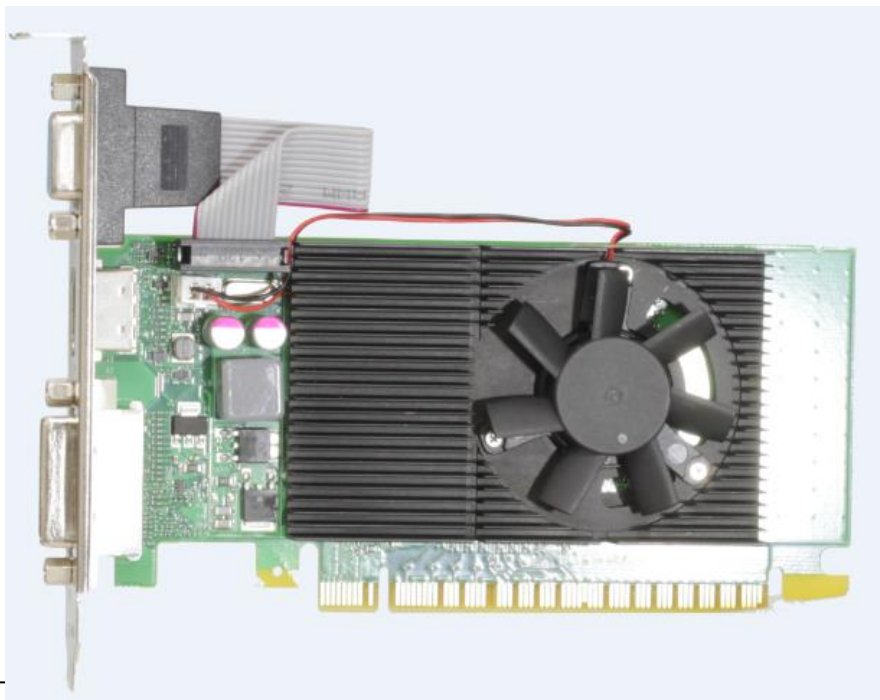


# ***NVIDIA GT710 2048MB DDR3 PCIe® ADD-IN BOARD***

## ***Datasheet***

ADVANTECH Model: GFX-NG710L16-3C

MPN numbers : 1A1-E000770ADP



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## 1. Feature

|  |  |
|--|--|
| <b>Model Name</b>                                | <b>GFX-NG710L16-3C</b>                           |
| <b>Graphics Processing Unit</b>                  |  |
| <b>GPU</b>                                       | <b>GeForce GT710 (GK208)</b>                     |
| <b>Process Technology</b>                        | <b>28 nm</b>                                     |
| <b>Graphics Engine Operating Frequency (max)</b> | <b>954 MHz</b>                                   |
| <b>Form Factor</b>                               | <b>Low profile (145 x 69 mm)</b>                 |
| <b>Card Interface</b>                            | <b>PCI Express® 2.0(x16)</b>                     |
| <b>CUDA Cores</b>                                | <b>192 CUDA</b>                                  |
| <b>Floating Point Performance</b>                | <b>366 GFLOPs</b>                                |
| <b>DirectX® capability</b>                       | <b>DirectX® 12 (Feature Level 11.0)</b>          |
| <b>OpenGL</b>                                    | <b>OpenGL™ 4.5</b>                               |
| <b>Video Decoder</b>                             | <b>H.264, VC-1, MPEG-2, MPEG-4 part 2 decode</b> |
| <b>Memory</b>                                    |  |
| <b>Memory Clock</b>                              | <b>900 MHz/ 1.8 Gbps</b>                         |
| <b>DDR Type</b>                                  | <b>DDR3</b>                                      |
| <b>Memory Bus</b>                                | <b>64-bit</b>                                    |
| <b>Memory Size</b>                               | <b>2048MB</b>                                    |
| <b>Display Interface</b>                         |  |
| <b>Display Output</b>                            | <b>Dual Link DVI-D, HDMI, VGA</b>                |
| <b>Multi-Display</b>                             | <b>3</b>   |
| <b>External Power</b>                            |  |
| <b>Power</b>                                     | <b>No</b>  |

## 2. Functional Overview

### 2.1. GPU Block diagram

Figure 1.1 shows a simplified block diagram of the GK208 GPUs.

