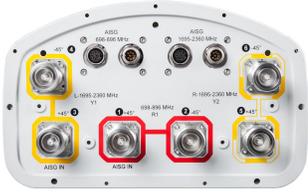


# NHH-65A-R2B



6-port sector antenna, 2x 698–896 and 4x 1695–2360 MHz, 65° HPBW, 2x RET. Both high bands share the same electrical tilt.

- Interleaved dipole technology providing for attractive, low wind load mechanical package
- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- Separate RS-485 RET input/output for low and high band
- One RET for low band and one RET for both high bands to ensure same tilt level for 4x Rx or 4x MIMO

## General Specifications

|   |  |
|---|--|
| <b>Antenna Type</b>                     | Sector   |
| <b>Band</b>                             | Multiband  |
| <b>Color</b>                            | Light Gray (RAL 7035)  |
| <b>Grounding Type</b>                   | RF connector body grounded to reflector and mounting bracket   |
| <b>Performance Note</b>                 | Outdoor usage   Wind loading figures are validated by wind tunnel measurements described in white paper WP-112534-EN |
| <b>Radome Material</b>                  | Fiberglass, UV resistant   |
| <b>Radiator Material</b>                | Aluminum   Low loss circuit board  |
| <b>Reflector Material</b>               | Aluminum   |
| <b>RF Connector Interface</b>           | 7-16 DIN Female  |
| <b>RF Connector Location</b>            | Bottom   |
| <b>RF Connector Quantity, high band</b> | 4  |
| <b>RF Connector Quantity, mid band</b>  | 0  |
| <b>RF Connector Quantity, low band</b>  | 2  |
| <b>RF Connector Quantity, total</b>     | 6  |

## Remote Electrical Tilt (RET) Information

|   |                                   |
|---|-----------------------------------|
| <b>RET Interface</b>                          | 8-pin DIN Female   8-pin DIN Male |
| <b>RET Interface, quantity</b>                | 2 female   2 male                 |
| <b>Input Voltage</b>                          | 10–30 Vdc                         |
| <b>Internal Bias Tee</b>                      | Port 1   Port 3                   |
| <b>Internal RET</b>                           | High band (1)   Low band (1)      |
| <b>Power Consumption, idle state, maximum</b> | 2 W                               |

# NHH-65A-R2B

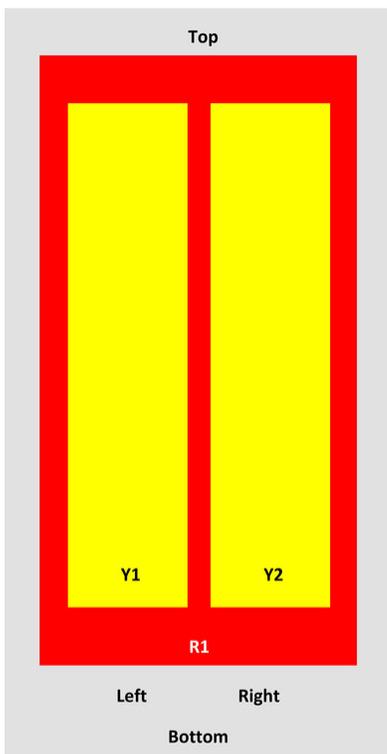
**Power Consumption, normal conditions, maximum** 13 W  
**Protocol** 3GPP/AISG 2.0 (Single RET)

## Dimensions

**Width** 301 mm | 11.85 in  
**Depth** 180 mm | 7.087 in  
**Length** 1413 mm | 55.63 in  
**Net Weight, without mounting kit** 15.9 kg | 35.053 lb

