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| ASUSTeK COMPUTER INC. | R9290X Standard Operation Procedure | Doc. No: | |
| | | Date: Dec. 4, 2013 Revision:1.00 | |
| | | Page: 9 | Grade: |

| Rev. | Modified Chapters | Modification Description | Issued Dept. | Issued by | Revised Date |
|------|----------------------|--------------------------|-----------------|-----------|--------------|
| 1.00 | | First Release | GRMA | Jory_yuan | Dec,4,2013 |

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| Authorize by | | Review by | | Originator By | Jory |
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1.Objectives

Create test procedure.

2.Scope

Model: R9290X

PN: YV05C0 (A02)YV05C1(A02)

3.Test Item

3.1 Diagnostic test in Ubuntu 12.04 64-bit Linux system

3.2 3DMark06(contain HDMI test)

3.3 Temperature test

3.4 Fan test

4.Relevant Document

None.

5.Definition :1. If the model name contains P, please test HDCP function.

Ex: EAH***/HTDP/512M/A

2. If you test HDMI already, it's unnecessary to test HDCP. The HDMI contains HDCP function.

3. System Memory: 1GB for a single GPU test station; please add an additional 512MB of system memory for each additional GPU used for the test configuration

4. R9290X Test Program in Ubuntu 12.04 64-bit Linux system.

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6. Operation Procedures:

6.1 Attention

- 6.1.1 To avoid damaging devices or M/B, please turn off A/C power then unplug VGA card.
- 6.1.2 While unplugging the card, do it in upright direction to avoid damaging slot & golden finger.
- 6.1.3 If any problem happens, please inform test supervisor. Base on ATX power specification, +5V standby voltage is existed while AC power is connecting. For safety reason, please turn off main power during break time or idling test.
- 6.1.4 Some test items should be tested under Windows environment. **(Please install windows test environment by yourself).**

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6.2 Fixture connect

6.2.1 Install Intel P7 CPU & CPU Fan.

6.2.2 Install DDR3 Memory to DIMM1~4. **(a minimum memory of 2GB for Linux test)**

6.2.3 Plug USB Mouse and PS/2 Keyboard into MB.

6.2.4 Plug VGA Card R9290X into PCIEX16_1.

6.2.5 If this card has 6 PIN or 8 PIN of Power supply, please connect power con of VGA card & Power supply via bundled power cable.

(6 PIN of Power supply to 6 PIN of VGA card)

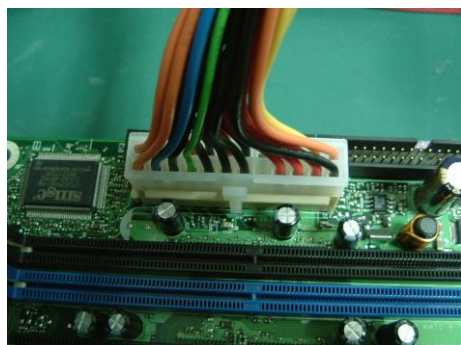
(8 PIN of Power supply to 8 PIN of VGA card)

6.2.6 Connect SATA HDD & SATA con via SATA cable



6.2.7 Plug 4PIN 12V power **(a minimum power of 1200W)** cable into CON12V.

6.2.8 Plug ATX Power on Power **(a minimum power of 1200W)** Connector.

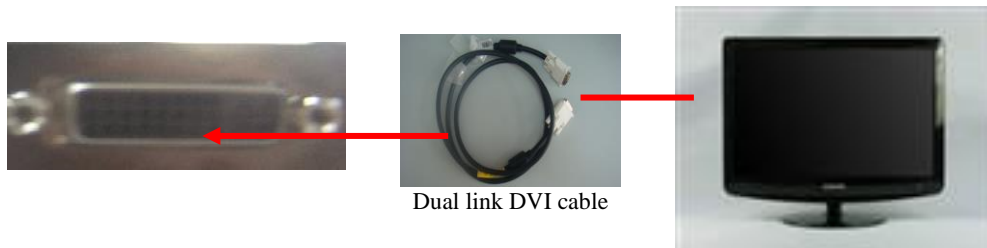


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6.3 Certain test.

