IEEE C95.1
KDB 447498 D03
47 C.F.R. Part 1, Subpart I, Section 1.1310
47 C.F.R. Part 2, Subpart J, Section 2.1091

RF EXPOSURE REPORT

For

Smart Home Gateway, Z-Wave Tool Box, Smart Home Controller, Nexia Bridge

Model:

NA301-ZWxxxxxxxx (the 1st x should be "blank" or "-"; the rest x could be 0 to 9, A to Z, "blank" or "-" , for marking purpose); G150xxxxxxxx; VeraEdgexxxxxxxx; TRF-ZW2xxxxxxxx (the 1st x should be "blank" or "-" ; the rest x could be 0 to 9, A to Z, "blank" or "-", for marking purpose); ZWP-TBX; TGFX-HUB1; BR200NX

Trade Name:

Sercomm; MiOS Limited; Accenture; Amdocs; Intamac; NorthQ; Vera Control, Ltd.; URC; Telguard; Zwaveproducts.com; NEXIA

Issued to

Sercomm Corporation
8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C.

Issued by

Compliance Certification Services Inc.
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)
http://www.ccsrf.com
service@ccsrf.com
Issued Date: December 14, 2017

Testing Laboratory
1309

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	2014/08/22	Initial Issue	ALL	Angel Cheng
01	2015/09/04	Rev. (01)	ALL	Doris Chu
02	2016/12/29	Rev. (02)	ALL	Angel Cheng
03	2017/02/22	Rev. (03)	ALL	Angel Cheng
04	2017/12/14	Rev. (04)	ALL	Allison Chen
05	2018/01/04	Rev. (05)	P.4, P.7	Allison Chen

Rev. (01)
1. Applicant added two adapters. (Adapter model name: MU12AR120100-A1 (VI) and WA-12M12FU (VI))
2. Applicant update standard.
3. Applicant changes model name and trade name.
4. Other information, please refer to the T140708D15 and this test report.
Rev. (02)
1. Applicant added model: TGFX-HUB1 & Trade Name: Telguard
2. Other information, please refer to the T161223D06 and this test report.
Rev. (03)
1. Applicant added model: ZWP-TBX, Trade Name: Zwaveproducts.com and Product name: Z-Wave Tool Box
2. Other information, please refer to the T161223D06 and this test report.
Rev. (04)
1. Applicant added model:BR200NX, Trade Name: NEXIA and Product name: Nexia Bridge, Smart Home Controller.
2. Other information, please refer to the T170217D18 and this test report.
Rev. (05)
1. Modify Frequency band (Operating).
2. Added 916MHz in Z-wave.

