Data Sheet

GFX-N3A1-71FSA1/GFX-N3A1-71FMA1

Version:V1.1
Report Date: Aug. 16 , 2012

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1. History

Report No.	Description	Release Date
V0.1	First Release	2012/07/02
V1.1	Update P/N	2012/08/16

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2. Product Specification

Part Number	GFX-N3A1-71FMA1	GFX-N3A1-71FSA1
Bus Support	PCI-Express 2.0 1X	PCI-Express 2.0 1X
GPU Engine Spec:		
GPU Name	NVIDIA GeForce GT 610	NVIDIA GeForce GT 610
CUDA Cores	48	48
Graphics Clock (MHz)	810	810
Processor Clock (MHz)	1620	1620
Texture Fill Rate (billion/sec)	6.5	6.5
Memory Specs:		
Memory Clock	1600MHz	1600MHz
Memory Size	1024MB DDR3 64bit	1024MB DDR3 64bit
Memory Bandwidth(GB/sec)	14.4	14.4
Display Support：		
Multi Monitor	Yes	Yes
Maximum Digital Resolution	2560x1600	2560x1600
Maximum VGA Resolution	2048x1536	2048x1536
HDMI	HDMI 4.1	HDMI 4.1
Display Connector	D-SUB, HDMI, Dual Link DVI-I	D-SUB,HDMI, Dual Link DVI-I
Thermal	Fan	Heat sink
Minimum System Power Requirement (W)	300W	300W
Feature Support	OpenGL 4.2 , DirectX11, CUDA, PhysX	

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3. Product Feature

3.1 Provides three-year long term supply.

The changes of industrial computer product specifications are not as rapid as the consumer type; it requires complicated testing and certification procedures. But because the graphics chip advances rapidly, after going through a long-period of pre-work, the industrial computer user's graphics card product cycle has also reached its end. In addition, the system mechanism's design cannot be changed as immediately and flexibly as the graphics card's specifications and size; this wastes a lot of time and cost. In response to this, ADV provides at least three years of long-term supply, allowing industrial computer users not having to worry about the supply period is too short and there are no products available for repairs after the products were tested and certified.

3.2 Uses tantalum capacitors, extending the product's usage life.

Tantalum capacitor's features include able to stand high temperatures, it is highly accurate and has long usage life etc. These features allow the product to be more stable and extend the product's usage life.

3.3 Low Profile equipped with single slot fan design saves more space.

The entire series uses a low profile design, with an optional purchase of one slot fans; this can vastly reduce the space occupied by the graphics card, allowing the system's exterior design to be more compact and lightweight. The smaller models can also be equipped with graphics card to increase the overall performance.

3.4 GPU Feature

3.41 NVIDIA® PureVideo® HD Technology

The combination of high-definition video decode acceleration and post-processing that delivers stunning picture clarity, smooth video, accurate color, and precise image scaling for movies and video.

*

3.42 Blu-ray 3D Support[2]

Connect your PC to any 3D enabled TV over HDMI and enjoy a cinematic 3D experience in your home with seamless support for 1080p Blu-ray 3D discs.

3.43 TrueHD and DTS-HD Audio Bitstreaming

Full support for TrueHD and DTS-HD advanced lossless multi-channel HD audio codecs brings the rich sound of the master recording to your living room.

3.44 Microsoft® DirectX® 11 Support

DirectX 11 GPU with Shader Model 5.0 support designed for ultra high performance in the new API's key graphics feature, GPU-accelerated tessellation.

3.45 NVIDIA CUDA™ Technology[3]

NVIDIA® CUDA™ technology unlocks the power of the GPU's processor cores to accelerate the most demanding system tasks – such as photo editing – delivering incredible performance improvements over traditional CPUs.

3.46 NVIDIA PhysX® Technology

Full support for PhysX technology, enabling a totally new class of physical gaming interaction for a more dynamic and realistic experience with GeForce.

3.47 NVIDIA FXAA Technology

Shader-based anti-aliasing technology available from the NVIDIA Control Panel that enables ultra-fast anti-aliasing in hundreds of PC games.

3.48 NVIDIA Adaptive Vertical Sync

Dynamically enables vertical sync based on your current frame rates for the smoothest gaming experience.

3.5 Display Feature

3.51 HDMI

Support for HDMI including GPU accelerated Blu-ray 3D support, x.v.Color, HDMI Deep Color, and 7.1 digital surround sound.

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3.52 Dual-link DVI

Able to drive industry's largest and highest resolution flat-panel displays up to 2560x1600.

3.6 Thermal Feature

3.61 The Two ball bearing fan fulfills the need for long-period usage. (Only GFX-N3A1-71FMA1 Model)

Graphics card products mainly malfunction due to the fan stopped operating, and not because the graphics chip itself malfunctioned; and the average graphics cards mostly use sleeve bearing Fan, which are lower in cost, and the design of these fans usually causes wearing down of the bearing due to the volatizing of the internal lubricants and causes the fan's rotation speed to slow down or even stop, resulting in the graphics chip being burnt due to overheating. And the operations of industrial computer products are mostly operating 24 hours a day, which causes even more wearing to the fan. Therefore for this series of products, ADV used two ball bearing fans to change the bearing's friction method and avoid lubricants from leaking, vastly increasing the fan's usage life and meets the industrial computer's long-term usage environment.

3.62 Passive heat sink creates zero-noise work environments. (Only For GFX-N3A1-71FSA1)

For work environments that have rigorous demands for zero-noise, passive heat sinks can be diversely selected for the radiator. Not only will no noise be generated when the fan is operating, there will also be no worries on the fan stop operating.

