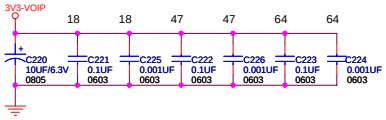
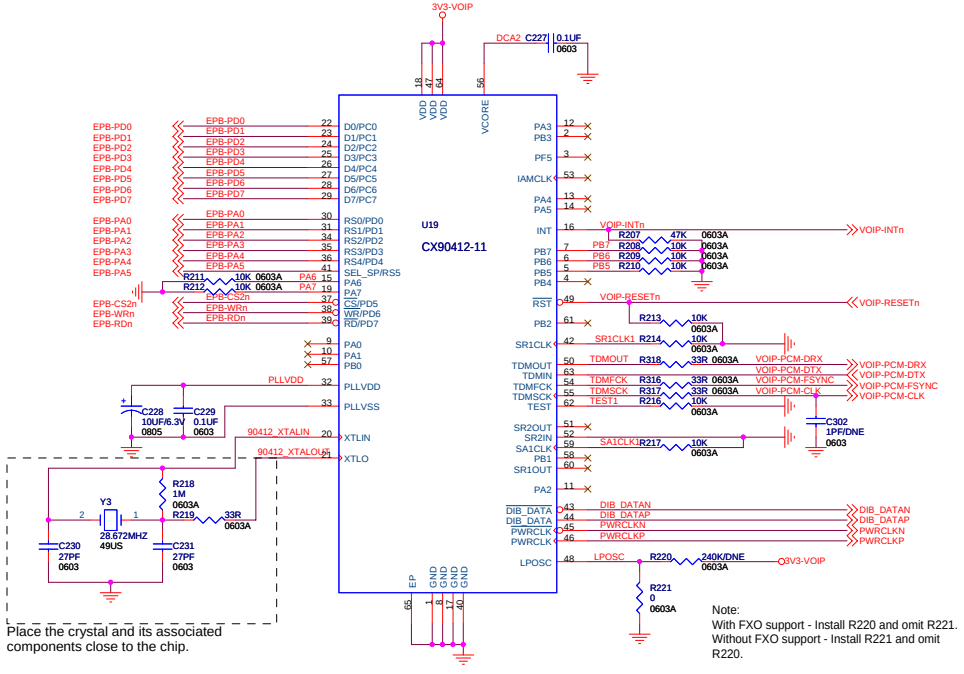
CX90412





Place the crystal and its associated components close to the chip.

Note:
With FXO support - Install R220 and omit R221.
Without FXO support - Install R221 and omit R220.

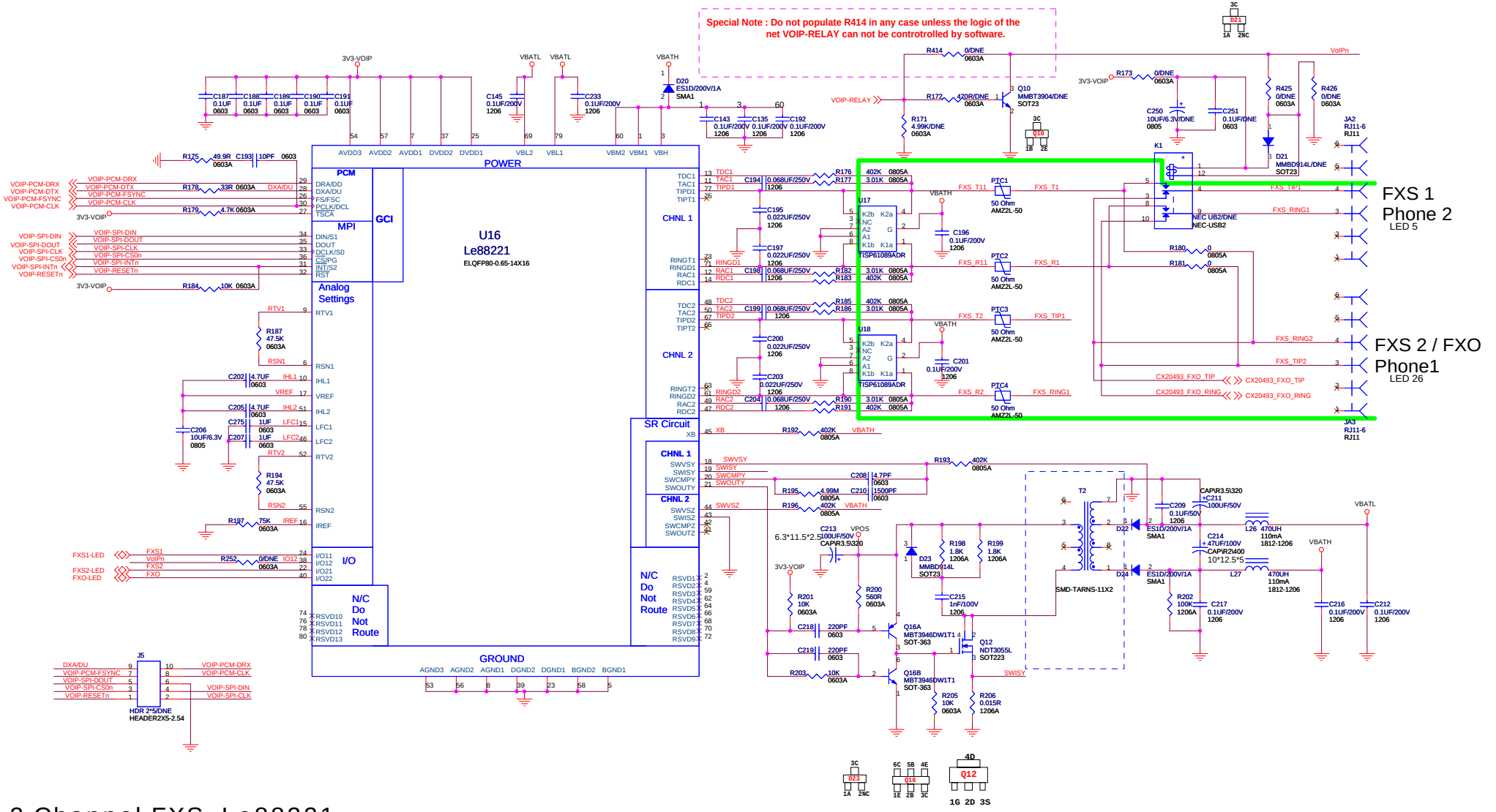
Notes :

Item	Function	System Power	Logic for net VOIP-RELAY	Logic for pin 12 of K1 relay	K1 Relay path through	Status			Do not populate	Signal paths	Singal to CO or PSTN
						ADSL	FXS	FXO			
1	ADSL+2FXS	ON	No function	No function	No function	Working	Working	No function	FXO ckts and K1 relay	Line 1 - FXS / CH 1 - CPU - AFE - CO Line 2 - FXS / CH 2 -	Data
2	ADSL+FXS+FXO	OFF	No function	No function	pin 3 - pin 4 pin 10 - pin 9	No function	No function	No function	CH 2 of U16 FXS ckts R180, R181	Line 1 - K1 Relay - Line 2 - PSTN	Voice
3	ADSL+FXS+FXO	ON	High	Low	pin 5 - pin 4 pin 8 - pin 9	Working	Working	Working	CH 2 of U16 FXS ckts R180, R181	Line 1 - FXS / CH 1 - CPU - AFE - CO Line 1 - FXS / CH 1 - CPU - FXO - PSTN	Data Voice
4	ADSL+FXS+FXO	ON	Low	High	pin 3 - pin 4 pin 10 - pin 9	No Link	Working	No Link	CH 2 of U16 FXS ckts R180, R181	Line 1 - K1 Relay - Line 2 - PSTN	Voice

