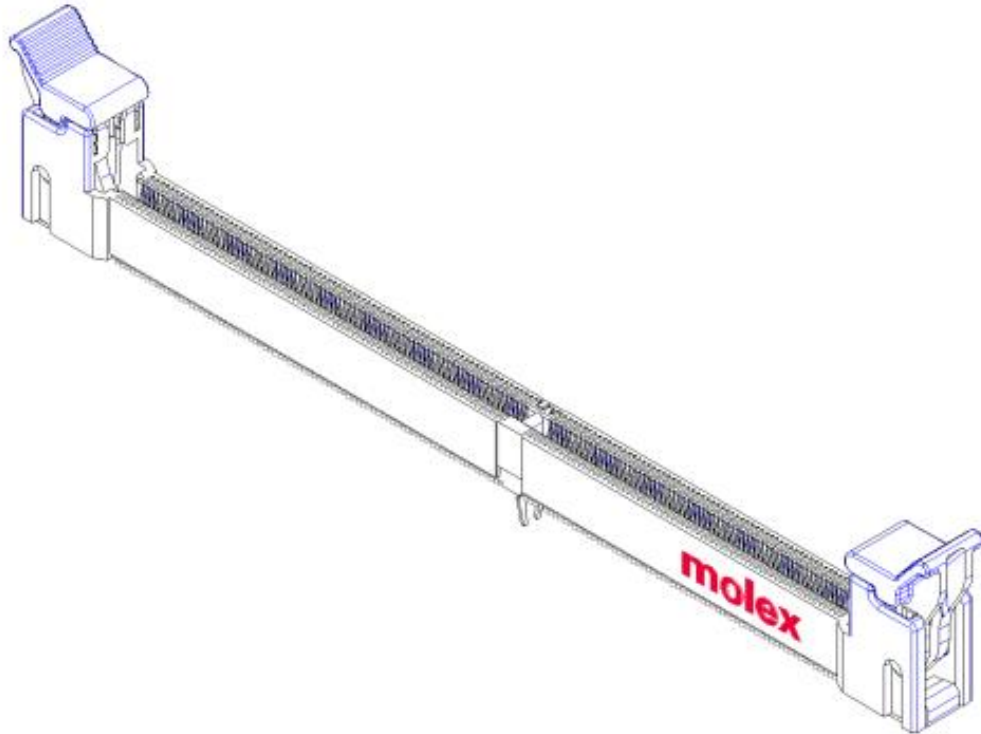




TEST SUMMARY

SIGNAL INTEGRITY TEST SUMMARY

DDR4 MINIDIMM 0.5MM PITCH VERTICAL CONNECTOR



1.0 SCOPE

This test summary covers the signal integrity performance of DDR4 MiniDIMM 0.5mm Pitch Vertical SMT connector. The measurement was conducted using Molex DDR4 MiniDIMM test fixture. Most of the test fixture effect was removed using AFR in PLTS.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND PART NUMBER

DDR4 DIMM 0. 5mm Pitch Vertical SMT connector, Part # 151105-0003 (Date Code : 15191)

REVISION: 1	ECN INFORMATION: EC No: S2016-0386 DATE: 2015/10/22	TITLE: Signal Integrity Test Summary DDR4 MiniDIMM 0.5MM PITCH Vertical SMT CONNECTOR	SHEET No. 1 of 13
DOCUMENT NUMBER: TS-151105-0001	CREATED / REVISED BY: WHFOO 2015/10/22	CHECKED BY: CMWONG 2015/10/22	APPROVED BY: WTCHUA 2015/10/22

