

New Project Proposal: SFF-8614

Presented: February 9, 2024

Editor: Egide Murisa [Molex]

Supporters: Paul Coddington [Amphenol], Egide Murisa [Molex],
Howard Andrews [Lotes], Michael Gregoire [Dell],
& Dan Gorenc [TE Connectivity]

New Project Proposal: SFF-8614, updates to Rev 3.5

- Over the years, occasional quality issues have come up where the contacts at the extreme left or right positions within the MiniSAS HD receptacle may get damaged during the mating process. The receptacle contacts are specified to be located within a specific zone. If these outside edge contacts happen to be located at the very edge of that specified zone, then there is a small chance that the contact may come in contact with the mating plug paddle card right at the corner chamfer and potentially get skewed to the side by the chamfer instead of riding straight up the leading edge chamfer. This can cause damage to the receptacle contacts at the outside edges of the connector. It is not desirable to have to deal with any damage to the receptacle connectors since replacing damaged ones in a system can be very expensive. It is easier to modify the mating plug dimensions. To prevent this rare damage condition from happening, we propose to reduce the size of the plug paddle card's corner chamfer, dimension A14, from $0.50 \pm 0.05 \times 45^\circ$ to $0.30 \pm 0.05 \times 45^\circ$. See the next few slides for further details.
- Due to the similarities between the dual paddle card design of the MiniSAS HD plugs and the dual paddle card design of the CDFP or SFF-TA-1032 plugs, it is recommended to also look at making potential improvements in the paddle card height dimensions locating the position of the paddle cards within the die-cast housings. We also propose to look at potential improvements for dimensions B14 and B15. The exact improvements to be made are to be determined.
- Another area of potential improvements is the mechanical interface (effective wipe and resulting stub lengths) to improve the electrical performance to be more in-line with other PCIe 5.0 solutions. This may involve adjustments in dimensions and/or tolerances regarding the mechanical latching function and/or module paddle card position relative to the die-cast housing and/or edge gold finger dimensions. The exact improvements to be made are to be determined.

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 1. Amphenol
 2. Molex
 3. Lotes
 4. Dell
 5. TE Connectivity

The A14 chamfer in question, from Figure 7-1 & Table 7-1, is highlighted in the images below ...

(Drawing view taken from Figure 7-1)

