COMMSCOPE®

# DCCS 5G passive device and antenna products introduction in 2019



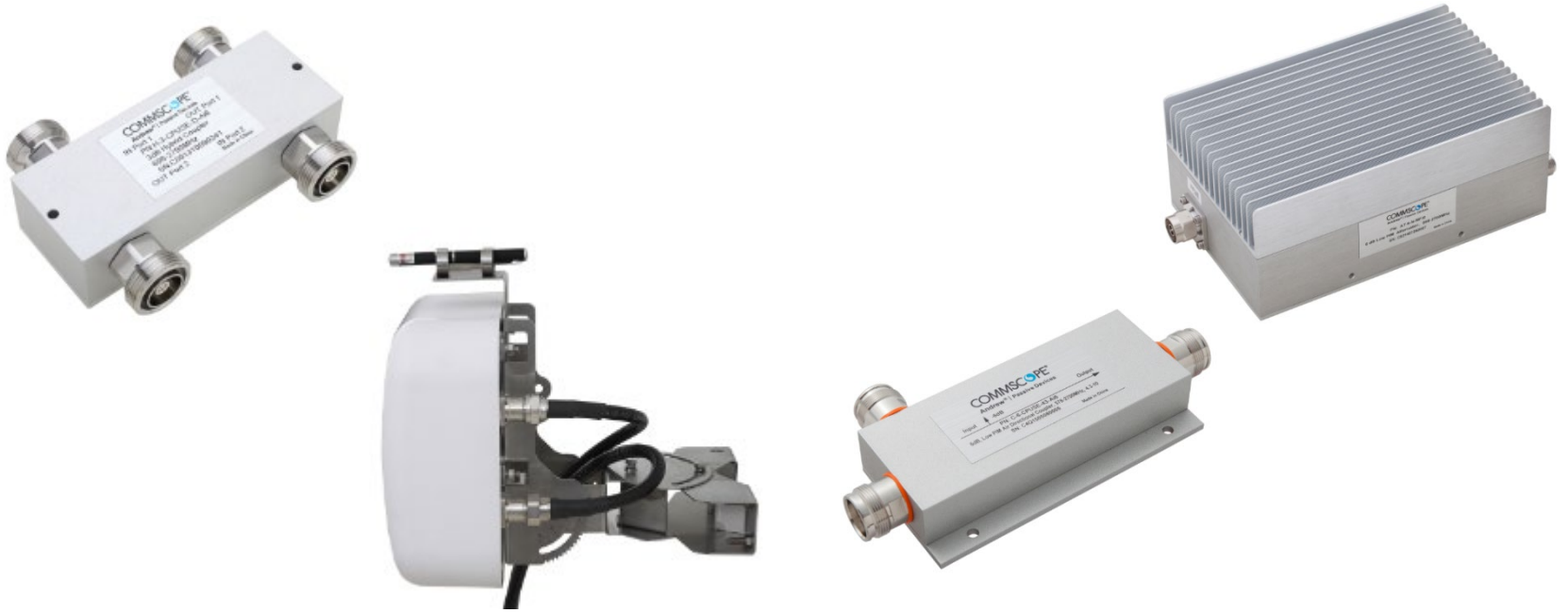

Distributed Coverage & Capacity Solutions (DCCS)

# Passive Product Family

## Passive Components

***Passive devices: Splitters, Couplers, Hybrids, etc.***

***DAS Antennas: Omni, directional***




PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G Passive device introduction

- Low PIM High Power Splitters
  - Frequency band: 555-6000MHz
- Low PIM Directional Couplers
  - Frequency band: 555-6000MHz
- Low PIM Coaxial Tappers
  - Frequency bands: 340-960/1695-2700/3500-4500/4900-6000MHz
- Non-PIM Termination Loads
  - Frequency band: DC-6000MHz
- Low PIM Low Power Splitters
  - Frequency band : 1695-4600MHz
- Low PIM 3dB Hybrid Coupler
  - Frequency band: 555-6000MHz
- Others, included Low PIM termination loads and Attenuators
  - Frequency bands: DC-6000MHz/555-6000MHz

