PIERS 2011 Suzhou

Progress In Electromagnetics Research Symposium

Program

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Suzhou, CHINA

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Session 4A6
High Power Electromagnetics (HPE) & Electromagnetic Pulse (EMP)

Thursday AM, September 15, 2011

Room F

Organized by Yan-Zhao Xie, Li-Hua Shi

Chaired by Yan-Zhao Xie, Li-Hua Shi

08:20 System-level Susceptibility Analysis for Intentional EMI Based on Bayesian Networks
Congguang Mao (*Northwest Institute of Nuclear Technology, China*); *Hui Zhou* (*Northwest Institute of Nuclear Technology, China*); *Zhitong Cui* (*Northwest Institute of Nuclear Technology, China*); *Aibin Zhai* (*Northwest Institute of Nuclear Technology, China*); *Beiyun Sun* (*Northwest Institute of Nuclear Technology, China*);

08:40 Time Domain Analysis of Nonlinear Load Terminated in Shielded Cable
Yinghui Zhou (*PLA University of Science & Technology, China*); *Li-Hua Shi* (*PLA University of Science and Technology, China*); *Liyuan Su* (*PLA University of Science and Technology, China*);

09:00 Research on High Voltage Electrostatic Discharge to EED and Fuze
Tuan Zhao (*Shaanxi Applied Physics-Chemistry Research Institute, China*); *Lixia Wang* (*Shaanxi Applied Physics-Chemistry Research Institute, China*); *Qingmei Feng* (*Shaanxi Applied Physics-Chemistry Research Institute, China*); *Hongzhi Yao* (*Shaanxi Applied Physics-Chemistry Research Institute, China*); *Xiangfei Ji* (*Shaanxi Applied Physics-Chemistry Research Institute, China*);

09:20 Analytic Solution of Electromagnetic Pulse (EMP) Coupling to Multiconductor Transmission Lines
Yan-Zhao Xie (*Northwest Institute of Nuclear Technology, China*); *Hui Xiang* (*Northwest Institute of Nuclear Technology, China*); *Dongyang Sun* (*Institute of Nuclear Technology, China*);

09:40 A Method for Assessing EED against HPEM
Hongzhi Yao (*Shaanxi Applied Physics-Chemistry Research Institute, China*); *Qingmei Feng* (*Shaanxi Applied Physics-Chemistry Research Institute, China*); *Tuan Zhao* (*Shaanxi Applied Physics-Chemistry Research Institute, China*); *Xiangfei Ji* (*Shaanxi Applied Physics-Chemistry Research Institute, China*);

10:00 **Coffee Break**

10:20 Measurement of the Shielding Effectiveness of Connector by Improved Triaxial Method
Qi Zhang (*University of Science & Technology, China*); *Li-Hua Shi* (*Nanjing Engineering Institute, China*); *Yinghui Zhou* (*PLA University of Science & Technology, China*); *Cheng Gao* (*University of Science & Technology, China*); *Yong Chao Guo* (*University of Science & Technology, China*);

10:40 A Small-sized Fast Rise Time HEMP Simulator
Yan-Xin Li (*Nanjing Engineering Institute, China*); *Qiwu Wang* (*Nanjing Engineering Institute, China*); *Li-Hua Shi* (*Nanjing Engineering Institute, China*); *Cheng Gao* (*Nanjing Engineering Institute, China*); *Feng Lu* (*Nanjing Engineering Institute, China*); *Bi-Hua Zhou* (*Nanjing Engineering Institute, China*);

11:00 Coupling Energy Analysis and Calculation of HEMP on EED
Xiangfei Ji (*Shaanxi Applied Physics-Chemistry Research Institute, China*); *Qingmei Feng* (*Shaanxi Applied Physics-Chemistry Research Institute, China*); *Tuan Zhao* (*Shaanxi Applied Physics-Chemistry Research Institute, China*); *Hongzhi Yao* (*Shaanxi Applied Physics-Chemistry Research Institute, China*);

11:20 A Multi-step Electromagnetic Topology Method to Compute the Coupling of External Electromagnetic Fields and Inner Wires of a Cavity through Apertures
Guyan Ni (*National University of Defense Technology, China*); *Ying Li* (*National University of Defence Technology, China*); *Jianshu Luo* (*National University of Defence Technology, China*);

