

Absorptive Microwave Bandpass Filters

Tech ID: 32042 / UC Case 2020-522-0

ABSTRACT

Researchers at the University of California, Davis have developed absorptive bandpass filters that enable improved passband flatness and good impedance matching both in-band and out-of-band.

FULL DESCRIPTION

In radio frequency and microwave systems, filters are used to improve signal clarity and remove or reject undesired “noise.” Conventional filters function by producing mismatched impedance to out-of-band signals. However, this approach can also simultaneously deteriorate the performance of nearby non-linear devices - such as analog-to-digital converters, mixers, and high-gain amplifiers. Therefore, an alternate, technical solution is an isolator. But, too often, these types of devices are bulky, expensive, bandwidth-limited and difficult to integrate into holistic communications systems. Due to these limitations, a more effective, less expensive, absorptive (reflectionless), filter would have broad scientific and commercial applications.

Researchers at the University of California, Davis have developed absorptive bandpass filters that have good impedance match not only in the passband but also in the stopband. These filters integrate absorptive stubs. The absorptive stubs absorb both the out-of-band reflection signals and the close-to-passband signals, resulting a reflectionless stopband and enhanced passband selectivity. As a result, this design for an absorptive filter is both more effective and efficient than other absorptive filters - and also offers much better performance than conventional filters.

APPLICATIONS

- Improves the performance of radio frequency and microwave systems

FEATURES/BENEFITS

- Absorbs out-of-band reflection signals and close-to-band signals, resulting in a reflectionless stopband and enhanced passband selectivity
- Significantly reduces passband insertion loss
- reflectionless at both input and output ports

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,356,129	06/07/2022	2020-522

CONTACT

Andrew M. Van Court
amvancourt@ucdavis.edu
 tel: .



INVENTORS

- Liu, Xiaoguang
- Wu, Xiaohu

OTHER INFORMATION

KEYWORDS

Signal Filters, Absorption

Stubs, Bandpass Filter,

Out-of-band, Microwave,

Radio Frequency

CATEGORIZED AS

- **Communications**
 - Other
 - Wireless
- **Engineering**
 - Engineering
 - Other

RELATED CASES

2020-522-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ Portable Heart Motion Monitor
- ▶ On-Chip Platform for Single-Molecule Electrical Conductance Measurements
- ▶ Using Contact Doppler Radar to Monitor PA Pressure in Heart Failure Patients
- ▶ Field Effect Bipolar Transistor
- ▶ Quarter-Rate Serial Link Receiver with Low Aperture Delay Samplers for High Data Rate Applications
- ▶ A Novel High-Qu Octave-Tunable Resonator And Filter With Lumped Tuning Elements

University of California, Davis

Technology Transfer Office

1 Shields Avenue, Mrak Hall 4th Floor,
Davis,CA 95616

Tel:

530.754.8649

techtransfer@ucdavis.edu

<https://research.ucdavis.edu/technology-transfer/>

Fax:

530.754.7620

© 2020 - 2022, The Regents of the University of California

[Terms of use](#)

[Privacy Notice](#)