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Table of Contents

| | |
|---|-----------|
| MEMS And Nano Technology For The Handheld, Portable Electronic And The Automotive Markets | 1 |
| <i>Albert P. Pisano</i> | |
| Concepts For Carbon Nanotube Sensors..... | 5 |
| <i>Christofer Hierold</i> | |
| Micro And Nano Chemical System On Chip..... | 11 |
| <i>Takehiko Kitamori</i> | |
| Contraction Measurements Of Cardiomyocytes Grown On Silicon Cantilevers..... | 17 |
| <i>M. Todorova, Ph. Stücklin, A. Bertsch, S. Rohr and Ph. Renaud</i> | |
| Micro Heater With Pt-Cr Thin Film Thermo-Couple For High Speed Biological Measurements | 20 |
| <i>F. Gillot, H.F. Arata, F.O. Morin, D. Collard, and H. Fujita</i> | |
| Spatially Focused Reagent Injection System For Cell Analysis Using 3-D Sheath Flow Scanner | 23 |
| <i>Yasuo Suzuki, Masaki Kanai, Kentaro Kawai, Takahiro Nishimoto, and Shuichi Shoji</i> | |
| Monolithic Integration Of Micro-Channel On Disposable Flow Sensors For Medical Applications..... | 27 |
| <i>S. Billat, K. Kliche, R. Gronmaier, P. Nommensen, J. Auber, F. Hedrich, R. Zengerle</i> | |
| Autonomous Genetic Analysis System To Study Space Effects On Microorganisms: Results From Orbit | 31 |
| <i>Antonio J. Ricco, John W. Hines, M. Piccini, M. Parra, L. Timucin, V. Barker, C. Storment, C. Friedericks, E. Agasid, C. Beasley, L. Giovangrandi, M. Henschke, C. Kitts, L. Levine, E. Luzzi, D. Ly, I. Mas, M. McIntyre, D. Oswell, R. Rasay, R. Ricks, K. Rozano, D. Squires, G. Swaiss, J. Tucker, B. Yost</i> | |
| A Manufacturable Chip-Scale Atomic Clock..... | 36 |
| <i>D. W. Youngner, L. M. Lust, D. R. Carlson, S. T. Lu, L. J. Forner, H. M. Chanhvongsak, and T. D. Stark</i> | |
| From The Implementation To The Characterisation And Assembling Of Microfabricated Optical Alcali Vapor Cell For MEMS Atomic Clocks | 42 |
| <i>L. Nieradko, C. Gorecki, J. Dziuban, A. Douahi, V. Giordano, J.C. Beugnot, S. Guérandel, M. Moraja</i> | |
| Mems Oscillators For High Volume Commercial Applications | 46 |
| <i>M. Lutz, A. Partridge, P. Gupta, N. Buchan, E. Klaassen, J. McDonald, K. Petersen</i> | |
| A Low-Voltage Temperature-Stable Micromechanical Piezoelectric Oscillator | 50 |
| <i>Reza Abdolvand, Hossein Mirilavasani, and Farrokh Ayazi</i> | |
| Novel Ultrasound Read-Out For A Wireless Implantable Passive Strain Sensor (Wipss)..... | 54 |
| <i>F. Gattiker, F. Umbrecht, D. Müller, J. Neuenschwander, U. Sennhauser, M. Wendlandt and Ch. Hierold</i> | |
| 7-Ghz CMOS Rf Front-End Monolithically Integrated With Inverted-F Antenna Forwireless Sensor System | 58 |
| <i>M. Ikebe, D. Ueo, H. Osabe, K. Inafune, E. Sano, M. Koutani, M. Ikeda, and K. Mashiko</i> | |
| Closed-Loop Transductor-Compensated Class E Driver For Inductive Links..... | 62 |
| <i>B. Lenaerts, F. Peeters and R. Puers</i> | |
| An Implantable Microsystem For Wireless Multi-Channel Cortical Recording | 66 |
| <i>Amir M. Sodagar, Gayatri E. Perlin, Ying Yao, Kensall D. Wise, and Khalil Najafi</i> | |
| Wirelessly Powered Sensor Transponder For Uhf Rfid..... | 70 |
| <i>P. Pursula, J. Marjonen, H. Ronkainen and K. Jaakkola</i> | |
| Achievements And Perspectives Of The Drie Technology For The Microsystems Market | 74 |
| <i>M. Puech, J.M. Thevenoud, J.M. Gruffat, N. Launay, P. Godinat and O. Le Barillec</i> | |
| A New Method For High-Rate Deep Dry Etching Of Silicate Glass With Variable Etch Profile..... | 78 |
| <i>A. Bertz, R. Fendler, R. Schuberth W. Hentsch and Th. Gessner,</i> | |
| A Novel Deep Hole Etching In Nld Plasma Low Gwp Gases | 82 |
| <i>Yasuhiro Morikawa, Takahide Murayama and Koukou Sun</i> | |

Table of Contents

| | |
|---|------------|
| Formation Of Silicon Nanopores And Nanopillars By A Maskless Deep Reactive Ion Etching Process | 85 |
| <i>Zhiyong Xiao, Chunhua Feng, Philip C.H. Chan and I-Ming Hsing</i> | |
| The Progress Of Biochip Development For Research And Consumer Market..... | 89 |
| <i>Jing Cheng</i> | |
| Scanning Magnetic Tunnel Junction Sensor For The Detection Of Magnetically Labeled DNA Microarray..... | 90 |
| <i>Mei-Lin Chan,, Gerardo M. Jaramillo, and David A. Horsley,</i> | |
| Characterization Of A D-Amino Acid Oxidase Microbiosensor For D-Serine Detection In The Central Nervous System..... | 94 |
| <i>Pierre Pernot, Jean-Pierre Mohet, Oleg Schuvailo, Alexey Soldatkin, Loredano Pollegioni, Mirella Pilone, Raymond Cesuglio, and Stéphane Marinesco</i> | |
| Towards The Formation Of Neuro-Transistor Artificial Chemical Synapse..... | 97 |
| <i>I. Goykhman, N. Korbakov, C. Bartic, G. Borghs, M. E. Spira, J. Shappir and S. Yitzchaik</i> | |
| Advances In Thick-Film Sensors..... | 101 |
| <i>N.M. White</i> | |
| Direct Metal Imprinting Lithography Based On Pulsed Laser Heating..... | 106 |
| <i>Yung-Chun Lee and Chun-Hung Chen</i> | |
| Full Wafer Fabrication Process For Microfluidic Glass Chips With Electroplated Electrodes | 110 |
| <i>P. Vulto, G. Igel, G.A. Urban</i> | |
| Evaporative Printing Of Organic Materials At Ambient Pressure Using A Micromachined Printhead..... | 114 |
| <i>Valerie Leblanc, Jianglong Chen, Peter Mardilovich, Vladimir Bulovi and Martin A. Schmidt</i> | |
| A Surface Mountable Glucose Fuel Cell For Medical Implants | 118 |
| <i>S. Kerzenmacher, R. Sumbharaju, J. Ducrée , R. Zengerle, and F. von Stetten</i> | |
| Harvesting Energy From Vibrations By A Micromachined Electret Generator | 122 |
| <i>T. Sterken, P. Fiorini, G. Altena, C. Van Hoof, and R. Puers</i> | |
| Microstructured In-Plane Thermoelectric Generators With Optimized Heat Path..... | 126 |
| <i>N. Kockmann, T. Huesgen, P. Woias</i> | |
| Tunable Capacitor Based On Polymer-Dispersed Liquid Crystal For Optimum Micro-Power Harvesting | 130 |
| <i>S.-Y. Chung, Y.-Y. Chen, W.-J. Wu, W.-P. Shih, and P.-Z. Chang</i> | |
| Electrostatic Transducers For Micro Energy Harvesting Based On Soi Technology | 134 |
| <i>U. Bartsch, A. Trautmann, P. Ruther, J. Gaspar and O. Paul</i> | |
| Novel Effa-Based Thin-Film RF-MEMS Technology..... | 138 |
| <i>X. Rottenberg, P. Ekkels, S. Brebels, T. Webers, P. Czarnecki, R. P. Mertens, B. Nauwelaers, R. Puers, L. Marchand, I. De Wolf, W. De Raedt and H. A. C. Tilmans</i> | |
| A 3V Operation RF MEMS Variable Capacitor Using Piezoelectric And Electrostatic Actuation With Lithographical Bending Control | 142 |
| <i>T. Ikehashi, E. Ogawa, H. Yamazaki and T. Ohguro</i> | |
| Smart Individual Switch Addressing Of 5×5 And 20×20 MEMS Double-Switch Arrays | 146 |
| <i>Stefan Braun, Joachim Oberhammer and Göran Stemme</i> | |
| An RF MEMS Switched Capacitor Array For A Tunable Band Pass Filter..... | 150 |
| <i>S.-S. Lee, H. Uchida, S. Soda, T. Nishino, H. Inoue, S. Izuo, Y. Yoshida and M. Miyazaki</i> | |
| Monolithic Phase Shifter Based On Mechanically Tunable Saw Delay Line | 154 |
| <i>J. H. Kuypers, M. E. Schmidt, S. Tanaka and M. Esashi</i> | |
| Non-Contact Nanoliter & Picoliter Liquid Dispensing..... | 158 |
| <i>P. Koltay and R. Zengerle</i> | |

Table of Contents

| | |
|---|------------|
| High Generation Rate Of Uniform Oil-In-Water Droplets Formed By Multi-Stage Divergence Microflow Device..... | 164 |
| <i>Y. Murakami, T. Arakawa, E. H. Jeong, J. S. Go and S. Shoji</i> | |
| Inkjet Printhead Arrays With No Separating Wall Between Bubbles..... | 168 |
| <i>C.M. Chang, I.D. Yang, R.J. Yu, Y.L. Lin, F.G. Tseng, and C.C. Chieng,</i> | |
| Studies Of Phosphorylation During Innate Immune Signaling Using On-Chip Cell Preparation And Downstream Flow Cytometry..... | 172 |
| <i>Nimisha Srivastava, James S. Brennan, Daniel J. Throckmorton, Steven S. Branda, Zhaodou Zhang, Anup K. Singh, Amy E. Herr</i> | |
| Preparation And Characterization Of Tin Oxide Nanowires On Sic..... | 176 |
| <i>S. Bianchi, E. Comini, M. Ferroni, G. Sberveglieri, L. Pandolfi, S. Kaciulis, W. Wlodarski, M. Shafiei and S. Kandasamy</i> | |
| Swnt Growth By LPCVD On Ferritin-Based Iron Catalyst Nanoparticles Towards CNT Sensors | 180 |
| <i>L. Durrer, T. Helbling, C. Zenger, A. Jungen, C. Stampfer, C. Hierold</i> | |
| Simple Technique For Direct Patterning Of Nanowires Using A Nanoslit Shadow-Mask | 184 |
| <i>H.D. Tong, H.V. Jansen, N.R. Tas, V.J. Gadgil, E.T. Carlen, and A. van den Berg</i> | |
| Towards Reliable 100-Nanometer Scale Stencil Lithography On Fullwafer: Progress And Challenges..... | 188 |
| <i>O. Vazquez Mena, M.A.F. van den Boogaart, J. Brugger</i> | |
| Polymer Surface Morphology Control For Microfluidic Devices..... | 192 |
| <i>H. Nabesawa,, T. Hitobo, S. Wakabayashi, T. Asaji, T. Abe, I. Nakatani, and M. Seki</i> | |
| A Three Dimensional Real-Time MEMS Based Optical Biopsy System For In-Vivo Clinical Imaging | 196 |
| <i>Daniel T. McCormick, Woonggyu Jung, Yeh-Chan Ahn, Zhongping Chen, and Norman C. Tien</i> | |
| A Novel Micro-Biopsy Actuator For Capsular Endoscope Using Liga Process | 202 |
| <i>Sunkil Park, Kyu-In Koo, Gil-Sub Kim, Seoung Min Bang , Si Young Song , Jung-Won Byun, Chong-Nam Chu, and Dongil Cho</i> | |
| Photochemically Patterned Biliary Stents With Integrated Permanent Magnets And Deformable Assembly Features For Wireless Magnetoelastic Tissue Growth Sensing..... | 206 |
| <i>Scott R. Green, Mark T. Richardson, Farah A. Shariff, and Yogesh B. Gianchandani,</i> | |
| Optical Characterisation Of Bone Tissue For Diffusion Optical Tomography Applied To Skeletal Implants..... | 211 |
| <i>E. Margallo-Balbás, A. Pifferi, P. Taroni, D. Comelli, A. Farina, R. Cubbedu, A.J. van Veen ,L.J. van Ruijven, Th. H. Smit, and P.J. French</i> | |
| An In Vivo Blood Microsampling Device For Pharmacokinetic Applications | 216 |
| <i>Tao Li, Adam Barnett, Deqing Xiao, Min Zhong, and Yogesh B. Gianchandani</i> | |
| CMOS-Compatible Dual-Resonator MEMS Temperature Sensor With Milli-Degree Accuracy | 220 |
| <i>C. M. Jha, G. Bahl, R. Melamud, S. A. Chandorkar, M. A. Hopcroft, B. Kim, M. Agarwal, J. Salvia, H. Mehta and T. W. Kenny</i> | |
| Monolithic 0.35-μm CMOS Cantilever For Mass Sensing In The Attogram Range With Self-Excitation..... | 224 |
| <i>J.Verd, A. Uranga, J.Teva, G.Abadal, F. Torres, J. Arcamone, J. L. López, F.Pérez-Murano, J. Fraxedas, J. Esteve and N.Barniol</i> | |
| Coupling Resonant Micro And Nanocantilevers To Improve Mass Responsivity By Detectability Product | 228 |
| <i>F. Torres, G. Abadal, J. Arcamone, J. Teva, J. Verd, A. Uranga, J. Ll. López, X. Borrisé, F. Pérez-Murano and N. Barniol</i> | |
| Dual-Harmonic Oscillator For Quartz Crystal Resonator Sensors | 232 |
| <i>M. Ferrari, V. Ferrari and K. K. Kanazawa</i> | |
| Geometrical Optimization Of Resonant Cantilever Sensors..... | 236 |
| <i>Kianoush Naeli, Prateek Tandon, and Oliver Brand</i> | |

Table of Contents

| | |
|---|------------|
| Microfluidic Channels In Porous Silicon Filled With A Carbon Absorbent For Gas Preconcentration..... | 240 |
| <i>E. H. M. Camara, C. Pijolat, J. Courbat, P. Breuil, D. Briand, N. F. de Rooij</i> | |
| Rapid Micro Array System For Passive Batch-Filling And Parallel-Printing Protein Solutions | 244 |
| <i>Cheng-En Ho, Chin-Chang Chieng, Min-Hung Chen, and Fan-Gang Tseng</i> | |
| High Through-Put Parallel Biomolecules Sorting Microsystem With Three Dimensional PDMS Stack | 248 |
| <i>Y. Nara, H. Sugino, T. Arakawa, Y. Shirasaki, T. Funatsu and S. Shoji</i> | |
| PPB-Level Detection Of Benzene Diluted In Water By Bubbling Extraction System And UV Spectroscopy Based Measurements | 252 |
| <i>S. Camou, A. Shimizu, T. Horiuchi and T. Haga</i> | |
| Monodisperse Double Emulsions Generated By Microfluidic Chips Utilizing Flow Focusing And Pneumatic Chopping Devices | 256 |
| <i>K.L. Lao and G.B. Lee</i> | |
| Radioisotope Powered Electrostatic Microactuators And Electronics | 260 |
| <i>Amit Lal, Rajesh Duggirala, and Steven Tin</i> | |
| A Wideband Electromagnetic Micro Power Generator For Wireless Microsystems | 265 |
| <i>Ibrahim Sari, Tuna Balkan and Haluk Kulah</i> | |
| 3D Silicon Betavoltaics Microfabricated Using A Self-Aligned Process For 5 Milliwatt/Cc Average, 5 Year Lifetime Microbatteries..... | 269 |
| <i>Rajesh Duggirala, Steven Tin, and Amit Lal</i> | |
| Design And Fabrication Of MEMS-Based Monolithic Fuel Cells | 273 |
| <i>Nariaki Kuriyama, Tadahiro Kubota, Daisuke Okamura, Toshifumi Suzuki, and Jun Sasahara</i> | |
| Power Efficient V-Shape Electro-Thermal Actuator Using Constrained Su-8 | 277 |
| <i>G.K. Lau , T. Chu Duc, J.F.L Goosen, P.M. Sarro, F. van Keulen</i> | |
| Surface Hydrophilic Polyurea Film For PMMA Blood Analysis Chip Realized By Vacuum Ultraviolet Light Irradiation..... | 281 |
| <i>H. Shinohara, Y. Takahashi, T. Nishi, K. Uemura, C. Takahashi, J. Mizuno and S. Shoji</i> | |
| Droplet Manipulation By Electrowetting On Polymer Dispersed Liquid Crystal | 285 |
| <i>Cheng-Pu Chiu, Shang-Chih Lin, and Shih-Kang Fan</i> | |
| Micro/Nano-Friction And Thermal-Mechanical Properties Of Polymer Thin-Film Investigated With An Integrated SPM Probe Array | 289 |
| <i>Haifei Bao, Bin Liu and Xinxin Li</i> | |
| Ultra-Thick Optical Components Using LF55GN Photosensitive Flexopolymer..... | 293 |
| <i>A. Sayah, V.K. Parashar, and M.A.M. Gijs</i> | |
| An MSI Micromechanical Differential Disk-Array Filter..... | 297 |
| <i>Sheng-Shian Li, Yu-Wei Lin, Zeying Ren, and Clark T.-C. Nguyen</i> | |
| Aqueous Transduction Of Poly-Sige Disk Resonators | 302 |
| <i>Hengky Chandrahalmi, Sunil A. Bhave, Emmanuel P. Quévy and Roger T. Howe</i> | |
| Micromachined Bulk Wave Acoustic Bandgap Devices..... | 306 |
| <i>Roy H. Olsson, James G. Fleming, Ihab F. El-Kady, Melanie R. Tuck and Frederick B. McCormick</i> | |
| UHF Nickel Micromechanical Spoke-Supported Ring Resonators..... | 311 |
| <i>Wen-Lung Huang, Sheng-Shian Li, Zeying Ren, and Clark T.-C. Nguyen</i> | |
| Phase Noise And Frequency Stability Of Very-High Frequency Silicon Nanowire Nanomechanical Resonators | 315 |
| <i>X.L. Feng, R.R. He, P.D. Yang, and M.L. Roukes</i> | |

