 74.00 | 54.00 | -12.97 | Peak |
| ſ | 4824 | H È | 41.55 | 311/2 | 0.64 | 42.19 | | 74.00 | 54.00 | -11.81 | Peak |
| | N/A | | illeation . | 300 | 1010914 | 117. | Cer | | ton Technol | 11 | 11/1/20 |

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

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| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|-------------------|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Mid | Contraction 100 | |

| 1 | Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actual Fs | | Peak Limit | AV Limit | Margin (dB) | Remark |
|---|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| | | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| Ī | 1289 | V | 52.32 | 101093 | -10.96 | 41.36 | (| 74.00 | 54.00 | -12.64 | Peak |
| | 2042 | V | 51.06 | | -8.58 | 42.48 | | 74.00 | 54.00 | -11.52 | Peak |
| ĺ | 2953 | V | 49.18 | | -5.86 | 43.32 | ,ology | 74.00 | 54.00 | -10.68 | Peak |
| I | 4874 | V | 40.50 | | 0.76 | 41.26 | 37 | 74.00 | 54.00 | - 12.74 | Peak |

| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|---------------|--|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Mid | The state of the s | Z. |
| allon fee | in the second | | 111//2 |

| Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actual Fs | | Peak Limit | AV Limit | Margin (dB) | Remark |
|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| 1245 | H | 49.66 | | -11.52 | 38.14 | n Technolog | 74.00 | 54.00 | -15.86 | Peak |
| 1959 | H | 49.05 | 5 | -8.64 | 40.41 | | 74.00 | 54.00 | -13.59 | Peak |
| 3452 | Н | 46.21 | 11 | -4.95 | 41.26 | 9 | 74.00 | 54.00 | -12.74 | Peak |
| 4874 | Н | 41.51 | | 0.76 | 42.27 | <u></u> | 74.00 | 54.00 | - 11.73 | Peak |

Notes: AV Means AV detector test data, Peak Means Peak detector test data. Emissions attenuated more than 20 dB below the permissible value are not reported.

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| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|-------------------|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX High | Cortin | 31111 |

| | Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|-----|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| | | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| | 1395 | V | 51.54 | 37 | -10.43 | 41.11 | | 74.00 | 54.00 | -12.89 | Peak |
| , i | 2276 | V | 50.490 | | -8.07 | 42.42 | 01099 | 74.00 | 54.00 | -11.58 | Peak |
| | 3112 | week V | 48.84 | | -5.63 | 43.21 | 31 | 74.00 | 54.00 | -10.79 | Peak |
| | 4924 | V | 41.46 | 3117 | 0.87 | 42.33 | | 74.00 | 54.00 | 11.67 | Peak |

| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|-------------------|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX High | | .117 |

| 1 | Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|-----|-------------|---------------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| e i | | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` / | (dBuV/m) | | Kemark |
| I | 1344 | H | 50.42 | 10911 | -10.84 | 39.58 | 3 | 74.00 | 54.00 | -14.42 | Peak |
| I | 2387 | Н | 49.76 | | -7.59 | 42.17 | | 74.00 | 54.00 | -11.83 | Peak |
| | 3704 | Н | 44.32 | | -4.24 | 40.08 | I | 74.00 | 54.00 | -13.92 | Peak |
| | 4924 | _{nology} H | 40.44 | | 0.87 | 41.31 | 31 | 74.00 | 54.00 | -12.69 | Peak |

Notes: AV Means AV detector test data, Peak Means Peak detector test data. Emissions attenuated more than 20 dB below the permissible value are not reported.

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| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|-------------------|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Low | | |

| Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | |
|-------------|-----------------|-----------------|-----------------|-----------------|------------------|----------------|---------------|-------------|----------------|--------|
| (14112) | 11/ \ | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | (dBuV/m) | (dBuV/m) | 1 1 | Remark |
| 1145 | V | 52.49 | | -11.24 | 41.25 | | 74.00 | 54.00 | -12.75 | Peak |
| 2586 | V | 50.50 | | -7.13 | 43.37 | (alogy | 74.00 | 54.00 | -10.63 | Peak |
| 3062 | V | 47.25 | | -5.74 | 41.51 | 3 | 74.00 | 54.00 | -12.49 | Peak |
| 4824 | V | 41.83 | /1/ | 0.64 | 42.47 | | 74.00 | 54.00 | <u>-11.53</u> | Peak |
| N/A | | Hication | | mology | 11/2 | Co | | Matton Tech | | |

| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|--------------------------|--|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Low | Section 1 | The state of the s |
| Certi | 1111/ | 11/2 | motos |

| 1 100 | Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|-------|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| | | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| | 1294 | Н | 49.42 | 11 | -10.96 | 38.46 | | 74.00 | 54.00 | -15.54 | Peak |
| I | 2038 | Н | 48.76 | = | -8.58 | 40.18 | | 74.00 | 54.00 | -13.82 | Peak |
| Ī | 3483 | Н | 47.21 | entific | -4.95 | 42.26 | 111 | 74.00 | 54.00 | -11.74 | Peak |
| I | 4824 | H | 40.75 | | 0.64 | 41.39 | | 74.00 | 54.00 | -12.61 | Peak |
| | N/A | | Tel dino of | 1111/ | 1/2 | | Centilles | (0) | - Indi | 90 | 11, |

Notes: AV Means AV detector test data, Peak Means Peak detector test data. Emissions attenuated more than 20 dB below the permissible value are not reported.

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| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|-------------------|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Mid | Contraction 100 | |

| | Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|---|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| | | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| ſ | 1374 | V | 51.59 | 101099 | -10.43 | 41.16 | | 74.00 | 54.00 | -12.84 | Peak |
| 5 | 2589 | V | 49.21 | | -7.13 | 42.08 | | 74.00 | 54.00 | -11.92 | Peak |
| | 3365 | V | 50.50 | | -5.18 | 45.32 | ology | 74.00 | 54.00 | -8.68 | Peak |
| I | 4874 | V | 42.20 | | 0.76 | 42.96 | \$ | 74.00 | 54.00 | -11.04 | Peak |

| | TON TON | | Corn. |
|-------------|-------------|-------------------|-----------------|
| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Mid | Tomore S | 111111 |

| I | Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|-----|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| 100 | | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ' | (dBuV/m) | | Kemark |
| | 1321 | Н | 52.00 | <u></u> | -10.84 | 41.16 | | 74.00 | 54.00 | -12.84 | Peak |
| Ī | 2314 | Н | 47.84 | ,,oan | -7.46 | 40.38 | 8 | 74.00 | 54.00 | -13.62 | Peak |
| I | 3577 | Н | 46.97 | -1 | -4.76 | 42.21 | | 74.00 | 54.00 | -11.79 | Peak |
| | 4874 | Н | 40.66 | - Certifica | 0.76 | 41.42 | - II | 74.00 | 54.00 | -12.58 | Peak |

Notes: AV Means AV detector test data, Peak Means Peak detector test data. Emissions attenuated more than 20 dB below the permissible value are not reported.

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| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|---|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX High | Commonweal | All/ |

| | Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|---|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| | | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| | 1302 | V | 52.20 | 101099 | -10.84 | 41.36 | | 74.00 | 54.00 | -12.64 | Peak |
| | 2982 | V | 48.28 | | -5.86 | 42.42 | | 74.00 | 54.00 | -11.58 | Peak |
| 1 | 3831 | V | 47.13 | | -3.96 | 43.17 | ology | 74.00 | 54.00 | -10.83 | Peak |
| | 4924 | V | 41.38 | | 0.87 | 42.25 | 37 | 74.00 | 54.00 | -11.75 | Peak |

| | TON . | | Cor. |
|-------------|-------------|---|-----------------|
| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX High | Tomores and the second | 1111111 |

| | Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|-----|----------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| 100 | | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ' | (dBuV/m) | | Kemark |
| | 1446 | Н | 49.62 | <u></u> | -10.29 | 39.33 | | 74.00 | 54.00 | -14.67 | Peak |
| | 2198 | Н | 46.32 | 11 | -8.24 | 38.08 | 8 | 74.00 | 54.00 | -15.92 | Peak |
| | 3905 | Н | 46.8 | | -3.68 | 43.12 | | 74.00 | 54.00 | -10.88 | Peak |
| | 4924 | Н | 41.66 | - Certifica | 0.87 | 42.53 | - VI | 74.00 | 54.00 | -11.47 | Peak |

Notes: AV Means AV detector test data, Peak Means Peak detector test data. Emissions attenuated more than 20 dB below the permissible value are not reported.

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| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|-------------------|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Low | Corner S | 3111/ |

| Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|--------------|-------------|----------|
| | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| 1492 | V | 51.62 | 3 | -10.27 | 41.35 | | 74.00 | 54.00 | -12.65 | Peak |
| 2671 | V | 49.20 | | -6.94 | 42.26 | mogy | 74.00 | 54.00 | -11.74 | Peak |
| 3948 | V | 46.7 | | -3.68 | 43.02 | 31 | 74.00 | 54.00 | -10.98 | Peak |
| 4824 | V | 41.52 | | 0.64 | 42.16 | | 74.00 | 54.00 | 11.84 | Peak |
| N/A | 2 | The attention | | alogu | | Cartilla | | - Jon Techni | - 1 | 111/1/19 |

| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|-------------------|--------------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Low | | W// |

| 1 | Contines | ELE | Technolos | 111// | | | diffication | 1 | Mos | u . |
|----------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|---------|
| Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
| | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Keniark |
| 1451 | Н | 49.60 | 1091 | -10.27 | 39.33 | 3 | 74.00 | 54.00 | -14.67 | Peak |
| 2839 | Н | 46.92 | = | -6.17 | 40.75 | | 74.00 | 54.00 | -13.25 | Peak |
| 3607 | Н | 47.47 | - Contille | -4.52 | 42.95 | II | 74.00 | 54.00 | -11.05 | Peak |
| 4824 | rology H | 43.78 | | 0.64 | 44.42 | | 74.00 | 54.00 | -9.58 | Peak |
| N/A | 17 | Technology | .111// | | 5 | | onrec | | 311 | |

Notes: AV Means AV detector test data, Peak Means Peak detector test data. Emissions attenuated more than 20 dB below the permissible value are not reported.

