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MM325S USB Flash Disk

Version:1.0 (2008/03/24)

1.Introduction

MM325S USB Flash Disk were made by “Abomem Technology Corporation” in Taiwan. It uses SMI SM325AC Controller. It is suitable for the usage of data storage memory medium for PC or any other electric equipment. This USB pen drive is equipped with 128/256/512/1024/2048/4096/8192 Mega byte Flash memory. By using this USB pen drive it is possible to operate good performance for the system which have USB slots.

2. Controller Description

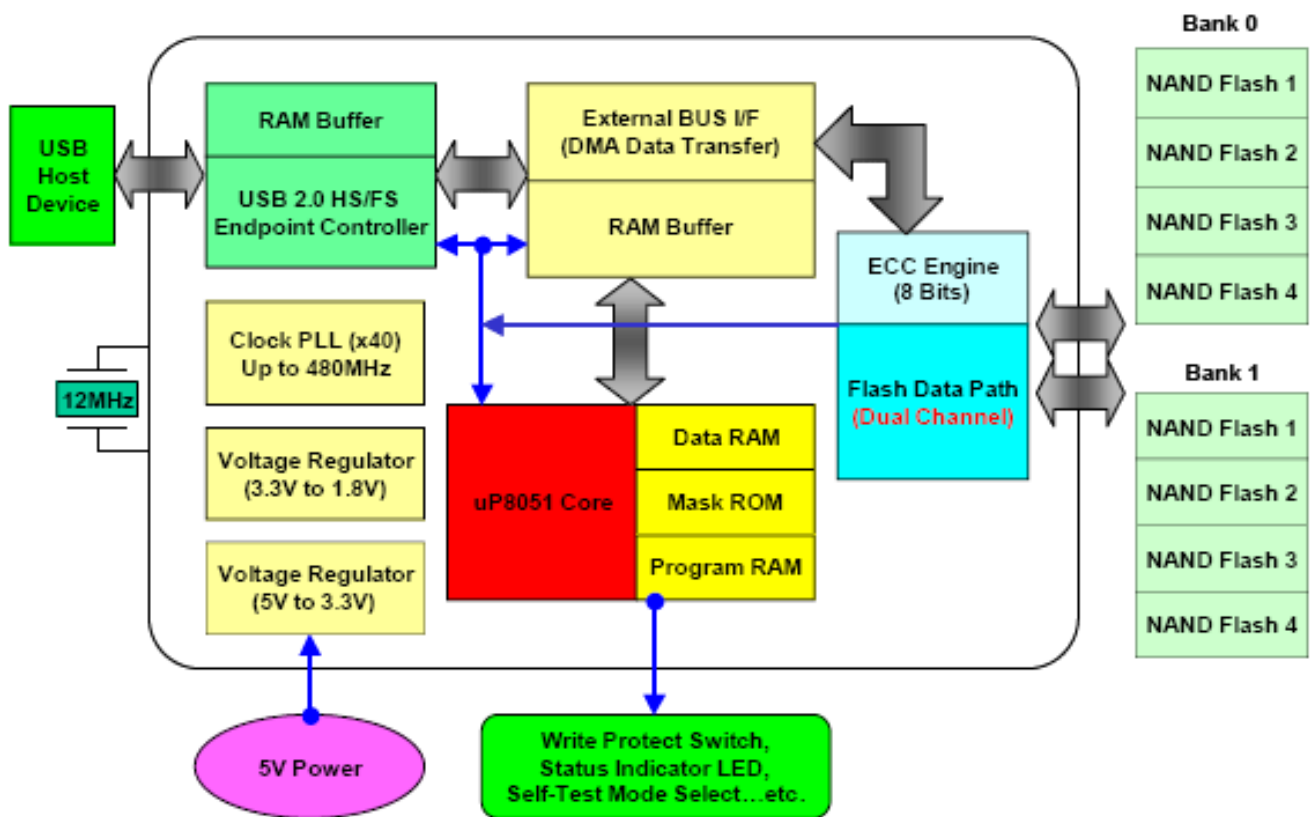
SM325 is the latest USB Flash Disk controller with highly compatibility, and best performance intended for supporting Dual-Channel SLC & MLC NAND type Flash memory in one chip. Based on 0.16um fabricated technology and low power consumption consideration, SM325 complies with USB power specification ver.2.0 for bus-powered devices. For USB2.0 Flash Disk application, SM325 supports high capacity up to 8 data Flash banks, “Write Protect” function, PC boot-up from USB2.0 Flash Disk, Password protection, and Secured Partitioning functions. SM325 controller also delivers extremely high data transfer rate and correct data through reliable 8-bit ECC engine for the coverage of the MLC flash read/write disturbance. By integrating 5V to 3.3V regulator and Power-on-Rest components, it will help customers to save overall cost. SM325 is available with 48pins and 64pins QFP package with a manufacturing-ready turnkey solution now.

3. Features

- ✚ Completes USB specification ver.2.0 compatibility
- ✚ Complies with USB Mass Storage Class specification ver.1.0
- ✚ Bulk Only transport protocol
- ✚ Complies with USB power specifications for bus-powered devices
- ✚ Operating system supported: Windows XP/2000/Me/98/98SE, Mac OS 9.x and above, Linux Kernel 2.4 and above.
- ✚ ISP (In System Programming) firmware update capability.
- ✚ Supports dual channel for Flash memory, averaged data transfer rate up to 32* MB/sec
- ✚ Compatible with SLC/MLC NAND type Flash and up to 8 banks
- ✚ Supports MLC Flash Memory with 8 bits/512B ECC engine.
- ✚ Supports VID, PID, serial number & vender information update
- ✚ Provides LED indicator when USB Flash Disk is in Ready/Working mode
- ✚ Supports “Write Protect” security function to protect data in UFD
- ✚ Supports suspend and wake-up resume
- ✚ Integrated 80C51 compatible 8-bit microprocessor with enhanced feature
- ✚ 12MHz crystal driver circuit
- ✚ Fabricated in 0.16um CMOS process
- ✚ 1.8 Volts low power core operation
- ✚ Operates on a single power supply (Vdd = 5.0V)
- ✚ Available in LQFP 48/64-pin (9x9mm including pads) package

*This figure may vary on different platform.

