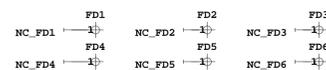
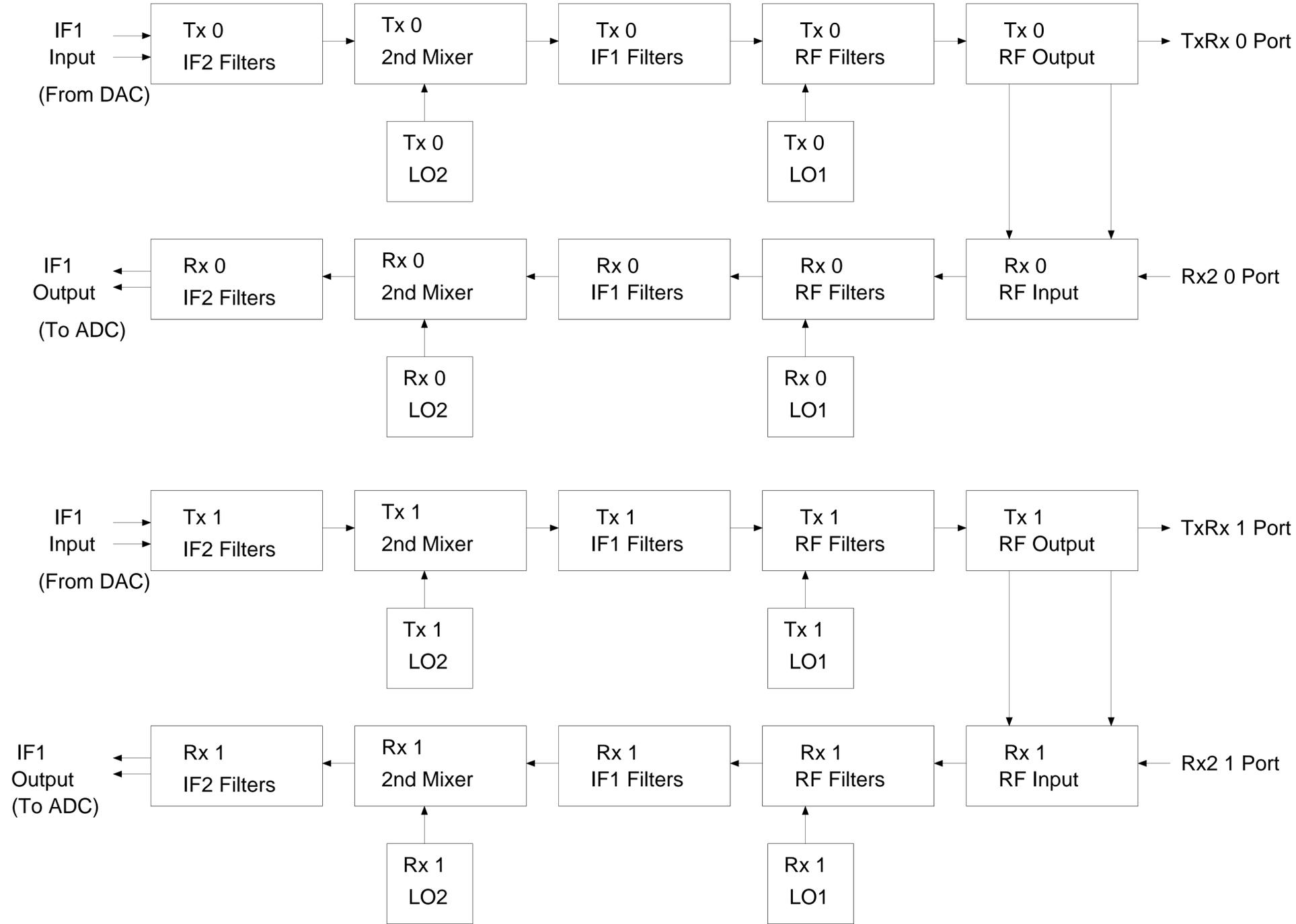


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REVISIONS	
REV	DESCRIPTION
1	REFER TO DATABASE FOR DWG STATUS



DESIGN TEAM		NI.COM AUSTIN, TEXAS			
DRAWN	DATE	TITLE SCHEMATIC DIAGRAM USRP ZBX, DAUGHTERBOARD			
REVISED	DATE				
CHECKED					
TECH		SIZE	CODE IDENT NO.	DRAWING NO.	REV
ENGR		C	7U296	130019C-01	1
SCALE: NONE				SHEET 1 OF 33	

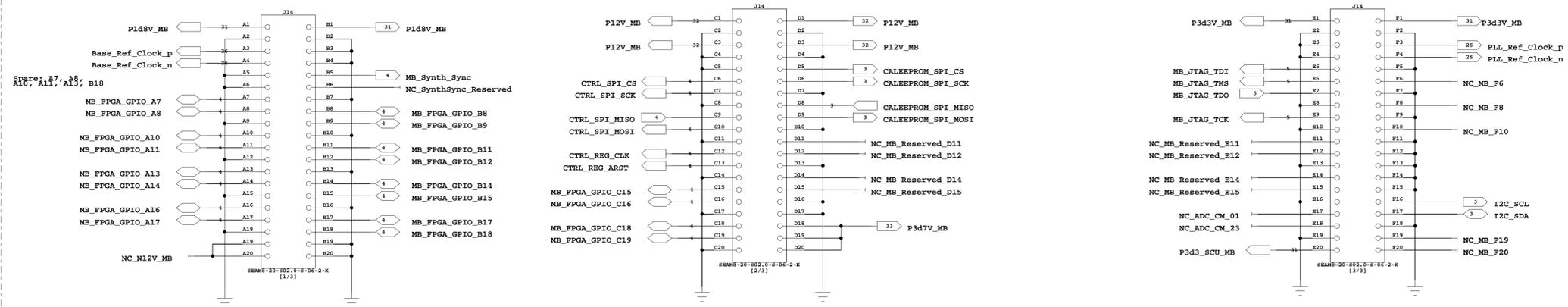
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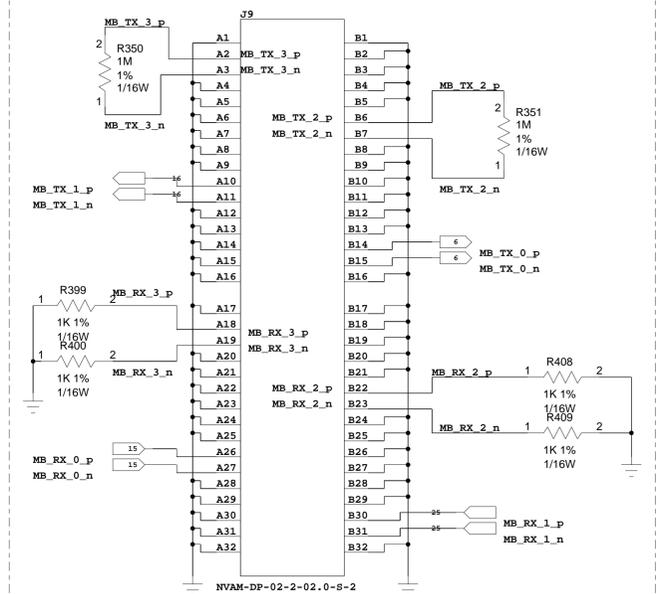
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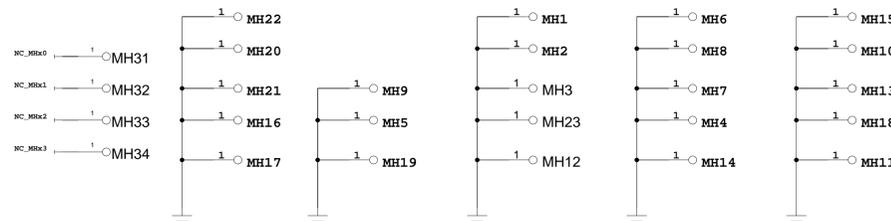
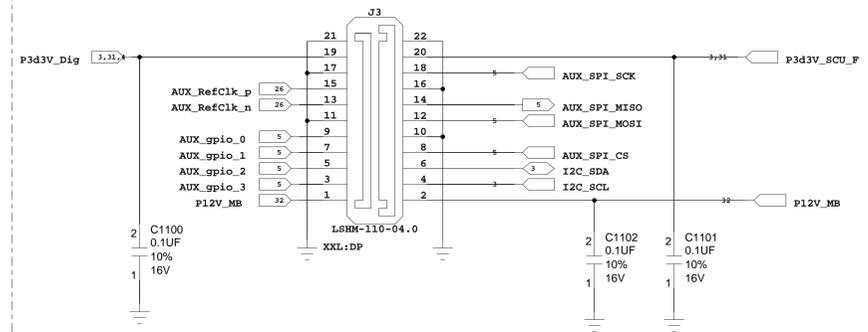
Motherboard Digital and Power Connector



Motherboard ADC/DAC Connector



Aux Board Connector



Mezzanine Connectors			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE		SHEET 2 OF 33	

