

Project Namel: Gambit MLK SFF  
PCB Number: 17530  
PCBA Ver.: A00  
SCH Ver.: A00  
Project Code : 3PD06M010001  
PCB Size: 285.7 x 200mm, 1.6mm, 4 Layers

PAGE	TITLE
01	Cover Page
02	Block Diagram
03	CPU_DDRA_DDRB
04	CPU_CFG/CLOCK
05	CPU (PCIE)
06	CPU (VSS)
07	CPU (VCC_CORE/SENCE)
08	CPU (DDI/EDP)
09	CPU (POWER CAP)
10	CPU (R)
11	DDR4 CHA DIMM 0
12	(R)
13	DDR4 CHB DIMM 0
14	(R)
15	PCH (Audio/SMBUS/JTAG/GPIO)
16	PCH (CLK)
17	PCH (SATA/PCIE/HOST)
18	PCH (DMI/USB2/USB3/PCIE)
19	PCH (DDI/USB3/GPIO)
20	PCH (UART/GPIO/I2C)
21	PCH (Strap Pin)
22	PCH (VCC)
23	PCH (VSS/GPIO)
24	SIO (SMSC5533)
25	SPI/RTC/BAT
26	FAN Control/Thermal sensor
27	AUDIO (ALC3820)
28	(R)
29	AUDIO JACK
30	(R)
31	LAN (RTL8111H)
32	RJ45+USB2.0
33	Card Reader (RTS5170)
34	(R)
35	(R)
36	Rear USB2.0
37	(R)
38	(R)
39	Front USB3.0
40	(R)
41	ATX CONNECTOR
42	(R)
43	3P3V_SB & 5V_S0 Power
44	VCORE/V_GT (NCP81203)
45	VCORE OUTPUT (NCP81166)
46	V_GT OUTPUT (NCP81166)
47	VCCSA (RT8237C)
48	VCCIO (APL5611A)
49	5V_S5/3P3V_S5 (RT6575D)
50	DDR_PWR (RT8231A)
51	PCH_1D0V (RT8237C)
52	DDR_2D5V_VPP
53	MINUS 12V (NCP3063)
54	3P3V_S0 Power
55	Sequence Circuit

PAGE	TITLE
56	HDMI
57	(R)
58	VGA (RTD2166)
59	(R)
60	HDD/ODD
61	(R)
62	NGFF
63	PCI_SLOT
64	PWR BTM/LED
65	(R)
66	(R)
67	(R)
68	LPC/UART Port
69	(R)
70	(R)
71	(R)
72	(R)
73	(R)
74	(R)
75	(R)
76	(R)
77	(R)
78	(R)
79	(R)
80	(R)
81	(R)
82	(R)
83	(R)
84	(R)
85	(R)
86	(R)
87	(R)
88	(R)
89	(R)
90	(R)
91	TPM
92	(R)
93	PCIeX16
94	PCIeX1
95	(R)
96	(R)
97	(R)
98	(R)
99	XDP & APS
100	(R)
101	(R)
102	Power Sequence
103	Power Block Diagram
104	Power Good & Reset Diagram
105	Clock Diagram
106	Reset Flow Chart
107	Change Histroy

#### Jumper Setting

JMP1	Pin 1-2	With Jumper to ME Disable
	Pin 3-4	Without Jumper to Clear Password
	Pin 5-6	With Jumper to Clear CMOS
DB1	PD 1K	PD 1K to GND for Debug, All Power-On

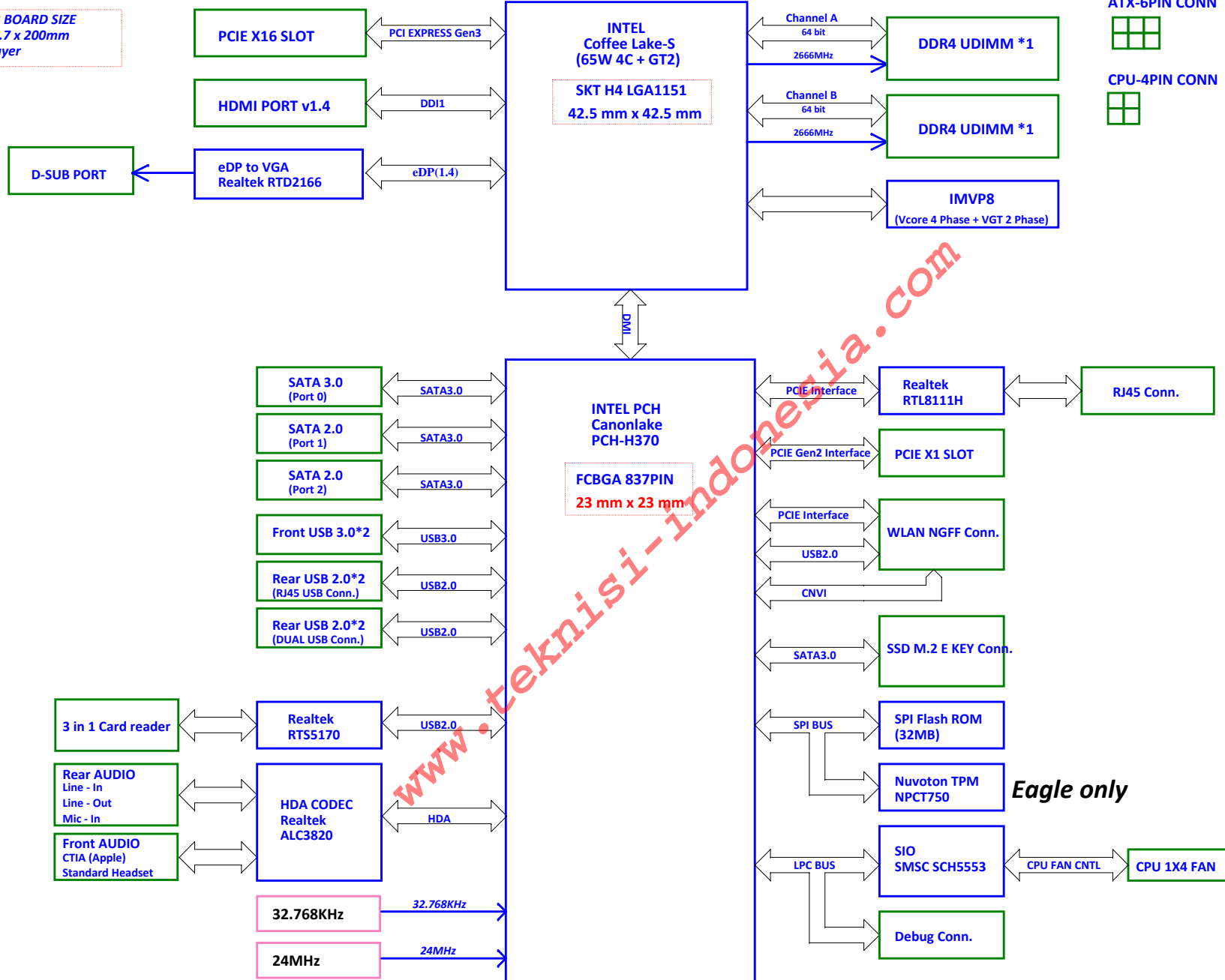
#### BOM Configuration

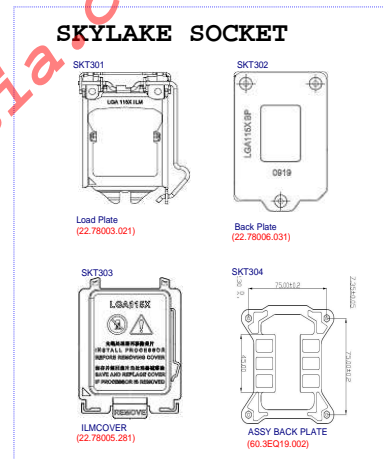
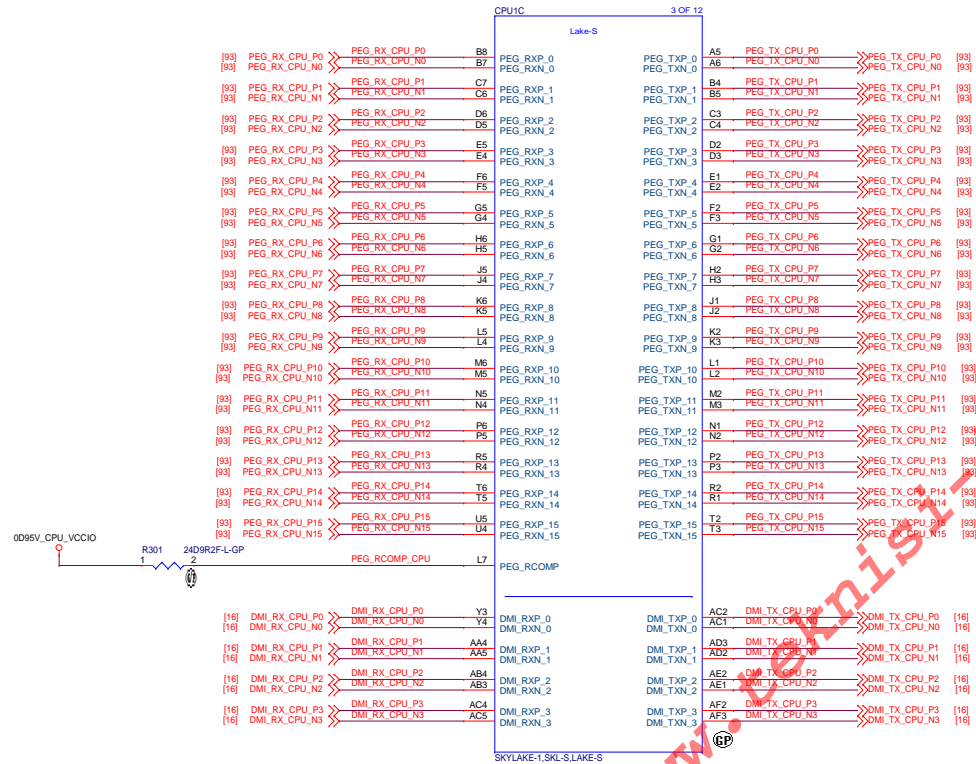
(R\_): Unmount  
(X\_): Debug  
(GAM\_): Gambit MLK SFF  
(EAG\_): Eagle SFF  
(TPM\_): With TPM  
(NONTPM\_): Without TPM

#### Power sates

	Name	G3	DSW	S5	S4	S3	S0
+12V	V_12P0_A		O	O	O	O	O
	+12V						O
	V_12V_CPU_S0		O	O	O	O	O
-12V	-12V						O
	5V_S0						O
+5V	USBVCC12						
	USBVCC34			O	O	O	O
	USBVCC78						
	5V_S5						
	V_5_CODEC		O	O	O	O	O
	3P3V_S0						O
	3P3V_AUD_S0						
3.3V	3P3V_SB						
	3P3V_SPI			O	O	O	O
	3P3V_LAN						
	3P3V_M2VAUX						
	3P3V_PCIVAUX						
	3P3V_S5		O	O	O	O	O
VBAT	3P0V_BAT_VREG						
	VBAT1	O	O	O	O	O	O
	VBAT2						
VDDQ	+VCCPLL_OC						O
	V_SM					O	O
DIMM	V_SM_VTT						O
	V_VPP						
PCH	V1P0_PCH_SB						
	+V1P0A_VCCAPLL						
	+V1P0A_VCCF24_1P0						
	+V1P0A_VCCAMPHYPLL			O	O	O	O
	V_CPU_ST_PLL						
CPU	V_CPU_CORE						
	V_CPU_GT						
	V_CPU_IO						
	V_CPU_SA						O
	+VCCFUSEPRG						

PCB BOARD SIZE  
285.7 x 200mm  
4 Layer

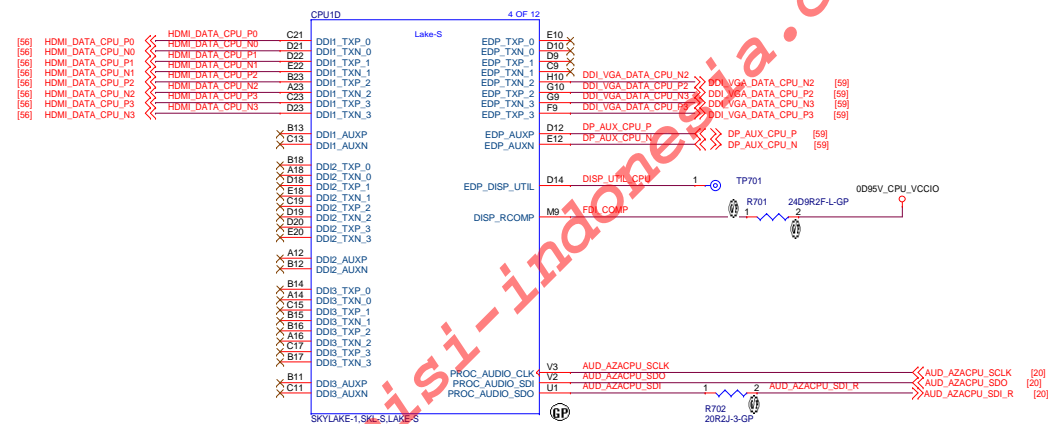








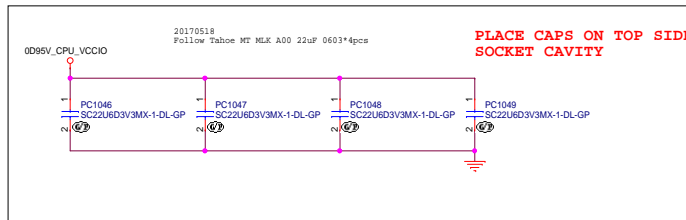
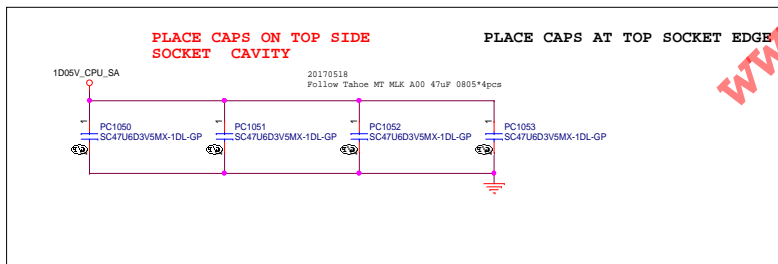
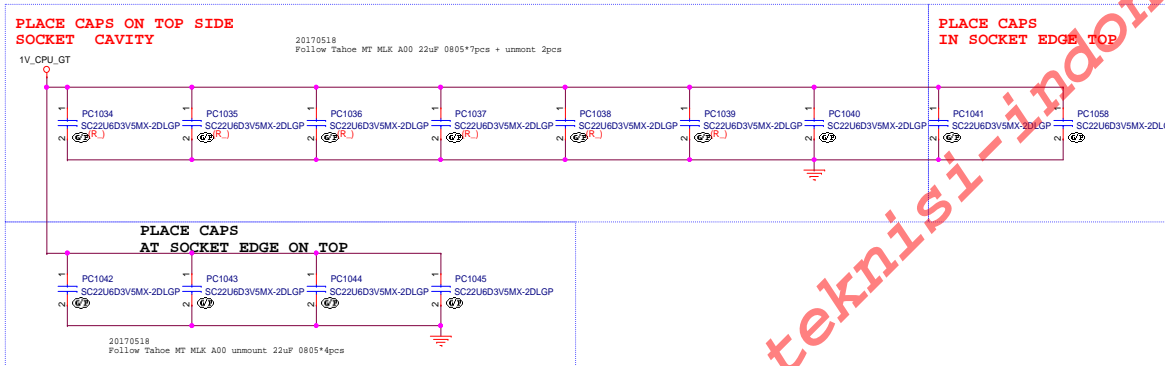
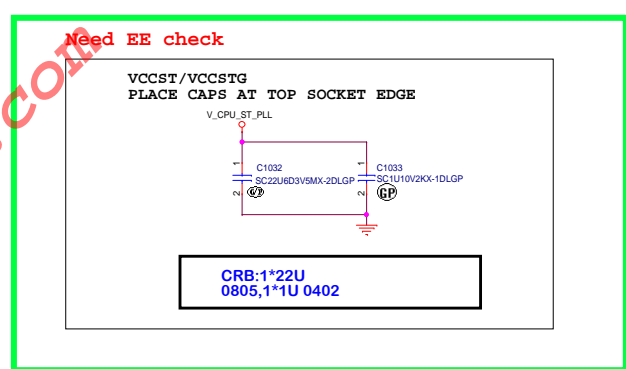
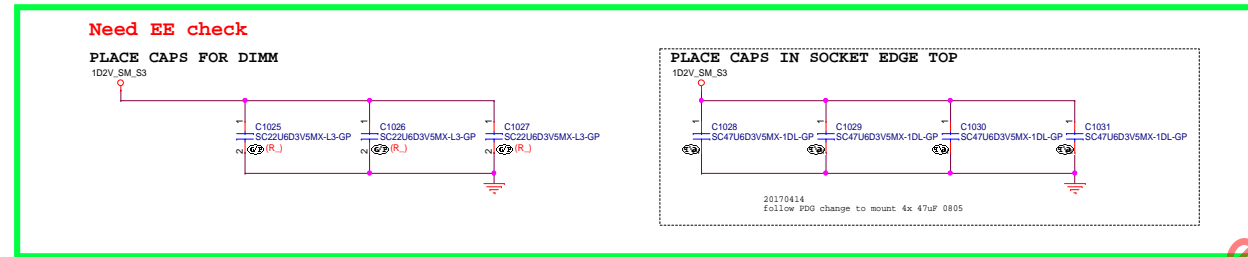
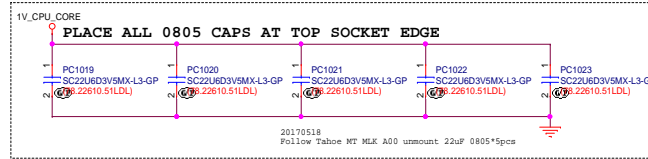
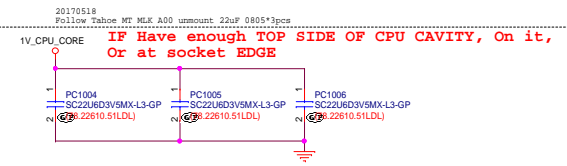
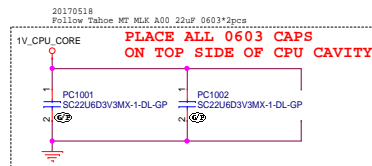
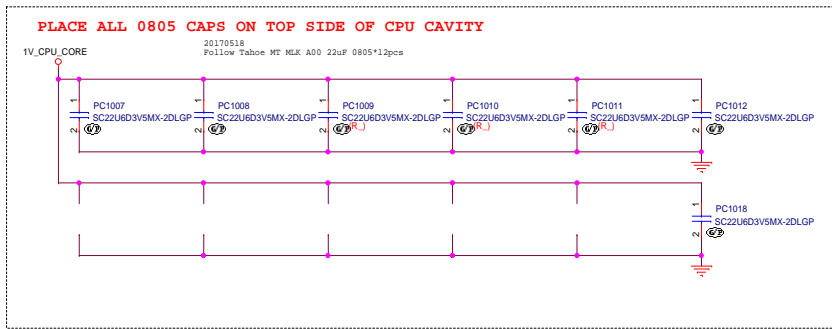




