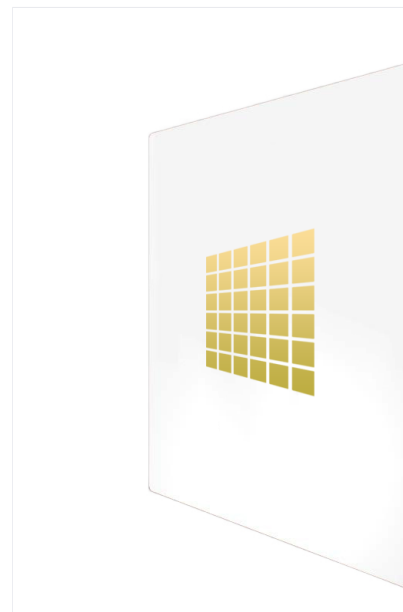


Phased Array Systems

Description:

MI-Wave's Phased Array Systems provide real-time, high-precision beamforming for applications requiring exceptional performance, adaptability, and scalability. Designed to meet the evolving needs of **defense, aerospace, telecommunications, radar, and scientific research**, our phased array solutions support **multi-channel signal processing, rapid beam steering**, and **high dynamic range** to deliver unparalleled accuracy and reliability in even the harshest environments.

Phased array technology offers a significant advantage over traditional antenna systems by electronically controlling the direction of RF beams without mechanical movement. This makes it ideal for applications demanding **fast target acquisition, enhanced communication**, and **real-time adaptability** across multiple frequency bands.



Key Features & Capabilities

- **Frequency Range:** Supports C- Band, L-Band, S-Band, 8–12 GHz, 19–29 GHz, 27–31 GHz, and 37–40 GHz frequencies.
- **Real-Time Beam Steering:** Electronically control beam direction with precision for enhanced target tracking and reliable communication.
- **Multi-Channel Integration:** Enables simultaneous support for multiple frequencies and beam patterns for flexible system design.
- **Low Phase Noise & High Stability:** Ensures clean, stable signals and accurate performance.
- **360° Phase Adjustment:** 2.8° resolution and ≥31 dB gain adjustment with <0.5 dB gain resolution.
- **Integrated Bias Control:** For transmitters and receivers, with memory for 121 pre-stored beam positions.
- **Optional Features:** Power detectors, integrated temperature sensors, and programmable bias modes.
- **Remote Interface:** Ethernet and WiFi connected with a GUI for calibration, gain, and phase control.
- **Compact, Scalable, and Rugged Design:** Optimized for size-constrained environments and built for extreme

Applications:

- **Defense & Military** – Real-time target detection, tracking, tactical communications, and electronic warfare (EW).
- **5G Networks** – Advanced beamforming for ultra-fast, reliable mmWave communication and high-capacity data transmission.
- **Satellite Communication** – Precision uplink/downlink performance for mobile ground stations and airborne platforms.
- **Radar Systems** – High-resolution imaging, weather monitoring, and long-range target tracking.
- **Scientific Research & Astronomy** – Custom solutions for radio astronomy, atmospheric studies, and space observation.

conditions like military, airborne, and industrial applications.

Benefits of Phased Array Antennas

1. Power

The signal strength is amplified by combining individual antenna signals.

2. Beam Shaping

Combining antenna arrays narrows the antenna pattern compared to individual antennas.

3. Beam Steering

Variable phase shifters enable flexible beam positioning without mechanical repositioning, providing faster adjustments than large antennas.

4. Reliability

In a single antenna system, a positioning failure limits pointing. While in an array, individual failures don't disrupt functionality, ensuring graceful degradation.

5. Weight

Phased array antennas weigh less than mechanically steered single antennas.

6. Multiple Beams

Different wide control ranges and multiple beam responses can be synthesized if needed.

7. Digital or Mixed Options

Phase shifting can analogically or digitally adjust the phase. Analog phase shifters involve signal down-conversion at the intermediate frequency (IF) mixer or Local Oscillator (LO) signal.

Why Choose MI-Wave for Phased Array Systems?

Tailored Designs: Every project is unique, and we offer customizable phased array solutions that meet your exact system requirements.

Proven Experience: With over **35 years of experience** in the **mmWave and microwave RF industry**, MI-Wave has delivered solutions for some of the most demanding applications worldwide.

Precision Manufacturing: Our phased arrays are built using advanced manufacturing processes to ensure reliability and durability in extreme environments.

Comprehensive Support: From initial design to testing, validation, and deployment, our team works closely with you at every step to ensure project success.

Take Your Phased Array System to the Next Level

Ready to enhance your system with **high-performance phased array technology**? **Contact MI-Wave today** to learn more about how our custom solutions can help you achieve your performance and operational goals.