





TEST REPORT

| Applicant: | Particle Industries,Inc |
|------------|---|
| Address: | 126 Post St, 4th floor, San Francisco, CA 94108 USA |

| Manufacturer or Supplier: | Particle Industries,Inc | |
|-------------------------------------|--|--|
| Address | 26 Post St, 4th floor, San Francisco, CA 94108 USA | |
| Product | Boron 2G/3G | |
| Brand Name | Particle | |
| Model | BRN310 | |
| Additional Model & Model Difference | BRN314; see items 2.1 | |
| Date of tests | Sep. 03, 2018 ~ Nov. 08, 2018 | |

The submitted sample of the above equipment has been tested for according to the requirements of the following standards:

EN 300 330 V2.1.1 (2017-02)

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

| Tested by Breeze Jiang | Approved by Glyn He |
|--|------------------------------------|
| Senior Project Engineer / EMC Department | Assistant Manager / EMC Department |

green

Date: Dec. 28, 2020

This report is governed by, and incorporates by reference, CPS Conditions of Service as posted at the date of issuance of this report at http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/ and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute you unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

Tel: +86 769 8998 2098
Fax: +86 769 8593 1080
Email: customerservice.dg@cn.bureauveritas.com

Email: additional action and additional action and additional action and action and action ac



TABLE OF CONTENTS

| REL | EASE CONTROL RECORD | . 3 |
|----------|--|----------|
| 1. | SUMMARY OF TEST RESULTS | . 4 |
| 1. | . TEST INSTRUMENTS | . 5 |
| 1. | | |
| 1. | | . 7 |
| 2. | GENERAL INFORMATION | . 8 |
| | | |
| 2. 2. | | |
| 2. 2. | | |
| 2. | | |
| 2. | | |
| 2 | TEST PROCEDURES AND RESULTS | |
| | | |
| | ANSMITTER PARAMETERSTRANSMITTER H-FIELD REQUIREMENTS | |
| 3. | 3.1.1 LIMITS OF TRANSMITTER H-FIELD REQUIREMENTS | |
| | 3.1.2 TEST PROCEDURES | |
| | 3.1.3 DEVIATION FROM TEST STANDARD | 12 |
| | 3.1.4 TEST SETUP | |
| | 3.1.5 TEST RESULTS | |
| | PERMITTED RANGE OF OPERATING FREQUENCY/OPERATING FREQUENCY | |
| R | NGES | 13 |
| | 3.2.1 LIMITS OF PERMITTED RANGE OF OPERATING FREQUENCY/OPERATING | |
| | FREQUENCY RANGES | |
| | 3.2.2 TEST PROCEDURES | |
| | 3.2.4 TEST SETUP | |
| | 3.2.5 TEST RESULTS | |
| 3. | | |
| | 3.3.1 LIMITS OF MODULATION BANDWIDTH | 15 |
| | 3.3.2 TEST PROCEDURES | 15 |
| | 3.3.3 DEVIATION FROM TEST STANDARD | |
| | 3.3.4 TEST SETUP | |
| | 3.3.5 TEST RESULTS | |
| 3. | | 17 |
| | 3.4.1 LIMITS OF SPURIOUS DOMAIN EMISSION LIMITS (<30MHZ) | 17 17 |
| | 3.4.3 TEST PROCEDURES | |
| | 3.4.4 DEVIATION FROM TEST STANDARD | |
| | 3.4.5 TEST SETUP | |
| | 3.4.6 TEST RESULTS | |
| 4. | PHOTOGRAPHS OF THE TEST CONFIGURATION | 24 |
| | | |
| | APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EURY THE LAR | T 25 |

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080

's Republic of China. Email: customerservice.dg@cn.bureauveritas.com



RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|-----------------|--|---------------|
| RE180831N010-2 | Original release | Dec. 10, 2018 |
| RE2012WDG0026-2 | Based on the original report RE180831N010-2 changed the brand name and added the additional model, but it doesn't need to be retested. | Dec. 28, 2020 |

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080

Email: customerservice.dg@cn.bureauveritas.com

Report Version 1



1. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| | APPLIED STANDARD: | | | | | |
|---------------------------------|--|-----------------------|-----------|--|--|--|
| | ETSI EN 300 330 V2.1.1 (2017-02) | | | | | |
| CLAUSE IN ETSI EN 300 330 | TEST PARAMETER | TEST APPLICABILITY | PASS/FAIL | | | |
| | TRANSMITTER PARAMETERS | | | | | |
| 4.3.4 | Transmitter H-filed requirements | Applicable | PASS | | | |
| 4.3.1 | Permitted range of operating frequency Applicable PAS | | PASS | | | |
| 4.3.3 | modulation bandwidth Applicable F | | PASS | | | |
| 4.3.8 | Transmitter radiated spurious domain emission limits<30MHz | | PASS | | | |
| 4.3.9 | Transmitter radiated spurious domain emission limits>30MHz Applicable | | PASS | | | |
| | RECEIVER PARAMETERS | | | | | |
| 4.4.2 | Receiver spurious radiation | Not Applicable(Note1) | N/A | | | |
| 4.4.4 | Blocking or desensitization Not Applicable(Note2) N/A | | | | | |

