

# P1070-A01

GF108, 512MB 32Mx32 GDDR5  
Desktop, 75W TGP, DL-DVI/VGA/HDMI

## TABLE OF CONTENTS

Page	Description
01	Table of Contents
02	Block Diagram
03	PCI Express
04	Framebuffer A,B: GPU Section
05	Memory A Bank 0..31
06	Memory A Bank 32..63
07	Memory Decoupling, Net Rules
08	GPU Power and GND, NVVDD Decoupling, THERMAL/MECHANICAL
09	Display: DACA (South DVI-I)
10	Display: DACB (Middle DSUB)
11	Display: LFPAB (South DVI-I)
12	Display: LFPC (North HDMI)
13	Unused: LFPD/EF, MIOA/B
14	MISC: VBIOS, XTAL, STRAPS
15	MISC:GPIO, JTAG, INFO ROM, THERMAL LATCH, FAN CONTROL
16	Power Supply: 12V INPUT, DDC_5V, PEXVDD
17	Power Supply: FBVDDQ
18	Power Supply: NVVDD

## 2010/11/30 MS-V258-1.0 changed list

Page	Description
08	add a SP-CAP near GPU bottom add screw & HDMI fee & PCB & cross point & Fan changed BKT1 PCB footprint to shorter name
15	deleted 12V BOOST circuit & removed net 12V_FAN & 12V_F contact FAN 12V input directly & add R688 & modified fan control circuit & Fan housing changed to 4 pin & delete INFO ROM circuit & I2CC link to VDD adjust circuit & delete JTAG circuit & delete D501
16	removed net 12V_FAN & delete LDO Option & delete Switcher Option changed 12V Input choke footprint & delete co-lay resistor
17	changed FBVDDQ Output choke footprint & delete co-lay choke
18	changed NVVDD Output choke footprint & delete co-lay choke
17,18	changed Q2 Q3 Q4 Q5 Q6 Q8 Q9 Q10 PCB footprint to shorter name & remove co-lay SMD OS-CON CAP
19	add a new page for VDD adjust circuit

## 2011/8/23 MS-V269-2.0 changed list

Page	Description
04	Remove FBB and add TERMINATION OPTION FOR 8 LOAD CMD LINE
05	Change to Memory 1st Bank 0..31
06	Change to Memory 1st Bank 32..63
07	Del some Memory Decoupling
08	Change THERMAL/MECHANICAL HOLES
15	Change Fan control circuit
16	Add 12V by-pass resistance & remove PEX_VDD control for 6262

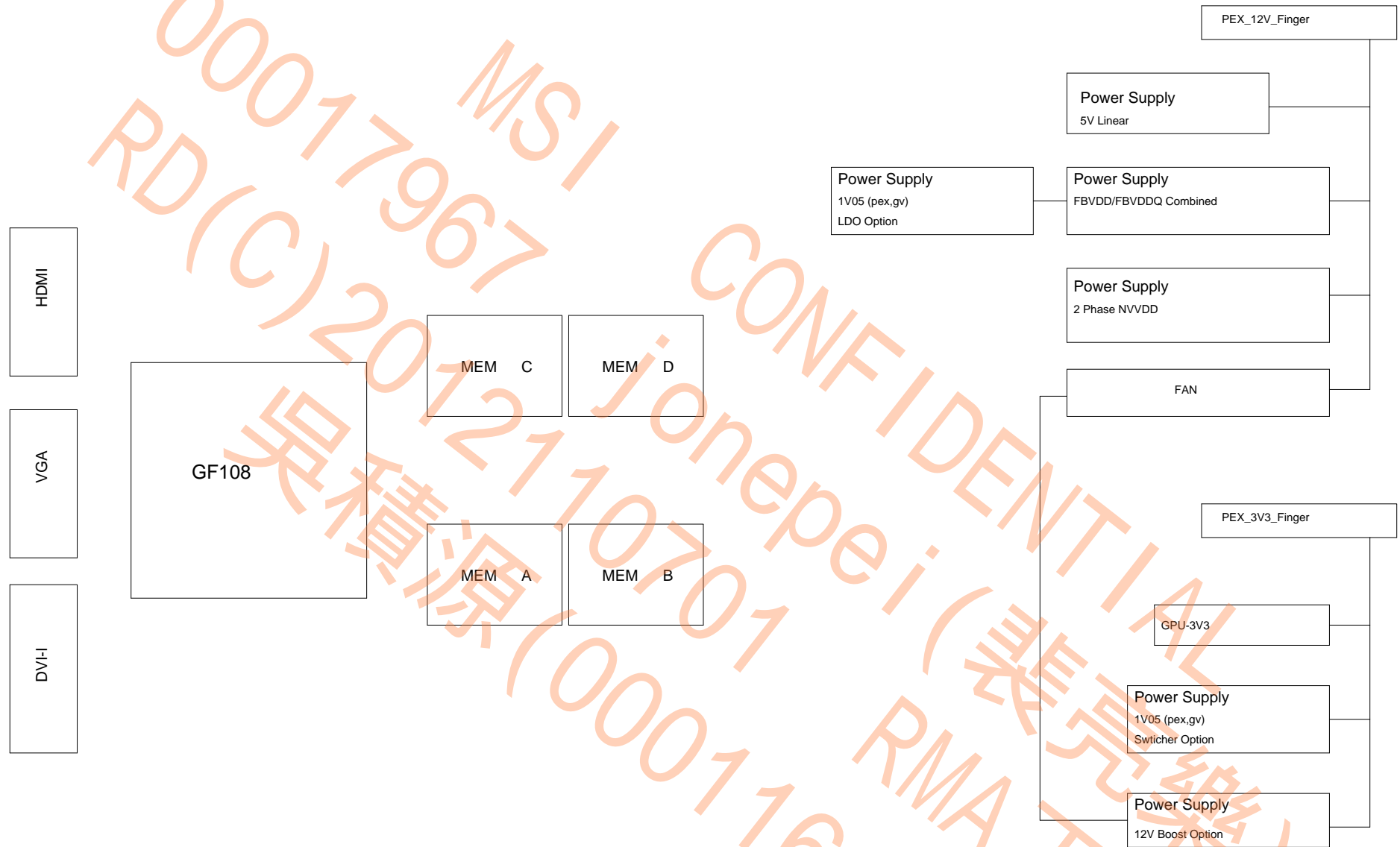
## 2012/4/16 MS-V269-3.0 changed list

Page	Description
04-07	Copy all the memory component from V230-6.0(128M*16bit*8pcs/128bit DDR3)
15	Del 4pin Fan control circuit, Add 2pin fan control circuit

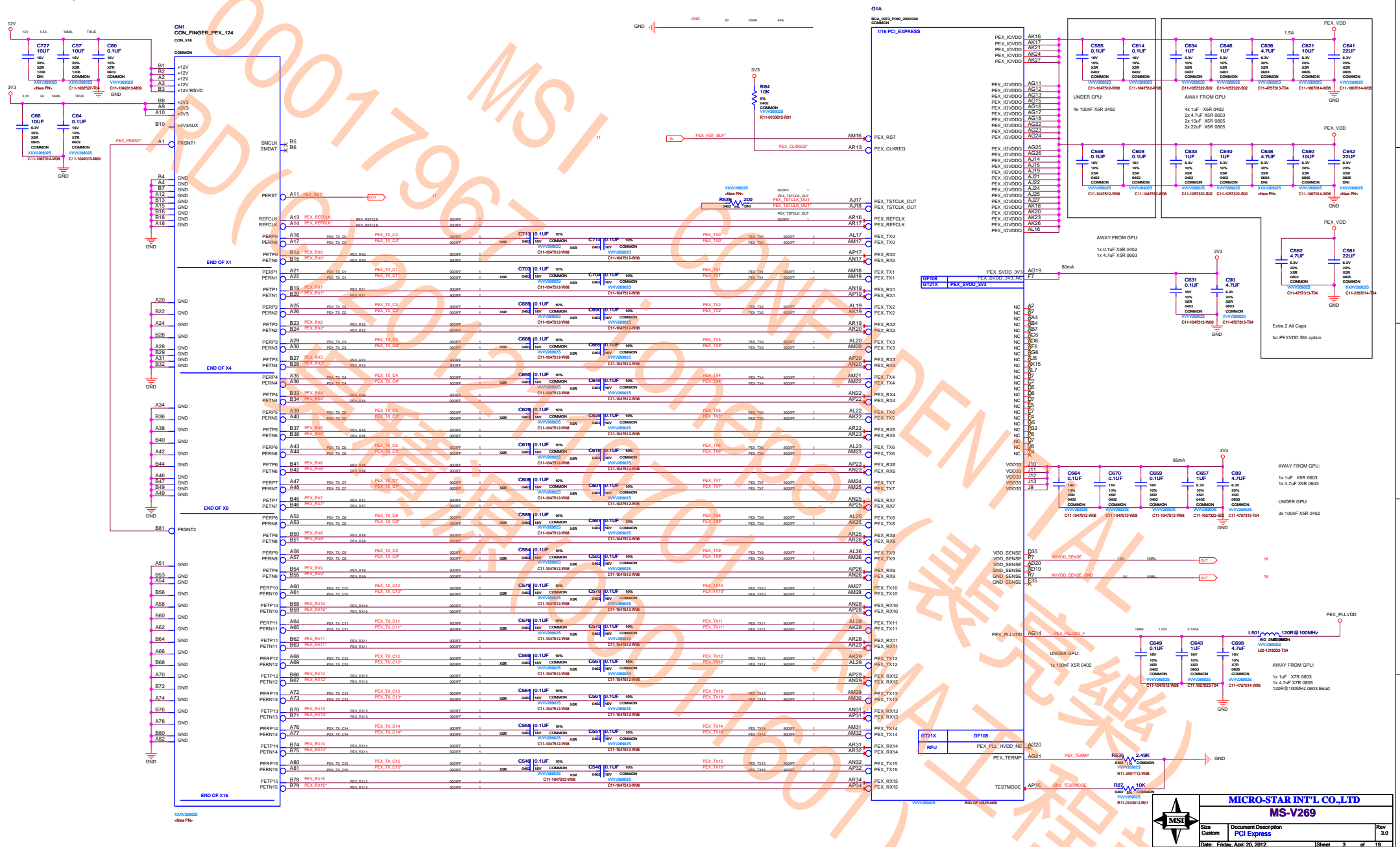
REV	VARIANT	NWPN	ASSEMBLY
B	BASE	600-11070-BASE-9ch	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
1	SKU0000	600-11070-0000-100	GF108-400, 512MB 32Mx32 GDDR5, DVI, VGA, HDMI
2	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
3	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
4	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
5	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
6	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
7	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
8	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
9	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
10	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
11	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
12	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
13	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
14	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
15	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>