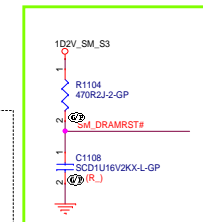
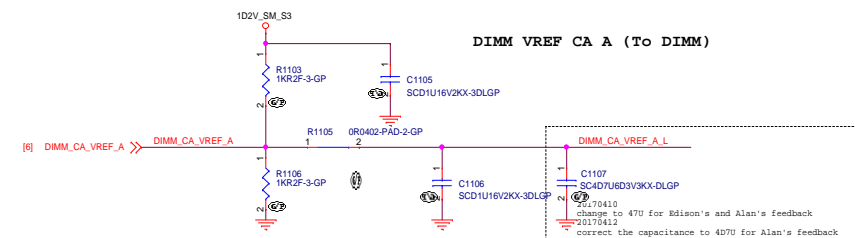
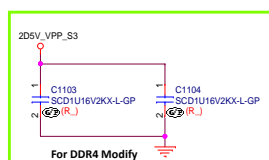
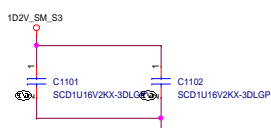
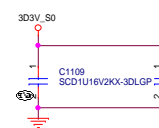
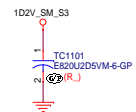
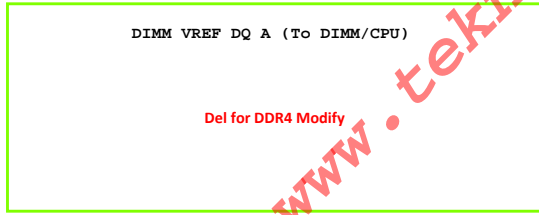
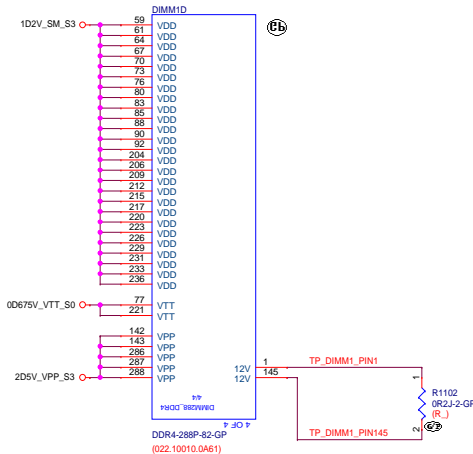
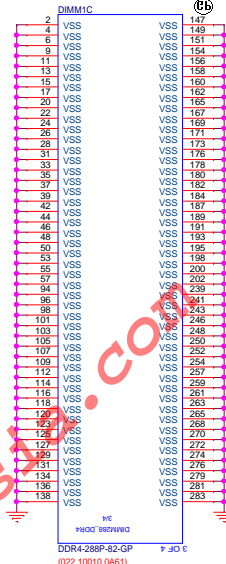
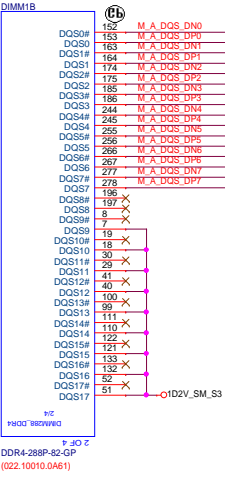
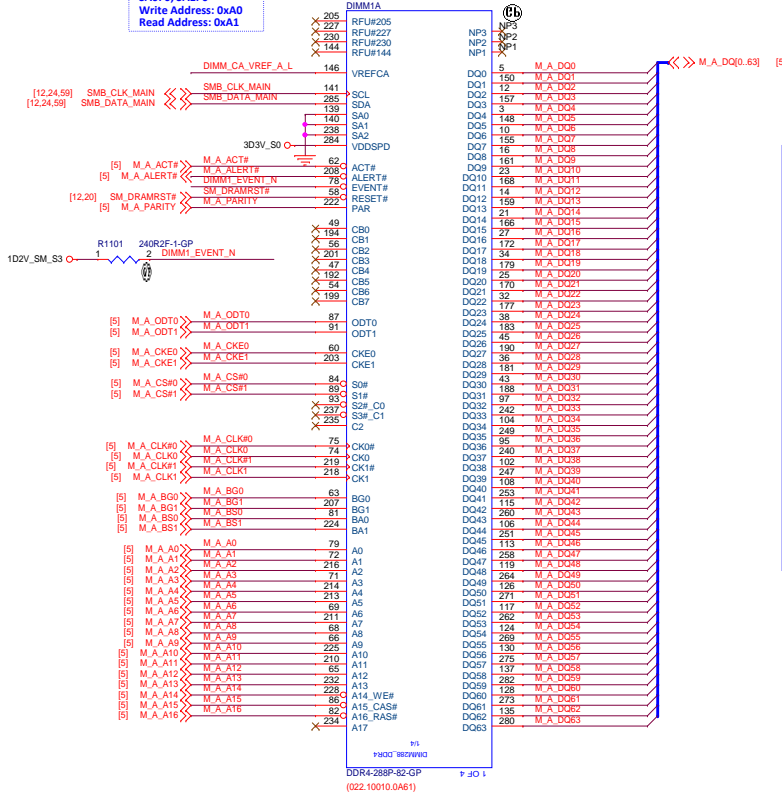









**DIMM1:**  
SA0: 0, SA1: 0  
Write Address: 0xA0  
Read Address: 0xA1






www.teknisi-indonesia.com

		<b>Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title <b>Reserved</b>			
Size <b>A</b>	Document Number <b>Gambits MLK SFF</b>		Rev <b>A00</b>
Date: Friday, February 02, 2018		Sheet	13 of 107

www.teknisi-indonesia.com



**Wistron Corporation**  
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

Reserved

Size

A

Document Number

Gambits MLK SFF

Rev

A00

Date: Friday, February 02, 2018

Sheet 14 of 107

20170406  
change to single 32MB SPI ROM  
remove SPI\_CS\_PCH\_M2  
change SPI\_CS\_PCH\_M1 to TWM

20170406  
USB charger function is removed  
net CHARG\_BRI # pin Y47  
net PCH\_CHARG\_CTL3 # pin AA45 is removed

20170410  
add 33k series resistor for Edison's & Alan's feedback

20170512  
Remove R1501

20170512  
Remove R1502

20170512  
Remove R1503

20170418  
mount R37 8K2R to follow D9 Bias

20170423  
Remove R1505

20170413  
change to on board power switch  
remove the net PP\_CBL\_DET # pin BF8  
20170420  
add the net PP\_CBL\_DET back for SFF

20170413  
change to on board power switch  
remove the net PP\_CBL\_DET # pin BF8  
20170420  
add the net PP\_CBL\_DET back for SFF

[63] CNV\_BRI\_DT\_R

[63] CNV\_BRI\_RSP\_R

[63] CNV\_RGL\_DT\_R

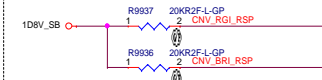
[63] CNV\_RGL\_RSP\_R

[23] CNV\_BRI\_DT

[23] CNV\_BRI\_RSP

[23] CNV\_RGL\_DT

[23] CNV\_RGL\_RSP







20170413  
change to on board power switch  
remove the net CHASSIS\_ID\_0 @ pin L47  
20170420  
add the net CHASSIS\_ID\_0 back for SFF

20170418  
PM\_CLK# change from GPP\_K9 to GPP\_K10 to follow D9 Bison  
PCH\_RST# change from GPP\_K10 to GPP\_F23 to follow D9 Bison

SBIC

3 OF 13

AR2

AT5

AL4

Q47

Q48

Q49

Q50

Q51

Q52

Q53

Q54

Q55

Q56

Q57

Q58

Q59

Q60

Q61

Q62

Q63

Q64

Q65

Q66

Q67

Q68

Q69

Q70

Q71

Q72

Q73

Q74

Q75

Q76

Q77

Q78

Q79

Q80

Q81

Q82

Q83

Q84

Q85

Q86

Q87

Q88

Q89

Q90

Q91

Q92

Q93

Q94

Q95

Q96

Q97

Q98

Q99

Q100

Q101

Q102

Q103

Q104

Q105

Q106

Q107

Q108

Q109

Q110

Q111

Q112

Q113

Q114

Q115

Q116

Q117

Q118

Q119

Q120

Q121

Q122

Q123

Q124

Q125

Q126

Q127

Q128

Q129

Q130

Q131

Q132

Q133

Q134

Q135

Q136

Q137

Q138

Q139

Q140

Q141

Q142

Q143

Q144

Q145

Q146

Q147

Q148

Q149

Q150

Q151

Q152

Q153

Q154

Q155

Q156

Q157

Q158

Q159

Q160

Q161

Q162

Q163

Q164

Q165

Q166

Q167

Q168

Q169

Q170

Q171

Q172

Q173

Q174

Q175

Q176

Q177

Q178

Q179

Q180

Q181

Q182

Q183

Q184

Q185

Q186

Q187

Q188

Q189

Q190

Q191

Q192

Q193

Q194

Q195

Q196

Q197

Q198

Q199

Q200

Q201

Q202

Q203

Q204

Q205

Q206

Q207

Q208

Q209

Q210

Q211

Q212

Q213

Q214

Q215

Q216

Q217

Q218

Q219

Q220

Q221

Q222

Q223

Q224

Q225

Q226

Q227

Q228

Q229

Q230

Q231

Q232

Q233

Q234

Q235

Q236

Q237

Q238

Q239

Q240

Q241

Q242

Q243

Q244

Q245

Q246

Q247

Q248

Q249

Q250

Q251

Q252

Q253

Q254

Q255

Q256

Q257

Q258

Q259

Q260

Q261

Q262

Q263

Q264

Q265

Q266

Q267

Q268

Q269

Q270

Q271

Q272

Q273

Q274

Q275

Q276

Q277

Q278

Q279

Q280

Q281

Q282

Q283

Q284

Q285

Q286

Q287

Q288

Q289

Q290

Q291

Q292

Q293

Q294

Q295

Q296

Q297

Q298

Q299

Q300

Q301

Q302

Q303

Q304

Q305

Q306

Q307

Q308

Q309

Q310

Q311

Q312

Q313

Q314

Q315

Q316

Q317

Q318

Q319

Q320

Q321

Q322

Q323

Q324

Q325

Q326

Q327

Q328

Q329

Q330

Q331

Q332

Q333

Q334

Q335

Q336

Q337

Q338

Q339

Q340

Q341

Q342

Q343

Q344

Q345

Q346

Q347

Q348

Q349

Q350

Q351

Q352

Q353

Q354

Q355

Q356

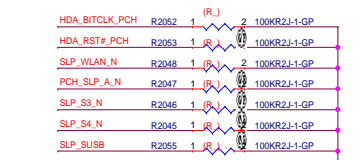
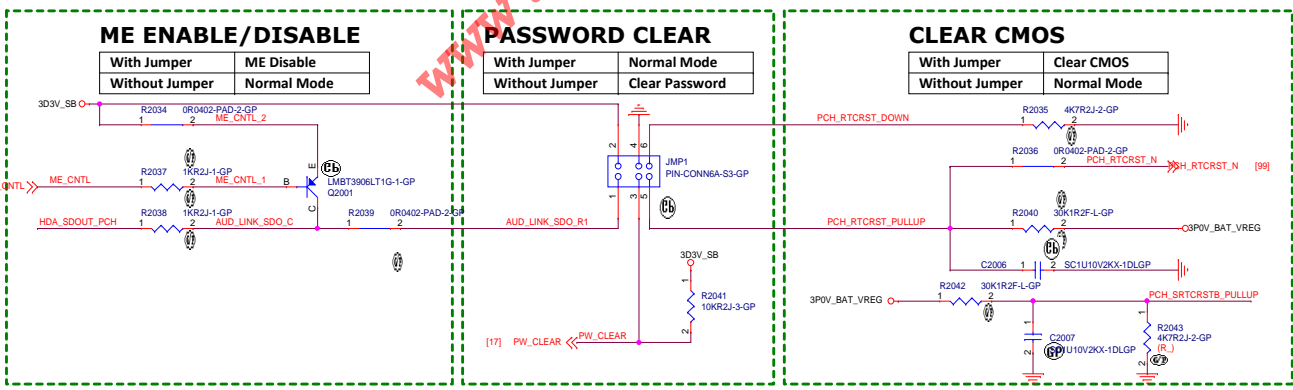
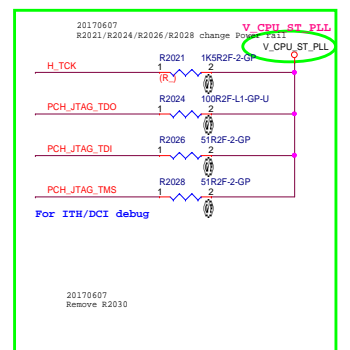
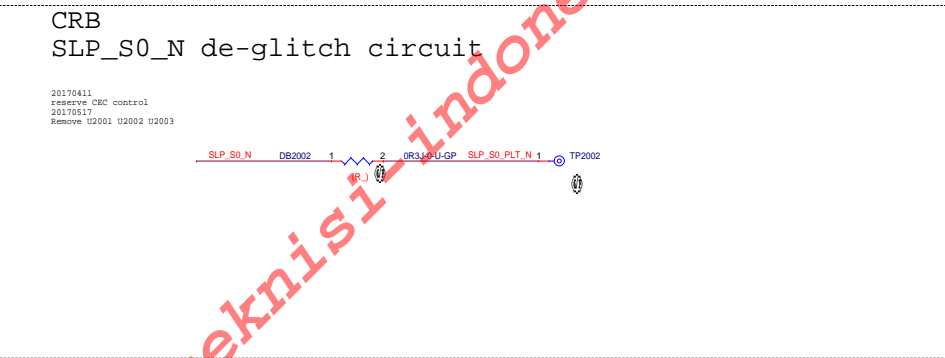
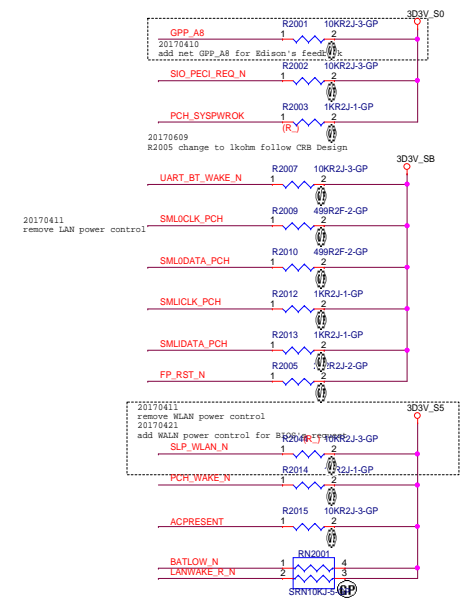
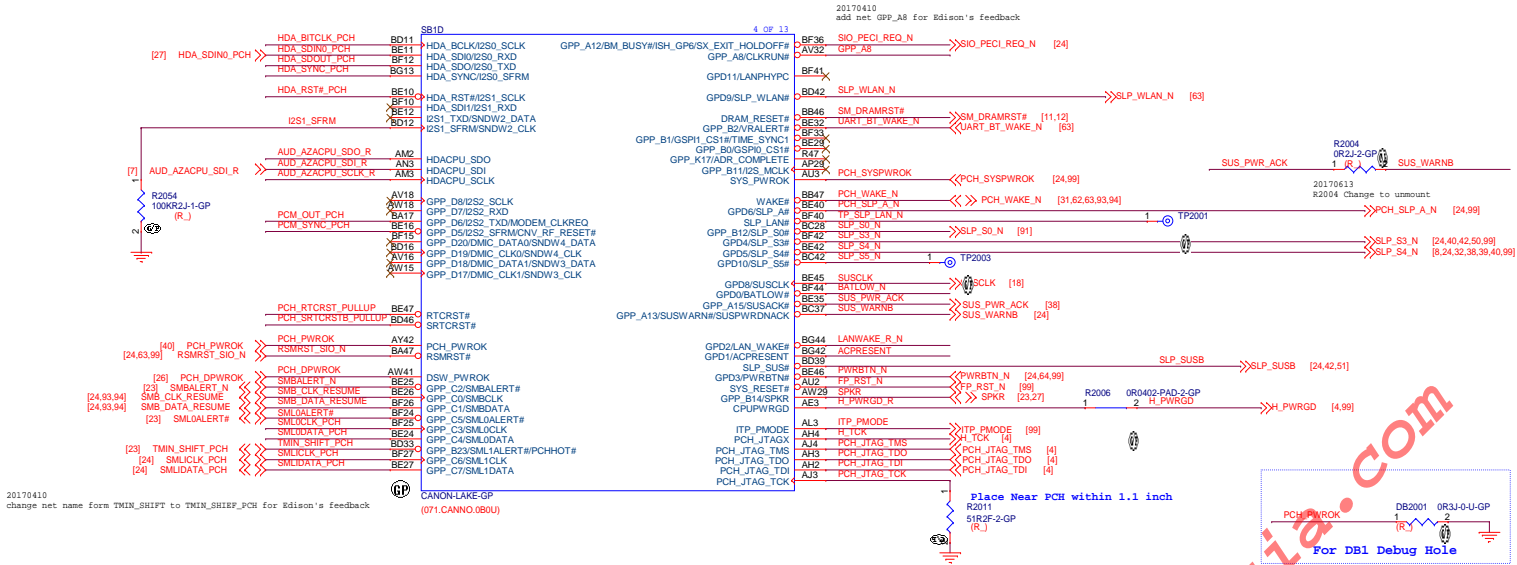
Q357

Q358

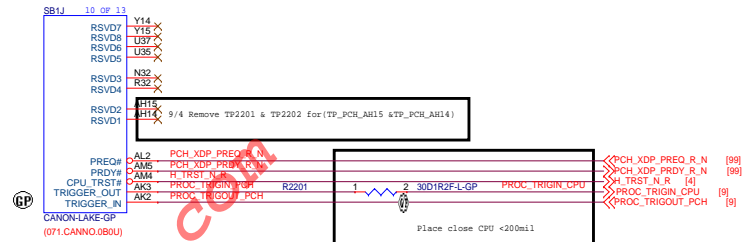
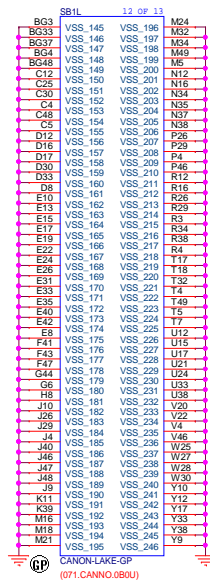
Q359



