AMD Radeon™ E9172MXM 3.1 Type A Module Specification

Hardware Board Specification - AMD Confidential

Part Number: 56158_1.01

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Revision History

Rev 1.01 (November 24, 2017)

- Updated E9172 MXM Module - Top Side figure in 1 Introduction (p. 9).
- Updated Connector Pin-Out table in 3 Connector Pin Assignments (p. 15).

Rev 1.00 (August 9, 2017)

- Preliminary release.

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1 Introduction

The AMD Radeon™ E9172 MXM module supports PCIe® 3.0×8 functionality, 2 GB of GDDR5 memory, and uses the MXM 3.1 interface to support up to five digital displays.

For more information, see the appropriate E9170 Series GPU databook, schematics, and reference documents.

Figure 1–1 AMD Radeon™ E9172 MXM Module - Top Side (No Thermal Solution)

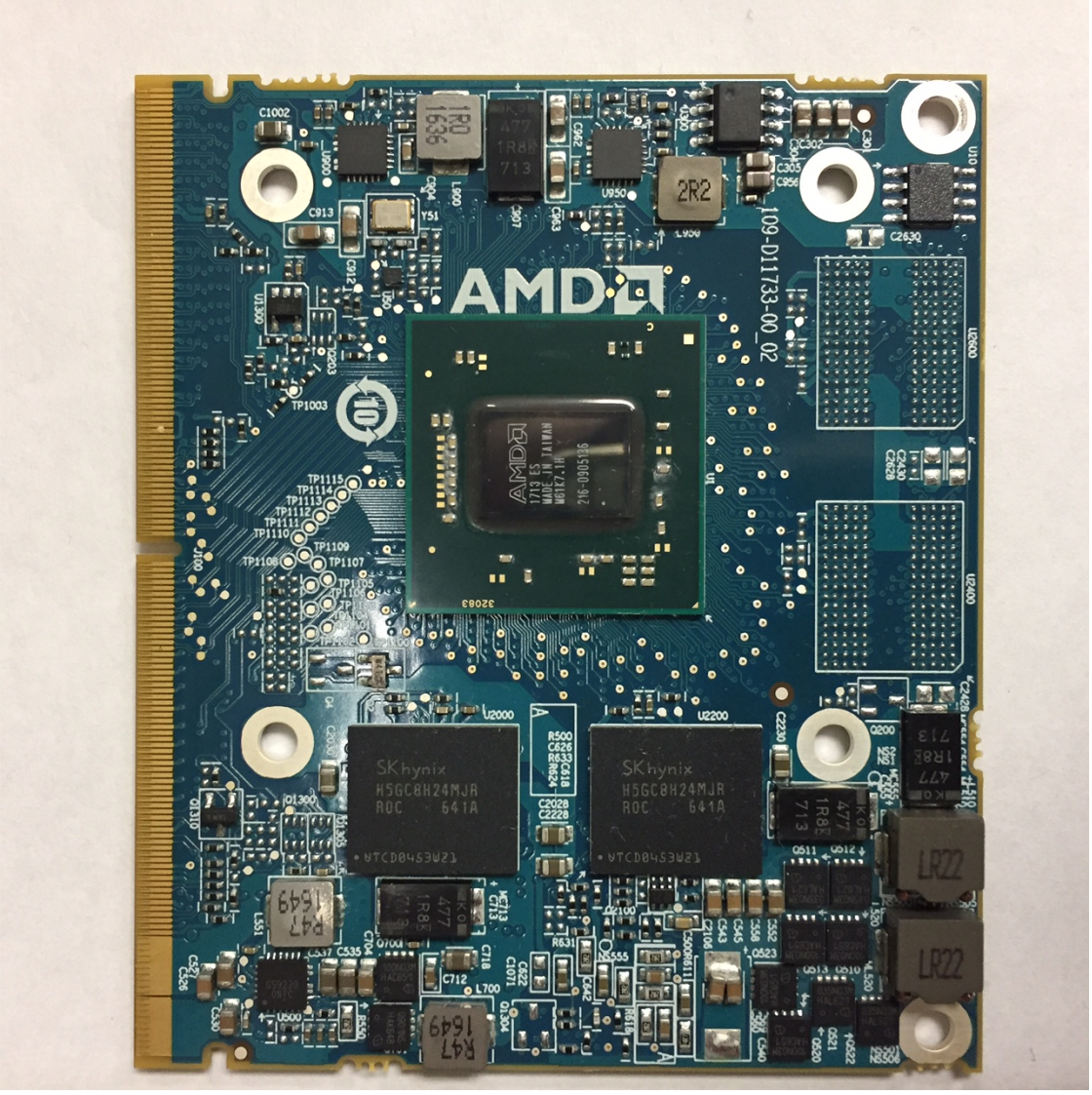


Figure 1–2 AMD Radeon™ E9172 MXM Module - Bottom Side (No Thermal Solution)