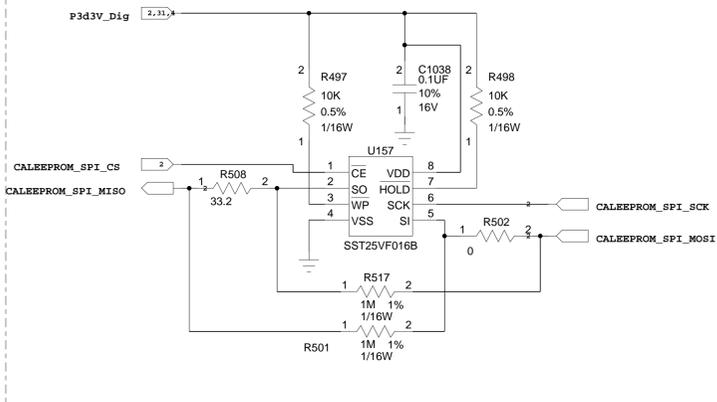
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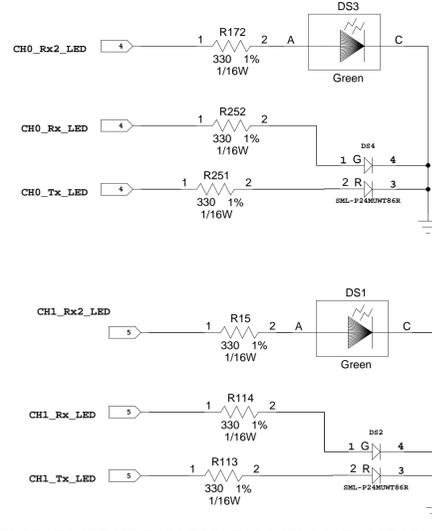
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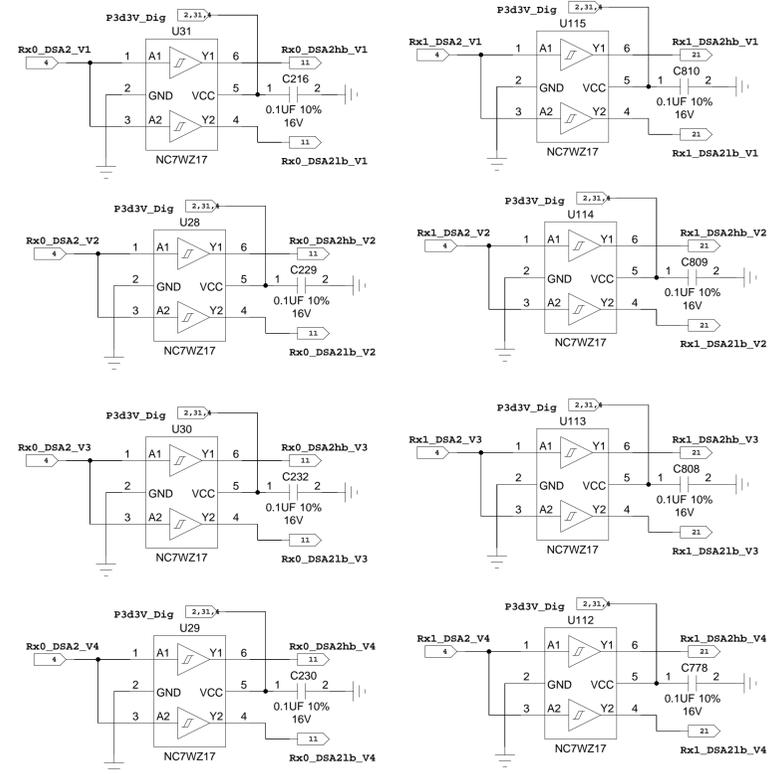
Calibration EEPROM



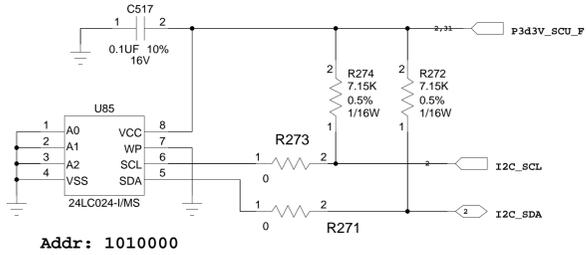
Front Panel LEDs



Rx DSA 2 Buffers

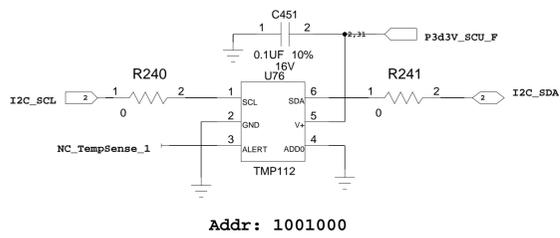


Bd ID EEPROM



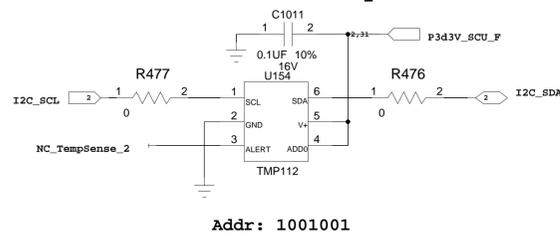
Temperature Sensor 1

Top Side Temp Sensor



Temperature Sensor 2

Bottom Side Temp Sensor



Misc Digital

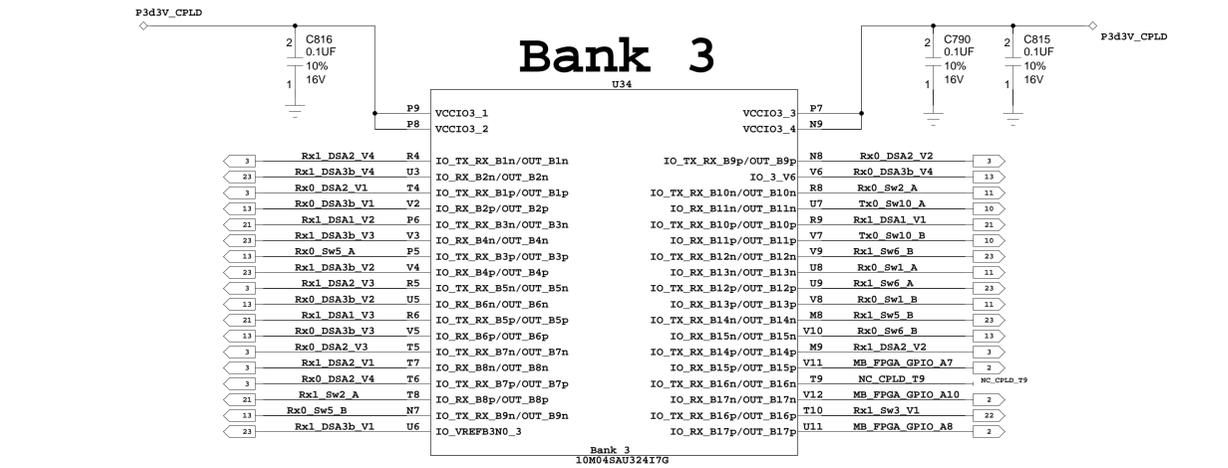
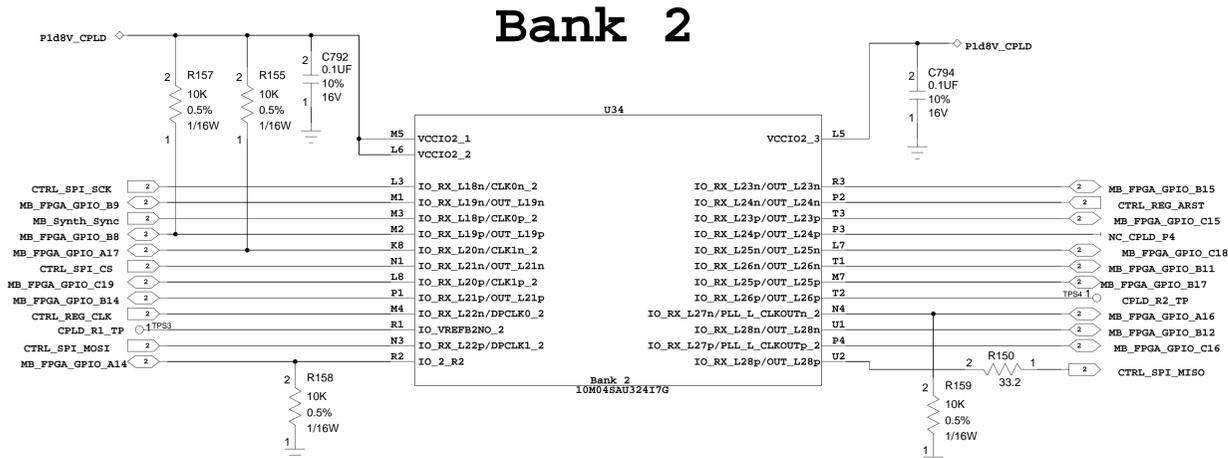
ZBX RF Daughterboard

SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE		SHEET 3 OF 33	

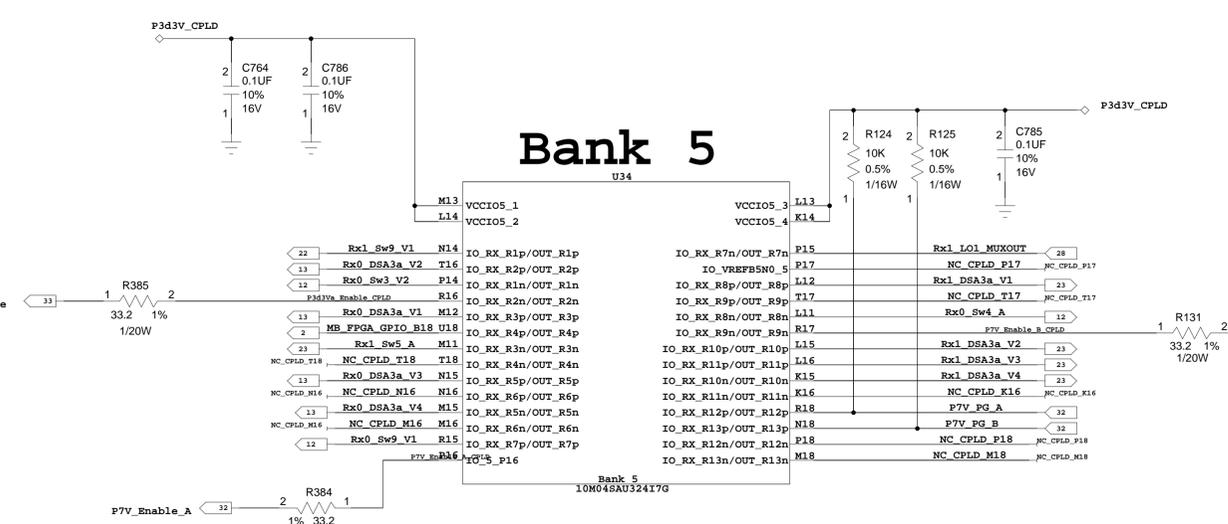
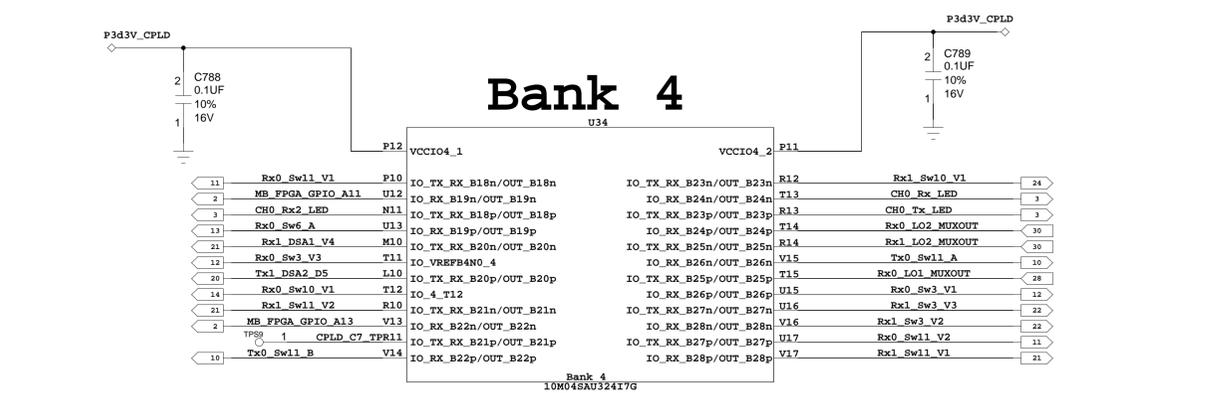
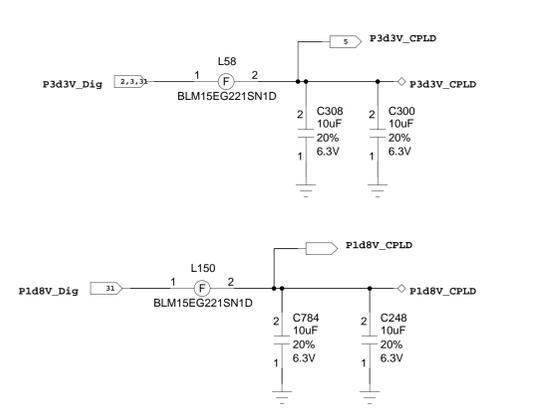
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CPLD Bulk Capacitance

