

***NVIDIA GT730 DDR5 1024  
PCIe® ADD-IN BOARD***

***GFX-NG730L16-5C  
MPN: 1A1-E000822ADP***

***Datasheet***



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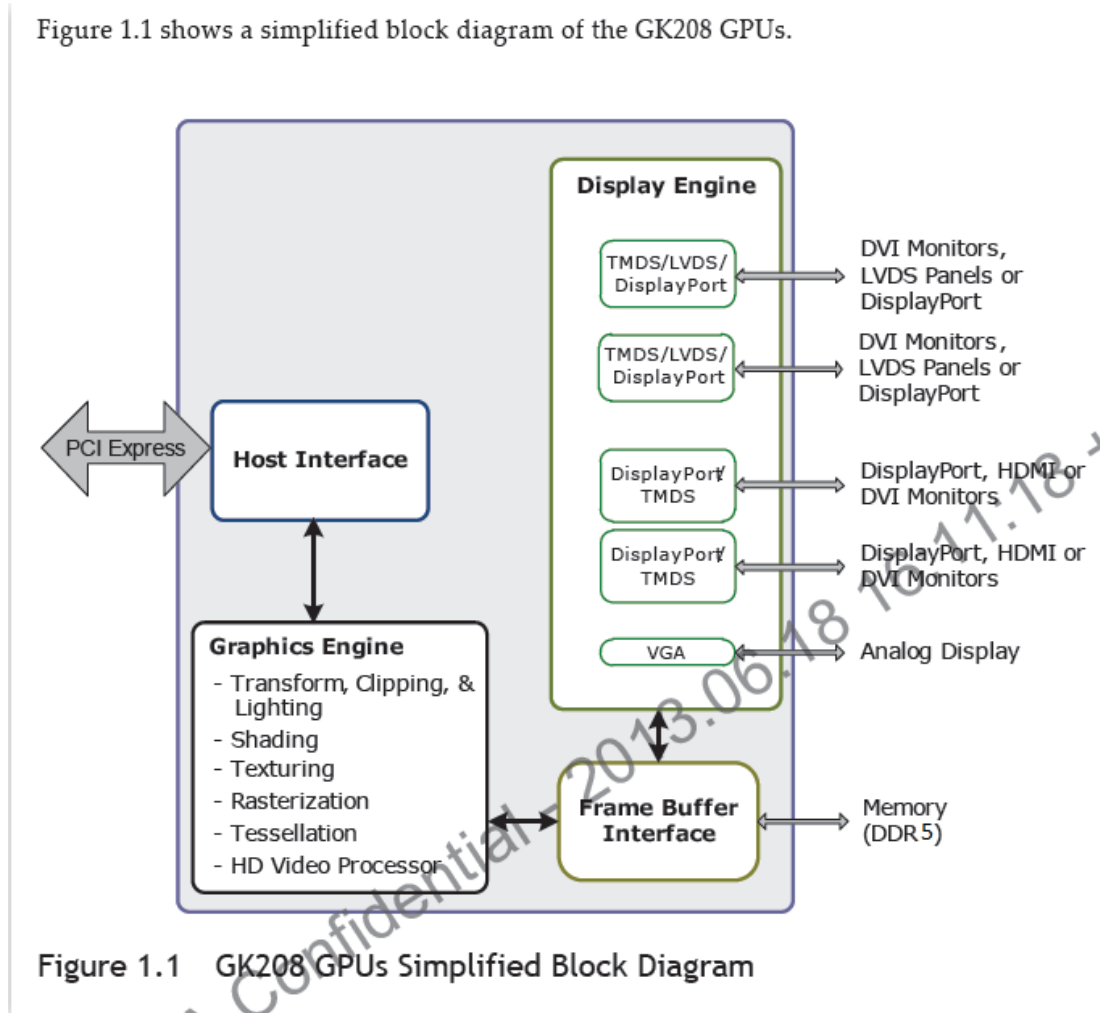
## 1. Feature

Model Name	<b>GFX-NG730L16-5C</b>
<b>Graphics Processing Unit</b>	
GPU	GT730(GK208)
Process Technology	28 nm
Graphics Engine Operating Frequency (max)	902 MHz
Form Factor	Low profile (114.3X68.91 mm)
Card Interface	PCI Express® 2.0 (X16)
CUDA Cores	384
Texture Fill Rate(billion/sec)	14.4
DirectX® capability	DirectX® 12
Shader Model	Shader Model 5.0
OpenGL	OpenGL™ 4.4
Video Decoder	H.264, VC-1, MPEG-2, MPEG-4 part 2 decode, MVC, 3D Blu Ray
<b>Memory</b>	
Memory Operating Frequency (max)	2500 MHz/ 5.0Gbps
Configuration, type	64-bit wide, 1 GB, GDDR5
<b>Display Interface</b>	
Dual-Link DVI	Dual Link DVI-D
HDMI	HDMI x1
VGA	VGA x1