Note: 1.These requirements does not apply to receivers used in combination with permanently co-located transmitters continuously transmitting. In these cases the receivers will be tested together with the transmitter in operating mode

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080

^{2.} Receiver blocking or desensitization is only applicable for channelized systems where channel definitions are used.



1.1. TEST INSTRUMENTS

9KHz~30MHz

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---------------------|---------------|----------------------|------------|------------|------------|
| EMI Test Receiver | Rohde&Schwarz | ESR7 | 101564 | Jan. 18,18 | Jan. 17,19 |
| Active Loop Antenna | SCHWARZBECK | FMZB 1519B | 1519B-045 | May 04,18 | May 03,19 |
| Amplifier | Burgeon | BPA-530 | 100210 | Apr. 18,18 | Apr. 18,19 |
| Test Software | ADT | ADT_Radiated V8.7.07 | N/A | N/A | N/A |

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in 10m Chamber

30MHz~1GHz

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|-----------------------------|---------------|------------------------------|------------|------------|------------|
| EMI Test Receiver | Rohde&Schwarz | ESU40 | 100449 | Mar. 21,18 | Mar. 20,19 |
| Bilog Antenna | Teseq | CBL 6111D | 30643 | Aug.11,18 | Aug. 10,19 |
| Amplifier | Burgeon | BPA-530 | 100220 | Apr. 18,18 | Apr. 18,19 |
| 3m Semi-anechoic Chamber | | | | Feb. 10,18 | Feb. 09,19 |
| Test software | ADT | ADT_Radiated _V7.6.15.9.2 | N/A | N/A | N/A |

NOTE:

- 1. The test was performed in 966 Chamber (a 3m Semi-anechoic chamber).
- 2. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
- 3. The horn antenna is used only for the measurement of emission frequency above1GHz if tested.

Fax: +86 769 8593 1080
Email: customerservice.dg@cn.bureauveritas.com

Tel: +86 769 8998 2098

Report Version 1

Page 5 of 25



| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---------------|------------------------------|-----------------|-------------|-------------|
| EMI Test Receiver | Rohde&Schwarz | ESU40 | 100449 | Mar. 21,18 | Mar. 20,19 |
| Signal and Spectrum Analyzer | Rohde&Schwarz | FSV40 | 101094 | Mar. 21,18 | Mar. 20,19 |
| Bilog Antenna | Teseq | CBL 6111D | 30643 | Jul. 28, 18 | Jul. 27, 19 |
| Horn Antenna | ETS-Lindgren | 3117 | 00062558 | Jul. 02,18 | Jul. 01,19 |
| GPS Generator+ Antenna | TOJOIN | GNSS-5000A | E1-010119 | Sep. 08,18 | Sep. 07,19 |
| 3m Semi-anechoic Chamber | ETS-LINDGREN | 9m*6m*6m | NSEMC003 | Feb. 10,18 | Feb. 09,19 |
| Test Software | ADT | ADT_Radiated _V7.6.15.9.2 | N/A | N/A | N/A |
| Horn Antenna (15GHz-40GHz) | SCHWARZBECK | BBHA 9170 | BBHA917014 7 | May 05,18 | May 04,19 |
| Amplifier | Burgeon | BPA-530 | 100220 | Apr. 18,18 | Apr. 18,19 |
| Broadband Preamplifier (1GHz~18GHz) | SCHWARZBECK | BBV9718 | 305 | Apr. 18,18 | Apr. 18,19 |
| Pre-Amplifier (18GHz-40GHz) | EMCI | EMC 184045 | 980102 | Nov. 08,18 | Nov. 07,19 |
| Spectrum Analyzer | Keysight | N9020A | MY55400499 | Mar. 21,18 | Mar. 20,19 |
| Signal Generator | Agilent | N5183A | MY50140980 | Jan. 02,18 | Jan. 01,19 |
| 10m Semi-anechoic Chamber | CHANGLING | 21.4m*12.1m* 8.8m | NSEMC006 | Feb. 10,18 | Feb. 09,19 |
| Signal Generator | Agilent | N5183A | MY50140980 | Jan. 02,18 | Jan. 01,19 |