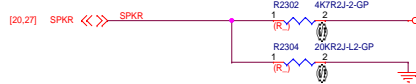








GPP_R14 / SPKR	Top Swap Override	Rising edge of PCH_PWR0K	The signal has a weak internal Pull-down. 0 = Disable "Top Swap" mode. (Default) 1 = Enable "Top Swap" mode. This inverts an address on access to SPI and firmware hub, so the processor believes it fetches the alternate boot block instead of the original boot-block. PCH will invert A16 (default) for cycles going to the upper two 64-KB blocks in the FWH or the appropriate address lines (A16, A17, or A18) as selected in Top Swap Block size and strap.
----------------	-------------------	--------------------------	---



GPP_R18 / GSP10_M0S1	No Reboot	Rising edge of PCH_PWR0K	The signal has a weak internal Pull-down. 0 = Disable "No Reboot" mode. (Default) 1 = Enable "No Reboot" mode (PCH will disable the TCO (THERM system reboot feature)). This function is useful when running ITP/XDP.
----------------------	-----------	--------------------------	---

20170515  
Remove R2308 & R2311, default is internal pull down  
add TP at PCH side

GPP_C2 / SMBALERT#	TLS Confidentiality	Rising edge of RSMRST#	This signal has a weak internal Pull-down. 0 = Disable Intel ME Crypto Transport Layer Security (TLS) cipher suite (no confidentiality). (Default) 1 = Enable Intel ME Crypto Transport Layer Security (TLS) cipher suite (with confidentiality). Must be pulled up to support Intel AMT with TLS.
--------------------	---------------------	------------------------	--



20170613  
Remove R2316, because CPU default Pull down

GPP_R22 / GSP11_M0S1	Boot BIOS Strap Bit BBS	Rising edge of PCH_PWR0K	This Signal has a weak internal Pull-down. This field determines the destination of accesses to the BIOS memory range. Also controllable using Boot BIOS Destination bit (Bus0, Device01, Function0, offset 0Ch, bit 6). Bit 6 Boot BIOS Destination 0 SPI (Default) 1 LPC
----------------------	-------------------------	--------------------------	--

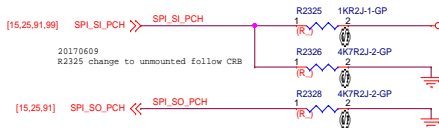
20170515  
Remove R2319 & R2320, default is internal pull down  
add TP at PCH side

GPP_C5 / SML0ALERT#	eSPI or LPC	Rising edge of RSMRST#	This signal has a weak internal Pull-down. 0 = LPC is selected (for EC). (Default) 1 = eSPI is selected (for EC).
---------------------	-------------	------------------------	---



20170613  
Remove R2321

SPI0_M0S1	Reserved	Rising edge of RSMRST#	External pull-up is required. Recommend 100K if pulled up to 3.3V or 75K if pulled up to 1.8V. This strap should sample HIGH. There should NOT be any on-board device driving it to opposite direction during strap sampling.
-----------	----------	------------------------	--

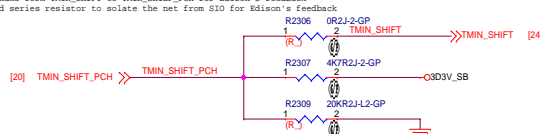


20170609  
R2325 change to unmounted follow CRB

GPP_R15 / SML1ALERT#	Reserved	Rising edge of RSMRST#	External pull-up is required. Recommend 100K if pulled up to 3.3V or 75K if pulled up to 1.8V. This strap should sample HIGH. There should NOT be any on-board device driving it to opposite direction during strap sampling.
----------------------	----------	------------------------	--



GPP_R23 / SML1ALERT# / PCH0RST#	Reserved	Rising edge of RSMRST#	This signal has an internal Pull-down. External pull-up is required. This strap should sample HIGH. There should NOT be any on-board device driving it to opposite direction during strap sampling.
---------------------------------	----------	------------------------	--



SPI0_I02	Reserved	Rising edge of RSMRST#	External pull-up is required. Recommend 100K if pulled up to 3.3V or 75K if pulled up to 1.8V. This strap should sample HIGH. There should NOT be any on-board device driving it to opposite direction during strap sampling.
----------	----------	------------------------	--



20170613  
R2313 change to mount

SPI0_I03	Reserved	Rising edge of RSMRST#	External pull-up is required. Recommend 100K if pulled up to 3.3V or 75K if pulled up to 1.8V. This strap should sample HIGH. There should NOT be any on-board device driving it to opposite direction during strap sampling.
----------	----------	------------------------	--



20170613  
R2317 change to mount

HDA_SDO / I280_TXD	Flash Descriptor Security Override	Rising edge of PCH_PWR0K	This signal has a weak internal pull-down. 0 = Enable security measures defined in the Flash Descriptor. (Default) 1 = Disable Flash Descriptor Security (override). This strap should only be asserted using external Pull-up in manufacturing/debug environments ONLY.
--------------------	------------------------------------	--------------------------	--

ME DISABLE JUMPER

GPP_R12 / SML2ALERT#	eSPI Flash Sharing Mode	Rising edge of RSMRST#	This signal has a weak internal pull-down. 0 = Always Attached Flash Sharing (AAPS) enabled (Default) 1 = Always Attached Flash Sharing (AAPS) disabled.
----------------------	-------------------------	------------------------	--

20170515  
Remove R2322  
add TP at PCH side follow D9

GPP_I6 / DDPC_CTRLDATA	Display Port B Detected	Rising edge of PCH_PWR0K	This signal has a weak internal Pull-down. 0 = Port B is not detected. (Default) 1 = Port B is detected.
------------------------	-------------------------	--------------------------	--



GPP_I8 / DDPC_CTRLDATA	Display Port C Detected	Rising edge of PCH_PWR0K	This signal has a weak internal Pull-down. 0 = Port C is not detected. (Default) 1 = Port C is detected.
------------------------	-------------------------	--------------------------	--



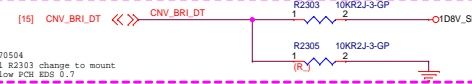
GPP_I10 / DDPC_CTRLDATA	Display Port D Detected	Rising edge of PCH_PWR0K	This signal has a weak internal pull-down. 0 = Port D is not detected. (Default) 1 = Port D is detected.
-------------------------	-------------------------	--------------------------	--



GPP_F23	Display Port F Detected	Rising edge of PCH_PWR0K	This signal has a weak internal pull-down. 0 = Port F is not detected. (Default) 1 = Port F is detected.
---------	-------------------------	--------------------------	--

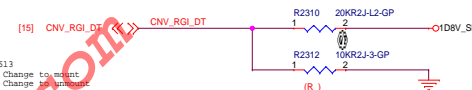
PCIVAIK power control

GPP_J4 / CNV_SMI_DT / UART0_RTS#	XTAL Frequency Select	Rising edge of RSMRST#	This signal has a weak internal pull-down. 0 = 38.4/19.2MHz XTAL frequency selected. (Default) 1 = 24MHz XTAL frequency selected.
----------------------------------	-----------------------	------------------------	---



20170504  
Will R2303 change to mount  
follow PCH EDS 0.7

GPP_J6 / CNV_RGI_DT / UART0_TXD	Modem Reference Clock Source Select	Rising edge of RSMRST#	An external pull-up or pull-down is required. 0 = Integrated CNVI enable (Default) 1 = Integrated CNVI disable
---------------------------------	-------------------------------------	------------------------	--



20170613  
R2310 Change to mount  
R2312 Change to mount

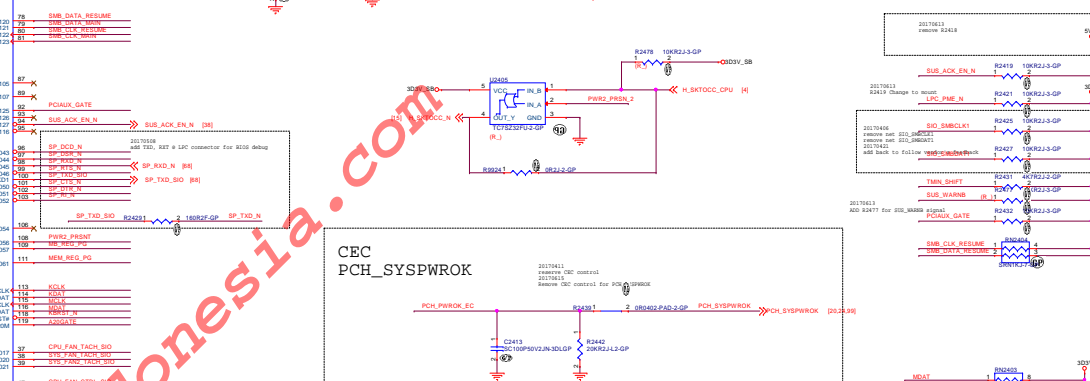
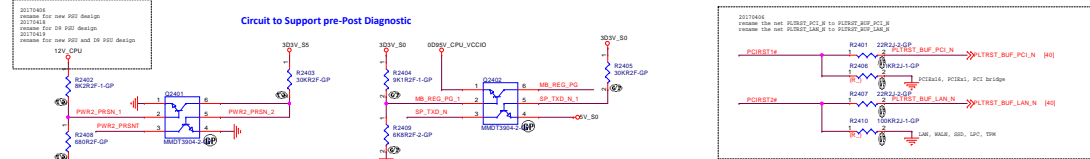
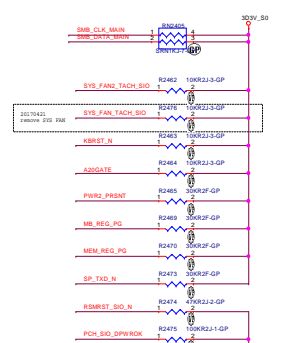
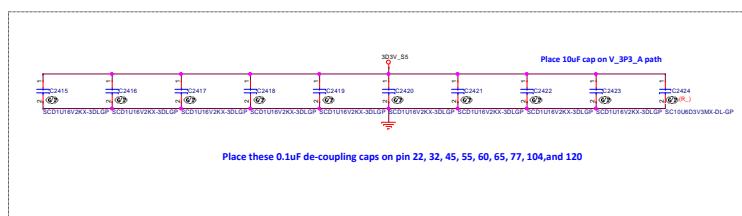
GPP_J9	1.8V VCCPSPI	Rising edge of RSMRST#	The signal has a weak internal pull-down 0 = VCCPSPI is connected to 3.3V rail 1 = VCCPSPI is connected to 1.8V rail
--------	--------------	------------------------	--

GP07	Reserved	Rising edge of DSN_PWR0K	External pull-up is required. Recommend 100K. This strap should sample HIGH. There should NOT be any on-board device driving it to opposite direction during strap sampling.
------	----------	--------------------------	---

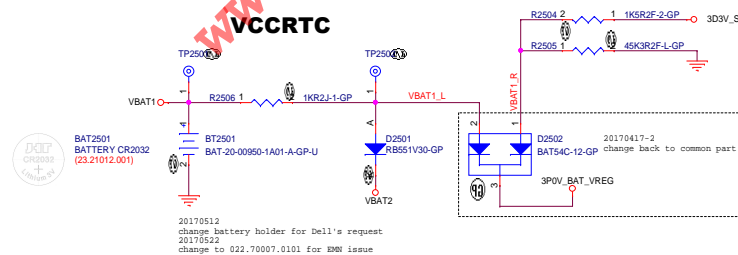
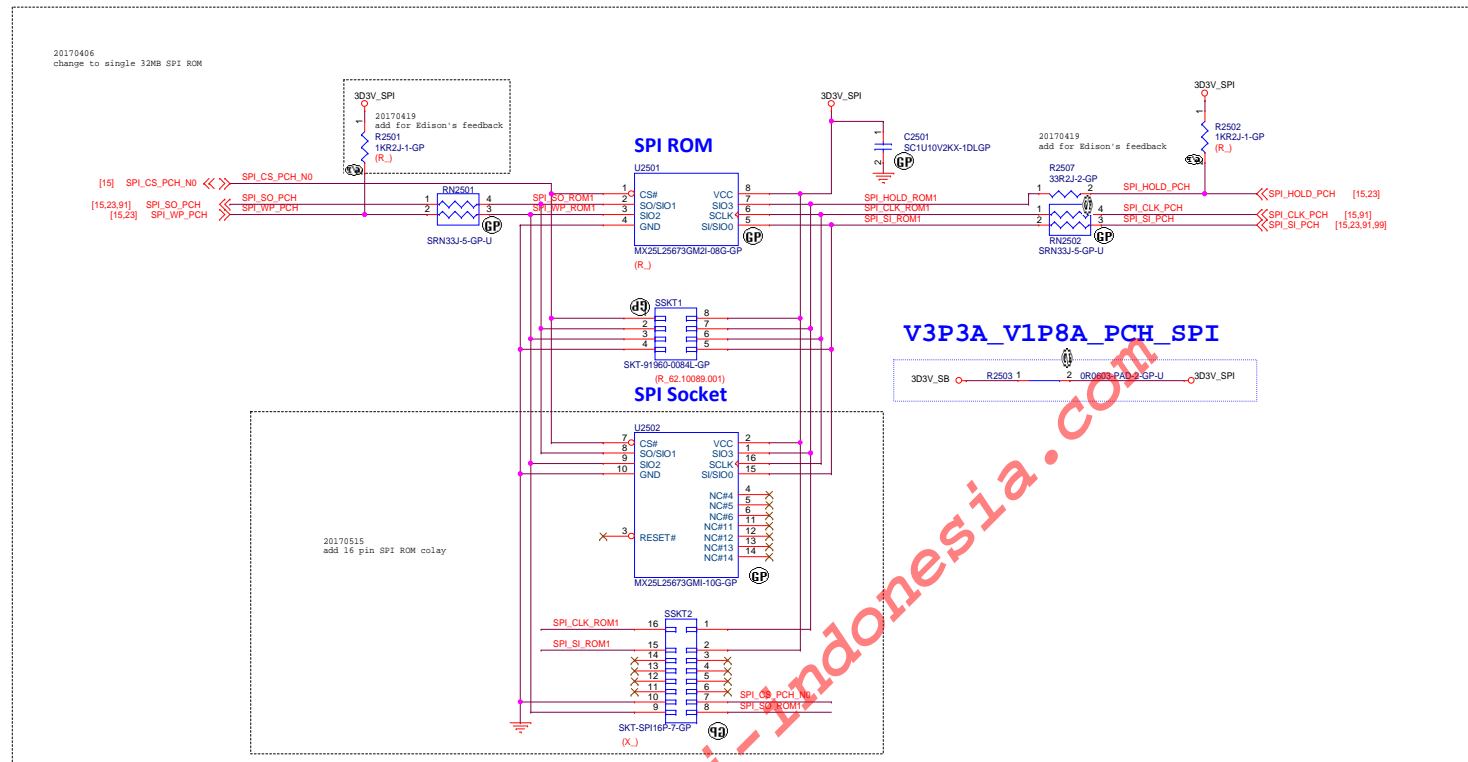


20170609  
update R2318 pull high kohn follow CS

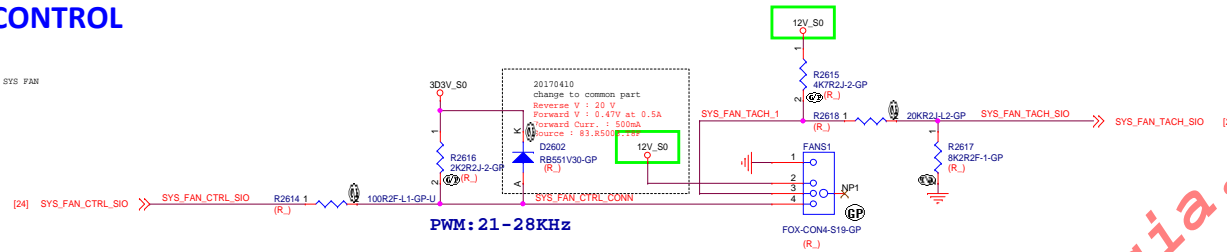
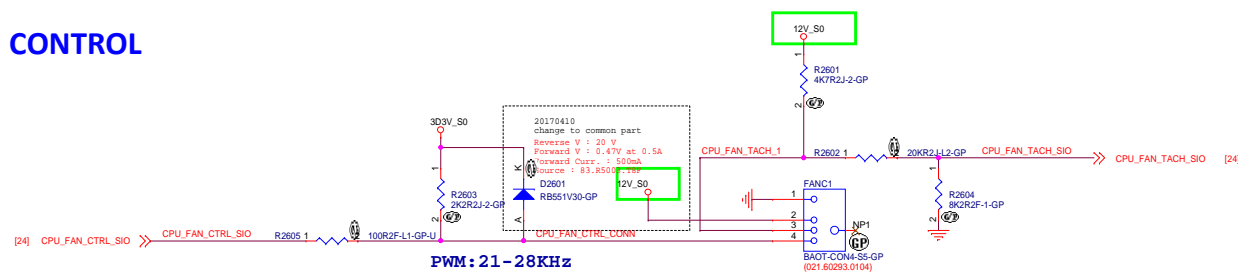


[illegible]





## Thermal sensor G709

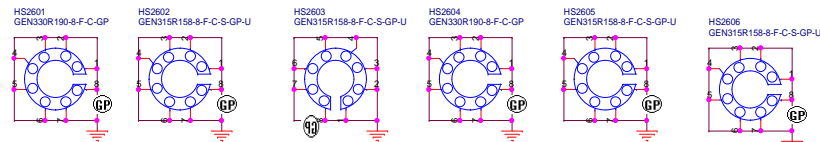
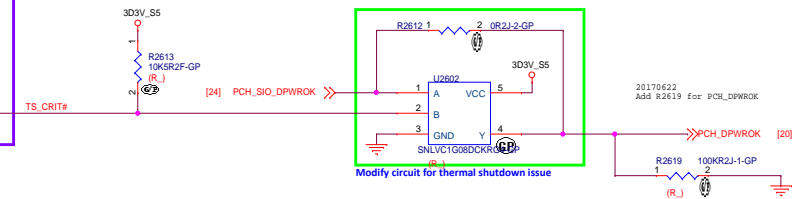
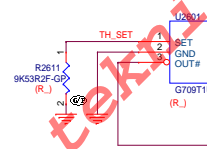


20170413  
change thermal shut down solution

$$R_{SET} \text{ (k}\Omega\text{)} = 0.0012T^2 - 0.9308T + 96.147$$

Temp.=	108 °C
RSET=	9.6174 K

		G709
HYST =	VCC	Hysteresis is 10°C
HYST =	GND	Hysteresis is 2°C



```
20170523
H2601 change footprint to ZZ.00PAD.DV1
H2604 change footprint to ZZ.AFEN8.190
Remove H2607 & H2608
```

