

**Contents**

01	<b>Dirk Riedinger</b> - A review and analysis of Quade's fundamental geometric time domain concept for the summation of non-active powers of poly-phase systems	1
02	<b>Přemysl JANÚ, Šimon Brázda, Barbora ODVÁRKOVÁ</b> - A module for analysis of power supplies of an electronic security systems	9
03	<b>Inna HONCHARUK, Ihor KUPCHUK, Vitaly YAROPUD, Ruslan KRAVETS, Serhiy BURLAKA, Valerii HRANIAK, Julia POBEREZHETS, Volodymyr RUTKEVYCH</b> - Mathematical modeling and creation of algorithms for analyzing the ranges of the amplitude-frequency response of a vibrating rotary crusher in the software Mathcad	14
04	<b>Agnieszka CHOROSZUCHO</b> - Analysis of the influence of the conductivity of bricks, type of bricks and size of the hollows on the values of the electric field intensity	21
05	<b>Vadim MANUSOV, Dmitry ORLOV, Vitaly KARMANOV, Alexander KHUSNUTDINOV, Sergey KOKIN, Murodbek SAFARALIEV</b> - Analysis of electricity consumption forecasting methods for the coal industry	26
06	<b>Naima HASSANI, Hamid BOUZEBOUDJA, Mimoun YOUNES</b> - Economic dispatch problem using artificial bee colony optimization based on predator and prey concept	32
07	<b>Darmansyah, Imam ROBANDI</b> - Intelligent Voltage Controller Based on Fuzzy Logic for DC-DC Boost Converter	36
08	<b>M. I. Idris, H. Hussin, S. A. M. Junos, W. H. M. Saad, M. N. Shah Zainudin, N. M. Yatim, A. S. Jaafar, M. R. Kamarudin, K. M. Saipullah</b> - VSLAM analysis using various ORBSLAM parameters setting	41
09	<b>Benmessaoud Mourad, Abboun A.M, Benmessaoud N</b> - Optimization of Direct Methanol Fuel Cell Power System	46
10	<b>Arkadiusz WILCZYŃSKI, Olena HEBDA</b> - Switch-mode power supply with a service life detection system based on monitoring of aluminium electrolytic capacitor parameters	51
11	<b>Marian HYLA</b> - Reactive power compensation in a 6 kV power grid supplying a 12-pulse thyristor hoisting machine	56
12	<b>Adam GARCZAREK, Dorota STACHOWIAK</b> - Static tests of current collectors in the production process and during operation	62
13	<b>Bartłomiej STEFAŃCZAK, Dariusz ZIELIŃSKI</b> - The problem of the influence of phase current asymmetry and the direction of energy flow on the idle current of a transformer in star-delta winding configuration	67
14	<b>Krzysztof WRÓBEL, Krzysztof TOMCZEWSKI, Andrzej TOMCZEWSKI</b> - Analysis of the possibility of expanding a photovoltaic installation with a wind generator	73
15	<b>Krzysztof SOŁTYS, Sebastian BARTEL, Krzysztof KLUSZCZYŃSKI</b> - Installation for the production of ferromagnetic powder by electrolysis in laboratory conditions	77
16	<b>Kalina DETKA, Sebastian LIGEZA</b> - Investigation of the properties of an inductor with a hybrid core	82
17	<b>Michał WYSOCKI, Robert NICPOŃ, Marta TRZASKA, Agnieszka CZAPIEWSKA</b> - Research of Accuracy of RSSI Fingerprint-Based Indoor Positioning BLE System	86
18	<b>Krzysztof GÓRECKI, Przemysław PTAK, Jakub HELENIAK</b> - Investigations of the distortion of the supply current and optical parameters of selected lamps	90
19	<b>Adrian PIETRUSZKA, Paweł GÓRECKI, Jacek TARASIUK, Agata SKWAREK</b> - Influence of the location of solder the thermal parameters of the MOSFET transistors	94
20	<b>Leszek PIECHOWSKI, Jan IWASZKIEWICZ, Adam MUC, Krystian KASPEREK</b> - 4-channel temperature meter using Pt100 sensors	99
21	<b>Damian BISEWSKI</b> - Application of the genetic algorithm in the estimation process of models parameters of semiconductor devices	103
22	<b>Krzysztof GÓRSKI, Michał ŁUKOMSKI</b> - Renewable energy sources in powering miniature electronic devices	107
23	<b>Leszek PIECHOWSKI, Jan IWASZKIEWICZ, Adam MUC</b> - The connection structure of the resistors is hidden in the value of a natural binary code	111
24	<b>Jan IWASZKIEWICZ, Adam MUC, Agata BIELECKA</b> - Six-phase Two-level VSI Control based on Polar Voltage Space Vectors	115
