



# Parade Technologies

Leading ICs supplier for a variety of popular display and high-speed interface standards used in computers, servers, consumer electronics and display panels

September 4, 2023

# Safe Harbor Notice

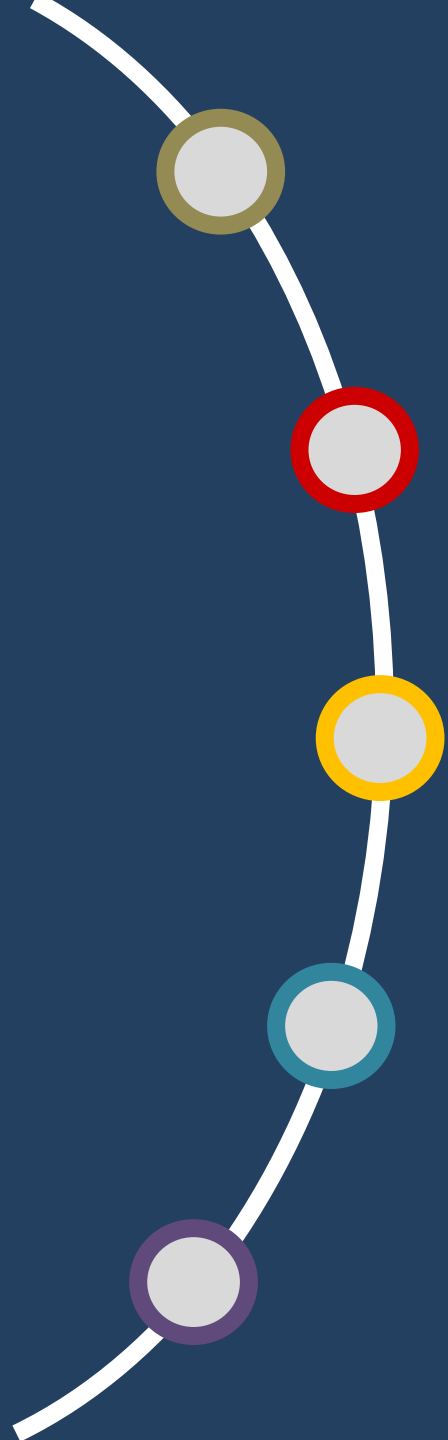
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# About Parade Technologies, Ltd.

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Leading solution provider of high-speed interface applications

- Leading expertise in DisplayPort technology and high-speed digital interface transmission
- Market leader in DP/eDP timing controller
- Industry's rich portfolio of high-speed interface product
- Rich portfolio of touchscreen and integrate display solutions
- Strategic collaboration with leading CPU/GPU vendor and tier-1 global brand end customers



IPO on September 13, 2011 - Taipei Exchange: 4966



Acquire Cypress TrueTouch mobile business on August 1, 2015 ;  
Acquire Fresco Logic on June 2, 2020



Worldwide 731 employees

# Global Presence



# Parade's Products



## High-Speed I/F

- Re-driver/Re-timer/Mux/DeMux; support DP1.4a, USB3.2 Gen 2x2, HDMI 2.1, PCIe4
- Convertors (DP 2.0 to HDMI 2.1)/(DP to LVDS)
- USB5 or USB4v2 (40 Gb/s) re-timer; USB4 re-timer with DP2.0 and TBT3 Alt mode; USB 3.2 Hub with HDMI & PD; USB Type-C PD
- 16-Channel PCIe5/PCIe6 (32/64 Gb/s) re-timer
- For PC/ Notebook/ Desktop/ Tablet/ TV/ Server/ Automotive/ Dongle applications



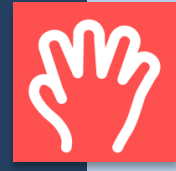
## DP/eDP TCON

- eDP v1.5 Tcon support Panel Replay up to UHD 144Hz and FHD360Hz
- eDP Tcon support AMOLED panels
- Mini-LED backlight controller(Bcon) support local dimming display
- Highly integrated eDP v1.2/1.4b/1.5 Tcon with embedded driver(TED) and touch(tTED)
- For Tablet/ Notebook/All-in-One / Monitor/ Automotive applications



## Source Driver

- Point-to-Point source driver; SIPI / iSP source driver
- TSD(Touch Source Driver); TLS(Touch Level Shifter)
- For Notebook/Tablet/Automotive panel applications



## Touch Controller

- Single touch, two-finger touch and multi-touch for screen size from 1.5"~17"
- TDDI/Flexible AMOLED touch controller
- For Smart phone/Tablet/Wearables/E-reader/ Automotive/Post machines

