ZRT 智锐通

Empowering Tomorrow's AI Computing

MM4080B6-12G

NVIDIA RTX 4080m MXM Graphics Card

User Manual

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目录

1.Specifications

Model	MM4080B6-12G
GPU Architecture	NVIDIA Ada Lovelace
Graphics Processing Unit	NVIDIA GeForce RTX4080 Max-Q
Bus Type	MXM3 .1 / up to PCI Express 4.0 x16
Graphics Clock	795MHz / 1350MHz (Boost)
Memory Size	12G 192bit GDDR6
Memory Clock	2250MHz (18.0 Gbps)
Memory Bandwidth	432.0GB/s
Display Features	DP_A: Display Port1.4++ DP_B: Display Port1.4++ DP_C: HDMI2.1 DP_D: eDP DP_E: HDMI
Max Resolution	DP:7680x4320@120Hz HDMI: 7680x4320@60Hz
Number of Output Channel	4
Board Power	90W
Board Dimensions	MXM Graphics Module Version 3.1 Type B (105x82mm)
Operation System	Windows 10 64bit、Windows 11、Linux 64bit
VIN Range	DC 12~19V, 3.3V & 5V; +/-5%
Operating Temperature	0~45℃
Storage Temperature	-20~75℃
Operating Humidity	0~95% (non-condensing)
Storage Humidity	10~90%
Render Config	
Shader Processing Units	7427
Tensor Core	232
RT Core	80
TMUs	232
ROPs	80
SM Count	58
L1 Cache	128KB (per SM)
L2 Cache	48MB

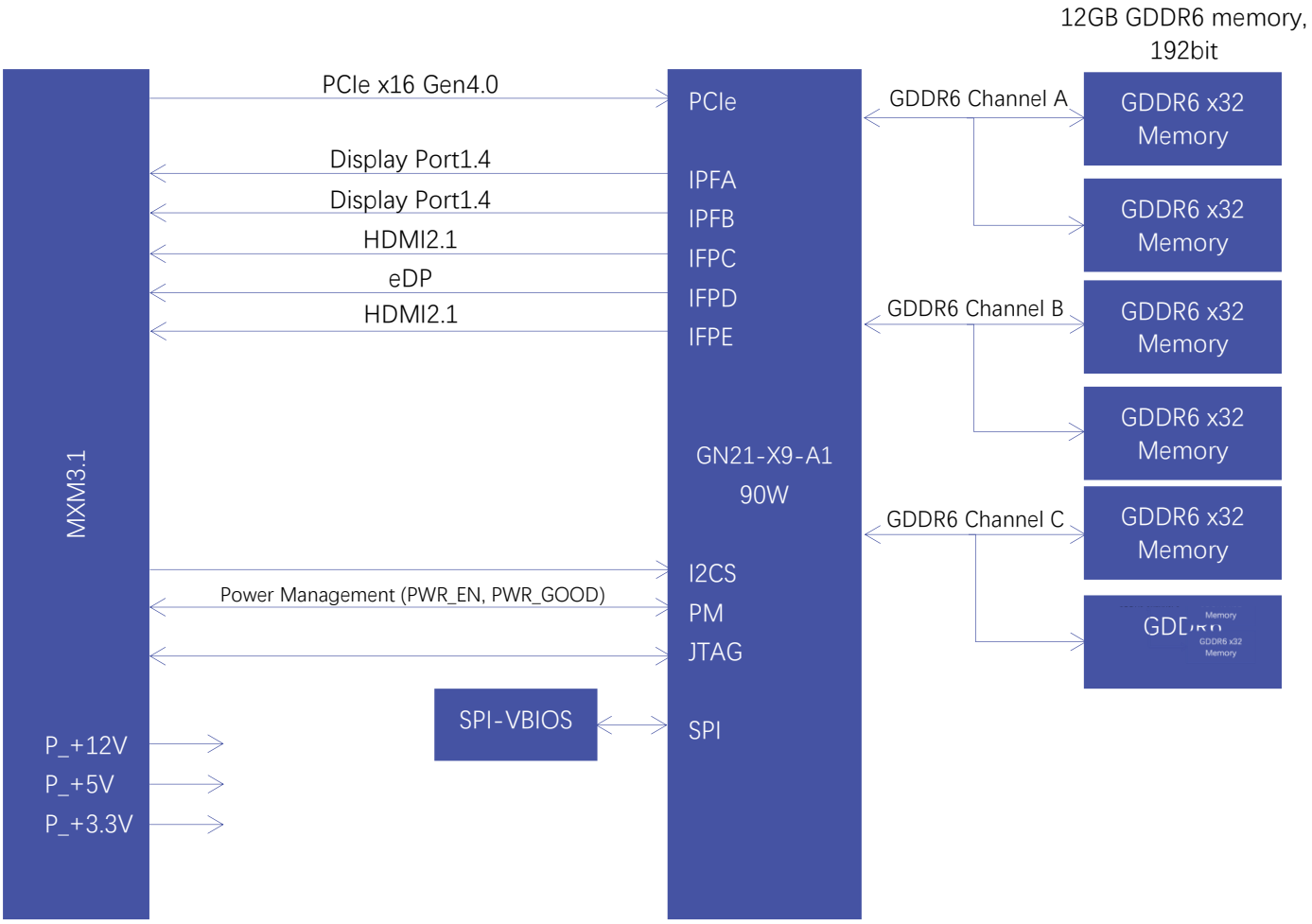
Theoretical Peformance	
Pixel Rate	108.0GPixel/s
Texture Rate	470.4GTexel/s
Single Precision FLOPS(AIDA64)	29946GFLOPS
Double Precision FLOPS(AIDA64)	470.4GFLOPS

Graphics Features	
DirectX	12 Ultimate (12_2)
OpenGL	4.6
OpenCL	3.0
Vulkan	1.3
Shader Model	6.7
CUDA	8.6
Video Playback	H.265, VC1, MPEG2 1080P

Surround(Landscape)	Surround(Portrait)
2x1(3840x1080@60Hz)	2x1(2160x1920@60Hz)
1x2(1920x2160@60Hz)	1x2(1080x3840@60Hz)
3x1(5760x1080@60Hz)	3x1(3240x1920@60Hz)
1x3(1920x3240@60Hz)	1x3(1080x5760@60Hz)
4x1(7680x1080@60Hz)	1x4(1080x7680@60Hz)
2x2(3840x2160@60Hz)	2x2(2160x3840@60Hz)

**Total resolution based on every display resolution is 1920*1080@60Hz.*

2.Block Diagram



3.Connector Pinout

Table 3.1 and Table 3.2 list the connector pinout.

