

Date: 2017/07/28

# User Manual

## Model Name: DHUR-AN32

### **Delivery Specifications**

|                     |                                                                                                                                                                                         |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Description | STAMP module 802.11 abgn & BT                                                                                                                                                           |
| WNC Part Number     | 81DHUR31.G01                                                                                                                                                                            |
| WNC Model Name      | DHUR-AN32                                                                                                                                                                               |
| Issue Version :     | V1.1                                                                                                                                                                                    |
| Manufacturer        | Wistron NeWeb Corporation (WNC)<br>Address: 20 Park Avenue II Road, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.<br>(ZIP Code: 308)<br>Tel: +886-3-666-7799                        |
| Production Factory  | Wistron NeWeb (Kunshan) Corporation<br>Address: 789 Yujinxiang Road, Comprehensive Free Trade Zone, Kunshan City, Jiangsu Province, P.R.C (ZIP Code: 215300)<br>Tel: 0086-512-5772-2688 |

|                                           |                                                                                      |
|-------------------------------------------|--------------------------------------------------------------------------------------|
| Production Country                        | People's Republic of China                                                           |
| PO Reception & Invoice<br>Release Company | ANC holding Corporation<br>P.O. Box 3152, Road Town, Tortola, British Virgin Islands |
|                                           |                                                                                      |

## Revision History

| Version | Change history                                                                                                                                 | Date       |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 1.0     | Draft version                                                                                                                                  | 2017/07/06 |
| 1.1     | 1. Update Power-on Sequence Specifications in page 9<br>2. Module board thickness tolerance in page 21<br>3. Add EEPROM information in page 16 | 2017/07/13 |
| 1.2     | 4. Add Module Photo in page 4<br>5. Add Clamshell Embossed Carrier information in page 29                                                      | 2018/07/19 |
|         |                                                                                                                                                |            |
|         |                                                                                                                                                |            |
|         |                                                                                                                                                |            |
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|         |                                                                                                                                                |            |
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## 1. Product Introduction

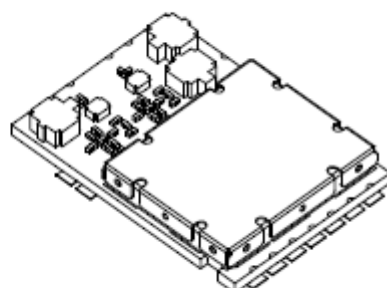
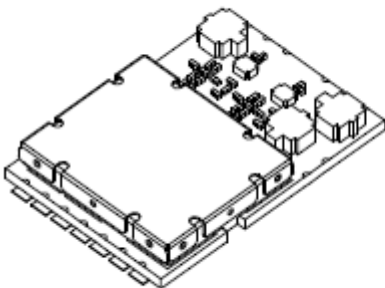
DHUR-AN32 is a 802.11 a/b/g/n WLAN/Bluetooth Combo Module which compliant with IEEE802.11n standard supports 2x2 a/b/g/n MIMO technology with data rate from MCS 0-15 in 20MHz/40MHz Channels, and BT4.2 LE specifications.

### Features

- Operation at 2.4~2.5GHz and 5.15~5.825GHz frequency band to meet worldwide regulations
- Bluetooth v4.2 Low Energy(LE);
- Bluetooth specification v2.1+EDR;
- Support wireless data encryption with 64/128-bit WEP for security
- Drivers support Windows 2000,XP,Vista
- ROHS compliant

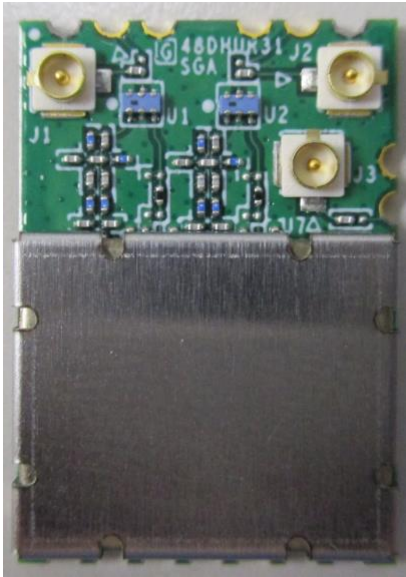
### Interfaces and Power supply

- WLAN / Bluetooth RF interface
- USB interface
- Chip power down control
- 3.3V supply voltage



## 2. Product Photograph

Top side



Bottom side



## 4. I/O Pin Definition

### Pin list

| Pin | Name | Pin | Name   | Pin | Name   |
|-----|------|-----|--------|-----|--------|
| 1   | GND  | 6   | GND    | 11  | USBDM  |
| 2   | ANT0 | 7   | GND    | 12  | 3.3V   |
| 3   | GND  | 8   | BT_ANT | 13  | BT_WOL |
| 4   | GND  | 9   | GND    | 14  | WOL    |
| 5   | ANT1 | 10  | USBDP  | 15  | RST    |

