

SAS/PCIE Presentation

Storage & Server IO Business Unit
(SSIO BU)

Aug, 2020

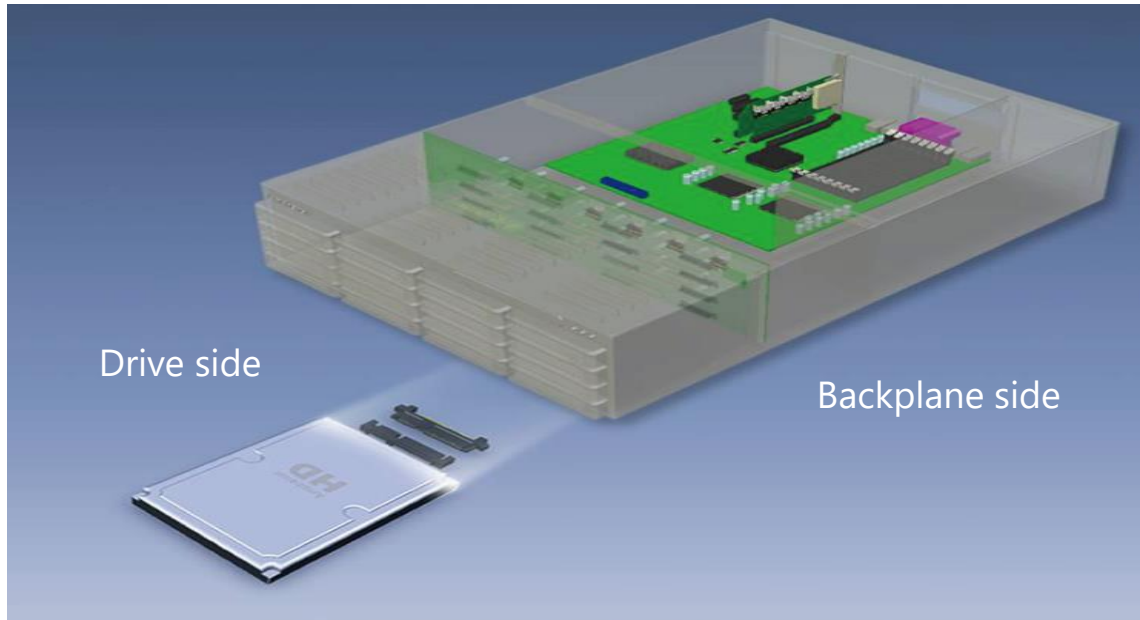
Charles Zhou, Product Manager

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Amphenol Information Communications
and Commercial Products