4. Function Block Diagram



5. Electrical Characteristics

Absolute Maximum Ratings

| | |
|---|----------------|
| Operating Temperature Range | 0°C to +70°C |
| Storage Temperature Range | -55o to +150°C |
| Lead Temperature Range (solder reflow max. 260°C) | +325°C |
| Positive Voltage on any pin, with respect to Ground | +5.5V |
| Negative Voltage on any pin, with respect to Ground | -0.3V |
| Maximum VDDU, VDD_18VI | +2.0V |
| Maximum VD33P, VDD_33VI | +3.6V |

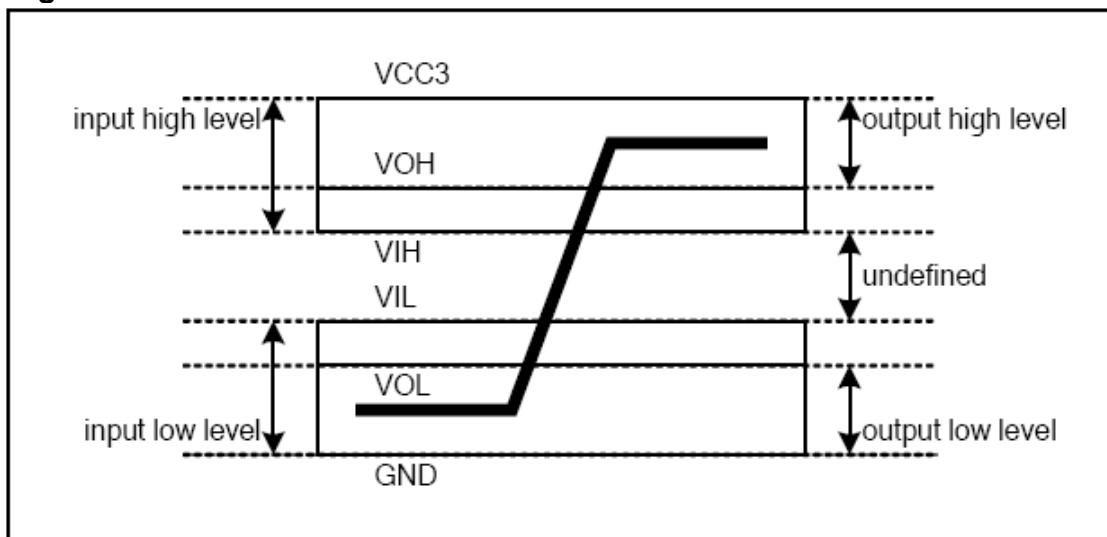
*Stresses above the specified parameters could cause permanent damage to the device. This is a stress rating only and functional operation of the device at any other condition above those indicated in the operation sections of this specification is not implied. of this specification is not implied.

AC/DC characteristics

General DC Characteristics

| Parameter | Symbol | Min. | Max. | Unit | Remark |
|----------------------------|--------|------|------|------|--------------------|
| Peak voltage on all lines | | -0.5 | 3.6 | V | Except VCC5V input |
| All input leakage current | | -10 | 10 | uA | |
| All output leakage current | | -10 | 10 | uA | |
| Supply voltage | VCC3 | 2.7 | 3.6 | V | |

Bus Signal Level



| Parameter | Symbol | Min. | Max. | Unit | Remark |
|---------------------|--------|------|------|------|--------|
| Output High voltage | VOH | 2.4 | | V | |
| Output Low voltage | VOL | | 0.4 | V | |
| Input High voltage | VIH | 2.0 | | V | |
| Input Low voltage | VIL | | 0.8 | V | |

Bus Signal Line Loading

| Parameter | Symbol | Min. | Max. | Unit | Remark |
|----------------------|--------|------|------|------|--------|
| Bus line capacitance | CL | | 20 | pF | |

Internal Regulator (5.0V to 3.3V):**Electrical characteristics:**

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|---------|--------------------------|-----------|------|------|------|------|
| VDD5I | Analog supply voltage | | 3.0 | 5.0 | 5.5 | V |
| VDD33O | Regulated output voltage | VBUS=5.0V | 3.15 | 3.3 | 3.45 | V |
| ISTB | Stand-by current | No Load | | 25 | 35 | uA |
| Ioutput | Output driving current | | | 300 | 400 | mA |

Note: The regulator output is @100mA condition.

Internal Regulator (3.3V to 1.8V):**Electrical characteristics:**

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|---------|--------------------------|----------------------|------|------|------|------|
| VDD33I | Analog supply voltage | | 3.0 | 3.3 | 3.6 | V |
| VDD18O | Regulated output voltage | V33=3.3V Cload=4.7uF | 1.75 | 1.8 | 1.85 | V |
| ISTB | Stand-by current | No Load | | 25 | 35 | uA |
| Ioutput | Output driving current | | | 70 | 100 | mA |