# Product Mix- FY2022

30%~35%



40%~45%



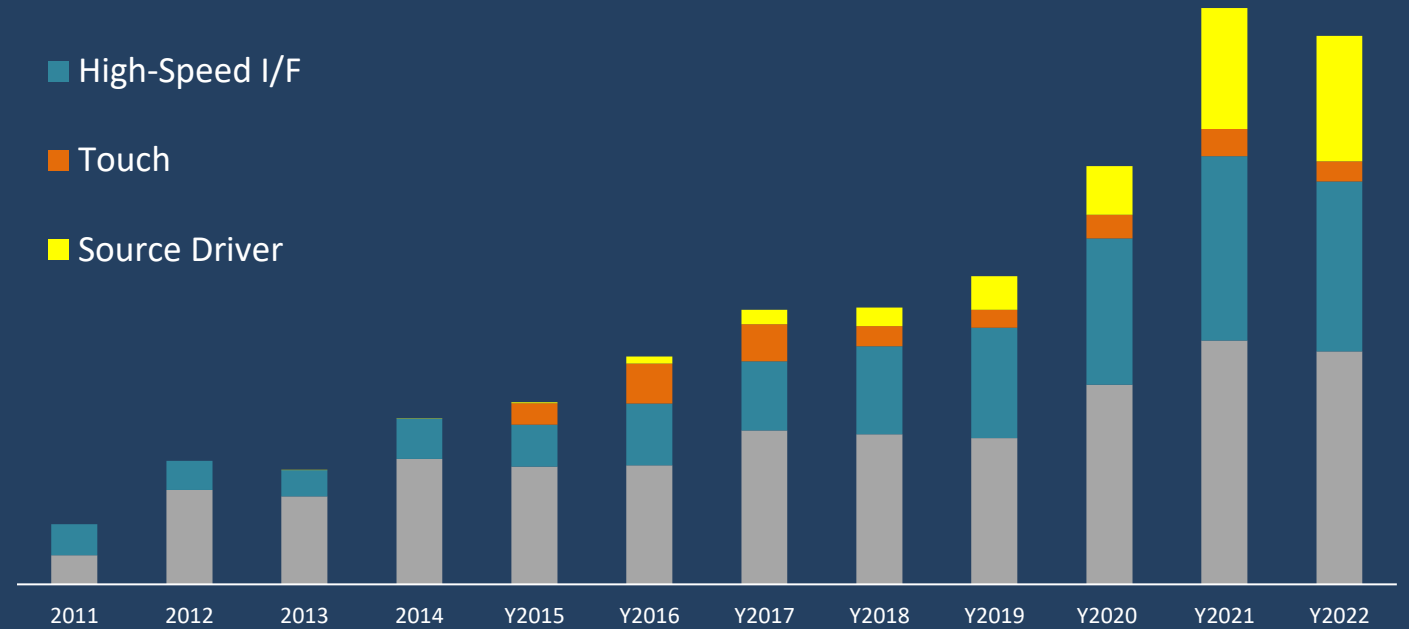
20%~25%



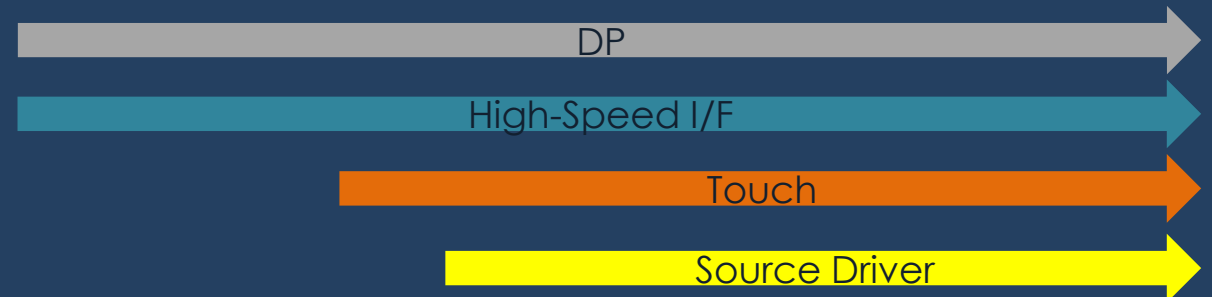
3%~5%

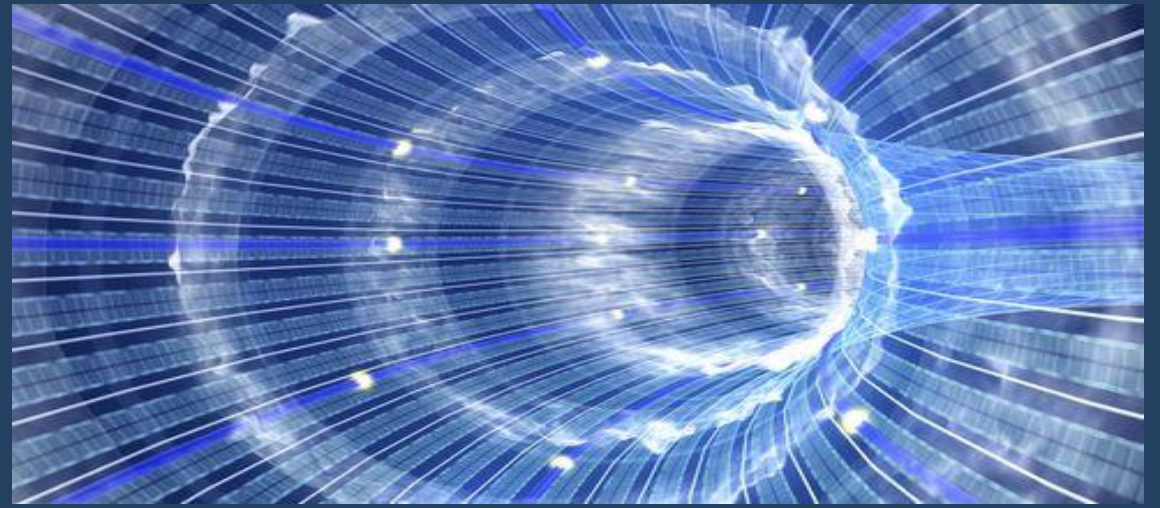


- DP
- High-Speed I/F
- Touch
- Source Driver



**Growth Engine**



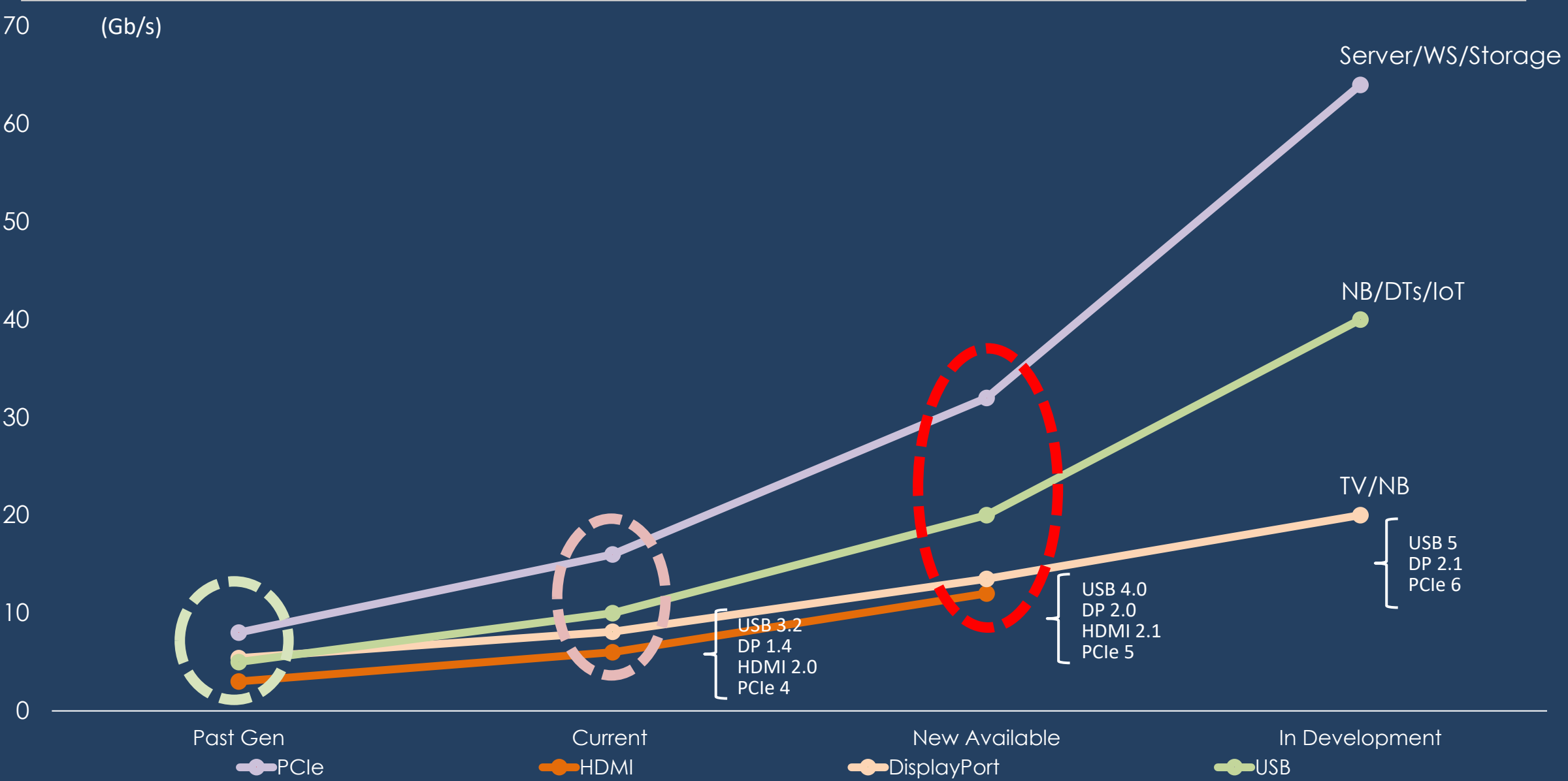


# Data Interface migrating to higher speed:

- USB Type-C goes to 20 Gbps; HDMI goes to 12 Gbps; DP goes to 20 Gbps; PCIe goes to 32 Gbps
- Strong demand for high-speed technologies to solve high-speed transmission problems
- Ability to provide rich portfolio and integrated solution for USB-Type C and next generation high-speed interface applications