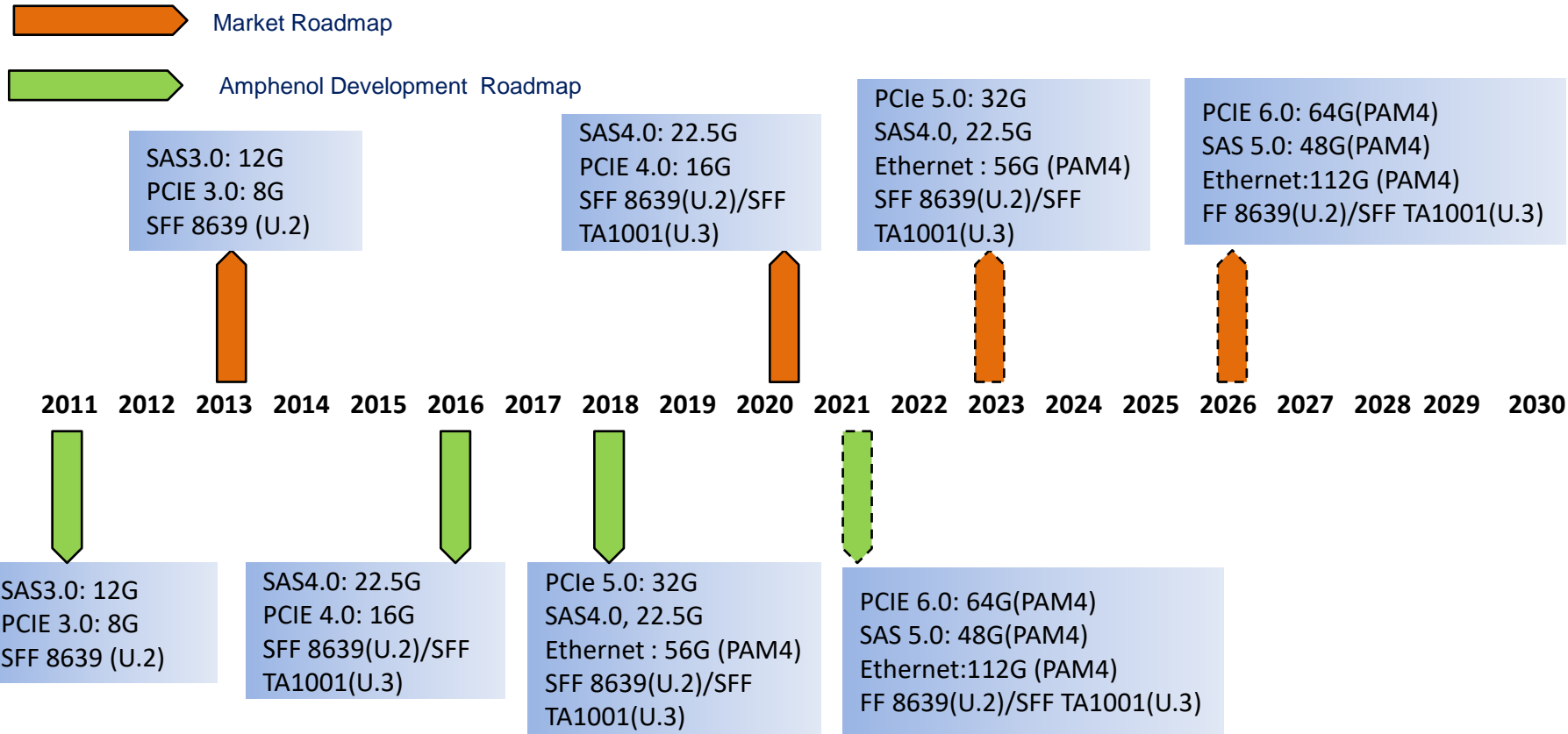


Amphenol ICC



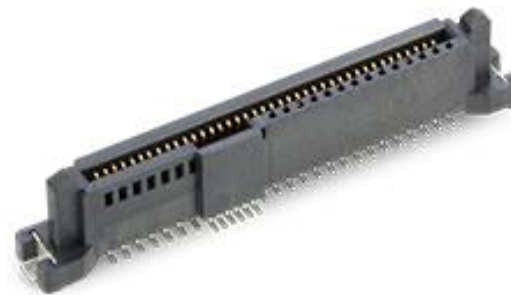
- **Backplane side:**
SAS, PSAS receptacle
- **HDD,SSD side:**
SAS, PSAS plug

SAS/PCIE Market Roadmap



- Goal is to keep next gen to be the same form factor and make it backward compatible with existing SAS 3.0/PCIE 3.0 solution.
- Support both SAS and PCIE protocol and follow SAS and PCIE protocol roadmap
- Amphenol developed PSAS 4.0 since 2016, tooled since 2017. developed PSAS5.0 since end of 2017, and tooled since 2018, always leading the market demand

Next generation SAS/PCle 4.0 (SFF-8639/U.2 or U.3 Application)



- Support up to **PCIE 4.0** data rate
- Support up to **SAS 3.0** data rate
- Support U.2 or U.3 application
- Impedance: 85/92/100ohm
- Backward to compatible with current SFF8639 interface
- Even footprint no need to change if upgraded to next generation SAS/PCIE
- Samples of plug and receptacle are available

