

# Nokia's Spectrum Request

Mar. 29, 2021

## Objective & Purpose:

- Spectrum request is made to support 3C CA IODT field testing between Nokia and Qualcomm at Nokia's Dallas facility

## Frequency & Bandwidth (BW) Request:

- n5 (850MHz) BW: 5MHz
- B2/n2 (PCS) BW: 10 MHz
- B66/n66 (AWS) BW: 10MHz

## Timeline:

- Mid-May to End of July (WK20-WK30)
- Preparation in progress and integration to validate frequencies and interference can be done beforehand.
- Depending on IODT progress, end date would be further re-evaluated and request extension as needed.

## Nokia's Field Test Network :

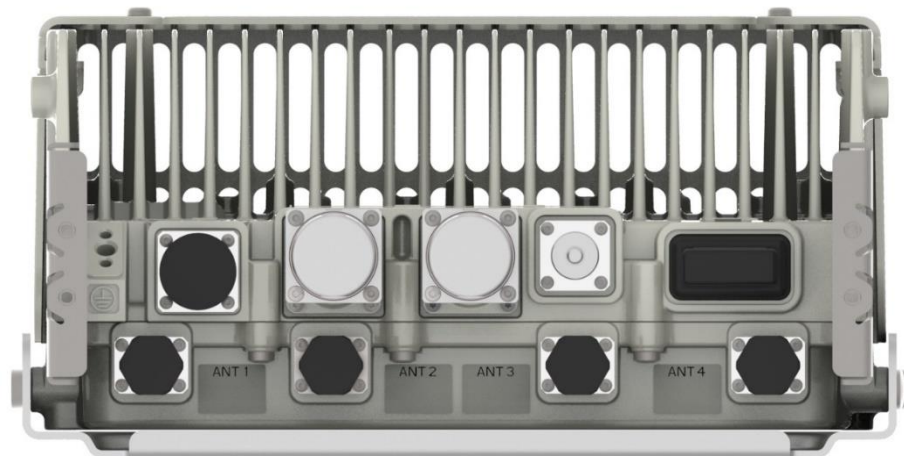
- Address: 3201 Olympus Blvd., Dallas, TX, 75019
- Coordinates: NL 32-56-08; WL 96-59-01
- Height – 85', Three Sectors



# AirScale Dual RRH 4T4R |

## AHFIB – 474216A

AHFIB	
<b>Supported Frequency bands</b>	3GPP Band 25, Band 66
<b>Frequencies</b>	Band 25: RX 1850 MHz – 1915 MHz, TX 1930 MHz – 1995 MHz Band 66: RX 1710 MHz – 1780 MHz, TX 2110 MHz – 2200 MHz
<b>Number of TX/RX paths/pipes</b>	4 pipes 4TX/4RX – Band 25 & Band 66
<b>Instantaneous Bandwidth IBW</b>	Full Band (LTE/WCDMA) Single RAT GSM IBW up to 37.5MHz for B25
<b>Occupied Bandwidth OBW</b>	80MHz
<b>Output Power</b>	40W per TX (2x4x40w)
<b>RF Sharing</b>	Band 25: GSM + WCDMA + LTE + NB-IoT + NR supported Band 66: WCDMA + LTE + NB-IoT + NR supported
<b>Supply Voltage / Voltage Range</b>	DC-48 V / -36 V to -60 V
<b>Typical Power Consumption</b>	850 W [ETSI Busy Hour Load at 8TX@40W (Both Bands Active)] 512 W [ETSI Busy Hour Load at 4TX@40W (One Band Active)]
<b>Antenna Ports</b>	4 ports, 4.3-10+
<b>Optical Ports</b>	2xRP3-01/CPRI 9.8Gbps. CPRI between SM and Radio. OBSAI or CPRI for RF chaining.
<b>ALD Control Interfaces</b>	AISG3.0 from ANT1, 2, 3, 4 and RET (Power supply ANT1 and ANT3)
<b>Other Interfaces</b>	External Alarm MDR-26 Serial connector (4 inputs, 1 Output) DC Circular Power Connector, Optional Fan



