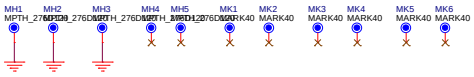
DATE	REVISION NUMBER	INITIALS	DESCRIPTION
March, 24, 2010	245-01951-010	JC	AP121-010
June, 24, 2010	245-01951-020	JC	1.Delete DC1.2V option. 2.Delete R3, R210, R206, C158, C159, C165, C166, R207, R11, R209, C35 3.Change C3 from 27pF to 10pF, change C4 from 33pF to 10pF, change C66 C67 from 1.5pF to 10pF, change C65 from 1.2pF to 1pF, change C68 C69 C70 C71 from 1.2pF to 2pF, change L1 L2 from 3nH to 2nH, change L18 L20 from 1.5nH to 2.0nH, change C97 from 2pF to 1pF, change C177 from No Load to 0.75pF, change C89 C90 from 4.7pF to 10pF, change L5 L6 from 2.2nH to 2.0nH, change C91 C92 from 1.5pF to 1.2pF, change C93 from No Load to 1pF, change L14 from 4.7uH to 15uH, change L22 from 4.7uH to 10uH, change C157 C143 from 390pF to 3.9nF, change R201 from No Load to 6.81K, change R166 from 16.2K to 26.1K, change R168 from 5.1K to 10K, change C144 from 10pF to 10nF, change R149 from 5.1K to 10K, change C167 from 33pF to No Load, change C27 from 0.01uF to 0.1uF, change R9 from 10K to No Load, change R12 from 100K to No Load, change C55 from 1uF to 22uF, change C152 from 10uF to 22uF, change C72 from No Load to 1pF, change C30 from 4.7uF to 10uF, change R5 from 56K to 10K 4.Add C203 2pF, R201 12K, C168 No Load, R215 56K, 1.2V option
June, 28, 2010	245-01951-030	JC	1.Add 1.2V option 2.Change C14 C15 C19 C20 from 0.01uF to No Load, change C54 C21 from 0.01uF to 1uF, change C32 from 0.01uF to 470pF, change R12 from No Load to 1uF change C65 from 1.2pF to 0.75pF, change C203 from 2pF to 1.5pF, change C72 from 1pF to No Load, change C177 from 0.75pF to 0.5pF, change C91 C92 from 1.2pF to 1pF,
August, 2, 2010	245-01951-031	JC	1.Change R4 R64 R65 R189 R194 R196 R198 R214 from 56K to 10K, change R188 from 56K to No Load, change R187 from No Load to 10k, change R12 from 1uf to 0.22uf, change R215 from 56K to No Load, change C68 C69 from 2.0pf to 1.8pf, change C65 from 0.75pf to 0.5pf, change L17 L19 from 4.7nh to 3.6nh, change C97 from 1pf to 1.5pf, change L5 L6 from 2.0nh to 2.2nh 2.Remove C93 C117
August, 30, 2010	245-01951-040	JC	1.Add L21, C204 2.Remove C34 3.Change R92 from 330 ohm to 270 ohm, change C187 from 10K to No Load, change C186 from No Load to 10K, change C74 from 10pF to 0.75pF, change C75 from No Load to 6.8nH, change C94 from No Load to 0.5pF, change C95 from 10pF to 2.7nH
October, 1, 2010	245-01951-041	JC	1.Change C65 from 0.5pf to No Load, C68 C69 from 1.8pf to 1pf, C70 C71 from 2pf to 1pf, C72 from No Load to 1pf, C97 from 1.5pf to 1.2pf C26 from0.01uf to No Load, L1 L2 from 2nh to 2.2nh, L17 L19 from 3.9nh to 4.7nh, L5 L6 from 2.2nh to 2.7nh
October, 15, 2010	245-01951-050	JC	1.Add R202 10k, R203 No Load, change C97 from 1.2pf to 1.5pf, change L21 from 10nh to 0ohm, change C204 from 0.1uf to 1nf, change C26 from No Load to 0.01uf, change R5 from 10K to No Load, change R215 from No Load to 10K, change JP1 to No Load, change J2 to No Load
February, 14, 2011	245-01951-060	JC	1.Del L21, TP8, TP10, TP11, TP12, TP13, C176, C177, C20 2.Change C54 from 1uf/0402 to 10pf/0201, change C27 from 1.5pf to 1.2pf, change C144 C129 from 0.01uf to 0.1uf, change C143 C157 from 3900pf to 3300pf, change R201 from 6.18K to 12K, change R210 from 12K to 20K, change R166 from 26.1K to 71.5K, change R168 from 10K to 22K, L17 L19 from 4.7uH to 3.9nH change R148 from 45.3K to 62K, change R149 from 10K to 11.8K, Change L15 L16 from 10nH to 4.7nH, change C68 C69 C70 C71 C91 C92 from 1pF to 1.2pF, change C89 C90 from 10pF to 3.9pF, change C21 from 1uF to 1nF, change C93 from No Load to 0.75pF, change C204 from 1nF to 1uF, change L18 L20 from 2.0nH to 1.8nH, change C181 C182 from 10pF to 0.1uF 3.Add C31, C34, C35, L21, L23
April, 14, 2011	245-01951-061	JC	1. update U1 symbol
May, 9, 2011	245-01951-062	JC	1. update no USB support