	MICRO-STAR INT'L CO.,LTD		
	MS-V269		
	Size	Document Description	Rev
	Custom	Overview	3.0
Date: Friday, April 20, 2012			Sheet 1 of 19

# Block Diagram



PCI Express



# Framebuffer A/B: GPU Section

GT10

BSA\_0027\_P000\_2000000

COMMON

216 FBA

FBA\_D0->L32 FBA\_D0

FBA\_D1->L33 FBA\_D1

FBA\_D2->L34 FBA\_D2

FBA\_D3->L35 FBA\_D3

FBA\_D4->L36 FBA\_D4

FBA\_D5->L37 FBA\_D5

FBA\_D6->L38 FBA\_D6

FBA\_D7->L39 FBA\_D7

FBA\_D8->L40 FBA\_D8

FBA\_D9->L41 FBA\_D9

FBA\_D10->L42 FBA\_D10

FBA\_D11->L43 FBA\_D11

FBA\_D12->L44 FBA\_D12

FBA\_D13->L45 FBA\_D13

FBA\_D14->L46 FBA\_D14

FBA\_D15->L47 FBA\_D15

FBA\_D16->L48 FBA\_D16

FBA\_D17->L49 FBA\_D17

FBA\_D18->L50 FBA\_D18

FBA\_D19->L51 FBA\_D19

FBA\_D20->L52 FBA\_D20

FBA\_D21->L53 FBA\_D21

FBA\_D22->L54 FBA\_D22

FBA\_D23->L55 FBA\_D23

FBA\_D24->L56 FBA\_D24

FBA\_D25->L57 FBA\_D25

FBA\_D26->L58 FBA\_D26

FBA\_D27->L59 FBA\_D27

FBA\_D28->L60 FBA\_D28

FBA\_D29->L61 FBA\_D29

FBA\_D30->L62 FBA\_D30

FBA\_D31->L63 FBA\_D31

FBA\_D32->L64 FBA\_D32

FBA\_D33->L65 FBA\_D33

FBA\_D34->L66 FBA\_D34

FBA\_D35->L67 FBA\_D35

FBA\_D36->L68 FBA\_D36

FBA\_D37->L69 FBA\_D37

FBA\_D38->L70 FBA\_D38

FBA\_D39->L71 FBA\_D39

FBA\_D40->L72 FBA\_D40

FBA\_D41->L73 FBA\_D41

FBA\_D42->L74 FBA\_D42

FBA\_D43->L75 FBA\_D43

FBA\_D44->L76 FBA\_D44

FBA\_D45->L77 FBA\_D45

FBA\_D46->L78 FBA\_D46

FBA\_D47->L79 FBA\_D47

FBA\_D48->L80 FBA\_D48

FBA\_D49->L81 FBA\_D49

FBA\_D50->L82 FBA\_D50

FBA\_D51->L83 FBA\_D51

FBA\_D52->L84 FBA\_D52

FBA\_D53->L85 FBA\_D53

FBA\_D54->L86 FBA\_D54

FBA\_D55->L87 FBA\_D55

FBA\_D56->L88 FBA\_D56

FBA\_D57->L89 FBA\_D57

FBA\_D58->L90 FBA\_D58

FBA\_D59->L91 FBA\_D59

FBA\_D60->L92 FBA\_D60

FBA\_D61->L93 FBA\_D61

FBA\_D62->L94 FBA\_D62

FBA\_D63->L95 FBA\_D63

FBA\_D64->L96 FBA\_D64

FBA\_D65->L97 FBA\_D65

FBA\_D66->L98 FBA\_D66

FBA\_D67->L99 FBA\_D67

FBA\_D68->L100 FBA\_D68

FBA\_D69->L101 FBA\_D69

FBA\_D70->L102 FBA\_D70

FBA\_D71->L103 FBA\_D71

FBA\_D72->L104 FBA\_D72

FBA\_D73->L105 FBA\_D73

FBA\_D74->L106 FBA\_D74

FBA\_D75->L107 FBA\_D75

FBA\_D76->L108 FBA\_D76

FBA\_D77->L109 FBA\_D77

FBA\_D78->L110 FBA\_D78

FBA\_D79->L111 FBA\_D79

FBA\_D80->L112 FBA\_D80

FBA\_D81->L113 FBA\_D81

FBA\_D82->L114 FBA\_D82

FBA\_D83->L115 FBA\_D83

FBA\_D84->L116 FBA\_D84

FBA\_D85->L117 FBA\_D85

FBA\_D86->L118 FBA\_D86

FBA\_D87->L119 FBA\_D87

FBA\_D88->L120 FBA\_D88

FBA\_D89->L121 FBA\_D89

FBA\_D90->L122 FBA\_D90

FBA\_D91->L123 FBA\_D91

FBA\_D92->L124 FBA\_D92

FBA\_D93->L125 FBA\_D93

FBA\_D94->L126 FBA\_D94

FBA\_D95->L127 FBA\_D95

FBA\_D96->L128 FBA\_D96

FBA\_D97->L129 FBA\_D97

FBA\_D98->L130 FBA\_D98

FBA\_D99->L131 FBA\_D99

FBA\_D100->L132 FBA\_D100

FBA\_D101->L133 FBA\_D101

FBA\_D102->L134 FBA\_D102

FBA\_D103->L135 FBA\_D103

FBA\_D104->L136 FBA\_D104

FBA\_D105->L137 FBA\_D105

FBA\_D106->L138 FBA\_D106

FBA\_D107->L139 FBA\_D107

FBA\_D108->L140 FBA\_D108

FBA\_D109->L141 FBA\_D109

FBA\_D110->L142 FBA\_D110

FBA\_D111->L143 FBA\_D111

FBA\_D112->L144 FBA\_D112

FBA\_D113->L145 FBA\_D113

FBA\_D114->L146 FBA\_D114

FBA\_D115->L147 FBA\_D115

FBA\_D116->L148 FBA\_D116

