



## A



## B



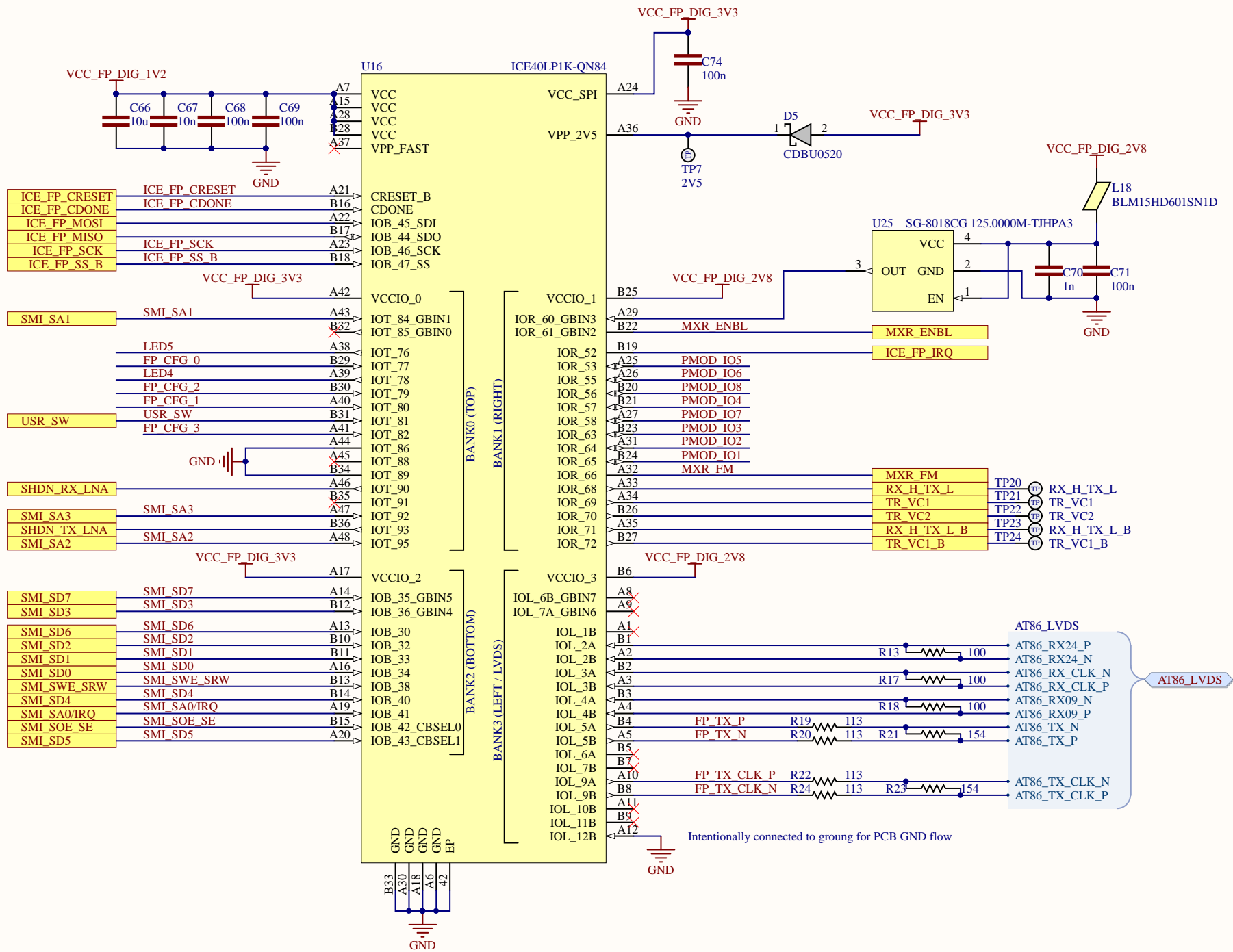
## B



## C

D

FPGA



LVDS Negated Pairs

AT86\_TX  
AT86\_RX09  
AT86\_TX\_CLK

The other two are direct logic.

PROGRAMMING

POR=> Check SS  
1. if SS='1' => if NVCM programmed, use NVCM, otherwise use external flash (SPI MASTER).  
2. if SS='0', wait to be configured from external controller through SPI

RESET - restarts the configuration  
CDONE - before configuration finished is '0', When done turns '1'