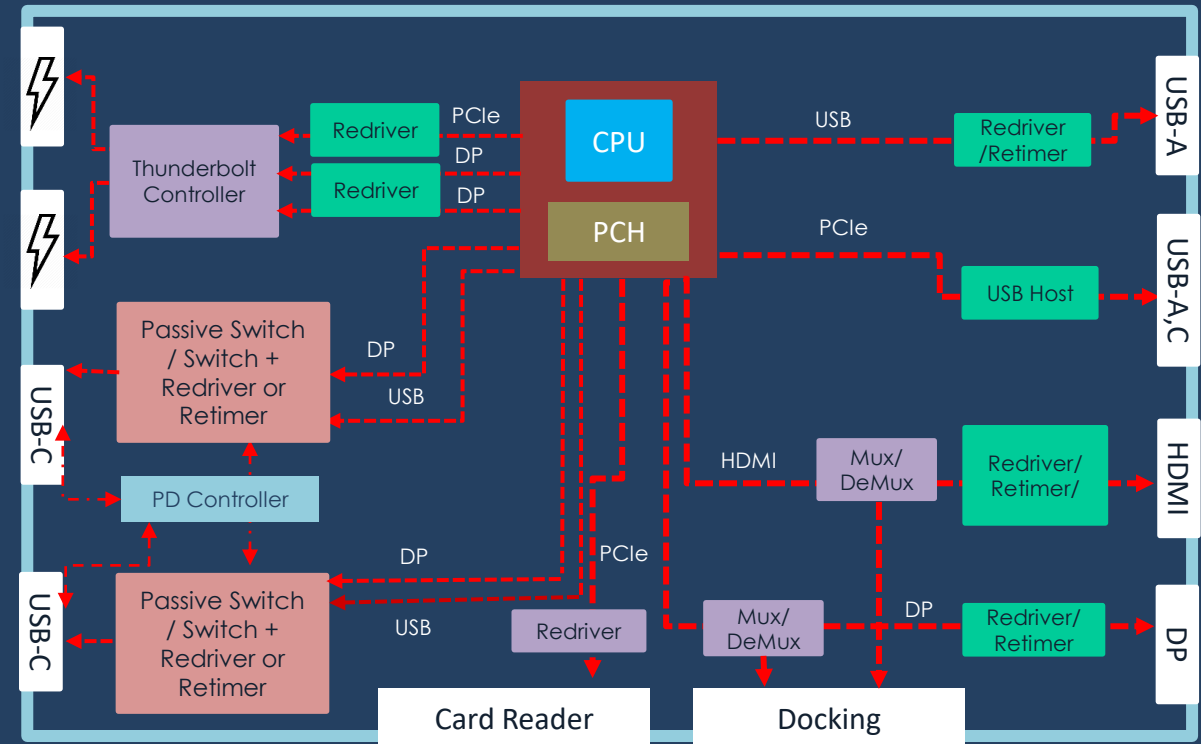


# Roadmap on Digital Interface Bit Rates



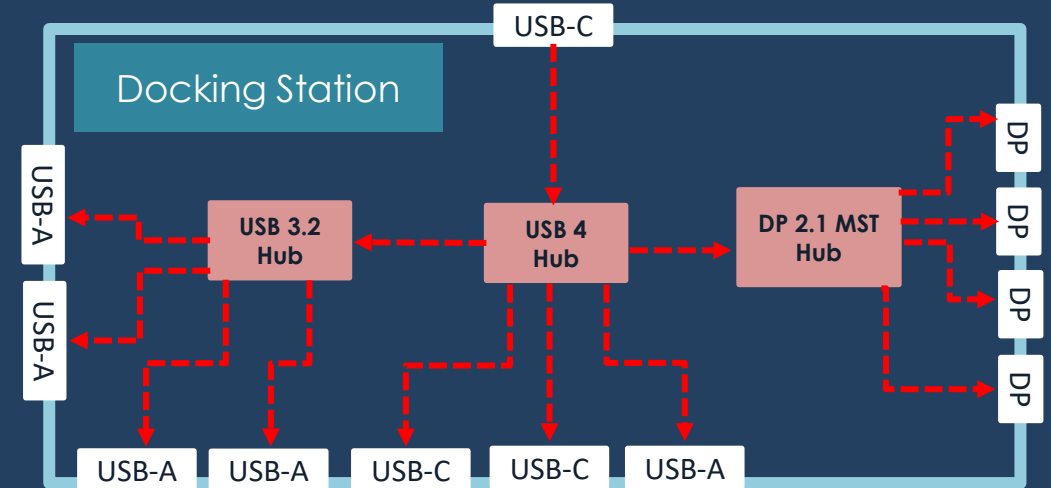
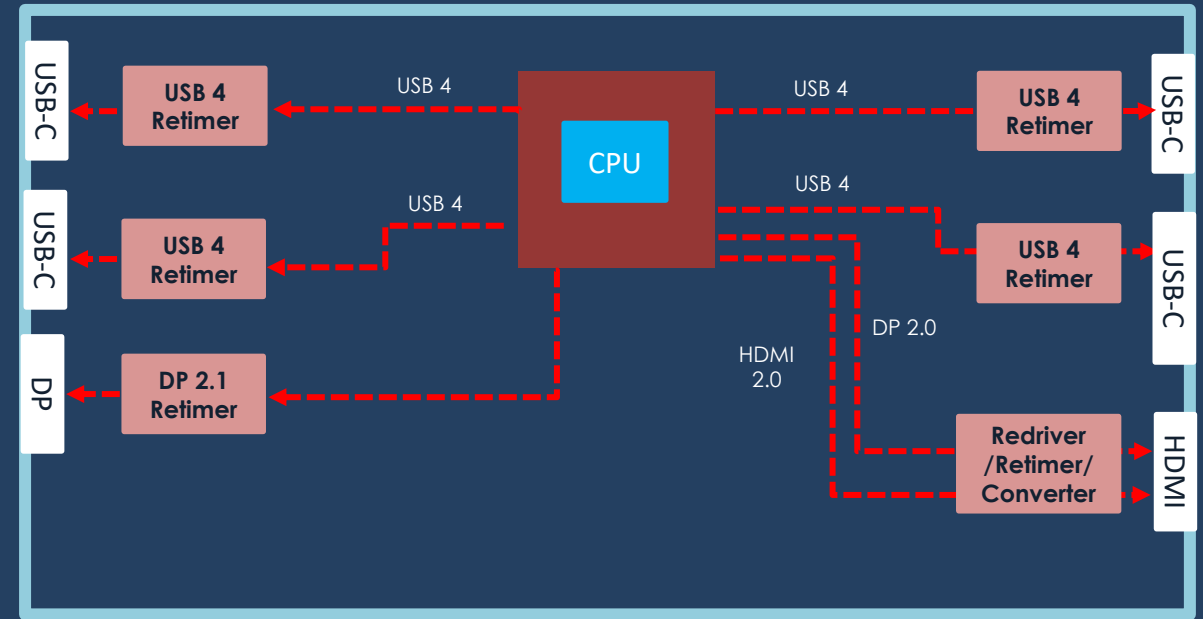
# Notebook Inter-connection solutions – Current 3Gb/s ~ 16Gb/s

