



PL2732 Single-Chip SuperSpeed USB 3.0 eMMC Storage Controller

Product Test Summary Guide

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Prolific Technology Inc.

7F, No. 48, Sec. 3, Nan Kang Rd.
Nan Kang, Taipei 115, Taiwan, R.O.C.
Telephone: +886-2-2654-6363
Fax: +886-2-2654-6161
E-mail: sales@prolific.com.tw
Website: <http://www.prolific.com.tw>

Test by : 胡智翔

CY Hu / Senior Engineer

Approved by : 周春昇

Maninov Chou / Manager

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1. Product Overview

The PL2732 is a single-chip SuperSpeed USB 3.0 eMMC storage controller with protocol engine that provides USB 3.0 to 8-bit eMMC interface for PCs/tablets/smartphones. When plugged into the PC SuperSpeed USB host, the PL2732 activates its USB BOT Mass Storage Class protocol engine and transfers files at USB 3.0 SuperSpeed rate of 5Gbps that pushes the eMMC media up to HS200 performance grade. The PL2732 uses OS built-in USB mass storage drivers so no driver installation is needed for major operating systems like Windows, Mac, Linux, and Android. The PL2732 can be configured as a single LUN USB drive using either one or two storage media. The PL2732 incorporates JBOD capability that provides the flexibility to use two storage media and combine their capacity into one logical drive.

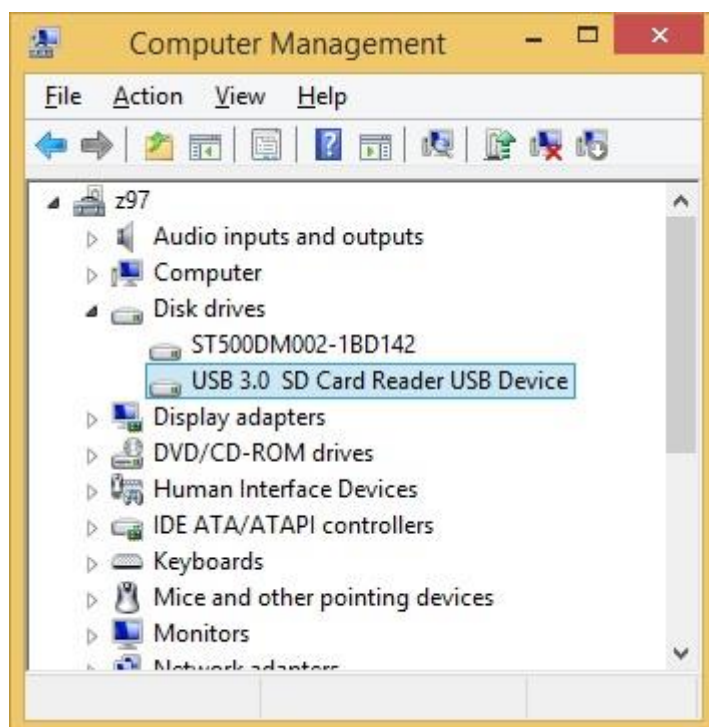
To save BOM cost, the PL2732 integrates both SuperSpeed transceiver and Hi-Speed/Full-speed transceiver. It also integrates power management components including eMMC power regulator and GPIO regulator. It also integrates chip power stability monitors to make sure controller does not enter unknown state when system power is unstable. To maximize system compatibility and to integrate more value-added features, the PL2732 can also be upgraded through commodity SPI flash.

2. USB 3.0 Interface

Test Configuration (Windows 10 X64)	
System	Gigabyte GA Z97-HDC
Chipset	Intel Z97
CPU	Intel(R)Core(TM)i3-4150 CPU@3.5G
Memory	4G
OS	Windows 10 (X64)
USB Host & Driver	Intel Z97 (Driver : 10.0.10586.0)
eMMC Type/Size	Samsung KLMBG4GEND-B031 32GB
Test Program	ATTO Disk Benchmark v2.47 / CrystalDiskMark v3.0.3 / H2

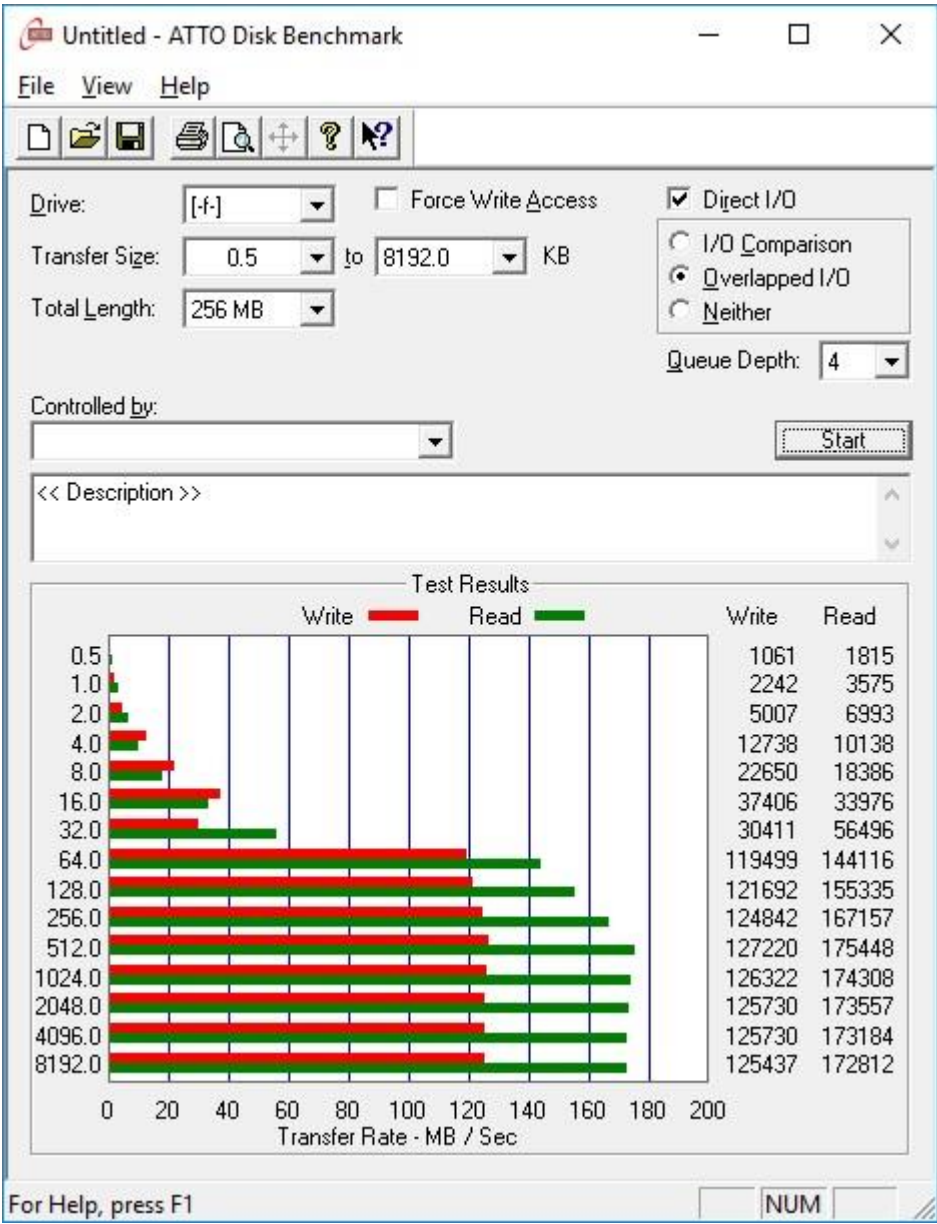
Table 2-1 : Test Configuration (Windows 10 X64)