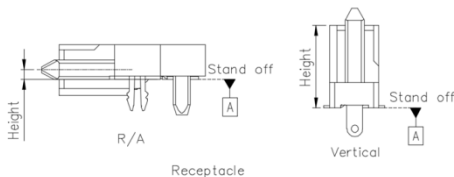
SAS/PCIe 4.0(SFF-8639) Portfolio

(U.2 or U.3 Application)

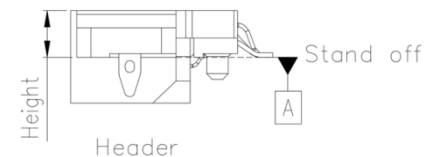


| SAS/PCIe 4.0, Receptacle (U.2) | | | | | | | | |
|--------------------------------|---------|-----------|-------------|-------------|-----------|---------|-------------------|-----------------|
| Vertical/RA | Height | Mount | Std/Reverse | Termination | Hold Down | Locator | other | MPN |
| Vertical | 8.15mm | Top Mount | Standard | SMT | DIP | Yes | widebase | PSAS4F3130021TR |
| Vertical | 8.15mm | Top Mount | Standard | SMT | DIP | Yes | 10K mating cycles | PSASF3130271TRW |
| Vertical | 8.15mm | Top Mount | Standard | SMT | SMT | Yes | | PSAS4F3130041TR |
| Vertical | 8.15mm | Top Mount | Standard | SMT | SMT | Yes | | PSAS4F3130111TR |
| Vertical | 8.15mm | Top Mount | Standard | SMT | DIP | Yes | | PSAS4F3130151TR |
| Vertical | 8.15mm | Top Mount | Standard | SMT | DIP | Yes | | PSAS4F3130121TR |
| Vertical | 8.15mm | Top Mount | Standard | SMT | DIP | Yes | | PSAS4F3130131TR |
| Vertical | 8.15mm | Top Mount | Standard | SMT | Fork lock | Yes | | PSAS4F3130181TR |
| Vertical | 14.15mm | Top Mount | Standard | SMT | DIP | Yes | | PSAS4F3130311TR |
| R/A | 0.93mm | Sink type | Standard | SMT | Fork lock | Yes | | PSAS4F2130041TR |
| R/A | 0.95mm | Sink type | Standard | hybrid | DIP | Yes | | PSAS4F4130011TR |
| R/A | 2.85mm | Top Mount | Standard | SMT | SMT | Yes | | PSAS4F2130051TR |
| R/A | 2.85mm | Top Mount | Standard | SMT | DIP | Yes | | PSAS4F2130021TR |
| R/A | 2.85mm | Top Mount | Reverse | SMT | DIP | Yes | | PSAS4F2130011TR |

| SAS/PCIe 4.0, Header (U.2) | | | | | | | | |
|----------------------------|--------|-----------|-------------|-------------|-----------|---------|-------|-----------------|
| Vertical/RA | Height | Mount | Std/Reverse | Termination | Hold Down | Locator | other | MPN |
| Vertical | 8.35mm | Top Mount | Standard | SMT | SMT | Yes | | PSAS4M3130061TR |
| R/A | 2.55mm | Sink Type | Standard | SMT | SMT | Yes | | PSAS4M2130081TR |
| R/A | 5.3mm | Top Mount | Standard | SMT | fork lock | No | | PSAS4M2130181TR |
| R/A | 4mm | Sink Type | Standard | SMT | SMT | Yes | | PSAS4M2130021TR |



