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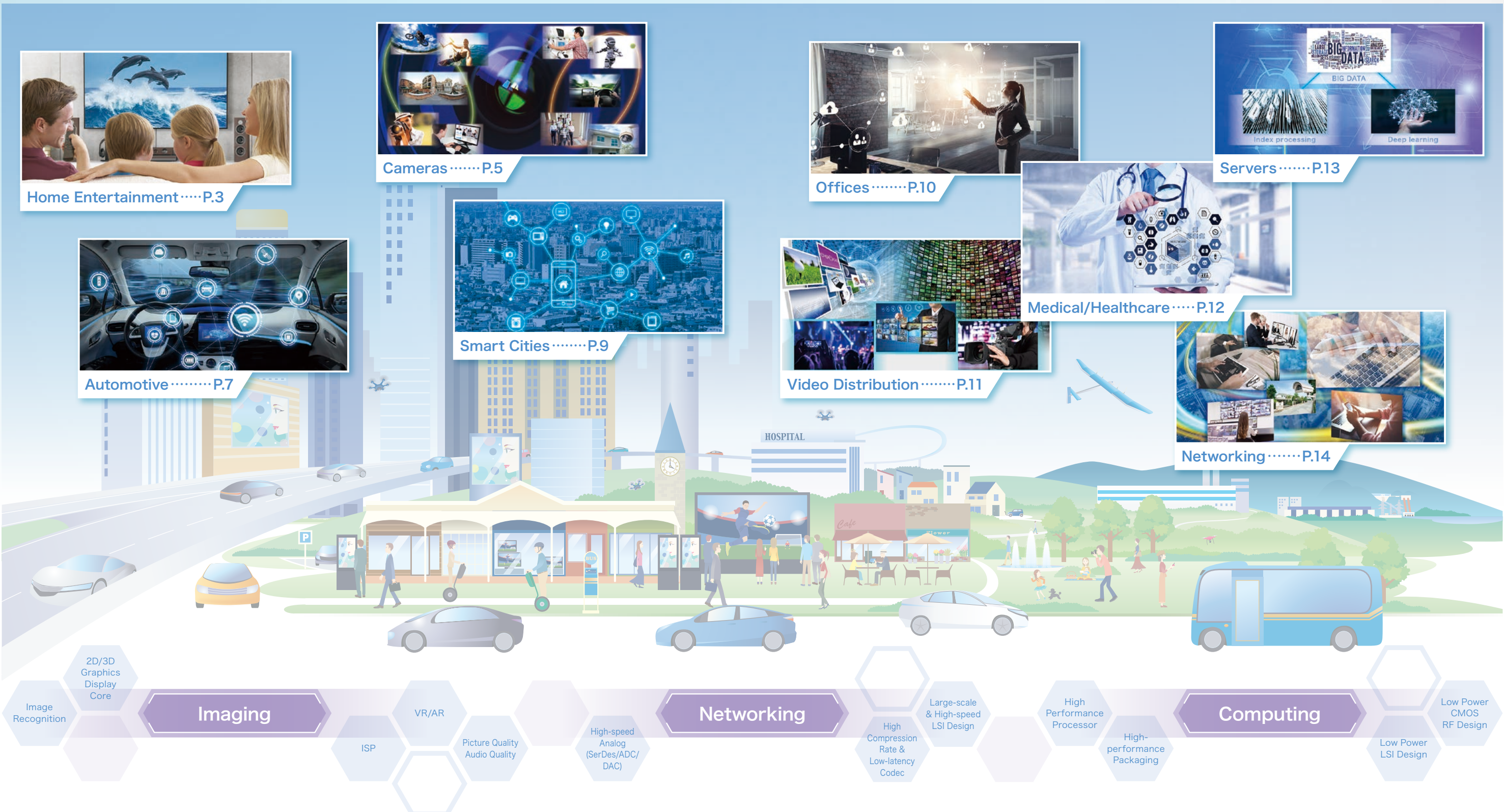
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Application Catalog



Awesome Technology Solution "for better quality of experience"

Our core technology that we have cultivated in the imaging, networking, and computing fields has supported the evolution of a wide range of applications through world-class solutions. As the world becomes more connected through IoT, the challenges that accompany it are increasing in variety and sophistication. In the face of these challenges, we continue to strive to create new value that provides extraordinary experiences for people, and envision a better society.



