Vidya Vikas Education Trust's
Universal College of Engineering
Accredited with B+ Grade by NAAC
(Permanently Unaided | Approved by AICTE, DTE & Affiliated to University of Mumbai)

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College Profile:

Everything you need to know about us:

Embraced by lush greenery and scenic beauty, Universal College of Engineering is a treasured place for aspiring engineers to leave their imprints on success.

As a college within the wider network frame, we are one of the fastest- growing institutions in India. Our institute has been accredited by the National Assessment and Accreditation Council (NAAC) with a B+ grade in the first cycle of accreditation. Times of India Survey Ranked No.1 in India among Top Emerging Private Engineering Institutes for 6 consecutive years 2015, 2016, 2017, 2018, 2019, and 2020 and the saga of accolades still continues.

In response to the expectations of quality technical education, our college is approved by the All- India Council for Technical Education (AICTE), New Delhi; Recognized by the Directorate of Technical Education (DTE), Government of Maharashtra; affiliated to Mumbai University. Our college is also associated with professional bodies like IEEE, IETE, ISA, and CSI to update the revolutionary technological advancements.

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We offer 4 years of full-time Bachelor of Engineering in Computer Engineering, Civil Engineering, Artificial Intelligence & Machine Learning, Information Technology

The unique state-of-the-art facility of the institute has been carefully designed to accommodate the needs of the students. Laboratories are equipped with world-class facilities based on the latest technology of different sectors. Our smart classrooms are well ventilated, spacious, and equipped with overhead and LCD projectors along with the public address system. The College library provides arich collection of specialist library resources and services to support student's academic work and enrich their research skills.

We are obliged to equip our students to get placed in highly reputed companies by mentoring their necessary skill set for cutting-edge technologies. The core highlighted areas are helping students with their technical competency, communication skills along with career guidance and counseling.
Universal College of Engineering has produced a large number of successful alumni who are working in reputed organizations in India and abroad and have contributed immensely to the cause of nation-building and society. We welcome all engineering aspirants to create an incredible legacy in the field of engineering.

That robot finger with living skin

Researchers at the University of Tokyo have grown a skin-like layered material from bio-materials found in human skin.

The result, demonstrated on a robot finger, self-fits to the underlying structure, is flexible, soft to the touch, and shows some self-healing properties.

A 3D printed three-jointed finger, later operated by nylon threads running through it, was used as a scaffold for 'skin' growth – growth which was spread over several steps and more than two weeks:

University of Tokyo robot skin. Firstly, the under-layer or 'dermis-equivalent' was initiated inside a vertical mould (diagram left), by pouring a collagen solution containing what the research team refers to as 'NHDFs' – for 'normal human dermal fibroblasts' – over the finger mechanism.

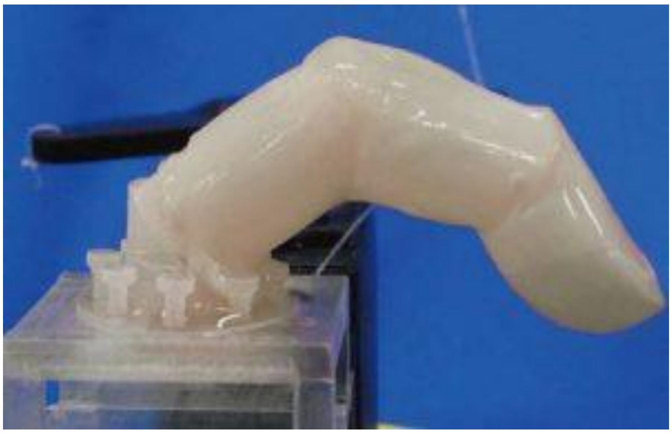
Three days held in a warm environment gave the collagen and fibroblasts, which are two of the main components of human skin connective tissue, time to form a hybrid structure where fibroblasts spreading through the cross-linking collagen matrix layer. As it integrated, it shrank tightly onto the surface of the printed finger.