2.1 Device Manager (View by Connection)

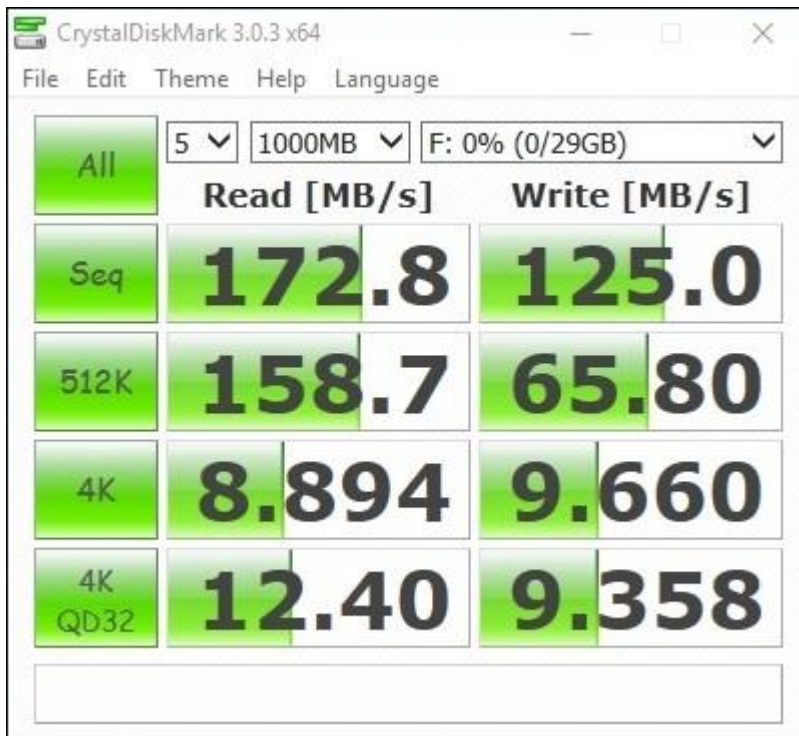


Driver Provider:	Microsoft
Driver Date:	10/29/2015
Driver Version:	10.0.10586.0
Digital Signer:	Microsoft Windows

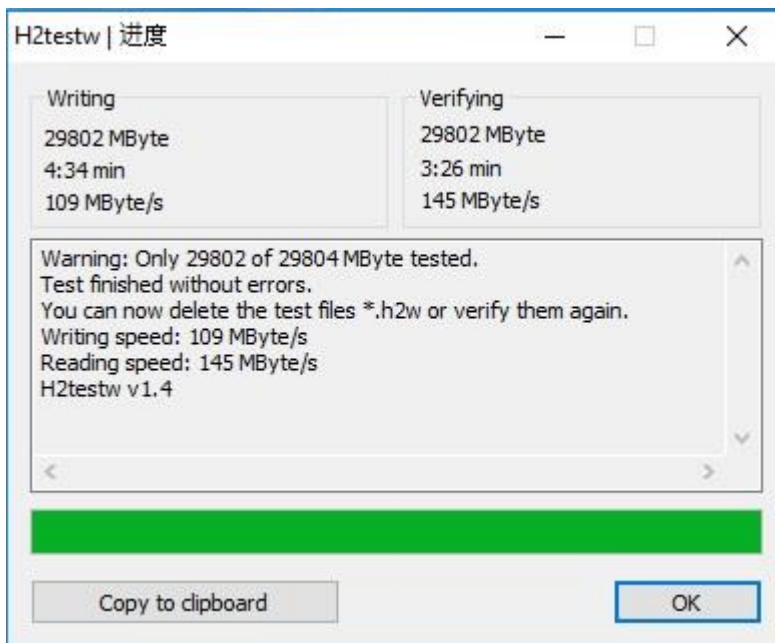
2.2 ATTO Disk Benchmark



2.3 CrystalDiskMark



2.4 H2



3. eMMC Compatibility

Test Configuration (Windows 10 X64)	
System	Gigabyte GA Z97-HDC
Chipset	Intel Z97
CPU	Intel(R)Core(TM)i3-4150 CPU@3.5G
Memory	4G
OS	Windows 10 (X64)
USB Host & Driver	Intel Z97 (Driver : 10.0.10240.16461)
Test Program	ATTO Disk Benchmark v2.47