(340.08501.0

(334.03A02.00

(347.03801.0001

PHOTOCOPYING

F80H-E2216-89A

Washer  
(340.03A0

340.03A0A.0001

Washer  
340.03A0A.C

Washer  
) (340,03A0

(342.06701.0001

## FW part

FW P/N	Location
BIOS BIOS FW BIOS FW P/N (353.09201.0001)	U2502
LAN LAN FW LAN FW P/N for Eagle SFF (353.09201.0001)	U3101
LAN LAN FW LAN FW P/N for Gambit MLK SFF (GAW 353.09101.0001)	U3101

DELL

**Wistron Corporation**  
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

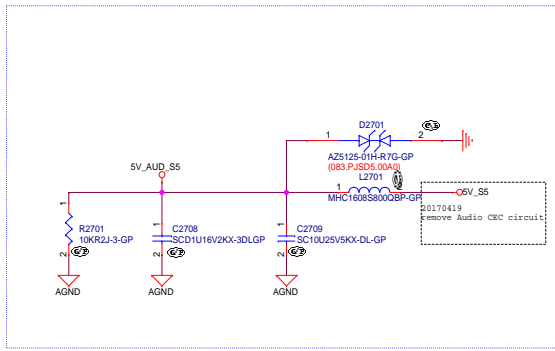
Title Thermal&FAN

Size	Document Number
------	-----------------

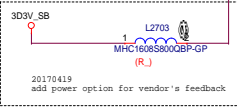
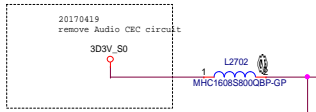
<b>C</b>	<b>Gambits MLK SFF</b>
----------	------------------------

A00

Sheet 26 of 107

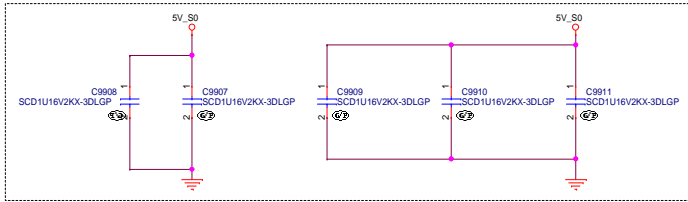


20170412  
remove internal speaker amp  
20170418  
add net EAPD back to control de-pop circuit

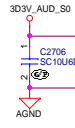


20170419  
remove Audio CEC circuit

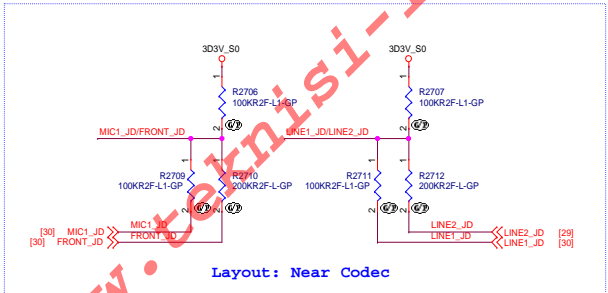
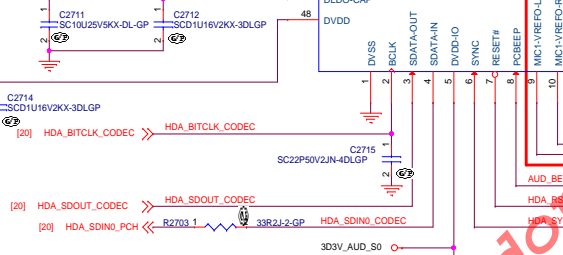
For EMC



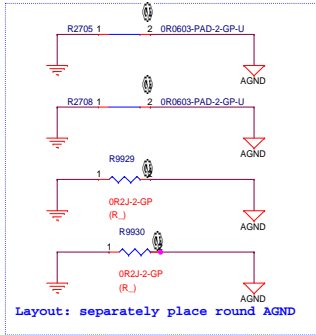
20170418  
HDA LINK core power is 3.3V  
do not need level shift



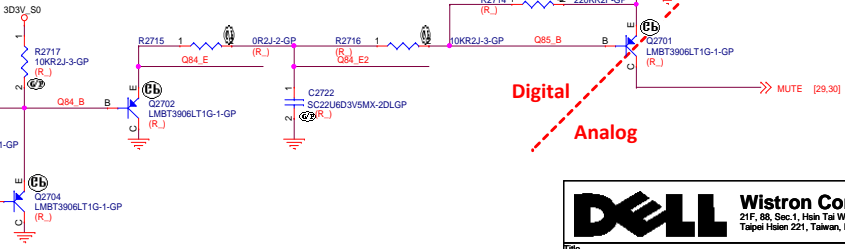
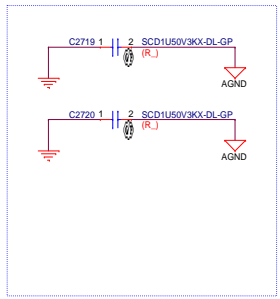
Analog  
Digital



Layout: Near Codec



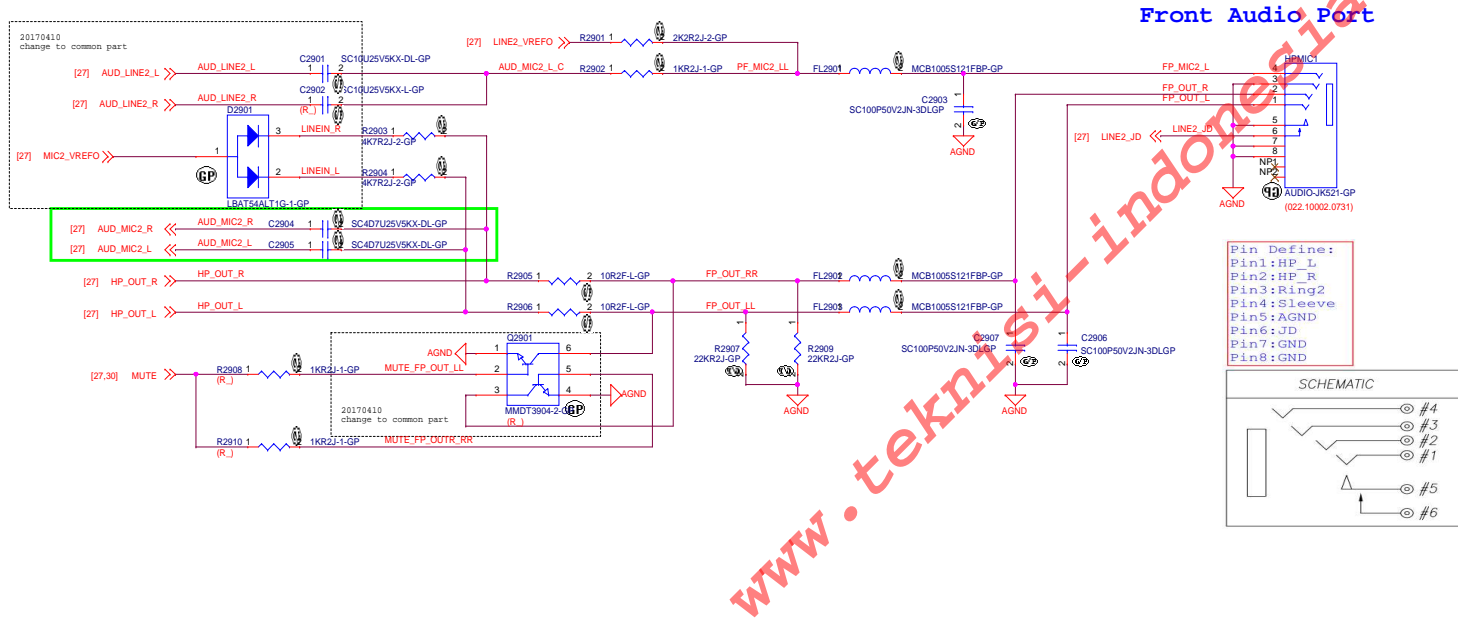
Layout: separately place round AGND



Digital  
Analog

20170412  
remove internal speaker amp

www.teknisi-indonesia.com



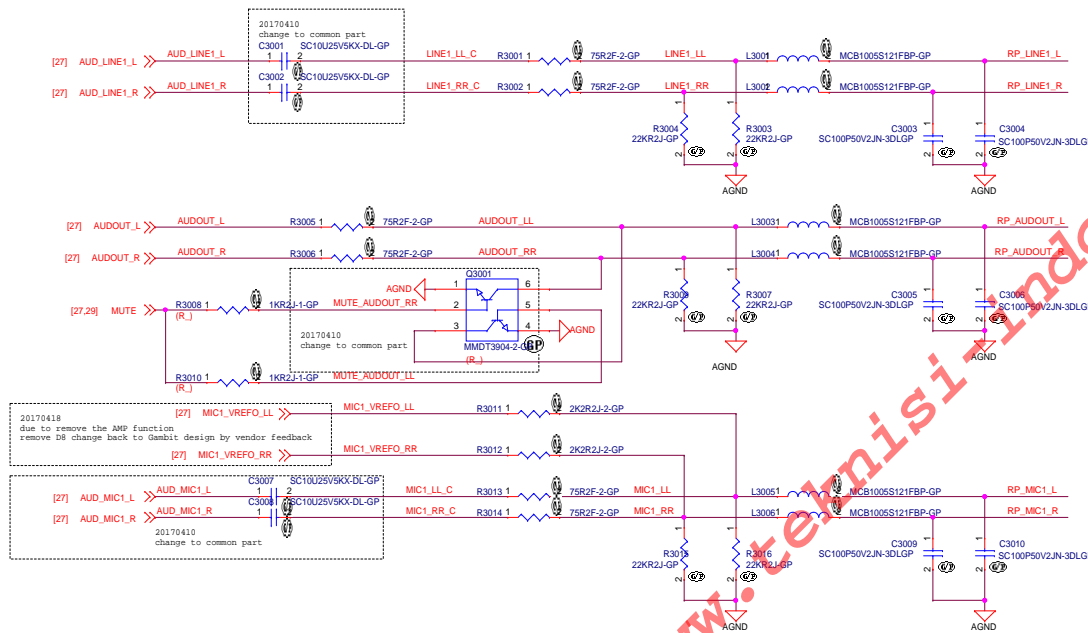
### Front Audio Port

### 4-pin 3.5mm Headset Connector Pinout

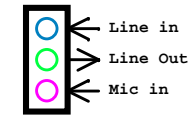
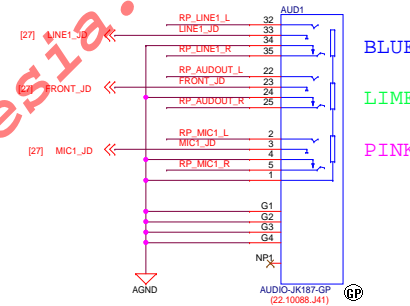


Nokia, Lenovo mobile		
Pin Number	Pin Name	Description
1	Tip	Left Audio Out
2	Ring-1	Right Audio Out
3	Ring-2	Microphone
4	Sleeve	Ground / Common

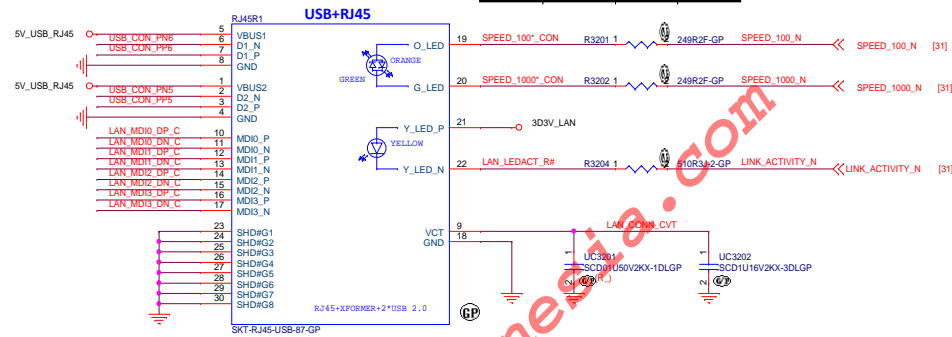
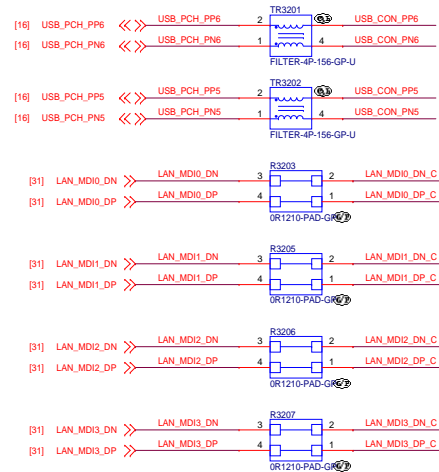
iPhone, Samsung, Blackberry, HTC		
Pin Number	Pin Name	Description
1	Tip	Left Audio Out
2	Ring-1	Right Audio Out
3	Ring-2	Ground / Common
4	Sleeve	Microphone



## Rear Audio Port

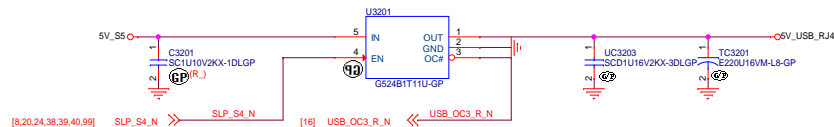
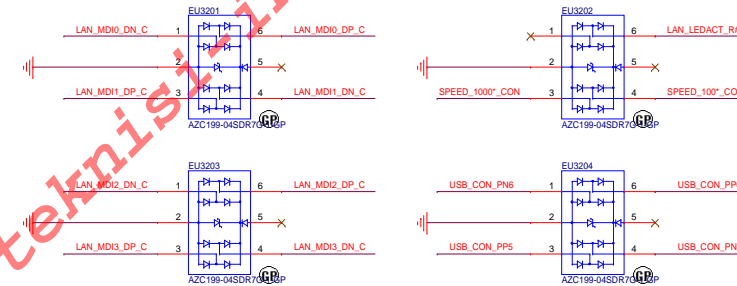






	Giga	100M	10M
Link	Orange	Green	Green
Act	Blink	Blink	Blink


# ESD







www.teknisi-indonesia.com

		<b>Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title <b>USB Charger (TPS2546)</b>			
Size <b>C</b>	Document Number <b>Gambits MLK SFF</b>		Rev <b>A00</b>
Date: Friday, February 02, 2018		Sheet	34 of 107

www.teknisi-indonesia.com



**Wistron Corporation**  
21F, 88, Sec.1, Hsin Tai Wuj Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title		
Reserved		
Size	Document Number	Rev
B	Gambits MLK SFF	A00
Date:	Friday, February 02, 2018	Sheet 1 35 of 107

www.teknisi-indonesia.com



**Wistron Corporation**  
21F, 88, Sec.1, Hsin Tai Wuj Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title		
Reserved		
Size	Document Number	Rev
B	Gambits MLK SFF	A00
Date:	Friday, February 02, 2018	Sheet 36 of 107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

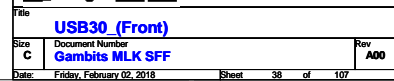
**Gambits MLK SFF**

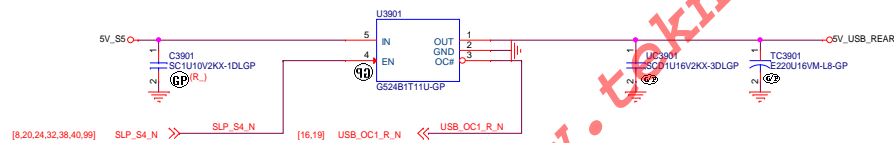
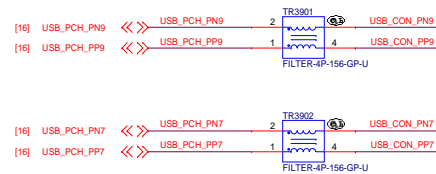
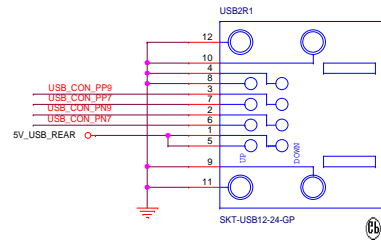
Rev