NOTE:

- 1. The test was performed in RF Oven room.
- 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080



1.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

| PARAMETER | UNCERTAINTY |
|----------------------|--------------------------|
| Radio frequency | ±1.06 x 10 ⁻⁸ |
| RF power (Conducted) | ±0.34 dB |
| RF power (Radiated) | ±3.294dB |
| Temperature | ±0.23 °C |
| Humidity | ±0.3 % |

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

1.3. MAXIMUM MEASUREMENT UNCERTAINTY

For the test methods, according to ETSI EN 300 330 standard, the measurement uncertainty figures shall be calculated in accordance with TR 100 028 [5] and shall correspond to an expansion factor (coverage factor) k = 1.96 or k = 2 (which provide confidence levels of respectively 95 % and 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Maximum measurement uncertainty

| PARAMETER | UNCERTAINTY |
|----------------------|-----------------------|
| RF frequency | ±1 x 10 ⁻⁷ |
| RF power (Conducted) | ±1.0 dB |
| RF power (Radiated) | ±6.0 dB |
| Temperature | ± 1°C |
| Humidity | ± 5.0 % |

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080

e's Republic of China. Email: customerservice.dg@cn.bureauveritas.com



2. GENERAL INFORMATION

2.1. GENERAL DESCRIPTION OF EUT

| PRODUCT | Boron 2G/3G |
|-----------------------------|--|
| MODEL NO. | BRN310 |
| ADDITIONAL MODEL | BRN314 |
| POWER SUPPLY | Li+ PIN /Battery connector: DC 3.7V from Li-ion Battery or VUSB PIN /USB connector :DC 5V from USB Host Unit |
| OPERATING TEMPERATURE RNAGE | -20 ~ +80℃ |
| MODULATION TECHNOLOGY | NFC |
| MODULATION TYPE | ASK |
| OPERATING FREQUENCY | 13.56MHz |
| NUMBER OF CHANNEL | 1 |
| H-FIELD STRENGTH | 22.46dBuA/m (Measured Max.) |
| ANTENNA TYPE | Loop Antenna |
| DATA CABLE | N/A |
| I/O PORTS | Refer to user's manual |

NOTE:

- For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
- 3. Please refer to the EUT photo document (Reference No.: 2012WDG0026) for detailed product photo.
- 4. Additional model BRN314 is identical with the test model BRN310 except the model name for trading purpose.
- 5. The EUT is wireless module, it no any accessories.

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080

Email: customerservice.dg@cn.bureauveritas.com

Report Version 1



2.2. DESCRIPTION OF TEST MODES

The EUT only have 1 channel.

| CHANNEL | FREQUENCY (MHz) |
|---------|-----------------|
| 1 | 13.56 |

2.3. TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

| EUT CONFIGURE | APPLICABLE TO | | | | DESCRIPTION | | |
|------------------|---------------|----------|----------|-----|-------------|----|--------------------------|
| MODE | THFR | PROF | MBW | TSE | RSE | RB | |
| А | - | V | √ | - | - | i | Powered by Fully Battery |
| В | V | - | - | √ | - | - | Powered by Adapter |

Where THFR: Transmitter H-filed requirements

PROF: Permitted range of operating frequency

MBW: Modulation Bandwidth **RB:** Receiver Blocking

TSE: Transmitter Spurious Emissions

RSE: Receiver Spurious Emissions

TRANSMITTER H-FILED REQUIREMENTS:

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

| EUT CONFIGURE MODE | AVAILABLE CHANNEL | OPERATING FREQUENCY (MHz) | MODULATION TYPE |
|-----------------------|-------------------|------------------------------|-----------------|
| Α | 1 | 13.56 | ASK |

PERMITTED RANGE OF OPERATING FREQUENCY:

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

| EUT CONFIGURE MODE | AVAILABLE CHANNEL | OPERATING FREQUENCY (MHz) | MODULATION TYPE |
|-----------------------|-------------------|------------------------------|-----------------|
| Α | 1 | 13.56 | ASK |

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080

Email: customerservice.dg@cn.bureauveritas.com

Page 9 of 25 Report Version 1



MODULATION BANDWIDTH:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| EUT CONFIGURE MODE | AVAILABLE CHANNEL | OPERATING FREQUENCY (MHz) | MODULATION TYPE |
|-----------------------|-------------------|------------------------------|-----------------|
| А | 1 | 13.56 | ASK |