## 2. Functional Overview

### 2.1. GPU Block diagram

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



## 2.2. KEY FEATURES

### GPU

- ▶ Core clock: 902 MHz
- ▶ Voltage: 0.9 V – 1.188V ± 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: 2.713 inches x 5.7 inches
- ▶ Board power: 25 W
- ▶ High definition digital content protection (HDCP) support

## 2.3. Memory

- ▶ Memory clock: 2500MHz
- ▶ Interface: 64 bit
- ▶ Local frame buffer 1 GB (4pieces 64M X 32 GDDR5, FBGA-170 package)

## 2.4. Features and Technologies

- ▶ Fully DirectX® 12 compliant and Shader Model 5.0
- ▶ OpenGL 4.4
- ▶ NVIDIA® Ageia 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

## 2.8. Bus Support Features

- ▶ Compliant with the PCI Express® Base Specification Revision 2.0, up to 1.8 GT/s
- ▶ Supports ×1, ×2, ×4, and ×8 lane widths.
- ▶ Supports 900 GT/s, and 1.8 GT/s link-data rates.
- ▶ Supports ×8 lane reversal where the receivers on lanes 0 to 7 on the graphics endpoint are mapped to the transmitters on lanes 7 down to 0 on the root complex.
- ▶ Supports ×8 lane reversal where the transmitters on lanes 0 to 7 on the graphics endpoint are mapped to the receivers on lanes 7 down to 0 on the root complex (requires corresponding support on the root complex).
- ▶ Supports full-swing and low-swing transmitter output levels.

## 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) (estimated input power)	1.9	A
	22.5	W
PCI Express edge connector (3V3) (estimated input power)	0.8	A
	2.5	W
Total estimated input graphics power (estimated TGP)	25	W

<b>Component Power (Estimated)</b>		
GPU (TDP, estimated)	17	W
Memory power (estimated; eight components)	3	W
Power supplies	3.5	W
Fan, PCB and other losses	1.5	W

## 5. Thermal Specifications

Parameter	Value	Unit
Fan inlet temperature (max.)	50	°C
Operating temperature	0~50	°C
GPU slowdown temperature (max.Tj)	97	°C
GPU shutdown temperature (max.)	102	°C
GPU junction temperature (estimated)	81	°C