Table 3.1 Connector Pinout

Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
E1	PWR_SRC	E2	PWR_SRC	69	PEX_RX12	70	GND
E3	GND	E4	GND	71	GND	72	PEX_TX11#
1	5V	2	PRSNT_R#	73	PEX_RX11#	74	PEX_TX11
3	5V	4	WAKE#	75	PEX_RX11	76	GND
5	5V	6	PWR_GOOD	77	GND	78	PEX_TX10#
7	5V	8	PWR_EN	79	PEX_RX10#	80	PEX_TX10
9	5V	10	27MHZ_REF	81	PEX_RX10	82	GND
11	GND	12	GND	83	GND	84	PEX_TX9#
13	GND	14	LVDS_U_HPD	85	PEX_RX9#	86	PEX_TX9
15	GND	16	JTAG_TESTEN	87	PEX_RX9	88	GND
17	GND	18	PWR_LEVEL	89	GND	90	PEX_TX8#
19	PEX_STD_SW#	20	TH_OVERT#	91	PEX_RX8#	92	PEX_TX8
21	VGA_DISABLE#	22	TH_ALERT#	93	PEX_RX8	94	GND
23	N/A	24	TH_PWM	95	GND	96	PEX_TX7#
25	N/A	26	GPIO0	97	PEX_RX7#	98	PEX_TX7
27	N/A	28	GPIO1	99	PEX_RX7	100	GND
29	HDMI_CEC	30	GPIO2	101	GND	102	PEX_TX6#
31	LVDS_L_HPD	32	SMB_DAT	103	PEX_RX6#	104	PEX_TX6
33	LVDS_DDC_DAT	34	SMB_CLK	105	PEX_RX6	106	GND
35	LVDS_DDC_CLK	36	GND	107	GND	108	PEX_TX5#
37	GND	38	OEM0	109	PEX_RX5#	110	PEX_TX5
39	OEM1	40	OEM2	111	PEX_RX5	112	GND
41	OEM3	42	OEM4	113	GND	114	PEX_TX4#
43	OEM5	44	OEM6	115	PEX_RX4#	116	PEX_TX4
45	OEM7	46	GND	117	PEX_RX4	118	GND
47	GND	48	PEX_TX15#	119	GND	120	PEX_TX3#
49	PEX_RX15#	50	PEX_TX15	121	PEX_RX3#	122	PEX_TX3
51	PEX_RX15	52	GND	123	PEX_RX3	124	GND
53	GND	54	PEX_TX14#	125	GND	126	KEY
55	PEX_RX14#	56	PEX_TX14	127	KEY	128	KEY
57	PEX_RX14	58	GND	129	KEY	130	KEY
59	GND	60	PEX_TX13#	131	KEY	132	KEY
61	PEX_RX13#	62	PEX_TX13	133	GND	134	GND
63	PEX_RX13	64	GND	135	PEX_RX2#	136	PEX_TX2#
65	GND	66	PEX_TX12#	137	PEX_RX2	138	PEX_TX2
67	PEX_RX12#	68	PEX_TX12	139	GND	140	GND

Table 3.2 Connector Pinout(continued)

Pin	Signal Name	Pin	Signal Name
141	PEX_RX1#	142	PEX_TX1#
143	PEX_RX1	144	PEX_TX1
145	GND	146	GND
147	PEX_RX0#	148	PEX_TX0#
149	REX_RX0	150	PEX_TX0
151	GND	152	GND
153	PEX_REFCLK#	154	PEX_CLK_REQ#
155	PEX_REFCLK	156	PEX_RST#
157	GND	158	VGA_DDC_DAT
159	JTAG_TDO	160	VGA_DDC_CLK
161	JTAG_TDI	162	VGA_VSYNC
163	JTAG_TCLK	164	VGA_HSYNC
165	JTAG_TMS	166	GND
167	JTAG_TRST#	168	VGA_RED
169	LVDS_UCLK#	170	VGA_GREEN
171	LVDS_UCLK	172	VGA_BLUE
173	GND	174	GND
175	LVDS_UTX3#	176	LVDS_LCLK#
177	LVDS_UTX3	178	LVDS_LCLK
179	GND	180	GND
181	LVDS_UTX2#	182	LVDS_LTX3#
183	LVDS_UTX2	184	LVDS_LTX3
185	GND	186	GND
187	LVDS_UTX1#	188	LVDS_LTX2#
189	LVDS_UTX1	190	LVDS_LTX2
191	GND	192	GND
193	LVDS_UTX0#	194	LVDS_LTX1#
195	LVDS_UTX0	196	LVDS_LTX1
197	GND	198	GND
199	DP_C_L0#	200	LVDS_LTX0#
201	DP_C_L0	202	LVDS_LTX0
203	GND	204	GND
205	DP_C_L1#	206	DP_D_L0#
207	DP_C_L1	208	DP_D_L0
209	GND	210	GND
211	DP_C_L2#	212	DP_D_L1#

Pin	Signal Name	Pin	Signal Name
213	DP_C_L2	214	DP_D_L1
215	GND	216	GND
217	DP_C_L3#	218	DP_D_L2#
219	DP_C_L3	220	DP_D_L2
221	GND	222	GND
223	DP_C_AUX#	224	DP_D_L3#
225	DP_C_AUX	226	DP_D_L3
227	RSVD	228	GND
229	RSVD	230	DP_D_AUX#
231	RSVD	232	DP_D_AUX
233	RSVD	234	DP_C_HPD
235	RSVD	236	DP_D_HPD
237	RSVD	238	RSVD
239	RSVD	240	3V3
241	RSVD	242	3V3
243	RSVD	244	GND
245	RSVD	246	DP_B_L0#
247	RSVD	248	DP_B_L0
249	RSVD	250	GND
251	GND	252	DP_B_L1#
253	DP_A_L0#	254	DP_B_L1
255	DP_A_L0	256	GND
257	GND	258	DP_B_L2#
259	DP_A_L1#	260	DP_B_L2
261	DP_A_L1	262	GND
263	GND	264	DP_B_L3#
265	DP_A_L2#	266	DP_B_L3
267	DP_A_L2	268	GND
269	GND	270	DP_B_AUX#
271	DP_A_L3#	272	DP_B_AUX
273	DP_A_L3	274	DP_B_HPD
275	GND	276	DP_A_HPD
277	DP_A_AUX#	278	3V3
279	DP_A_AUX	280	3V3
281	PRSNT_L#	-	