FBA\_D117->L149 FBA\_D117

FBA\_D118->L150 FBA\_D118

FBA\_D119->L151 FBA\_D119

FBA\_D120->L152 FBA\_D120

FBA\_D121->L153 FBA\_D121

FBA\_D122->L154 FBA\_D122

FBA\_D123->L155 FBA\_D123

FBA\_D124->L156 FBA\_D124

FBA\_D125->L157 FBA\_D125

FBA\_D126->L158 FBA\_D126

FBA\_D127->L159 FBA\_D127

FBA\_D128->L160 FBA\_D128

FBA\_D129->L161 FBA\_D129

FBA\_D130->L162 FBA\_D130

FBA\_D131->L163 FBA\_D131

FBA\_D132->L164 FBA\_D132

FBA\_D133->L165 FBA\_D133

FBA\_D134->L166 FBA\_D134

FBA\_D135->L167 FBA\_D135

FBA\_D136->L168 FBA\_D136

FBA\_D137->L169 FBA\_D137

FBA\_D138->L170 FBA\_D138

FBA\_D139->L171 FBA\_D139

FBA\_D140->L172 FBA\_D140

FBA\_D141->L173 FBA\_D141

FBA\_D142->L174 FBA\_D142

FBA\_D143->L175 FBA\_D143

FBA\_D144->L176 FBA\_D144

FBA\_D145->L177 FBA\_D145

FBA\_D146->L178 FBA\_D146

FBA\_D147->L179 FBA\_D147

FBA\_D148->L180 FBA\_D148

FBA\_D149->L181 FBA\_D149

FBA\_D150->L182 FBA\_D150

FBA\_D151->L183 FBA\_D151

FBA\_D152->L184 FBA\_D152

FBA\_D153->L185 FBA\_D153

FBA\_D154->L186 FBA\_D154

FBA\_D155->L187 FBA\_D155

FBA\_D156->L188 FBA\_D156

FBA\_D157->L189 FBA\_D157

FBA\_D158->L190 FBA\_D158

FBA\_D159->L191 FBA\_D159

FBA\_D160->L192 FBA\_D160

FBA\_D161->L193 FBA\_D161

FBA\_D162->L194 FBA\_D162

FBA\_D163->L195 FBA\_D163

FBA\_D164->L196 FBA\_D164

FBA\_D165->L197 FBA\_D165

FBA\_D166->L198 FBA\_D166

FBA\_D167->L199 FBA\_D167

FBA\_D168->L200 FBA\_D168

FBA\_D169->L201 FBA\_D169

FBA\_D170->L202 FBA\_D170

FBA\_D171->L203 FBA\_D171

FBA\_D172->L204 FBA\_D172

FBA\_D173->L205 FBA\_D173

FBA\_D174->L206 FBA\_D174

FBA\_D175->L207 FBA\_D175

FBA\_D176->L208 FBA\_D176

FBA\_D177->L209 FBA\_D177

FBA\_D178->L210 FBA\_D178

FBA\_D179->L211 FBA\_D179

FBA\_D180->L212 FBA\_D180

FBA\_D181->L213 FBA\_D181

FBA\_D182->L214 FBA\_D182

FBA\_D183->L215 FBA\_D183

FBA\_D184->L216 FBA\_D184

FBA\_D185->L217 FBA\_D185

FBA\_D186->L218 FBA\_D186

FBA\_D187->L219 FBA\_D187

FBA\_D188->L220 FBA\_D188

FBA\_D189->L221 FBA\_D189

FBA\_D190->L222 FBA\_D190

FBA\_D191->L223 FBA\_D191

FBA\_D192->L224 FBA\_D192

FBA\_D193->L225 FBA\_D193

FBA\_D194->L226 FBA\_D194

FBA\_D195->L227 FBA\_D195

FBA\_D196->L228 FBA\_D196

FBA\_D197->L229 FBA\_D197

FBA\_D198->L230 FBA\_D198

FBA\_D199->L231 FBA\_D199

FBA\_D200->L232 FBA\_D200

FBA\_D201->L233 FBA\_D201

FBA\_D202->L234 FBA\_D202

FBA\_D203->L235 FBA\_D203

FBA\_D204->L236 FBA\_D204

FBA\_D205->L237 FBA\_D205

FBA\_D206->L238 FBA\_D206

FBA\_D207->L239 FBA\_D207

FBA\_D208->L240 FBA\_D208

FBA\_D209->L241 FBA\_D209

FBA\_D210->L242 FBA\_D210

FBA\_D211->L243 FBA\_D211

FBA\_D212->L244 FBA\_D212

FBA\_D213->L245 FBA\_D213

FBA\_D214->L246 FBA\_D214

FBA\_D215->L247 FBA\_D215

FBA\_D216->L248 FBA\_D216

FBA\_D217->L249 FBA\_D217

FBA\_D218->L250 FBA\_D218

FBA\_D219->L251 FBA\_D219

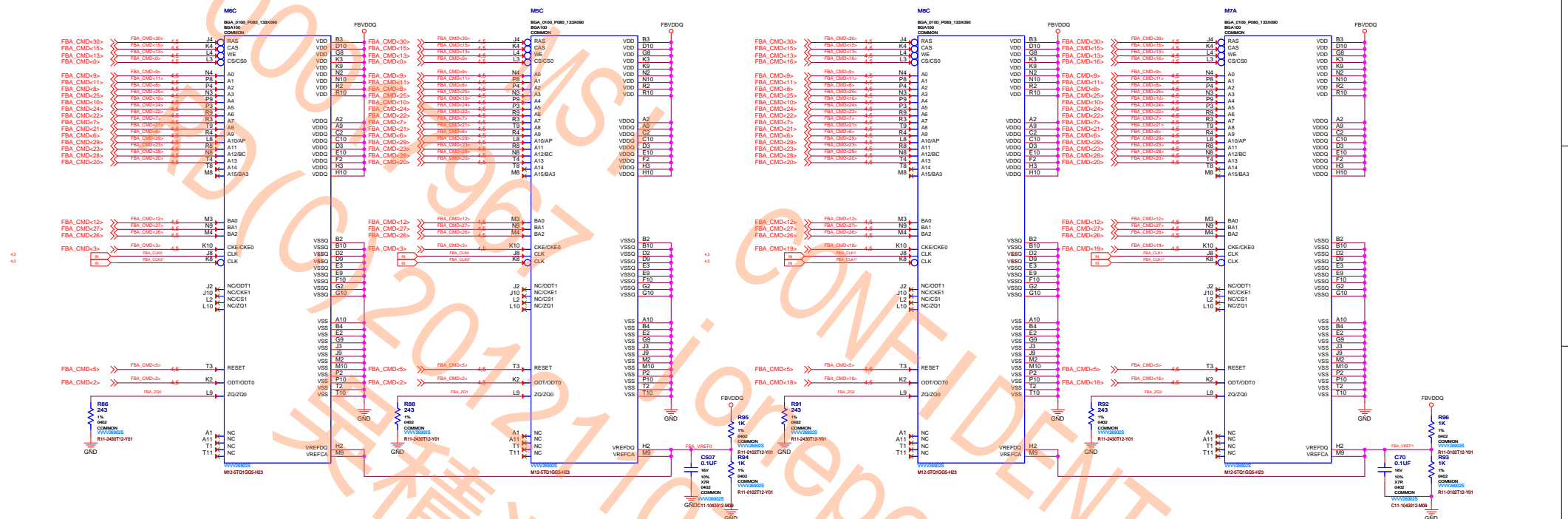
FBA\_D220->L252 FBA\_D220

FBA\_D221->L253 FBA\_D221

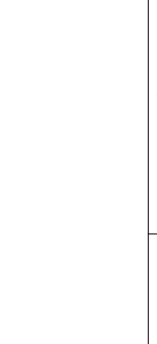
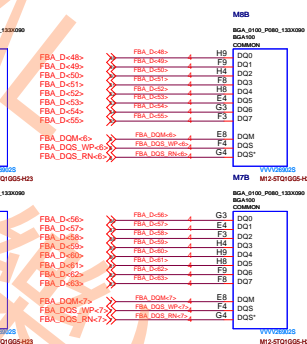
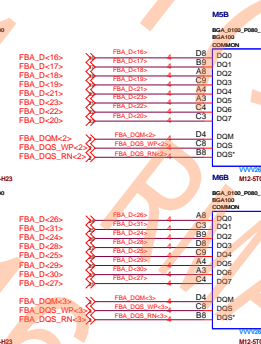
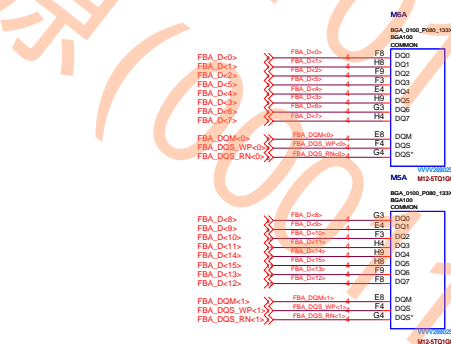
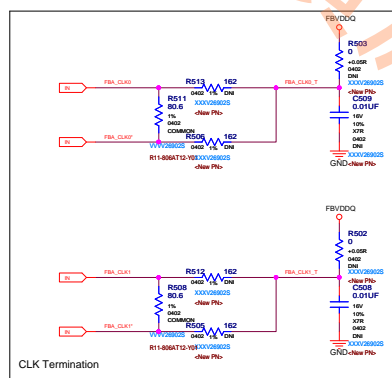
FBA\_D222->L254 FBA\_D222