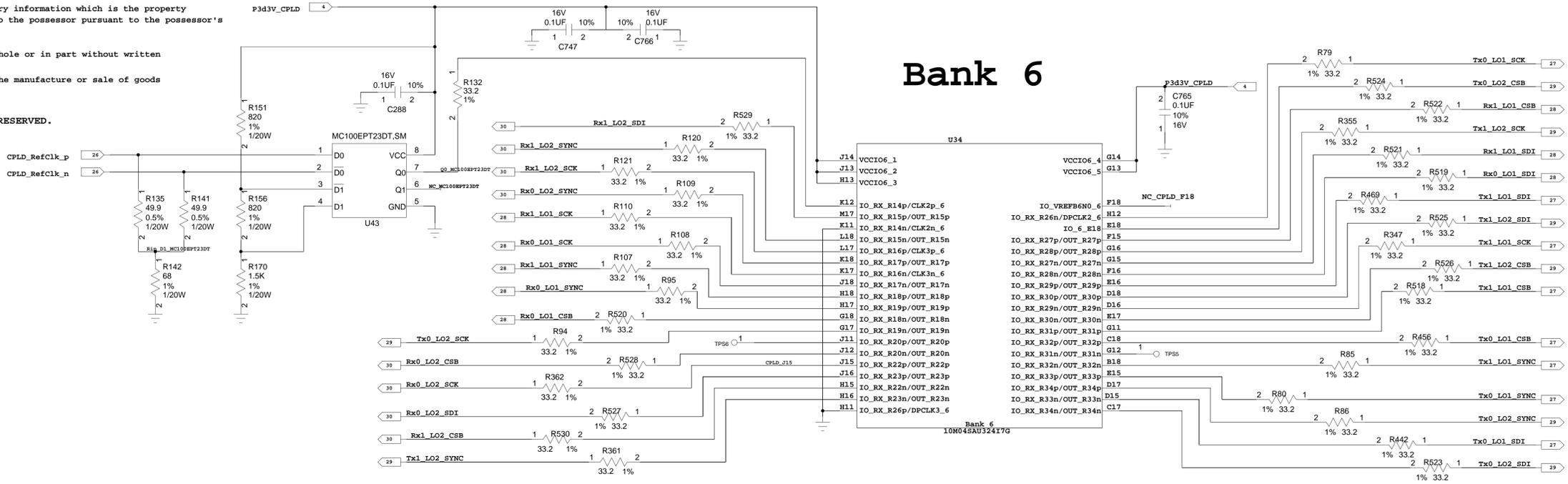


CPLD A			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE		SHEET 4 OF 33	

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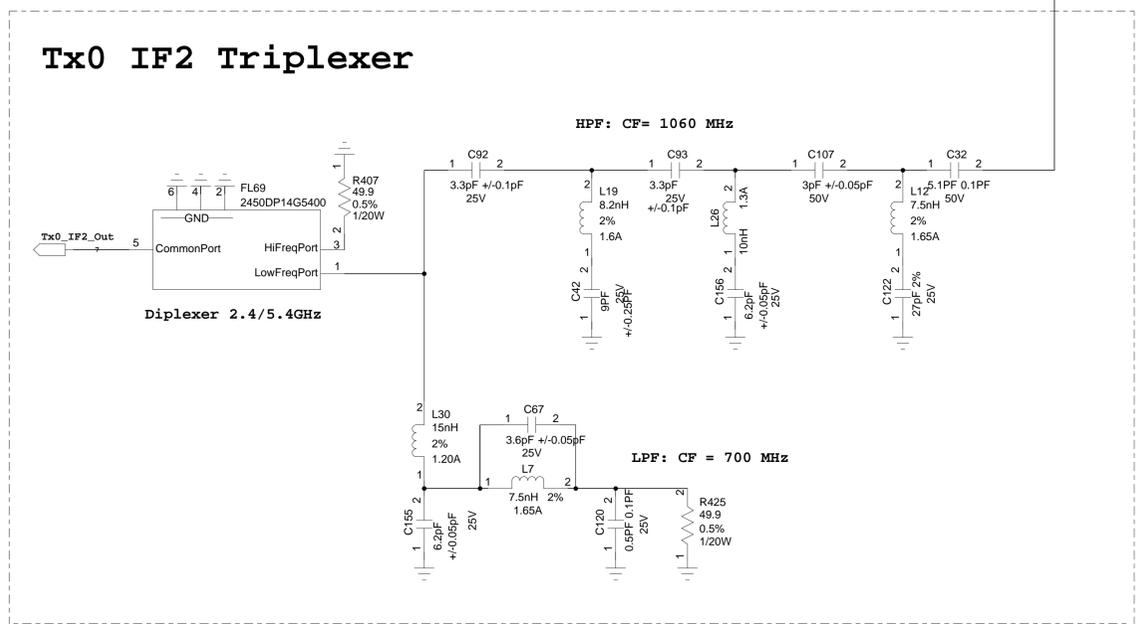
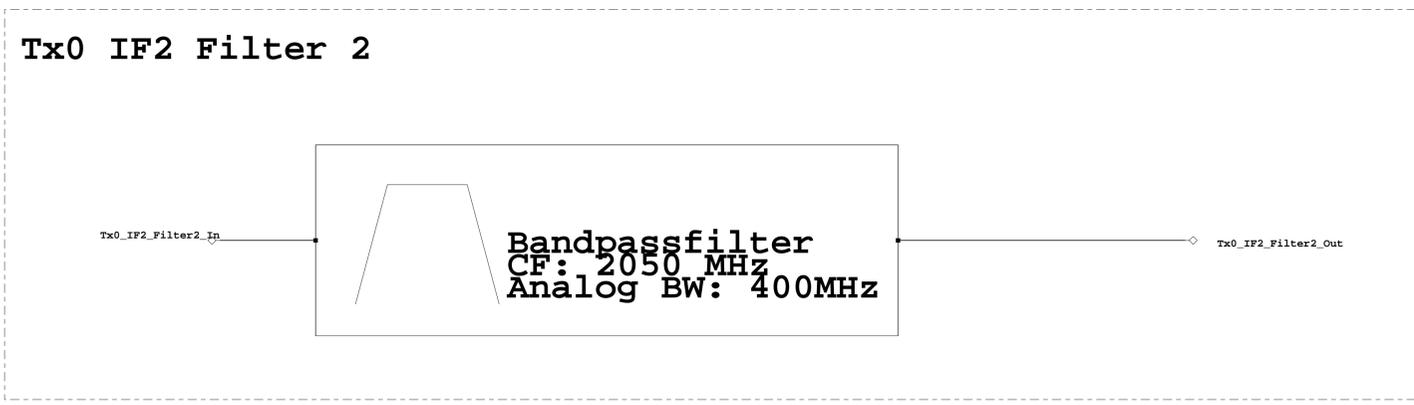
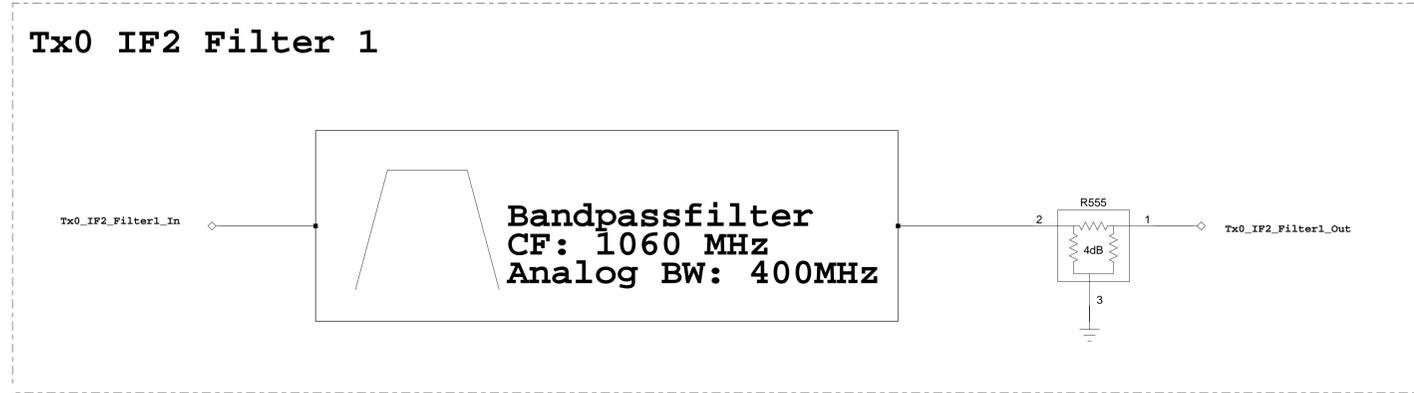
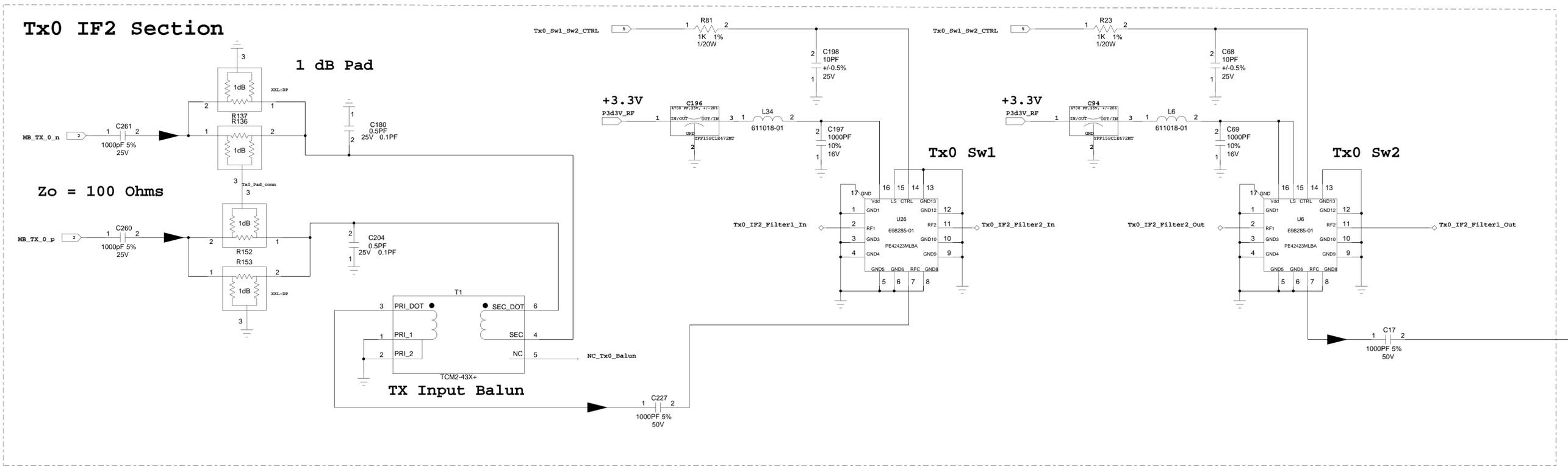
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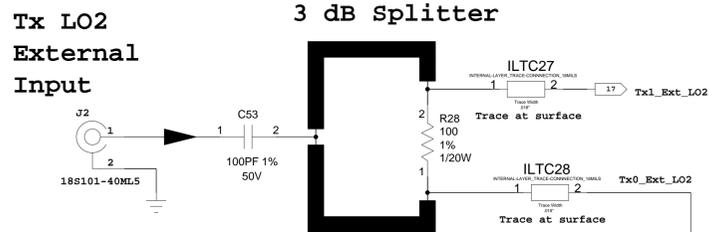
Tx0 IF2 Filters			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE		SHEET 6 OF 33	