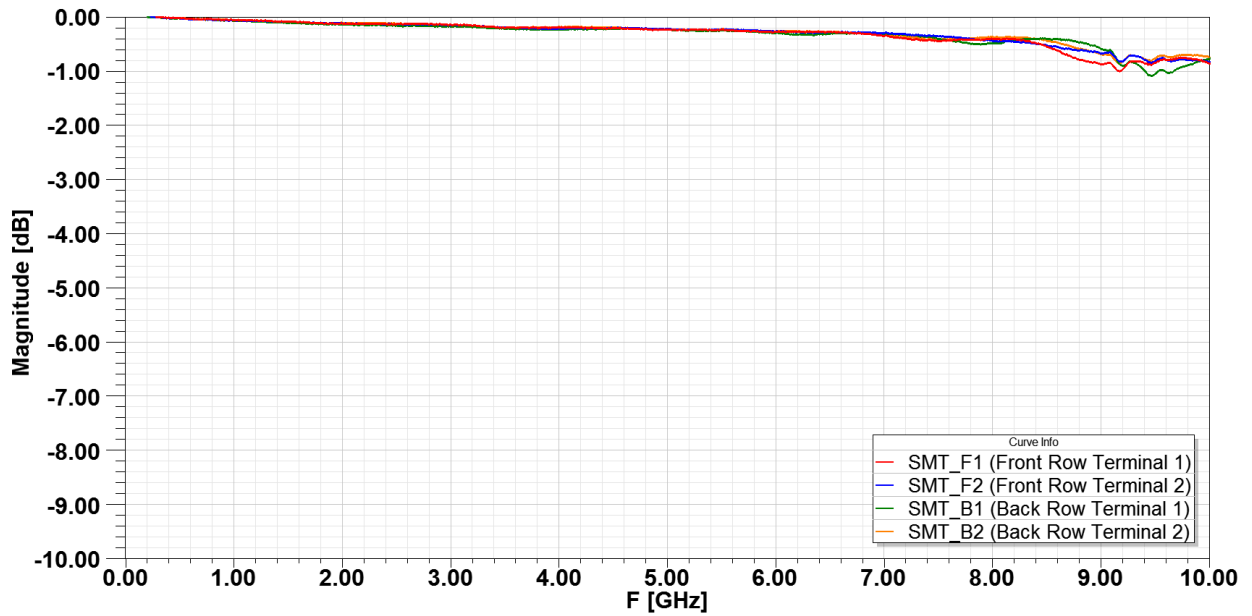


TEST SUMMARY

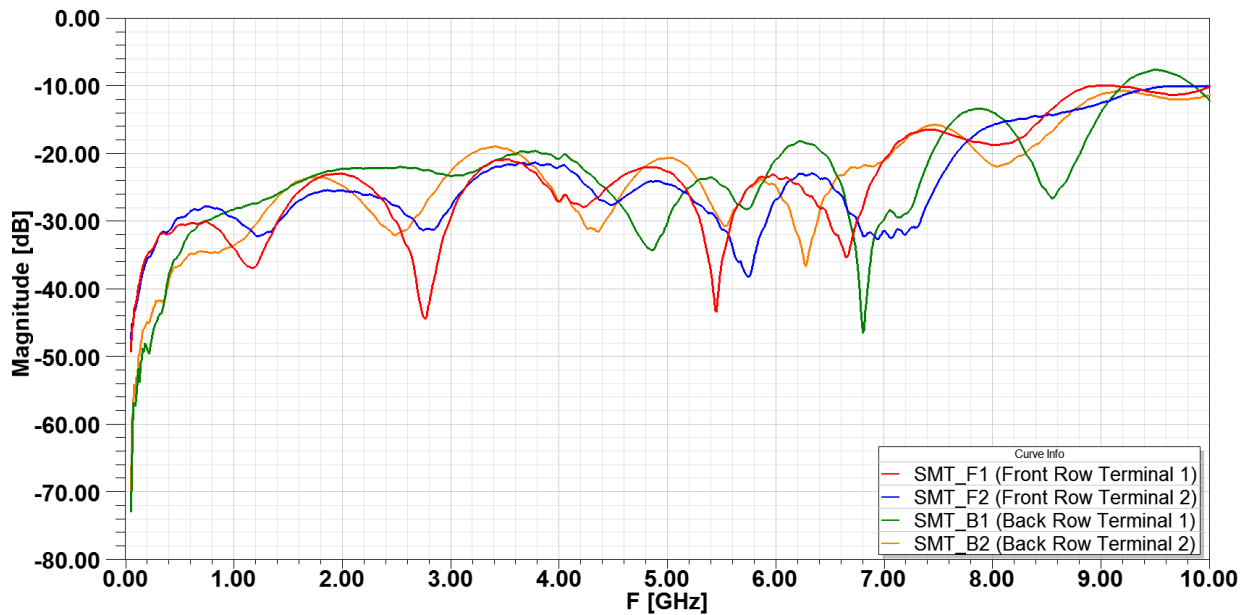
3.0 PERFORMANCE

Frequency Domain

Insertion Loss



Return Loss



REVISION: 1	ECN INFORMATION: EC No: S2016-0386 DATE: 2015/10/22	TITLE: Signal Integrity Test Summary DDR4 MiniDIMM 0.5MM PITCH Vertical SMT CONNECTOR	SHEET No. 2 of 13
DOCUMENT NUMBER: TS-151105-0001	CREATED / REVISED BY: WHFOO 2015/10/22	CHECKED BY: CMWONG 2015/10/22	APPROVED BY: WTCHUA 2015/10/22

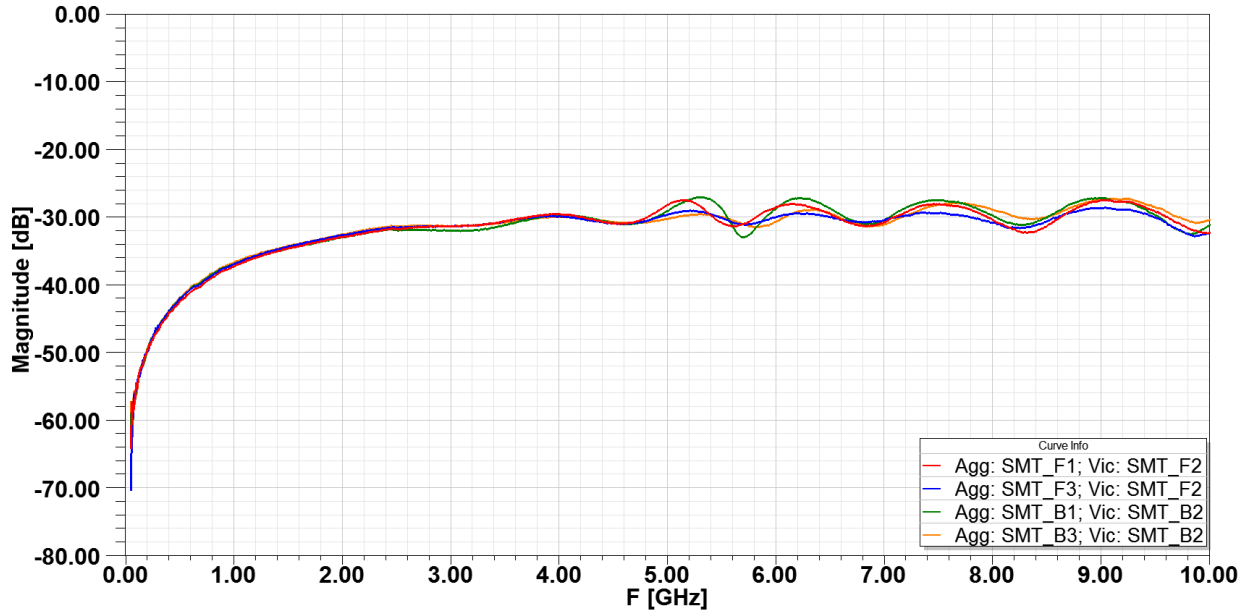


TEST SUMMARY

Frequency Domain (continued)

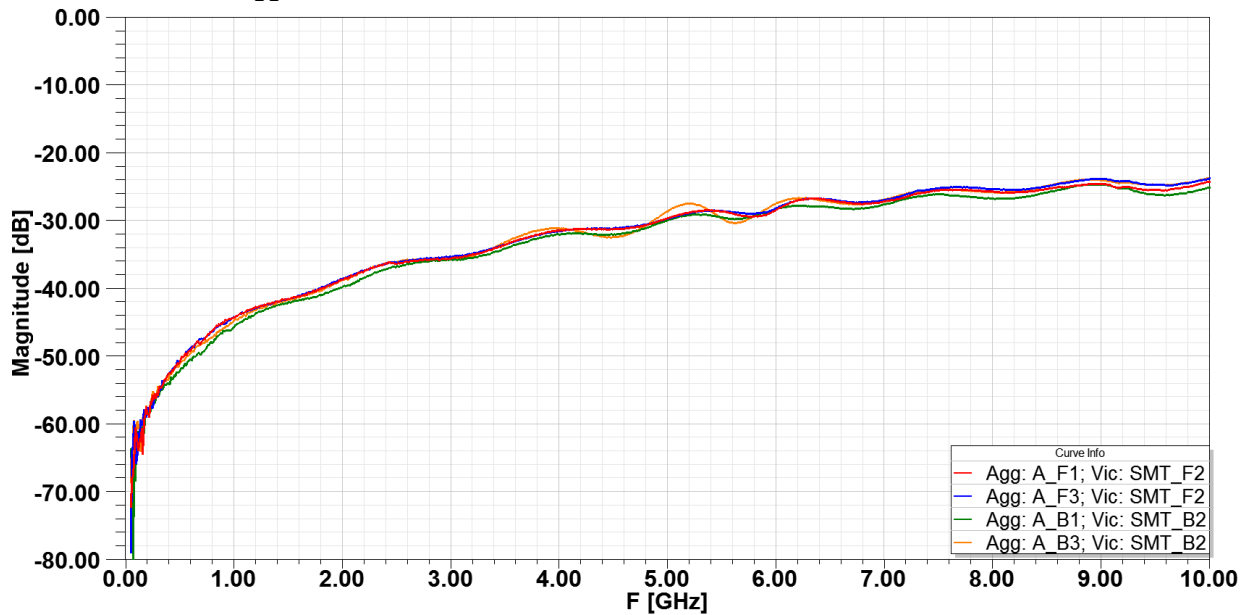
Near End Cross-Talk (Same Side)

- 1:1 S/G ratio
- Both victim and aggressor located at same row



Far End Cross-Talk (Same Side)

- 1:1 S/G ratio
- Both victim and aggressor located at same row



REVISION: 1	ECN INFORMATION: EC No: S2016-0386 DATE: 2015/10/22	TITLE: Signal Integrity Test Summary DDR4 MiniDIMM 0.5MM PITCH Vertical SMT CONNECTOR	SHEET No. 3 of 13
DOCUMENT NUMBER: TS-151105-0001	CREATED / REVISED BY: WHFOO 2015/10/22	CHECKED BY: CMWONG 2015/10/22	APPROVED BY: WTCHUA 2015/10/22