FBA\_D223->L255 FBA\_D223

## FBA Partition

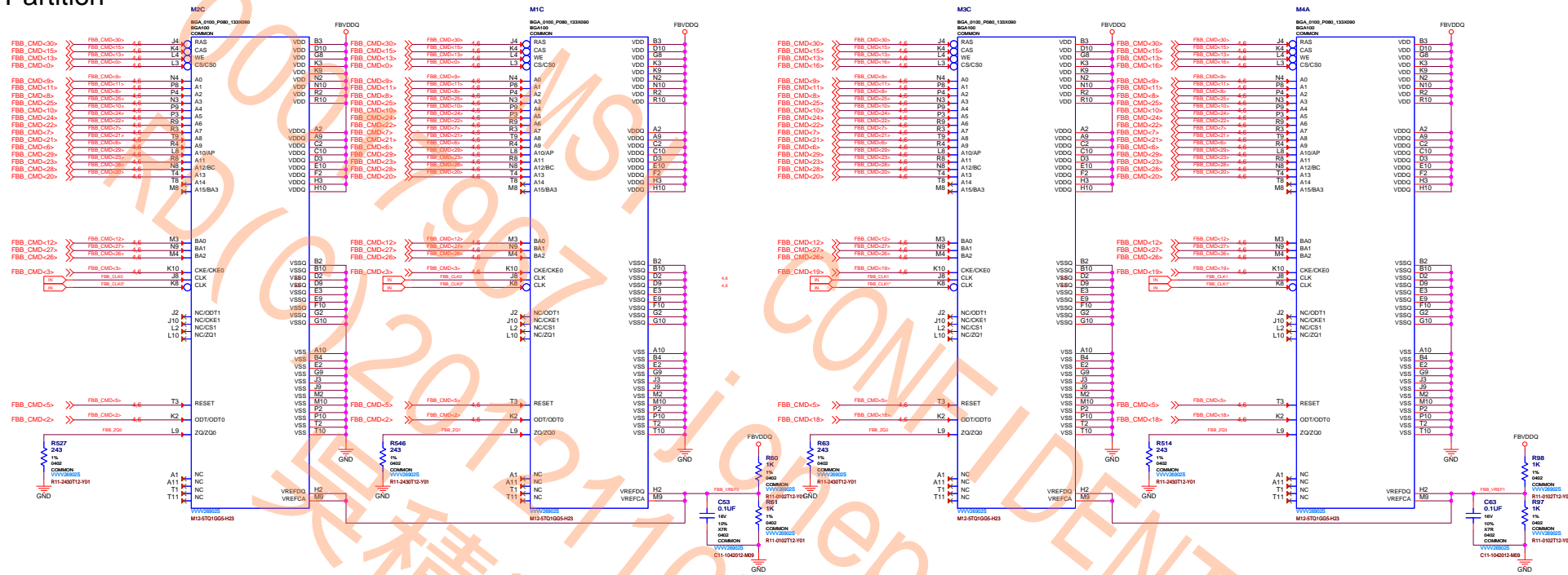


CMD Mapping		
CMD	$\leq 31\%$	$\geq 33\%$
CMD0	CMD0	
CMD1	CMD1	
CMD2	CMD2	4, 5
CMD3	CMD3	
CMD4		
CMD5	RST	RST
CMD6	A0	
CMD7	A2	A2
CMD8	A7	4, 5
CMD9	A0	
CMD10	A1	A1
CMD11	A4	A4
CMD12	BA0	BA0
CMD13	W0	W0
CMD14		
CMD15	CAS*	CAS*
CMD16		
CMD17		
CMD18	CMD	CMD
CMD19		
CMD20	A10	A10
CMD21	A1	A1
CMD22	A6	A6
CMD23	A15	4, 5
CMD24	A5	A5
CMD25	A3	A3
CMD26	BA2	BA2
CMD27	BA1	BA1
CMD28	A10	A10
CMD29	A10	4, 5
CMD30	BA5*	BA5*
CMD31		

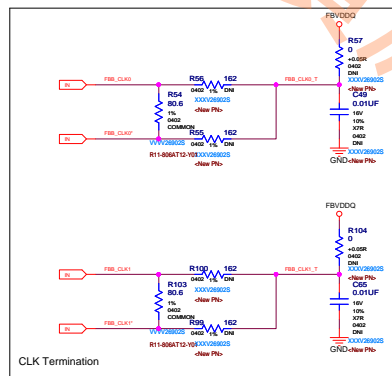




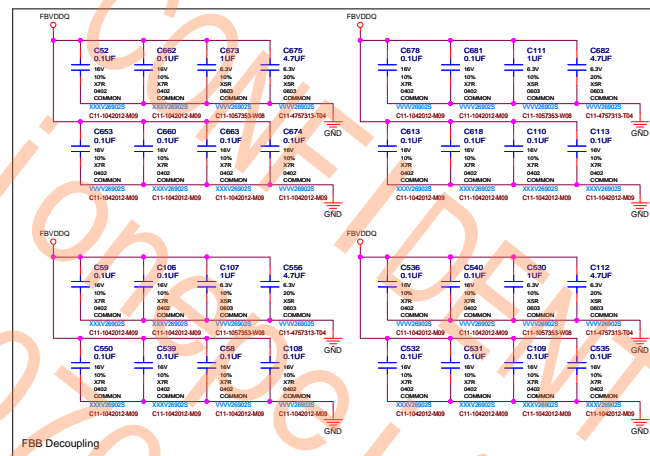
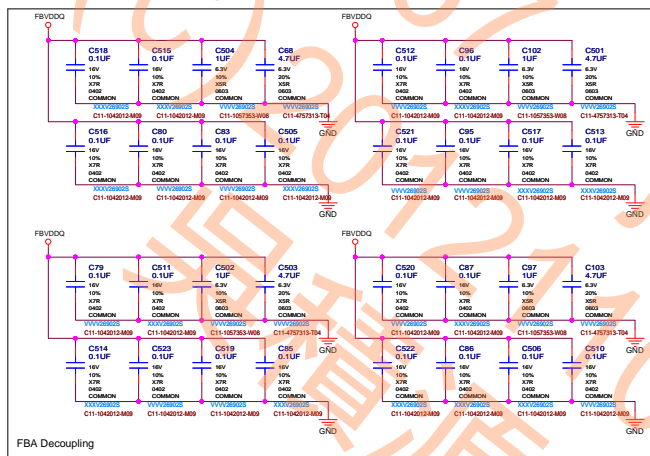
## FBB Partition



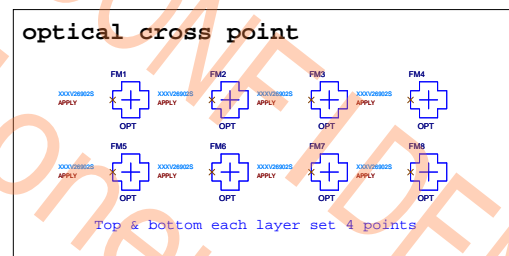
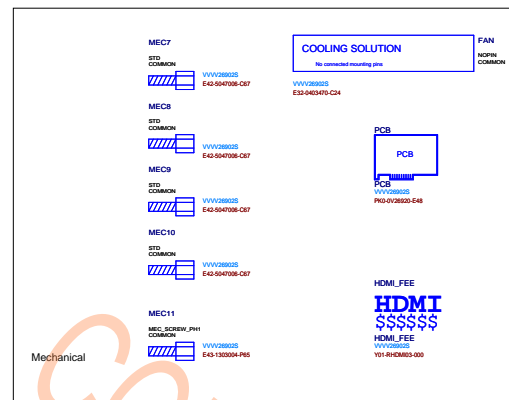
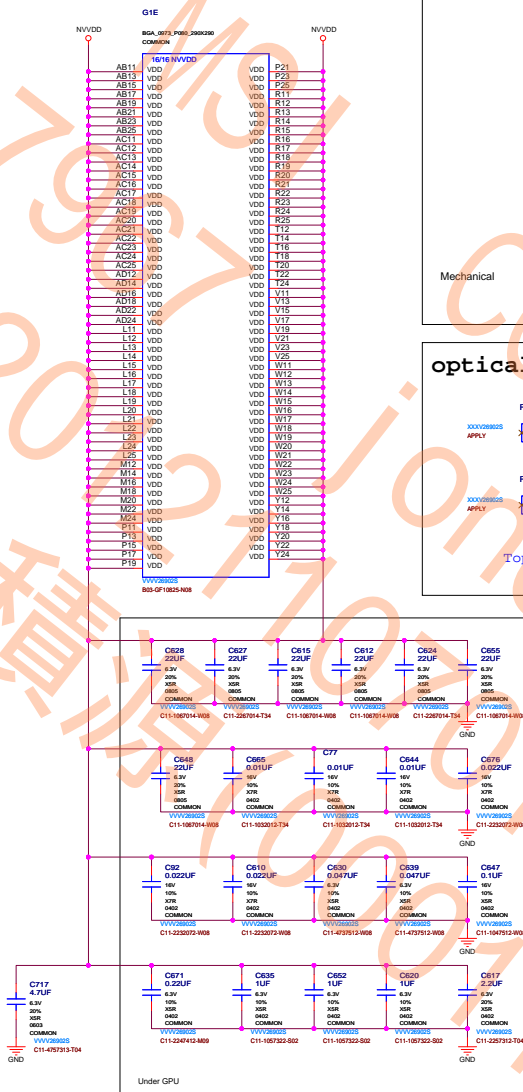
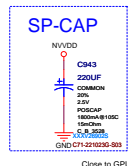
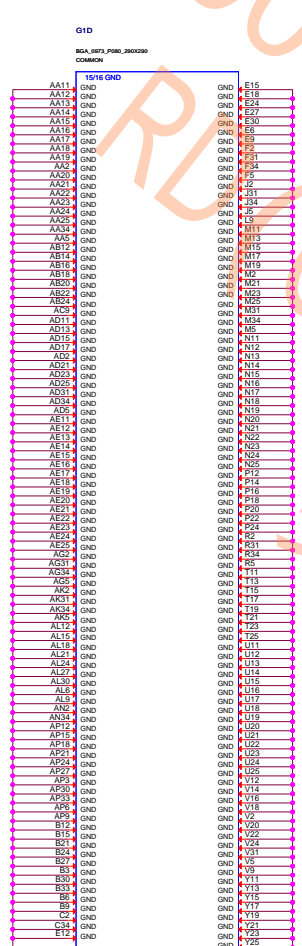
CMD	<B>+<B>	<B>+<B>
CMD0	CMD0	
CMD1		
CMD2	CMD2	4,6
CMD3	CMD3	
CMD4	CMD4	
CMD5	RST	RST
CMD6	A0	
CMD7	A2	A2
CMD8	A3	4,6
CMD9	A0	A0
CMD10	A1	A1
CMD11	A1	A1
CMD12	BA0	BA0
CMD13	WE0	WE0
CMD14		
CMD15	CMD0	CMD0
CMD16		
CMD17		
CMD18		
CMD19		
CMD20		
CMD21	A10	A10
CMD22	A0	A0
CMD23	A0	A0
CMD24	A11	4,6
CMD25	A0	A0
CMD26	A0	A0
CMD27	BA0	BA0
CMD28	A10	A10
CMD29	A10	4,6
CMD30	RA0	RA0
CMD31		



# Memory Decoupling



## GPU Power and GND, NVVDD Decoupling, THERMAL/MECHANICAL



UNDER GPU

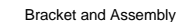
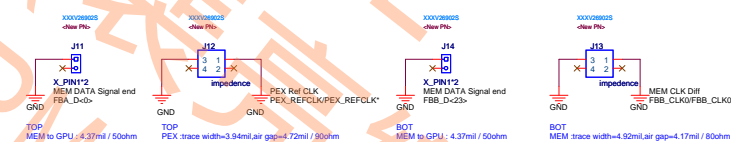
- 4x 0402 x7R 10nF  
4x 0402 x7R 22nF  
2x 0402 x7R 47nF  
2x 0402 x5R 100nF  
1x 0402 x5R 220nF  
3x 0402 x5R 1uF  
1x 0402 x5R 2.2uF