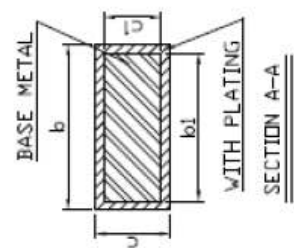
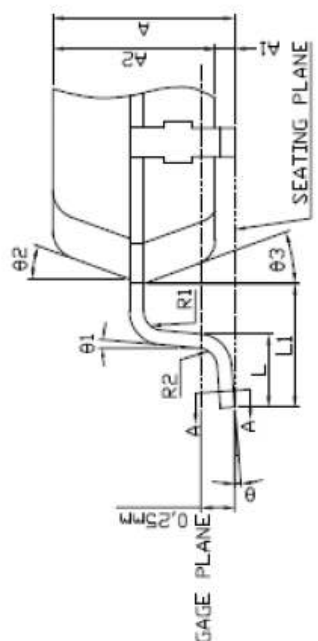
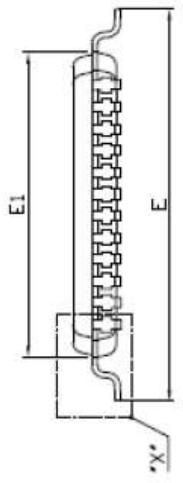
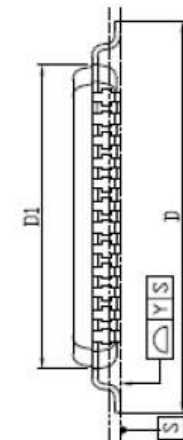
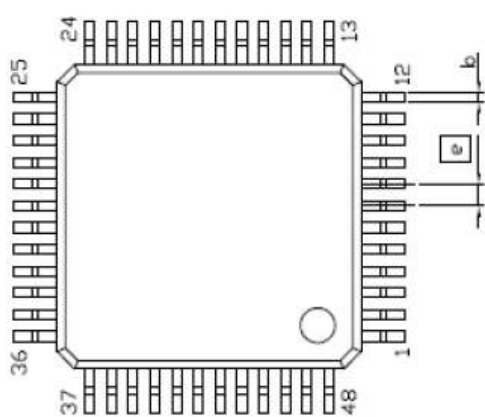
Voltage Detector (2.7V):**Electrical characteristics:**

| Symbol | Parameter | Min. | Typ. | Max. | Unit |
|----------|------------------------|------|------|------|------|
| VDD33I | Power Supply Voltage | 2 | 3.3 | 3.6 | V |
| P_POR_RR | Reference High Voltage | 2.6 | 2.8 | 3 | V |
| P_POR_FR | Reference Low Voltage | 2.4 | 2.6 | 2.8 | V |
| VHYS | Hysterisis Width | 0.1 | 0.2 | 0.3 | V |

6. Packaging Specification

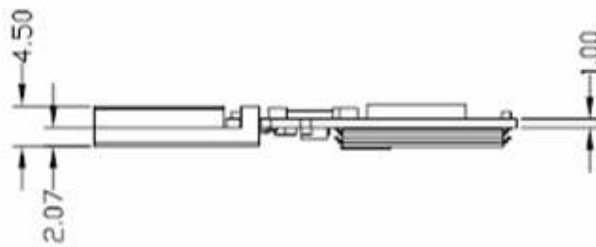
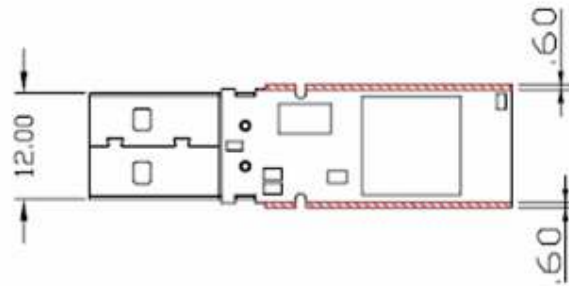
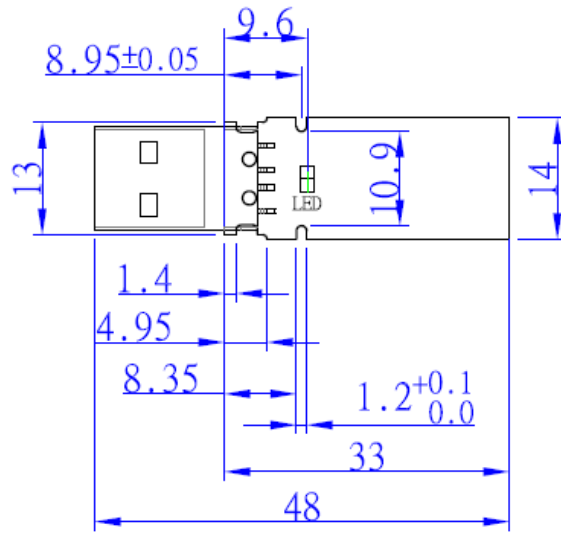
QFP 48-pin Packaging Dimension

| SYMBOL | DIMENSION (MM) | | | DIMENSION (MIL) | | |
|--------|----------------|----------|-------|-----------------|---------|------|
| | MIN. | NDM. | MAX. | MIN. | NOM. | MAX. |
| A | | | 1.60 | | | 63 |
| A1 | 0.05 | | 0.15 | 2 | | 6 |
| A2 | 1.35 | 1.40 | 1.45 | 53 | 55 | 57 |
| b | 0.17 | 0.22 | 0.27 | 7 | 9 | 11 |
| B1 | 0.17 | 0.20 | 0.23 | 7 | 8 | 12 |
| c | 0.09 | | 0.20 | 4 | | 8 |
| C1 | 0.09 | | 0.16 | 4 | | 6 |
| D | | 9.00 BSC | | | 354 BSC | |
| D1 | | 7.00 BSC | | | 276 BSC | |
| E | | 9.00 BSC | | | 354 BSC | |
| E1 | | 7.00 BSC | | | 276 BSC | |
| E2 | | 0.50 BSC | | | 20 BSC | |
| L | 0.45 | 0.60 | 0.75 | 18 | 24 | 30 |
| L1 | | 1.00 REF | | | 39 REF | |
| R1 | 0.08 | | | | 3 | |
| R2 | 0.08 | | 0.20 | 3 | | 8 |
| Y | | | 0.075 | | | 3 |
| θ | 0° | 3.5° | 7° | 0° | 3.5° | 7° |
| θ1 | 0° | | | 0° | | |
| θ2 | 11° | 12° | 13° | 11° | 12° | 13° |
| θ3 | 11° | 12° | 13° | 11° | 12° | 13° |