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| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|-------------------|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Mid | Contraction 100 | |

| 1 | Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|---|----------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| | | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| | 1262 | V | 52.20 | 101093 | -10.96 | 41.24 | (| 74.00 | 54.00 | -12.76 | Peak |
| 5 | 2013 | V | 50.66 | | -8.58 | 42.08 | | 74.00 | 54.00 | -11.92 | Peak |
| 3 | 3798 | V | 49.39 | | -4.07 | 45.32 | 1010gy | 74.00 | 54.00 | -8.68 | Peak |
| | 4874 | V | 42.53 | | 0.76 | 43.29 | 37 | 74.00 | 54.00 | -10.71 | Peak |

| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|---------------|--|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Mid | The state of the s | Z. |
| allon fee | in the second | | 111//2 |

| | Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actual Fs | | Peak Limit | AV Limit | Margin (dB) | Remark |
|---|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| | | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| | 1511 | H | 51.21 | | -10.14 | 41.07 | n Technolog | 74.00 | 54.00 | -12.93 | Peak |
| | 2353 | m Tec H | 50.91 | 5 | -7.59 | 43.32 | | 74.00 | 54.00 | -10.68 | Peak |
| | 3266 | Н | 46.82 | 11 | -5.39 | 41.43 | 0 | 74.00 | 54.00 | -12.57 | Peak |
| 4 | 4874 | Н | 41.85 | = | 0.76 | 42.61 | <u> </u> | 74.00 | 54.00 | -11.39 | Peak |

Notes: AV Means AV detector test data, Peak Means Peak detector test data. Emissions attenuated more than 20 dB below the permissible value are not reported.

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| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|-------------------|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX High | Z. Taranta | All/ |

| Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| 1477 | V | 51.44 | 11 | -10.27 | 41.17 | (| 74.00 | 54.00 | -12.83 | Peak |
| 2703 | V | 47.96 | | -6.43 | 41.53 | | 74.00 | 54.00 | -12.47 | Peak |
| 3561 | V | 47.08 | | -4.76 | 42.32 | 1010gy | 74.00 | 54.00 | -11.68 | Peak |
| 4924 | V | 42.78 | | 0.87 | 43.65 | 37 | 74.00 | 54.00 | -10.35 | Peak |

| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|--|-------------------|-------------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX High | | 111/1/2 |
| E Jan | 111/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/ | - Tillication | and on the second |

| I | Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|---|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|---------|
| | | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` , | (dBuV/m) | | Killaik |
| I | 1503 | Н | 50.17 | <u></u> | -10.14 | 40.03 | | 74.00 | 54.00 | -13.97 | Peak |
| I | 3588 | Н | 44.38 | ,iogu 11 | -4.96 | 39.42 | 3 | 74.00 | 54.00 | -14.58 | Peak |
| I | 4153 | Н | 44.75 | | -2.48 | 42.27 | | 74.00 | 54.00 | -11.73 | Peak |
| | 4924 | Н | 40.56 | - Certifica | 0.87 | 41.43 | , jogu | 74.00 | 54.00 | -12.57 | Peak |

Notes: AV Means AV detector test data, Peak Means Peak detector test data. Emissions attenuated more than 20 dB below the permissible value are not reported.

FCC ID: 2AATL-F89ESSM23

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IEEE 802.11n/HT40 with 2.4G

| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|-------------------|--|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Low | Corum | The state of the s |

| Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actual Fs | | Peak Limit | AV Limit | Margin (dB) | Remark |
|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|----------|
| | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kentark |
| 1551 | V | 50.15 | | -10.07 | 40.08 | | 74.00 | 54.00 | -13.92 | Peak |
| 2695 | V | 49.37 | Certi | -6.94 | 42.43 | 11 | 74.00 | 54.00 | -11.57 | Peak |
| 3463 | V | 46.32 | | -4.95 | 41.37 | = | 74.00 | 54.00 | -12.63 | Peak |
| 4844 | V | 43.19 | 7/11/ | 0.64 | 43.83 | Cartine | 74.00 | 54.00 | -10.17 | Peak |
| N/A | C | | - Mon To | | | | | Certifica | | Chrology |

| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|-------------------|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Low | | 31111 |

| Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|-------------|---------------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| 1542 | Н | 50.3 | | -10.14 | 40.16 | | 74.00 | 54.00 | -13.84 | Peak |
| 2358 | Н | 48.90 | | -7.59 | 41.31 | ue | 74.00 | 54.00 | -12.69 | Peak |
| 3096 | _{tology} H | 48.01 | | -5.74 | 42.27 | | 74.00 | 54.00 | -11.73 | Peak |
| 4844 | Н | 40.77 | 33172 | 0.64 | 41.41 | | 74.00 | 54.00 | -12.59 | Peak |
| N/A | | incation ! | 300 | ology | 11/- | Cer | | ton Technol | 11 | |

Notes: AV Means AV detector test data, Peak Means Peak detector test data. Emissions attenuated more than 20 dB below the permissible value are not reported.

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| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|-------------------|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Mid | Contraction 100 | |

| 1 | Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actual Fs | | Peak Limit | AV Limit | Margin (dB) | Remark |
|---|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| 8 | | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| ſ | 1628 | V | 51.50 | 101099 | -9.84 | 41.66 | (| 74.00 | 54.00 | -12.34 | Peak |
| | 2593 | V | 50.37 | | -7.13 | 43.24 | | 74.00 | 54.00 | -10.76 | Peak |
| ĺ | 3301 | V | 47.74 | | -5.31 | 42.43 | ,ology | 74.00 | 54.00 | -11.57 | Peak |
| I | 4874 | V | 41.31 | | 0.76 | 42.07 | | 74.00 | 54.00 | -11.93 | Peak |

| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|---------------|--|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX Mid | The state of the s | Z. |
| allon fee | in the second | | 111//2 |

| Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actual Fs | | Peak Limit | AV Limit | Margin (dB) | Remark |
|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| 1564 | H | 50.40 | | -10.07 | 40.33 | n Technolog | 74.00 | 54.00 | -13.67 | Peak |
| 2248 | H | 50.28 | 5 | -8.13 | 42.15 | | 74.00 | 54.00 | -11.85 | Peak |
| 3159 | Н | 47.48 | 11 | -5.52 | 41.96 | 9 | 74.00 | 54.00 | -12.04 | Peak |
| 4874 | Н | 42.67 | = | 0.76 | 43.43 | <u> </u> | 74.00 | 54.00 | -10.57 | Peak |

Notes: AV Means AV detector test data, Peak Means Peak detector test data. Emissions attenuated more than 20 dB below the permissible value are not reported.

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| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
|-------------|-------------|-------------------|-----------------|
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX High | Z. Taranta | All/ |

| Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| 1645 | V | 52.11 | 101099 | -9.84 | 42.27 | | 74.00 | 54.00 | -11.73 | Peak |
| 2590 | V | 50.45 | | -7.13 | 43.32 | | 74.00 | 54.00 | -10.68 | Peak |
| 3851 | V | 46.37 | | -3.84 | 42.53 | ology | 74.00 | 54.00 | -11.47 | Peak |
| 4904 | V | 43.77 | | 0.87 | 44.64 | 37 | 74.00 | 54.00 | -9.36 | Peak |

| | TON . | | Cor. |
|-------------|-------------|---|-----------------|
| EUT | WIFI Module | Model Name | F89ESSM23-W1 |
| Temperature | 26°C | Relative Humidity | 56% |
| Pressure | 960hPa | Test voltage | DC 3.3V From PC |
| Test Mode | TX High | Tomores and the second | 1111111 |

| I | Freq. (MHz) | Ant. Pol H/V | Peak Reading | AV Reading | Ant. / CL CF | Actu | al Fs | Peak Limit | AV Limit | Margin (dB) | Remark |
|---|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
| | | | (dBuV) | (dBuV) | (dB) | Peak (dBuV/m) | AV (dBuV/m) | ` ′ | (dBuV/m) | | Kemark |
| | 1792 | Н | 50.69 | | -9.27 | 41.42 | | 74.00 | 54.00 | -12.58 | Peak |
| Ī | 2804 | Н | 46.42 | ,,,ogu 11 | -6.17 | 40.25 | 3 | 74.00 | 54.00 | -13.75 | Peak |
| I | 3743 | Н | 47.30 | -1 | -4.24 | 43.06 | | 74.00 | 54.00 | -10.94 | Peak |
| | 4904 | Н | 44.85 | - Certifica | 0.87 | 45.72 | , jogu | 74.00 | 54.00 | -8.28 | Peak |

Notes: AV Means AV detector test data, Peak Means Peak detector test data. Emissions attenuated more than 20 dB below the permissible value are not reported.

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6 POWER LINE CONDUCTED EMISSION

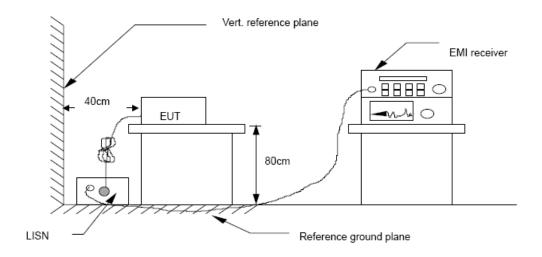
6.1 Conducted Emission Limits(15.207)

| Frequency | Limits dI | Β(μV) |
|-------------|------------------|---------------|
| MHz | Quasi-peak Level | Average Level |
| 0.15 -0.50 | 66 -56* | 56 - 46* |
| 0.50 -5.00 | 56 | 46 |
| 5.00 -30.00 | 60 | 50 |

Notes: 1. *Decreasing linearly with logarithm of frequency.