25	<b>Magdalena BUDNAROWSKA, Jerzy MIZERACZYK</b> - Simulation and experimental studies of the electromagnetic properties of a planar metamaterial array structure in the microwave range	119
26	<b>Sergii BESPALKO, Jerzy MIZERACZYK</b> - The plasma discharges in the anodic and cathodic regimes of plasma driven solution electrolysis for hydrogen production	122
27	<b>Magdalena BUDNAROWSKA, Jerzy MIZERACZYK</b> - Numerical simulation in the frequency domain of the shielding effectiveness of the interior of the enclosure with an opening against an ultrashort high power electromagnetic pulse	126
28	<b>Krzysztof GÓRSKI, Sebastian SZYMAŃSKI, Igor MIELCZAREK, Jakub GRZESIAK</b> - The literature review on detection and combating Unmanned Aerial Systems	130
29	<b>Agnieszka CZAPIEWSKA, Ryszard STUDAŃSKI, Andrzej ŻAK</b> - Data transmission in the hydroacoustic channel under NLOS	135
30	<b>Kalina DETKA, Krzysztof GÓRECKI</b> - Analysis the usefulness of the method of determining power losses in magnetic materials based on the measurement of the hysteresis loop surface area	139
31	<b>Michał DOWNAR-ZAPOLSKI, Piotr MYSIAK</b> - Analysis and synthesis, design and implementation of the single-phase voltage inverter model controlled by PFM modulation	143
32	<b>Radosław GŁĄB, Dorota Rabczuk</b> - Application to monitor the base station of a radio communication system using the SNMP protocol	147
33	<b>Emilian ŚWITALSKI, Krzysztof GÓRECKI</b> - Using Lambert-W function in modelling characteristics of an alkaline electrolyser	150
34	<b>Wiesław CITKO, Wiesław Sieńko</b> - Image Recognition and Reconstruction as Inverse Problem, Using Machine Learning System	154
35	<b>Krzysztof GÓRECKI, Paweł GÓRECKI</b> - Influence of the form of the thermal model on accuracy of computing DC characteristics of IGBT module	158
36	<b>Dominika DĄBRÓWKA, Robert P. SARZAŁA</b> - Suppression of the thermal crosstalk effect in laser arrays	162
37	<b>Robert P. SARZAŁA, Julieta POBORSKA</b> - Thermal Investigation of GaAs-Based 2D VCSEL Diode Arrays	166
38	<b>Witalis PELLOWSKI Agnieszka IWAN , Krzysztof A. BOGDANOWICZ</b> - Conversion of photons of light generated by radiation excited photoluminescence into electricity in izo-photovoltaic cells a new challenge for energy security	170
39	<b>Jacek KONOPACKI, Jan MACHNIEWSKI</b> - A simple, digital method for background estimation of timing mismatches in time-interleaved ADCs -	174

**Contents**

40	<b>Agnieszka IWAN, Krzysztof A. BOGDANOWICZ, Wojciech PRZYBYŁ</b> - Organic hole transporting layer in polymer and perovskite solar cells – selected materials and technical aspects	178
41	<b>Wojciech PRZYBYŁ, Ireneusz PLEBANKIEWICZ, Krzysztof A. BOGDANOWICZ, Agnieszka IWAN</b> - Detections methods of structural defects in layers of organic solar cells	182
42	<b>Karolina KOWALSKA, Marta KUWIK, Joanna PISARSKA, Dominik DOROSZ, Wojciech A. PISARSKI</b> - Multicomponent titanate-germanate glasses for infrared photonics	186
43	<b>Jacek CHĘCINSKI, Zdzisław FILUS</b> - Virus- and bactericidal LED lamp with increased efficiency	190
44	<b>Piotr MAĆKÓW, Piotr GUZDEK, Jacek BISKUPSKI, Wojciech GRZESIAK</b> - Innovative energy storage with monitoring and supervision functions. Selected Issues	194
45	<b>Jakub KISAŁA, Andrzej KOCIUBIŃSKI, Karolina CZARNACKA, Mateusz GĘCA, Jakub DUK</b> - Investigations of the influence of copper layer thickness on the giant magnetoresistance effect in NiFe/Cu/NiFe thin films	199
46	<b>Ewa SCHAB-BALCERZAK, Jolanta KONIECZKOWSKA, Karolina BUJAK</b> - Controlling the photoinduced properties of azopolymers	202
47	<b>Julian BALCEREK, Adam KONIECZKA, Paweł PAWŁOWSKI, Cyprian DANKOWSKI, Mateusz FIRLEJ, Piotr FULARA</b> - Automatic recognition of vehicle wheel parameters	205
48	<b>Adam KONIECZKA, Szymon BALAWAJDER</b> - Laboratory stand for the automatic testing of digital cameras parameters	209