## 5. Product Specification

### 5.1 WiFi portion

| Item                                         | Key specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |       |       |       |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|-------|-------|---------|--|------|--|------|----|------|----|---------|-------|-------|-------|-------|---------|-------|-------|-------|-------|----------------|------|--|------|--|--------------------|------|--|------|--|
| Main chipset                                 | MTK MT7632TU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |       |       |       |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |
| TX/RX                                        | 2T2R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |         |       |       |       |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |
| Frequency range                              | 2.400 ~ 2.497GHz,5.15GHz ~ 5.85GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |       |       |       |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |
| Modulation technique                         | <p>➤ <b>802.11 a/b/g</b><br/>DSSS (DBPSK, DQPSK, CCK)<br/>OFDM (BPSK, QPSK, 16-QAM, 64-QAM)<br/>DSSS (Direct Sequence Spread Spectrum) with<br/>DBPSK (Differential Binary Phase Shift Keying 1Mbps),<br/>DQPSK (Differential Quaternary Phase Shift Keying 2Mbps), and<br/>CCK (Complementary Code Keying 5.5&amp;11Mbps), and<br/>OFDM (Orthogonal Frequency Division Multiplexing with BPSK for 6,9Mbps 、 QPSK for 12,18Mbps 、 16QAM for 24,36Mbps 、 64QAM for 48,54Mbps)</p> <p>➤ <b>802.11n a/g</b><br/>OFDM (BPSK, QPSK, 16-QAM, 64-QAM)</p> |         |       |       |       |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |
| Host interface                               | ➤ USB 2.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |       |       |       |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |
| Operation voltage                            | ➤ 3.3V DC +/-9% (including voltage ripple)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |       |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |
| Power consumption<br>@25° C                  | <table><tr><th rowspan="2">Mode</th><th colspan="2">Average</th><th colspan="2">Peak</th></tr><tr><th>2.4G</th><th>5G</th><th>2.4G</th><th>5G</th></tr><tr><td>WiFi Tx</td><td>430mA</td><td>620mA</td><td>580mA</td><td>780mA</td></tr><tr><td>WiFi Rx</td><td>165mA</td><td>160mA</td><td>240mA</td><td>230mA</td></tr><tr><td>Driver disable</td><td colspan="2">20mA</td><td colspan="2">55mA</td></tr><tr><td>Standby<br/>WiFi+BT</td><td colspan="2">15mA</td><td colspan="2">50mA</td></tr></table>                                         |         |       |       | Mode  | Average |  | Peak |  | 2.4G | 5G | 2.4G | 5G | WiFi Tx | 430mA | 620mA | 580mA | 780mA | WiFi Rx | 165mA | 160mA | 240mA | 230mA | Driver disable | 20mA |  | 55mA |  | Standby<br>WiFi+BT | 15mA |  | 50mA |  |
|                                              | Mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Average |       | Peak  |       |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |
|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2.4G    | 5G    | 2.4G  | 5G    |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |
|                                              | WiFi Tx                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 430mA   | 620mA | 580mA | 780mA |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |
|                                              | WiFi Rx                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 165mA   | 160mA | 240mA | 230mA |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |
|                                              | Driver disable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 20mA    |       | 55mA  |       |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |
| Standby<br>WiFi+BT                           | 15mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |         | 50mA  |       |       |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |
| *WiFi Tx and Rx is for continuous Tx and Rx  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |       |       |       |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |
| **Power consumption measured on PC platform. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |       |       |       |         |  |      |  |      |    |      |    |         |       |       |       |       |         |       |       |       |       |                |      |  |      |  |                    |      |  |      |  |