4.MXM Connector

Figure 4.1 MXM Connector (Card Top)

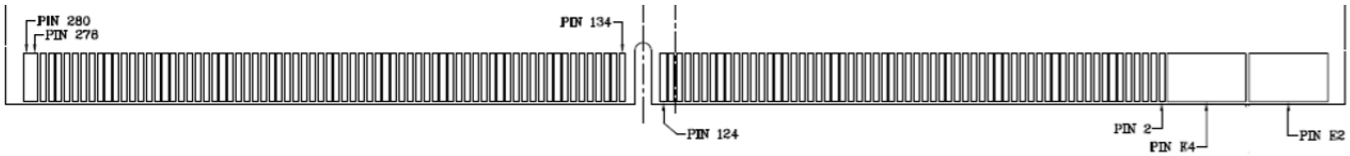
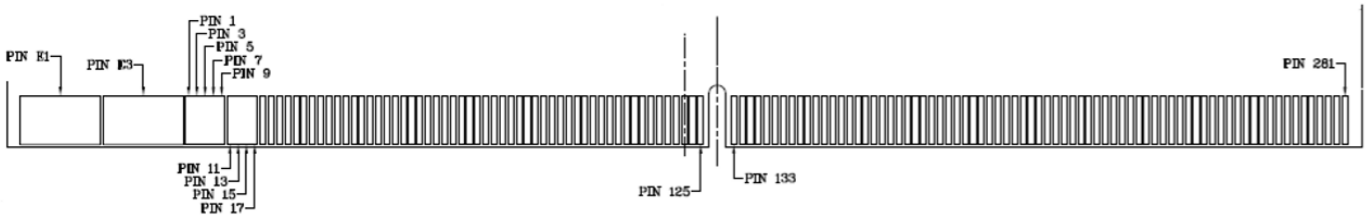


Figure 4.2 MXM Connector (Card Bottom)



5.Power Group

Table 5.1 shows the MXM module power requirements. The voltage tolerances in the table are specified as measured on module edge finger. The system must be able to supply the full specified current on rails (except PWR_SRC) at all times. Th current capability of the PWR_SRC rail must be defined by the system in the MXM system information structure.

Table 5.1 MXM Power Rails

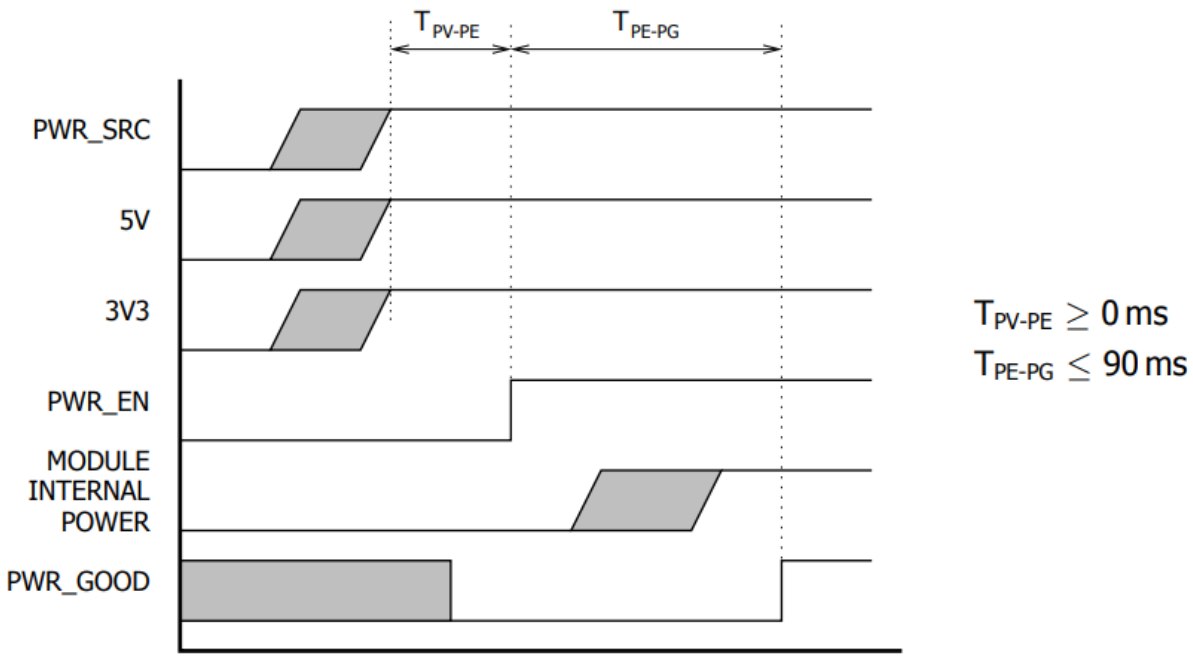
Signal Name	I/O	Type	Impedance	Voltage	Current
PWR_SRC	I	Power	N/A	12-19V	up to 10A
5V	I	Power	N/A	5.0V ± 6%	2.5A
3.3V	I	Power	N/A	3.3V ± 6%	2.0A

Note: PWR_SRC voltage range is assumed to be DC or RMS. However under any circumstances the maximum peak voltage shall not exceed 22V and minimum voltage shall not fall below 6.5V.