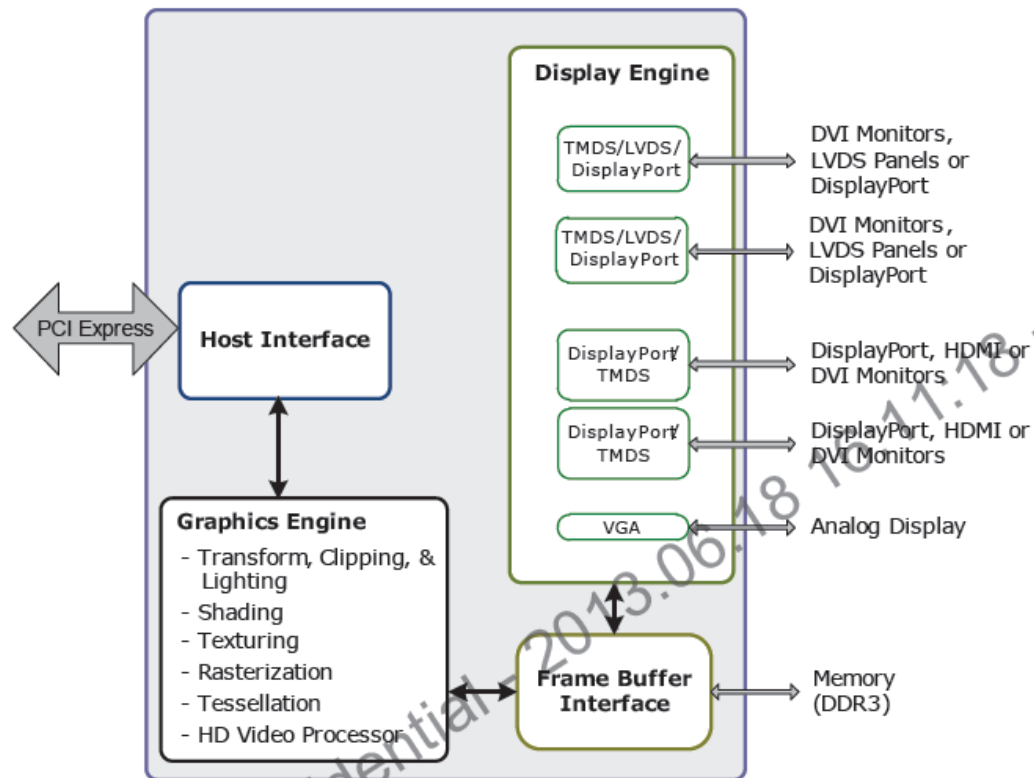


Figure 1.1 GK208 GPUs Simplified Block Diagram

## 2.2. KEY FEATURES

### GPU

- ▶ Core clock: 954 MHz
- ▶ Voltage: 0.85625 V – 1.1875V ± 2%
- ▶ Package size: 23mm x 23mm, 595-ball FCBGA(GB2-64)

### Board

- ▶ 4-layer printed circuit board (PCB)
- ▶ PCI Express 2.0, 8 lanes
- ▶ Physical dimensions: 145 x 69 mm
- ▶ Board power: 19 W

## 2.3. Memory

- ▶ Memory clock: 900 MHz
- ▶ Interface: 64 bit
- ▶ Local frame buffer 2 GB (4pieces 256M X 16 DDR3, FBGA-96 package)

## 2.4. Features and Technologies

- ▶ DirectX® 12 compliant and Shader Model 5.0
- ▶ OpenGL 4.5
- ▶ NVIDIA® PhysX™ technology
- ▶ NVIDIA® CUDA technology