- 2. The lower limit shall apply at the transition frequencies.
- 3. The limit decreases in line with the logarithm of the frequency in the rang of 0.15 to 0.50 MHz.

6.2 Test Setup





6.3 Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4-2003 on Conducted Emission Measurement. The bandwidth of test receiver (R & S ESCF89ESSM23-W10) is set at 9 kHz.

6.4 Test Results

PASS

Detailed information please see the following page.

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Shenzhen Certification Technology Service Co., Ltd.
2F, Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 Fax: +86-755-26736857
Website: http://www.cessz.com/Email:Service@cessz.com/

| 80 Level (dBuV |) | | | Date: 2 | 014-02-17 T | ime: 16:13 |
|---------------------------|---------------------------|-----------|---------|---------|-------------|----------------|
| 80 | | | | | | |
| | | | | | | |
| 70 | | | | | | |
| _ | | | | | 100000000 | |
| 60 | | | | | FCC PA | ART 15 B Q |
| | | | | | | |
| 50 | | | | | FCC PA | ART 15 B A |
| 50 | | | 0 | | 22 | |
| | 3.2 | 5 | ı | VSX. | 11 | |
| 40 1 | 2 | | 7 M | lla - | 1 | - |
| my production of the said | Mary may make my make the | My | J Mark | WAL | JV | |
| 30 | | ALVAN MAL | 77 / 11 | 21 | 1 | |
| -man Amoun | + | A | \$ | 4414 | 11/12 | KT |
| 20 | | and which | Man Man | | A LALLY " | Mal 4 |
| 20 | | | March | ייטועיי | MAN / | Mary Lady Mary |
| | | | | "\ | ALL IN | 11 |
| 10 | | | | - WHALL | Thinks. | May Ly |
| | | | | | | |
| | | | | | | |

POL: NEUTRAL Temp:24 °C

: FCC PART 15 B QP : WIFI Module : F89ESSM23-W1 : Link mode : DC 3.3V Test Mode Test Engineer: Simple

Remark

| Ite | n Freq | Read | LISN Factor | Preamp Factor | Cable Lose | Level | Limit | Margin | Remark |
|-----|--------|----------|----------------|------------------|---------------|-------|-------|--------|---------|
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dBuV | |
| | | 50000000 | | | | | | | |
| 1 | 0.230 | 28.28 | 0.03 | -9.72 | 0.10 | 38,13 | 62.44 | -24.31 | QP |
| 2 | 0.230 | 16.28 | 0.03 | -9.72 | 0.10 | 26.13 | 52,44 | -26.31 | Average |
| 3 | 0.367 | 25.91 | 0.03 | -9.72 | 0.10 | 35.76 | 58.56 | -22.80 | QP |
| 4 | 0.367 | 14.91 | 0.03 | -9.72 | 0.10 | 24.76 | 48.56 | -23.80 | Average |
| 5 | 0.796 | 31.98 | 0.00 | -9.71 | 0.10 | 41.79 | 56.00 | -14.21 | QP |
| 6 | 0.796 | 25.98 | 0.00 | -9.71 | 0.10 | 35.79 | 46.00 | -10.21 | Average |
| 7 | 1.602 | 27.08 | 0.05 | -9.71 | 0.10 | 36.94 | 56.00 | -19.06 | QP |
| 8 | 1.602 | 15.08 | 0.05 | -9.71 | 0.10 | 24.94 | 46.00 | -21.06 | Average |
| 9 | 3.276 | 34.37 | 0.07 | -9.69 | 0.12 | 44.25 | 56.00 | -11.75 | QP |
| 10 | 3.276 | 11.37 | 0.07 | -9.69 | 0.12 | 21.25 | 46.00 | -24.75 | Average |
| 11 | 12.920 | 33.81 | 0.23 | -9.44 | 0.22 | 43.70 | 60.00 | -16.30 | QP |
| 12 | 12.920 | 13.81 | 0.23 | -9.44 | 0.22 | 23.70 | 50.00 | -26.30 | Average |

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

FCC ID: 2AATL-F89ESSM23















Shenzhen Certification Technology Service Co., Ltd.
2F, Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 Fax: +86-755-26736857
Website: http://www.cessz.com/Email:Service@cessz.com/

| 80 Level (dBu | IV) | | | Date: 2 | 014-02-17 Ti | me: 16:19 |
|----------------|--|--|---------|-----------------|--------------|------------|
| 80 | | | | | | Ī |
| | | | | | | |
| 70 | | | | | | |
| | | | | | | |
| 60 | | | | | FCC PA | ART 15 B Q |
| 00 | | | | 57 | | |
| | | | | | FCC PA | ART 15 B A |
| 50 | | | | | 100 | |
| | | | 7 | | 11 | |
| 40 1 | | 5 | 1 | ti tak | — A | |
| some handstone | MANUAL BULLINE | MALL I | I IND | | 11131. | |
| 00 | man 3 minuman | A MANAGEMENT OF THE PARTY OF TH | My II W | 7 P. | | |
| 30 2 | | 6 | MANNA 8 | | 1 12 | |
| | and the same of th | May water 1 | 1 1 | . hw late | . W V | M . |
| 20 | | weld will | 1 | N 10 , hrv Will | Valura, V. | MusleyM |
| | | | - WW | Was had | N W | T. PART |
| 10 | | | | NUM III | Add N | |
| 2.K | | | | 2000 | | Mules |
| | | | | | | |
| | | | | | | |

POL: LINE

: FCC PART 15 B QP : WIFI Module : F89ESSM23-W1 Test Mode : Link mode Power : DC 3.3V Test Engineer: Simple

Remark

| Ite | n Freq | Read | LISN Factor | Preamp Factor | Cable Lose | Level | Limit | Margin | Remark |
|-----|--------|-------|----------------|------------------|---------------|-------|-------|--------|---------|
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dBuV | |
| 1 | 0.208 | 28.12 | 0.03 | -9.72 | 0.10 | 37.97 | 63.27 | -25.30 | QP |
| 2 | 0.208 | 16.12 | 0.03 | -9.72 | 0.10 | 25.97 | 53.27 | -27.30 | Average |
| 3 | 0.426 | 25.57 | 0.03 | -9.72 | 0.10 | 35.42 | 57,33 | -21.91 | QP |
| 4 | 0.426 | 14.57 | 0.03 | -9.72 | 0.10 | 24.42 | 47.33 | -22.91 | Average |
| 5 | 0.775 | 29.82 | 0.00 | -9.71 | 0.10 | 39.63 | 56.00 | -16.37 | QP |
| 6 | 0.775 | 16.82 | 0.00 | -9.71 | 0.10 | 26.63 | 46.00 | -19.37 | Average |
| 7 | 2,554 | 31.39 | 0.06 | -9.70 | 0.11 | 41.26 | 56.00 | -14.74 | QP |
| 8 | 2.554 | 15.39 | 0.06 | -9.70 | 0.11 | 25.26 | 46.00 | -20.74 | Average |
| 9 | 4.070 | 30.80 | 0.08 | -9.69 | 0.12 | 40.69 | 56.00 | -15.31 | QP |
| 10 | 4.070 | 8.80 | 0.08 | -9.69 | 0.12 | 18.69 | 46.00 | -27.31 | Average |
| 11 | 12.784 | 34.71 | 0.24 | -9.44 | 0.22 | 44.61 | 60.00 | -15.39 | QP |
| 12 | 12.784 | 15.71 | 0.24 | -9.44 | 0.22 | 25.61 | 50.00 | -24.39 | Average |

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

FCC ID: 2AATL-F89ESSM23











7 Conducted Maximum Output Power

7.1 Test limit

Please refer section 15.247.

Regulation 15.247(b) The limit of Maximum Peak Output Power Measurement is 1W(30dBm)

7.2 Test Procedure

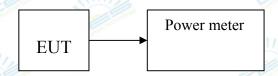
Details see the KDB558074 Meas Guidance V03

- 7.2.1 Place the EUT on the table and set it in transmitting mode.
- 7.2.2 Connected the EUT's antenna port to peak power meter by 20dB attenuator.
- 7.2.3 Measure out each mode and each bands peak output power of EUT.

Note: The cable loss and attenuator loss were offset into measure device as amplitude offset.