Table 3-1 : Test Configuration (Windows 10 X64)

eMMC 11.5x13						ATTO Benchmark	
No.	Brand	Type	Size	Spec. Ver.	Speed Mode	Read	Write
1	Samsung	KLMBG4GEND-B031	32GB	V5.0	HS200	168474	119837
2	Samsung	KLMAG2WEPD-B031	16GB	V5.0	HS200	151373	62137
3	Samsung	KLM8G1WEPD-B031	8GB	V5.0	HS200	141281	41361
4	Samsung	KLM8G1GEND-B031	8GB	V5.0	HS200	169182	41361
5	Samsung	KLM8G1WEMB-B031	8GB	V5.0	HS200	118514	6313
6	Samsung	KLM2G1HE3F-B001	2GB	V4.41	HS	44078	9894
7	Samsung	KLM4G1YE4C-B001	4GB	V4.41	HS	44813	6766
8	Samsung	KLMBG8FEAB-B001	32GB	V4.41	HS	44739	39244
9	Samsung	KLMAG2GEAC-B002	16GB	V4.5	HS200	170255	55233
10	Samsung	KLM8G2FE3B-B001	8GB	V4.41	HS	44964	19622
11	Skymedi	SP18A4G751B-0003	4GB	V5.0	HS200	34195	10894
12	Skymedi	SP18A8G861B-0003	8GB	V5.0	HS200	98328	15436
13	Skymedi	SP18AAG862B-0003	16GB	V5.0	HS200	107159	32225
14	Skymedi	SP18ABG864B-0003	32GB	V5.0	HS200	106946	32225
15	SanDisk	SDIN9DW4-32G	32GB	V5.0	HS200	168827	104449
16	SanDisk	SDIN9DW4-16G	16GB	V5.0	HS200	168474	78720
17	SanDisk	SDIN7DP4-32G	32GB	V4.5	HS	44964	41617
18	Kingston	EMMC16G-V100	16GB	V5.0	HS200	88301	32147
19	Kingston	EMMC16G-S100	16GB	V5.0	HS200	132560	67361
20	Kingston	KE4CN2H5A	4GB	V4.5	HS200	87867	12410
21	Micron	MTFC4GMVEA-1M WT	4GB	V4.41	HS	44739	12091

22	Micron	MTFC2GMVEA-0M WT	2GB	V4.41	HS	29305	6763
23	Micron	MTFC4GM2DM-1M WT ES	4GB	V4.5	HS200	131586	14032
24	Micron	MTFC4GMCAM	4GB	V4.5	HS200	96386	14324
25	Micron	MTFC8GLVEA-1M WT	8GB	V4.41	HS	44739	13203
26	Micron	MTFC8GLCDM-1M WT	8GB	V4.51	HS200	97790	14565
27	Micron	MTFC8GLYAM-WT ES	8GB	V4.51	HS200	129055	13822
28	Micron	2KA98JW788	16GB	V4.41	HS	40245	12674
29	Micron	3HA98JWA19	4GB	V4.41	HS	44664	13043
30	Hynix	H26M21001ECR	2GB	V4.3	HS	27616	10493

Table 3-2 : eMMC 11.5x13 Brand and Type

eMMC 12x16						ATTO Benchmark	
No.	Brand	Type	Size	Spec. Ver.	Speed Mode	Read	Write
1	Samsung	KLMAG2GE4A-A001	16GB	V4.41	HS	44739	36226
2	Samsung	KLMAG8DEDD-A101	16GB	V4.41	HS	15471	16978
3	Samsung	KLMBG8FEJA-A001	32GB	V4.41	HS	44739	19636
4	Samsung	KLM8G2FEJA-A002	8GB	V4.41	HS	44813	14113
5	Samsung	KLMAG2GE4A-A001	16GB	V4.41	HS	44813	35743
6	Samsung	KLMAG4FEJA-A003	16GB	V4.41	HS	44664	20744
7	Samsung	KLMAG2GE2A-A001	16GB	V4.5	HS200	167772	48984
8	Samsung	KLMAG2WE4A-A001	16GB	V4.41	HS	44813	13496
9	Samsung	KLM8G1WE4A-A001	8GB	V4.41	HS	44813	30748
10	Samsung	KLM8G2FEJA-A001	8GB	V4.41	HS	44813	16580
11	KINGMAX	KEC08GSA-SACAM	8GB	V4.41	HS	43577	8328
12	Toshiba	THGBM4G7D2GBAIE	16GB	V4.41	HS	44664	23485
13	Toshiba	THGBM4G8D4GBAIE	32GB	V4.41	HS	44813	25687
14	SanDisk	SDIN5C2-16G	16GB	V4.41	HS	44739	22595
15	Kingston	KE4CN3K6A	8GB	V4.5	HS200	86175	12596
16	Kingston	KE4CN4K6A	16GB	V4.5	HS200	148306	24740
17	Hynix	H26M52003EQR	16GB	V4.51	HS200	129992	25157
18	Hynix	H26M52002EQR	16GB	V4.41	HS	43436	20664
19	BiWIN	BWCMG-16G	16GB	V4.41	HS	43648	8406
20	Micron	8GA18JW203	1GB	V4.41	25MHz	24010	4716
21	Micron	MTFC16GLTDV-WT	16GB	V4.41	HS	44223	13858
22	MemoRight	MREMK3A004	4GB	V4.5	HS200	47764	6069
23	Elpida	TYAOHM13157DRC	16GB	V4.51	HS200	159783	20032

