

CommScope Mosaic™ antenna platform: the shortest route to integrated 4G/5G

Mobile network operators are racing to add more capacity and capability to their networks by adding new bands and advanced architectures like mMIMO. These additions also mean towers need to accommodate more radios and antennas, which introduce wind, weight and appearance challenges. To add capacity without overloading tower tops, operators need an integrated, compact solution to support 4G and 5G networks. CommScope's new Mosaic™ antenna platform is just the answer operators need.

CommScope CTO Outdoor Wireless Networks addresses a few frequently asked questions.

Q. What is the main driver for the Mosaic antenna platform?

A. Through our continual collaboration with our customers, we understood they were looking for a pragmatic way to upgrade 4G cell sites to add 5G capabilities, without increasing the number or size of antenna assemblies required. They also couldn't accept adverse impacts on 4G performance in the process of adding active 5G infrastructure. We have addressed that need with a modular, compact and upgradable solution that lets our customers specify the band, length, port count and more. This enables them to upgrade to 5G mMIMO on an economically and technologically reliable path—while also supporting all legacy sub-6 GHz bands.

Q. Is Mosaic a proprietary technology?

A. Yes, Mosaic features our patented interleaved technology to provide excellent 4G and 5G performance and eliminates the need for RF connectivity.



Q. What are the most compelling benefits of the Mosaic platform?

A. First, there's the advantage of **simplification**. The Mosaic platform's agile, plug-and-play design enables operators to deploy active, passive or combined solutions as needed, where needed, quickly and without the need to re-zone the site.

Second, there's the added **network planning flexibility** afforded by Mosaic. It hosts the radio(s) that best suit your network (whether from a traditional OEM or an Open RAN supplier, 32T32R or 64T64R), with the ability to upgrade without expanding footprint or degrading network performance.

Third, there's the big benefit of **reduced total cost of ownership (TCO)** with Mosaic, thanks to its many deployment and operational efficiencies. Mosaic platform installations do not require re-optimization of existing network coverage, and Mosaic also reduces incremental site maintenance and troubleshooting costs by managing PIM effectively.

Last, there's the ease of deployment, which is built on three simple steps: lift, slide and tighten. It speeds up installations and accelerates 5G rollouts. (see Figure 1)

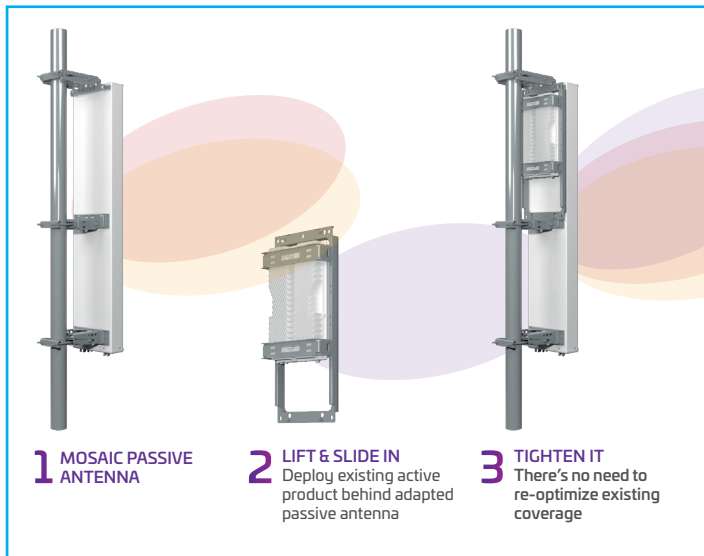


Figure 1

Q. How does the Mosaic platform affect the performance of 3.5 GHz active antenna systems (AAS)?

A. Mosaic isolates the 5G signal from the low-band 4G signal—enabling the 5G signal to go through passive antennas. A special window in the reflector enables RF energy at 3.5 GHz to pass, while reflecting energy at lower frequencies. This allows the 3.5 GHz AAS to operate with nearly the same performance whether the Mosaic solution is present or not. There is some minor distortion of the 3.5 GHz patterns from the Mosaic radome at shallow incidence angles; however, the reduction in gain on boresight is only a few tenths of a dB, while, for broad scan angles, it is around 1 dB. We expect these minor distortions to have no impact on network KPIs.

