

Tue, 18 July 2023
Weekly Newsletter

DVN
Lighting & ADAS

NEWSLETTER #812

PixCell LED

Ultimate precision in perfect alignment

100+ individual cells with just 25 µm spacing, perfectly matrixed onto a single LED chip for intelligent headlamps

SAMSUNG



Editorial

DVN's Day At Koito



Takayuki Katsuda, Wolfgang Huhn

Koito are a big, important player in the vehicle lighting market. They run R&D units in their home base Shizuoka, Japan, as well as in China, Thailand, the EU, and the US; sensor development is located also in Israel, Germany, and Silicon Valley. Koito have a 20-per-cent worldwide market share for headlamps, net sales of €4.8bn in 2022, and profit of €385m. Impressive data, no doubt.

DVN had the big honour to speak with the designated senior R&D officer (CTO) Takayuki Katsuda, who will soon succeed well-known Kenji Arima, who is retiring. Arima-san himself came to the meeting to say hello and goodbye, a lovely gesture for which we thank him; the whole DVN team wish him all the best for his retirement.

Tremendous support for our visit was given by Motohiro Komatsu and Satoshi Tsukamoto.

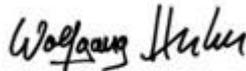
Mr. Katsuda has been with Koito for eight years; before that he spent 30 years at Toyota. His last Toyota job was the chief engineer of the Lexus RX series.

The open and lively discussion with Takayuki Katsuda started with styling questions. Good styling proposals to the customer are important. Koito have in-house styling designers who work together with the customers in the early phase of a project. The stylists have a good network with the customers because they create many proposals, and they never say no without an alternative suggestion.

Concerning the future of ADB, Katsuda san said ADB will become thinner and simpler. Koito can make ADB electronics and software in-house, and graphic data from the customer can easily be integrated. Synergies to lidar are obvious, because lidar data is visual data, too, and the heat management is similar to other opto-electronical devices. In future, lidar will be integrated into the headlamps, which will make headlamp cleaning systems more important.

About sustainability, Takayuki Katsuda supports weight reduction, the use of recycled material, and of course the reduction of power consumption. He wants to invest electrical power into safety and efficiency; 'wow-features' only come on request by the customers.

Enjoy this week's DVNewsletter, and don't forget to sign up for the [U.S. DVN Workshop](#) to be held in San Francisco the end of August!



Wolfgang Huhn
DVN Senior Advisor

In Depth Lighting Technology



DVN Interview: Takayuki Katsuda's Koito Team



Motohiro Komatsu, Takayuki Katsuda, Wolfgang Huhn, Eiichi Ono (DVN)

DVN: What were the last innovations Koito brought to the market

Koito: Our proprietary "BladeScan®" technology achieves a high-resolution equivalent to ADBs using several hundred LEDs by synchronously controlling the rotation of the blade mirror and the turning on and off of 12 LEDs at high speed.

The world's first "Light Green®" resin, which is thinner and has a lower specific gravity, was developed ahead of other materials in the world, resulting in a 30% weight reduction of the whole lamp assembly.

**DVN: What headlamp and what rear lamp styling trend do you expect?
Still super flat lighting components?**

Koito: Graphically oriented trends, particularly in signal lighting, are expected to continue to evolve into the late 2020s. We believe that the role of lighting will become increasingly integrated with the vehicle body, and that it will grow in importance in terms of design expression and information dissemination. Innovative and extreme designs by developing BEV-specific manufacturers are also likely to influence the formation of market value.

DVN: What is the lowest headlamp and taillamp you are producing?

Koito: The smallest light emitting width/lamp width already mass-produced are as follows:

Headlamps: Light emitting width is 16mm, Lamp width: Prius 60mm

Tail lamps: Light emitting width: VOXY 5mm, Lamp width: Crown Crossover 20mm

DVN: Do you offer any hidden light tech also known as shy tech solutions?

Koito: Hidden light technology is described below.

"Blackout" to reduce internal reflections in the headlamps by using black components (e.g., Yaris Cross)

"Blind Spot Placement" to make headlamp unit difficult to be recognized from the outside (e.g., Prius)

DVN: What is more important today and in near future, improved lighting quality or extreme styling?