Table 3-3 : eMMC 12x16 Brand and Type

eMMC 14x18						ATTO Benchmark	
No.	Brand	Type	Size	Spec. Ver.	Speed Mode	Read	Write
1	Micron	MTFC16GJVEC-WT	16GB	V4.41	HS	44369	22463
2	Hynix	H26M52002CKR	16GB	V4.41	HS	43296	21153
3	Toshiba	THGBM1G7D4EBA12	16GB	V4.3	HS	26683	22020

Table 3-4 : eMMC 14x18 Brand and Type

4. USB 3.0 Host & System Compatibility Test

4.1 Windows OS Platform

No.	Test Items
1	DUT Detection – Device Manager, Disk Management, My Computer
2	Partition - Quick Format – Benchmark Test
3	Copy/Compare 4GB Files/Folder
4	Power Cycle Test 5X – Plug USB cable and do Cold Boot, Warm Boot, DUT Power On/OFF, Hotplug USB Cable, Safe Removal, Standby (S1/S3), Hibernate (S4)
5	Abnormal Test (While Copy Files do Unplug USB cable, Standby/Hibernate, and Power Off DUT) – DUT should still be detected and work properly after doing Abnormal Test
6	Plug to USB 2.0 root port and do copy/compare test

Table 4-1 : Test Configuration (Windows 10 X64)

System + OS + Host Compatibility List			
No.	System	Host Controller	OS
1	Asus Z97-C Motherboard Intel(R)Core(TM)i3-4150 CPU@3.5G 4GB RAM Memory Intel Z97 Chipset	Asmedia USB 3.1 xHCI Host On-board Chipset Driver v10.0.10240.16461	Win10 x64 Win10 x86
2	GA-F2A88X-D3H Motherboard AMD A10-7700K APU with Radeon(tm)R7 Graphics 3.4G 4GB RAM Memory AMD A88X Chipset	AMD USB 3.0 xHCI Host On-board Chipset Driver v10.0.10240.16461	Win10 x64 Win10 x86
3	Asus Z97-C Motherboard Intel(R)Core(TM)i3-4150 CPU@3.5G 4GB RAM Memory Intel Z97 Chipset	Intel USB 3.0 xHCI Host On-board Chipset Driver v10.0.10240.16461	Win10 x64 Win10 x86

4	Asus Z87-PRO Motherboard Intel(R)Core(TM)i3-4130 CPU@3.4G 4GB RAM Memory Intel Z87 Chipset	Intel USB 3.0 xHCI Host On-board Chipset Driver v10.0.10240.16461	Win10 x64 Win10 x86
5	Asus P8H77 Motherboard Intel Core i3 3.30GHz CPU 4GB RAM Memory Intel H77 Chipset	Intel USB 3.0 xHCI Host On-board Chipset Driver v10.0.10240.16461	Win10 x64 Win10 x86
6	ASUS P8H67 Motherboard Intel(R) core(TM)i3-2120 CPU @ 3.30G 3.30G / 4GB RAM Intel H67 Chipset	NEC USB 3.0 Host PCIe Host Card μPD720202A 2-Ports Driver v10.0.10240.16461	Win10 x64 Win10 x86
7	ASUS P8H67 Motherboard Intel(R) core(TM)i3-2120 CPU @ 3.30G 3.30G / 4GB RAM Intel H67 Chipset	NEC USB 3.0 Host On-board NEC Chip μPD720201 2-Ports Driver v10.0.10240.16461	Win10 x64 Win10 x86
8	ASUS P8H67 Motherboard Intel(R) core(TM)i3-2120 CPU @ 3.30G 3.30G / 4GB RAM Intel H67 Chipset	NEC USB 3.0 Host On-board NEC Chip μPD720200 2-Ports Driver v10.0.10240.16461	Win10 x64 Win10 x86
9	ASUS M5A97 Motherboard AMD FX(tm)-4100 Quad-Core Processor 3.60G / 4GB RAM SB950 Chipset	Asmedia 1042 USB 3.0 Host On-board Chipset Driver v10.0.10240.16461	Win10 x64 Win10 x86
10	ASUS P8H67 Motherboard Intel(R) core(TM)i3-2120 CPU @ 3.30G 3.30G / 4GB RAM Intel H67 Chipset	Fresco Logic USB 3.0 PCIe Host Card (GEN2) FL1100 4-Port Driver v10.0.10240.16461	Win10 x64 Win10 x86
11	ASUS M5A97 Motherboard AMD FX(tm)-4100 Quad-Core Processor 3.60G / 4GB RAM SB950 Chipset	Etron USB 3.0 Host PCIe Host Card (GEN2) EJ198A 2-Ports Driver v10.0.10240.16461	Win10 x64 Win10 x86

12	ASUS M5A97 Motherboard AMD FX(tm)-4100 Quad-Core Processor 3.60G / 4GB RAM SB950 Chipset	Etron USB 3.0 Host PCIe Host Card (GEN2) EJ188A 2-Ports Driver v10.0.10240.16461	Win10 x64 Win10 x86
13	ASUS M5A97 Motherboard AMD FX(tm)-4100 Quad-Core Processor 3.60G / 4GB RAM SB950 Chipset	Etron USB 3.0 Host PCIe Host Card (GEN2) EJ168A 2-Ports Driver v10.0.10240.16461	Win10 x64 Win10 x86
14	GA-H61M-USB3H Motherboard Intel(R)Core(TM)i3-3240 CPU@3.4G / 4GB RAM Intel H61 Chipset	Via 805 USB 3.0 Host On-board Chipset Driver v10.0.10240.16461	Win10 x64 Win10 x86
15	ASUS P8H61M-LX Motherboard Intel(R)Core(TM)i3-2100 CPU@3.1G / 4GB RAM Intel H61 Chipset	TI USB 3.0 Host PCIe Host Card (GEN4) TI 35I 4-Ports Driver v10.0.10240.16461	Win10 x64 Win10 x86
16	GA-F2A88X-D3H Motherboard AMD A10-7700K APU with Radeon(tm)R7 Graphics 3.4G 4GB RAM Memory AMD A88X Chipset	AMD USB 3.0 xHCI Host On-board Chipset Driver v6.3.9600.17393	Win8.1 x64 Win8.1 x86
17	Asus Z97-C Motherboard Intel(R)Core(TM)i3-4150 CPU@3.5G 4GB RAM Memory Intel Z97 Chipset	Intel USB 3.0 xHCI Host On-board Chipset Driver v6.3.9600.17393	Win8.1 x64 Win8.1 x86
18	Asus Z87-PRO Motherboard Intel(R)Core(TM)i3-4130 CPU@3.4G 4GB RAM Memory Intel Z87 Chipset	Intel USB 3.0 xHCI Host On-board Chipset Driver v6.3.9600.17393	Win8.1 x64 Win8.1 x86
19	Asus P8H77 Motherboard Intel Core i3 3.30GHz CPU 4GB RAM Memory Intel H77 Chipset	Intel USB 3.0 xHCI Host On-board Chipset Driver v6.3.9600.17393	Win8.1 x64 Win8.1 x86