Calculation of differential lines

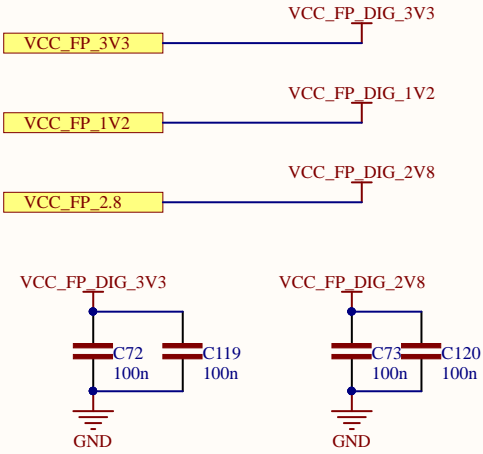
VCCIO = 2.8V  
VOD = 0.5V (this is the differential swing nominal)  
Rouput = 30 Ohms (given by ICE40 Specs)

The parallel output resistor:  
 $R_p = 2 * (50 * 2.8 / (2.8 - (2 * 0.5))) = 280 / 1.8 = 155 \text{ Ohms}$

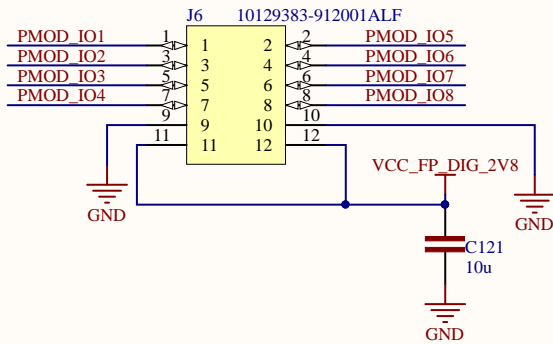
The series output resistors:  
 $R_s = (50 * 77) / (77 - 50) - 30 = 112 \text{ Ohms}$

Connect the positive or true polarity side of the differential pair to the DPxxA input and the negative or complementary side of the pair to the DPxxB input.  
==== If it is easier to route the differential pair, the input pins can be swapped, which produces an inverted input value. =====  
====The inverted input value can subsequently be inverted by logic within the FPGA. =====

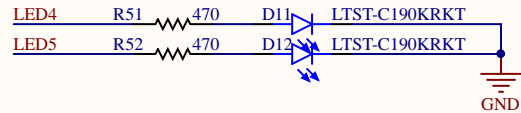
POWER TERMINALS



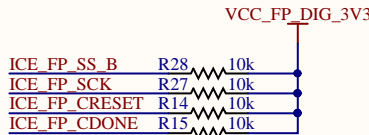
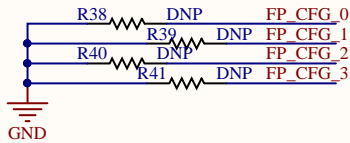
PMOD




LEDS



Configuration Resistors - Place 10k for pulldown as needed  
Apply internal FPGA pullups on all config pins



TITLE FPGA ICE40LP		PRODUCT NAME / P/N CaribouLite / CARIBOULITE-V2		<div> <a href="http://www.cariboulabs.co">www.cariboulabs.co</a> Open Source RF Tools</div>
DESIGNER:     DM				
REVIEWER:    -				
DATE:   6/14/2021		REV:    B		
SIZE	DRAWING NO.	SHT	OF	
A3	DN00001	4	7	