## 2.5. Display Support

- ▶ Support Multi Monitor
- ▶ Internal dual-link TMDS; Maximum resolution over digital port 2560x1600x32bpp@60Hz
- ▶ 400MHz integrated RAMDAC; Maximum VGA Resolution 2048x1536
- ▶ Support HDCP/HDMI

## 2.6. Digital Audio

- ▶ Supports for HD Audio over PCI Express

- ▶ Support for secure premium audio (e.g. 7.1 Audio)
- ▶ Data rates of 44.1KHz, 48KHz, 88.2KHz, 96KHz, 176KHz and 192KHz
- ▶ Word sizes of 16-bit, 20bit, and 24-bit

## 2.7. Video

The following video formats are supported:

- ▶ MPEG-2
- ▶ MPEG-4 Part 2 Advanced Simple Profile
- ▶ H.264 SVC codec support
- ▶ Support for 3D Blu Ray
- ▶ VC1
- ▶ DivX version 3.11 and later
- ▶ MVC

A full range of video resolutions are supported including 1080p, 1080i, 720p, 480p and 480i

## 3. PIN Assignment and Description

### 3.1. DVI-D Connector Pinout

| Pin | Signal               | Pin | Signal                     |
|-----|----------------------|-----|----------------------------|
| 1   | TMDS data 2-         | 13  | TMDS data 3+               |
| 2   | TMDS data 2+         | 14  | +5VDC power                |
| 3   | TMDS data 2/4 shield | 15  | Ground (Return for +5)     |
| 4   | TMDS data 4-         | 16  | Hot plug detected          |
| 5   | TMDS data 4+         | 17  | TMDS data 0-               |
| 6   | DDC clock            | 18  | TMDS data 0+               |
| 7   | DDC data             | 19  | TMDS data 0/5 shield       |
| 8   | Analog vertical sync | 20  | TMDS data 5-               |
| 9   | TMDS data 1-         | 21  | TMDS data 5+               |
| 10  | TMDS data 1+         | 22  | TMDS clock shield          |
| 11  | TMDS data 1/3 shield | 23  | TMDS clock+                |
| 12  | TMDS data 3-         | 24  | TMDS clock-                |
| C1  | Analog red           | C4  | Analog horizontal sync     |
| C2  | Analog green         | C5  | Analog ground (RGM return) |
| C3  | Analog blue          |     |                            |

### 3.2. HDMI Connector Pinout

| Pin | Signal             | Pin | Signal            |
|-----|--------------------|-----|-------------------|
| 1   | TMDS Data 2+       | 11  | TMDS Clock Shield |
| 2   | TMDS Data 2 Shield | 12  | TMDS Clock-       |
| 3   | TMDS Data 2-       | 13  | No Connect        |
| 4   | TMDS Data 1+       | 14  | No Connect        |
| 5   | TMDS Data 1 Shield | 15  | DDC Clock         |
| 6   | TMDS Data 1-       | 16  | DDC Data          |
| 7   | TMDS Data 0+       | 17  | Ground            |
| 8   | TMDS Data 0 Shield | 18  | +5V Power         |
| 9   | TMDS Data 0-       | 19  | Hot Plug Detect   |

|    |             |  |  |
|----|-------------|--|--|
| 10 | TMDS Clock+ |  |  |
|----|-------------|--|--|

### 3.3. VGA Connector Pinout

| Pin | Signal   | Description            |
|-----|----------|------------------------|
| 1   | Red      | Red                    |
| 2   | Green    | Green                  |
| 3   | Blue     | Blue                   |
| 4   | Reserved | Macintosh sense , RW   |
| 5   | Ground   | DDC return             |
| 6   |          | Red ground             |
| 7   |          | Green ground           |
| 8   |          | Blue ground            |
| 9   | +5V      | DDC power              |
| 10  | SGND     | Sync ground            |
| 11  | ID0      | Monitor ID bit 0 (Opt) |
| 12  | SDA      | Serial data (DDC2B)    |
| 13  | HSYNC    | Horizontal sync        |
| 14  | VSYNC    | Vertical sync          |
| 15  | SCL      | Serial clock (DDC2B)   |