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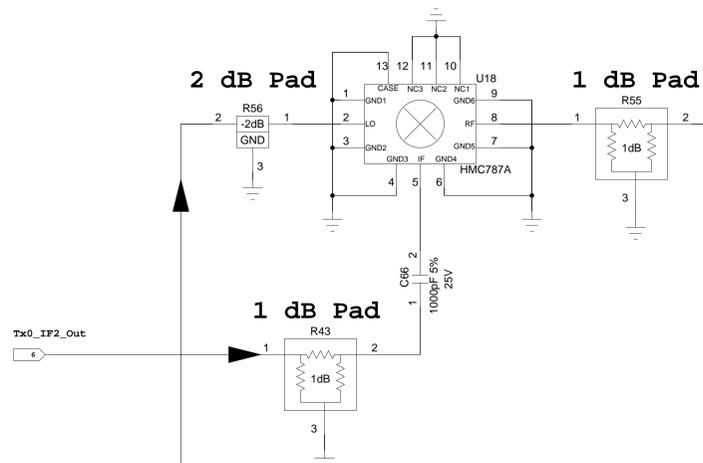
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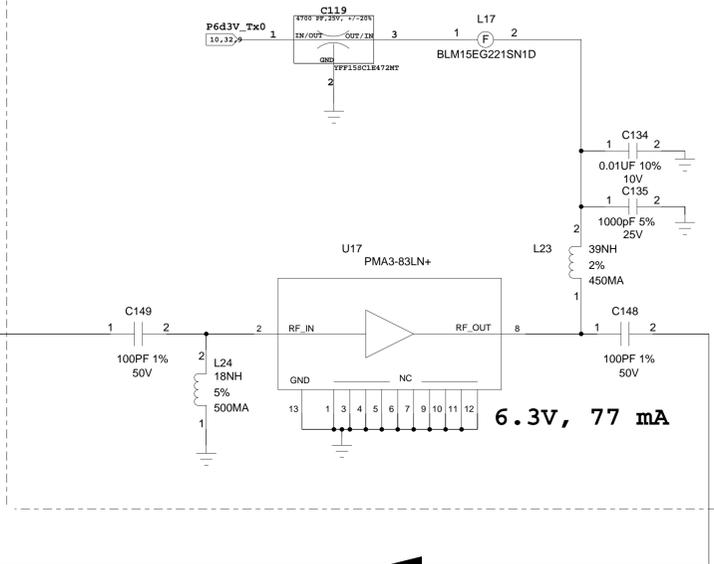
Tx0 LO2 Power Splitter