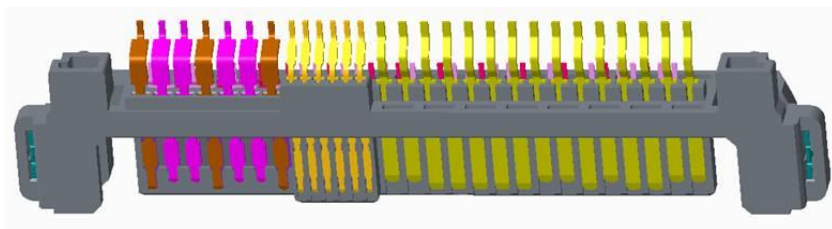
Receptacle
R/A & Vertical



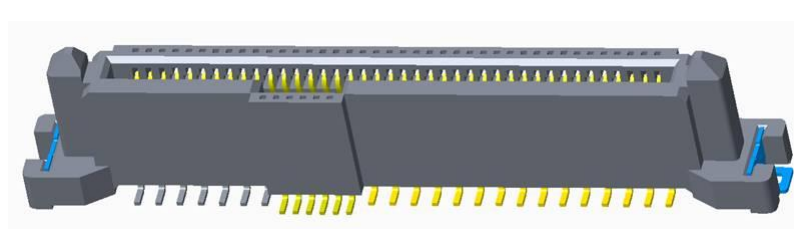
Plug:
R/A

Next generation SAS/PCIe 4.0

(U.2 & U.3 application)



Plug



Receptacle

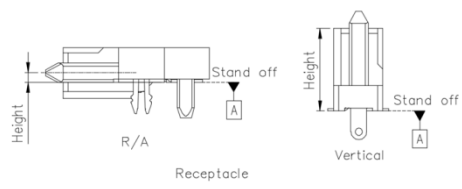
- Support up to **PCIE 4.0** data rate
- Support up to **SAS 4.0** data rate
- Support both U.2 and U.3 application
- Impedance: 85/92/100ohm
- Backward to compatible with SFF-8639 interface
- Footprint compatible with current 12G SAS/PCIe
- Samples are available

SAS/PCIe 4.0(U.2/U.3) Portfolio (U.2 & U.3 Application)

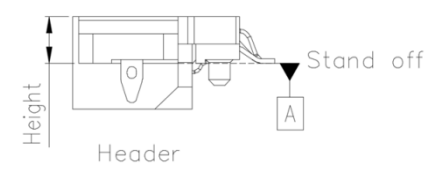


| SAS4.0&PCIe 4.0, Receptacle | | | | | | | | |
|-----------------------------|--------|-----------|-------------|-------------|-----------|---------|------------------|-----------------|
| Vertical/RA | Height | Mount | Std/Reverse | Termination | Hold Down | Locator | other | MPN |
| Vertical | 8.15mm | Top Mount | Standard | SMT | SMT | Yes | 92 ohm | PSAS4F3130071TR |
| Vertical | 8.15mm | Top Mount | Standard | SMT | SMT | Yes | 92ohm | PSAS4F3130011TR |
| Vertical | 8.15mm | Top Mount | Standard | SMT | DIP | Yes | 92ohm | PSAS4F3130081TR |
| Vertical | 8.15mm | Top Mount | Standard | SMT | DIP | Yes | 92ohm, wide base | PSAS4F3130171TR |
| Vertical | 8.15mm | Top Mount | Standard | SMT | SMT | Yes | 92ohm, wide base | PSAS4F3130201TR |
| R/A | 0.35mm | SINK type | reverse | SMT | fork lock | Yes | 92ohm, | PSAS4F2130122TR |

| SAS4.0&PCIe 4.0, Header (U.2&U.3) | | | | | | | | |
|-----------------------------------|--------|-----------|-------------|-------------|-----------|---------|--------------|-----------------|
| Vertical/RA | Height | Mount | Std/Reverse | Termination | Hold Down | Locator | other | MPN |
| R/A | | Straddle | Standard | SMT | SMT | No | with SIO pin | PSAS4M2130122TR |
| R/A | 2.55mm | Sink Type | Standard | SMT | SMT | Yes | | PSAS4M2130011TR |
| R/A | 2.75mm | Sink Type | Standard | SMT | SMT | Yes | 85ohm | PSAS4M2130171TR |
| R/A | 4.9mm | TOP mount | Standard | SMT | SMT | Yes | 85ohm | PSAS4M2130141TR |