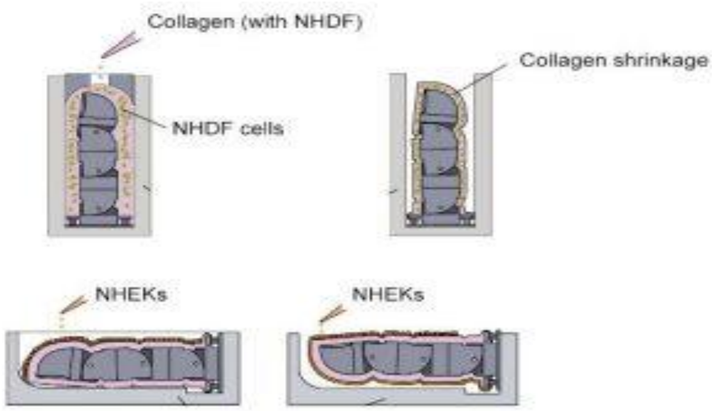
The second step involved pouting a solution containing 'NHEKs' – 'normal human epidermal keratinocytes' – over the back of the finger, now held horizontal, and then a day later over the front of the finger. Keratinocytes are a major constituent of the outer layer of human skin.

During the following two weeks of incubation, the keratinocytes proliferated through the other materials, and the skin-equivalent self-assembled, becoming stronger as time elapsed and developing a water-shedding outer surface. The self-repair technique was inspired by medical treatments for burns that use grafted hydrogels.

It involved placing a plain collagen sheet over a wound in the skin-equivalent, into which fibroblasts migrated over the following week, until the boundary was no longer distinct. The proof-of-concept skin has some of the self-assembling and self-maintaining characteristics of living skin. While not as strong as human skin, it was robust to repeated flexing. Despite a dense and water-shedding top surface, the skin-equivalent could not be left out in the air for long periods and had to be kept wet between experiments.

The team is intending to add further types of cells to reduce limitations and increase function. The above is a huge simplification of a complex process, covered fully in the detailed paper 'Living skin on a robot ', published in Matter, which can be read in full without payment.





Toshiba adds to mini-MOSFET gate drivers

Toshiba has added five new MOSFET gate-driver ICs in the TCK42xG series, suitable for a wide range of applications including battery powered, consumer and industrial equipment. The devices in this series control the applied gate voltage independent of the input voltage and feature an over-voltage lockout function to protect the circuit.

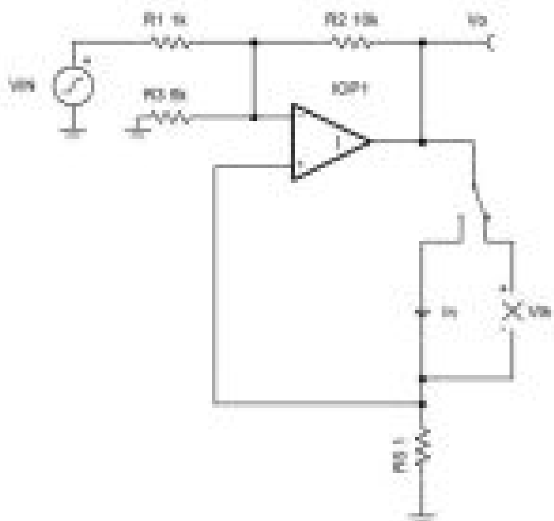
The new products are now joining the TCK421G, announced earlier this year. Products in the series can be selected for a gate-source voltage of 10V or 5.6V, allowing use with a wide variety of MOSFETs. A choice of detection voltages for the input over-voltage lockout allows them to operate from power lines from 5V to 24V. The drivers available are the TCK420G for 24V power lines, TCK422G and TCK423G for 12V, TCK424G for 9V, and TCK425G for 5V.

Each new driver in the series features a built-in charge pump that ensures a stable gate-source voltage at the external MOSFET while the input can vary from 2.7V to 28V. This allows large currents to be switched. In addition, when used to control two N-channel MOSFETs connected back-to-back, they are suitable for configuring load-switch or power-multiplexer circuits with reverse-current blocking. Housed in a 1.2mm x 0.8mm WCSP6G package, one of the smallest in the industry, Toshiba's TCK42xG gate drivers have a tiny footprint that allows high-density mounting in space-constrained portable products. They also have a low input OFF current, IQ (OFF), of 0.5µA (maximum, at VIN=5V) that helps to prolong battery runtime.

TI reigns supreme in analogue

With its 2021 analogue sales up 29% on 2020 at $14.1 billion and holding a 19% market share, TI firmly maintained its No.1 position in analogue last year, increasing its sales by $3.2 billion over 2020.