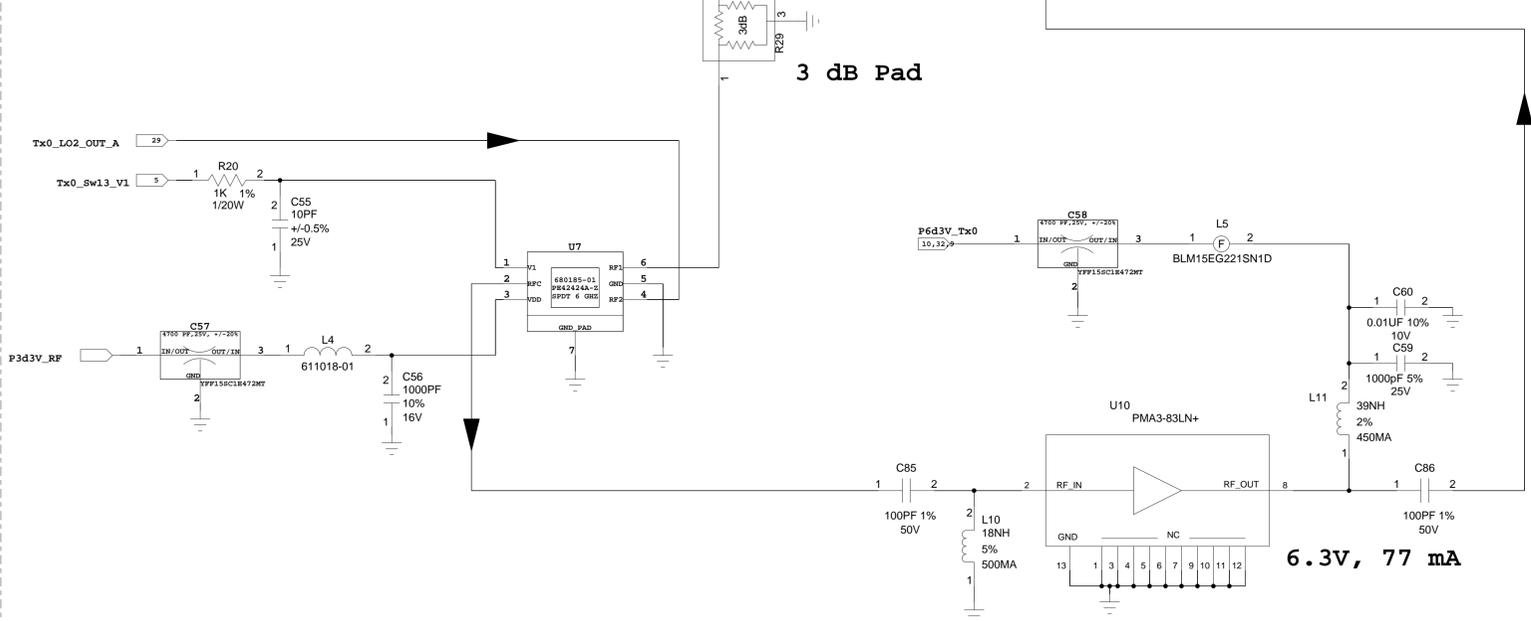
Tx0 Second Mixer



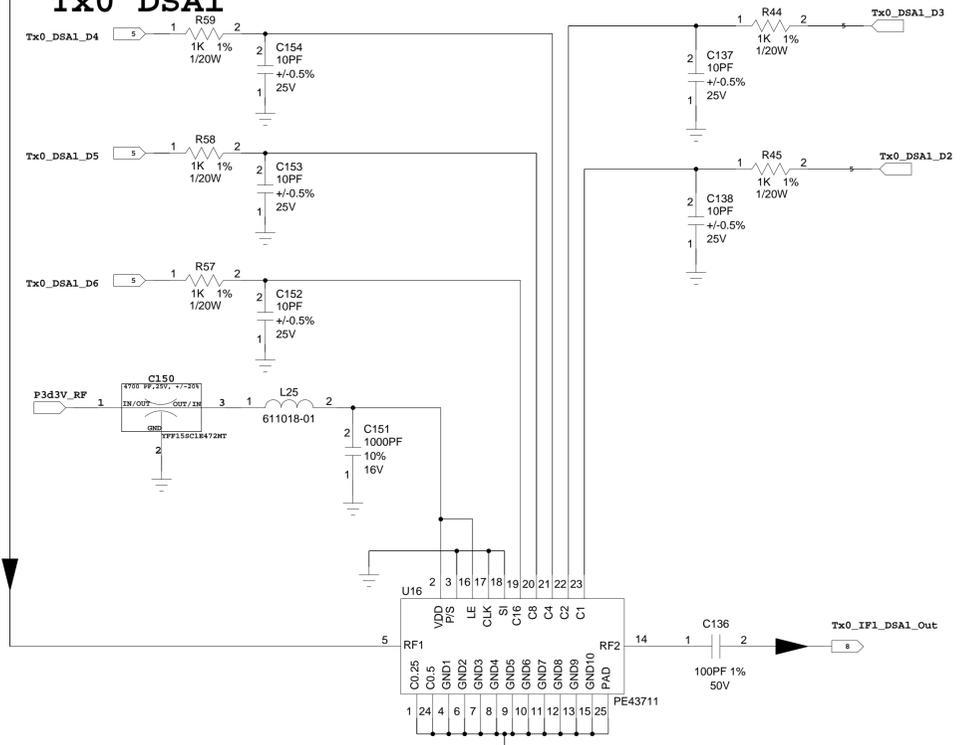
Tx0 IF1 Amplifier 1



Tx0 LO2 Amplifier



Tx0 DSA1



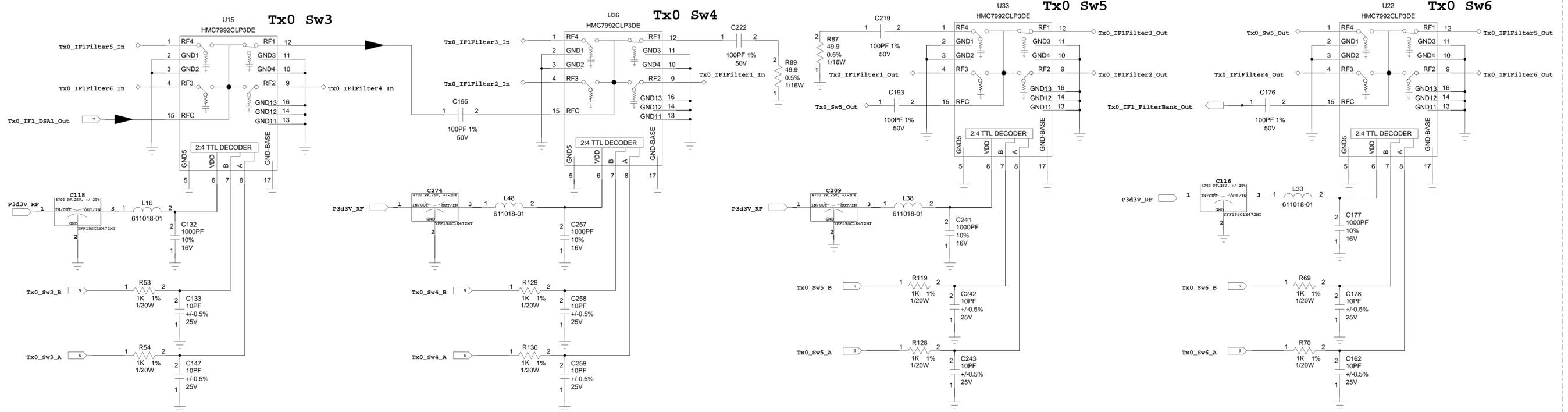
Tx0 2nd Mixer			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE			SHEET 7 OF 33

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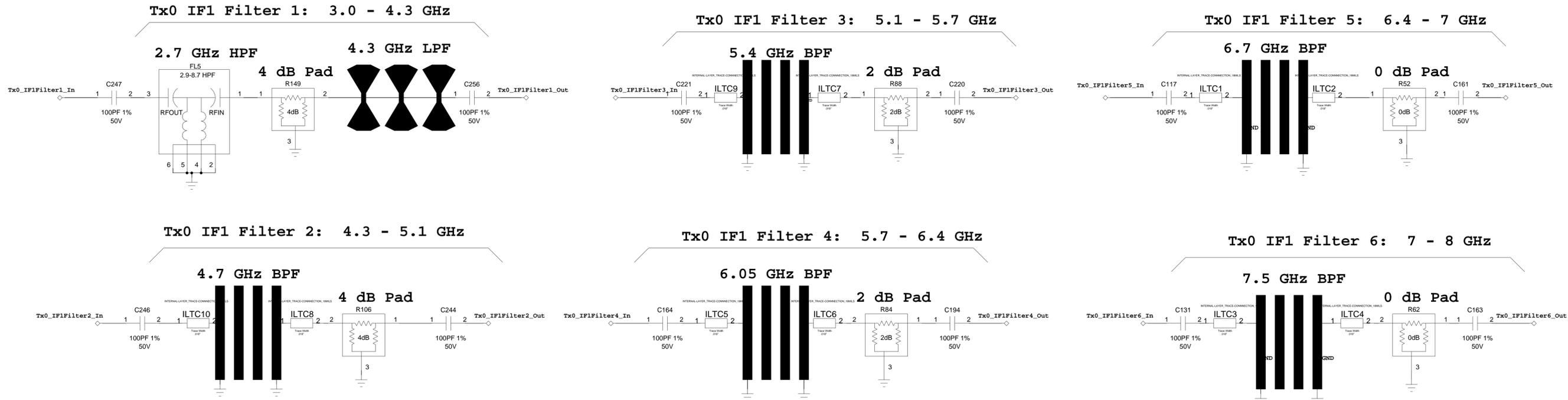
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Tx0 IF1 Filter Switches



Tx0 IF1 Filters



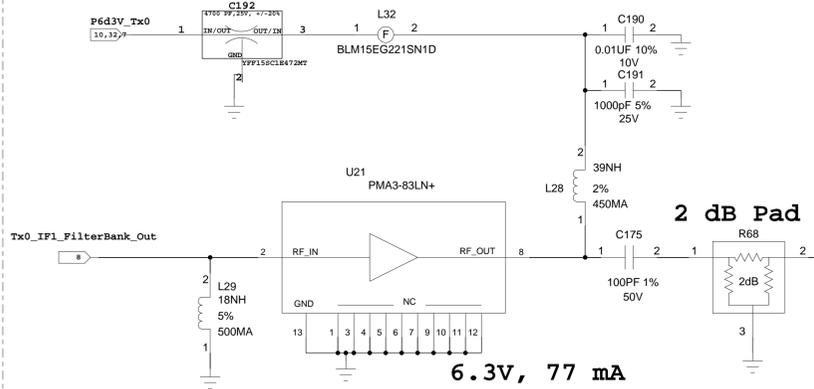
Tx0 IF1 Filters			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE			SHEET 8 OF 33

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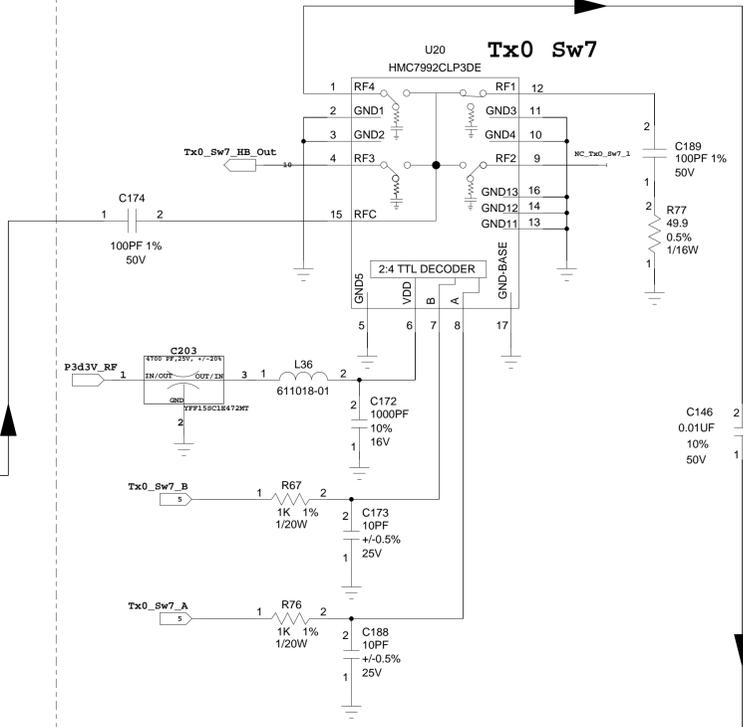
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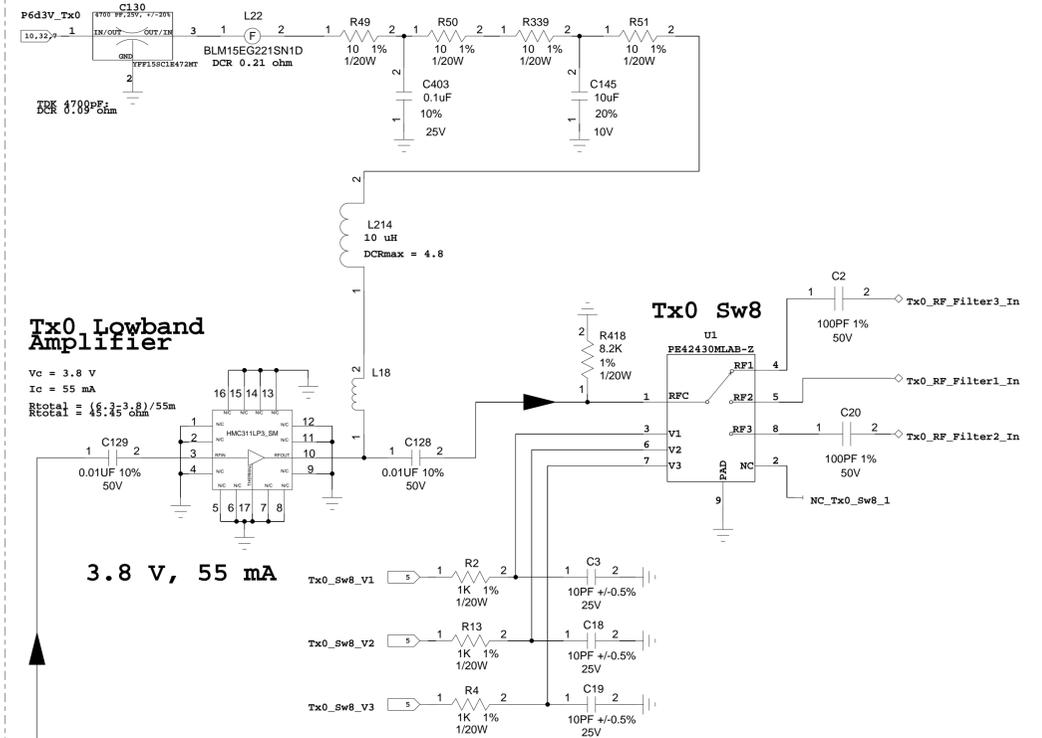
Tx0 IF1 Amplifier 2