Table of Contents

| | |
|--|------------|
| Using MEMS To Build The Device And The Package | 319 |
| <i>B. Kim, M. Hopcroft, C.M Jha, R. Melamud, S. Chandorkar, M. Agarwal, K. L. Chen, W. T. Park, R. Candler, G. Yama, A. Partridge, M. Lutz, T.W. Kenny</i> | |
| A Generic Environment-Resistant Packaging Technology For MEMS..... | 323 |
| <i>S.-H. Lee, S. W. Lee, and K. Najafi</i> | |
| The Influence Of Surface Profile On Leakage In Room Temperature Seal-Bonding | 327 |
| <i>H. Okada, T. Itoh, and T. Suga</i> | |
| Thin Film Encapsulation Of Microstructures Using Sacrificial CF-Polymer | 331 |
| <i>D. Reuter, A. Bertz, T. Werner, M. Nowack and T. Gessner,</i> | |
| Healthcare Chip For Home Medical Diagnosis..... | 335 |
| <i>Y. Horiike, H. Ogawa, M. Nagai, H. Koda, C.-H.Chang, S. Hashioka, M. Takai and Y. Morimoto</i> | |
| In-Vitro Rapid Centimeter-Scale Reconstruction Of Lobule-Mimetic Liver Tissue Employing Dielectrophoresis-Based Cell Patterning | 339 |
| <i>Chen-Ta Ho, Ruei-Zeng Lin, Hwan-You Chang, and Cheng-Hsien Liu</i> | |
| Hydrolytic Microneedles As Transdermal Drug Delivery System | 343 |
| <i>T. Miyano, T. Miyachi, T. Okanishi, H. Todo, K. Sugabayashi T. Uemura, N. Takano, and S. Konishi</i> | |
| A Low Power, Microvalve-Regulated Drugdelivery System Using A Simicro-Spring Pressurized Balloon Reservoir..... | 347 |
| <i>Allan T. Evans, Jong M. Park, Gregory F. Nellis, Sanford A. Klein, Jeffrey R. Feller, Louis Salerno, and Yogesh B. Gianchandani</i> | |
| Dielectric Charging Sensitivity On MEMS Switches..... | 351 |
| <i>F. Souchon, PL. Charvet, C. Maeder-Pachurka, M. Audoin</i> | |
| Effects Of Relative Humidity And Actuation Voltage On MEMS Reliability..... | 355 |
| <i>M. Hon, F. W. DelRio, C. Carraro, and R. Maboudian</i> | |
| Non-Destructive Functionality And Reliability Assessment Of Dynamic MEMS Using Acoustic Phonon Characterization | 359 |
| <i>Wai-Kin Wong, Chee-Leong Wong, Moorthi Palaniapan, Francis Eng Hock Tay</i> | |
| Effects Of Environmental Condition On The Strength Of Submicron-Thick Single Crystal Silicon Film | 363 |
| <i>S. Nakao, T. Ando, M. Shikida and K. Sato</i> | |
| Comparison Of Bulge Test And Point Deflection Methods For The Mechanical Characterisation Of Submicron Thick Composite Membranes | 367 |
| <i>P. Martins, P. Delobelle, C. Malhaire, S. Brida, D. Barbier</i> | |
| A Novel Circular Ferro-Fluid Driven Flow-Through Microchip For Rapid DNA Amplification..... | 371 |
| <i>Y. Sun, Y. C. Kwok and N. T. Nguyen</i> | |
| One-Step Pathogen Specific DNA Extraction From Whole Blood On A Centrifugal Microfluidic Device | 375 |
| <i>Yoon-Kyoung Cho, Jeong-Gun Lee, Jong-Myeon Park, Beom-Seok Lee, Youngsun Lee and Christopher Ko</i> | |
| Nano-PCR: Breaking The Bottom Limit Of The PCR Denaturation Temperature Using Nanogold..... | 379 |
| <i>Yu-Cheng Lin, and Hua-Lin Wu</i> | |
| Electrical And Mechanical Characteristics Of DNA Bundles Revealed By Silicon Nanotweezers | 383 |
| <i>Christophe Yamahata, Tetsuya Takekawa, Momoko Kumemura, Maho Hosogi, Gen Hashiguchi, Dominique Collard and Hiroyuki Fujita</i> | |
| Nanopore With Transverse Nanoelectrodes For Electrical Characterization And Sequencing Of DNA..... | 387 |
| <i>Brian C. Gierhart, David G. Howitt, Shiahn J. Chen, Zheneng Zhu, David E. Kotecki, Rosemary L. Smith, and Scott D. Collins</i> | |
| Self-Assembled Zno Nanowires Via Local Vapor Transport Synthesis As UV Sensor | 391 |
| <i>L. Luo and L. Lin</i> | |

Table of Contents

| | |
|--|------------|
| Process-Independent, Ultrasound-Enhanced, Electrostatic Batch Assembly..... | 395 |
| <i>Serhan Ardanuç, Amit Lal, and David Reyes</i> | |
| Micro-Scale System Integration Via Molten-Alloy Driven Self-Assembly And Scaling Of Metal Interconnects..... | 399 |
| <i>Christopher J. Morris and Babak A. Parviz</i> | |
| Multi-Object Conveyance By Peripherally Controlled Micro Actuator/Sensor Array..... | 403 |
| <i>M. Ataka, M. Mita, and H. Fujita</i> | |
| A Wafer Transfer Technology For Integration Of RF MEMS And CMOS On Organic Substrate..... | 407 |
| <i>Q. X. Zhang, A. B. Yu, M. Tang, H.Y. Li, R. Yang, E.B. Liao, L. H. Guo, R. Kumar, A. Q. Liu, G. Q. Lo, N. Balasubramanian and D. L. Kwong</i> | |
| Towards A Fully-Integrated CMOS-Based In Vivo Neural Imaging And Interface Device..... | 411 |
| <i>D. C. Ng, T. Nakagawa, T. Mizuno, T. Tokuda, M. Nunoshita, H. Tamura, Y. Ishikawa, S. Shiosaka, and J. Ohta</i> | |
| An Autonomous Implantable Distraction Nail Controlled By An Inductive Power And Data Link | 415 |
| <i>J. Van Ham, P. Reynders-Frederix and R. Puers</i> | |
| Wearable Line-Of-Sight Detection System Utilizing Dye-Sensitized Photovoltaic Devices | 419 |
| <i>T. Shigeoka and N. Miki</i> | |
| Wearable Sensor System For Human Behavior Recognition (First Report: Basic Architecture And Behavior Prediction Method)..... | 423 |
| <i>H. Mizuno, H. Nagai, K. Sasaki, H. Hosaka, C. Sugimoto, K. Khalil and S. Tatsuta</i> | |
| Three-Dimensional In Vivo Real Time Imaging By A Miniature Dual-Axes Confocal Microscope Based On A Two-Dimensional MEMS Scanner..... | 427 |
| <i>W. Piyawattanametha, H. Ra, M. J. Mandella, J. T. C. Liu, L. K. Wong, C. B. Du, T. D. Wang, C. H. Contag, G. S. Kino, and O. Solgaard</i> | |
| Electrostatically Actuated Nonconductive Polymer Microresonators With Amplified Quality Factor In Gaseous And Aqueous Environment | 431 |
| <i>S. Schmid, P. Senn, and C. Hierold</i> | |
| Built-In Upwards-Bending Electrostatic Actuator Capable Of Three-Level-Structural Variable Capacitor | 435 |
| <i>Hiroshi Konishi, Madoka Nishiyama, Junji Suzuki, Yasuo Tezuka, Atsushi Komai, Yoshihiko Suzuki, and Kenichiro Suzuki</i> | |
| Novel Micro Transportation Systems Based On Ratchet Mechanism And Electrostatic Actuators..... | 439 |
| <i>Phuc Hong Pham, Dzung Viet Dao, Satoshi Amaya, Ryoji Kitada and Susumu Sugiyama</i> | |
| Dynamic Pull-In And Switching For Sub-Pull-In Voltage Electrostatic Actuation..... | 443 |
| <i>G. N. Nielson, R. H. Olsson, G. R. Bogart, P. R. Resnick, O. B. Spahn, C. Tigges, G. Grossetete, and G. Barbastathis</i> | |
| A Totally Free Flexible Membrane: A Design For Low Electrostatic Actuation MEMS..... | 448 |
| <i>K. Segueni, A.-S. Rollier, L. Le Garrec, R. Robin, S. Touati, A. Kanciurzewski, L. Buchaillot, O. Millet</i> | |
| Aqueous Droplets As Single-Molecule Reaction Containers..... | 452 |
| <i>Daniel T. Chiu</i> | |
| Using Electric Cell-Substrate Impedance Sensing To Measure Changes In The Projected Area Of Individual Cells | 456 |
| <i>Pahnit Seriburi, Ashutosh Shastry, Tim Ren, Steven Gales, Karl F. Böhringer and Deirdre Meldrum</i> | |
| Assembly Of Single Cells Array Using Image Dielectrophoresis | 460 |
| <i>Y. S. Lu, Y. L. Liang, Y. P. Huang, J. Y. Huang, C. Lee and J. Andrew Yeh,</i> | |
| Phototransistor-Based Optoelectronic Tweezers For Cell Manipulation In Highly Conductive Solution | 464 |
| <i>H. Y. Hsu, A. T. Ohta, P. Y. Chiou, A. Jamshidi, and M. C. Wu</i> | |

Table of Contents

| | |
|---|------------|
| MEMS Process Flow Insensitive To Timed Etch Induced Anchor Perimeter Variation On SoI And Bulk Silicon Wafer Substrates..... | 468 |
| <i>G. J. O'Brien and D. J. Monk</i> | |
| Wet Release Of Multipolymeric Structures With A Nanoscale Release Layer..... | 472 |
| <i>Daniel Pesáñez and A.P. Gadre</i> | |
| Fabrication Of Reinforced Nanoporous Membranes | 476 |
| <i>A.C. Hoogerwerf, C. Hinderling, S. Krishnamoorthy, C. Hibert, V. Spassov and T. Overstolz</i> | |
| Tapered Deep Reactive Ion Etching: Method And Characterization | 480 |
| <i>Niclas Roxhed, Patrick Griss and Göran Stemme</i> | |
| In-Situ Isotropic And Anisotropic Drie Sequence For Massive Parallel Multistage Brownian Ratchets | 484 |
| <i>Hoa T.M. Pham, Jia Wei, Charles R. de Boer, Pasqualina M. Sarro</i> | |
| Fast Dry Fabrication Process With Ultra-Thin Atomic Layer Deposited Mask For Released MEMS-Devices With High Electromechanical Coupling..... | 488 |
| <i>M. Koskenvuori, N. Chekurov, V.-M. Airaksinen and I. Tittonen</i> | |
| Silicon Undercut Characterization In A CMOS-MEMS Process..... | 492 |
| <i>Jingwei Liu and Gary K. Fedder,</i> | |
| Nitrogen Doped Polycrystalline 3C-SiC Films Deposited By LPCVD For MEMS Applications | 496 |
| <i>X. A. Fu, J. Trevino, S. Noh, C. A. Zorman, and M. Mehregany</i> | |
| Electrodeposited Metal Structures In High Aspect Ratio Cavities Using Vapor Deposited Polymer Molds And Laser Micromachining..... | 500 |
| <i>F. Herrault, C.-H. Ji, S. Rajaraman, R.H. Shafer, and M.G. Allen</i> | |
| Solid Phase Direct Write (SPDW) Of Carbon Via Scanning Force Microscopy | 504 |
| <i>Patrick S. Spinney, Scott D. Collins, and Rosemary L. Smith</i> | |
| Micropatterning Of Streptavidin-Functionalized Magnetic Beads On Glass Using Electrostatic Self-Assembly..... | 508 |
| <i>V. Sivagnanam, A. Sayah, C. Vandevyver and M.A.M. Gijs</i> | |
| Qualification And Applications Of A Piezoelectric MEMS Process | 512 |
| <i>E. Poppe, N. P. Østbø, W. Booij, F. Tyholdt, F. Calame, B. Hök, F. Jensen, H. Ræder, and P. Muralt</i> | |
| A High Aspect Ratio, Flexible, Transparent And Low-Cost Parylene-C Shadow Mask Technology For Micropatterning Applications | 516 |
| <i>S. Selvarasah, S. H. Chao, C.-L. Chen, D. Mao, J. Hopwood, S. Ryley, S. Sridhar, A. Khademhosseini, A. Busnaina, and M. R. Dokmeci,</i> | |
| Photosensitive Poly(Dimethylsiloxane) (Photopdms) For Rapid And Simple Polymer Fabrication | 520 |
| <i>Ali Asgar S. Bhagat, Preetha Jothimuthu, and Ian Papautsky</i> | |
| Atomic Layer Deposition Of Al₂O₃, TiO₂ And ZnO Films Into High Aspect Ratio Pores | 524 |
| <i>S. Sirviö, L. Sainiemi, S. Franssila, K. Grigoras</i> | |
| Thermally Driven Bimorph Nano Actuators Fabricated Using Focused Ion Beam Chemical Vapor Deposition | 528 |
| <i>Jiyoung Chang, Jongbaeg Kim , Byung-Kwon Min and Liwei Lin</i> | |
| Moving-Mask UV Lithography For 3-Dimensional Positive- And Negative-Tone Thick Photoresist Microstructuring..... | 532 |
| <i>Y. Hirai, Y. Inamoto, K. Sugano, T. Tsuchiya and O. Tabata</i> | |
| Cavity-Through Deep Reactive Ion Etching Of Directly-Bonded Silicon Wafers | 536 |
| <i>Piljoong Kang, Shuji Tanaka and Masayoshi Esashi</i> | |
| Mechanical Properties Of Electrodeposited Permalloy Thin Film Measured By Using A Tensile Test | 541 |
| <i>Xueping Li, Guifu Ding, Hong Wang, Taeko Ando, Mitsuhiro Shikida, and Kazuo Sato</i> | |

Table of Contents

| | |
|---|------------|
| A New Method For Protection Of Anchors In Releasing Microstructure By Using XeF₂ Etching Process..... | 545 |
| <i>Feng Fei, Yang Guangli, Xiong Bin and Wang Yuelin</i> | |
| Self-Formed High-Aspect-Ratio Polymer Nanopillars By Rie..... | 549 |
| <i>M.-H. Chen, T.-H. Hsu, Y.-J. Chuang, P.-H. Chen, and F.-G. Tseng, ,</i> | |
| Laser Microfabrication Of Long Thin Holes On Biodegradable Polymer Under Vacuum And Its Application To Collecting Blood..... | 553 |
| <i>H. Izumi, Y. Isono, S. Aoyagi and H. Ogawa</i> | |
| Tensile Testing Of Single Crystal Silicon Thin Films At 800 C Using Ir Heating..... | 557 |
| <i>T. Ikeda, K. Sugano, T. Tsuchiya and O. Tabata</i> | |
| Comparison Of Improved Bulge And Microtensile Techniques For Mechanical Thin Film Characterization Application To Polysilicon | 561 |
| <i>J. Gaspar, M. Schmidt and O. Paul</i> | |
| Si₃N₄ Thin Films Properties For RF-MEMS Reliability Investigation | 565 |
| <i>M. Lamhamdi, L. Boudou, P. Pons, J. Guastavino, A. Belarbi, M. Dilhan, Y. Segui and R. Plana</i> | |
| Study For The Design Of Eddy Current Microsensor Arrays For Non Destructive Testing Applications | 569 |
| <i>C. Ravat, M. Woytasik, P.-Y. Joubert, Y. Le Bihan, C. Marchand, E. Dufour-Gergam, J. Moulin, E. Martincic</i> | |
| Highly Flexible Su-8 Microstructures..... | 573 |
| <i>J.P.F. Spratley, M.C.L. Ward, P.S. Hall</i> | |
| Modification Of Sensing Properties Of Thin Polymer Films By Vuv Irradiation | 577 |
| <i>E. Sarantopoulou, Z. Kollia, K. Manoli, M. Sanopoulou, D. Goustouridis, S. Chatzandrulis, and I. Raptis</i> | |
| Highly Oriented ZnO Thin Films Obtained With Low Temperature Annealing Of Sol-Gel Coatings | 581 |
| <i>Andrelina M. P. Santos and Edval J. P. Santos</i> | |
| Contact Angle Hysteresis Characterization Of Textured Super-Hydrophobic Surfaces..... | 585 |
| <i>Ashutosh Shastry, Shaghayegh Abbasi, Aziel Epilepsia, and Karl F. Böhringer</i> | |
| Temperature Dependent Mechanical Properties Of Doped Silicon Microcantilevers..... | 589 |
| <i>J. Lee, F. T. Goericke, and W. P. King</i> | |
| Thermal Calibration Of Heated Silicon Atomic Force Microscope Cantilevers..... | 593 |
| <i>Brent A. Nelson and William P. King</i> | |
| Soft-Landing And Bounce-Back Actuation For Active Stiction Control | 597 |
| <i>Yuyan Wang and Joseph J. Talghader</i> | |
| Influence Of Air Heat Exchange Upon On-Chip Measurement Of Thermal Conductivity Using MEMS Test Structures..... | 601 |
| <i>A. Roncaglia, E. Cozzani, F. Mancarella, M. Passini, G. C. Cardinali, M. Severi</i> | |
| Low Complexity Testing Micromachines Revealing Size-Dependent Mechanical Properties Of Thin Al Films..... | 605 |
| <i>J.-P. Raskin, D. Fabrègue, N. André, M. Coulombier, and T. Pardoen</i> | |
| Realization Of Thin Film Specimens For Micro Tensile Tests | 609 |
| <i>Christophe Malhaire, Michel Ignat, Karim Dogheche, Sebastiano Brida, Charles Josserond and Laurent Debove</i> | |
| In-Situ Raman Spectroscopic Surface Stress Measurement Of Single Crystal Silicon Microstructures Subjected To Uniaxial Tensile Loading | 613 |
| <i>T. Namazu, Y. Nagai, N. Naka, S. Kashiwagi, K. Ohtsuki, and S. Inoue</i> | |
| Extremely High Capacitance Ratio (C/R) RF MEMS Variable Capacitor With Chameleon Actuators..... | 617 |
| <i>Madoka Nishiyama, Hiroshi Konishi, Junji Suzuki, Yasuo Tezuka, Yoshihiko Suzuki, and Kenichiro Suzuki</i> | |
| Non Linear Compact Modeling Of RF-MEMS Switches By Means Of Model Order Reduction | 621 |
| <i>L. Del Tin, J. Iannacci, R. Gaddi, A. Gnudi, E. B. Rudnyi, A. Greiner and J. G. Korvink</i> | |

