###  [Compact and Distributed Modeling of Cryogenic Bulk MOSFET Operation](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5456141&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Akturk, A.; Holloway, M.; Potbhare, S.; Gundlach, D.; Li, B.; Goldsman, N.; Peckerar, M.; Cheung, K. P.;
[Electron Devices, IEEE Transactions on](http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=16)
Volume: 57 , [Issue: 6](http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=5466557)
Digital Object Identifier: [10.1109/TED.2010.2046458](http://dx.doi.org/10.1109/TED.2010.2046458%22%20%5Ct%20%22blank)
Publication Year: 2010 , Page(s): 1334 - 1342

IEEE Journals

[AbstractPlus](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5456141&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)  |  Full Text: [PDF](http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5456141) (1193 KB)



We have developed compact and physics-based distributed numerical models for cryogenic bulk MOSFET operation down to 20 K to advance simulation and first-pass design of device and circuit operation at low temperatures. To achieve this, we measured and simulated temperature-dependent current–voltage characteristics of 0.16- and 0.18-$muhbox{m}$ bulk MOSFETs. Our measurements indicate that these MOSFETs supply approximately 40% more current in the saturation and linear regions of operation when they are cooled from room temperature to 20 K. The threshold voltage monotonically increases as the temperature is lowered, but it saturates below 40 K. The subthreshold slope decreases with the temperature lowering but at a rate that is less than theoretically predicted. The extrapolation of the subthreshold slope indicates a finite value at near absolute zero. We show that the measured behavior can be well corroborated with distributed numerical simulations using the drift–diffusion transport model. In addition, to obtain a compact model for use in low-temperature circuit design, SPICE-type compact models need to be modified to incorporate the subtle temperature effects that are not part of the standard models. To this end, we use the analog behavioral language Verilog-A and the BSIM3 model equation set to include additional temperature dependences into the standard compact models to accurately reproduce measured characteristics. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5456141&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [Impact of Decorrelation Techniques on Sampling Noise in Radio-Frequency Applications](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5401090&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Lauritzen, K. C.; Talisa, S. H.; Peckerar, M.;
[Instrumentation and Measurement, IEEE Transactions on](http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=19)
Volume: PP , [Issue: 99](http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=4407674)
Digital Object Identifier: [10.1109/TIM.2009.2036344](http://dx.doi.org/10.1109/TIM.2009.2036344%22%20%5Ct%20%22blank)
Publication Year: 2010 , Page(s): 1 - 8

IEEE Early Access

[AbstractPlus](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5401090&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)  |  Full Text: [PDF](http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5401090) (803 KB)



Analog-to-digital converter (ADC) noise limits the dynamic range of many radio-frequency systems for test and measurement, sensor, and communications applications. Improvements in the total dynamic range (as measured by the SNR) can be achieved by combining $M$ ADCs in parallel, yielding an increase in SNR of $M$ if the noise is fully uncorrelated across ADC units. However, the presence of correlated noise will limit the SNR improvement to a factor less than $M$. Noise in an ADC is due to thermal processes, quantization, and clock jitter. In an array of ADCs, thermal and quantization noise are independently generated in each ADC, but if a common clock is used, its jitter will generate correlated sampling noise in all the ADCs in the array. In this paper, we analyze and experimentally measure the impact of previously proposed harmonic decorrelation techniques on the sampling noise of an array of parallel ADCs driven by a common clock, sampling at an intermediate frequency. Both theory and experiments reveal that the decorrelation techniques reduce the total sampling noise by half, which is a result that could substantially relax clock requirements for high-dynamic-range systems and thus reduce clock costs. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5401090&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [Array of Two UV-Wavelength Detector Types](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5453058&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Ngu, Y.; Peckerar, M. C.; Sander, D.; Eddy, C. R.; Mastro, M. A.; Hite, J. K.; Holm, R. T.; Henry, R. L.; Tuchman, A.;
[Electron Devices, IEEE Transactions on](http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=16)
Volume: 57 , [Issue: 6](http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=5466557)
Digital Object Identifier: [10.1109/TED.2010.2045706](http://dx.doi.org/10.1109/TED.2010.2045706%22%20%5Ct%20%22blank)
Publication Year: 2010 , Page(s): 1224 - 1229