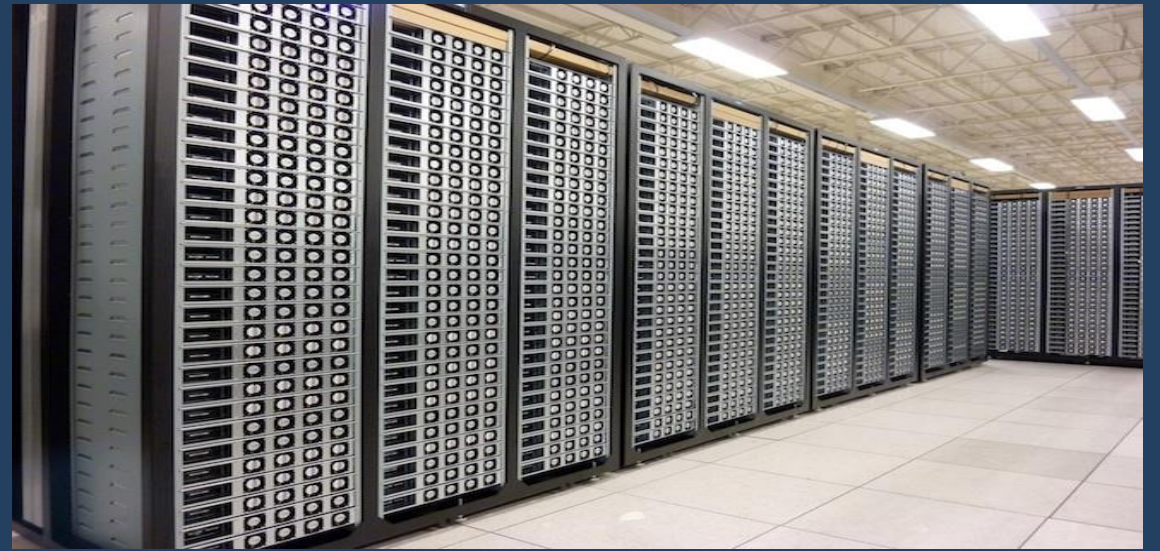
- Protocol data rate move to higher speed causing channel loss significantly impact signal integrity that demand re-drivers or re-timers
- Market leader in USB Type-C 10Gb/s re-timer and re-driver
- HDMI 2.0 repeater with Jitter cleaning is market best solution to solve design challenge of HDMI 2.0
- HDMI 2.1 re-timer fully compliant to HDMI 1.4/2.0/2.1 with low standby power and robust performance targeting 8K applications
- DP 2.0 to HDMI 2.1 converters support to expand HDMI2.1 connectivity
- PCIe3/4 low power linear re-driver extend topology of on board design
- DP1.4 retiming Mux/DeMux for discrete GPU on gaming/workstation applications



# Notebook Inter-connection solutions – Future $\geq 20\text{Gb/s}$

- USB4 introduce the ability to support multiple protocol and different data rate up to 20 Gb/s. Notebook demand USB4 as USB-C standard
- Industry encountering design challenge when data rate goes up to 20 Gb/s
- Parade has introduced PS8830 USB4 Re-timer and is industry's first USB4/DP 2.0/TBT 3.0 re-timer solution available on the market
- DP2.1 re-timer solution help to support 8k and above with higher refresh rate
- USB4 Hub for docking station application
- DP 2.1 MST Hub for docking station, MST video hub, daisy-chain monitor/signage application
- USB5 or USB4v2 (40 Gb/s) re-timer with new technology for next generation platform



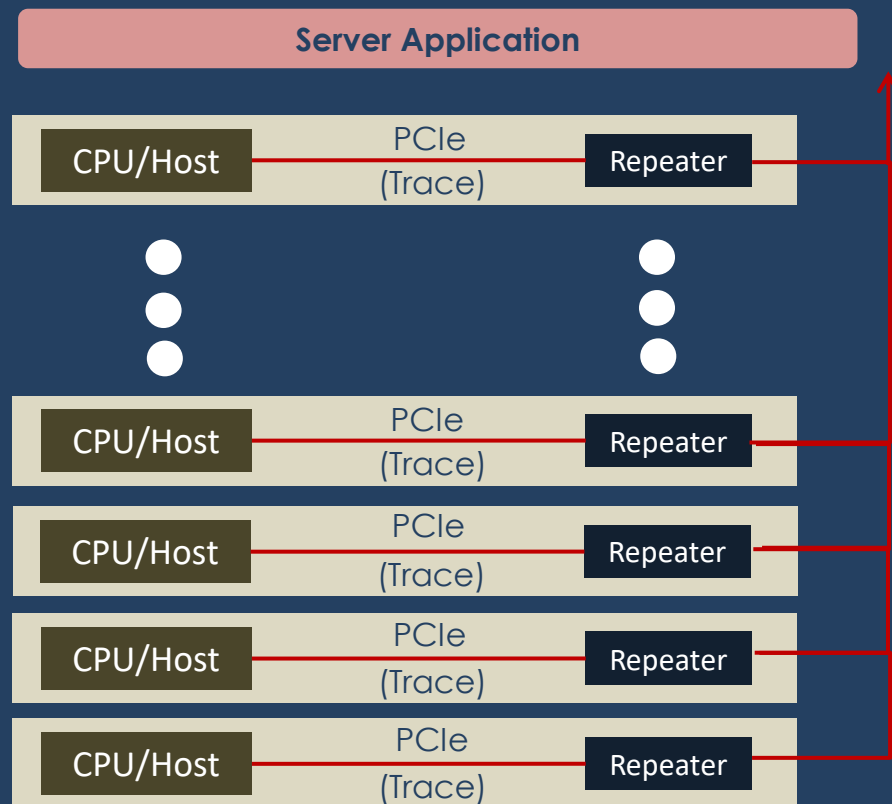


# Data Center:

- PCIe goes to >16 Gbps
- Increasing demand of signal integrity for data center or workstations