Table of Contents

| | |
|---|------------|
| Extremely High Capacitance Ratio (C/R) Rf MEMS Variable Capacitor With Chameleon Actuators..... | 625 |
| <i>Madoka Nishiyama, Hiroshi Konishi, Junji Suzuki, Yasuo Tezuka, Yoshihiko Suzuki, and Kenichiro Suzuki</i> | |
| Characterization Of CMOS Compatible RF MEMS Switch At Cryogenic Temperatures | 629 |
| <i>P. Rantakari and T. Vähä-Heikkilä</i> | |
| Quality Factor And Resonance Frequency Shift Due To Air In RF MEMS Radial Disk Resonators | 633 |
| <i>Timo Veijola</i> | |
| A Plastic W-Band MEMS Phase Shifter..... | 637 |
| <i>Firas Sammoura and Liwei Lin</i> | |
| Modeling And Measurement Of The Dynamic Performance Of An Ohmic Contact-Type RF MEMS Switch..... | 641 |
| <i>Z. J. Guo, N. E. McGruer, and G. G. Adams</i> | |
| Circular Plate Electrostatic Zipping Actuator For The Application Of A Tunable Electromagnetic Cavity Resonator..... | 645 |
| <i>X. Yang, J. H. Lang, and A.H. Slocum</i> | |
| Metal-Transfer-Micromolding Of Air-Lifted RF Components..... | 649 |
| <i>Yanzhu Zhao, Yong-Kyu Yoon, Xiaosong Wu, and Mark G Allen</i> | |
| Monolithic RF MEMS Probe Array System Using RF MEMS Sp3t Switches For Permittivity Measurement..... | 653 |
| <i>Jung-Mu Kim, Namgon Kim, Jae-Hyoung Park, Changyul Cheon, Youngwoo Kwon, Yong-Kweon Kim</i> | |
| Thermal Driven Metastructural Reconfigurable Millimeter Wave Antenna..... | 657 |
| <i>K.Sakiyama, I. Kanno, T. Suzuki, T. Murayama, D.Hiramaru and H. Kotera</i> | |
| Design And Fabrication Of A Laterally Driven Bistable Electromagnetic Microrelay..... | 661 |
| <i>S. J. Hwang, M. G. Lee, P. G. Jung, J. H. Kim, D. J. Oh, J. S. Go, B. Shin, and J. S. Ko</i> | |
| Highly-Mobile 2D Micro Impact Actuator For Space Applications | 665 |
| <i>Makoto Mita, Kazuhiro Takahashi, Manabu Ataka, Hiroyuki Fujita, and Hiroshi Toshiyoshi</i> | |
| A Low-Loss Single-Pole-Double-Throw (SPDT) Switch Circuit | 669 |
| <i>M. Tang, A. Q. Liu, and A. Agarwal</i> | |
| Controlled Bio-Carriers Based On Magnetotactic Bacteria | 673 |
| <i>Z. Lu and S. Martel</i> | |
| High Throughput Cell Electroporation Array Fabricated By Single-Mask Inclined UV Lithography Exposure And Oxygen Plasma Etching | 677 |
| <i>Takaaki Suzuki, Hideo Yamamoto, Masataka Ohoka, Atsuhito Okonogi, Hiroyuki Kabata, Isaku Kanno, Masao Washizu and Hidetoshi Kotera,</i> | |
| A Tailored-Contour Aperture For Cellular Electrophysiology..... | 681 |
| <i>Chang-Yu Chen, Kuan-Ting Liu, Andrew M. Wo, and De-Shien Jong</i> | |
| Electrical Detection And Ejection Of Beads In A One-Cell-Per-Drop Microdispenser | 685 |
| <i>Raphaël Tornay, Violaine Chapuis, Vincent Haguet, François Chatelain and Philippe Renaud</i> | |
| Label-Free, Microfluidic Separation Of Human Breast Carcinoma And Epithelial Cells By Adhesion Difference | 689 |
| <i>Keon Woo Kwon, Sang Ho Lee, Byungkyu Kim, Min Cheol Park, Pilnam Kim and Kahp Y. Suh</i> | |
| Microfluidic Platform With Microacoustics And Dielectrophoresis For High Throughput Analyses Of Spatiotemporal Signaling In Biological Cells | 693 |
| <i>Surendra K. Ravula, Diane S. Lidke, Janet M. Oliver, Darren W. Branch, Gregory Kaduchak, Conrad D. James, Igal Brener</i> | |

Table of Contents

| | |
|---|------------|
| Meniscus-Assisted Magnetic Bead Trapping On Ewod-Based Digital Microfluidics For Specific Protein Localization | 697 |
| <i>Gaurav J. Shah, Erik Pierstorff, Dean Ho, Chang-Jin Kim</i> | |
| In-Droplet Magnetic Beads Concentration And Separation For Digital Microfluidics | 701 |
| <i>Yi Zhong Wang, Yuejun Zhao, and Sung Kwon Cho</i> | |
| Diamagnetic Levitation Of Beads And Cells Above Permanent Magnets | 705 |
| <i>H. Chetouani, V. Haguet, C. Jeandey, C. Pigot, A. Walther, N. M. Dempsey, F. Chatelain, B. Delinchant and G. Reyne</i> | |
| Fabrication And Mechanical Characterization Of Microneedle Array For Cell Surgery | 709 |
| <i>T. Shibata, A. Nakanishi, T. Sakai, N. Kato, T. Kawashima, T. Mineta, and E. Makino</i> | |
| Electrostatic Stretching Of Hyaluronic Acid Molecule And Cutting With A Fm Probe..... | 713 |
| <i>M. Kanezawa, T. Mineta, E. Makino, T. Sugawara, S. Toh</i> | |
| Microsystem For Single-Cell Metabolomics..... | 717 |
| <i>N. Goedecke, R. Toelke, F. Heer and A. Hierlemann</i> | |
| A Novel Device For Fixing Small Objects Using Through-Pore Porous Silicon | 721 |
| <i>Atsuko Kato, Atsushi Uchiumi and Masanori Hayase</i> | |
| Automated Fluidic System With A Chaotic Microfluidic Reaction Chamber For Rapid, Multi-Analyte Immunosensing | 725 |
| <i>Junhai Kai, Zhiwei Zou, Jungyoup Han, Soo-Hyun Lee, Bin Hong, Yongjie Ren , Kyung A. Kang , and Chong H. Ahn</i> | |
| Temperature And Trapping Characterization Of An Acoustic Lateral Trap For ¼Tas..... | 729 |
| <i>Linda Johansson, Mikael Evander, Tobias Lilliehorn, Monica Almqvist, Johan Nilsson, Thomas Laurell, Stefan Johansson</i> | |
| A Piezoelectrically-Actuated Valve For Modulation Of Liquid At High Flow Rate Under High Pressure..... | 733 |
| <i>Srihari Rajgopal, Aaron Knobloch, Stacey Kennerly, Mehran Mehregany</i> | |
| Liquid Handling In A Microfluidic Chip By Micro-Aspiration | 737 |
| <i>M. Le Berre, C. Crozatier, G. Velve Casquillas and Y. Chen,</i> | |
| Non-Contact Detection Of Free Flying Nanoliter Droplets..... | 741 |
| <i>A. Ernst, W. Streule, R. Zengerle and P. Koltay</i> | |
| Predictable Three-Dimensional Microfluidic Channel Fabrication In A Single-Mask Process | 745 |
| <i>Kevin Gantz and Masoud Agah</i> | |
| A Simple Opto-Fluidic Switch Detecting Liquid Filling In Polymer-Based Microfluidic Systems | 749 |
| <i>F. Bundgaard, O. Geschke, R. Zengerle,, J. Ducrée,</i> | |
| Microfluidic ATP-Bioluminescence Sensor For Detection Of Airborne Microbe..... | 753 |
| <i>Seung Jae Lee, Jae Sung Park, Hee Taek Im, and Hyo-Il Jung</i> | |
| A Perfusion-Based Micro 3-D Cell Culture Platform..... | 757 |
| <i>S. B. Huang, M. H. Wu, Z. F. Cui, Z. Cui, J. L. Lin and G. B. Lee</i> | |
| A 128-Pixel Digitally-Programmable Microfluidic Platform For Non-Contact Droplet Actuation Using Marangoni Flows | 761 |
| <i>Amar S. Basu and Yogesh B. Gianchandani</i> | |
| An Electrical Particle Velocity Profiler For In-Channel Clogging Detection And Flow Pattern Characterization | 765 |
| <i>Tae Yoon Kim and Young-Ho Cho</i> | |
| Plug Dispersion Compensation In Moving Field Cappillary Electrophoresys Applications..... | 769 |
| <i>F. Tatar, L. Zhang, J. Bastemeijer, J. Mollinger, A. Bossche</i> | |

Table of Contents

| | |
|---|------------|
| A Microfluidic System For Automatic Cell Culture | 773 |
| <i>C. W. Huang, S. B. Huang and G. B. Lee</i> | |
| Monolithic 3-D Microfluidic Device For Cell Assay With An Integrated Combinatorial Mixer | 777 |
| <i>Mike C. Liu, Dean Ho, and Yu-Chong Tai,</i> | |
| Silicon Nano-Esi Emitters For Mass Spectrometry: A Mixed Micromechanical And Microfluidic Design..... | 781 |
| <i>B. Legrand, L. Buchaillot, A.E. Ashcroft, S. Arscott</i> | |
| Development Of A Cellular Biochip Mimicking In Vitro Organs For Chronic Toxicity Analysis..... | 785 |
| <i>Regis Baudoin, Laurent Griscom, Anne Corlu, Pierre Layrolle, Cecile Legallais, Eric Leclerc</i> | |
| High Throughput Cytotoxicity Screening Using Photonic Crystal Biosensors | 789 |
| <i>Leo L. Chan, Saujanya L. Gosangari, Kenneth L. Watkin, and Brian T. Cunningham</i> | |
| Probing The Adhesion And Viability Of Individual Cells With Field-Effect Transistors | 793 |
| <i>S. Ingebrandt, G. Wrobel, S. Eick, S. Schäfer and A. Offenhäusser</i> | |
| Fluorescent Labeling, Sensing And Differentiation Of Leukocytes From Undiluted Whole Blood Samples..... | 797 |
| <i>Siyang Zheng, Jeffrey Chun-Hui Lin, Harvey L. Kasdan, and Yu-Chong Tai</i> | |
| A Multi-Channel SPR Biomolecule Detection System Using An Integrated PDMS Nano-Scale Grating Chip..... | 801 |
| <i>Young-Hyun Jin and Young-Ho Cho</i> | |
| An Investigation On A Vibration-Based Active Protein Desorption Mechanism For Implantable MEMS-Based Biosensor Applications | 805 |
| <i>Po-Ying Yeh, Mu Chiao, and Jayachandran N. Kizhakkedathu</i> | |
| Fabrication And Packaging Of Nanoporous Membrane Chips For Label-Free Ion-Channel Transducer Based Biosensor | 809 |
| <i>V. Agache, F. Sauter, C. Pudda, R. Blanc, C. Chabrol, P. Caillet, T. Plenat, A. Varnier Agasoster, L. Ghenim, A. Fuchs</i> | |
| Piezoelectric Micromembranes For The Fabrication Of A Diagnostic Chip Based On The Real-Time Monitoring Of Antigen-Antibody Interactions | 813 |
| <i>C. Ayela and L. Nicu</i> | |
| Electrochemical Impedance Spectroscopy Of The Cardiomyocyte Adhesion To Extracellular Matrix On Micro-Fabricated Biosensors..... | 817 |
| <i>Yiling Qiu, Ronglih Liao and Xin Zhang,</i> | |
| Biomolecular Sensing Using Surface Micromachined Silicon Plates | 821 |
| <i>A.M. Zapata, E.T. Carlen, E.S. Kim, J. Hsiao, D. Traviglia, M.S. Weinberg</i> | |
| A Delta-Sigma Approach For Ion Channel Based Biosensor Arrays..... | 825 |
| <i>M. Bennati, F. Lodesani, M. Crescentini, A. Mariani, and M. Tartagni</i> | |
| Abio-Thermochemical Microbolometer With Immobilized Intact Liposome On Sensor Solid Surface | 829 |
| <i>M. Noda, T. Shimanouchi, M. Okuyama, and R. Kuboi</i> | |
| Cell-Based Microfluidic Biochip For Electrochemical Real-Time Monitoring Of Glucose And Oxygen..... | 833 |
| <i>N. Pereira Rodrigues, H. Kimura, Y. Sakai,, T. Fujii,</i> | |
| Optimization Of Gene Transfection Condition Using Taguchi Method For An Electroporation Microchip | 837 |
| <i>Keng-Shiang Huang, Sheng-Chung Yang,, Hung-Yi Chen, Yu-Cheng Lin,</i> | |
| Single Living Cell Refractometry Using Fbg-Based Resonant Cavity | 841 |
| <i>L. K. Chin, C. S. Lim, P. H. Yap, J. H. Ng, J. Z. Hao, S. Takahashi and A. Q. Liu</i> | |
| High Performance Blood Glucose Sensor Using Charge Transfer Technique..... | 845 |
| <i>Seung-Ro Lee, Takeshi Hizawa, Kazuaki Sawada, Hidekuni Takao, and Makoto Ishida</i> | |
| Application Of Vertical Micororeactor Stack With Polystyrene Microbeads To Immuno Assay | 849 |
| <i>Yoshiaki Ukit, Seiji Negoro, and Yuichi Utsumi</i> | |

Table of Contents

| | |
|---|------------|
| Electromechanical Modeling Of Micro Electret Generator For Energy Harvesting | 853 |
| <i>Takumi Tsutsumino, Yuji Suzuki, and Nobuhide Kasagi</i> | |
| Design, Simulation, And Fabrication Of A Novel Vibration-Based Magnetic Energy Harvesting Device..... | 857 |
| <i>Tien-Kan Chung, Dong-Gun Lee, Motoki Ujihara and Gregory P. Carman</i> | |
| Novel Micro Vibration Energy Harvesting Device Using Frequency Up Conversion | 861 |
| <i>D.-G. Lee, G. P. Carman, D. Murphy, and C. Schulenburg</i> | |
| A Low Cost Generator Concept For Energy Harvesting Applications..... | 865 |
| <i>M. Wischke, F. Goldschmidtboeing, P. Woias</i> | |
| Fabrication And Test Of Integrated Micro-Scale Vibration Based Electromagnetic Generator | 869 |
| <i>Santosh Kulkarni, Elena Koukharenko, John Tudor, Steve Beeby, Terence O'Donnell, Saibal Roy</i> | |
| Autonomous, Low Voltage, High Efficiency, CMOS Rectifier For Three-Phase Micro Generators..... | 873 |
| <i>H. Raisigel, J.-C. Crebier, Y. Lembeye, J. Delamare, and O. Cugat</i> | |
| Integrated Power Harvesting System Including A MEMS Generator And A Power Management Circuit | 877 |
| <i>M. Marzencki, Y. Ammar and S. Basrour</i> | |
| Piezoelectric Harvesters And MEMS Technology: Fabrication, Modeling And Measurements..... | 881 |
| <i>M. Renaud, T. Sterken, A. Schmitz, P. Fiorini, C. Van Hoof, R. Puers</i> | |
| Innovative Structure For Mechanical Energy Scavenging | 885 |
| <i>G. Despesse, J.J. Chaillout, T. Jager, F. Cardot and A. Hoogerwerf</i> | |
| Ultraminiaturized Milliwatt-Scale Permanent Magnet Generators..... | 889 |
| <i>F. Herrault, C.-H. Ji, R.H. Shafer, S.-H. Kim, and M.G. Allen</i> | |
| Bio-Actuated Power Generator Using Heart Muscle Cells On A PDMS Membrane | 893 |
| <i>T. Ishisaka, H. Sato, Y. Akiyama, Y. Furukawa, and K. Morishima</i> | |
| A Novel RF Induced DC Power Supply System For Integrated Ubiquitous Micro Sensor Devices | 897 |
| <i>Minoru Sudou, Hidekuni Takao, Kazuaki Sawada, Makoto Ishida,</i> | |
| Micromachined Thermopiles For Energy Scavenging On Human Body | 901 |
| <i>Z. Wang, V. Leonov, P. Fiorini, and C. Van Hoof,</i> | |
| Performance And Design Issues Of A Silicon Microfabricated Fuel Cell | 905 |
| <i>N. Torres, J.P. Esquivel, N. Sabaté, J. Santander, C. Cané</i> | |
| Nanoimprint Fuel Cell For On-Chip Power Application..... | 909 |
| <i>Y. Zhang, J. Lu, H. S. Zhou and R. Maeda</i> | |
| Monolithically Integrated Planar Micro Fuel Cell Arrays..... | 913 |
| <i>Zhiyong Xiao , Chunhua Feng, Philip C.H. Chan and I-Ming Hsing</i> | |
| Microfluidic Centrifuge Of Nano Particles Using Rotating Flow In A Microchamber | 917 |
| <i>J.B. Ha, Y.K. Bahk, S.H. Yoon, J.H. Lee, E.H. Jeong, S.Y. Yoon, T. Arakawa, J.S. Ko, B.S. Shin, K.C. Kim, J.S. Boo, S. Shoji and J.S. Go</i> | |
| On Chip Synthesis Approach For Biochips -From Gemkeytm DNA Chip To Future Glyco Chip..... | 921 |
| <i>S. Yamasaki, Y. Hara, K. Sasaki, D. Obara, Y. Gosho, N. Ishikawa, J. Akiyama, Y. Horiguchi, T. Kuroiwa, M. Escude, A. Hoang, F. Mittler, V. Robert and F. Vinet</i> | |
| Novel Optoelectronic Platform Using An Amorphous/Nanocrystalline Silicon Biosensor For The Specific Identification Of Unamplified Nucleic Acid Sequences Based On Gold Nanoparticle Probes | 925 |
| <i>L. B. Silva, P. Baptista, L. Raniero, G. Doria, R. Franco R. Martins and E. Fortunato</i> | |
| High-Throughput Single-Cell Electroporation Microchip With Three Dimensional Si Microelectrodes For Gene Transfection..... | 929 |
| <i>Y.H. Cho, S.W. Lee, B.Le Pioufle, N. Takama, S. Takeuchi, T. Fujii and B.J. Kim</i> | |

Table of Contents

| | |
|--|-------------|
| Integrated Microfluidic Chip For Fast Diagnosis Of Piscine Nodavirus | 933 |
| <i>S.H. Lee, M.C. Ou, T.Y. Chen and G.B. Lee,</i> | |
| Label-Free CMOS DNA Quantification With On-Chip Noise Reduction Schemes | 937 |
| <i>Seong-Jin Kim, Mithun Shenoi, Kyutae Yoo, Jeoyoung Shim, Wonseok Chung, Christopher Ko, Lee-Sup Kim and Euisik Yoon,</i> | |
| Biosensor For The Detection Of Specific DNA Sequences By Impedance Spectroscopy | 941 |
| <i>Daniel Berdat, V. Sauvage, L. Bernau, D. Killis, M.A.M. Gijs</i> | |
| A Robust Fluorescencemultiplex Immunoassay Biosensor Designed For Field Applications | 945 |
| <i>Schultz E., Perraut F., Flahaut T., Planat-Chrétien A., Galland R., Lesbre F., Hoang A., Boutal H., Volland H.</i> | |
| On-Chip Control Of DNA Immobilization And Hybridization With Nanosecond Electric Field Pulses | 949 |
| <i>R. Cabeça, D.M.F. Prazeres, V. Chu, J.P. Conde,</i> | |
| Novel Bacterial DNA Sample Preparation Method From Whole Blood Using Surface-Modified Silicon Microstructures..... | 953 |
| <i>Kyu-Youn Hwang, Joon-Ho Kim, Seong-Young Jung, Jung-Im Han, Nam Huh and Christopher Ko</i> | |
| Fabrication Of Replicated DNA Microarray Using Polyacrylamide Gel | 957 |
| <i>G. S. Lim, K.S. Yun, B.C. Shim, S. M. Cho and H.K. Hong</i> | |
| Microfabricated Electrochemical Sensor For Chemical Warfare Agents: Smaller Is Better | 961 |
| <i>Ilwhan Oh, Chelsea Monty, Mark A. Shannon, Rich I. Masel</i> | |
| Nasicon-Based Planar-Type Co₂ Sensor Attached With Solid Reference Electrode Stable Under High Humid Conditions..... | 965 |
| <i>T. Kida, S. Kishi, M. Yuasa, K. Shimano, and N. Yamazoe</i> | |
| Solid State Gas Sensor For Fast Carbon Dioxide Detection | 969 |
| <i>J. Herrán, G. G. Mandayo, E. Castaño</i> | |
| Planar, Impedance-Metric Nox Sensor With Nio Sensing Electrode For High Temperature Applications..... | 973 |
| <i>M. Stranzenbach and B. Saruhan</i> | |
| Density Functional Theory Study Of ZnO Nanostructures For NO And NO₂ Sensing | 977 |
| <i>M.J.S. Spencer, I. Yarovsky, W. Włodarski and K. Kalantar-zadeh</i> | |
| Selective Gas Sensor System For CO And H₂ Distinction At High Temperatures Based On A Langasite Resonator Array | 981 |
| <i>D. Richter, T. Schneider, S. Doerner, H. Fritze and P. Hauptmann</i> | |
| A Simple Optical Gas Sensor Based On Micromachined Silicon Plasma Igniters And Image Processing..... | 985 |
| <i>Alain Phommahaxay, Gaëlle Lissorgues, Lionel Rousseau, Vincent Perrais, Olivier Français, Tarik Bourouina and Pierre Nicole</i> | |
| Four-Cantilever Trace Explosive Sensors With Dual SAMs Functionalized For Specific-Sensing Improvement And Nonspecific-Adsorption Depression..... | 989 |
| <i>Xinxin Li, Guomin Zuo, Peng Li, Zhixiang Zhang, Yuelin Wang, Zhenxing Cheng, Min Liu</i> | |
| Work Place Monitoring Using A High Sensitive Surface Acoustic Wave Based Sensor System..... | 993 |
| <i>N. Barié, A. Skrypnik, A. Voigt, M. Rapp, J. Marcoll</i> | |
| In-Situ Soil Gas Analysis With A Robust Saw Sensor System Integrated In Percussion Driven Penetration Cones..... | 997 |
| <i>Aleksandr Skrypnik, Achim Voigt, Michael Rapp</i> | |
| Towards An All Polymeric Electronic Nose: Device Fabrication And Characterization, Electronic Control, Data Analysis..... | 1001 |
| <i>A. De Girolamo Del Mauro, G. Burrasca, S. De Vito, E. Massera, F. Loffredo, L. Quercia, G. Di Francia, D. Della Sala</i> | |