## 6. Output configuration and Board Dimension

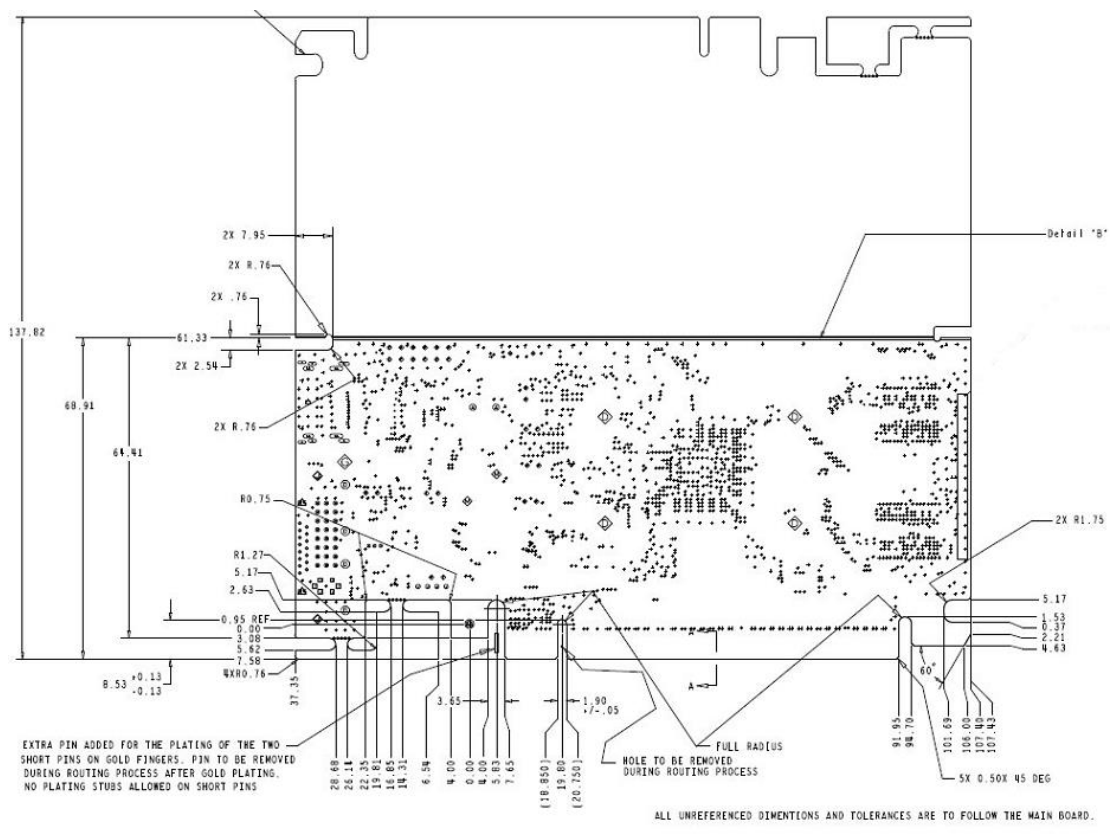
### 6.1. Output Configuration





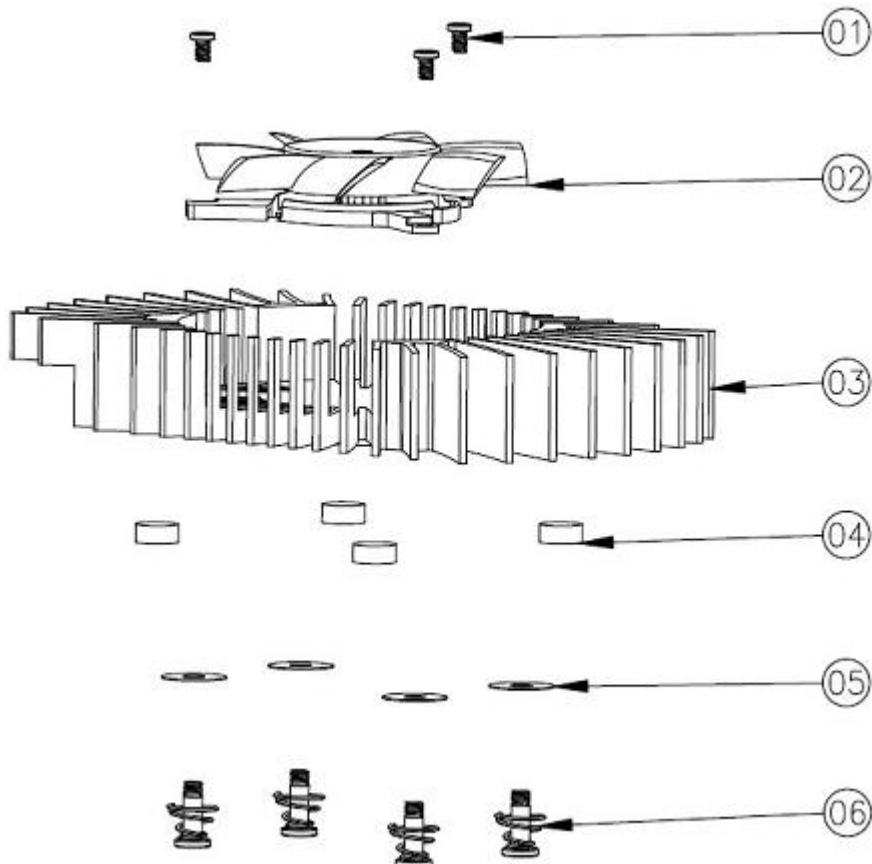
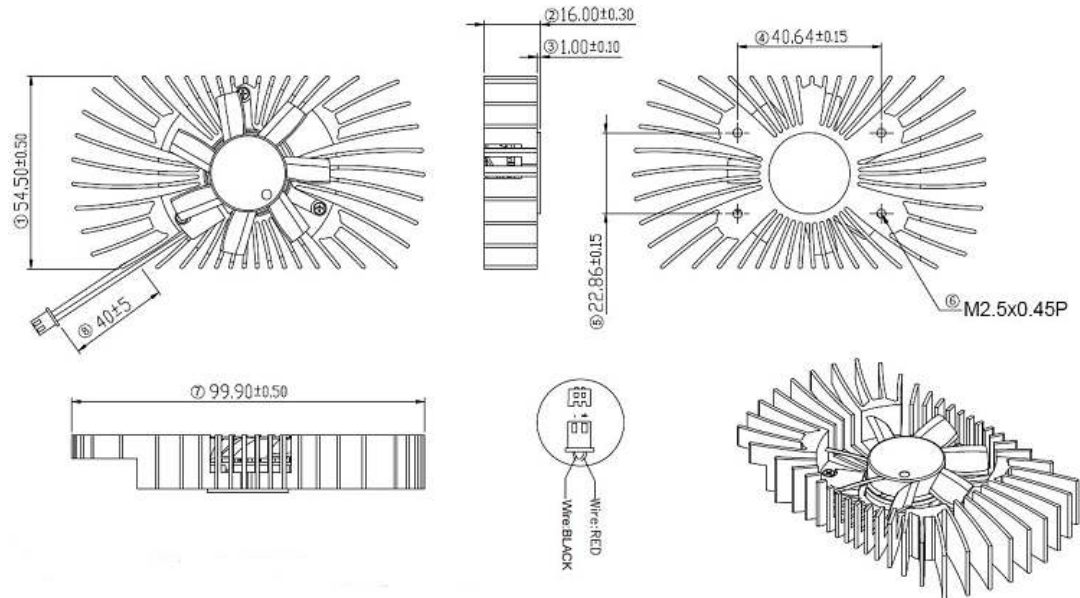
Packing size: 220\*165mm (excluding BOX)