**A00**

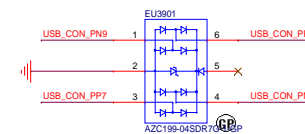
Date: Friday, February 02, 2018

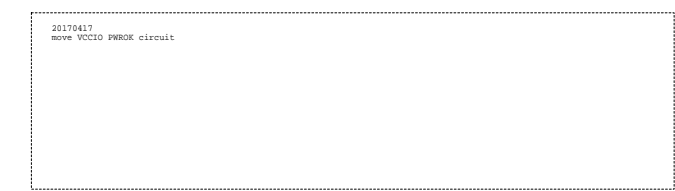
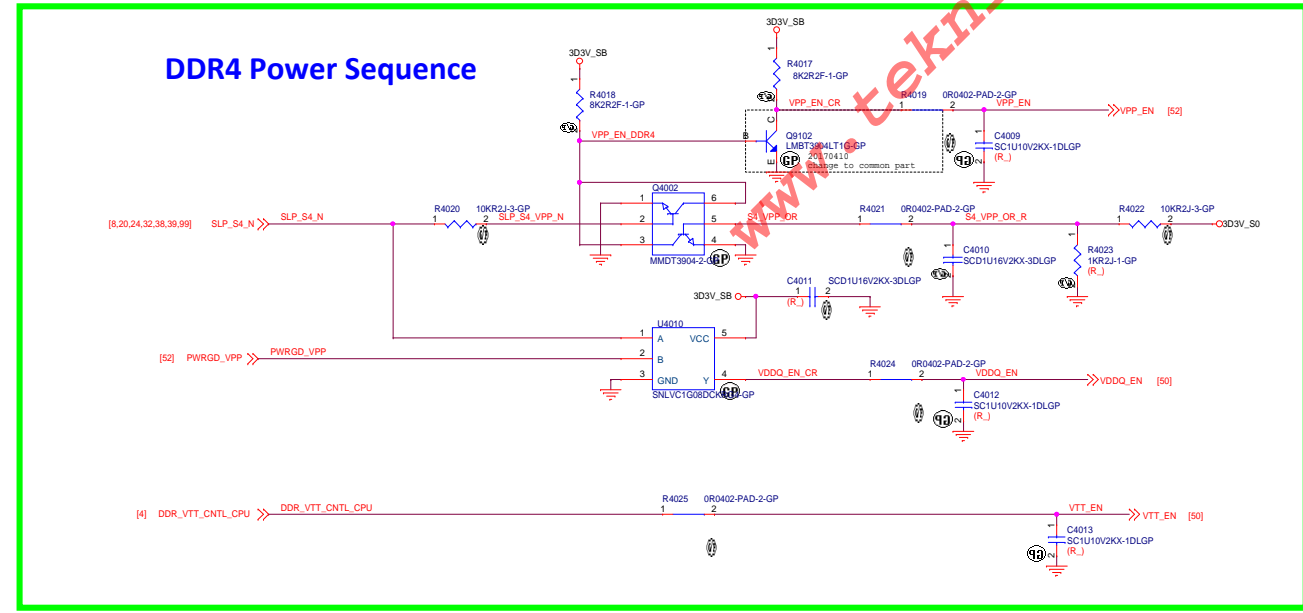
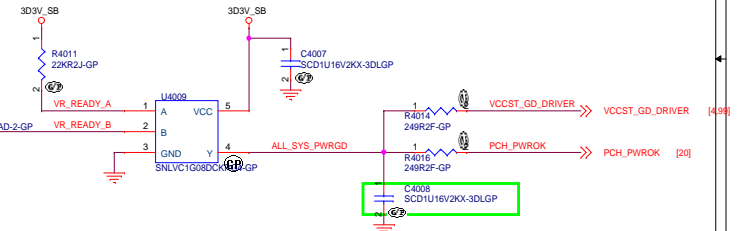
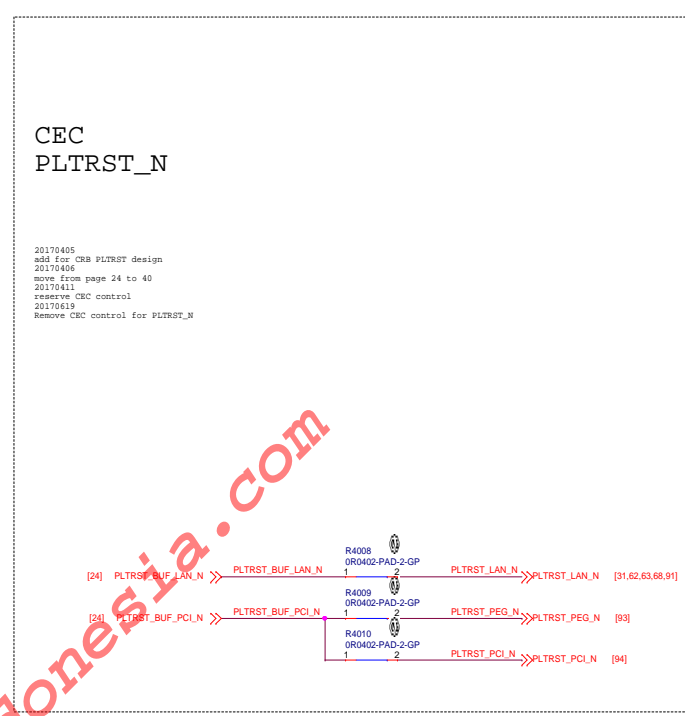
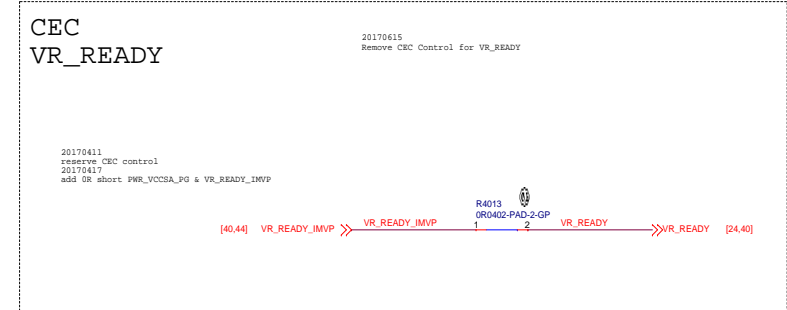
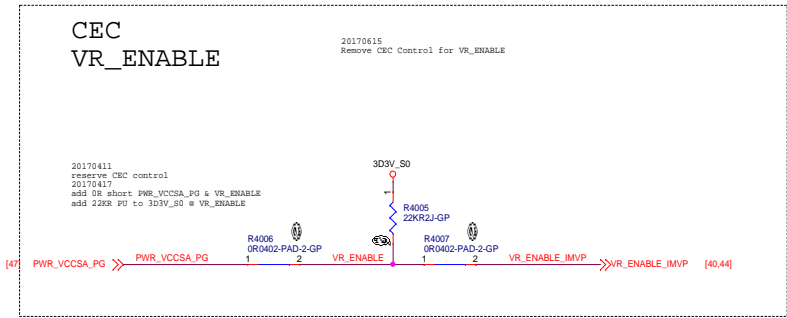
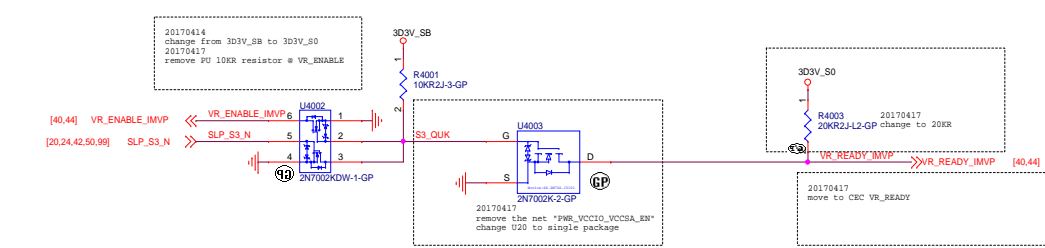
Sheet 37 of 107






# ESD

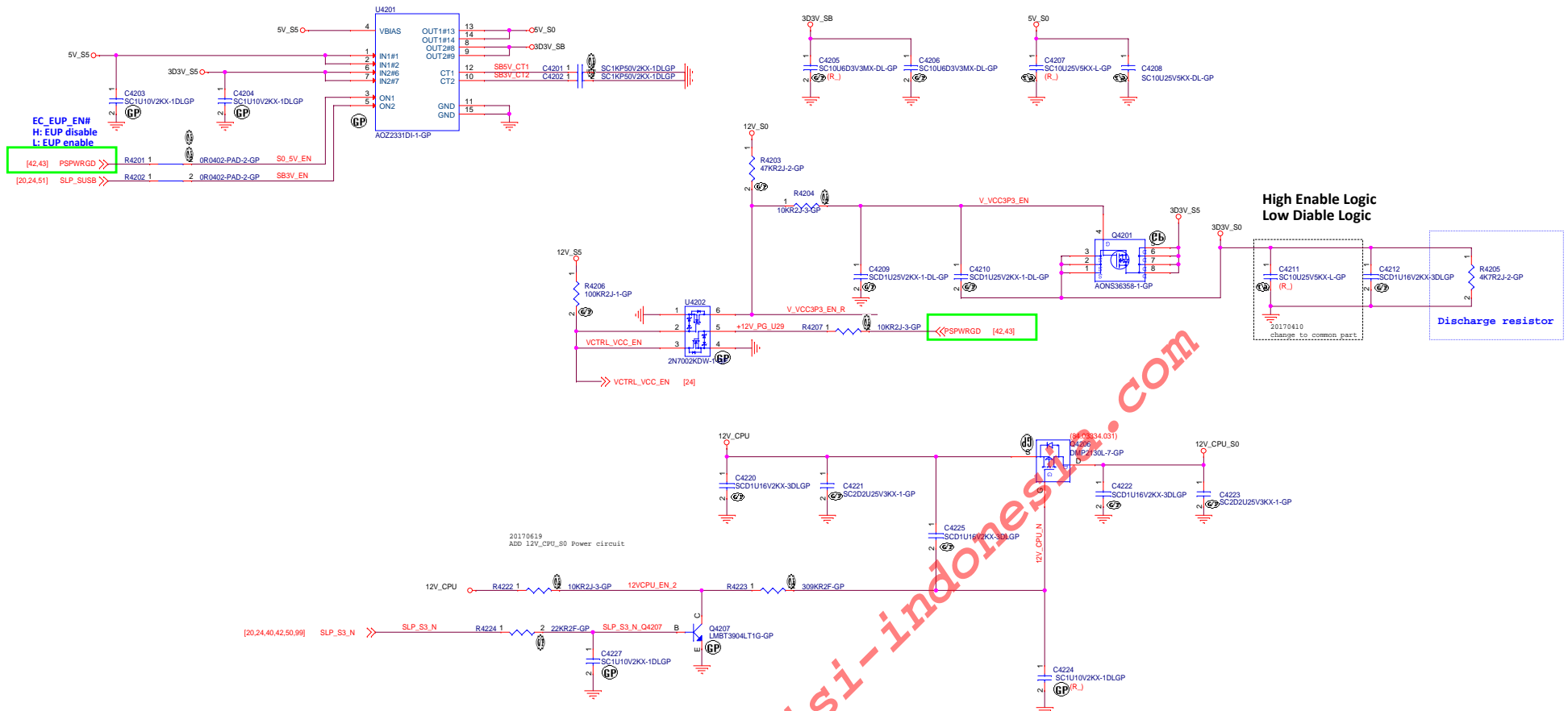






www.teknisi-indonesia.com

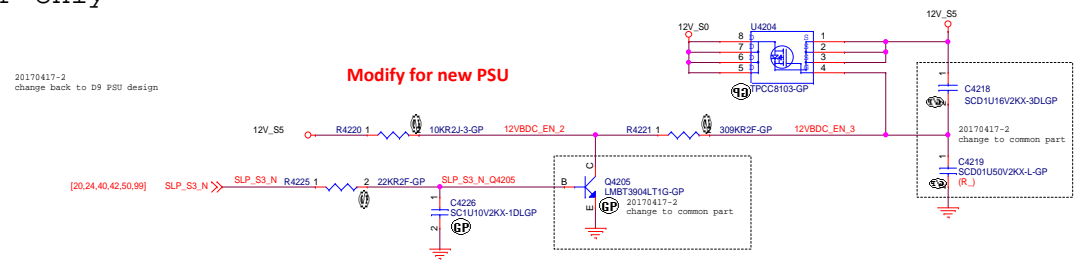
		<b>Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.
Title <b>Reserved</b>		
Size <b>A</b>	Document Number <b>Gambits MLK SFF</b>	Rev <b>A00</b>
Date: Friday, February 02, 2018		Sheet 41 of 107



MT only

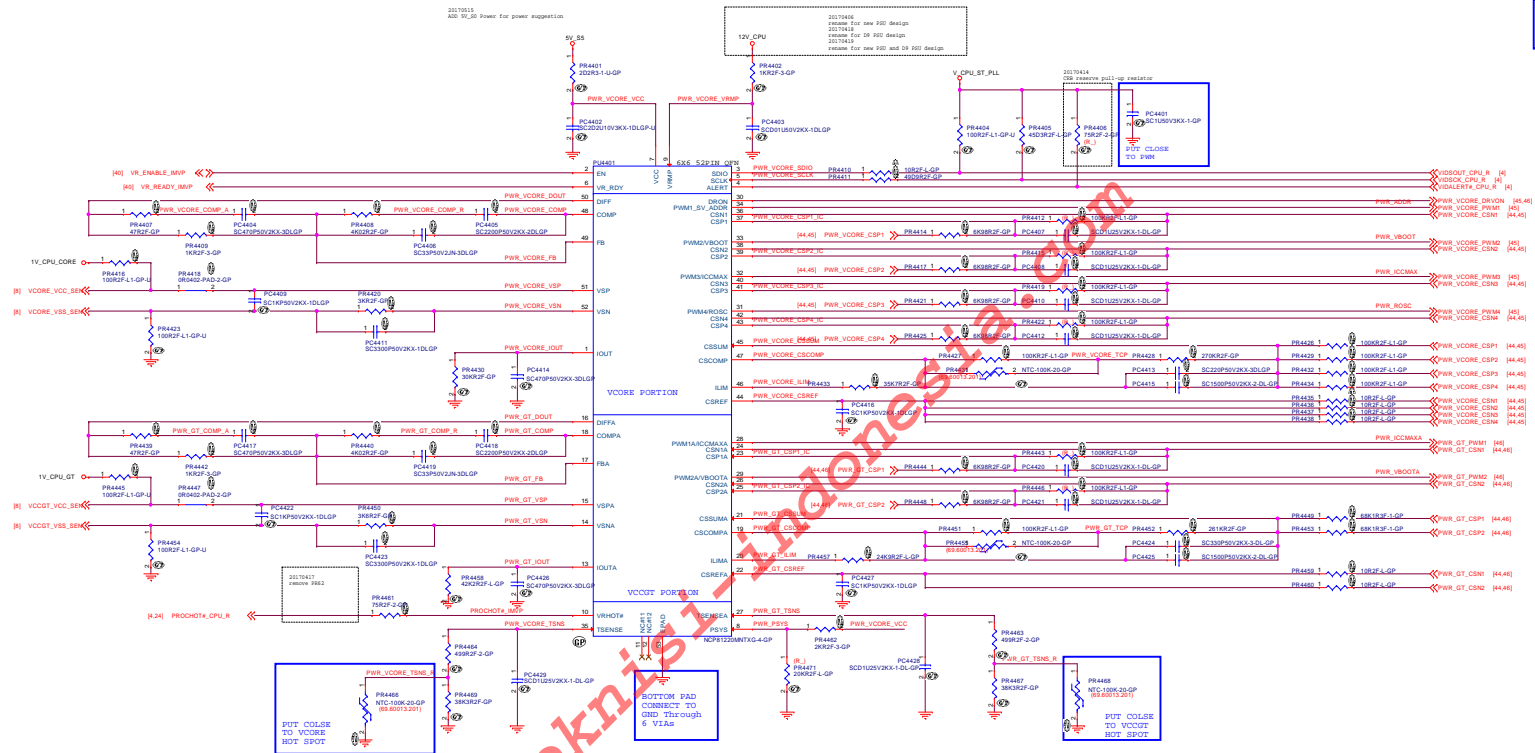
20170405  
change 12V circuit for CY15 PSU design  
20170419  
add 12V circuit for CY15 PSU design back  
20170423  
Remove 12V circuit for CY15 PSU design back

SFF only

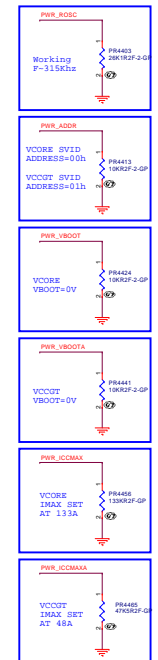




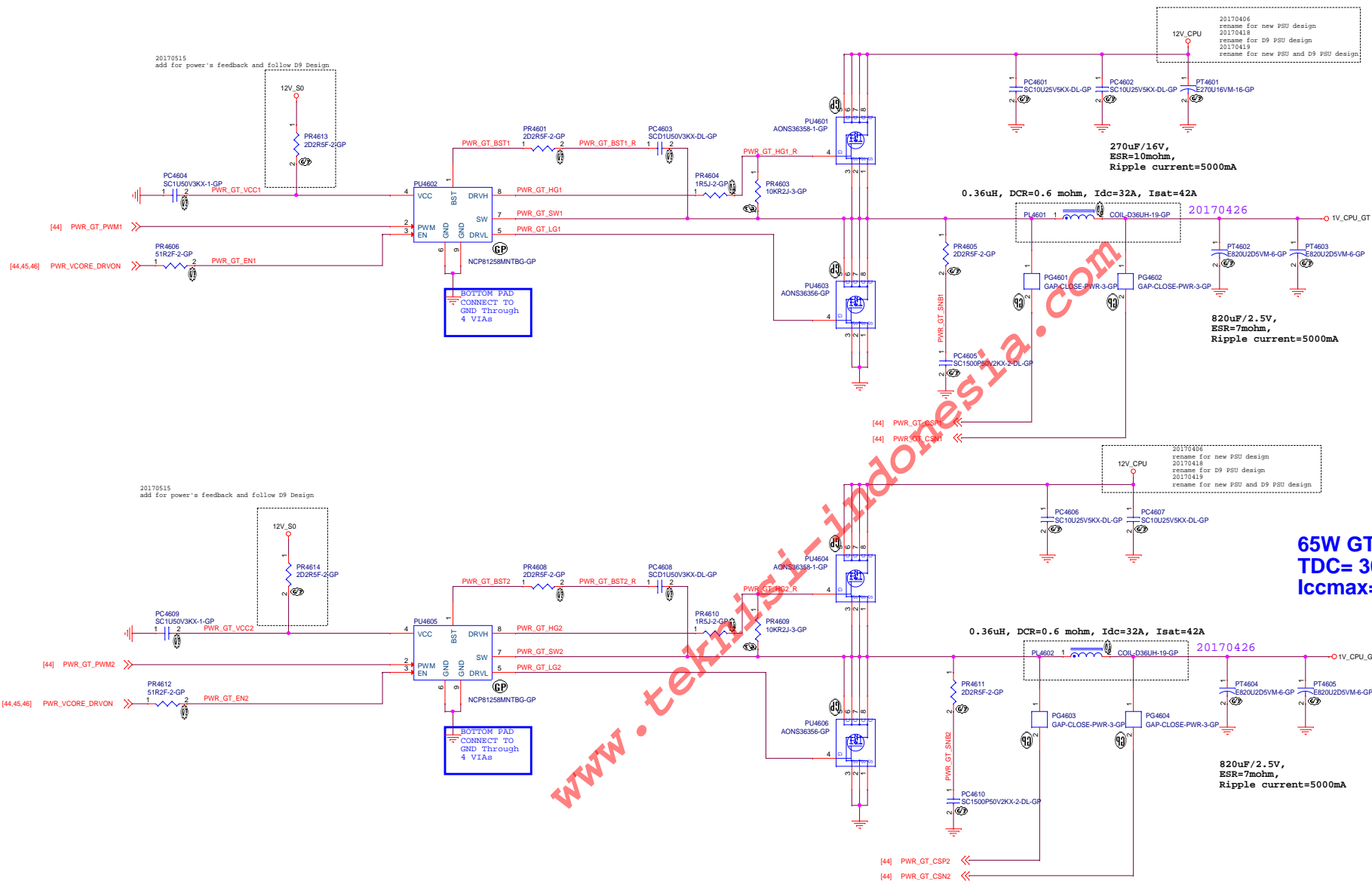
## Intel Coffeelake IMVP8 POWER CKT - S-LINE 62 95W 4+2 PHASE



S-Line 62 65W CPU power spec  
Vcore ICCMAX=133A, TDC=91A  
VccGT ICCMAX=45A, TDC=30A