VOIP OPTION

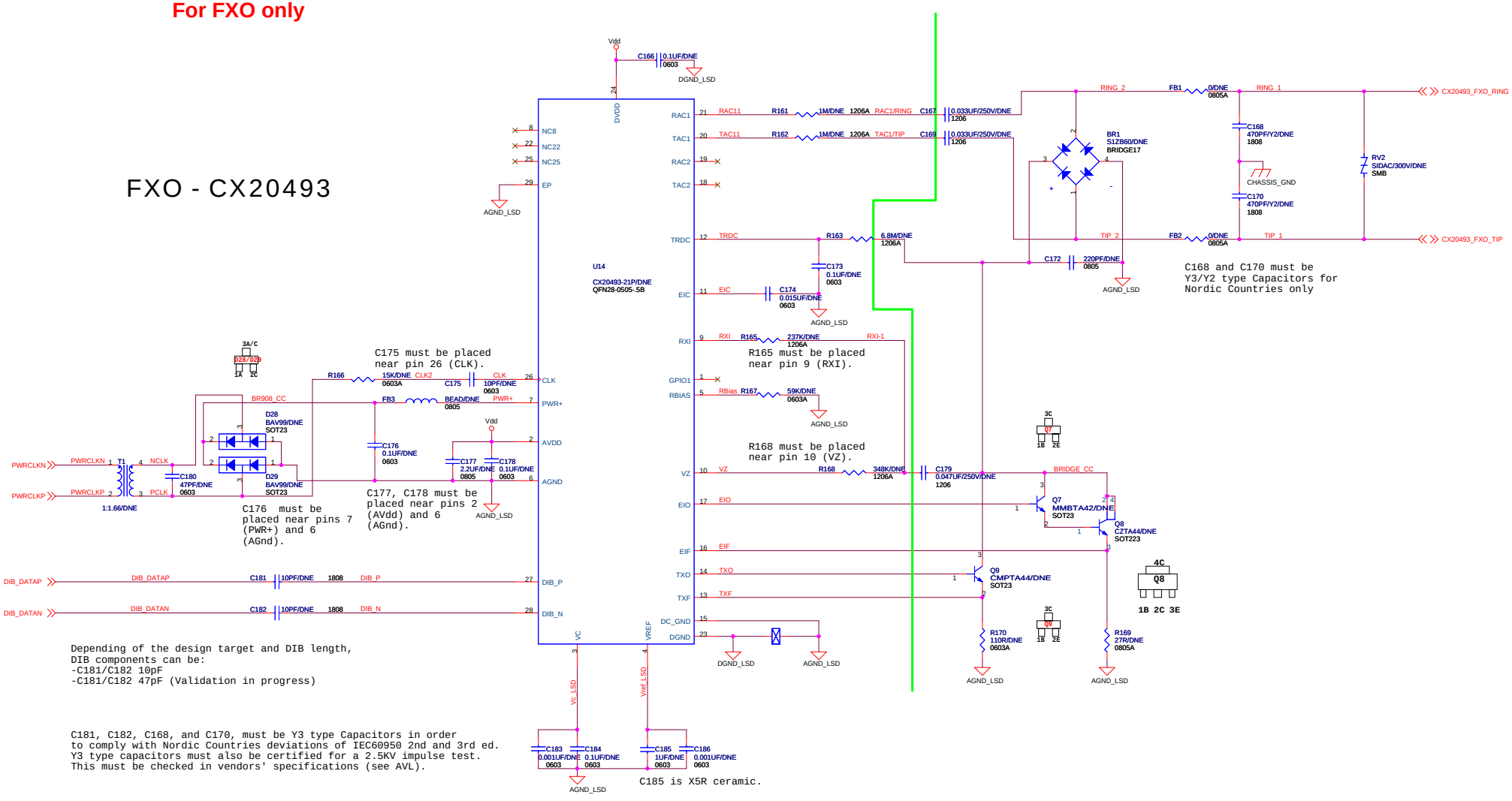
2FXS : populate R180,R181,R185,R186,R190,R191
C199,C200,C201,C203,C204
PTC3,PTC4,U18
omit K1,R171,R172,R173C250,C251,D21,Q10

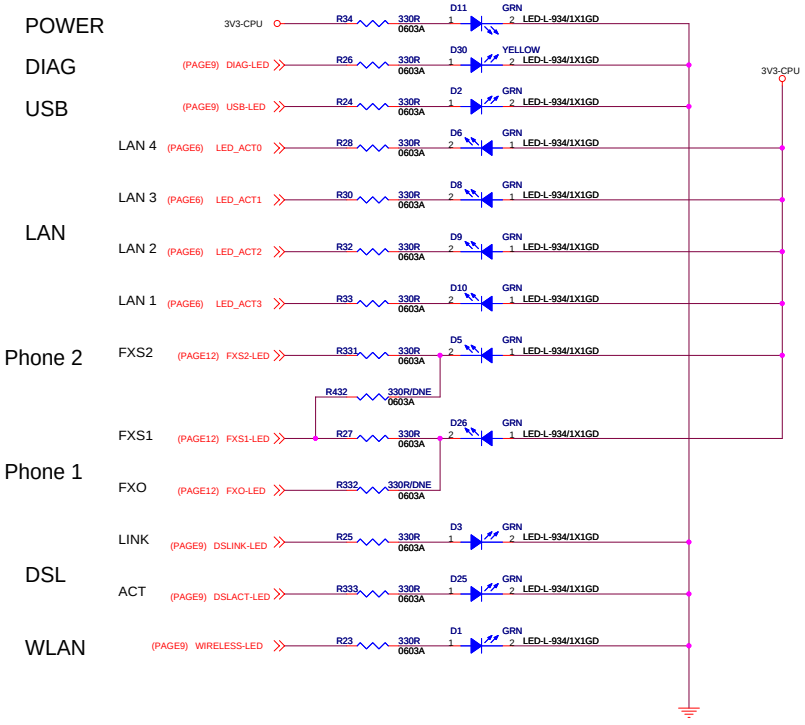
FXS+FXO : populate R171,R172,R173,R425,C250,C251
D21,Q10,K1
omit R180,181,R185,R186,R190,R191
C199,C200,C201,C203,C204
PTC3,PTC4,U18