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4. PIN Assignment

Ball Name	Ball No
BUFRST_N	N5
DACA_BLUE	AD3
DACA_GREEN	AE3
DACA_HSYNC	AD2
DACA_RED	AE2
DACA_REST	AE1
DACA_VDD	AG2
DACA_VREF	AF1
DACA_VSYNC	AD1
DACB_BLUE	R4
DACB_GREEN	T4
DACB_HSYNC	U6
DACB_RED	T5
DACB_RSET	V6
DACB_VDD	W5
DACB_VREF	R6
DACB_VSYNC	U4
NC	W6
NC	Y6
NC	AA6
FB_CAL_PD_VDDQ	B15
FB_CAL_PU_GND	A15
FB_CAL_TERM_GND	B16
FB_DLLAVDD	T19
FB_PLLAVDD	AC19
FB_PLLAVDD	R19
FB_VREF	A16
FBA_CLK0	F24
FBA_CLKO_N	F23
FBA_CLK1	N24
FBA_CLK1_N	N23
FBA_CMD0	G24
FBA_CMD1	F27
FBA_CMD10	H22

Ball Name	Ball No
FBA_CMD11	J26
FBA_CMD12	G22
FBA_CMD13	G23
FBA_CMD14	J22
FBA_CMD15	J27
FBA_CMD16	M24
FBA_CMD17	L24
FBA_CMD18	J23
FBA_CMD19	K23
FBA_CMD2	F25
FBA_CMD20	K22
FBA_CMD21	M23
FBA_CMD22	K24
FBA_CMD23	M27
FBA_CMD24	N27
FBA_CMD25	M26
FBA_CMD26	K26
FBA_CMD27	K27
FBA_CMD28	K25
FBA_CMD29	M25
FBA_CMD3	F26
FBA_CMD30	F22
FBA_CMD4	L22
FBA_CMD4	G26
FBA_CMD5	G27
FBA_CMD6	G25
FBA_CMD7	J25
FBA_CMD8	J24
FBA_CMD9	H24
FBA_D0	D22
FBA_D1	E24
FBA_D10	C21
FBA_D11	C19
FBA_D12	C18

Ball Name	Ball No
FBA_D13	D18
FBA_D14	B18
FBA_D15	C16
FBA_D16	E21
FBA_D17	F20
FBA_D18	D20
FBA_D19	F21
FBA_D2	E22
FBA_D20	D17
FBA_D21	F18
FBA_D22	D16
FBA_D23	E16
FBA_D24	A22
FBA_D25	C24
FBA_D26	D21
FBA_D27	B22
FBA_D28	C22
FBA_D29	A25
FBA_D3	D24
FBA_D30	B25
FBA_D31	A16
FBA_D32	U24
FBA_D33	V24
FBA_D34	T23
FBA_D35	T23
FBA_D36	R24
FBA_D37	P24
FBA_D38	P22
FBA_D39	R23
FBA_D4	B27
FBA_D40	AC24
FBA_D41	AB23
FBA_D42	AB24
FBA_D43	W24
FBA_D44	AA22

*

Ball Name	Ball No
FBA_D45	W23
FBA_D46	W22
FBA_D47	V22
FBA_D48	AA25
FBA_D49	W27
FBA_D5	D27
FBA_D50	W26
FBA_D51	W25
FBA_D52	AD27
FBA_D53	AB26
FBA_D54	AD26
FBA_D55	FBA_AB25
FBA_D56	V25
FBA_D57	V25
FBA_D58	V26
FBA_D59	V27
FBA_D6	C27
FBA_D60	R26
FBA_D61	T25
FBA_D62	N25
FBA_D63	N26
FBA_D7	D26
FBA_D8	A21
FBA_D9	B21
FBA_DEBUG0	M22
FBA_DQM0	C26
FBA_DQM1	B19
FBA_DQM2	D19
FBA_DQM3	D23
FBA_DQM4	T24
FBA_DQM5	AA23
FBA_DQM6	AB27
FBA_DQM7	T26
FBA_DQS_RN0	D25
FBA_DQS_RN2	E18

Ball Name	Ball No
FBA_DQS_RN3	B24
FBA_DQS_RN4	R22
FBA_DQS_RN5	Y24
FBA_DQS_RN6	AA27
FBA_DQS_RN7	R27
FBA_DQS_WP0	C25
FBA_DQS_WP1	A19
FBA_DQS_WP2	E19
FBA_DQS_WP3	A24
FBA_DQS_WP4	T22
FBA_DQS_WP5	AA24
FBA_DQS_WP6	AA26
FBA_DQS_WP7	T27
FBVDDQ	A13
FBVDDQ	B13
FBVDDQ	C13
FBVDDQ	D14
FBVDDQ	E13
FBVDDQ	F13
FBVDDQ	F14
FBVDDQ	F15
FBVDDQ	F16
FBVDDQ	F17
FBVDDQ	F19
FBVDDQ	F22
FBVDDQ	H23
FBVDDQ	H26
FBVDDQ	J15
FBVDDQ	J16
FBVDDQ	J18
FBVDDQ	J19
FBVDDQ	L19
FBVDDQ	L23
FBVDDQ	L26

Ball Name	Ball No
FBVDDQ	M19
FBVDDQ	N22
FBVDDQ	U22
FBVDDQ	Y22
GND	AC11
GND	AC14
GND	AC17
GND	AC2
GND	AC20
GND	AC23
GND	AC26
GND	AC5
GND	AC8
GND	AF11
GND	AF14
GND	AF17
GND	AF2
GND	AF20
GND	AF23
GND	AF26
GND	AF5
GND	AF8
GND	B11
GND	B14
GND	B17
GND	B2
GND	B20
GND	B23
GND	B26
GND	B5
GND	B8
GND	E11
GND	E17
GND	E2
GND	E20