6.3.1 Diagnostic test in Ubuntu 12.04 64-bit linux system.

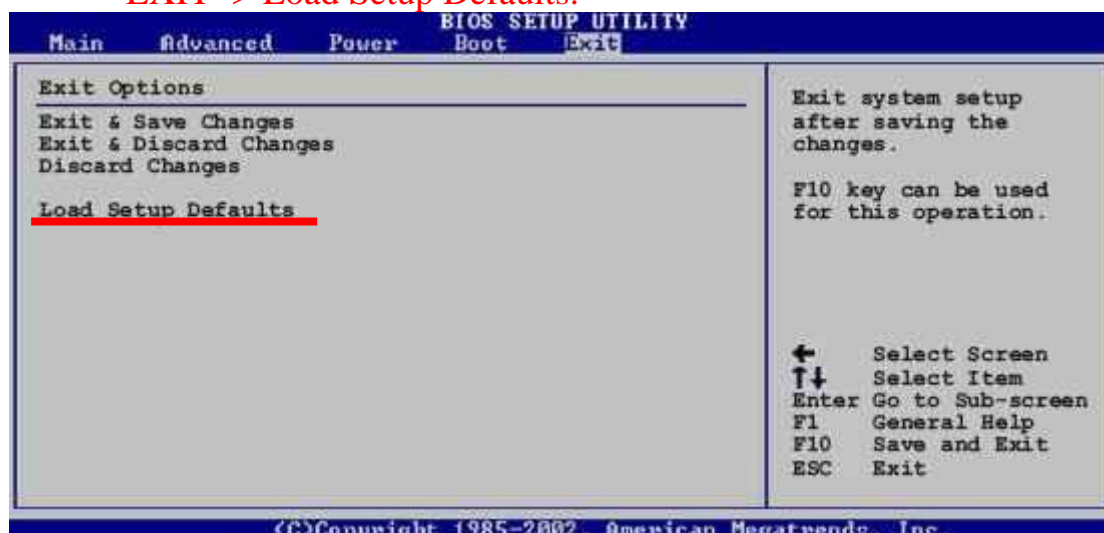
6.3.1.1 Please connect LCD monitor & card's DVI CON via a DVI cable.



6.3.1.2 Press Power Switch then turn on power button.

6.3.1.3 Press “Del” to enter CMOS setup menu while boot screen is displaying.

EXIT -> Load Setup Defaults.



6.3.1.4 Run test program in Ubuntu 12.04 64-bit linux system.

Path: R9290XB\yv05c0a0.sh or yv05c1a0.sh

6.3.1.5 Memory test

If you want to test memory, please run

tserver -boardtest=memfa

Path: R9290X\

6.3.1.6 BIOS Version

If you want to see the version of bios, please run **./biosinfo**

Path: R9290X\

6.3.1.7 BIOS flash

Please use the following command to flash bios and notice the size of character.

Path: R9290X\

Command: **./atiflash -p -f 0 xxx.rom** (0 is for the master gpu, and 1 is for the slave gpu.)

Notice:

If you can not flash bios because of the bios locked, please use **./atiflash -unlockrom 0/1** to unlock bios. And then, please use **./atiflash -lockrom 0/1** to lock bios after updating latest bios.

6.3.1.8 FAN test

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Please run AFTBN,
Path:R9290X\AFT

6.3.1.9 After finish Linux64 testing, please enter Windows environment to test 3DMark.

6.3.2 3DMark test(contain HDMI test)