### 3.4. VGA Header Pinout

| Pin | Signal | Description          |
|-----|--------|----------------------|
| 1   | SCL    | Serial clock (DDC2B) |
| 2   | SDA    | Serial data (DDC2B)  |
| 3   | +5V    | DDC power            |
| 4   | VSYNC  | Vertical sync        |
| 5   | HSYNC  | Horizontal sync      |
| 6   | GND    | Ground               |
| 7   | Red    | Red                  |
| 8   | GND    | Ground               |
| 9   | Green  | Green                |
| 10  | GND    | Ground               |
| 11  | Blue   | Blue                 |



|    |     |        |
|----|-----|--------|
| 12 | GND | Ground |
|----|-----|--------|

## 4. Power Specifications

| Parameter   | Value | Unit |
|---|-------|------|
| <b>Input Board Power (Estimated)</b>                        |       |      |
| PCI Express edge connector (12V)<br>(estimated input power) | 1.2   | A    |
|   | 14    | W    |
| PCI Express edge connector (3V3)<br>(estimated input power) | 1.5   | A    |
|   | 5     | W    |
| Total estimated input graphics power<br>(estimated TGP)     | 19    | W    |

| <b>Component Power (Estimated)</b>         |    |   |
|--|----|---|
| GPU (TDP, estimated)                       | 14 | W |
| Memory power (estimated; eight components) | 1  | W |
| Power supplies                             | 3  | W |
| Fan, PCB and other losses                  | 1  | W |

## 5. Thermal Specifications

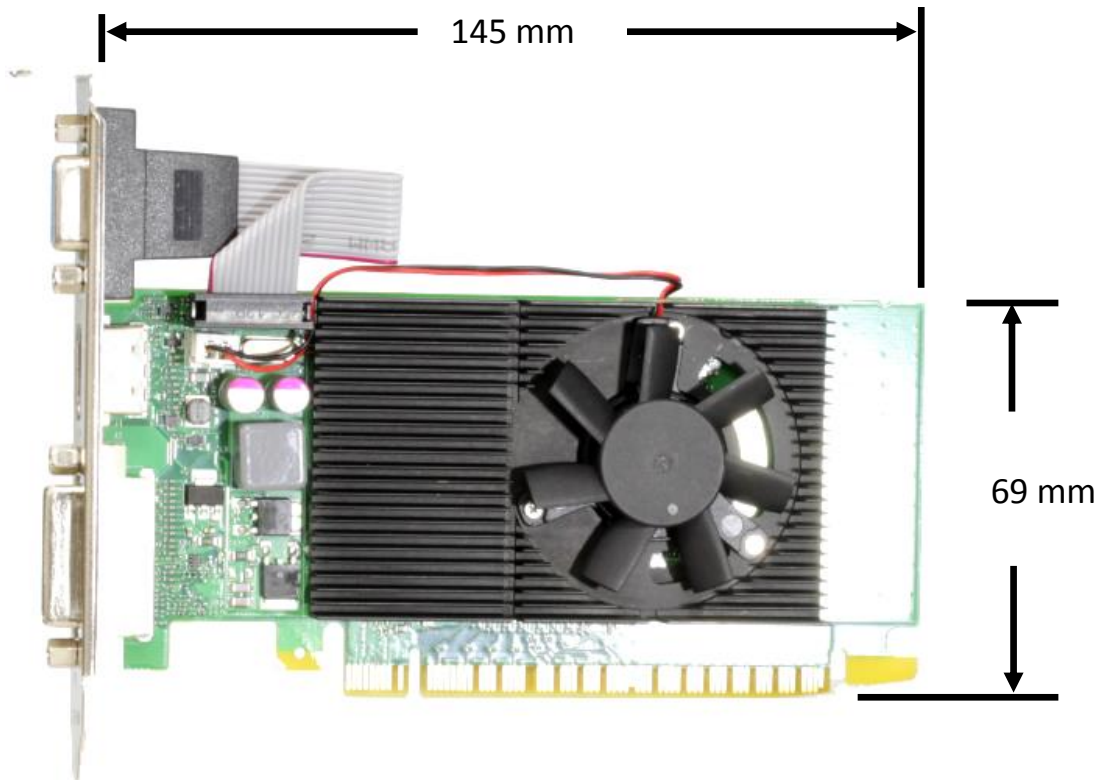
| Parameter                            | Value | Unit |
|--------------------------------------|-------|------|
| Fan inlet temperature (max.)         | 55    | °C   |
| GPU slowdown temperature (max.Tj)    | 95    | °C   |
| GPU shutdown temperature (max.)      | 102   | °C   |
| GPU junction temperature (estimated) | 88    | °C   |