## Array Layout

NHH

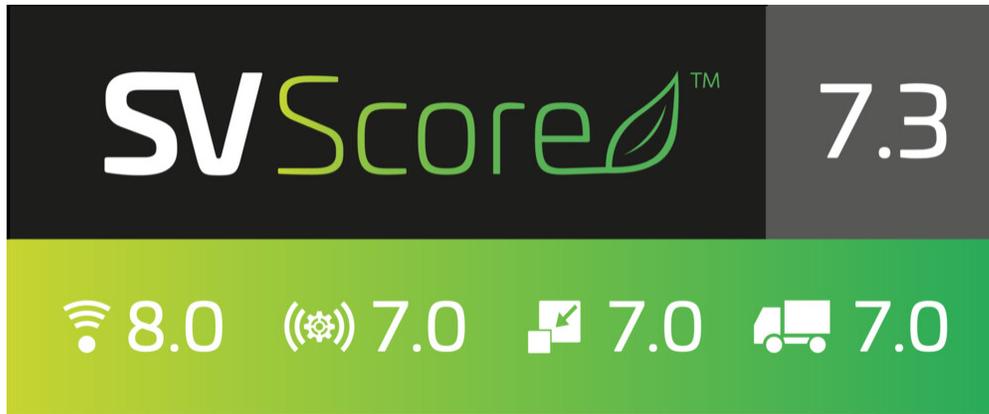


| Array | Freq (MHz) | Combs | RET (SRET) | AISG RET UID     |
|-------|------------|-------|------------|------------------|
| R1    | 698-896    | 1-2   | 1          | ANXXXXXXXXXXXXX1 |
| Y1    | 1695-2360  | 3-4   | 2          | ANXXXXXXXXXXXXX2 |
| Y2    | 1695-2360  | 5-6   |            |                  |

View from the front of the antenna  
(Sizes of colored boxes are not true depictions of array sizes)

## Logo Image

# NHH-65A-R2B



## Electrical Specifications

|                                   |                                 |
|-----------------------------------|---------------------------------|
| <b>Impedance</b>                  | 50 ohm                          |
| <b>Operating Frequency Band</b>   | 1695 – 2360 MHz   698 – 896 MHz |
| <b>Polarization</b>               | ±45°                            |
| <b>Total Input Power, maximum</b> | 900 W @ 50 °C                   |

## Electrical Specifications

| Frequency Band, MHz                                 | 698–806  | 806–896  | 1695–1880 | 1850–1990 | 1920–2200 | 2300–2360 |
|---|----------|----------|-----------|-----------|-----------|-----------|
| <b>Gain, dBi</b>                                    | 13.4     | 13.5     | 16.4      | 16.5      | 17.1      | 17.5      |
| <b>Beamwidth, Horizontal, degrees</b>               | 66.2     | 61       | 69        | 64        | 61        | 61        |
| <b>Beamwidth, Vertical, degrees</b>                 | 17.8     | 16.2     | 7.1       | 6.5       | 6.1       | 5.5       |
| <b>Beam Tilt, degrees</b>                           | 0–18     | 0–18     | 0–10      | 0–10      | 0–10      | 0–10      |
| <b>USLS (First Lobe), dB</b>                        | 18       | 16       | 18        | 17        | 16        | 15        |
| <b>Front-to-Back Ratio at 180°, dB</b>              | 29       | 26       | 33        | 32        | 30        | 32        |
| <b>Isolation, Cross Polarization, dB</b>            | 25       | 25       | 25        | 25        | 25        | 25        |
| <b>Isolation, Inter-band, dB</b>                    | 30       | 30       | 30        | 30        | 30        | 30        |
| <b>VSWR   Return loss, dB</b>                       | 1.5 14.0 | 1.5 14.0 | 1.5 14.0  | 1.5 14.0  | 1.5 14.0  | 1.5 14.0  |
| <b>PIM, 3rd Order, 2 x 20 W, dBc</b>                | -153     | -153     | -153      | -153      | -153      | -153      |
| <b>Input Power per Port at 50°C, maximum, watts</b> | 300      | 300      | 250       | 250       | 250       | 200       |

## Mechanical Specifications

|   |   |
|---|---|
| <b>Effective Projective Area (EPA), frontal</b> | 0.19 m <sup>2</sup>   2.045 ft <sup>2</sup> |
|---|---|

# NHH-65A-R2B

---

|   |   |
|---|---|
| <b>Effective Projective Area (EPA), lateral</b> | 0.16 m <sup>2</sup>   1.722 ft <sup>2</sup> |
| <b>Mechanical Tilt Range</b>                    | 0°–18°                                      |
| <b>Wind Loading @ Velocity, frontal</b>         | 206.0 N @ 150 km/h (46.3 lbf @ 150 km/h)    |
| <b>Wind Loading @ Velocity, lateral</b>         | 169.0 N @ 150 km/h (38.0 lbf @ 150 km/h)    |
| <b>Wind Loading @ Velocity, maximum</b>         | 396.0 N @ 150 km/h (89.0 lbf @ 150 km/h)    |
| <b>Wind Loading @ Velocity, rear</b>            | 208.0 N @ 150 km/h (46.8 lbf @ 150 km/h)    |
| <b>Wind Speed, maximum</b>                      | 241 km/h (150 mph)                          |

