

DCPS Mezzanine Boards - Data Sheet

This file contains all the known delay parameters of the various DCPS Mezzanine Boards. There are currently 11 boards labeled 0 – 10 (inclusive).

All delays were measured using a 160MHz clock in a room temperature setting. All coarse delays were measured with the stage 4 and stage 5 tunes both set to two, and the fine control set to zero. All fine delays were measured with the stage 4 and stage 5 tunes both set to zero, and the coarse control set to zero.

Mezzanine boards 0 – 2 have been known to have I2C read and write errors. The cause of this issue is unknown but failed to be reproduced in the latest tests of our boards. Even when these I2C errors occur, our software accounts for this by repeatedly sending reads and writes until it correctly sets the registers on the selected DCPS channel. Registers set using this method have not been seen to affect the resultant signal delay in any way, shape, or form.

DCPS Mezzanine Board 0

Channel	Delay Type	Mean Delay per Step	Delay per Step Standard Deviation	Delay Cell Residual Standard Deviation
2	Coarse	6.549 ± 0.008 ps/step	0.026 ps/step	2.28 ps
3	Coarse	6.604 ± 0.006 ps/step	0.020 ps/step	2.15 ps
2	Fine	281.9 ± 0.3 fs/step**	1.4 fs/step**	59.6 fs**
3	Fine	290.8 ± 0.1 fs/step**	0.5 fs/step**	61.5 fs**

DCPS Mezzanine Board 1

Channel	Delay Type	Mean Delay per Step	Delay per Step Standard Deviation	Delay Cell Residual Standard Deviation
2	Coarse	N/A*	N/A*	N/A*
3	Coarse	6.616 ± 0.005 ps/step	0.015 ps/step	2.22 ps
2	Fine	N/A*	N/A*	N/A*
3	Fine	287.5 ± 0.4 fs/step	1.2 fs/step	55.3 fs

DCPS Mezzanine Board 2

Channel	Delay Type	Mean Delay per Step	Delay per Step Standard Deviation	Delay Cell Residual Standard Deviation
2	Coarse	6.551 ± 0.006 ps/step	0.018 ps/step	2.02 ps
3	Coarse	6.568 ± 0.003 ps/step	0.008 ps/step	1.92 ps
2	Fine	286.4 ± 0.2 fs/step	1.0 fs/step	55.0 fs
3	Fine	281.8 ± 0.4 fs/step	1.1 fs/step	52.4 fs

*Mezzanine Board 1 is no longer working on channel 2.

**Mezzanine Board 0 fine delay cells are no longer working consistently as expected

DCPS Mezzanine Board 3

Channel	Delay Type	Mean Delay per Step	Delay per Step Standard Deviation	Delay Cell Residual Standard Deviation
2	Coarse	6.527 ± 0.005 ps/step	0.013 ps/step	2.25 ps
3	Coarse	6.597 ± 0.003 ps/step	0.010 ps/step	2.20 ps
2	Fine	285.4 ± 0.2 fs/step	0.7 fs/step	53.1 fs
3	Fine	288.7 ± 0.4 fs/step	2.0 fs/step	65.4 fs

DCPS Mezzanine Board 4

Channel	Delay Type	Mean Delay per Step	Delay per Step Standard Deviation	Delay Cell Residual Standard Deviation
2	Coarse	6.506 ± 0.007 ps/step	0.023 ps/step	2.16 ps
3	Coarse	6.596 ± 0.006 ps/step	0.017 ps/step	2.08 ps
2	Fine	286.8 ± 0.3 fs/step	1.0 fs/step	58.6 fs
3	Fine	289.7 ± 0.3 fs/step	1.2 fs/step	60.1 fs

DCPS Mezzanine Board 5

Channel	Delay Type	Mean Delay per Step	Delay per Step Standard Deviation	Delay Cell Residual Standard Deviation
2	Coarse	6.546 ± 0.002 ps/step	0.007 ps/step	2.33 ps
3	Coarse	6.530 ± 0.007 ps/step	0.021 ps/step	2.00 ps
2	Fine	286.8 ± 0.2 fs/step	0.9 fs/step	53.6 fs
3	Fine	287.0 ± 0.2 fs/step	0.8 fs/step	56.5 fs

DCPS Mezzanine Board 6

Channel	Delay Type	Mean Delay per Step	Delay per Step Standard Deviation	Delay Cell Residual Standard Deviation
2	Coarse	6.510 ± 0.006 ps/step	0.017 ps/step	2.27 ps
3	Coarse	6.528 ± 0.007 ps/step	0.021 ps/step	2.11 ps
2	Fine	286.0 ± 0.2 fs/step	1.2 fs/step	57.5 fs
3	Fine	287.9 ± 0.3 fs/step	1.0 fs/step	68.9 fs

DCPS Mezzanine Board 7

Channel	Delay Type	Mean Delay per Step	Delay per Step Standard Deviation	Delay Cell Residual Standard Deviation
2	Coarse	6.625 ± 0.007 ps/step	0.021 ps/step	2.37 ps
3	Coarse	6.601 ± 0.006 ps/step	0.019 ps/step	2.30 ps
2	Fine	290.3 ± 0.3 fs/step	0.9 fs/step	60.2 fs
3	Fine	290.5 ± 0.2 fs/step	0.7 fs/step	62.0 fs

DCPS Mezzanine Board 8

Channel	Delay Type	Mean Delay per Step	Delay per Step Standard Deviation	Delay Cell Residual Standard Deviation
2	Coarse	6.524 ± 0.008 ps/step	0.023 ps/step	2.11 ps
3	Coarse	6.541 ± 0.004 ps/step	0.013 ps/step	1.96 ps
2	Fine	284.7 ± 0.2 fs/step	1.0 fs/step	65.0 fs
3	Fine	284.3 ± 0.4 fs/step	1.2 fs/step	61.5 fs

DCPS Mezzanine Board 9

Channel	Delay Type	Mean Delay per Step	Delay per Step Standard Deviation	Delay Cell Residual Standard Deviation
2	Coarse	6.534 ± 0.002 ps/step	0.008 ps/step	2.20 ps
3	Coarse	6.535 ± 0.005 ps/step	0.016 ps/step	2.09 ps
2	Fine	284.3 ± 0.2 fs/step	1.5 fs/step	54.9 fs
3	Fine	286.4 ± 0.2 fs/step	0.6 fs/step	65.2 fs

DCPS Mezzanine Board 10

Channel	Delay Type	Mean Delay per Step	Delay per Step Standard Deviation	Delay Cell Residual Standard Deviation
2	Coarse	6.532 ± 0.006 ps/step	0.018 ps/step	2.24 ps
3	Coarse	6.583 ± 0.004 ps/step	0.014 ps/step	2.22 ps
2	Fine	284.6 ± 0.3 fs/step	1.0 fs/step	60.8 fs
3	Fine	288.9 ± 0.3 fs/step	1.0 fs/step	68.0 fs