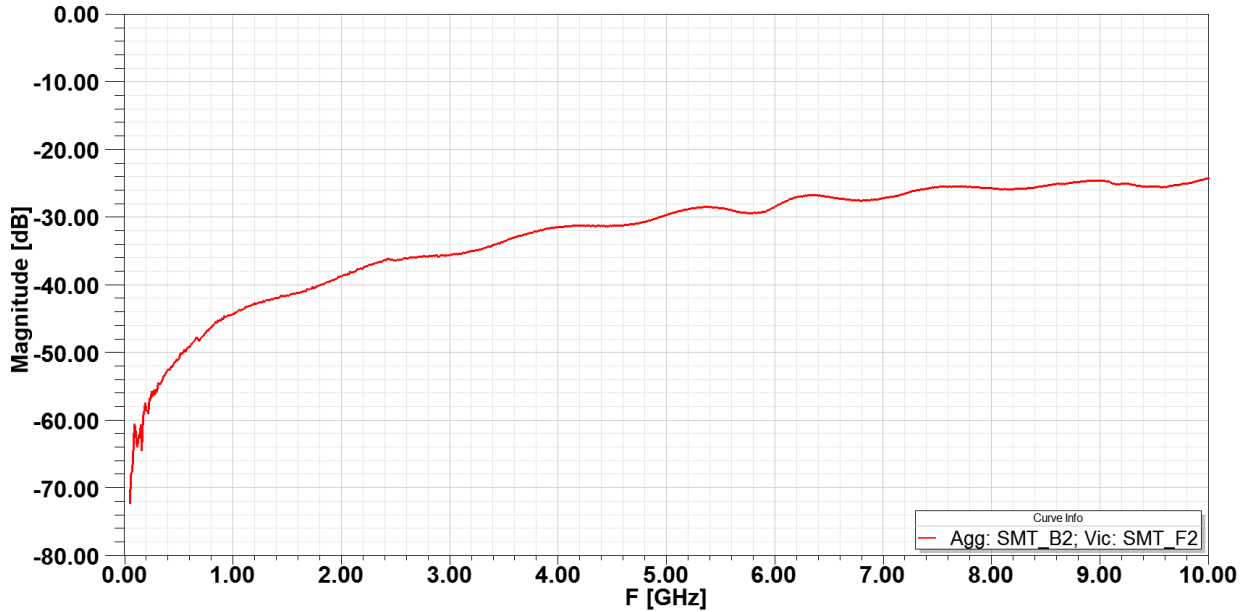


TEST SUMMARY

Frequency Domain (continued)

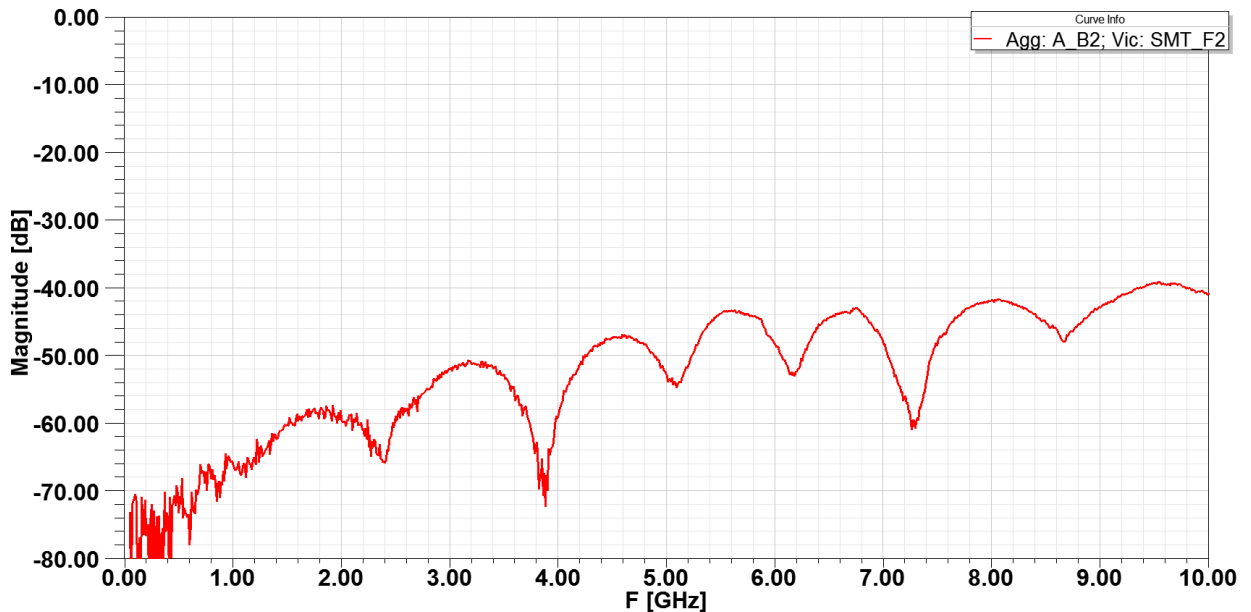
Near End Cross-Talk (Opposite Side)

- 1:1 S/G ratio
- Victim locates at front side
- Aggressor locates at back side



Far End Cross-Talk (Opposite Side)

- 1:1 S/G ratio
- Victim locates at front side
- Aggressor locates at back side.
-



REVISION: 1	ECN INFORMATION: EC No: S2016-0386 DATE: 2015/10/22	TITLE: Signal Integrity Test Summary DDR4 MiniDIMM 0.5MM PITCH Vertical SMT CONNECTOR	SHEET No. 4 of 13
DOCUMENT NUMBER: TS-151105-0001	CREATED / REVISED BY: WHFOO 2015/10/22	CHECKED BY: CMWONG 2015/10/22	APPROVED BY: WTCHUA 2015/10/22

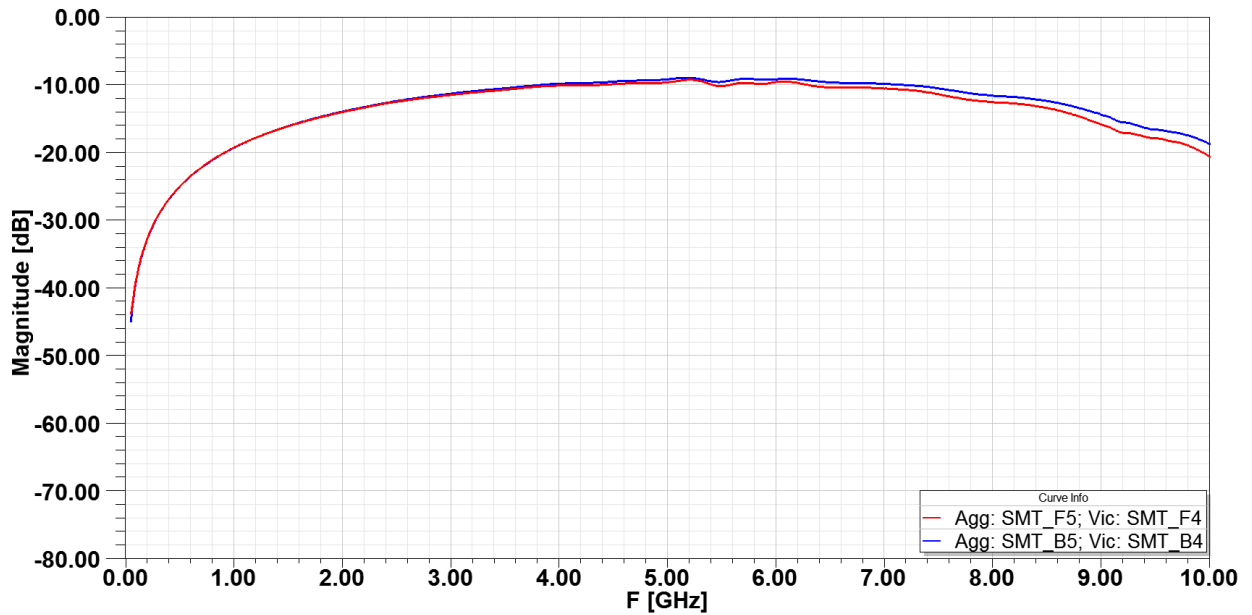


TEST SUMMARY

Frequency Domain (continued)