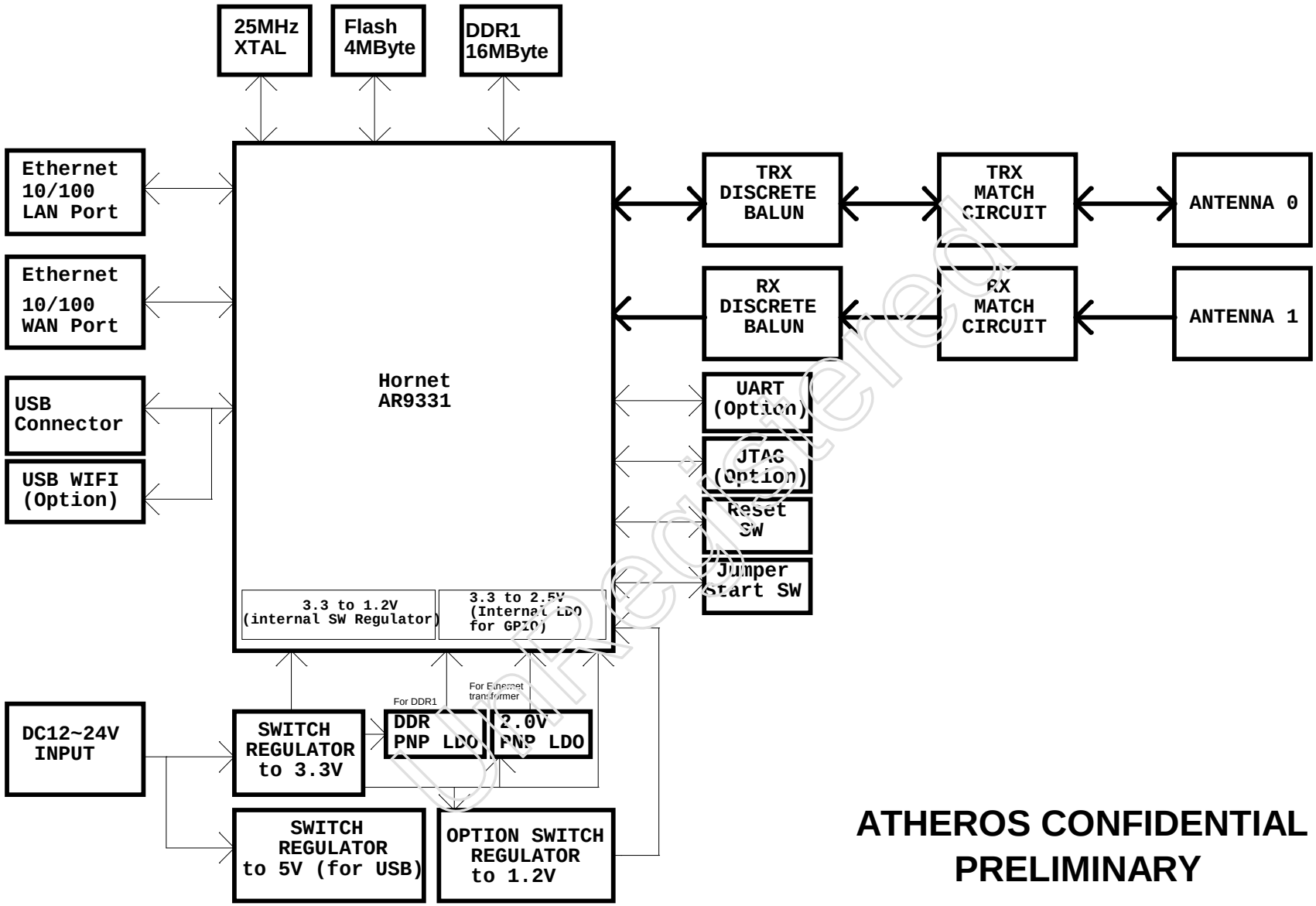
AP121 802.11b/g/n 1x1 2.4GHz Access Point
AR9331 4LAN + 1WAN 10/100 Router Reference Design