AWAY FROM GPU:

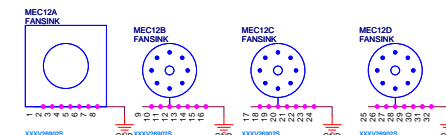
- 1x 0603 x5R 4.7UF


AFTER VRM:

- 10x 0805 x5R 10UF



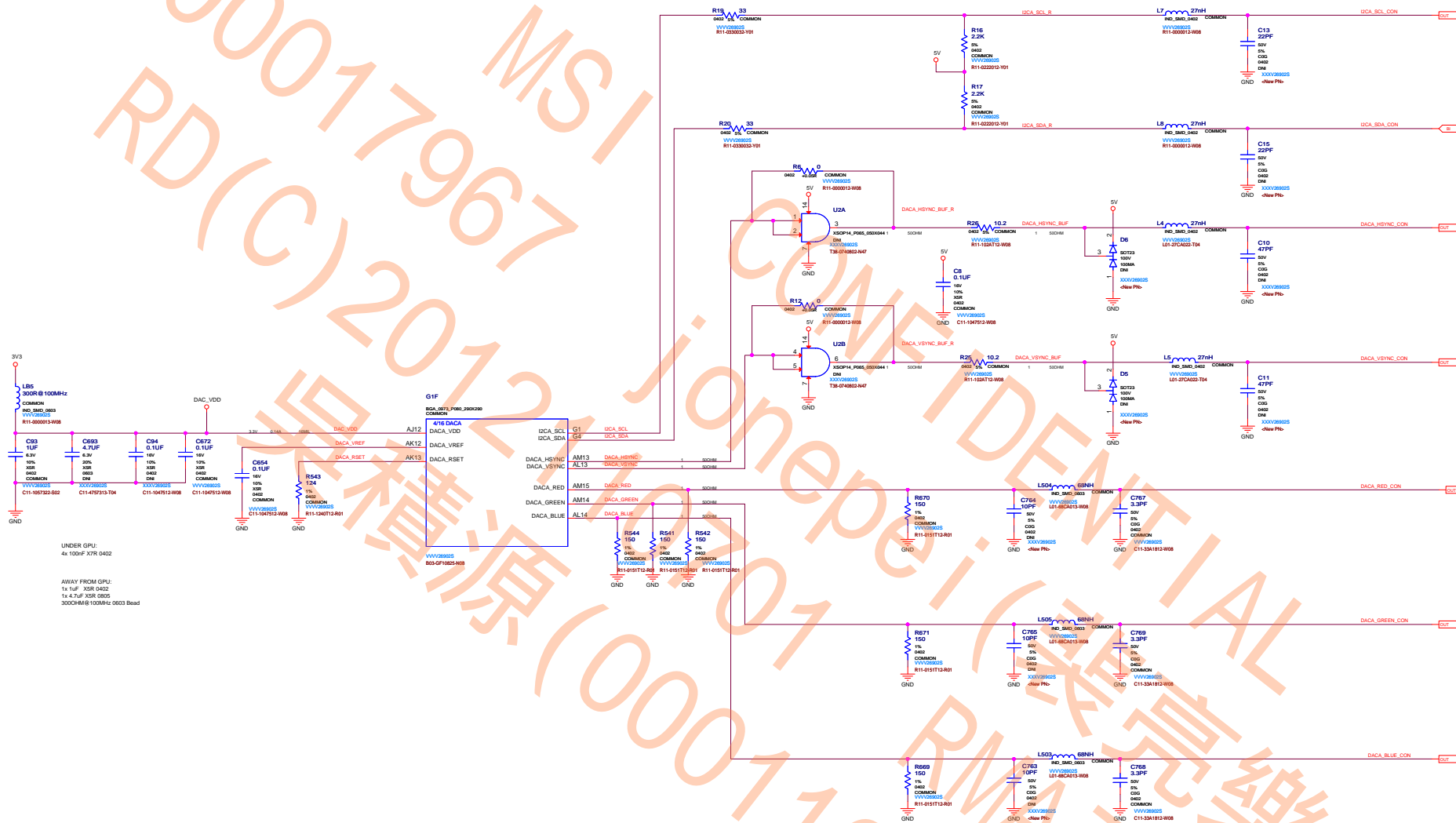
No more Screw symbol in schematic!



	<b>MICRO-STAR INT'L CO.,LTD</b> <b>MS-V269</b>		
	Size	Document Description	Rev
	Custom	GPU Power and GND, NVDD Decoupling	3
Date: <u>Edison, April 20, 2012</u>		Sheet <u>2</u> of <u>3</u>	

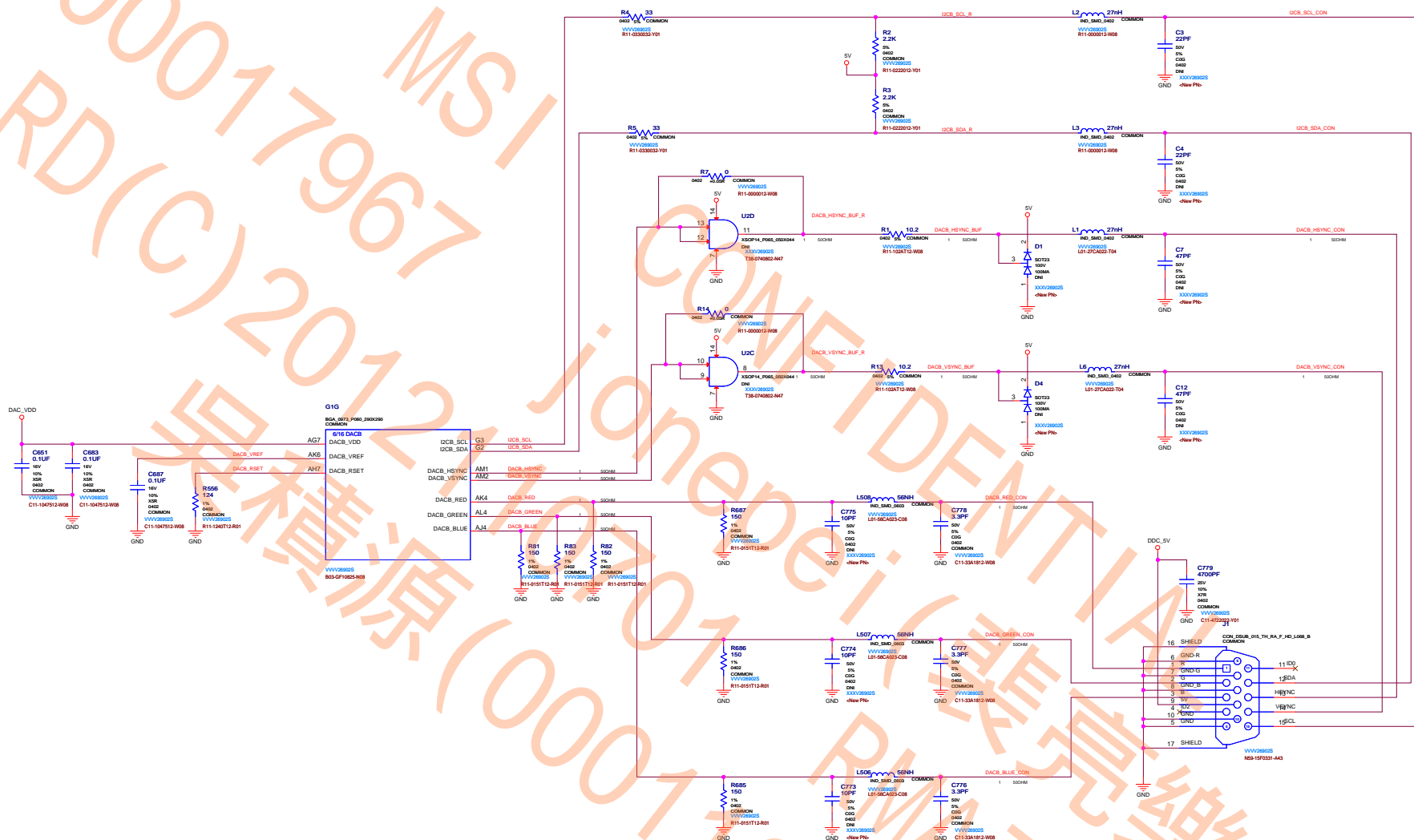


Display: DACA (South DVI-I)



NET	NV_CRITICAL	NV_IMPEDANCE
OUT DACA_HSYNCH_CON	11.9	500UM
OUT DACA_VSYNCH_CON	11.9	500UM
DACA_RED_CON	11.9	500UM
OUT DACA_GREEN_CON	11.9	500UM
OUT DACA_BLUE_CON	11.9	500UM