## 6. Output configuration and Board Dimension

### 6.1. Output Configuration

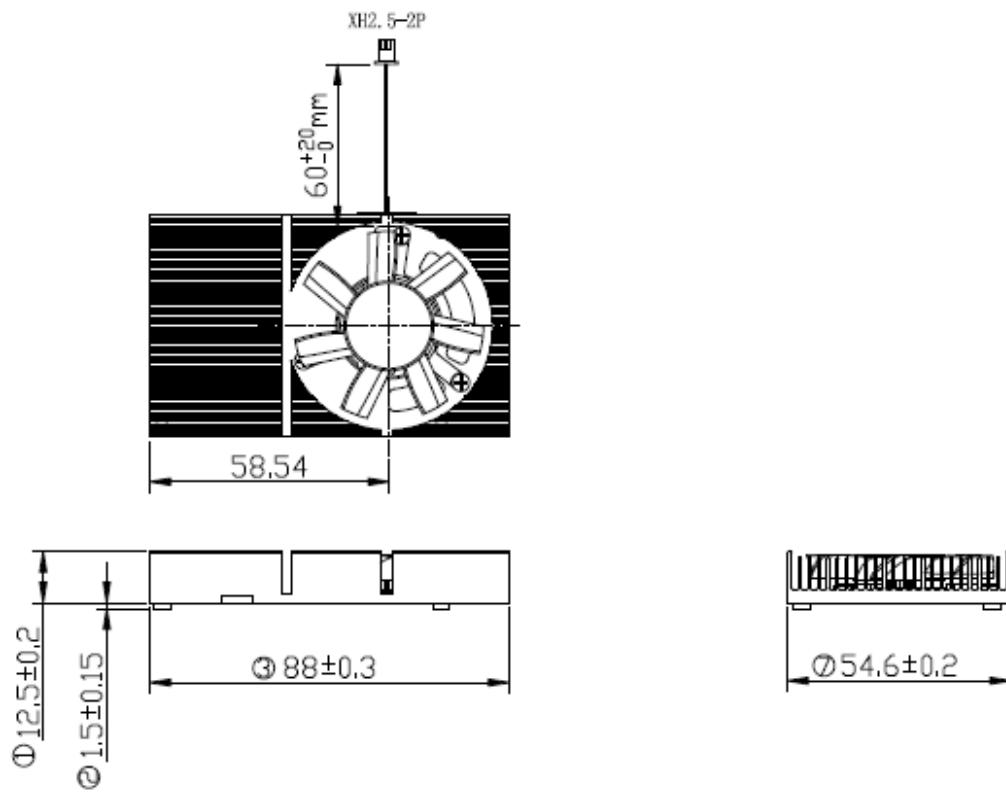


### 6.2. Board Dimension



Tolerances : +/- 0.13 mm

## 7. Thermal Mechanism



## Change log or update history

| Rev. | Data       | History                   |
|------|------------|---------------------------|
| 1.0  | 2016/07/01 | 7102048Q3S64LAU datasheet |
|      |            |                           |