ATHEROS CONFIDENTIAL

PRELIMINARY



Atheros Communications, Inc. 5480 Great America Parkway Santa Clara, CA 95054			Title: Title and Reversion History		
Date: Thursday, August 02, 2012	Size: C	Rev: 000	Sheet: 1 of 8	DWG NO: AP121-245-01951-062	



ATHEROS CONFIDENTIAL
PRELIMINARY

Atheros Communications, Inc. 5480 Great America Parkway Santa Clara, CA 95054				Title	AP121 Block Diagram
Date Monday, August 06, 2012	Size C	Rev 000	Sheet 2 of 8	DWG NO	AP121-245-01951-062

Note: Pin name is 0.99 (20100316)

CK_P, DQS_0, DQS1 short together if use SDRAM.

USB---按PCB阻抗90 OHM设计，差分等长处理

Use DDR1, RESET=High

Use DDR1, XLNA =Low

Route USB DP/DM as 90 ohm differential, match lengths to within +/-5mils

With ICE, JUMPSTART=High; Without ICE, JUMPSTART=Low.

TP7和TP6两个测试点要紧挨着

Note: Hornet Digital IO pads(Flash, UART,JTAG, LED) are 2.5V CMOS logic, don't apply >2.9V on it otherwist might damage the IC.

Atheros Communications, Inc.	Title: Hornet
5480 Great America Parkway, Santa Clara, CA 95054	
Date: Thursday, August 02, 2012	Size: Custom; Rev: 000; Sheet: 3 of 8; DWG NO

Memory bus clock speed and voltage:
SDRAM: 166MHz, 3.0V
DDR1:200MHz, 2.5V
DDR2:200MHz, 1.8V

DDR1(default is loaded, 16MByte)

SO_66P_22D22X11D76_0D65_H1D2

U3
SDRAM-2MX4BX16

R49,R53靠近主芯片放置

GPIO24 controls Write_Protect.

Flash memory footprint is SO8-200mil

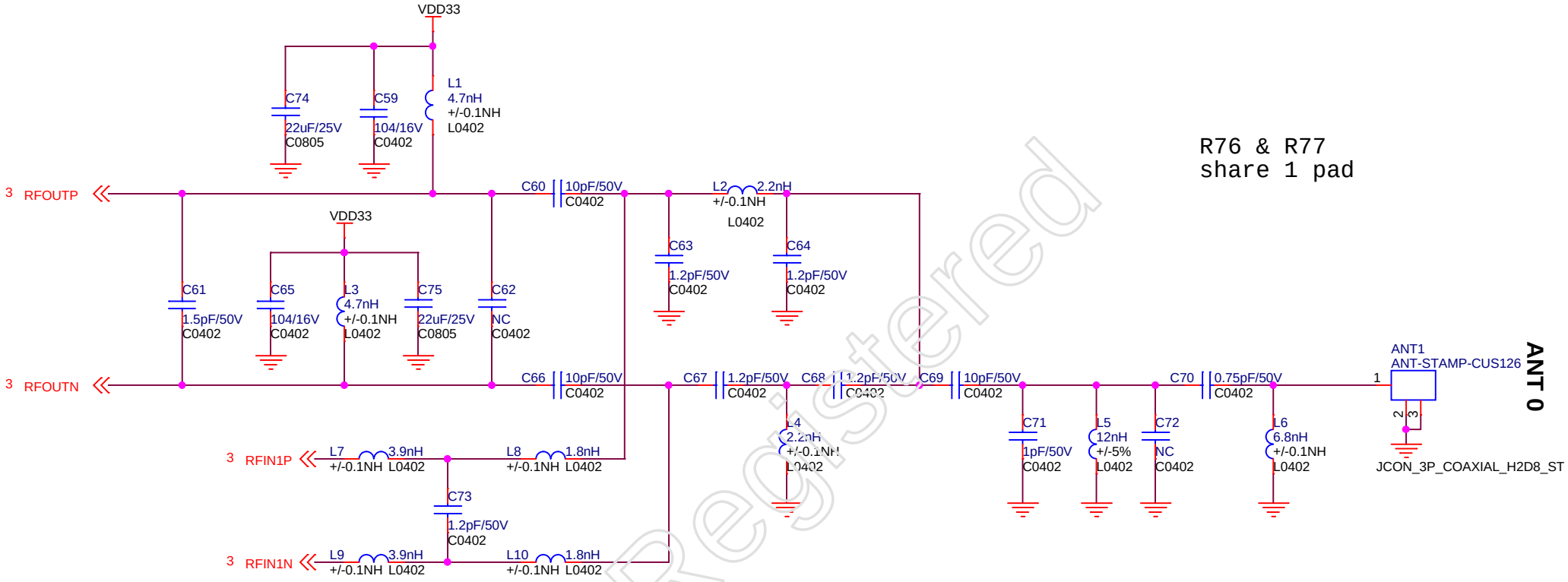
R69,R68 are voltage divider to reduce the logic level to 2.5V.