6.Power Sequencing

There is no power sequencing requirement for the input voltages to the MXM module. However the PWR_EN signal may be asserted only after all power rails are within specified tolerance. The state of PWR_GOOD is undefined until all rails are fully ramped. Refer to Figure 6.1 for details

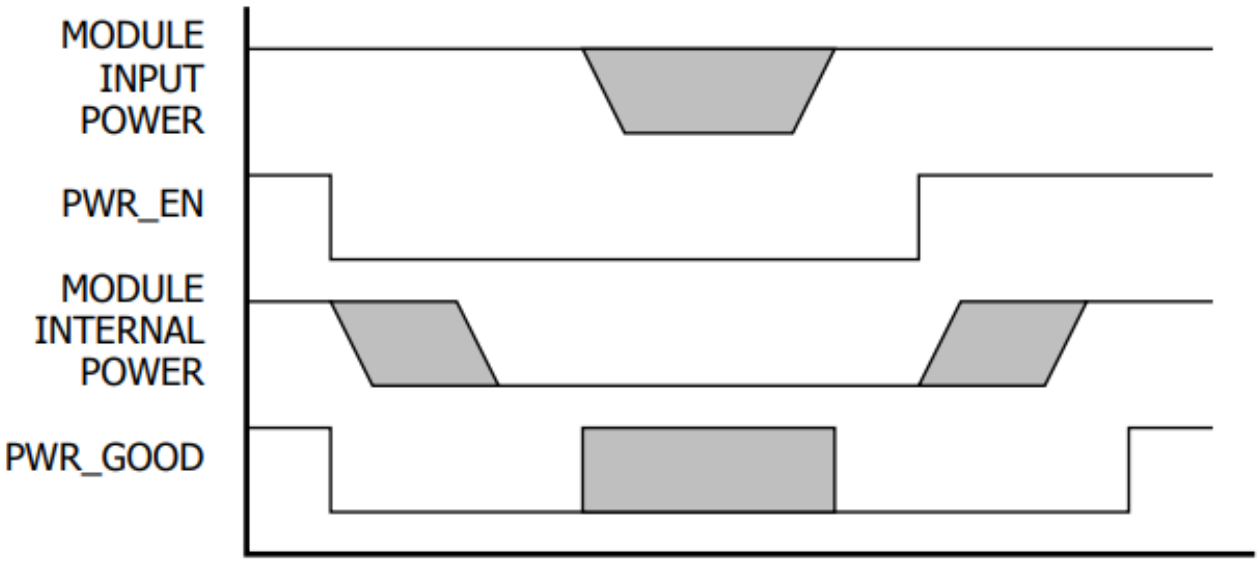
Figure 6.1 Power Sequencing



7.Module Power Down and Power Up

The MXM module may be powered down using the PWR_EN signal. The system designer may choose to shut down or keep the input power while the module is powered down. Refer to Figure 7.1 for details.

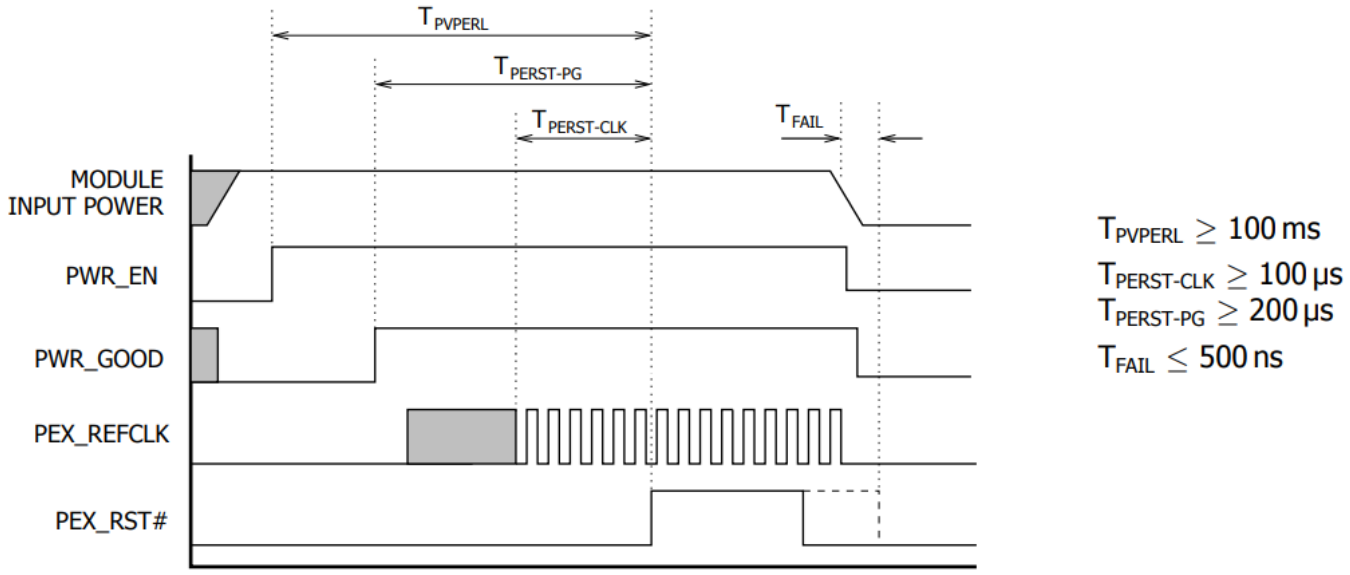
Figure 7.1 Module Power Down



8.Reset Requirements

System reset may be deasserted only after the assertion of the PWR_GOOD signal. Figure 8.1 shows the reset requirements relative to the PWR_EN and PWR_GOOD signals. This sequence must be followed on initial power on, system reset and resume from suspend/hibernate.