|                                                                   |                                                                                                                                                                                                                               |             |                                   |           |           |                                   |           |          |          |
|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------------------------|-----------|-----------|-----------------------------------|-----------|----------|----------|
| Output power<br>(for each<br>chain;<br>tolerance<br>+1.5/-1.5 dB) | ➤ 802.11a                                                                                                                                                                                                                     |             |                                   |           |           |                                   |           |          |          |
|                                                                   | Test Frequencies                                                                                                                                                                                                              | 6-12_Target | 18_Target                         | 24_Target | 36_Target | 48_Target                         | 54_Target |          |          |
|                                                                   | 5180                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        |          |          |
|                                                                   | 5320                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        |          |          |
|                                                                   | 5500                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        |          |          |
|                                                                   | 5600                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        |          |          |
|                                                                   | 5700                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        |          |          |
|                                                                   | 5825                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        |          |          |
|                                                                   | ➤ 802.11b                                                                                                                                                                                                                     |             |                                   |           |           |                                   |           |          |          |
|                                                                   | Test Frequencies                                                                                                                                                                                                              | 1/2_Target  | 5.5_Target                        | 11_Target |           |                                   |           |          |          |
|                                                                   | 2412                                                                                                                                                                                                                          | 15          | 15                                | 15        |           |                                   |           |          |          |
|                                                                   | 2472                                                                                                                                                                                                                          | 15          | 15                                | 15        |           |                                   |           |          |          |
|                                                                   | 2484                                                                                                                                                                                                                          | 15          | 15                                | 15        |           |                                   |           |          |          |
|                                                                   | ➤ 802.11g                                                                                                                                                                                                                     |             |                                   |           |           |                                   |           |          |          |
|                                                                   | Test Frequencies                                                                                                                                                                                                              | 6-12_Target | 18_Target                         | 24_Target | 36_Target | 48_Target                         | 54_Target |          |          |
|                                                                   | 2412                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        |          |          |
|                                                                   | 2442                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        |          |          |
|                                                                   | 2472                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        |          |          |
|                                                                   | ➤ 802.11n                                                                                                                                                                                                                     |             |                                   |           |           |                                   |           |          |          |
|                                                                   | Freq. Range: HT20                                                                                                                                                                                                             |             |                                   |           |           |                                   |           |          |          |
|                                                                   | Test Freq                                                                                                                                                                                                                     | MCS 0/8     | MCS 1/9                           | MCS 2/10  | MCS 3/11  | MCS 4/12                          | MCS 5/13  | MCS 6/14 | MCS 7/15 |
|                                                                   | 5180                                                                                                                                                                                                                          | 12          | 12                                | 12        | 12        | 12                                | 12        | 12       | 12       |
|                                                                   | 5240                                                                                                                                                                                                                          | 12          | 12                                | 12        | 12        | 12                                | 12        | 12       | 12       |
|                                                                   | 5320                                                                                                                                                                                                                          | 12          | 12                                | 12        | 12        | 12                                | 12        | 12       | 12       |
|                                                                   | 5500                                                                                                                                                                                                                          | 12          | 12                                | 12        | 12        | 12                                | 12        | 12       | 12       |
|                                                                   | 5700                                                                                                                                                                                                                          | 12          | 12                                | 12        | 12        | 12                                | 12        | 12       | 12       |
|                                                                   | 5745                                                                                                                                                                                                                          | 12          | 12                                | 12        | 12        | 12                                | 12        | 12       | 12       |
|                                                                   | 5825                                                                                                                                                                                                                          | 12          | 12                                | 12        | 12        | 12                                | 12        | 12       | 12       |
|                                                                   | Freq. Range: HT40                                                                                                                                                                                                             |             |                                   |           |           |                                   |           |          |          |
|                                                                   | Test Freq                                                                                                                                                                                                                     | MCS 0/8     | MCS 1/9                           | MCS 2/10  | MCS 3/11  | MCS 4/12                          | MCS 5/13  | MCS 6/14 | MCS 7/15 |
|                                                                   | 5190                                                                                                                                                                                                                          | 12          | 12                                | 12        | 12        | 12                                | 12        | 12       | 12       |
|                                                                   | 5230                                                                                                                                                                                                                          | 12          | 12                                | 12        | 12        | 12                                | 12        | 12       | 12       |
|                                                                   | 5270                                                                                                                                                                                                                          | 12          | 12                                | 12        | 12        | 12                                | 12        | 12       | 12       |
|                                                                   | 5510                                                                                                                                                                                                                          | 12          | 12                                | 12        | 12        | 12                                | 12        | 12       | 12       |
|                                                                   | 5670                                                                                                                                                                                                                          | 12          | 12                                | 12        | 12        | 12                                | 12        | 12       | 12       |
|                                                                   | 5755                                                                                                                                                                                                                          | 12          | 12                                | 12        | 12        | 12                                | 12        | 12       | 12       |
|                                                                   | 5795                                                                                                                                                                                                                          | 12          | 12                                | 12        | 12        | 12                                | 12        | 12       | 12       |
|                                                                   | Freq. Range: HT20                                                                                                                                                                                                             |             |                                   |           |           |                                   |           |          |          |
|                                                                   | Test Freq                                                                                                                                                                                                                     | MCS 0/8     | MCS 1/9                           | MCS 2/10  | MCS 3/11  | MCS 4/12                          | MCS 5/13  | MCS 6/14 | MCS 7/15 |
|                                                                   | 2412                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        | 14       | 14       |
|                                                                   | 2437                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        | 14       | 14       |
|                                                                   | 2472                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        | 14       | 14       |
|                                                                   | Freq. Range: HT40                                                                                                                                                                                                             |             |                                   |           |           |                                   |           |          |          |
|                                                                   | Test Freq                                                                                                                                                                                                                     | MCS 0/8     | MCS 1/9                           | MCS 2/10  | MCS 3/11  | MCS 4/12                          | MCS 5/13  | MCS 6/14 | MCS 7/15 |
|                                                                   | 2412                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        | 14       | 14       |
|                                                                   | 2437                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        | 14       | 14       |
|                                                                   | 2472                                                                                                                                                                                                                          | 14          | 14                                | 14        | 14        | 14                                | 14        | 14       | 14       |
| EVM                                                               | The transmit modulation accuracy is measured using error vector magnitude (EVM).<br>EVM is the magnitude of the phase difference as a function of time between an ideal reference signal and the measured transmitted signal. |             |                                   |           |           |                                   |           |          |          |
|                                                                   | ➤ 802.11a                                                                                                                                                                                                                     |             |                                   |           |           |                                   |           |          |          |
|                                                                   | Modulation                                                                                                                                                                                                                    | Code Rate   | Relative constellation error (dB) |           |           | Relative constellation error (dB) |           |          |          |
|                                                                   |                                                                                                                                                                                                                               |             | IEEE Spec (1Tx dB)                |           |           | Typical (1Tx dB)                  |           |          |          |
|                                                                   | BPSK                                                                                                                                                                                                                          | 1/2         | -5                                |           |           | -20                               |           |          |          |
|                                                                   | BPSK                                                                                                                                                                                                                          | 3/4         | -8                                |           |           | -20                               |           |          |          |
|                                                                   | OPSK                                                                                                                                                                                                                          | 1/2         | -10                               |           |           | -22                               |           |          |          |