## Packaging and Weights

|                       |                     |
|-----------------------|---------------------|
| <b>Width, packed</b>  | 380 mm   14.961 in  |
| <b>Depth, packed</b>  | 295 mm   11.614 in  |
| <b>Length, packed</b> | 1537 mm   60.512 in |
| <b>Weight, gross</b>  | 26.5 kg   58.422 lb |

## Regulatory Compliance/Certifications

| <b>Agency</b> | <b>Classification</b>  |
|---------------|--|
| CHINA-ROHS    | Above maximum concentration value  |
| ISO 9001:2015 | Designed, manufactured and/or distributed under this quality management system |
| ROHS          | Compliant/Exempted   |
| UK-ROHS       | Compliant/Exempted   |



## Included Products

|          |   |  |
|----------|---|--|
| BSAMNT-3 | – | Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set. |
|----------|---|--|

## \* Footnotes

|                         |   |
|-------------------------|---|
| <b>Performance Note</b> | Severe environmental conditions may degrade optimum performance |
|-------------------------|---|

# SAMSUNG

## AWS/PCS MACRO RADIO

### DUAL-BAND AND HIGH POWER FOR MACRO COVERAGE

Samsung's future proof dual-band radio is designed to help effectively increase the coverage areas in wireless networks. This AWS/PCS 4T4R dual-band radio has 4Tx/4Rx to 2Tx/2Rx RF chains options and a total output power of 320W, making it ideal for macro sites.

Model Code    RF4439d-25A



Homepage  
[samsungnetworks.com](http://samsungnetworks.com)

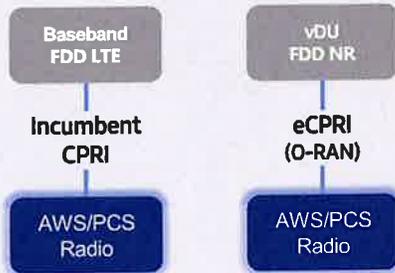


Youtube  
[www.youtube.com/samsungSg](http://www.youtube.com/samsungSg)

## Points of Differentiation

### Continuous Migration

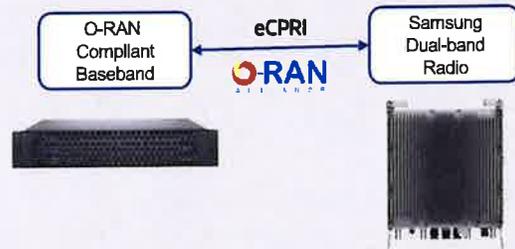
Samsung's AWS/PCS macro radio can support each incumbent CPRI interface as well as advanced eCPRI interfaces. This feature provides installable options for both legacy LTE networks and added NR networks.



### O-RAN Compliant

A standardized O-RAN radio can help in implementing cost-effective networks, which are capable of sending more data without compromising additional investments.

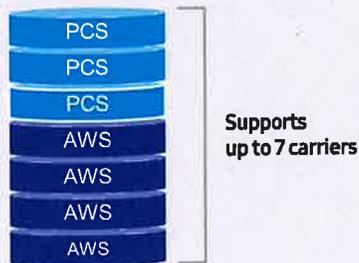
Samsung's state-of-the-art O-RAN technology will help accelerate the effort toward constructing a solid O-RAN ecosystem.



### Optimum Spectrum Utilization

The number of required carriers varies according to site (region). Supporting many carriers is essential for using all frequencies that the operator has available.

The new AWS/PCS dual-band radio can support up to 3 carriers in the PCS (1.9GHz) band and 4 carriers in the AWS (2.1GHz) band, respectively.



### Brand New Features in a Compact Size

Samsung's AWS/PCS macro radio offers several features, such as dual connectivity for baseband for both CDU and vDU, O-RAN capability, more carriers and an enlarged PCS spectrum, combined into an incumbent radio volume of 36.8L.