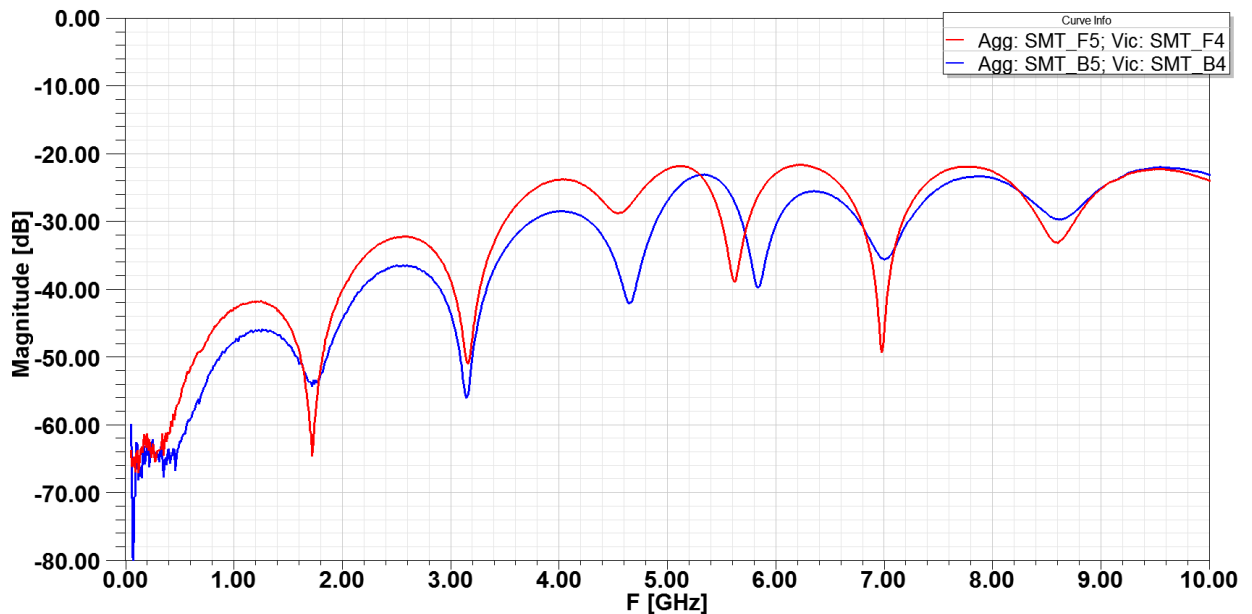
Near End Cross-Talk (Same Side)

- 2:1 S/G ratio



Far End Cross-Talk (Same Side)

- 2:1 S/G ratio

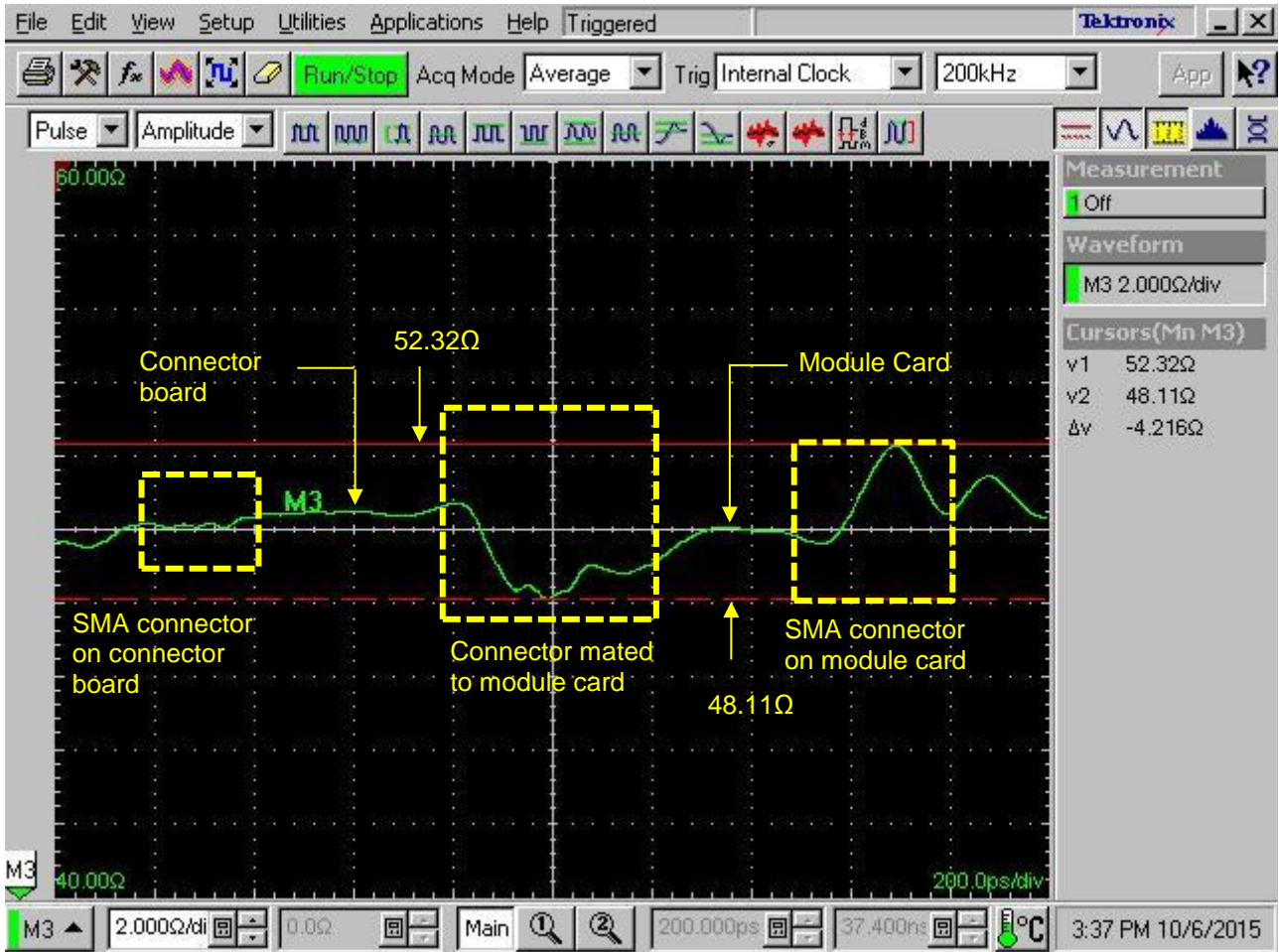


REVISION: 1	ECN INFORMATION: EC No: S2016-0386 DATE: 2015/10/22	TITLE: Signal Integrity Test Summary DDR4 MiniDIMM 0.5MM PITCH Vertical SMT CONNECTOR	SHEET No. 5 of 13
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Time Domain

TDR Impedance

- SMT_F1 – Front Row Terminal
- Referenced rise-time of 100ps [10%~90%] launched at connector footprint