Details see the KDB558074 DTS Meas Guidance V03

7.3 Test Setup



7.4 Test Results

PASS

Detailed information please see the following page.



| EUT: WIFI Module | M/N: F89E | SSM23-W1 | · | Cartifica |
|-----------------------|-----------------|-----------------------|--------------|----------------|
| Test date: 2014-02- | Test si | te: RF site Tes | sted by: Sim | ple Guan |
| Mode | Frequency (MHz) | PK Output power (dBm) | Limit (dBm) | Margin (dB) |
| | CH1: 2412 | 9.47 | 30 | 20.53 |
| IEEE 802.11 b | CH6: 2437 | 9.31 | 30 | 20.69 |
| | CH11: 2462 | 9.25 | 30 | 20.75 |
| 111/1/1/ | CH1: 2412 | 9.02 | 30 | 20.98 |
| IEEE 802.11 g | СН6: 2437 | 8.94 | 30 | 21.06 |
| | CH11: 2462 | 8.85 | 30 | 21.15 |
| IEEE 002 11 | CH1: 2412 | 8.73 | 30 | 21.27 |
| IEEE 802.11 n/HT20 | СН6: 2437 | 8.46 | 30 | 21.54 |
| 11/11120 | CH11: 2462 | 8.63 | 30 | 21.37 % |
| IEEE 000 11 | CH1: 2422 | 7.58 | 30 | 22.42 |
| IEEE 802.11 n/HT40 | CH4: 2437 | 7.31 | 30 | 22.69 |
| П/П140 | CH7: 2452 | 7.46 | 30 | 22.54 |
| Conclusion: PASS | Series = | Treatment 1111/ | | Certification |

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8 PEAK POWER SPECTRAL DENSITY

- Test limit 8.1
- 8.1.1 Please refer section 15.247.
- For direct sequence systems, the peak power spectral density conducted from the 8.1.2 intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
- 8.1.3 The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.
- 8.2 Method of measurement Details see the KDB558074 D01 DTS Meas Guidance v03r01.
- 8.2.1 Place the EUT on the table and set it in transmitting mode.
- 8.2.2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 8.2.3 Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, span=5-30%EBW, detail see the test plot.
- 8.2.4 Record the max reading.
- 8.2.5 Repeat the above procedure until the measurements for all frequencies are completed.

8.3 Test Setup



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Report No.: CST-TCB140212006

8.4 Test Results

PASS.

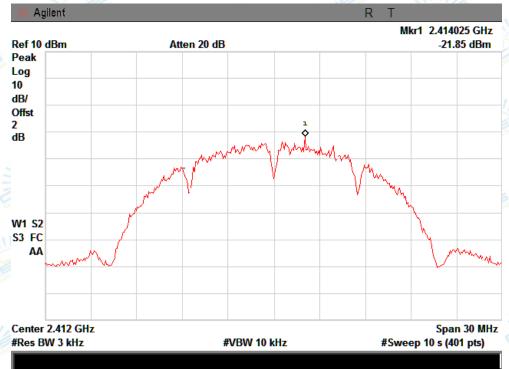
Detailed information please see the following page.

| y. | Cartification | - Jacob Control Code | 111/1/11 | |
|-------------|-----------------|--|--------------------|---------------|
| Channel | Frequency (MHz) | Power Spectral Density (dBm) | Limit (dBm) | Result |
| EEE 802.11 | b: | Contraction 2 | JIII/ | 146 |
| Low | 2412 | -21.85 | 8 | PASS |
| Mid | 2437 | -23.96 | 8 | PASS |
| High | 2462 | -22.58 | 811/ | PASS |
| EEE 802.11 | g: (1) | 1111 | The ton Technology | - Indo |
| Low | 2412 | -27.47 | 8 | PASS |
| Mid | 2437 | -25.92 | 8 | PASS |
| High | 2462 | -26.98 | 8 | PASS |
| IEEE 802.11 | n/HT20 | S. I. | | Certification |
| Low | 2412 | -23.00 | 8 | PASS |
| Mid | 2437 | -24.07 | 8 | PASS |
| High | 2462 | -28.08 | 8 | PASS |
| IEEE 802.11 | n/HT40 | Control of the Contro | Too te morous | |
| Low | 2422 | -24.53 | 8 | PASS |
| Mid | 2437 | -24.97 | 8 | PASS |
| High | 2452 | -23.82 | 8 | PASS |

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IEEE 802.11b:

CH Low:



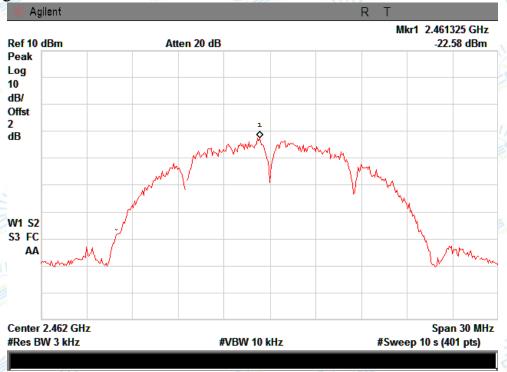
CH Mid:



FCC ID: 2AATL-F89ESSM23

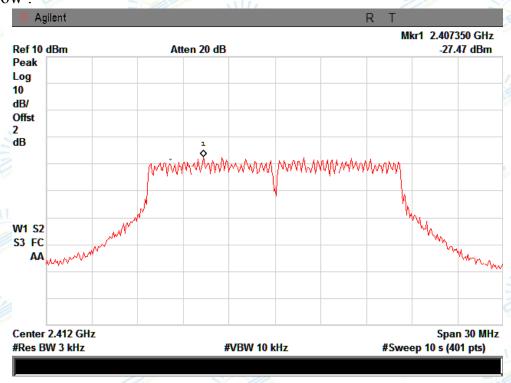
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CH High:



IEEE 802.11g:

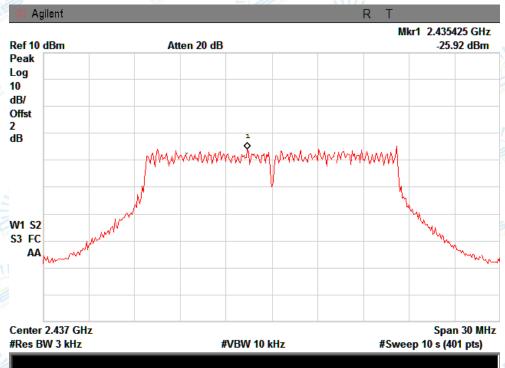
CH Low:



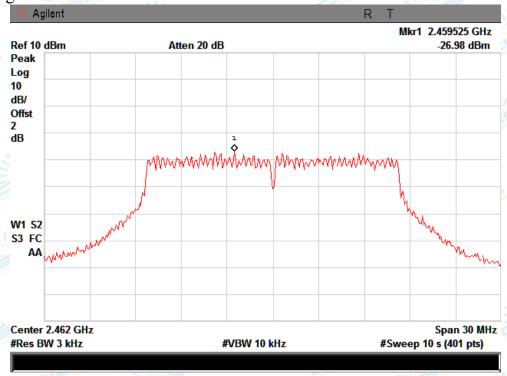
FCC ID: 2AATL-F89ESSM23

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CH Mid:



CH High:

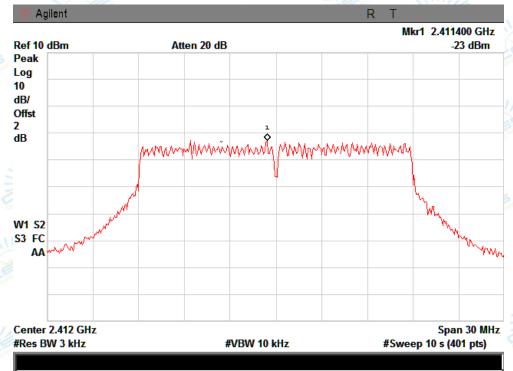


FCC ID: 2AATL-F89ESSM23

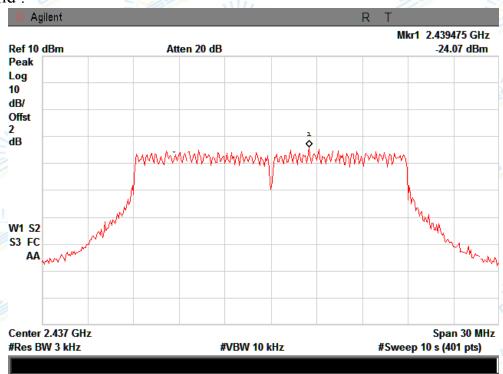
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IEEE 802.11n/HT20:

CH Low:



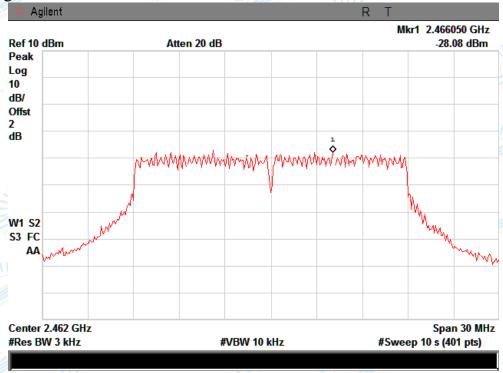
CH Mid:



FCC ID: 2AATL-F89ESSM23

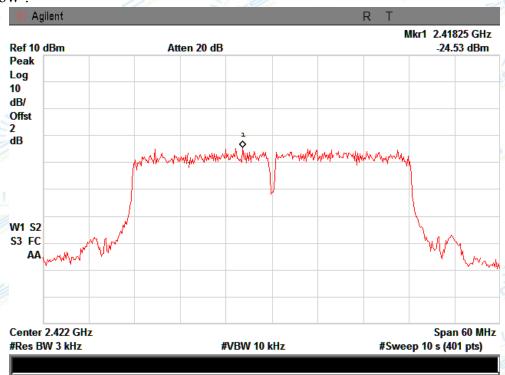
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CH High:



IEEE 802.11n/HT40:

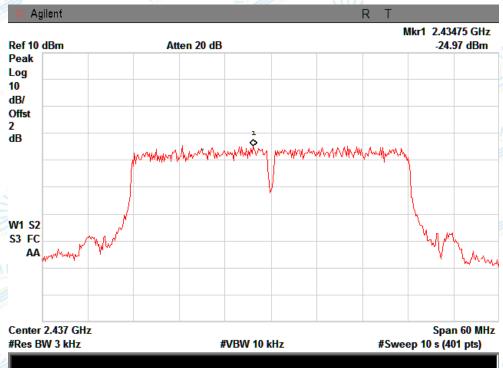
CH Low:



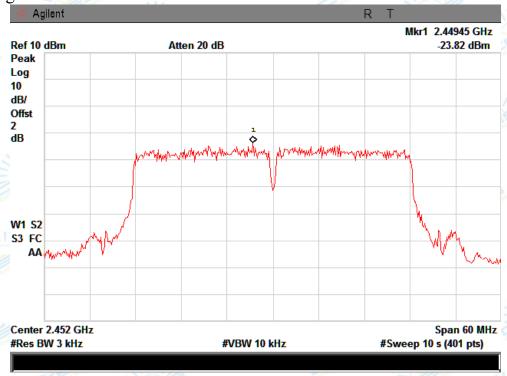
FCC ID: 2AATL-F89ESSM23

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CH Mid:



CH High:



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9 Bandwidth

9.1 Test limit

Please refer section 15.247

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

9.2 Method of measurement

Details see the KDB558074 D01 DTS Meas Guidance v03r01.