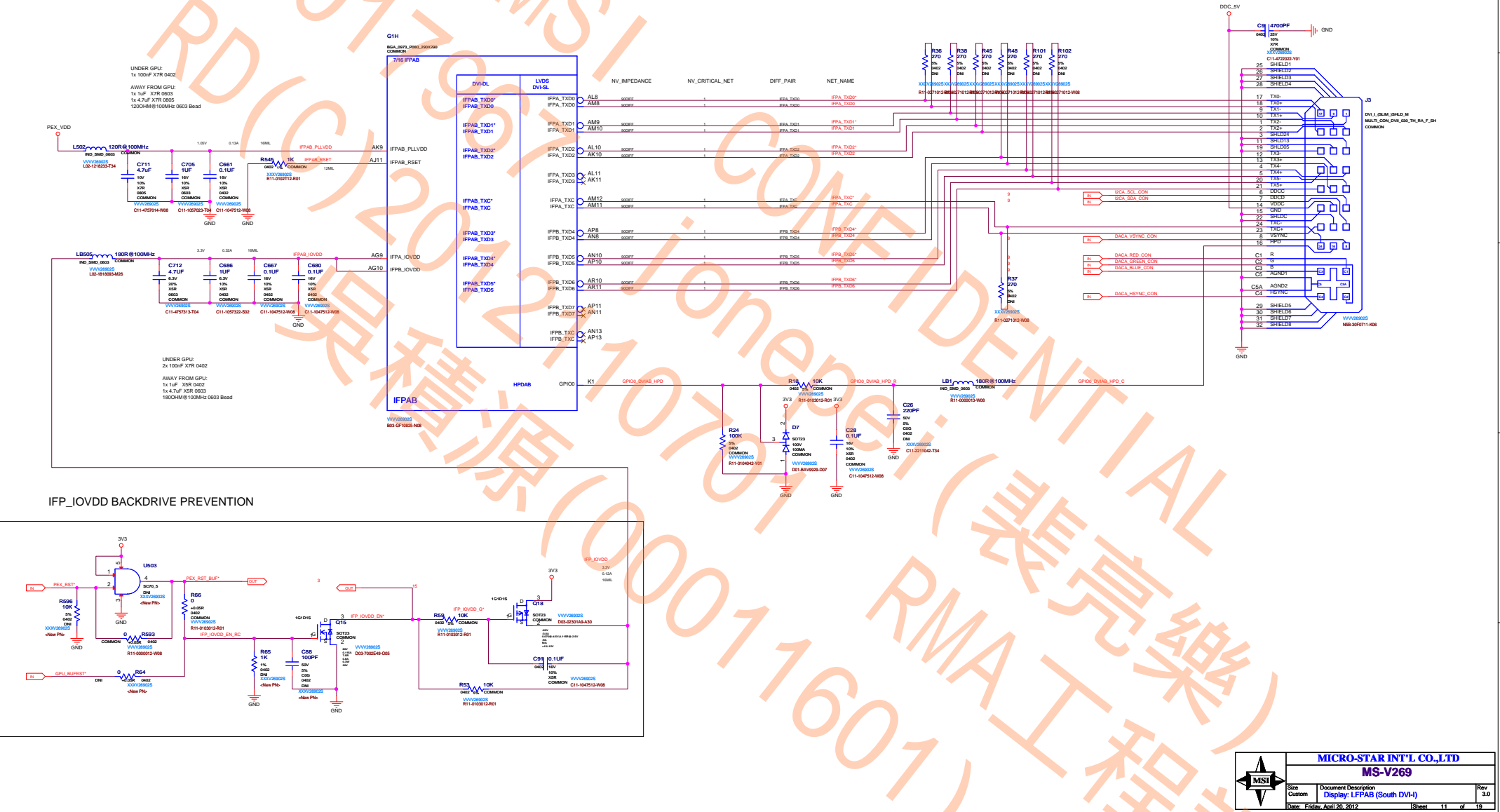
Display: DACB (Middle DSUB)



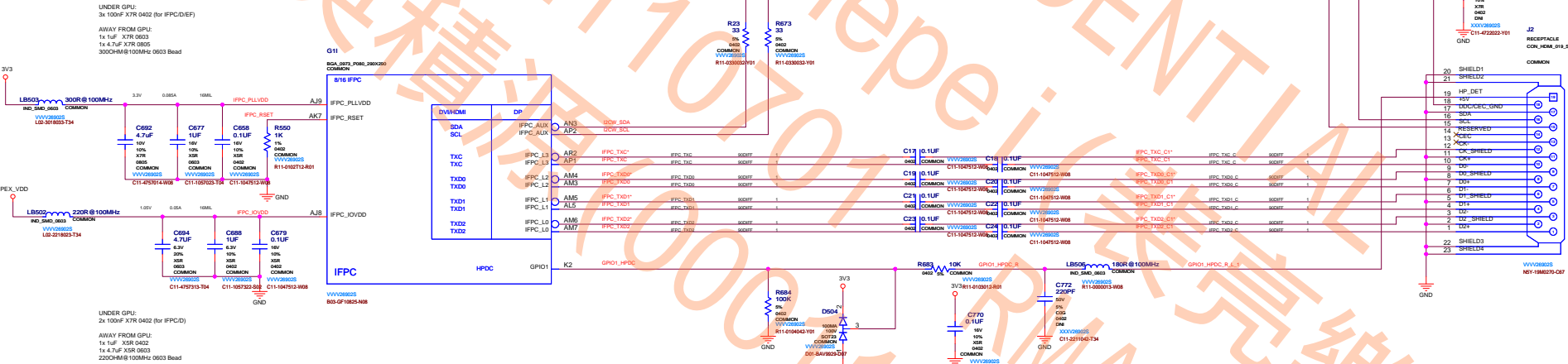
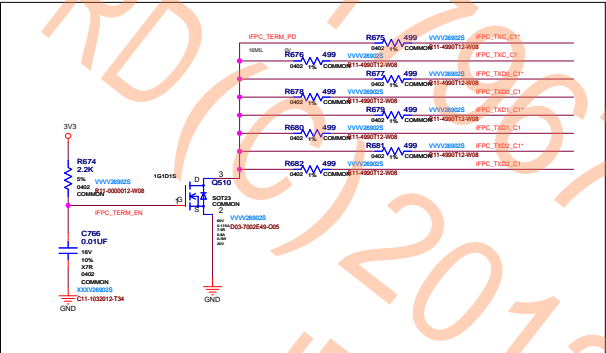
**MICRO-STAR INT'L CO.,LTD**  
**MS-V269**

Size Custom	Document Description Display: DACB (Middle DSUB)	Re 3
Date: Friday, April 20, 2012	Sheet 10 of 10	

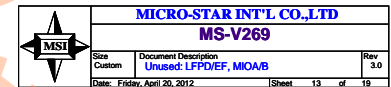
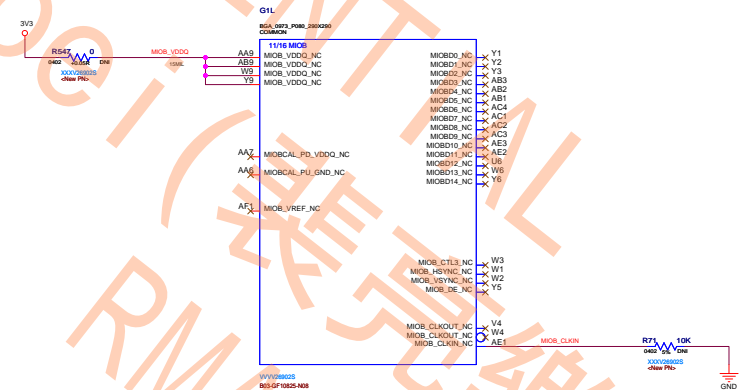
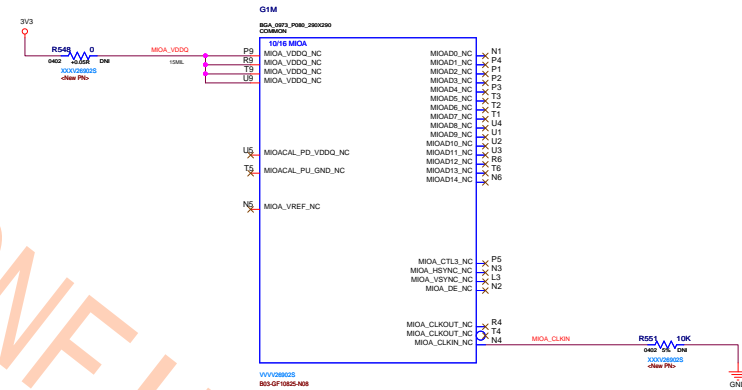
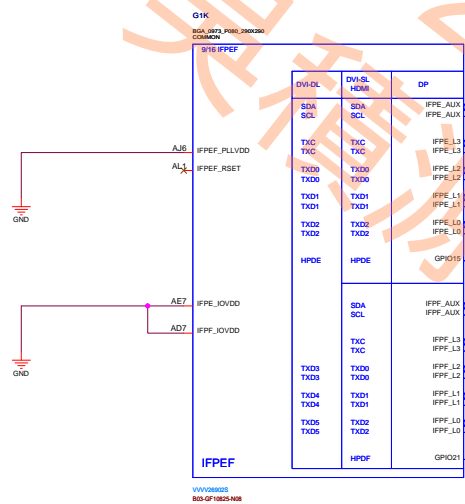
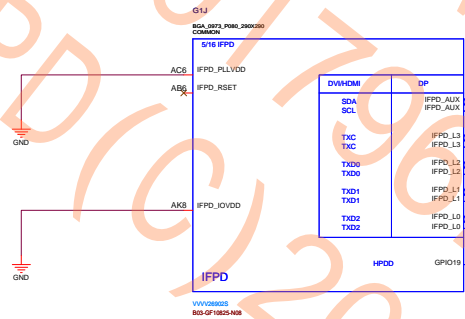
Display: LFPAB (South DVI-I)