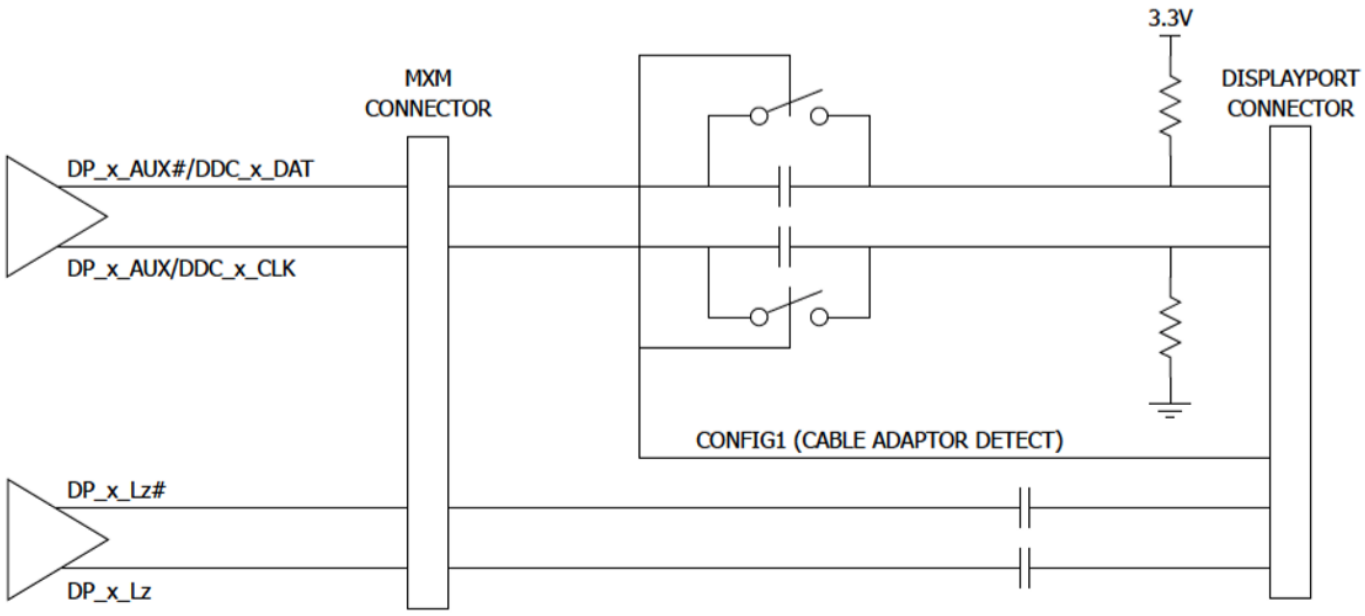
Figure 8.1 Reset Sequencing



9.DisplayPort Interface

DC blocking capacitors of DisplayPort must be placed on the system board. In addition to the MXM implementation of Dual-mode DisplayPort requires the circuit in Figure 9.1 on the AUX lines for proper dongle detection. The HPD signal conditioning must also be placed on the system board.

Figure 9.1 Dual-mode DisplayPort Implementation



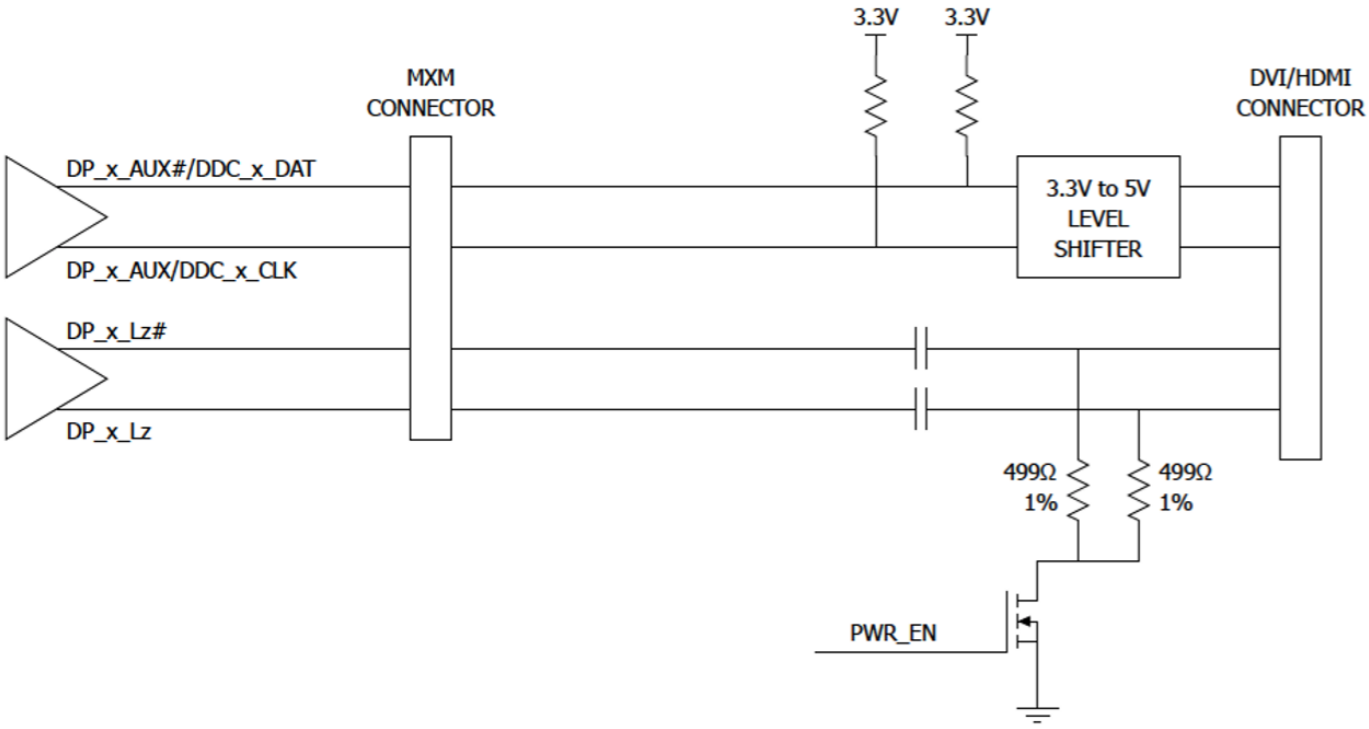
10.DVI/HDMI on DP Interface

Native DVI or HDMI connector support can be implemented using a DisplayPort interface. Additional circuitry is required on the system and the proper signal mapping must be observed. As Figure 10.1 shows, 499Ω 1% pull-down resistors to ground on the DP lane signals must be placed on the con1ector side of AC coupling capacitors gated by a FET to limit the leakage. Additionally level shifting circuits must also be implemented on DDC Data and Clock.
Table 10.1 shows the mapping to connect the signals from the MXM connector to the HDMI/DVI connector.

