



Product Brochure

Viper 1414Ka

Multi-Orbit Ka-Band Electronically Steered Antenna for Unmanned Aerial Platforms

Compact, Low-Profile Ka-band ESA

The RaySat Viper Ka is a compact, full-duplex Ka-band electronically steered antenna (ESA) designed to deliver reliable, high-throughput satellite connectivity for unmanned aerial systems. Optimized for size, weight and power (SWaP) constrained military applications, it combines a flat, low-profile form factor with multi-orbit operational flexibility across GEO, MEO and LEO satellite networks.

Supporting multi-Mbps throughput and extremely fast electronic beam steering, the Viper Ka supports mission-critical communications for ISR, command and control, and data-intensive unmanned operations in dynamic and contested environments.

Purpose-Built for Unmanned Systems

The Viper Ka is engineered specifically for tactical UAV platforms where traditional mechanically steered antennas are not practical. The airborne configuration weighs approximately 4 kg excluding the modem and measures only 40 x 20 x 7 cm, enabling integration into aerodynamic airframes and space-constrained vehicle designs.

The ultra-low profile of 7 cm allows installation without impacting aerodynamics or payload capacity. With no moving parts, the Viper Ka delivers excellent MTBF and high reliability under continuous motion, vibration and harsh operational conditions.

Multi-Orbit Ka-Band Operations

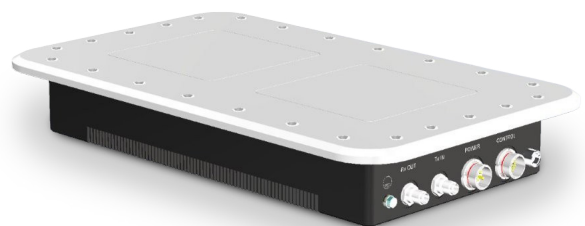
Designed to operate seamlessly across satellite orbits, the Viper Ka supports GEO, MEO and LEO networks and is compatible with both existing Ka-band systems and emerging Ka LEO constellations. The antenna supports the full Ka frequency range, with software control enabling or disabling of military bands as required:

- Transmit: 27.5 to 31.0 GHz
- Receive: 17.7 to 21.2 GHz

Extremely fast and seamless beam and polarization switching ensure continuity of service across beams, satellites and orbital layers without mechanical movement.

Benefits

- Compact, low-profile, low-SWaP Ka-band ESA optimized for tactical UAVs
- Lightweight airborne implementation of approximately 4 kg
- Full-duplex, multi-orbit operation across GEO, MEO and LEO
- Full Ka-band frequency support with software-controlled military bands
- Full 360° azimuth and wide elevation coverage with fast beam switching
- No moving parts for high reliability and excellent MTBF
- Flexible architecture with integrated or OpenAMIP external modem deployment
- Smart power management for extended unmanned missions



Viper Ka

High-Performance ESA Technology

The Viper Ka ESA is based on a proven COTS chipset, delivering field-tested performance in a compact form factor suitable for unmanned aero platforms.

It delivers up to 44 dBW Tx EIRP and 6 dB/K Rx G/T under boresight conditions. The antenna supports a full field of view with 360° azimuth coverage and an elevation range of approximately 15° to 90°, maintaining connectivity during maneuvering and high-dynamic mission profiles.

Integrated and Flexible Architecture

The Viper Ka can be ordered as a single-box solution including an integrated modem or deployed with any OpenAMIP compliant external modem. The antenna enclosure includes all required ACU, RF, tracking sensors and power supply, simplifying integration and installation.

When navigation, heading or inertial data are provided by the platform, the Viper Ka can integrate with external inputs to enable lighter and more cost-efficient implementations while maintaining performance and accuracy.

Power-Efficient Operation

The Viper Ka incorporates smart power management and supports full-duplex, receive-only and standby modes. This operational flexibility allows tactical platforms to optimize power consumption throughout the mission while preserving connectivity and endurance.

Ruggedized for Aero Environments

The ruggedized Viper Ka is designed for demanding operational conditions across air and land domains. The airborne version is designed to meet aero environmental requirements.

Advancing Mission-Critical SATCOM Connectivity

The Viper Ka is part of Gilat Defense's end-to-end SATCOM portfolio, enabling mission-critical connectivity for defense applications across evolving operational environments.

It supports multi-verse communications across orbits, bands and waveforms, while addressing the demands of the future battlefield with proven performance in operational conditions.

The Viper Ka is optimized for unmanned and autonomous platforms operating in demanding defense scenarios. It enables reliable BLoS communications for ISR missions requiring real-time video and data transmission, supports tactical UAV operations with compact, low SWaP terminals, and maintains continuous connectivity through seamless transition across beams, satellites and orbits. Additional use cases include border security, maritime surveillance and special operations, where consistent, high-performance communications are critical across dynamic and distributed operational theaters.

Technical Specifications:

OpenAMIP:

OpenAMIP for external modem integration

GUI:

Web-based interface for antenna controller for full management and monitoring of the antenna

Beam Switching:

Support beam and satellite switchovers in <100msec

BIT:

CBIT, IBIT, PBIT

Power Saving Modes:

TX+RX, RX only, Stby

Cold Start Acquisition (from power up) Time:

< 60 sec

Re-acquisition (after link loss during flight):

< 3 sec

Terminal Size:

40 x 20 x 7 cm (L x W x H) – Radome-less design

Light Weight:

< 4 Kg

Power Input (DC):

22–36 VDC (TBC)

Frequencies of Operation:

TX 27.5–31 GHz

RX: 17.7 – 21.2 GHz

G/T:

6 dB/K at boresight

EIRP:

44 dBW

Elevation Scan Range:

0° to 75° from boresight

MIL STD 810G:

Support Shock, Vibrations, Temperature, Altitude, Acceleration as defined in MIL-STD-810G

MIL STD 461F:

Support electromagnetics as defined in MIL-STD-461F

About RaySat

RaySat, a Gilat subsidiary, is a leading European provider of satellite communication systems, with a strong engineering base and dedicated R&D teams in Bulgaria and Spain. The company specializes in ground segment technologies for both fixed and mobility applications, combining deep expertise in radio frequency (RF), modems, network management, and advanced antenna technologies.

RaySat specializes in system integration, end-to-end system delivery, and turnkey projects. Its portfolio spans VSAT platforms, satellite modems, electronically steered antennas (ESAs), SSPAs, and portable and transportable terminals.



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