## Technical Specifications

| Item           | Specification  |
|----------------|--|
| Tech           | LTE / NR   |
| Brand          | B25(PCS), B66(AWS)   |
| Frequency Band | DL: 1930 – 1995MHz, UL: 1850 – 1915MHz<br>DL: 2110 – 2200MHz, UL: 1710 – 1780MHz |
| RF Power       | (B25) 4 × 40W or 2 × 60W<br>(B66) 4 × 60W or 2 × 80W                             |
| IBW/OBW        | (B25) 65MHz / 30MHz<br>(B66) DL 90MHz, UL 70MHz / 60MHz                          |
| Installation   | Pole, Wall   |
| Size/Weight    | 14.96 x 14.96 x 10.04inch (36.8L) / 74.7lb                                       |

# 700/850 4T4R Macro 320W ORU - New Filter (RF4461d-13A)

SAMSUNG

## Specifications



| Item                                     | Specification  |  |
|--|--|--|
| Air Interface                            | LTE, NR(HW resource ready)   |  |
| Band                                     | Band13 (700MHz)  | Band5 (850MHz)                         |
| Frequency                                | DL: 746~756MHz   | DL: 869~894MHz                         |
|  | UL: 777~787MHz   | UL: 824~849MHz                         |
| IBW                                      | 10MHz  | 25MHz                                  |
| OBW                                      | 10MHz  | 25MHz                                  |
| Carrier Bandwidth                        | LTE/NR 5*/10MHz  | LTE 5/10MHz<br>NR 5/10/15/20MHz        |
| # of carriers                            | 2C*  | 3C                                     |
| Total # of carriers                      | 4C + B13 (SDL) 1C  |  |
| RF Chain                                 | 4T4R/2T4R/2T2R/1T2R<br>2T2R+2T2R bi-sector                             |  |
| RF Output Power                          | 4 x 40W or 2 x 60W   | 4 x 40W or 2 x 60W                     |
| Spectrum Analyzer                        | TX/RX Support  |  |
| RX Sensitivity                           | Typ. -104.5dBm @1Rx (25RBs 5MHz)                                       |  |
| Modulation                               | 256QAM support, (1024QAM with 1~2dB power back-off)                    |  |
| Input Power                              | -48VDC (-38VDC to -57VDC)  |  |
| Power Consumption                        | 1,165 Watt @ 100% RF load, room temperature                            |  |
| Size (WHD)                               | 380 x 380 x 260 mm (14.96 x 14.96 x 10.23 inch)                        |  |
| Volume                                   | 37.5 L   |  |
| Weight (W/o Solar Shield & finger guard) | 35.9 kg (79.1 lb)  |  |
| Operating Temperature                    | -40°C (-40°F) ~ 55°C (131°F) (Without solar load)                      |  |
| Cooling                                  | Natural convection   |  |
| Unwanted Emission                        | 3GPP 36.104  | 3GPP 36.104                            |
|  | FCC 47 CFR 27.53 c), f)  | FCC 47 CFR 22.917                      |
|  | -  | -69 dBm/100 kHz per path @ 896 ~901MHz |
| CPRI Cascade                             | Not supported  |  |
| Optic Interface                          | 20km, 2 ports (9.8Gbps x 2), SFP+, single mode, Duplex (Option: Bi-di) |  |
| RET & TMA Interface                      | AISG 3.0   |  |
| Bias-T                                   | 4 ports (2 ports per band)   |  |
| Mounting Options                         | Pole, wall   |  |
| NB-IoT                                   | 2GB+2IB or 4IB   | 2SA+2GB or 2GB+2IB or 4GB              |
| PIM Cancellation                         | Support  |  |
| # of antenna port                        | 4  |  |
| External Alarm                           | 4  |  |
| Fronthaul Interface                      | Opt. 8 CPRI / Opt. 7-2x selectable (not simultaneous support)          |  |
| CPRI compression                         | Not Support  |  |

\* 5MHz supporting in B13(700MHz) depends on 3GPP std. and UE capability.  
External filters in interferer and victim sides for Mexican boarder to support 5MHz service need to be considered  
\*\* Finger guard is not needed.