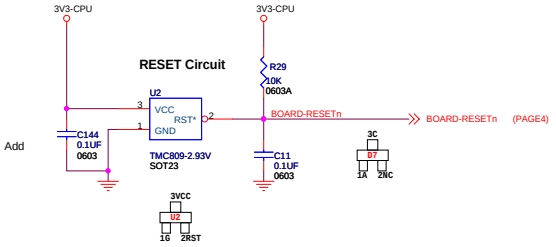


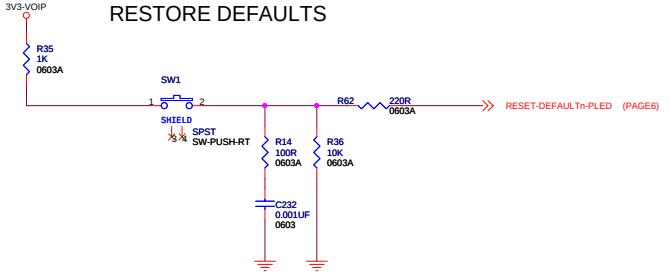
For FXO only

FXO - CX20493





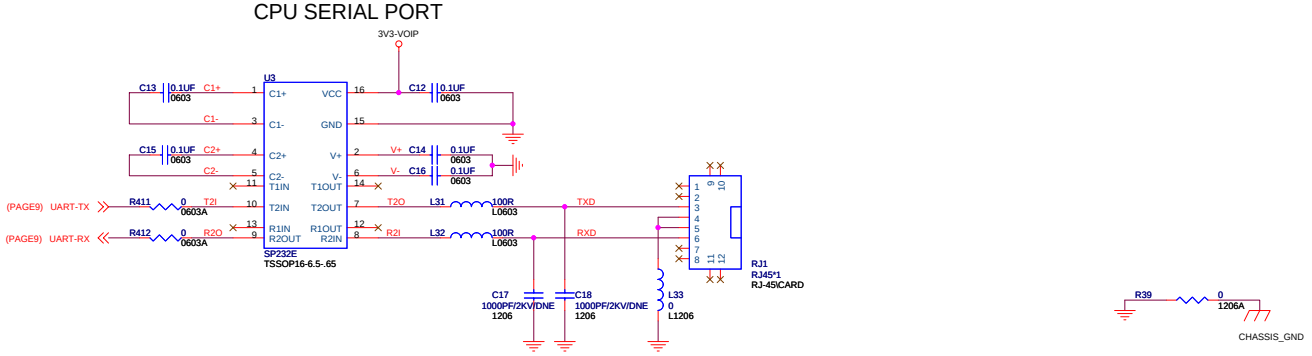


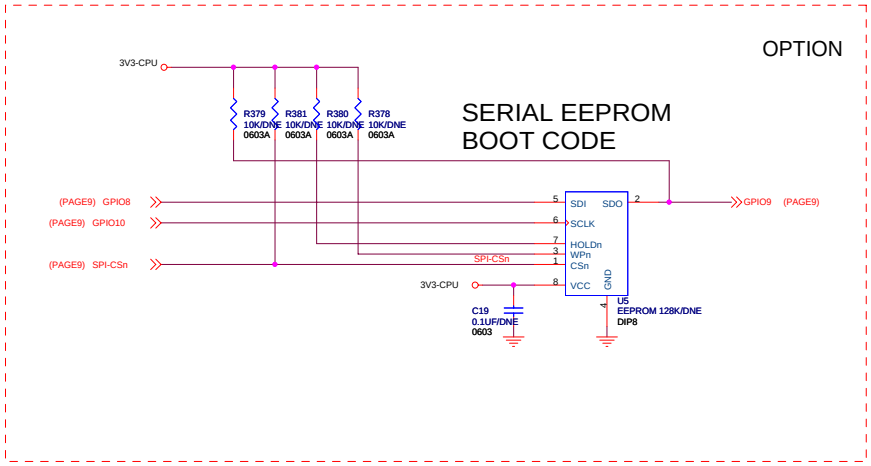


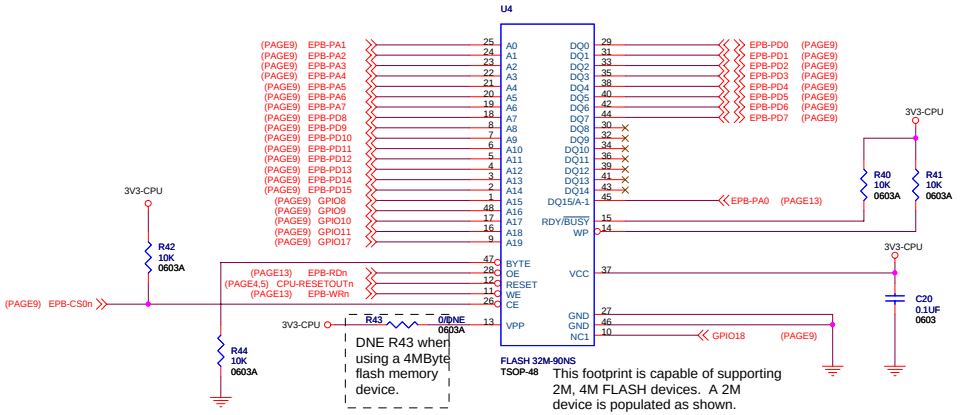
VoIP LED OPTION

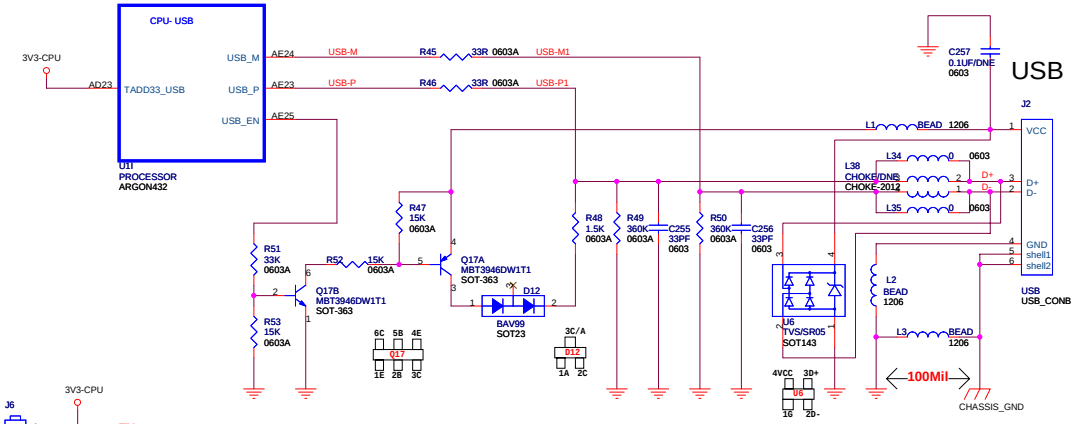
2FXS : populate R27,R331 / omitR332,R432

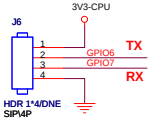
FXS+FXO : populate R332,R432 / omit R27,R331

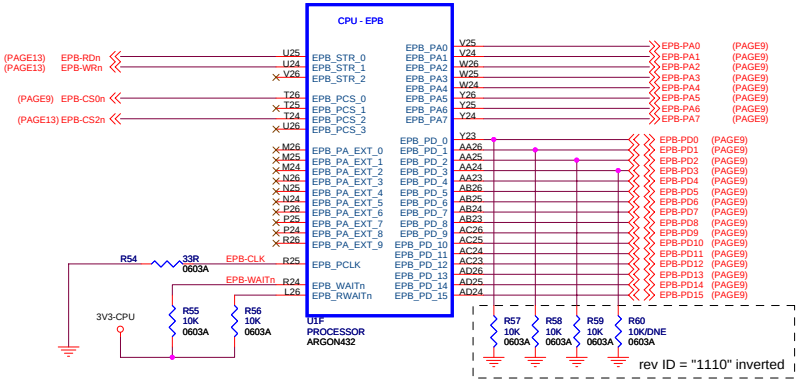


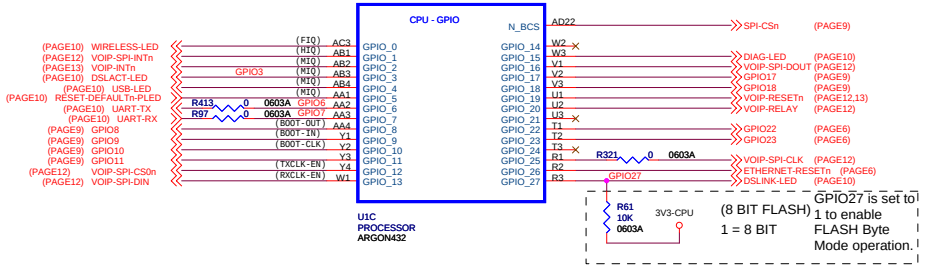

OPTION
SERIAL EEPROM
BOOT CODE
3V3-CPU
R379 10K/DNE 0603A
R381 10K/DNE 0603A
R380 10K/DNE 0603A
R378 10K/DNE 0603A
(PAGE9) GPIO8
(PAGE9) GPIO10
(PAGE9) SPI-CSn
SPI-CSn
SDI
SDO
SCLK
HOLDn
WPn
CSn
VCC
GND
GPIO9 (PAGE9)
C19 0.1UF/DNE 0603
U5 EEPROM 128K/DNE DIP8