Home Entertainment

We provide a superb home entertainment experience through sophisticated technological collaboration that delivers outstanding performance.



In the ever-evolving world of broadcasting and web content, which includes 8K TVs that provide an astonishingly immersive and fluid viewing experience, as well as IoT devices AI-equipped that are changing our lives, sophisticated technological collaboration is essential to fully deliver excellent performance. We provide a superb home entertainment experience through comprehensive solutions that utilize the latest in video processing technology.

4K Media Player Solutions

Due to wider variety of viewing environment and high-resolution video format like 4K, today's media boxes play the role of a hub, integrating playback, recording, and distribution functions. We were among the first to meet these needs, and we continue to provide new user experiences through our SoC for compact, low-power media boxes that integrate encoders, as well as transcoders.



4K Ultra HD Blu-ray™/STB Solutions

The evolution of playback devices and content resulted in the need to support new methods for playback, recording, and distribution, such as time-shifted viewing of full-channel recording and redistribution of content via networks. The solutions we provide realize 4K Ultra HD Blu-ray™ recorders, STB equipment, and other products that are fun and convenient to use. We integrate various codecs, including H.265 (HEVC), the storage, and network functionality into a compact space.



2K/4K Global TV Solutions

For latest TV, besides broadcast viewing, viewing content via networks is becoming more important. With our unique video engine supporting advanced codec and security systems as well as state-of-the-art video and audio technology, our total solution can fully convey the spectacular and impressive power and excitement of 4K VOD content transmitted from all over the world via network distribution service.



8K TV Solutions

We provided first chipset for 8K TV broadcasting in the world. By taking advantage of video signal processing technologies developed while providing 2K and 4K TV solutions, we are producing video that is optimized for 8K display panels of higher resolution and high-brightness. In collaboration with broadcasters and TV makers, we will lead the diffusion and development of 8K TV broadcasting services globally.

- Our 8K chipset*¹ can easily realize 8K TV systems.
- 8K video decoder, supporting the H.265(HEVC)*² standard
- Demodulator, supporting both ISDB-S3 and multiple-carrier transmission methods

*1: SC1400A(BONNY), SC1501A(ISDB-S3), SC1401A/SC1408A(LD20)

*2: 8K/60P, ITU-R BT.2073



Audio Solutions

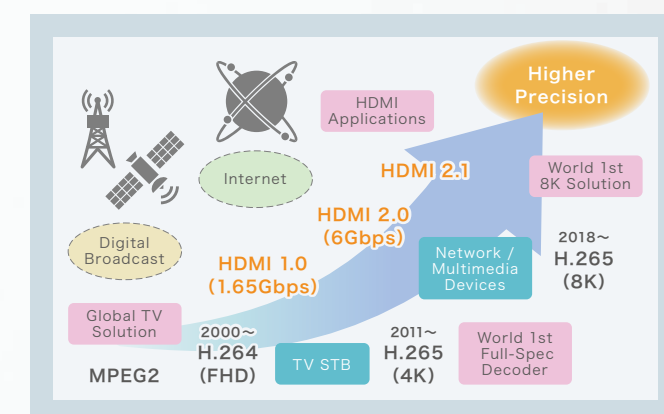
Use of multi channel audio, like 22.2 channel surround system, is becoming more popular. Meanwhile, TV speakers have become thinner and smaller, making it more difficult to reproduce powerful sound. Our audio solutions solve these issues. With IP-based acoustic software technologies for reproducing powerful bass, even with small diameter speakers, and localizing sound images at various positions only with the front speakers, our technologies improve the reproduction of sounds from a wide range of products.