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Ball Name	Ball No
GND	E23
GND	E26
GND	E5
GND	E8
GND	H2
GND	H5
GND	J11
GND	J14
GND	J17
GND	K19
GND	K9
GND	L11
GND	L12
GND	L13
GND	L14
GND	L15
GND	L16
GND	L17
GND	L2
GND	L5
GND	M12
GND	M14
GND	M15
GND	M16
GND	P19
GND	P2
GND	P23
GND	P2
GND	P23
GND	P26
GND	P5
GND	P9
GND	T12
GND	T13
GND	T14
GND	T15
GND	T16
GND	U11

Ball Name	Ball No
GND	U12
GND	U13
GND	U14
GND	U15
GND	U16
GND	U17
GND	U2
GND	U23
GND	U26
GND	U5
GND	V19
GND	V9
GND	W11
GND	W14
GND	W17
GND	Y2
GND	Y23
GND	Y26
GND	Y5
GND_SENSE	E14
GND_SENSE	W16
GPIO0	N1
GPIO1	G1
GPIO10	D2
GPIO12	J3
GPIO13	J1
GPIO14	K1
GPIO15	F3
GPIO16	G3
GPIO17	G2
GPIO18	F1
GPIO19	F2
GPIO2	C1
GPIO20	A3
GPIO21	A4
GPIO3	M2
GPIO4	M3
GPIO5	K3

Ball Name	Ball No
GPIO6	K2
GPIO7	J2
GPIO8	M1
GPIO9	M1
I2CA_SCL	R1
I2CA_SDA	T3
I2CC_SCL	A2
I2CC_SDA	B1
I2CS_SCL	T1
I2CS_SDA	T2
IFPA_IOVDD	V3
IFPA_TXC	AC4
IFPA_TXC_N	AD4
IFPA_TXD0	V5
IFPA_TXD0_N	V4
IFPA_TXD1	AA5
IFPA_TXD1_N	AA4
IFPA_TXD2	W4
IFPA_TXD2_N	Y4
IFPA_TXD3	AB4
IFPA_TXD3_N	AB5
IFPAB_PLLVDD	AD5
IFPAB_RSET	AB6
IFPB_IOVDD	V2
IFPB_TXC	AB3
IFPB_TXD4	W1
IFPB_TXD4_N	V1
IFPB_TXD5	W3
IFPB_TXD5_N	W2
IFPB_TXD6	AA2
IFPB_TXD6_N	AA3
IFPB_TXD7	AB1
IFPB_TXD7_N	AA1
IFPC_AUX_ 12CW_SCL	G4
IFPC_AUX_ 12CW_SDA_N	G5

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Ball Name	Ball No
IFPC_L0	P4
IFPC_L0_N	N4
IFPC_L1	M5
IFPC_1_N	M4
IFPC_L2	L4
IFPC_L2_N	K4
IFPC_L3	H4
IFPC_L3_N	J4
IFPC_PLLVDD	P6
IFPC_RSET	R5
IFPCD_IOVDD	J6
IFPD_AUX_ 12CX_SCL	D3
IFPD_AUX_ 12CX_SDA_N	D4
IFPD_L0	F5
IFPD_L0_N	F4
IFPD_L1	E4
IFPD_L2	C3
IFPD_L2_N	C4
IFPD_L3_N	B4
IFPD_PLLVDD	N6
IFPD_RSET	M6
IFPE_AUX_ 12CY_SCL	F7
IFPE_AUX_ 12CY_SDA_N	G6
IFPE_IOVDD	H6
IFPE_L0	D6
IFPE_L0_N	C6
IFPE_L1	A6
IFPE_LQ_N	A7
IFPE_L2	B6
IFPE_L2_N	B7

Ball Name	Ball No
IFPE_L3	E6
IFPE_L3_N	E7
IFPE_PLLVDD	D7
IFPE_RSET	F8
JTAG_TCK	AF3
JTAG_TDI	AG4
JTAG_TMS	AF4
JTAG_TRST_N	AG3
MULTI_STRAP_REF GND	F11
MULTI_STRAP_REF GND	F10
MULTI_STRAP_REF GND	T6
PEX_CLKREQ_N	AE9
PEX_IOVDD	AC9
PEX_IOVDD	AD7
PEX_IOVDD	AD8
PEX_IOVDD	AE7
PEX_IOVDD	AF7
PEX_IOVDD	AG7
PEX_IOVDDQ	AB13
PEX_IOVDDQ	AB16
PEX_IOVDDQ	AB17
PEX_IOVDDQ	AB7
PEX_IOVDDQ	AB8
PEX_IOVDDQ	AB9
PEX_IOVDDQ	AC13
PEX_IOVDDQ	AC7
PEX_IOVDDQ	AD6
PEX_IOVDDQ	AE6
PEX_IOVDDQ	AF6
PEX_IOVDDQ	AG6
PEX_PLLVDD	AF9
PEX_REFCLK	AB10
PEX_REFCLK_N	AC10
PEX_RST_N	AD9