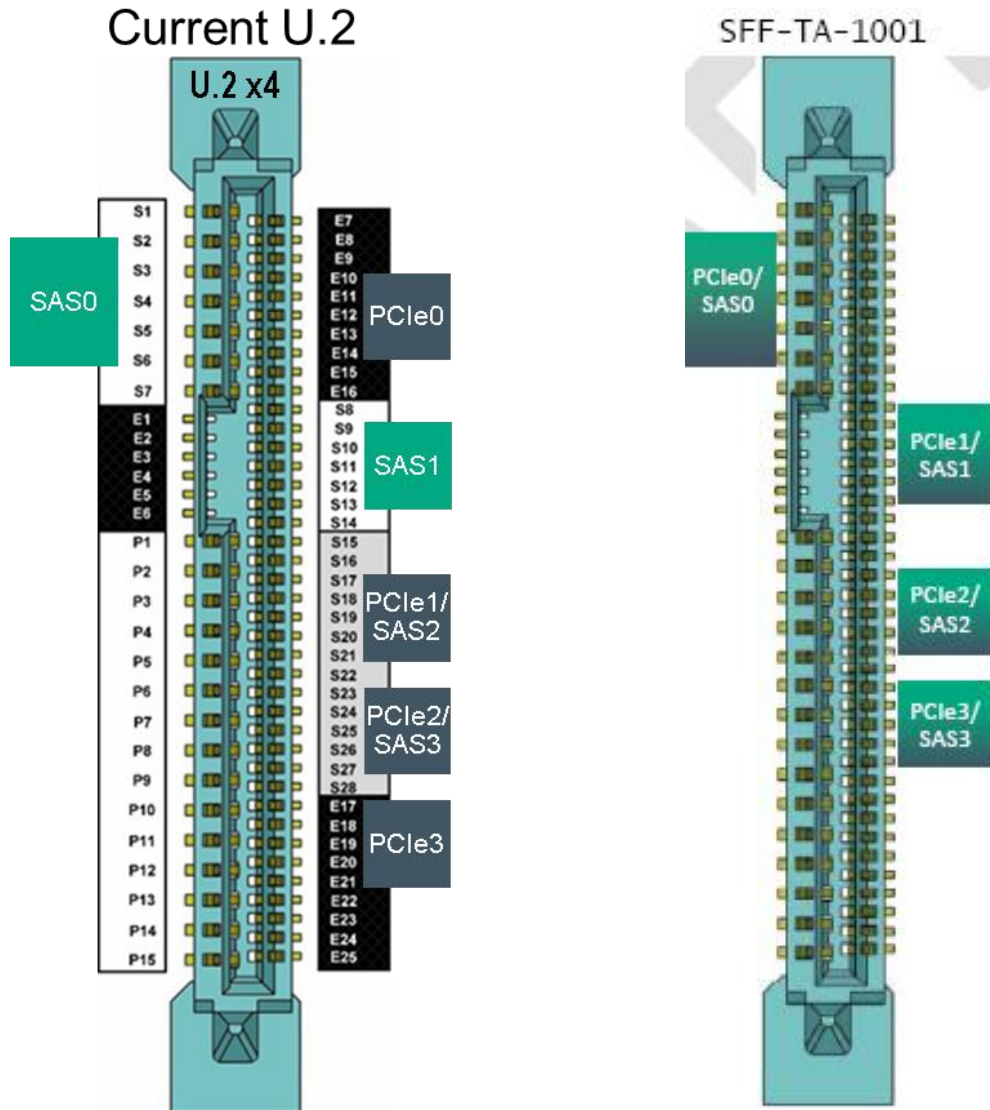


Receptacle
R/A & Vertical



Plug:
R/A

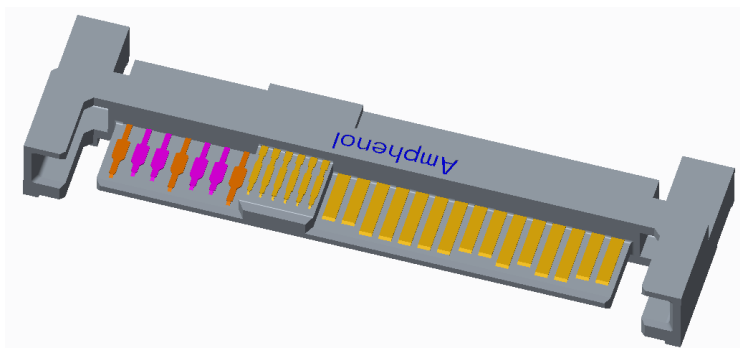
SFF8639(U.2) VS SFF-TA1001(U.3)



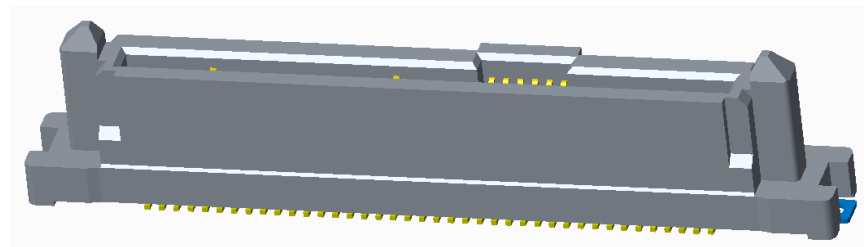
Only difference is pin definition, The general connector interface is the same, however, the circuit design / pin layout is different

- U.3 application is not next generation of U.2 application
- U.3 NVMe drive may not work in current U.2 host.
- Four ports selected for carrying signals changed from U.2 definition.
- Both of U.2 and U.3 have their own roadmap

Next generation SAS/PCIe 5.0 U.2 application



Plug



Receptacle

- 6 lanes to support up to **PCIE 5.0** data rate
- Support up to **SAS 4.0** data rate
- Impedance: 85ohm
- Interface: compatible with SFF-8639
- Samples are available

Plug PN: PSAS5M2130021TR

Receptacle PN: PSAS5F3130021TR/PSAS5F3130031TR

