Business News

US MMIC companies doing well

THE latest set of quarterly results from some of the major players in the North American MMIC business present a mainly healthy picture for the industry. Net sales are increasing by substantial amounts, although there are still challenges to be faced.

Recent news includes:

* Anadigics Inc reported net sales had increased 57% to a record US$26.7 million;
* Alpha Industries Inc has had its fifth consecutive quarter with growth in orders and shipments;
* TriQuint Semiconductor Inc revenues reached $17.6 m, a 16% increase on the $15.1 million recorded in the comparable period of 1996.
* Vitesse Semiconductor Corp's sales for the fourth quarter were $30.8 m, an increase of 61% on the same quarter a year earlier.

The success of Anadigics, based in Warren, New Jersey, reflects its penetration into the cellular and personal communications services (PCS) markets with its IC power amplifiers. Compared with a year earlier, the company more than doubled, 207%, it sales into these applications in the third quarter of 1997 to $17.1 million. Sales of these products grew 35% sequentially, while its earnings from power amplifiers expanded for all three major digital standards, GSM, TDMA, and CDMA. In the television market, where Anadigics has always been strong, IC sales for CATV applications increased, but were offset by decreasing IC sales for DBS applications.

In addition to significant sales growth of power amplifier ICs for GSM and TDMA cellular phones, Anadigics enjoyed a resurgence in sales of power amplifier IC sales for CDMA PCS phones. It has also just begun production of its next-generation of dual-band power amplifier ICs for application in GSM/DCS phones, as well as a lower voltage power amplifier IC for dual-band TDMA/AMPS phones.

Just across the state line, in Woburn, Massachusetts, Alpha Industries posted net sales for the second quarter ending 28 September, 1997, of $28.6 million, compared with $20.1 million for the same period in 1996. Alpha said new orders for the quarter totalled $30.0 million, up $9.5 m on a year earlier. Increasing acceptance of its RF products, especially GaAs ICS, have been driving the growth. Of particular note, deliveries to one major original equipment manufacturer increased to 21% of total sales for the first six months of the 1998 financial year.

Meanwhile, on the West Coast, TriQuint Semiconductor of Portland, Oregon, posted what were in the main good financial results for its third quarter 1997. For the first nine months of the financial year its revenues were $52.9 million, a 22% increase on the $43.3 million for 1996. Net income for the quarter, however, was $1.3 million, a 29% decrease from the $1.9 million reported a year earlier. Nevertheless, TriQuint said its long term outlook remains positive, with target markets continuing to offer "extraordinary opportunities". The company said its accumulated design wins were expected to translate into very strong growth during second half 1998 and beyond.

The Camarillo, California, based Vitesse Semiconductor reported a strong finish to what it described as an excellent year. "We exceeded our annual goals in revenue, profit and bookings executed well in manufacturing and design. All three of our core focus businesses, telecom, datacom and test equipment, showed significant revenue growth and ended the year with a strong backlog," said president Lou Tomasetta.

Imminent results from other companies are expected to show comparable gains in sales and profits from the burgeoning wireless, cellular and TV markets. The market strength is also extending through to the suppliers of the chip makers with materials and equipment sales also reportedly strong.

Roy Szweda

Company News

Riber clarification

RIBER has asked *III-Vs Review's* to clarify the situation regarding its Paris Application Lab and the production of epilayers.

In Roy Szweda's 'Crystal Gazing' column that appeared in Issue 6 (page 55), it was mentioned that this unit was being used to "produce merchant epilayers for an equipment customer".

Riber wants to emphasize that this service is part of customer training and the testing of new accessories and does not signal the company's entry into the merchant epi-wafer market.

Indeed, Mr Picault, president of Riber's executive board, says the firm is very keen to maintain this separation between its activities as an equipment manufacturer and the device supplier role of its customers.

Picault will outline these views in a forthcoming issue of *III-Vs Review*.

A 'MBE 49' molecular beam epitaxy (MBE) system, the company's most advanced production epitaxy system for compound semiconductors, has been commissioned by Riber's chief scientist, Dr Catherine Chaix, and demonstrated its superior performance capabilities.

Some 19 epilayers were grown with the unit and these showed uniformity of 0.33%, doping uniformity of 1.2% with Al composition uniformity of 0.42%.

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Application News

Portable radioisotope detector uses CZT sensors

A HAND-HELD medical device that uses highly sensitive cadmium zinc telluride (CZT) sensors to track radioisotopes has been released by Neoprobe Corp of Dublin, Ohio , USA.