***Very Low PIM: -165dBc @ 2x43dBm***

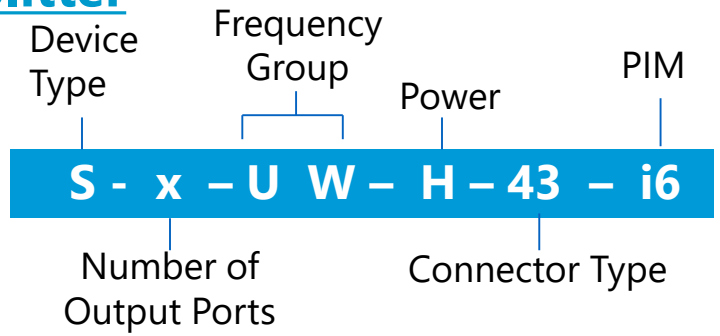




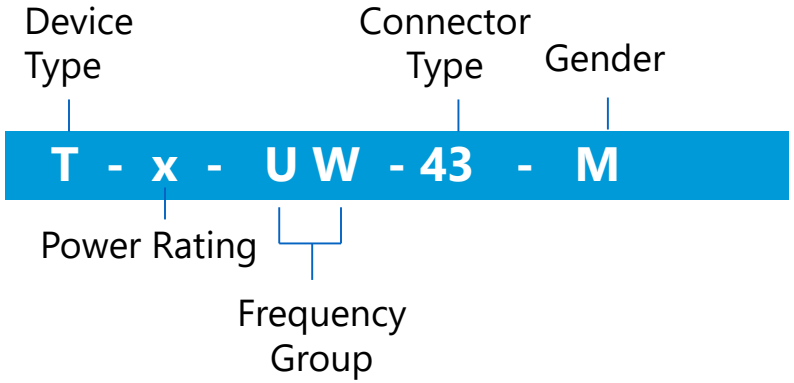
PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# Passive Devices Model Number Nomenclature Chart

## Splitter




## Termination Load




**Device Type**

S = Splitter T = Termination

**Frequency Group**

T = 300-500 MHz Tetra Band
C = 700/578-1000 MHz LTE/Cellular/GSM Band
P = 1700-2000 MHz PCN/PCS Band
U = 2000-2300 MHz UMTS/3G Band
S = 2300-2400 MHz Spread Spectrum Band
E = 555/698-800 & 2400-2700 MHz Evolution Band
UW = 555-6000MHz / DC-6000MHz / 1695-4600MHz