TRANSMITTER SPURIOUS EMISSIONS TEST:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| EUT CONFIGURE MODE | AVAILABLE CHANNEL | OPERATING FREQUENCY (MHz) | MODULATION TYPE |
|-----------------------|-------------------|------------------------------|-----------------|
| А | 1 | 13.56 | ASK |

TEST CONDITION:

| APPLICABLE TO | ENVIRONMENTAL CONDITIONS | INPUT POWER | TESTED BY |
|------------------|--------------------------|----------------------|--------------|
| THFR | 25deg. C, 60%RH | DC 5V From Adapter | Robert Cheng |
| PROF | 25deg. C, 60%RH | DC 3.7V From Battery | Robert Cheng |
| MBW | 25deg. C, 60%RH | DC 3.7V From Battery | Robert Cheng |
| TSE | 21deg. C, 58%RH | DC 5V From Adapter | Daniel |
| RSE | N/A | N/A | N/A |
| RB | N/A | N/A | N/A |

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080



2.4. GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standard:

EN 300 330 V2.1.1 (2017-02)

All test items have been performed and recorded as per the above standard.

2.5. DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| NO. | PRODUCT | BRAND | MODEL NO. | SERIAL NO. | FCC ID |
|-----|----------------|--------------|------------|-------------|--------|
| 1 | DC source | LONG WEI | PS-6403D | 010934269 | N/A |
| 2 | Li-ion Battery | N/A | DC3.7V | N/A | N/A |
| 3 | Adapter | N/A | DC5V 1.5A | N/A | N/A |
| 4 | Mobile phone | mobile Phone | Galaxy S9+ | SM-G9650/DS | N/A |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|---|
| 1 | DC Line: Unshielded, Detachable 1.0m |
| 2 | N/A |
| 3 | USB Line: Unshielded, Detachable 0.6m |
| 4 | N/A |

NOTE: All power cords of the above support units are non-shielded (1.8m).

Page 11 of 25

Tel: +86 769 8998 2098
Fax: +86 769 8593 1080
Email: customerservice.dg@cn.bureauveritas.com

Report Version 1



3. TEST PROCEDURES AND RESULTS

TRANSMITTER PARAMETERS

3.1 TRANSMITTER H-FIELD REQUIREMENTS

3.1.1 LIMITS OF TRANSMITTER H-FIELD REQUIREMENTS

| Frequency Range (MHz) | H-field Strength Limit (H _f) dBμA/m at 10 m |
|-----------------------|---|
| 13.553 ≤ f < 13.567 | 42 |

3.1.2 TEST PROCEDURES

Please refer to Subclause 6.2.4 of EN 300 330 V2.1.1 (2017-02).

3.1.3 DEVIATION FROM TEST STANDARD

No deviation.

3.1.4 TEST SETUP

The EUT was placed on the turntable in semi anechoic chamber and supplied with nominated power source. It was adjusted to the maximum output power during the test.

3.1.5 TEST RESULTS

| FREQUENCY (MHz) | H-field Strength (dBµA/m) | Polar 90°/180° | LIMIT (dBμA/m) | PASS / FAIL |
|-----------------|------------------------------|-------------------|-------------------|-------------|
| 13.56 | 19.84 | 180° | 42 | PASS |
| 13.56 | 21.14 | 90° | 42 | PASS |

523942. People's Republic of China.

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080

Email: customerservice.dg@cn.bureauveritas.com



3.2 PERMITTED RANGE OF OPERATING FREQUENCY/OPERATING FREQUENCY RANGES

3.2.1 LIMITS OF PERMITTED RANGE OF OPERATING FREQUENCY/OPERATING FREQUENCY RANGES

The permitted range of operating frequencies for intentional emissions shall be entirely within the frequency bands

| | Frequency Bands/frequencies | Applications |
|----------------------|---|---|
| Fransmit and Receive | 9 kHz to 90 kHz | Inductive devices, Generic use |
| Transmit and Receive | 90 kHz to 119 kHz | Inductive devices, Generic use |
| Transmit and Receive | 119 kHz to 140 kHz | Inductive devices, Generic use |
| Transmit and Receive | 140 kHz to 148,5 kHz | Inductive devices, Generic use |
| Transmit and Receive | 148,5 kHz to 5 MHz | Inductive devices, Generic use |
| Transmit and Receive | 400 kHz to 600 kHz | RFID only |
| Transmit and Receive | 5 MHz to 30 MHz | Inductive devices, Generic use |
| Transmit and Receive | 3 155 kHz to 3 400 kHz | Inductive devices, Generic use |
| Transmit and Receive | 984 kHz to 7 484 kHz | Inductive devices, Railway applications |
| | (Note 3, Centre frequency is 4 234 kHz) | |
| Transmit and Receive | 4 516 kHz | Inductive devices, Railway applications |
| Transmit and Receive | 6 765 kHz to 6 795 kHz | Inductive devices, Generic use |
| Transmit and Receive | 7 400 kHz to 8 800 kHz | Inductive devices, Generic use |
| Transmit and Receive | 10 200 kHz to 11,000 MHz | Inductive devices, Generic use |
| Transmit and Receive | 11,810 MHz to 15,310 MHz | RFID only |
| | (Centre frequency is 13,56 MHz) | |
| Transmit and Receive | 12,5 MHz to 20 MHz | Inductive devices, Wireless healthcare |
| Transmit and Receive | 13,553 MHz to 13,567 MHz | Inductive devices, Generic use |
| Transmit and Receive | 26,957 MHz to 27,283 MHz | Inductive devices, Generic use |
| Transmit and Receive | 27,090 MHz to 27,100 MHz | Inductive devices, Railway applications |