Cross/Footprint compatible table

Gen3/Gen4/Gen5



| | PSAS3.0 | PSAS 4.0 | PSAS 5.0 | Picture |
|------|-----------------------------------|--------------------|-----------------|---------|
| Rcpt | PSASF3130131TR | PSAS4F3130101TR | NA | |
| Rcpt | PSASF3130201TR | PSAS4F3130011TR | PSAS5F3130021TR | |
| Rcpt | PSASF3130201TR | PSAS4F3130071TR | PSAS5F3130021TR | |
| Rcpt | PSASF3130161TR/ PSASF3130181TR | PSAS4F3130081TR | PSAS5F3130031TR | |
| Rcpt | PSASF3130031TR | PSAS4F3130201TR | NA | |
| Rcpt | PSASF3130211TR/ PSASF3130221TR | PSAS4F3130171TR | NA | |
| Rcpt | PSASF3130051TR | PSAS4F3130281TR | NA | |
| Plug | PSASM3130131TR | PSAS4M3130251TR | NA | |
| Plug | 10123699-003C-TRLF | 10153157-001C-TRLF | NA | |
| Plug | PSASM2130421TR | PSAS4M2130011TR | NA | |
| Plug | PSASM2130381TR | PSAS4M2130241TR | PSAS5M2130021TR | |

Amphenol ICC

Thank You