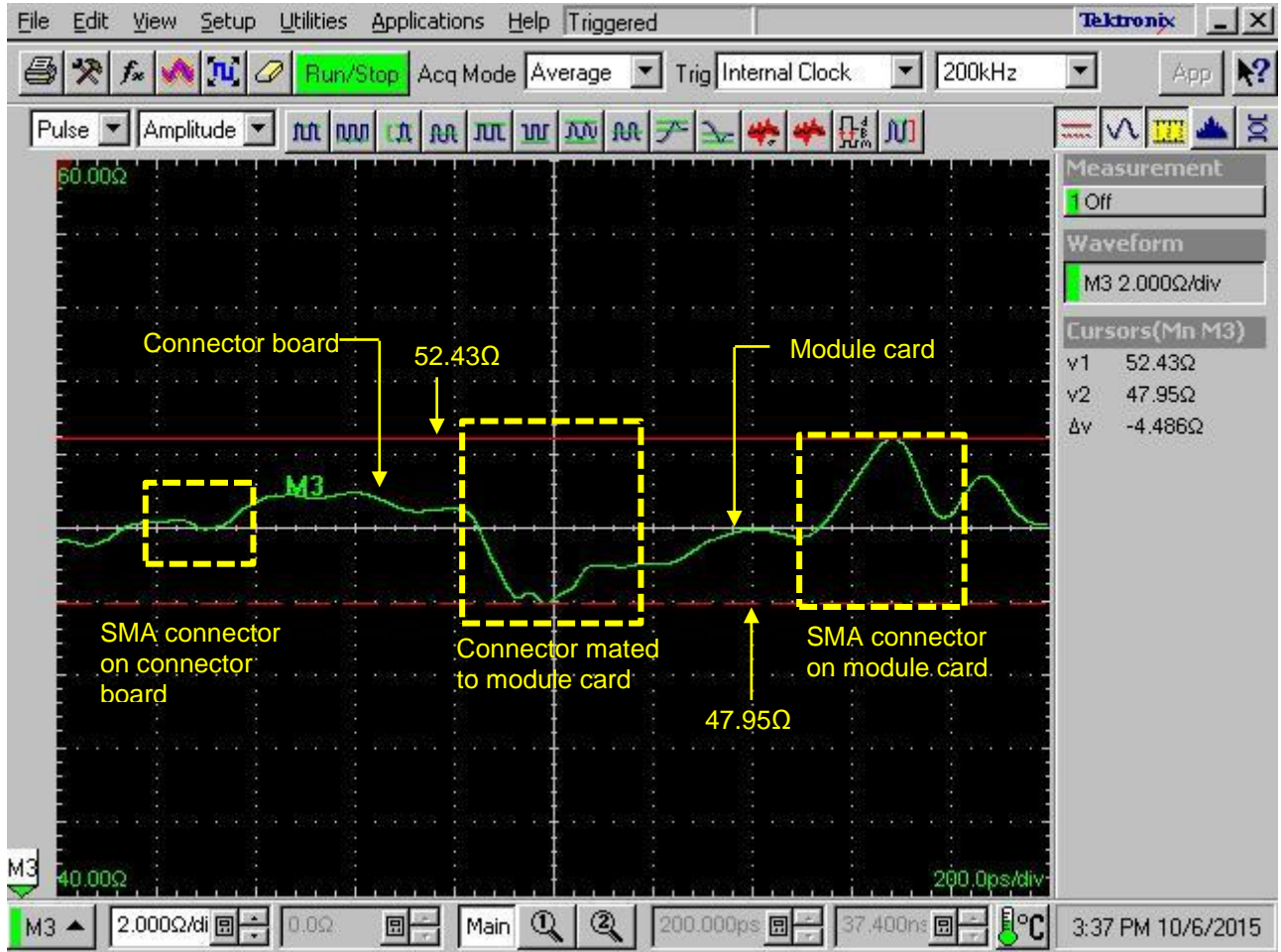


REVISION: 1	ECN INFORMATION: EC No: S2016-0386 DATE: 2015/10/22	TITLE: Signal Integrity Test Summary DDR4 MiniDIMM 0.5MM PITCH Vertical SMT CONNECTOR	SHEET No. 6 of 13
DOCUMENT NUMBER: TS-151105-0001	CREATED / REVISED BY: WHFOO 2015/10/22	CHECKED BY: CMWONG 2015/10/22	APPROVED BY: WTCHUA 2015/10/22

Time Domain (continued)

TDR Impedance

- SMT_F2 – Front Row Terminal
- Referenced rise-time of 100ps [10%~90%] launched at connector footprint

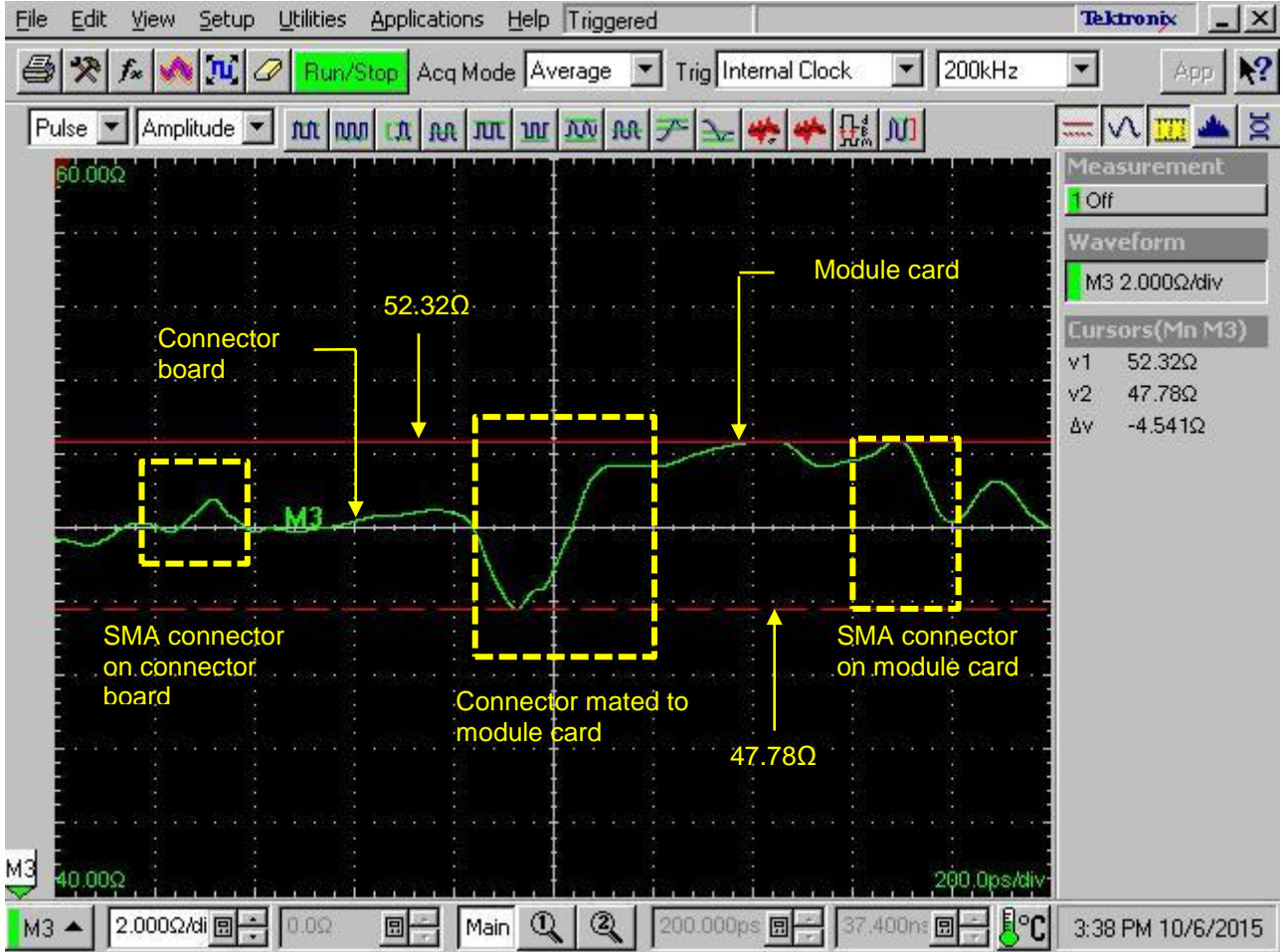


REVISION: 1	ECN INFORMATION: EC No: S2016-0386 DATE: 2015/10/22	TITLE: Signal Integrity Test Summary DDR4 MiniDIMM 0.5MM PITCH Vertical SMT CONNECTOR	SHEET No. 7 of 13
DOCUMENT NUMBER: TS-151105-0001	CREATED / REVISED BY: WHFOO 2015/10/22	CHECKED BY: CMWONG 2015/10/22	APPROVED BY: WTCHUA 2015/10/22