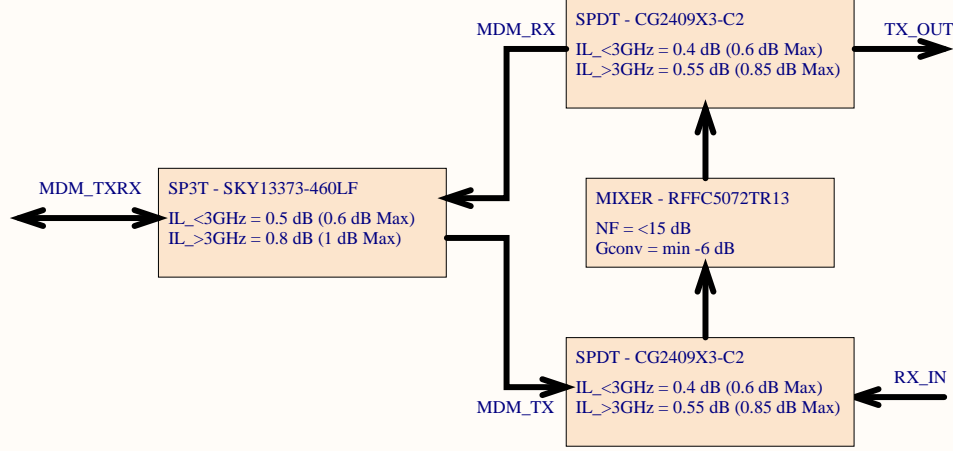
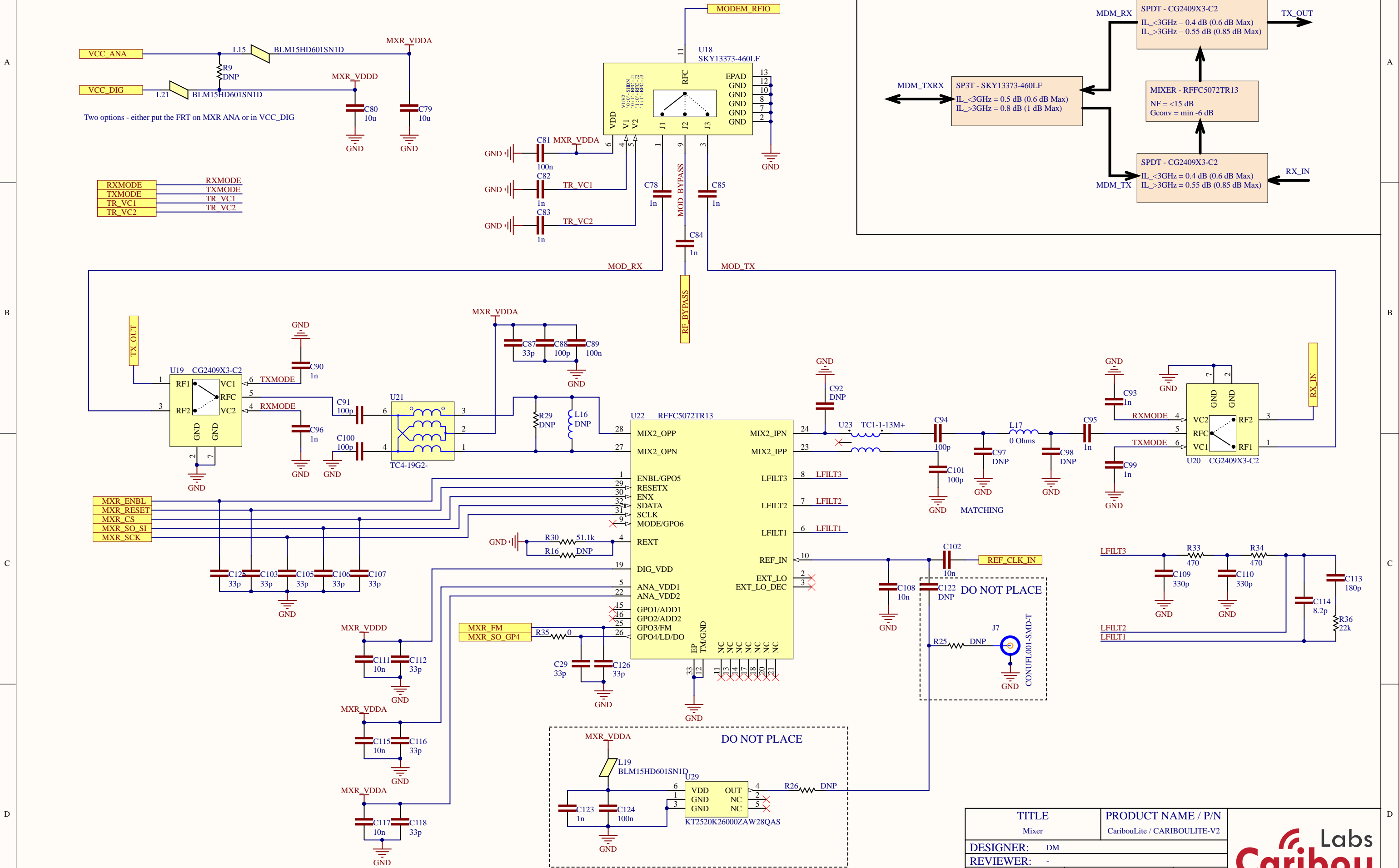
## A




