RF TEST REPORT



Report No.: FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 Supersede Report No.: FCC_IC_RF_SL18012901-ZBR-003_Co-Location

| Applicant : Zebra Technologies Corp. | | | | | | |
|---|------------------------------------|--|--|--|--|--|
| Host Product Name | ; | ZC100, ZC150, ZC300, ZC350 | | | | |
| Module Model No. | | T4NM-FDC0 WYSBHVGXG | | | | |
| Test Standard | : | FCC 15.225, 15.247 RSS 247 Issue 2, RSS-210 Issue 9: 2016 | | | | |
| Test Method | ** | CC 15.225, 15.247 NSI C63.10 2013 RSS Gen Issue 4 2014 | | | | |
| FCC ID | ; | I28MD-ZCLFHF I28MD-FXLAN11AC | | | | |
| IC ID | :: | 3798B-ZCLFHF 3798B-FXLAN11AC | | | | |
| Dates of test | | 02/01/2018 – 02/08/2018 | | | | |
| Issue Date | ; | 03/06/2018 | | | | |
| Test Result | 1 | ⊠ Pass □ Fail | | | | |
| Equipment complied with the specification [X] Equipment did not comply with the specification [] | | | | | | |
| This Test Report is Issued Under the Authority of: | | | | | | |
| Shuo | | | | | | |
| Shuo Zhang Chen Ge | | | | | | |
| RF Te | RF Test Engineer Engineer Reviewer | | | | | |
| This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only | | | | | | |

Issued By:
SIEMIC Laboratories
775 Montague Expressway, Milpitas, CA 95035



775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 2 of 20 |

Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

| Country/Region | Accreditation Body | Scope | |
|----------------|------------------------|-----------------------------------|--|
| USA | FCC, A2LA | EMC, RF/Wireless, Telecom | |
| Canada | IC, A2LA, NIST | EMC, RF/Wireless, Telecom | |
| Taiwan | BSMI, NCC, NIST | EMC, RF, Telecom, Safety | |
| Hong Kong | OFTA, NIST | RF/Wireless, Telecom | |
| Australia | NATA, NIST | EMC, RF, Telecom, Safety | |
| Korea | KCC/RRA, NIST | EMI, EMS, RF, Telecom, Safety | |
| Japan | VCCI, JATE, TELEC, RFT | EMI, RF/Wireless, Telecom | |
| Mexico | NOM, COFETEL, Caniety | EMC, RF/Wireless, Telecom, Safety | |
| Europe | A2LA, NIST | EMC, RF, Telecom, Safety | |
| Israel | MOC, NIST | EMC, RF, Telecom, Safety | |

Accreditations for Product Certifications

| Country | Accreditation Body | Scope | | |
|-----------|--------------------|---------------------|--|--|
| USA | FCC TCB, NIST | EMC, RF, Telecom | | |
| Canada | IC FCB, NIST | EMC, RF, Telecom | | |
| Singapore | iDA, NIST | EMC, RF, Telecom | | |
| EU | NB | EMC & RED Directive | | |
| Japan | MIC (RCB 208) | RF, Telecom | | |
| Hong Kong | OFTA (US002) | RF, Telecom | | |