20	ASUS P8H67 Motherboard Intel(R) core(TM)i3-2120 CPU @ 3.30G 3.30G / 4GB RAM Intel H67 Chipset	NEC USB 3.0 Host PCIe Host Card μPD720202A 2-Ports Driver v6.3.9600.17393	Win8.1 x64 Win8.1 x86
21	ASUS P8H67 Motherboard Intel(R) core(TM)i3-2120 CPU @ 3.30G 3.30G / 4GB RAM Intel H67 Chipset	NEC USB 3.0 Host On-board NEC Chip μPD720201 2-Ports Driver v6.3.9600.17393	Win8.1 x64 Win8.1 x86
22	ASUS P8H67 Motherboard Intel(R) core(TM)i3-2120 CPU @ 3.30G 3.30G / 4GB RAM Intel H67 Chipset	NEC USB 3.0 Host On-board NEC Chip μPD720200 2-Ports Driver v6.3.9600.17393	Win8.1 x64 Win8.1 x86
23	ASUS M5A97 Motherboard AMD FX(tm)-4100 Quad-Core Processor 3.60G / 4GB RAM SB950 Chipset	Asmedia 1042 USB 3.0 Host On-board Chipset Driver v6.3.9600.17393	Win8.1 x64 Win8.1 x86
24	ASUS P8H67 Motherboard Intel(R) core(TM)i3-2120 CPU @ 3.30G 3.30G / 4GB RAM Intel H67 Chipset	Fresco Logic USB 3.0 PCIe Host Card (GEN2) FL1100 4-Port Driver v6.3.9600.17393	Win8.1 x64 Win8.1 x86
25	ASUS M5A97 Motherboard AMD FX(tm)-4100 Quad-Core Processor 3.60G / 4GB RAM SB950 Chipset	Etron USB 3.0 Host PCIe Host Card (GEN2) EJ198A 2-Ports Driver v6.3.9600.17393	Win8.1 x64 Win8.1 x86
26	ASUS M5A97 Motherboard AMD FX(tm)-4100 Quad-Core Processor 3.60G / 4GB RAM SB950 Chipset	Etron USB 3.0 Host PCIe Host Card (GEN2) EJ188A 2-Ports Driver v6.3.9600.17393	Win8.1 x64 Win8.1 x86
27	ASUS M5A97 Motherboard AMD FX(tm)-4100 Quad-Core Processor 3.60G / 4GB RAM SB950 Chipset	Etron USB 3.0 Host PCIe Host Card (GEN2) EJ168A 2-Ports Driver v6.3.9600.17393	Win8.1 x64 Win8.1 x86

28	GA-H61M-USB3H Motherboard Intel(R)Core(TM)i3-3240 CPU@3.4G / 4GB RAM Intel H61 Chipset	Via 805 USB 3.0 Host On-board Chipset Driver v6.3.9600.17393	Win8.1 x64 Win8.1 x86
29	ASUS P8H61M-LX Motherboard Intel(R)Core(TM)i3-2100 CPU@3.1G / 4GB RAM Intel H61 Chipset	TI USB 3.0 Host PCIe Host Card (GEN4) TI 35I 4-Ports Driver v6.3.9600.17393	Win8.1 x64 Win8.1 x86
30	GA-F2A88X-D3H Motherboard AMD A10-7700K APU with Radeon(tm)R7 Graphics 3.4G 4GB RAM Memory AMD A88X Chipset	AMD USB 3.0 xHCI Host On-board Chipset Driver v8.0.915.0	Win 7 x64 SP1 Win 7 x86 SP1
31	Asus Z97-C Motherboard Intel(R)Core(TM)i3-4150 CPU@3.5G 4GB RAM Memory Intel Z97 Chipset	Intel USB 3.0 xHCI Host On-board Chipset Driver v3.0.23.0	Win 7 x64 SP1 Win 7 x86 SP1
32	Asus P8H77 Motherboard Intel Core i3 3.30GHz CPU 4GB RAM Memory Intel H77 Chipset	Intel USB 3.0 xHCI Host On-board Chipset Driver v3.0.23.0	Win 7 x64 SP1 Win 7 x86 SP1
33	ASUS P8H67 Motherboard Intel(R) core(TM)i3-2120 CPU @ 3.30G 3.30G / 4GB RAM Intel H67 Chipset	NEC USB 3.0 Host PCIe Host Card μPD720202A 2-Ports Driver v3.0.23.0	Win 7 x64 SP1 Win 7 x86 SP1
34	ASUS P8H67 Motherboard Intel(R) core(TM)i3-2120 CPU @ 3.30G 3.30G / 4GB RAM Intel H67 Chipset	NEC USB 3.0 Host On-board NEC Chip μPD720201 2-Ports Driver v3.0.23.0	Win 7 x64 SP1 Win 7 x86 SP1
35	ASUS P8H67 Motherboard Intel(R) core(TM)i3-2120 CPU @ 3.30G 3.30G / 4GB RAM Intel H67 Chipset	NEC USB 3.0 Host On-board NEC Chip μPD720200 2-Ports Driver v2.1.39	Win 7 x64 SP1 Win 7 x86 SP1