Table of Contents

| | |
|--|-------------|
| Single Carbon Nanotube Pirani Gauge By Local Synthesis..... | 1005 |
| <i>T. Kawano, M. Suter, C. Y. Cho, H. Chiamori, and L. Lin</i> | |
| Fabrication And Evaluation Of Carbon Nanotube-Parylene Functional Composite-Films | 1009 |
| <i>C.-L. Chen, E. Lopez, P. Makaram, S. Selvarasah, A. Busnaina, Y.-J. Jung, S. Miiftü, and M. R. Dokmeci</i> | |
| A Three Dimensional Thermal Sensor Based On Single-Walled Carbon Nanotubes | 1013 |
| <i>S. Selvarasah, C.-L. Chen, S.-H. Chao, P. Makaram, A. Busnaina, and M. R. Dokmeci</i> | |
| Chemical Sensitivity Of Porphyrin Nanotubes | 1017 |
| <i>E. Martinelli, F. Dini, I. Iannaccone, D. Monti, G. Pomarico, R. Generosi, M. Luce, A. D'Amico, R. Paolesse, C. Di Natale</i> | |
| Site Controlled Nanotube Shell Etching For Interlayer Motion Based NEMS..... | 1021 |
| <i>A. Subramanian, T.-Y. Choi, L. X. Dong, K. Y. Shou, J. Tharian, U. Sennhauser, D. Poulikakos, and B. J. Nelson</i> | |
| Multi-Walled Carbon Nanotube Networks As Gas Sensors For No2 Detection | 1025 |
| <i>I. Sayago, H. Santos, M.C. Horrillo, M. Aleixandre, M.J. Fernández, E. Terrado, W.K. Maser, A.M. Benito, M.T. Martinez, J. Gutiérrez and E. Muñoz</i> | |
| New TiO2 And Carbon Nanotube Hybrid Microsensors For Detecting Traces Of O2 In Beverage Grade Co2 | 1029 |
| <i>E. Sotter, E. Llobet, E.H. Espinosa, R. Ionescu, X. Vilanova, C. Bittencourt, A. Felten, J.J. Pireaux, and X. Correig</i> | |
| Nanotube Micro-Opto-Mechanical Systems (N-MOMS)..... | 1033 |
| <i>S. Lu, N. Shao, Y. Liu and B. Panchapakesan</i> | |
| Electrical And Electromechanical Characteristics Of Nano-Assembled Carbon Nanotube Thin Film Resistors On Flexible Substrates | 1037 |
| <i>Wei Xue and Tianhong Cui</i> | |
| Silicon Nanowire Array Bio-Sensor Using Top-Down CMOS Technology | 1041 |
| <i>Ajay Agarwal, I. K Lao, K. Buddharaju, N. Singh, N. Balasubramanian and D. L. Kwong</i> | |
| Using Dried Rhodamine B Fluorescence For Temperature Characterization Of Sub-Micron Scale Devices | 1045 |
| <i>Peter Löw, , Nobuyuki Takama, Beomjoon Kim and Christian Bergaud</i> | |
| Development Of Micro-Fluidic Nitrate-Selective Sensor Based On Polypyrrole Nanowires..... | 1049 |
| <i>Shyam Aravamudhan and Shekhar Bhansali</i> | |
| Dielectrophoretic Characterization Of SnO2 Nanobelts..... | 1053 |
| <i>Surajit Kumar, Heungjoo Shin, Zhengchun Peng, Cantwell G. Carson, Zhong Lin Wang, Rosario A. Gerhardt, and Peter J. Hesketh</i> | |
| Fabrication Of An Ion Source Using Carbon Nanoparticle Field Emitters For A Micro Time-Of-Flight Mass Spectrometer | 1057 |
| <i>H. J. Yoon, S. H. Song, J.B. Cho, K. W. Jung, S. Lee, K. H. Koh, S. S. Yang</i> | |
| Electro-Mechanical Measurement Of Nano Wires Evaluation Of Lambda DNA Wire Coated With Palladium Nano Particles..... | 1061 |
| <i>M. Sogi, G. Hashiguchi, K. Ayano, H. Takahashi, M. Haga, T. Yonezawa and H. Fujita</i> | |
| A Lateral-Shift-Free And Large-Vertical-Displacement Electrothermal Actuator For Scanning Micromirror/Lens..... | 1065 |
| <i>L. Wu and H. Xie</i> | |
| Polymer Microoptoelectromechanical Systems: Variable Optical Attenuators And Accelerometers | 1069 |
| <i>A. Llobera, G. Villanueva, V. J. Cadarso, V. Seidemann, S. Büttgenbach and J.A. Plaza</i> | |
| Novel Monocrystalline Silicon Micromirrors For Maskless Lithography..... | 1073 |
| <i>M. Bring and P. Enoksson</i> | |

Table of Contents

| | |
|---|-------------|
| A PDMS-On-Silicon Deformable Grating For Spectral Differentiation Of Mixed Wavelength Signals | 1077 |
| <i>S.C. Truxal, Y.-C. Tung, and K. Kurabayashi</i> | |
| Microlens Array Film With Full Fill Factor For Enhancing Outcoupling Efficiency From Oled Lighting..... | 1081 |
| <i>Hyouk Kwon, Youngjoo Yee, Chi-Hwan Jeong, Hyo-Jin Nam Ki-Won Park, Gun-Woo Lee, and Jong-Uk Bu</i> | |
| Chitosan-Mediated Bio Mems Platform For Optical Sensing | 1085 |
| <i>V. Badilita, I. Shamim, H. Yi, S.T. Koev, K. Gerasopoulos, and R. Ghodssi</i> | |
| Flip Chipped Ingaas Photodiode Arrays For Gated Imaging With Eye-Safe Lasers | 1089 |
| <i>J. Bentell, P. Nies, J. Cloots, J. Vermeiren, B. Grietens , O. David , A. Shurkun and R. Schneider</i> | |
| Micromachined Oblique Incidence Reflectometry (OIR) Probe For Skin Cancer Detection..... | 1093 |
| <i>A. Garcia-Uriel, J.-M. Hong1, J. Zou1 and L. V. Wang2</i> | |
| A Light-Addressable Potentiometric Sensor System For Fast, Simultaneous And Spatial Detection Of The Metabolic Activity Of Biological Cells | 1097 |
| <i>T. Wagner, R. Molina, M. Biselli, M. Canzoneri, T. Schnitzler, T. Yoshinobu and M.J. Schöning</i> | |
| A Dual Layer Scintillation Microdevice For Gamma And Beta Particle Energy Spectroscopy..... | 1102 |
| <i>Scott Pellegrin, John Olivier, and Chester G. Wilson</i> | |
| Quantitative Chemical Analysis Using Dvds And Conventional Computer Optical Disk Drives | 1106 |
| <i>R. A. Potyrailo, W. G. Morris, A. M. Leach, T. M. Sivavec, L. Hassib, K. Krishnan, C. Surman, R. Wroczynski, S. Boyette, C. Xiao, A. Agree, and T. Ceccone</i> | |
| A MEMS Based Optical Moire Approach For In Situ Cardiac Myocyte Force Probing..... | 1110 |
| <i>Xiaoyu Zheng and Xin Zhang</i> | |
| A Rotary Micromotor Supported On Microball Bearings..... | 1114 |
| <i>N. Ghalichechian, A. Modafe, M.I. Beyaz, and R. Ghodssi</i> | |
| Micro Mass Flow Controller For A Mini-Hcci-Motor Driven Power Generator | 1118 |
| <i>M. Schiffer, C. Stefanini, P. Tunestål, and E. Obermeier</i> | |
| MEMS Rotary Actuator Using An Integrated Ball Bearing And Air Turbine..... | 1122 |
| <i>C.M. Waits, N.R. Jankowski, B. Geil, and R. Ghodssi</i> | |
| Homopolar Micromotor With Liquid Metal Rotor | 1126 |
| <i>Teimour Maleki and Babak Ziae</i> | |
| Design And Fabrication Of An Electrostatic Micromotor With A Low Operating Voltage..... | 1130 |
| <i>Mohamed A. Basha, Safieddin Safavi-Naeini, and Sujeeet K. Chaudhuri</i> | |
| Differential Electrode Design For Electrostatic Actuator In Conducting Media..... | 1135 |
| <i>Vikram Mukundan and Beth Pruitt</i> | |
| Electrostatic Latch Mechanism For Handling Projection On Arrayed Vertical Motion System..... | 1139 |
| <i>S. Takagi, H. Sasaki, M. Shikida and K. Sato,</i> | |
| A DC-Powered High-Voltage Generator Using A Bulk Pt-Rh Oscillating Micro-Relay..... | 1143 |
| <i>Kabir Udeshi and Yogesh B. Gianchandani</i> | |
| Frequency Transition Phenomenon Of Self-Oscillated Micro-Cantilever By Changing Driving Voltage | 1147 |
| <i>Makoto Mita, Manabu Ataka, Tadashi Ishida, Hiroyuki Fujita, and Hiroshi Toshiyoshi</i> | |
| Microswitch With Mixed Piezoelectric And Electrostatic Actuation..... | 1151 |
| <i>F. Chapuis, E. Defay, F. Casset, J.F. Manceau, F. Bastien, M. Aïd</i> | |
| Stability Improvement Of Surface Acoustic Wave Motor Using Chemically Reduced Lithium Niobate | 1155 |
| <i>Takashi Shigematsu and Minoru Kurabayashi Kurosawa</i> | |
| Ultra-Compact, Zero-Power Latching Linear Motor With Integrated Position Sensor For Portable Electronics | 1159 |
| <i>Chang-Hoon Oh, Seong-Hyok Kim, Jung-Hoon Choi, Hyo-Jjin Nam, and Jong-Uk Bu</i> | |

Table of Contents

| | |
|--|-------------|
| Post-Processing Micromachined Pull-In Accelerometer | 1163 |
| <i>L.S. Pakula and P.J. French</i> | |
| In-Situ Pressure Measurements Of Encapsulated Gyroscopes..... | 1167 |
| <i>I. Simon, S. Billat, T. Link, P. Nommensen, J. Auber, Y. Manoli,</i> | |
| Low-Power, Continuous-Time Sigma-Delta Interface For Micromachined Gyroscopes Employing A Sub-Nyquist-Sampling Technique..... | 1171 |
| <i>M. Dienger, A. Buhmann, T. Northemann, T. Link and Y. Manoli,</i> | |
| Investigation On The Pressure-Dependent Performance Of A Surface Micromachined Gyroscope..... | 1175 |
| <i>A. Kulygin, U. Schmid and H. Seidel</i> | |
| Impact Of Si Drie On Vibratory MEMS Gyroscope Performance | 1179 |
| <i>P. Merz, W. Pilz, F. Senger, K. Reimer, M. Grouchko, T. Pandhumsoporn, W. Bosch, A. Cofer, and S. Lassig</i> | |
| Sub-μg Ultra-Low-Noise MEMS Accelerometers Based On CMOS-Compatible Piezoelectric AlN Thin Films..... | 1183 |
| <i>F. Gerfers, M. Kohlstadt, H. Bar, M.-Y. He, Y. Manoli, and L.-P. Wang</i> | |
| In-Plane Nano-G Accelerometer Based On An Optical Resonant Detection System | 1187 |
| <i>U. Krishnamoorthy, D.W. Carr, G.R. Bogart, M.S. Baker, R.H. Olsson</i> | |
| Anti-Phase Driven Rate Gyroscope With Multi-Degree Of Freedom Sense Mode..... | 1191 |
| <i>Adam R. Schofield, Alexander A. Trusov, Cenk Acar, and Andrei M. Shkel</i> | |
| Diamagnetically Levitated MEMS Accelerometers..... | 1195 |
| <i>D. Garmire, H. Choo, R. Kant, S. Govindjee, C. H. Séquin, R. S. Muller, J. Demmel</i> | |
| Vibrating Beam Accelerometer With Hard Suspension Beams | 1199 |
| <i>Kazusuke Maenaka, Yoshihiko Miki, Hiroki Okada, and Takayuki Fujita</i> | |
| A Fully Integrated MEMS-Based Convective 3-D Of Gyroscope | 1203 |
| <i>Dzung Viet Dao, Van Thanh Dau, Thien Xuan Dinh, and Susumu Sugiyama</i> | |
| A Novel Two-Dimensional Micromachined Accelerometer Based On Thermocapillary Heat Transfer..... | 1207 |
| <i>Ke-Min Liao and Rongshun Chen</i> | |
| Surface Micromachinable Accelerometer Using Fringe Electrical Field Of Penetrating Ferroelectric Substrate And Its Characterization | 1211 |
| <i>Y. Isono and S. Aoyagi</i> | |
| Bio-Microelectronic Information Processing Device Consisting Of Natural Neurons On A CMOS Microsystem | 1215 |
| <i>S. Hafizovic, F. Heer, U. Frey, T. Ugnivenko, A. Blau, C. Ziegler and A. Hierlemann</i> | |
| Evaluation Of Sirof Microelectrodes For Single Neuron Stimulation In Biohybrid Circuits..... | 1219 |
| <i>A. van Ooyen, B. Wessling, E. Slavcheva, U. Schnakenberg</i> | |
| A Novel Method Of Fabricating Convoluted Shaped Electrode Arrays For Neural And Retinal Prostheses | 1223 |
| <i>R. Bhandari, S. Negi, L. Riet, R. A. Normann and F. Solzbacher</i> | |
| A Polynorbornene-Based Microelectrode Array For Neural Interfacing..... | 1227 |
| <i>Allison E. Hess, Jeremy L. Dunning, Dustin J. Tyler, and Christian A. Zorman,</i> | |
| Nano-Grating Force Sensor For Measurement Of Neuron Membrane Characteristics Under Growth And Cellular Differentiation | 1231 |
| <i>Ashwini Gopal, Zhiqian Luo, Karthik Kumar, Jae Young Lee, Kazunori Hoshino, Bin Li, Christine Schmidt, Paul S. Ho, Xiaojing Zhang</i> | |
| Design And Function Principle Of A Large Scale Sensor Array For The Bi-Directional Coupling To Electrogenic Cells..... | 1235 |
| <i>M. Schindler, S. Ingebrandt, S. Meyburg and A. Offenhäusser</i> | |

Table of Contents

| | |
|--|-------------|
| Improved Neuronal Adhesion To The Surface Of Electronic Device By Engulfment Of Protruding Micro-Nails Fabricated On The Chip Surface..... | 1239 |
| <i>Micha E. Spira, Dotan Kamber, Ada Dormann, Ariel Cohen, Carmen Bartic, Gustaf Borghs, J.P.M. Langedijk, Shlomo Yitzchaik, Keren Shabtai, and Josef. Shappir</i> | |
| Three-Dimensional Metal Transfer Micromolded Microelectrode Arrays (MEAS) For In-Vitro Brain Slice Recordings..... | 1243 |
| <i>Swaminathan Rajaraman, Maxine A. McClain, Seong-O Choi, James D. Ross, Stephen P. DeWeerth, Michelle C. LaPlaca, and Mark G. Allen</i> | |
| Design And Performance Of Aluminum Nitride Piezoelectric Microphones..... | 1247 |
| <i>R. Shane Fazzio, Tina Lamers, Osvaldo Buccafusca, Atul Goel, and Walter Dauksher</i> | |
| Ultra Low Tensile Stress Electroplated Nickel Layers: A New Application As Membrane Material For Acoustic Devices..... | 1251 |
| <i>Stefan Junge, Frank Jakobs, Wolfgang Benecke and Walter Lang</i> | |
| Automated Extraction Of Multi-Energy Domain Reduced-Order Models Demonstrated On Capacitive MEMS Microphones | 1255 |
| <i>W. Bedyk, M. Niessner, G. Schrag, G. Wachutka, B. Margesin, and A. Faes</i> | |
| Adaptation For Frequency Focusing And Increased Sensitivity In Biomimetic Flow Sensors Using Electrostatic Spring Softening | 1259 |
| <i>J. Floris, N. Izadi, R.K. Jaganatharaja, R.J. Wiegerink, T.S.J. Lammerink and G.J.M. Krijnen</i> | |
| Ultrasonic Position Measurement Using Phased Array Microsensors With Resonant Frequency Variation..... | 1263 |
| <i>K. Yamashita, K. Iwahashi, Y. Ohmura and M. Okuyama</i> | |
| Miniature High Sensitivity Ultrasonic Transducers Using Epitaxial Pzt Thin Films Grown On Epitaxial Al_2O_3-Si Substrates For Smart Devices..... | 1267 |
| <i>M. Ito, M. Takabe, M. Otonari, D. Akai, N. Okada, K. Sawada,, and M. Ishida,,,</i> | |
| High Frequency Surface Acoustic Wave Atomizer..... | 1271 |
| <i>J. Ju, Y. Yamagata, T. Higuchi, K. Inoue and H. Ohmori</i> | |
| Harmonic Operation Of Acoustic Transducer For Droplet Ejection Application..... | 1275 |
| <i>Chuang-Yuan Lee, Hongyu Yu, and Eun Sok Kim</i> | |
| A Lateral Field Excited Acoustic Wave Sensor..... | 1279 |
| <i>Lester A. French Jr., Donald F. McCann, Mitchell Wark, Shane Winters, John F. Vetelino</i> | |
| Novel In-Plane Polarized Pzt Film Based Ultrasonic Micro-Acoustic Device | 1283 |
| <i>Yi-Ping Zhu, Tian-Ling Ren , Chao Wang, Zhe-Yao Wang, Li-Tian Liu, Zhi-Jian Li</i> | |
| Silicon Cochlear Microphone “Fishbone” With Complex Filtering And Hilbert Transform Capability For Instantaneous Signal Detection And Analysis..... | 1287 |
| <i>Shigeru Ando, Shoichi Koyama, Nobutaka Ono, and Naoki Ikeuchi</i> | |
| Modeling And Simulation Of A Condenser Microphone..... | 1291 |
| <i>Jen-Yi Chen, Yu-Chun Hsu, Tamal Mukherjee, Gary K. Fedder,</i> | |
| Design And Fabrication Of The High Directional Ultrasonic Ranging Sensor To Enhance The Spatial Resolution | 1295 |
| <i>Haksue Lee, Daesil Kang and Wonkyu Moon</i> | |
| High-Stability Mems Frequency Reference..... | 1299 |
| <i>M.A. Hopcroft, H.K. Lee, B. Kim, R. Melamud, S. Chandorkar, M. Agarwal, C.M. Jha, J. Salvia, G. Bahl, H. Mehta, and T.W. Kenny</i> | |
| 32 × 32 Ph Image Sensors For Real Time Observation Of Biochemical Phenomena | 1303 |
| <i>T. Hizawa, J. Matsuo, T. Ishida, H. Takao,, H. Abe, K. Sawada,, and M. Ishida</i> | |
| A Standing Micro Coil For A High Resolution MRI..... | 1305 |
| <i>T. Dohi, K. Kuwana, K. Matsumoto, and I. Shimoyama</i> | |

