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Compact wideband multi-section quarter-wave-like transformers

By: Satitchantrakul, T (Satitchantrakul, Thanatcha)^[1]; Akkaraekthalin, P (Akkaraekthalin, Prayoot)^[2]; Silapunt, R (Silapunt, Rardchawadee)^[1]; Torrungrueng, D (Torrungrueng, Dana)^[3]

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Abstract

This paper proposes a novel design technique of the compact wideband transformer based on the quarter-wave-like transformer (QWLT) theory and the approximate theory of small reflections (ATSR). The ATSR for multi-section QWLTs is applied for analysing characteristics of multi-section QWLTs. The prototypes of two-section QWLTs operating at 2.4GHz with 25% physical size reduction, comparing to that of the corresponding of wideband multi-section quarter-wave transformer (QWT), are implemented. It is found that measured results are matched reasonably well with results of the ATSR for multi-section QWLTs. In addition, the two-section QWLT prototypes provide slightly less bandwidth compared to that of the corresponding wideband multi-section QWT.

Keywords

Author Keywords: Approximate theory of small reflections; quarter-wave transformer; quarter-wave-like transformer; wideband multi-section transformer

KeyWords Plus: IMPEDANCE TRANSMISSION-LINES; POWER DIVIDERS; DESIGN; FILTERS

Author Information

Reprint Address: Silapunt, R (reprint author)

King Mongkuts Univ Technol, Dept Elect & Telecommun Engr, Bangkok, Thailand.

Addresses:

[1] King Mongkuts Univ Technol, Dept Elect & Telecommun Engr, Bangkok, Thailand

[2] King Mongkuts Univ Technol North Bangkok, Dept Elect & Comp Engr, Bangkok, Thailand

[3] King Mongkuts Univ Technol North Bangkok, Dept Teacher Training Elect Engr, Bangkok, Thailand

E-mail Addresses: rardchawadee.sil@kmutt.ac.th

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ABSTRACT

This paper proposes a novel design technique of the compact wideband transformer based on the quarter-wave-like transformer (QWLT) theory and the approximate theory of small reflections (ATSR). The ATSR for multi-section QWLTs is applied for analysing characteristics of multi-section QWLTs. The prototypes of two-section QWLTs operating at 2.4 GHz with 25% physical size reduction, comparing to that of the corresponding of wideband multi-section quarter-wave transformer (QWT), are implemented. It is found that measured results are matched reasonably well with results of the ATSR for multi-section QWLTs. In addition, the two-section

QWLT prototypes provide slightly less bandwidth compared to that of the corresponding wideband multi-section QWT.

KEYWORDS: Approximate theory of small reflections, quarter-wave transformer, quarter-wave-like transformer, wideband multi-section transformer

Additional information

Author information

Thanatcha Satitchantrakul

Thanatcha Satitchantrakul received her BE and ME from King Mongkut's University of Technology Thonburi in 2010 and 2014, where she is currently pursuing the PhD degree. Her research interests include antenna applications, transmission line, RF and microwave circuit.

Prayoot Akkaraekthalin

Prayoot Akkaraekthalin received the BE and ME degrees in Electrical Engineering from King Mongkut's University of Technology North Bangkok, Thailand, in 1986 and 1990, respectively, and the PhD degree from the University of Delaware, Newark, USA, in 1998. From 1986 to 1988, he worked in the Microtek Laboratory, Thailand. In 1988, he joined the Department of Electrical Engineering, KMUTNB. His current research interests include passive and active microwave circuits, wideband and multiband antennas, and telecommunication systems. He was the Chairman for the IEEE MTT/AP/ED Thailand Joint Chapter during 2007 and 2008, and the president for ECTI Association, Thailand from 2014 to 2015. He is now working on the Senior Research Scholar Project for Thailand Research Fund (2015–2017).

Rardchawadee Silapunt

Rardchawadee Silapunt received the BE degree in electrical

engineering from Chulalongkorn University, Thailand, in 1996, and the MS and PhD degrees in electrical and computer engineering from University of Wisconsin-Madison, USA, in 1998 and 2004, respectively. In 2004, she joined the Department of Electronic and Telecommunication Engineering, King Mongkut's University of Technology Thonburi, Thailand, as a lecturer. Her current research interests include transmission lines and applications, microwave devices, photonics, and plasmonics. Since the beginning of her career, she has received several research grants from government funding agencies and private sectors.

Danai Torrungrueng

Danai Torrungrueng received his BE degree in electrical engineering from Chulalongkorn University, Bangkok, Thailand, in 1993. He obtained his MS and PhD degrees in electrical engineering from The Ohio State University, Ohio, USA in 1996 and 2000, respectively. From 1995 to 2000, he was a Graduate Research Assistant (GRA) in the Department of Electrical Engineering, ElectroScience Laboratory, The Ohio State University. Prior to joining Asian University in Thailand in 2002, he worked as a senior engineer in the USA, involved in research and development of the urban propagation modeling project. At present, he is a professor in the Department of Teacher Training in Electrical Engineering in the Faculty of Technical Education at King Mongkut's University of Technology North Bangkok, Bangkok. His research interests are in the areas of electromagnetic sensors, fast computational electromagnetics, rough surface scattering, propagation modeling, electromagnetic wave theory, microwave theory and techniques and antennas.

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Disclosure statement

No potential conflict of interest was reported by the authors.