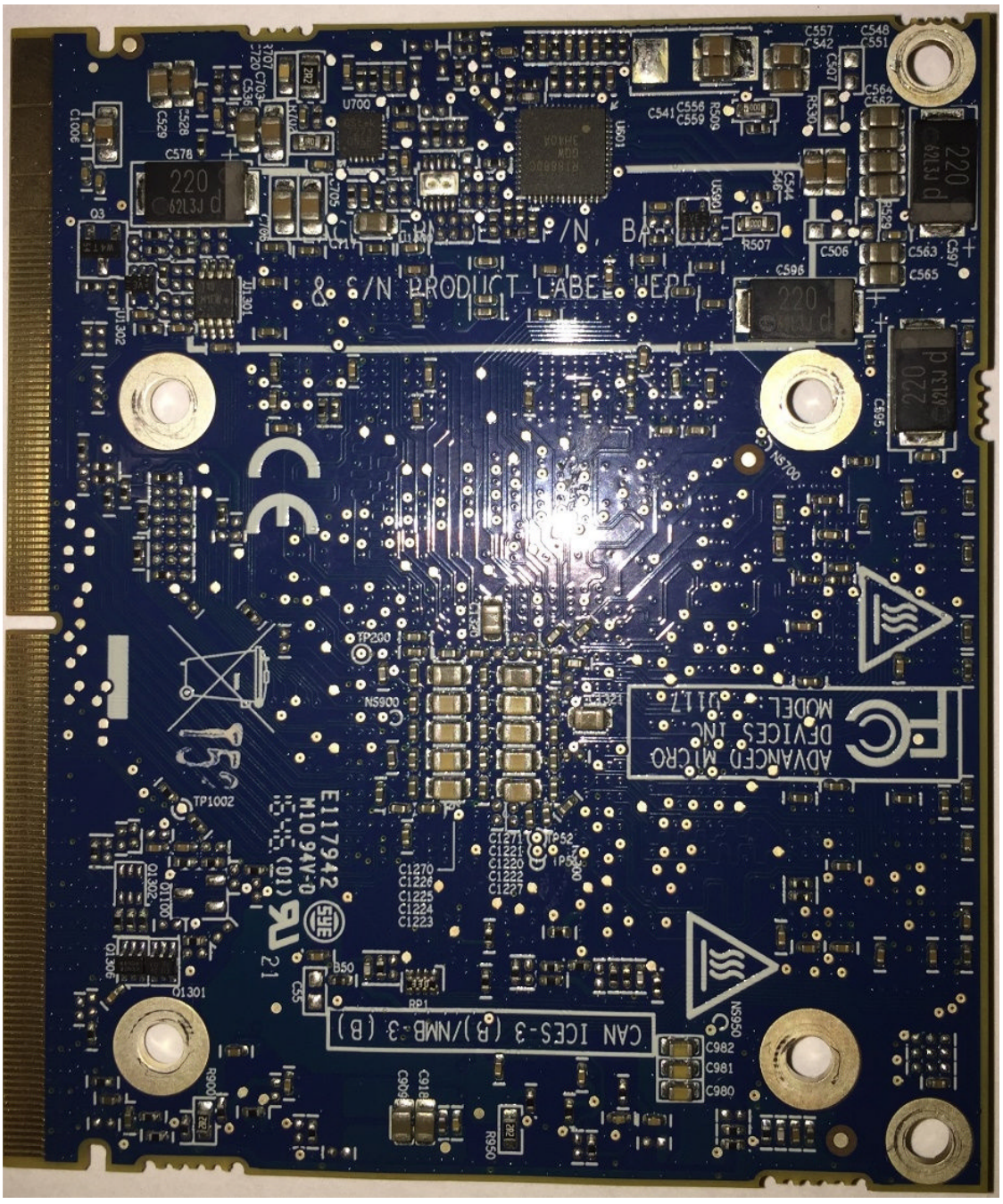


Figure 1–3 AMD Radeon™ E9172 MXM Module - Top Side

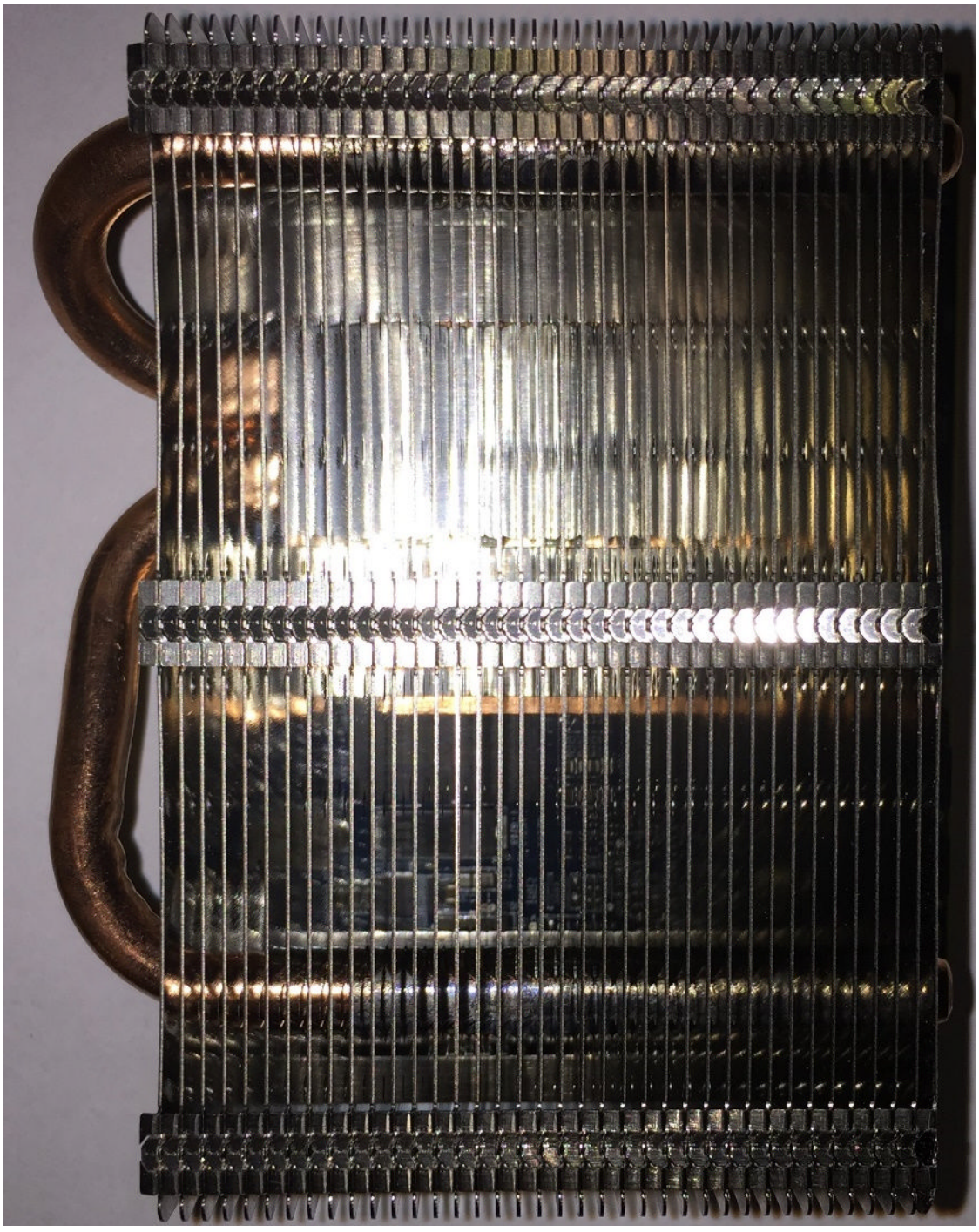
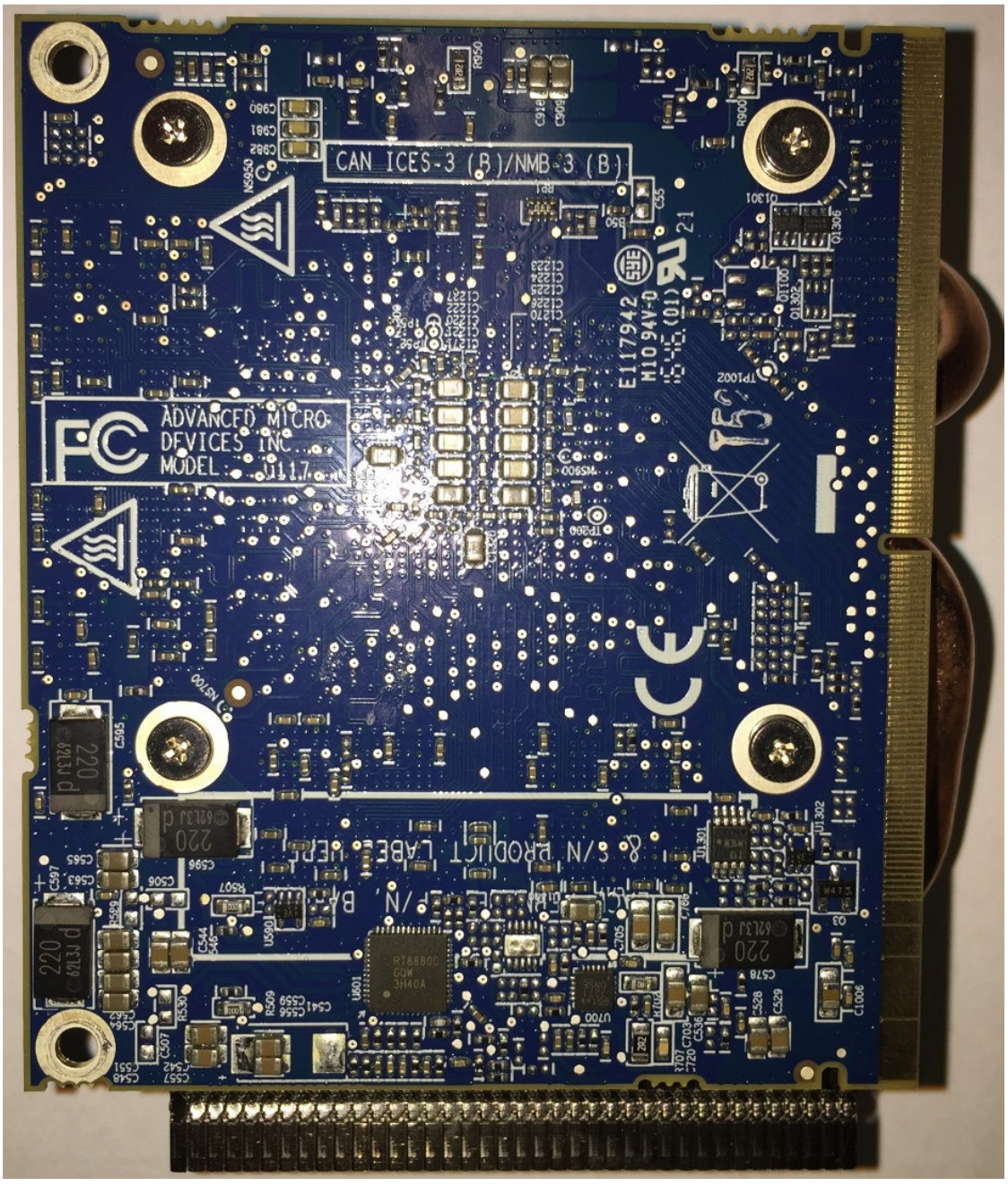


Figure 1–4 AMD Radeon™ E9172 MXM Module - Bottom Side



Note: Actual boards may not look exactly as depicted.

For more details, see the databook and schematics as appropriate.

2 Configuration Features

The following tables describe the maximum configuration and available features for the "E9172 MXM" module.

Table 2–1 Performance Features

Feature	Maximum Configuration	Notes
Bus Interface	PCIe® 3.0 ×8	MXM 3.1 interface to the main board connector.
GPU & Variant	"E9172 MXM"	14 nm, 24.5 mm × 24.5 mm BGA
Memory Type	GDDR5	
Maximum # of Memory Devices	2	
Memory Bit Configuration	256 M × 32	
Memory Interface Bandwidth (bits)	64	
Maximum Frame Buffer Size (GB)	2	

Table 2–2 Electrical Features

Feature	Maximum Configuration	Notes
GPU Clock Source(s)	Crystal	
Crystal/Oscillator Frequency (MHz)	27 MHz	
Spread-spectrum Support	Yes	

Table 2–3 Power Features

Feature	Maximum Configuration
Total Board Power	35 W
ASIC Thermal Design Power (TDP)	25 W
GPU Core (VDDC) Regulator Type	Single-phase SMPS Dynamic VDDC through SVI2
GPU Core Interface (VDDCI) Regulator Type	Single-phase SMPS Dynamic VDDCI through SVI2
Memory Core and I/O Regulator Type	Single-phase SMPS MVDD 1.5 V
Power Sequence Support	Yes

Table 2–4 Thermo-mechanical Specifications

Feature	Maximum Configuration	Notes
Form Factor	MXM 3.1 Type A	
Product Dimensions	82 mm × 70 mm	
GPU Socket Support	No	
Thermal Solution Type	N/A	Customers can design their own platform-specific thermal solution, or use the heatpipe SKU if suitable.

