

Technical Change Notice (TCN)

Purpose:

Due to the evolution of NAND flash generation, 42nm will be phased in to replace the current 60nm; meanwhile, new controller will be implemented on UDMIII. In order for better understanding about the changes, the following contents will be focused on:

- Technical comparison between UDMII and UDMIII based on the *component level* and *controller level*.

Component Level

Key Parameters in Design & Feature Specification

The following contents are the comparison tables between 60nm and 42nm in 1G / 2G / 4G bit NAND flash.

<1G bit>

Item		60nm	42nm
Cell Size		0.0189819 um ²	0.01091um ²
Chip Size		9,014um x 6,779um	6,783 x 6,346um
Vcc		2.7~3.6V	2.7~3.6V
Operating Characteristics	Read	Max 30mA	Max 35mA
	Program		
	Erase		
P/E Endurance		100K cycle (1-bit ECC)	100K cycle (1-bit ECC)
Read EDC Status		N/A	N/A
Erase time		Max. 10ms	Max. 10ms

<2G bit>

Item		60nm	42nm
Cell Size		0.0189819 um ²	0.01091um ²
Chip Size		9,014um x 6,779um	6,783 x 6,346um
Vcc		2.7~3.6V	2.7~3.6V
Operating Characteristics	Read	Max 30mA	Max 35mA
	Program		
	Erase		
P/E Endurance		100K cycle (1-bit ECC)	100K cycle (1-bit ECC)
Read EDC Status		N/A	N/A
Erase time		Max. 10ms	Max. 10ms

<4G bit>

Item		60nm	42nm
Cell Size		0.0189819 um ²	0.00923um ²
Chip Size		8,914um x 11,444um	4,176.8um x 16,146um
Vcc		2.7~3.6V	2.7~3.6V
Operating Characteristics	Read	Max 30mA	Max 35mA
	Program		
	Erase		
P/E Endurance		100K cycle (1-bit ECC)	100K cycle (1-bit ECC)
Read EDC Status		N/A	N/A
Erase time		Max. 10ms	Max. 10ms

When the NAND has changed from 60nm to 42nm, there are the changes on cell and chip size and the operating characteristics with 5mA increased. On the SSD level, there will be no impacts for these changes.

Controller Level

Feature Specification

The following contents are the comparison tables between UDMII and UDMIII.

Module Name		UDM II	UDM III
Controller		UCP332CLFG	UN86CT0
Interface		USB2.0	USB2.0
# of Channel		Single / Dual	Single / Dual
Support Flash Page size		2 / 4	2 / 4 / 8
Performance *	sustained read	Up to 30 MB/s	Up to 30 MB/s
	sustained write	Up to 20 MB/s	Up to 20 MB/s
Power Consumption *	Active	110	135
	Idle	45	51
ECC Engine		6/12 bit correction per 1024 bytes	14/28 bit correction per 1024 bytes
Wear-leveling Technique		Dynamic / Static	Dynamic / Static
Security Feature	AES Encryption **	No	128bit/256bit
	Quick Erase **	No	Yes
	Destroy **	No	Yes
	Write Protect	Yes	Yes

*Performance and power consumption vary with flash configurations, please refer to the performance and electrical section in the product specification.

**Option Features

Summary

1. According to the data above, it has shown the full compatibility on both host-to-controller and controller-to-NAND to the change of NAND flash process.
2. For the application of data protect level, UDMIII is more reliable than UDMII.