IEEE Journals

[AbstractPlus](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5453058&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)  |  Full Text: [PDF](http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5453058) (1106 KB)



An approach to fabricate a set of simultaneously operating dual-UV-wavelength detectors is described. The fabrication flow relies on the confined-epitaxy growth method. The confined epitaxial $hbox{Al}\_{x}hbox{Ga}\_{1 - x}hbox{N}$-layer stacking approach is used to establish simultaneous multiple UV-wavelength detection. The chosen stoichiometries of specific epitaxial layers set the wavelength sensitivity at approximately 355 nm for pixel A and 320 nm for pixel B. Spectral responsivity plots of the detectors clearly show the dual-UV-color sensitivity of the pair. The detectors have signal-to-noise ratios of 15 and 17 and spectral responsivity values of 0.12 A/W and 0.05 A/W for pixel A and pixel B, respectively. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5453058&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [Flexing Their Muscles: Building a successful business partnership [Career Advisor: Experiences from the Real World]](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5452813&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Salim, N.;
[Women in Engineering Magazine, IEEE](http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=4509581)
Volume: 4 , [Issue: 1](http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=5452783)
Digital Object Identifier: [10.1109/MWIE.2010.936173](http://dx.doi.org/10.1109/MWIE.2010.936173%22%20%5Ct%20%22blank)
Publication Year: 2010 , Page(s): 18 - 19

IEEE Journals

[AbstractPlus](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5452813&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)  |  Full Text: [PDF](http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5452813) (679 KB)



What do you get when you pair a passionate and intelligent engineering professor at the University of Maryland with two ambitious and hard working recent engineering graduates? FlexEl.This company develops a novel, high-capacity, rechargeable thin film battery. IEEE Fellow Dr. Martin Peckerar, professor of microelectronic engineering at the University of Maryland's A. James Clark School of Engineering and the brains that helped launch the company, tells us how it all started. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5452813&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [Fabrication of a thin film asymmetric tunneling diode using geometric field enhancement](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378297&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Kwangsik Choi; Dagenais, M.; Peckerar, M.M.;
[Semiconductor Device Research Symposium, 2009. ISDRS '09. International](http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=5372454)
Digital Object Identifier: [10.1109/ISDRS.2009.5378297](http://dx.doi.org/10.1109/ISDRS.2009.5378297%22%20%5Ct%20%22blank)
Publication Year: 2009 , Page(s): 1 - 2

IEEE Conferences

[AbstractPlus](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378297&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)  |  Full Text: [PDF](http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5378297) (105 KB)



In this paper, we consider a metal-insulator-metal (MIM) diode as an infrared detector. Past research has successfully demonstrated the operation of these structures at infrared frequencies with an optimized antenna-coupling scheme. Rectifying incident signals is essential for detection. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378297&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [Low leakage current technology in P+N silicon photodiode detector](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378119&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Myunghwan Park; Kwangsik Choi; Singh, S.; Aslam, S.; Peckerar, M.;
[Semiconductor Device Research Symposium, 2009. ISDRS '09. International](http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=5372454)
Digital Object Identifier: [10.1109/ISDRS.2009.5378119](http://dx.doi.org/10.1109/ISDRS.2009.5378119%22%20%5Ct%20%22blank)
Publication Year: 2009 , Page(s): 1 - 2

IEEE Conferences

[AbstractPlus](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378119&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)  |  Full Text: [PDF](http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5378119) (293 KB)



In conclusion, we have successfully fabricated 4cm2 large area silicon photodiode detectors with extremely low leakage currents (InA/cm2). The effectiveness of shallow implantation, guard-ring structures, and gettering have been investigated. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378119&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [RF energy scavenging system utilising switched capacitor DC-DC converter](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4807027&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Salter, T.; Choi, K.; Peckerar, M.; Metze, G.; Goldsman, N.;
[Electronics Letters](http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=2220)
Volume: 45 , [Issue: 7](http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=4807003)
Digital Object Identifier: [10.1049/el.2009.0153](http://dx.doi.org/10.1049/el.2009.0153%22%20%5Ct%20%22blank)
Publication Year: 2009 , Page(s): 374 - 376