Feature	Maximum Configuration	Notes
Temperature Sensor Support	External	P/N: ADM1032ARMZ-1; SMBus address = 0×4C.
Recommended Operating Ambient Temperature	0°C to 65°C	
Recommended Maximum GPU Operating Temperature	95°C	
Thermal Protection	Critical temperature shutdown (CTF)	SW CTF is 99°C; HW CTF is 101°C

Table 2–5 PCB Specification

Feature	Maximum Configuration
PCB Dimensions	82 mm × 70 mm
Layer Count	8
Single/Dual Slot	Single slot
PCB Colour	Blue

2.1 Display Outputs

The AMD Radeon™ E9172 MXM design supports up to five digital display pipelines at various modes depending on the interface (whether DisplayPort 1.4, HDMI™ 2.0b, Dual-link DVI or Single-link DVI).

For more details, see the databook and schematics as appropriate.

2.2 Optional Display Settings

The AMD Radeon™ E9172 MXM module can be configured with two dual-link DVI, up to five HDMI™, or up to five DisplayPort v1.4 outputs.

The MXM module description of DP_A, DP_B, DP_C, and DP_D (corresponding DP A, DP C, DP B, and DP D respectively for GPU descriptions) can be configured as single-link DVI, HDMI™, or DisplayPort v1.4.

Only a maximum of two legacy displays (CRT, DVI, or HDMI™) can be displayed at the same time. Each HDMI™ and DisplayPort output supports HD audio stream independently, up to a maximum of five output streams.

Examples of possible configurations in addition to the default settings:

- Single-link DVI-I + 4 DisplayPort
- HDMI™ + 4 DisplayPort
- 5 DisplayPort
- Dual-link DVI-D + single-link DVI-D + 2 DisplayPort

Note: Legacy displays are CRT, DVI, or HDMI™ displays.

3 Connector Pin Assignments

The following table provides the connector pin assignment for the AMD Radeon™ E9172 MXM module. Note that pin 249 is different compared to the MXM Graphics Module Mobile PCI Express® Module Electromechanical Specification Version 3.0, Revision 1.0.

Table 3–1 Connector Pin Out

Pin #	Pin Name	Pin Description
E1	PWR_SRC_E1	Main power source 7-20V (recommend using 12V) up to 10A.
E3	GND_E3	GND
1	5V_1	5V ±5% 2.5A
3	5V_3	5V ±5% 2.5A
5	5V_5	5V ±5% 2.5A
7	5V_7	5V ±5% 2.5A
9	5V_9	5V ±5% 2.5A
11	GND_11	GND
13	GND_13	GND
15	GND_15	GND
17	GND_17	GND
19	PEX_STD_SW#_19	N/A
21	VGA_DISABLE#_21	N/A
23	PNL_PWR_EN_23	Internal panel power enable for LVDS or eDP.
25	PNL_BL_EN_25	Internal panel backlight enable for LVDS or eDP.
27	PNL_PWM_27	Internal panel PWM brightness control LVDS or eDP.
29	HDMI_CEC_29	N/A
31	DVI_HPD_31	Optional, used for configuration with five or more display output HPD5).
33	LVDS_DDC_DAT_33	AUX5N (or DVI-D DDC Data or LVDS DDC Data)
35	LVDS_DDC_CLK_35	AUX5P (or DVI-D DDC CLK to LVDS DDC CLK)
37	GND_37	GND
39	OEM_39	N/A
41	OEM_41	N/A
43	OEM_43	N/A
45	OEM_45	N/A
47	GND_47	GND
49	PEX_RX15#_49	N/A
51	PEX_RX15_51	N/A
53	GND_53	GND
55	PEX_RX14#_55	N/A
57	PEX_RX14_57	N/A
59	GND_59	GND
61	PEX_RX13#_61	N/A
63	PEX_RX13_63	N/A
65	GND_65	GND

Pin #	Pin Name	Pin Description
67	PEX_RX12#_67	N/A
69	PEX_RX12_69	N/A
71	GND_71	GND
73	PEX_RX11#_73	N/A
75	PEX_RX11_75	N/A
77	GND_77	GND
79	PEX_RX10#_79	N/A
81	PEX_RX10_81	N/A
83	GND_83	GND
85	PEX_RX9#_85	N/A
87	PEX_RX9_87	N/A
89	GND_89	GND
91	PEX_RX8#_91	N/A
93	PEX_RX8_93	N/A
95	GND_95	GND
97	PEX_RX7#_97	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
99	PEX_RX7_99	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
101	GND_101	GND
103	PEX_RX6#_103	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
105	PEX_RX6_105	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
107	GND_107	GND
109	PEX_RX5#_109	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
111	PEX_RX5_111	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
113	GND_113	GND
115	PEX_RX4#_115	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
117	PEX_RX4_117	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
119	GND_119	GND
121	PEX_RX3#_121	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
123	PEX_RX3_123	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
125	GND_125	GND
133	GND_133	GND
135	PEX_RX2#_135	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
137	PEX_RX2_137	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
139	GND_139	GND

Pin #	Pin Name	Pin Description
141	PEX_RX1#_141	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
143	PEX_RX1_143	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
145	GND_145	GND
147	PEX_RX0#_147	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
149	PEX_RX0_149	PCI EXPRESS® input to the root complex. DC blocking caps must be placed on the system board.
151	GND_151	GND
153	PEX_REFCLK#_153	PCI Reference Clock Differential Clock (-).
155	PEX_REFCLK_155	PCI Reference Clock Differential Clock (+).
157	GND_157	GND
159	RSVD_159	JTAG interface: JTAG_TDO
161	RSVD_161	JTAG interface: JTAG_TDI
163	RSVD_163	JTAG interface: JTAG_TCK
165	RSVD_165	JTAG interface: JTAG_TMS
167	RSVD_167	JTAG interface: JTAG_TRSTB
169	LVDS_UCLK#_169	N/A
171	LVDS_UCLK_171	N/A
173	GND_173	GND
175	LVDS_UTX3#_175	N/A
177	LVDS_UTX3_177	N/A
179	GND_179	GND
181	LVDS_UTX2#_181	N/A
183	LVDS_UTX2_183	N/A
185	GND_185	GND
187	LVDS_UTX1#_187	N/A
189	LVDS_UTX1_189	N/A
191	GND_191	GND
193	LVDS_UTX0#_193	N/A
195	LVDS_UTX0_195	N/A
197	GND_197	GND
199	DP_C_L0#_199	DPD_0N (dual-link DVI-D TMDS Data_5N, or single-link DVI-D TMDS Data_2N, or HDMI™ TMDS Data_2N). DC blocking caps for DPB must be placed on the system board.
201	DP_C_L0_201	DPD_0P (dual-link DVI-D TMDS Data_5P, or single-link DVI-D TMDS Data_2P, or HDMI™ TMDS Data_2P). DC blocking caps for DPB must be placed on the system board.
203	GND_203	GND
205	DP_C_L1#_205	DPD_1N (dual-link DVI-D TMDS Data_4N, or single-link DVI-D TMDS Data_1N, or HDMI™ TMDS Data_1N). DC blocking caps for DPB must be placed on the system board.
207	DP_C_L1_207	DPD_1P (dual-link DVI-D TMDS Data_4P, or single-link DVI-D TMDS Data_1P, or HDMI™ TMDS Data_1P). DC blocking caps for DPB must be placed on the system board.
209	GND_209	GND