Table of Contents

| | |
|--|-------------|
| Thin Electrowetting Controlled Optical System With Pan/Tilt And Variable Focus Functions | 1309 |
| <i>A. Takei, E. Iwase, K. Matsumoto, I. Shimoyama</i> | |
| Exceptional Wear Resistance Of MEMS Devices Coated With Carbon-Doped Alumina Films | 1311 |
| <i>C. Carraro, J. Chinn, B. Kobrin</i> | |
| A Micromachined X-Ray Collector For Space Astronomy..... | 1313 |
| <i>Y. Ezoe, M. Koshiishi, M. Mita, Y. Maeda, K. Mitsuda, T. Osawa, M. Suzuki, A. Hoshino, Y. Ishisaki, T. Takano, and R. Maeda</i> | |
| Quality Factors And Energy Losses Of Single-Crystal Silicon Nanowire Electromechanical Resonators..... | 1317 |
| <i>X.L. Feng, R.R. He, P.D. Yang, and M.L. Roukes</i> | |
| Nickel-Tin Transient Liquid Phase (TLP) Wafer Bonding For MEMS Vacuum Packaging | 1319 |
| <i>W.C. Welch and K. Najafi</i> | |
| Soi-CMOS Platform For Monolithically Integrating High-Voltage Driver Circuits With Bulk-Micromachined Actuators | 1321 |
| <i>K. Takahashi, M. Mita, H. Fujita, H. Toshiyoshi, K. Suzuki, H. Funaki, and K. Itaya</i> | |
| Three Dimensional Perfusion Culture Of Encapsulated Embryonic Stem Cells In Microfluidic Chip..... | 1325 |
| <i>C. Kim, K.S.Lee, I.H.Lee, K. S. Shin, Ed. Kang, K.J.Lee and J.Y.Kang</i> | |
| A Novel Fluid Suction Tool For Capsular Endoscope..... | 1327 |
| <i>Kyo-In Koo, Sunkil Park, Jae-won Ban and Dongil Cho</i> | |
| Artificial Capillary Network Chip For In Vitro 3D Tissue Culture..... | 1329 |
| <i>M. Ikeuchi and K. Ikuta</i> | |
| Simultaneous Dielectrophoretic Separation And Impedimetric Detection Of Microbeads Using Interdigitated Electrodes Array | 1333 |
| <i>Zhiwei Zou, Soo-Hyun Lee, and Chong H. Ahn</i> | |
| Accumulation Of Uniform Aqueous Plugs In A Microchannel With Porous Sidewalls For Generating Arrayed Nanomembranes Of Amphiphilic Molecules | 1337 |
| <i>Takahiro Baba, Takeshi Hatsuzawa, , and Takasi Nisisako</i> | |
| AC Electroosmotic Generated In-Plane Microvortices For Stationary Or Continuous Fluid Mixing | 1341 |
| <i>Shih-Hao Huang, Shou-Kai Wang, Hwa Seng Khoo, and Fan-Gang Tseng</i> | |
| Micro-Structured Surface Ratchets For Droplet Transport..... | 1345 |
| <i>Ashutosh Shastry, Dane Taylor, and Karl F. Böhringer</i> | |
| MEMS-Based Uncooled Infrared Focal Plane Arrays | 1349 |
| <i>Masafumi Kimata</i> | |
| A 16-Cell 80db Dynamic-Range Auto-Ranging Read-Out Array For Uncooled Ir Micro-Bolometers | 1353 |
| <i>N. Viarani, N. Liberatore, A. J. Syed, M. Gottardi, N. Massari, C. Corsi and A. Baschirotto</i> | |
| A New Single Photon Avalanche Diode In CMOS High-Voltage Technology..... | 1357 |
| <i>Z. Xiao, D. Pantic, and R. S. Popovic</i> | |
| MEMS Temperature Characterization By CdSe Quantum Dots | 1361 |
| <i>Sha Li, Kai Zhang, Jui-Ming Yang, Liwei Lin, and Haw Yang</i> | |
| Micro Multi-Probes Electrode Array For The Recording Retinal Neuron Signal..... | 1365 |
| <i>D.J. Yao, C.H. Chen, C.C. Chiao and S.W. Lu</i> | |
| The Effect Of Biodegradable Drug Release Coatings On The Electrical Characteristics Of Neural Electrodes | 1369 |
| <i>André Mercanzini, Sai Reddy, Marc Boers, Diana Velluto, Arnaud Bertsch, Jeffrey Hubbell and Philippe Renaud</i> | |
| Si Micro Probe And SiO₂ Micro Tube Array Integrated With NMOSFETS | 1373 |
| <i>Kuniharu Takei, Takahiro Kawashimo, Hidekuni Takao, Kazuaki Sawada, and Makoto Ishida,,</i> | |

Table of Contents

| | |
|---|-------------|
| High-Density Flexible Parylene-Based Multielectrode Arrays For Retinal And Spinal Cord Stimulation..... | 1377 |
| <i>D.C. Rodger, A.J. Fong, W. Li, H. Ameri, I. Lavrov, H. Zhong, S. Saati, P. Menon, E. Meng, J.W. Burdick, R.R. Roy, V.R. Edgerton, J.D. Weiland, M.S. Humayun, and Y.C. Tai</i> | |
| A Fully Functional, Packaged Active Microscaffold System With Fluid Perfusion And Electrical Stimulation/Recording Functionalities For 3-D Neuronal Culture Studies..... | 1381 |
| <i>L. Rowe, Y. Choi, J. Ross, K. Lee, N. Fogelman, G.J. Brewer, J. Vukasinovic, A. Glezer, S.P. DeWeerth, and A.B. Frazier</i> | |
| A Depletion Layer Actuator..... | 1385 |
| <i>James H. T. Ransley, Colm Durkan, and Ashwin A. Seshia</i> | |
| Design And Testing Of A Field-Chopping Electric Field Sensor Using Thermal Actuators With Mechanically Amplified Response..... | 1389 |
| <i>B. Bahreyni, G. Wijeweera, C. Shafai, and A. Rajapakse</i> | |
| Mechanically Bi-Stable In-Plane Switch With Dual-Stiffness Actuators..... | 1393 |
| <i>M. Sternner, N. Roxhed, G. Stemme and J. Oberhammer</i> | |
| Cardiomyocytes Self-Powered Polymer Microrobot | 1397 |
| <i>Jinseok Kim, Sungwook Yang, Jeongeun Baek, Sewan Park, Hyeon Cheol Kim, Eui-Sung Yoon, and Kukjin Chun</i> | |
| A Portable Pneumatically-Actuated Refreshable Braille Cell | 1401 |
| <i>Xiaosong Wu, Haihong Zhu, Seong-Hyok Kim, Mark G. Allen</i> | |
| A Nanowire Sensor For Aromatic Nitro Compounds Using Charge Transfer Interaction | 1405 |
| <i>Kumi Masunaga, Motohiro Sato, Kenshi Hayashi and Kiyoshi Toko</i> | |
| MEMS-Based Air Quality Sensor | 1409 |
| <i>U. Mescheder, M.-L. Bauersfeld, A. Kovacs, J. Kritwattanakhron, B. Müller, A. Peter, Ch. Ament, S. Rademacher and J. Wöllenstein</i> | |
| Whole-Cell Conductometric Biosensor For Determination Heavy-Metals In Water | 1413 |
| <i>A.L. Berezhetsky, C. Durrieu, J.-M. Chovelon, S.V. Dzyadevych, C. Tran-Minh</i> | |
| Analysis Of Heavy Metal Ions In Real Samples Using A Concentrator Device With A Super-Hydrophobic Surface | 1417 |
| <i>Isao Yanagimachi, Norihiro Nashida, Koichiro Iwasa, and Hiroaki Suzuki</i> | |
| Cellulose-Based Optical Sensor For The Selective And Quantitative Detection Of Mercury Ions In Aqueous Media..... | 1421 |
| <i>C. Diez-Gil, A. Caballero, R. Martinez, I. Ratera, A. Tárraga, P. Molina and J. Veciana</i> | |
| MEMS Tunable Dual-Wavelength Laser With Large Tuning Range | 1425 |
| <i>H. Cai, X. M. Zhang, J. Wu, D. Y. Tang, Q. X. Zhang, and A. Q. Liu..</i> | |
| Real Pivot Mechanism Of Rotary Comb-Drive Actuators For MEMS Continuously Tunable Lasers | 1429 |
| <i>X. M. Zhang, A. Q. Liu., J. Tamil, A. B. Yu, , H. Cai, D. Y. Tang, and C. Lu</i> | |
| MEMS Tunable Coupled-Cavity Laser | 1433 |
| <i>H. Cai, X. M. Zhang, Q. X. Zhang, and A. Q. Liu</i> | |
| Lowloss Tunable Optical Filter Using Silicon Photonic Bandgap Mirrors | 1437 |
| <i>Ariel Lipson and Eric M. Yeatman</i> | |
| An Integrated Photonic MEMS Switch System With Fast Switching Speed And Low Power Demand..... | 1441 |
| <i>E. H. Khoo, J. Li, H. Cai, D. Pinjala, and A. Q. Liu..</i> | |
| Glove Type Of Wearable Tactile Sensor Produced By Artificial Hollow Fiber | 1445 |
| <i>Y. Hasegawa, M. Shikida, D. Ogura, and K. Sato</i> | |
| 3-Axes Tactile Sensor With Tunable Sensing Range..... | 1449 |
| <i>Chih-Chieh Wen, Chia-Min Lin, and Weileun Fang,</i> | |

Table of Contents

| | |
|--|-------------|
| Fabrication And Characterization Of Silicon-Polymer Beam Structures For Cantilever-Type Tactile Sensors | 1453 |
| <i>M. Sohgawa, Y. -M. Huang, K. Yamashita, T. Kanashima, M. Noda, , M. Okuyama and H. Noma</i> | |
| A Robust And Sensitive Silicon-MEMS Tactile-Imager With Scratch Resistant Surface And Over-Range Protection | 1457 |
| <i>Hidekuni Takao, Masaki Yawata, Kazuaki Sawada, and Makoto Ishida,</i> | |
| Cantilever-Based Tactile Sensor With Improved Sensitivity For Dimensional Metrology Of Deep Narrow Drillings | 1461 |
| <i>P. Ruther, S. Spinner, M. Cornils and O. Paul</i> | |
| Benefits Of Mems Based Seismic Accelerometers For Oil Exploration | 1465 |
| <i>Jérôme Laine and Denis Mougenot</i> | |
| A Novel Elastomer-Based Magnetoresistive Accelerometer | 1471 |
| <i>K.L. Phan, A. Mauritz and F.G.A. Homburg</i> | |
| A Differential Capacitive Three-Axis Soi Accelerometer Using Vertical Comb Electrodes | 1475 |
| <i>H. Hamaguchi, K. Sugano, T. Tsuchiya and O. Tabata</i> | |
| A Novel Out-Of-Plane Accelerometer With Fully-Differential Sensing Circuit And Sub-Micron Gap | 1479 |
| <i>Ming-Han Tsai, Chuanwei Wang, Chih-Ming Sun, and Weileun Fang,</i> | |
| An Integrated Micro-Analytical System For Complex Vapor Mixtures | 1483 |
| <i>Edward T. Zellers, Shaelah Reidy, Rebecca A. Veeneman, Robert Gordenker, William H. Steinecker, Gordon R. Lambertus, Hanseup Kim, Joseph A. Potkay, Michael P. Rowe, Qiongyan Zhong, Christopher Avery, Helena K. L. Chan, Richard D. Sacks, Khalil Najafi, Kensall D. Wise</i> | |
| A Fully-Integrated Mems Preconcentrator For Rapid Gas Sampling | 1489 |
| <i>Byunghoon Bae, Junghoon Yeom, Adarsh D. Radadia, Richard I. Masel and Mark A. Shannon</i> | |
| A Miniaturized Ion Mobility Spectrometer For Detection Of Hazardous Compounds In Air..... | 1493 |
| <i>S. Zimmermann and S. Barth</i> | |
| A Micropump-Driven High-Speed MEMS Gas Chromatography System..... | 1497 |
| <i>Hanseup Kim, William H. Steinecker, Shaelah Reidy, Gordon R. Lambertus, Aaron A. Astle, Khalil Najafi, Edward T. Zellers, Luis P. Bernal, Peter D. Washabaugh, and Kensall D. Wise</i> | |
| A Novel Tilting Micromirror With A Triangular Waveform Resonance Response And An Adjustable Resonance Frequency For Raster Scanning Applications..... | 1501 |
| <i>D. Elata, V. Leus, A. Hirshberg, O. Salomon, and M. Naftali</i> | |
| High Reflectivity Broadband Photonic Crystal Mirror MEMS Scanner | 1505 |
| <i>Il Woong Jung, Sora Kim, and Olav Solgaard</i> | |
| NiFe Plated Biaxial Magnetostatic MEMS Scanner | 1509 |
| <i>Arda D. Yalcinkaya, Hakan Urey and Sven Holmstrom</i> | |
| Novel Spatial Light Phasemodulator With Bidirectional Tilt-Piston Micromirror Array | 1513 |
| <i>S. Yamashita, M. Mita, H. Fujita, T. Yamamoto, M. Kawai and M. Yano</i> | |
| A Thermo-Pneumatically Actuated Tip-Tilt-Piston Mirror | 1517 |
| <i>Armin Werber and Hans Zappe</i> | |
| Proposition Of Atomic Force Probes Based On Silicon Ring-Resonators | 1521 |
| <i>Marc Faucher, Benjamin Walter, Anne-Sophie Rollier, Karim Seguini, Bernard Legrand, Gérard Couturier, Jean-Pierre Aimé, Charlotte Bernard, Rodolphe Boisgard and Lionel Buchaillot</i> | |
| Development Of Self-Vibration And -Detection Afm Probe By Using Quartz Tuning Fork..... | 1525 |
| <i>H. Hida, M. Shikida, K. Fukuzawa, A. Ono, K. Sato, K. Asaumi, Y. Iriye, T. Muramatsu, Y. Horikawa, and K. Sato</i> | |

Table of Contents

| | |
|---|-------------|
| Highly Sensitive Cantilevers, With And Without Magnetic Tip, For Magnetic Resonance Force Microscopy | 1529 |
| <i>S. Mouaziz, A. Dysli, J. Brugger and G. Boero</i> | |
| Nanotopography Imaging Using A Heated Microcantilever In Tapping Mode..... | 1533 |
| <i>K. Park, J. Lee, Z. M. Zhang, and W. P. King</i> | |
| Design And Test Of A Novel Higher Harmonic Imaging Afm Probe With A Dedicated Second Cantilever For Harmonic Amplification | 1537 |
| <i>B. Zeyen, K.L. Turner</i> | |
| "CNT-Polymer" Composite-Film As A Material For Microactuators..... | 1541 |
| <i>Huai-Yuan Chu, Ting-Hsien Chen, Wen-Kuang Hsu, and Weileun Fang,</i> | |
| Carbon Nanotube Micro-Electrode Array | 1545 |
| <i>T. Gabay, M. Ben-David, I. Kalifa, Z. R. Abrams, R. Sorkin, E. Ben-Jacob and Y. Hanein</i> | |
| Evaluation Of Piezoresistive Effects For Carbon Nanowire Using MEMS Actuators | 1549 |
| <i>Mario Kiuchi, Yoshitada Isono, Shinji Matsui, and Kenichiro Nakamatsu</i> | |
| Nanoscale Straining Of Individual Carbon Nanotubes By Micromachined Transducers..... | 1553 |
| <i>A. Jungen, L. Durrer, C. Stampfer, and C. Hierold</i> | |
| Piezoresistance Of Single-Walled Carbon Nanotubes | 1557 |
| <i>C. Stampfer, T. Helbling, A. Jungen, and C. Hierold</i> | |
| Optofluidic Maskless Lithography System..... | 1561 |
| <i>Su E. Chung, Wook Park, Hyunsung Park, Kyoongsik Yu, Namkyoo Park, and Sungsoon Kwon</i> | |
| Continuous Production Of Spherical Microcapsules With Nano-Pores And Use As A Potential Encapsulant..... | 1565 |
| <i>D. H. Yoon, D. G. Won, S. Y. Park, E. H. Jeong, S. Abraham, T. Arakawa, I. Kim, S. Shoji, K. C. Kim and J. S. Go</i> | |
| Surface Wett Ability In Terms Of Prominence And Depression Of Diverse Microstructure And Their Sizes..... | 1569 |
| <i>S. M. Lee, S. W. Ha, I. D. Jung, J. S. Go, B. Shin, and J. S. Ko,</i> | |
| Micro Proximity Electron Source With Apertured Electron Window For Nanolithography In Atmosphere..... | 1573 |
| <i>Wonja Cho, Takahito Ono and Masayoshi Esashi</i> | |
| A Method To Form Bonded Micromagnets Embedded In Silicon..... | 1577 |
| <i>B. J. Bowers, J. S. Agashe, and D. P. Arnold</i> | |
| Sensor Networks For Integration Into Textile-Reinforced Composites..... | 1581 |
| <i>K.-U. Roscher, W.-J. Fischer, J. Landgraf, G. Pfeifer and E. Starke</i> | |
| Nanoscale Al-Al And Cu-Cu Contacts | 1585 |
| <i>Qingquan Liu, Daniel T. McCormick, Robert C. Roberts, and Norman C. Tien</i> | |
| A Biaxially Stretchable Interconnect With Liquid Alloy Joints On Flexible Substrate | 1589 |
| <i>Hyun-Joong Kim, Meng Zhang, and Babak Ziae</i> | |
| Double-Cantilever Infrared Detector: Fabrication, Curvature Control And Demonstration Of Thermal Detection | 1593 |
| <i>Shusen Huang, Hu Tao, I-Kuan Lin, Xin Zhang</i> | |
| Fabrication And Characterization Of High Aspect Ratio Silicon Plate Springs With High Out-Of Plane Stiffness..... | 1597 |
| <i>H. W. van Zeijl, S. L. Paalvast, J. Su, J. van Eijk and P. M. Sarro</i> | |
| Stacked SiO₂/Si Nanonail Array Fabricated By Spacer Technology For Biomedical Applications | 1601 |
| <i>X. Han, H. Luo, W.G. Wu, J. Xu, G.Z. Yan, Y.F. Jin and Y.L. Hao</i> | |