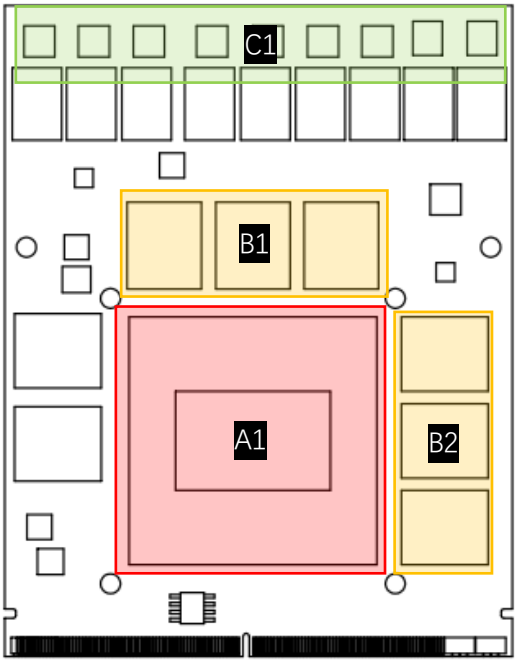
Table 10.1 DisplayPort Multiplexed Signal Definition

Pin Name	DVI/HDMI
DP_xL0 DP_xL0#	TX_x_D2 TX_x_D2#
DP_x_L1 DP_x_L1#	TX_x_D1 TX_x_D1#
DP_x_L2 DP_x_L2#	TX_x_D0 TX_x_D0#
DP_x_L3 DP_x_L3#	TX_x_CLK TX_x_CLK#
DP_x_AUX DP_x_AUX#	DDC_x_CLK DDC_x_DAT

Figure 10.1 DVI/HDMI Implementation Using DP Interface



11.Thermal



Components	Area	TDP	Height
GPU	A1	64.5W	3mm
Memory	B1、B2	2W*3	0.9mm
Mosfet	C1	1.5W*9	0.75mm

Chipset		Specification
Dimensions		15.5*19.8*3mm
Stress	Maximum	75 PSI
	Normal	30-40 PSI

Cooling Suggestion:

1、显卡建议先固定在散热器上，散热器外径为 4mm，M2 的螺柱。
2、散热器的重量要用箱体来支撑固定。
3、显存和 MOS 要加导热垫。

Components	壳温满载限温（环温 45℃）
GPU	95℃
Memory	85℃
Mosfet	105℃

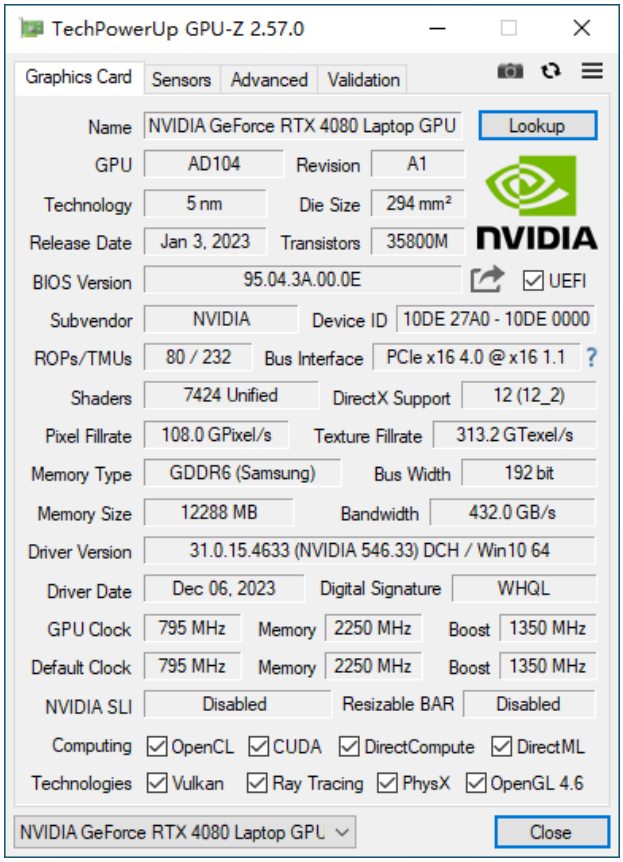
**显存和 MOS 由"探针"监测；GPU 由"Furmark（1920*1080）"监测。*

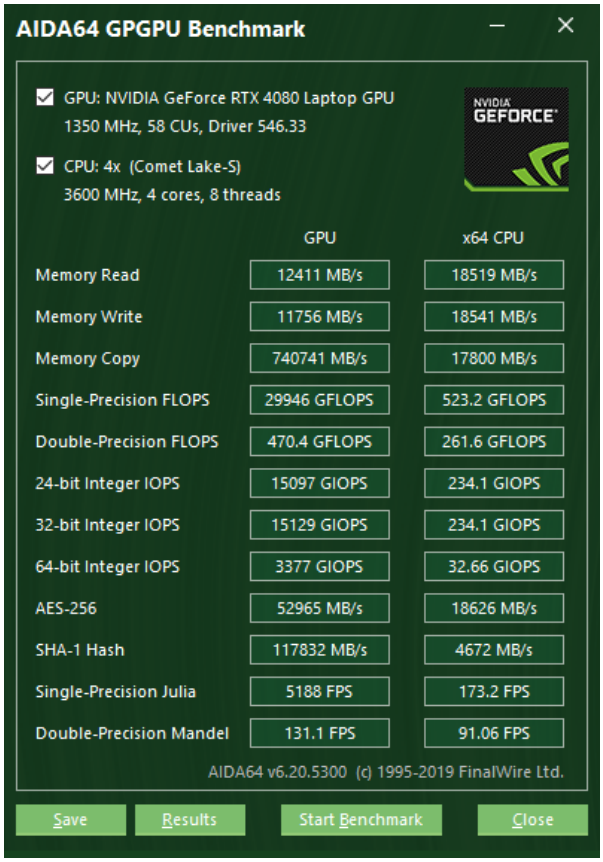
12.Install Video

https://www.douyin.com/user/MS4wLjABAAAAfV567McP9KjHrjFWngJgFG8h7XMSWsqH55hBIryutmg?modal_id=7306824293789207843