The 'Neoprobe 1500' detects gamma rays and can be used either externally or intra-operatively to track an injected radio pharmaceutical within the body. A key feature of the unit is that its three probe tips (and Neoprobe's 19 mm reusable chrome probe) use the CZT detector devices which are capable of detecting every commercially available radioisotope, including In-111, I-125 and Tm-99. The importance of these isotopes derives from their use in surgical procedures such as intraoperative lymphatic mapping.

The versatility of the new detector means that surgeons do not have to purchase separate probes for procedures requiring different radioisotopes. Neoprobe sources the CZT detectors used in the unit from eV Products, a division of II-VI Inc of Saxonburg, Pennsylvania, USA.

"The Neoprobe 1500 device fulfills a critical need for such widely growing surgical procedures as intraoperative lymphatic mapping for patients with melanoma, and, investigationally, breast cancer," says David C. Bupp, Neoprobe's president.

The Neoprobe 1500 device features three re-usable interchangeable probe tips: 12 mm uncollimated, 12 mm collimated and 19 mm uncollimated. Each of these uses a universal, disposable handle and cable which allows surgeons to quickly change probes during an operation as a procedure requires. The control unit is a microprocessor-based platform which translates the gamma pulses detected by the prob into understandable displays and sounds.

Notably, the instrument has received 510(k) marketing clearance from the US Food and Drug Administration.

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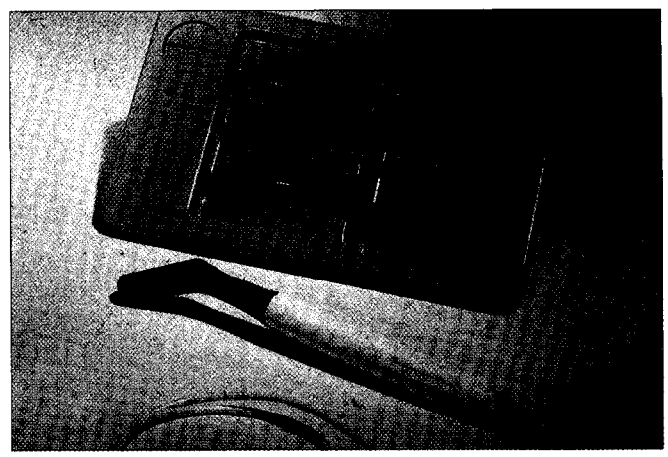


The Neoprobe 1500 features reusable, interchangable probe tips that can detect every commercially available radioisotope.

Laser News

Xerox scientists achieve blue diode laser breakthrough

SCIENTISTS at the Xerox Palo Alto Research Center (PARC) in California, USA, have generated a blue diode laser beam — a pivotal achievement in the company's development of a new generation of high speed, high quality laser printers.

The breakthrough came on 14 October at PARC's Electronic Materials Laboratory with a gallium nitride-based blue diode laser operated under pulsed current-injection conditions at room temperature.

Xerox says the development places the company at the forefront of document technology developers worldwide striving to develop production of commercially viable blue diode lasers which have significant implications in the document industry. "Having invented the first high speed laser printer at PARC some 20 years ago, this breakthrough reinforces Xerox's leadership position in the field of laser document production and places us well ahead of our competitors," said Mark B. Myers, Xerox senior vice president for Corporate Research and Technology. "While we still have much work ahead of us, this is a significant step towards realizing our goal of using this technology in Xerox printers and digital copiers."

The work at PARC has received matching funds from the Defense Advanced Research Projects Agency (DARPA) through the blue BAND II Consortium and the US Department of Commerce. The Xerox team has been working to create LEDs, as well as laser diodes, that operate in the blue to green region of the visible spectrum.

"This achievement marks the culmination of more than two years of intense research," said Noble Johnson, a PARC principal scientist. "We can now begin the exciting task of fine-tuning the performance of these devices for their intended commercial applications."

For more on blue laser developments, including a breakthrough at the University of California, Santa Barbara (UCSB), turn to "The blue laser race - a marathon not a sprint", pages 22-25).

Xerox Palo Alto Research Center (PARC) in California, USA, tel: +1-650-812-4000.

Device News

Mitsubishi Electric expands GaAs MMIC range

MITSUBISHI Electric has expanded its range of monolithic microwave MMICS, with two products designed for use with Code Division Multiple Access (CDMA) base hand-held telephones and similar applications.