NOTE 1: In addition, it should be noted that other frequency bands may be available in a country within the frequency range 9 kHz to 30 MHz.

NOTE 2: On non-harmonised parameters, national administrations may impose certain conditions such as the type of modulation, frequency, channel/frequency separations, maximum transmitter radiated power, duty cycle, and the inclusion of an automatic transmitter shut-off facility, as a condition for the issue of an Individual Rights for use of spectrum or General Authorization, or as a condition for use under "licence exemption" as it is in most cases for Short Range Devices.

NOTE 3: Transmitting only on receipt of a Balise/Eurobalise tele-powering signal from a train.

3.2.2 TEST PROCEDURES

Please refer to Subclause 6.2.2.2 of EN 300 330 V2.1.1 (2017-02)

3.2.3 DEVIATION FROM TEST STANDARD

No deviation.

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080

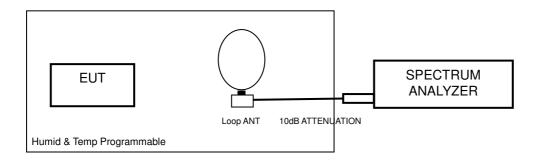
Email: <u>customerservice.dg@cn.bureauveritas.com</u>

Page 13 of 25



3.2.4 TEST SETUP

Under normal use condition, the transmitter will transmit power only when the EUT power on.



3.2.5 TEST RESULTS

| Frequency (13.56MHz) | | | Measured Frequencies | | Limit | Pass/Fail | |
|--------------------------|---------------------------|----------------------|----------------------|-----------------|-----------------------------|-----------|------|
| Test Condition | | F _L (MHz) | F _H (MHz) | Lillit | 1 433/1 411 | | |
| T _{nom} (°C) | +20 | V _{nom} (v) | 13.5574 | 13.5624 | | | |
| T (°C) | $V_{max}(v)$ $V_{min}(v)$ | V _{min} (v) | 13.5565 | 13.5628 | F _L > 13.553 MHz | | |
| T _{min} (°C) | | n(C) -20 | V _{max} (v) | 13.5571 | 13.5619 | and | Pass |
| T _{max} (°C) +8 | | 13.5569 | 13.5625 | Fн < 13.567 MHz | | | |
| | | +80 | V _{max} (v) | 13.5570 | 13.5625 | | |

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080



3.3 MODULATION BANDWIDTH

3.3.1 LIMITS OF MODULATION BANDWIDTH

The modulation bandwidth shall be within the assigned frequency band see table 1 or \pm 7.5 % of the carrier frequency whichever is the smallest. For RFID and EAS systems, the modulation bandwidth shall be within the transmitter emission boundary of figure I.1, I.2, I.3 and I.4.

For further information, see CEPT/ERC/REC 70-03 [i.1] or ERC/ECC/CEPT Decisions as implemented through National Radio Interfaces (NRI) and additional NRI as relevant.

3.3.2 TEST PROCEDURES

Please refer to Subclause 6.2.3 of EN 300 330 V2.1.1 (2017-02)

3.3.3 DEVIATION FROM TEST STANDARD

No deviation.

3.3.4 TEST SETUP

The EUT was placed on the turntable in semi anechoic chamber and supplied with nominated power source. It was adjusted to the maximum output power during the test.