36	ASUS M5A97 Motherboard AMD FX(tm)-4100 Quad-Core Processor 3.60G / 4GB RAM SB950 Chipset	Asmedia 1042 USB 3.0 Host On-board Chipset Driver v1.16.24	Win 7 x64 SP1 Win 7 x86 SP1
37	ASUS P8H67 Motherboard Intel(R) core(TM)i3-2120 CPU @ 3.30G 3.30G / 4GB RAM Intel H67 Chipset	Fresco Logic USB 3.0 PCIe Host Card (GEN2) FL1100 4-Port Driver v3.5.108.0	Win 7 x64 SP1 Win 7 x86 SP1
38	ASUS M5A97 Motherboard AMD FX(tm)-4100 Quad-Core Processor 3.60G / 4GB RAM SB950 Chipset	Etron USB 3.0 Host PCIe Host Card (GEN2) EJ198A 2-Ports Driver v1.0.0.119	Win 7 x64 SP1 Win 7 x86 SP1
39	ASUS M5A97 Motherboard AMD FX(tm)-4100 Quad-Core Processor 3.60G / 4GB RAM SB950 Chipset	Etron USB 3.0 Host PCIe Host Card (GEN2) EJ188A 2-Ports Driver v1.0.0.119	Win 7 x64 SP1 Win 7 x86 SP1
40	ASUS M5A97 Motherboard AMD FX(tm)-4100 Quad-Core Processor 3.60G / 4GB RAM SB950 Chipset	Etron USB 3.0 Host PCIe Host Card (GEN2) EJ168A 2-Ports Driver v1.0.0.119	Win 7 x64 SP1 Win 7 x86 SP1
41	GA-H61M-USB3H Motherboard Intel(R)Core(TM)i3-3240 CPU@3.4G / 4GB RAM Intel H61 Chipset	Via 805 USB 3.0 Host On-board Chipset Driver v4.90a	Win 7 x64 SP1 Win 7 x86 SP1
42	ASUS P8H61M-LX Motherboard Intel(R)Core(TM)i3-2100 CPU@3.1G / 4GB RAM Intel H61 Chipset	TI USB 3.0 Host PCIe Host Card (GEN4) TI 35I 4-Ports Driver v1.16.4	Win 7 x64 SP1 Win 7 x86 SP1

4.2 Mac OS Platform

Mac Test Configuration	
System	Apple MacBook Air
CPU / RAM	1.3GHz Dual-Core Intel Core i5 processor / 4GB Memory
Chipset	Intel xHCI Chipset
OS	Mac OS X 10.10.5
USB 3.0 Host Controller	Intel xHCI Controller
eMMC Type/Size	Samsung KLMBG4GEND-B031 32GB

Table 4-2 : Test Configuration (Mac)

No.	Test	Test Item	Test Results
1	Enumeration Test	Detect Device Properly (Device Manager)	Pass
		Partition / Format Disk (Disk Management)	Pass
		Quick Format (My Computer)	Pass
2	Benchmark Test	AJA_SystemTest_Mac- Read (MB/sec)	157.3
		AJA_SystemTest_Mac- Write (MB/sec)	66
3	Power Cycle Test	Shutdown 3X	Pass
		Restart 3X	Pass
		Safe Removal 3X	Pass
		Hotplug 3X	Pass
		Standby / Sleep 3X	Pass
		DUT Power Reset 3X	Pass
4	Copy/Compare Test	4GB Files/Folder	Pass
5	Abnormal Test	Unplug cable while copy files	Pass
		Standby while copy files	Pass
		Power off DUT while copy files	Pass

5. Android System Compatibility Test

5.1 Android Platform

No.	Test Items
1	DUT Detection –USB Mass Storage
2	Copy/Compare 4GB Files/Folder
3	Power Cycle Test 5X – Plug USB cable and do Cold Boot, Warm Boot, Hotplug USB Cable, Standby
4	Abnormal Test (While Copy Files do Unplug USB cable, Standby – DUT should still be detected and work properly after doing Abnormal Test)

Table 5-1 : Test Configuration (Android)

System + OS + Host Compatibility List			
No.	System	Host Controller	OS
1	Asus MeMo Pad	USB 2.0 Host	Android 4.1
2	ACER Iconia One 7	USB 2.0 Host	Android 4.4
3	SONY Z3	USB 2.0 Host	Android 5.0.2
4	SONY Z3 Table Compact	USB 2.0 Host	Android 4.4
5	LG G tablet 8.0 V480	USB 2.0 Host	Android 4.4.2
6	LG Nexus 5X	USB 3.0 Host	Android 6.0.1
7	Samsung Galaxy S3	USB 2.0 Host	Android 4.1.1
8	Samsung Galaxy S6	USB 2.0 Host	Android 5.0.2
9	Samsung Galaxy Tab4 7.0	USB 2.0 Host	Android 4.4
10	Samsung Galaxy Note Pro 12.2	USB 2.0 Host	Android 4.4
11	Samsung Galaxy S3	USB 2.0 Host	Android 4.1.1
12	Samsung Galaxy Note 10.1	USB 2.0 Host	Android 4.1.2
13	Huawei Nexus 6P	USB 3.0 Host	Android 6.0

5.2 Linux Platform

No.	Test Items
1	DUT Detection – USB Mass Storage
2	Copy/Compare 4GB Files/Folder
3	Power Cycle Test 5X – Plug USB cable and do Cold Boot, Warm Boot, Hotplug USB Cable, Standby
4	Abnormal Test (While Copy Files do Unplug USB cable, Standby – DUT should still be detected and work properly after doing Abnormal Test)