Pin #	Pin Name	Pin Description
211	DP_C_L2#_211	DPD_2N (or dual-link DVI-D TMDS Data_3N, or single-link DVI-D TMDS Data_0N, or HDMI™ TMDS Data_0N). DC blocking caps for DPB must be placed on the system board.
213	DP_C_L2_213	DPD_2P (dual-link DVI-D TMDS Data_3P, or single-link DVI-D TMDS Data_0P, or HDMI™ TMDS Data_0P). DC blocking caps for DPB must be placed on the system board.
215	GND_215	GND
217	DP_C_L3#_217	DPD_3N (single-link DVI-D TMDS CLK_N, or HDMI™ TMDS CLK_N. No connection for dual-link DVI-D). DC blocking caps for DPB must be placed on the system board.
219	DP_C_L3_219	DPD_3P (single-link DVI-D TMDS CLK_P, or HDMI™ TMDS CLK_P. No connection for dual-link DVI-D). DC blocking caps for DPB must be placed on the system board.
221	GND_221	GND
223	DP_C_AUX#_223	AUX4N (or DDC Data for DVI-D or HDMI™)
225	DP_C_AUX_225	AUX4P (or DDC Clock for DVI-D or HDMI™)
227	RSVD_227	N/A
229	RSVD_229	N/A
231	RSVD_231	N/A
233	RSVD_233	N/A
235	RSVD_235	N/A
237	RSVD_237	N/A
239	RSVD_239	N/A
241	RSVD_241	N/A
243	RSVD_243	N/A
245	RSVD_245	N/A
247	RSVD_247	N/A
249	RSVD_249	N/A
251	GND_251	GND
253	DP_A_L0#_253	DPB_0N (dual-link DVI-D TMDS Data_2N, or single-link DVI-D TMDS Data_2N, or HDMI™ TMDS Data_2N). DC blocking caps for DPA must be placed on the system board.
255	DP_A_L0_255	DPB_0P (dual-link DVI-D TMDS Data_2P, or single-link DVI-D TMDS Data_2P, or HDMI™ TMDS Data_2P). DC blocking caps for DPA must be placed on the system board.
257	GND_257	GND
259	DP_A_L1#_259	DPB_1N (dual-link DVI-D TMDS Data_1N, or single-link DVI-D TMDS Data_1N, or HDMI™ TMDS Data_1N). DC blocking caps for DPA must be placed on the system board.
261	DP_A_L1_261	DPB_1P (dual-link DVI-D TMDS Data_1P, or single-link DVI-D TMDS Data_1P, or HDMI™ TMDS Data_1P). DC blocking caps for DPA must be placed on the system board.
263	GND_263	GND
265	DP_A_L2#_265	DPB_2N (dual-link DVI-D TMDS Data_0N, or single-link DVI-D TMDS Data_0N, or HDMI™ TMDS Data_0N). DC blocking caps must be placed on the system board
267	DP_A_L2_267	DPB_2P (dual-link DVI-D TMDS Data_0P, or single-link DVI-D TMDS Data_0P, or HDMI™ TMDS Data_0P). DC blocking caps for DPA must be placed on the system board.
269	GND_269	GND

Pin #	Pin Name	Pin Description
271	DP_A_L3#_271	DPB_3N (dual-link DVI-D TMDS CLK_N, or single-link DVI-D TMDS CLK_N, or HDMI™ TMDS CLK_N). DC blocking caps for DPA must be placed on the system board.
273	DP_A_L3_273	DPB_3P (dual-link DVI-D TMDS CLK_P, or single-link DVI-D TMDS CLK_P, or HDMI™ TMDS CLK_P). DC blocking caps for DPA must be placed on the system board.
275	GND_275	GND
277	DP_A_AUX#_277	DDC_AUX2N (or DDC Data for DVI-D or HDMI™)
279	DP_A_AUX_279	DDC_AUX2P (or DDC Clock for DVI-D or HDMI™)
281	PRSNT_L#_281	MXM module present detect. Weak pull-up required on system if module detection is desired. Module pin is connected to ground.
E2	PWR_SRC_E2	Main power source 7-20V (recommend using 12V) up to 10A.
E4	GND_E4	GND
2	PRSNT_R#_2	MXM module present detect. Weak pull-up required on system if module detection is desired. Module pin is connected to ground.
4	WAKE#_4	Wake up signal, connected to GPU
6	PWR_GOOD_6	Power sequencing sideband. The module will assert this signal when all its internal power regulators are within the required tolerance.
8	PWR_EN_8	Module power enable. System must assert this signal to power on the module. May be asserted only after all input rails are within the specified tolerance.
10	27MHZ_REF_10	27 MHz
12	GND_12	GND
14	LVDS_U_HPD_14	N/A
16	TESTEN_16	JTAG_TESTEN
18	PWR_LEVEL_18	Signals the module to switch to a lower power state. Modules must reduce the power by at least 20% within 50ms.
20	TH_OVERT#_20	Thermal shutdown request. System must power down the MXM module within 500ms to prevent permanent damage. Pull-up resistor to 3.3V of appropriate value is required on the system board.
22	TH_ALERT#_22	Thermal interrupt request. Signal may be used by the system to signal to module to reduce power consumption. The signal may also be used by the module to signal to the system a non-critical temperature alert. Pull-up resistor to 3.3V of appropriate value is required on the system board.
24	TH_PWM_24	Thermal PWM. This signal may be used to control a fan connected to the module thermal solution.
26	GPIO0_26	N/A
28	GPIO1_28	N/A
30	GPIO2_30	N/A
32	SMB_DAT_32	SMBus Data.
34	SMB_CLK_34	SMBus Clock.
36	GND_36	GND
38	OEM_38	N/A
40	OEM_40	N/A
42	OEM_42	N/A
44	OEM_44	N/A
46	GND_46	GND
48	PEX_TX15#_48	N/A