- a)The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.
- b) The test receiver set RBW = 1-5 % EBW, VBW≥3RBW, Sweep time set auto, detail see the test plot.

9.3 Test Setup



9.4 Test Results PASS.

Detailed information please see the following page.

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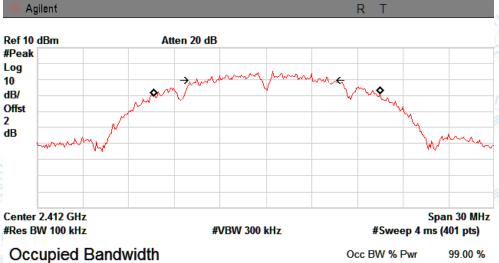
| | Cers | | | |
|-----------------|--|---------------------------------|--|--|
| Frequency (MHz) | 6dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) | Limit (MHz) | Result |
| 2.11b: | and the state of t | MILL | - Tonto | 1 |
| 2412 | 8.62 | 14.86 | 0.5 | PASS |
| Mid 2437 10.07 | | 14.87 | 0.5 | PASS |
| 2462 | 10.09 | 14.89 | 0.5 | PASS |
| 2.11g: | | STORY STORY | 117. | Certifica |
| 2412 | 16.29 | 16.46 | 0.5 | PASS |
| 2437 | 16.44 | 16.47 | 0.5 | PASS |
| 2462 | 16.48 | 16.49 | 0.5 | PASS |
| 2.11n/HT20: | | E-man | Redmology 111 | 11/1 |
| 2412 | 17.54 | 17.62 | 0.5 | PASS |
| 2437 | 17.62 | 17.63 | 0.5 | PASS |
| 2462 | 17.62 | 17.67 | 0.5 | PASS |
| 2.11n/HT40: | and recommond | 111/1 | Certification red | |
| 2422 | 35.26 | 35.68 | 0.5 | PASS |
| 2437 | 35.13 | 35.73 | 0.5 | PASS |
| 2452 | 35.16 | 35.78 | 0.5 | PASS |
| | (MHz) 2.11b: 2412 2437 2462 2.11g: 2412 2437 2462 2.11n/HT20: 2412 2437 2462 2.11n/HT40: 2422 2437 | (MHz) (MHz) 2.11b: 2412 | (MHz) (MHz) Bandwidth (MHz) 2.11b: 2412 8.62 14.86 2437 10.07 14.87 2462 10.09 14.89 2.11g: 16.29 16.46 2437 16.44 16.47 2462 16.48 16.49 2.11n/HT20: 2412 17.54 17.62 2437 17.62 17.63 2462 17.62 17.67 2.11n/HT40: 2422 35.26 35.68 2437 35.13 35.73 | (MHz) (MHz) Bandwidth (MHz) (MHz) 2.11b: 2412 8.62 14.86 0.5 2437 10.07 14.87 0.5 2462 10.09 14.89 0.5 2.11g: 2412 16.29 16.46 0.5 2437 16.44 16.47 0.5 2462 16.48 16.49 0.5 2.11n/HT20: 2412 17.54 17.62 0.5 2437 17.62 17.63 0.5 2.11n/HT40: 2422 35.26 35.68 0.5 2437 35.13 35.73 0.5 |

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IEEE 802.11b:

CH Low:

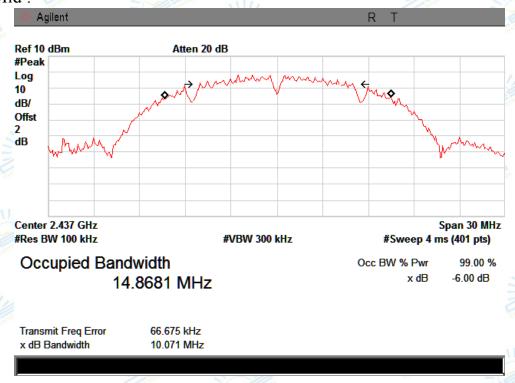


14.8647 MHz

99.00 % Occ BW % Pwr x dB -6.00 dB

Transmit Freq Error 60.580 kHz x dB Bandwidth 8.642 MHz

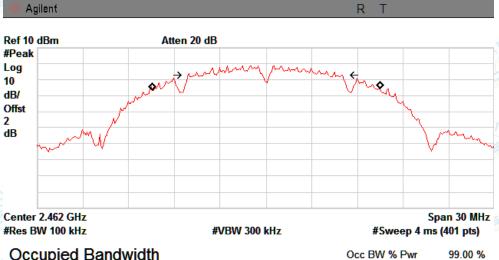
CH Mid:



FCC ID: 2AATL-F89ESSM23

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CH High:



Occupied Bandwidth 14.8879 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB

Transmit Freq Error 19.583 kHz x dB Bandwidth 10.094 MHz

IEEE 802.11g:

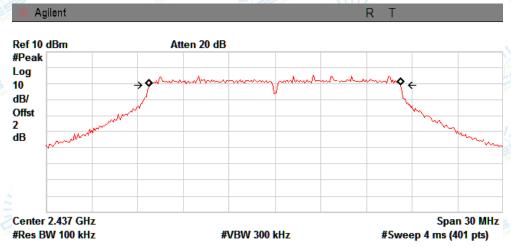
CH Low:

| ₩ Agilent | | | R T | |
|---------------------|------------------|----------|--------------|--------------|
| Ref 10 dBm | Atten 20 dB | | | |
| #Peak | | | | |
| Log 10 | > Outrammy North | ummunden | mpmox | |
| dB/ | [/ | V | | |
| Offst | VW. | | Many | |
| dB ~~~ | | | | MANAGAMA |
| ~~~~· | | | | ~ 4440 |
| | | | | |
| | | | | |
| | | | | |
| Center 2.412 GHz | | | | Span 30 MHz |
| #Res BW 100 kHz | #VBW 300 | kHz | #Sweep 4 m | ıs (401 pts) |
| Occupied Band | dwidth | | Occ BW % Pwr | 99.00 % |
| • | 6.4597 MHz | | x dB | -6.00 dB |
| | | | | |
| Transmit Freq Error | 6.477 kHz | | | |
| x dB Bandwidth | 16.286 MHz | | | |
| | | | | |
| | | | W- | |

FCC ID: 2AATL-F89ESSM23

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CH Mid:



Occupied Bandwidth 16.4737 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB

Transmit Freq Error -3.204 kHz x dB Bandwidth 16.440 MHz

CH High:

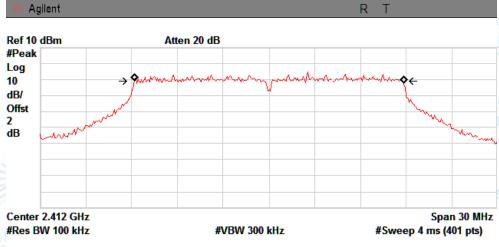
| ₩ Agilent | | R T | |
|-------------------------------------|---|----------------------------------|------|
| Ref 10 dBm | Atten 20 dB | | |
| #Peak Log 10 dB/ | - Annanananananananananananananananananan | manama of | |
| 2 dB w/www. | | | لرسم |
| Center 2.462 GHz #Res BW 100 kHz | #VBW 300 kHz | Span 30 I #Sweep 4 ms (401 pt | |
| Occupied Band | dwidth | Occ BW % Pwr 99.00 |) % |
| 16 | 6.4930 MHz | x dB -6.00 d | В |
| Transmit Freq Error x dB Bandwidth | 3.577 kHz 16.481 MHz | | |
| | | | |

FCC ID: 2AATL-F89ESSM23

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IEEE 802.11 n/HT20:

CH Low:

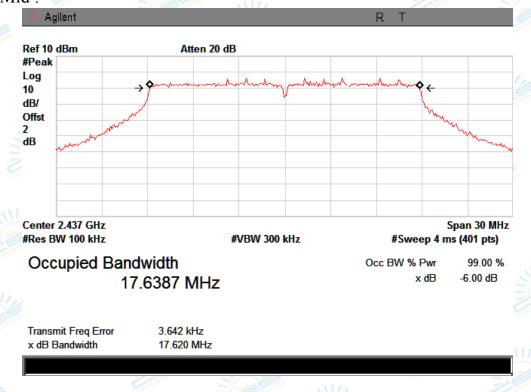


Occupied Bandwidth 17.6228 MHz Occ BW % Pwr x dB -{

99.00 % -6.00 dB

Transmit Freq Error 17.720 kHz x dB Bandwidth 17.543 MHz

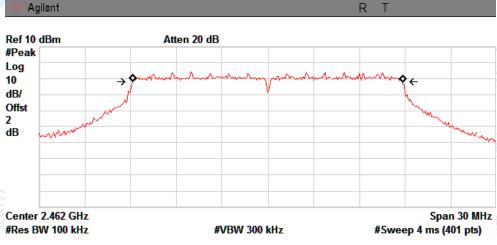
CH Mid:



FCC ID: 2AATL-F89ESSM23

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CH High:

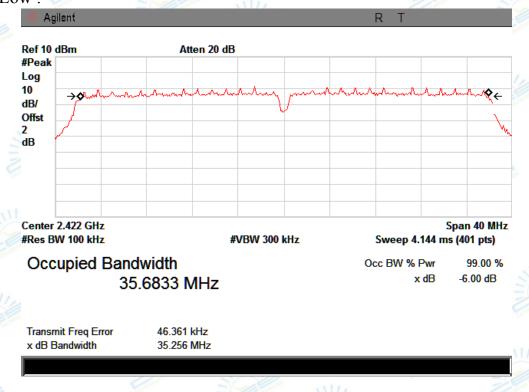


Occupied Bandwidth 17.6669 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB

Transmit Freq Error x dB Bandwidth -9.985 kHz 17.624 MHz

IEEE 802.11n/HT40:

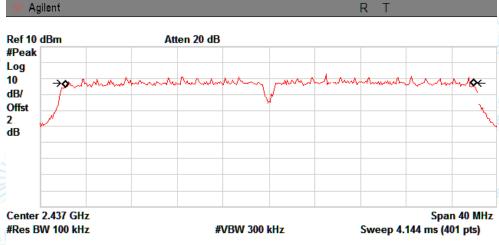
CH Low:



FCC ID: 2AATL-F89ESSM23

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CH Mid:

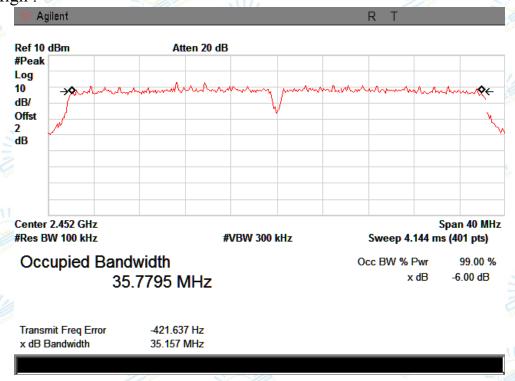


Occupied Bandwidth 35.7326 MHz

Occ BW % Pwr x dB 99.00 % -6.00 dB

Transmit Freq Error 27.880 kHz x dB Bandwidth 35.128 MHz

CH High:



FCC ID: 2AATL-F89ESSM23

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10 Band Edge Check

10.1 Test limit

Please refer section 15.247

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz and 5725MHz to 5850MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

- 10.2 Test Procedure
- 12.2.1 Put the EUT on a 0.8m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission
- 12.2.2 Check the spurious emissions out of band.
- 12.2.3 RBW, VBW Setting, please see the following test plot.
- 10.3 Test Setup Same as 5.2.2.
- 10.4 Test Result PASS.

Detailed information please see the following page.

FCC ID: 2AATL-F89ESSM23

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Report No.: CST-TCB140212006 IEEE 802.11b: CH LOW: Shenzhen Certification Technology Service Co., Ltd. 2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China Tel: 4006786199 FAX: +86-755-26736857

Website: http://www.cessz.com/Email: Service@cessz.com/ File: D::无线测试\WIFI\FN-LINK\Biandai-MODULE.EM6 (16) 100 Level (dBuV/m) Date: 2014-02-21 Time: 22:45:34 90 80 70 FCC PART 15_18G AVG 20 23**1**0 2320. Frequency (MHz) : FCC PART 15_18G PEAK 3m : WIFI Module : F89ESSM23-W1 POL: VERTICAL Condition EUT Model No Test Mode IEEE.802.b CH Low: 2412 Power DC 3.3V From PC with AC 120V/60Hz Test Engineer Remark Temp Read MHz dBuV dB dB dBuV dBuV dBuV Peak Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss FCC ID: 2AATL-F89ESSM23 Page 50 of 73





Shenzhen Certification Technology Service Co., Ltd. 2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China Tel: 4006786199 FAX: +86-755-26736857 Website: http://www.cessz.com/Email: Service@cessz.com/

File: D:\无线测试\WIFI\FN-LINK\Biandai-MODULE.EM6 (16) Data: 2 100 Level (dBuV/m) Date: 2014-02-21 Time: 21:40:21 90 80 FCC PART 1 70 60 FCC PART 15_18G AVG 50 40 30 20 10 ⁰2310 2320. 2360. 2400. 2420 Frequency (MHz)

Condition : FCC PART 15_18G PEAK 3m

EUT : WIFI Module Model No : F89ESSM23-W1

Test Mode : IEEE.802.b CH Low: 2412

Power : DC 3.3V From PC with AC 120V/60Hz

Test Engineer : Store Remark : Temp :

Antenna Margin Level Factor Loss MHz dB dB dBuV 27.62 2390.00 39.88 3.92 36.45 74.00 -37.55 Peak 2400.00 49.43 27.62 46.02 74.00 -27.98 Peak

POL: HORIZONTAL

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

-2-



Report No.: CST-TCB140212006
CH High: Shenzhen Certification Technology Service Co., Ltd. 2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China Tel: 4006786199 FAX: +86-755-26736857 Website: http://www.cessz.com Email: Service@cessz.com File: D::无线测试\WIFI\FN-LINK\Biandai-MODULE.EM6 (16) Data: 11 100 Level (dBuV/m) Date: 2014-02-21 Time: 22:08:14 90 80 FCC PART 15_18G PEAK 70 60 FCC PART 15_18G AVG 40 30 2450 2460. 2500. 2510. 2540. 2550 Frequency (MHz) Condition EUT Model No : FCC PART 15_18G PEAK 3m : WIFI Module : F89ESSM23-W1 POL: HORIZONTAL IEEE.802.b CH High: 2462 DC 3.3V From PC with AC 120V/60Hz Store Test Mode Power Test Engineer Temp Level dBuV MHz 1 2483.50 -31.09 Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss





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File: D:\无线测试\WIFI\FN-LINK\Biandai-MODULE.EM6 (16) Data: 12 100 Level (dBuV/m) Date: 2014-02-21 Time: 22:09:36 90 80 FCC PART 15_18G PEAK 70 60 FCC PART 15_18G AVG 50 40 30 20 10 ⁰2450 2460. 2500. 2510. 2540. 2550 Frequency (MHz)

: FCC PART 15_18G PEAK 3m : WIFI Module Condition POL: VERTICAL

EUT Model No : F89ESSM23-W1

: IEEE.802.b CH High: 2462 Test Mode

Power DC 3.3V From PC with AC 120V/60Hz

Test Engineer Remark

Temp

| Item | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit | Margin | Remark |
|------|---------|---------------|-------------------|------------------|---------------|-------|-------|--------|--------|
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dBuV | |
| 1 | 2483.50 | 41.70 | 27.59 | 34.97 | 4.00 | 38.32 | 74.00 | -35.68 | Peak |

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

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Report No.: CST-TCB140212006 IEEE 802.11g: CH LOW: Shenzhen Certification Technology Service Co., Ltd. 2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China Tel: 4006786199 FAX: +86-755-26736857
Website: http://www.cessz.com/Email: Service@cessz.com/ File: D:\无线测试\WIFI\FN-LINK\Biandai-MODULE.EM6 (16) 100 Level (dBuV/m) Date: 2014-02-21 Time: 21:44:13 90 80 70 ART 15_18G AVG 20 23**1**0 2320. Frequency (MHz) : FCC PART 15_18G PEAK 3m : WIFI Module : F89ESSM23-W1 POL: HORIZONTAL Condition EUT Model No Test Mode IEEE.802.g CH Low: 2412 Power DC 3.3V From PC with AC 120V/60Hz Test Engineer Remark Temp Read Cable MHz dBuV dB dB dBuV dBuV dBuV 2390.00 53.16 63.46 49.75 60.05 Average Peak Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

FCC ID: 2AATL-F89ESSM23

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Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 FAX: +86-755-26736857 Website: http://www.cessz.com Email: Service@cessz.com

Data: 4 File: D:\无线测试\WIFI\FN-LINK\Biandai-MODULE.EM6 (16) 100 Level (dBuV/m) Date: 2014-02-21 Time: 21:45:24 90 80 70 60 FCC P RT 15_18G AVG 50 40 30 20 10 ⁰2310 2320. 2360. 2400. 2420 Frequency (MHz)

: FCC PART 15_18G PEAK 3m : WIFI Module POL: VERTICAL Condition

EUT Model No F89ESSM23-W1

Test Mode IEEE,802.g CH Low: 2412

Power DC 3.3V From PC with AC 120V/60Hz

Test Engineer Remark Temp

| Item | Freq | Read | Antenna | AT 107 100 100 100 100 100 100 100 100 100 | Cable | Level | Limit | Margin | Remark |
|------|---------|---------------|--------------|--|-------|-------|-------|--------|---------|
| | MHz | Level dBuV | Factor dB | Factor dB | Loss | dBuV | dBuV | dBuV | |
| | | | 2 2002 | | | | | | |
| 1 | 2390,00 | 42.25 | 27.62 | 34.97 | 3.92 | 38.82 | 74.00 | -35.18 | Peak |
| 2 | 2400.00 | 49.78 | 27.62 | 34.97 | 3.94 | 46.37 | 54.00 | -7.63 | Average |
| 3 | 2400.00 | 61.97 | 27.62 | 34.97 | 3.94 | 58.56 | 74.00 | -15.44 | Peak |