Table 5-2 : Test Configuration (Android)

System + OS + Host Compatibility List			
No.	System	Host Controller	OS
1	ECS-MCP73T-M2 Motherboard Intel(R) Celerom(R) CPU 3.06G 3.07G / 2GB RAM Nvidia 630i	USB 2.0 Host	Ubuntu 14.04.1

6. USB Command Verifier Test & Interoperability Test

Test Configuration (Windows 8.1 X64)	
System	DELL XPS
Chipset	Intel Z87
CPU	Intel(R)Core(TM)i7-4770 CPU@3.4G
Memory	4G
OS	Windows 8.1 (X64)
USB Host & Driver Verison	Intel Z87
Test Program	USB20CV 1.4.16.2 、USB30CV 2.0.3.3

Table 6-1 : Test Configuration (Windows 8.1 X64)

No.	Test Category	Test Items	Results
1	Frameworks Test (USB30CV) Chapter 9 Test	Super-Speed(USB 3.0) - SS device behind Root Port	Pass
		Super-Speed(USB 3.0) - SS device behind SS Hub	Pass
		High-Speed(USB 2.0) - SS device under High-Speed	Pass
		Full-Speed(USB 2.0) - SS device under Full-Speed	Pass
2	Frameworks Test (USB20CV) Chapter 9 Test	High-Speed(USB 2.0) - SS device behind High-Speed Hub	Pass
		Full-Speed(USB 2.0) - SS device behind Full-Speed Hub	Pass
3	Power Current Test (Super Speed)	Unconfiguration Power (X <=150mA)	Pass
		U0 Configuration Power (High power:<=900mA, Lower Power:X<=150mA)	Pass
		U0 Operation Power (High power:<=900mA, Lower Power:X<=150mA)	Pass
		U1 Power	Pass
		U2 Power	Pass
		U3 Power (X<=2.5mA)	Pass
4	Power Current Test (High Speed)	Operating Power (High power:<=500mA, Lower Power:X<=100mA)	Pass
		Unconfiguration Power (X <=100mA)	Pass
		Configuration Power (High power:<=500mA, Lower Power:X<=100mA)	Pass

		Suspend Mode Power with remote wake up	Pass
		Suspend Mode Power without remote wake up ($X \leq 2.5\text{mA}$)	Pass
		Powered' State Suspend Mode Power ($\leq 2.5\text{mA}$)	Pass
5	Power Current Test (Full Speed)	Operating Power (High power: $\leq 500\text{mA}$, Lower Power: $X \leq 100\text{mA}$)	Pass
		Unconfiguration Power ($X \leq 100\text{mA}$)	Pass
		Configuration Power (High power: $\leq 500\text{mA}$, Lower Power: $X \leq 100\text{mA}$)	Pass
		Suspend Mode Power with remote wake up	Pass
		Suspend Mode Power without remote wake up ($X \leq 2.5\text{mA}$)	Pass
		Powered' State Suspend Mode Power ($\leq 2.5\text{mA}$)	Pass

Table 6-2 : Test Item

7. USB 3.0 Link Layer Compliance test

No	Test Category	Test Items	Test Results
1	PL2732 Test	Ellisys USB Compliance	Pass
2		LeCroy USB Compliance	Pass

7.1 Ellisys

Test Configuration (Windows 7 X86)	
System	Asus P8Z97
Chipset	Intel Z97
CPU	Intel(R)Core(TM)i3-4150 CPU@3.5G
Memory	4G
OS	Windows 7 (X86)
USB Speed	USB 3.0
Test Program (Ellisys)	Ellisys USB 3.0 Examiner Version: 2.0.5723 Ellisys USB 3.0 Analyzer Version: 2.0.4932

1	Ellisys	TD.6.1 Lane Polarity Inversion Test - Testing Upstream Port (Device)	Pass
2		TD.6.2 Skip Test - Testing Upstream Port (Device)	Pass
3		TD.6.3 Elasticity Buffer Test - Testing Upstream Port (Device)	Pass
4		TD.6.4 LFPS Frequency Test - Testing Upstream Port (Device)	Pass
5		TD.6.4 LFPS Frequency Test - Testing Upstream Port (Device)	Pass
6		TD.6.5 Polling.LFPS Duration Test - Testing Upstream Port (Device)	Pass
7		TD.7.1 Link Bring Up Test - Testing Upstream Port (Device)	Pass
8		TD.7.2 Link Command Framing Test - Testing Upstream Port (Device)	Pass
9		TD.7.3 Link Command CRC Test - Testing Upstream Port (Device)	Pass
10		TD.7.4 Invalid Link Command Test - Testing Upstream Port (Device)	Pass
11		TD.7.5 Header Packet Framing Test - Testing Upstream Port (Device)	Pass
12		TD.7.6 Data Payload Framing Test - Testing Upstream Port (Device)	Pass
13		TD.7.7 RX Header Retransmission Test - Testing Upstream Port (Device)	Pass
14		TD.7.8 TX Header Retransmission Test - Testing Upstream Port (Device)	Pass
15		TD.7.9 PENDING_HP_TIMER Deadline Test - Testing Upstream Port (Device)	Pass
16		TD.7.10 CREDIT_HP_TIMER Deadline Test - Testing Upstream Port (Device)	Pass
17		TD.7.11 PENDING_HP_TIMER Timeout Test - Testing Upstream Port (Device)	Pass
18		TD.7.12 CREDIT_HP_TIMER Timeout Test - Testing Upstream Port (Device)	Pass
19		TD.7.13 Wrong Header Sequence Test - Testing Upstream Port (Device)	Pass
20		TD.7.14 Wrong LGOOD_N Sequence Test - Testing Upstream Port (Device)	Pass
21		TD.7.15 Wrong LCRD_X Sequence Test - Testing Upstream Port (Device)	Pass
22		TD.7.16 Link Command Missing Test - Testing Upstream Port (Device)	Pass
23		TD.7.17 tPortConfiguration Timeout Test - Testing Upstream Port (Device)	Pass
24		TD.7.22 PM_ENTRY_TIMER Timeout Test - Testing Upstream Port (Device)	Pass
25		TD.7.23 Accepted U1 Transaction Test - Testing Upstream Port (Device)	Pass
26		TD.7.24 Accepted U2 Transaction Test - Testing Upstream Port (Device)	Pass
27		TD.7.25 Accepted U3 Transaction Test - Testing Upstream Port (Device)	Pass
28		TD.7.26 U0 to Recovery Transition Test - Testing Upstream Port (Device)	Pass
29		TD.7.27 Hot Reset in Polling Test - Testing Upstream Port (Device)	Pass
30		TD.7.28 Hot Reset in U0 Test - Testing Upstream Port (Device)	Pass
31		TD.7.30 Recovery on 3 Failed RX HP Test - Testing Upstream Port (Device)	Pass
32		TD.7.33 Exit Compliance Mode Test - Testing Upstream Port (Device)	Pass
33		TD.7.37 Packet Pending Test - Testing Upstream Port (Device)	Pass
34		TD.7.38 Port Capability Tiebreaker Test - Testing Upstream Port (Device)	Pass