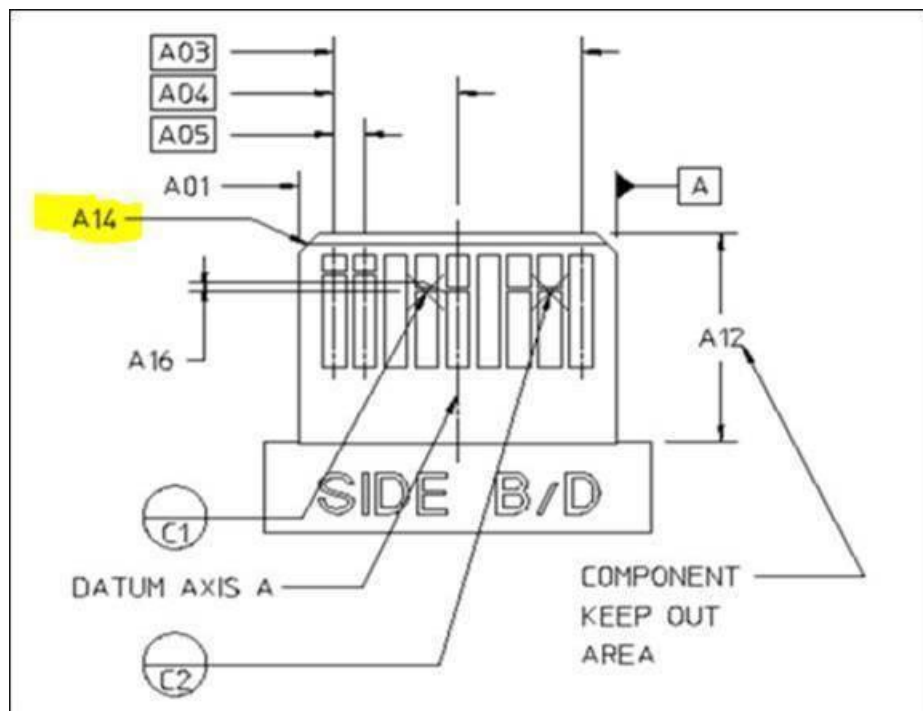
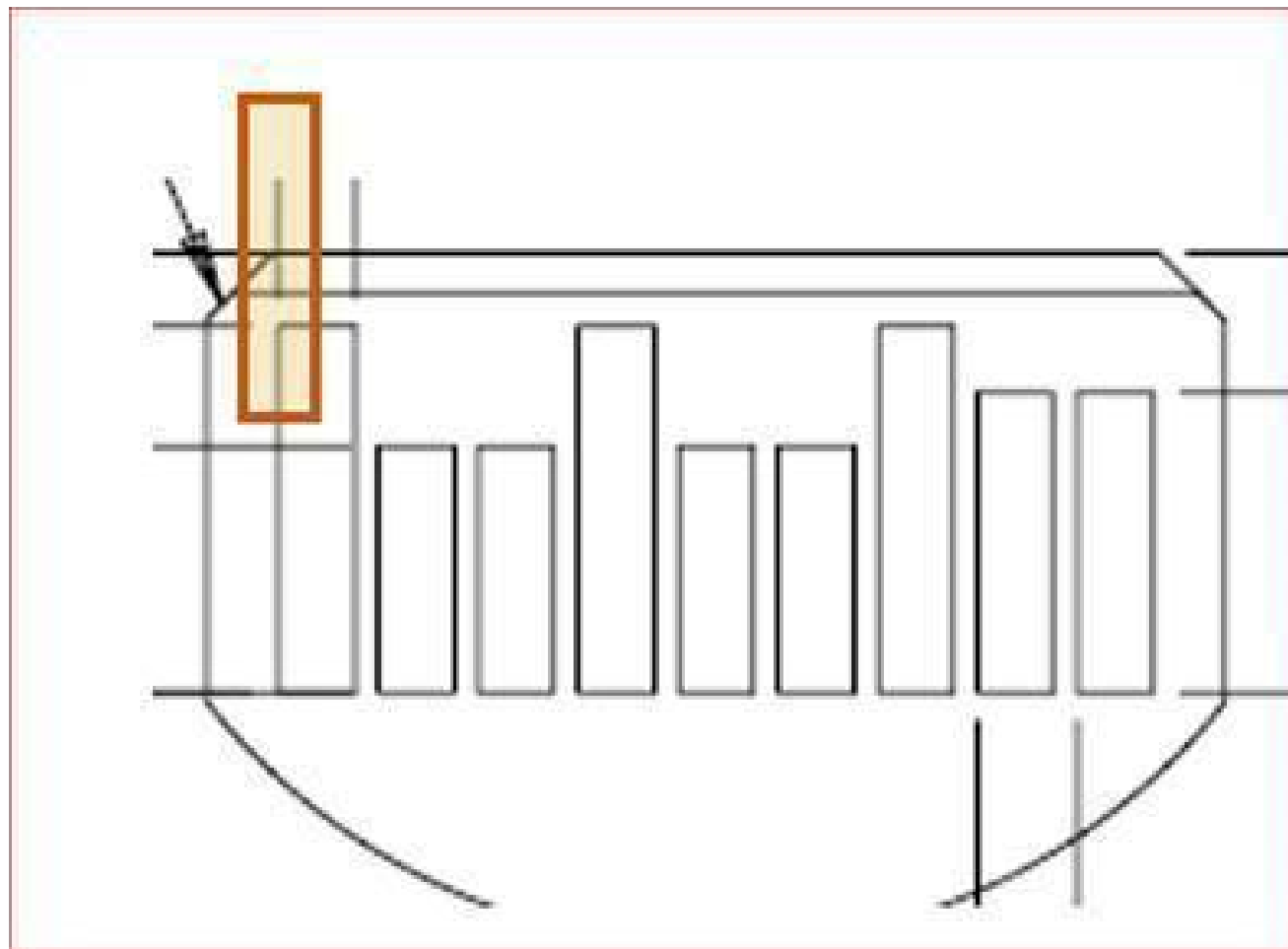