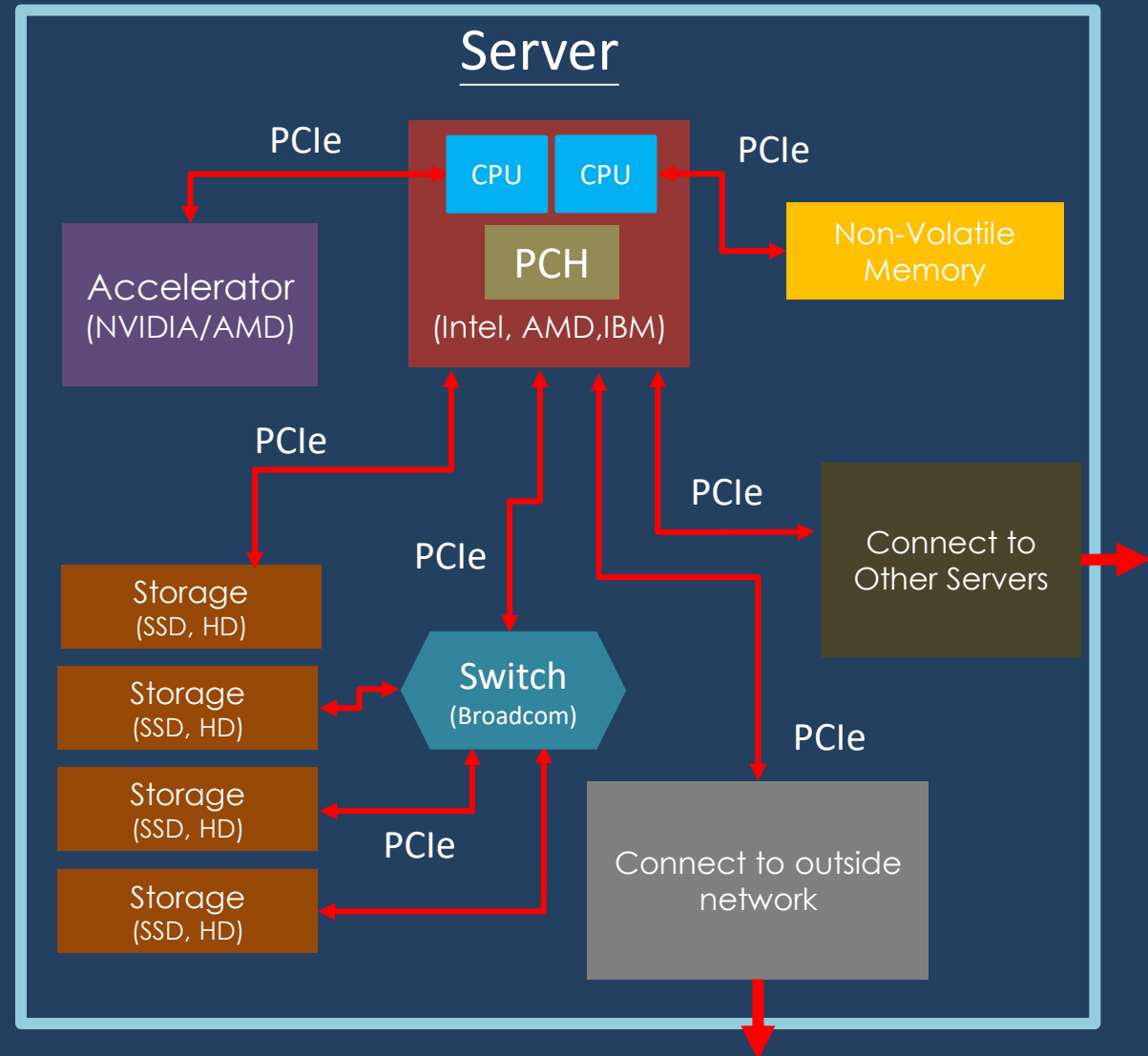
# Server Application of PCIe repeater

- Servers inherently require the use of long interconnects and multiple connectors to transfer signals.
- By incorporating Parade's PCIe repeater into the PCIe signal path, either on the system PCB or within the interconnect cable, the PCB path or interconnect cable can be made longer



# Server Inter-connection solutions – 8Gb/s ~ 32Gb/s

- With PCIe 4(16Gb/s)/ PCIe 5(32Gb/s), data rate has increased by 2x/4x compared to PCIe 3 (8Gb/s), resulting in shorter channel reach
- It is expected that significant number of platforms using PCIe 4/ PCIe 5 will require re-timers
- Re-timer common use cases include channels expanding over system boards, backplanes, cables, risers and add-in cards
- Parade 4 & 16-Channel 16 Gb/s PCIe 4 re-timer with low power has been mass production for server applications
- Parade PCIe 4 re-driver and PCIe 5 re-timer has been introduced in January 2023.





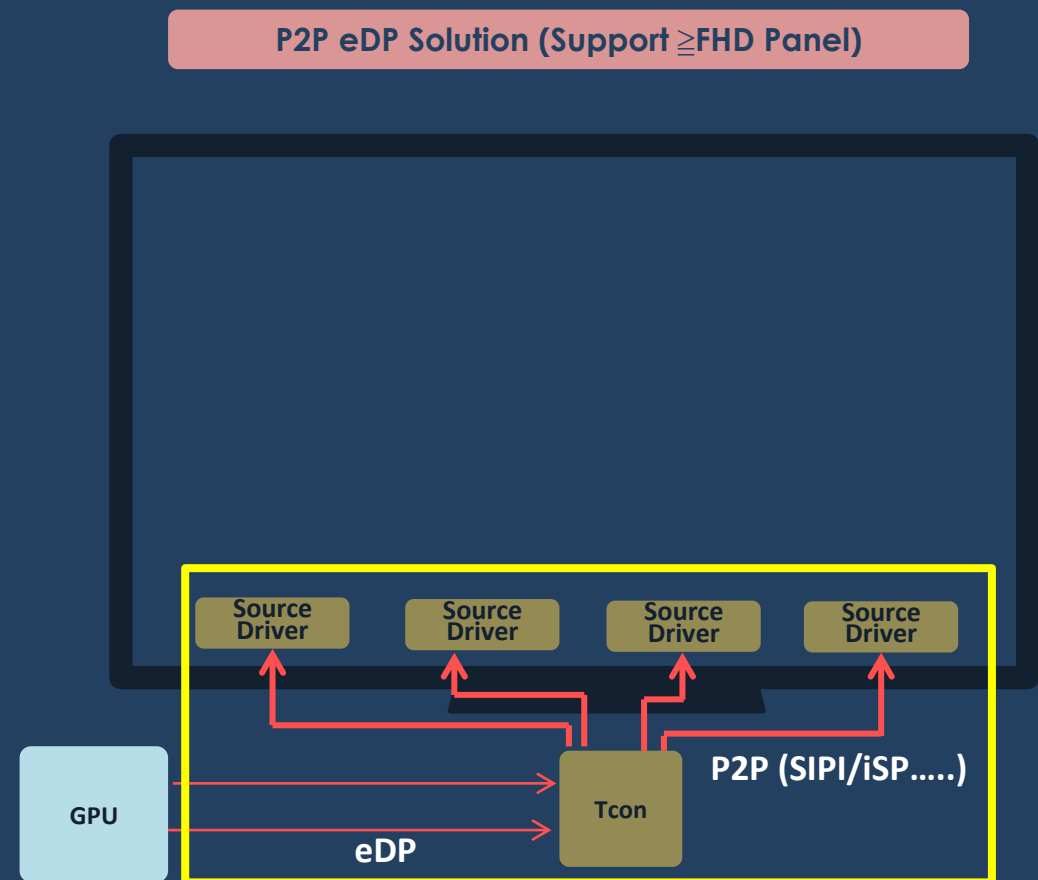
# Display: Faster speed and higher bandwidth