49	<b>Małgorzata RUDNICKA, Ewa KLUGMANN-RADZIEMSKA</b> - Consequences of suboptimal design of Building Integrated Photovoltaic Installation – a case study for Gdańsk, Poland	213
50	<b>Jakub SUDER</b> - Parameters evaluation of cameras in embedded systems	216
51	<b>Monika Pokladko-Kowar, Katarzyna Wojtasik</b> - Organic light-emitting diodes based on pyrazoloquinoxaline derivatives	220
52	<b>Paweł KIELAN, Szymon OLEŚ</b> – An augmented reality application design dedicated to multi-module valve terminals in the Festo CPX series	224
53	<b>Jarosław WRÓBEL, Sebastian ZŁOTNIK, Jacek BOGUSKI, Marek KOJDECKI, Jerzy WRÓBEL</b> - Characterization of multi-channel charge carrier transport for epitaxial semiconductor structures	228
54	<b>Katarzyna DYNDĄŁ, Zbigniew SOBKOW, Jerzy SANETRA, Konstanty W. MARSZAŁEK</b> - Hall effect test bench for temperature dependence of carrier concentration	231
55	<b>Jan GIELZECKI, Ryszard MANIA, Konstanty MARSZAŁEK, Robert WOLANSKI</b> - Deposition of Thin (Ti,Si)N Reflective Layers on Textiles Substrates	235
56	<b>S. IWANEK, Jerzy SANETRA, Konstny W. MARSZAŁEK</b> - Optical method for homogeneity testing of thin films electrodes for photovoltaic cells	239
57	<b>Katarzyna DYNDĄŁ, Konstanty W. MARSZAŁEK, Zbigniew KĄKOL</b> - Design of complex energy systems (thin film photovoltaics, collectors, heat pumps and energy storage)	243
58	<b>Szymon KIEŁCZAWA, Artur WIATROWSKI</b> - Specific method of deposition of aluminium-doped zinc oxide thin films on flexible glass substrates	247
59	<b>Janusz RYBAK, Konstanty MARSZAŁEK</b> - Deposition and optical properties investigations of $WO_3$ thin films for electrochromic device applications	251
60	<b>Katarzyna UNGEHEUER, Konstanty W. MARSZAŁEK, Marzena MITURA-NOWAK, Zbigniew. KAKOL</b> - Modification of semiconducting copper oxide thin films using ion implantation	255
61	<b>Krzysztof Kluszczyński, Zbigniew Pilch</b> - Comparison of the magnetorheological 1- and 2-disc clutch in terms of overall dimensions, coefficients of the use of active materials, electric power consumption and spatial temperature distribution	259
62	<b>Maksymilian CIERNIEWSKI, Wojciech JAKUSZKO, Paweł STOBNICKI</b> - Control of the main circuit of a hybrid rail vehicle	265
63	<b>Tomasz MAKOWSKI, Maciej GIBAS, Kacper CHOJKOWSKI</b> - Design and construction of a wheelchair with a caterpillar drive with a seat auto-leveling system	269
64	<b>Ewa ZAWADZKA, Henryk BRZEZIŃSKI, Urszula ŚWITALA</b> - Secondary raw materials in composite products in the automotive industry	273
65	<b>Milena KURZAWA, Rafał M. WOJCIECHOWSKI</b> - Determination of the parameters of equivalent schema of the pulse transformer using the Cauer circuits	277
66	<b>Jakub BERNATT, Stanisław GAWRON, Tadeusz GLINKA, Artur POLAK</b> - Block Transformer Fires	282
67	<b>Marek HRECZKA, Wojciech BURLIKOWSKI, Janusz HETMAŃCZYK, Aleksandra Kolano-BURIAN, Roman KOLANO</b> - Core of brushless DC motors made of amorphous soft magnetic material	126
68	<b>Maciej JAROSZEWSKI, Paweł RÓZGA, Abderrahmane BEROUAL, Karol SKOWROŃSKI, Mariusz WÓJCIAK</b> - Some factors that influence the breakdown voltage of biodegradable transformer oil	293
69	<b>Bogusław GRUSZCZYŃSKI, Rafał M. WOJCIECHOWSKI</b> - Design and synthesis of the magnetic circuit of a differential eddy current transducer for non-destructive testing	296
70	<b>Jakub BERNATT, Stanisław GAWRON, Tadeusz GLINKA, Tomasz WOLNIK</b> - Analysis of the benefits of using 6-phase windings in motors excited with permanent magnets	302
71	<b>Krzysztof Mars, Mateusz Sałęga – Starzecki, Elżbieta Godlewska</b> - Influence of the magnetron power mode on the properties of SnSe layers	307
72	<b>Stanisław Krawczyk, Elżbieta Czerwosz, Halina Wronka, Piotr Firek, Mariusz Sochacki, Jan Szmidt</b> - Comparison of Field Effect Transistor with C-nPd gate and resistive C-nPd film sensing properties toward hydrogen	311