TABLE OF CONTENTS

1. LIMIT

According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

2. EUT SPECIFICATION

<table>
<tr><td>Product</td><td colspan="3">Smart Home Gateway, Z-Wave Tool Box,
Smart Home Controller, Nexia Bridge</td></tr>
<tr><td>Trade Name</td><td colspan="3">Sercomm; MiOS Limited; Accenture; Amdocs; Intamac; NorthQ;
Vera Control, Ltd.; URC; Telguard, Zwaveproducts.com, NEXIA</td></tr>
<tr><td>Model Number</td><td colspan="3">NA301-ZWxxxxxxxx (the 1st x should be "blank" or "-"; the rest x could be 0 to 9, A to Z, "blank" or “-“ , for marking purpose) ;
G150xxxxxxxx ; VeraEdgexxxxxxxx ; TRF-ZW2xxxxxxxx (the 1st x should be "blank" or "-"; the rest x could be 0 to 9, A to Z, "blank" or “-“ , for marking purpose);
TGFX-HUB1; ZWP-TBX; BR200NX</td></tr>
<tr><td>Model Discrepancy</td><td colspan="3">1. All the model numbers (list on this report) are identical, just for marketing purpose only except Brand.
2. The means of “x” (The “x” in model name can be 0 to 9, A to Z, blank or “-“ , for marking purpose) on model number are identical, just for marketing purpose only.
3. Client consigns only one model sample (Model number: NA301-ZW-US) to test. Therefore testing Lab. just guarantees the units, which have been tested.
<table>
<tr><th></th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th></tr>
<tr><td>Product</td><td>Nexia Bridge</td><td>Z-Wave Tool Box</td><td>Smart Home Gateway</td><td>Smart Home Gateway</td><td>Smart Home Controller</td><td>Smart Home Gateway</td><td>Smart Home Gateway</td></tr>
<tr><td>Model Number</td><td>BR200NX</td><td>ZWP-TBX</td><td>NA301-ZWxxxxxxxx</td><td>G150xxxxxxxx</td><td>VeraEdgexxxxxxxx</td><td>TGFX-HUB1</td><td>TRF-ZW2xxxxxxxx</td></tr>
<tr><td>Trade Name</td><td>NEXIA</td><td>Zwaveproducts.com</td><td>Sercomm</td><td>MiOS Limited</td><td>Vera Control, Ltd.</td><td>Telguard</td><td>URC</td></tr>
<tr><td colspan="8">Note : for Model (the 1st x should be "blank" or "-" ; the rest x could be 0 to 9, A to Z, "blank" or "-", for marking purpose)</td></tr>
</table></td></tr>
<tr><td>RF Module</td><td>MEDIATEK</td><td>Model</td><td>MT7620A</td></tr>
<tr><td>Frequency band (Operating)</td><td colspan="3">☒ 802.11b/g/n HT20: 2.412GHz ~ 2.462GHz
802.11n HT40: 2.422GHz ~ 2.452GHz
☒ 908MHz, 916MHz
☐ Others</td></tr>
<tr><td>Device category</td><td colspan="3">☐ Portable (<20cm separation)
☒ Mobile (>20cm separation)
☐ Others</td></tr>
<tr><td>Exposure classification</td><td colspan="3">☐ Occupational/Controlled exposure (S = 5mW/cm^2)
☒ General Population/Uncontrolled exposure (S=1mW/cm^2)</td></tr>
</table>

Antenna Specification	For 2.4G Monopole Antenna Antenna Gain : 3.62 dBi (Numeric gain: 2.30) PCB Antenna Antenna Gain : 4.99 dBi (Numeric gain: 3.16) Worst For Z-Wave PIFA Antenna Antenna Gain : 0.56 dBi (Numeric gain: 1.14) 2.4GHz: Directional gain = 4.99 dBi +10log (2) = 8.00 dBi (Numeric gain: 6.31)
Maximum Average output power	IEEE 802.11b Mode: 17.99 dBm (62.951 mW) IEEE 802.11g Mode: 16.64 dBm (46.132 mW) IEEE 802.11n HT 20 Mode: 17.27 dBm (53.333 mW) IEEE 802.11n HT 40 Mode: 17.01 dBm (50.234 mW) Z-Wave 2.00 dBm (1.585 mW)
Maximum Tune up Power	IEEE 802.11b Mode: 19.00 dBm (79.433 mW) IEEE 802.11g Mode: 18.00 dBm (63.096 mW) IEEE 802.11n HT 20 Mode: 18.00 dBm (63.096 mW) IEEE 802.11n HT 40 Mode: 19.00 dBm (79.433 mW) Z-Wave 2.00 dBm (1.585 mW)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

3. TEST RESULTS

No non-compliance noted.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

Where E = Field strength in Volts / meter
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{377 d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ ***Equation 1***

Where d = Distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power density in mW / cm²

4. MAXIMUM PERMISSIBLE EXPOSURE

Substituting the MPE safe distance using d = 20 cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where P = Power in mW
G = Numeric antenna gain
S = Power density in mW / cm²

IEEE 802.11b mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
1	2412	79.433	3.16	20	0.0500	1

IEEE 802.11g mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
1	2412	63.096	3.16	20	0.0397	1

IEEE 802.11n HT20 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
6	2437	63.096	6.31	20	0.0792	1

IEEE 802.11n HT40 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
1	2412	79.433	6.31	20	0.0997	1

Z-Wave:

Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
908	1.585	1.14	20	0.0004	1
916	1.585	1.14	20	0.0004	1