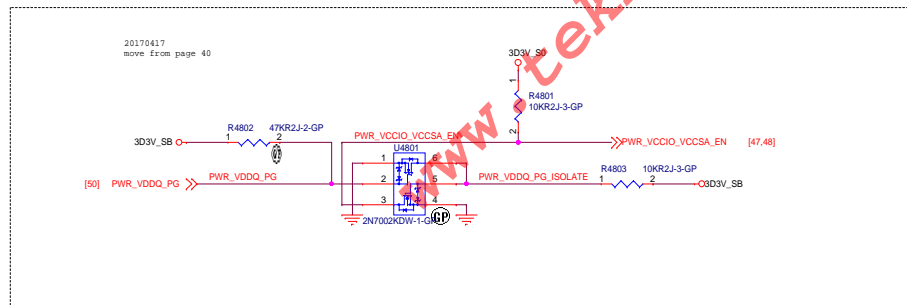
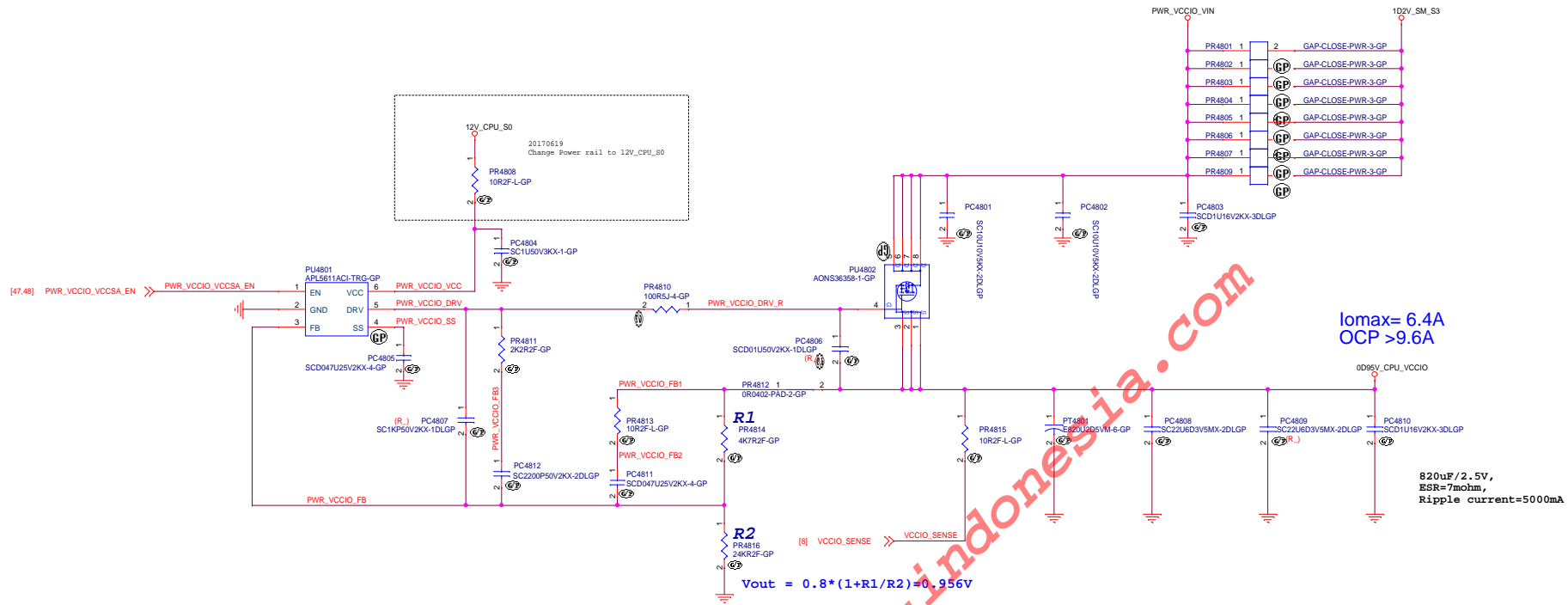




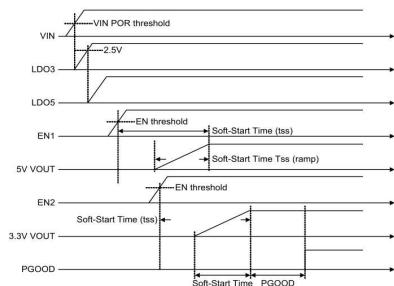


**65W GT**  
**TDC= 30A**  
**Iccmax= 45A**



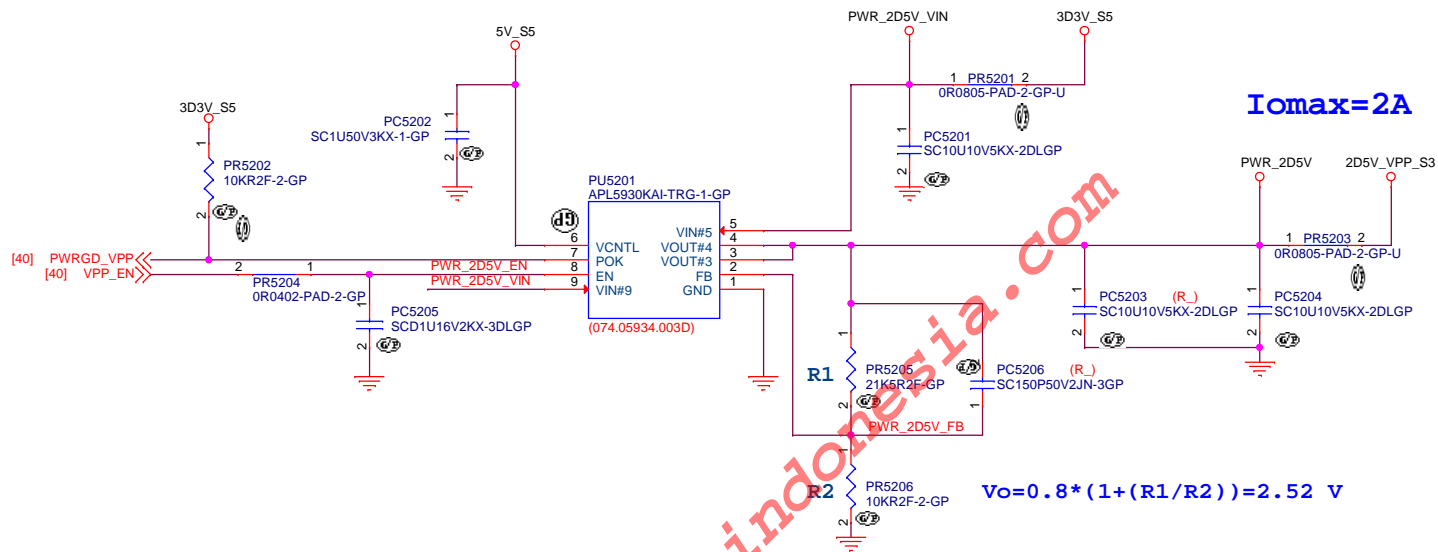












www.teknisi-indonesia.com

20170423  
remove -12V\_S0 power control



**Wistron Corporation**  
21F, 88, Sec.1, Hsin Tai Wuj Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title		
Reserve		
Size	Document Number	Rev
B	Gambits MLK SFF	A00
Date:	Friday, February 02, 2018	Sheet 53 of 107

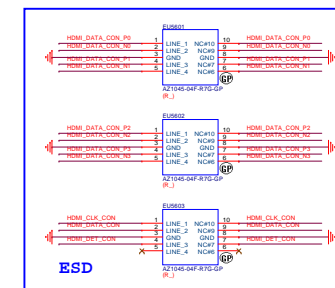
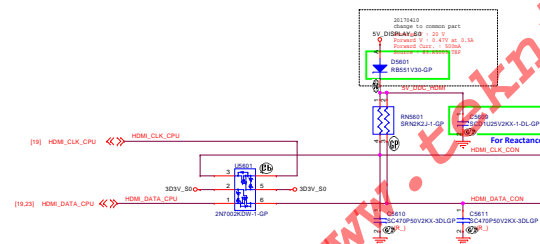
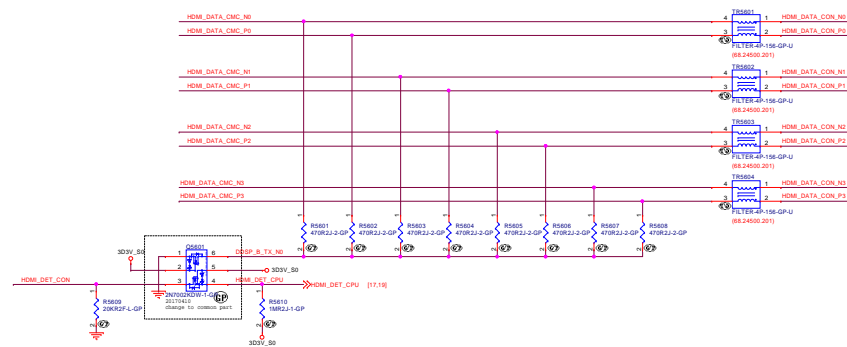
20170504  
remove 1D8V\_SB power solution

20170412  
remove 1D24V\_SB power solution

www.teknisi-indonesia.com

www.teknisi-indonesia.com

		<b>Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title <b>Reserve</b>			
Size <b>C</b>	Document Number <b>Gambits MLK SFF</b>		Rev <b>A00</b>
Date: Friday, February 02, 2018		Sheet	55 of 107





www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

Rev

**A00**

Date: Friday, February 02, 2018

Sheet 57 of 107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

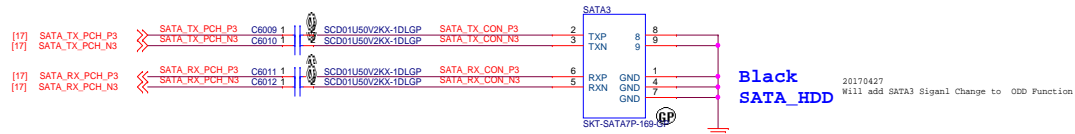
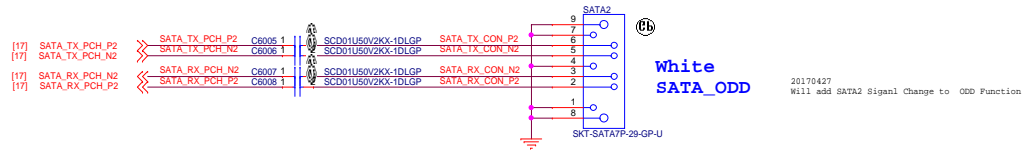
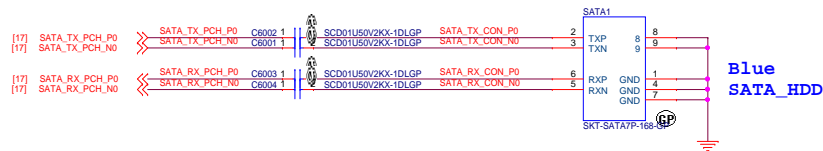
Rev

**A00**

Date: Friday, February 02, 2018

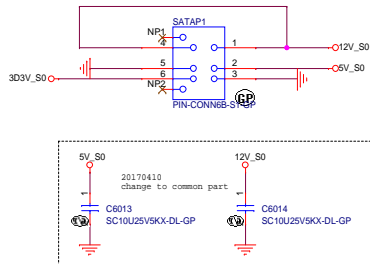
Sheet 58 of 107






20170423  
remove HDD3 Connector

### 3.5" SATA HDD POWER CONNECTOR



20170423  
remove 2.5" SATA HDD POWER CONNECTOR

www.teknisi-indonesia.com



**Wistron Corporation**  
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

Reserved

Size

A

Document Number

Gambits MLK SFF

Rev

A00

Date:

Friday, February 02, 2018

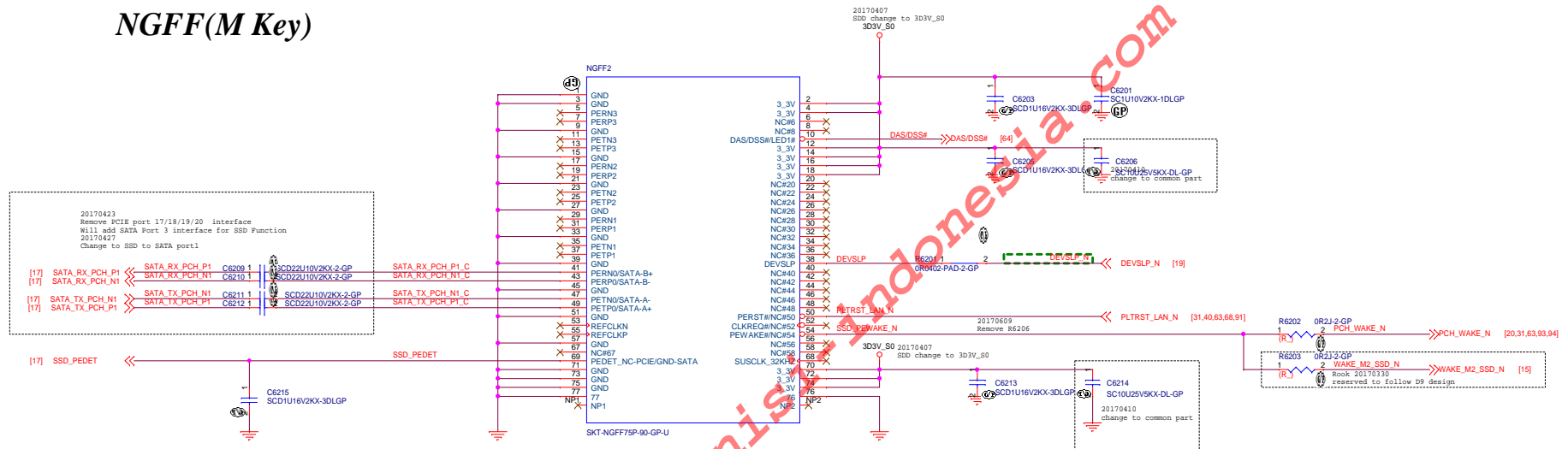
Sheet

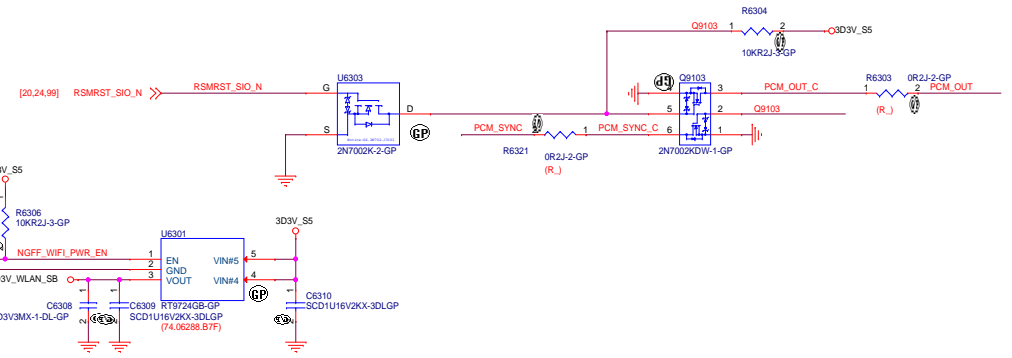
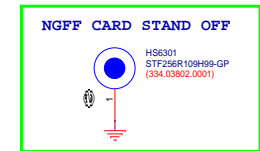
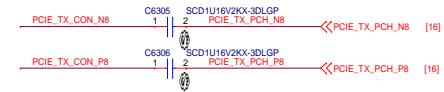
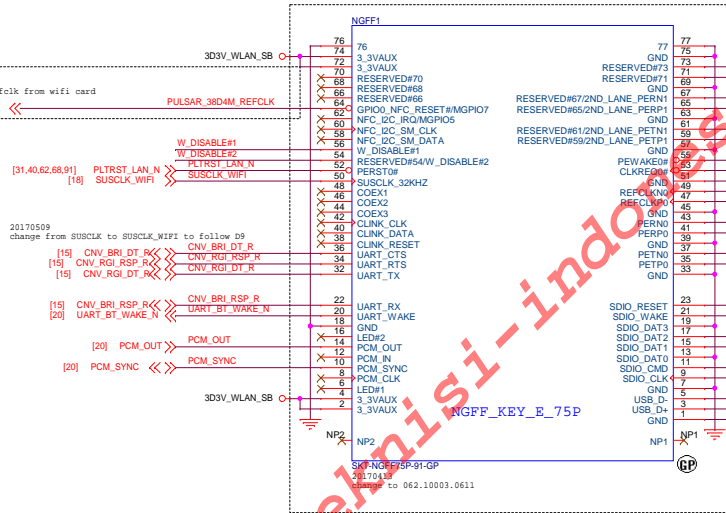
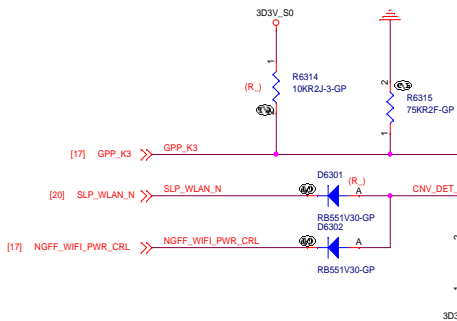
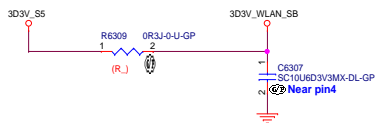
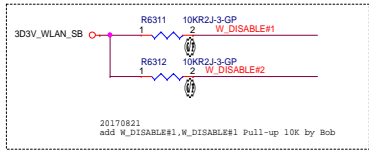
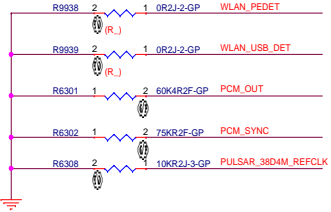
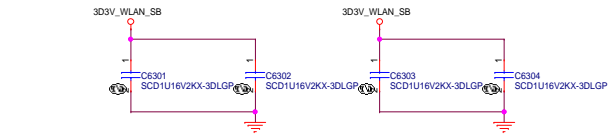
61

of

107

# NGFF(M Key)

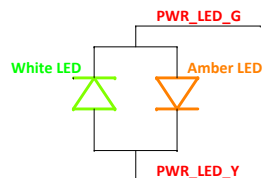




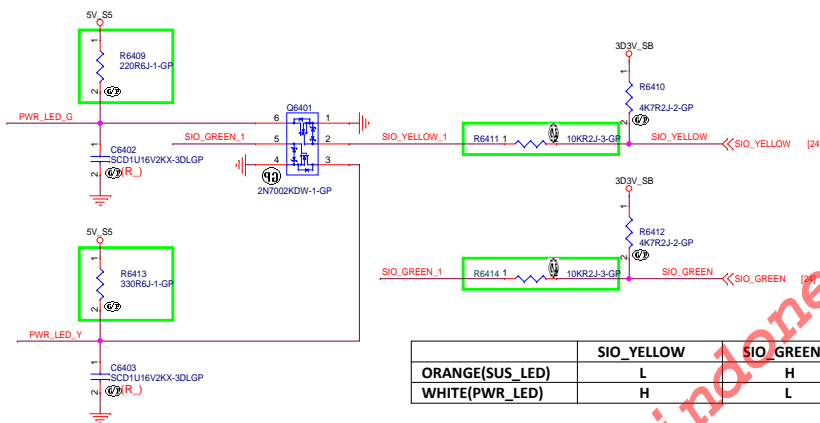
MT only

## POWER BUTTON

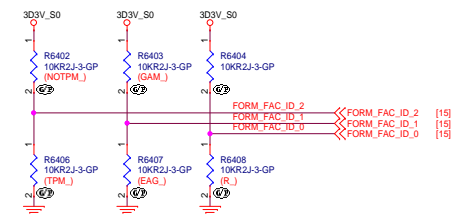
20170413  
change to on board power switch  
remove the net FP\_CBL\_DET, CHASSIS\_ID\_0  
20170424  
Remove for MT power button circuit