Time Domain (continued)

TDR Impedance

- SMT_B1 –Back Row Terminal
- Referenced rise-time of 100ps [10%~90%] launched at connector footprint

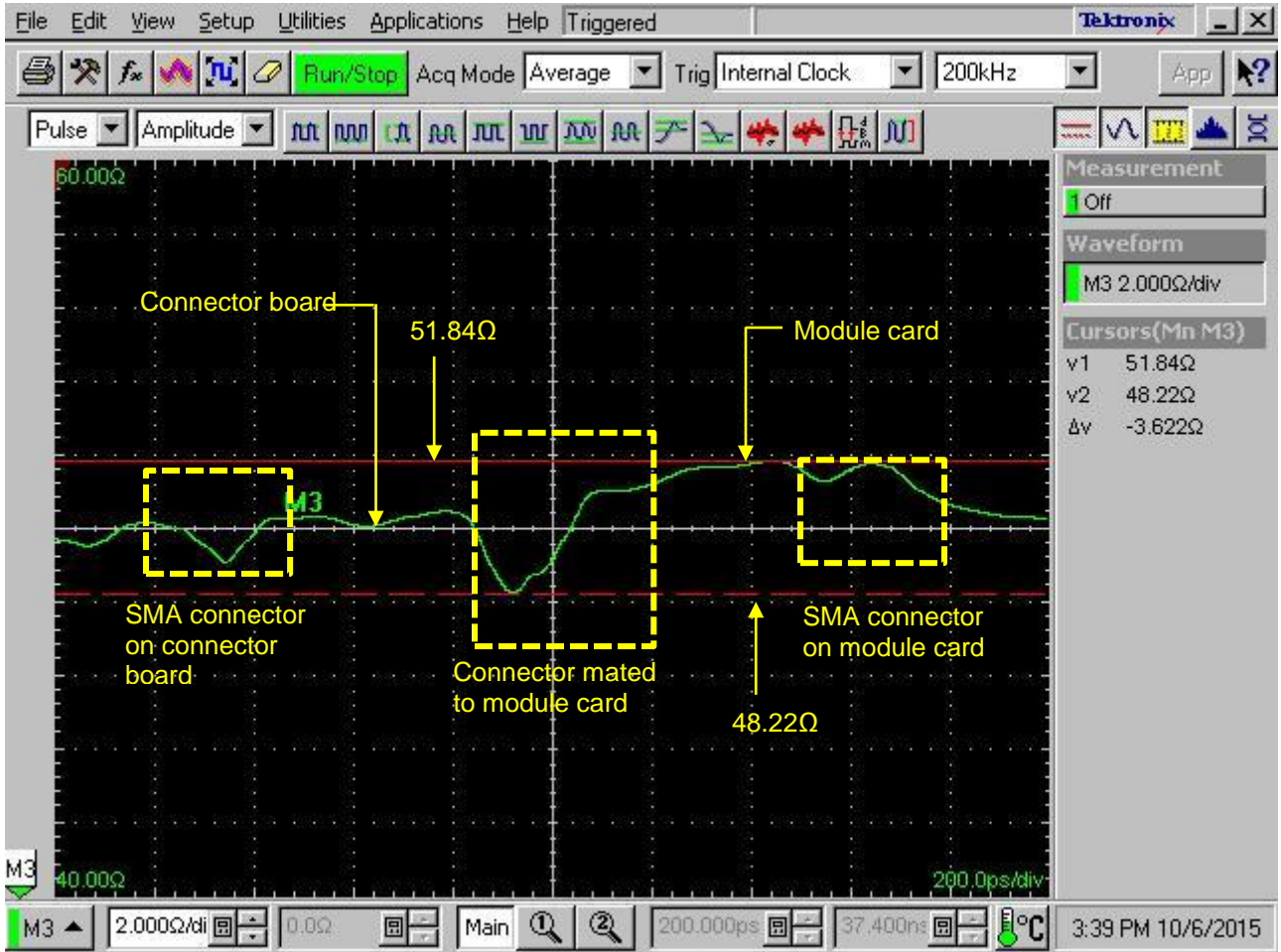


REVISION: 1	ECN INFORMATION: EC No: S2016-0386 DATE: 2015/10/22	TITLE: Signal Integrity Test Summary DDR4 MiniDIMM 0.5MM PITCH Vertical SMT CONNECTOR	SHEET No. 8 of 13
DOCUMENT NUMBER: TS-151105-0001	CREATED / REVISED BY: WHFOO 2015/10/22	CHECKED BY: CMWONG 2015/10/22	APPROVED BY: WTCHUA 2015/10/22

Time Domain (continued)

TDR Impedance

- SMT_B2 – Back Row Terminal
- Referenced rise-time of 100ps [10%~90%] launched at connector footprint



REVISION: 1	ECN INFORMATION: EC No: S2016-0386 DATE: 2015/10/22	TITLE: Signal Integrity Test Summary DDR4 MiniDIMM 0.5MM PITCH Vertical SMT CONNECTOR	SHEET No. 9 of 13
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4.0 TEST FIXTURES



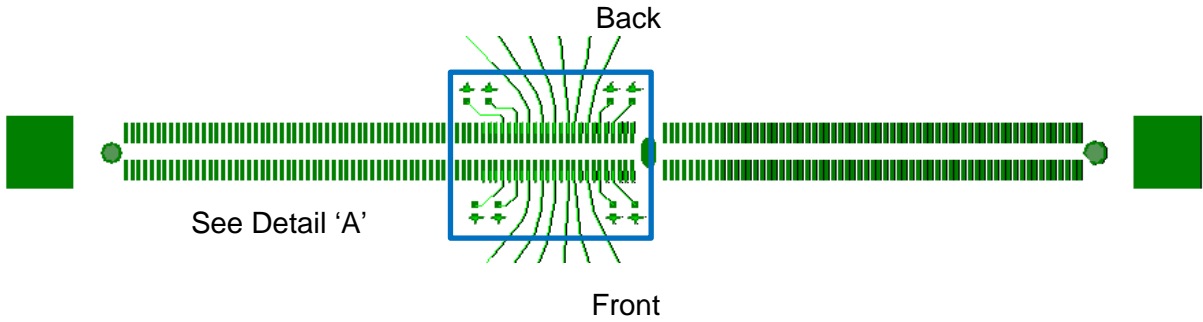
Molex DDR4 Test Fixture Board Information