Ball Name	Ball No
PEX_RX0	AE12
PEX_RX0_N	AF12
PEX_RX1	AG12
PEX_RX10	AG21
PEX_RX10_N	AG22
PEX_RX11	AF22
PEX_RX11_N	AE22
PEX_RX12	AE24
PEX_RX12_N	AF24
PEX_RX13	AG24
PEX_RX13_N	AF25
PEX_RX14	AG25
PEX_RX14_N	AG26
PEX_RX15	AF27
PEX_RX15_N	AE27
PEX_RX2	AF13
PEX_RX2_N	AE13
PEX_RX3	AE15
PEX_RX3_N	AF15
PEX_RX4	AG15
PEX_RX4_N	AG16
PEX_RX5	AF16
PEX_RX5_N	AE16
PEX_RX6	AE18
PEX_RX6_N	AF18
PEX_RX7	AG18
PEX_RX7_N	AG19
PEX_RX8	AF19
PEX_RX8_N	AE19
PEX_RX9	AE21
PEX_RX9_N	AF21
PEX_SVDD_3V3	AG9
PEX_TERMP	AG10
PEX_TSTCLK_OUT	AF10

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Ball Name	Ball No
PEX_TSTCLK_OUT_N	AE10
PEX_TX0	AD10
PEX_TX0_N	AD11
PEX_TX1	AD12
PEX_TX1_N	AC12
PEX_TX10	AD19
PEX_TX11	AD21
PEX_TX11_N	AC21
PEX_TX12	AB21
PEX_TX12_N	AB22
PEX_TX13	AC22
PEX_TX13_N	AD22
PEX_TX14	AD23
PEX_TX14_N	AD24
PEX_TX15	AE25
PEX_TX15_N	AE26
PEX_TX2	AB11
PEX_TX2_N	AB12
PEX_TX3	AD13
PEX_TX3_N	AD14
PEX_TX4	AD15
PEX_TX5	AB14
PEX_TX6	AC16
PEX_TX6_N	AD16
PEX_TX7	AD17
PEX_TX7_N	AD18
PEX_TX8	AC18
PEX_TX8_N	AB18
PEX_TX9	AB19
PEX_TX9_N	AB20
PGOOD	J5
PLLVDD	K5
ROM_CS_N	B10
ROM_SCLK	C9

Ball Name	Ball no
ROM_SCLK	C9
ROM_SI	A10
ROM_SO	C10
SP_PLLVDD	L6
STRAP0	C7
STRAP1	B9
STRAP2	A9
STRAP3	F9
STRAP4	N2
TESTMODE	AD25
THERMDN	D8
THERMDP	D9
VDD	J10
VDD	J12
VDD	J13
VDD	J9
VDD	L9
VDD	M11
VDD	M17
VDD	M9
VDD	N11
VDD	N12
VDD	N13
VDD	N14
VDD	N15
VDD	N16
VDD	N17
VDD	N18
VDD	N19
VDD	N9
VDD	P11
VDD	P12
VDD	P13
VDD	P14

Ball Name	Ball no
VDD	P15
VDD	P16
VDD	P17
VDD	R11
VDD	R12
VDD	R13
VDD	R14
VDD	R15
VDD	R16
VDD	R17
VDD	R9
VDD	T11
VDD	T17
VDD	T9
VDD	U19
VDD	U9
VDD	W10
VDD	W12
VDD	W13
VDD	W9
VDD_SENSE	E15
VDD_SENSE	W15
VDD33	A12
VDD33	B12
VDD33	C12
VDD33	D12
VDD33	E12
VDD33	F12
VID_PLLVDD	K6
XTAL_IN	D10
XTAL_OUT	E10
XTAL_OUTBUFF	E9
XTAL_SSIN	D11

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5. Power Consumption

Windows 7 64 bit (GFX-N3A1-71FMA1 / GFX-N3A1-71FSA1)

5.1. Varying GPU Heater duty from 20% ~ 100%.
5.2. Set P12 Model for 10 minutes in windows 7 64bit.

GLS duty	Power Consumption (w)
20%	15.240
40%	17.879
60%	19.578
80%	23.034
100%	26.149
P12	8.014