Koito: Lamps have a history of evolving in a balance between technology (efficiency) and style (inefficiency). This trend is not likely to change in the future. In addition to a direct paradigm shift in technology, such as the change from light bulbs to LEDs as a light source, changes in user mindsets due to the further digitization of society will also have a significant impact on design.

DVN: How is the success of ADB systems in the Koito portfolio?

Is the specific mechanical system BladeScan developed by Koito for ADB will be continued in the future or replaced by microleds for instance?

Koito: Our ADBs are not limited to luxury cars but are used in all categories (except buses) from small cars to large trucks. We believe that our ADB has been successful in terms of promoting the spread of ADB. BladeScan® will be replaced by high-resolution ADBs such as micro-LEDs in the future. However, for the time being, BladeScan® will continue to be an item that fill up the price/performance gap with array-type ADBs.

DVN: Which share have the following ADB technologies today, and what is expected in 3 to 5 years? (low resolution with stripes – mid resolution with up to about 100 pixel – high resolution up to 20k pixel – UHD with 1M pixel)

Koito: Although we do not know our shares at each resolution, our strategy for the future is as follows:

Low resolution (array): Adoption for vehicles that have not yet adopted it.

Medium resolution (BladeScan®): Shifting from vehicles with low resolution (array type)

High resolution/HD: Shifting from vehicles with medium resolution (BladeScan®)

DVN: Will Koito introduce an ADB system in the US under the new rule?

Koito: Yes, we are planning to introduce it.

Currently, we are promoting studies for introduction with each of our customers.

DVN: Does Koito have any Micro Optics products in production?

Koito: Since the definition of micro-optics is unclear, I cannot give you a general answer. But we are working on miniaturization of optical components and light sources, and micro-shape processing to realize new designs.

DVN: Where do you expect the most applications for Micro Optics in 3 to 5 years, e. g. in headlamps, in signalling lamps or in lamps for decoration purpose like ground projection, light carpets etc.?

Koito: Micro-optics are expensive. The application that the customer is willing to pay for must have a new feature that strongly appeals the novelty and advanced nature of the vehicle to those around it. In this regard, eHMI applications such as road surface projection and grille displays are appropriate.

DVN: What activities Koito does and what is planned to deliver more sustainable products? (Reduce, Re-use, Recycle)

Koito: We are developing the lamps that are lighter in weight, use materials with lower CO2 emissions, and utilize recycled materials.

DVN: Actual headlamps and taillamps grow in weight and size. What to do?

Koito: Since lamp size is dependent on customer needs, we are focusing on weight reduction. We are reducing the whole lamp weight by using the above-mentioned "Light Green®" resin for thinner wall thickness and lightweight heat-dissipating components.

DVN: Do you see a contradiction in styling and sustainability, e. g. complex DRL and position light signatures and animations?

Koito: As many people have already thought, the styling differentiation is shifting from conventional hardware to software update of light emission patterns and other aspects of styling. We expect that the environmental considerations, such as low power consumption, will be incorporated in this process.

DVN: Koito has often been the defender of sensor integration in lighting systems: is it still a priority and do you expect applications soon?

Koito: We believe that priority is high. ADAS system suppliers would like to expand the ODD (operational domain) using a variety of sensors. This will increase the number of sensors, including lidar, and we assume that mounting locations will become an issue, so we believe that mounting into lamp will be effective. Also, by integrating sensor with lamp, the risk to spoil vehicle design can be avoided, and the lamp cleaner can be used to remove dirt.

DVN: Which evolution for lighting are you expecting with the development of L3 and L4 vehicles?

Koito: In the motorcycle field, as with the four-wheeler vehicle field, we believe that safety improvement technologies are required. We think ADB function together with bank angle, road surface projection, lamps with built-in sensors are correspondent to them.

DVN: Which priorities do you see to best improve safety through our lighting products in the future?

Koito: We are working on expanding our product line-up utilizing our own technologies we have obtained in the lighting field, based on our policies from the conventional "for drivers" to "for drivers and vehicle systems" and further to "for all participants in traffic". For example, we are currently working on development and mass-production of lidar, sensor-related applications and HUD.