775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 3 of 20 |

CONTENTS

| 1 | | REPOR | T REVISION HISTORY | 4 |
|----|-----|---------|--|----|
| 2 | | | TIVE SUMMARY | |
| 3 | | | MER INFORMATION | |
| | | | ITE INFORMATION | |
| 4 | | | CATION | |
| 5 | | | | |
| 6 | | | FORMATION | |
| | 6.1 | EUT | Description | 6 |
| | 6.2 | ? Radi | io Description | 6 |
| | 6.3 | BUT | test modes/configuration Description | 8 |
| 7 | ; | SUPPO | RTING EQUIPMENT/SOFTWARE AND CABLING DESCRIPTION | 9 |
| | 7.1 | Sup | porting Equipment | 9 |
| | 7.2 | 2 Cab | ling Description | 9 |
| | 7.3 | 3 Test | Software Description | 9 |
| 8 | • | TEST S | UMMARY | 10 |
| 9 | | MEASU | REMENT UNCERTAINTY | 11 |
| | 9.1 | Rad | iated Emissions (30MHz to 1GHz) | 11 |
| | 9.2 | 2 Radi | iated Emissions (1GHz to 40GHz) | 11 |
| | 9.3 | RF o | conducted measurement | 12 |
| 10 | | MEA | ASUREMENTS, EXAMINATION AND DERIVED RESULTS | 13 |
| | 10. | .1 A | ntenna Requirement | 13 |
| | 10. | .2 R | adiated Measurements | 14 |
| | | 10.2.1 | Radiated Measurements 30MHz to 1GHz | 14 |
| | | 10.2.2 | Radiated Spurious Emissions between 1GHz-25GHz. | 16 |
| 1A | NNE | EX A. T | EST INSTRUMENT | 18 |
| Δ1 | JNF | EX A SI | EMIC ACCREDITATION | 19 |



| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 4 of 20 |

Report Revision History

| Report No. | Report Version | Description | Issue Date |
|---|----------------|-----------------|------------|
| FCC_IC_RF_SL18012901-ZBR-003_Co-Location | None | Original | 02/12/2018 |
| FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 | 1.0 | Update EUT info | 03/06/2018 |
| | | | |
| | | | |
| | | | |





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 5 of 20 |

2 **Executive Summary**

The purpose of this test program was to demonstrate compliance of following product

Company:Zebra Technologies CorporationHost Product:ZC100, ZC150, ZC300, ZC350

Module(s) Model: T4NM-FDC0 WYSBHVGXG

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

3 Customer information

| Applicant Name | | Zebra Technologies Corp. |
|----------------------|---|--|
| Applicant Address | | 3 Overlook Point Lincolnshire, IL 60069, USA |
| Manufacturer Name | | Zebra Technologies Corp. |
| Manufacturer Address | : | 3 Overlook Point Lincolnshire, IL 60069, USA |

4 Test site information

| Lab performing tests | | SIEMIC Laboratories |
|----------------------|---|---|
| Lab Address | | 775 Montague Expressway, Milpitas, CA 95035 |
| FCC Test Site No. | | 881796 |
| IC Test Site No. | | 4842D-2 |
| VCCI Test Site No. | : | A0133 |

5 Modification

| Index | Item | Description | Note |
|-------|------|-------------|------|
| - | - | - | - |
| - | - | - | |

775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 6 of 20 |

EUT Information

EUT Description <u>6.1</u>

| Product Name | Color Card Printer |
|---------------------------|---------------------------------|
| Host Model No. | ZC100, ZC150, ZC300, ZC350 |
| Trade Name | Zebra Technologies Corporation |
| Serial No. | C3J17390595 |
| Input Power | 100-240Vac, 2.8A, 50/60Hz |
| Power Adapter Manu/Model | N/A |
| Power Adapter SN | N/A |
| Date of EUT received | February 5 th , 2018 |
| Equipment Class/ Category | DTS, 125 kHz, 13.56MHz |
| Clock Frequencies | N/A |
| Port/Connectors | RJ45 |

Radio Description <u>6.2</u>

Specifications for Radio:

Bluetooth LE:

| Radio Type | Bluetooth (Ver4.1) |
|------------------------|--------------------|
| Operating Frequency | 2402MHz-2480MHz |
| Modulation | GFSK |
| Channel Spacing | 2MHz |
| Antenna Type | Monopole Antenna |
| Antenna Gain | 1 dBi |
| Antenna Connector Type | u.FL |
| Note | N/A |

Specifications for Radio:

| Radio Type | RFID |
|------------------------|------------------------------|
| Operating Frequency | 125KHz, 13.56MHz |
| Modulation | ASK (125KHz), ASK (13.56MHz) |
| Channel Spacing | None |
| Antenna Type | Loop Antenna |
| Antenna Gain(dBi) | 125KHz:-134, 13.56MHz: -51 |
| Antenna Connector Type | N/A |