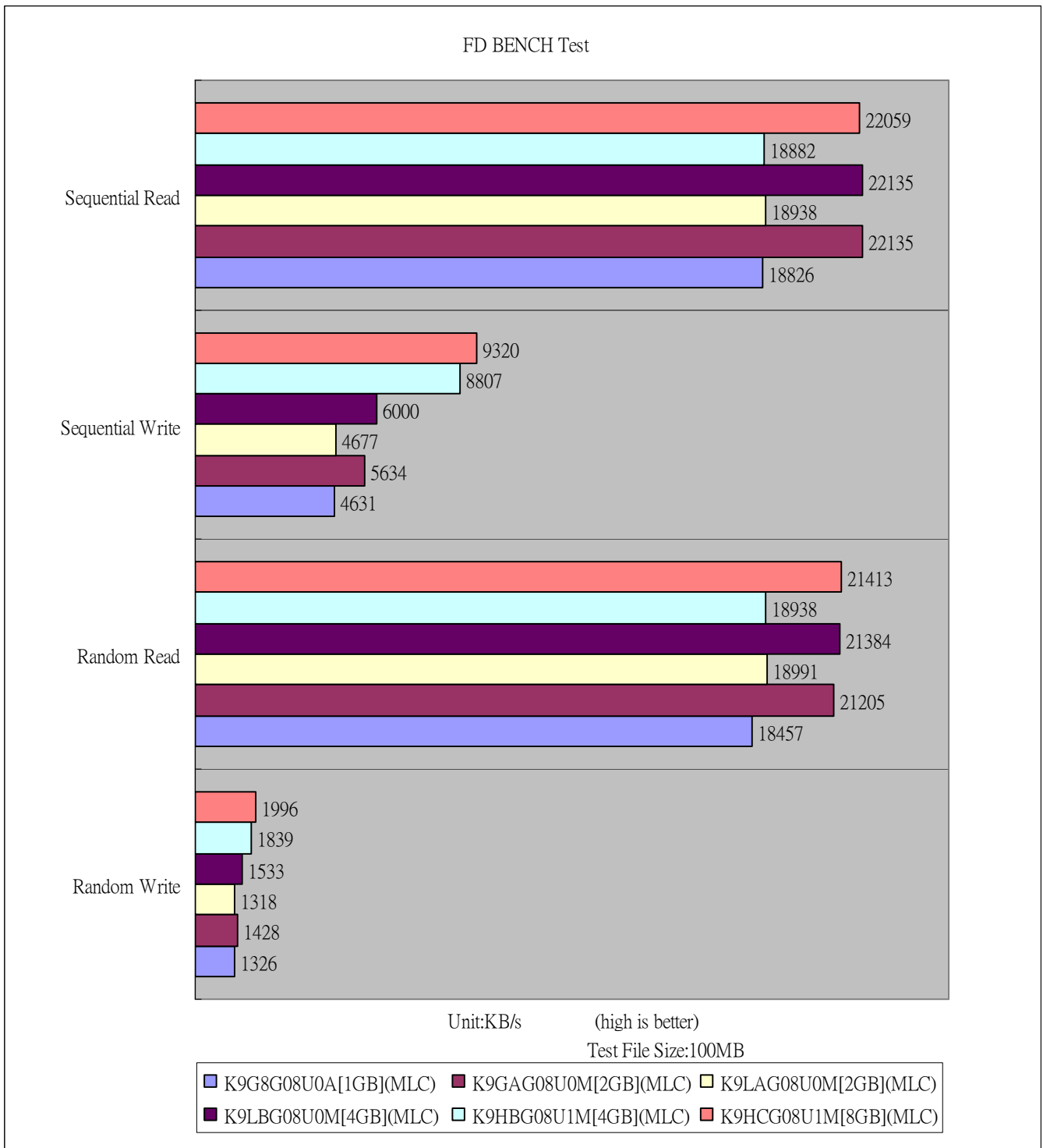


- NOTE:
1. REFER TO JEDEC MS-026/BSC
 2. DIMENSION D1 AND E1 DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE PROTRUSION IS 0.25mm PER SIDE D1 AND E1 ARE MAXIMUM PLASTIC BODY SIZE DIMENSION INCLUDING MOLD MISMATCH.
 3. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL NOT CAUSE THE LEAD WIDTH TO EXCEED THE MAXIMUM b DIMENSION BY MORE THAN 0.08mm.
 4. ALL DIMENSIONS IN MILLIMETERS.
- △ SRemark-Modify PKG. CODE

