

## OPINION

in a competition for the academic position "Associate Professor" in the area of higher education 5. Technical science, professional field 5.2. Electrical engineering, electronics and automatics, Scientific speciality Industrial electronics, promulgated in State Gazette, issue 68/31.07.2020 for TU-Gabrovo, Department of Electronics  
Candidate: Prodan Ivanov Prodanov, PhD, Assistant Professor

Member of Scientific Jury: Assoc. Prof, PhD, Eng. Dimitar Arnaudov,  
TU-Sofia, Department of Power electronics

### 1. Summary of the scientific activity and achievements of the candidate

The research and scientific applied activity of Assistant Prof. Prodan Prodanov is in the field of electronic devices for electrical technology. It is related to the modeling of electronic converters and modeling of their reliability. The topics are relevant and cover electricity converters for electrical technologies, power supplies for lighting, reliability of electronic equipment, reliability of energy storage systems, control of new types of transistors, motor control and more.

In the competition for Associate Professor the candidate participates with publications equivalent to monographic work. The performance of the indicators by groups according to the national minimum requirements of the LDASRB is as follows:

**Group A – Indicator 1:** The candidate has submitted a PhD diploma in the professional field 5.2. and an abstract of a thesis defended at the Technical University of Gabrovo and a PhD diploma.

**Group B – Indicator 4:** There are 11 publications, equivalent to a monographic work, on the topic "Reliability of electrotechnologic devices" with a total of 370 points (minimum 100 points are required). The publications are in the Scopus and WoS world databases.

**Group Γ – Indicator 7:** There are 4 publications with a total of 93,33 points. One of them is in an journal with with SJR. **Indicator 8:** 23 publications with a total of 225,03 points (total for group Γ – 318,36 points (minimum of 200 points required).) Four of the publications are stand-alone. A total of six stand-alone publications by groups B and Γ.

**Group Д – Indicator 12:** The candidate has submitted 140 points on this indicator (50 points are required).

**Group Ж – Indicator 30:** - lectures on the last years – Asistant Prof. Prodanov has held lectures on various disciplines in the field of electronic converters. The disciplines are from the curriculum of the specialties: "Electronics", "Communication Equipment and Technologies" and "Mechatronics" - Bachelor's degree, as well as from the curriculum for Master's degree in "Electronics".

## **2. General characteristics of the candidate's activity**

### **2.1. Evaluation of the pedagogical preparation and activities of the candidate.**

The teaching activity of Ch. Assistant Professor Prodanov started as an assistant in 2010 in the Department of Electronics, and currently holds academic position "ch. assistant" in the same department. In 2010 he also received an PhD. The submitted documents indicate 15 students who, under the guidance of Ch. Assistant Professor Prodanov participated in student research sessions in the period from 2011 to 2020. These developments were the basis of their theses. He is the supervisor of the diploma theses of 34 students with a bachelor's degree and 19 students with a master's degree. Ch. Assistant Professor Prodanov is a co-author of three manuals for laboratory exercises and the author of a textbook. He has participated in the development of 11 curricula. I believe that he has fulfilled the indicators from a methodological point of view for working with students. He has created and modernized the laboratory base of three laboratories at the Technical University - Gabrovo. One of the laboratories is equipped with the help of a leading company in the field of electronics.

### **2.2. Scientific and scientific-applied activity**

The scientific activity of the candidate is reflected in the presented publications. He is a participant in six research contracts with the assignor TU-Gabrovo. On one contract he is a manager. He is also a member of the research team of a contract funded by the NSF.

### **2.3. Implementation activity**

The candidate has submitted four implementation documents. The implementations are related to the design and implementation of electronic units of electrical systems. As a result of the implementations, the reliability of these systems has been increased.

## **3. Basic scientific and applied contribution. Significance of contributions to science and practice**

Scientific contributions - These contributions are related to the compiled classifications and structure of the methodologies for analysis of the failure rate of electronic components. A new approach for determining the limit values of the thermal regimes of a whole class of power semiconductor elements is presented, as well as for the analysis of the reliability indicators of power MOSFET transistors based on a model.

Applied scientific contributions - These contributions are in the field of synthesis of probabilistic models: taking into account the time for preventive prophylaxis and functional connections on the reliability of inclusion, determining the effectiveness of protective circuits in power circuits of converters, for electricity storage systems.

Another group of contributions is related to the proposed simulation models and performed simulation research in the PSPICE environment of the modes of operation of a wide class of electronic circuits of power converters. As a result of these studies, parameters are obtained that are very difficult to measure experimentally. Devices with improved functionality, element base and control methods have been developed, researched and implemented.

## **4. Evaluation of the personal contribution of the candidate**

I had the opportunity to talk to the candidate, as a participant or as part of an organizing committee of scientific forums. From the interview with him I am convinced of his personal contribution to the publishing and research activities. No separation protocols have been submitted for the publications.

## **5. Critical remarks and recommendations**

I have no significant remarks on the presented materials, I recommend that the results of the author's research be presented in an appropriate way in scientific journals with impact factor and impact rank. Also to increase the number of scientific forums, where he presents his results.

## **6. Personal impressions**

My personal impressions are that Assistant Professor Dr. Eng. Prodan Prodanov is a promising young university lecturer and scientist. He has the necessary competencies. I am convinced that his development in his academic career will increase the scientific capacity of the department and the university.

## **7. Conclusion**

Having in mind the above, **I propose Ch. Assistant Professor Dr. Prodan Ivanov Prodanov should be awarded** with the academic rank of **“Associate Professor”** in professional field **5.2. Electrical engineering, electronics and automatics**, scientific specialty **“Industrial electronics”**.

18.12.2020 г.

**Scientific Jury member: /signature/  
/Assoc. Prof. PhD Dimitar Arnaudov/**