Channel List:

| Туре | Mode | Channel No. | Frequency (MHz) | Available (Y/N) |
|------|----------|-------------|-----------------|-----------------|
| RFID | 125KHz | 1 | 0.125 | Υ |
| RFID | 13.56MHz | 1 | 13.56 | Υ |





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 7 of 20 |

| Radio Type | 802.11b | 802.11g | 802.11n-20M | 802.11n-40M | | |
|---------------------------|--|---|------------------------------------|---------------------------------|--|--|
| Operating Frequency | 2412-2462MHz | 2412-2462MHz | 2412-2462MHz | 2422-2452MHz | | |
| Modulation | DSSS (CCK, DQPSK, DBPSK) | OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM) | OFDM (BPSK, QPSK, 16QAM, 64QAM) | OFDM (BPSK, QPSK, 16QAM, 64QAM) | | |
| Channel Spacing | 5MHz | 5MHz | 5MHz | 5MHz | | |
| Number of Channels | 11 | 11 | 11 | 7 | | |
| Antenna Type | | Internal Omni PCB Antenna | | | | |
| Antenna Gain (Peak) | 2.4GHz: 3.66 dBi | | | | | |
| Antenna Connector Type | U.FL | | | | | |
| Note | 2.4GHz and 5GHz Radio does not transmit simultaneously and 2.4GHz has higher power | | | | | |





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 8 of 20 |

EUT test modes/configuration Description 6.3

| Mode | Note |
|------------|-------------------------------------|
| RF test | EUT is set to continuously transmit |
| | |
| | |
| Note: None | |

| Test Item | Operating mode | Tested antenna port |
|-----------------------------|---------------------|---------------------|
| Antenna Requirement | N/A | - |
| Conducted Emissions Voltage | N/A | - |
| Radiated Spurious Emission | Continuous Transmit | - |
| Frequency Stability | N/A | - |
| Occupied Bandwidth | N/A | - |
| Note: - | | |





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 9 of 20 |

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

| Index | Supporting Equipment Description | Model | Serial No | Manu | Note |
|-------|----------------------------------|-------|-----------|------|------|
| - | - | - | - | - | - |

7.2 Cabling Description

| Name | e | | Connection Stop | | Length / shielding Info | | Note |
|------|-----|-----------|-----------------|-----|-------------------------|---|------|
| Name | | | To I/O Port | | Length (m) Shielding | | |
| 1 | EUT | Connector | Computer | USB | 5 | - | - |

7.3 Test Software Description

| Test Item | Software | Description |
|---|----------|-------------|
| RF Testing Tera Term Set the EUT to transmit continuously | | |
| - | - | - |

775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088



| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 10 of 20 |

Test Summary

| Test Item | | Test standard | Test Method/Procedure | Pass / Fail |
|--------------------------------|-----|--------------------------|---|-------------|
| Antenna Requirement | FCC | 15.203 | ANSI C63.10 – 2013 | ☐ Pass |
| / interina riequirement | IC | - | 558074 D01 DTS Meas. Guidance v03r02 | ⊠ N/A |
| AC Conducted Emissions Voltage | FCC | 15.225(a) | ANSI C63.10 2013 | ☐ Pass |
| AC Conducted Emissions Voltage | IC | RSS Gen (7.2.2) | RSS Gen. 8.8 | ⊠ N/A |
| Remark | 1. | Device is battery operat | ed. Conducted Emission test is not required | |

| Test Item | Test standard | | Test Method/Procedure | | Pass / Fail | | |
|----------------------------|----------------|---|-----------------------|-------------|-------------|--|--|
| Dadiated Courieus Emission | FCC | | FCC | RSS Gen 7.1 | □ Pass | | |
| Radiated Spurious Emission | IC | • | IC | R55 Gen 7.1 | □ N/A | | |
| Fraguency Stability | FCC | - | FCC | - | ☐ Pass | | |
| Frequency Stability | IC | - | IC | - | ⊠ N/A | | |
| Occupied Bandwidth | FCC | - | FCC | - | ☐ Pass | | |
| Occupied Baridwidth | IC | - | IC | - | ⊠ N/A | | |
| Remark | 2. 3. 4. | 3. The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual. | | | | | |