[Product Line-up]

Field	Product	Feature
8K TV	SC1400A (BONNY)	H.265(HEVC) 8K/60p decoder
	SC1501A (ISDB-S3)	ISDB-S3/ITU-T J.183 compatible demodulator
4K TV	SC1401A/SC1408A (LD20)	4K Smart TV H.265(HEVC)/VP9 4K/60p
2K TV	SC1405AP1 (LD11)	2K Smart TV DDR on-chip
	MN2WS0290 (sLD10e)	2K TV DDR on-chip
2K-4K Converter/Image Interface Conversion	MN86912x (HV2 series)	HDMI 2.0 Rx (4ch) HDMI 2.0 Tx/Panel output IF (1-ch each) 2K-4K conversion, ultra-high resolution
Digital Broadcast Demodulation LSI	MN884433	ISDB(Japan, South America)
	MN884434	ISDB(Japan, South America) For W tuners
	MN88436	ATSC(North America)
AV-SoC	SC1100A (PXs3)	H.265(HEVC)/VP9 4K/60p decoder AV recording and playback
Audio	—	Localization of audio sources at the ear, harmonic bass

[Product Roadmap(TV)]



[Main IPs]

- Blu-ray Disc™ recorder function
- 4K/8K video up-converter
- Digital broadcast demodulation
- Media processor (IPP)
- Secure transaction processor
- H.264 decoder/encoder
- H.265(HEVC) decoder/encoder
- Resolution processing
- Audio processing
- AV input/output control
- HDMI 2.0 Rx/Tx
- 3D audio processing

Cameras

Our Milbeaut® technology forms the core of camera solutions that captures the world with stunning image quality while consuming little power.



Cameras are moving with the times and expanding from devices such as DSCs, DSLRs and Action Cams that are human eyes, to becoming the eyes of machines in the surveillance, automotive, and robotics fields. Our camera solutions centered on Milbeaut® ASSP technology achieve stunning image quality and low power consumption in each of these fields.

Surveillance Camera Solutions

As for surveillance camera solutions, our intelligent ASSP with low power consumption strongly supports image sensing such as detection, identification and prediction. Moreover, equipped with the superior backlight compensation function and the low luminance shooting function, our solutions meet the ever increasing security needs in the world as well as the rising surveillance camera market.



Action Camera Solutions

With high performance electronic image stabilization (EIS) and rolling shutter compensation, we provide action camera solutions that enable action scenes to be shot with stability. We also provide the latest solutions that are optimal for shooting in various scenes, including a slow motion function for shooting golf swing practice and other sports actions and the HDR function to control the luminance to a desired level even in dark scenes.



360-degree Camera Solutions

In our 360-degree camera solutions, we provide solutions that enable you to create 360-degree videos by stitching multiple camera images together in real time.



IoT Camera/Digital Camera Solutions

Demand for high image quality has been on the rise, not only in the market of consumer cameras, but also in markets of USB cameras (web camera systems), which have seen rapid expansion in market share, cameras for industrial use and wearable cameras. Our solutions will surely meet such demand (for low power consumption and high image quality) in the latest market.



Automotive Camera Solutions

In the automotive field, there is an increasing need for rear-view cameras, blind-spot cameras, cameras that combine images into panoramic views, and other vision-assistance functions. Not to mention vehicle surveillance functions that use infrared cameras, and image-sensing functions that can detect paths, obstacles, and pedestrians. The various applications that Milbeaut controls use these functions to improve driver visibility and support safe navigation.



Robotics Camera Solutions

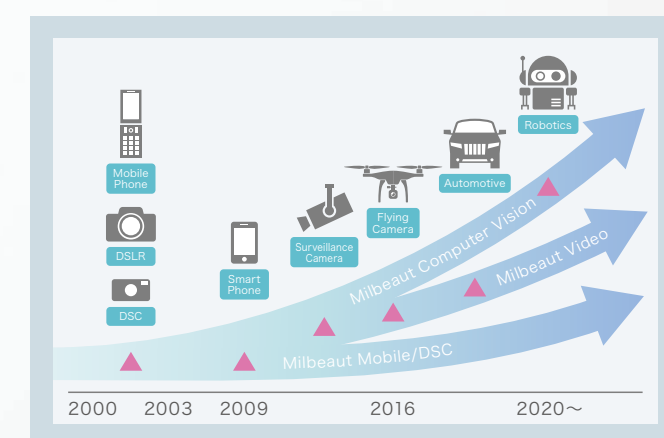
Nowadays, cameras that serve as the eyes for the robots used in various applications feature high-speed and high-precision technologies such as human face recognition, object detection and recognition, and distance measurement using stereo cameras. Our Milbeaut technology performs strongly in dark places, meaning they can be used in a wide range of environments.



