

# 2009XTBN

## 2000 Triple-Band Ku-Band PLL LNB (0.9 dB)

**Frequency:** B: 10.95 - 11.70 GHz | 11.70 - 12.25 GHz |  
12.25 - 12.75 GHz

**L.O. Stability:** External Reference

**Output Connector:** N: 50 Ohm



## KEY SPECIFICATIONS

|                         |                    |
|-------------------------|--------------------|
| Band                    | Ku-Band            |
| Input Frequency Band 1  | 10.95 - 11.70 GHz  |
| Input Frequency Band 2  | 11.70 - 12.25 GHz  |
| Input Frequency Band 3  | 12.25 - 12.75 GHz  |
| LO Frequency 1          | 10.00 GHz          |
| LO Frequency 2          | 10.75 GHz          |
| LO Frequency 3          | 11.30 GHz          |
| LO Stability            | Ext Ref            |
| LO Type                 | PLL                |
| Noise Figure Max        | 1.0 dB             |
| Noise Figure Typ        | 0.9 dB             |
| Number Of Onboard Los   | Triple-Band        |
| Output Frequency Band 1 | 950 - 1700 MHz     |
| Output Frequency Band 2 | 950 - 1500 MHz     |
| Output Frequency Band 3 | 950 - 1450 MHz     |
| Tone Frequency          | 22 kHz $\pm$ 4 kHz |

## RF SPECIFICATIONS

|                     |                  |
|---------------------|------------------|
| Control Signal 1    | 13V / No Tone    |
| Control Signal 2    | 13V / 22kHz Tone |
| Control Signal 3    | 18V / No Tone    |
| Conversion Gain Max | 65 dB            |
| Conversion Gain Min | 55 dB            |



## Innovative Communication Solutions

|                                |                               |
|--------------------------------|-------------------------------|
| Conversion Gain Typ            | 60 dB                         |
| Gain Flatness (over Full Band) | ≤ 6 dB p-p                    |
| Input VSWR                     | 2.3 : 1 max.                  |
| Output P1db                    | + 5 dBm min.                  |
| Output VSWR                    | 2.2 : 1 max.                  |
| Phase Noise 0.1kHz Offset Max  | Depends on External Reference |
| Phase Noise 1kHz Offset Max    | Depends on External Reference |
| Phase Noise 10kHz Offset Max   | Depends on External Reference |
| Phase Noise 100kHz Offset Max  | Depends on External Reference |

## ELECTRICAL SPECIFICATIONS

|                     |                |
|---------------------|----------------|
| Current Consumption | 350 mA max     |
| Power Requirements  | +12 to +24V DC |

## INTERFACE SPECIFICATIONS

|                    |                         |
|--------------------|-------------------------|
| IF Connector       | N-Connector             |
| RF Input Connector | WR-75 waveguide grooved |

## ENVIRONMENTAL SPECIFICATIONS

|                         |                |
|-------------------------|----------------|
| Humidity                | 0 - 95%        |
| IP Rating               | IP 66          |
| Temperature Operational | -40°C to +70°C |
| Temperature Storage     | -50 to +80°C   |

## PHYSICAL SPECIFICATIONS

|                |          |
|----------------|----------|
| Product Height | 1.70 in  |
| Product Length | 4.46 in  |
| Product Weight | 0.255 kg |
| Product Width  | 1.72 in  |

## LOGISTICS SPECIFICATIONS

| HS Code | Country of Origin | Ex Works             | ECCN Number | Unit Package                   |
|---------|-------------------|----------------------|-------------|--------------------------------|
|         | Made in Canada    | Richmond, BC, Canada | EAR99       | 135 x 68 x 48 mm  <br>0.335 kg |

## HOW TO ORDER



## 2108HSAF

|              |               |                                                                         |
|--------------|---------------|-------------------------------------------------------------------------|
| LNB SERIES # | CONNECTOR     | F: 75 Ohm<br>N: 50 Ohm                                                  |
|              | FREQUENCY     | A / B / C / D / E / F / G<br>(Please see next page for frequency bands) |
|              | BAND          | S: Single-Band<br>D: Dual-Band<br>T: Triple-Band<br>U: Quad-Band        |
|              | REFERENCE     | H: Internal Reference<br>X: External Reference                          |
|              | NOISE FIGURE  | 7: 0.7 dB<br>8: 0.8 dB<br>9: 0.9 dB                                     |
|              | L.O STABILITY | 0: External Reference<br>1: $\pm 10$ kHz<br>2: $\pm 25$ kHz             |