Q. Does Mosaic work differently with and without the AAS in position?

A. Since the window in the Mosaic reflector reflects all the FDD frequencies at which the Mosaic arrays are operating, the performance is identical whether the AAS is present or not. That means the Mosaic antenna can be installed prior to availability of the AAS, and that AAS can be removed in the field without any degradation in performance.

Q. What are the most common use cases for the Mosaic antenna platform?

A. There are several common use cases; for instance, having a **limited number of poles**. With Mosaic, all FDD bands as well as C-band and 3.45 GHz can be deployed on two poles. It also is the best solution when only one pole is available per sector.

Since Mosaic allows for configurations with smaller sector widths it is ideal for those cases where there are **sector width constraints**.

And then there are cases with **sector height constraints**. A standard configuration is to vertically stack the C-band and 3.45 GHz arrays on a single pipe. But this exceeds the maximum height allowance for some sites. Mosaic is available from 1.5 (5 feet) to 2.7 (8 feet) meters, making it ideal in lengths where the antenna height is severely restricted (see Figure 2).

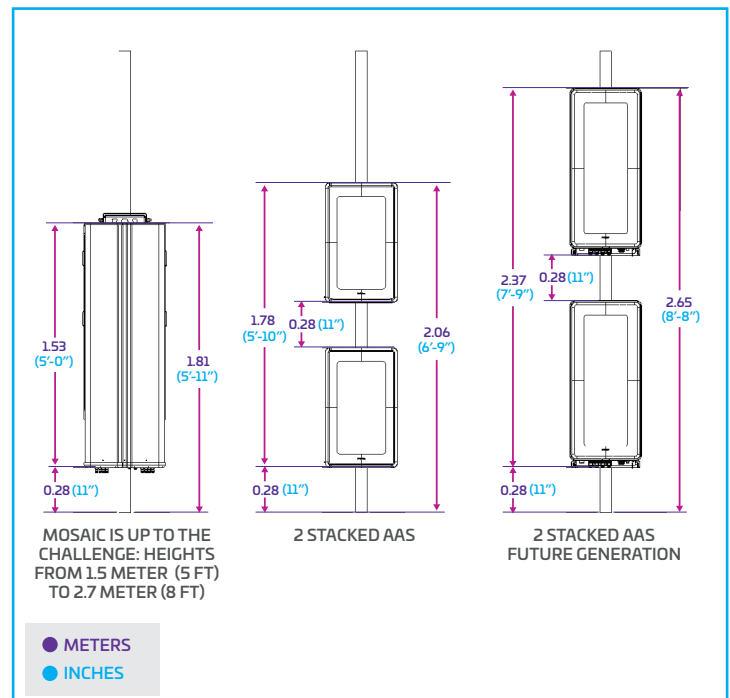


Figure 2 – Mosaic meets high space constraints

Q. What effect does the Mosaic antenna platform have on PIM?

A. CommScope has carefully designed Mosaic to provide very high isolation between the FDD band arrays and the 3.5 GHz AAS. As a result, RF coupling that could otherwise lead to multi-band PIM hits is actually lower for Mosaic than for cases where the AAS is deployed side-by-side with FDD passive antennas.

Also, because the Mosaic platform is built on CommScope's unique expertise, the combined solution can be factory tested and validated for cross-band PIM performance before it even arrives at the deployment site.

Q. What effect does Mosaic have on wind loading?

A. The Mosaic antenna platform is lightweight and compact enough that it maintains the original antenna footprint, which reduces wind load compared to a non-integrated solution. This avoids the need for structural reinforcement.

Frontal wind loading is reduced by 20 percent in a typical configuration, though the exact reduction in any specific case depends on the AAS being used (since different AAS have higher or lower frontal EPA) and the site configuration.

Q. Which radios does Mosaic work with?

A. Mosaic has been designed as a radio-agnostic solution. It's compatible with certified AAS from traditional OEM and Open RAN vendors.



Mike Wolfe

**CTO, Outdoor Wireless Networks
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Mike is an evangelist for CommScope outdoor wireless solutions, overseeing strategy, marketing and technical support within the Outdoor Wireless Networks business segment. He has over 28 years of experience in wireless technology, and his passion lies in making CommScope the most valued partner to our customers as they continuously evolve their networks towards 5G technology and beyond.

Prior to his current CTO role, Mike held a variety of roles in system engineering, product management, and sales at CommScope, and he also worked for 14 years in the Defense Industry.



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