## 6.2 Board Dimension

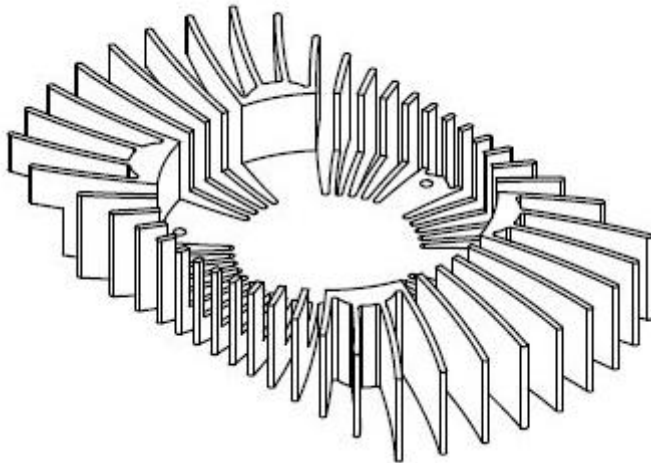
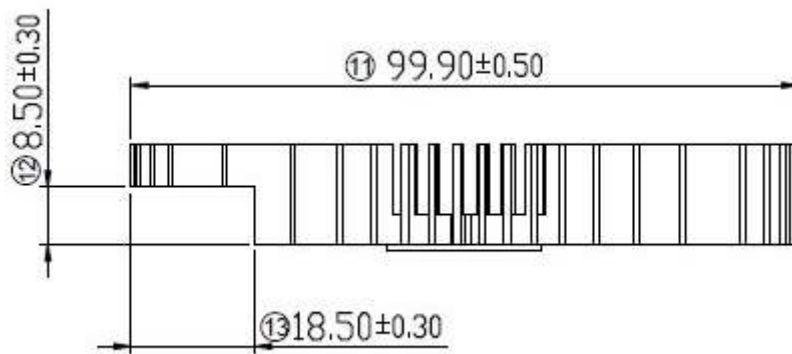
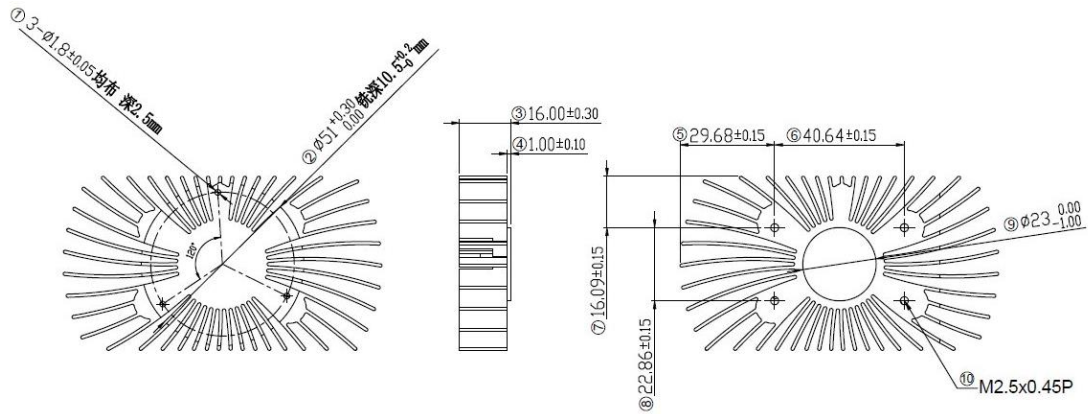


Tolerances : +/- 0.13 mm

## 7. Thermal Mechanism







## Change log or update history

Rev.	Date	History
0.1	2015/10/29	1 <sup>st</sup> Draft