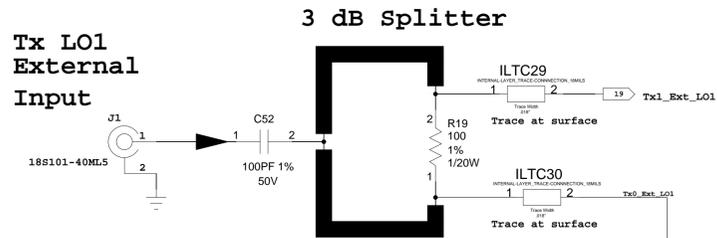
Tx0 Switch 7



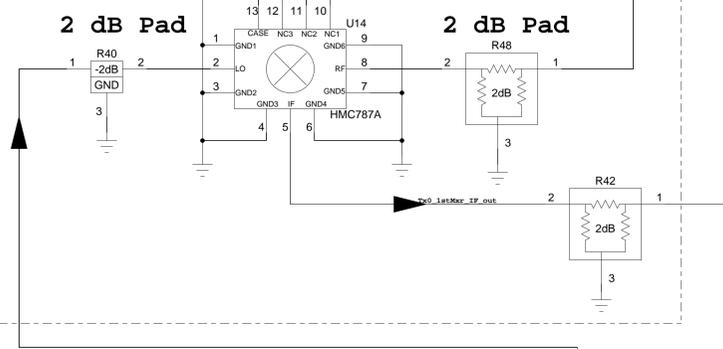
Tx0 Lowband Amp



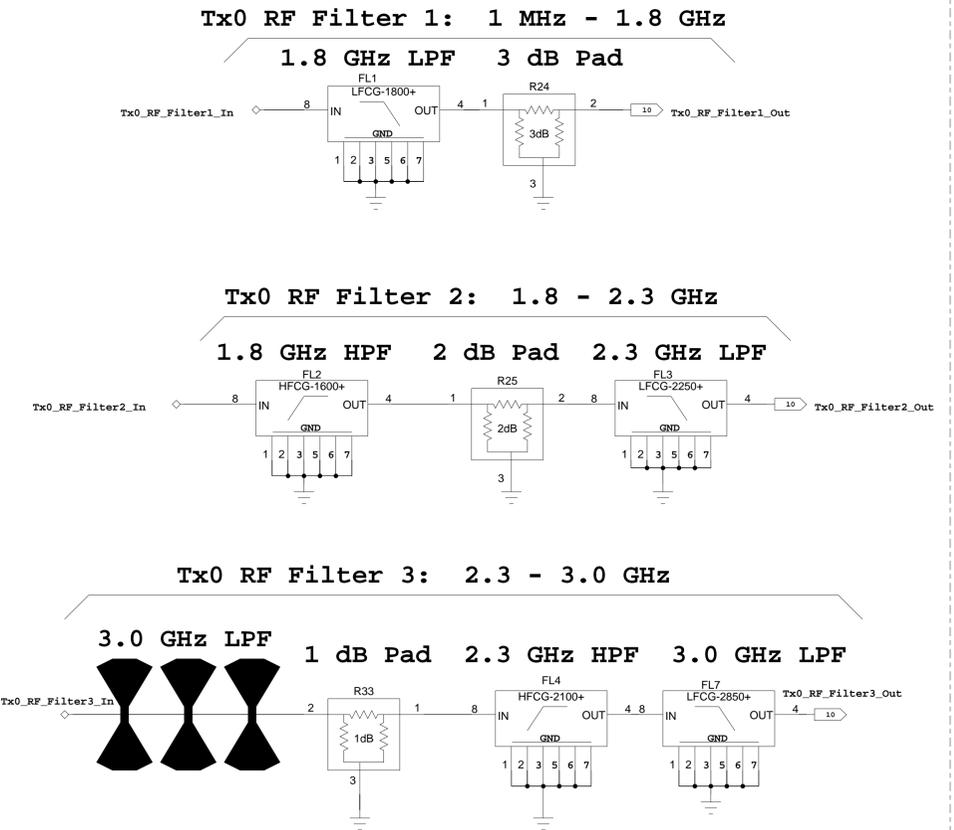
Tx0 LO1 Power Splitter



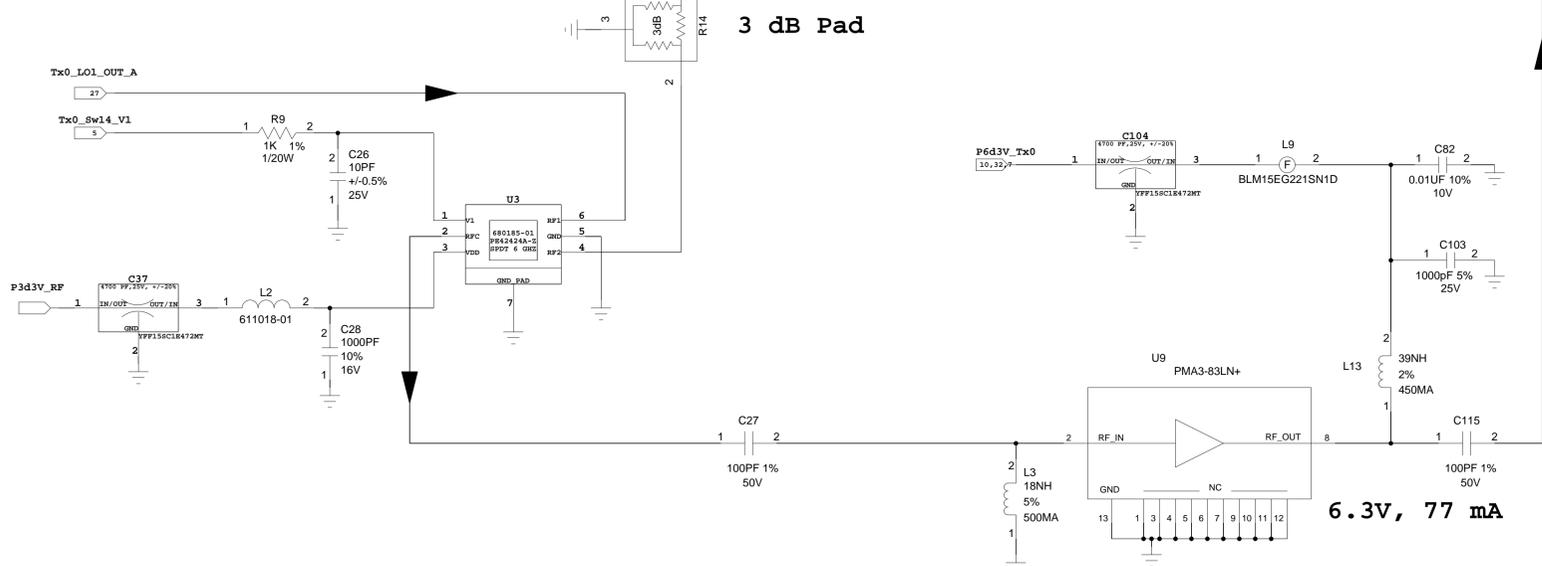
Tx0 First Mixer



Tx0 RF Filters



Tx0 LO1 Amplifier



Tx0 Lowband			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE			SHEET 9 OF 33

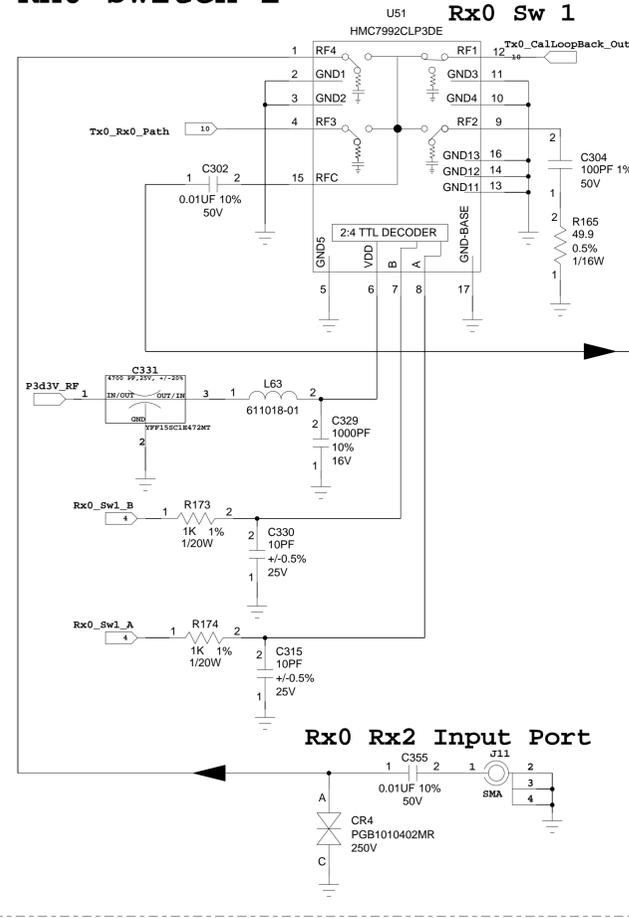
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Rx0 Switch 1



