

## Focus on industrial equipment and healthcare business as well as automotive business Outlook for FY2019: An Interview with Takahiro Hayashi, New Japan President of Maxim

Since entering an official distributor contract in East Asia with Maxim Integrated Products, Inc. ("Maxim") in 2007, NEXTY Electronics Corporation ("NEXTY") has succeeded in expanding analog semiconductors whose growth has continued steadily not only to East Asia, but to other regions as well.

Newly appointed as president of Maxim in December 2018, Mr. Hayashi was involved in establishing product development for four years at Maxim's US headquarters, and he is now taking advantage of that experience to boost the number of dedicated Maxim followers in the Japanese market as well.

Against the backdrop of appreciable changes in the global semiconductor market, NEXTY Director Shinichi Hosoda interviewed President Hayashi on the outlook for FY2019.

### Building a broad network of relationships while in the Industrial Business Unit at Maxim HQ

**Hosoda** : Congratulations on your appointment as Japan President. To start with, could you tell us about your history with Maxim?

**Hayashi** : I joined Maxim in 2003. Later from 2010 to 2014, I worked as business manager for the Industrial Business Unit at Maxim HQ where I was in charge of launching the development of BMS (Battery Management Systems) as well as Himalaya High-Voltage Synchronous Step-Down DC-DC Converter.

As a matter of fact, starting from zero, we were able to successfully co-develop BMS products with automotive Japanese OEMs and Tier 1 customers, which turned out to be an incredible experience.

While working in the Industrial Business Unit, I was able to build a broad network of personal connections from executive to manager levels in every division at headquarters, and these have proven to be a major asset even to today.

After returning Japan, I was appointed as Regional Sales Manager, Sales Osaka where I was able to support customers in all the major segments we target including automotive, industrial equipment and consumer products.



Maxim Japan  
President **Takahiro Hayashi**

### Tripled sales of automotive business in 5 years

**Hosoda** : What can you tell us about Maxim's company-wide earnings outlook and mid-to-long term strategy?

**Hayashi** : Sales growth, especially in Maxim's automotive business, has had a remarkable increase over the past five years with sales growth more than tripled. And in the first quarter of FY2019 (July to September 2018), sales increased by 15% (year-on-year).

Although the global economic environment remains uncertain for 2019, the trend towards electrical vehicle system shows no signs of stopping. Since the number of electronic components incorporated in automobiles will continue increasing, we expect our automotive business to grow steadily in the future.

### Collaboration with NVIDIA on ADAS & autonomous driving

**Hosoda** : What is Maxim's partnership strategy in the global market?

**Hayashi** : We have built up mutual partnerships in digital and analog fields to provide customers with better services including reference designs. Specifically, we've been collaborating with NVIDIA in the fields of vehicle ADAS and autonomous driving.



## Focus on industrial equipment and healthcare business as well as automotive business

**Hosoda** : What are business conditions like in the Japanese market?

**Hayashi** : Although we are linked to the company-wide situation, growth of the automotive business has grown significantly, accounting for about 50% of 2018 sales. We are also seeing a strong performance from things like GMSL (Gigabit Multimedia Serial Link) used for high-speed data transfer in automobiles as well as power management products that support ASIL Function Safety Standard.

**Hosoda** : How about your company's mid-to-long term initiatives to grow sales in Japanese market, as well as priority fields, and priority products?

**Hayashi** : Although our automotive business is strong, we are also focusing on industrial equipment and healthcare businesses. In the former, the trend of smart factories emblematic of Industry 4.0 is accelerating, and there is increasing adoption of IO-Link products and Himalaya uSLIC power modules aimed at miniaturization. In the latter, biosensor products are being adopted in the field of preventive medicine, which we view as a new growth area for the future.

Everything happening in the world is analog, and amid the growing sophistication of digital processing, we believe that high-performance analog semiconductors will be essential for supporting future applications. We are committed to continue development in ways that best serve our customers with products typified by ruggedness, miniaturization, and low power consumption.