IET Journals

[AbstractPlus](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4807027&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)  |  Full Text: [PDF](http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4807027) (216 KB)



An RF energy scavenging circuit implementing a power matched Villard voltage doubler followed by a switched capacitor DC-DC converter for scavenging ultra-low RF power levels (20 dBm) is presented. Measurement results for the circuit, fabricated in a 130 nm CMOS process, show that 1 V can be generated across a 5 M load from as little as 25.5 Bm of input RF energy at 2.2 GHz. This represents a 9.5 dB improvement, over the measured sensitivity of our RF energy scavenging circuit without the use of a switched capacitor DC-DC converter stage. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4807027&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [Implementation of e-beam proximity effect correction using linear programming techniques for the fabrication of asymmetric bow-tie antennas](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378016&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Yesilkoy, F.; Peckerar, M.;
[Semiconductor Device Research Symposium, 2009. ISDRS '09. International](http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=5372454)
Digital Object Identifier: [10.1109/ISDRS.2009.5378016](http://dx.doi.org/10.1109/ISDRS.2009.5378016%22%20%5Ct%20%22blank)
Publication Year: 2009 , Page(s): 1 - 2

IEEE Conferences

[AbstractPlus](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378016&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)  |  Full Text: [PDF](http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5378016) (876 KB)



Antenna-coupled tunnel junction diodes have recently been offering great advantages for IR and Terahertz detection applications. Fabrication has been a major constraint in our ability to field these devices. The first obstacle is the relatively small size of the antenna. As the length of the wave to be detected gets smaller, the size of the antenna shrinks according to the Â¿/4 rule. This eliminates the use of traditional photolithographic fabrication techniques, which fails in the nanometer geometry range. For this reason, e-beam lithographic technique is used. The second challenge appears in the fabrication of the tunnel junction. The tunnel junction part of the device is formed by sandwiching an insulation layer in between two conductor antenna parts. Previously, many fabrication techniques were offered for the vertical conductor-insulator-conductor (CIC) structures where two metal layers overlap each other forming a tunnel junction vertical to the antenna surface. However, planar CIC structures have become more popular because they enable the surface plasmon excitement across the tunnel junction barrier. The fabrication of planar tunnel junction requires the patterning of a nano-size gap that will enable the tunneling of the electrons in between two conductor antenna wings. At this critical location, e-beam proximity effect (pixel-to-pixel beam interactions) becomes a very important issue to be addressed in order to create a nanometer-range accuracy gap. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378016&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [Ultra-low power series pass element voltage regulator for RF-DC energy harvesting](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378128&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Myunghwan Park; Kwangsik Choi; Peckerar, M.;
[Semiconductor Device Research Symposium, 2009. ISDRS '09. International](http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=5372454)
Digital Object Identifier: [10.1109/ISDRS.2009.5378128](http://dx.doi.org/10.1109/ISDRS.2009.5378128%22%20%5Ct%20%22blank)
Publication Year: 2009 , Page(s): 1 - 2

IEEE Conferences

[AbstractPlus](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378128&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)  |  Full Text: [PDF](http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5378128) (530 KB)



In conclusion, a novel ultra-low power distributing system for RuOx electrochemical cell is developed implementing a switched capacitor DC-DC converter and a single series pass element voltage regulator. With one single depletion mode MOSFET, battery output voltage is regulated to have long lifetime of the cell itself. Measurements of the circuits show that for the active mode of ad-hoc sensors, a charged battery discharges its charges through a switch capacitor DC-DC converters and voltage regulator. Therefore, we can observe a regulated output voltage at the end of our power distribution system. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378128&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [Distributed numerical modeling of low temperature MOSFET operation](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378004&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Akturk, A.; Holloway, M.; Gundlach, D.; Potbhare, S.; Li, B.; Goldsman, N.; Peckerar, M.; Cheung, K.P.;
[Semiconductor Device Research Symposium, 2009. ISDRS '09. International](http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=5372454)
Digital Object Identifier: [10.1109/ISDRS.2009.5378004](http://dx.doi.org/10.1109/ISDRS.2009.5378004%22%20%5Ct%20%22blank)
Publication Year: 2009 , Page(s): 1 - 2