<b>Operational Temperature Range</b>	-40°C to 55°C (with no solar load)
<b>Dimensions (mm) Height x width x depth</b>	Standard W/WO Heat Shield = 327x578x155 / 308x560x149 Envelope W/WO Heat Shield = 327x675x165 / 327x675x160
<b>Volume (liters)</b>	Standard W/WO Heat Shield = 30 / 26 Envelope W/WO Heat Shield = 37 / 36
<b>Weight (kg)</b>	W/WO mounting bracket = 32 / 31
<b>Ingress protection class</b>	IP65
<b>Installation options</b>	Pole or Wall; Vertical or Horizontal Book Mount
<b>Surge protection</b>	Class II 5kA

# 473966A AHCA AirScale RRH 4T4R B5 160W

## Technical data

Specification	Details
<b>Standard</b>	WCDMA, FDD-LTE, 5G NR
<b>Band / Frequency range</b>	3GPP band5 TX 869-894 MHz, RX 824-849 MHz
<b>Max. supported modulation</b>	256 QAM
<b>Number of TX/RX paths</b>	4T4R
<b>Instantaneous bandwidth IBW</b>	25 MHz
<b>Occupied bandwidth OBW</b>	25 MHz
<b>Max. output power per TRX</b>	4T4R 40W per TX antenna, Total 160W 2T4R 60W per TX antenna, Total 120W
<b>Dimensions</b>	337mm x 295mm x 165mm
<b>Volume</b>	16.4L
<b>Weight</b>	16.7kg
<b>Supply voltage / Connector type</b>	DC -48V / -36 to -60 VDC / 2 pole Screw
<b>Power consumption</b>	301 W (4x40W), 219W (2x60W) [ETSI 24 h weighted load mix for nominal power] 529 W (4x40W), 388W (2x60W) [100% RF load]
<b>Antenna ports</b>	4 x 4.3-10
<b>Optical ports</b>	2x CPRI 9.8Gbit/s, R2CT IP seal
<b>Other interfaces / Connector type</b>	RET, EAC MDR26
<b>Operational temperature range</b>	-40°C to 55°C
<b>Cooling</b>	Convection cooling, FAN optional item
<b>Installation options</b>	Vertical, Horizontal (with FAN), Pole, Wall, RAS 3.0 Vertical or Horizontal Bookmount
<b>Ingress / Surge protection</b>	IP65, Class II 5 kA DC-port
<b>Supported RAT</b>	WCDMA/FDD LTE/5G NR

## AirScale High Power RRH benefits

- Connectivity with FSMF/AirScale BBU
- High RF OP 2x60 W or 4x40W
- Support for Multi-RAT (2G/3G/4G/5G)
- Deployment flexibility for different use cases with multiple mounting options



473966A AHCA

**NOKIA**

# Nokia's Spectrum Request

## Initial Antenna



### 2' 8-Port Dual-Band 65° Base Station Antenna [617-896 and 1695-2690 MHz]

## GP2408-06789

#### Description:

- Single-sector 8-Port MIMO antenna for Base Station, Small Cell and Outdoor DAS applications.
- 65° beam width dual-polarized covering 600 MHz/LTE/CELL and AWS/PCS/WCS/BRS Bands.
- 4x ports for 617-896 MHz
- 4x ports for 1695-2690 MHz with Manual Electrical Tilt (MET)



8-Port 617-896 and 1695-2690 MHz Dual-Band Directional Panel Antenna

#### Electrical Specifications

Frequency Band [MHz]	617-698	698-806	806-896	1695-2180	2300-2400	2496-2690
Input Connector Type	4x 4.3-10(F)			4x 4.3-10(F)		
Polarization	Dual slant 45° (±45°)					
Horizontal Beamwidth	71°	71°	65°	66°	67°	62°
Vertical Beamwidth	76.8°	72.0°	60.1°	15.1°	11.6°	10.7°
Electrical Tilt	0° Fixed			2° - 12° MET		
Gain (max.)	8.6 dBi	8.8 dBi	9.3 dBi	14.2 dBi	14.8 dBi	15.6 dBi
Gain (avg.)	7.7 dBi	8.1 dBi	8.7 dBi	13.2 dBi	13.9 dBi	14.2 dBi
Front-to-Back Ratio, 180°	28 dB	30 dB	30 dB	28 dB	28 dB	25 dB
XPOL Discrimination @ 0°	18 dB	20 dB	20 dB	20 dB	20 dB	25 dB
VSWR/RL	1.5:1 / 14.0 dB					
Port-to-Port Isolation	20 dB					
PIM @ 2x43 dBm	<-153 dBc					
Max Power / Port	100 Watts			100 Watts		
Impedance	50 Ω					

2019