S0	White
S3	White(blinking)
S4/S5	LED off
No Post	Amber
Failure to Post	Amber(blinking)



	SIO_YELLOW	SIO_GREEN
ORANGE(SUS_LED)	L	H
WHITE(PWR_LED)	H	L



## SKU ID

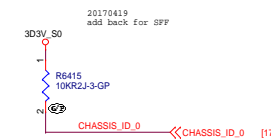
Type	ID_2	ID_1	ID_0
Eagle MT(With TPM)	0	0	0
Eagle SFF(With TPM)	0	0	1
Gambit MLK MT (Non-TPM)	1	1	0
Gambit MLK SFF (Non-TPM)	1	1	1
Eagle SFF(Non-With TPM)	1	0	1
Eagle MT(Non-With TPM)	1	0	0

SFF only

## Chassis ID

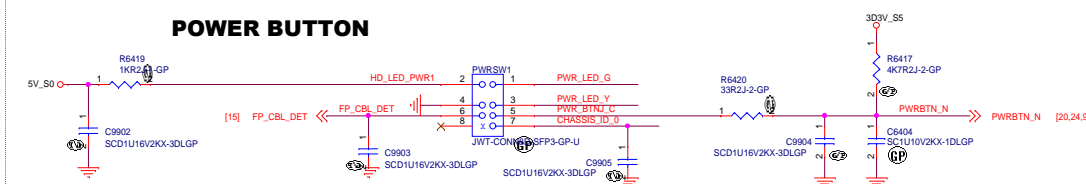
ID_0	Chassis	CY18 (CFL)
0	Vostro	Eagle SFF
1	Inspiron	Gambit_MLK SFF

Power switch cable select



SFF only

## POWER BUTTON




20170410  
change to mounted  
20170425  
No need L\_BAR function  
So remove L\_BAR Circuit


SFF only



www.teknisi-indonesia.com

		<b>Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title <b>Reserved</b>			
Size <b>A</b>	Document Number <b>Gambits MLK SFF</b>		Rev <b>A00</b>
Date:	Friday, February 02, 2018	Sheet	65 of 107

www.teknisi-indonesia.com



**Wistron Corporation**  
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

Reserved

Size

A

Document Number

Gambits MLK SFF

Rev

A00

Date: Friday, February 02, 2018

Sheet 66 of 107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

Rev

**A00**

Date:

Friday, February 02, 2018

Sheet

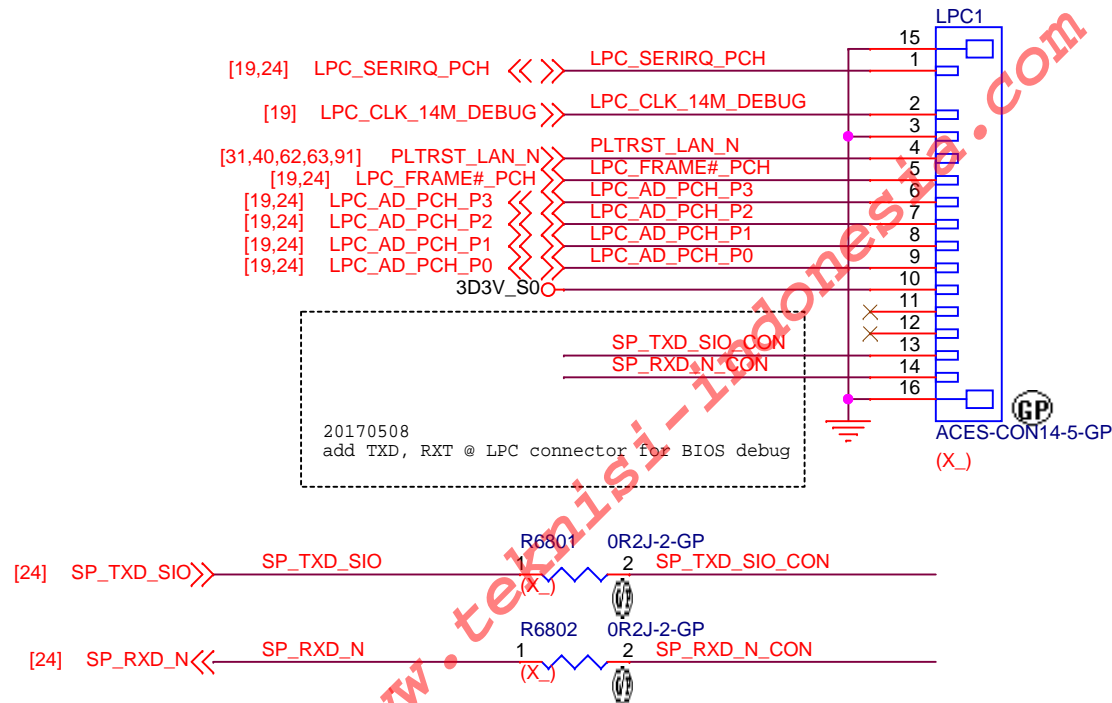
67

of

107

# LPC DEBUG PORT

20170508  
change to standard LPC debug connector



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**LPC/UART Port**

Size

**A**

Document Number

**Gambits MLK SFF**


Rev

**A00**

Date: Friday, February 02, 2018

Sheet 68 of 107

www.teknisi-indonesia.com

		<b>Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title <b>Reserved</b>			
Size <b>A</b>	Document Number <b>Gambits MLK SFF</b>		Rev <b>A00</b>
Date: Friday, February 02, 2018		Sheet	69 of 107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

Rev

**A00**

Date:

Friday, February 02, 2018

Sheet

70

of

107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

Rev

**A00**

Date: Friday, February 02, 2018

Sheet 71 of 107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size  
**A**

Document Number  
**Gambits MLK SFF**

Rev  
**A00**

Date: Friday, February 02, 2018

Sheet 72 of 107



www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

Rev

**A00**

Date:

Friday, February 02, 2018


Sheet

73

of

107

www.teknisi-indonesia.com



**Wistron Corporation**  
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

Reserved

Size

A

Document Number

Gambits MLK SFF

Rev

A00

Date:

Friday, February 02, 2018


Sheet

74

of

107

www.teknisi-indonesia.com

		<b>Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title <b>Reserved</b>			
Size <b>A</b>	Document Number <b>Gambits MLK SFF</b>		Rev <b>A00</b>
Date:	Friday, February 02, 2018	Sheet	75 of 107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**


Rev

**A00**

Date: Friday, February 02, 2018

Sheet 76 of 107

www.teknisi-indonesia.com



**Wistron Corporation**  
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

Reserved

Size

A

Document Number

Gambits MLK SFF

Rev

A00

Date: Friday, February 02, 2018

Sheet 77 of 107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**


Rev

**A00**

Date: Friday, February 02, 2018

Sheet 78 of 107

www.teknisi-indonesia.com



**Wistron Corporation**  
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

Reserved

Size

A

Document Number

Gambits MLK SFF

Rev

A00

Date: Friday, February 02, 2018

Sheet 79 of 107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

Rev

**A00**

Date: Friday, February 02, 2018

Sheet 80 of 107



www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

Rev

**A00**

Date: Friday, February 02, 2018

Sheet 81 of 107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

Rev

**A00**

Date:

Friday, February 02, 2018

Sheet

82

of

107

www.teknisi-indonesia.com



**Wistron Corporation**  
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title		
Reserved		
Size	Document Number	Rev
A	Gambits MLK SFF	A00
Date:	Friday, February 02, 2018	Sheet 83 of 107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

Rev

**A00**

Date: Friday, February 02, 2018

Sheet 84 of 107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

Rev

**A00**

Date: Friday, February 02, 2018

Sheet 85 of 107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

Rev

**A00**

Date:

Friday, February 02, 2018


Sheet

86

of

107

www.teknisi-indonesia.com

		<b>Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title <b>Reserved</b>			
Size <b>A</b>	Document Number <b>Gambits MLK SFF</b>		Rev <b>A00</b>
Date:	Friday, February 02, 2018	Sheet	87 of 107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size  
**A**

Document Number  
**Gambits MLK SFF**

Rev  
**A00**

Date: Friday, February 02, 2018

Sheet 88 of 107



www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

Rev

**A00**

Date:

Friday, February 02, 2018

Sheet

89

of

107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

Rev

**A00**

Date:

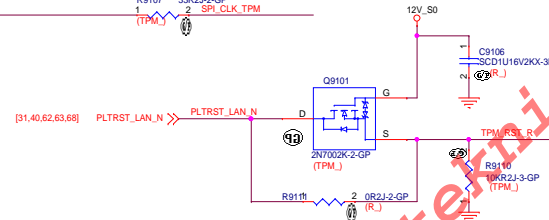
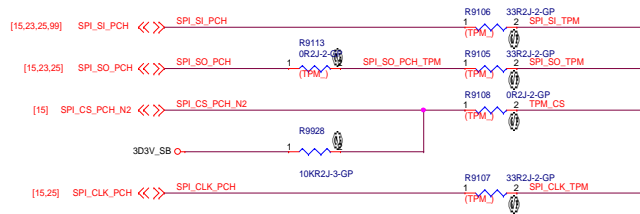
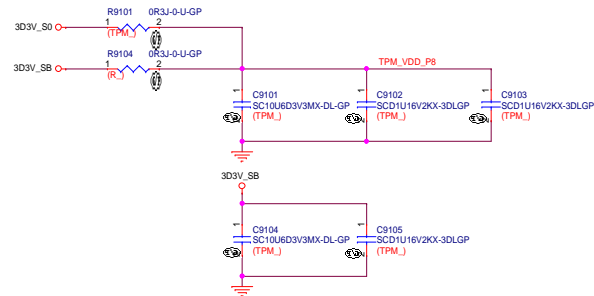
Friday, February 02, 2018

Sheet

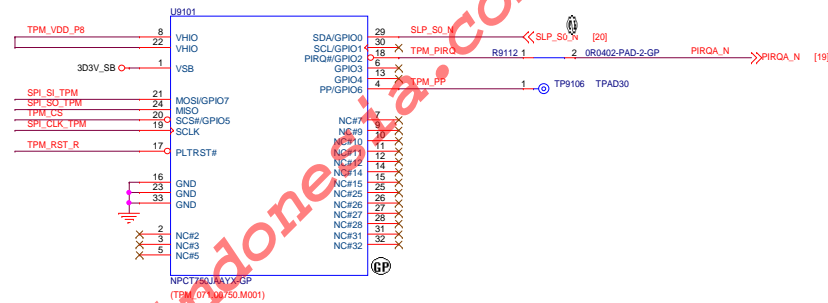
90

of

107




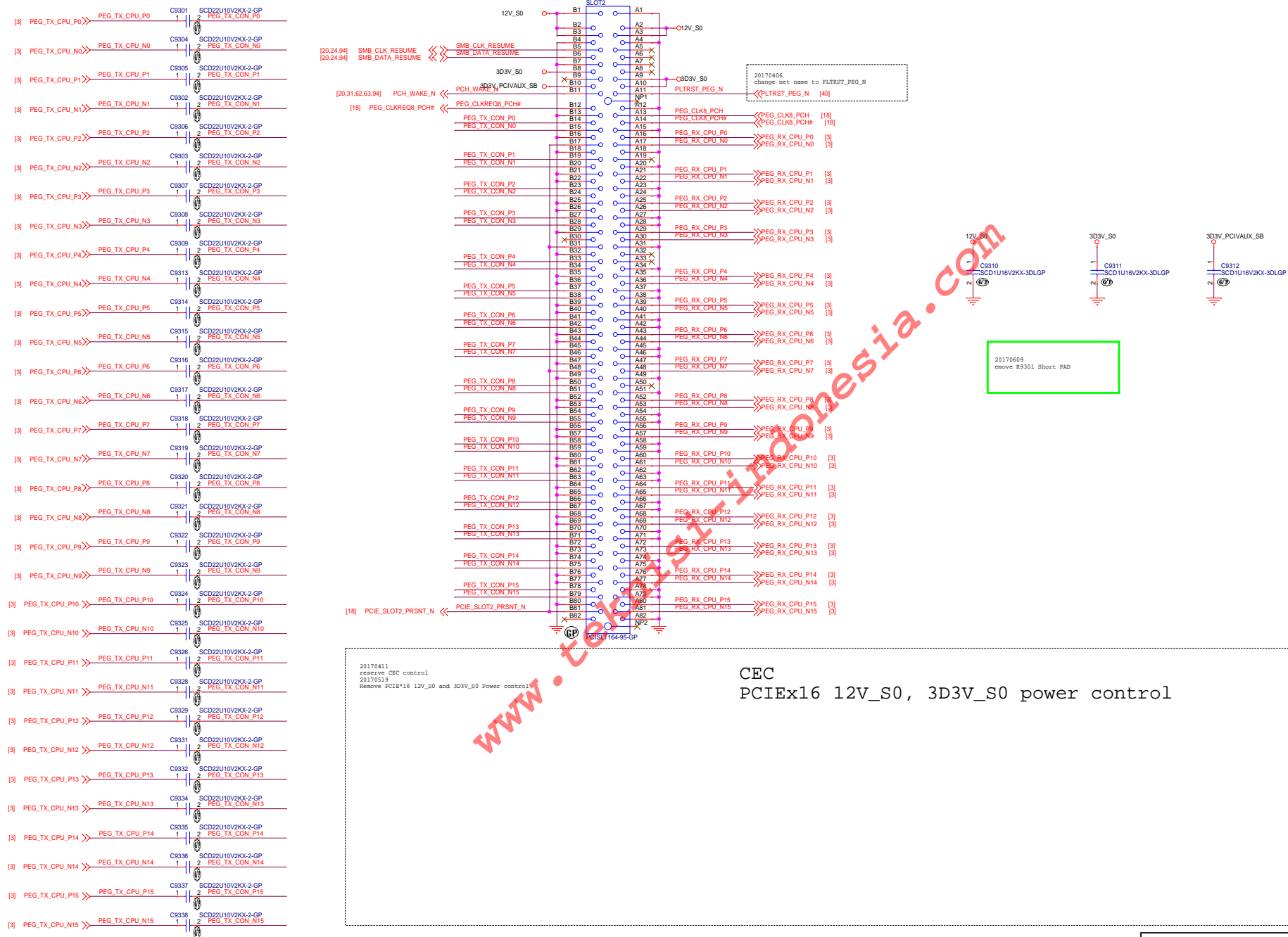
## Nuvoton TPM

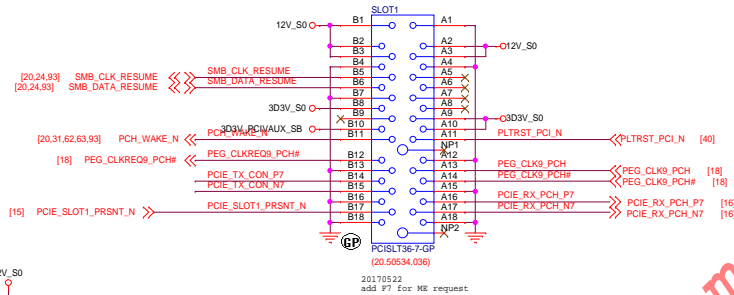
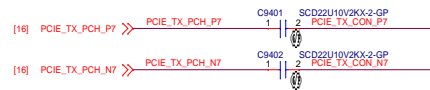


20170421  
Remove PCI Slot

www.teknisi-indonesia.com

		<b>Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wuj Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title <b>Reserved</b>			
Size <b>B</b>	Document Number <b>Gambits MLK SFF</b>		Rev <b>A00</b>
Date:	Friday, February 02, 2018	Sheet	92 of 107

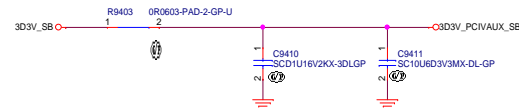




20170423  
Remove SLOT4 Slot

20170411  
reserve CEC control  
20170615  
PCIVAU power control and CEC control


CEC  
PCIVAU power control



20170421  
Remove IT8893E function

[www.teknisi-indonesia.com](http://www.teknisi-indonesia.com)

www.teknisi-indonesia.com

		<b>Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title <b>Reserved</b>			
Size <b>A</b>	Document Number <b>Gambits MLK SFF</b>		Rev <b>A00</b>
Date:	Friday, February 02, 2018	Sheet	96 of 107



www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**


Rev

**A00**

Date: Friday, February 02, 2018

Sheet 97 of 107

www.teknisi-indonesia.com

		<b>Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title <b>Reserved</b>			
Size <b>A</b>	Document Number <b>Gambits MLK SFF</b>		Rev <b>A00</b>
Date:	Friday, February 02, 2018	Sheet	98 of 107

## XDP for CPU

[4] H\_PREQ\_N  
[4] H\_PRDY\_N  
[4,20] H\_PWRGD  
[4,40] VCCST\_GD\_DRIVER  
[15,23,25,91] SLP\_SLP\_PCH

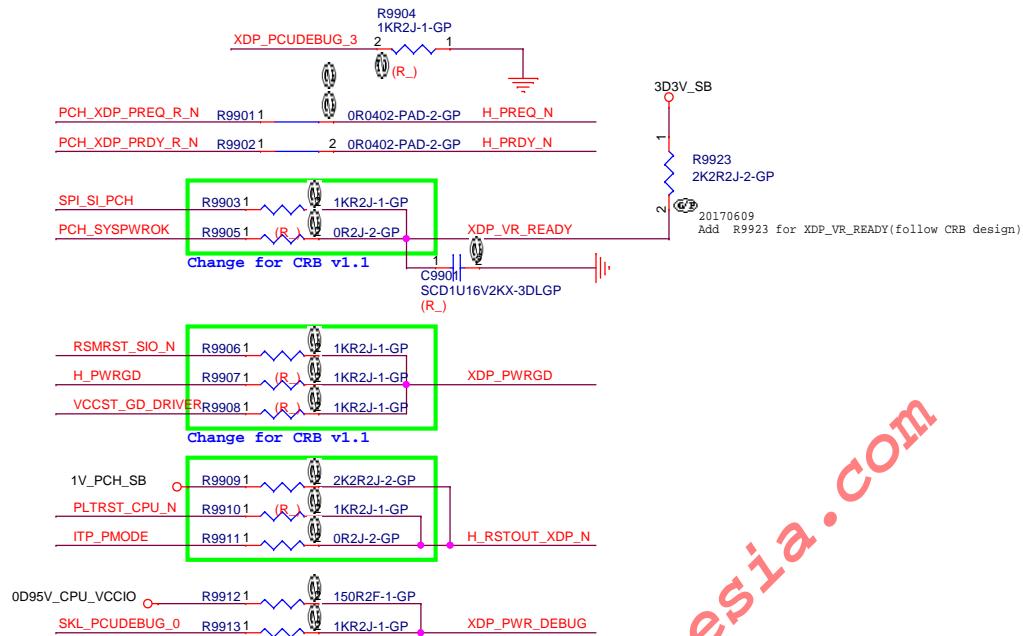
[4] SKL\_PCUDEBUG\_0  
[22] PCH\_XDP\_PRDY\_R\_N  
[22] PCH\_XDP\_PREQ\_R\_N