|   |                        |           |                                                         |                                                       |
|---|------------------------|-----------|---------------------------------------------------------|-------------------------------------------------------|
|   | QPSK                   | 3/4       | -13                                                     | -22                                                   |
|   | 16-QAM                 | 1/2       | -16                                                     | -30                                                   |
|   | 16-QAM                 | 3/4       | -19                                                     | -32                                                   |
|   | 64-QAM                 | 2/3       | -22                                                     | -32                                                   |
|   | 64-QAM                 | 3/4       | -25                                                     | -33                                                   |
| ➤ | <b>802.11b</b>         |           |                                                         |                                                       |
|   | Modulation             | Code Rate | Relative constellation error (dB)<br>IEEE Spec (1Tx dB) | Relative constellation error (dB)<br>Typical (1Tx dB) |
|   | DBPSK                  |           | -10                                                     | -15                                                   |
|   | DQPSK                  |           | -10                                                     | -15                                                   |
|   | CCK                    |           | -10                                                     | -15                                                   |
| ➤ | <b>802.11g</b>         |           |                                                         |                                                       |
|   | Modulation             | Code Rate | Relative constellation error (dB)<br>IEEE Spec (1Tx dB) | Relative constellation error (dB)<br>Typical (1Tx dB) |
|   | BPSK                   | 1/2       | -5                                                      | -20                                                   |
|   | BPSK                   | 3/4       | -8                                                      | -20                                                   |
|   | QPSK                   | 1/2       | -10                                                     | -20                                                   |
|   | QPSK                   | 3/4       | -13                                                     | -20                                                   |
|   | 16-QAM                 | 1/2       | -16                                                     | -30                                                   |
|   | 16-QAM                 | 3/4       | -19                                                     | -30                                                   |
|   | 64-QAM                 | 2/3       | -22                                                     | -32                                                   |
|   | 64-QAM                 | 3/4       | -25                                                     | -33                                                   |
| ➤ | <b>802.11ng (HT20)</b> |           |                                                         |                                                       |
|   | Modulation             | Code Rate | Relative constellation error (dB)<br>IEEE Spec (1Tx dB) | Relative constellation error (dB)<br>Typical (1Tx dB) |
|   | (MCS0) BPSK            | 1/2       | -5                                                      | -20                                                   |
|   | (MCS1) QPSK            | 1/2       | -10                                                     | -20                                                   |
|   | (MCS2) QPSK            | 3/4       | -13                                                     | -20                                                   |
|   | (MCS3) 16-QAM          | 1/2       | -16                                                     | -28                                                   |
|   | (MCS4) 16-QAM          | 3/4       | -19                                                     | -30                                                   |
|   | (MCS5) 64-QAM          | 2/3       | -22                                                     | -32                                                   |
|   | (MCS6) 64-QAM          | 3/4       | -25                                                     | -32                                                   |
|   | (MCS7) 64-QAM          | 5/6       | -27                                                     | -33                                                   |
|   | (MCS8) BPSK            | 1/2       | -5                                                      | -20                                                   |
|   | (MCS9) QPSK            | 1/2       | -10                                                     | -20                                                   |
|   | (MCS10) QPSK           | 3/4       | -13                                                     | -20                                                   |
|   | (MCS11) 16-QAM         | 1/2       | -16                                                     | -28                                                   |
|   | (MCS12) 16-QAM         | 3/4       | -19                                                     | -30                                                   |
|   | (MCS13) 64-QAM         | 2/3       | -22                                                     | -32                                                   |
|   | (MCS14) 64-QAM         | 3/4       | -25                                                     | -32                                                   |
|   | (MCS15) 64-QAM         | 5/6       | -27                                                     | -33                                                   |
|   | <b>(HT40)</b>          |           |                                                         |                                                       |
|   | Modulation             | Code Rate | Relative constellation error (dB)<br>IEEE Spec (1Tx dB) | Relative constellation error (dB)<br>Typical (1Tx dB) |
|   | (MCS0) BPSK            | 1/2       | -5                                                      | -20                                                   |
|   | (MCS1) QPSK            | 1/2       | -10                                                     | -20                                                   |
|   | (MCS2) QPSK            | 3/4       | -13                                                     | -20                                                   |
|   | (MCS3) 16-QAM          | 1/2       | -16                                                     | -28                                                   |
|   | (MCS4) 16-QAM          | 3/4       | -19                                                     | -30                                                   |
|   | (MCS5) 64-QAM          | 2/3       | -22                                                     | -32                                                   |
|   | (MCS6) 64-QAM          | 3/4       | -25                                                     | -32                                                   |
|   | (MCS7) 64-QAM          | 5/6       | -27                                                     | -33                                                   |
|   | (MCS8) BPSK            | 1/2       | -5                                                      | -20                                                   |
|   | (MCS9) QPSK            | 1/2       | -10                                                     | -20                                                   |
|   | (MCS10) QPSK           | 3/4       | -13                                                     | -20                                                   |
|   | (MCS11) 16-QAM         | 1/2       | -16                                                     | -28                                                   |
|   | (MCS12) 16-QAM         | 3/4       | -19                                                     | -30                                                   |
|   | (MCS13) 64-QAM         | 2/3       | -22                                                     | -32                                                   |