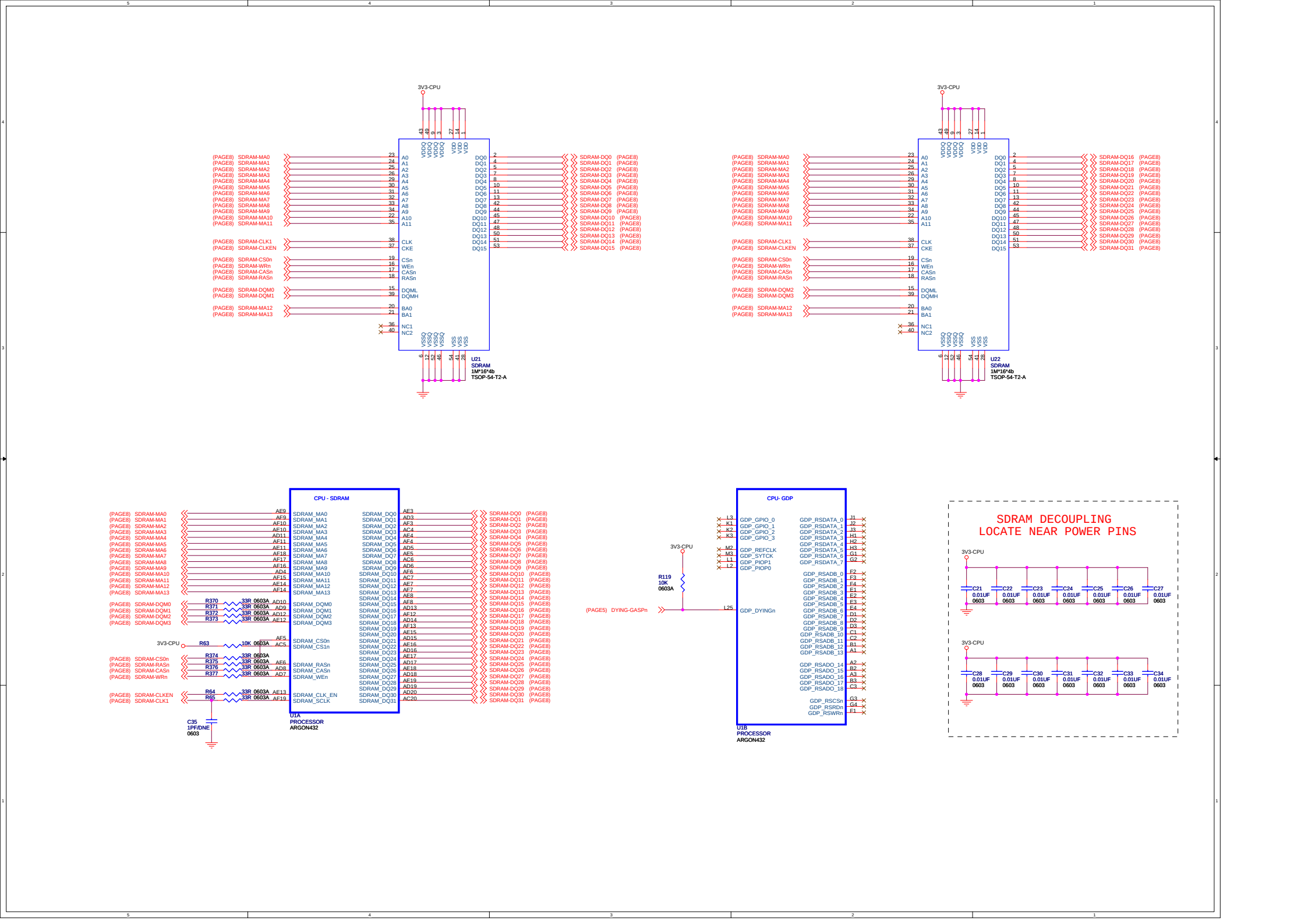

PARALLEL FLASH
U4
(PAGE9) EPB-PA1
(PAGE9) EPB-PA2
(PAGE9) EPB-PA3
(PAGE9) EPB-PA4
(PAGE9) EPB-PA5
(PAGE9) EPB-PA6
(PAGE9) EPB-PA7
(PAGE9) EPB-PD8
(PAGE9) EPB-PD9
(PAGE9) EPB-PD10
(PAGE9) EPB-PD11
(PAGE9) EPB-PD12
(PAGE9) EPB-PD13
(PAGE9) EPB-PD14
(PAGE9) EPB-PD15
(PAGE9) GPIO8
(PAGE9) GPIO9
(PAGE9) GPIO10
(PAGE9) GPIO11
(PAGE9) GPIO17
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19
DQ0 DQ1 DQ2 DQ3 DQ4 DQ5 DQ6 DQ7 DQ8 DQ9 DQ10 DQ11 DQ12 DQ13 DQ14 DQ15/A-1
EPB-PD0 (PAGE9)
EPB-PD1 (PAGE9)
EPB-PD2 (PAGE9)
EPB-PD3 (PAGE9)
EPB-PD4 (PAGE9)
EPB-PD5 (PAGE9)
EPB-PD6 (PAGE9)
EPB-PD7 (PAGE9)
EPB-PA0 (PAGE13)
RDY/BUSY
WP
BYTE
OE
RESET
WE
CE
VPP
VCC
GND
GND
NC1
GPIO18 (PAGE9)
3V3-CPU
R40 10K 0603A
R41 10K 0603A
C20 0.1UF 0603
R42 10K 0603A
(PAGE9) EPB-CS0n
(PAGE13) EPB-RDn
(PAGE4,5) CPU-RESETOUTn
(PAGE13) EPB-WRn
R43 0/DNE 0603A
DNE R43 when using a 4MByte flash memory device.
R44 10K 0603A
FLASH 32M-90NS
TSOP-48
This footprint is capable of supporting 2M, 4M FLASH devices. A 2M device is populated as shown.