**Power**

L = Low Power H = High Power

**Connector Type**

N = N Type D = 7-16 DIN 43 = 4.3-10

**PIM**

i53 = -153dBc PIM
i6 = -160dBc /-162dBc /-163dBc /-165dBc PIM

**Number of Output Ports**

x = 2,3,4 ways

**Power Rating**

x = 2,10,25,30,50,100 and 200 Watts

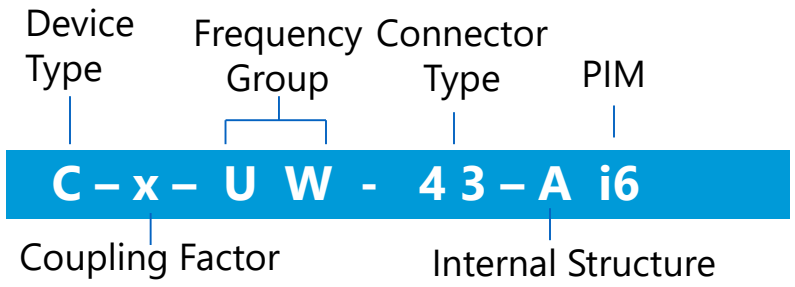
**Gender**

M = Male F = Female

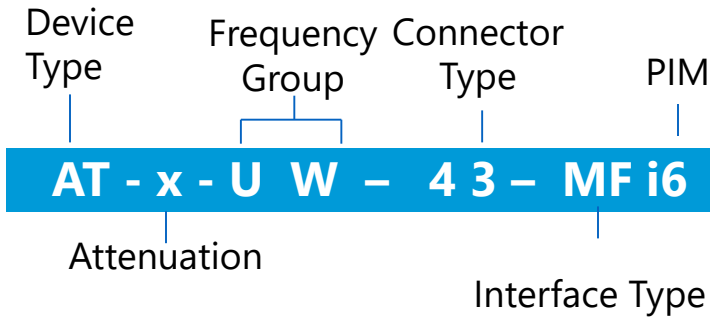

PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# Passive Devices Model Number Nomenclature Chart

## Hybrid, Coupler and Tapper




## Attenuator




**Device Type**

C = Coupler CT = Coaxial Tapper
H = Hybrid Coupler H-4X4 = 4X4 Matrix
AT = Attenuator

**Frequency Group**

T = 300-500 MHz Tetra Band
C = 700/578-1000 MHz LTE/Cellular/GSM Band
P = 1700-2000 MHz PCN/PCS Band
U = 2000-2300 MHz UMTS/3G Band
S = 2300-2400 MHz Spread Spectrum Band
E = 555/698-800 & 2400-2700 MHz Evolution Band
UW =555-6000MHz / DC-6000MHz

**Connector Type**

N = N Type D = 7-16 DIN 43 =4.3-10

**PIM**

i6 = -160dBc /-162dBc /-163dBc /-165dBc PIM

**Interface Type**

FF = Female to Female
MF = Male to Female

**Coupling Factor**

= 3 dB for Hybrid
= 6, 8, 10,13,15,20,30 dB for Couplers, Tappers

**Attenuation**

= 6,10,15,20,30 dB


PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G Passive device details – Low PIM High Power Splitters




## S-*-UW-H-43-i6 / S-*-UW-H-N-i6

- Frequency band supported: 555-6000MHz
- Included 2, 3, and 4 way.
- Connector types: 4.3-10 female and N female
- 3rd PIM spec 2x20w: -165dBc for 4.3-10 and -163dBc for N.
- Corrosion resistance : IEC60068-2-11, 30 days
- Will replace “CPUSE” (555-2700MHz) and “CPUSEW” (578-3800MHz) products.
- These products are available for order.








PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G Passive device details – Low PIM Directional Couplers

## C-*-UW-43-Ai6 / C-*-UW-N-Ai6

- Frequency band supported: 555-6000MHz
- Included 6, 8, 10, 13, 15, 20 and 30dB
- Connector types: 4.3-10 female and N female
- 3rd PIM spec 2x20w: -165dBc for 4.3-10 and -163dBc for N.
- Corrosion resistance : IEC60068-2-11, 30 days
- Will replace “CPUSE” (555-2700MHz) and “CPUSEW” (578-3800MHz) products.
- These products are available for order.





PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G Passive device details – Low PIM Coaxial Tappers

## CT-*-TUW-43-i6 / CT-*-TUW-Ni6

- Frequency bands supported: 340-960/1695-2700/3500-4500/4900-6000MHz
- Included 6, 8, 10, 13, 15, 20 and 30dB
- Connector types: 4.3-10 female and N female
- 3rd PIM spec 2x20w: -165dBc for 4.3-10 and -163dBc for N.
- Corrosion resistance : IEC60068-2-11, 30 days
- Will replace “TCPUSE” (340-2700MHz) products.
- These products are available for order.



# 5G Passive device details – Non PIM Termination Loads

## T-*-UW-43-M / T-*-UW-43-F / T-*-UW-NM / T-*UW-NF

- Frequency band supported: DC-6000MHz
- Included 2, 10, 25, 50 and 100W
- Connector types: 4.3-10 male and female, N male and female
- Will replace current DC-3000MHz products.
- These products will be released in April and available for order in May






PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G Passive device details – Low PIM Low Power Splitters

## S-*-UW-L-43-i53 / S-*-UW-L-N-i53

- Frequency band supported: 1695-4600MHz
- Included 2, 3, and 4 way
- Connector types: 4.3-10 female and N female
- Corrosion resistance : IEC60068-2-11, 30 days
- 3rd PIM spec 2x20w: -153dBc
- These products will be released in May and available for order in June.








PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G Passive device details – Low PIM 3dB Hybrid Coupler

## H-3-UW-43-Ai6 / H-3-UW-N-Ai6

- Frequency band supported: 555-6000MHz
- Connector types: 4.3-10 female and N female
- 3rd PIM spec 2x20w: -165dBc for 4.3-10 and -163dBc for N.
- Corrosion resistance : IEC60068-2-11, 30 days
- Will replace “CPUSE” (555-2700MHz) products.
- These products are in the design stage and will be available in Q2




PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G Passive device details – Low PIM termination loads and Attenuators

## T-*-43-M-i6 / T-*-43-F-i6 / AT-*-43-**I6

- Frequency band support: 340-6000MHz/555-6000MHz
- Connector types: 4.3-10 male and female
- 3rd PIM spec 2x20w: -165dBc
- Will replace current 555-2700MHz products.
- These products will be available till Q3-Q4.






PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G Passive device development summary

| Part number | Product Description | Frequency bands (MHz) | Connector type | PIM spec (2x43dBm) | Available for order | Proposed release time |
|---|---|---|---|---|---|---|
| S-*-UW-H-Ni6 | Low PIM High Power Splitters | 555-6000 | N female | -163 | Yes | Released |
| S-*-UW-H-43-i6 | | 555-6000 | 4.3-10 female | -165 | Yes | Released |
| C-*UW-N-Ai6 | Low PIM Directional Couplers | 555-6000 | N female | -163 | Yes | Released |
| C-*UW-43-Ai6 | | 555-6000 | 4.3-10 female | -165 | Yes | Released |
| CT-*-TUW-Ni6 | Low PIM Coaxial Tappers | 340-6000 | N female | -163 | Yes | Released |
| CT-*-TUW-43-i6 | | 340-6000 | 4.3-10 female | -165 | Yes | Released |
| T-*-UW-N* | Termination Loads, *W | DC-6000 | N male and female | None | No | April |
| T-*-UW-43-* | | DC-6000 | 4.3-10 male and female | None | No | April |
| S-*-UW-L-N-i53 | Low PIM Low Power Splitters | 1695-4600 | N female | -153 | No | May |
| S-*-UW-L-43-i53 | | 1695-4600 | 4.3-10 female | -153 | No | May |
| H-3-UW-N-Ai6 | Low PIM 3dB Hybrid Coupler | 555-6000 | N female | -163 | No | July |
| H-3-UW-43-Ai6 | | 555-6000 | 4.3-10 female | -165 | No | July |
| T-*-43-M-i6 | Low PIM Termination Loads | 340-6000 | 4.3-10 male | -165 | No | August |
| T-*-43-F-i6 | | 340-6000 | 4.3-10 female | -165 | No | August |
| AT-*-43-**I6 | Low PIM Attenuators | 555-6000 | 4.3-10 male and female | -165 | No | October |


PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

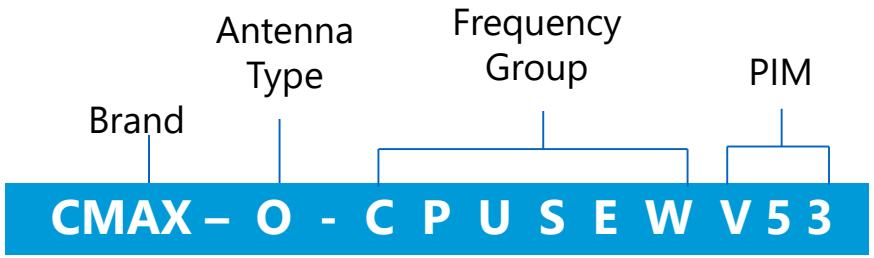
# 5G DAS antenna introduction

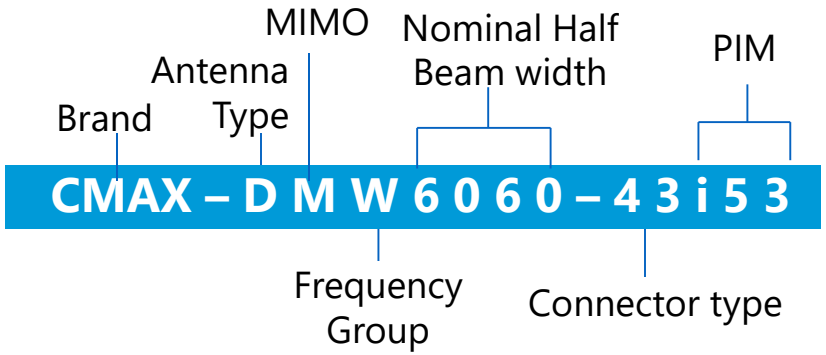
- Omni and Directional SISO indoor antennas
  - Frequency bands: 698-6000 / 698-4200 / 1695-6000MHz
- Omni and Directional MIMO indoor antennas
  - Frequency bands: 617-6000MHz / 1695-6000MHz
- Under The Seat Stadium antennas
  - Frequency bands: 1695-6000MHz
- Handrail Stadium antennas
  - Frequency bans: 1695-6000MHz
- Over The Head Stadium antennas
  - Frequency bands: 617-4200 / 617-6000MHz / 1695-6000MHz

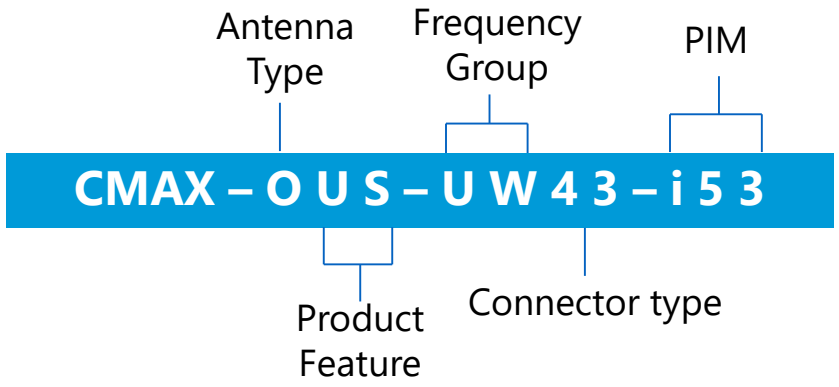




# DAS Antenna Model Number Nomenclature Chart




**Brand**

CELLMAX = CommScope CellMax™ Antenna

CMAX = CommScope CMAX™ Antenna

**Antenna Type**

O = OMINI Antenna D = Directional Antenna

**Frequency Group**

T = 300-500 MHz Tetra Band

C = 700-1000 MHz LTE/Cellular/GSM Band

P = 1700-2000 MHz PCN/PCS Band

U = 2000-2300 MHz UMTS/3G Band

S = 2300-2400 MHz Spread Spectrum Band

E = 2400-2700 MHz Evolution Band

W = 1695-6000MHz H = 1690-2600/1695-2700MHz

UW = 617-6000MHz/698-6000MHz/1695-6000MHz

**PIM**

i = -140 or -150dBc low PIM

i53 = -153dBc low PIM and VSWR > 1.5

V53 = -153dBc low PIM and VSWR 1.5

**Normal Half Beam Width**

60 = 60° 30 = 30° 20 = 20°

**Connector type**

43 = 4.3 -10 female Non 43 = N female

**Product feature**

US = Ultra Slim MF = MIMO full band, S = Small size, 1 = Version

**Environmental Rating**

O = Outdoor Rated EXT = Exterior


PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G DAS antenna details – Omni SISO indoor antennas

## CMAX-O-43-WV53 / CMAX-O-CPUSEWV53

- Frequency band supported: 698-6000MHz
- Low VSWR: 1.5 and 1.6
- Connector types: 4.3-10 female and N female
- 3rd PIM spec 2x20w: -153dBc
- Pattern feature: TURE Omni
- Polarization: Vertical
- These products are available for order.



