

We're proud to be a part of your network's story.

Here at CommScope, we embrace our role as a trusted resource, partner, and facilitator. We create the infrastructure that connects the world and evolves with every advance in technology. By investing all of our capabilities, resources, relationships, and products into your toughest challenges, we continue our long history of solving problems together—paving the way for new ideas and fresh ways of thinking.

We're a trusted resource and partner around the world because we're invested in you: your people, your networks, your success. It inspires us to build relationships and infrastructure... connect people and technologies across protocols, oceans, and time zones... and share what we learn along the way. We'll never stop connecting and evolving networks for the business of life at home, at work, and on the go.

**This is our promise to you.
This is CommScope.**



www.commscope.com

Visit our website or contact your local CommScope representative for more information.

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BR-104461.2-EN (10/13)



PIM Site Audit and Avoidance: Identifying, eliminating and preventing PIM



Solution Name

BR-104461.2-EN (10/13)

POWERED BY



Need Headline

Despite increasing voice and data requirements, your customers expect a seamless wireless experience. They want a network that provides reliable connections with user loyalty.

But interference, especially passive intermodulation (PIM), can negatively impact network efficiency as it degrades data throughput.

This is especially true for newer devices. Antennas and radios are highly sensitive, susceptible to increasingly smaller levels of distortion whose impact is amplified dramatically. Indeed, for each 1 dB reduction in uplink sensitivity caused by PIM, coverage drops 11 percent. And, with each component in the RF path a potential source of PIM, network threats abound.

Identifying, eliminating and, ultimately, preventing PIM is therefore critical to maximizing capacity usage of finite frequency and radio resources, ensuring the most favorable customer experience. Anything less and customer satisfaction can suffer—a performance failure that impacts your bottom line.

re-write as a stat:

Effects of PIM on network coverage

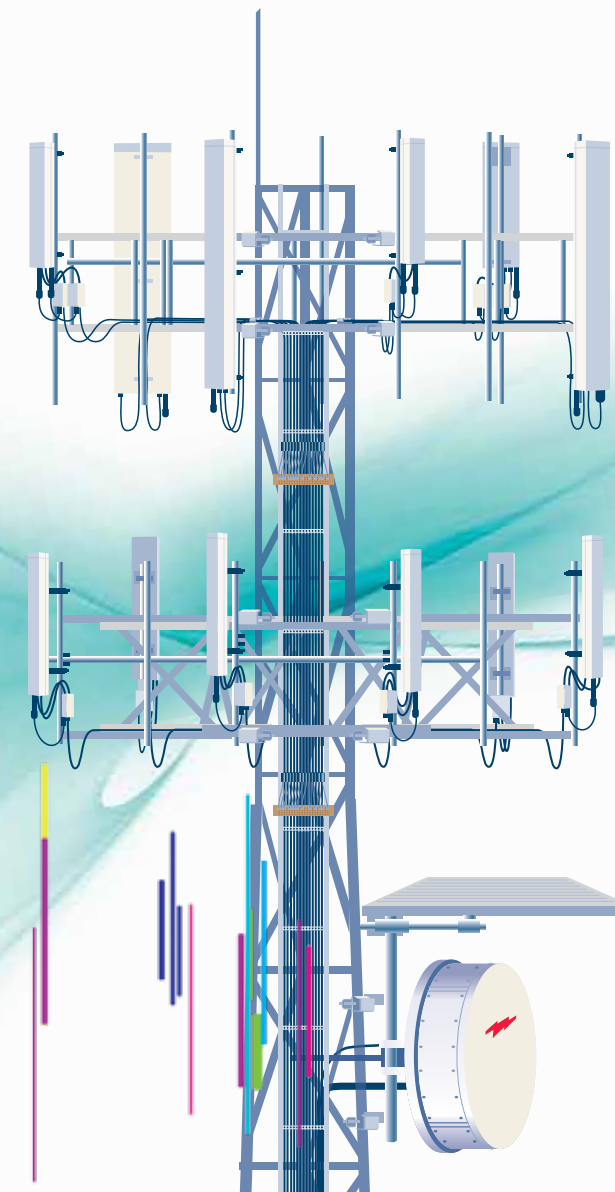
Just a 1dB loss in uplink sensitivity results in an 11 percent decrease in coverage.

STAT

10 ON 12 POINT ALL CAPS TEXT.

Turn to CommScope

For nearly 20 years, CommScope has been an industry leader in developing products that reduce the occurrence of PIM. We have shared our best practices approach with thousands of installers around the world, helping them identify, resolve, and prevent PIM.



What is PIM?

Passive intermodulation, or PIM, is generated by the non-linear mixing of two or more frequencies in a passive circuit.

What causes PIM?

In a passive RF circuit, any degree of current rectification at the conductor joints and/or poor mechanical junctions in the RF path can lead to non-linearity and PIM. This can be caused by a number of factors, including:

- Surface oxidation in the RF path
- Loose metal-to-metal contacts
- Contaminants, such as solder splatters
- Ferromagnetic materials in or near the current path
- Contact between dissimilar metals
- Insufficiently thick-plated metal
- Improperly torqued connectors
- Structures or objects in close proximity to the site

The industry's first proactive, system-wide approach to controlling PIM

PIM is more likely to occur when any of the following conditions are present:

- PIM PRODUCTS FALL IN THE RECEIVER BAND
- TWO OR MORE TRANSMITTER CHANNELS SHARE A COMMON ANTENNA
- TRANSMITTER SIGNAL LEVELS ARE HIGH
- RECEIVER SENSITIVITY IS HIGH
- TRANSMITTERS AND RECEIVERS ARE DIPLEXED



While many suppliers are focused on simply measuring PIM distortion—reacting after interference occurs—we work proactively to minimize it and, whenever possible, eliminate it.