**Hosoda** : We at NEXTY also look forward to seeing the results of Maxim's competitive development capabilities. As you mentioned, we need to focus not solely on in-vehicle technology, but also industrial equipment and healthcare products. In fact, we are also now developing healthcare solutions that will utilize Maxim's pulse wave sensors.

Global expansion is also one of our strong points, and we sell Maxim products not only to customers from Japanese companies around China and Asia, but to many other customers as well. This is due to the fact that we consider Maxim an extremely unique supplier, and hope to continue broadening our partnership in the years to come.



NEXTY ELECTRONICS CORPORATION  
Director **Shinichi Hosoda**

## High expectations towards NEXTY features, especially ODM/EMS, software development, and quality

**Hosoda** : From your point of view, what are the strengths and appeal of NEXTY?

**Hayashi** : For starters, NEXTY has an unequalled track record and experience in the automotive field. We are counting on NEXTY's ability to penetrate automotive markets where the electronics continue to further advance. We also believe that NEXTY's strengths lie not only in its conventional functions as a trading company, but also its ODM/EMS outsourcing, software development, and in-house quality center, which provide a comprehensive system that supports customers at every stage from initial development to mass production. At present, NEXTY is helping to expand our business mainly in the automotive field. However, we look forward to generating synergies between NEXTY's new initiatives and Maxim's products, and building a win-win relationship as partners in all aspects including fields like industrial and medical equipment.

**Hosoda** : Finally, could you share with us some of your aspirations?

**Hayashi** : We hope to further strengthen our partnership with NEXTY and build a system that is useful for all customers.

**Hosoda** : Thank you for your time, President Hayashi. We look forward to continuing to work with you.



**The following pages describe Maxim and NEXTY's efforts in more detail.**

GMSL products and NEXTY's GMSL support system: P5

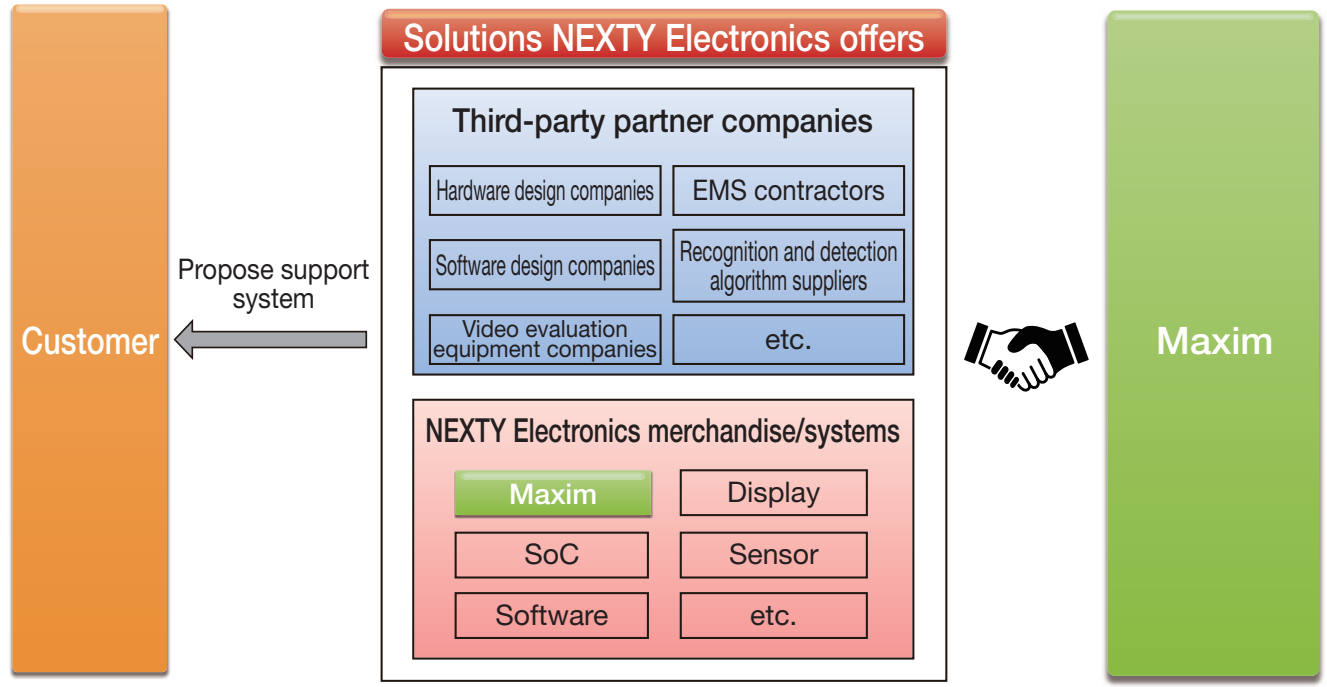
Introduction to healthcare solutions that use pulse wave sensors: P6