## CMAX-OUS-43-i53 / CMAX-OUS-UW43-i53

- Frequency bands supported: 698-4200MHz / 1695-6000MHz
- Ultra Slim antenna: 18mm / 12mm
- Connector types: 4.3-10 female
- 3rd PIM spec 2x20w: -153dBc
- Pattern feature: TURE Omni
- Polarization: Horizontal
- These products will be available in Feb 2019 and order in March.



# 5G DAS antenna details – Directional SISO indoor antenna

## CMAX-D-43-UW-i53 / CMAX-D-UW-i53

- Frequency bands supported: 698-960, 1695-2700, 3400-3800 and 4900-6000MHz
- VSWR: 1.7
- Connector types: 4.3-10 female and N female
- 3rd PIM spec 2x20w: -153dBc
- Polarization: Vertical
- These products will be available in March and order in Q2.




PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G DAS antenna details – Omni MIMO indoor antennas

## CMAX-OMF3-43-UWi53 / CMAX-OMF3-UWi53

- Frequency bands supported: 1695-2700, 3300-4200, 4900-6000MHz
- Connector types: 4.3-10 female and N female
- 3rd PIM spec 2x20w: -153dBc
- Pattern feature TURE Omni
- Polarization: Vertical/Horizontal, MIMO 2x2
- These products are available for order.



## CMAX-OMF6-43-UWi53

- Frequency band supported: 617-6000MHz
- Connector types: 4.3-10 female
- 3rd PIM spec 2x20w: -153dBc
- Polarization:  Linear Horizontal, MIMO 2x2
- These products will be available in Q2.


PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G DAS antenna details – Directional MIMO indoor antennas

## CMAX-DMF-43-UWi53

- Frequency bands supported: 4 ports, 2 x 698-960 and1695-2700MHz + 2 x 3300-4000 and 4800-6000MHz
- VSWR: 1.7
- Connector types: 4.3-10 female
- 3rd PIM spec 2x20w: -153dBc
- Polarization: +/-45°,  MIMO 2x2
- These products will be available in Q2-Q3.


PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G DAS antenna details – Under The Seat Stadium antennas

## CMAX-DMW6060-43i53



- Frequency bands supported: 2 ports, 2 x 1695-2700, 3400-3800 and 4900-6000MH
- VSWR: 1.8
- Connector types: 4.3-10 female
- 3rd PIM spec 2x20w: -153dBc
- Beam Width: Azimuth 60°, Elevation 60°
- Polarization: +/-45°, MIMO 2x2
- This antenna is available for order.

## CMAX-DMW60X-43i53

- Frequency bands supported: 4 ports, 4 x 1695-2700, 3400-3800 and 4900-6000MHz
- VSWR: 1.8
- Connector types: 4.3-10 female
- 3rd PIM spec 2x20w: -153dBc
- Beam Width: Azimuth 60°, Elevation 60°
- Polarization: +/-45°, MIMO 4x4
- This antenna is available in Q2.


PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G DAS antenna details – Handrail Stadium antennas

## CMAX-DMW6020-43i53

- Frequency bands supported: 4 ports, 2 x 1695-2700MHz + 2 x 3300-3800 and 4900-6000MHz
- Low VSWR: 1.5
- Connector types: 4.3-10 female
- 3rd PIM spec 2x20w: -153dBc
- Beam Width: Azimuth 60°, Elevation 20°
- Beam tilt (internal): 10 degrees
- Polarization: +/-45°, MIMO 2x2
- This antenna will be released in February and available in March.