|             |                          |           |                                                         |                                                       |
|-------------|--------------------------|-----------|---------------------------------------------------------|-------------------------------------------------------|
|             | (MCS14) 64-QAM           | 3/4       | -25                                                     | -32                                                   |
|             | (MCS15) 64-QAM           | 5/6       | -27                                                     | -33                                                   |
|             | ➤ <b>802.11na (HT20)</b> |           |                                                         |                                                       |
|             | Modulation               | Code Rate | Relative constellation error (dB)<br>IEEE Spec (1Tx dB) | Relative constellation error (dB)<br>Typical (1Tx dB) |
|             | (MCS0) BPSK              | 1/2       | -5                                                      | -20                                                   |
|             | (MCS1) QPSK              | 1/2       | -10                                                     | -20                                                   |
|             | (MCS2) QPSK              | 3/4       | -13                                                     | -20                                                   |
|             | (MCS3) 16-QAM            | 1/2       | -16                                                     | -28                                                   |
|             | (MCS4) 16-QAM            | 3/4       | -19                                                     | -30                                                   |
|             | (MCS5) 64-QAM            | 2/3       | -22                                                     | -32                                                   |
|             | (MCS6) 64-QAM            | 3/4       | -25                                                     | -32                                                   |
|             | (MCS7) 64-QAM            | 5/6       | -27                                                     | -33                                                   |
|             | (MCS8) BPSK              | 1/2       | -5                                                      | -20                                                   |
|             | (MCS9) QPSK              | 1/2       | -10                                                     | -20                                                   |
|             | (MCS10) QPSK             | 3/4       | -13                                                     | -20                                                   |
|             | (MCS11) 16-QAM           | 1/2       | -16                                                     | -28                                                   |
|             | (MCS12) 16-QAM           | 3/4       | -19                                                     | -30                                                   |
|             | (MCS13) 64-QAM           | 2/3       | -22                                                     | -32                                                   |
|             | (MCS14) 64-QAM           | 3/4       | -25                                                     | -32                                                   |
|             | (MCS15) 64-QAM           | 5/6       | -27                                                     | -33                                                   |
|             | (HT40)                   |           |                                                         |                                                       |
|             | Modulation               | Code Rate | Relative constellation error (dB)<br>IEEE Spec (1Tx dB) | Relative constellation error (dB)<br>Typical (1Tx dB) |
|             | (MCS0) BPSK              | 1/2       | -5                                                      | -20                                                   |
|             | (MCS1) QPSK              | 1/2       | -10                                                     | -20                                                   |
|             | (MCS2) QPSK              | 3/4       | -13                                                     | -20                                                   |
|             | (MCS3) 16-QAM            | 1/2       | -16                                                     | -28                                                   |
|             | (MCS4) 16-QAM            | 3/4       | -19                                                     | -30                                                   |
|             | (MCS5) 64-QAM            | 2/3       | -22                                                     | -32                                                   |
|             | (MCS6) 64-QAM            | 3/4       | -25                                                     | -32                                                   |
|             | (MCS7) 64-QAM            | 5/6       | -27                                                     | -33                                                   |
|             | (MCS8) BPSK              | 1/2       | -5                                                      | -20                                                   |
|             | (MCS9) QPSK              | 1/2       | -10                                                     | -20                                                   |
|             | (MCS10) QPSK             | 3/4       | -13                                                     | -20                                                   |
|             | (MCS11) 16-QAM           | 1/2       | -16                                                     | -28                                                   |
|             | (MCS12) 16-QAM           | 3/4       | -19                                                     | -30                                                   |
|             | (MCS13) 64-QAM           | 2/3       | -22                                                     | -32                                                   |
|             | (MCS14) 64-QAM           | 3/4       | -25                                                     | -32                                                   |
|             | (MCS15) 64-QAM           | 5/6       | -27                                                     | -33                                                   |
| Sensitivity | ➤ <b>802.11a</b>         |           |                                                         |                                                       |
|             | Modulation               | Code Rate | IEEE Spec (1Rx dBm)                                     | Typical (1Rx dBm)                                     |
|             | BPSK                     | 1/2       | -82                                                     | -88                                                   |
|             | BPSK                     | 3/4       | -81                                                     | -86                                                   |
|             | QPSK                     | 1/2       | -79                                                     | -84                                                   |
|             | QPSK                     | 3/4       | -77                                                     | -82                                                   |
|             | 16-QAM                   | 1/2       | -74                                                     | -78                                                   |
|             | 16-QAM                   | 3/4       | -70                                                     | -76                                                   |
|             | 64-QAM                   | 2/3       | -66                                                     | -72                                                   |
|             | 64-QAM                   | 3/4       | -65                                                     | -70                                                   |
|             | ➤ <b>802.11b</b>         |           |                                                         |                                                       |
|             | Modulation               | Code Rate | IEEE Spec (1Rx dBm)                                     | Typical (1Rx dBm)                                     |
|             | DBPSK                    |           | not specified                                           | -92                                                   |
|             | DQPSK                    |           | not specified                                           | -90                                                   |
|             | CCK                      |           | not specified                                           | -86                                                   |
|             | ➤ <b>802.11g</b>         |           |                                                         |                                                       |
|             | Modulation               | Code Rate | IEEE Spec (1Rx dBm)                                     | Typical (1Rx dBm)                                     |
|             | BPSK                     | 1/2       | -82                                                     | -90                                                   |
|             | BPSK                     | 3/4       | -81                                                     | -88                                                   |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |                     |                   |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------|-------------------|
|                            | QPSK                                                                                                                                                                                                                                                                                                                                                                                                                             | 1/2       | -79                 | -86               |
|                            | QPSK                                                                                                                                                                                                                                                                                                                                                                                                                             | 3/4       | -77                 | -84               |
|                            | 16-QAM                                                                                                                                                                                                                                                                                                                                                                                                                           | 1/2       | -74                 | -82               |
|                            | 16-QAM                                                                                                                                                                                                                                                                                                                                                                                                                           | 3/4       | -70                 | -78               |
|                            | 64-QAM                                                                                                                                                                                                                                                                                                                                                                                                                           | 2/3       | -66                 | -74               |
|                            | 64-QAM                                                                                                                                                                                                                                                                                                                                                                                                                           | 3/4       | -65                 | -72               |
|                            | <b>➤ 802.11ng (HT20)</b>                                                                                                                                                                                                                                                                                                                                                                                                         |           |                     |                   |
|                            | Modulation                                                                                                                                                                                                                                                                                                                                                                                                                       | Code Rate | IEEE Spec (1Rx dBm) | Typical (1Rx dBm) |