[Product Line-up]

Field	Product	Feature
Surveillance Camera	SC2000	4K, H.264/H.265(HEVC), Dual-camera support, 360-degree distortion correction
	SC2002	3M/30p, H.264/H.265(HEVC)
Digital Camera	SC2000	4K, H.264/H.265(HEVC), Dual-camera support, 360-degree distortion correction
	MB86S22	1080/60i, H.264
	MB91696B	1080/30p, H.264
IoT Camera	MBG967	16M/30, Dual-camera support, PDAF
360-degree Camera	SC2000	4K, H.264/H.265(HEVC), Dual-camera support, 360-degree distortion correction
	MBG967	16M/30, Dual-camera support, PDAF
Action Camera	SC2000	4K, H.264/H.265(HEVC), Dual-camera support, 360-degree distortion correction

[Product Roadmap]



[Main IPs]

- HybridAF
- Dual Camera IP
- Color Correction
- Brightness Correction
- Electronic Image Stabilization(EIS)
- Video HDR
- Face Detection/ Face Recognition
- Auto Haze Density Detection
- Haze Removal
- Noise Reduction/ Sensitivity Optimization
- 3DNR

Automotive

We contribute to a safer and more comfortable driving experience through our interactive technology that accurately visualizes and audibly delivers a wide range of information.



Today's on-board information systems display ever-increasing amounts of information, and more advanced features such as improved design and visibility, as well as low power consumption are demanded. We contribute to a safer and more comfortable driving experience, while improving development efficiency and reducing costs with our comprehensive solutions. These solutions use interactive technology to precisely visualize and audibly deliver a wide range of information.

Display Solutions

Integrated Human Machine Interface (HMI)

We provide solutions to control various displays such as instrument clusters, head-up displays, and in-vehicle infotainment systems. Through the uniform control of information using products such as high-performance graphics SoC (GDC) and display controllers, users can customize the display of information, providing a more seamless HMI, a high-resolution display, and a safer system. Another great advantage we offer is a common design that is compatible with various car models and grades.

- Ability to uniformly control multiple displays
- Achieves lower BOM costs through a simple structure



360° Wrap-Around View Systems

This system can display the area you want to see from the location and the angle you want to see it from. For example, this system can seamlessly display an image of your car as seen from above, providing a wide, 360° wrap-around view of the vehicle without the viewer noticing differences in brightness. The optimum LSI and basic software is provided in one package, allowing customers to build systems in fewer man-hours. The 360° Wrap-Around View System conforms to the Drive Monitoring System standards (IEC63033).

- Advanced 3D technology that can apply camera images from all directions to provide binocular vision of the vehicle's surroundings
- Users can freely set the direction of projection as needed for any car or situation



3D Audio HMI Solutions

We use our proprietary audio localizing technology cultivated in our experience in the video game industry, and apply it to vehicles with asymmetrically positioned speakers. This technology makes it possible to control audio localization using only two speakers. By applying this technology to driver support systems and in-vehicle infotainment systems, information such as warning sounds create a sense of direction, achieving a more intuitive way to communicate information through audio HMI.

- Speakers can more intuitively communicate a sense of direction by producing sounds as if they were placed right by the driver's ears or at specified positions.
- Drivers can experience the effects without installing or replacing hardware, as the built-in car speakers play sounds processed offline.
(By placing additional dedicated speakers around the driver, even more effective results can be achieved.)