- Industry increasing adoption of eDP 1.4 Tcon and bundle solutions(Tcon + Source Drivers)
- NB/Tablet panel has trend to support borderless panel and in-cell touch that demand highly integrated chips

# Mainstream $\geq$ FHD Panel: Bundle solution (eDP Tcon + SIPI Source Driver)

- For higher resolution (or higher refresh rate) panels, existing source drivers becomes a bottleneck (mini LVDS = serial connection, low speed)
- SIPI is a proprietary high-speed driver (point-to-point, high bandwidth) to improve performance

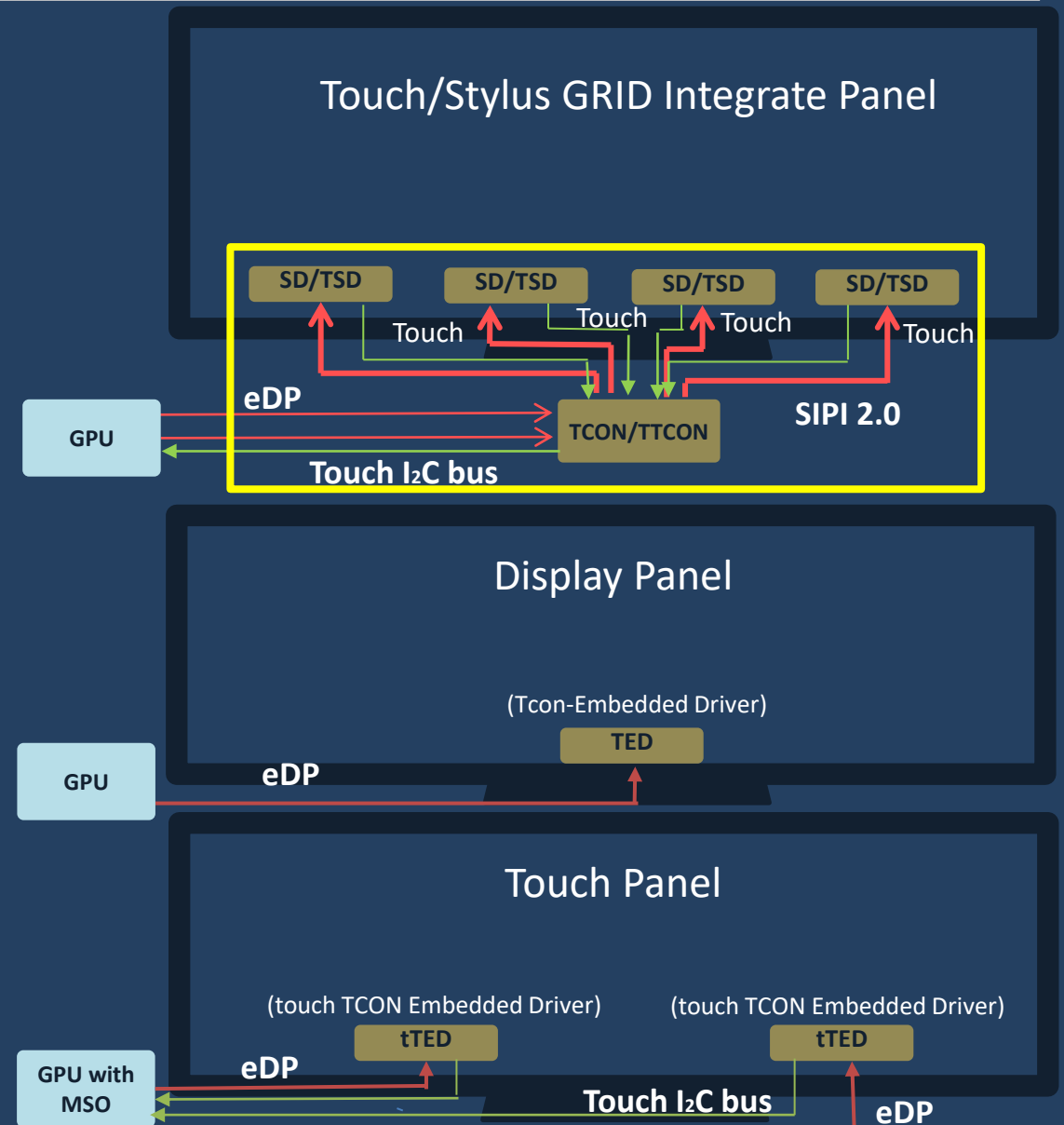
- Parade is leading industry to provide most advance products :
  - Very low power eDP 1.2 v Tcon with Smart-Backlight TM feature
  - eDP 1.4b Tcon support up to UHD and 120 Hz refresh rate
  - eDP Tcon for AMOLED Panels supports eDP 1.4b for Extended Battery Life
- Bundle solution become mainstream solution in NB panel industry
- Secured design-wins with major OEMs
- eDP v1.2 and eDP v1.4 TCON paired with SIPI source driver has design-in/win with many panel makers and are leading solutions for NB/Tablet panel





# Advance Panel: Flexible/Integrated in-cell solution

- TED (Tcon embedded driver) solution for thin-profile panel has mass production
- tTED (Tcon embedded driver and touch) has introduced; with MSO and PSR features; supports in-cell and stylus touch
- Parade has Introduced discrete in-cell solutions for Touch/Stylus GRID Integrate Panel: TCON(Touch TCON),TSD(Touch Source Driver) and TLS(Touch Level Shifter) form a complete in-cell touch solution for high resolution displays.
- Parade integrated in-cell solution may support Wacom/MS/USI active pen
- SIPI 2.0 with embedded in-cell touch data channels is a point-to-point interface between the Touch Embedded Timing Controller (TCON) and the Touch Source Driver (TSD)