U4
MX25L1605DM2I-12G
SO_8P_7D9X5D2_1D27_H2D2

20120806:change to MX25L3205DM2I-12G

Atheros Communications, Inc. 5480 Great America Parkway Santa Clara, CA 95054		Title: AP121 Memory	
Date Monday, August 06, 2012	Size Custom	Rev 000	Sheet 4 of 8
			DWG NO

L15, L16 recommend useing low DCR
Psat power current 150mA~180mA

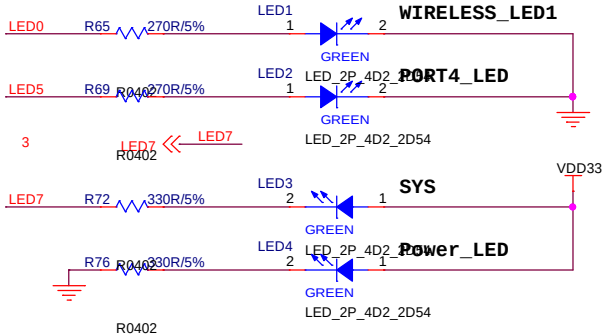


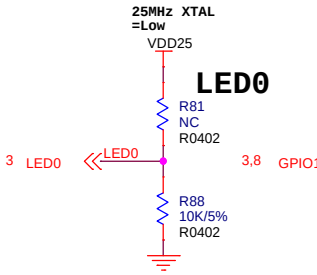
R76 & R77
share 1 pad

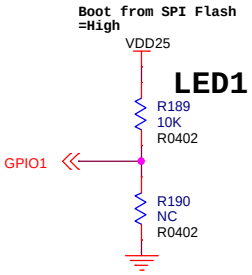
Atheros Communications, Inc. 5480 Great America Parkway Santa Clara, CA 95054			Title: AP121 RF	
Date Thursday, August 02, 2012	Size Custom	Rev 000	Sheet 5 of 8	DWG NO

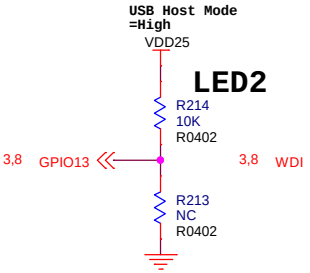
Trade-offs:
Nets name LED0, LED1, LED2, LED3, LED4, LED6 are also for Boot-strap during power on.
To avoid wrong voltage applyed on the IO pin from LED, these GPIOs should be source current only.
The rest LEDs are using sink current mode to reduce the Hornet internal 2.5V LDO loading (thermal).

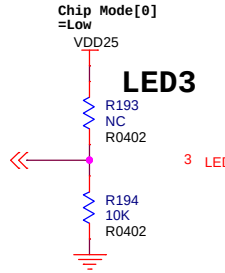
LEDs are 0603 SMT type
becaused of plastic optical guide.

