

Indigo4

Smart Automotive Display Controller

Indigo4 Key Features



■ Video link

- » Bandwidth
- » Daisy chain
- » Sideband
- » Multi stream

■ Image quality

- » Local dimming
- » Image enhancement
- » Visibility in sunlight

■ Warping on-the-fly

- » Defined warp map
- » Dynamic adjustment

■ Safety

- » Normal contents check
- » Local dimming
- » Image enhancement
- » Warping

Indigo Family Roadmap

4K-8K

MULTI PANEL
WIDE DISPLAYS

FullHD

HD

HS BGA-319
Indigo3+
SC1702AK3-xxx
CS: Q3/2021

HS BGA-319
Indigo3-MX
SC1701MK3-200
CS: Q1/2021

EP LQFP-216
Indigo3-LLX
SC1701BH5-300

HS BGA-319
Indigo3
SC1701BK3-100

EP LQFP-216
Indigo3-L
SC1701BH5-100

QFP-208
Indigo2
MB88F334/6

EP LQFP-176
Indigo2-L
SC1711-AH5

TE BGA-449
Indigo4-H
SC1723AK3-1xx
ES: 2022/Dec

TBD
Indigo5
SC17xxx
ES: tbd

TE BGA-449
Indigo4-HX
SC1723AK3-200
ES: 2022/Dec

TE BGA-449
Indigo4-MX
SC1722AK3-200
ES: 2022/Sep

TE BGA-449
Indigo4-M
SC1722AK3-200
ES: 2022/Oct

EP LQFP-216
Indigo4-L
SC1721AH5-1xx
ES: 2022/Jul

EP LQFP-216
Indigo4-LX
SC1721xxx
ES: 2022/Q3

- **APIX3** 12G
- HDCP 1.4

- **APIX3** 12G
- HDCP 2.3

- DUAL LVDS
- MIPI DSI

- **APIX3** 2x3G
- HDCP 1.4

- **APIX2** 3G
- HDCP 1.4

- DUAL LVDS

- DUAL LVDS
- LD 512 zone

- **APIX3** Repeater
- LD 512 zone

- **APIX3** Repeater
- LD 512 zone
- Warping

- DUAL LVDS
- LD 512 zone
- Warping

- **APIX3** Repeater
- eDP output
- LD1024 zone

- DUAL LVDS capture
- eDP output
- LD1024 zone

GF55LPx

GF55LPx

GF22FDX
(under consideration)