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



Report No.: CST-TCB140212006
CH High: Shenzhen Certification Technology Service Co., Ltd. 2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China Tel: 4006786199 FAX: +86-755-26736857 Website: http://www.cessz.com Email: Service@cessz.com File: D::无线测试\WIFI\FN-LINK\Biandai-MODULE.EM6 (16) 100 Level (dBuV/m) Date: 2014-02-21 Time: 22:00:16 80 FCC PART 15_18G PEAK 40 30 2450 2460. 2500. 2510. 2540. 2550 Frequency (MHz) Condition EUT Model No : FCC PART 15_18G PEAK 3m : WIFI Module : F89ESSM23-W1 POL: VERTICAL IEEE.802.g CH Low: 2462 DC 3.3V From PC with AC 120V/60Hz Store Test Mode Power Test Engineer Temp Level dBuV MHz Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss FCC ID: 2AATL-F89ESSM23 Page 56 of 73





Shenzhen Certification Technology Service Co., Ltd. 2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China Tel: 4006786199 FAX: +86-755-26736857 Website: http://www.cessz.com/Email: Service@cessz.com/

| Level (dBuV/m) | | | | | Date | . 2014-0 | 2-21 Tim | 0, 22,04, |
|-----------------|--|-------------------|--------------------|----------------|-------------------|---------------|---------------------------|---------------------|
| 90 mayor deplay | | | | | | | | |
| 80 | | | | | | FCC F | PART 15_1 | 18G PEAR |
| 70 | 1 | | | | | 1000000 | _ | |
| 60 | 1 | | | | | FCC | PART 15 | 18G AV(|
| 50 | The same | | | | | | | |
| 40 | ************************************** | de la de la lande | Compression of the | e-hours design | ne by proposed in | hallogatheria | The section of the second | hall fel mental min |
| 30 | | | | | | | | |
| 20 | | | | | | | | |
| 10 | | | | | | | | |
| | | | | | | | | |

Condition EUT : FCC PARI 15_18G PEAK 3m : WIFI Module : F89ESSM23-W1

Model No Test Mode

IEEE.802.g CH Low: 2462 DC 3.3V From PC with AC 120V/60Hz Power

Test Engineer Remark

Temp

| Item | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit | Margin | Remark |
|------|---------|---------------|-------------------|------------------|---------------|-------|-------|--------|--------|
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dBuV | |
| 1 | 2483.50 | 44.77 | 27.59 | 34.97 | 4.00 | 41.39 | 74.00 | -32.61 | Peak |

POL: HORIZONTAL

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

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Report No.: CST-TCB140212006 IEEE 802.11n/HT20: CH LOW: Shenzhen Certification Technology Service Co., Ltd. 2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China Tel: 4006786199 FAX: +86-755-26736857

Website: http://www.cessz.com/Email: Service@cessz.com/ File: D:\无线测试\WIFI\FN-LINK\Biandai-MODULE.EM6 (16) 100 Level (dBuV/m) Date: 2014-02-21 Time: 21:49:27 90 80 70 RT 15_18G AVG 50 30 20 23**1**0 2320. Frequency (MHz) : FCC PART 15_18G PEAK 3m : WIFI Module : F89ESSM23-W1 POL: VERTICAL Condition EUT Model No Test Mode IEEE.802.n/HT20 CH Low: 2412 DC 3.3V From PC with AC 120V/60Hz Power Test Engineer Remark Temp Read Cable MHz dBuV dB dB dBuV dBuV dBuV 2390.00 52.99 64.29 49.58 60.88 Average Peak Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss FCC ID: 2AATL-F89ESSM23 Page 58 of 73





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Website: http://www.cessz.com/Email: Service@cessz.com/

| 00 Level (dBuV/i | n) | | Date: 201 | 4-02-21 Time: 21:51:3 |
|------------------|---------------------------------------|--|---------------------------|-----------------------|
| 90 | | | | Anthropy States |
| 80 | | | | C PART 15_18G PEAK |
| 70 | | | | C PART 15_160 PEAN |
| 60 | | | | CC PART 15_18G AVG |
| 50 | | | | |
| 40 | | المراجعة الم | annight speed made of the | and a |
| 30 | A A A A A A A A A A A A A A A A A A A | 444 Process | | |
| 20 | | | | |
| 10 | | | | |
| 02310 2320. | 2340. | 2360. | 2380. | 2400. 24 |

Condition EUT

POL: HORIZONTAL

Model No

: FCC PART 15_18G PEAK 3m POL: WIFI Module : F89ESSM23-W1 : IEEE.802.n/HT20 CH Low: 2412 : DC 3.3V From PC with AC 120V/60Hz Test Mode Power

Test Engineer Remark Temp

| Item | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit | Margin | Remark |
|------|---------|---------------|-------------------|------------------|---------------|-------|-------|--------|---------|
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dBuV | |
| 1 | 2390.00 | 45.63 | 27.62 | 34.97 | 3.92 | 42.20 | 74.00 | -31.80 | Peak |
| | 2400.00 | 50.24 | 27.62 | 34.97 | 3.94 | 46.83 | 54.00 | -7.17 | Average |
| 3 | 2400.00 | 60.61 | 27.62 | 34.97 | 3.94 | 57.20 | 74.00 | -16.80 | Peak |

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



Report No.: CST-TCB140212006
CH High: Shenzhen Certification Technology Service Co., Ltd. 2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China Tel: 4006786199 FAX: +86-755-26736857 Website: http://www.cessz.com Email: Service@cessz.com File: D:\无线测试\WIFI\FN-LINK\Biandai-MODULE.EM6 (16) 100 Level (dBuV/m) Date: 2014-02-21 Time: 21:55:10 90 80 FCC PART 15_18G PEAK 70 FCC PART 15_18G AVG 40 30 2450 2460. 2500. 2510. 2540. 2550 Frequency (MHz) Condition EUT Model No : FCC PART 15_18G PEAK 3m : WIFI Module : F89ESSM23-W1 POL: HORIZONTAL IEEE.802.n/HT20 CH Low: 2462 DC 3.3V From PC with AC 120V/60Hz Store Test Mode Power Test Engineer Temp Level dBuV MHz -28.57 Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss FCC ID: 2AATL-F89ESSM23 Page 60 of 73





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Website: http://www.cessz.com/Email: Service@cessz.com/

| | l (dBuV/m) | | | | | | | | |
|----|--------------------------|-------|--------|-----------------|-------------------|--------------------|----------|---------------|---|
| 90 | - sproquation of a basis | 1 | | | - | | | | |
| 80 | | | | | | | FCC P | ART 15_1 | ISG PFAI |
| 70 | | 4 | | | | | 1001 | | 00 / 2/11 |
| 60 | | Make. | | | | | FCC | PART 15 | 18G AV0 |
| 50 | | T A A | Wille. | s lietalen sade | har-year-lifeness | | 9.6 | | |
| 40 | | | TYL | Martin and . | | Long to State Land | WARMAN . | wheelphysolds | indicated by the special section of the section of |
| 30 | | | | | | | | | |
| 20 | | | | | | | | | |
| 10 | | | | | - | | | | |

Condition EUT

Model No

: FCC PART 15_18G PEAK 3m POL:
: WIFI Module
: F89ESSM23-W1
: IEEE.802.n/HT20 CH Low: 2462
: DC 3.3V From PC with AC 120V/60Hz Test Mode Power

Test Engineer Remark

Temp

| Item | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit | Margin | Remark |
|------|---------|---------------|-------------------|------------------|---------------|-------|-------|--------|--------|
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dBuV | |
| 1 | 2483.50 | 53.51 | 27.59 | 34.97 | 4.00 | 50.13 | 74.00 | -23.87 | Peak |

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



Report No.: CST-TCB140212006 IEEE 802.11 n/HT40: CH LOW: Shenzhen Certification Technology Service Co., Ltd. 2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China Tel: 4006786199 FAX: +86-755-26736857

Website: http://www.cessz.com/Email: Service@cessz.com/ File: D::无线测试\WIFI\FN-LINK\Biandai-MODULE.EM6 (16) 100 Level (dBuV/m) Date: 2014-02-21 Time: 22:24:39 90 80 FCC PART 15_18G PEAK 70 FCC PART 15_18G AVG 20 23**1**0 2320. Frequency (MHz) : FCC PART 15_18G PEAK 3m : WIFI Module : F89ESSM23-W1 POL: HORIZONTAL Condition EUT Model No Test Mode IEEE.802.n/HT40 CH Low: 2422 DC 3.3V From PC with AC 120V/60Hz Power Test Engineer Remark Temp Read MHz dBuV dB dB dBuV dBuV dBuV Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

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Website: http://www.cessz.com/Email: Service@cessz.com/

File: D:\无线测试\WIFI\FN-LINK\Biandai-MODULE.EM6 (16) Data: 16 100 Level (dBuV/m) Date: 2014-02-21 Time: 22:26:02 90 80 FCC PART 15_18G PEAK 70 60 FCC PART 15_18G AVG 50 40 30 20 10 ⁰2310 2320. 2360. 2400. 2420 Frequency (MHz)

Condition : FCC PART 15_18G PEAK 3m

POL: VERTICAL

EUT : WIFI Module
Model No : F89ESSM23-W1

Test Mode : IEEE.802.n/HT40 CH Low: 2422
Power : DC 3.3V From PC with AC 120V/60Hz

Test Engineer : Store Remark : Temp :

Antenna Margin Level Factor Loss MHz dB dB dBuV 27.62 2390.00 3.92 38.22 74.00 -35.78 Peak 2400.00 49.17 27.62 45.76 74.00 -28.24 Peak