775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088

Visit us at: www.siemic.com: Follow us at:





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 11 of 20 |

9 Measurement Uncertainty

9.1 Radiated Emissions (30MHz to 1GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- NSA Calibration
- Etc., details see the below table

| Source of Uncertainty | Value | Probability | Division | Sensitivity | Expanded | |
|------------------------------|----------------------------|--------------|----------|-------------|-------------|--|
| Source of Officertainty | (dB) | Distribution | DIVISION | Coefficient | Uncertainty | |
| Receiver Reading | 0.12 | Rectangular | 1.732 | 1 | 0.069284 | |
| Cable Insertion Loss | 0.21 | Normal | 2 | 1 | 0.105 | |
| Filter Insertion Loss | 0.25 | Normal | 2 | 1 | 0.125 | |
| Antenna Factor | 0.65 | Normal | 2 | 1 | 0.325 | |
| Receiver CW accuracy | 0.5 | Rectangular | 1.732 | 1 | 0.2886836 | |
| Pulse Amplitude Response | 1.5 | Rectangular | 1.732 | 1 | 0.86605081 | |
| PRF Response | 1.5 | Rectangular | 1.732 | 1 | 0.86605081 | |
| Mismatch Filter - Receiver | 0.25 | U-Shape | 1.414 | 1 | 0.1768033 | |
| NSA Calibration | 4.0 | U-Shape | 1.414 | 1 | 2.8288543 | |
| Combined Standard Uncertaint | 3.0059131 | | | | | |
| Expanded Uncertainty (K=2) | Expanded Uncertainty (K=2) | | | | | |

The total derived measurement uncertainty is +/- 6.00 dB.

9.2 Radiated Emissions (1GHz to 40GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- VSWR Calibration
- Etc., details see the below table

| Source of Uncertainty | Value | Probability | Division | Sensitivity | Expanded | |
|-----------------------------|----------------------------|--------------|----------|-------------|-------------|--|
| Source of Officertainty | (dB) | Distribution | DIVISION | Coefficient | Uncertainty | |
| Receiver Reading | 0.12 | Rectangular | 1.732 | 1 | 0.0692840 | |
| Cable Insertion Loss | 0.21 | Normal | 2 | 1 | 0.1050000 | |
| Filter Insertion Loss | 0.25 | Normal | 2 | 1 | 0.1250000 | |
| Antenna Factor | 0.65 | Normal | 2 | 1 | 0.3250000 | |
| Receiver CW accuracy | 0.5 | Rectangular | 1.732 | 1 | 0.2886836 | |
| Pulse Amplitude Response | 1.5 | Rectangular | 1.732 | 1 | 0.8660508 | |
| PRF Response | 1.5 | Rectangular | 1.732 | 1 | 0.8660508 | |
| Mismatch Filter - Receiver | 0.25 | U-Shape | 1.414 | 1 | 0.1768033 | |
| VSWR Calibration | 2.0 | U-Shape | 1.414 | 1 | 1.4144272 | |
| Combined Standard Uncertain | 4.2363 | | | | | |
| Expanded Uncertainty (K=2 | Expanded Uncertainty (K=2) | | | | | |

775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 12 of 20 |

The total derived measurement uncertainty is +/- 8.47 dB.

