

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. 5G network deployments present civil engineering challenges for mobile operators, especially in urban sites where mMIMO radios are the preferred solution. Site limitations complicate the addition of active antennas (and upgrading support infrastructure). This increases deployment time and cost, and even makes some deployments impossible. Likewise, site-sharing restrictions and higher lease costs also limit economical options for operators.

CommScope's answer is a modular, compact, upgradable solution customizable for band, length, port count and more, while also supporting all legacy sub-6 GHz bands for a complete 4G/5G solution.

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)

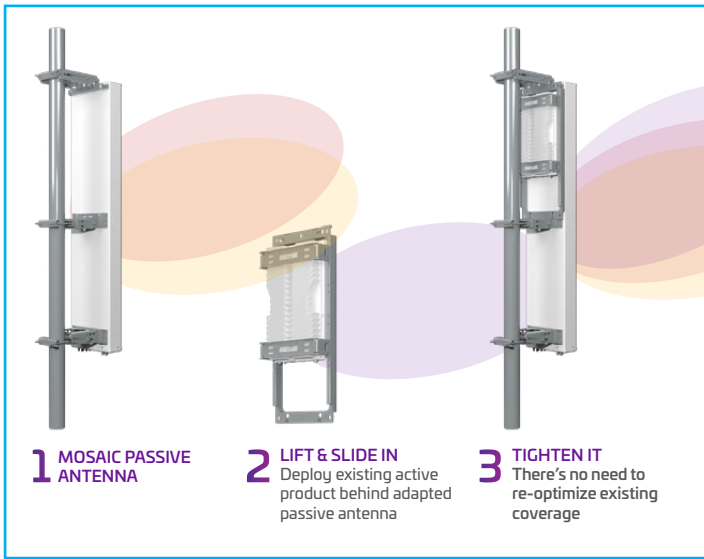


Figure 1

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. One such use case is working with **a limited number of poles**. With MOSAIC, all FDD/TDD as well as 5G NR TDD bands can be deployed on a single pole, driving both operational efficiency and lease savings.

In cases where operators must contend with **sector width constraints**, MOSAIC allows for configurations with smaller sector widths to work within those limitations. all FDD/TDD as well as 5G NR TDD bands can be deployed on a single pole.

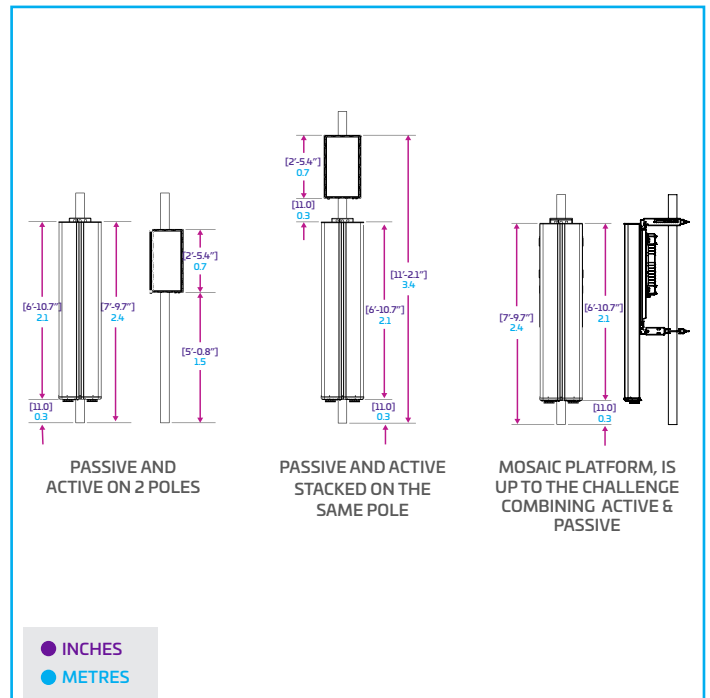


Figure 2 - All FDD/TDD as well as 5G NR TDD bands can be deployed on a single pole

There are also cases with sector height constraints. A standard configuration is to vertically stack the active antenna and the passive one on a single pipe, but this design may exceed the maximum height allowance for some sites. MOSAIC antennas are available from 1.5m (5 feet) to 2.7m (8 feet), giving operators the flexibility to deploy even where antenna height is severely restricted (see Figure 3).

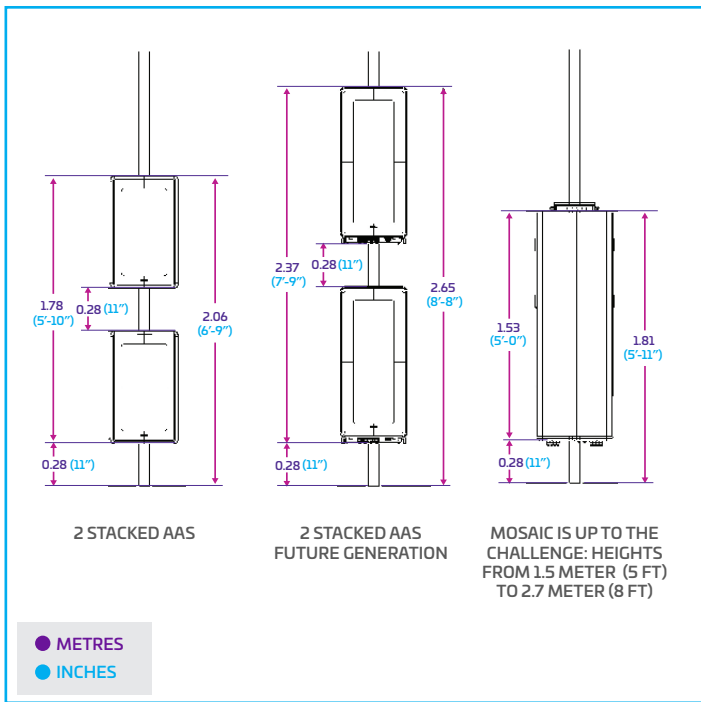


Figure 3 - MOSAIC platform meets height space constraints

In all these common use cases, MOSAIC platform enables operators to deploy in ways and places that were not available before. Subscribers maintain their coverage levels, and operators reduce deployment and site costs in 5G New Radio (NR) rollouts.

Q. Which radios does MOSAIC work with?

A. MOSAIC is designed to be band-agnostic and compatible with certified AAS from traditional OEM and Open RAN manufacturers. Because MOSAIC’s design decouples the active and passive antennas, hardware from different vendors can coexist and be upgraded independently as needed. This is particularly valuable to operators because it protects existing passive antenna investment if a change in vendors becomes necessary, or if the operator wishes to begin or expand a smooth Open RAN rollout. This evolutionary design prolongs the lifespan and increases the value potential for every MOSAIC deployment.

Another advantage is that MOSAIC can be deployed separately and in advance of the radios themselves. This is useful for operators who are dealing with radio delivery delays and the ongoing semiconductor shortage problem. Not only does MOSAIC broaden the operator’s choice of radio, but it also makes it easy to slide the radio into place on an otherwise fully deployed site.



Mike Wolfe

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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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