IEEE Conferences

[AbstractPlus](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378004&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)  |  Full Text: [PDF](http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5378004) (88 KB)



We developed device simulators that predict MOSFET current-voltage characteristics for temperatures as low as 20 K. This is achieved through the development of novel physics-based modeling techniques, and verified by low temperature current-voltage measurements. Our numeric simulations indicated that all the observed device and IC temperature characteristics can be self-consistently explained. Our investigations showed that carrier freeze-out was not detrimental for MOSFET direct-current and transient operations. We also observed that the DC transconductance as well as the threshold voltage rose several percent as the temperature decreased within the aforementioned range. Our modeling showed that any effects of freeze-out are mitigated by impurity band formation, larger mobilities are achieved at low temperatures due to suppressed phonon-limited scattering, and cut-off frequency of devices as well as circuits are expected to increase with decreasing temperatures. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5378004&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [Impact Ionization and Freeze-Out Model for Simulation of Low Gate Bias Kink Effect in SOI-MOSFETs Operating at Liquid He Temperature](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5290227&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Akturk, A.; Peckerar, M.; Dornajafi, M.; Goldsman, N.; Eng, K.; Gurrieri, T.; Carroll, M.S.;
[Simulation of Semiconductor Processes and Devices, 2009. SISPAD '09. International Conference on](http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=5290183)
Digital Object Identifier: [10.1109/SISPAD.2009.5290227](http://dx.doi.org/10.1109/SISPAD.2009.5290227%22%20%5Ct%20%22blank)
Publication Year: 2009 , Page(s): 1 - 4

IEEE Conferences

[AbstractPlus](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5290227&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)  |  Full Text: [PDF](http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5290227) (256 KB)



A 0.4 mum p-channel silicon-on-insulator (SOI) metal-oxide-field-effect-transistor (MOSFET) is measured at 300 K and 4 K. Finite difference two dimensional numeric device simulations are performed at these temperatures to provide physical insight about the mechanisms that lead to the observed cryogenic effects at liquid Helium temperature. The MOSFET subthreshold slope is measured as 88 mv/dec at 300 K and is observed to have a drain bias dependence at 4 K ranging from 30 mv/dec at low source-to-drain (VSD) voltage (0.05 V) to 10 mv/dec at high VSD (3.3 V). A kink in the current is furthermore observed at low gate bias (1.35 V) and drain bias above 2 V. The numeric simulations indicate that incomplete ionization of dopants at cryogenic temperatures and impact ionization significantly affect the device behavior in the subthreshold region of operation at 4 K. Specifically, for a low source-to-gate (VSG) bias (VSG = 1.35 V, which is near subthreshold) the former affects the base current level, and the latter along with the incomplete ionization gives rise to a current kink for high drain biases (Vsd > V). The simulation techniques to handle the numerical challenges related to device modeling at 4 K are also presented. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5290227&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [Device Verification Testing of High-Speed Analog-to-Digital Converters in Satellite Communication Systems](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4648446&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Seokjin Kim; Elkis, R.; Peckerar, M.;
[Instrumentation and Measurement, IEEE Transactions on](http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=19)
Volume: 58 , [Issue: 2](http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=4740169)
Digital Object Identifier: [10.1109/TIM.2008.2005948](http://dx.doi.org/10.1109/TIM.2008.2005948%22%20%5Ct%20%22blank)
Publication Year: 2009 , Page(s): 270 - 280

IEEE Journals

[AbstractPlus](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4648446&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)  |  Full Text: [PDF](http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4648446) (1645 KB)



This paper presents a step-by-step sequence of operations for the dynamic performance testing of a high-speed analog-to-digital converter (ADC) using on-chip digital demultiplexing and clock distribution. Demultiplexed digital outputs are postprocessed and fed into a computer-aided ADC performance characterization tool. The described methodology reduces test costs and overcomes many test hardware limitations. The problems of high-sampling-rate ADC testing are described. As our focus is on RF communication system applications, we emphasize the measurement of intermodulation distortion (IMD) and effective resolution bandwidth (ERB). Accurate gain and phase matching are also of critical importance. As Fourier analysis is an important component of characterization, we address the issue of automated sample window adjustment to eliminate leakage and false spur generation. A 6-bit 800 MSample/s dual-channel SiGe-based ADC is used as a target example. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4648446&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [High-speed ADC dynamic performance validation: The impact of skew-corner lot testing](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4662578&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Seokjin Kim; Peckerar, M.;
[AUTOTESTCON, 2008 IEEE](http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=4653640)
Digital Object Identifier: [10.1109/AUTEST.2008.4662578](http://dx.doi.org/10.1109/AUTEST.2008.4662578%22%20%5Ct%20%22blank)
Publication Year: 2008 , Page(s): 29 - 32