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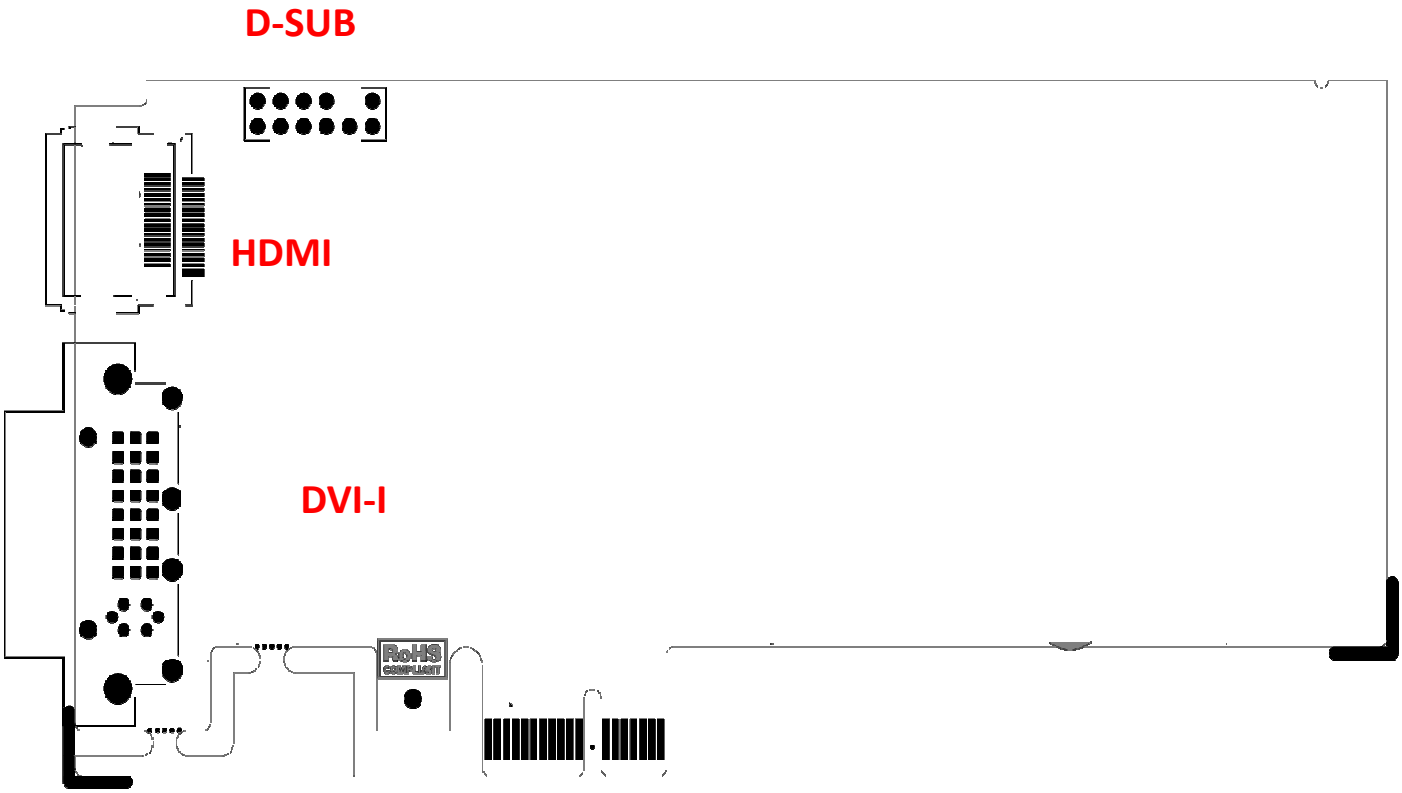
6. Output Configuration and Board Dimension

6.1 Output Configuration



◆ GFX-N3A1-71FSA1 / GFX-N3A1-71FMA1

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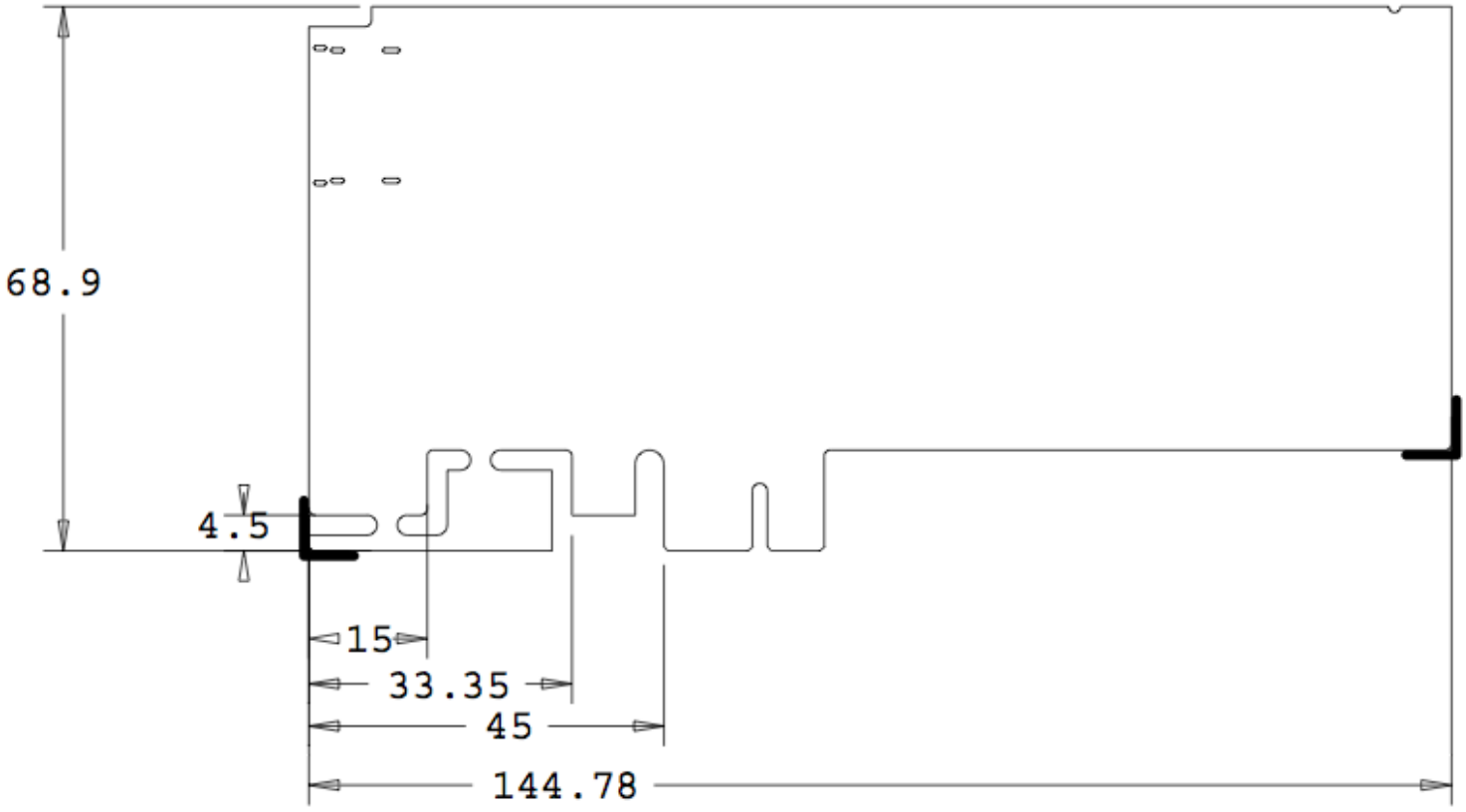
6.2 Board Dimension (mm)