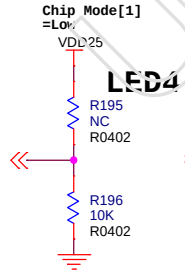


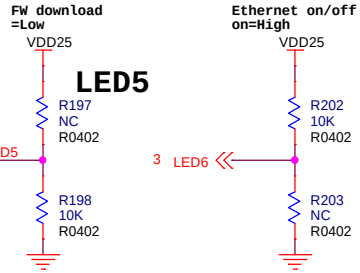


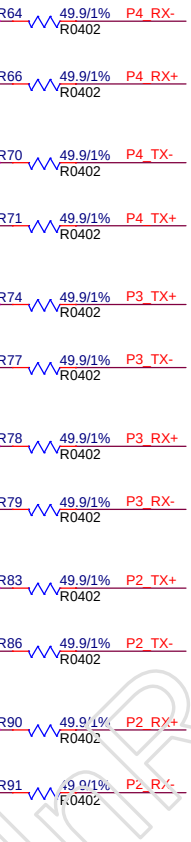


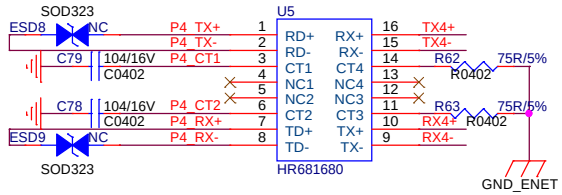


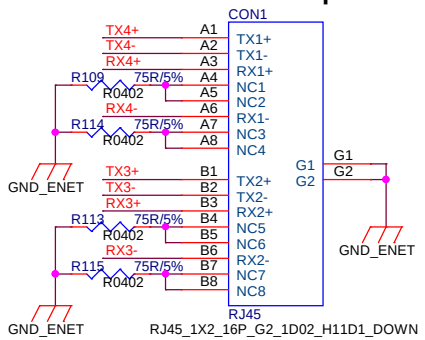


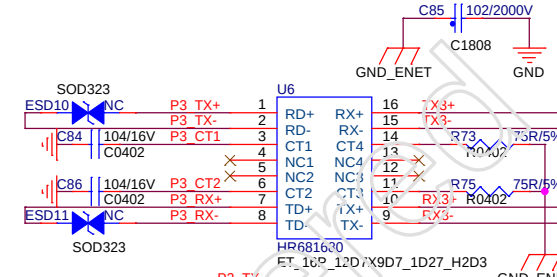


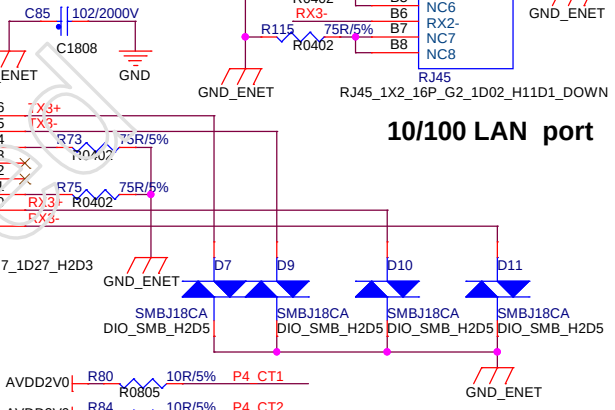


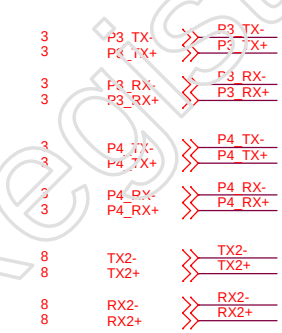




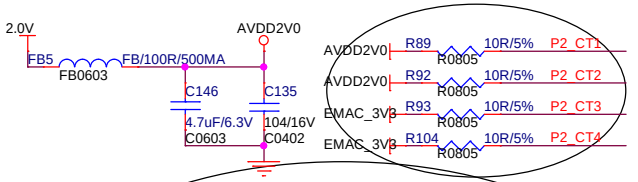


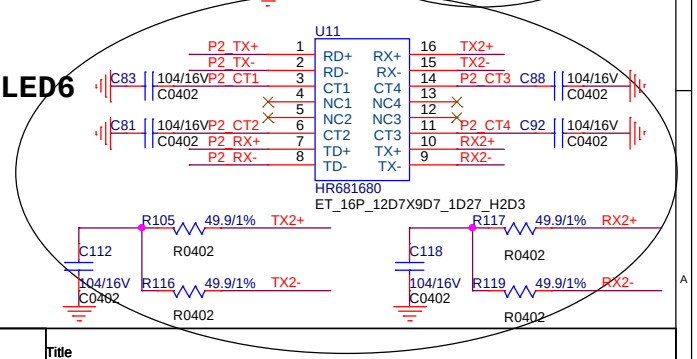




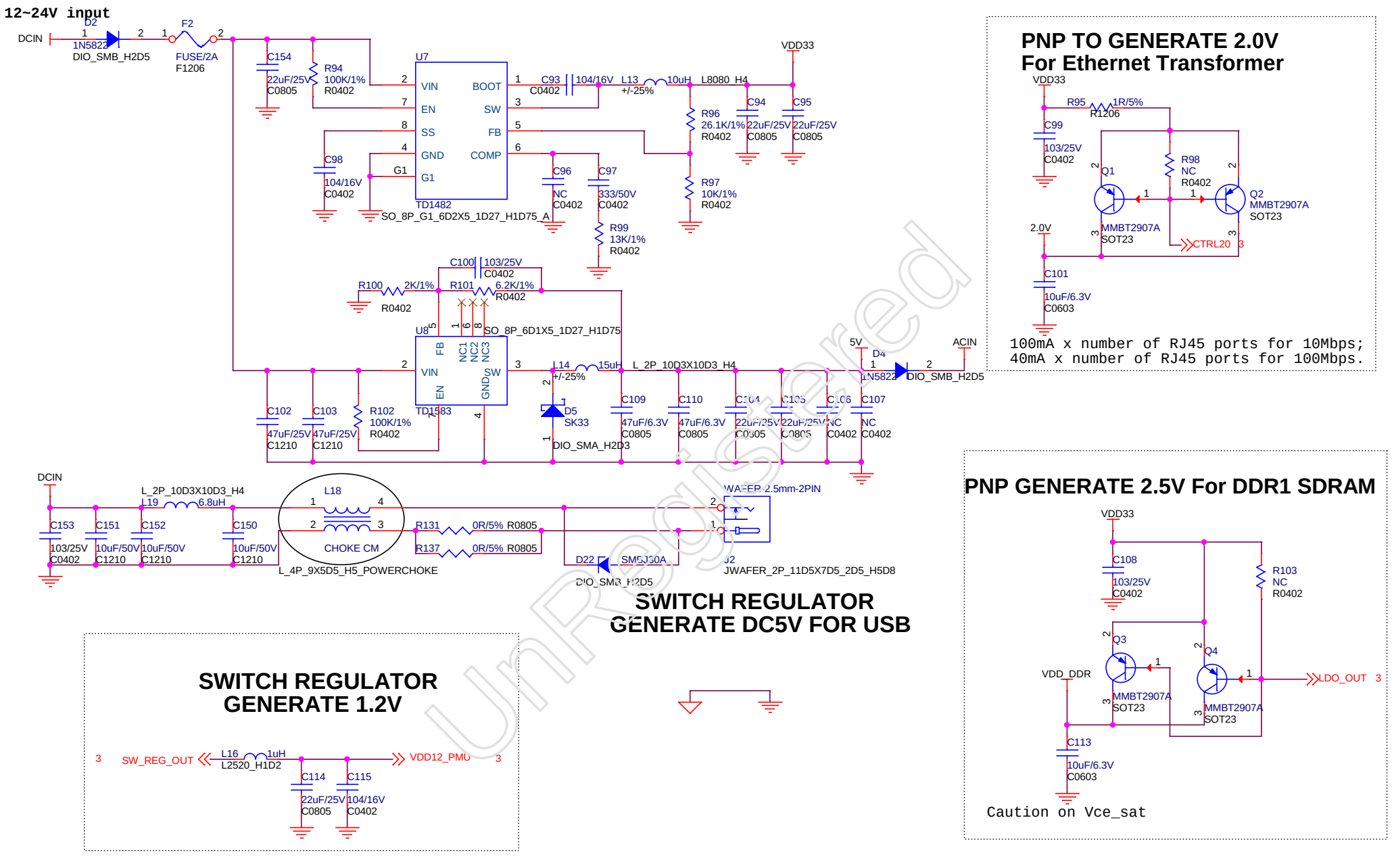


All WAN and LAN ports support Auto-MDIX.





Atheros Communications, Inc. 5480 Great America Parkway Santa Clara, CA 95054				Title: AP121 Ethernet Interface
Date Thursday, August 02, 2012	Size Custom	Rev 000	Sheet 6 of 8	DWG NO


12~24V input
PNP TO GENERATE 2.0V
For Ethernet Transformer
100mA x number of RJ45 ports for 10Mbps;
40mA x number of RJ45 ports for 100Mbps.
PNP GENERATE 2.5V For DDR1 SDRAM
Caution on Vce_sat
SWITCH REGULATOR
GENERATE DC5V FOR USB
SWITCH REGULATOR
GENERATE 1.2V
UnRegistered
Atheros Communications, Inc.
5480 Great America Parkway
Santa Clara, CA 95054
Title
AP121 Power
Date Thursday, August 02, 2012
Size Custom
Rev 000
Sheet 7 of 8
DWG NO