ONFI Technical Errata

Errata ID	**013**
Affected Spec Ver.	**ONFI 4.0**
Corrected Spec Ver.	

Submission info

Name	Company	Date
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The erratum changes the TdIO and TdIO mismatch values based on discussions with in the Technical Team and in the Joint Task Group. The values are a compromise based on Signal Integrity analysis. The erratum also adds the parameter tdIO RE that separates the tdIO value for RE and the I/Os.

Description of the specification change

Modify Section 4.10.3 shown below:

The requirements in this section apply to devices that support the NV-DDR3 data interface and are optional for the SDR and NV-DDR interfaces. The requirements in this section are optional for the NV-DDR2 interface when the device supports I/O speeds 533 MT/s or less and required for NV-DDR2 interface when the device supports I/O speeds greater than 533 MT/s. The Parameter Page will specify if the device supports the requirements in this section (see **Error! Reference source not found.**, Parameter Page Byte 6-7, bit 15),

ZIO ~~and TdIO apply~~ applies to DQ[7:0], DQS_t, DQS_c, RE_t and RE_c. TdIO RE applies to RE_t and RE_c. TdIO and TdIOMismatch apply to DQ[7:0], DQS_t and DQS_c. Mismatch and Delta values are required to be met across same data bus on given package (i.e. package channel), but not required across all channels on a given package. All other pins only need meet requirements described in section **Error! Reference source not found.**

Symbol	Parameter	<=400 MT/s		533 MT/s		667 MT/s		800 MT/s		Unit
		Min	Max	Min	Max	Min	Max	Min	Max	
Z_{IO}	Input/Output Zpkg	35	90	35	90	35	90	40	90	Ohms
Td_{IO}	Input/Output Pkg Delay	-	160	-	160	-	~~100~~ 145	-	~~80~~ 130	ps
$Td_{IO\ RE}$	Input/Output Pkg Delay	-	160	-	160	-	145	-	130	ps
Td_{IO}Mismatch	Input/Output Pkg Delay Mismatch	-	50	-	~~25~~ 40	-	~~25~~ 40	-	~~25~~ 40	ps
$D\ Z_{IO\ DQS}$	Delta Zpkg for DQS_t and DQS_c	-	10	-	10	-	10	-	10	Ohms
$D\ Td_{IO\ DQS}$	Delta Pkg Delay for DQS_t and DQS_c	-	10	-	10	-	10	-	10	ps
$D\ Z_{IO\ RE}$	Delta Zpkg for RE_t and RE_c	-	10	-	10	-	10	-	10	Ohms
$D\ Td_{IO\ RE}$	Delta Pkg Delay for RE_t and RE_c	-	10	-	10	-	10	-	10	ps

NOTE:

1. The package parasitic(L & C) are validated using package only samples. The capacitance is measured with Vcc, VccQ, Vss, VssQ shorted with all other signal pins floating. The inductance is measured with Vcc, VccQ, Vss and VssQ shorted and all other signal pins shorted at the die side(not pin).
2. Package only impedance (Z_{IO}) is calculated based on the Lpkg and Cpkg total for a given pin where: Z_{IO}(total per pin) = SQRT(Lpkg/Cpkg)
3. Package only delay(Td_{IO}) is calculated based on Lpkg and Cpkg total for a given pin where: Td_{IO}(total per pin) = SQRT(Lpkg*Cpkg)
4. Mismatch for Td_{IO} (Td_{IO}Mismatch) is value of Pkg Delay of fastest I/O minus the value of Pkg Delay for slowest I/O.
5. Delta for DQS is Absolute value of ZIO(DQS_t-ZIO(DQS_c) for impedance(Z) or absolute value of TdIO(DQS_t)-TdIO(DQS_c) for delay(Td)
6. Delta for RE is Absolute value of ZIO(RE_t-ZIO(RE_c) for impedance(Z) or absolute value of TdIO(RE_t)-TdIO(RE_c) for

Disposition log

5/18/2015	Erratum captured.

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