We accomplish that through the deployment of a five-prong, systematic approach:

Awareness

Educating network operators on the causes and effects of PIM.

Prevention

Training installers in the best practices for field installation.

Identification

Helping installers and engineers identify and localize sources of PIM.

Resolution

Delivering PIM-certified replacement components to maximize uptime.

Support

Providing 24/7 technical support to troubleshoot and resolve PIM issues.

By leveraging our deep pool of global resources and a team of RF experts, we help you identify and minimize PIM at every phase of network development and deployment.

It's an integrated, system-wide approach that maximizes network performance and efficiency and, in the process, reduces customer churn while boosting your bottom line.

1. Awareness

The first step of our approach addresses awareness. Our team of PIM experts helps educate operators as to the causes and effects of PIM, a direct approach that helps minimize PIM's impact. As part of that process, we offer a wide range of education and awareness tools on our website, including white papers, eBooks, PIM calculators, FAQs, and other assets that help educate installers, purchasers, system designers, network testers and others tasked with maintaining network performance. At CommScope, we believe that a more knowledgeable wireless network industry enables better decisions that fuel greater success.



2. Prevention

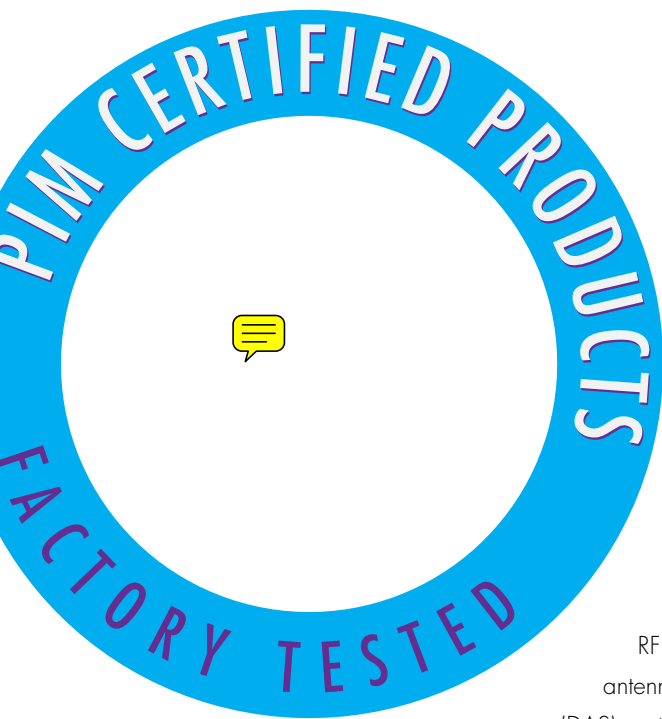
PIM prevention is best addressed during field installation. Our virtual CommScope Infrastructure Academy offers network installers and field engineers a comprehensive training and certification course for PIM and voltage standing wave ratio (VSWR), teaching them the proper techniques for testing, measuring and mitigating PIM for wireless infrastructures. It's a best practices approach for site installation with an underlying goal of minimizing and even preventing PIM. For more information, visit www.commscopetraining.com



3. Identification

Identifying PIM in the RF path quickly and accurately is critical for minimizing network disruptions. Our Wireless Turnkey Deployment services provide experienced personnel and advanced equipment to pinpoint the sources of PIM in your network. We identify the compromising components in your RF path and recommend a practical solution that optimizes your network's performance.





4. Resolution

Once we identify a component as lacking PIM compliance or exceeding a system-specified PIM performance level, we recommend replacing it as soon as possible.

We manufacture a wide variety of PIM-certified products, including: RF conditioning, base station antennas, antennas for distributed antenna systems (DAS), points of interface, transmission lines, and passive devices.

As part of our manufacturing process, we factory-test each product for PIM and VSWR, and we further test all cable products for distance to fault (DTF). This comprehensive testing phase ensures that every product we produce meets our stringent specifications for PIM compliance and performance.

Visit our product catalog on www.commscope.com for detailed specifications.

5. Support

With the growing complexity of today's infrastructure, responsive and qualified technical support is more critical than ever. Through CommScope's Technical Support Center, we offer 24/7 technical support for all PIM-related issues, with a dedicated team of technical experts experienced in troubleshooting, diagnosing, and resolving PIM issues.

They are available via toll-free phone (800-255-1479) or email (acicustomersupportcenter@commscope.com).



CommScope certified report systems provide you with quick and easy access to factory performance testing.

WebTrak®—provides 24/7 factory testing reports, including attenuation and cable construction for CommScope fiber, hybrid fiber and twisted-pair cables, cable assemblies, and base station antennas.

Start using it today: visit www.commscope.com/webtrak.

cTrak™—cTrak is the mobile version of our WebTrak certified report system, and provides users with performance testing results for BSA antennas, cable assemblies, twisted-pair cables, and fiber and hybrid fiber cables. **Download cTrak from iTunes® today!**



The CommScope Advantage®

Leveraging decades of experience and the talents of the industry's brightest engineers, CommScope is uniquely positioned to help network operators proactively work to minimize the effects of PIM in their networks. Incorporating a holistic, systematic approach, we have successfully helped thousands of operators throughout the world optimize their networks' performance.

Not on our watch

Reducing PIM in the RF path is a critical challenge for operators, one that directly impacts customer satisfaction and profitability.

Through awareness, prevention, identification, resolution and support, we help minimize and even eliminate PIM, optimizing network efficiency and performance while producing a healthier bottom line for our customers.

Contact your local CommScope sales representative to learn how we can help you proactively identify, eliminate and prevent PIM in your system.