9.3 RF conducted measurement

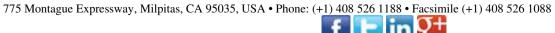
The test is to measure the RF output power from the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the Reference Level Uncertainty
- Uncertainty of variable attenuators
- Uncertainty of cables
- Uncertainty due to the mismatches

| Source of Uncertainty | Value (dB) | Probability Distribution | Division | Sensitivity Coefficient | Expanded Uncertainty |
|--------------------------------|-----------------|-----------------------------|----------|----------------------------|-------------------------|
| Reference Level | 0.12 | Rectangular | 1.732 | 1 | 0.069284 |
| Cable Insertion Loss | 0.21 | Normal | 2 | 1 | 0.105 |
| Attenuator | 0.25 | Normal | 2 | 1 | 0.125 |
| Mismatch | 0.25 | U-Shape | 1.414 | 1 | 0.1768033 |
| Combined Standard Unce | 0.476087 | | | | |
| Expanded Uncertainty (I | <=2) | | | | 0.952174 |

The total derived measurement uncertainty is +/- 0.95 dB.





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 13 of 20 |

10 Measurements, examination and derived results

10.1 Antenna Requirement

| Spec | Requirement | Applicable |
|---------|---|------------|
| §15.203 | 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. Antenna requirement must meet at least one of the following: a) Antenna must be permanently attached to the device. b) The antenna must use a unique type of connector to attach to the device. c) Device must be professionally installed. The installer shall be responsible for ensuring that the correct antenna is employed by the device. | × |
| Remark | N/A | |
| Result | ⊠ PASS □ FAIL | |

775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088

Visit us at: www.siemic.com: Follow us at:





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 14 of 20 |

10.2 Radiated Measurements

10.2.1 Radiated Measurements 30MHz to 1GHz

Requirement(s):

| Spec | Requirement | | | Applicable |
|---------------------------------|---|---|---|---|
| 47 CFR §15.225 RSS-210 (B.6) | Operation with (a) The field strength of any em not exceed 15,8 (b) Within the bands 13.410– strength of any emissions sha (c) Within the bands 13.110– strength of any emissions sha (d) The field strength of any en MHz band shall not exceed t Frequency range (MH: 30 – 88 | | | |
| | 88 – 216 | 15 | | |
| | 216 960 | 20 | | |
| | Above 960 | 50 |)() | |
| Test Setup | Fladio Absorting Material | Semi Anechoic Chamber Jon Other Antenna Ground Plane | F-dm Spectrum Analyzer | |
| Procedure | The test was carried out at Maximization of the emissic polarization, and adjusting a. Vertical or horizo rotation of the EU b. The EUT was the c. Finally, the anten 3. A Quasi-peak measuremer | and allowed to warm up to its not the selected frequency points or ons, was carried out by rotating the antenna height in the followintal polarisation (whichever gav IT) was chosen. It is notated to the direction that gan height was adjusted to the hot was then made for that frequency for the next frequency point, the selection of the selection that gan the selection that frequency for the next frequency point, the selection of the selection that frequency point, the selection of the selection | btained from the EUT cha the EUT, changing the ar ng manner: e the higher emission lev ave the maximum emission eight that gave the maximency point. | racterisation. tenna el over a full on. num emission. |
| Test Date | 02/01/2018 – 02/08/2018 | Environmental conditions | Temperature Relative Humidity Atmospheric Pressure | 20.1°C 36% 1026mbar |
| Remark | - | | | |
| Result | ⊠ Pass □ Fail | | | |
| Test Data ⊠ Yes | See below) | | | |
| Test Plot ⊠ Yes | See below) | | | |

Visit us at: www.siemic.com; Follow us at:

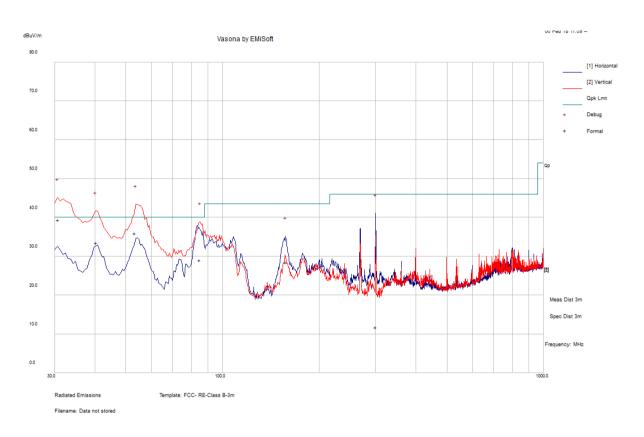
Test was done by Shuo Zhang at 10-meter chamber.



| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 15 of 20 |

| Test specification: | Radiated Emissions | | | |
|---------------------|---|--|---------|------------------|
| Mains Power: | 120VAC, 60Hz | | | |
| Tested by: | Shuo Zhang | | Result: | ⊠ Pass □ Fail |
| Test Date: | 02/04/2018 | | | |
| Remarks: | RFID and BT and 2.4GHz WLAN transmit simultaneously | | | |

f=30MHz - 1000MHz plot and 3-meter distance



f=30MHz - 1000MHz Measurements

| Frequency MHz | Raw dBµV/m | Cable Loss | AF dB | Level dBµV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
|------------------|---------------|---------------|----------|-----------------|---------------------|-----|-----------|------------|-----------------|--------------|---------------|
| 30.82 | 41.71 | 11.3 | -13.66 | 39.35 | Quasi Max | ٧ | 110 | 321 | 40 | -0.65 | Pass |
| 53.40 | 51.7 | 11.61 | -27.42 | 35.9 | Quasi Max | ٧ | 100 | 128 | 40 | -4.11 | Pass |
| 40.39 | 43.51 | 11.46 | -21.47 | 33.49 | Quasi Max | ٧ | 126 | 242 | 40 | -6.51 | Pass |
| 84.95 | 45.12 | 11.86 | -27.99 | 29 | Quasi Max | ٧ | 177 | 152 | 40 | -11 | Pass |
| 299.80 | 21.18 | 13.43 | -22.82 | 11.8 | Quasi Max | Н | 105 | 288 | 46 | -34.2 | Pass |
| 157.48 | 39.63 | 12.39 | -23.61 | 28.41 | Quasi Max | Н | 221 | 9 | 43.5 | -15.09 | Pass |

775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 16 of 20 |

10.2.2 Radiated Spurious Emissions between 1GHz-25GHz

Requirement(s):

| Spec | Item | Requirement | Applicable | | | | |
|----------------------------------|---|---|---|--|--|--|--|
| 47CFR§15.247(d), RSS210(A8.5) | a) | For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required 20 dB down 30 dB down | | | | | |
| | b) □ 20 dB down □ 30 dB down or restricted band, emission must also comply with the radiated emission limits specified in 15.209 | | | | | | |
| Test Setup | Radio | Semi Anechoic Chamber Absorbing Material 3m Antenna Ground Plane | Spectrum Analyzer | | | | |
| Procedure | 2. T M all a. a. b. c. 3. A 4. S | rotation of the EUT) was chosen. The EUT was then rotated to the direction that gave the maximum emi | characterisation. e antenna polarization, level over a full ssion. eximum emission. | | | | |
| Remark | | as scanned up to 40GHz. Both horizontal and vertical polarities were investigate worst case. | ated. The results | | | | |
| Result | ⊠ Pass | | | | | | |

Test Data ⊠ Yes (See below) □ N/A

775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 17 of 20 |

| Test specification: | Radiated Emissions | | | |
|---------------------|-----------------------------------|---------------------|---------|---|
| Mains Power: | 120VAC, 60Hz | | | |
| Tested by: | Shuo Zhang | | Result: | ☑ Pass☐ Fail |
| Test Date: | 02/05/2018 | | | |
| Remarks: | RFID and BT and 2.4GHz WLAN trans | smit simultaneously | 1 | |