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080

Report Version 1

Email: customerservice.dg@cn.bureauveritas.com



3.3.5 TEST RESULTS

| FREQUENCY | 13.56MHz |
|-----------|----------|
| | |

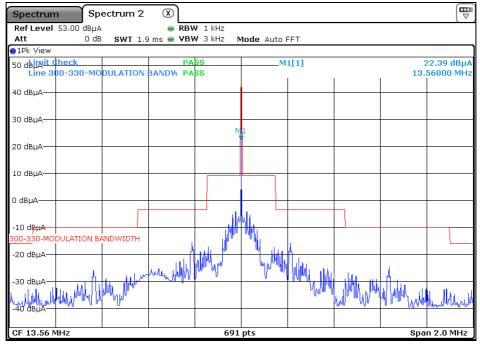


Figure I.3

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080



3.4 SPURIOUS DOMAIN EMISSION LIMITS

3.4.1 LIMITS OF SPURIOUS DOMAIN EMISSION LIMITS (<30MHz)

| FREQUENCY RANGE | 9 kHz ≤ f < 10MHz(at 10m) | 10MHz ≤ f < 30MHz(at 10m) |
|---------------------|---|---------------------------|
| Limit (On a vation) | 27 dBµA/m at 9kHz descending 3 dB/oct | -3.5 dBµA/m |
| Limit (Operating) | 78.5 dBµV/m descending 3 dB/oct | 48 dBμV/m |
| Limit (Standby) | 5.5 dBµA/m at 9kHz descending 3 dB/oct | -25 dBµA/m |
| | 57 dBµV/m descending 3 dB/oct | 26.5 dBµV/m |

3.4.2 LIMITS OF SPURIOUS DOMAIN EMISSION LIMITS (≥30MHz)

| FREQUENCY RANGE | 47MHz to 74MHz 87.5MHz to 118MHz 174MHz to 230MHz 470MHz to 790MHz | OTHER FREQUENCIES BELOW 1GHz |
|--------------------|---|---------------------------------|
| Limit (Operating) | 4nW (-54dBm) | 250nW (-36dBm) |
| Limit (Standby) | 2nW (-57dBm) | 2nW (-57dBm) |

3.4.3 TEST PROCEDURES

Please refer to Subclause 6.2.8 and 6.2.9 of EN 300 330 V2.1.1 (2017-02)

3.4.4 DEVIATION FROM TEST STANDARD

No deviation.

3.4.5 TEST SETUP

- 1 For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration).
- 2 Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.



3.4.6 TEST RESULTS

| SPURIOUS EMISSION FREQUENCY RANGE | 9kHz ~ 30MHz | OPERATING STATE | Operating |
|-----------------------------------|--------------|-----------------|-----------|
|-----------------------------------|--------------|-----------------|-----------|

| | SPURIOUS EMISSION LEVEL | | | | | |
|--------------------|-------------------------|-------------------|-------------------|----------------|--|--|
| Frequency (MHz) | Antenna Angle (°) | Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | | |
| 0.035 | 180 | 29.41 | 72.59 | -43.18 | | |
| 0.064 | 180 | 28.63 | 69.99 | -41.36 | | |
| 0.071 | 180 | 25.15 | 69.54 | -44.39 | | |
| 0.078 | 180 | 23.93 | 69.16 | -45.23 | | |
| 0.099 | 180 | 23.15 | 68.13 | -44.98 | | |
| 0.129 | 180 | 26.30 | 66.99 | -40.69 | | |
| 0.175 | 180 | 39.65 | 65.63 | -25.98 | | |
| 0.619 | 180 | 33.21 | 60.19 | -26.98 | | |
| 2.522 | 180 | 26.63 | 54.11 | -27.48 | | |
| 5.719 | 180 | 25.54 | 50.57 | -25.03 | | |
| 8.110 | 180 | 26.83 | 49.05 | -22.22 | | |
| 11.079 | 180 | 25.85 | 48.00 | -22.15 | | |
| | | | | | | |
| 0.035 | 90 | 29.28 | 72.59 | -43.31 | | |
| 0.064 | 90 | 27.95 | 69.99 | -42.04 | | |
| 0.071 | 90 | 24.32 | 69.54 | -45.22 | | |
| 0.078 | 90 | 24.58 | 69.16 | -44.58 | | |
| 0.093 | 90 | 23.58 | 68.40 | -44.82 | | |
| 0.129 | 90 | 25.95 | 66.99 | -41.04 | | |
| 0.156 | 90 | 40.98 | 66.13 | -25.15 | | |
| 0.622 | 90 | 33.71 | 60.17 | -26.46 | | |
| 3.293 | 90 | 26.41 | 52.95 | -26.54 | | |
| 4.129 | 90 | 26.87 | 51.97 | -25.10 | | |
| 6.914 | 90 | 27.07 | 49.74 | -22.67 | | |
| 8.688 | 90 | 26.61 | 48.76 | -22.15 | | |

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080



| SPURIOUS EMISSION FREQUENCY RANGE | 9kHz ~ 30MHz | OPERATING STATE | Standby |
|-----------------------------------|--------------|-----------------|---------|
|-----------------------------------|--------------|-----------------|---------|