Introduction to Himalaya High-Voltage Synchronous Step-Down DC-DC Converter: P7

# Maxim GMSL (SerDes) Product Support Structure

Be sure to contact us if considering Gigabit Multimedia Serial Link (GMSL) products provided by Maxim. Third-parties and NEXTY Electronics coordinate in providing support for customers struggling with development issues. Specifically, we not only provide design support for involving GMSL individual products, but also support for everything from hardware & software development for cameras/SoC/display solutions that utilize GMSL, to signal quality, EMC assessment, simulations, and more.

## GMSL Product Support Structure



## NEXTY support system proposals for various customer-side processes



- ① **Proposals for new technology/products**  
We propose solutions for the technologies and products that customers develop using the products we handle, including Maxim products
- ② **Technical support for designing/hardware and software design, evaluation and simulation**  
In collaboration with third-parties, we offer support for not just product design, but development and design of entire systems.
- ③ **Support for customers' global expansion plans**  
By taking advantage of our offices established in countries around the world, we offer support for procurement anywhere on a global level.
- ④ **Proposals for EMS/ODM solutions**  
We can help customers struggling with issues such as insufficient mass production lines, production at overseas plants, and small volume production.
- ⑤ **Sales support**  
We utilize our extensive sales network to support the sale of our customers' products.

For inquiries, contact Marketing Dept. III, Maxim Group [maximg\\_members@nexty-ele.com](mailto:maximg_members@nexty-ele.com)

# Maxim Healthcare solutions using pulse wave sensors

We can provide customers with solutions that combine the proprietary healthcare algorithms of NEXTY System Design Corporation ("NSD") with Maxim's pulse sensors. NSD's proprietary algorithms are able to calculate the vascular age and blood pressure from pulse info. We also offer customers solutions for health care systems that utilize third-parties and deliver features such as a complete module or smartphone app.

## Maxim Pulse Wave Sensor

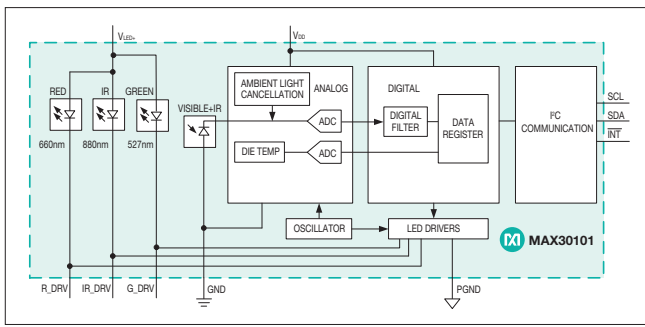
### Product Features

This product integrates red/infrared/green LEDs, a photodiode, and control IC into a single compact package for monitoring biometrics such as blood oxygen levels and photoplethysmogram.