Pin #	Pin Name	Pin Description
50	PEX_TX15_50	N/A
52	GND_52	GND
54	PEX_TX14#_54	N/A
56	PEX_TX14_56	N/A
58	GND_58	GND
60	PEX_TX13#_60	N/A
62	PEX_TX13_62	N/A
64	GND_64	GND
66	PEX_TX12#_66	N/A
68	PEX_TX12_68	N/A
70	GND_70	GND
72	PEX_TX11#_72	N/A
74	PEX_TX11_74	N/A
76	GND_76	GND
78	PEX_TX10#_78	N/A
80	PEX_TX10_80	N/A
82	GND_82	GND
84	PEX_TX9#_84	N/A
86	PEX_TX9_86	N/A
88	GND_88	GND
90	PEX_TX8#_90	N/A
92	PEX_TX8_92	N/A
94	GND_94	GND
96	PEX_TX7#_96	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (-).
98	PEX_TX7_98	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (+).
100	GND_100	GND
102	PEX_TX6#_102	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (-).
104	PEX_TX6_104	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (+).
106	GND_106	GND
108	PEX_TX5#_108	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (-).
110	PEX_TX5_110	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (+).
112	GND_112	GND
114	PEX_TX4#_114	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (-).
116	PEX_TX4_116	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (+).
118	GND_118	GND
120	PEX_TX3#_120	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (-).

Pin #	Pin Name	Pin Description
122	PEX_TX3_122	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (+).
124	GND_124	GND
134	GND_134	GND
136	PEX_TX2#_136	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (-).
138	PEX_TX2_138	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (+).
140	GND_140	GND
142	PEX_TX1#_142	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (-).
144	PEX_TX1_144	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (+).
146	GND_146	GND
148	PEX_TX0#_148	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (-).
150	PEX_TX0_150	PCI EXPRESS® output from the root complex. DC blocking caps must be placed on the system board (+).
152	GND_152	GND
154	CLK_REQ#_154	PCI EXPRESS® clock request. Pull-up resistor to 3.3V is required on the system board if the function is supported.
156	PEX_RST#_156	PCI EXPRESS® reset signal.
158	VGA_DDC_DAT_158	VGA DDC Data.
160	VGA_DDC_CLK_160	VGA DDC Clock.
162	VGA_VSYC_162	N/A
164	VGA_HSYC_164	N/A
166	GND_166	GND
168	VGA_RED_168	N/A
170	VGA_GREEN_170	N/A
172	VGA_BLUE_172	N/A
174	GND_174	GND
176	LVDS_LCLK#_176	DPE_3N (single-link DVI-D TMDS CLKN). DC blocking caps for DPE must be placed on the system board.
178	LVDS_LCLK_178	DPE_3P (single-link DVI-D TMDS CLKP). DC blocking caps for DPE must be placed on the system board.
180	GND_180	GND
182	LVDS_LTX3#_182	N/A
184	LVDS_LTX3_184	N/A
186	GND_186	GND
188	LVDS_LTX2#_188	DPE_0N (single-link DVI-D TMDS DATA_2N). DC blocking caps for DPE must be placed on the system board.
190	LVDS_LTX2_190	DPE_0P (single-link DVI-D TMDS DATA_2P). DC blocking caps for DPE must be placed on the system board.
192	GND_192	GND
194	LVDS_LTX1#_194	DPE_1N (single-link DVI-D TMDS DATA_1N). DC blocking caps for DPE must be placed on the system board.
196	LVDS_LTX1_196	DPE_1P (single-link DVI-D TMDS DATA_1P). DC blocking caps for DPE must be placed on the system board.