13.Performance

Benchmark	Score
3Dmark13	FS:34971 FSE:16714 FSU:8069
3Dmark11	E19010 P19903 X12409
3Dmark Vantage	70841
Heaven	5122
鲁大师	508813
glmark2	16698
Single Precision FLOPS(CUDA-Z)	30.3812Tflop/s
Double Precision FLOPS(CUDA-Z)	475.622Gflop/s



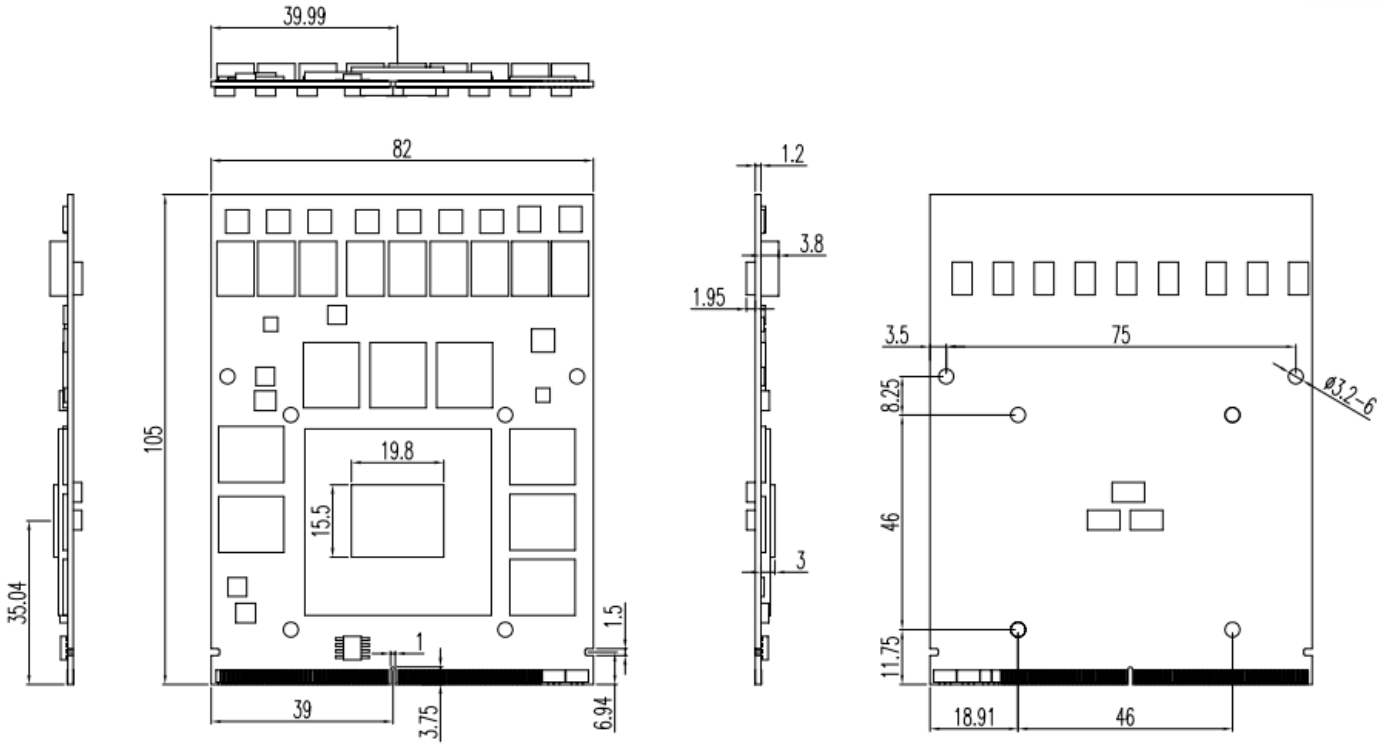


14.Driver

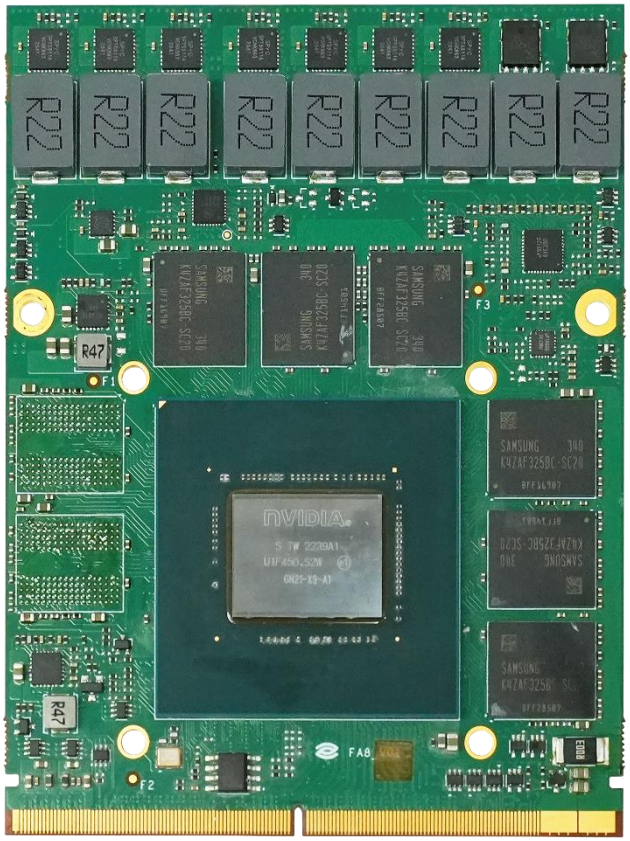
Windows 11：https://pan.baidu.com/s/1uFnoXduKJ77AlPj7kvFtQQ?pwd=rv3y
Windows 10 64bit：https://pan.baidu.com/s/1uFnoXduKJ77AlPj7kvFtQQ?pwd=rv3y
Linux 64bit: Linux x64 (AMD64/EM64T) Display Driver | 550.78 | Linux 64-bit | NVIDIA