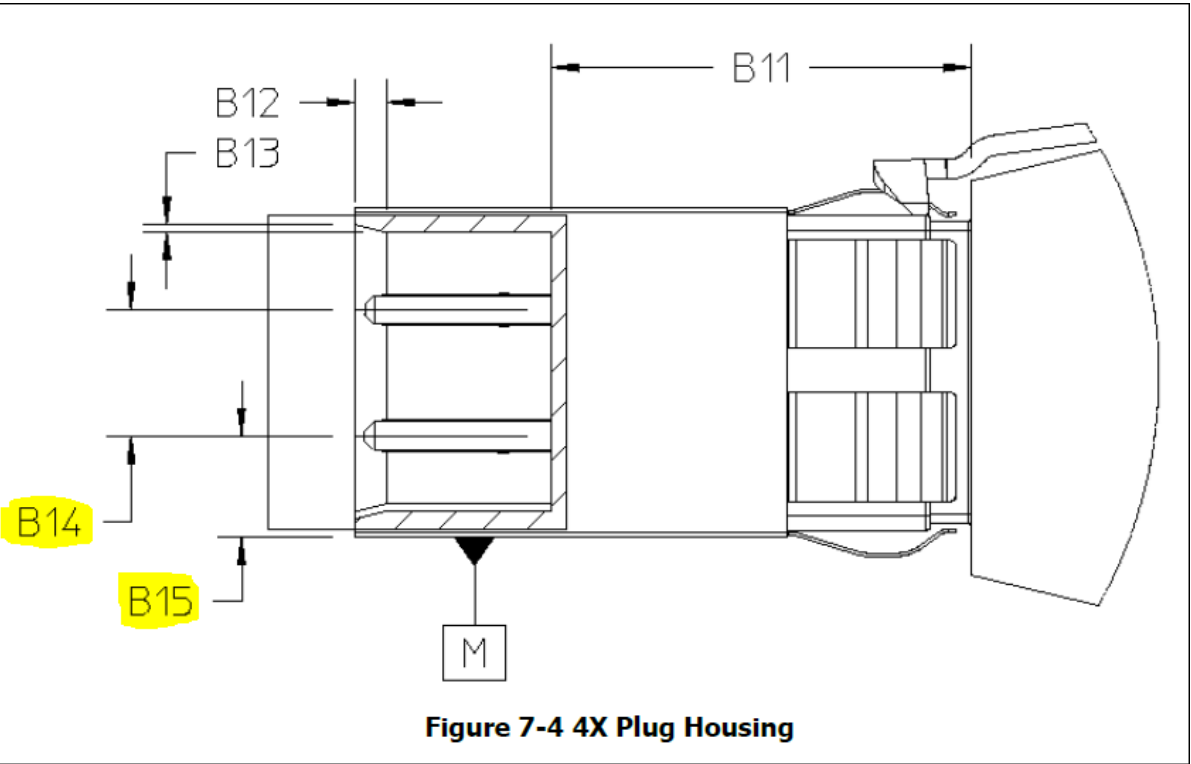
Table 7-1 Plug Paddle Card Dimensions

Designator	Description	Dimension	Tolerance +/-
A01	Paddle card width	7.65	0.10
A02	Paddle card thickness (across pads)	1.00	0.10
A03	First to last pad centers	6.00	Basic
A04	Card center to outer pad center	3.00	Basic
A05	Pad center-to-center (pitch)	0.75	Basic
A06	Pad width	0.57	0.03
A07	Pad length – Third mate	1.85	MIN
A08	Third mate to first mate	0.90	0.05
A09	Third mate to second mate	0.40	0.05
A10	Card edge to third mate pad	1.45	0.10
A11	Pad to pre-pad	0.10	0.05
A12	Component keep-out area	5.40	MIN
A13	Lead-in flat	0.40	REF
A14	Lead-in chamfer x 45 degrees	0.50	0.05
A15	Lead-in chamfer x 45 degrees	0.30	0.05
A16	Third mated pad to Datum C	0.00	0.03

Here is a view showing the MiniSAS HD receptacle contact zone (where the contact must be located within this zone) overlaid on top of the mating plug paddle card's corner chamfer's current size and location.



