

Charge Sensitive Preamplifiers

CoolFET®



Noise @ 0 pF: 670 eV FWHM (Si)
~76 electrons RMS

Noise Slope: 13 eV/pF with Low C_{iss} FET
11.5 eV/pF with high C_{iss} FET

Fast Rise Time: 2.5 ns

FEATURES

- Thermoelectrically Cooled FET
- 3 FETs to match detector
- Lowest Noise and Noise Slope
- AC or DC coupling to the detector
- Both Energy and Timing outputs
- Optional input protection
- Easy to use

STATE-OF-THE-ART A250

External FET

FET can be cooled

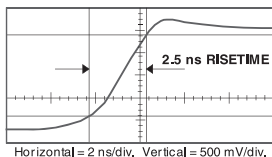
Noise: <100 e⁻ RMS (Room Temp.)

<20 e⁻ RMS (Cooled FET)

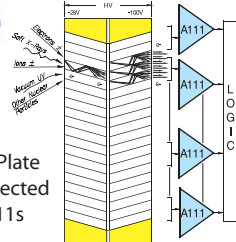
Gain-Bandwidth $f_t > 1.5$ GHz

Power: 19 mW typical

Slew rate: >475 V/ μ s



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(MCP) Array Connected
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NEW PRODUCTS

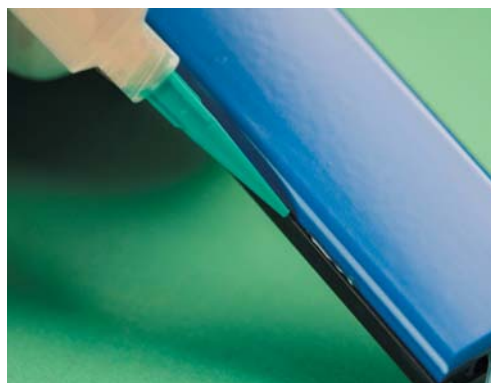
Focus on materials, semiconductors, vacuum, and cryogenics

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers. PHYSICS TODAY can assume no responsibility for their accuracy. For more information about a particular product, visit the website at the end of the product description. For all new products submissions, please send to ptpub@aip.org.

Andreas Mandelis

Epoxy made from sustainable biomaterial

Master Bond EP70CN is a two-part, thermally stable epoxy adhesive formulated using a natural, renewable, and sustainable ingredient. It forms bonds that have a high tensile strength of 11 000–12 000 psi and a high tensile modulus of 300 000–350 000 psi. EP70CN features a mixed viscosity of 2500–5000 cps and a glass transition temperature of 130–135 °C. It has a long working life of 60–90 min and good chemical resistance when cured at the optimal schedule: overnight at room temperature and then 3–4 h at 140–170 °F. The adhesive bonds well to many substrates, including metals, ceramics, plastics, many rubbers, and composites. It can be used for bonding, sealing, coating, and potting in aerospace, electronic, optoelectronic, and OEM applications. Excellent wetting properties make it particularly suitable for applications involving fibers. **Master Bond Inc**, 154 Hobart St, Hackensack, NJ 07601, www.masterbond.com



AFM accessory for nanoscale magnetics research



The VFM4, a variable field module accessory for Oxford Instruments Asylum Research MFP-3D atomic force microscopes (AFMs), enables measurements under applied in-plane and out-of-plane magnetic fields that can help improve understanding of the effects of those fields on nanoscale magnetic domain structures. Characterizing magnetic properties at the nanoscale is key to developing

next-generation data storage and logic elements. The VFM can also be used with techniques such as conductive AFM and on diverse samples such as piezoelectric and ferroelectric materials. The VFM4 attaches easily to most Asylum Research MFP-3D AFMs and includes replaceable pole tips to quickly adapt between in-plane and out-of-plane configurations. It offers approximately 1 G field resolution and maintains a steady magnetic field with rare-earth magnets that produce no heat, thermal drift, or mechanical vibration. **Oxford Instruments Asylum Research**, 6310 Hollister Ave, Santa Barbara, CA 93117, www.asylumresearch.com



Vacuum transducer internet interface

The vacuum transducers in Thyracont Vacuum Instruments' Smartline product family measure absolute pressure in the range of 1200 to 5×10^{-10} mbar. They come with a standard RS-485 interface with a 0–10 V DC scale and now also offer optional EtherCAT and Profinet interfaces. Profinet is an advanced industrial Ethernet communication protocol used in manufacturing and R&D to exchange data between controllers and devices. It offers speedy data communication of up to 100 MBit/s

full-duplex in real time. Thyracont claims to be the first vacuum metrology manufacturer to introduce Profinet for vacuum transducers and make possible direct communication from anywhere in the world between its devices and any PC or tablet. **Thyracont Vacuum Instruments GmbH**, Max-Emanuel-Str 10, 94036 Passau, Germany, <https://thyracont-vacuum.com>