- Part No. MAX30101
    - High Sample Rates, High SNR
    - Tiny 14-Pin (5.6 mm × 3.3 mm × 1.55 mm)
    - Ultra-Low Shutdown Current (0.7μA, typ)
- Visit the company's official website for more information on this and other Maxim products.



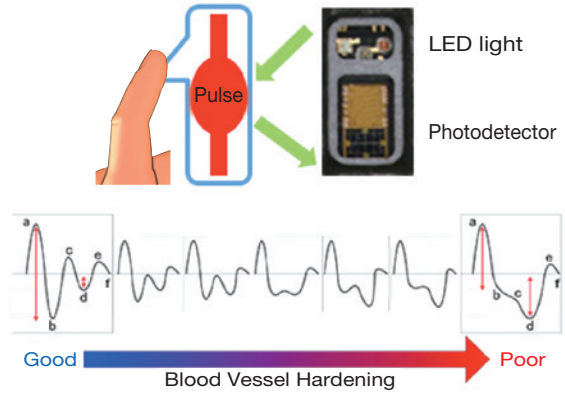
### MAX30101



## Healthcare Algorithms from NSD

### Vascular age assessment algorithm

Vascular age, an indicator of blood vessel hardening, is calculated by identifying changes in blood flow by monitoring the pulse wave. Physical health can be assessed by using vascular age as a health indicator.

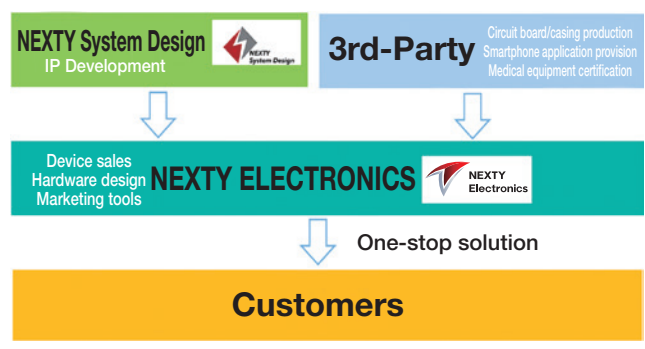


### Algorithm extensibility

A wide variety of vitals can be measured by applying software updates without the need to upgrade or replace hardware.

Measurement target	Development status
Heart rate	Development started
Estimated blood pressure	Development started
Vascular age	Development started
Stress	Development started
Total body water	Planning underway
Oxygen saturation	Planning underway
Autonomic imbalance	Planning underway

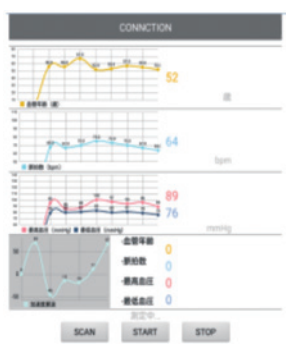
## Business Scheme Examples



### Development module



### Smartphone app



### Use-case concept image



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# Maxim Himalaya uSLIC Power Modules

Himalaya uSLIC™ power modules offer the smallest packages available, while accepting a wide range of input voltage from 4.0V to 60V.

## Reduce the power supply solution size by utilizing advanced packaging technology!

### Power supply solution is reduced in size by 2.25 times (56%)

Himalaya uSLIC power modules leverage advanced packaging technology to reduce the power supply solution size by 2.25 times (56%) resulting in micro-sized system-level IC (uSLIC) devices. This is achieved by integrating Synchronous Step-Down Himalaya Buck Converter—which includes built-in FETs, compensation, and additional functions—with an inductor

### Complies with the JESD22-B103/B104/B111 mechanical standard

The combination of these components results in ultra-small power modules that can be used in highly space-constrained systems while complying with the JESD22-B103/B104/B111 mechanical standard. In addition, compliance with the CISPR 22 electromagnetic interference (EMI) standard helps to improve the first-time success rate for EMI certification of the end products.

