

PIERS 2025 Abu Dhabi

Photonics & Electromagnetics Research Symposium
also known as Progress In Electromagnetics Research Symposium

Program

May 4–8, 2025
Abu Dhabi, UAE

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- 16:40 Spatiotemporal Topology in High-order Harmonic Generation
Zijian Lyu (Peking University); Yiqi Fang (Peking University); Yunquan Liu (Peking University);
- 16:55 Spatiotemporal Airy Rings (STAR) Wavepacket
Qian Cao (University of Shanghai for Science and Technology); Xiaolin Su (University of Shanghai for Science and Technology); Andy Chong (Pusan National University); Qiwen Zhan (University of Shanghai for Science and Technology);
- 17:10 Spin-orbit Quantum Frequency Conversion
Rafael Barros (Tampere University); A. Junior (Universidade Federal Fluminense); A. Z. Khoury (Universidade Federal Fluminense); Robert Fickler (Tampere University);
- 14:15 Memristor Based Reconfigurable Band-stop Filter for Aerospace Applications
Rida Gadhafi (University of Dubai); Sabina Abdul Hadi (University of Dubai); Ahmad Ali (University of Dubai); Abdulla Almarzooqi (University of Dubai); Ammar Nayfeh (Khalifa University); Wathiq Mansoor (University of Dubai);
- 14:30 An Ultra-wideband Electromagnetic Protection Antenna
Quanjie Xiong (Southwest University of Science and Technology); Junyi Yang (Southwest University of Science and Technology); Qi Chen (Southwest University of Science and Technology); Jinqi Dong (Southwest University of Science and Technology); Shuyun Lin (Southwest University of Science and Technology);

Session 3P7

Advances in Multi-Band IF, RF, and Microwave Active, Passive and Antenna Components for Aerospace, Defense and Space System Applications across L/S/C/X/Ku/K/Ka Bands

Wednesday PM, May 7, 2025

Room 7 - Capital Suite 4

Organized by Venkata Kishore Kothapudi, Lakshman Pappula

Chaired by Venkata Kishore Kothapudi, Lakshman Pappula

- 14:45 **A Conceptual Design of Microwave Power Dividing Amplifiers**
Jongsik Lim (Soonchunhyang University); Jeongho Park (Soonchunhyang University); Sang-Min Han (Soonchunhyang University); Dal Ahn (Soonchunhyang University); Yongchae Jeong (Jeonbuk National University);
- 15:00 Modified Coplanar Waveguide RF MEMS Based Switch
M. P. Lauksiga (Amrita Vishwa Vidyapeetham); Pranav Vinod (Amrita Vishwa Vidyapeetham); A. P. Praveen (Amrita Vishwa Vidyapeetham); Sreedevi K. Menon (Amrita Vishwa Vidyapeetham);
- 15:15 An Open Stub Loaded Microstrip Line for Adulteration of Liquid Food Materials
Nair S. Bhuvana (Amrita Vishwa Vidyapeetham); C. E. Arya Eswar (Amrita Vishwa Vidyapeetham); Ignacio Gil (Universitat Politècnica de Catalunya); Sreedevi K. Menon (Amrita Vishwa Vidyapeetham);
- 15:30 **Coffee Break**
- 16:00 Design and Development of a High Performance Two-element MIMO Antenna for 5.9 GHz Vehicular Communication
Bhavya Babu (Amrita Vishwa Vidyapeetham); Sajeer Aiswarya (Amrita Vishwa Vidyapeetham); Nair S. Bhuvana (Amrita Vishwa Vidyapeetham);
- 16:15 Metamaterial Based Frequency Tunable mmWave Antenna for Communication Applications
R. Budhi Sagar (Center for Wireless Networks & Applications (WNA)); L. Meenu (Center for Wireless Networks & Applications (WNA)); Sajeer Aiswarya (Center for Wireless Networks & Applications (WNA));
- 16:30 Ultra-compact Substrate Integrated Waveguide Band-pass Filter with Unequal Termination Impedance and Wide-stopband Characteristics
Phanam Pech (Jeonbuk National University); Palaystint Thorng (Jeonbuk National University); Girdhari Chaudhary (Jeonbuk National University); Jongsik Lim (Soonchunhyang University); Yongchae Jeong (Jeonbuk National University);
- 13:30 Arbitrary Power Division Ratio Multi-functional Filtering Power Divider With Reciprocal and Non-reciprocal Frequency Response
Girdhari Chaudhary (Jeonbuk National University); Palaystint Thorng (Jeonbuk National University); Suyeon Kim (Jeonbuk National University); Phanam Pech (Jeonbuk National University); Yongchae Jeong (Jeonbuk National University);
- 13:45 Unequal Termination Impedance 3dB Branch Line Hybrid Coupler
Palaystint Thorng (Jeonbuk National University); Suyeon Kim (Jeonbuk National University); Phanam Pech (Jeonbuk National University); Girdhari Chaudhary (Jeonbuk National University); Yongchae Jeong (Jeonbuk National University);
- 14:00 A Dual-band Electromagnetic Protection Antenna
Junyi Yang (Southwest University of Science and Technology); Quanjie Xiong (Southwest University of Science and Technology); Jinqi Dong (Southwest University of Science and Technology); Shuyun Lin (Southwest University of Science and Technology); Qi Chen (Southwest University of Science and Technology);