IEEE Conferences

[AbstractPlus](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4662578&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)  |  Full Text: [PDF](http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4662578) (537 KB)



Corner-lot process statistics have been demonstrated to provide important data on component yield and functionality. In this paper, we review the basics of this statistical approach and we show how they are applied to the dynamic performance of a high-speed (800 MS/s) dual channel 6-bit ADC. The skew-corner ADC performance test results allow us to determine (a) the quality the semiconductor fabricate process, (b) the sufficiency of the high speed ADC test and measurement equipment, and (c) which process parameters dominate yield. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4662578&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [Sensor Support Systems for Asymmetric Threat Countermeasures](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4529216&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Chung-Ching Shen; Kupershtok, R.; Adl, S.; Bhattacharyya, S.S.; Goldsman, N.; Peckerar, M.;
[Sensors Journal, IEEE](http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=7361)
Volume: 8 , [Issue: 6](http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=4529162)
Digital Object Identifier: [10.1109/JSEN.2008.922726](http://dx.doi.org/10.1109/JSEN.2008.922726%22%20%5Ct%20%22blank)
Publication Year: 2008 , Page(s): 682 - 692

IEEE Journals

[AbstractPlus](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4529216&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)  |  Full Text: [PDF](http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4529216) (1174 KB)



In the past, primary focus has been given to novel sensor elements for deployment against urban terrorists and in limited force engagements. The issue explored in this paper is the adequacy of electronic system support for these new sensing elements. For example, ad hoc distributed networks must lie dormant for long periods of time and ldquocome aliverdquo when threats are nearby. This presents a unique challenge in the storage, generation, and management of power. In this paper, we demonstrate designs of processor algorithms and telecommunication protocols that alleviate current power-system shortcomings for these stationary networks. These advances include: 1) low-power protocols for data fusion and fault tolerance and 2) system-level energy modeling and analysis. As a concrete example, we define a distributed sensor support system for line crossing recognition. We demonstrate that threat detection is a system-level problem. Single elements of the system chain individually have small impact on overall performance. Through the development of a preamplifier/amplifier chain for optimum signal-to-noise (S/N) ratio, we show the degree to which system-level architecture can improve reliable detection. Specifically, the use of sensor redundancy to improve performance is analyzed from a statistical basis. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4529216&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [Line-spike induced failure mechanism in integrated circuit bond-wires](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4558969&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Seokjin Kim; Kwangsik Choi; Peckerar, M.; Christou, A.;
[Reliability Physics Symposium, 2008. IRPS 2008. IEEE International](http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=4550747)
Digital Object Identifier: [10.1109/RELPHY.2008.4558969](http://dx.doi.org/10.1109/RELPHY.2008.4558969%22%20%5Ct%20%22blank)
Publication Year: 2008 , Page(s): 647 - 648

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A novel type of bond wire failure is described. In the present mechanism, the voltage line spikes are of such a short duration that they cannot propagate into the chip core circuits and cause internal failure. However, the induced spike is reflected back into the wire itself. It is shown that multiple spikes can propagate through interconnect lines and can result in constructive interference leading to a concentration of high power and thermal energy. The net effect is instantaneous melting of the associate bond-wire. Such induced spike trains are only observed in lines which are connected to ESD coupled diodes. [Read More»](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4558969&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

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### [Low-Noise Signal Processing Chain for High Capacitance Sensors](http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=4666726&queryText%3Dpeckerar%26openedRefinements%3D*%26sortType%3Ddesc_Publication+Year%26searchField%3DSearch+All)

Adl, S.; Peckerar, M.;
[Sensors Journal, IEEE](http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=7361)
Volume: 8 , [Issue: 11](http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=4655533)
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