6.3.2.1 Please install 3DMark program by yourself.

6.3.2.2 Please connect VGA card to LCD via HDMI cable.

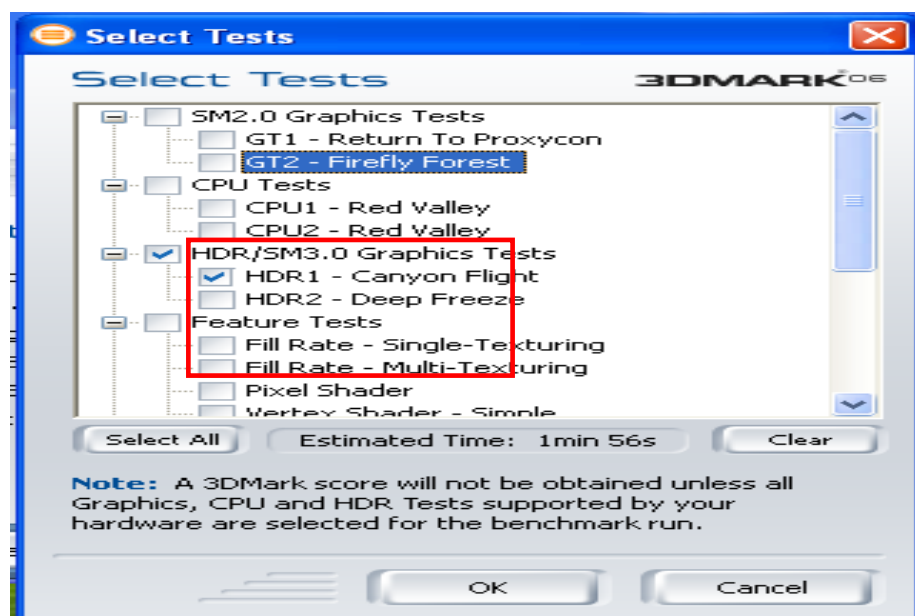


HDMI CON

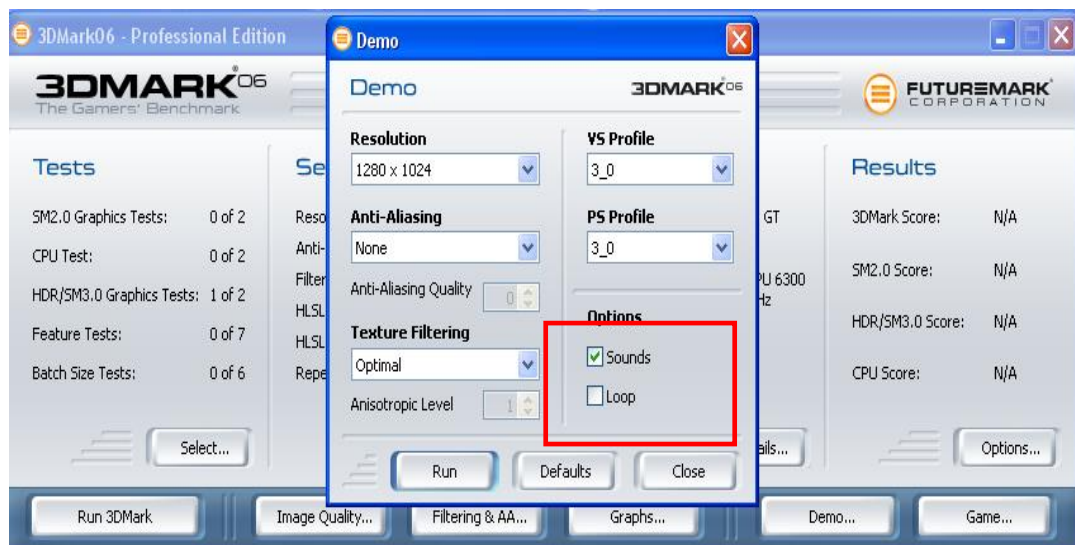
6.3.2.3 Please install VGA card driver in Windows(You must use individual driver of this card).

6.3.2.4 Please run 3DMark06 base on this card (please test 1 cycle).

6.3.2.5 Press “Select” to enter Select test menu. You can choose “HDR1” for default setting.



6.3.2.6 Press “Demo” to enter Demo menu. You can choose “Sounds” for default setting.



6.3.2.7 Please pay attention to check if there is flickering, discolor, crash and so on.

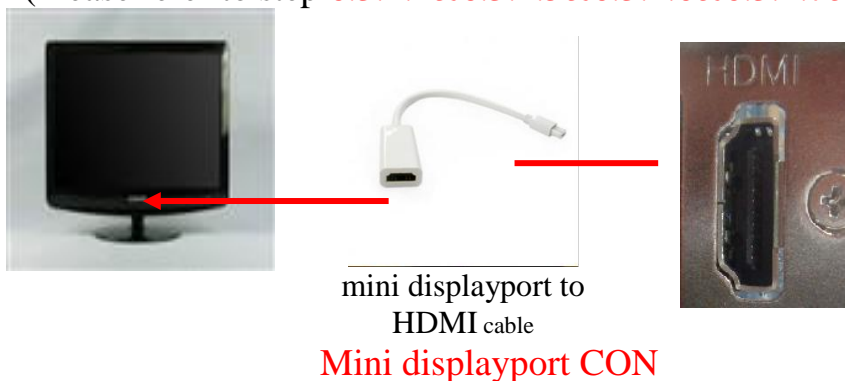
If there's no problem, it can be judged OK!

6.3.2.8 Please listen to voice carefully to check whether it outputs sounds. If not, HDMI test fail.



6. 3.2.9 If test OK, please test **mini Display port**.

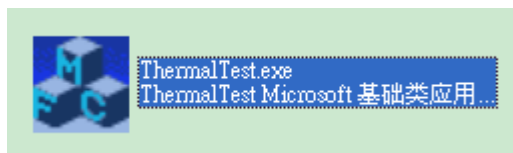
6. 3.2.10 Please connect VGA card to LCD via mini displayport to HDMI cable
(Please refer to step 6.3.2.4&6.3.2.5&6.3.2.6&6.3.2.7&6.3.2.8)