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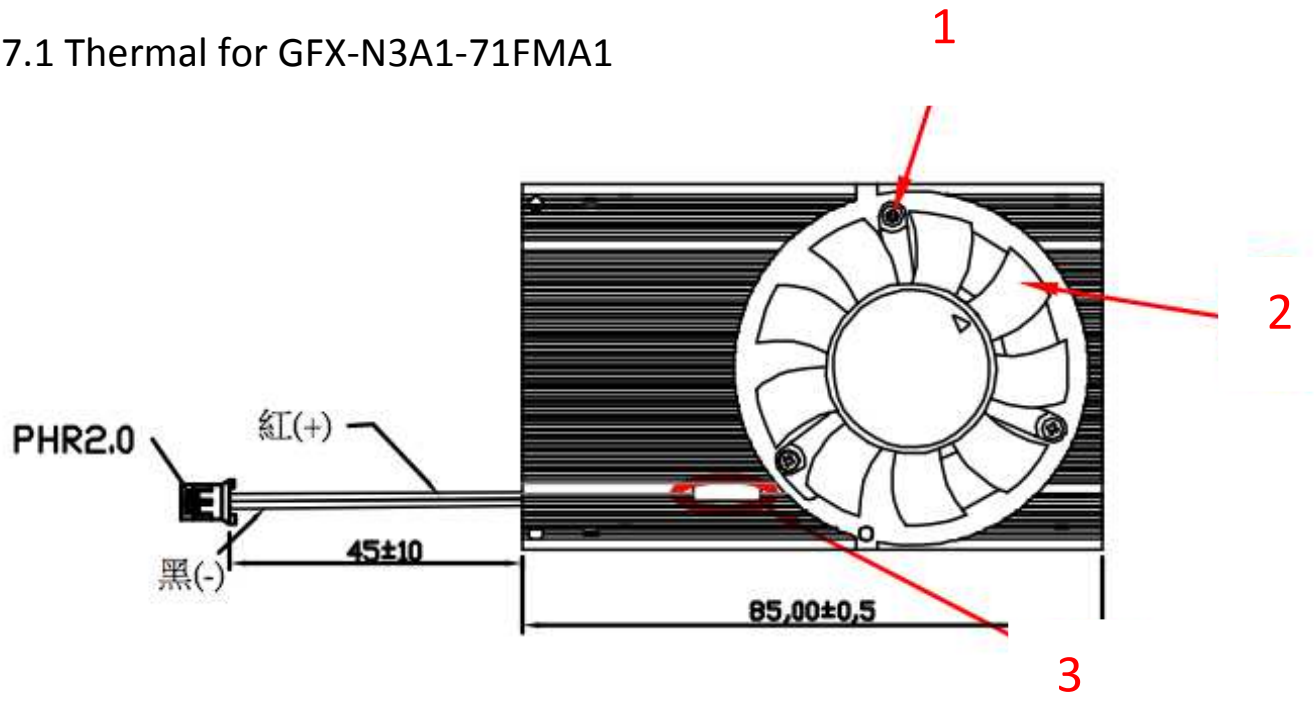
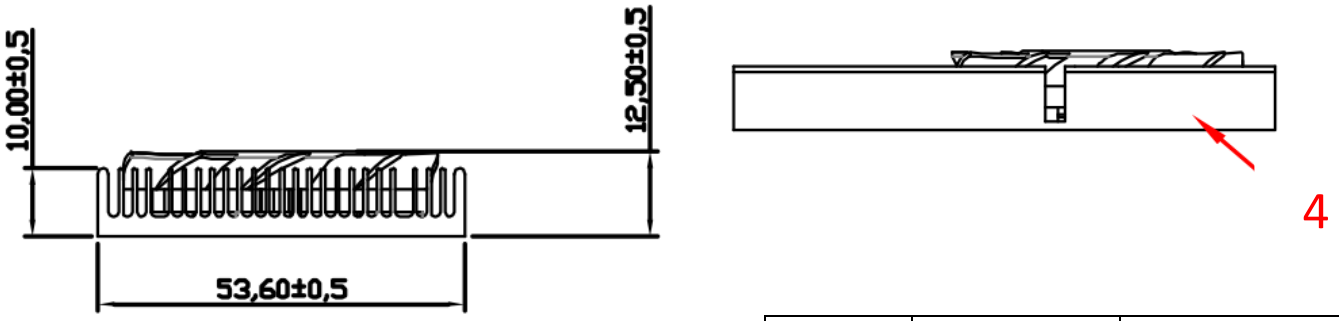
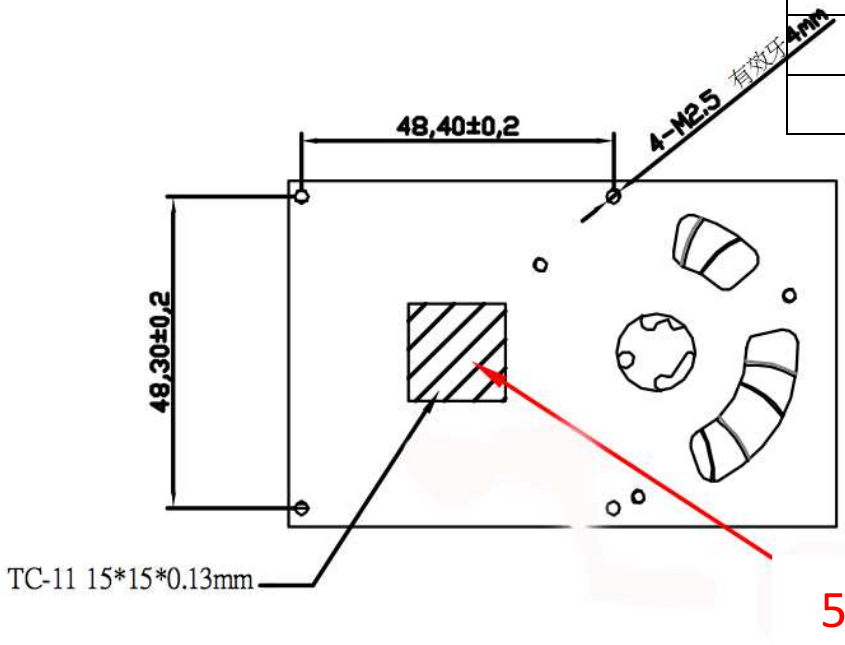
7. Thermal Mechanism