Material : TU-872-LK
 Thickness : 1.4mm
 High Speed Traces : High-Speed Signals on Top Layer (referenced to Layer 2) and Bottom Layer (referenced to Layer 3)
 0.1016mm dielectric thickness between Top Layer & Layer 2 ; Layer 3 & Bottom Layer
 50.8mm single-ended length (both main and module board)

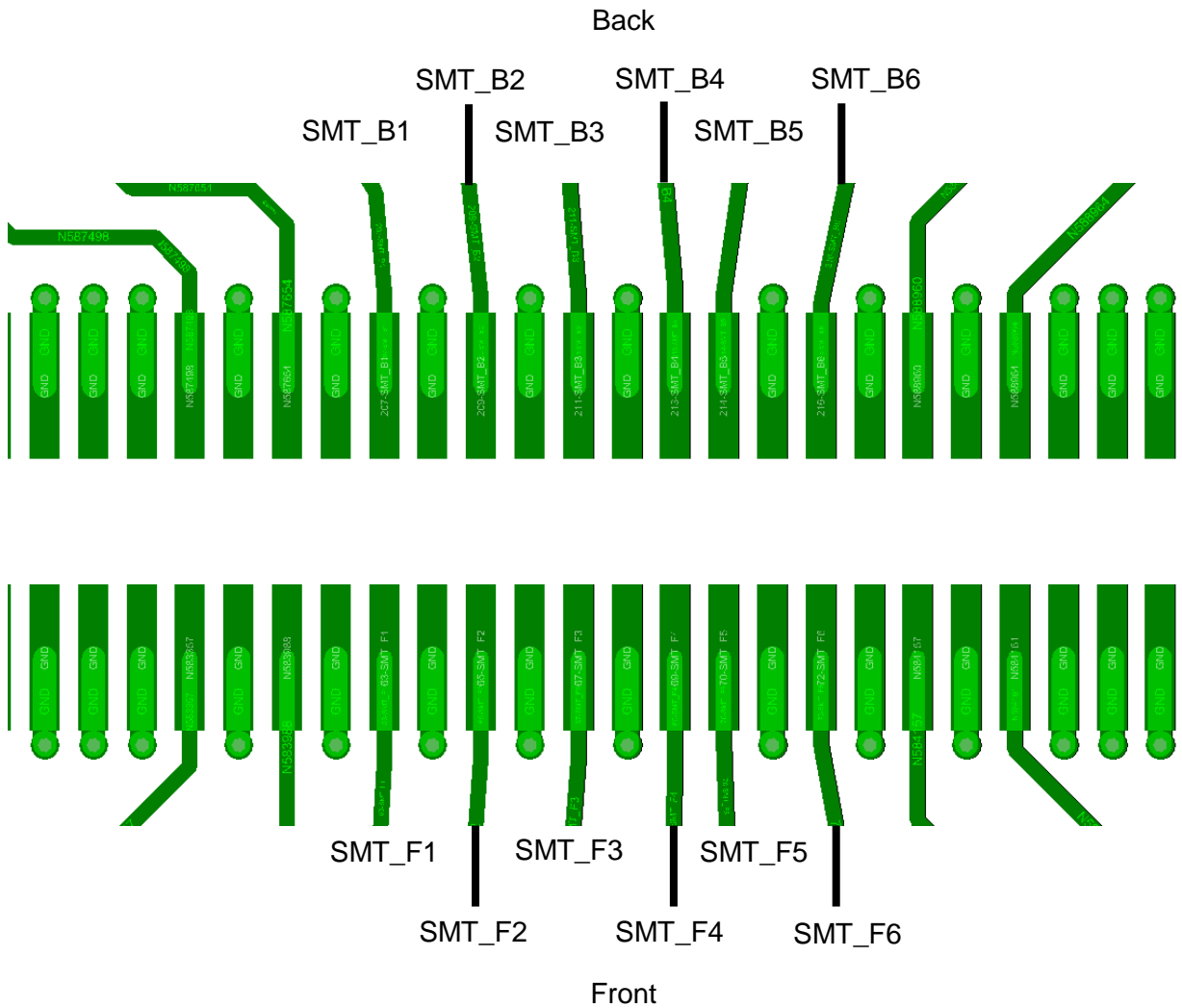
REVISION: 1	ECN INFORMATION: EC No: S2016-0386 DATE: 2015/10/22	TITLE: Signal Integrity Test Summary DDR4 MiniDIMM 0.5MM PITCH Vertical SMT CONNECTOR	SHEET No. 10 of 13
DOCUMENT NUMBER: TS-151105-0001	CREATED / REVISED BY: WHFOO 2015/10/22	CHECKED BY: CMWONG 2015/10/22	APPROVED BY: WTCHUA 2015/10/22

TEST SUMMARY

Mainboard Footprint Detail



Detail 'A'

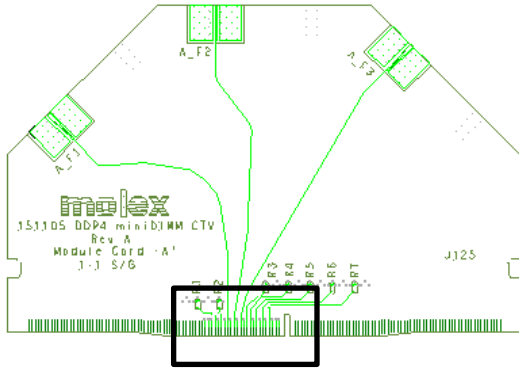


REVISION: 1	ECN INFORMATION: EC No: S2016-0386 DATE: 2015/10/22	TITLE: Signal Integrity Test Summary DDR4 MiniDIMM 0.5MM PITCH Vertical SMT CONNECTOR	SHEET No. 11 of 13
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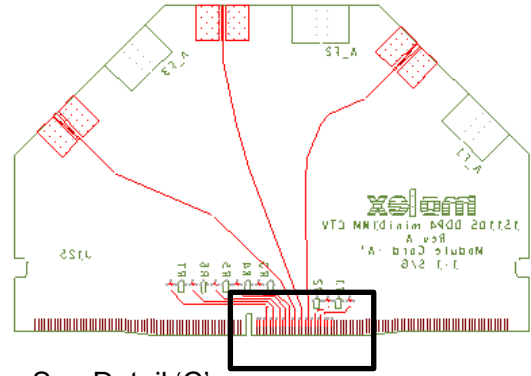
TEST SUMMARY

Module 'A' Card Footprint Detail



See Detail 'B'