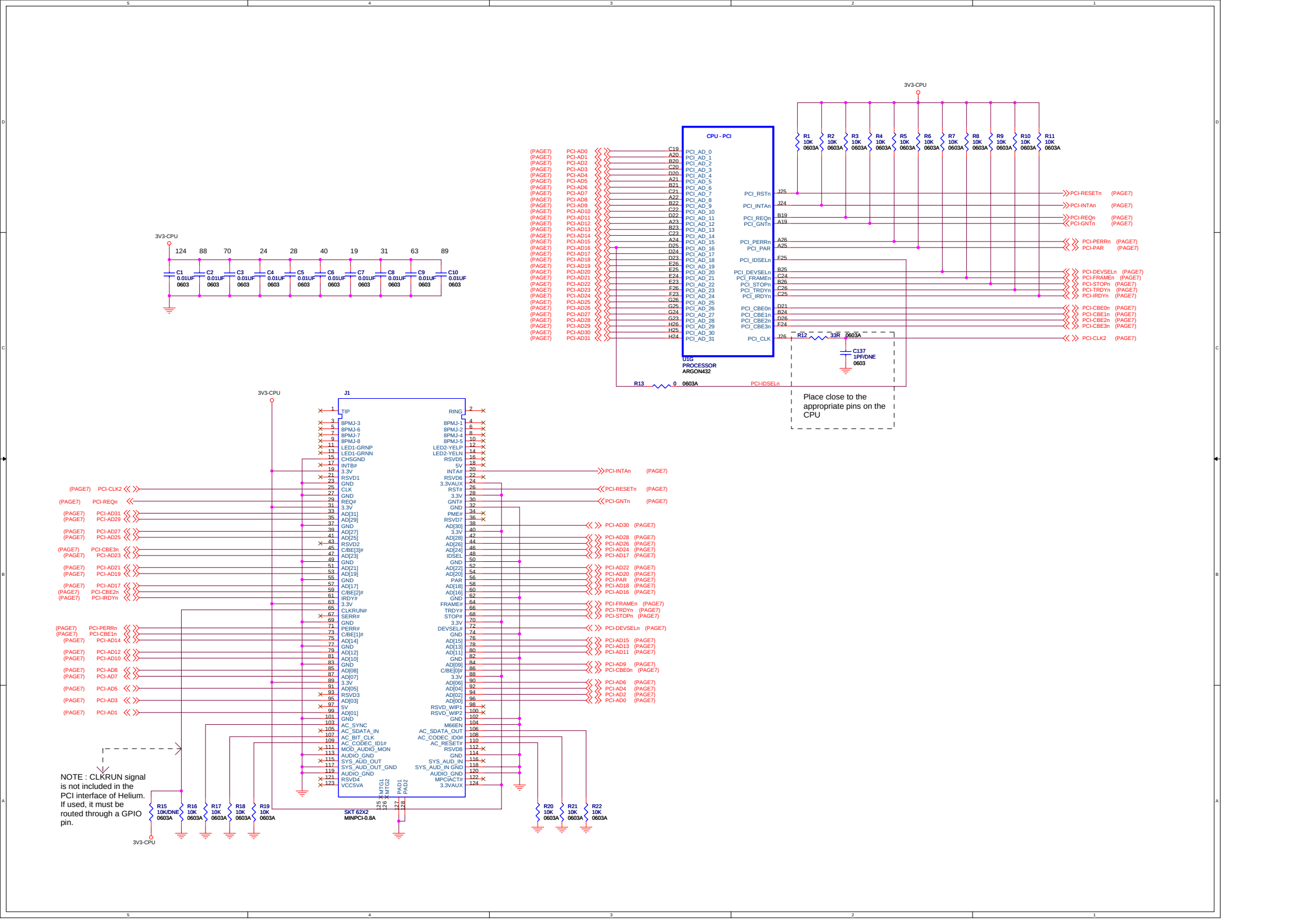

USB
CPU- USB
3V3-CPU
AD23
TADD33_USB
USB_M
USB_P
USB_EN
AE24
AE23
AE25
USB-M
USB-P
R45 33R 0603A
R46 33R 0603A
USB-M1
USB-P1
U11 PROCESSOR ARGON432
C257 0.1UF/DNE 0603
L1 BEAD 1206
L34 0 0603
L35 0 0603
L38 CHOKE/DNE CHOKE-2012
J2
VCC
D+
D-
GND
shell1
shell2
USB
USB_CONB
R47 15K 0603A
R48 1.5K 0603A
R49 360K 0603A
R50 360K 0603A
C255 33PF 0603
C256 33PF 0603
R51 33K 0603A
R52 15K 0603A
R53 15K 0603A
Q17A MBT3946DW1T1 SOT-363
Q17B MBT3946DW1T1 SOT-363
D12
BAV99 SOT23
U6 TVS/SR05 SOT143
L2 BEAD 1206
L3 BEAD 1206
100Mil
CHASSIS_GND

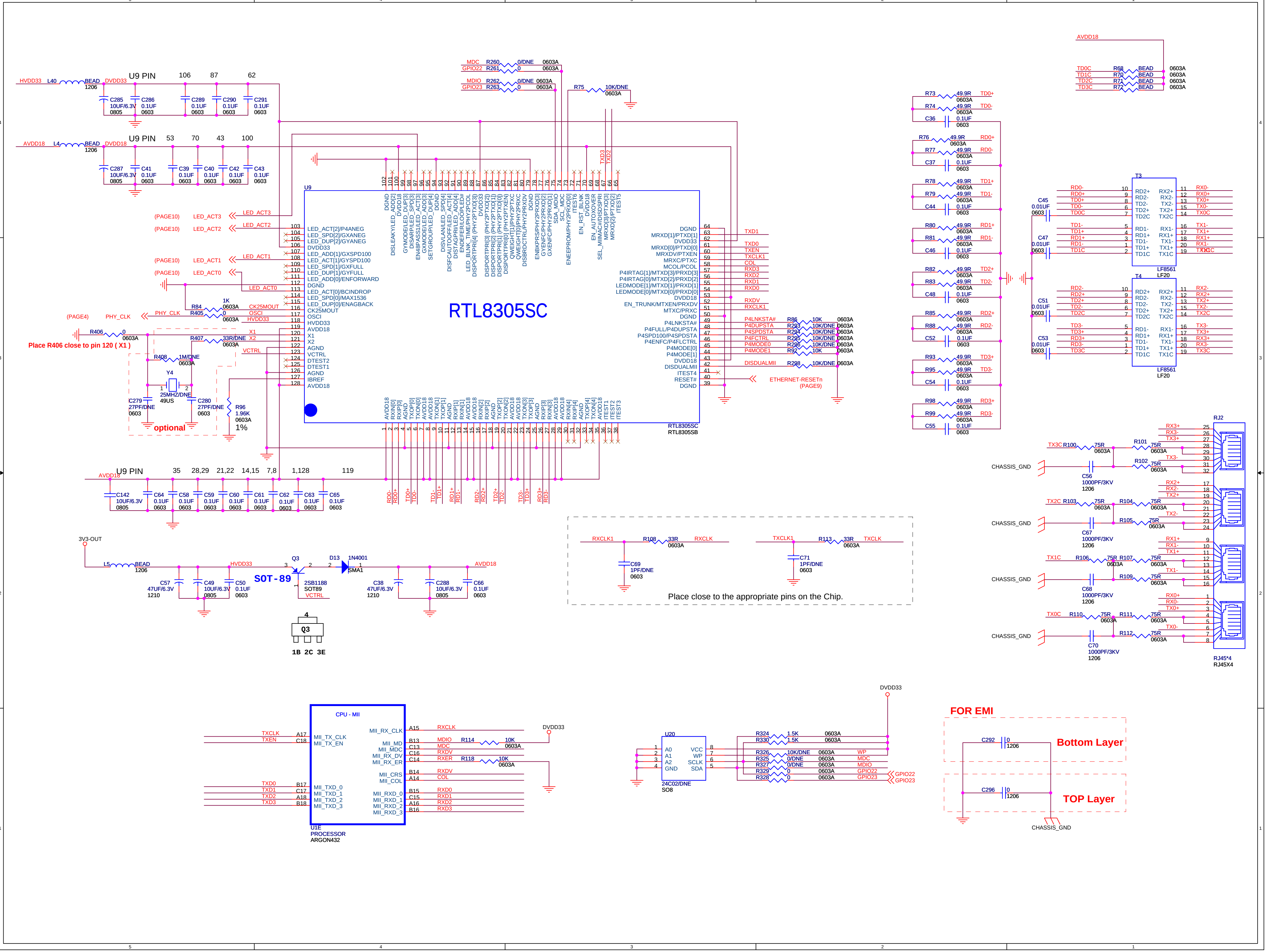

3V3-CPU
J6
GPIO6
GPIO7
TX
RX
HDR 1*4/DNE
SIP\4P
Console Jack


CPU - EPB
(PAGE13) EPB-RDn
(PAGE13) EPB-WRn
(PAGE9) EPB-CS0n
(PAGE13) EPB-CS2n
EPB_STR_0
EPB_STR_1
EPB_STR_2
EPB_PCS_0
EPB_PCS_1
EPB_PCS_2
EPB_PCS_3
EPB_PA_EXT_0
EPB_PA_EXT_1
EPB_PA_EXT_2
EPB_PA_EXT_3
EPB_PA_EXT_4
EPB_PA_EXT_5
EPB_PA_EXT_6
EPB_PA_EXT_7
EPB_PA_EXT_8
EPB_PA_EXT_9
EPB_PCLK
EPB_WAITn
EPB_RWAITn
EPB_PA0
EPB_PA1
EPB_PA2
EPB_PA3
EPB_PA4
EPB_PA5
EPB_PA6
EPB_PA7
EPB_PD_0
EPB_PD_1
EPB_PD_2
EPB_PD_3
EPB_PD_4
EPB_PD_5
EPB_PD_6
EPB_PD_7
EPB_PD_8
EPB_PD_9
EPB_PD_10
EPB_PD_11
EPB_PD_12
EPB_PD_13
EPB_PD_14
EPB_PD_15
EPB-PA0 (PAGE9)
EPB-PA1 (PAGE9)
EPB-PA2 (PAGE9)
EPB-PA3 (PAGE9)
EPB-PA4 (PAGE9)
EPB-PA5 (PAGE9)
EPB-PA6 (PAGE9)
EPB-PA7 (PAGE9)
EPB-PD0 (PAGE9)
EPB-PD1 (PAGE9)
EPB-PD2 (PAGE9)
EPB-PD3 (PAGE9)
EPB-PD4 (PAGE9)
EPB-PD5 (PAGE9)
EPB-PD6 (PAGE9)
EPB-PD7 (PAGE9)
EPB-PD8 (PAGE9)
EPB-PD9 (PAGE9)
EPB-PD10 (PAGE9)
EPB-PD11 (PAGE9)
EPB-PD12 (PAGE9)
EPB-PD13 (PAGE9)
EPB-PD14 (PAGE9)
EPB-PD15 (PAGE9)
R54 33R 0603A
R55 10K 0603A
R56 10K 0603A
R57 10K 0603A
R58 10K 0603A
R59 10K 0603A
R60 10K/DNE 0603A
3V3-CPU
U1F PROCESSOR ARGON432
rev ID = "1110" inverted