Wolfgang Huhn, Izuka-san, Tsukamoto-san, Komatsu-san, Eiichi Ono (DVN)

Lighting News

Fruitful Sessions at the DVN Workshop in US

LIGHTING NEWS



The graphic is a blue rectangular banner with white and yellow text. In the top left, there is a yellow circle with the text 'SAVE THE DATE!'. To its right, a dark blue box contains the dates '29-30 AUGUST 2023' and 'SAN FRANCISCO'. The 'DVN Lighting' logo is in the top right. The main title 'DVN US WORKSHOP' is in large white letters, followed by the subtitle 'Lighting the Future: Safety, Communication and Emotions for EVs, AVs & Trucks'. Below this, the event activities are listed: 'Social Cocktail • Meet & Greet Dinner • Conference • Expo'. At the bottom, a dark blue bar contains the text '- 28TH DVN WORKSHOP • SAN FRANCISCO -' in yellow.

SAVE THE DATE!

**29-30
AUGUST
2023**
SAN FRANCISCO

DVN
Lighting

DVN US WORKSHOP

Lighting the Future:
Safety, Communication and Emotions
for EVs, AVs & Trucks

Social Cocktail • Meet & Greet Dinner • Conference • Expo

- 28TH DVN WORKSHOP • SAN FRANCISCO -

After the 2 opening keynotes from PN Research Laboratory scientists Naomi Miller and Lia Irvin on an under-studied aspect of lighting, crucial for seeing, safety, and wellbeing, and from the well-known John Bullough, now program director Icahn School of Medicine at *Mount Sinai on the influence of headlight performance on safety*, the DVN US workshop present three fruitful sessions.

Five automakers present new technologies and functions (Chair: Wolfgang Huhn)

Lucid • Hans-Christoph Eckstein, Lighting Department Head, Director Electronics and Optical Engineering:

Full Digital Headlamp Constraints and Opportunities

Rivian • Shammika Wickramasinghe, Body Lighting & Engineering Senior Director:
Safety, Emotion and Communication Through Good Lighting

Zoox • Lingxuan Zhu, Exterior & Lighting Manager:

The Crucial Role of Lighting Performance in Sensing, Perception, and Communication for AV

Lotus • Rouven Haberkorn, Senior Lighting Engineer:

The Evolution of Lotus Lighting for Safety, Communication, and Emotions in EVs

IM Motors • [tba]

Six tier-1 suppliers present new tech and functions (Chair: Paul Henri Matha)

Hella · Dr. Michael Kleinkes, Lighting Board member:

Lighting Architecture of the Future

Mobis · Taewon Lee, Product Planning Manager:

Trend of the Automotive Lighting Industry and the Direction of Mobis

Magna · Edward Bailey, LED Technology Manager:

High Brightness Advanced Lighting Mini-LED Displays

Marelli AL · Gustavo Menezes, R&D Manager:

Lighting Communication and Assistance by Projectors and Displays

Plastic Omnium · Courtney Hewitt, Innovation Head:

Highlight Value of Lighting Integration— Projection Lighting Portfolio (TBC)

Valeo · [speaker tba]:

Line Lens and HD for US ADB

Seven light source suppliers describe new tech and functions (Chair: M. Kleinkes)

Lumileds · Lars Dabringhausen, Technical Marketing Director:

Benefits of Direct Imaging Solutions for NAFTA ADB

Seoul Semiconductor · Mahad Abbasi, Senior Technical Sales Manager:

Advancements in Automotive Lighting and Safety with Next Generation WICOP Technologies

Everlight · Max Ma, Automotive Product Marketing Manager:

Visionary Transformation of Smart LED

ams Osram · Markus Hofmann, Senior Principal Engineer:

Enhancing Safety and Sustainability with LEDs for Forward Lighting

Nichia · Ted Schriefer, Assistant General Manager:

Future Light Sources for Increased Safety, Communication, and Emotion

KSLD · Josip Kovacevic, Sales and Support Officer:

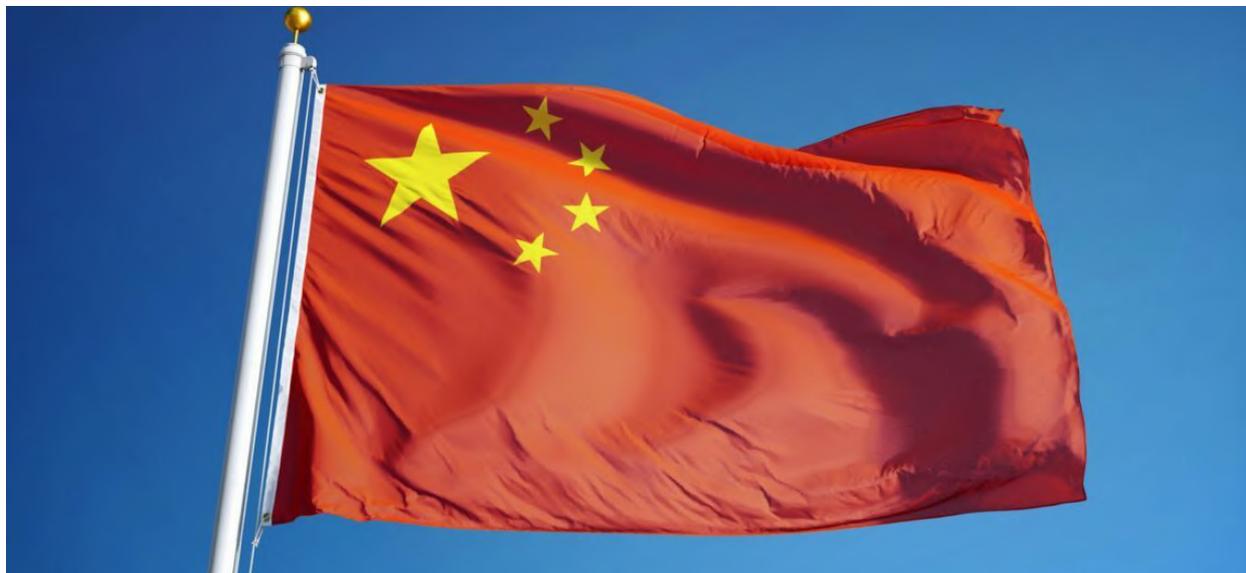
LaserLight Changes the Paradigms for Safety, Communication and Styling

Appotronics · Dr. Yu Xin, Vice President:

The Intellectual Application of Lasers in the Field of Lighting

New Launches in China: HiPhi Y SUV and Hongqi HS3

LIGHTING NEWS



HiPhi Y SUV



HiPhi of Human Horizon officially announced the launch of HiPhi Y. As the third model launched by HiPhi, it is positioned as a pure electric mid-size SUV. Compared with HiPhi X and HiPhi Z, HiPhi Y's appearance is more towards traditional cars, no longer reflecting a particularly radical "futuristic feel" like previous models, but still using a family-style wingspan door, calling itself a "mobile cloakroom".

Hongqi HS3



The Hongqi HS3 is officially launched, positioned as a compact SUV. Adopting the latest family design language, the large-size straight waterfall grille is paired with the abstract shape of the Hongqi logo. Split LED headlights. The front surround has a sporty design. End to end taillight, with two ends shaped like red flags in the wind. The rear part echoes the front of the car.

Hella's SlimLine Range Launches with Bi-LED Headlamp

LIGHTING NEWS



Hella are launching their first rectangular headlamp module, the SlimLine Bi-LED, in pursuit of a major design trend. The headlamp offers excellent light output and is ideal for a wide range of highly demanding applications. It offers low and high beam in a single headlamp module, and is suitable for use on agricultural and construction machinery, trucks, buses, motorhomes, in the powersports sector, and on passenger cars. Its sturdy housing and robust construction suit it for harsh environments and heavy-duty applications.



It's also the first product in Hella's new SlimLine range. More modules—a fog lamp with cornering light and a module that combines DRL, position light, and direction indicator—are currently under development.