[4] XDP\_PCUDEBUG\_3  
[20,24,63] RSMRST\_SIO\_N  
[20,24] PCH\_SYSPWROK  
[20] FP\_RST\_N  
[20] ITP\_PMODE

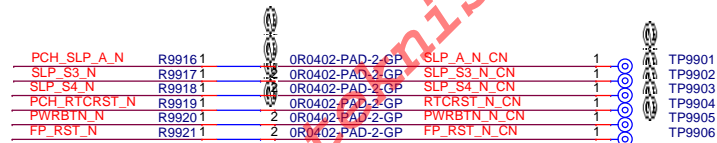
[4,17] PLTRST\_CPU\_N

## APS DEBUG

[20,24,40,42,50] SLP\_S3\_N  
[8,20,24,32,38,39,40] SLP\_S4\_N  
[20,24] PCH\_SLP\_A\_N  
[20,24,64] PWRBTN\_N  
[20] PCH\_RTCRST\_N

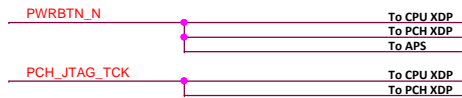


## APS CONNECTOR



20170523  
Remove APS Conn

Pitch:1.0mm, Hight: 4.25mm




Layout Notes

**DELL** Wistron Corporation  
21F, 88, Sec.1, Hsin Tai Wuj Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title: **XDP&ITP**  
Size B: Document Number: **Gambits MLK SFF** Rev: **A00**  
Date: Friday, February 02, 2018 Sheet: 99 of 107

www.teknisi-indonesia.com



**Wistron Corporation**  
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

Reserved

Size

A

Document Number

Gambits MLK SFF

Rev

A00

Date: Friday, February 02, 2018

Sheet 100 of 107

www.teknisi-indonesia.com



**Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title

**Reserved**

Size

**A**

Document Number

**Gambits MLK SFF**

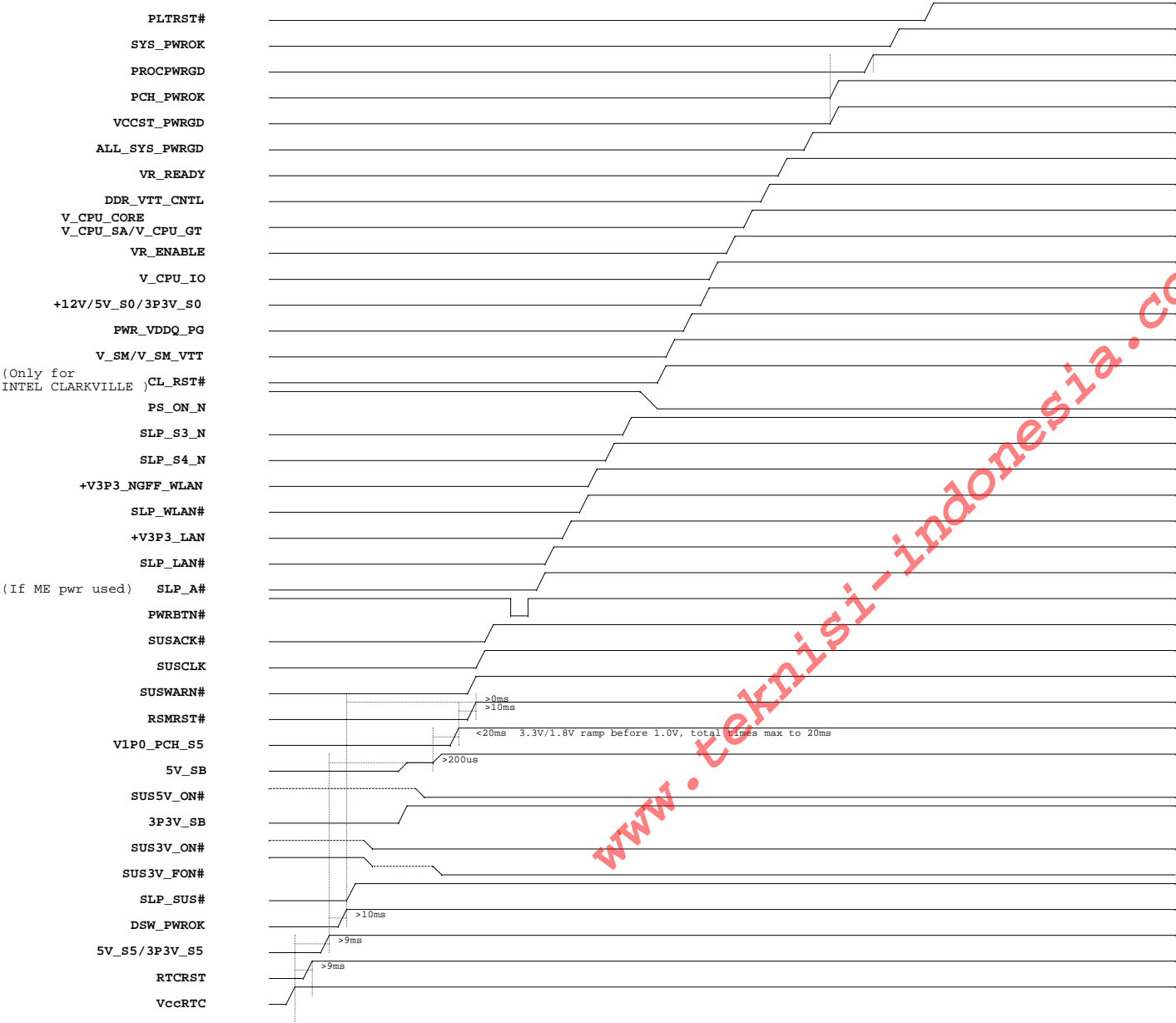
Rev

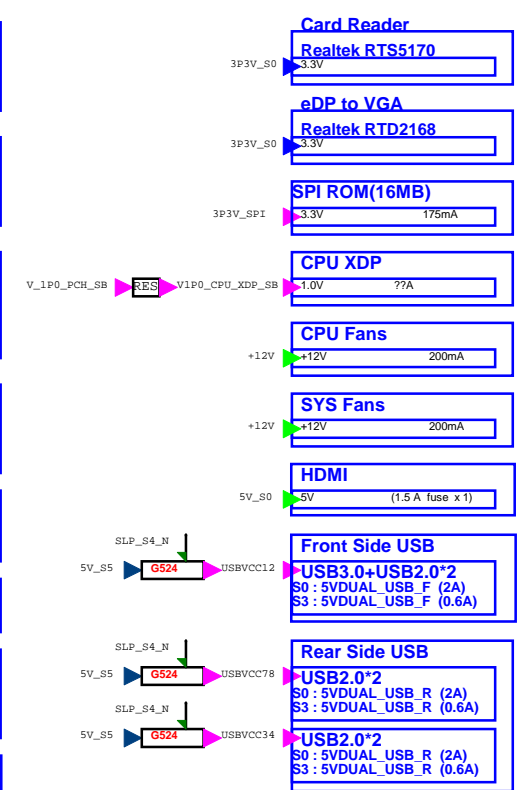
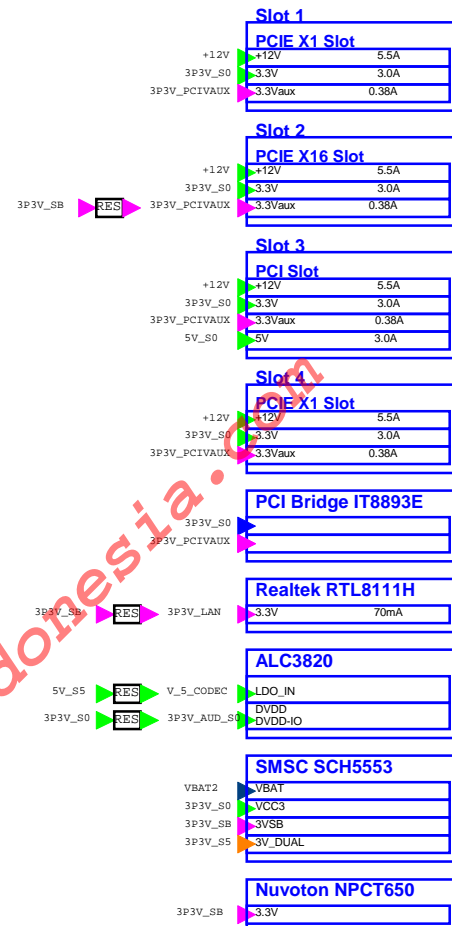
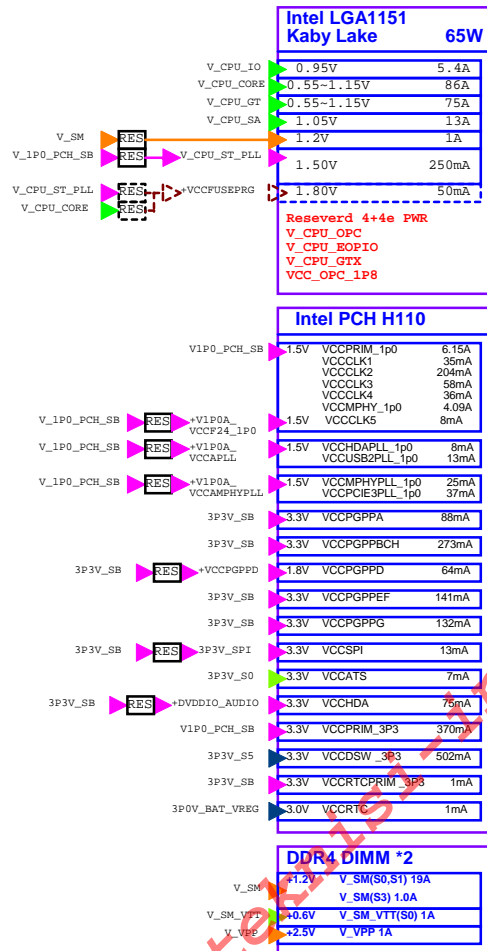
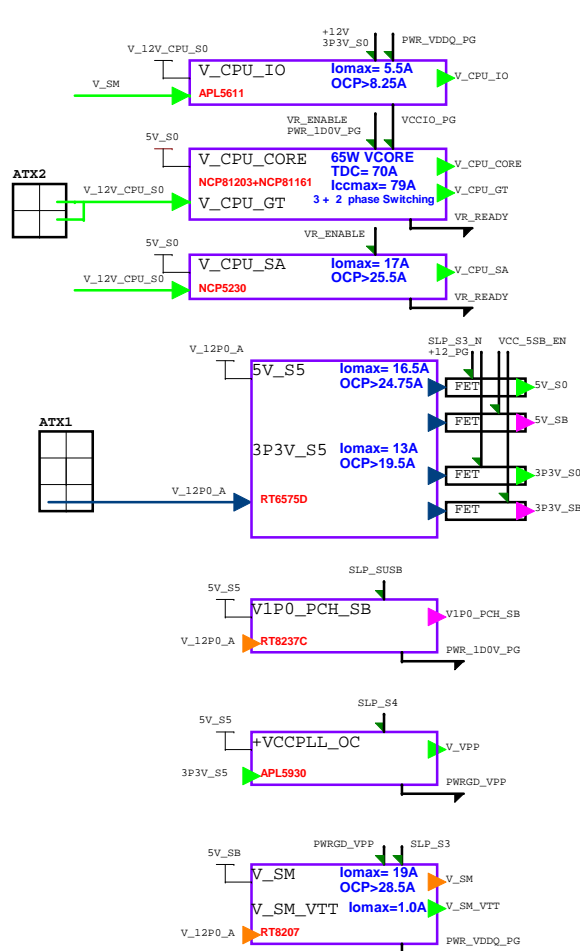
**A00**

Date: Friday, February 02, 2018

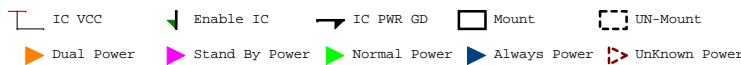
Sheet 101 of 107

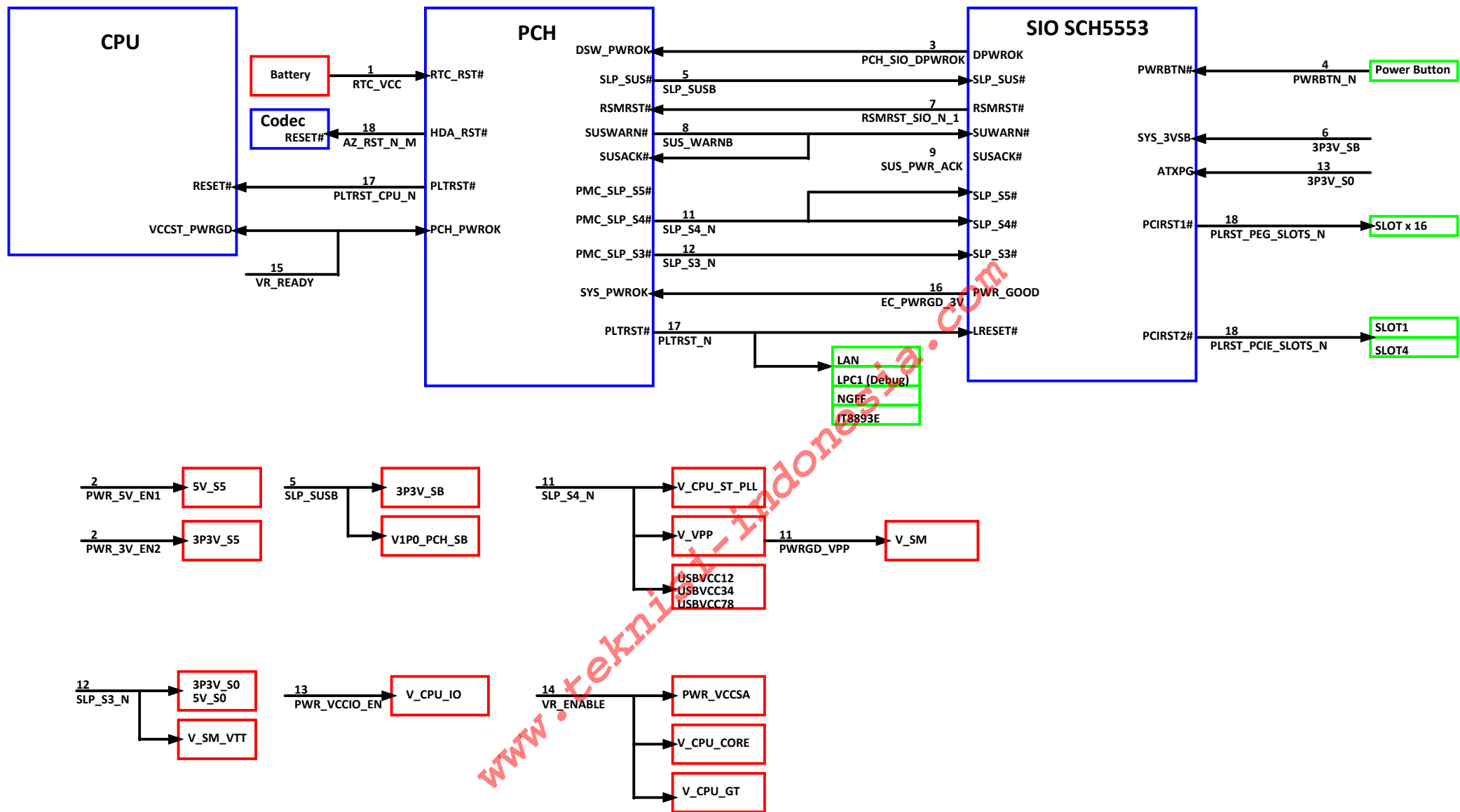
POWER ON SEQUENCE





www.tokiosia.com







SLOT4 SLOT3 SLOT2 SLOT1

INTEL  
Coffee Lake-S  
(65W 4C + GT2)

SKT H4 LGA1151  
42.5 mm x 42.5 mm



Channel A  
2666MHz

DDR4 DIMM  
Unbuffered 8GB

Channel B  
2666MHz

DDR4 DIMM  
Unbuffered 8GB

1 2 3

INTEL PCH

PCH-H

FCBGA 837PIN  
23 mm x 23 mm



100MHz

Realtek Lan  
RTL8111H

25MHz

100MHz

CPU XDP

PCH XDP

100MHz

ITE IT8893E

33MHz

100MHz

NGFF

24MHz

LPC 80 Port

24MHz

SIO  
SMSC SCH5553

24MHz

24MHz

32.768KHz

32.768KHz

	Name	Type	SSC Capable	Description
	CLKOUT_ITPXPDP_P CLKOUT_ITPXPDP_N	O	Yes	Differential ITP Debug Clock: 100 MHz differential output to processor XDP/ITP connector on the platform
1	CLKOUT_CPUNSSC_P CLKOUT_CPUNSSC_N	O	No	Unfiltered Clock from Crystal to CPU: 24 MHz differential re-buffered crystal reference clock to the processor
2	CLKOUT_CPUPCIBCLK_P CLKOUT_CPUPCIBCLK_N	O	Yes	Differential PCIe* Reference Clock to CPU: 100 MHz PCIe* 3.0 specification compliant differential PCIe* reference clock to the processor
3	CLKOUT_CPUBCLK_P CLKOUT_CPUBCLK_N	O	Yes	Differential Clock to CPU: 100 MHz differential core reference clock to the processor
	CLKOUT_SRC_P[15:0] CLKOUT_SRC_N[15:0]	O	Yes	PCI Express* Clock Output: 100 MHz PCIe* 3.0 specification compliant differential output clocks to PCIe* devices
	CLKOUT_LPC[1:0]	O	No	LPC Clock Outputs: Single-Ended 24 MHz output to various single load connectors/devices
	CLKOUT_48	O	No	48 Clock Output (SKL-H Server Only): Single-Ended 48 MHz output to Server BMC devices
	SRCLCKRQ#[15:0]	I/O	N/A	Clock Request: Clock request signals for PCIe* 100 MHz differential clocks
	XTAL24_IN	I	N/A	Crystal Input: Input connection for 24 MHz crystal to PCH oscillator circuit
	XTAL24_OUT	O	N/A	Crystal Output: Output connection for 24 MHz crystal to PCH oscillator circuit

www.teknisi-indonesia.com



**Wistron Corporation**  
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title		
REST Flow Chart		
Size	Document Number	Rev
A	Gambits MLK SFF	A00
Date:	Friday, February 02, 2018	Sheet 106 of 107

www.teknisi-indonesia.com



**Wistron Corporation**  
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.

Title		
Change History		
Size	Document Number	Rev
A	Gambits MLK SFF	A00
Date:	Friday, February 02, 2018	Sheet 107 of 107