CPU - GPIO
(PAGE10) WIRELESS-LED
(PAGE12) VOIP-SPI-INTn
(PAGE13) VOIP-INTn
(PAGE10) DSLACT-LED
(PAGE10) USB-LED
(PAGE10) RESET-DEFAULTn-PLED
(PAGE10) UART-TX
(PAGE10) UART-RX
(PAGE9) GPIO8
(PAGE9) GPIO9
(PAGE9) GPIO10
(PAGE9) GPIO11
(PAGE12) VOIP-SPI-CS0n
(PAGE12) VOIP-SPI-DIN
GPIO3
R413 0 0603A GPIO6
R97 0 0603A GPIO7
(FIQ) (MIQ) (BOOT-OUT) (BOOT-IN) (BOOT-CLK) (TXCLK-EN) (RXCLK-EN)
N_BCS
SPI-CSn (PAGE9)
DIAG-LED (PAGE10)
VOIP-SPI-DOUT (PAGE12)
GPIO17 (PAGE9)
GPIO18 (PAGE9)
VOIP-RESETn (PAGE12,13)
VOIP-RELAY (PAGE12)
GPIO22 (PAGE6)
GPIO23 (PAGE6)
R321 0 0603A
VOIP-SPI-CLK (PAGE12)
ETHERNET-RESETn (PAGE6)
DSLINK-LED (PAGE10)
GPIO27
R61 10K 0603A
3V3-CPU
U1C PROCESSOR ARGON432
(8 BIT FLASH)
1 = 8 BIT
GPIO27 is set to 1 to enable FLASH Byte Mode operation.


3V3-CPU
U21
SDRAM
1M*16*4b
TSOP-S4-T2-A
U22
SDRAM
1M*16*4b
TSOP-S4-T2-A
CPU - SDRAM
U1A
PROCESSOR
ARGON432
CPU- GDP
U1B
PROCESSOR
ARGON432
R119
10K
0603A
R63
10K 0603A
C35
1PF/DNE
0603
SDRAM DECOUPLING
LOCATE NEAR POWER PINS
C21 0.01UF 0603
C22 0.01UF 0603
C23 0.01UF 0603
C24 0.01UF 0603
C25 0.01UF 0603
C26 0.01UF 0603
C27 0.01UF 0603
C28 0.01UF 0603
C29 0.01UF 0603
C30 0.01UF 0603
C31 0.01UF 0603
C32 0.01UF 0603
C33 0.01UF 0603
C34 0.01UF 0603


3V3-CPU
124 88 70 24 28 40 19 31 63 89
C1 0.01UF 0603
C2 0.01UF 0603
C3 0.01UF 0603
C4 0.01UF 0603
C5 0.01UF 0603
C6 0.01UF 0603
C7 0.01UF 0603
C8 0.01UF 0603
C9 0.01UF 0603
C10 0.01UF 0603
3V3-CPU
CPU - PCI
U1G
PROCESSOR
ARGON432
PCI_RSTn
PCI_INTAn
PCI_REQn
PCI_GNTn
PCI_PERRn
PCI_PAR
PCI_IDSELn
PCI_DEVSELn
PCI_FRAMEn
PCI_STOPn
PCI_TRDYn
PCI_IRDYn
PCI_CBE0n
PCI_CBE1n
PCI_CBE2n
PCI_CBE3n
PCI_CLK
R1 10K 0603A
R2 10K 0603A
R3 10K 0603A
R4 10K 0603A
R5 10K 0603A
R6 10K 0603A
R7 10K 0603A
R8 10K 0603A
R9 10K 0603A
R10 10K 0603A
R11 10K 0603A
R12 33R 0603A
C137 1PF/DNE 0603
R13 0 0603A
Place close to the appropriate pins on the CPU
3V3-CPU
J1
SKT 62X2
MINIPCI-0.8A
NOTE : CLKRUN signal is not included in the PCI interface of Helium. If used, it must be routed through a GPIO pin.
R15 10K/DNE 0603A
R16 10K 0603A
R17 10K 0603A
R18 10K 0603A
R19 10K 0603A
R20 10K 0603A
R21 10K 0603A
R22 10K 0603A
3V3-CPU



RTL8305SC
U9
RTL8305SC
RTL8305SB
U9 PIN
Place R406 close to pin 120 (X1)
optional
25MHZ/DNE
SOT-89
Q3
1B 2C 3E
2SB1188
1N4001
Place close to the appropriate pins on the Chip.
T3
T4
LF8561
LF20
RJ2
RJ45*4
RJ45X4
CHASSIS_GND
CPU - MII
U1E
PROCESSOR
ARGON432
U20
24C02/DNE
SO8
FOR EMI
Bottom Layer
TOP Layer
ETHERNET-RESETn
(PAGE9)
(PAGE10)
(PAGE4)
PHY_CLK
HVDD33
AVDD18
DVDD33
3V3-OUT

Place PI filter components close to analog front end, see Design Guide for details.

Place at pins 32,34.

Place 10uF capacitor CA5 close to diodes. Provide footprint for zener diode to limit voltage across supply during surge / linecross.

No ground plane in enclosed area. A DNE footprint for a common mode choke is provided for controlling EMI emissions and improving EMI immunity.

Traces 40 Mils

Co-location of component footprints permitted.

Place at pins 44,52.

CA6,CA11,CA9,CA10 NPO 5%

RA2,RA4,RA5 1% Resistance

Footprint RA8 is required for ADSL Annex B. It is not populated for Annex A.

Traces 25 Mils

Do not co-locate RA6 and RA7, or RA9 and RA10. All four footprints must be included.

CA17 NPO 5%

AFE 3881

QFN-64A2

CA15,CA16,CA20,CA21,CA22 NPO 5%

RA8,RA11,RA12,RA13,RA14,RA15,RA16,RA17 1% Resistance

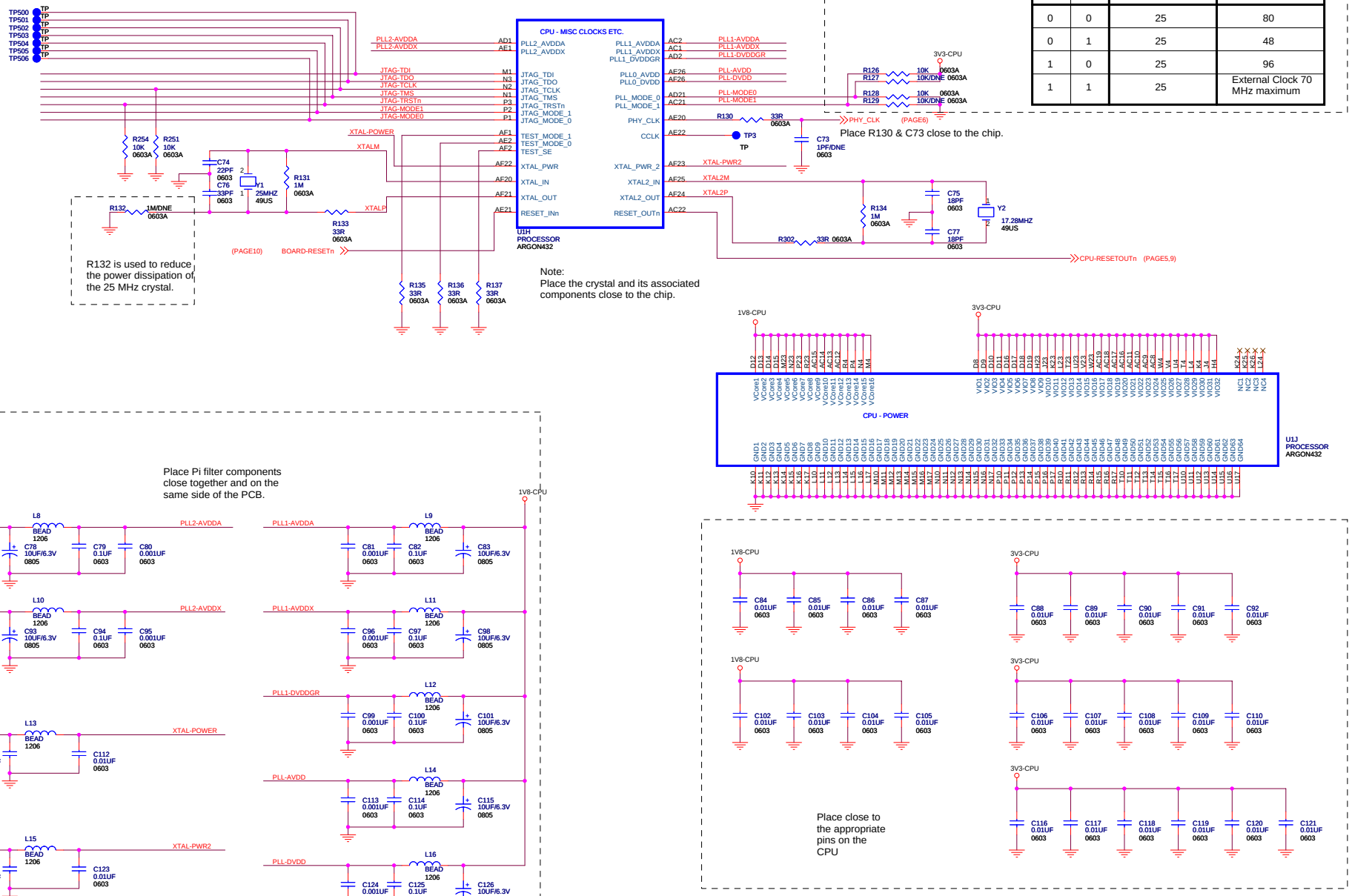
Populate capacitor footprints CA25, CA26, CA32, and CA33 with zero ohms. Do not populate CA29, CA30, LA4, and LA5.