The company says the 'MGF7169C', which requires connection to a matching circuit, is an ideal two stage amplifier solution as it combines low voltage operation with a high power output. The 3V operation UHF band GaAs power amplifiers provide typically 28 dBm output power at 1.715~1.78 GHz and 1.85~1.91 GHz wavebands, with extremely low distortion of -46 dBc maximum at 28dBm output power. Mitsubishi says the devices boast an extremely high efficiency, with a typical drain current figure of 450 mA at 28 dBm output power.

Absolute ratings at 25C for the devices include 5V and -4V drain supply and gate supply voltages respectively and 15dBm input power. Operating case temperature is -30~+85C and the devices can be safely stored at temperatures ranging from -30~+100°C. The MGF7169C GaAs MMICs are available in small outline surface mounting packages measuring just 7x6.1x1.1 mm.

For users looking for a higher functionality MMIC, the company has released the 'MGF7171C'. The device comes in a small surface mount packaging and delivers a typical efficiency of 470 mA at 28 dBm output power with 3V drain supply.The multi-function, high power amplifier requires a matching circuit an incorporates a negative voltage generator and up-converter.

The MGF7171C operates over the frequency range of 1850~1910 MHZ, with a local operating frequency of 1715-1780 MHZ and a typical intermediate frequency of 130 MHZ.

Mitsubishi's MGF7169C power amplifier MMIC.

Mitsubishi Electric Europe BV; tel: +44-1707-276100; fax: +44-1707-278997.

Epitaxy News

MOCVD proves it pHEMT worth in US study

A JOINT research project between EMCORE Corp and MA/COM has found that metal organic chemical vapour deposition (MOCVD) is equivalent to molecular beam epitaxy (MBE) in the production of wafers used to fabricate compound semiconductor-based pHEMTs. The companies say a switch in growth methods to produce these devices will result in a 30% reduction in MMIC manufacturing costs.

The US companies performed the research under a Phase II Small Business Innovative Research (SBIR) program for the US Air Force. Meeting the tasks set in the program, EMCORE fabricated InGaAs-based epitaxial wafer lots using M/A-COM's existing mask sets. The collaborative team then determined the equivalent circuit models of the resulting PCM devices and designed a 35 GHz 0.5 Watt power MMIC circuits. Finally, wafer lots of the power MMICs were fabricated and the chips characterized.

In a separate development, EMCORE has sold a 'Discovery 75/125' MOCVD system to NASA's Lewis Research Center in Cleveland, Ohio, USA. Emcore has tailored the reactor specifically for the exceptionally high temperature deposition required in NASA's SiC development efforts. It is equipped with the company's latest radio frequency heating option that allows operation in excess of 1600°C.

Emcore Corp; tel: +1-732-271-9090; fax: +1-732-271-9686.

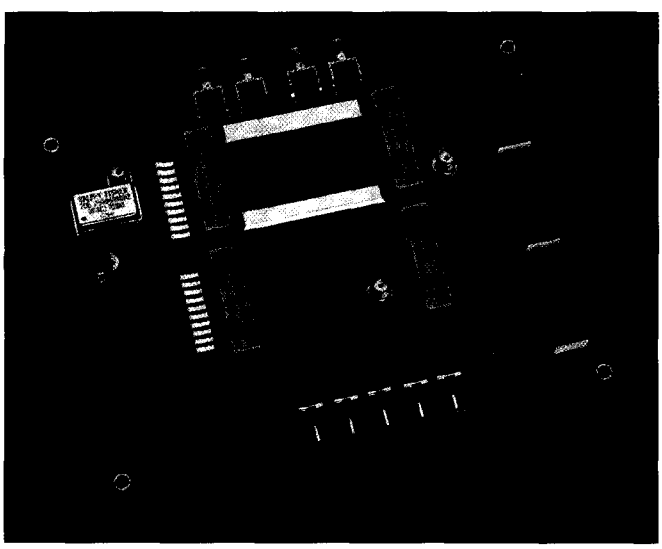
Company News

Vitesse opens telecommunications IC design centre

VITESSE Semiconductor Corp has opened an IC design centre at its plant in Portland, Oregon, USA, to support its growth into high speed communications markets.

"Growth in the telecommunications market creates strong demand for Vitesse's high bandwidth integrated circuits," said Bill Woodruff, director of telecommunications products, opening the centre. "Continuing to provide innovative products to meet this demand requires that Vitesse rapidly expand its design capability."