Table of Contents

| | |
|---|-------------|
| Fabrication Of Vertical Electrodes On Channel Sidewall For Picoliter Liquid Measurement | 1605 |
| <i>J. Wei, M. van der Velden , P.M. Sarro</i> | |
| Polymer Microchip For Electrophoresis-Mass Spectrometry Fabricated By Hot Embossing And Low Temperature Direct Bonding..... | 1609 |
| <i>T. Suzuki, F. Kitagawa, H. Shinohara, J. Mizuno, K. Otsuka, and S. Shoji</i> | |
| Fabrication Of Three-Dimensional Nano-Patterns By Inclined Nanoimprinting Lithography | 1613 |
| <i>Zhan Liu, David G. Bucknall, and Mark G. Allen</i> | |
| High Performance Microcooler Fabricated By Multiple Stacking Of Electroplated Metal Patterns | 1617 |
| <i>T. Yamada, K. Tabata, D. Nagao, and M. Takahashi</i> | |
| Improved Hydrophobicity Of Vapor Coated Chlorosilane Self Assembled Monolayers Using Evaporative Drying Of Solvent And Annealing..... | 1621 |
| <i>H.S. Khoo, T.W. Huang, Y.F. Chen, M.H. Chen, T.H. Hsu, and F.G. Tseng,</i> | |
| Mechanical Properties Of Silicon-Based Membrane Windows Applied For Aminiature Electron Beam Radiation System | 1625 |
| <i>M. Yamaguchi, Y. Yamada, Y. Goto, M. Shikida and K. Sato</i> | |
| 3D Metal Microstructure Fabrication Using A Molten Dod Inkjet System | 1629 |
| <i>Taik-Min Lee, Tae Goo Kang, Jeong-Soo Yang, Jeong-Dai Jo, Kwang-Young Kim, Byung-Oh Choi, Dong-Soo Kim</i> | |
| Self-Aligned Stylus With High Sphericity For Micro Coordinate Measurement | 1633 |
| <i>Y.-C. Tsai, D.-R. Chang, L.-C. Tsao, M.-D. Wu, P.-J. Shih, and W.-P. Shih</i> | |
| Conductive Polymer Patternd Media For Scanning Multiprobe Data Storage | 1637 |
| <i>Shinya Yoshida, Takahito Ono, and Masayoshi Esashi</i> | |
| Development Of Scanning Probe Parallel Nanowriting System With Electron Beam Resist | 1641 |
| <i>Naoki Matsuzaka, Bungo Tanaka, Toshihiko Nagamura, Tohru Sasaki, Takahiro Namazu, and Yoshitada Isono</i> | |
| Characterization Of The Micro Contact Resistance Using A Novel On-Chip Apparatus | 1645 |
| <i>Ben-Hwa Jang, Po-Hsun Tseng, Hsin-Yu Huang, Sheng-Ta Lee and Weileun Fang,</i> | |
| Investigation Of Anti-Stiction Coating For MEMS Switch Using Atomic Force Microscope | 1649 |
| <i>T. Yamashita, T. Itoh, and T. Suga</i> | |
| Material Properties Measurement And Numerical Simulation For Characterization Of Ultra-Low-Power Consumption Hotplates..... | 1653 |
| <i>E. Cozzani, A. Roncaglia, S. Zampolli, I. Elmi, F. Mancarella, F. Tamarri, G.C. Cardinali</i> | |
| Simulation, Design And Test Of A Novel Planar RF micro Ion Trap..... | 1657 |
| <i>M. Kröner, M. Debatin , J. Mikosch, S. Trippel, E. Just, M. Reetz-Lamour, R. Wester, M. Weidemüller, P. Woias</i> | |
| Analysis And Experimental Validation Of Electromechanical Buckling | 1661 |
| <i>D. Elata and S. Abu-Salih</i> | |
| Modular Multifunctional Silicon Microsystems For Spacecraft Applications | 1665 |
| <i>J. Köhler, H. Kratz, H. Nguyen, and G. Thornell</i> | |
| Horizontal Hall Devices: A Lumped-Circuit Model For Eda Simulators..... | 1669 |
| <i>P. D. Dimitropoulos, P. M. Drljaca, and R. S. Popovic</i> | |
| Modeling And Test Of Nanostructure Fabricated On 160 Nm Thin Soi Wafer For In-Ic Integration..... | 1673 |
| <i>Philippe Andreucci, Laurent Duraffourg, Eric Ollier, Eric Colinet, Sébastien Hentz, Hervé Fontaine, Valérie Nguyen, Marie Thérèse Delaye, Hubert Grange, Denis Renaud, Philippe Robert</i> | |
| MEMS Electrometer System Simulation Using A Time-Domain Variable Capacitor Model | 1677 |
| <i>Yong Zhu, Joshua Lee, Ashwin Seshia</i> | |
| Sliding Contact Micro-Bearing For Nano-Precision Sensing And Positioning | 1681 |
| <i>Narayanan Ramakrishnan, Earl C. Johns, Yongjun Zhao, James D. Kiely, Mark D. Bedillion and Patrick B. Chu</i> | |

Table of Contents

| | |
|---|-------------|
| Parallel Plate Capacitive Detection Of Large Amplitude Motion In MEMS | 1685 |
| <i>Alexander A. Trusov and Andrei M. Shkel</i> | |
| Prediction And Validation Of Chaotic Behavior In An Electrostatically Actuated Microelectromechanical Oscillator | 1689 |
| <i>B.E. DeMartini, H.E. Butterfield, J. Moehlis, and K.L. Turner</i> | |
| An Atomic Level Simulation System For Silicon Anisotropic Etching Processes Handling Complex Cases: Accuracy, Efficiency And Experimental Verification | 1693 |
| <i>Zai-Fa Zhou, Qing-An Huang and Wei-Hua Li</i> | |
| Smart Flapping Wings With A PvdF Sensor To Modify Aerodynamic Performance Of A Micro UAV | 1697 |
| <i>Lung-Jieh Yang, Cheng-Kuei Hsu, Chao-Kang Feng, H.-M. Shih, G.-H. Feng and M.-W. Gao</i> | |
| Integration Of MOSFET Transistors In MEMS Resonators For Improved Output Detection | 1701 |
| <i>Daniel Grogg, Dimitrios Tsamados, Nicoleta Diana Badila and Adrian Mihai Ionescu</i> | |
| A Novel Miniaturized Electromagnetically Excited Vibrating Membrane Rheometer..... | 1705 |
| <i>Erwin K. Reichel, Christian Riesch, and Bernhard Jakoby</i> | |
| Novel Magnetic-Acoustic Face Shear Mode Resonators For Liquid Property Sensing | 1709 |
| <i>Frieder Lucklum and Bernhard Jakoby</i> | |
| An Experimental Study Of Nonlinear Limits In High-Q Silicon Vibrating Micro-And Nanomechanical Sensors | 1713 |
| <i>B. Le Foulgoec, A. Bosseboeuf, T. Bourouina, O. Le Traon, S. Masson and A. Parent</i> | |
| Adjustable Force Coupled Sensor-Actuator System For Low Frequency Resonant Vibration Detection | 1717 |
| <i>R. Forke, D. Scheibner, J. Mehner, T. Gessner, W. Dötzl</i> | |
| Application Of A Lateral Field Excited Acoustic Wave Device As A New Sensor Principle In Biointerface Analysis..... | 1721 |
| <i>U. Hempel, R. Lucklum, P. Hauptmann</i> | |
| Equivalent-Circuit Model For CMOS-Based Resonant Cantilever Biosensors | 1725 |
| <i>C. Vanura, K.-U. Kirstein, Y. Li, F. Josse, A. Hierlemann</i> | |
| Liquid-Phase Biochemical Sensing With Disk-Type Resonant Microsensor | 1729 |
| <i>Jae Hyeong Seo, Lorena Betancor, Kemal Safak Demirci, Albert Byun, Jim Spain, Oliver Brand</i> | |
| Resonance Induced Impedance Sensing Of Human Blood Cells | 1733 |
| <i>Siyang Zheng, Mandheerej S. Nandra, Victor Shih, Wei Li and Yu-Chong Tai</i> | |
| Exploitation Of Nonlinear Effects For Enhancement Of The Sensing Performance Of Resonant Sensors | 1737 |
| <i>Seungkeun Choi, Seong-Hyok Kim, Yong-Kyu Yoon and Mark G. Allen</i> | |
| Microprobe Integrated With Single-Electron Transistor For Magnetic Resonance Force Microscopy..... | 1741 |
| <i>Suk-Ho Song, Takahito Ono and Masayoshi Esashi</i> | |
| 12.9mhz Lame-Mode Differential SOI Bulk Resonators | 1745 |
| <i>Lynn Khine, Moorthi Palaniapan and Wai-Kin Wong</i> | |
| MEMS-Based Enthalpy Arrays..... | 1749 |
| <i>D. De Bruyker, M. V. Wolkin, M. I. Recht, F. E. Torres, A. G. Bell, G. B. Anderson, E. Peeters, A. Kolatkar, P. Kuhn and R. H. Bruce</i> | |
| Chip-Based Scanning Nano-Calorimeter For Protein Stability Analysis In Biosensor Membranes..... | 1753 |
| <i>T. Weiß, G. Igel, G. Urban</i> | |
| High Efficiency Sample Transfer Between IEF And SDS-Page Separations On A Miniaturized Proteomics Chip..... | 1757 |
| <i>Zuzana Demanova, Eemeli Pöysä, Sami Fransila and Marc Baumann</i> | |
| Hydrophoresis: A New-Phoretic Method For High-Resolution Particle Separation..... | 1761 |
| <i>Sungyoung Choi and Je-Kyun Park</i> | |

Table of Contents

| | |
|---|-------------|
| A High-Throughput Su-8 Microfluidicmagnetic Bead Separator | 1765 |
| <i>M. Bu, T.B. Christensen, K. Smistrup, A. Wolff, M.F. Hansen</i> | |
| Focusing And Continuous Separation Of Cells In A Microfluidic Device Using Lateral Dielectrophoresis | 1769 |
| <i>N. Demierre, T. Braschler, R. Muller and P. Renaud</i> | |
| A Total Internal Reflection (TIR)-Based Chip For Ultra-Sensitive Fluorescent Sensing | 1773 |
| <i>Nam Cao Hoai Le, Dzung Viet Dao, Ryuji Yokokawa, John Wells, and Susumu Sugiyama</i> | |
| Ng/MI-Level Alpha-Fetoprotein Immuno-Detection With Torsion-Mode Cantilever Sensors For Early-Stage Hepatocellular Carcinoma Diagnosis | 1777 |
| <i>Zhixiang Zhang, Hanhan Bao, Haitao Yu, Xinxin Li</i> | |
| High Sensitivitymicropillar Electrosprayionization Chip Fabricated Of Silicon..... | 1781 |
| <i>L. Sainiemi, T. Nissilä&, T. Sikanen, T. Kotiaho&, R. Kostiainen, R. A. Ketola and S. Franssila</i> | |
| Simultaneous Multipoint Measurement Of Cellular Network By Isolated Micro Channel Array With Pt-Black Electrodes..... | 1785 |
| <i>W. Tonomura, T. Kurashima, Y. Takayama, H. Moriguchi, Y. Jimbo and S. Konishi</i> | |
| Fabrication Of Cell-Encapsulated Microfiber Using Microfluidic Channel..... | 1789 |
| <i>B. Kim, W.S. Choi, Intae Kim, S.-W. Kim, J. S. Kim and Geunbae Lim</i> | |
| A Passive Microfluidic Valve Using Superhydrophobic/Hydrophilic Nanostructures For Lab-On-A-Chip (Loc) Systems | 1793 |
| <i>G. Londe, A. Wesser, H. J. Cho, L. Zhai, A. Chunder, and S. Subbarao</i> | |
| An Integrated Electronic Meniscus Sensor For Measurement Of Evaporative Flow | 1797 |
| <i>D. Gazzola, B. Iafelice, E. Jung, E. Franchi, and R. Guerrieri</i> | |
| 3D Droplet Actuation In Digital Microfluidics Devices..... | 1801 |
| <i>Mohamed Abdelgawad and Aaron R. Wheeler</i> | |
| Uniform Nanoliter-Sized Droplet Deposition Using Fluid Motion In Ratcheted Micro-Channels | 1805 |
| <i>Zhenwen Ding, and Babak Ziae,</i> | |
| Mixing Immiscible Fluids In A Microchannel Through Surface Modifications | 1809 |
| <i>Julia Viertel and Jürgen Rühe</i> | |
| Novel Hybrid Material For Microfluidic Devices | 1813 |
| <i>Susanna Aura, Tiina Sikanen, Tapio Kotiaho, Sami Franssila</i> | |
| A High Throughput Microfluidic Bioparticle Sensor..... | 1817 |
| <i>Jiang Zhe, Ashish Jagtiani, Prashanta Dutta, Jun Hu, Joan Carletta</i> | |
| Overcoming The Diffusion Barrier: Ultra-Fast Micro-Scale Mixing Via Ferrofluids | 1821 |
| <i>Leidong Mao and Hur Koser</i> | |
| The Influence Of Physical Cell Parameters On Projection Cytometer Measurements..... | 1825 |
| <i>S. Kostner and M. J. Vellekoop</i> | |
| Bidirectional Field-Flow Particle Separation Method In A Dielectrophoretic Chipwith 3D Electrodes | 1829 |
| <i>C. Iliescu, L. Yu,, F.E.H. Tay, and A.J. Pang</i> | |
| A Microsystem Chip For The Manipulation Of Bio-Particles Via AC Electrokinetics Array..... | 1833 |
| <i>Kuang-han Chu, Ching-Chen Tu and Cheng-Hsien Liu</i> | |
| Analysis Of Micrometer Sample Flows In A Non Coaxial Sheath Flow Device..... | 1837 |
| <i>G. Hairer, G.S. Pärr, P. Svasek, A. Jachimowicz, and M.J. Vellekoop</i> | |
| Thermal Characterization Of A Microfluidic Cell Using The 3. Method..... | 1841 |
| <i>T. Barilero, P.-O. Chapuis, D. Pujade, S. Guilet, V. Croquette, L. Jullien, S. Volz, and C. Gosse</i> | |
| Effects Of Microchannel Cross-Section And Applied Electric Field On Electroosmotic Mobility | 1845 |
| <i>Ali Asgar S. Bhagat, Subhashish Dasgupta, Rupak K. Banerjee, and Ian Papautsky</i> | |

Table of Contents

| | |
|---|------|
| "Smart" Microfluidic Preconcentration Of Specific Biomolecules..... | 1849 |
| <i>T.H. Nguyen, R. Pei, M. Stojanovic, and Q. Lin</i> | |
| Rapid Detection Of Waterborne Protozoa In Environmental Samples With A Filter-Based Biochip..... | 1853 |
| <i>X. L. Peh, L. Zhu, C.Y. Teo, H. M. Ji, H. H. Feng, W.-T. Liu</i> | |
| A Centrifugation-Enhanced High-Efficiency Micro-Filter With Spiral Channel..... | 1857 |
| <i>Xu Ji, Wei Wang, Xia Lou, Jianhong Peng, and Zhihong Li</i> | |
| The Multi Vortexes Generated Inside A Micro Droplet And Used To Enhance The Droplet Mixing Efficiency | 1861 |
| <i>Heng-Cang Hu, Ming-Yu Lin, Chih-Sheng Yu, Yi-Chiuen Hu</i> | |
| Compressive Cell Stimulation Using PDMS Membrane Deflection In A Microfluidic Device..... | 1865 |
| <i>Yu Chang Kim, Joo H. Kang, Sang-Jin Park, Eui-Soo Yoon and Je-Kyun Park</i> | |
| Direct Liquid Manipulation By Parallel Micro Syringe System For High Controllability With Pico-Liter Scale | 1869 |
| <i>T. Saika, R. Yokokawa, H. Fujita and S. Konishi</i> | |
| Charge Transfer Type Ph Sensor With Super High Sensitivity | 1873 |
| <i>J.Matsu, T. Hizawa, K. Sawada, H. Takao, and M. Ishida</i> | |
| Protein Assemblies On Gold Using Polyelectrolytes For The Construction Of Analytical Signal Chains | 1877 |
| <i>F. Lisdat, R. Dronov, D. Kurth, H. Möhwald, F. Scheller</i> | |
| Electrical Detection Of Nucleic Acids Using Target-Guided Formation Conducting Polymer Nanowires In Nanogaps | 1879 |
| <i>Y. Fan, X.T. Chen, C.H. Tung, J.M. Kong, and Z.Q. Gao</i> | |
| Nanocrystalline Diamond-Based Field-Effect Capacitive Ph Sensor | 1883 |
| <i>P. Christiaens, M.H. Abouzar, A. Poghossian, T. Wagner, N. Bijnens, O. A. Williams, M. Daenen, K. Haenen, M.J. Schöning, and P. Wagner</i> | |
| Fet Transduction Of Electric Dipole Changes In Organic Layers | 1887 |
| <i>E. Martinelli, K. Buchholt, R. Paolesse, A. D'Amico, I. Lundström, A. Lloyd-Spetz, C. Di Natale</i> | |
| Multibiosensor On The Basis Of Yeast Cells For Detection Of Glucose And Sucrose In Aqueous Solutions..... | 1891 |
| <i>A.L. Kukla, M.I. Kanyuk and S.S. Nagorna</i> | |
| Eis-Capacitor-Based Lc Wireless Chemical Sensors | 1895 |
| <i>J. Garcia-Canton, L. Moreno, C. Jimenez, A. Merlos, and A. Baldi</i> | |
| Amperometric Oxygen Sensor Array With Novel Chronoamperometric Protocols For Hypoxic Tumor Cell Cultures | 1899 |
| <i>J. Kieninger, A. Dannenberg, K. Aravindalochanan, G. Jobst, E. O. Pettersen and G. A. Urban</i> | |
| Embedded MEMS-Based Concentration Sensor For Improved Active Fuel Cell Performance | 1903 |
| <i>D. Sparks, D. Riley, V. Cruz, N. Tran, A. Chimbayo, N. Najafi, K. Kawaguchi, M. Yasuda</i> | |
| Laser-Terahertz Emission Readout Of Chemical Sensors..... | 1907 |
| <i>T. Kiwa, J. Kondo, S. Oka, I. Kawayama, H. Yamada, M. Tonouchi and K. Tsukada</i> | |
| Direct Detection Of Nucleic Acids By Tagging Phosphates On Their Backbones With Conductive Nanoparticles | 1911 |
| <i>Y. Fan, X. Chen, J. Kong and Z. Gao</i> | |
| Highly Ordered Nanostructures For Ultra-Sensitive Sers | 1915 |
| <i>A. Agarwal, C. Fang, K.D. Buddharaju, N. Balasubramanian, D.L. Kwong, N. Md. Khalid, S. M. Salim, E. Widjaja and M. Garland</i> | |
| Improved And Accelerated Analytical Calculation Algorithm For Multi-Wire Coils To Power Wireless Sensor Systems | 1919 |
| <i>Christian Peters, Yiannos Manoli</i> | |