|                            | (MCS0) BPSK                                                                                                                                                                                                                                                                                                                                                                                                                      | 1/2       | -82                 | -88               |
|                            | (MCS1) QPSK                                                                                                                                                                                                                                                                                                                                                                                                                      | 1/2       | -79                 | -86               |
|                            | (MCS2) QPSK                                                                                                                                                                                                                                                                                                                                                                                                                      | 3/4       | -77                 | -82               |
|                            | (MCS3) 16-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 1/2       | -74                 | -80               |
|                            | (MCS4) 16-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 3/4       | -70                 | -76               |
|                            | (MCS5) 64-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 2/3       | -66                 | -73               |
|                            | (MCS6) 64-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 3/4       | -65                 | -71               |
|                            | (MCS7) 64-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 5/6       | -64                 | -69               |
|                            | <b>(HT40)</b>                                                                                                                                                                                                                                                                                                                                                                                                                    |           |                     |                   |
|                            | Modulation                                                                                                                                                                                                                                                                                                                                                                                                                       | Code Rate | IEEE Spec (1Rx dBm) | Typical (1Rx dBm) |
|                            | (MCS0) BPSK                                                                                                                                                                                                                                                                                                                                                                                                                      | 1/2       | -79                 | -86               |
|                            | (MCS1) QPSK                                                                                                                                                                                                                                                                                                                                                                                                                      | 1/2       | -76                 | -82               |
|                            | (MCS2) QPSK                                                                                                                                                                                                                                                                                                                                                                                                                      | 3/4       | -74                 | -80               |
|                            | (MCS3) 16-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 1/2       | -71                 | -77               |
|                            | (MCS4) 16-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 3/4       | -67                 | -74               |
|                            | (MCS5) 64-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 2/3       | -63                 | -69               |
|                            | (MCS6) 64-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 3/4       | -62                 | -68               |
|                            | (MCS7) 64-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 5/6       | -61                 | -66               |
|                            | <b>➤ 802.11na (HT20)</b>                                                                                                                                                                                                                                                                                                                                                                                                         |           |                     |                   |
|                            | Modulation                                                                                                                                                                                                                                                                                                                                                                                                                       | Code Rate | IEEE Spec (1Rx dBm) | Typical (1Rx dBm) |
|                            | (MCS0) BPSK                                                                                                                                                                                                                                                                                                                                                                                                                      | 1/2       | -82                 | -86               |
|                            | (MCS1) QPSK                                                                                                                                                                                                                                                                                                                                                                                                                      | 1/2       | -79                 | -84               |
|                            | (MCS2) QPSK                                                                                                                                                                                                                                                                                                                                                                                                                      | 3/4       | -77                 | -82               |
|                            | (MCS3) 16-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 1/2       | -74                 | -80               |
|                            | (MCS4) 16-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 3/4       | -70                 | -77               |
|                            | (MCS5) 64-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 2/3       | -66                 | -71               |
|                            | (MCS6) 64-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 3/4       | -65                 | -70               |
|                            | (MCS7) 64-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 5/6       | -64                 | -69               |
|                            | <b>(HT40)</b>                                                                                                                                                                                                                                                                                                                                                                                                                    |           |                     |                   |
|                            | Modulation                                                                                                                                                                                                                                                                                                                                                                                                                       | Code Rate | IEEE Spec (1Rx dBm) | Typical (1Rx dBm) |
|                            | (MCS0) BPSK                                                                                                                                                                                                                                                                                                                                                                                                                      | 1/2       | -79                 | -84               |
|                            | (MCS1) QPSK                                                                                                                                                                                                                                                                                                                                                                                                                      | 1/2       | -76                 | -80               |
|                            | (MCS2) QPSK                                                                                                                                                                                                                                                                                                                                                                                                                      | 3/4       | -74                 | -78               |
|                            | (MCS3) 16-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 1/2       | -71                 | -75               |
|                            | (MCS4) 16-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 3/4       | -67                 | -71               |
|                            | (MCS5) 64-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 2/3       | -63                 | -67               |
|                            | (MCS6) 64-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 3/4       | -62                 | -66               |
|                            | (MCS7) 64-QAM                                                                                                                                                                                                                                                                                                                                                                                                                    | 5/6       | -61                 | -64               |
| Transmit spectrum mask     | <p>For transmitted spectral mask for 11b shall be less than -50dBr for 22MHz&lt;f&lt;fc+22MHz.</p> <p>For transmitted spectral mask for 11g shall be less than -40dBr for fc-30MHz&lt;f&lt;fc+30MHz.</p> <p>For transmitted spectral mask for 11n 20MHz shall be less than -45dBr for fc-30MHz&lt;f&lt;fc+30MHz.</p> <p>For transmitted spectral mask for 11n 40MHz shall be less than -45dBr for fc-60MHz&lt;f&lt;fc+60MHz.</p> |           |                     |                   |
| Transmit spectrum flatness | <p>For 802.11g the average energy of the constellations in each of spectral lines -16..-1 and +1..+16 will deviate no more than +/- 2dB from their average energy.</p> <p>For 802.11n 40MHz mode, the average energy of the constellations in each of spectral lines -42..-2 and +2..+42 will deviate no more than +/- 2dB from their average energy.</p> <p>The transmitted spectral flatness should be with in +2/- 4dB.</p>   |           |                     |                   |
| Transmit                   | The transmitted center frequency tolerance shall be ±20 ppm maximum.                                                                                                                                                                                                                                                                                                                                                             |           |                     |                   |