Production

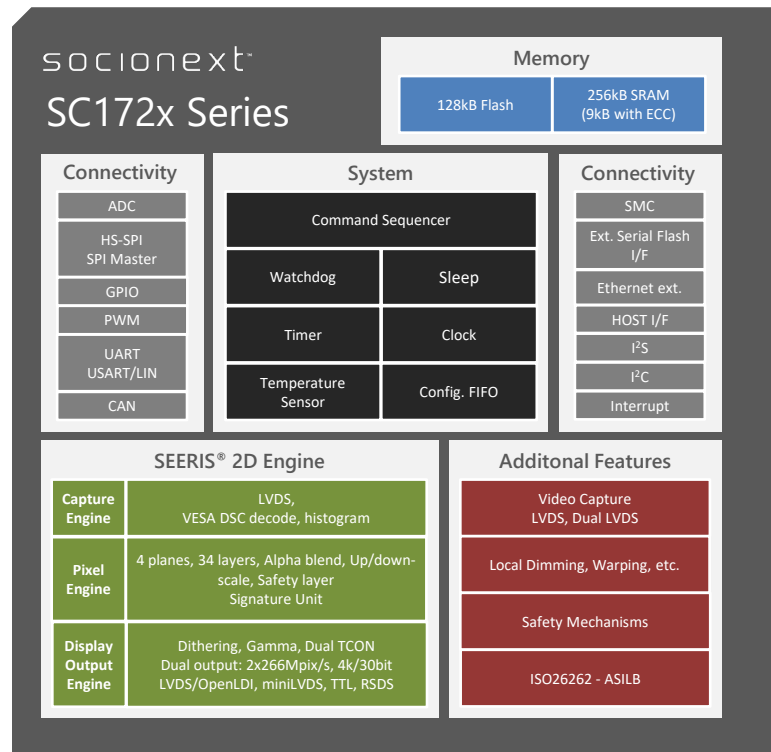
Development

Concept

Indigo4-X Line-Up & Block Diagram

PRELIMINARY

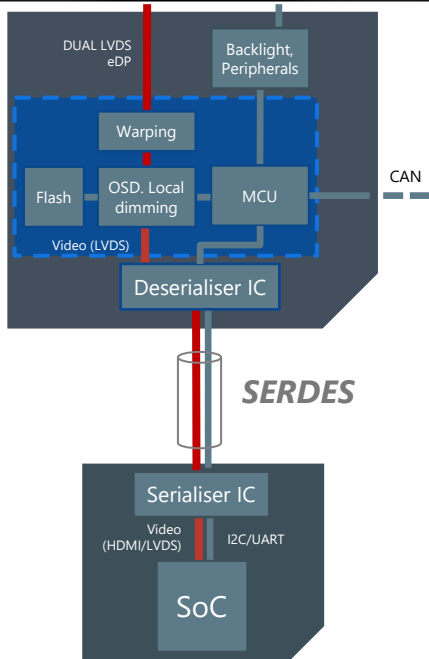
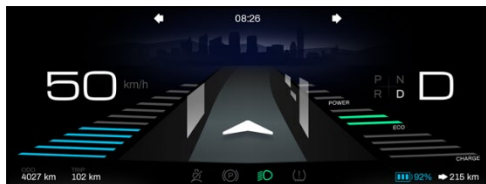
Feature	Indigo4-HX SC1723AK3-200 ES: Dec/2022	Indigo4-MX SC1722AK3-200 ES: Sep/2022	Indigo4-LX SC1721AH5-200 ES: Q4/2022
Maximum pixel clock	t.b.d. (*1)	266MHz	135MHz (*2)
Resolution example	t.b.d. (*3)	3840x1080	1920x1080
Local Dimming	1024 LED block	512 LED block	512 LED block
Warping	No	No	Yes
CPU subsystem	ARM Cortex-M23		
eDP output	5.4Gbps 4lane	No	No
Dual LVDS output	No	Yes	Yes
Dual LVDS Rx	Yes	Yes	Yes
HDR	Yes (Full video pipeline supports 10bit)		
Wide Gamut	Yes		
Ambient control (incl. LED, Sensor)	Yes		
Safety (ASIL compliant)	Developed under ISO26262 ASIL-B		
FLASH memory	256kB (128kB+128kB partitioning) for CPU / 192kB (64kB+64kB partitioning + 64kB warp map storage) for CMDSEQ		
SRAM	256kB		
PKG	TEBGA449 23x23mm		EP-LPQF216 24x24mm



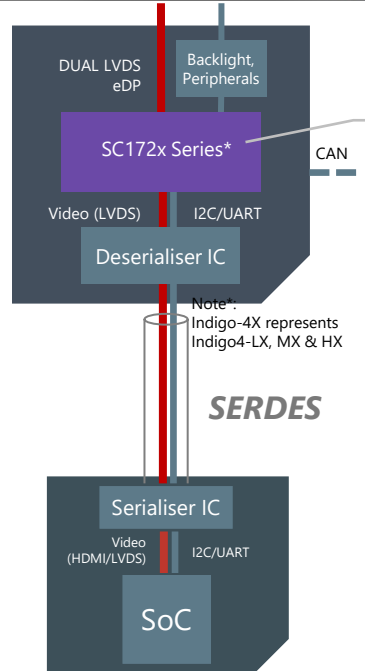
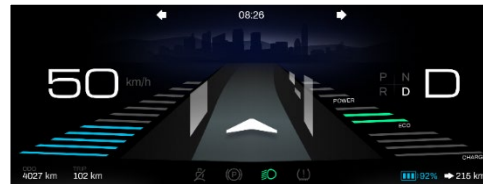
(*1) Indigo4-HX pixel clock & resolution will be somewhere in between Indigo4-M & Indigo4-H

(*2) Max pixel clock can be increased depending on the use case (i.e. warping), or if customer ensures the appropriate thermal design.

System integration = Cost Savings (\$\$)



- Cost optimization due to high integration
- State of the art video processing and corresponding safety mechanism
- System integration by CPU/CMDSEQ and embedded Flash



Note:
Indigo-4X represents
Indigo4-LX, MX & HX

- Local Dimming (w S/W)
- DSC decode
- HDCP decryption
- Warping
- CPU
- Embedded Flash
- eDP output

Indigo4-X Key Features list

■ Resolution

- » Up to 4K (3840x2160, 5760x1080, etc.)

■ Display interface

- » Dual LVDS, eDP 5.4Gbps x 4lane Tx

■ Video Capture

- » Dual LVDS

■ CPU Subsystem

- » ARM debugging system & tooling
- » ARM Cortex-M23
- » Dedicated 256kB Flash for CPU

■ Reference Software

- » Low level driver for peripherals, Flash, etc.
- » Local dimming API
- » Example application, boot loader

■ Process Technology

- » GF55LPx (NVM)

■ SEERIS Graphics Engine

- » Warping On-the-Fly
- » Local Dimming Processing
- » Gamut Mapping (3DLUT)
- » Histogram Unit

■ Functional Safety

- » ISO26262 ASIL-B compliant development process
- » Signature check after Warping
- » Local dimming pixel compensation check

■ Sample schedule

Device	ES	CS
I4-HX	Q4/2022	Q4/2023
I4-MX	e/Sep/2022	e/Sep/2023
I4-MX	Q4/2022	Q4/2023

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