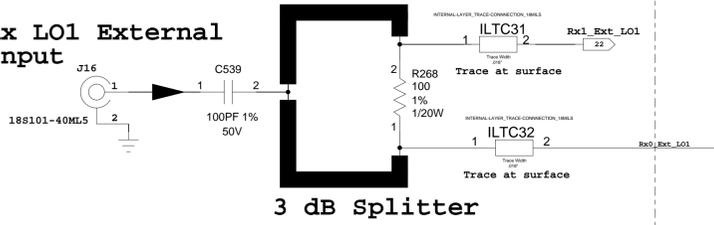
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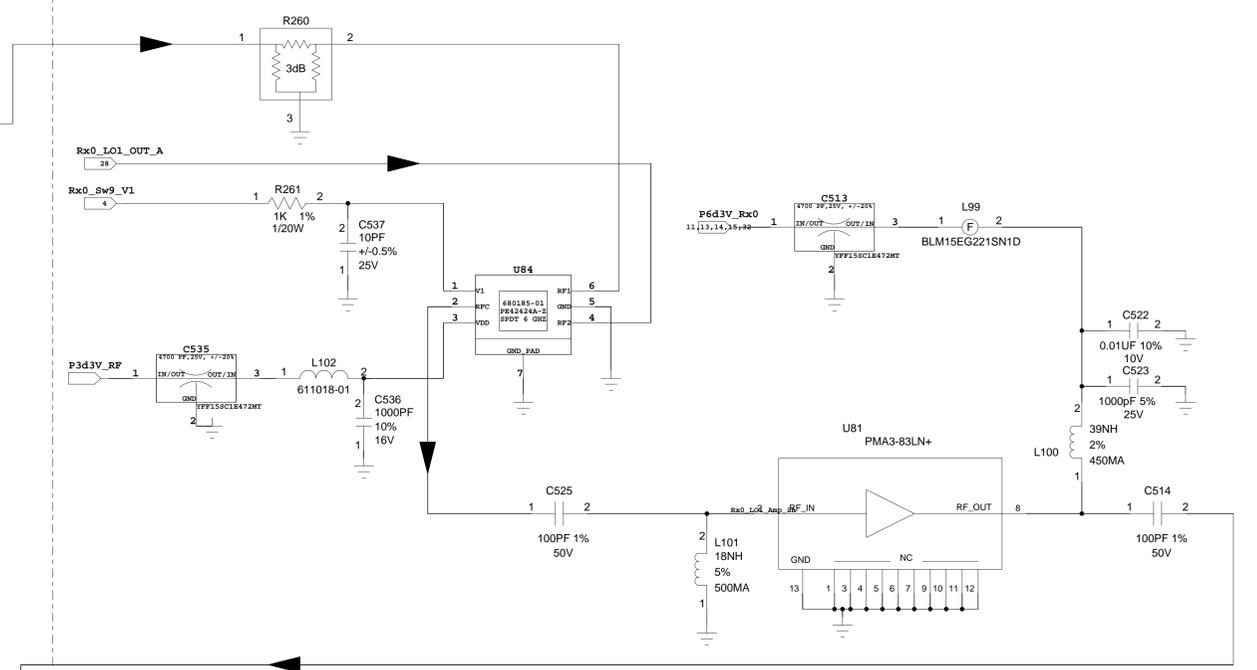
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Rx0 LO1 Power Splitter

Rx LO1 External Input



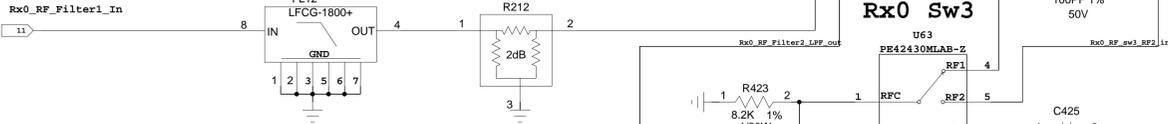
Rx0 LO1 Amplifier



Rx0 RF Filters

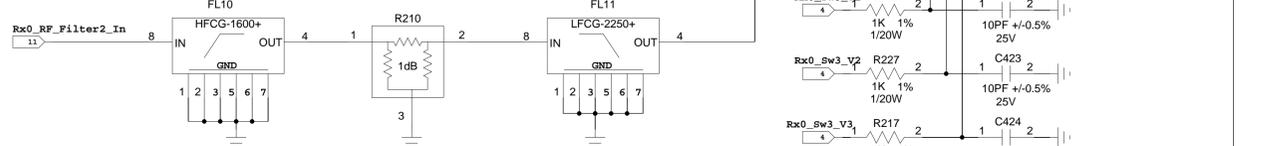
Rx0 RF Filter 1: 1 MHz - 1.8 GHz

1.8 GHz LPF 2 dB Pad



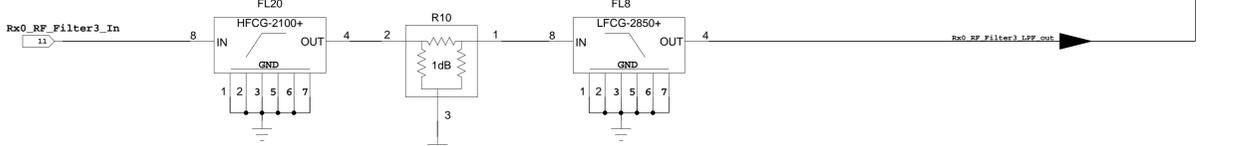
Rx0 RF Filter 2: 1.8 - 2.3 GHz

1.8 GHz HPF 1 dB Pad 2.3 GHz LPF

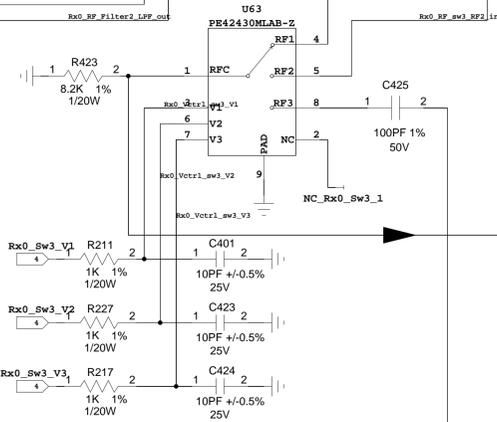


Rx0 RF Filter 3: 2.3 - 3.0 GHz

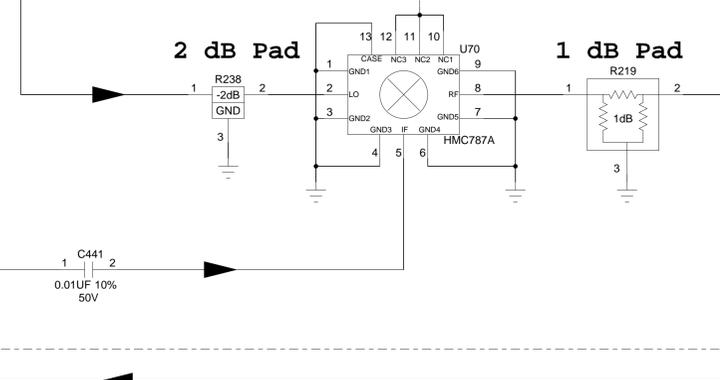
2.3 GHz HPF 1 dB Pad 3.0 GHz LPF



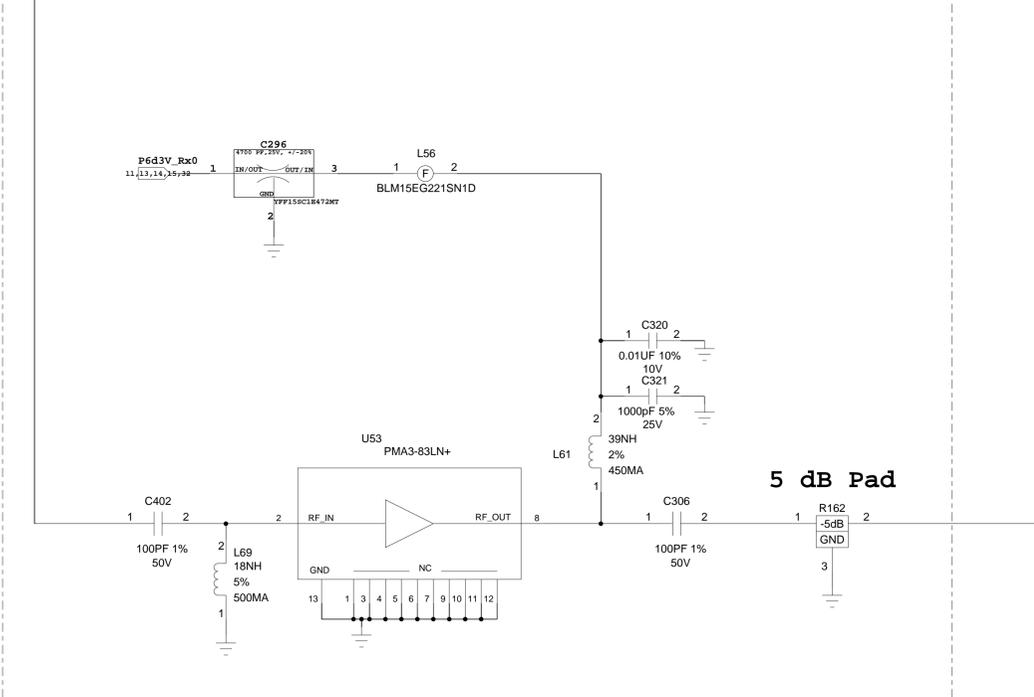
Rx0 Sw3



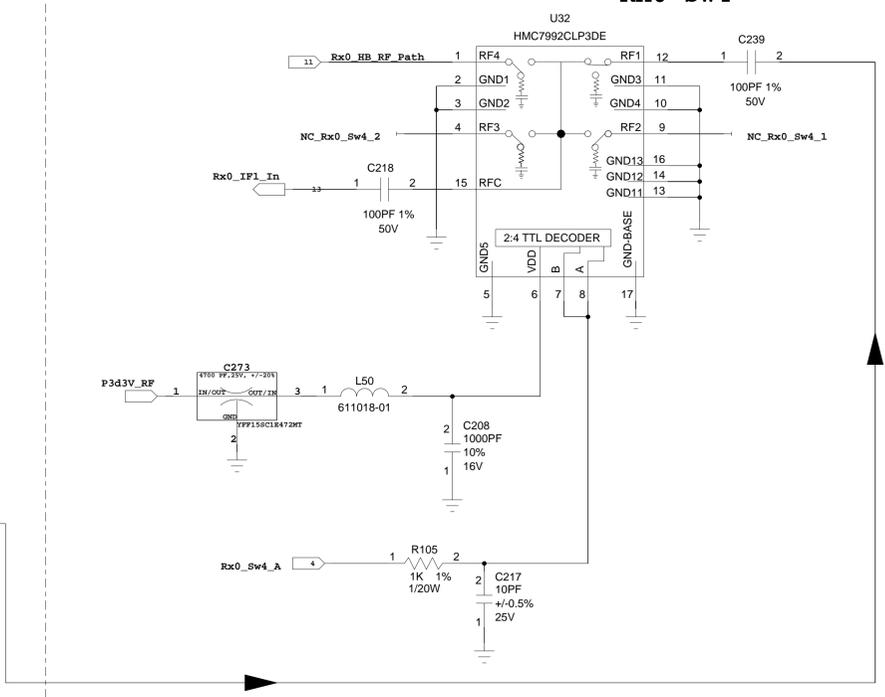
Rx0 First Mixer



Rx0 Lowband Amplifier



Rx0 Switch 4



Rx0 Lowband			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE			SHEET 12 OF 33