CA27,CA28,CA31,CA34,CA35 NPO 5%

RA18 1% Resistance

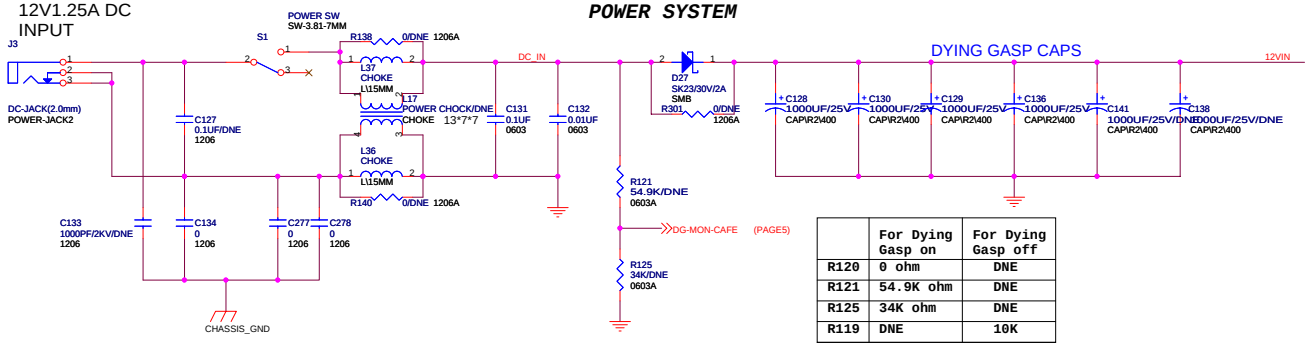
Place close to the appropriate pins on the CPU

Place R122 & C72 close to the chip.

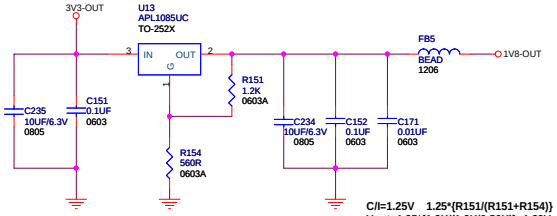

CPU - MISC CLOCKS ETC.
U1H
PROCESSOR
ARGON432
PLL_MODE
1
0
Crystal reference frequency (MHz)
Core clock frequency (MHz)
0 0 25 80
0 1 25 48
1 0 25 96
1 1 25 External Clock 70 MHz maximum
Place R130 & C73 close to the chip.
R132 is used to reduce the power dissipation of the 25 MHz crystal.
Note:
Place the crystal and its associated components close to the chip.
CPU - POWER
U1J
PROCESSOR
ARGON432
Place Pi filter components close together and on the same side of the PCB.
Place close to the appropriate pins on the CPU

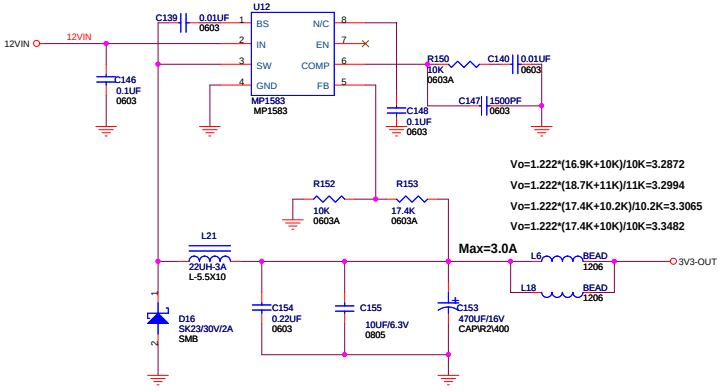
POWER SYSTEM

12V1.25A DC INPUT

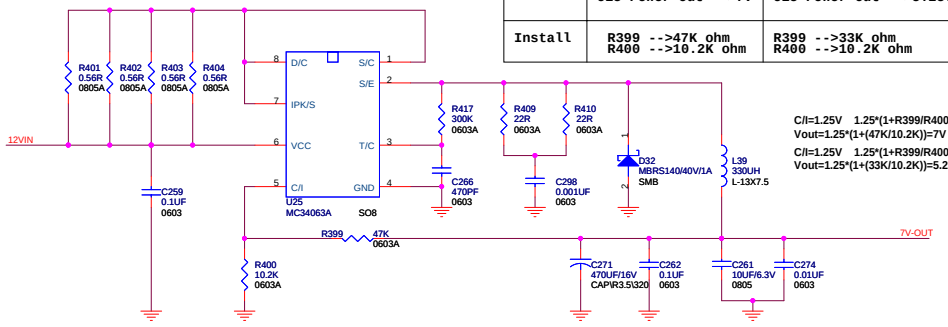


	For Dying Gasp on	For Dying Gasp off
R120	0 ohm	DNE
R121	54.9K ohm	DNE
R125	34K ohm	DNE
R119	DNE	10K

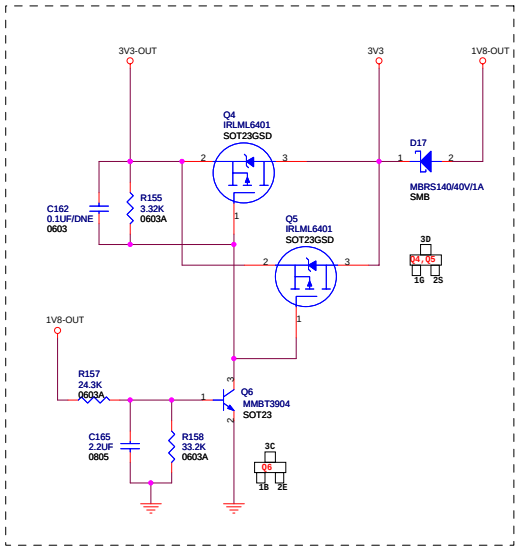




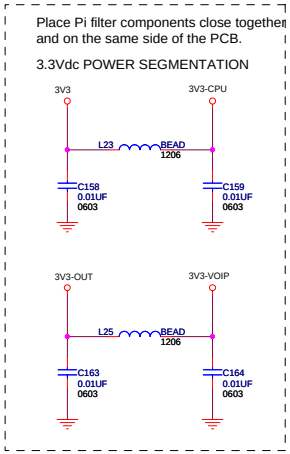
	U25 Power Out -->7V	U25 Power Out -->5.25V
Install	R399 -->47K ohm R400 -->10.2K ohm	R399 -->33K ohm R400 -->10.2K ohm



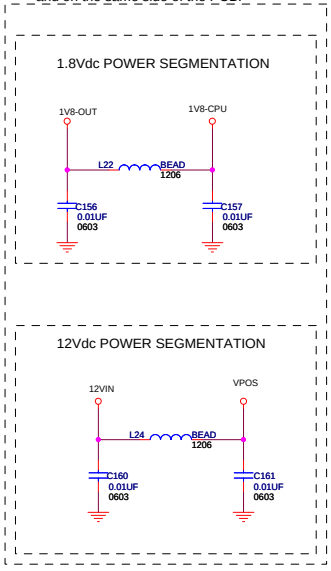
Power sequencing circuitry. Place components close to 1.8V regulators.
Please refer to application note DO-400569-AN.