|                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| center frequency tolerance                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Carrier suppression                             | <p>802.11a:<br/>The leakage of the center frequency component shall not exceed -15 dB relative to overall transmitted power or, equivalently, +2 dB relative to the average energy of the rest of the sub-carriers.</p> <p>802.11b:<br/>The RF carrier suppression, measured at the channel center frequency, shall be at least 15 dB below the peak SIN(x)/x power spectrum.</p> <p>802.11g:<br/>The leakage of the center frequency component shall not exceed -15 dB relative to overall transmitted power or, equivalently, +2 dB relative to the average energy of the rest of the sub-carriers.</p> <p>802.11n:<br/>For all 20 MHz modes of transmission<br/>The leakage of the center frequency component shall not exceed -15 dB relative to overall transmitted power or, equivalently, +2 dB relative to the average energy of the rest of the sub-carriers.<br/>For all 40 MHz modes of transmission<br/>The center frequency leakage shall not exceed -18 dB relative to overall transmitted power, or, equivalently, +2 dB relative to the average energy of the rest of the sub-carriers.</p> |
| Transmit power on ramp and power down ramp time | <ul style="list-style-type: none"> <li>➤ The transmitting power-on ramp for 10% to 90% of maximum power m shall be no greater than 2 μs.</li> <li>➤ The transmitting power-down ramp for 90% to 10% of maximum power shall be no greater than 2 μs.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Receiver maximum input level                    | <ul style="list-style-type: none"> <li>➤ 802.11a<br/>Modulation Code Rate IEEE Spec (1Rx dBm)<br/>&gt;-30</li> <li>➤ 802.11b<br/>Modulation DBPSK IEEE Spec (1Rx dBm)<br/>&gt;-10<br/>DQPSK &gt;-10<br/>CCK &gt;-10</li> <li>➤ 802.11g<br/>Modulation Code Rate IEEE Spec (1Rx dBm)<br/>&gt;-20</li> <li>➤ 802.11na<br/>Modulation Code Rate IEEE Spec (1Rx dBm)<br/>&gt;-30</li> <li>➤ 802.11ng<br/>Modulation Code Rate IEEE Spec (1Rx dBm)<br/>&gt;-20</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| PCB dimension                                   | <ul style="list-style-type: none"> <li>➤ 16+/-0.1.mm x 23.00+/-0.1mm x 1.0+/-0.1mm 4L FR4</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Transfer data rate                              | <ul style="list-style-type: none"> <li>➤ 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps</li> <li>➤ 802.11b: 1, 2, 5.5, 11Mbps</li> <li>➤ 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps</li> <li>➤ 802.11n: @800GI(400GI) <ul style="list-style-type: none"> <li>● 20MHz BW <ul style="list-style-type: none"> <li>▪ 1 Nss: 65(72.2) Mbps maximal</li> <li>▪ 2 Nss: 130(144.444) Mbps maximal</li> </ul> </li> <li>● 40MHz BW <ul style="list-style-type: none"> <li>▪ 1 Nss: 135(150) Mbps maximal</li> <li>▪ 2 Nss: 270(300) Mbps maximal</li> <li>▪ 1 Nss: 390(433.3) Mbps maximal</li> <li>▪ 2 Nss: 780(866.7) Mbps maximal</li> </ul> </li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|                       |                             |
|-----------------------|-----------------------------|
| Security              | WEP, WPA ,WPA2 ,AES, TKIP   |
| Operation temperature | -10° ~ 70° C                |
| Storage temperature   | - 35° ~ 70° C ,R.H:90%      |
| Antenna               | 2 I-PEX connector on module |
| PID/VID               | PID: 76A1, VID: 0E8D        |