## CMAX-DMW3020-43i53

- Frequency bands supported: 4 ports, 2 x 1695-2700MHz + 2 x 3300-3800 and 4900-6000MHz
- Low VSWR: 1.7
- Connector types: 4.3-10 female
- 3rd PIM spec 2x20w: -153dBc
- Beam Width: Azimuth 30°, Elevation 20°
- Beam tilt (internal): 10 degrees
- Polarization: +/-45°, MIMO 2x2
- This antenna will be released in March and available in April.


PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G DAS antenna details – Over The Head Stadium antennas

## CMAX-3030S1-43-V53 / CMAX-3030S1-D-V53

- Frequency bands supported: 4 ports, 2 x 617-960 and 1695-2700MHz + 2 x 3300-4200MHz
- Low VSWR: 1.7/1.5
- Connector types: 4.3-10 female and DIN female
- 3rd PIM spec 2x20w: -153dBc
- Beam Width: Azimuth 30°, Elevation 30°
- Polarization: +/-45°, MIMO 2x2
- This antenna will be released in February and available in March.



## CMAX-DMW3060-43i53

- Frequency bands supported: 4 ports, 4 x 1695-2700, 3300-3800 and 4900-6000MHz
- Low VSWR: 1.5/1.7
- Connector types: 4.3-10 female
- 3rd PIM spec 2x20w: -153dBc
- Beam Width: Azimuth 30°, Elevation 60°
- Polarization: +/-45°, MIMO 4x4
- This antenna is available for order.




PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G DAS antenna details – Over The Head Stadium antennas

## CMAX-DMW3030-43i53

- Frequency bands supported: 4 ports, 4 x 1695-2700, 3300-3800 and 4900-6000MHz
- Low VSWR: 1.7
- Connector types: 4.3-10 female
- 3rd PIM spec 2x20w: -153dBc
- Beam Width: Azimuth 30°, Elevation 30°
- Polarization: +/-45°, MIMO 4x4
- This antenna will be released in April and available in May.

## CMAX-DMW2060-43i53

- Frequency bands supported: 4 ports, 2 x 1695-2700MHz + 2 x 3300-4000 and 4800-6000MHz
- Low VSWR: 1.7
- Connector types: 4.3-10 female
- 3rd PIM spec 2x20w: -153dBc
- Beam Width: Azimuth 20°, Elevation 60°
- Polarization: +/-45°, MIMO 2x2
- This antenna will be available in March and order in April.


PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G DAS antenna details – Over The Head Stadium antennas

## CMAX-DM60-43-UWi53

- Frequency bands supported: 4 ports, 2 x 617-960 and 1695-2700 + 2 x 3300-4000 and 4800-6000MHz
- Low VSWR: 1.7
- Connector types: 4.3-10 female
- 3rd PIM spec 2x20w: -153dBc
- Beam Width: Azimuth 60°, Elevation 60°
- Polarization: +/-45°, MIMO 2x2
- This antenna will be released in Q3.

## CMAX-DM30-43-UWi53

- Frequency bands supported: 4 ports, 2 x 617-960 and 1695-2700 + 2 x 3300-4000 and 4800-6000MHz
- Low VSWR: 1.7
- Connector types: 4.3-10 female
- 3rd PIM spec 2x20w: -153dBc
- Beam Width: Azimuth 30°, Elevation 60°
- Polarization: +/-45°, MIMO 2x2
- This antenna will be available in Q3.