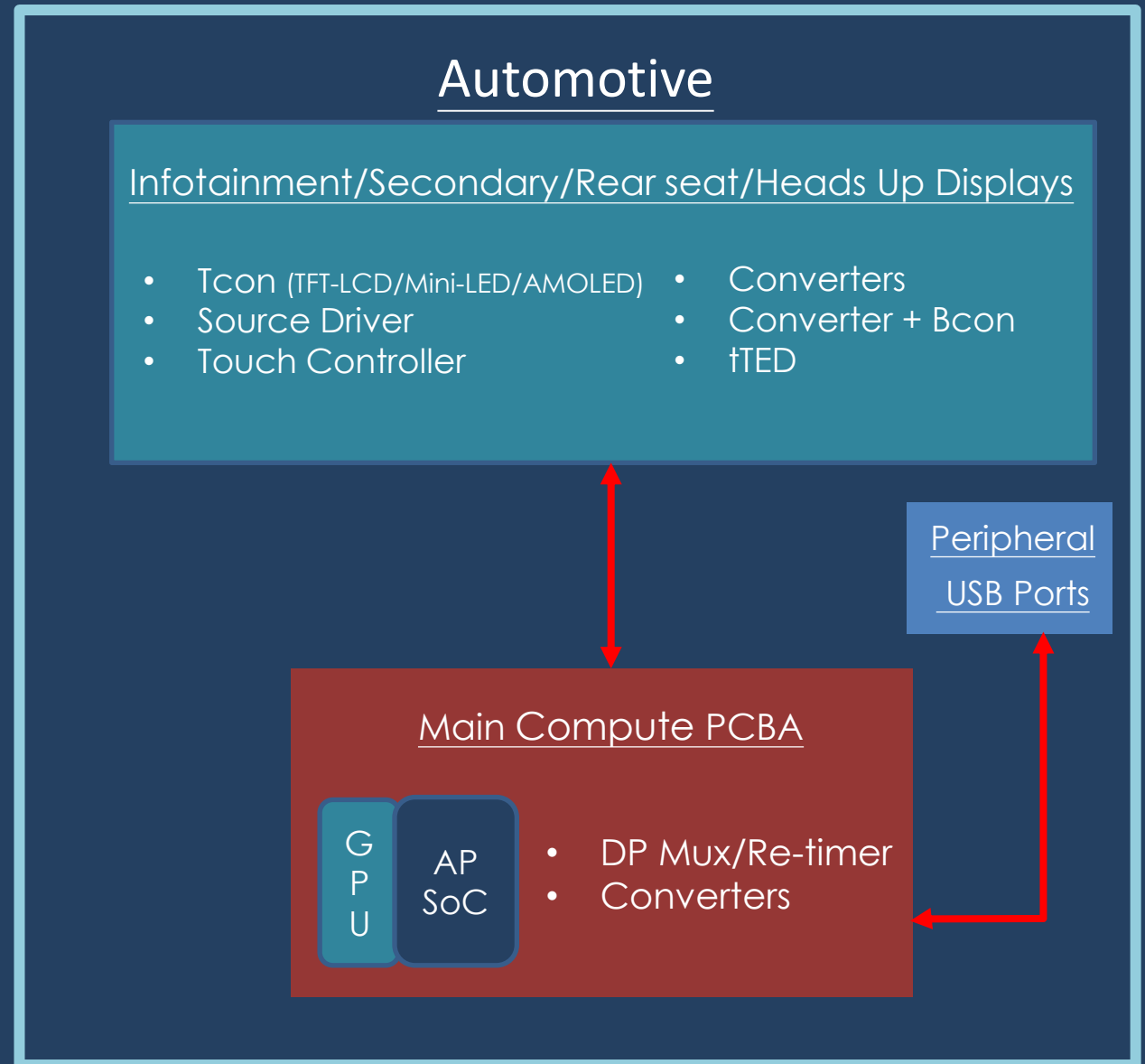


# Automotive:

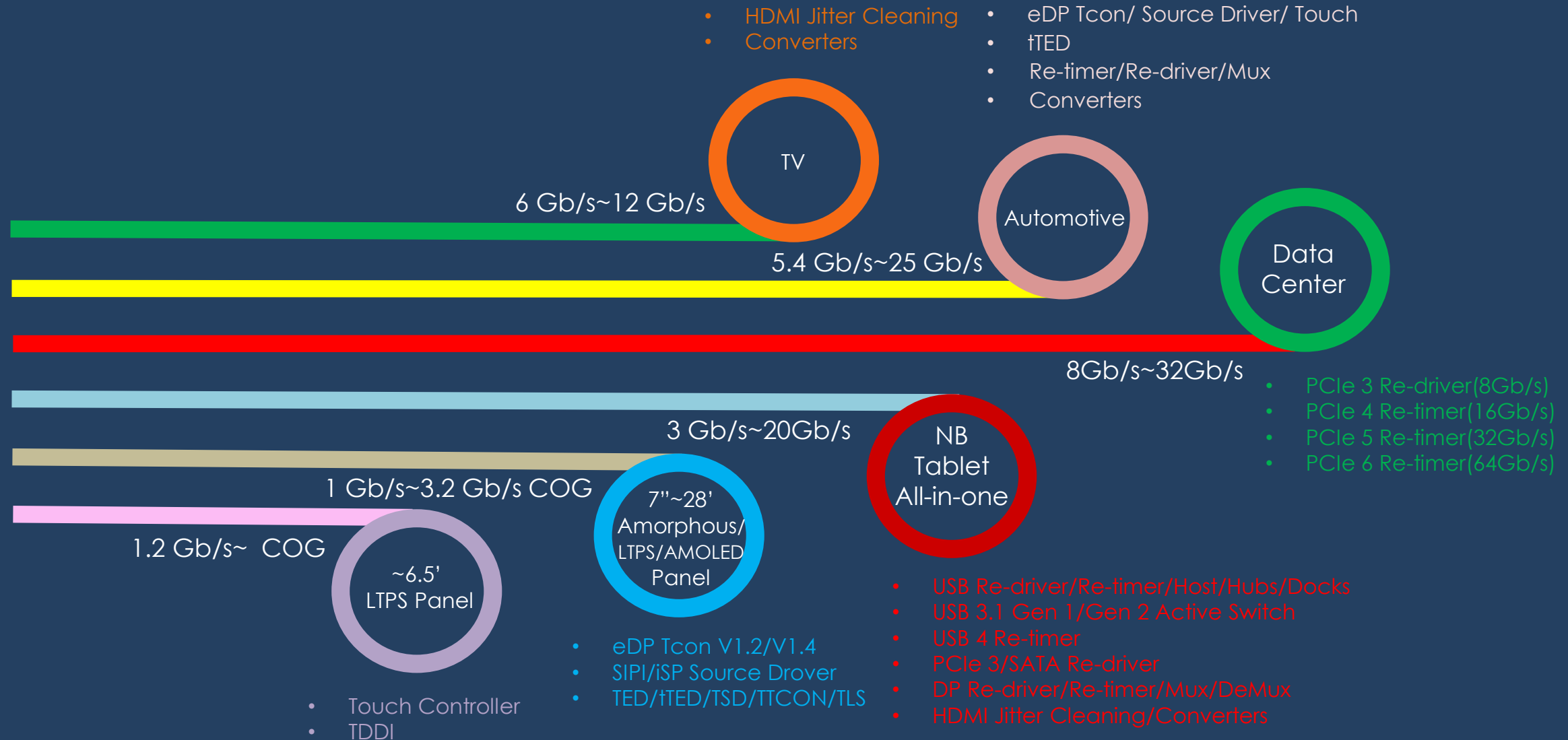
- Automotive leans to adopt DP similar standard for their advanced panel display
- Demand for less wires and high-speed transmission

# Parade Opportunities in Automotive

- DP/eDP is the interface of choice for new Automotive SoC
- Display panel will move from LVDS to eDP/DP as performance is required
- DP 1.4 retiming Mux + DP to LVDS Protocol Converter provide a cost effective solution to replace current FPDLink SerDes solution in automotive
- DP 1.4 retiming Mux has shipping to Tier-1 automotive company
- eDP Tcon + source driver + touch controller and local dimming technology supporting auto security provide a total solution for central infotainment and instrument cluster display