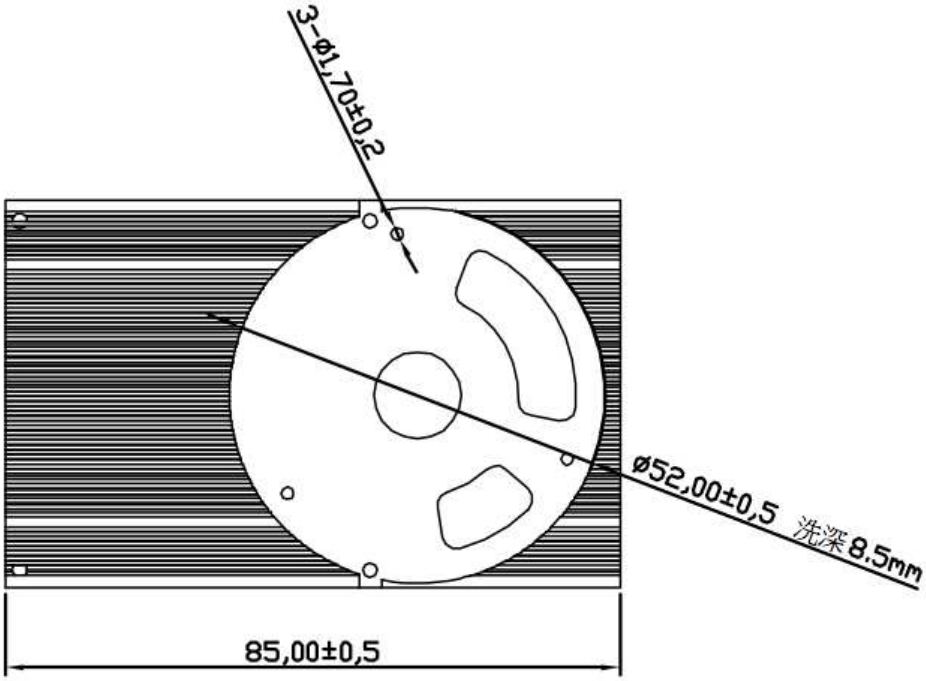
7.1 Thermal for GFX-N3A1-71FMA1

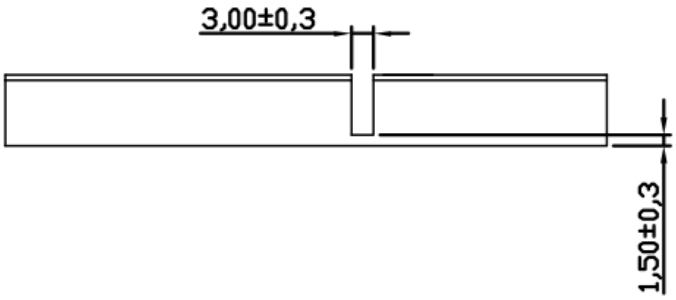


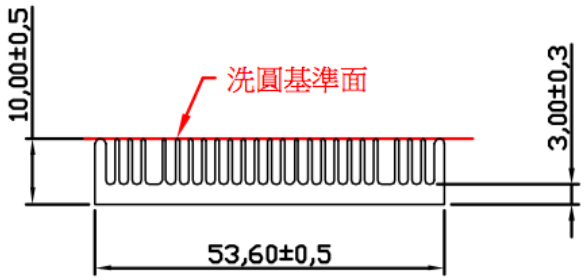


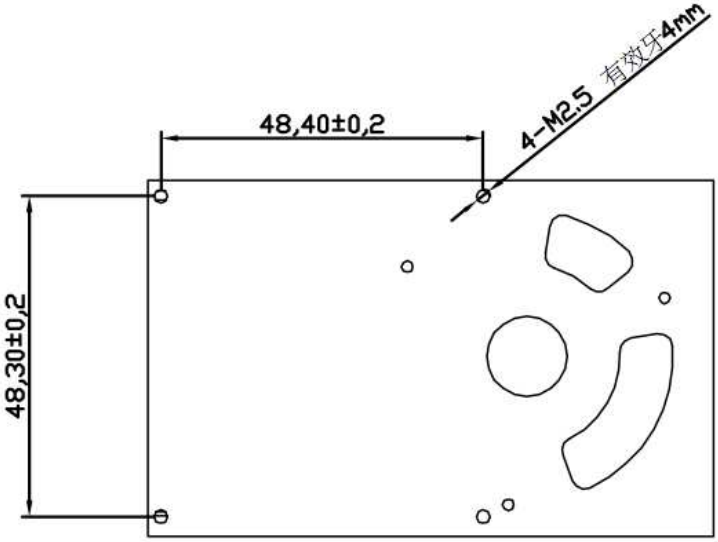
Item Number	Part name	Size
1	Screw	M2*33 mm
2	Fan	5010 5000RPM
3	Rubber	3.5*3.5*10mm
4	Het sink	53.6*85*10mm
5	Thermal Pad	15*15*0.13mm