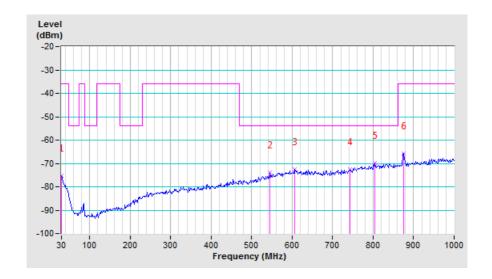
| | SPURIOUS EMISSION LEVEL | | | | | |
|--------------------|-------------------------|-------------------|-------------------|----------------|--|--|
| Frequency (MHz) | Antenna Angle(°) | Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | | |
| 0.012 | 180 | 22.58 | 55.91 | -33.33 | | |
| 0.019 | 180 | 23.75 | 53.67 | -29.92 | | |
| 0.026 | 180 | 23.88 | 52.44 | -28.56 | | |
| 0.035 | 180 | 28.97 | 51.10 | -22.13 | | |
| 0.064 | 180 | 26.96 | 48.49 | -21.53 | | |
| 0.129 | 180 | 25.66 | 45.49 | -19.83 | | |
| 0.156 | 180 | 39.28 | 44.63 | -5.35 | | |
| 3.698 | 180 | 25.78 | 30.95 | -5.17 | | |
| 7.870 | 180 | 26.07 | 27.68 | -1.61 | | |
| 8.970 | 180 | 25.77 | 27.12 | -1.35 | | |
| 17.122 | 180 | 24.29 | 26.50 | -2.21 | | |
| 21.860 | 180 | 25.71 | 26.50 | -0.79 | | |
| | | | | | | |
| 0.035 | 90 | 29.13 | 51.09 | -21.96 | | |
| 0.039 | 90 | 24.11 | 50.67 | -26.56 | | |
| 0.045 | 90 | 22.23 | 50.02 | -27.79 | | |
| 0.064 | 90 | 27.21 | 48.49 | -21.28 | | |
| 0.078 | 90 | 22.20 | 47.64 | -25.44 | | |
| 0.129 | 90 | 25.59 | 45.49 | -19.90 | | |
| 0.158 | 90 | 39.79 | 44.59 | -4.80 | | |
| 2.387 | 90 | 26.15 | 32.85 | -6.70 | | |
| 5.456 | 90 | 26.26 | 29.27 | -3.01 | | |
| 9.565 | 90 | 25.98 | 26.77 | -0.79 | | |
| 14.544 | 90 | 25.20 | 26.50 | -1.30 | | |
| 18.773 | 90 | 25.20 | 26.50 | -1.30 | | |

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080



| SPURIOUS EMISSION FREQUENCY RANGE | 30MHz ~ 1GHz | OPERATING STATE | Operating |
|-----------------------------------|--------------|-----------------|-----------|
|-----------------------------------|--------------|-----------------|-----------|

| SPURIOUS EMISSION LEVEL | | | | | | |
|-------------------------|-------------------------|----------------|----------------|----------------|--|--|
| Frequency (MHz) | Antenna Polarization | Level (dBm) | Limit (dBm) | Margin (dB) | | |
| 30.00 | Н | -75.17 | -36.00 | -39.17 | | |
| 544.54 | Н | -73.82 | -54.00 | -19.82 | | |
| 605.16 | Н | -72.45 | -54.00 | -18.45 | | |
| 743.51 | Н | -72.37 | -54.00 | -18.37 | | |
| 804.13 | Н | -69.68 | -54.00 | -15.68 | | |
| 875.64 | Н | -65.81 | -36.00 | -29.81 | | |

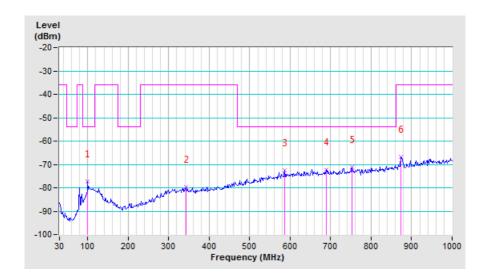


Tel: +86 769 8998 2098 Fax: +86 769 8593 1080



| SPURIOUS EMISSION FREQUENCY RANGE 30MHz ~ 1GH | OPERATING STATE | Operating |
|---|-----------------|-----------|
|---|-----------------|-----------|

| SPURIOUS EMISSION LEVEL | | | | | | |
|-------------------------|-------------------------|----------------|----------------|----------------|--|--|
| Frequency (MHz) | Antenna Polarization | Level (dBm) | Limit (dBm) | Margin (dB) | | |
| 99.95 | V | -77.25 | -54.00 | -23.25 | | |
| 342.45 | V | -79.56 | -36.00 | -43.56 | | |
| 586.51 | V | -72.47 | -54.00 | -18.47 | | |
| 689.10 | V | -72.17 | -54.00 | -18.17 | | |
| 752.84 | V | -71.09 | -54.00 | -17.09 | | |
| 872.53 | V | -66.66 | -36.00 | -30.66 | | |