TI's 2021 analogue revenue accounted for 86% of its $16.3 billion in IC sales and 81% of its $17.3 billion in semiconductor revenue.



The complete list of top 10 analogue IC suppliers for 2021 is shown in Figure 1. IC Insights' ranking includes sales of general-purpose analogue components, mixed-signal analogue, and application-specific analogue devices that have at least 50% analogue circuitry on board.

This follows the definition established by WSTS that reads, "Devices are classified as analogue if at least 50% of the total die area of the integrated circuits(s) in the device is occupied by analogue circuitry." As shown, the ranking of top analogue suppliers remained unchanged in 2021 compared to 2020.From smart thermostats to toothbrushes with built-in Bluetooth connectivity, smart devices play an increasingly important role in our lives today. Yet the importance of smart devices is extending beyondour households and into critical areas like healthcare.

One such example of a smart device is a recently announced pre-filled syringe made by NP Plastibell that is able to relay important information about its contents to doctors and patients using near-field communications (NFC) technology.

Intel Rethinks a Common Substrate to Combat Chip Shortage

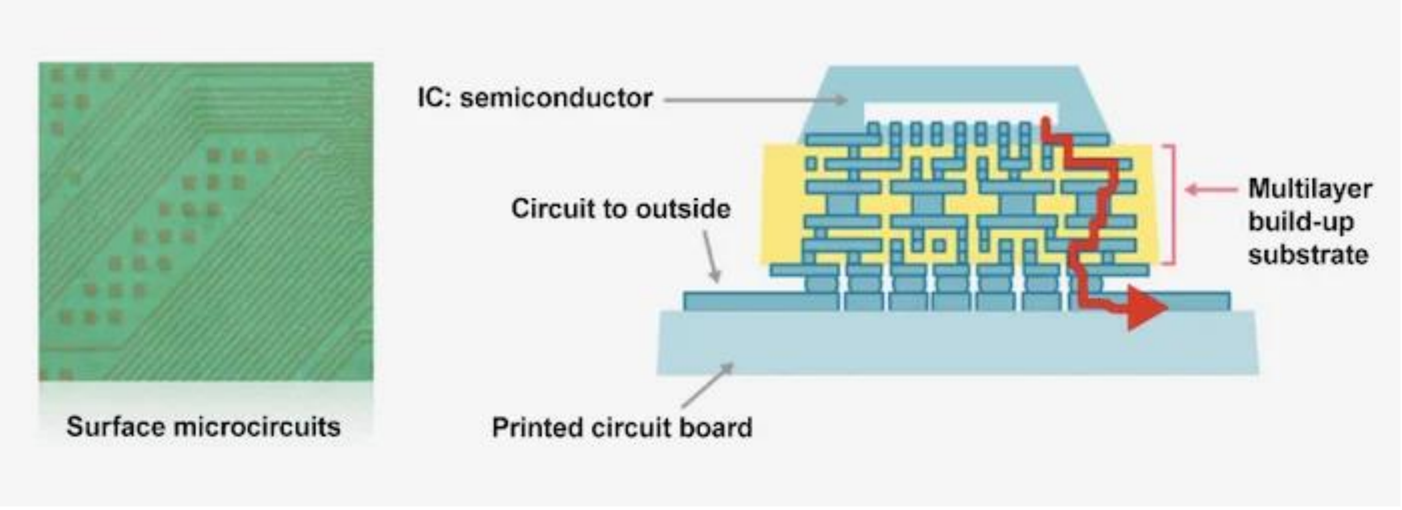
Today, the continued chip shortage has caused the cost of components to fluctuate wildly—sometimes even in the span of 24 hours. These shortages have also given rise to a flood of counterfeit components known as the "gray market."
Because Intel is one of the world's top chipmakers, the company has been working behind the scenes to speed up manufacturing processes and revitalize the semiconductor supply chain at large. This week, Intel recognized its Vietnam site for easing supply chain shortages through a new initiative that rethinks Ajinomoto build-up films (ABF).

What is an ABF Substrate?

One of the least glamorous, yet most important components to manufacture processing units is the Aijnomoto build-up film (ABF) substrate.

Today, semiconductor-based processing units have become extremely complex and highly integrated in order to scale down to nanometer processes. While this integration has been a significant boon for performance, it has also complicated the details of interconnection. Interconnecting electronics to the board and system level is more common on the millimeter scale—not the nanometer scale.