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

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Report No.: CST-TCB140212006
CH High: Shenzhen Certification Technology Service Co., Ltd. 2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China Tel: 4006786199 FAX: +86-755-26736857 Website: http://www.cessz.com Email: Service@cessz.com File: D:\无线测试\WIFI\FN-LINK\Biandai-MODULE.EM6 (16) Data: 13 100 Level (dBuV/m) Date: 2014-02-21 Time: 22:16:56 FCC PART 15_18G PEAK 60 FCC PART 15_18G AVG 40 30 2450 2460. 2500. 2510. 2540. 2550 Frequency (MHz) Condition EUT Model No : FCC PART 15_18G PEAK 3m : WIFI Module : F89ESSM23-W1 POL: VERTICAL IEEE.802.n/HT40 CH High: 2452 DC 3.3V From PC with AC 120V/60Hz Store Test Mode Power Test Engineer Temp Level dBuV MHz 1 2483.50 -35.47 Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

FCC ID: 2AATL-F89ESSM23

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Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 FAX: +86-755-26736857
Website: http://www.cessz.com/Email: Service@cessz.com/

File: D:\无线测试\WIFI\FN-LINK\Biandai-MODULE.EM6 (16) Data: 14 100 Level (dBuV/m) Date: 2014-02-21 Time: 22:20:25 90 80 FCC PART 15_18G PEAK 70 60 FCC PART 15_18G AVG 50 40 30 20 10 ⁰2450 2460. 2500. 2510. 2540. 2550 Frequency (MHz)

Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL

EUT : WIFI Module Model No : F89ESSM23-W1

Test Mode : IEEE.802.n/HT40 CH High: 2452 Power : DC 3.3V From PC with AC 120V/60Hz

Test Engineer : Store
Remark :
Temp :

| Item | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit | Margin | Remark |
|------|---------|---------------|-------------------|------------------|---------------|-------|-------|--------|--------|
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dBuV | |
| 1 | 2483.50 | 41.96 | 27.59 | 34.97 | 4.00 | 38.58 | 74.00 | -35.42 | Peak |

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

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11 Antenna Requirement

11.1 Standard 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 shall be considered sufficient to comply with the provisions of this Section. 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.

11.2 Antenna Connected Construction

The directional gains of antenna used for transmitting is 0 dBi, and the antenna connector is de-signed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

11.3 Result

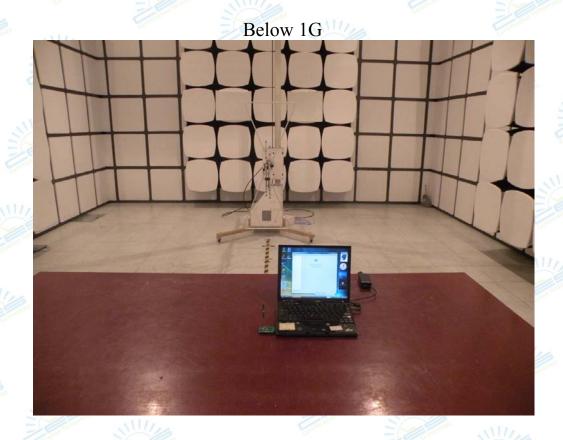
The EUT antenna is Integral Antenna. It comply with the standard requirement.

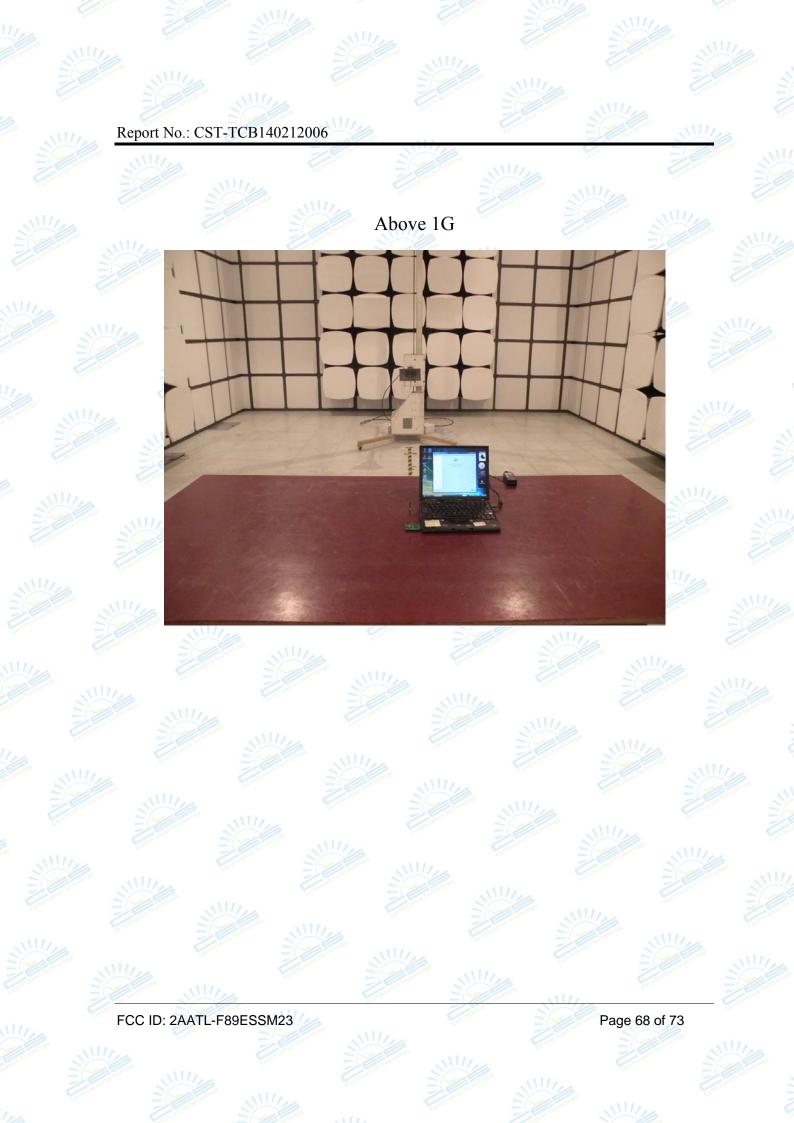
FCC ID: 2AATL-F89ESSM23

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12 Photographs of Test Setup

Photographs-Radiated Emission Test Setup in Chamber





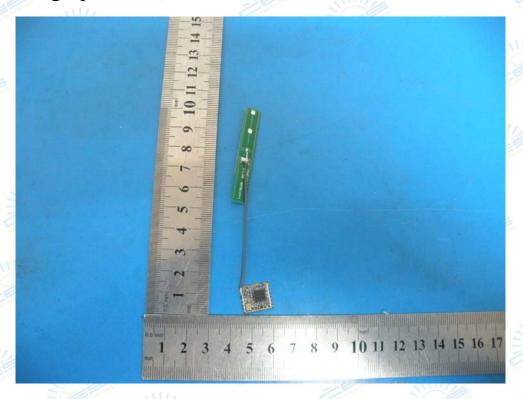
Photographs-Conducted Emission Test Setup



FCC ID: 2AATL-F89ESSM23

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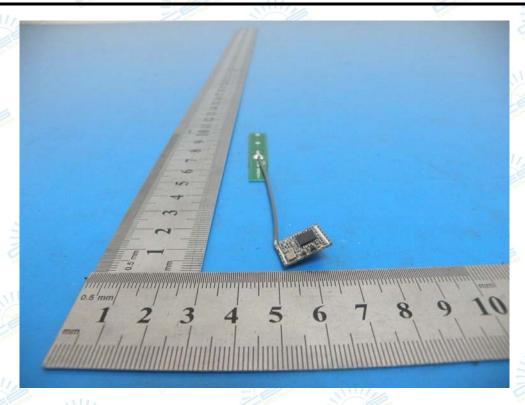
Report No.: CST-TCB140212006 13 Photographs of EUT



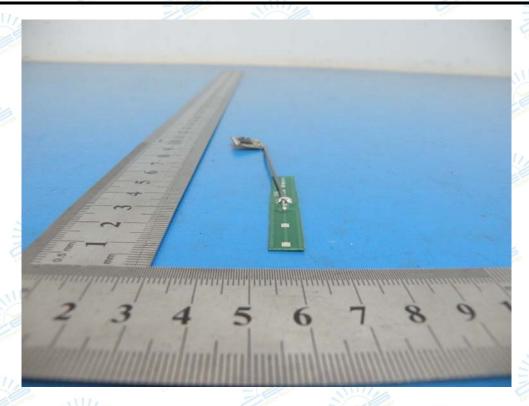


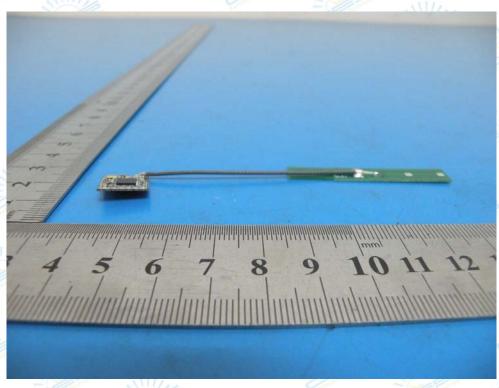
FCC ID: 2AATL-F89ESSM23

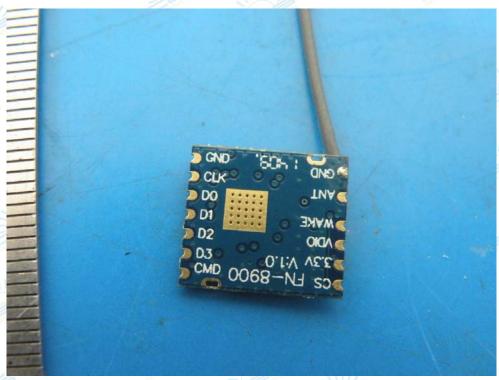
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----END OF THE REPORT-----

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