HDMI PULL DOWNS

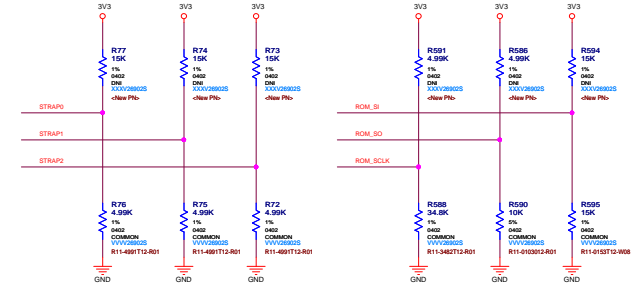
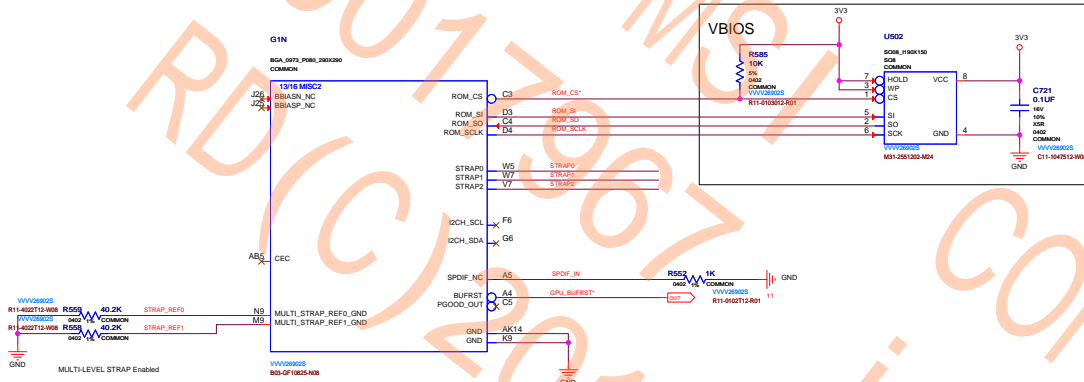


Unused: LFPD/EF, MIOA/B





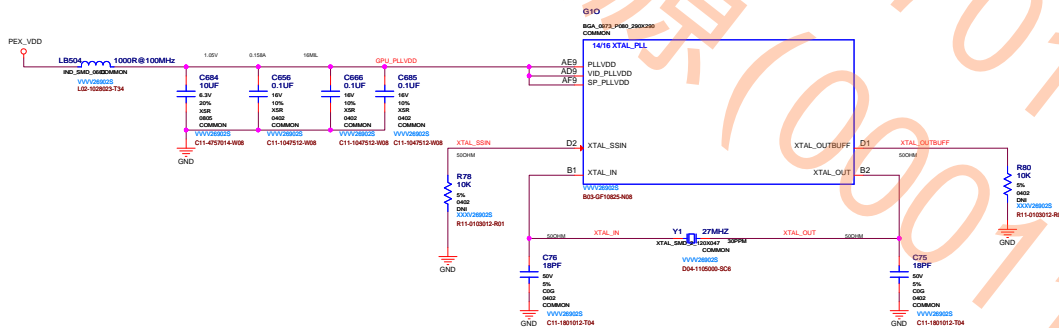
# MISC: VBIOS, XTAL, STRAPS



	GND	3V3
5k	0000	1000
10k	0001	1001
15k	0010	1010
20k	0011	1011
25k	0100	1100
30k	0101	1101
35k	0110	1110
45k	0111	1111

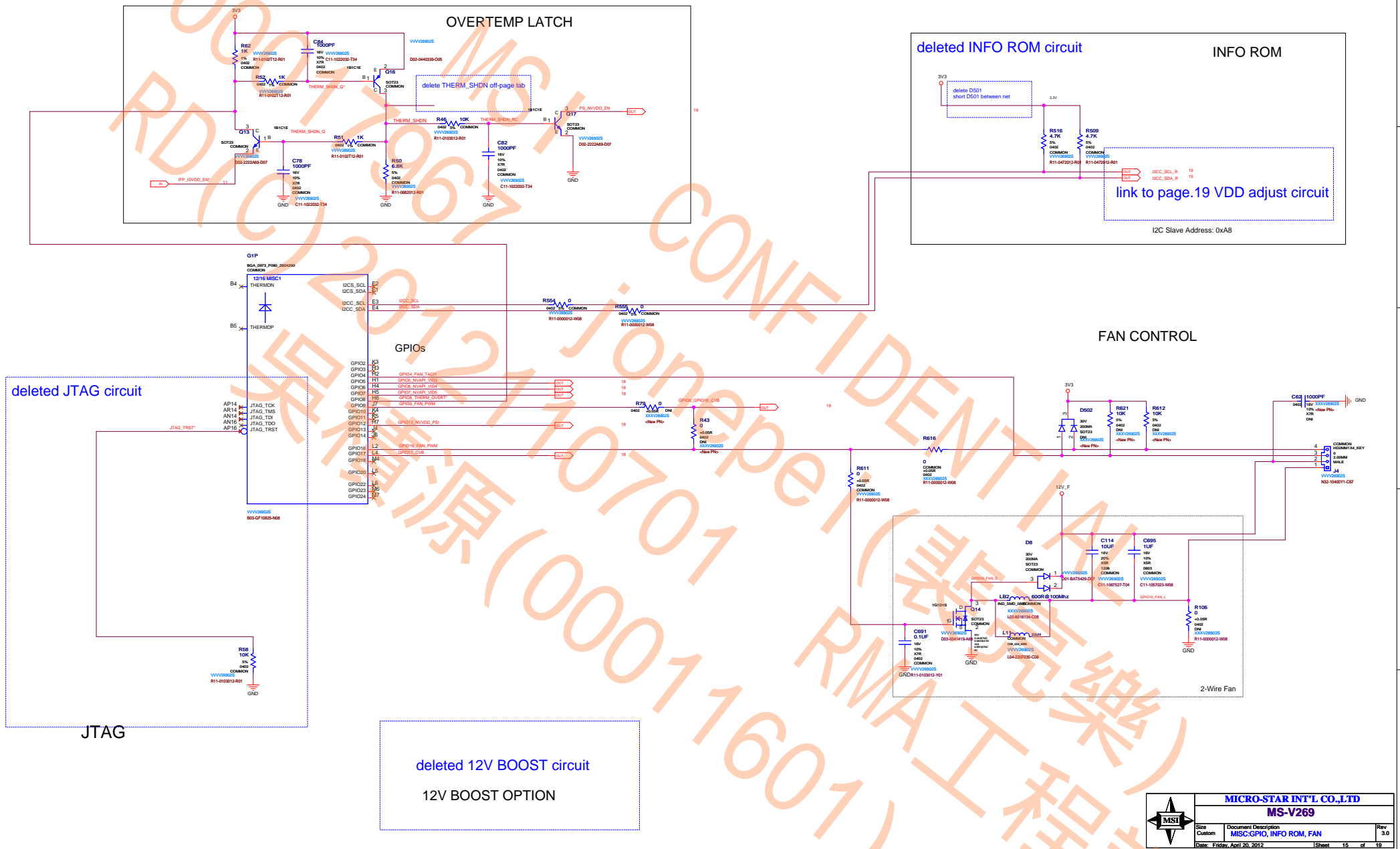
UNDER GPU:  
4x 100uF X7R 0402

AWAY FROM GPU:  
1x 10uF X7R 0805  
30CHM@100MHz 0603 Bead

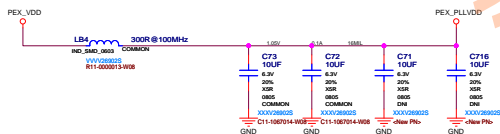
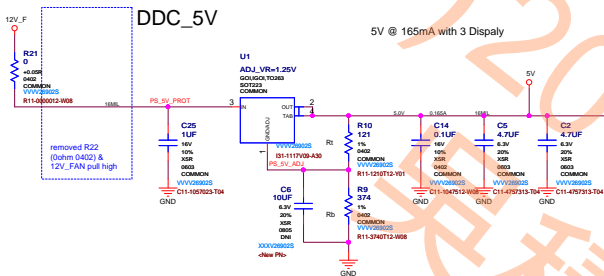
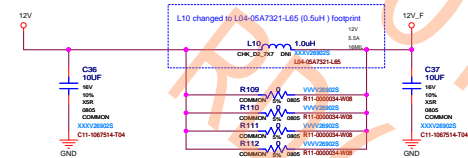


RAMCFG[3]	0001	32Mx32 128-bit Qimonda	=> 15K PD
RAMCFG[2]	0010	32Mx32 128-bit Hynix	=> 20K PD
RAMCFG[1]	0011	32Mx32 128-bit Samsung	
RAMCFG[0]	0101	64Mx32 128-bit Qimonda	
	0110	64Mx32 128-bit Hynix	
	0111	64Mx32 128-bit Samsung	
XCLK_417		0 277MHz (Default)	
FB[0]_BAR_SIZE		0 256MB (Default)	10K PD
SMB_ALT_ADDR		0 0x9E (Default)	
VGA_DEVICE		1 VGA Device (Default)	
PCI_DEVID_EXT		0 DID<4>=0	
SUB_VENDOR		1 BIOS ROM Present	
SLOT_CLK_CFG		1 Share Ref CLK	45K PD
PEX_PLL_EN_TERM100		1 Enable	
STRAP0	USER_BIT [3..0]	0000 Default	5K PD
STRAP1	3GIO_PADCFG_LUT_ADR [3..0]	0000 Desktop	5K PD
STRAP2	PCI_DEVID [3..0]	0000 DID: 0x0DE0	5K PD