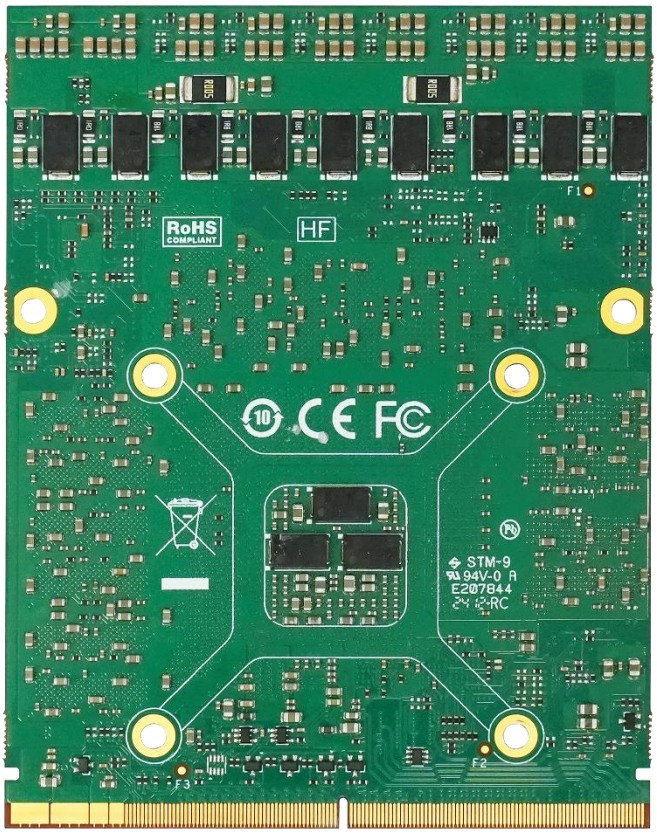
Uninstall Driver Video：
https://www.douyin.com/user/MS4wLjABAAAAfV567McP9KjHrjFWngJgFG8h7XMSWsqH55hBIryutmg?modal_id=7321980490926279951

15.Dimensions



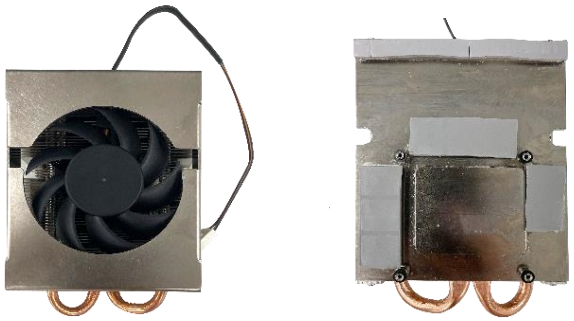
16.Photo





17.Cooling Option

1.ZRT.48-6350-00-A00（For 120W）	
Dimension	103*83*34mm
Rated Speed	8000*2
Out of Frame Lead Wires	200mm
Connector	4Pin 2.54



1.ZRT.48-6306-00-A00	
Dimension	130*80*49.9mm
Rated Speed	4500
Out of Frame Lead Wires	200mm
Connector	4Pin 2.54

18.Question

故障	排除
不开机	1、更改 pgood 信号。（部份主板） 2、确认 PCIE 复位信号。 3、主板 BIOS 更改为 UEFI BIOS。
不显示	**Windows 10：(**需 1809 版本之后） 在主板 BIOS 下，将 CSM 中 CSM Support 设置由 Enabled 更改为 Disabled。
设备管理员出现惊叹号	1、原系统显卡驱动删除干净。（请使用 Display Driver Uninstaller 删除，https://www.wagnardsoft.com/） 2、Windows 10 版本 16299 不支持，需更新至最新版（17763、17134 均可）。 3、确认核显驱动是否已安装。（不需独立显卡显示）
不显示（HDMI 输出）	1、4K 60Hz 显示屏，确认 HDMI 线材是否为 HDMI2.0。 2、将显示器分辨率降为 2K 60Hz。
显卡不工作	量下 3V3/5V/2V/Reset 信号是否有电/短路？若有电，显卡就会工作。
安装 Linux 系统，图形界面异常/无限循环登陆界面，无法登录系统	装驱动的时，加上--no-opengl-files。 （禁用 opengl，若系统上有用到这套组件，将无法使用）
控制面板无法正常开启	仅可在独显显示时，才能正常开启；若使用集显显示，将无法正常开启。
X86 在中标麒麟系统下，显卡驱动后集显输出不能进系统	将 xorg.conf 文件内容清空。

故障	排除
显卡无法辨视	检查 PCIE LANE Numbering Reversal 设置。 主要关注下上电和 pcie，确认下 1、PCIE 的连接（是否 0-15 反、差分正负反、x16 是否拆分，bios 可修改，软硬件要一致），耦合电容是否少以及容值；协议兼容性（降 gen1，或用 x1 试试，显卡都能支持 x1） 2、信号质量，100MHz clk（示波器看下抖动，bios 是否有展频），pcie 的信号质量（看实际距离不长，概率不大，可以 bios 调不同的去加重、预加重值试试，能测试眼图最好） 3、上电主要是给显卡的 enable 信号，其他的不影响开机，时序（主板启动比显卡快，bios 可以对 reset 信号延时试试）
设备管理器显示设备安装成功，但 GPU-Z 显存容量与主频显示为 0	开机时按 DEL 键进 BIOS 设置中选择 Chipset→System Agent (SA) Configuration→PCI Express Configuration→PCI Express Root Port 中的 ASPM 选着 Disabled (注：PCI Express Root port 所有选项中的 ASPM 都选着 Disabled.)
Win11 系统下安装驱动会报缺少 clb.dll 文件	clb.dll 档案拷贝放到 Win11 系统对应目录下（如下）→重启系统→再安装显卡驱动。 C:\windows\SysWOW64 -- (32bit) C:\Windows\WinSxS\wow64_microsoft-windows-registry-editor_31bf3856ad364e35_10.0.19041.746_none_dc7caa836f08ad57 --(32bit) C:\windows\system32 --(64bit) C:\Windows\WinSxS\amd64_microsoft-windows-registry-editor_31bf3856ad364e35_10.0.19041.746_none_d22800313aa7eb5c --(64bit)

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