[Product Line-up]

Field	Product	Feature
Display *1: Integrated HMI *2: 360° wrap-around view	MB86R11/12/13 *1 *2	Cortex®-A9, 3D GPU, SEERIS® (Socionext 2D GPU)
	MB86R24 *1 *2	Cortex®-A9 Dual, 3D GPU, SEERIS® (Socionext 2D GPU)
	SC1810 *1 *2	Cortex®-A9 Quad, 3D GPU, SEERIS® (Socionext 2D GPU), VPU (Vision processor unit), CODEC (H.264), M-JPEG Decoder
	MB88F334/336 SC1711A *1	APIX2® 3Gbps SEERIS® (Socionext 2D GPU)
	SC1701A *1	APIX3® 12Gbps SEERIS® (Socionext 2D GPU)
	MB86R91 *1	APIX IF Conversion companion chip
3D Audio HMI	—	Localization of audio sources at the ear

[Product Roadmap]



[Main IPs]

- 360° wrap-around view
- 3D audio processing

Smart Cities

Taking advantage of our technological strength in visualizing a wide range of information, we contribute to the development of smart cities by connecting images and sensors.



In smart cities, the free movement of people, information provision and use of renewable energy are important. To fulfil these needs, demand is increasing for technology that visualizes a wide range of information, such as cameras, various sensors, digital signage, and public screening systems. Through our application of imaging and sensing technologies to networking and computing, we are contributing to the next generation of urban development.

Security System Solutions

We also provide compact, lightweight, and energy-efficient ASSPs that are optimal for edge devices that are used in applications such as face-recognition functions, detection and recognition functions that perform strongly even in darkness, and 4K resolution imaging that covers a wide field of vision. Furthermore, by combining these devices with edge servers that use highly responsive AI recognition technology to search for vehicles using their number plates and generate alerts by detecting accidents, we contribute to the security market in a world that is rapidly becoming more sophisticated.



Public Signage Solutions

We provide digital signage solutions with SoCs used in display devices equipped with various built-in interfaces. Taking advantage of our proprietary adjustment technology, which is compatible with 10x10-panel multi-screen displays - the largest in the industry - makes it possible for customers to develop new products more efficiently. We've also developed 8K signage BOX (s8) that connect to existing distribution-type digital signage systems that is compatible with IP connection.



[Product Line-up]

Field	Product	Feature
Security Systems	SC2000	4K, H.264/H.265(HEVC), Dual-camera support, 360-degree distortion correction
	SC2002	3M/30p, H.264/H.265(HEVC)

Field	Product	Feature
Public Signage	MN81010H (GARNET)	Interactive signage Compatible with multi-screens
	8K Signage BOX (s8)	8K HEVC streaming playback (8K/60p)

Offices

Companies can accelerate their digital transformation with our SoC solutions for offices.



In recent years, companies have been accelerating their digital transformation to innovate their existing business models and processes. We support work-style updates by helping customers to improve task efficiency and safety through SoC solutions designed for applications in VDI (virtual desktop infrastructure), multi-function machines, and printers.

Document Solutions

By placing high-performance and highly extensible SoCs at the core, and using a power saving sub-system (network standby/response), interface macro (LCD controller), analog front end (scanner, touch panel), and other IPs, we provide custom SoCs that meet the needs of customers in a short period. Also, by using our design service (LSI design verification, PCB co-design), customers can reduce costs and shorten development periods.



Thin Client Solutions

We provide a comprehensive solution for the increasingly ubiquitous thin client, optimizing server-client communications. This solution allows client terminals to use cloud applications and remote desktop environments with ultra-low latency. Also, using this solution eliminates the need to upgrade terminals to handle different types of software, significantly lowering running cost.



[Product Line-up]

Field	Product	Feature
Document (Platform SoC)	MB86S71 MB86S72	Cortex®-A15 Dual/A7 Dual, Mali™-T624
	MB86S73	Cortex®-A7 Dual, Mali™-T624

Field	Product	Feature
Virtual Desktop	SC1110 (PXIV)	PCoIP® hardware decoder 2-channel, 4K video output

Video Distribution

We support an enhanced video viewing experience by delivering high-resolution and high-density solutions.



