ONFI Technical Errata

Errata ID	**019**
Affected Spec Ver.	**ONFI 3.0, 3.1, 3.2, 4.0**
Corrected Spec Ver.	

Submission info

Name	Company	Date
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This errata adjusts ICC1, ICC2, ICC3 and ISBQ values for 3D NAND and NV-DDR3 support. Also, Re-defines random data pattern requirement for ICC2 testing from A5h, AAh, 5Ah, 55h to vendor required random data pattern.

Description of the specification change

Modify 2.12 shown below:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Array read current	ICC1	Refer to Appendix **Error! Reference source not found.**	-	-	~~50~~ 100	mA
Array program current	ICC2		-	-	~~50~~ 100	mA
Array erase current	ICC3		-	-	~~50~~ 100	mA

Table 1 DC and Operating Conditions for raw NAND, measured on Vcc or VccQ rail

Parameter	Symbol	Test Conditions		Min	Typ	Max	Units
Array read current	ICC1	Refer to Appendix **Error! Reference source not found.**	Per LUN	-	-	~~85~~100	mA
Array program current	ICC2		Per LUN	-	-	~~85~~100	mA
Array erase current	ICC3		Per LUN	-	-	~~85~~100	mA

Table 2 DC and Operating Conditions for EZ NAND, measured on Vcc or VccQ rail

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Standby current 3	ISBQ	CE_n=VccQ-0.2V, WP_n=0V/VccQ	-	-	~~50~~75	µA

Table 3 DC and Operating Conditions for VccQ of 1.8V (NV-DDR), measured on VccQ rail

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Standby current3	ISBQ	CE_n=VccQ-0.2V, WP_n=0V/VccQ	-	-	~~50~~75	µA

Table 4 DC and Operating Conditions for VccQ of 1.8V (NV-DDR2), measured on VccQ rail

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Standby current3	ISBQ	CE_n=VccQ-0.2V, WP_n=0V/VccQ	-	-	~~50~~75	µA

Table 5 DC and Operating Conditions for VccQ of 1.2V (NV-DDR3), measured on VccQ rail

Modify Appendix D shown below:

Parameter	Testing Condition
General conditions	1. Vcc = Vcc(min) to Vcc(max) 2. VccQ = VccQ(min) to VccQ(max) 3. CE_n = 0 V 4. WP_n = VccQ 5. IOUT = 0 mA 6. Measured across operating temperature range 7. N data input or data output cycles, where N is the number of bytes or words in the page 8. No multi-plane operations. 9. Sample a sufficient number of times to remove measurement variability. 10. Sample an equal ratio of page types that exist in a block. A page type is a group of page addresses and is commonly referred to as upper or lower page (or middle page for 3 bits per cell devices). 11. Choose the first good even/odd block pair beginning at blocks 2-3
Array preconditioning for ICC1, ICC2, and ICC3	The array is preconditioned ~~to match the data input pattern for ICC2.~~ with vendor required random data pattern.
Fixed wait time (no R/B_n polling)	ICC1: tR = tR(max) ICC2: tPROG = tPROG(max) ICC3: tBERS = tBERS(max)

Table 104 Common Testing Conditions for ICC

Parameter	SDR	NV-DDR	NV-DDR2/NV-DDR3
AC Timing Parameters	tWC = tWC(min) tRC = tRC(min) tADL = ~tADL(min) tCCS = ~tCCS(min) tRHW = ~tRHW(min)	tCK = tCK(avg) tADL =~tADL(min) tCCS = ~tCCS(min) tRHW = ~tRHW(min)	tWC = tWC(min) tRC = tRC(avg) tDSC = tDSC(avg) tADL = ~tADL(min) tCCS = ~tCCS(min)
Bus idle data pattern	IO[7:0] = FFh IO[15:0] = FFFFh	DQ[7:0] = FFh	DQ[7:0] = FFh
Repeated data pattern (Used for ~~ICC2~~, ICC4R, ICCQ4R, ICCQ4W and ICC4W)	IO[7:0] = A5h, AAh, 5Ah, 55h IO[15:0] = A5A5h, AAAAh, 5A5Ah, 5555h	DQ[7:0] = A5h, AAh, 5Ah, 55h	DQ[7:0] = A5h, AAh, 5Ah, 55h

NOTES:
1. The value of tCK(avg), tRC(avg), and tDSC(avg) used should be the minimum value of the timing modes supported for the device. The NV-DDR, NV-DDR2, and NV-DDR3 timing modes supported by the device are indicated in the parameter page.
2. ICCQ4R testing is performed with default drive strength setting.

Table 105 Data Interface Specific Testing Conditions for ICC

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Disposition log

7/18/2016	Erratum captured.

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