## ◆ C Band Verizon MMU Gen.2 (MT6413)

Table 1. Specification

| Item                                |                          | MT6413-77A  |
|-------------------------------------|--------------------------|---|
| Air Technology                      |                          | NR  |
| Duplex                              |                          | TDD   |
| OFR                                 |                          | 3,700 to 3,980 MHz  |
| IBW                                 |                          | 200 MHz   |
| OBW                                 |                          | 200 MHz   |
| Carrier Configuration               | Ch. BW                   | NR 20/40/60/80/100 MHz  |
|                                     | # of carriers (per unit) | 2CC   |
| TRX Path Configuration              |                          | 64T64R  |
| Antenna Configuration               |                          | 4V16H 192 AE (6 x 1 sub-array)  |
| Conductive Power                    |                          | 320 W   |
| MIMO Capacity                       |                          | DL 16L, UL 16RX (8L)  |
| Function Split                      |                          | Opt. 7-2x   |
| Optic Interface                     |                          | 20 km, 25 Gbps x 4 ports  |
| Input Voltage                       |                          | -48 V DC (-36 to -58 V DC)  |
| Power Consumption <sup>a)</sup>     |                          | <ul style="list-style-type: none"> <li>• 882 W @ 40 % room temp</li> <li>• 1,260 W @ 100 % room temp</li> <li>• 1,299 W @ 100 % all temp</li> </ul> |
| Volume / Dimension (W x H x D)      |                          | 41.1 L / 15.75 x 28.9 x 5.51 in. (400 x 734 x 140 mm)   |
| Weight                              |                          | 57.32 lb (26 kg) or less (without a Bracket)  |
| Operating Temperature <sup>b)</sup> |                          | -104 °F to +131 °F (-40 °C to +55 °C), (without solar load)   |
| Cooling Scheme                      |                          | Natural Convection  |
| Installation                        |                          | Pole, Wall  |
| Operating Humidity <sup>b)</sup>    |                          | 5 to 100 % RH (non-condensing, not to exceed 30 g/m <sup>3</sup> absolute humidity)   |
| Altitude                            |                          | Telcordia GR-63-CORE, Issue 5, Section 4.1.3  |
| Noise                               |                          | Telcordia GR-487-CORE, Issue 5, Section 3.34 (45 dBA)   |
| Ingress Protection Rating           |                          | IEC 60529 (IP65)  |
| Salt Fog / Salt Spray               |                          | Telcordia GR-487-CORE, Issue 5, Section 3.40.1  |
| Wind Resistance                     |                          | Telcordia GR-487-CORE, Issue 5, Section 3.36  |
| Earthquake                          |                          | Telcordia GR-63-CORE, Issue 5, Section 4.4.1 (Zone 4)   |
| Vibration                           |                          | Telcordia GR-63-CORE, Issue 5, Section 4.4.4 / 4.4.5  |
| EMC                                 |                          | FCC Title 47 CFR Part 15 Subpart B  |
| Safety                              |                          | UL 62368-1  |
| RF                                  |                          | FCC Title 47, CFR Part 27   |

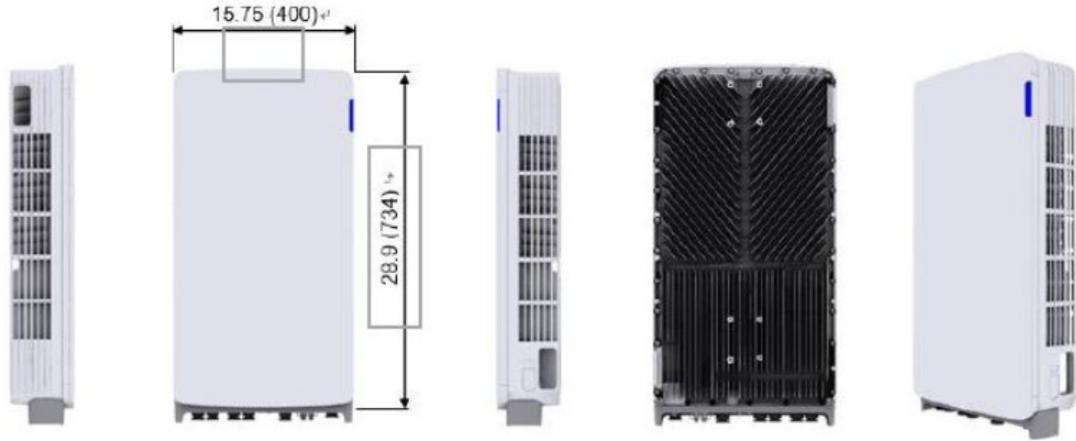


<sup>a)</sup> These values is predictive from simulation. Measurement data can be changed by +/- 10% when development is completed. <sup>aa)</sup>

Unit: in. (mm)



[Top View]



[Left View]

[Front View]

[Right View]

[Rear View]



[Bottom View]