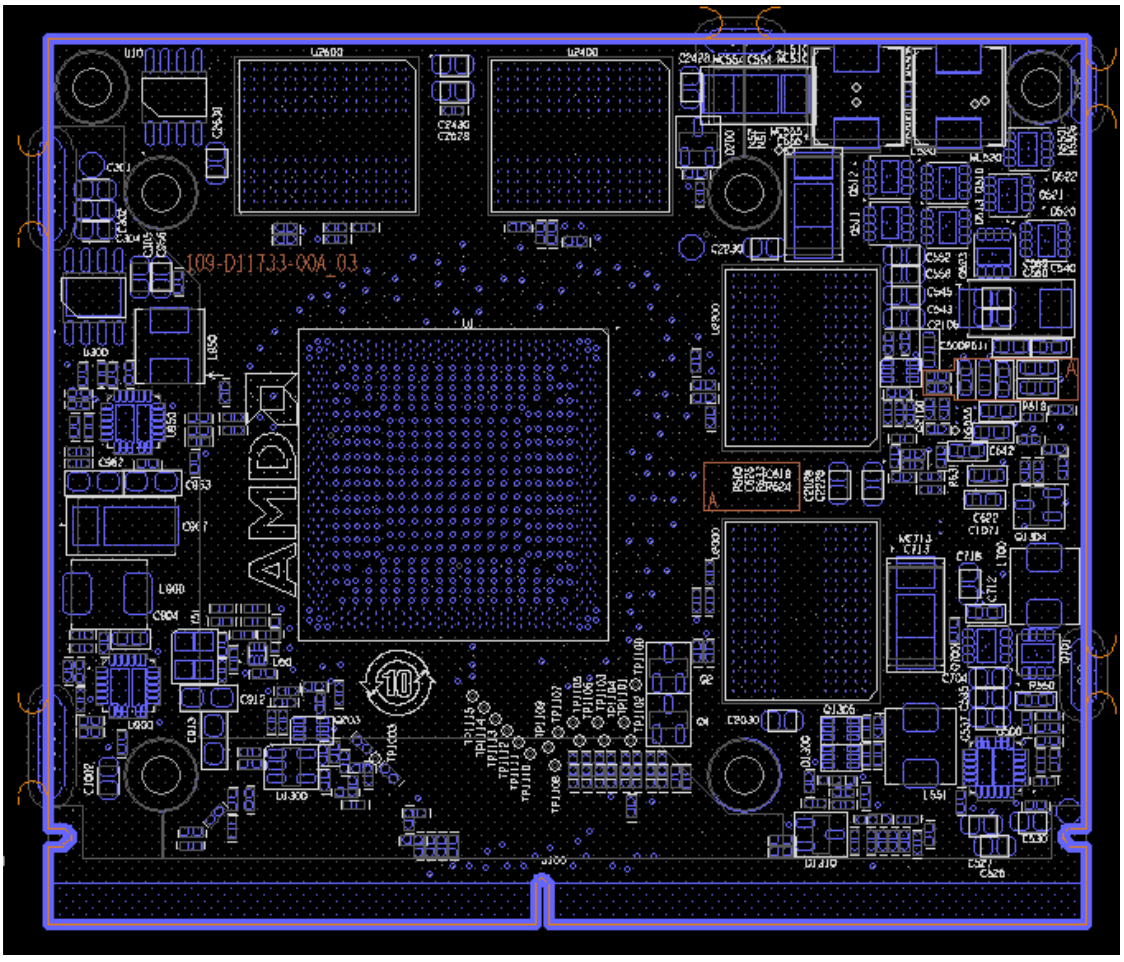
Pin #	Pin Name	Pin Description
198	GND_198	GND
200	LVDS_LTX0#_200	DPE_2N (single-link DVI-D TMDS DATA_0N). DC blocking caps for DPE must be placed on the system board.
202	LVDS_LTX0_202	DPE_2P (single-link DVI-D TMDS DATA_0P). DC blocking caps for DPE must be placed on the system board.
204	GND_204	GND
206	DP_D_L0#_206	DPC_0N (dual-link DVI-D TMDS Data_5N, or single-link DVI-D TMDS Data_2N, or HDMI™ TMDS Data_2N). DC blocking caps for DPD must be placed on the system board.
208	DP_D_L0_208	DPC_0P (dual-link DVI-D TMDS Data_5P, or single-link DVI-D TMDS Data_2P, or HDMI™ TMDS Data_2P). DC blocking caps for DPD must be placed on the system board.
210	GND_210	GND
212	DP_D_L1#_212	DPC_1N (dual-link DVI-D TMDS Data_4N, or single-link DVI-D TMDS Data_1N, or HDMI™ TMDS Data_2N). DC blocking caps for DPD must be placed on the system board.
214	DP_D_L1_214	DPC_1P (dual-link DVI-D TMDS Data_4P, or single-link DVI-D TMDS Data_1P, or HDMI™ TMDS Data_1P). DC blocking caps for DPD must be placed on the system board.
216	GND_216	GND
218	DP_D_L2#_218	DPC_2N (dual-link DVI-D TMDS Data_3N, or single-link DVI-D TMDS Data_0N, or HDMI™ TMDS Data_0N). DC blocking caps for DPD must be placed on the system board.
220	DP_D_L2_220	DPC_2P (dual-link DVI-D TMDS Data_3P, or single-link DVI-D TMDS Data_0P, or HDMI™ TMDS Data_0P). DC blocking caps for DPD must be placed on the system board.
222	GND_222	GND
224	DP_D_L3#_224	DPC_3N (single-link DVI-D TMDS CLK_N, or HDMI™ TMDS CLK_N. No connection for dual-link DVI-D). DC blocking caps for DPD must be placed on the system board.
226	DP_D_L3_226	DPC_3P (single-link DVI-D TMDS CLK_P, or HDMI™ TMDS CLK_P. No connection for dual-link DVI-D). DC blocking caps for DPD must be placed on the system board.
228	GND_228	GND
230	DP_D_AUX#_230	AUX3N (or DDC Data for DVI-D or HDMI™)
232	DP_D_AUX_232	AUX3P (or DDC Clock for DVI-D or HDMI™)
234	DP_C_HPD_234	DisplayPort hotplug detect. Protection circuit must be placed on the system board. (HPD4)
236	DP_D_HPD_236	DisplayPort hotplug detect. Protection circuit must be placed on the system board. (HPD3)
238	RSVD_238	N/A
240	3V3_240	3.3V ±5% 1A
242	3V3_242	3.3V ±5% 1A
244	GND_244	GND
246	DP_B_L0#_246	DPA_0N (dual-link DVI-D TMDS Data_2N, or single-link DVI-D TMDS Data_2N, or HDMI™ TMDS Data_2N). DC blocking caps for DPC must be placed on the system board.
248	DP_B_L0_248	DPA_0P (dual-link DVI-D TMDS Data_2P, or single-link DVI-D TMDS Data_2P, or HDMI™ TMDS Data_2P). DC blocking caps for DPC must be placed on the system board.
250	GND_250	GND

Pin #	Pin Name	Pin Description
252	DP_B_L1#_252	DPA_1N (dual-link DVI-D TMDS Data_1N, or single-link DVI-D TMDS Data_1N, or HDMI™ TMDS Data_1N). DC blocking caps for DPC must be placed on the system board.
254	DP_B_L1_254	DPA_1P (dual-link DVI-D TMDS Data_1P, or single-link DVI-D TMDS Data_1P, or HDMI™ TMDS Data_1P). DC blocking caps for DPC must be placed on the system board.
256	GND_256	GND
258	DP_B_L2#_258	DPA_2N (dual-link DVI-D TMDS Data_0N, or single-link DVI-D TMDS Data_0N, or HDMI™ TMDS Data_0N). DC blocking caps for DPC must be placed on the system board.
260	DP_B_L2_260	DPA_2P (dual-link DVI-D TMDS Data_0P, or single-link DVI-D TMDS Data_0P, or HDMI™ TMDS Data_0P). DC blocking caps for DPC must be placed on the system board.
262	GND_262	GND
264	DP_B_L3#_264	DPA_3N (dual-link DVI-D TMDS CLK_N, or single-link DVI-D TMDS CLK_N, or HDMI™ TMDS CLK_N). DC blocking caps for DPC must be placed on the system board.
266	DP_B_L3_266	DPA_3P (dual-link DVI-D TMDS CLK_P, or single-link DVI-D TMDS CLK_P, or HDMI™ TMDS CLK_P). DC blocking caps for DPC must be placed on the system board.
268	GND_268	GND
270	DP_B_AUX#_270	DDC_AUX1N (or DDC Data for DVI-D or HDMI™)
272	DP_B_AUX_272	DDC_AUX1P (or DDC Clock for DVI-D or HDMI™)
274	DP_B_HPD_274	DisplayPort Hotplug Detection (HPD1)
276	DP_A_HPD_276	DisplayPort Hotplug Detection. Protection circuit must be placed on the system board (HPD2).
278	3V3_278	3.3V ±5% 1A
280	3V3_280	3.3V ±5% 1A