Gary McCormack, has been appointed director of the Portland Design Center. McCormack, formerly with TriQuint Semiconductor, has more than 16 years' experience in the semiconductor industry, primarily focused on serving telecommunications markets using GaAs technology. Joining McCormack is Ian Kyles, an 8-year semiconductor design veteran, with experience in both CMOS and GaAs technologies. Kyles joins Vitesse from LSI Logic Corp.



The LAB26 analyser board from Vitesse.

In addition to the Portland site, Vitesse also has a design centre at its headquarters in Camarillo, California, as well as in Santa Clara, California; Richardson, Texas; and a recently opened centre in Colorado Springs, Colorado. The Colorado Springs Design Center is housed in the same facility as Vitesse's 6" GaAs fabrication facility currently under construction in the Arrows West Business Park, which is targeted for full-scale production in mid-1998.

Recent additions to the Vitesse product line, meanwhile, include four transimpedance amplifiers for use in Synchronous Digital Hierarchy (SDH) optoelectronic telecommunications systems. The 'VSC7902' and 'VSC7903' are designed for 155 Mb.s-1 operation, while the 'VSC7911' and 'VSC7912' are for 622 Mb.s-1 data rates. Vitesse says two amplifiers are offered at each data rate to meet both single-ended and differential output configurations. All of the amplifiers are designed for use with commercially available long-wavelength optical detectors. Pricing per unit for 10 000 units is $8 for the VSC7902 and VSC7903, and $25 for the VSC7911 and VSC7912.

Another recent release is the 'LAB26' Logic Analyzer Board, which enables the evaluation of its 'VSC7126' fibre channel and 'VSC7126' gigabit Ethernet transceiver ICS. The company says the LAB26 is a self-contained evaluation unit for testing characteristics such as output jitter, waveform integrity and basic functionality. It is priced at $600.

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Company News

M/A-COM forms integrated solutions group for SMT

A DEDICATED team for developing surface mount technology (SMT) integrated solutions has been formed at M/A-COM of Lowell, Massachusetts, USA.

The company says the "is group" will provide standard and customized multi-functional and multi-technology component solutions in single unit packages for the wireless original equipment manufacturer (OEM) industry.

The first product from the group is an ASIC GaAs driver designed to consolidate multiple chip functionality into a single package, thus reducing system board size and power consumption. It is housed in a plastic surface mount small-outline-integrated circuit (SOIC) package for easier board integration.

Along with providing standard off-the-shelf multi-functional devices, M/A-COM's new team will also work with customers on a consultative basis to apply its wireless expertise to develop SMT solutions. The company says SMT integrated solutions provide customers with the opportunity to develop higher performing, smaller sized and lower cost end user products through product integration.

Currently producing ASIC switches and digital attenuators, 1998 plans for the group include the production of high density, multiple chip, multiple technology solutions such as mixers, amplifiers and passives. It can provide both standard and customized SMT integrated solutions, incorporating amplifier and mixer building blocks with control components. These integrated solutions are developed from a combination of ASIC, GaAs, silicon and glass platforms which will be available in a variety of surface mount packages based on the specific needs of customers.

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Company News

ITT Industries wins US$10 million radar contract from US Air Force

ITT Gilfillan, a unit of ITT Industries, has been awarded a US$10 million contract from The Electronic Systems Center at Hanscom Air Force Base for its 'GCA-2000' Tactical Air Traffic Control and Landing System. A main feature of the system is that its active array architecture uses GaAs transmit/receive (T/R) modules, which are manufactured under an ITT patented production.

Several systems will be provided for use by the Air Mobility Command in a highly mobile configuration to support the US Air Force's worldwide deployment requirements. The GCA-2000 gives the US Air Force the capability of rapidly fielding an air traffic control system to support bad weather operations anywhere in the world on short notice whenever a crisis dictates.

Along with the GCA-2000 hardware and software, training and lifetime support will be provided.

ITT Gilfillan, based in Van Nuys, California, was selected by the US Air Force after an extensive flight test, operational demonstration and analysis. The company says the all solid-state GCA-2000 provides remotely controlled multi-runway coverage, digital colour displays and an extensive BIT (Built In Test) program for simplified on-line maintenance.

It says the system is unique as it combines commercial standards with a ruggedized, modular design allowing for reduced acquisition costs and low support costs.