To accomplish such interconnections, almost all major semiconductor manufacturers employ an ABF. The ABF acts as a bed within the device package and consists of multiple layers of microcircuits that interface between the PCB and the nanoscale CPU.

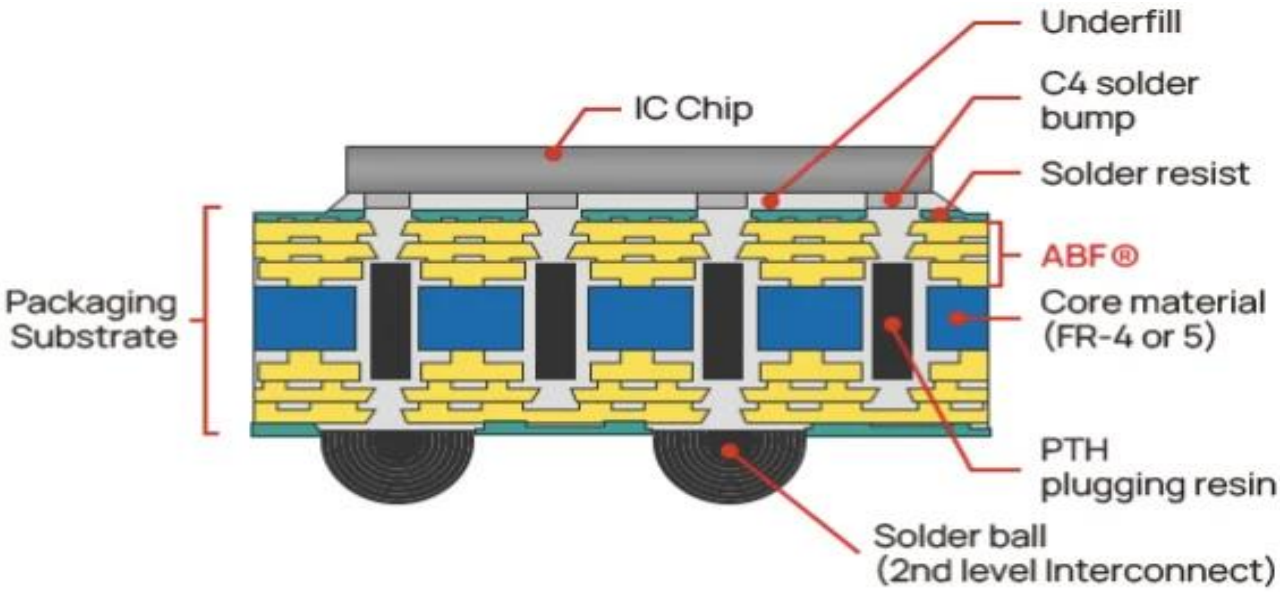


An ABF interfaces an IC and the PCB. Image used courtesy of the Ajinomoto Group

The component takes its name from the Ajinomoto Group, which famously designs the thermosetting film that provides insulation to the processing unit. The film also exhibits important characteristics such as high durability and low thermal expansion.

ABF Decentralization

One of the major challenges plaguing the semiconductor industry is the acute shortage of ABF substrates. According to Intel, an added challenge of manufacturing ABF substrates is that these films are extremely decentralized. For example, a key element of the ABF substrate is capacitors, which are largely used for decoupling and occupy both sides of the substrate. However, Intel has historically attached capacitors to only one side of the substrate while relying on external suppliers to attach them to the other side



A lower level look at the ABF within a package. Image used courtesy of the Ajinomoto Group

Intel's ABF Initiatives

Now, with ABF shortages looming large, Intel is aiming to compensate by increasing the productivity of its existing ABF manufacturing processes. To do this Intel has announced that its Vietnam Assembly and Test (VNAT) factory will now attach capacitors to both sides of the ABF substrate in-house. This change will allow Intel to effectively remove a level of dependence on external suppliers during the ABF manufacturing process. The result, according to Intel, is the ability to complete chip assembly 80% faster. Intel is offloading demand from the ABF suppliers by adding capacitors to both sides of ABF. In doing so, Intel hopes to not only improve its own manufacturing productivity but also help alleviate supply chain issues by letting ABF manufacturers focus on increasing their supply.

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