A key advantage is that we can reduce users' data consumption while maintaining high-quality video. As the use of social media and video streaming services expands, a vast amount of video data other than TV broadcasts is being transmitted. We use cutting-edge video compression and expansion LSI technologies to meet customer needs for video distribution systems, such as high-density, low energy consumption, and high performance to support an enhanced video viewing experience.

Video Distribution Solutions

Our video distribution solutions make communication easy and show content that attracts viewers. These solutions don't just reduce the number of bands required for video distribution; they also take advantage of our video compression and expansion technologies to improve the storage capacity for content. Offering the most advanced encoding, we achieve maximum value for video distribution and provide new value to our customers.

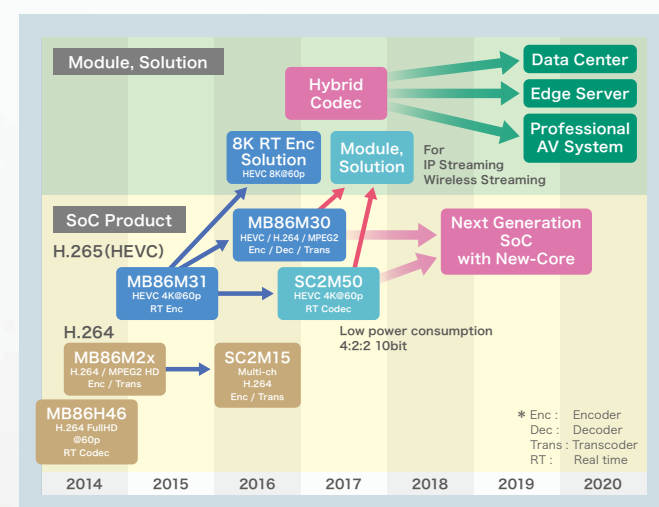


- Multi-format codec / real-time encode
- Compact and low power consumption codec
- Hybrid codec
- Real-time transcode engine

[Product Line-up]

Field	Product	Feature
AV Codec	M820L	H.265(HEVC)/H.264 compatible Video encoding/ Transcoding accelerator card
	SC2M50	H.265(HEVC) 4K/60p Compact and low power consumption codec
	MB86M30	H.265(HEVC) 4K/60p Multi-format codec
	8K H.265(HEVC) Real-time Encoder	H.265(HEVC) 8K/60p Real-time encoder (By application to codec products)
	MB86M31	H.265(HEVC) 4K/60p Real-time encoder

[Product Roadmap]



Medical/Healthcare

We contribute to the future of medical care by developing new solutions that use technology cultivated in the system LSI business.

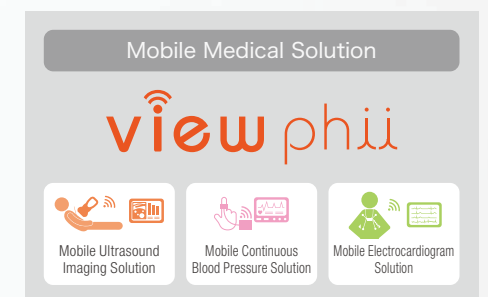


With the technology cultivated in the system LSI business at our core, we provide new medical equipment development solutions that are compact in size, no cable, lightweight and power-saving. We proactively pursue innovation through strong collaboration with medical equipment makers and medical care professionals, helping to formulate future medical care systems such as telemedicine and preventive medicine that apply IoT technology.

Mobile Medical Equipment Solutions

Using our expertise in sensing technology, we have developed "viewphii™" a mobile medical-device solution for non-invasive monitoring. We combine this technology with tablet applications that display sensing data to provide a technological platform that can be applied to the field of medical care.