# Market TAM Expansion – Leverage by High-Speed Solution

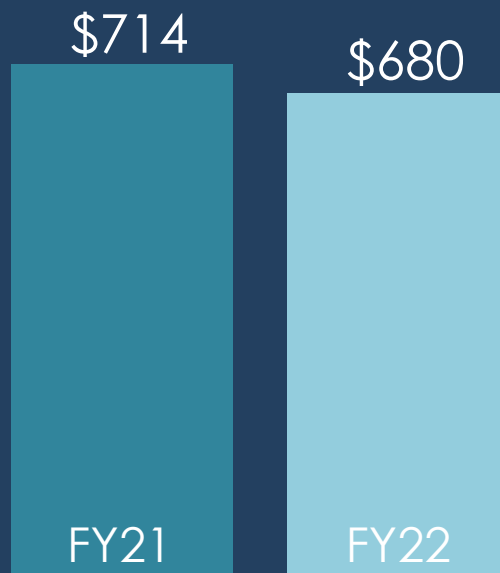


# Financial Performance - FY22

((US\$ in millions; EPS in US\$))

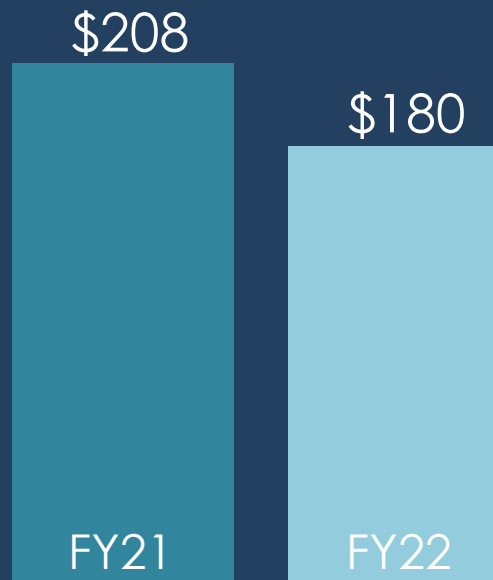
Revenue

-5%



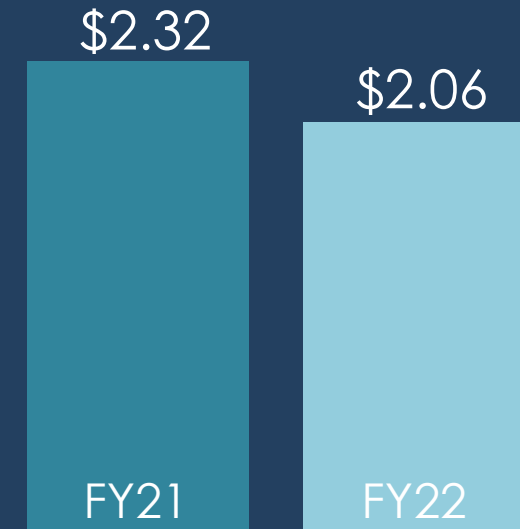
Operating income

-13%



Diluted earnings per share

-11%

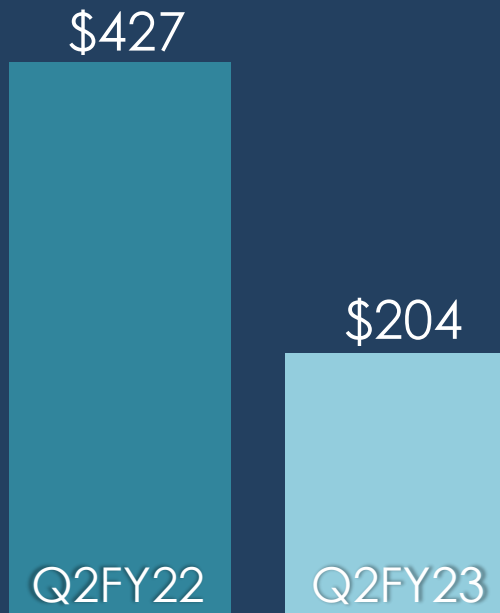


# Financial Performance – Q2FY23 YTD

(US\$ in millions; EPS in US\$)

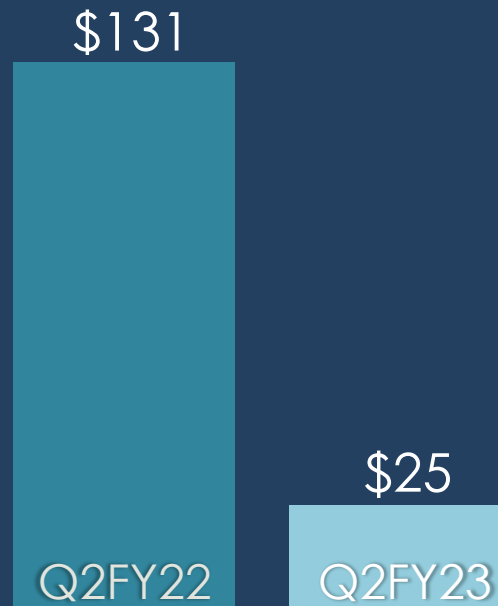
Revenue

-52%



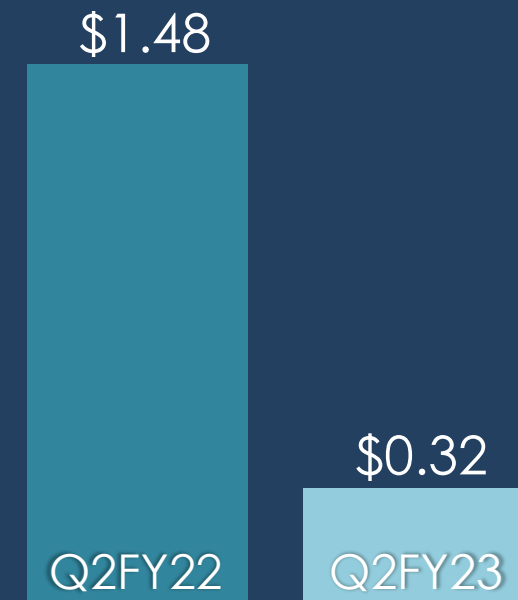
Operating income

-81%



Diluted earnings per share

-78%



# Capital Allocation

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## Dividend

- FY21 dividend: NT\$32.48 (~US\$1.16) per share, with a payout ratio of 50%
- FY22 dividend: NT\$30.59 (~US\$1.03) per share, with a payout ratio of 50%



## Share Repurchase

- Buybacks in Q4FY22: NT\$1,547M (~US\$50.4M)



## Investments

- Growing our core technologies and talents for long-term growth

# ESG Highlights



Members of the BoD are independent



Suppliers are compliance to Conflict Minerals legislation



New female independent director joined in October 2022



Increase in female employee headcount in 2022



Directors' meeting attendance rate in 2022 (remained at 100% up to 8/9/2023)



Average hours of training per employee in 2022



Occupational injury frequency rate (FR) in 2022



BoD approved the GHG Disclosure and Verification Schedule in 2022



Conducting BoD self-evaluation every year



Headquarters in San Jose adopted 60% renewable energy in 2022



Adopted the Anti-Bribery Policy



Providing competitive compensation and benefits to employees



# Business Outlook

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Based on current business outlook, Parade is providing the following guidance for the third quarter of fiscal 2023:

- Revenue: US\$107 – 119 Million
- Gross margin: 43% - 47%
- Operating expenses: US\$30 – 33 Million

Thank You