7.PCB Outline

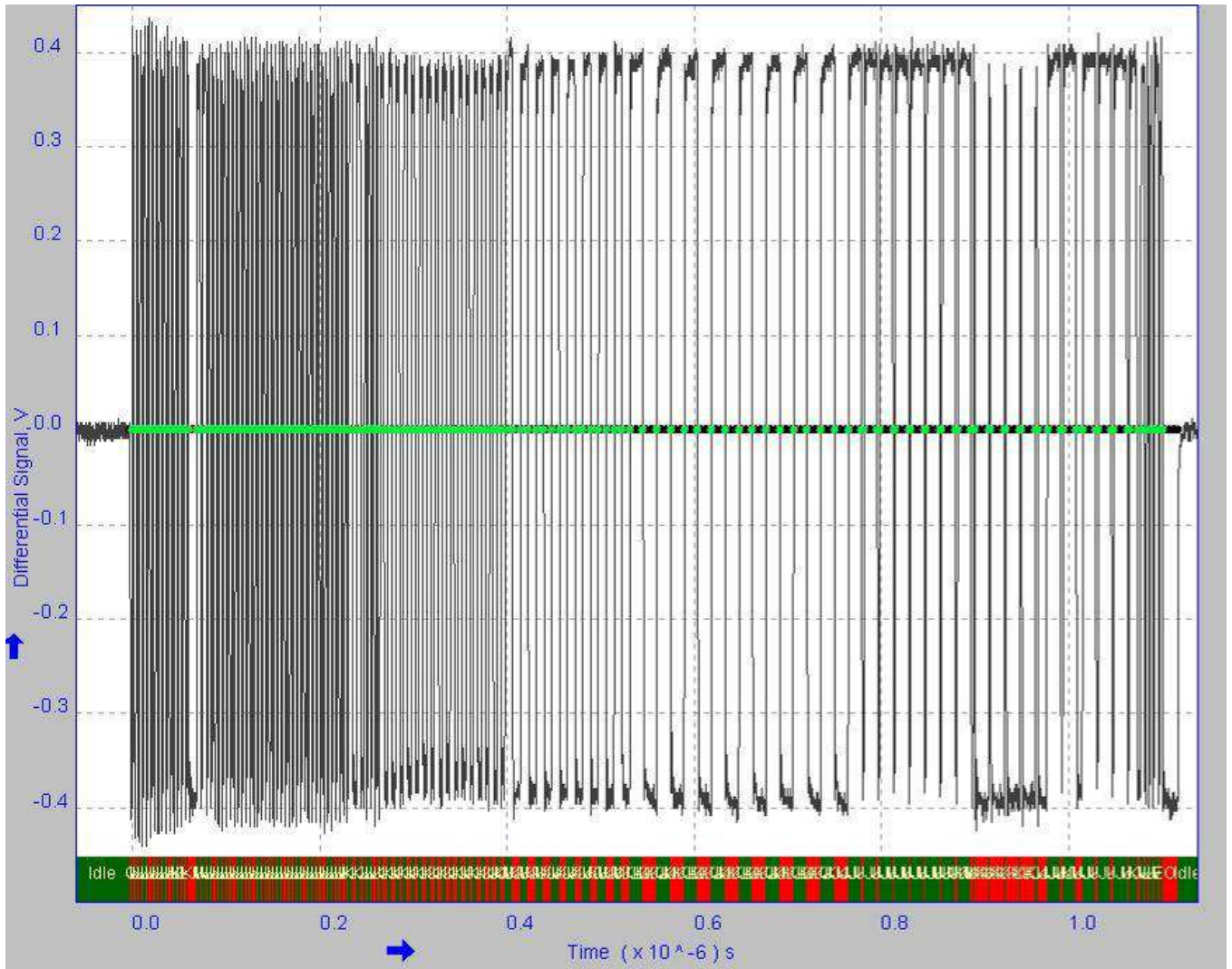


8. R/W Performance Test

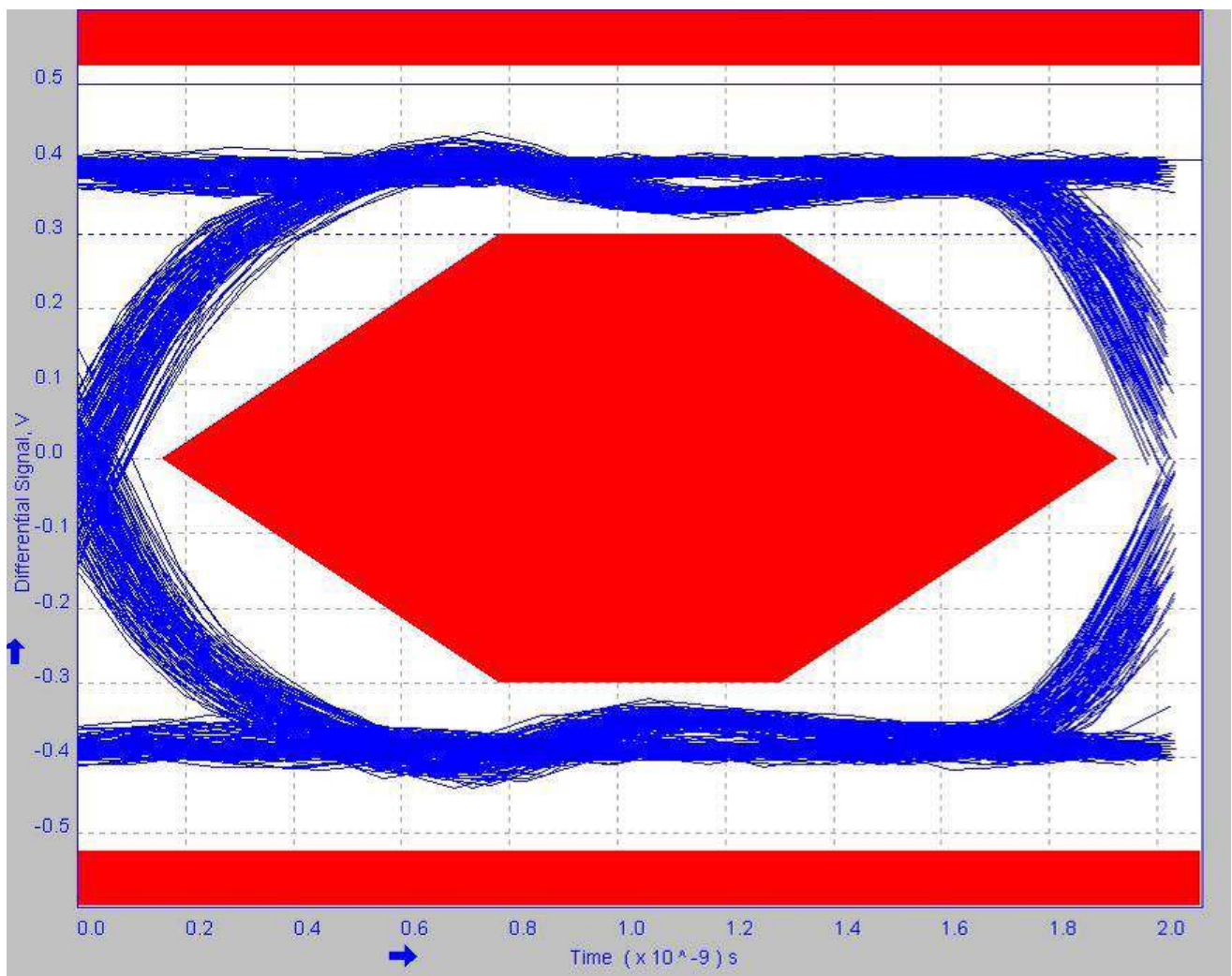


9.Signal Quality Test Results

This report test by Abomem .Just provide reference



Waveform Plot



Eye Diagram

Results based on USB-IF / Waiver Limits :

| Measurement Name | Minimum | Maximum | Mean | pk-pk | Standard Deviation | RMS | Population | Status |
|--------------------|--------------|--------------|--------------|------------|--------------------|--------------|------------|--------|
| Monotonic Property | - | - | - | - | - | - | 0 | Pass |
| Eye Diagram Test | - | - | - | - | - | - | - | Pass |
| Signal Rate | 467.6238Mbps | 493.4887Mbps | 480.0394Mbps | 0.0000bps | 4.930034Mbps | 479.8342Mbps | 528 | Pass |
| EOP Width | - | - | 16.89697ns | - | - | - | 1 | Pass |
| EOP Width (Bits) | - | - | 8.111211 | - | - | - | 1 | Pass |
| Rise Time | 557.2221ps | 713.7703ps | 636.0601ps | 156.5482ps | 36.08690ps | 637.0741ps | 115 | Pass |
| Fall Time | 543.7173ps | 723.3618ps | 633.0146ps | 179.6445ps | 46.23537ps | 634.6861ps | 114 | Pass |

Monotonicity test is performed on the test limits of 15.0% and 85.0%.

Additional Information :

Consecutive Jitter range : -106.1ps to 99.97ps RMS Jitter 42.13ps

KJ Paired Jitter range : -73.57ps to 79.36ps RMS Jitter 30.65ps

JK Paired Jitter range : -122.6ps to 71.58ps RMS Jitter 33.61ps

*The Overall Result for this test is **Pass**, because one or more individual status of the measurements is **Pass**. For this test, the recommended configuration for USB2 testing (as per USB-IF) is on Tier 1.

10.PC Host Compatibility

Summary

| No. | Test Category & Item | Pass |
|-----|----------------------|------|
| 1 | PC Compatibility | MLC |
| | | SLC |
| 2 | MAC Compatibility | MLC |
| | | SLC |

PC-MLC

| | | | | Testing Item | | | | | | | |
|-----|---|--|-----|--------------|------------------|-----------------|--------------|-------------|-----------|------------------|--|
| No. | Chipset Southbridge | O.S. | USB | Hot Plug | Restart OS w/UFD | Cold Boot w/UFD | Quick Format | Full Format | Eject UFD | Suspend & Resume | |
| | | Service Pack or Edition | | | | | | | | | |
| 1 | NVidia nForce4 rev. A3 NVidia nForce4 MCP REV. A3 | Vista 32 Vista 64 WinXP SP2 Win2K SP4 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS | |
| 2 | ATI RADEOM 9100 IGP ATI 434C | Vista 32 Vista 64 WinXP SP2 Win2K SP4 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS | |
| 3 | ATI XPRESS 3200(RD580) ATI SB600 | Vista 32 Vista 64 WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS | |
| 4 | ATI RS690/RS690M ATI SB600 | Vista 32 Vista 64 WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS | |
| 5 | Intel P35 Inter ICH9R | Vista 32 Vista 64 WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS | |
| 6 | SiS 760GX rev. 03 SiS ID965 rev. 47 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS | |
| 7 | Intel i925XE rev. C2 Intel 82801FB (ICH6) rev. 4 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS | |
| 8 | Intel i915P/i915G rev. B1 Intel 82801FB (ICH6) rev. 3 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS | |
| 9 | ALI M1683 rev. 00 ALI M1563 rev. 2 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS | |
| 10 | nVidia nForce4 rev. A3 nVidia ID50 rev. A3 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS | |
| 11 | SiS 661FX rev. 11 SiS 964 rev. 36 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS | |
| 12 | Intel i865P/PE/G/i848P rev. A2 Intel 82801EB (ICH5) rev. 2 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS | |
| 13 | VIA KT880 rev. 00 VIA VT8237 rev. 0 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS | |

| | | | | | | | | | | |
|----|--|-----------|-----|------|------|------|------|------|------|------|
| 14 | nVidia nForce2 Ultra 400 rev. C1 nVidia ID80 rev. A3 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 15 | Intel i915P/i915G rev. B1 Intel 82801FB (ICH6) rev. 3 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 16 | SiS 661FX rev. 11 SiS ID8 rev. 25 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 17 | Intel i955X rev. 81 Intel 82801GB (ICH7) rev. 01 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 18 | nVidia nForce4 rev. A3 nVidia ID50 rev. A3 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 19 | MATSUSHITA Intel 82801FBM(ICH6-M) | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 20 | SONY Intel 82801DB (ICH4-M) | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 21 | Toshiba AW5 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 22 | Intel 82371EB | 2K SP4 | 1.1 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 23 | VIA Apollo Pro rev. 44 VIA VT82C596 | WinXP SP2 | 1.1 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 24 | SiS LPC Bridge | WinXP SP2 | 1.1 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |

PC-SLC

| | | | Testing Item | | | | | | | |
|-----|--|--|--------------|----------|------------------------|--------------------|-----------------|----------------|--------------|------------------------|
| No. | Chipset Southbridge | O.S. | USB | Hot Plug | Restart OS w/UFD | Cold Boot w/UFD | Quick Format | Full Format | Eject UFD | Suspend & Resume |
| | | Service Pack or Edition | | | | | | | | |
| 1 | nVidia nForce4 rev. A3 nVidia nForce4 MCP REV. A3 | Vista 32 Vista 64 WinXP SP2 Win2K SP4 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 2 | ATI RADEOM 9100 IGP ATI 434C | Vista 32 Vista 64 WinXP SP2 Win2K SP4 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 3 | ATI XPRESS 3200(RD580) ATI SB600 | Vista 32 Vista 64 WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 4 | ATI RS690/RS690M ATI SB600 | Vista 32 Vista 64 WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 5 | Intel P35 Inter ICH9R | Vista 32 Vista 64 WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 6 | SiS 760GX rev. 03 SiS ID965 rev. 47 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 7 | Intel i925XE rev. C2 Intel 82801FB (ICH6) rev. 4 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 8 | Intel i915P/i915G rev. B1 Intel 82801FB (ICH6) rev. 3 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |

| | | | | | | | | | | |
|----|---|-----------|-----|------|------|------|------|------|------|------|
| 9 | ALI M1683 rev. 00 ALI M1563 rev. 2 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 10 | nVidia nForce4 rev. A3 nVidia ID50 rev. A3 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 11 | SiS 661FX rev. 11 SiS 964 rev. 36 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 12 | Intel i865P/PE/G/i848P rev. A2 Intel 82801EB (ICH5) rev. 2 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 13 | VIA KT880 rev. 00 VIA VT8237 rev. 0 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 14 | nVidia nForce2 Ultra 400 rev. C1 nVidia ID80 rev. A3 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 15 | Intel i915P/i915G rev. B1 Intel 82801FB (ICH6) rev. 3 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 16 | SiS 661FX rev. 11 SiS ID8 rev. 25 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 17 | Intel i955X rev. 81 Intel 82801GB (ICH7) rev. 01 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 18 | nVidia nForce4 rev. A3 nVidia ID50 rev. A3 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 19 | MATSUSHITA Intel 82801FBM(ICH6-M) | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 20 | SONY Intel 82801DB (ICH4-M) | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 21 | Toshiba AW5 | WinXP SP2 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 22 | Intel 82371EB | 2K SP4 | 1.1 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 23 | VIA Apollo Pro rev. 44 VIA VT82C596 | WinXP SP2 | 1.1 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
| 24 | SiS LPC Bridge | WinXP SP2 | 1.1 | PASS | PASS | PASS | PASS | PASS | PASS | PASS |

MAC-MLC

| No. | MAC Model | O.S. | Testing Item | | | | | | |
|-----|---------------|--------|--------------|-------|-----------|--------------|-----------|--------------|----------------------|
| | | | USB | Erase | Copy File | Compare File | Read File | Delete Files | Instant Voltage Test |
| 1 | NB MAC G4 | 10.4.3 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS |
| 2 | NB MAC Duo | 10.4.7 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS |
| 3 | PC MAC | 10.2.3 | 1.1 | PASS | PASS | PASS | PASS | PASS | PASS |

MAC-SLC

| No. | MAC Model | O.S. | Testing Item | | | | | | |
|-----|---------------|--------|--------------|-------|-----------|--------------|-----------|--------------|----------------------|
| | | | USB | Erase | Copy File | Compare File | Read File | Delete Files | Instant Voltage Test |
| 1 | NB MAC G4 | 10.4.3 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS |
| 2 | NB MAC Duo | 10.4.7 | 2.0 | PASS | PASS | PASS | PASS | PASS | PASS |
| 3 | PC MAC | 10.2.3 | 1.1 | PASS | PASS | PASS | PASS | PASS | PASS |

11.SM325AC Flash Supporting Test

Testing Environment

| CPU | Chipset | Motherboard | USB2.0 Host | OS | Memory |
|---------------------|------------------------|---------------------|---------------------|------------|--------|
| AMD Athlon 64 3000+ | nVidia nForce4 rev. A3 | ASUS A8N-SLI DELUXE | nVidia ID50 rev. A3 | WIN XP SP2 | 256MB |

| CPU | Chipset | Motherboard | USB2.0 Host | OS | Memory |
|---------------------|------------------------|---------------------|---------------------|------------|--------|
| AMD Athlon 64 3000+ | nVidia nForce4 rev. A3 | ASUS A8N-SLI DELUXE | nVidia ID50 rev. A3 | WIN 2K SP4 | 256MB |

SAMSUNG 4K/page

| Flash Information | | | | Testing Item/Result | | | |
|--------------------------------|--------------------------|-------|-------------|---------------------|-----------|-----------|-----------|
| Samsung 4KB/page SLC/MLC Flash | | | | Pretest | Copy2 (2) | Copy4 (2) | Copy6 (2) |
| 1 | Single-2plane | NOP=1 | K9F8G08U0M | pass | pass | pass | pass |
| 2 | Twin-2plane-Interleave | NOP=1 | K9KAG08U0M | pass | pass | pass | pass |
| 3 | Single-2plane-interleave | NOP=1 | K9W BG08U1M | pass | pass | pass | pass |
| 4 | Twin-2plane-Interleave | NOP=1 | K9NCG08U5M | pass | pass | pass | pass |
| 5 | Single-2plane | NOP=1 | K9GAG08U0M | pass | pass | pass | pass |
| 6 | Twin-2plane-Interleave | NOP=1 | K9LBG08U0M | pass | pass | pass | pass |
| 7 | Single-2plane-interleave | NOP=1 | K9HCG08U1M | pass | pass | pass | pass |
| 8 | Twin-2plane-Interleave | NOP=1 | K9MDG08U5M | pass | pass | pass | pass |