The B14 & B15 dimensions in question, from Figure 7-4 & Table 7-2, are highlighted in the images below. These dimensions are important for preventing the stubbing of the module paddle cards on the front face of the mating receptacle connector during the mating process.



The exact improvements to be made are to be determined. We may want to change the dimension scheme for these and use GD&T to better locate the paddle card heights.

Table 7-2 4X Plug Dimensions

Designator	Description	Dimension	Tolerance +/-
B01	Plug body width	10.85	MAX
B02	Snout width	10.45	0.15
B03	Snout height	10.45	0.15
B04	Plug body length	32.00	MAX
B05	Snout top to plug body top	4.70	0.15
B06	Plug body height	20.30	MAX
B07	Snout groove lead-in length	2.92	0.25
B08	Datum E to snout groove end	1.50	0.10
B09	Snout groove lead-in width	5.00	0.15
B10	Snout inside width	9.35	REF
B11	Datum E to internal keep-out area	13.33	0.10
B12	Lead-in chamfer	1.00	0.15
B13	Lead-in chamfer	0.25	0.10
B14	PCB centerline to PCB centerline	4.00	0.10
B15	Snout bottom to lower PCB centerline	3.22	0.10
B16	Plug body to PCB datum	17.80	0.25
B17	Snout length	19.56	0.10
B18	Datum E to blocking key slot end	13.33	0.10
B19	Blocking key slot width	1.00	0.15
B20	Snout groove lead-in width	3.34	0.15
B21	Latch bard zone	0.70	REF
B22	Snout inside height	8.62	0.10
B23	Snout inside height	8.85	0.10
B24	Plug side wall thickness	0.55	0.08
B25	Snout groove height	0.45	0.10
B26	Snout top thickness	0.78	0.10
B27	Latch catch width	4.57	REF

Comparison of Effective Wipe calculations ...

Current SFF-8614

Effective Wipe	Calculated Values
MIN (RSS)	0.51mm
NOMINAL	1.15mm
MAX (RSS)	1.59mm

- SFF-8614 has not kept pace with improvements made in other form factors

Comparison Calculations

Effective Wipe	CDFP (INF-TA-1003)	SFF-TA-1032 Previous Revision
MIN (RSS)	0.56mm	0.37mm
NOMINAL	1.36mm	0.96mm
MAX (RSS)	2.16mm	1.55mm

- SFF-TA-1032 wipe calculations here do not include the more-recent improvements documented in Revision 0.0.13

Some various dimensions in question (among others), from Figure 7-6, Figure 7-9, & Figure 7-1, and the associated tables, are highlighted in the images below ...

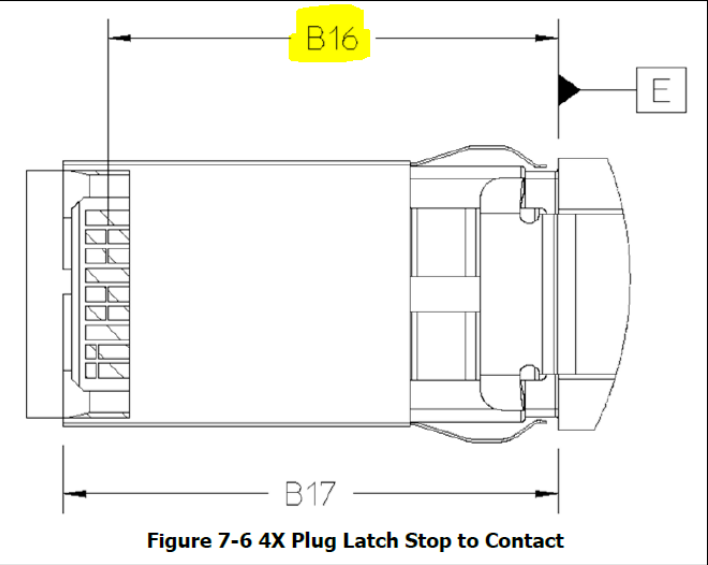


Figure 7-6 4X Plug Latch Stop to Contact

Table 7-2 4X Plug Dimensions

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B17	Snout length	19.56	0.10
B18	Datum E to blocking key slot end	13.33	0.10
B19	Blocking key slot width	1.00	0.15
B20	Snout groove lead-in width	3.34	0.15
B21	Latch barb zone	0.70	REF