## Himalaya uSLIC Power Module Lineup

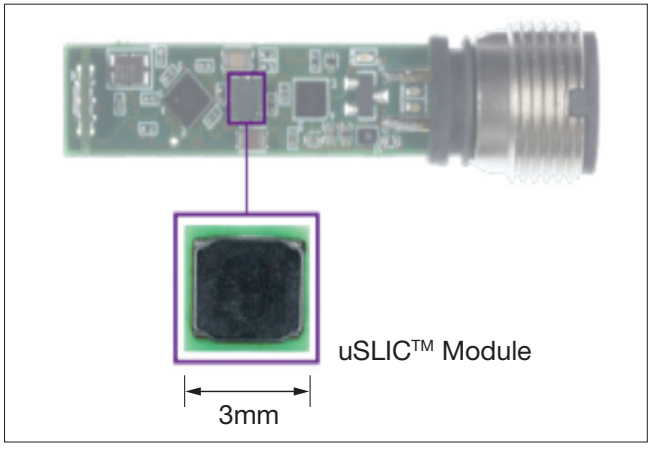
Part Number	Input Voltage	Output Voltage	FB Voltage Accuracy	Maximum Output Current	Shutdown Current	Operating Temperature Range	PKG
MAXM17900	4V~24V	0.9V~5.5V	±1.75%	100mA	1.2uA (typ.)	-40 to +125	10pin, 2.6×3×1.5mm
MAXM17903	4.5V~24V	0.9V~3.3V	±1.44%	300mA	2.2uA (typ.)		
MAXM17552	4V~60V	0.9V~5.5V	±1.75%	100mA	1.2uA (typ.)		
MAXM15064	4.5V~60V	0.9V~5V	±1.44%	300mA	2.2uA (typ.)		
MAXM15462	4.5V~42V	0.9V~5V	±1.44%	300mA	2.2uA (typ.)		
MAXM17532	4V~42V	0.9V~5.5V	±1.75%	100mA	1.2uA (typ.)		

### Product Features

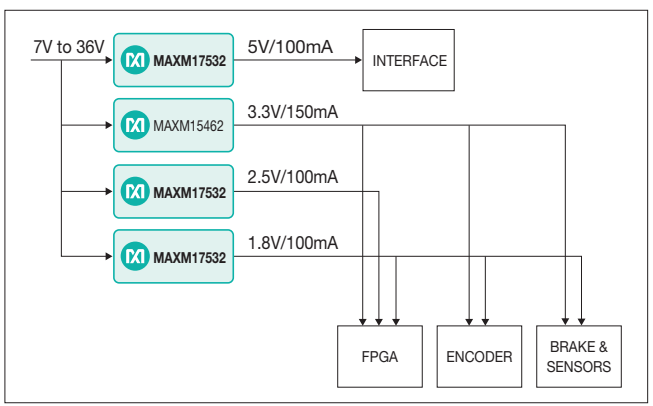
- Easy to use
  - Wide input voltage range
  - High feedback-voltage accuracy
  - Internally compensated
  - All ceramic capacitors
- High-efficiency
  - Fixed-frequency PWM
  - Pulse frequency modulation (PFM) mode to increase light-load efficiency
- Flexible design
  - Programmable soft-start and prebias startup
  - Open-drain power good output (Active-Low RESET pin)
  - Programmable EN/UVLO threshold
- Rugged
  - Complies with CISPR22(EN55022) Class B conducted and radiated emissions
  - Passes drop, shock, and vibration standards: JESD22-B103, B104, B111
- Robust operation
  - Hiccup overcurrent protection
  - Overtemperature Protection

### Applications/Uses

- 4mA–20mA current-loop powered sensors
- Battery-powered equipment
- General purpose point-of-load
- HVAC and building control
- Industrial sensors and process control
- LDO replacement
- USB Type-C powered loads