Great Big Order Sets ZKW Wieselberg Plant Humming

LIGHTING NEWS



A multimillion-Euro order from a German car manufacturer means ZKW's Wieselberg plant will be industriously busy in the short and medium term.

CEO Dr. Wilhelm Steger says, "Our company headquarters in Wieselberg is the hub for innovative lighting systems for premium brands. The goal is to achieve profitable and sustainable growth through concentration and focus". This major order means job security for a large part of the workforce in Wieselberg, following on the heels of the job cuts announced this past spring, though the cost-cutting programme will continue as planned with the reduction of 600 jobs by the end of next year.

The new strategic orientation for the headquarters is based on four pillars: a focus on premium products, lighting systems for trucks and buses, a strengthened after-sales area, and development and production of innovative lighting modules.

The good news of the big order comes as ZKW's cost cutbacks are beginning to help out. Steger says the cost-cutting was "a difficult but also important step for ZKW, demonstrating its commitment to sustainable growth in the face of challenging market conditions".

Lucid, SUSS MicroOptics Impress Crowds at Lake Neuchâtel

LIGHTING NEWS



American EV maker Lucid Motors, along with SUSS MicroOptics, organised a test-drive event in SUSS MicroOptics' hometown of Neuchâtel, Switzerland.

Lucid, who recently opened a studio in Geneva, and SUSS MicroOptics, who make high quality microoptics, joined forces to increase brand awareness and introduce fully-electric cars to the Swiss public.

Anyone interested could book one of the half-hour test drives in a Lucid Air, either the Dream Edition or Grand Touring; the test drives took place in downtown Neuchâtel and its surroundings. Lucid Geneva staffers briefed all drivers on the cars' technology and controls, and answered questions about the design, performance and range. Driver reactions after their test drives tended to run along the lines of "smooth", "elegant", and "incredible acceleration".

SUSS MicroOptics are veteran designers and producers of refractive and diffractive microoptics with experience in optical design, engineering, wafer-level manufacturing, metrology and packaging. They got into the automotive industry not long ago; their technology in this field is currently booming. Product miniaturisation trends, together with the need to provide powerful illumination at low power consumption, makes micro-technology a perfect fit for slim headlights and other challenging systems.

Driver Assistance News

Hesai Win SAIC Lidar Supply Contract

DRIVER ASSISTANCE NEWS



Hesai Technology have been selected to provide lidar units for several models of the SAIC Motor Commercial Vehicle Division's original-equipment project. The new models will be equipped with Hesai's automotive-grade, ultrahigh-resolution long-range AT128 lidar.

These design wins are a part of the strategic cooperation between Hesai, SAIC Commercial Vehicle Division, and Utopilot to develop new intelligent driving technologies for consumer-facing product implementations.

Utopilot are a tech company under the SAIC Group, focusing on providing intelligent driving solutions for commercial vehicles. They've inherited over ten years' worth of SAIC's accumulated intelligent driving technology, supply chain advantages, and more than three years of commercial operation expertise. In 2021, Hesai collaborated with Utopilot to equip an L^4 heavy-duty truck with a high-performance "Pandar" lidar; the truck has already achieved semi-commercial operation at Shanghai Yangshan Port.

The AT128's 128 independent VCSEL laser transmitters allow it to achieve 1.53 million data points per second and a detection range of 200 metres. It entered mass production in 2022.

Hesai Technology's lidar products enable a broad spectrum of applications across passenger and commercial vehicles with ADAS and AV fleets. As of 31 December 2022, Hesai have shipped over 100,000 lidar units.

Lidar is Revolutionising Autonomous Mobility: Valeo Lidar CTO

DRIVER ASSISTANCE NEWS



Clément Nouvel
LIDAR CTO

"The technology I hold in my hand is revolutionising autonomous mobility", said Valeo's Lidar CTO Clément Nouvel of his company's newest Scala³ lidar. He continued: "Over the last 20 years, lidar has been associated with autonomous driving and Valeo have been enabling level-3 automation for several car manufacturers for the first time in automotive history with our market-leading Scala technology.

"The primary purpose of our technology—the 3rd sensing modality—is to bring an additional safety layer to make autonomous driving viable for our customers and for the society. As such, safety is a prerequisite for autonomy, not a mere byproduct".