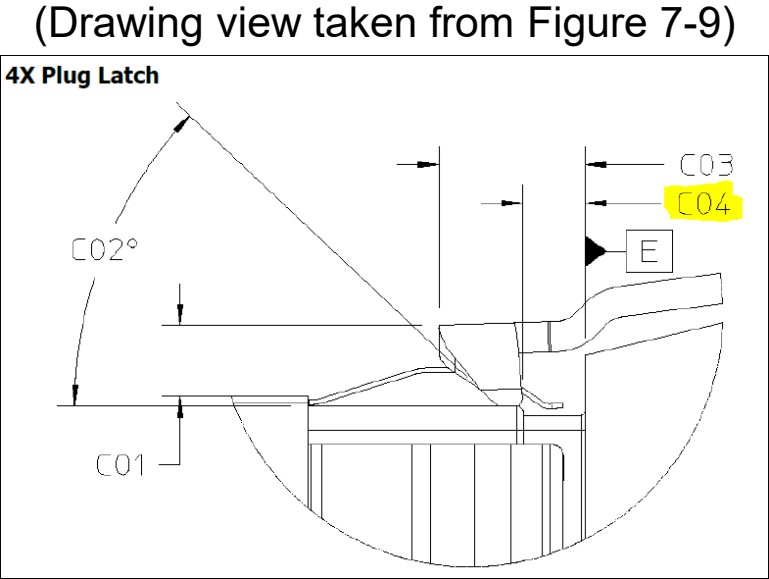


Table 7-4 4X Plug Latch Dimensions

Designator	Description	Dimension	Tolerance +/-
C01	Latch height	1.51	REF
C02	Latch lead-in angle	43°	REF
C03	Latch length	3.70	MAX
C04	Latch barb location	1.32	0.15

The exact dimensional improvements to be made are to be determined and should be dependent on targeting potential simulated or measured SI improvements.

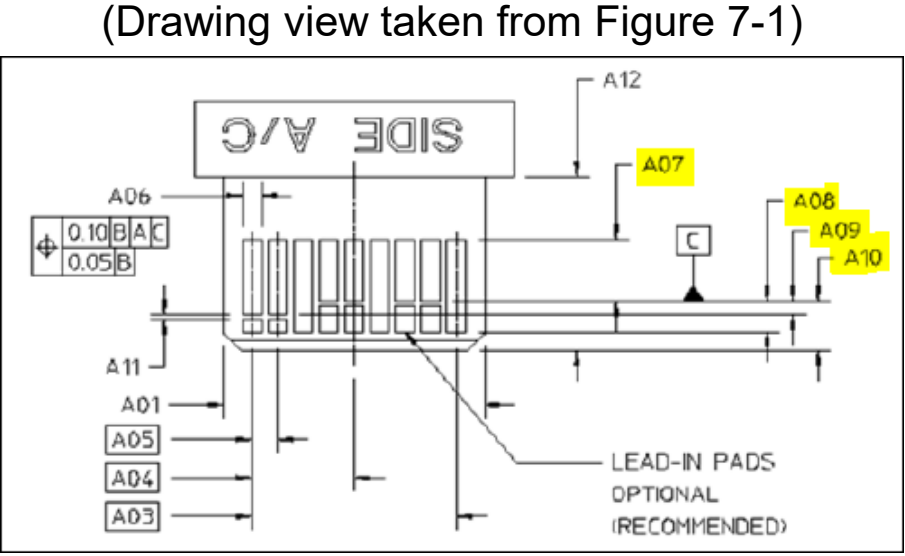


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Updated New Project Proposal: SFF-8614, updates to Rev 3.5

■ IP Declaration:

- NOTE: The document will undergo a new IP disclosure period once published as a new Rev 3.6 per the SNIA SFF Process Guide

■ General timeline for project completion (estimates only)

- Initial Project Start Approval: February 9, 2024
- DRAFT Revision 3.5.1 by March 1, 2024?
- Review Ballot end by April 3, 2024?
- Comment Resolution & updated revision estimated by April 19, 2024?
- Approval Ballot end estimated by May 22, 2024?
- Comment Resolution & final Published revision estimated by May 31, 2024?
- IP Declaration completion estimated by August 2, 2024?