## MECHANICAL DIAGRAMS





### FREQUENCY BANDS

| Single Band |               |                |                | Dual Band      |               |                |               |                |                 |               |
|-------------|---------------|----------------|----------------|----------------|---------------|----------------|---------------|----------------|-----------------|---------------|
| Band        | RF freq (GHz) | L.O freq (GHz) | Output freq    | Band           | RF freq (GHz) | L.O freq (GHz) | Output freq   | Voltage/Tone   |                 |               |
| A           | 11.7 - 12.20  | 10.75          | 950 - 1450 MHz | A              | Band 1        | 10.95 - 11.70  | 10            | 950 - 1700 MHz | 13 V            |               |
| B           | 12.25 - 12.75 | 11.3           | 950 - 1450 MHz |                | Band 2        | 11.70 - 12.75  | 10.75         | 950 - 2000 MHz | 18 V            |               |
| C           | 10.95 - 11.70 | 10             | 950 - 1700 MHz | B              | Band 1        | 10.70 - 11.70  | 9.75          | 950 - 1950 MHz | 13 V            |               |
| D           | 10.70-11.80   | 9.75           | 950 - 2050 MHz |                | Band 2        | 11.70 - 12.75  | 10.75         | 950 - 2000 MHz | 18 V            |               |
| Triple Band |               |                |                | C              | Band 1        | 10.95 - 11.70  | 10            | 950 - 1700 MHz | 13 V            |               |
| Band        | RF freq (GHz) | L.O freq (GHz) | Output freq    |                | Voltage/Tone  | Band 2         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 13 V / 22 kHz |
| A           | Band 1        | 10.95 - 11.70  | 10             | 950 - 1700 MHz | D             | Band 1         | 10.70 - 11.70 | 9.75           | 950 - 1950 MHz  | 13 V          |
|             | Band 2        | 11.70 - 12.20  | 10.75          | 950 - 1450 MHz |               | Band 2         | 11.70 - 12.25 | 10.75          | 950 - 1500 MHz  | 18 V          |
| B           | Band 3        | 12.20 - 12.75  | 11.25          | 950 - 1500 MHz | E             | Band 1         | 10.95 - 11.70 | 10             | 950 - 1700 MHz  | 13 V          |
|             | Band 1        | 10.95 - 11.70  | 10             | 950 - 1700 MHz |               | Band 2         | 12.25 - 12.75 | 11.3           | 950 - 1450 MHz  | 18 V          |
| C           | Band 2        | 11.70 - 12.25  | 10.75          | 950 - 1500 MHz | F             | Band 1         | 10.70 - 11.70 | 9.75           | 950 - 1950 MHz  | 13 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 2         | 11.70 - 12.25 | 10.6           | 1100 - 2150 MHz | 18 V          |
| D           | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz | G             | Band 1         | 10.70 - 11.70 | 9.75           | 950 - 1950 MHz  | 13 V          |
|             | Band 2        | 11.70 - 12.20  | 10.75          | 950 - 1450 MHz |               | Band 2         | 11.70 - 12.20 | 10.75          | 950 - 1950 MHz  | 13 V / 22 kHz |
| E           | Band 3        | 12.20 - 12.75  | 11.25          | 950 - 1500 MHz | H             | Band 3         | 12.25 - 12.75 | 11.25          | 950 - 1450 MHz  | 18 V          |
|             | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz |               | Band 4         | 12.25 - 12.75 | 11.3           | 950 - 1450 MHz  | 18 V          |
| F           | Band 2        | 11.70 - 12.25  | 10.75          | 950 - 1500 MHz | I             | Band 1         | 10.70 - 11.20 | 9.75           | 950 - 1450 MHz  | 13 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 2         | 11.20 - 11.70 | 10.25          | 950 - 1450 MHz  | 13 V / 22 kHz |
| G           | Band 1        | 10.95 - 11.70  | 10             | 950 - 1700 MHz | J             | Band 3         | 11.70 - 12.25 | 10.75          | 950 - 1500 MHz  | 18 V          |
|             | Band 2        | 11.55 - 12.25  | 10.6           | 950 - 1650 MHz |               | Band 4         | 12.25 - 12.75 | 11.3           | 950 - 1450 MHz  | 18 V / 22kHz  |
| H           | Band 3        | 12.20 - 12.70  | 11.25          | 950 - 1450 MHz | K             | Band 1         | 10.70 - 10.95 | 9.75           | 950 - 1200 MHz  | 13 V          |
|             | Band 1        | 10.70 - 11.80  | 9.75           | 950 - 2050 MHz |               | Band 2         | 10.95 - 11.70 | 10             | 950 - 1700 MHz  | 13 V / 22 kHz |
| I           | Band 2        | 10.95 - 12.10  | 10             | 950 - 2100 MHz | L             | Band 3         | 11.70 - 12.25 | 10.75          | 950 - 1500 MHz  | 18 V          |
|             | Band 3        | 11.70 - 12.75  | 10.75          | 950 - 2000 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| J           | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz | M             | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| K           | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz | N             | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| L           | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz | O             | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| M           | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz | P             | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| N           | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz | Q             | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| O           | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz | R             | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| P           | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz | S             | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| Q           | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz | T             | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| R           | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz | U             | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| S           | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz | V             | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| T           | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz | W             | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| U           | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz | X             | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| V           | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz | Y             | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| W           | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz | Z             | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| X           | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz | AA            | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| Y           | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz | AB            | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| Z           | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz | AC            | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| AA          | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz | AD            | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| AB          | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz | AE            | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| AC          | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz | AF            | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| AD          | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz | AG            | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| AE          | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz | AH            | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| AF          | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz | AI            | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| AG          | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz | AJ            | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| AH          | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz | AK            | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| AI          | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz | AL            | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| AJ          | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz | AM            | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| AK          | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz | AN            | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| AL          | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz | AO            | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| AM          | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz | AP            | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| AN          | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz | AQ            | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| AO          | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz | AR            | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| AP          | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz | AS            | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| AQ          | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz | AT            | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| AR          | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz | AU            | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| AS          | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz | AV            | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| AT          | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz | AW            | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  | 13 V / 22 kHz |
| AU          | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz | AX            | Band 3         | 11.70 - 12.20 | 10.75          | 950 - 1450 MHz  | 18 V          |
|             | Band 1        | 10.70 - 11.70  | 9.75           | 950 - 1950 MHz |               | Band 4         | 12.20 - 12.75 | 11.25          | 950 - 1500 MHz  | 18 V / 22kHz  |
| AV          | Band 2        | 11.70 - 12.70  | 10.75          | 950 - 1950 MHz | AY            | Band 1         | 10.95 - 11.45 | 10             | 950 - 1450 MHz  | 13 V          |
|             | Band 3        | 12.25 - 12.75  | 11.3           | 950 - 1450 MHz |               | Band 2         | 11.45 - 11.95 | 10.5           | 950 - 1450 MHz  |               |