General News

First-half U.S. sales scorecard

GENERAL NEWS



Six months into 2023, the supply shortages that have handcuffed sales for several years were fading, and volume was up year over year in nearly every vehicle segment.

General Motors outsold Toyota at the halfway point for a second consecutive year, and Ford was on pace to be the top brand for the first time in three years. Hyundai-Kia leapfrogged Stellantis to become the No. 4 automaker, as Tesla — based on estimates since it doesn't report U.S. results — climbed to No. 8. Tesla still had three of the four most popular electric vehicles, though others are grabbing more market share every quarter.

It's a tight race for pickup sales supremacy between Ford, which was No. 1 in the second quarter, and GM, which had a slight lead year to date. GM's highly profitable large SUVs easily outsold the competition from Stellantis and Ford combined. And among gasoline-powered pony cars, the Ford Mustang is making a bid to reclaim its crown from the Dodge Challenger after two years in second place.

	Sales x 1,000	Change
GM	1,288	+16%
Toyota	1,038	-1%
Ford	1,000	+10%
Hyundai-Kia	820	+17%
Stellantis	807	-1%
Honda	632	+25%
Nissan	526	+22%
Tesla	343	+50%
Subaru	304	+15%
VW Group	257	+12%

Volkswagen CEO Schaefer to Managers: 'The Roof Is on Fire'

GENERAL NEWS



Volkswagen CEO Thomas Schaefer is warning of tough times, suggesting “all is at stake” in a fiery address during an internal managers’ meeting held this week.

In the hour-long meeting, Schaefer laid out the breadth and severity of problems facing VW as it seeks to become a leading manufacturer of EV while continuing to serve global markets with traditional internal-combustion-engine models, telling more than 2,000 senior managers, “The roof is on fire.”

In an energetic appeal, the German called for an immediate freeze on spending. “We are letting the costs run too high in many areas,” he said.

Schaefer indicated the next weeks and months for VW will be “very tough” and called on its managers to make “small wins,” according to sources with information on the minutes of the meeting.

The so-called “performance programs” have already been discussed at board-member level, Schaefer indicated.

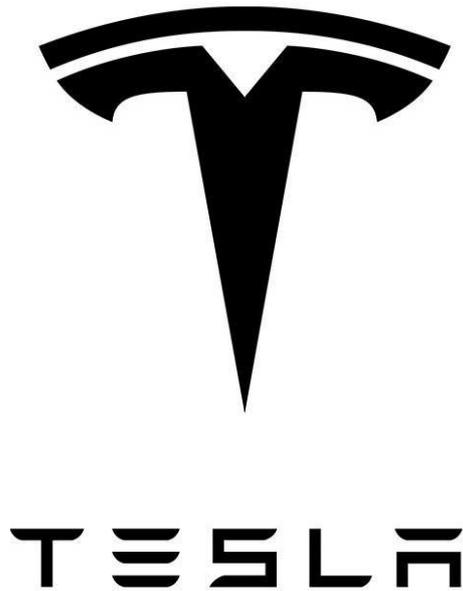
The call for fiscal belt-tightening at the VW brand comes as it invests heavily in EV technology and production infrastructure while continuing development of ICE vehicles to meet increasingly stringent emission and safety regulations.

It also comes amid a downturn in sales in its largest market, China, where VW has been forced to discount many of its most profitable models to remain competitive against increasing Chinese competition, both in electric- and ICE-vehicle segments.

“Our structures and processes are still too complex, slow and inflexible,” he said.

Tesla Reportedly in India Factory Talks

GENERAL NEWS



Tesla is discussing an investment proposal with the Indian government to set up a factory with an annual capacity of about half a million electric vehicles, the *Times of India* reported, citing government sources.

The company is also looking at using India as an export base to ship cars to countries in the Indo-Pacific region, the report said.

India was keen for Tesla to manufacture vehicles locally, but the company said it wanted to export its cars first to the country so that it could test the strength of demand. In renewed efforts to enter the domestic market with a change of stance, Tesla held discussions with officials about incentives being offered by the government for its cars and battery manufacturing, Reuters reported.