Toshiba/Micron/Intel 4KB/page

| Flash Information | | | | | Testing Item /Result | | | |
|---|-----|---------------|-------|-----------------|----------------------|-----------|-----------|-----------|
| Toshiba/Micron/Intel 4KB/page SLC/MLC Flash | | | | | Pretest | Copy2 (2) | Copy4 (2) | Copy6 (2) |
| 1 | MLC | Single-2plane | NOP=1 | TC58NVG4D1DTG00 | pass | pass | pass | pass |
| 2 | MLC | Twin-1plane | NOP=1 | TC58NVG3D1DTGI0 | pass | pass | pass | pass |
| 3 | MLC | Single-2plane | NOP=1 | JS29F16G08AAMC1 | pass | pass | pass | pass |
| 4 | MLC | Twin-1plane | NOP=1 | MT29F16G08MAA | pass | pass | pass | pass |
| 5 | MLC | Single-2plane | NOP=1 | MT29F32G08QAA | pass | pass | pass | pass |
| 6 | MLC | Twin-1plane | NOP=1 | TC58NVG5D1DTG20 | pass | pass | pass | pass |

Samsung/Hynix 2KB/page

| Flash Information | | | | | Testing Item/Result | | | |
|----------------------------------|-----|--------------------------|-------|---------------|---------------------|-----------|-----------|-----------|
| Samsung/Hynix 2KB/page MLC Flash | | | | | Pretest | Copy2 (2) | Copy4 (2) | Copy6 (2) |
| 1 | MLC | Single-2plane | NOP=1 | HY27UT088G2M | pass | pass | pass | pass |
| 2 | MLC | Twin-2plane-Interleave | NOP=1 | HY27UU08AG5M | pass | pass | pass | pass |
| 3 | MLC | Single-2plane | NOP=1 | HY27UV08BGF M | pass | pass | pass | pass |
| 4 | MLC | Twin-2plane-Interleave | NOP=1 | K9G8G08U0A | pass | pass | pass | pass |
| 5 | MLC | Single-2plane | NOP=1 | K9G8G08U0M | pass | pass | pass | pass |
| 6 | MLC | Twin-2plane-Interleave | NOP=1 | K9LAG08U0M | pass | pass | pass | pass |
| 7 | MLC | Single-2plane-interleave | NOP=1 | K9HBG08U1M | pass | pass | pass | pass |
| 8 | MLC | Single-2plane | NOP=1 | MT29F8G08MAA | pass | pass | pass | pass |
| 9 | MLC | Twin-2plane-Interleave | NOP=1 | MT29F16G08QAA | pass | pass | pass | pass |
| 10 | MLC | Single-2plane-interleave | NOP=1 | MT29F32G08TAA | pass | pass | pass | pass |

Samsung/Hynix 2KB/page

| Flash Information | | | | | Testing Item/Result | | | |
|-----------------------------------|-----|--------------------------|-------|-----------------|---------------------|-----------|-----------|-----------|
| Sam sung/Hynix 2KB/page SLC Flash | | | | | Pretest | Copy2 (2) | Copy4 (2) | Copy6 (2) |
| 1 | SLC | Single-2plane | NOP=1 | K9F1G08U0B | pass | pass | pass | pass |
| 2 | SLC | Twin-2plane-Interleave | NOP=1 | K9F2G08U0A | pass | pass | pass | pass |
| 3 | SLC | Single-2plane | NOP=1 | K9F4G08U0A | pass | pass | pass | pass |
| 4 | SLC | Twin-2plane-Interleave | NOP=1 | K9K8G08U0A | pass | pass | pass | pass |
| 5 | SLC | Single-2plane-interleave | NOP=1 | K9W AG08U1A | pass | pass | pass | pass |
| 6 | SLC | Twin-2plane-Interleave | NOP=1 | MT29F4G08AAC | pass | pass | pass | pass |
| 7 | SLC | Single-2plane | NOP=1 | MT29F4G08AAA | pass | pass | pass | pass |
| 8 | SLC | Twin-2plane-Interleave | NOP=1 | MT29F8G08BAA | pass | pass | pass | pass |
| 9 | SLC | Single-2plane-interleave | NOP=1 | MT29F8G08DAA | pass | pass | pass | pass |
| 10 | SLC | Twin-2plane-Interleave | NOP=1 | HY27UF084G2B | pass | pass | pass | pass |
| 11 | SLC | Single-1plane | NOP=1 | HY27UF084G2M | pass | pass | pass | pass |
| 12 | SLC | Twin-1plane-Interleave | NOP=1 | HY27UG088G5M | pass | pass | pass | pass |
| 13 | SLC | Single-1plane-interleave | NOP=1 | HY27UH08AG5M | pass | pass | pass | pass |
| 14 | SLC | Twin-2plane-Interleave | NOP=1 | JS29F04G08AANC1 | pass | pass | pass | pass |
| 15 | SLC | Single-2plane | NOP=1 | JS29F04G08AANB1 | pass | pass | pass | pass |
| 16 | SLC | Twin-2plane-Interleave | NOP=1 | JS29F08G08CANB1 | pass | pass | pass | pass |
| 17 | SLC | Single-2plane-interleave | NOP=1 | JS29F16G08FANB1 | pass | pass | pass | pass |