Table 7-1 : Test Configuration (Windows 7 X86)

7.2 LeCroy

Test Configuration (Windows 8.1 X64)	
System	Asus P8Z97
Chipset	Intel Z97
CPU	Intel(R)Core(TM)i3-4150 CPU@3.5G
Memory	4G
OS	Windows 8.1 (X64)
USB Speed	USB 3.0
Test Program(LeCroy)	Lecroy USB Compliance Suite Version: 2.70 Build 0373 Lecroy USB Protocol Suite Version: 7.24 Build 2137

1	LeCroy	TD.6.1.1 Lane Polarity Inversion Test (No Invert)	Pass
2		TD.6.1 Lane Polarity Inversion Test	Pass
3		TD.6.2 Skip Test	Pass
4		TD.6.3 Elasticity Buffer Test	Pass
5		TD.6.3 Elasticity Buffer Test	Pass
6		TD.6.5 Polling.LFPS Duration Test	Pass
7		TD.6.6 SCD Duration Test	N/A
8		TD.6.7 PWM Duration Test	N/A
9		TD.7.01 Link Bring-up Test (Subtest 1)	Pass
10		TD.7.02 Link Bring-up Test (Subtest 2)	N/A
11		TD.7.03 Link Bring-up Test (Subtest 3)	N/A
12		TD.7.04 Link Bring-up Test (Subtest 4)	N/A
13		TD.7.02 Link Commands Framings Robustness Test	Pass
14		TD.7.03 Link Commands CRC-5 Robustness Test	Pass
15		TD.7.04 Invalid Link Commands Test	Pass
16		TD.7.05 Header Packet Framing Robustness Test	Pass
17		TD.7.06 Data Payload Packet Framing Robustness Test	Pass
18		TD.7.07 RX Header Packet Retransmission Test	Pass
19		TD.7.08 TX Header Packet Retransmission Test	Pass
20		TD.7.09 PENDING_HP_TIMER Deadline Test	Pass
21		TD.7.10 CREDIT_HP_TIMER Deadline Test	Pass
22		TD.7.11 PENDING_HP_TIMER Timeout Test	Pass
23		TD.7.12 CREDIT_HP_TIMER Timeout Test	Pass
24		TD.7.13 Wrong Header Sequence Test	Pass
25		TD.7.14 Wrong LGOOD_N Sequence Test	Pass
26		TD.7.15 Wrong LCRD_X Sequence Test	Pass
27		TD.7.16 Link Command Missing Test	Pass
28		TD.7.17 tPortConfiguration Time Timeout Test	Pass
29		TD.7.22 PM_ENTRY_TIMER Timeout Test	Pass
30		TD.7.23 Accepted Power Management Transaction for U1 Test	Pass
31		TD.7.24 Accepted Power Management Transaction for U2 Test	Pass
32		TD.7.25 Accepted Power Management Transaction for U3 Test	Pass
33		TD.7.26 Transition to U0 from Recovery Test	Pass
34		TD.7.27 Hot Reset Detection in Polling Test	Pass
35		TD.7.28 Hot Reset Detection in U0 Test	Pass
36		TD.7.30 Recovery on three consecutive failed RX Header Packets Test	Pass
37		TD.7.33 Exit Compliance Mode Test	Pass
38		TD.7.37 Packet Pending Test	Pass
39		TD.7.38 Port Capability Tiebreaker Test	Pass

Table 7-2 : Test Configuration (Windows 8.1 X64)

8. SPI Flash Support List

Company	Size	Result
ATMEL	AT25F512AN 512K (1 bit)	Pass
MXIC	MX25L5121EMC-20G 512K (1 bit)	Pass
MXIC	MX25L1021EMC-20G 1M (1 bit)	Pass
MXIC	MX25L8036EM21-08G 8M (4 bit)	Pass
Chingis	Pm25LD256C 256K (2 bit)	Pass
Chingis	Pm25LQ032C 32M (4 bit)	Pass
Winbond	W25X40CL 4M (2 bit)	Pass
Winbond	W25Q128FV 128M (4 bit)	Pass
AMIC	A25LQ32AM-F/G 32M (4 bit)	Pass
ENO	EN25QH16 16M (4 bit)	Pass
ATMEL	AT25DQ321 32M (4 bit)	Pass
ATMEL	AT25DF321A 32M (1 bit)	Pass
GigaDevice	GD25Q16BSIGR 16M (4 bit)	Pass
Microchip	SST25VF064C 64M (2 bit)	Pass
港宏電子	KH25L5121EMC-20G 512K (1 bit)	Pass

Table 8-1 : SPI Support Type