Table of Contents

| | |
|---|-------------|
| A Lowpower Radio Telemetry Achieving Very High Data Rates At Biocompatible Frequencies | 1923 |
| <i>D.Turgis and R.Puers</i> | |
| Pressure Sensitivity Evaluation Of Passive Saw Microsensor Integrated With Pressure-Temperature And Id Tag On 41o-Yx Linbo3 | 1927 |
| <i>Wen Wang, Keekeun Lee Taehyun Kim, Sangsik Yang, and Ikmo Park</i> | |
| Bimetallic Thermal Radiation Microsensor With Integrated Dipole Antenna | 1931 |
| <i>Yongfang Li, Takahito Ono and Masayoshi Esashi</i> | |
| An Implantable Active Microport Based On A Self-Priming High-Performance Two-Stage Micropump | 1935 |
| <i>A. Geipel, F. Goldschmidtböing, A. Doll, S. Nadir, P. Jantscheff, N. Esser, U. Massing, and P. Woias</i> | |
| Micro-Ablation Of Skin By Arc-Discharge Jet Ejection For Transdermal Drug Delivery..... | 1939 |
| <i>Priya D. Gadiraju, Jung-Hwan Park, Jeong Woo Lee, Mark R. Prausnitz, and Mark G. Allen</i> | |
| 6-Stage Cascade Mode Magnetophoretic Microseparator For Human Blood Cells..... | 1943 |
| <i>Youngdo Jung, Yoonsu Choi, Ki-Ho Han and A. Bruno Frazier</i> | |
| Development And Use Of Amicro Optical Blood Flow Sensor Based On System In Package (SIP) Technology That Fuses Optical MEMS And Integrated Circuit To Detect Avian Influenza | 1947 |
| <i>R. Seto, R. Sawada, E. Higurashi, T. Itoh, K. Suzuki, K. Tsukamoto, T. Ikebara, R. Maeda, Takashi Masuda, and T. Fujitsu0</i> | |
| Micro-Dissecting Dual-Probe Testicular Tubule Assay | 1951 |
| <i>A. Ramkumar, X. Chen, D.A. Paduch, P.N. Schlegel and A. Lal</i> | |
| In Situ Monitoring Drug Effects On Cancer Cell At “Few Cells” Level | 1955 |
| <i>Y. Chen, L.H. Lim, Q.X. Zhang, S.C. Chong, K.C. Tang, N. Balasubramanian</i> | |
| Blood Plasma Separation Device Using Capillary Phenomenon | 1959 |
| <i>S. Khumpuang, T. Tanaka, F. Aita, Z. Meng, K. Ooe, M. Ikeda, Y. Omori, K. Miyamura, H. Yonezawa, K. Matsumoto, and S. Sugiyama</i> | |
| On-Chip Multi Wavelength Detection Sensor For Real Time Monitoring Of Fluorescence And Opacity..... | 1963 |
| <i>Y. Maruyama, K. Sawada, H. Takao, and M. Ishida,</i> | |
| A Nucleic Acid Biosensor Based On Catalyzed Formation Of Polyaniline | 1967 |
| <i>Z. Gao and S. Rafea</i> | |
| Synthesis Of Electrochemical Probes For Nucleic Acid Detection | 1971 |
| <i>G. Chatelain, C. Chaix, B. Mandrand</i> | |
| Low Concentrated DNA Detection By Sgfet..... | 1975 |
| <i>M. Harnois, O. De Sagazan, A. Girard, A-C. Salaiün, T. Mohammed-Brahim</i> | |
| Printable DNA Sensor Using Organic Transistors | 1979 |
| <i>Qintao Zhang, Vivek Subramanian</i> | |
| Voltammetric Analysis Of DNA Films Immobilized On Gold Film Electrodes Carrying Single Base Pair Mismatches..... | 1983 |
| <i>Oliver Pänke, and Fred Lisdat</i> | |
| Application Of A Bio-Qcm To Study Carbohydrates Self-Interaction In Presence Of Calcium..... | 1987 |
| <i>S. A. Rodriguez-Segui, I. Bucior, M. M. Burger, J.Samitier, A.Errachid and X. Fernandez-Busquets</i> | |
| First Characterization Of A Biosensor For Large DNA Molecules Using Quartz Crystal Microbalance And Impedance Spectroscopy..... | 1991 |
| <i>I.A. Marques de Oliveira, M. Barreiros dos Santos, S. Rodriguez-Segui, M.T.S.R. Gomes, R. Eritja, J. Samitier and A. Errachid</i> | |
| Silicon Nanowire Arrays For Ultrasensitive Label-Free Detection Of DNA..... | 1995 |
| <i>Z. Gao, A. Agarwal, A. D. Trigg, N. Singh, C. Fang, C.H. Tung and K.D. Buddharaju</i> | |

Table of Contents

| | |
|---|-------------|
| A New Self-Compensated Thermocycler For Polymerase Chain Reaction | 1999 |
| <i>T.M. Hsieh, F.C. Huang, C.S. Liao, C.H. Wang, C.H. Luo, and G.B. Lee,</i> | |
| New Column Designs For Microge..... | 2003 |
| <i>Adarsh D. Radadia, Richard I. Masel and Mark A. Shannon</i> | |
| A One - Chip Solution Of A Mass Spectrometer | 2007 |
| <i>E. Wapelhorst, J.-P. Hauschild, and J. Müller</i> | |
| Increase Of The Selectivity Of Sensor Arrays Through Consumption Effects Of Metal Oxide Sensors..... | 2011 |
| <i>Frank Röck, Nicolae Bârsan, Udo Weimar</i> | |
| Integrated Interface Circuit With Multiplexed Input And Digital Output For A 5x5 SnO₂ Gas-Sensor Matrix | 2015 |
| <i>M. Grassi, P. Malcovati, L. Francioso, P. Siciliano, A. Baschirotto</i> | |
| A Gas Density Detector Utilizing Uranium Doped Scintillating Ceramic Microchannels | 2019 |
| <i>John D. Olivier, Scott M. Pellegrin, and Chester G. Wilson</i> | |
| An Uncalibrated Wide-Range Single-Supply Integrable Front-End For Resistance And Capacitance Estimation..... | 2023 |
| <i>A. Depari, A. Flammini, D. Marioli, A. Taroni, A. De Marcellis, G. Ferri and V. Stornelli</i> | |
| Alumina MEMS Platform For Impulse Semiconductor And Ir Optic Gas Sensors..... | 2027 |
| <i>A.A. Vasiliev, R.G. Pavelko, S.Yu. Gogish-Klushin, D.Yu. Kharitonov, O.S. Gogish-Klushina, A.V. Sokolov, N.N. Samotaev</i> | |
| Capacitive Humidity Sensors On Flexible RF Id Labels..... | 2031 |
| <i>Alexandru Oprea, Nicolae Bârsan, Udo Weimar , Marie-Luise Bauersfeld, Dirk Ebling, Jürgen Wöllenstein</i> | |
| Hydrogen Sensing Characteristics Of A Pd/GaAs Semiconductor Transistor-Type Sensor | 2035 |
| <i>C.W. Hung, H.I. Chen, , D.F. Guo, J.H. Tsai, S.Y. Cheng, Y.Y. Tsai, T.P. Chen, and W.C. Liu</i> | |
| A New Pt-Oxide-InAlP-Based Schottky Diode Hydrogen Sensor | 2039 |
| <i>Yan-Ying-Tsai, Shiou-Ying Cheng, Jung-Hui Tsai, , Der-Feng Guo, Huey-Ing Chen, and Wen-Chau Liu,</i> | |
| Simultaneous Formation Of Through Wafer Electrical Interconnects And Highly Dense & Uniform Nickel Tips For Silicon-Cantilever Probe-Cards | 2043 |
| <i>Fei Wang, Xinxin Li, Yuelin Wang, Songlin Feng</i> | |
| Wirebonding Characterization And Optimization On Thick Filmsu-8 MEMS Structures And Actuators..... | 2047 |
| <i>D. Sameoto, S.-W. Lee, and M. Parameswaran</i> | |
| Fabrication Of Feed Through Atom Trapping Chips For Atomic Optics..... | 2051 |
| <i>H.C.(Rick) Chuang, T.K. Hakala., D.Z. Anderson, and V.M. Bright</i> | |
| Via-Free Interconnection In Quasi-Hermetic Wafer-Level Packaging For Rf-Mems Applications And 3D Integration | 2055 |
| <i>Alain Phommahaxay, Gaëlle Lissorgues, Lionel Rousseau, Vincent Perrais, Frédéric Marty, Tarik Bourouina and Pierre Nicole</i> | |
| A Reusable In-Plane Polymer Integrated Microfluidic Interconnect | 2059 |
| <i>Ronalee Lo and Ellis Meng</i> | |
| Dry Film Package For System In Package Molding Process | 2063 |
| <i>J.A.M. Sondag-Huethorst, S. de Jager, C. de Nooijer, R.B.R. van Silfhout, and M.H. van Kleef</i> | |
| Low Temperature A-SiC/Si Direct Bonding Technology For MEMS/NEMS..... | 2067 |
| <i>Jiangang Du and Christian A. Zorman</i> | |
| Fully Dry 2D And 3D Self-Assembly With Interlocking Pin Fasteners | 2071 |
| <i>Sangjun Park and Karl F. Böhringer</i> | |
| Real Time 3D Stress Measurement In Curing Epoxy Packaging..... | 2075 |
| <i>J. Richter, A. Hyldgård, K. Birkeland, O. Hansen and E.V. Thomsen</i> | |

Table of Contents

| | |
|---|-------------|
| CMOS compatible Wafer-Level Microdevice-Distribution Technology..... | 2079 |
| <i>R. Guerre, U. Drechsler, D. Jubin, and M. Despont</i> | |
| MEMS Wafer-Level Packaging With Conductive Vias And Wafer Bonding..... | 2083 |
| <i>C. H. Yun, J. R. Martin, T. Chen, and D. Davis</i> | |
| Polydimethylsiloxane (PDMS) Bonding Strength Characterization By A Line Force Model In Blister Tests..... | 2087 |
| <i>Yen-Wen Lu, Po-Ting Lin and Chien-Shing Pai</i> | |
| A Novel Zero-Level Packaging Using Bcb Adhesive Bonding And Glass Wet-Etching For Millimeter-Wave Applications..... | 2091 |
| <i>Seonho Seok, Nathalie Rolland and Paul-Alain Rolland</i> | |
| Wafer Bonding With Nanoprecision Alignment For Micro/Nano Systems..... | 2095 |
| <i>Liudi Jiang, G. Pandraud, P. J. French, S. M. Spearing, and M. Kraft</i> | |
| A Novel Low-Temperature Microcap Packaging Using Su-8 Bonding..... | 2099 |
| <i>Y.K. Kim, S.H. Yi, S.W. Kim, and B.K. Ju</i> | |
| Thru-Wafer Interconnect For Soi-MEMS 3D Wafer-Level Hermetic Packaging..... | 2103 |
| <i>Chiung-Wen Lin, Hsueh-An Yang,, Wei Chung Wang,, and Weileun Fang,</i> | |
| Fabrication And Characterization Of RF MEMS Package Based On Ltcc Lid Substrate And Gold-Tin Eutectic Bonding..... | 2107 |
| <i>Yong-Seung Bang, Jong-Man Kim, Yongsung Kim, , Jung-Mu Kim, and Yong-Kweon Kim</i> | |
| Microstructured Devices For Computer Screen Photo Assisted Optical Fingerprinting Of High Density Response Patterns..... | 2111 |
| <i>S. Macken, C. Di Natale, R. Paolesse, A. D' Amico, I. Lundström, D. Filippini</i> | |
| Detection Of Single Biological Cells Using A DVD Pickup Head..... | 2115 |
| <i>S. Kostner and M.J. Vellekoop</i> | |
| High Sensitivity On-Chip Fluorescence Detection Based On Cross-Polarization And Thin-Film Organic Photo | 2119 |
| <i>Andrea Pais, Ansuman Banerjee, Dilip K. Bandi, David Klotzkin, and Ian Papautsky</i> | |
| Via-In-Pixel Design Of Truly 2d Extendable Photodiode Detector For Medical Ct Imaging..... | 2123 |
| <i>Fan Ji, Mikko Juntunen, Simo Eränen, Seppo Leppävuori, Iiro Hietanen</i> | |
| Ultra High Contrast Gxltm Device For Laser Projector..... | 2127 |
| <i>K. Saruta, M. Nishida, M. Yamaguchi, Y. Ito, K. Yamashita, A. Taguchi, K. Oniki, and H. Tamada</i> | |
| Characterization Of Latching 2x2 Optical Switch With Movable Polymer Waveguide | 2131 |
| <i>Hao-Bing Liu and Franck Chollet</i> | |
| Novel Absorption Photometry Microchip With No Reference Solution | 2135 |
| <i>T. Noda, N. Hirokubo, H. Takao, K. Miyamura, N. Oku, K. Matsumoto, K. Sawada and M. Ishida</i> | |
| Novel Micro Lens With Tunable Astigmatism..... | 2139 |
| <i>Sz-Yuan Lee, Hsi-Wen Tung, Wen-Chih Chen, and Weileun Fang,</i> | |
| Driving Of Micromirror And Simultaneous Detection Of Rotation Angle Using Integrated Piezoresistive Sensor..... | 2143 |
| <i>Minoru Sasaki, Motoki Tabata, and Kazuhiro Hane</i> | |
| A Hybrid-Assembled MEMS Fabry-Perot Wavelength Tunable Filter | 2147 |
| <i>Toshio Yamanoi,, Takashi Endo, and Hiroshi Toshiyoshi</i> | |
| Differential Mach-Zehnder Interferometer For Simultaneously Determining Size And Refractive Index Of Living Cells..... | 2151 |
| <i>W. Z. Song, C. S. Lim, P. H. Yap and A. Q. Liu</i> | |

Table of Contents

| | |
|---|-------------|
| Genetic Extended-Fiber Network (GEN) Stretched Over Microbridges Fabricated By Single-Mask Inclined Uv Lithography..... | 2155 |
| <i>Takaaki Suzuki, Daisuke Hiramaru, Ariko Fuke, Isaku Kanno, Hiroyuki Kabata and Hidetoshi Kotera,</i> | |
| Experimental Study Of A Novel Silicon Carbide MEMS Ignition Device..... | 2159 |
| <i>Aaron J. Knobloch, Richard Saia, Kevin Durocher, and Kanakasabapathi Subramanian</i> | |
| Bubble Driven Arrayed Actuator Device For A Tactile Display..... | 2163 |
| <i>S. Ukai, T. Imamura, M. Shikida and K. Sato</i> | |
| A Single-Layer Step-Bridge For Out-Of-Plane Thermal Actuator..... | 2167 |
| <i>Po-I Yeh, Wen-Chih Chen, Chih-Fan Hu, and Weileun Fang,</i> | |
| On-Chip Array Of Thermoelectric Peltier Microcoolers..... | 2171 |
| <i>L.M. Goncalves, J.G. Rocha, C. Couto, P. Alpuim, J.H. Correia</i> | |
| Analysis Of Valveless Piezoelectric Micropump Using Electrical Equivalent Circuit Model..... | 2175 |
| <i>S. Tanaka, O. Ichihashi, K. Sugano, T. Tsuchiya and O. Tabata</i> | |
| A Dram-Like Mechanical Non-Volatile Memory..... | 2179 |
| <i>Weon Wi Jang, Jeong Oen Lee, and Jun-Bo Yoon</i> | |
| Robust Trimorph Bulk Sma Microactuators For Batch Manufacturing And Integration..... | 2183 |
| <i>Stefan Braun, Thomas Grund, Sveinbjörg Ingvarsdóttir, Wouter van der Wijngaart, Manfred Kohl and Göran Stemme</i> | |
| Ti-Ni Sma Film-Actuated 2-D Multi-Probe Array For Scanning Probe Nano-Lithography On A Wide Area..... | 2187 |
| <i>Y. Okamura, T. Namazu, D. Kamoyama, N. Urushihara, T. Sasaki, T. Nagamura, and Y. Isono</i> | |
| A Bi-Stable Latchable Pdms Valve Employing Low Melting Temperature Metal Alloys | 2191 |
| <i>Kashan A. Shaikh and Chang Liu</i> | |
| MEMS Applications In Hard Disk Drives..... | 2195 |
| <i>Toshiki Hirano and Henry Yang</i> | |
| A Micro Diffuser/Nozzle Pump With Fins On The Sidewall | 2199 |
| <i>X. H. Li, X. M. Yu, D. C. Zhang, Z. H. Li, W. H. Xu</i> | |
| Biochemical-Powered Pump With An Asymmetric Enzyme Membrane | 2203 |
| <i>Kohji Mitsubayashi, Yoshihiko Wakabayashi and Toshiaki Okamoto</i> | |
| A Digital Push-Pull Liquid Pump For Tunable Liquid-Filled Lens..... | 2207 |
| <i>C. Gary Tsai and J. Andrew Yeh,</i> | |
| Performance Evaluations Of Prototype Of Tube-Type Micropump Using Heart Muscle Cells Actuator | 2211 |
| <i>K. Morishima and T. Obata</i> | |
| Parallel Transportation Of Droplets In A Multilayer Device By Mewod..... | 2215 |
| <i>Li-Yu Chu and Shih-Kang Fan</i> | |
| High-Accuracy Digital-To-Analog Actuators Using Load Spring Compensating Fabrication Errors | 2219 |
| <i>Won Han, Won Chul Lee, and Young-Ho Cho</i> | |
| A Virtual Impactor For Hydrodynamic Particle Classification | 2223 |
| <i>Y.H. Kim, S. Park, M.H. Lim, J. Hwang, J.S. Shin, and Y.J. Kim</i> | |
| A Magnetic Repulsive Force MEMS Actuator..... | 2227 |
| <i>Tsung-Lin Tang, Hsueh-An Yang, Han-Tang Su, and Weileun Fang,</i> | |
| Rotational Brownian Motion Of Magnetically Clamped Silicon Nanoneedle: Towards Nano-Motors Fueled By Brownian Motion | 2231 |
| <i>Ersin Altintas, Karl F. Böhringer and Hiroyuki Fujita</i> | |

Table of Contents

| | |
|--|-------------|
| Reinforced Pressure Sensor For Marine Environment..... | 2235 |
| <i>Shyam Aravamudhan and Shekhar Bhansali</i> | |
| High Piezoresistive Organic Film For Plastic Pressure Sensors..... | 2239 |
| <i>E. Laukhina, V. Laukhin,, M. Mas-Torrent C. M. Creely, D.V. Petrov, J. Veciana, C. Rovira</i> | |
| Extreme Narrow Gap Surface Micromachined Pirani Pressure Sensor | 2243 |
| <i>K. Khosravian and A. M. Leung</i> | |
| Fabrication And Characterization Of The Piezoelectric Microcantilever Integrated With Pzt Thin-Film Microforce Sensor And Actuator | 2247 |
| <i>Mengwei Liu, Tianhong Cui, and Liding Wang</i> | |
| Transparent Su-8 Three-Axis Micro Strain Gauge Force Sensing Pillar Arrays For Biological Applications..... | 2251 |
| <i>N. Klejwa, N. Harjee, R. Kwon, S.M. Coulthard, and B.L. Pruitt</i> | |
| Investigating The Role Of Orientation Angle On Gecko Setae Adhesion Using A Dual-Axis MEMS Force Sensor..... | 2255 |
| <i>Ginel C. Hill, Daniel R. Soto, Stephanie J. Lue, Anne M. Peattie, Robert J. Full, and Thomas W. Kenny</i> | |
| Compact Multilayer Piezoresistive Gauge For In-Plane Strain Measurment In Liquids | 2259 |
| <i>Jean-Baptiste Bureau, Bernard Legrand, Dominique Collard, and Lionel Buchaillot</i> | |
| Thermal Characterization Of Porous Silicon Micro- Hotplates Using Ir Thermography..... | 2263 |
| <i>R. Triantafyllopoulou, C. Tsamis, S. Chatzandroulis, T. Speliotis, J. Parthenios, K. Papagelis, and C. Galiotis</i> | |
| Flexible Pcb Vertical Thermopile Ir Sensor | 2267 |
| <i>Mikael Lindeberg,, Hanna Yousef, Henrik Rödjegård, Hans Martin and Klas Hjort</i> | |
| Miniaturised Flexible Temperature Sensor..... | 2271 |
| <i>Y. Moser and M.A.M. Gijs</i> | |
| The Effect Of Substrate Doping On The Behaviour Of A CMOS Electrothermal Frequency-Locked-Loop..... | 2275 |
| <i>C. Zhang and K.A.A. Makinwa</i> | |
| Flexible Temperature Sensor Array Using Electro-Resistive Polymer Forhumanoid Artificial Skin | 2279 |
| <i>L.-C. Tsao, M.-Y. Cheng, I.-L. Chen, W.-P. Shih, Y.-J. Yang, F.-Y. Chang, K.-C. Fan, and S.-H. Chang,</i> | |
| Towards Enhanced Detection Of Chemical Agents: Design And Development Of A Microfabricated Preconcentrator | 2283 |
| <i>Rekha S. Pai, R. Andrew McGill, Stanley V. Stepnowski, Jennifer L. Stepnowski, Kimberly P. Williams, Heather Summers, Robert Furstenberg, Matthew T. Rake, Viet K. Nguyen, Duane L. Simonson, Bernadette Higgins, Chris Kendziora, and Eric J. Houser</i> | |
| A Photo- Switchable Signal Chain For Superoxide Detection Using A Cdse/ Zns- Quantum Dot Modified Gold Electrode | 2287 |
| <i>Ch. Stoll, M. Zanella, W. Parak, F. Lisdat</i> | |
| A Nanobiosensor Fabricated By Nanoimprinting Technology | 2291 |
| <i>T. Nishikawa, H. Yamashita, R. Hasui, Y. Ohno, S. Fujita, R. Masuda, T. Matsushita, Y. Okuno, and S. Aoyama</i> | |
| Miniatute Tunneloxide Electrodes On Silicon For Aqueous Hot Electron Electrochemistry And Electrochemiluminecscence Studies | 2295 |
| <i>A. J. Niskanen, T. Ylinen, M. Häkansson, J. Suomi, T. Ala-Kleme, S. Kulmala and S. Franssila</i> | |
| Microfabricated Gate-Modulated Electrochemical Miniaturized Quartz Crystal Microbalance Arrays..... | 2299 |
| <i>M. Tabib-Azar, R. Wang, S. Mutlu, C. H. Mastrangelo and Y. B. Gianchandani</i> | |
| Sams And Protein Adsorption Studies For The Calibration Of Miniaturized Quartz Crystal Microbalance Arrays | 2303 |
| <i>Ping Kao, Abhijat Goyal, David Allara, and Srinivas Tadigadapa</i> | |

