YTTEK

FlexBeam™

mmWave Module

Ultra-flexible and integrated for mmWave OTA testing

Detachable antenna and embedded UDC in one compact device

The YTTEK FlexBeam is a highly flexible and integrated 28 GHz mmWave Front-End Module (FEM) designed for LEO and 5G mmWave R&D. Featuring a detachable antenna module for easy swapping and up to 64 customizable antenna elements, FlexBeam streamlines testing workflows and delivers reliable performance—making it an indispensable tool for advanced mmWave over-the-air (OTA) testing.

Detachable antenna for flexible antenna swapping

FlexBeam's detachable antenna module enables the swapping of different antenna arrays, making it easy for antenna designers to evaluate arrays built on various substrates—such as Rogers or LTCC—and to compare linear and circular polarization performance across diverse testing scenarios.

Applications

Academic and Research Solutions

Key features

- Detachable antenna module
- Highly integrated FEM with embedded UDC & beamformer
- Dual arrays with independent RHCP/LHCP control
- 6-bit phase resolution achieves precise beamforming
- Supports LEO and 5G FR2 mmWave bands

Up to 64 customizable antenna elements for high EIRP

The modular sub-board design allows customers to tailor the number of sub-boards (each driving eight antenna elements) to fit specific testing requirements. Supporting up to eight sub-boards for a total of 64 antenna elements, FlexBeam achieves EIRP levels of up to 48 dBm.

Highly integrated FEM with embedded UDC and beamformer

FlexBeam integrates critical mmWave components—including a wide IF input frequency range up/down converter (UDC), T/R switch, power amplifier (PA), low-noise amplifier (LNA), phase shifters, and antenna array—into a single, compact module. This high level of integration reduces setup complexity and ensures consistent, repeatable testing.

Dual arrays with independent RHCP/LHCP control for real-world simulation

FlexBeam's dual-array architecture provides independent control (Pol. A and Pol. B) of right-hand circular polarization (RHCP) and left-hand circular polarization (LHCP), enabling researchers and engineers to explore polarization diversity and improve signal reliability in multipath environments.

6-bit phase resolution achieves precise beamforming

With up to 64 controllable RF channels—each supporting 360° phase shifting (in 5° steps) and 24 dB attenuation (in 0.5 dB steps)—FlexBeam provides precise beam control and steering, ideal for rigorous algorithm testing and real-world validation.

DCI-enabled for real-time codebook testing

Through the DCI interface, FlexBeam seamlessly integrates with YTTEK's PluSDR Software-Defined Radio Platform. This integration enables real-time codebook testing with precise synchronization, accelerating algorithm development and advanced wireless research.

Seamless GUI and API integration

Controlling FlexBeam is simple and flexible, offering both GUI and API options. Both interfaces can be utilized simultaneously, enhancing operational efficiency and testing flexibility.

Specifications

Item	Spec
Operation Frequency	1. 26.5 – 29.5 GHz 2. 27.5 – 28.5 GHz
Antenna element	8 – 64
EIRP/pol	48 dBm
Polarization	LHCP/RHCP
Max scan range	+/–60 °
Phase adjustment resolution	5.6 degree
Gain adjustment resolution	0.5 dB
IF frequency range	2.6 – 5.8 GHz
Control interface	SPI/GPIO
Duplex mode	TDD
Power	12 V
Dimension	102.6 × 76.9 × 102.6 mm

Visit YTTEK

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