4 Component Placement and Stackup

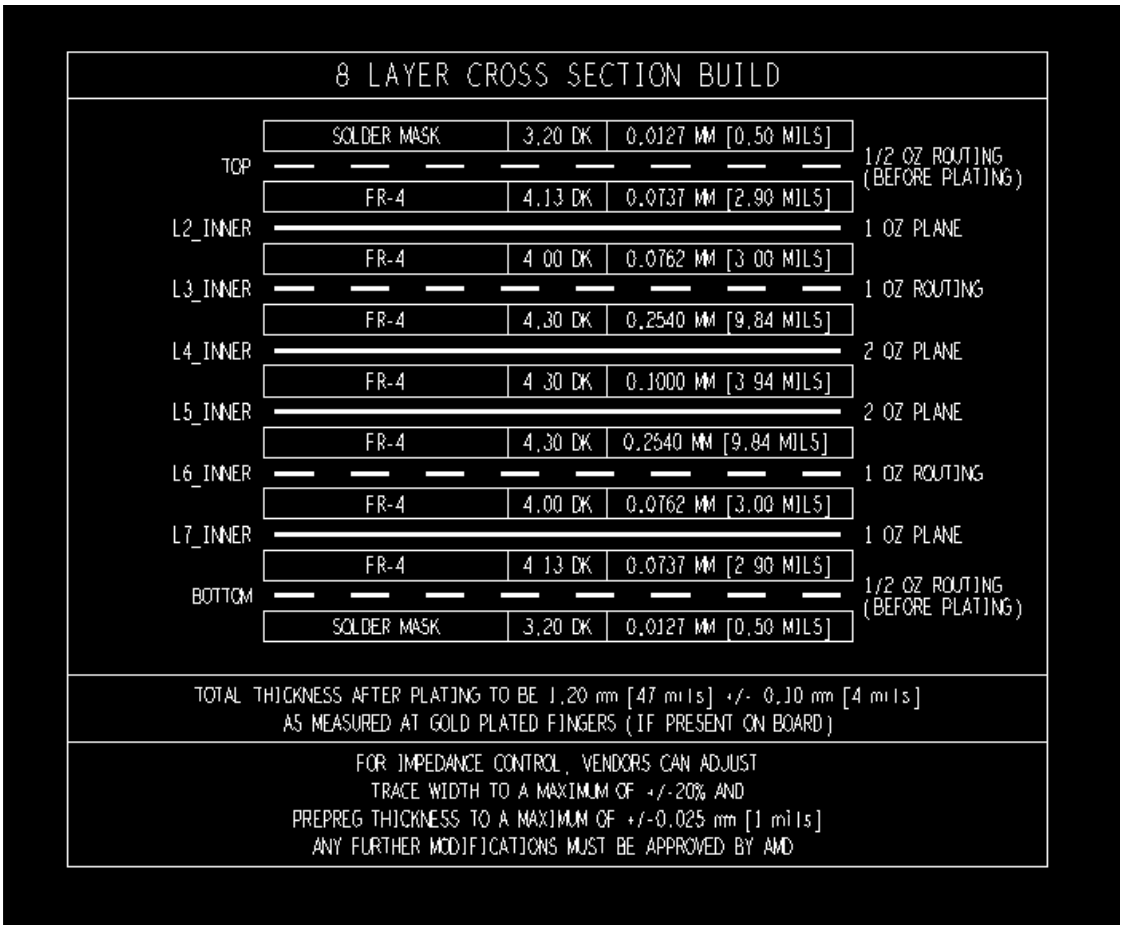
The following figure shows the component placement for the AMD Radeon™ E9172 MXM module.

Figure 4–1 Component Placement



The following figure shows the PCB stackup.

Figure 4–2 PCB Stackup



5 SKU Data

The following tables provides SKU information for the "E9172 MXM" module.

Table 5–1 Available Board Design SKUs

Board Configuration	Board Part Number	Ordering Part Number
E9172 MXM 3.1 TypeA 5DP GDDR5 2GB HSNK	102-D11712-00	100-K00259
E9172 MXM 3.1 TypeA 5DP GDDR5 2GB NOSNK	102-D11714-00	100-K00264

Table 5–2 OEM Reference Design: (102-D11712-00)

Feature	Description
SKU Summary	HF, PCI EXPRESS®3.0, "E9172 MXM", 64-bit, 2GB, 2pcs, 256M×32 GDDR5, 8L, 5 DFP/LVDS
ASIC	"E9172 MXM", p/n: 216-0905136
Memory Configuration 1	Samsun B die, 8Gb GDDR5, 7Gbps @1.5V, 6Gbps @1.35V, p/n 23F48GB7MB70 MVDD 1.50 V

Feature	Description
Memory Configuration 2	SKHynix D-die, 8G, GDDR5, 7GBPS, 1.5/6 1.35V, p/n 23F28GB7MD70 MVDD 1.50V
PCB	109-D11733-00
Thermal Solution	N/A
Bracket	N/A
Dynamic VDDC	Yes
Dynamic VDDCI	Yes
HDCP Support	Ready, internal key
AMD Eyefinity Support	Yes, up to five displays
Stereosync Support	Yes
AMD CrossFire™ Support	Yes
AMD PowerXpress™ Support	Yes
AMD OverDrive™ Support	N/A
Audio	DisplayPort and HDMI™ audio support