Ultra-compact proximity sensor

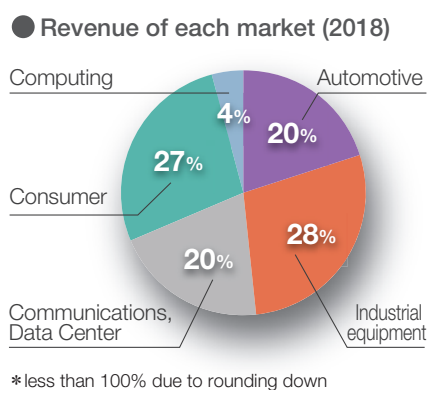


Example of a Himalaya power block for an encoder and digital rating plate

# Maxim Maxim profile and global expansion

## Maxim Profile

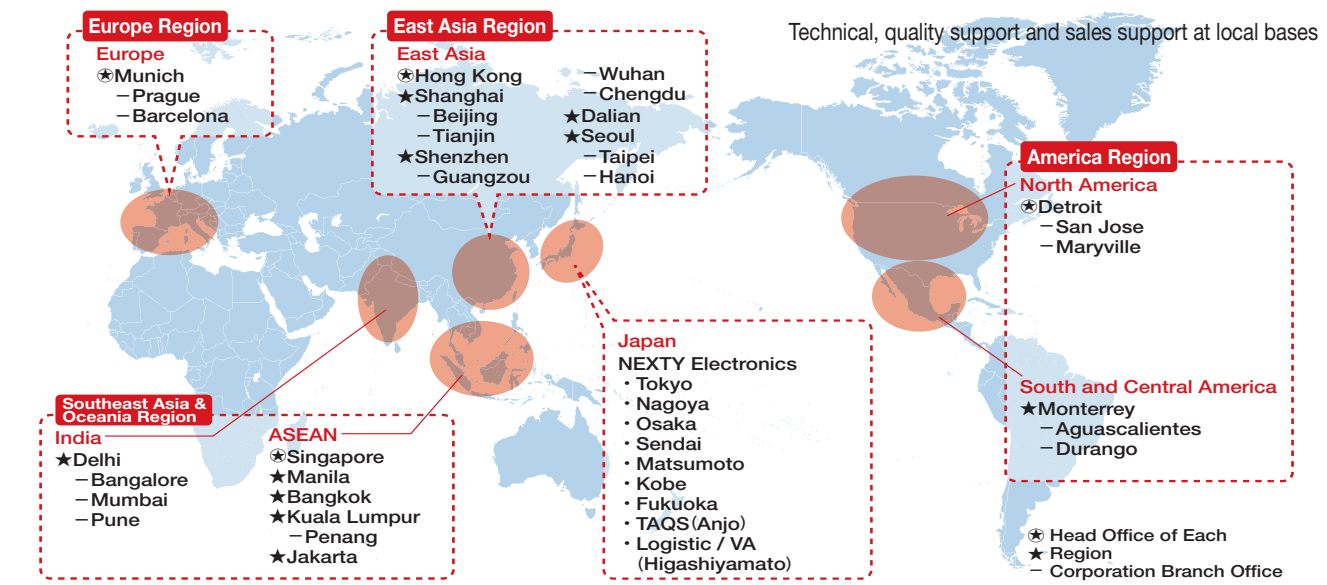
Corporate name : Maxim Japan  
 Founded : August 1st 1984  
 Capital : 400 million yen  
 Representative : President Takahiro Hayashi  
 URL : <https://www.maximintegrated.com/jp.html>  
 Official name : Maxim Integrated Products, Inc.  
 Founded : April 1st 1983  
 Representative : President & CEO Tunç Doluca  
 Revenue : \$ 2.5 billion (June, 2018)  
 Employees : 7000 (approx. June, 2018)  
 Headquarters : San Jose, CA, U.S.  
 URL : <https://www.maximintegrated.com/en.html>



## Maxim Worldwide Locations



## About our global support organization



For inquiries, contact Marketing Dept. III, Maxim Group [maximg\\_members@nexty-ele.com](mailto:maximg_members@nexty-ele.com)