

## Seamless 5G: How Interference Mitigation Filters Safeguard Satellite Services in Colombia

### ■ Background

In 2023, in response to the auctioning of the 5G frequency band, the Ministry of Information and Communications Technologies (Ministerio de Tecnologías de la Información y las Comunicaciones, MinTIC) of Colombia issued a resolution aimed at protecting fixed satellite service (FSS) stations. This resolution mandated that operators provide necessary filters to FSS operators to mitigate potential interference.

The resolution outlined specific obligations for assignees of permits to use the radio spectrum in the 3500 MHz band. These obligations required the application of technical conditions to protect FSS stations operating within the frequency range of 3740 – 4200 MHz.



FSS stations (reference)

### ■ Challenges

For the deployment of International Mobile Telecommunications (IMT) base stations in the 3500 MHz band, the assigned Telecommunications Networks and Services Providers (Proveedor de Redes y Servicios de Telecomunicaciones, PRSTs,) needed to ensure the provision of an RF filter external to the Low Noise Block (LNB) for satellite earth stations. PRSTs are legal entities responsible for operating networks and providing telecommunications services to third parties.

The challenge was multifaceted:

- Meeting the specific technical characteristics with small insertion loss and high rejection.
- Ensuring compliance with the reception-

only spectrum use permission.

- Applying the solution to the specified registered earth stations within the given timeframe.

### ■ Solutions

PROSE proposed the Interference Mitigation Filter to address the needs of the customers. The solution involved:

**Improving Insertion Loss Performance:**  
Increasing the Q value to enhance insertion loss performance. This approach allowed the filters to retain more power and maintain the integrity of the input signal, meeting the stringent requirements of the FSS operators.

**Enhancing Rejection Performance:**

Increasing cross-coupling to improve rejection performance. This method significantly boosted the filter's ability to suppress unwanted signals, providing robust protection for the FSS stations.

**Ensuring Rapid Delivery:**

Leveraging PROSE's capability to deliver filters at an exceptionally fast pace. Customers were able to receive the necessary filters quickly, ensuring compliance with the MinTIC regulations and facilitating the timely deployment of the 5G base stations.

## ■ Benefits

The implementation of the Interference Mitigation Filters provided several key benefits:

- **Regulatory Compliance:** Enabled customers to meet the MinTIC requirements, ensuring their operations were compliant with national regulations.
- **Spectrum Usage Permission:** Helped customers secure permission to use the radio spectrum in the 3500 MHz band without delays.
- **Operational Efficiency:** Enhanced the performance of the FSS stations by maintaining signal integrity and effectively mitigating interference.



Interference Mitigation Filter

The collaborative effort between PROSE and the PRSTs resulted in a successful deployment of the Interference Mitigation Filters, meeting the technical and regulatory challenges posed by the 5G frequency band allocation. This case study exemplifies how strategic technical solutions and efficient delivery can overcome complex regulatory and operational hurdles, facilitating the advancement of telecommunications infrastructure in Colombia.

# PROSE