## D

MIXER - QORVO RFFC5072

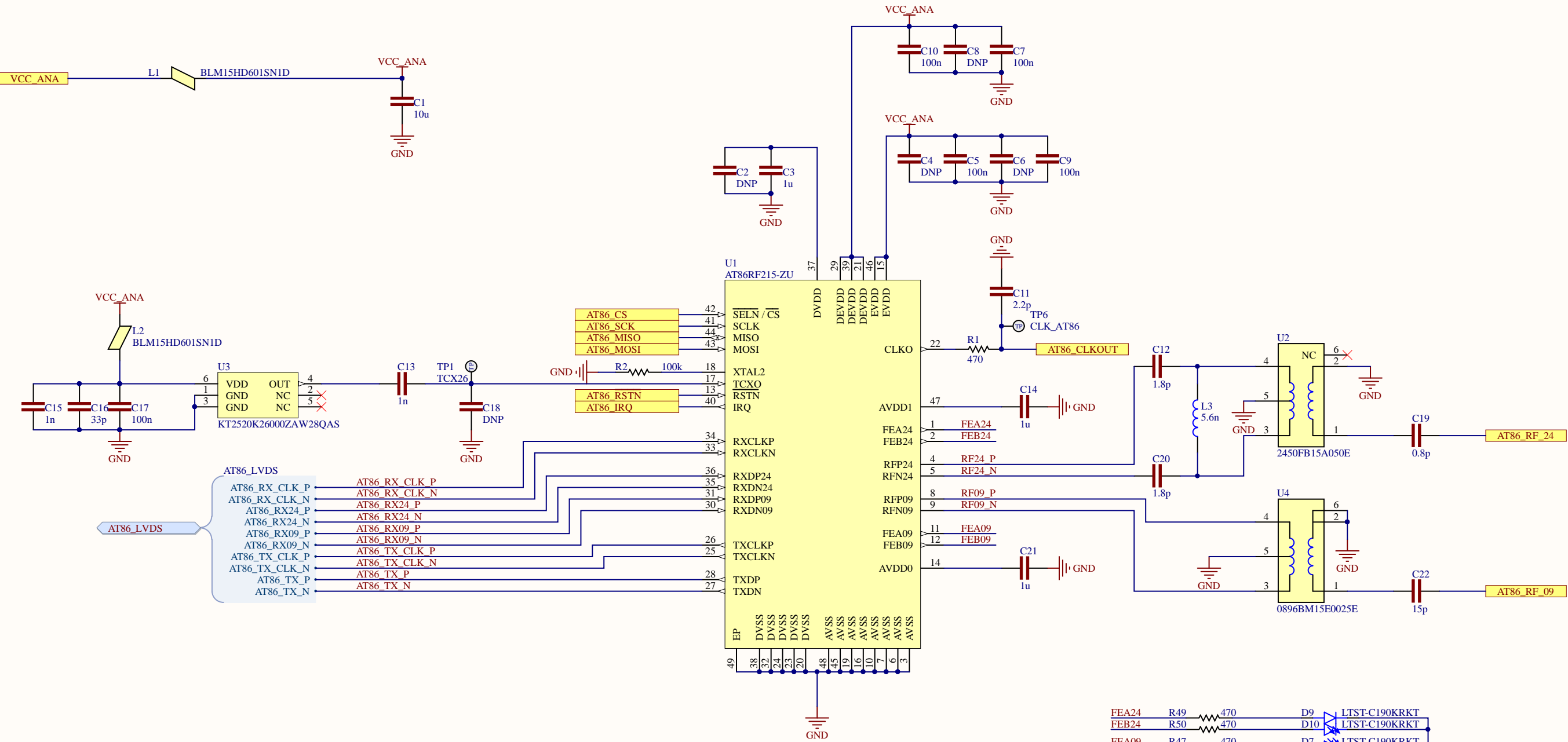
RF DOCUMENTATION



TITLE Mixer		PRODUCT NAME / P/N CaribouLite / CARIBOULITE-V2		<div> <a href="http://www.cariboulabs.co">www.cariboulabs.co</a> Open Source RF Tools</div>
DESIGNER: DM				
REVIEWER: -				
DATE: 6/14/2021		REV: B		
SIZE A3	DRAWING NO. DN00001	SHT 6	OF 7	
open source hardware				



MODEM - AT86RF215

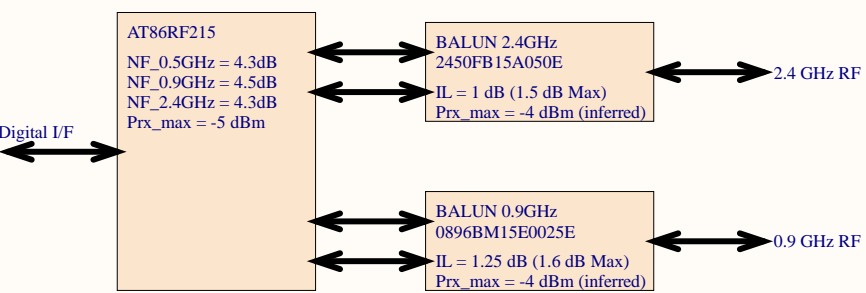


FEA24	R49	470	D9	LTST-C190KRKT
FEB24	R50	470	D10	LTST-C190KRKT
FEA09	R47	470	D7	LTST-C190KRKT
FEB09	R48	470	D8	LTST-C190KRKT

Frontend Pin Configuration  
=====

All Off => A=0, B=0  
RX LNA mode => A=0, B=1  
TX mode => A=1, B=0  
RX Bypass => A=1, B=1

RF DOCUMENTATION



TITLE Modem and TCXO		PRODUCT NAME / P/N CaribouLite / CARIBOULITE-V2	
DESIGNER: DM			
REVIEWER: -			
DATE: 6/14/2021		REV: B	
SIZE A3	DRAWING NO. DN00001	SHT 7	OF 7

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