PRIVATE AND CONFIDENTIAL © 2017 CommScope, Inc | v1.1

# 5G DAS antenna development summary

| Part number | Product Description | Frequency bands (MHz) | Polarization | Connector type | Port number | MIMO type | Available for order | Proposed release time |
|---|---|---|---|---|---|---|---|---|
| CMAX-O-CPUSEWV53 | Low PIM Omni in-building antenna | 698-6000 | Vertical | N female | 1 | | Yes | Released |
| CMAX-O-43-WV53 | | 698-6000 | Vertical | 4.3-10 female | 1 | | Yes | Released |
| CMAX-OUS-43-i53 | Low PIM Omni In-building Ultra Slim antenna | 698-960,1695-2700,3300-4200 | Horizontal | 4.3-10 female | 1 | | | February |
| CMAX-OUS-UW43-i53 | | 1695-2700,3300-4200,4900-6000 | Horizontal | 4.3-10 female | 1 | | | February |
| CMAX-D-UW-i53 | Low PIM directional in-building antenna | 698-960,1695-2700,3400-3800,4900-6000 | Vertical | N female | 1 | | | May |
| CMAX-D-43-UW-i53 | | 698-960,1695-2700,3400-3800,4900-6000 | Vertical | 4.3-10 female | 1 | | | May |
| CMAX-OMF3-UWi53 | Low PIM Omni MIMO In-building antenna | 1695-2700,3300-4200,4900-6000 | Vertical/Horizontal | 4.3-10 female | 2 | 2x2 | Yes | Released |
| CMAX-OMF3-43-UWi53 | | 1695-2700,3300-4200,4900-6000 | Vertical/Horizontal | 4.3-10 female | 2 | 2x2 | Yes | Released |
| CMAX-OMF6-43-UWi53 | Low PIM Omni MIMO In-building antenna | 617-960,1695-2700,3400-3800,4900-6000 | Linear Horizontal | 4.3-10 female | 2 | 2x2 | | June |
| CMAX-DMF-43-UWi53 | Low PIM directional MIMO in-building antenna | 2 x 698-960,1695-2700 + 2 x 3300-4000,4800-6000 | +/-45° | 4.3-10 female | 4 | 2x2 | | September |
| CMAX-DMW6060-43i53 | Stadium Under The Seat MIMO antenna | 1695-2700,3400-3800,4900-6000 | +/-45° | 4.3-10 female | 2 | 2x2 | Yes | Released |
| CMAX-DMW60X-43i53 | Stadium Under The Seat MIMO antenna | 1695-2700,3400-3800,4900-6000 | +/-45° | 4.3-10 female | 4 | 4x4 | | June |
| CMAX-DMW6020-43i53 | Stadium Handrail MIMO antenna | 2 x 1695-2700 + 2 x 3300-3800,4900-6000 | +/-45° | 4.3-10 female | 4 | 2x2 | | February |
| CMAX-DMW3020-43i53 | Stadium Handrail MIMO antenna | 2 x 1695-2700 + 2 x 3300-3800,4900-6000 | +/-45° | 4.3-10 female | 4 | 2x2 | | March |
| CMAX-3030S1-D-V53 | Staduim Over The Head antenna | 2 x 617-960,1695-2700 + 2 x 3300-4200 | +/-45° | DIN female | 4 | 2x2 | | February |
| CMAX-3030S1-43-V53 | Staduim Over The Head antenna | 2 x 617-960,1695-2700 + 2 x 3300-4200 | +/-45° | 4.3-10 female | 4 | 2x2 | | February |
| CMAX-DMW3060-43i53 | Staduim Over The Head antenna | 4 x 1695-2700,3300-3800,4900-6000 | +/-45° | 4.3-10 female | 4 | 4x4 | Yes | Released |
| CMAX-DMW3030-43i53 | Staduim Over The Head antenna | 4 x 1695-2700,3300-3800,4900-6000 | +/-45° | 4.3-10 female | 4 | 4x4 | | April |
| CMAX-DMW2060-43i53 | Staduim Over The Head antenna | 2 x 1695-2700 + 2 x 3300-3800,4900-6000 | +/-45° | 4.3-10 female | 4 | 2x2 | | March |
| CMAX-DM60-43-UWi53 | Staduim Over The Head antenna | 2 x 617-960,1695-2700 + 2 x 3300-4000,4800-6000 | +/-45° | 4.3-10 female | 4 | 2x2 | | September |
| CMAX-DM30-43-UWi53 | Staduim Over The Head antenna | 2 x 617-960,1695-2700 + 2 x 3300-4000,4800-6000 | +/-45° | 4.3-10 female | 4 | 2x2 | | September |


COMMSCOPE®

COMMSCOPE®

# Thank you

*Eric.zhang@commscope.com*