Semiconductor wafer multiparameter metrology

Semilab now offers its EIR-3000 and EIR-2200 instruments for use as Fourier-transform IR spectrometers capable of performing epitaxial thickness and dopant monitoring and investigating dielectric composition and cesium and interstitial oxygen in wafer bulks. According to Semilab, by combining model-based IR analysis and absolute reflectance correction, the EIR devices improve accuracy and reliability and limit the need for system setup calibration. The EIR-3000 and EIR-2200 use calibration-free optical model analysis and an Igram side-burst-based interferogram FFT fast-calibration method well adapted for thick epitaxies. It measures complex stacks, transition layers, and dopant concentration and delivers accurate thickness measurements. **Semilab USA LLC**, 10770 N 46th St, Ste E700, Tampa, FL 33617, www.semilab.hu



High-intensity broadband pulsed-light system

According to Xenon, its benchtop X-1100 high-intensity pulsed-light system overcomes limitations inherent in laser systems. Narrow laser beams can limit the area in which researchers can operate, and laser light can damage materials with

which it interacts. The X-1100 system is a wide-area solution; the emitted pulsed light is more flexible to use and eliminates potential harm to exposed materials. While laser light is monochromatic and narrowband, the X-1100 produces the complete spectrum from deep UV to far-IR. Users can deliver that broadband energy by precisely controlling its power, frequency, and intensity. Laser systems produce coherent light that can cause speckle from interference effects that hamper uniform illumination. The incoherent pulsed light from the X-1100 is free from those effects and thus uniform. **Xenon Corporation**, 37 Upton Dr, Wilmington, MA 01887, www.xenoncorp.com

High-speed dry vacuum pumps

Ulvac has announced its LS vacuum series of dry vacuum pumps with high pumping speeds and low power consumption. According to Ulvac, typical dry vacuum pumps with low power consumption tend toward long pump-down time because they have low pumping speeds near atmospheric pressure. In the LS series, Ulvac increased pumping speeds near atmospheric pressure and shortened pump-down time by about 20% compared with typical dry vacuum pumps. The series includes four models with pumping speeds from 120 m³/h to 1200 m³/h, so users can choose a pump with the optimal exhaust capacity for their equipment. Ulvac claims that the series achieves the industry's lowest power consumption of less than 0.6 kW while reaching ultimate pressure. A built-in silencer reduces the noise level to less than 61 dBA. **Ulvac Inc**, 2500 Hagisono, Chigasaki, Kanagawa, Japan 253-8543, www.ulvac.co.jp/en



High Resolution AFM



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NEW PRODUCTS

Elemental analysis system

Bruker has designed a benchtop wavelength-dispersive x-ray fluorescence (WDXRF) spectrometer to close the gap between its floor-standing and benchtop energy-dispersive XRF instruments. The S6 Jaguar is suitable for academic and industrial materials research and for quality control. It features a compact WDXRF goniometer, closely coupled x-ray optics, 400 W excitation power, and the company's new solid-state HighSense XE detector with a linear range of 2×10^6 counts/s. According to Bruker, the S6 Jaguar outperforms other compact WDXRF instruments by delivering higher sensitivity and spectral resolution, reducing measurement times by 50%, and providing flexibility that enables multielement analysis in a concentration range from ppm to 100%. **Bruker Corporation**, 40 Manning Rd, Billerica, MA 01821, www.bruker.com



Micro solder-in probe head

Keysight's MX0100A InfiniiMax micro probe head is less than half the size of existing solder-in probe heads. It helps researchers who need small geometry solutions for probing modern electronic devices, which have small pads and narrow pitch spacing. As data rates increase for such applications as double data-rate memory, conventional probing pads become a source of electromagnetic interference. The micro probe can measure and analyze signals without interference in high-density, fine-pitch devices. The lead wires can be adjusted to accommodate targets from 0 mm to 7 mm apart. When used with Keysight's 1169B 12 GHz InfiniiMax II probe amplifier, the MX0100A delivers up to 12 GHz of bandwidth. The company claims it is the first and only one of its kind currently available and offers the best probe-loading performance—0.17 pF and 50 k Ω differentially—in its class. **Keysight Technologies Inc**, 1400 Fountaingrove Pkwy, Santa Rosa, CA 95403-1738, www.keysight.com

Polymer characterization

Waters Corp and Malvern Panalytical are collaborating on a new hybrid system that will improve the speed and quality of polymer analysis compared with traditional gel permeation chromatography. They are pairing Waters' Acquity advanced polymer chromatography (APC) system with Malvern Panalytical's Omnisec Reveal multidetector module. According to the companies, the high sensitivity and low dispersion characteristics of the Omnisec Reveal are well suited to the APC system's high resolution and high-efficiency separation characteristics. They claim that the combined system offers excellent performance for the analysis of natural and synthetic polymers and reveals details that would otherwise be missed. The system can calculate absolute molecular weight, intrinsic viscosity, and hydrodynamic radius. Those parameters can be used to predict polymer behaviors in solutions and product matrices and yield a comprehensive understanding of polymer structure. **Malvern Panalytical Ltd**, Enigma Business Park, Grovewood Rd, Malvern WR14 1XZ, UK, www.malvernpanalytical.com **PT**

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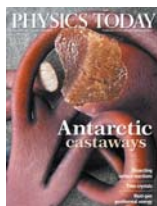
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