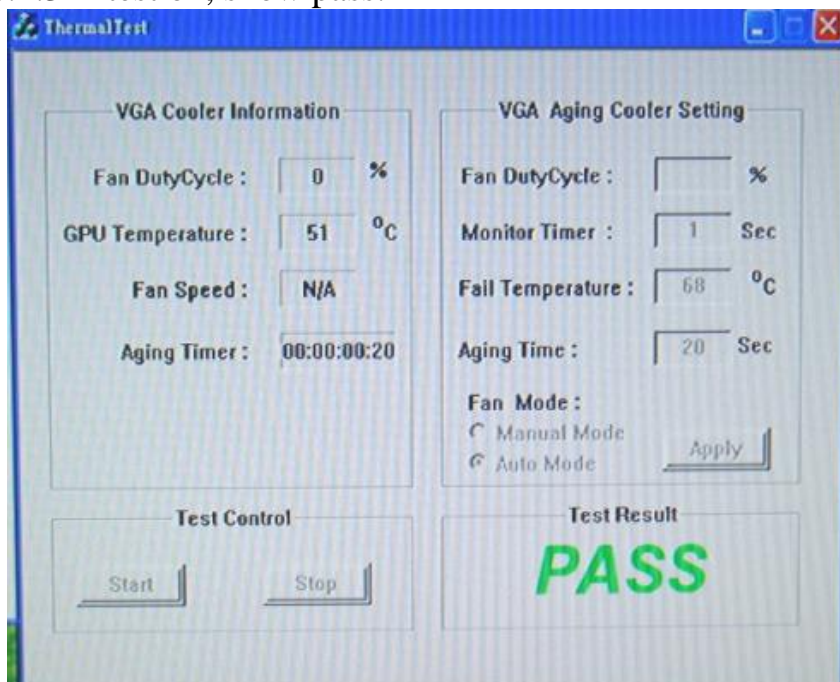
6.4 Temperature test

6.4.1 Please copy Thermaltool(1.0.05) to Windows by yourself.

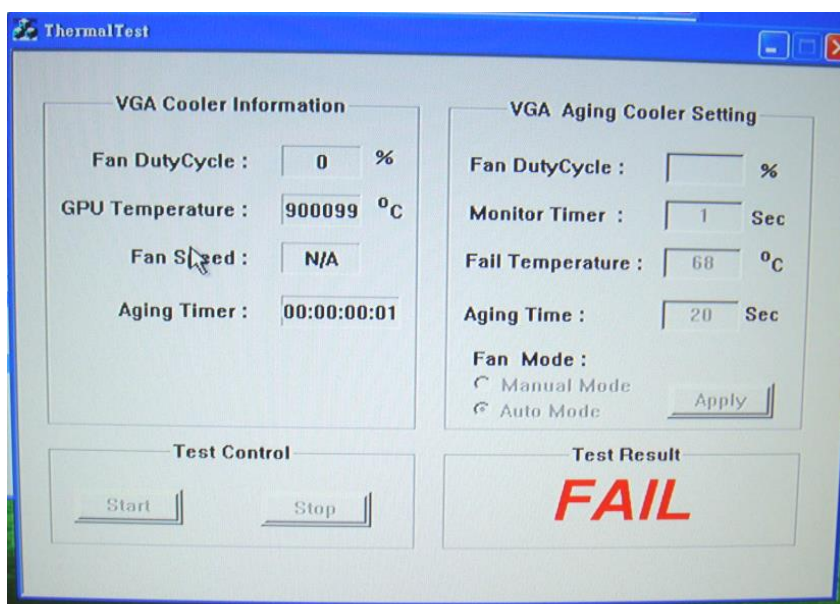
6.4.2 Please run ThermalTest.exe.



6.4.3 If test ok, show pass.



6.4.4 If test fail, show fail.



6.4.5 If test OK, please NTF test.

7.Appendix

| NO# | Equipment Description | ASUS Part# | Supplier | Quantity | Remarks |
|-----|--|--------------|----------|----------|---|
| 1 | Dell 30 inches (3008WFP) (Buying a local LCD by yourself) | | | 1 |  |
| 2 | USB MOUSE | | | 1 |  |
| 3 | PS/2 KEYBOARD | | | 1 |  |
| 4 | ATX POWER SUPPLY(a minimum power of 500W) | | | 1 |  |
| 5 | Intel CPU Intel(R) Core(TM)2 CPU | | local | 1 |  |
| 6 | Heat sink + FAN | 22-240000160 | | 1 |  |
| 7 | DDR3 1333 2G | 20-TT2605618 | local | 4 |  |
| 8 | TEST HDD | | | 1 |  |
| 9 | SATA HDD Cable | 14-000107070 | ASUS | 1 |  |
| 10 | PCIEX16 VGA CARD | | | 1 | |
| 11 | Dual link DVI cable (Buying a local DVI cable by yourself) | | | 1 |  |
| 12 | HDMI extend cable (Buying a local HDMI cable by yourself) | | | 1 |  |
| 13 | P7H55-M/USB3 MB | 80- MIBBKA-* | | 1 | |
| 14 | Display port cable (Buying a local HDMI cable by yourself) | | | 1 |  |
| 15 | mini displayport to HDMI cable (Buying a local cable by yourself) | | | 1 |  |