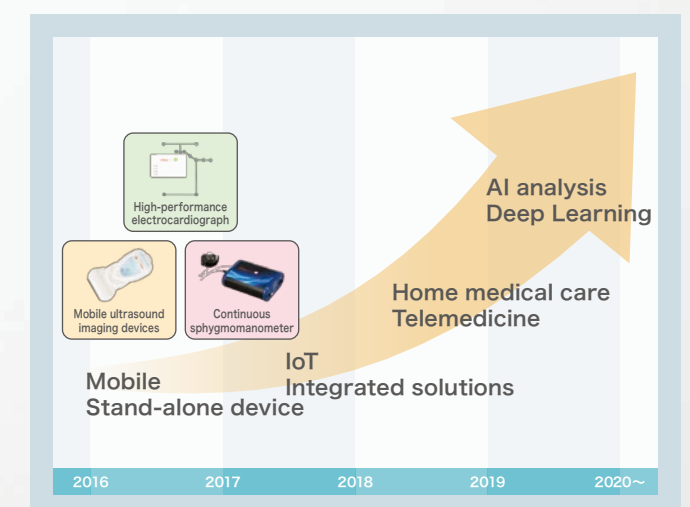
- Mobile Ultrasound Imaging Solution "viewphii US"
- Mobile Continuous Blood Pressure Solution "viewphii CBP"
- Mobile Electrocardiogram Solution "viewphii ECG"



[Product Line-up]

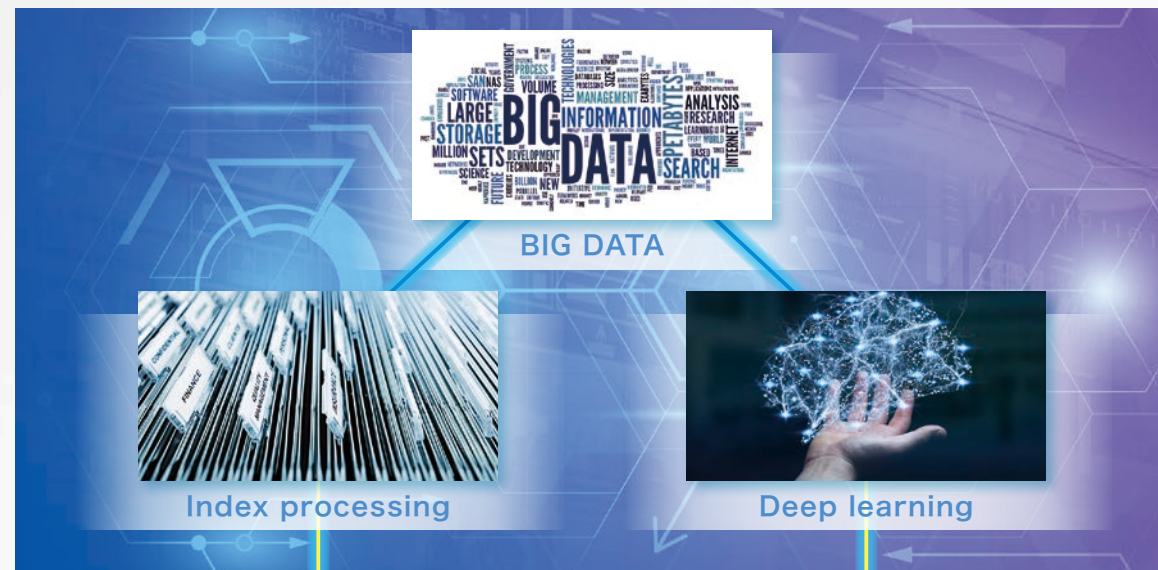
Field	Product	Feature
Mobile Medical Equipment	viewphii	Mobile ultrasound imaging Mobile continuous blood pressure meter Mobile electrocardiogram

[Product Roadmap]



Servers

We provide cutting-edge solutions for various evolving ICT fields by solving challenges of power consumption, processing performance, scalability and cost.



As computing power continues to expand by rapid ICT evolution, we offer industry-leading server solutions. Solving the challenges of power consumption, processing performance, scalability and cost, we contribute to the deployment and operations of various online services and cloud applications which use big data and AI based on deep learning.

Server Solutions SynQuacer™

The application of big data has progressed from data analysis to AI deep learning and inference. The scalability by SynQuacer™ and SynQuacer™X enables us to propose optimal solutions for these applications to our customers.