A Conceptual Design of Microwave Power Dividing Amplifiers

Jongsik Lim¹, Jeongho Park¹, Sang-Min Han¹, Dal Ahn¹, and Yongchae Jeong²

¹Soonchunhyang University, Republic of Korea

²Jeonbuk National University, Republic of Korea

Abstract— Conventional microwave amplifiers have one input port and one output port. Therefore, only one input matching network (IMN) and output matching network (OMN) are required, respectively. If one wishes to get two output signals from a microwave amplifier, the combination between, so-called the single ended amplifier (SEA) and a microwave power dividing structure such as Wilkinson divider has been essential. In this study, the design of microwave amplifiers which has a power dividing function is described. In designing of the output matching network of the power dividing amplifier (PDA), the impedance of the output matching network is doubled compared to the conventional single ended amplifier so that the half of the amplified signal is transmitted to each of two output ports. In this study, as an example, a normal single ended amplifier with the single output port (Fig. 1) is designed at 3.5 GHz, of which gain is around 14 ~ 15 dB, to be compared for the verification of the proposed idea. In addition, the proposed power dividing amplifier (Fig. 2), of which gain is 11 ~ 12 dB per each port, is designed and compared. The comparison between two gains (Fig. 3) show that the gain of the proposed power dividing amplifier is only half of the conventional single-output (single-ended) amplifier, while port matching performances are so similar to the conventional single ended amplifier. The difference in the gain of the two amplifiers is around 3 dB, which means the proposed power dividing amplifier does not require any power dividing structure as does in conventional design.

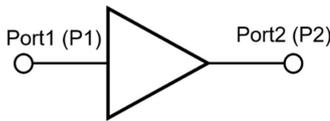


Figure 1: Conventional structure of single-ended amplifiers.

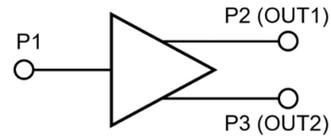


Figure 2: Proposed structure of the proposed power dividing amplifier.

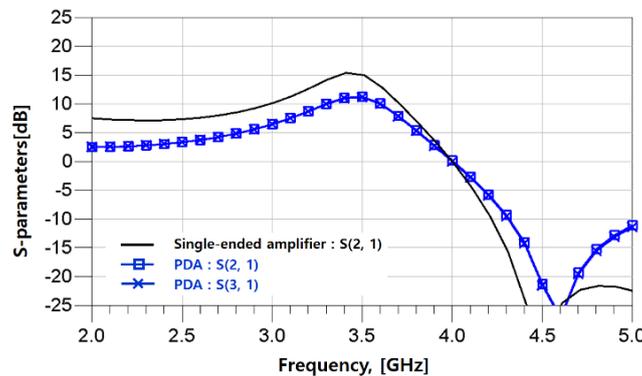


Figure 3: Comparison of gains from the single-ended amplifier and proposed PDA.

ACKNOWLEDGMENT

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