ITT Gilfillan designs and manufactures state-of-the-art air traffic control and air/battlefield defence radar systems which are deployed around the world. The company has been producing advanced radar systems for more than 50 years. ITT Industries is a leading diversified manufacturing company, with 1996 sales of $8.4 billion from its three primary business segments:Automotive, Defence and Electronics and Fluid Technology.

ITT Gilfillan; tel: +1-818-988-2600.

Company News

Ansoft and TriQuint form high frequency partnership

ANSOFT Corp and TriQuint Semiconductor Inc have formed an alliance for high frequency GaAs IC design.

Under the terms of the agreement, TriQuint will purchase a site-wide license for Ansoft's RF and wireless design suite, 'Serenade 7.0' and Ansoft will develop customized simulator capabilities for TriQuint. Serenade 7.0 is a PC-based design suite offering integrated schematic, circuit analysis, and layout capability in a single easy-to-use graphical interface. High frequency designs can be captured, analysed, optimized, and physically designed while taking performance and manufacturing requirements into account.

"TriQuint places great emphasis on computer aided engineering (CAE) tools for our wireless IC design and development," says Ronald Ruebusch, Vice President of TriQuint's Wireless Communications Division. "Strategic alliances with CAE vendors like Ansoft are essential to drive design tool development in the direction the wireless industry needs.

Ansoft has been a pioneer of commercial high frequency CAE tools for microwave circuit design, harmonic balance for non-linear circuit design as well as the first commercial high frequency structure simulator. The company says it will encourage ongoing technical exchanges to establish new capabilities and priorities.

TriQuint Semiconductor; tel: +1-503-615-9000; fax: +1-503-615-8901.

MOVCD News

NASA purchases MOCVD system from AIXTRON

NASA Lewis Research Center in Cleveland, Ohio, USA, has ordered an 'AIX 200/4 HT' metal organic chemical vapour deposition (MOCVD) reactor from AIXTRON as parts of its expansion of its SiC research.

NASA Lewis will use the unit to advance SiC crystal growth research for high temperature electronic devices and sensors. It is the second MOCVD reactor AIXTRON has supplied to NASA and is scheduled to be installed at the Cleveland premises early in 1998. ordered by ITT Night Vision

Another recent AIXTRON sale in the US, will see the company supply a second 'AIX 2400 Planetary Reactor®' to ITT Night Vision of Roanoke, Virginia. This unit will enable ITT Night Vision to double its production of GaAs photocathodes for night vision equipment.

A third sale will see the German company supply Rockwell Semiconductor Systems in Newbury Park, California, with a 'AIX 2600G3', the newest version of the multiwafer MOCVD Planetary Reactor. Rockwell will use the system in an automated 9x4 batch mode to produce power amplifiers.

AIXTRON AG; tel: +49-241-8909-0; fax: +49-241-8909-40.

Mems News

Micro-electric power generator machined from GaAs

A REMOTE power generator microsystem has been developed at the MEMS Unit of the University of Sheffield, UK, by micromachining GaAs.

The development meets an outstanding need, as microsystems are usually completely embedded within a structure and, therefore, have no physical connection to the outside world.

To generate power from the surrounding environment, the MEMS Unit has made a self-contained power supply that generates power from mechanical vibrations.The vibrations drive a transducer and thereby generate electrical energy. In this case the transduction method is electromagnetic, with a polyimide membrane as the spring. This membrane supports a rare-earth magnet, below which is a planar pick-up coil. A two wafer device was developed to optimize the magnet-coil separation.

The flexible membranes were fabricated by bulk micromachining a GaAs (001) substrate coated with 7 μm of cured polyimide. A planar Au coil, with a thickness of 2.5 μm, line-width of 20 μm and separation of 5 μm, were patterned on a separate wafer by metallization and lift-off.

A square cavity was defined on the rear of the coil chip to accommodate the movement of the magnet. A rare earth magnet, with dimensions of 1x1x0.3 mm and weighing 0.0024 grams, was attached to the membrane using a polyimide solution. Finally, the membrane and coil chip were bonded together with silver epoxy to form a working generator.

Presenting a paper at the recent 'Eurosensors XI' conference, the researchers reported that the packaged generators have been characterized and performed well. In a comparison of the measured and predicted power, measured power follows the predicted power at low amplitudes, but is reduced at high amplitudes as the spring becomes non-linear.

Initial results have also shown how the generator might be improved with possible avenues including evacuation of the device, a reduction of coil resistance, and, most importantly, by increasing the linearity of the spring.

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