3-Φ1,70±0,2
Φ52,00±0,5 洗深8,5mm
85,00±0,5


3,00±0,3
1,50±0,3


10,00±0,5
洗圓基準面
3,00±0,3
53,60±0,5


48,40±0,2
4-M2.5 有效牙4mm
48,30±0,2

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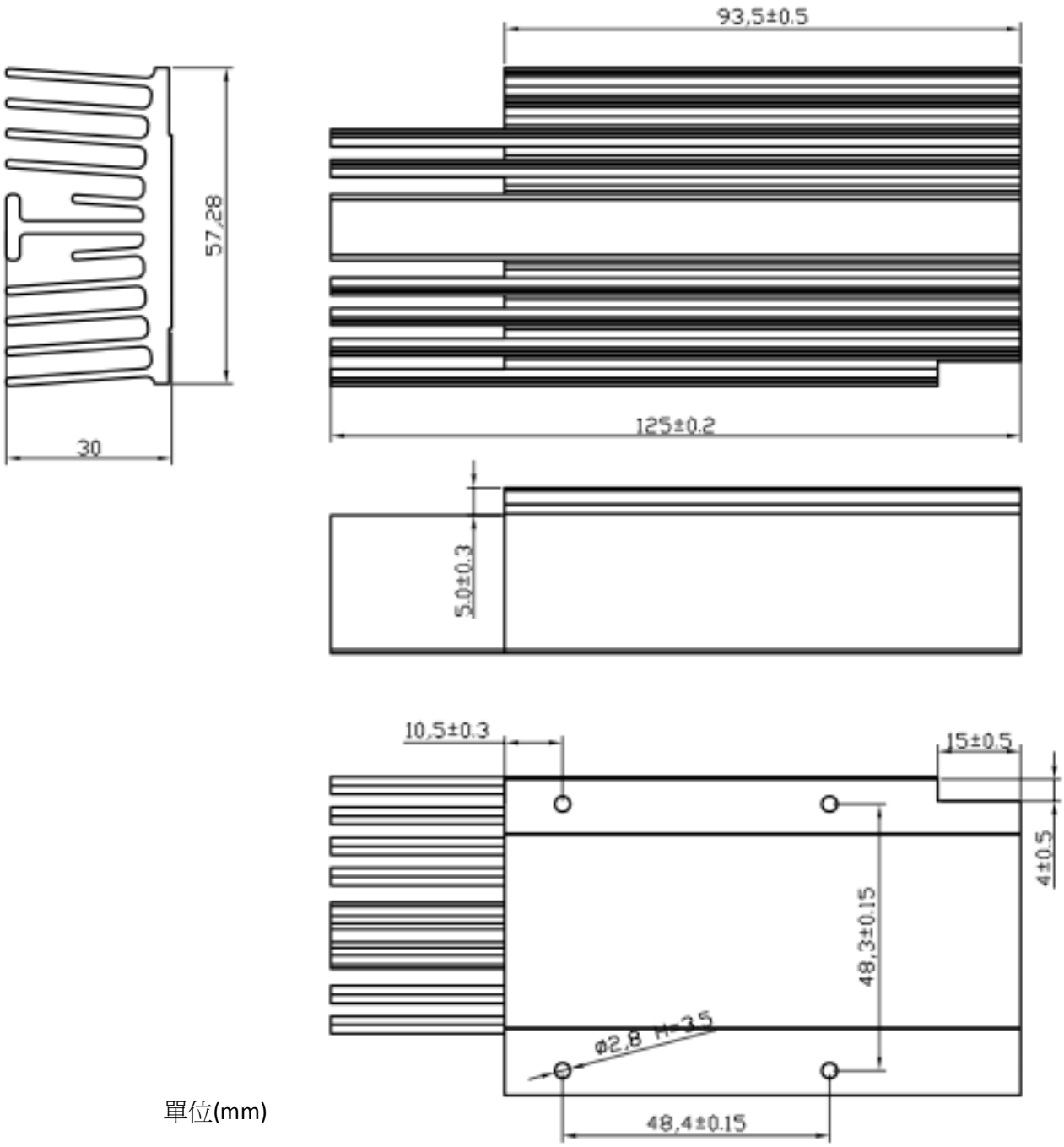
7.2 Thermal for GFX-N3A1-71FSA1



單位(mm)

Tolerances	
0-0.6	±0.1
6.0-80	±0.15
80-180	±0.2
180--	±0.35

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8. Order Information

Part Number	GFX-N3A1-71FMA1	GFX-N3A1-71FSA1
Bus Type	PCI-E 1X	PCI-E 1X
GPU	NVIDIA GeForce GT 610	NVIDIA GeForce GT 610
Memory Size	1GB DDR3 64bit	1GB DDR3 64bit
Output	DVI-I+HDMI+DSUB	DVI-I+HDMI+DSUB
Thermal	Two Ball Bearing Fan	Heat sink
Form Factor	Low Profile	Low Profile

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