## 5.2 BT portion

| Item                                | Key specifications                                                                     |          |          |
|-------------------------------------|----------------------------------------------------------------------------------------|----------|----------|
| Main chipset                        | ➤ MTK MT7632TU                                                                         |          |          |
| Compliance                          | ➤ Bluetooth v4.2 LE                                                                    |          |          |
| Frequency range                     | ➤ 2400 ~ 2483.5MHz                                                                     |          |          |
| Initial carrier frequency tolerance | ➤ +/- 40kHz (typical)                                                                  |          |          |
| Modulation technique                | ➤ Frequency hopping, 1600 hops/sec                                                     |          |          |
| Channel spacing                     | ➤ 1MHz                                                                                 |          |          |
| Channels support                    | ➤ 79 channels                                                                          |          |          |
| Operation voltage                   | ➤ 5V +/-9% (including voltage ripple)                                                  |          |          |
| Power consumption @25° C            |                                                                                        | Avg (mA) | Max (mA) |
|                                     | Continuous DH5 TX                                                                      | 38       | 79       |
|                                     | Continuous 2DH5 TX                                                                     | 36.5     | 72       |
|                                     | Continuous 3DH5 TX                                                                     | 36.5     | 72       |
|                                     | Continuous BLE TX                                                                      | 33.5     | 65       |
|                                     | Note :<br>*BT Tx is for continuous Tx<br>**Power consumption measured on PC platform.. |          |          |
| Output power (dBm)                  | ➤ Class 1, BT output power is adjusted by FW .                                         |          |          |
| Sensitivity                         | ➤ -85 dBm (typ.) for pi/4-DQPSK, 0.1%BER                                               |          |          |
| Operation temperature               | ➤ -10° ~ 70° C                                                                         |          |          |
| Storage temperature                 | ➤ -35° ~ 70° C , R.H. : 90%                                                            |          |          |
| Antenna                             | ➤ 1 I-PEX connector on module                                                          |          |          |
| PID/VID                             | ➤ PID: 76A1, VID: 0E8D                                                                 |          |          |

## **5.3 EEPROM Information**

### **5.3.1 WiFi Information**

- WiFi MAC Address
- PA parameter
- Vendor ID
- Product ID

### **5.3.2 BT Information**

- BT MAC Address
- Vendor ID
- Product ID

## Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device is restricted for indoor use.

### IMPORTANT NOTE:

#### FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

### IMPORTANT NOTE:

This module is intended for OEM integrator. The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated.

Additional testing and certification may be necessary when multiple modules are used.

### USERS MANUAL OF THE END PRODUCT:

In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied.

The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

If the labelling area is small than the palm of the hand, then additional FCC part 15.19 statement is required to be available in the users manual: This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

### LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: NKR-DHURAN32 ".

If the labelling area is larger than the palm of the hand, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.  
*Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

This radio transmitter DHUR-AN32 has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

*Le présent émetteur radio DHUR-AN32 a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.*

### Bluetooth

| Ant. No. | Type | Gain (dBi) | Connector | Remark |
|----------|------|------------|-----------|--------|
| 1        | PIFA | 3.61       | UFL       | ---    |

### WIFI 2.4G

| Ant. No. | Model                | Type | Gain (dBi) | Connector | Remark |
|----------|----------------------|------|------------|-----------|--------|
| 1        | RFMTA340740IMLB701   | PIFA | 2.3        | UFL       | ---    |
| 2        | RFMTA340765IMLB702_A | PIFA | 2.3        | UFL       | ---    |

### WIFI 5G

| Ant. No. | Model                | Type | Connector | Operating Frequencies (MHz) / Antenna Gain (dBi) |           |           |           |
|----------|----------------------|------|-----------|--------------------------------------------------|-----------|-----------|-----------|
|          |                      |      |           | 5150~5250                                        | 5250~5350 | 5470~5725 | 5725~5850 |
| 1        | RFMTA340740IMLB701   | PIFA | UFL       | 4.36                                             |           |           |           |
| 2        | RFMTA340765IMLB702_A | PIFA | UFL       | 4.36                                             |           |           |           |

Dynamic Frequency Selection (DFS) for devices operating in the bands 5250- 5350 MHz, 5470-5600 MHz and 5650-5725 MHz.

*Sélection dynamique de fréquences (DFS) pour les dispositifs fonctionnant dans les bandes 5250-5350 MHz, 5470-5600 MHz et 5650-5725 MHz.*

The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

*les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.*

The maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit.

*le gain maximal d'antenne permis pour les dispositifs utilisant les bandes 5250-5350 MHz et 5470-5725 MHz doit se conformer à la limite de p.i.r.e.*

The maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate.

*le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5725-5850 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas.*

Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

*De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.*

For indoor use only.

*Pour une utilisation en intérieur uniquement.*

**IMPORTANT NOTE:**

**IC Radiation Exposure Statement:**

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un

environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20

cm de distance entre la source de rayonnement et votre corps.

**IMPORTANT NOTE:**

This module is intended for OEM integrator. The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated.

Additional testing and certification may be necessary when multiple modules are used.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

**USERS MANUAL OF THE END PRODUCT:**

In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the IC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied.

The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

**LABEL OF THE END PRODUCT:**

The final end product must be labeled in a visible area with the following " Contains IC: 4441A-DHURAN32 ".

The Host Model Number (HMN) must be indicated at any location on the exterior of the end product or product packaging or product literature which shall be available with the end product or online.