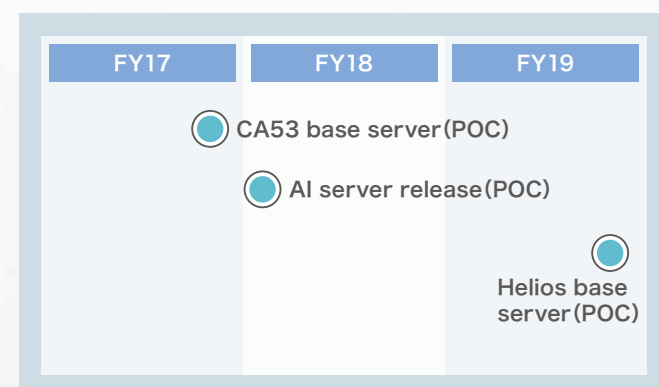
- Power-saving multi-core CPU (SC2A11) is highly efficient
- High-speed interconnect that scales out computer clusters, enabling big data analysis (SC2A20)
- Various options for AI servers that expand data analysis



[Product Line-up]

Field	Product	Feature
Server System	SC2A11 (SynQuacer)	Cortex®-A53 MPCore 24cores 1GHz 2ch DDR4 2ch PCIeG2 4-lane 2ch LAN 1Gbps
	SC2A20 (SynQuacerX)	Socionext DDT(Direct Data Transaction) 9ch PCIeG2 4-lane 1ch USB3.0(Host) 1ch SATA2

[Product Roadmap]



Networking

We connect all regions and support ever-evolving networking technology with advanced solutions.

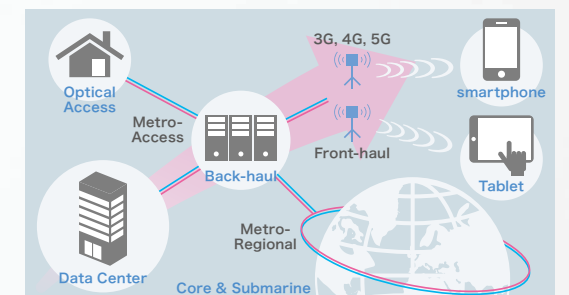


As the year 2020 approaches, when 5th generation (5G) ultrahigh-speed wireless communication is due to roll out, demand is growing for optical fibers that transmit vast amounts of data. Our networking solutions, which take advantage of our strength: high-performance IP installed on SoCs, are a key technology for expanding the network traffic that connects all regions. These advanced custom SoCs meet our customers' various needs.

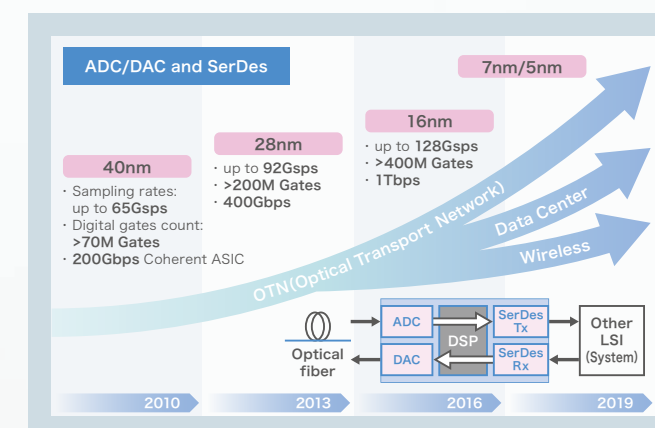
Network Solutions

Our low power consumption, custom SoCs, which use cutting-edge, high-quality IPs, support IT infrastructure around the world. We supported the launch of the world's leading 100, 200, 400-Gigabit and 1-Terabit optical communication technologies. As a leading provider of advanced solutions for communications networks, our high-performance designs evolve in step with the needs of our customers and their next generation systems.

- The world's leading high-speed ADC/DAC
- High-speed SerDes
- High performance package



[Product Roadmap]



[Main IPs]

- ADC 30-128Gsps*1 / DAC 30-128Gsps
- SerDes 1 to 56Gbps, Very Short Reach (VSR) to Long Reach (LR)

*1: sps: samples per second