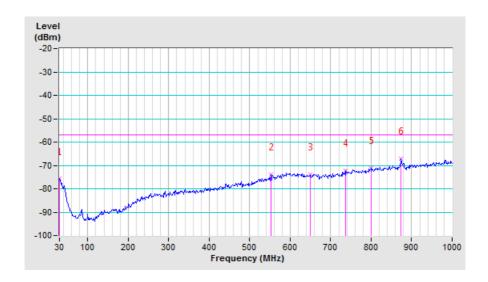


Tel: +86 769 8998 2098 Fax: +86 769 8593 1080



| SPURIOUS EMISSION FREQUENCY RANGE 30MHz ~ 1GHz | OPERATING STATE | Standby |
|--|-----------------|---------|
|--|-----------------|---------|

| SPURIOUS EMISSION LEVEL | | | | | |
|-------------------------|-------------------------|----------------|----------------|----------------|--|
| Frequency (MHz) | Antenna Polarization | Level (dBm) | Limit (dBm) | Margin (dB) | |
| 30.00 | Н | -75.72 | -57.00 | -18.72 | |
| 552.31 | Н | -73.91 | -57.00 | -16.91 | |
| 650.24 | Н | -73.77 | -57.00 | -16.77 | |
| 737.29 | Н | -72.19 | -57.00 | -15.19 | |
| 799.47 | Н | -71.06 | -57.00 | -14.06 | |
| 874.09 | Н | -67.06 | -57.00 | -10.06 | |

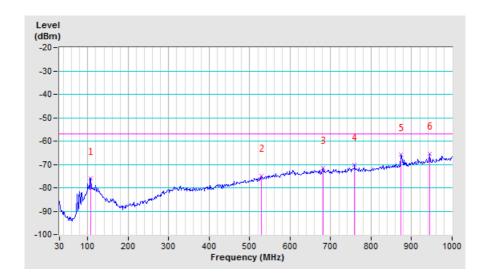


Tel: +86 769 8998 2098 Fax: +86 769 8593 1080



| SPURIOUS EMISSION FREQUENCY RANGE 30MHz ~ 1GHz | OPERATING STATE | Standby |
|--|-----------------|---------|
|--|-----------------|---------|

| SPURIOUS EMISSION LEVEL | | | | | |
|-------------------------|-------------------------|----------------|----------------|----------------|--|
| Frequency (MHz) | Antenna Polarization | Level (dBm) | Limit (dBm) | Margin (dB) | |
| 107.72 | V | -76.05 | -57.00 | -19.05 | |
| 528.99 | V | -74.99 | -57.00 | -17.99 | |
| 681.33 | V | -71.56 | -57.00 | -14.56 | |
| 759.05 | V | -70.21 | -57.00 | -13.21 | |
| 874.09 | V | -65.85 | -57.00 | -8.85 | |
| 944.04 | V | -65.48 | -57.00 | -8.48 | |

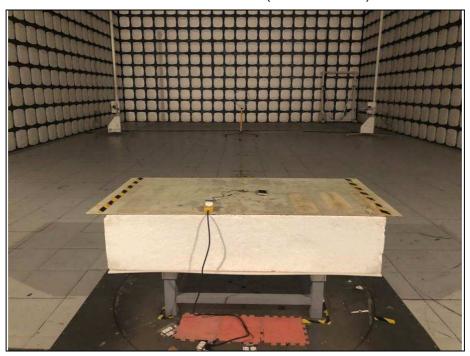


Tel: +86 769 8998 2098 Fax: +86 769 8593 1080



4. PHOTOGRAPHS OF THE TEST CONFIGURATION

SPURIOUS EMISSION (9KHz-30MHz)



SPURIOUS EMISSION (30MHz-1GHz)



Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch

No. 96, Guantai Road (Houjie Section), Houjie Town, Dongguan City, Guangdong Province. 523942. People's Republic of China. Tel: +86 769 8998 2098 Fax: +86 769 8593 1080



5. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications were made to the EUT by the lab during the test.

--- END ---

Tel: +86 769 8998 2098 Fax: +86 769 8593 1080