Table of Contents

| | |
|--|-------------|
| An Out-Of-Plane MEMS Quadrupole For A Portable Mass Spectrometer..... | 2307 |
| <i>L. F. Velásquez-García, and A.I. Akinwande</i> | |
| Hydrogel-Based Sensor For A Rheochemical Characterization Of Solutions..... | 2313 |
| <i>M. Guenther, G. Gerlach, C. Corten, D. Kuckling, J. Sorber, and K.-F. Arndt</i> | |
| On The Possibility Of A Graphene Based Chemical Sensor..... | 2317 |
| <i>Prasoon Joshi, Awnish Gupta, Peter C. Eklund, Srinivas A. Tadigadapa</i> | |
| Gas Flow In Nano-Channels: Thermal Transpiration Models With Application To A Si-Micromachined Knudsen Pump..... | 2321 |
| <i>Naveen K. Gupta, Nathan D. Masters, Wenjing Ye, and Yogesh B. Gianchandani</i> | |
| AeroMEMS Wall Hot-Wire Sensor Arrays On Polyimide With Through Foil Vias And Bottom Side Electrical Contacts..... | 2325 |
| <i>U. Buder, L. Henning, A. Neumann, and E. Obermeier</i> | |
| High Performance Sensor For Angular Resolved Flow Measurement..... | 2329 |
| <i>F. Keplinger, F. Kohl, R. Beigelbeck, J. Kuntner, A. Jachimowicz, and J. Schalko</i> | |
| Biocompatible Flow Sensor With Integrated Solvent Concentration Measurement..... | 2333 |
| <i>T. Velten, T. Knoll, W. Haberer, T. Koch and O. Scholz</i> | |
| Transient Analysis Of An Injection Quantity Sensor For Automotive Applications..... | 2337 |
| <i>U. Schmid and H. Seidel</i> | |
| Characteristics Of On-Wall In-Tube Flexible Thermal Flow Sensor At Wrap Pipe Condition..... | 2341 |
| <i>J. Naito, Z. Y. Tan, M. Shikida, M. Hirota and K. Sato</i> | |
| Contactless Liquid Level Sensing Using Wave Damping Phenomena In Free-Space | 2345 |
| <i>C. Pelczar, M. Meiners., D. Gould, W. Lang, and W. Benecke</i> | |
| A Displacement Sensor Based On Directional Resonant Photodetector..... | 2349 |
| <i>B.S. Choi, Y. Kanamori, and K. Hane</i> | |
| Displacement Sensing By Field Emission With Nanometer Resolution | 2353 |
| <i>A.J. le Fèbre, M. Siekman, L. Abelmann and J.C. Lodder</i> | |
| Experimental Characterization Of Micromachined Electromagnetic Probes Using Scanning Hall Probe Microscopy | 2357 |
| <i>M. K. Yapici, A. E. Ozmetin, J. Zou and D. G. Naugle</i> | |
| Characterisation Of Magnetic Wires For Fluxgate Cores | 2361 |
| <i>P. Ripka, M. Butta, M. Malatek, S. Atalay, F. E. Atalay</i> | |
| Cmos Compatible Out-Of-Plane & In-Plane Magnetometers | 2365 |
| <i>Mehdi El Ghorba, Nicolas Andre, Stanislas Sobieski, Jean-Pierre Raskin</i> | |
| Geometric Optimization And Microstructuring Of Magnetic Concentrators For A Resonant Magnetic Sensor..... | 2369 |
| <i>S. Brugger and O. Paul</i> | |
| Robust Susceptibility-Matched Nmr Probes For Compensation Of Gradient Field Imperfections In Magnetic Resonance Imaging | 2373 |
| <i>P. Sipilä, D. Lange, S. Lechner,, W. Loew, P. Gross, M. Baller, G. Wachutka, and F. Wiesinger</i> | |
| Evaluation Of Magnetic Beads Agitation Performance Operated By Multi-Layered Flat Coils | 2377 |
| <i>M. Koyama, N. Nagao, R. Imai, M. Shikida, H. Honda, M. Okochi, H. Tsuchiya and K. Sato</i> | |
| Industrialisation Of Gas Sensors For Comfort, Security And Wellness..... | 2381 |
| <i>Maximilian Fleischer</i> | |
| MEMS Based Paramagnetic Oxygenmeasurement | 2385 |
| <i>P. Krippner, M. Wetzeko, P. Szasz, B. Andres, and T. Bauer</i> | |

Table of Contents

| | |
|--|-------------|
| Enabling MEMS Chemical Microsensor Arrays For Trace Analyte Detection..... | 2389 |
| <i>Douglas C. Meier, Jon K. Eyju, Kurt D. Benkstein, Baranidharan Raman, Zvi Boger, David L. Lahr and Steve Semancik</i> | |
| Highly Integrated Wafer Level Packaged Mox Gas Sensors | 2393 |
| <i>D. Briand, L. Guillot, S. Raible, J. Kappler and N.F. de Rooij</i> | |
| A New Fabrication Method Of Ultra-Small Laser Scanning Module..... | 2397 |
| <i>K. Abe, S. Yoshihara, J. Ohara, Y. Takeuchi and N. Kawahara</i> | |
| Air-Spaced Cylindrical Prisms For Fast Thermo-Optic Switching | 2401 |
| <i>T. Zhong, X. M. Zhang, H. Cai, and A. Q. Liu</i> | |
| 2D Cantilever Array Spm Using Optical Interference | 2405 |
| <i>H. Koyama, F. Oohira, M. Hosogi, G. Hashiguchi, T. Hamada and K. Suga</i> | |
| Variable Nano-Grating For Tunable Filters | 2409 |
| <i>X. M. Zhang, Q. W. Zhao, T. Zhong, A. B. Yu, E. H. Khoo, C. Lu and A. Q. Liu</i> | |
| Multi-Cantilever-Driven Rotational Micrograting For Moems Spectrometer | 2413 |
| <i>Joe F. Lo, Shih-Jui Chen, Hongyu Yu, Derrick Chi, Chuang-Yuan Lee, Laura Marcu, Eun Sok Kim, and Martin Gundersen</i> | |
| A Micromachined Vapor-Jet Vacuum Pump..... | 2417 |
| <i>M. Doms, J. Müller</i> | |
| Metallic High-Pressure Microfluidic Pump With Active Valves..... | 2421 |
| <i>R. Bodén , U. Simu, J. Margell, M. Lehto, K. Hjort, G. Thornell, and J.-Å. Schweitz</i> | |
| Micro Fabrication Of SiC Mesoscale Lean Direct Injector Array: Toward Active Combustion Control..... | 2425 |
| <i>R. S. Okojie, R. Tacina, C. Wey, and C. Blaha</i> | |
| Electrokinetically Pumped Liquid Propellant Microthrusters For Orbital Station Keeping | 2429 |
| <i>Michael S. Bartsch, Matthew H. McCrink, Robert W. Crocker, Bruce P. Mosier, Kenneth A. Peterson, Karl Wally, and Kamlesh D. Patel</i> | |
| Explosive Micro-Bubble Actuator..... | 2433 |
| <i>D.M. van den Broek and M. Elwenspoek</i> | |
| 6mhz Bulk-Mode Resonator With Q Values Exceeding One Million | 2437 |
| <i>Lynn Khine, Moorthi Palaniapan and Wai-Kin Wong</i> | |
| On-Chip High Quality Factor CMOS-MEMS Silicon-Fin Resonators..... | 2441 |
| <i>Chiung-C. Lo and Gary K. Fedder</i> | |
| Quality Factor Boosting Via Mechanically-Coupled Arraying | 2445 |
| <i>Yu-Wei Lin, Li-Wen Hung, Sheng-Shian Li, Zeying Ren, and Clark T.-C. Nguyen</i> | |
| Novel Temperature Compensation Scheme For Microresonators Based On Controlled Stiffness Modulation | 2449 |
| <i>Jae Hyeong Seo, Kemal Safak Demirci, Albert Byun, Stuart Truax, Oliver Brand</i> | |
| Effect Of Electrode Configuration On The Frequency And Quality Factor Repeatability Of RF Micromechanical Disk Resonators..... | 2453 |
| <i>Yang Lin, Jing Wang, Sabino Pietrangelo, Zeying Ren and Clark T.-C. Nguyen</i> | |
| Enhanced Discrimination Ofcomplex Odours Based Upon Spatio-Temporalsignals From A Micro-Mucosa..... | 2457 |
| <i>J. W. Gardner, S. L. Tan, J. A. Covington and T. C. Pearce</i> | |
| Study Of Odor Classification In Dynamically Changing Concentration Using Qcm Sensor Array And Short-Time Fourier Transform | 2461 |
| <i>N. Nimsuk and T. Nakamoto</i> | |
| Novel Convolution Based Signal Processing Techniques For A Simplified Artificial Olfactory Mucosa..... | 2465 |
| <i>J.W. Gardner and J.E. Taylor</i> | |

Table of Contents

| | |
|---|-------------|
| Characterization Of Smelling Contaminations On Textiles Using A Gradient Micro Array As An Electronic Nose..... | 2469 |
| <i>Daniel Haeringer and Joachim Goschnick</i> | |
| A Method For Online Measurement Of Odour With A Chemosensor System..... | 2473 |
| <i>Torsten Haas, Peter Schulze Lammers, Bernd Diekmann, Gerhard Horner and Peter Boeker</i> | |
| Photonic MEMS: From Laser Physics To Cell Biology..... | 2477 |
| <i>A. Q. Liu and, X. M. Zhang</i> | |
| A Microfluidic Oxygenator For Biological Cell Culture..... | 2481 |
| <i>Raymond H. W. Lam, Min-Cheol Kim, and Todd Thorsen</i> | |
| A CMOS Microsystem Combining Magnetic Actuation And In-Situ Optical Detection Of Microparticles..... | 2485 |
| <i>U. Lehmann, M. Sergio, S. Pietrocola, C. Niclass, E. Charbon and M.A.M. Gijs</i> | |
| Microanalysis System Based On Electrochemiluminescence With Automatic Mixing And Ph-Regulation Functions | 2489 |
| <i>Wataru Satoh, Hiroki Hosono, Mariko Toya, Katsuya Morimoto, Junji Fukuda, and Hiroaki Suzuki</i> | |
| Scanning Electron Microscopy For Vacuum Quality Factor Measurement Of Small-Size Mechanical Resonators | 2493 |
| <i>J.P. Gilles, S. Megherbi, G. Raynaud, F. Parrain, H. Mathias, and A. Bosseboeuf</i> | |
| In-Situ Tem Observation Of Crystal-Facet-Dependent Self-Rearranging Gold Atoms Under Tensile Stress Controlled By MEMS Nanoprobe Positioner..... | 2497 |
| <i>Tadashi Ishida, Kuniyuki Kakushima, Makoto Mita, Hiroshi Toshiyoshi, and Hiroyuki Fujita</i> | |
| Multi-Probe With Metallic Tips For Ferroelectric Recording Probe Storage | 2501 |
| <i>Hirokazu Takahashi, Yasuhiro Mimura, Shuntaro Mori, Masahiro Ishimori, Atsushi Onoe, Takahito Ono and Masayoshi Esashi</i> | |
| Self-Sensing Quartz-Crystal Cantilever For Nanometric Sensing | 2505 |
| <i>Yu-Ching Lin, Takahito Ono, and Masayoshi Esashi</i> | |
| MEMS-Based Probe Array For Wafer Level Lsi Testing Transferred Onto Low Cte Ltcc Substrate By Au/Sn Eutectic Bonding | 2509 |
| <i>S-H. Choe, S. Tanaka, and M. Esashi</i> | |
| Development And Commercialization Of MEMS In Taiwan A Bumpy Exciting Experience..... | 2513 |
| <i>Star Rueyshing Huang</i> | |
| Convective Gas Gyroscope Based On Thermo-Resistive Effect In Si P-N Junction..... | 2517 |
| <i>Van Thanh Dau, Dzung Viet Dao, Tatsuo Shiozawa, and Susumu Sugiyama</i> | |
| Precise MEMS Gyroscope With Ladder Structure | 2521 |
| <i>Yoichi Mochida, Yoshitaka Kato, Yoshihiro Konaka, Akira Mori, Masato Kobayashi, Shinji Kobayashi</i> | |
| Microgyroscope Control System Using A High-Order Band-Pass Continuous-Time Sigma-Delta Modulator..... | 2525 |
| <i>Y. Dong, M. Kraft, N. Hedenstierna, and W. Redman-White</i> | |
| System Design And Analysis Concept Of A Highly Adaptable Ndir Sensor For Gas Analysis..... | 2529 |
| <i>Alexander Graf, Holger Mielenz, Maximilian Sauer, Michael Arndt, and Gerald Gerlach</i> | |
| Fabrication And Characterization Of A Hydrogen Sensor Based On Palladium Nanowires..... | 2533 |
| <i>V. La Ferrara, B. Alfano, E. Massera, I. Nasti and G. Di Francia</i> | |
| Chiral Discrimination Performance Of A Monolithic CMOS Gas Sensor Microsystem | 2537 |
| <i>P. Kurzawski and A. Hierlemann</i> | |
| Ball Surface Acoustic Wave Hydrogen Sensor With Widest Sensing Range And Fast Response | 2541 |
| <i>K. Yamanaka, T. Abe, N. Iwata, T. Tsuji, T. Mihara, S. Akao, K. Noguchi, N. Nakaso, D. Sim, N. Takeda, Y. Ebi, T. Fukiura, and H. Tanaka</i> | |

Table of Contents

| | |
|---|-------------|
| No2 Gas Sensors Based On Individual Suspended Single-Walled Carbon Nanotubes | 2545 |
| <i>T. Helbling, L. Durrer, R. Pohle, C. Stampfer, A. Goyal, M. Fleischer and C. Hierold</i> | |
| Pneumatically-Actuated Tunable Microlens For Endoscopic Optical Coherence Tomography..... | 2549 |
| <i>Khaled Aljasem, Armin Werber, Stephan Reichelt, Daniel Mader, and Hans Zappe</i> | |
| On-Chip Scanning Confocal Microscope With 3D MEMS Scanner And Vcsel Feedback Detection | 2553 |
| <i>C. Gorecki, L. Nieradko, S. Bargiel, J. Dziuban, D. Henis, J.A. Sylvestre, K. Alkowska, G. Soto-Romero, J. Thevenet, R. Yahiaoui</i> | |
| Design And Fabrication Of Micromachined Silicon Based Mid Infrared Multilenses For Gas Sensing Applications..... | 2557 |
| <i>J. Fonollosa, R. Rubio, J. Hildenbrand, S. Hartwig, J. Santander, M. Moreno, S. Marco, L. Fonseca, and J. Wöllenstei</i> n | |
| Modify 2D Gradient-Electrostatic-Forces To Manipulate Micro-Aspherical Lens For Small Form Factor Dvd Pickup Head | 2561 |
| <i>K. Y. Hung, T. H. Liang, F. G. Tseng, , and C. T. Chen</i> | |
| Optical Characterization Of Repositionable Liquid Micro-Lenses..... | 2565 |
| <i>Wolfgang Mönch, Riyaz P. Shaik, Leif Lasinger, Florian Krogmann, and Hans Zappe</i> | |
| Investigation Of Giant-Magneto-Impedance (GMI) Effect And Magnetic Hysteresis In Microfabricated Permalloy/Copper Device..... | 2569 |
| <i>O. Zorlu, P. Kejik, and R. S. Popovic</i> | |
| Performances Of A Newly High Sensitive Trilayer F/Cu/F Gmi Sensor | 2573 |
| <i>F. Alves, B. Kaviraj, L. Abi Rached, J. Moutoussamy and C. Coillot</i> | |
| Microfluxgate Sensors For High Frequency And Low Power Applications..... | 2577 |
| <i>T. Jager, M. Audoin, M. Beranger, R. Cuchet, E. Delevoye, B. Guihlatmat and R. Hida</i> | |
| Integrated Nickel Micro-Nano-Hall Sensors On Su-8 Cantilevers For Scanning Hall Probe Microscopy..... | 2581 |
| <i>S. Mouaziz, C. Imboden, C. Santschi, O. Vazquez Mena, R. Popovic, J. Brugger and G. Boero</i> | |
| Circular Hall Transducer For Angular Position Sensing..... | 2585 |
| <i>P. Kejik, S. Reymond, and R.S. Popovic</i> | |
| A Silicon Carbide Capacitive Pressure Sensor For High Temperature And Harsh Environment Applications..... | 2589 |
| <i>Li Chen and Mehran Mehregany</i> | |
| A Low-Cost And Highly Integrated Fiber Optical Pressure Sensor System | 2593 |
| <i>F. Ceyssens, M. Driesen, K. Wouters, R. Puers</i> | |
| Optically Detected, Framed Silicon Cantilever For High Precision Acoustic Sensing | 2597 |
| <i>P. Sievilä, J. Fonsen, O. Hahtela, N. Chekurov, J. Kauppinen and I. Tittonen</i> | |
| Development Of A Capacitive Ultrasonic Sensor Having Parylene Diaphragm..... | 2601 |
| <i>S. Aoyagi, K. Furukawa, K. Yamashita, T. Tanaka, K. Inoue and M. Okuyama</i> | |
| Small Silicon Condenser Microphone Improved With A Backchamber With Concave Lateral Sides..... | 2605 |
| <i>Takashi Kasai, Yoshitaka Tsurukame, Toshiyuki Takahashi, Fumihiko Sato and Sumio Horiike</i> | |