socionext™

for better quality of experience

LSI lineup for in-vehicle display systems
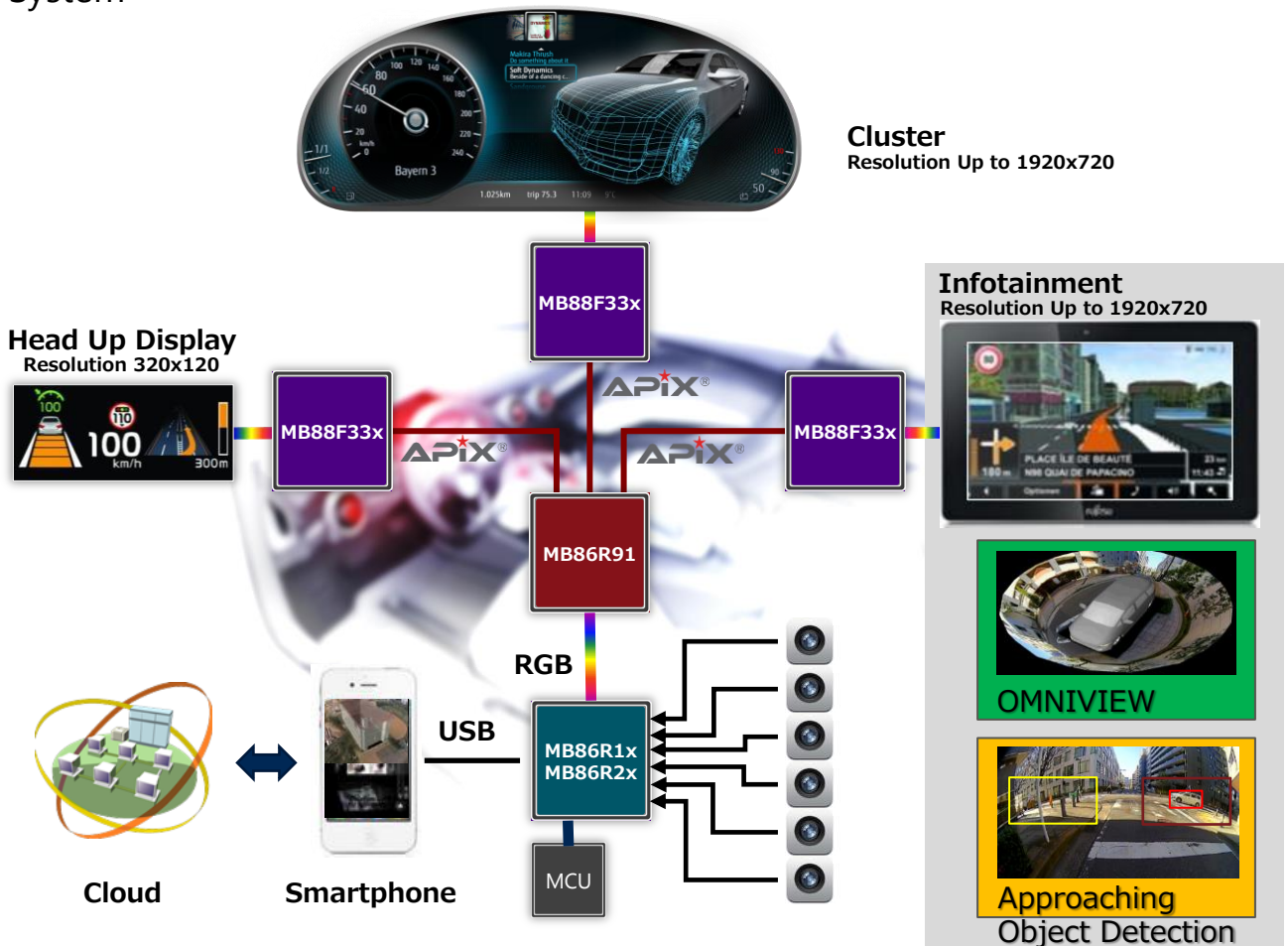## − support of integrated HMI solution −

Advantage

- Modularizing the display can reduce the BOM and enables a single SoC to control the content
- High-performance 2D, 3D engine creates a vivid and impressive display system
- Cooperation with the authoring tool enables cluster designs in reduced time

■ Overview

Unlike traditional in-vehicle display systems, the Socionext solution does not use a controller for each display. Instead Socionext integrates its high-performance graphics SoCs and ancillary chipsets to create an integrated HMI solution that enables low-cost, simple configurations. The system frees the designer from previous development cycles, which make it difficult to apply increasingly complex content and image input / output. The designer can develop systems using a common process, irrespective of the target platform.