# MISC:GPIO, JTAG, INFO ROM, THERMAL LATCH, FAN CONTROL

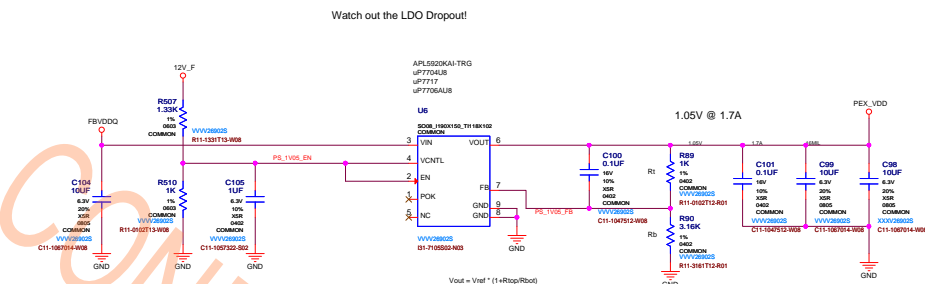


## PEX\_12V INPUT - 66W



LDO Option  
delete LDO Option

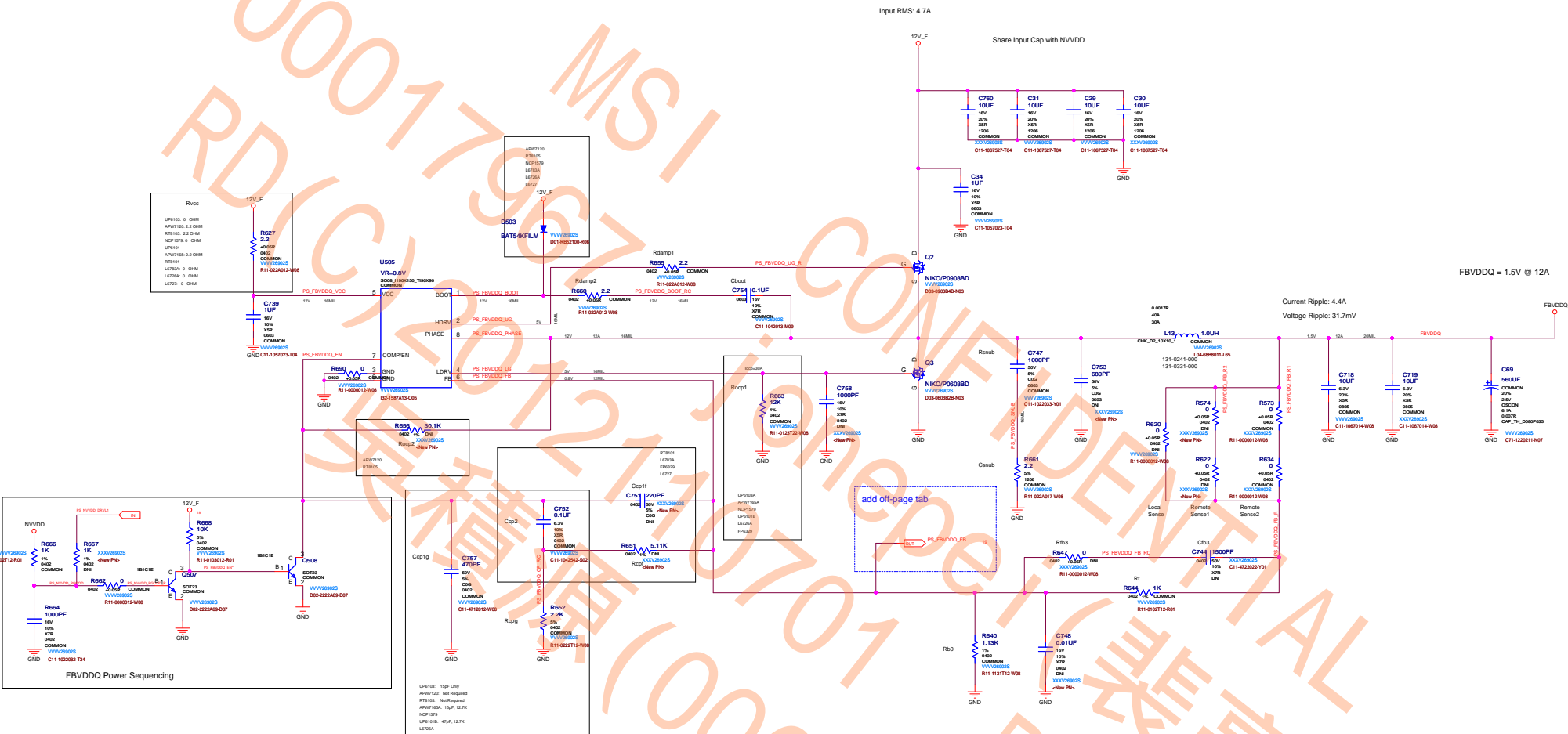
## PEX VDD



Place Voltage Divider close to LDO

Switcher Option  
delete Switcher Option

Power Supply: FBVDDQ

 $V_{out} = V$ 

DVS:

GE

---

LUNG 103M  
A1MCT13

APWT16

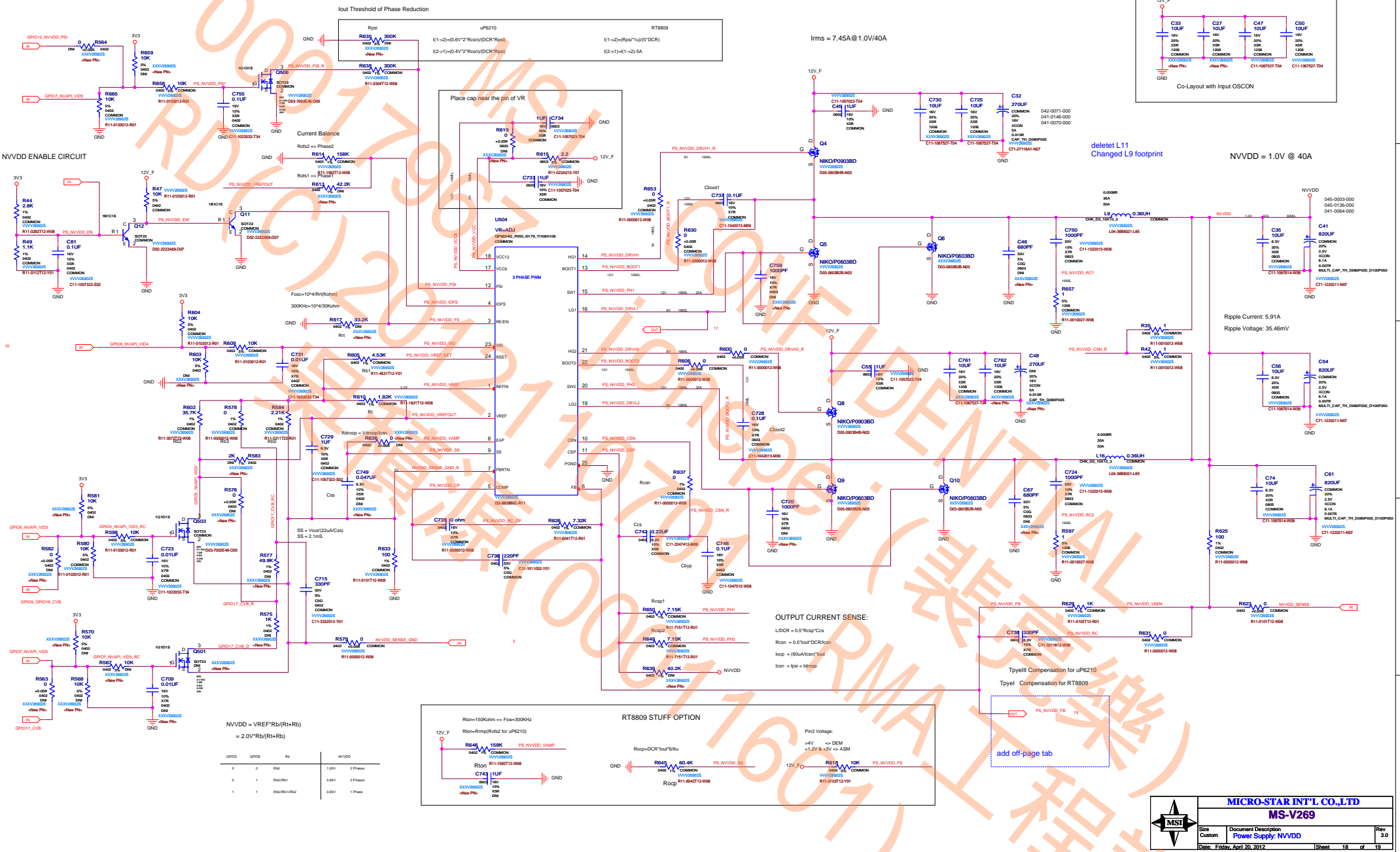
RTB101  
UPG101E

FPE329

---

	<b>MICRO-STAR INT'L CO.,LTD</b>		
	<b>MS-V269</b>		
	Size Custom	Document Description <b>Power Supply: FBVDDQ</b>	Rev 3.0
Date: Friday, April 20, 2012		Sheet 17 of 19	

# Power Supply: NVVDD





### VDD adjust circuit