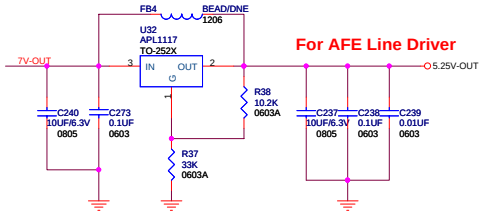
Place Pi filter components close together and on the same side of the PCB.

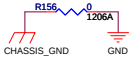


Place Pi filter components close together and on the same side of the PCB.

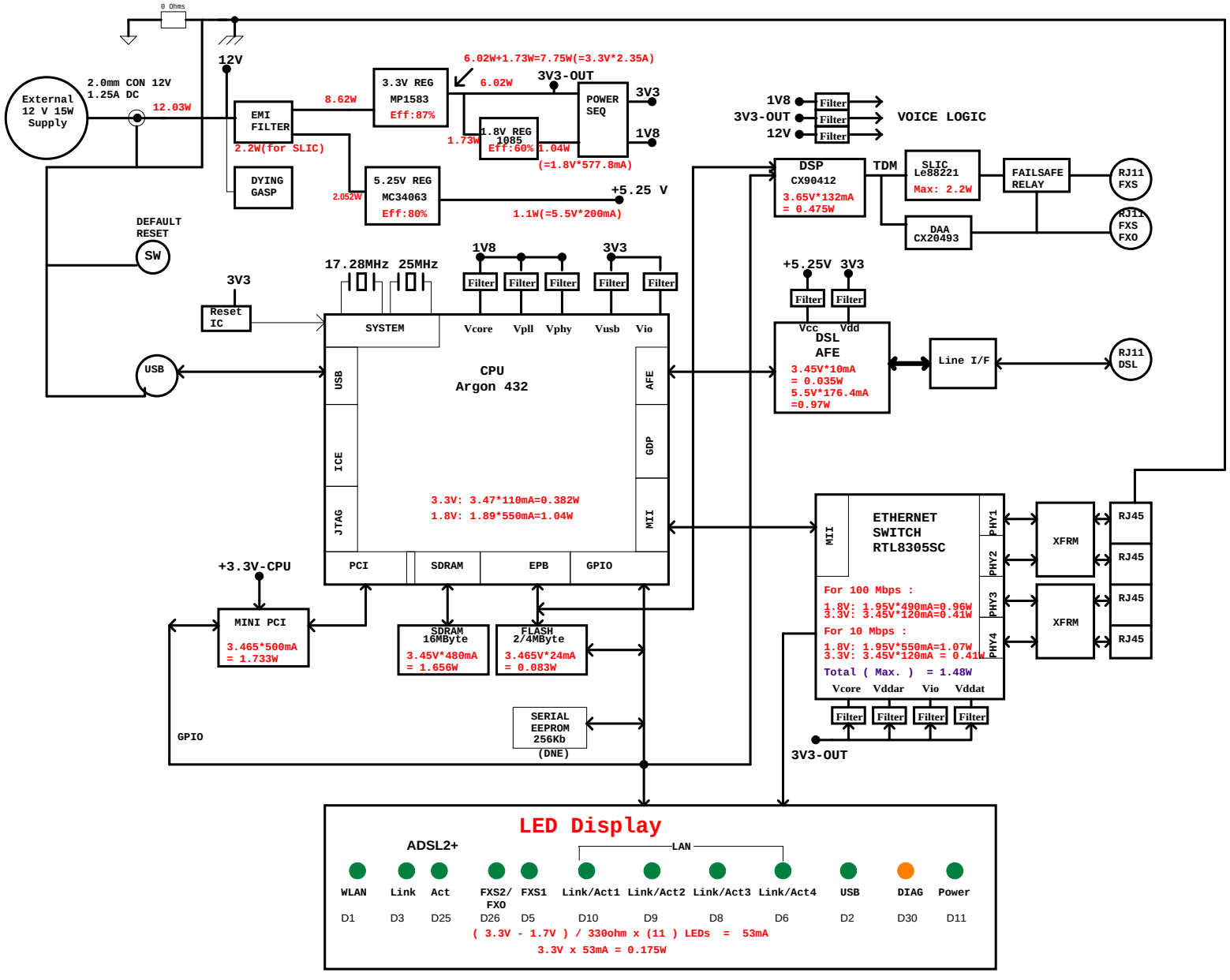


Optional





CHASSIS GROUND


0 Ohms
12V
External 12 V 15W Supply
2.0mm CON 12V 1.25A DC
12.03W
EMI FILTER
2.2W(for SLIC)
8.62W
3.3V REG MP1583 Eff:87%
6.02W+1.73W=7.75W(=3.3V*2.35A)
6.02W
3V3-OUT
POWER SEQ
3V3
1V8
1.8V REG 1085 Eff:60%
1.73W
1.04W
(=1.8V*577.8mA)
DYING GASP
5.25V REG MC34063 Eff:80%
2.052W
+5.25 V
1.1W(=5.5V*200mA)
DEFAULT RESET
SW
3V3
Reset IC
17.28MHz 25MHz
1V8
3V3
Filter
SYSTEM
Vcore Vpll Vphy Vusb Vio
USB
CPU Argon 432
ICE
JTAG
AFE
GDP
MII
3.3V: 3.47*110mA=0.382W
1.8V: 1.89*550mA=1.04W
PCI
SDRAM
EPB
GPIO
+3.3V-CPU
MINI PCI
3.465*500mA = 1.733W
SDRAM 16MByte
3.45V*480mA = 1.656W
FLASH 2/4MByte
3.465V*24mA = 0.083W
SERIAL EEPROM 256Kb (DNE)
GPIO
1V8
3V3-OUT
12V
VOICE LOGIC
DSP CX90412
3.65V*132mA = 0.475W
TDM
SLIC Le88221
Max: 2.2W
FAILSAFE RELAY
RJ11 FXS
DAA CX20493
RJ11 FXS FXO
+5.25V 3V3
Vcc Vdd
DSL AFE
3.45V*10mA = 0.035W
5.5V*176.4mA =0.97W
Line I/F
RJ11 DSL
MII
ETHERNET SWITCH RTL8305SC
PHY1
PHY2
PHY3
PHY4
For 100 Mbps :
1.8V: 1.95V*490mA=0.96W
3.3V: 3.45V*120mA=0.41W
For 10 Mbps :
1.8V: 1.95V*550mA=1.07W
3.3V: 3.45V*120mA = 0.41W
Total (Max.) = 1.48W
Vcore Vddar Vio Vddat
XFRM
RJ45
3V3-OUT
LED Display
ADSL2+
LAN
WLAN Link Act FXS2/FXO FXS1 Link/Act1 Link/Act2 Link/Act3 Link/Act4 USB DIAG Power
D1 D3 D25 D26 D5 D10 D9 D8 D6 D2 D30 D11
(3.3V - 1.7V) / 330ohm x (11) LEDs = 53mA
3.3V x 53mA = 0.175W

VDR824G Schematic

Table of Contents