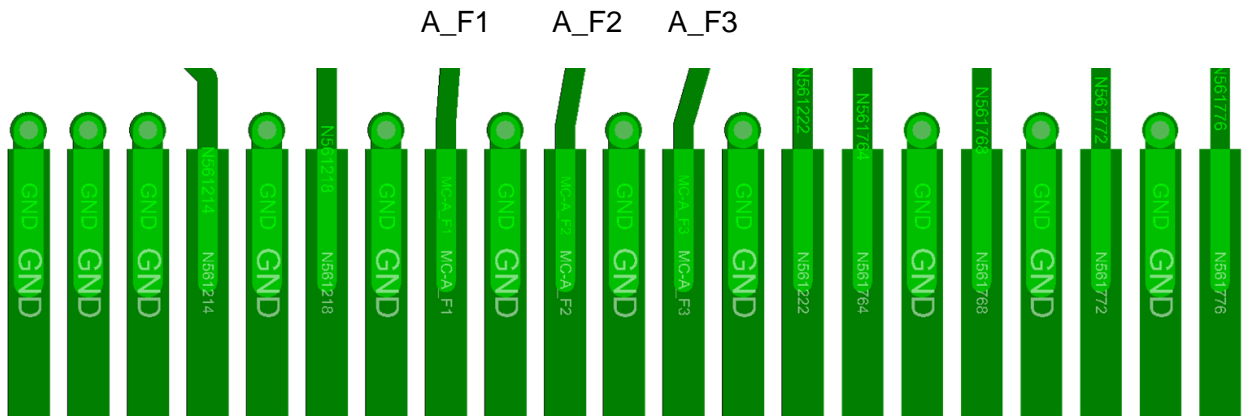
Front



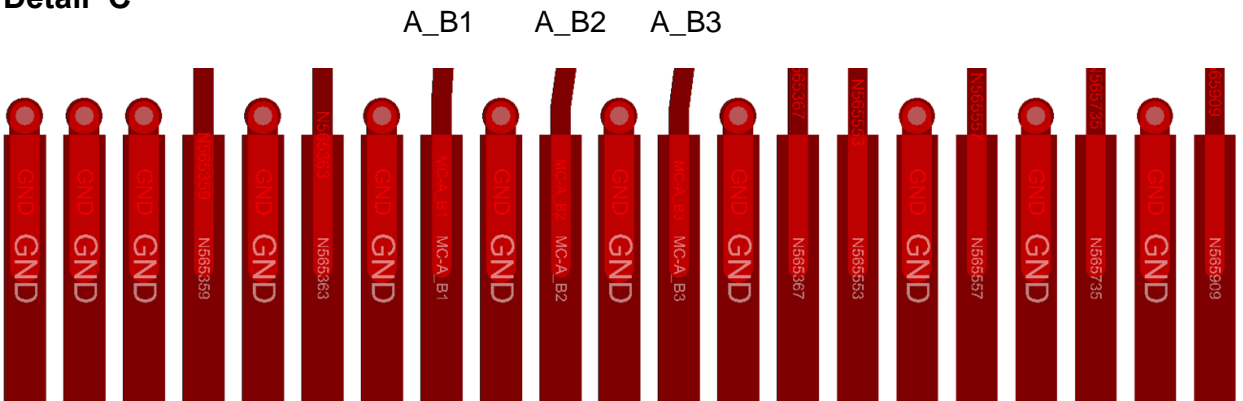
See Detail 'C'

Back

Detail 'B'



Detail 'C'

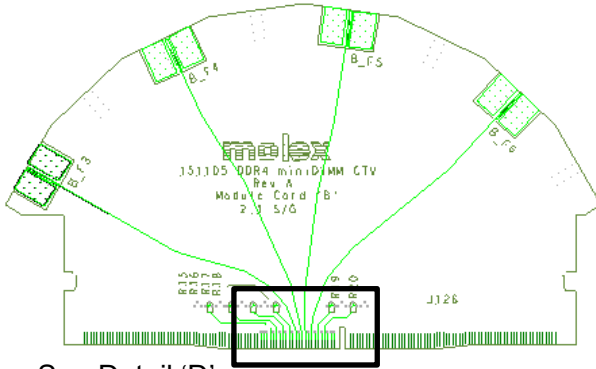


REVISION: 1	ECN INFORMATION: EC No: S2016-0386 DATE: 2015/10/22	TITLE: Signal Integrity Test Summary DDR4 MiniDIMM 0.5MM PITCH Vertical SMT CONNECTOR	SHEET No. 12 of 13
DOCUMENT NUMBER: TS-151105-0001	CREATED / REVISED BY: WHFOO 2015/10/22	CHECKED BY: CMWONG 2015/10/22	APPROVED BY: WTCHUA 2015/10/22



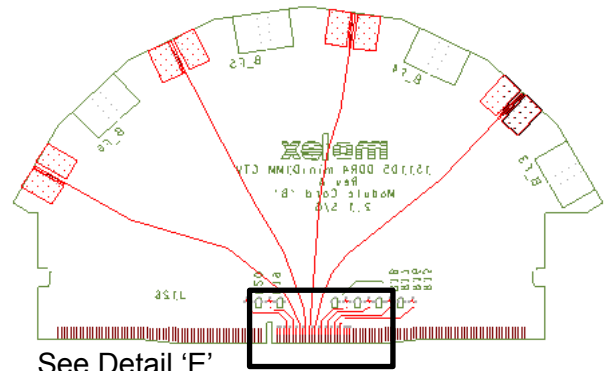
TEST SUMMARY

Module 'B' Card Footprint Detail



See Detail 'D'

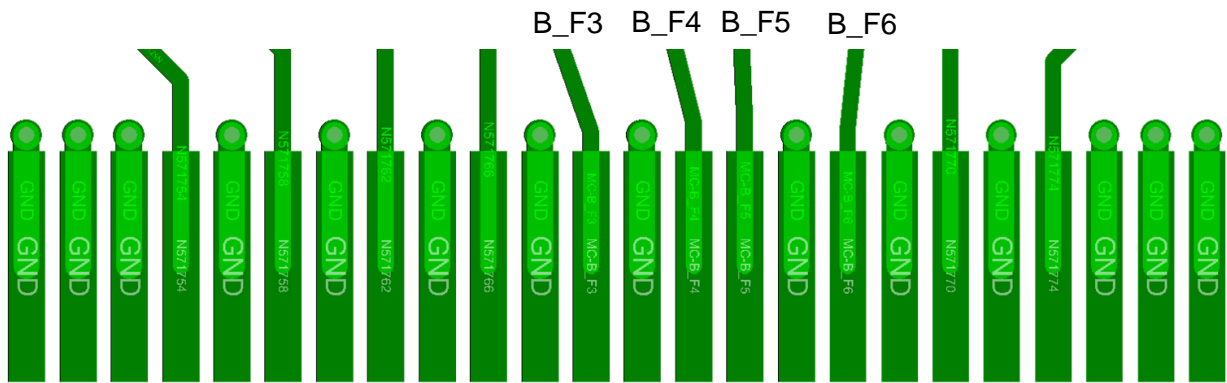
Front



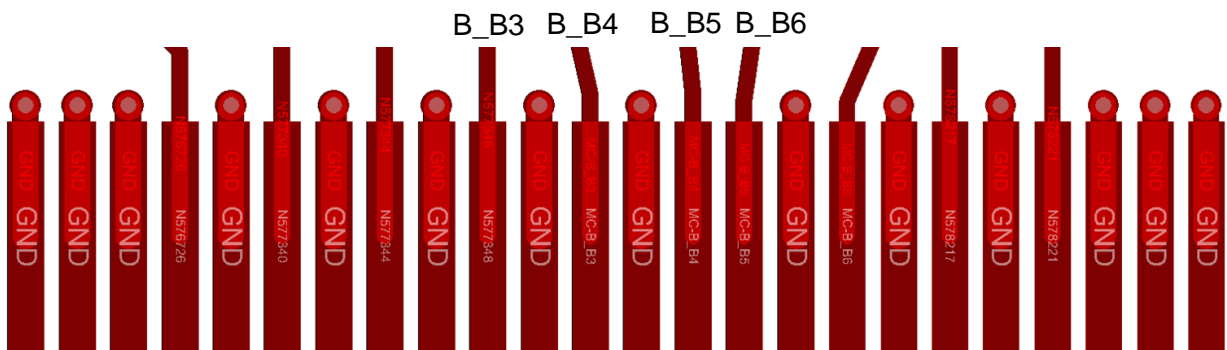
See Detail 'E'

Back

Detail 'D'



Detail 'E'



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DOCUMENT NUMBER: TS-151105-0001	CREATED / REVISED BY: WHFOO 2015/10/22	CHECKED BY: CMWONG 2015/10/22	APPROVED BY: WTCHUA 2015/10/22