● System

Cluster
Resolution Up to 1920x720

Infotainment
Resolution Up to 1920x720

Head Up Display
Resolution 320x120

MB88F33x

APIX®

MB88F33x

APIX®

APIX®

MB88F33x

MB86R91

RGB

OMNIVIEW

USB

MB86R1x
MB86R2x

Approaching Object Detection

Cloud

Smartphone

MCU

Note: APIX stands for **A**utomotive **Pix**el Link
APIX is a Point-to-Point Video and Data Link optimized for Automotive environment provided by Inova Semiconductor, which is Headquartered in Munich, Germany.
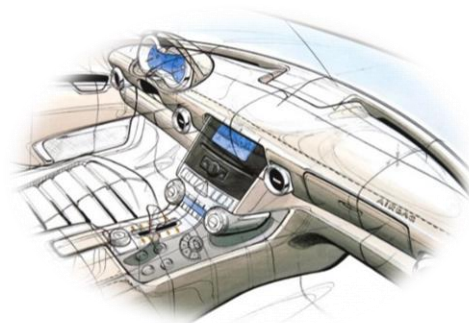
■ Lineup

● Graphic Display Controllers

	MB88F332	MB88F333	MB88F334
Package	LQFP 208	LQFP 176	LQFP 208
Processor	-	-	-
Display Controller	1×up to 1280×480 RGB666/RSDS	1×up to 1280×480 RGB666/RSDS	1×up to 1920×768 RGB/RSDS/LVDS
Graphics	Socionext Sprite Engine	Socionext Sprite Engine	Socionext Pixel Engine
Video	-	-	-
Memory	External Serial Flash I/F Embedded 160KB NOR-Flash	Embedded 160KB NOR-Flash	External Serial Flash I/F Embedded 32KB NOR-Flash
Standard I/O	I2C Sound I/F UART SPI SMC PWM ADC	I2C Sound I/F UART SPI SMC PWM ADC	I2C Sound I/F UART SPI SMC PWM ADC
Network	-	-	-
APIX	APIX® RX 1port	APIX® RX 1port	APIX2® RX 1port

● System On Chip

	MB86R11F	MB86R12	MB86R13	MB86R24
Package	PBBGA 544	TEBGA 544	TEBGA 544	FCBGA 672
Processor	Single ARM® Cortex™-A9 1×400MHz (Automotive)	Single ARM® Cortex™-A9 1×533MHz (Automotive)	Single ARM® Cortex™-A9 1×533MHz (Automotive)	Dual ARM® Cortex™-A9 2×533MHz (Automotive)
Display Controller	3×up to 1600×600@60Hz RGB/RSDS	3×up to 1600×600@60Hz RGB/RSDS	3×up to 1600×600@60Hz RGB/RSDS	2×up to 1920×720p 1×up tp 1920×1080p RGB/FPD
Graphics	Socionext 2D/3D Engine	Socionext 2D/3D Engine	Socionext 2D/3D Engine	Socionext 2D Engine POWERVR™ SGX543-MP1 3D Engine
Video	1×up to 1920×1080 3×up to 1280×720 Socionext Image Processor	1×up to 1920×1080 3×up to 1280×720 Socionext Image Processor	1×up to 1920×1080 3×up to 1280×720 Socionext Image Processor	6×up to 1920×1080 Socionext Image Processor
Memory	DDR2-800 DDR3-800/1066 ×16 ×32	DDR2-800 DDR3-800/1066 ×16 ×32	DDR2-800 DDR3-800/1066 ×16 ×32	DDR3/3L-1066 ×16 ×32 ×64
Standard I/O	I2C I2S UART SPI	I2C I2S UART SPI	I2C I2S UART SPI	I2C I2S UART SPI FPD-Link
Network	CAN Ethernet MOST (3-pin)	CAN Ethernet MOST (3-pin)	CAN Ethernet MOST (3-pin)	CAN Ethernet
APIX	-	APIX2® Tx 3port APIX2® Rx 1port	-	-

● Companion Chip

	MB86R91
Package	FBGA 289
Automotive Interconnect	2× Automotive Interconnect (AIC) for connection to e.g. Socionext's MB9DF126 'Atlas' MCU
Video	1× LVDS video input, configurable as follows: 　・ 2× 4 lanes with up to 615 Mbps/lane (8 bit color) 　・ 2× 3 lanes with up to 615 Mbps/lane (6 bit color) 　・ 1× 8 lanes with up to 375 Mbps/lane (8 bit color) 　・ 1× 6 lanes with up to 455 Mbps/lane (6 bit color) 1× Digital RGB888 video input 1× MIPI CSI2 transmitter (D-PHY 1.0), configurable 2 or 4 lanes 1× Media Independent Interface (MII-M) 1× Media Independent Interface (MII-P)
APIX	APIX2® Tx 3port APIX2® Rx 1port

For more information about our graphics SoC products, please visit http://www.socionext.com/en/products/imaging/gdc/