| Frequency MHz | Raw dBµV/m | Cable Loss | AF dB | Level dBµV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
|------------------|---------------|---------------|----------|-----------------|---------------------|-----|-----------|------------|-----------------|--------------|---------------|
| 4923.90 | 42.08 | 4.22 | -0.95 | 45.35 | Peak Max | Η | 138 | 349 | 74 | -28.66 | Pass |
| 9455.43 | 38.76 | 5.71 | 0.25 | 44.71 | Peak Max | V | 235 | 51 | 74 | -29.29 | Pass |
| 7766.86 | 38.83 | 5.23 | -0.32 | 43.75 | Peak Max | V | 171 | 163 | 74 | -30.25 | Pass |
| 4923.90 | 32.57 | 4.22 | -0.95 | 35.83 | Average Max | Н | 138 | 349 | 54 | -18.17 | Pass |
| 9455.43 | 26.64 | 5.71 | 0.25 | 32.59 | Average Max | ٧ | 235 | 51 | 54 | -21.41 | Pass |
| 7766.86 | 26.46 | 5.23 | -0.32 | 31.37 | Average Max | V | 171 | 163 | 54 | -22.63 | Pass |

775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088

Visit us at: www.siemic.com: Follow us at:





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 18 of 20 |

Annex A. TEST INSTRUMENT

| Instrument | Model | Serial # | Cal Date | Cal Cycle | Cal Due | In use |
|-----------------------------|--------|----------|------------|-----------|------------|--------|
| Radiated Emissions | | | | | | |
| Spectrum Analyzer | N9030B | 10SL0289 | 09/06/2017 | 1 Year | 09/06/2018 | ~ |
| ETS-Lingren Loop Antenna | 6512 | 00049120 | 07/14/2017 | 1 Year | 07/14/2018 | > |
| Bi-Log antenna (30MHz~2GHz) | JB1 | A030702 | 07/13/2017 | 1 Year | 07/13/2018 | > |
| Horn Antenna (1-26.5GHz) | 3115 | 10SL0059 | 11/09/017 | 1 Year | 11/09/2018 | > |
| RF Conducted Measurement | | | | | | |
| Spectrum Analyzer | N9030B | 10SL0289 | 09/06/2017 | 1 Year | 09/06/2018 | > |





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 19 of 20 |

Annex A. SIEMIC Accreditation

| Accreditations | Document | Scope / Remark |
|--------------------------------------|----------|--|
| ISO 17025 (A2LA) | | Please see the documents for the detailed scope |
| ISO Guide 65 (A2LA) | | Please see the documents for the detailed scope |
| TCB Designation | | A1, A2, A3, A4, B1, B2, B3, B4, C |
| FCC DoC Accreditation | 7 | FCC Declaration of Conformity Accreditation |
| FCC Site Registration | Z | 3 meter site |
| FCC Site Registration | Z | 10 meter site |
| IC Site Registration | Z | 3 meter site |
| IC Site Registration | | 10 meter site |
| | | Radio Equipment: EN45011: EN ISO/IEC 17065 |
| EU NB | | Electromagnetic Compatibility: EN45011 – EN ISO/IEC 17065 |
| Singapore iDA CB(Certification Body) | 包包 | Phase I, Phase II |
| Vietnam MIC CAB Accreditation | Z | Please see the document for the detailed scope |
| | | (Phase II) OFCA Foreign Certification Body for Radio and Telecom |
| Hong Kong OFCA | Z | (Phase I) Conformity Assessment Body for Radio and Telecom |
| | Z. | Radio: Scope A – All Radio Standard Specification in Category I |
| Industry Canada CAB | | Telecom: CS-03 Part I, II, V, VI, VII, VIII |





| Test report | FCC_IC_RF_SL18012901-ZBR-003_Co-Location_Rev1.0 |
|-------------|---|
| Page | 20 of 20 |

| Japan Recognized Certification Body Designation | 包包 | Radio: A1. Terminal equipment for purpose of calling Telecom: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law |
|---|----|--|
| Korea CAB Accreditation | | EMI: KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI EMS: KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS Radio: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68 |
| | | Telecom: President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4 |
| Taiwan NCC CAB Recognition | | LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08 |
| Taiwan BSMI CAB Recognition | Z | CNS 13438 |
| Japan VCCI | | R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measurement |
| | 12 | EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4 |
| Australia CAB Recognition | | Radiocommunications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771 |
| | | Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06 AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1 |
| Australia NATA Recognition | | AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016,AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2 |