Session 4P2a
Defected Ground Structure (DGS) and Its Applications

Thursday PM, September 15, 2011

Room B

Organized by Dal Ahn

Chaired by Hai-Wen Liu, Jongsik Lim

13:00 A Miniaturized Low Pass Filter Using Common Defected Ground Structures
Jun Lee (*Soonchunhyang University, Republic of Korea*); *Jaehoon Lee* (*Soonchunhyang University, Republic of Korea*); *Jongsik Lim* (*Soonchunhyang University, Republic of Korea*); *Yongchae Jeong* (*Chonbuk National University, South Korea*); *Sang-Min Han* (*Soonchunhyang University, Korea*); *Dal Ahn* (*Soonchunhyang University, Korea*);

Session 4P2a
Defected Ground Structure (DGS) and Its Applications

A Miniaturized Low Pass Filter Using Common Defected Ground Structures

Jun Lee[1], **Jaehoon Lee**[1], **Jongsik Lim**[1], **Yongchae Jeong**[2], **Sang-Min Han**[1], **and Dal Ahn**[1]

[1]Soonchunhyang University, Republic of Korea
[2]Chonbuk National University, Republic of Korea

Abstract— A new design method for a miniaturized low pass filter (LPF) for microwave frequency region using a common defected ground structure (CDGS) is described in this paper. As has been widely known already, defected ground structures (DGS) are etched patterns on the ground plane around transmission lines such as microstrip and coplanar waveguide. The representative geometry of DGS is dumb-bell shape, as shown in Fig. 1, which cause the additional inductive and capacitive components equivalently. Thus the characteristic impedance and slow wave factor of the microstrip line increase, so it is useful in design new type of circuits and reducing the circuit size. If two microstrip lines exist back-to-back to each other's ground plane, the DGS pattern may exist commonly on the shared ground plane (Fig. 2) and give two microstrip lines the well known advantages commonly. Therefore, the advantages of previous DGS LPF (Fig. 3) such as compact size may be doubled by folding the microstrip line section and consisting of the common DGS (CDGS) as shown in Fig. 4. As the result, the half-sized LPF is obtained using CDGS. In order to show the validity of the proposed design, an example of LPF using CDGS and double-sided microstrip lines is designed using the dielectric substrate with 2.2 of dielectric constant and 31 mils of thickness. The size of the designed LPF using CDGS is only 52.6% (Fig. 5) compared to that designed by the previous LPF with the conventional DGS. It is shown that the performances of the proposed LPF are well preserved after the size-reduction with the S_{11} and S_{21} are $-25\,\mathrm{dB_{min}}$ and $-0.1\,\mathrm{dB_{max}}$, respectively.

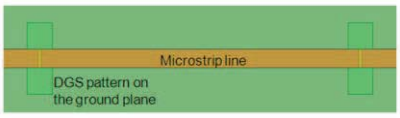

Figure 1.

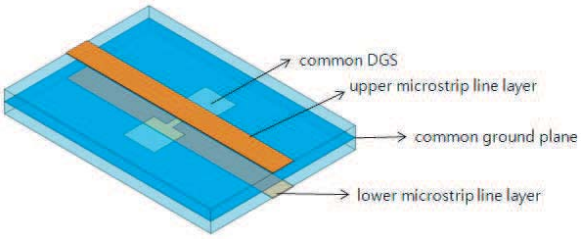

Figure 2.

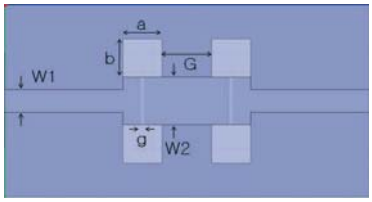

Figure 3.

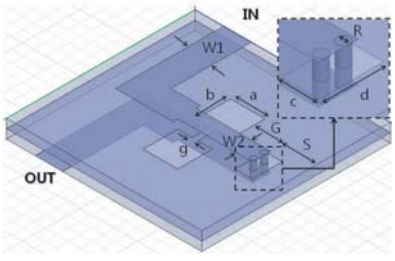

Figure 4.

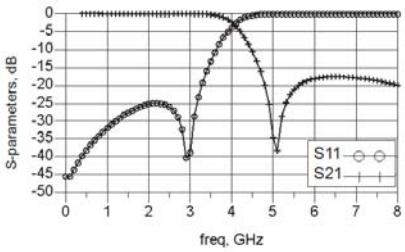

Figure 5.

ACKNOWLEDGMENT

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