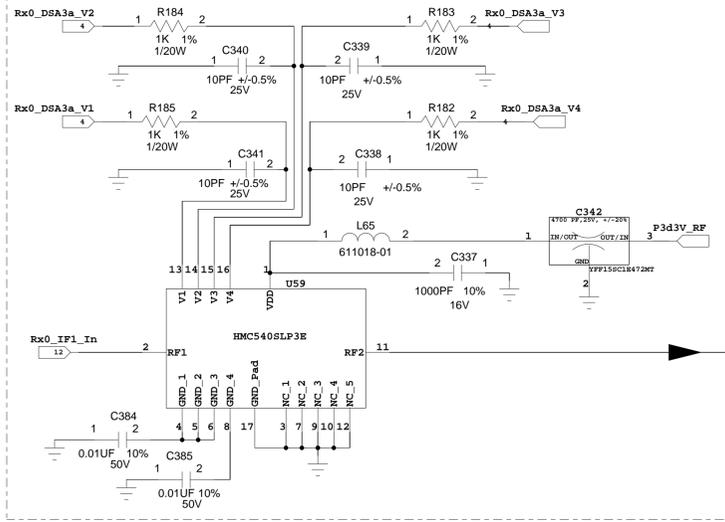
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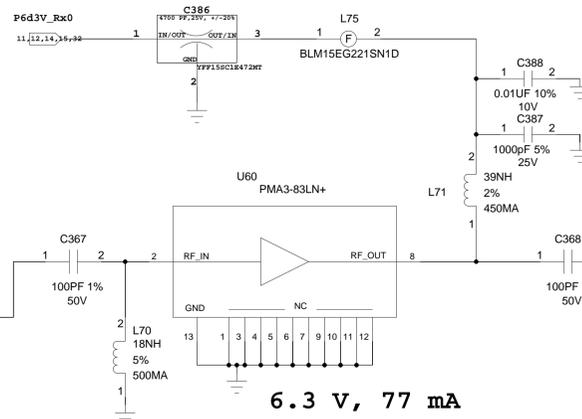
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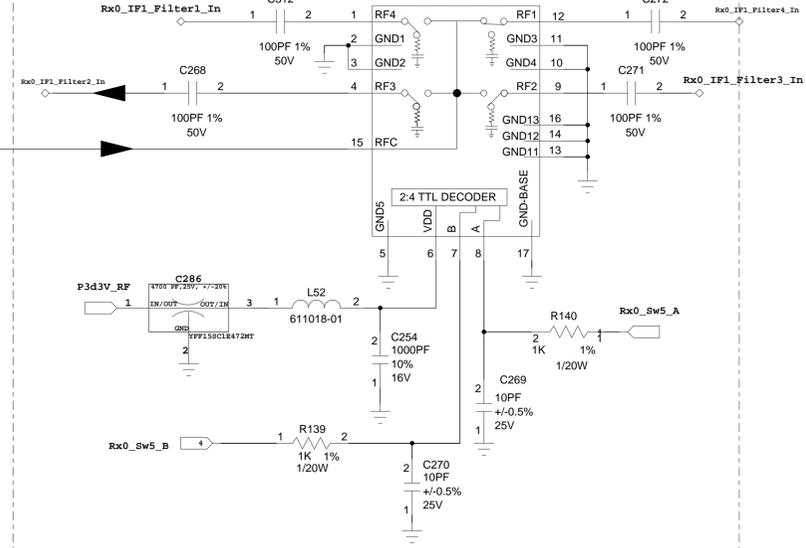
Rx0 DSA 3a



Rx0 IF1 Amplifier 1

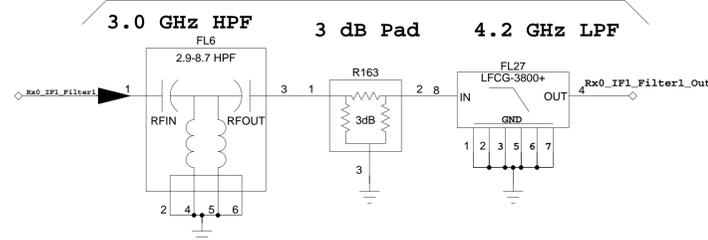


Rx0 Switch 5

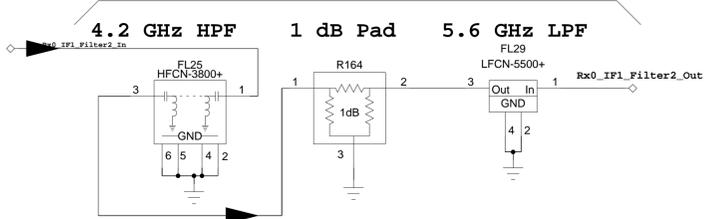


Rx IF1 Filters

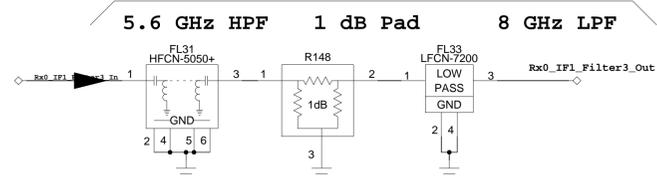
Rx0 IF1 Filter 1: 3.0 - 4.2 GHz



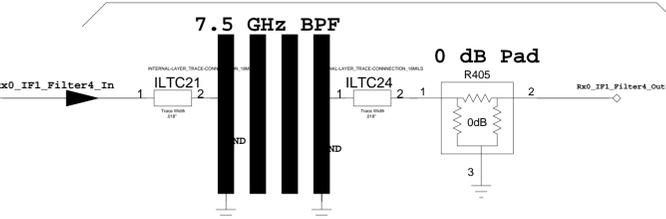
Rx0 IF1 Filter 2: 4.2 - 5.6 GHz



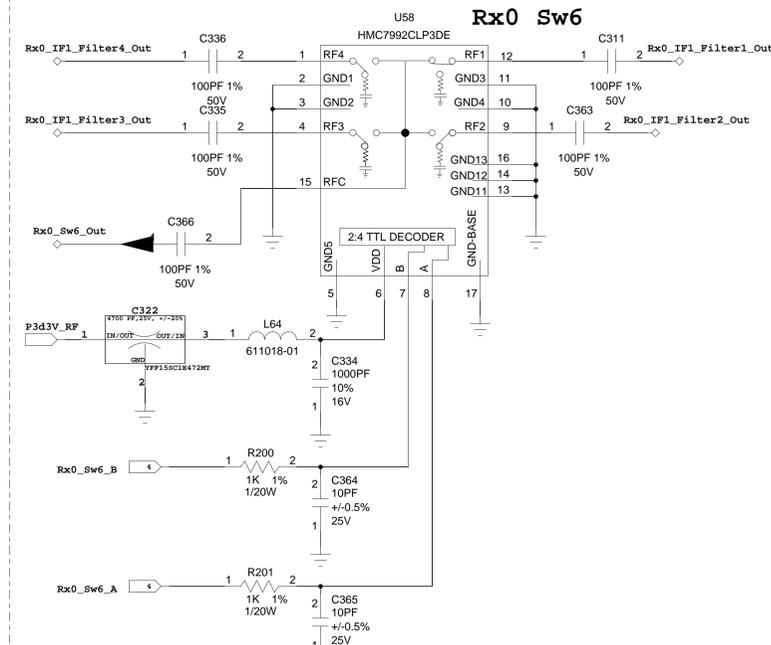
Rx0 IF1 Filter 3: 5.6 - 7 GHz



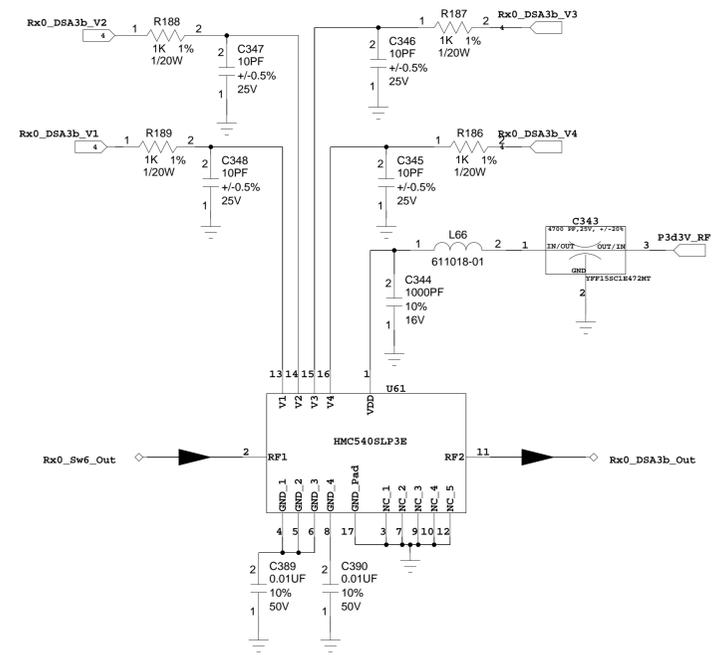
Rx0 IF1 Filter 4: 6.8 - 8.2 GHz



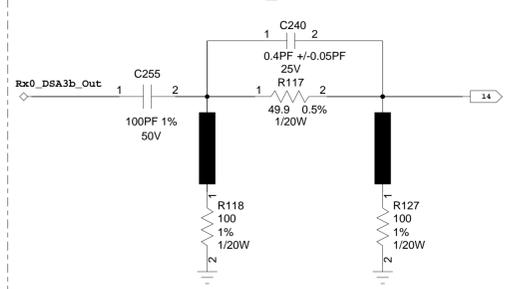
Rx0 Switch 6



Rx0 DSA 3b



Rx0 IF1 Slope Pad



Rx0 IF1			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE			SHEET 13 OF 33

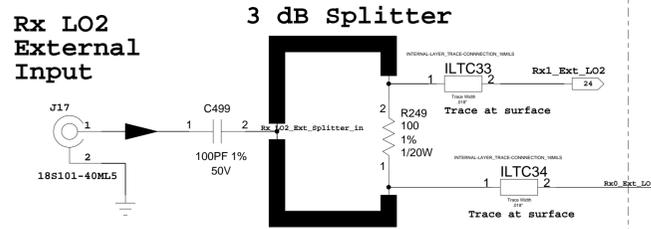
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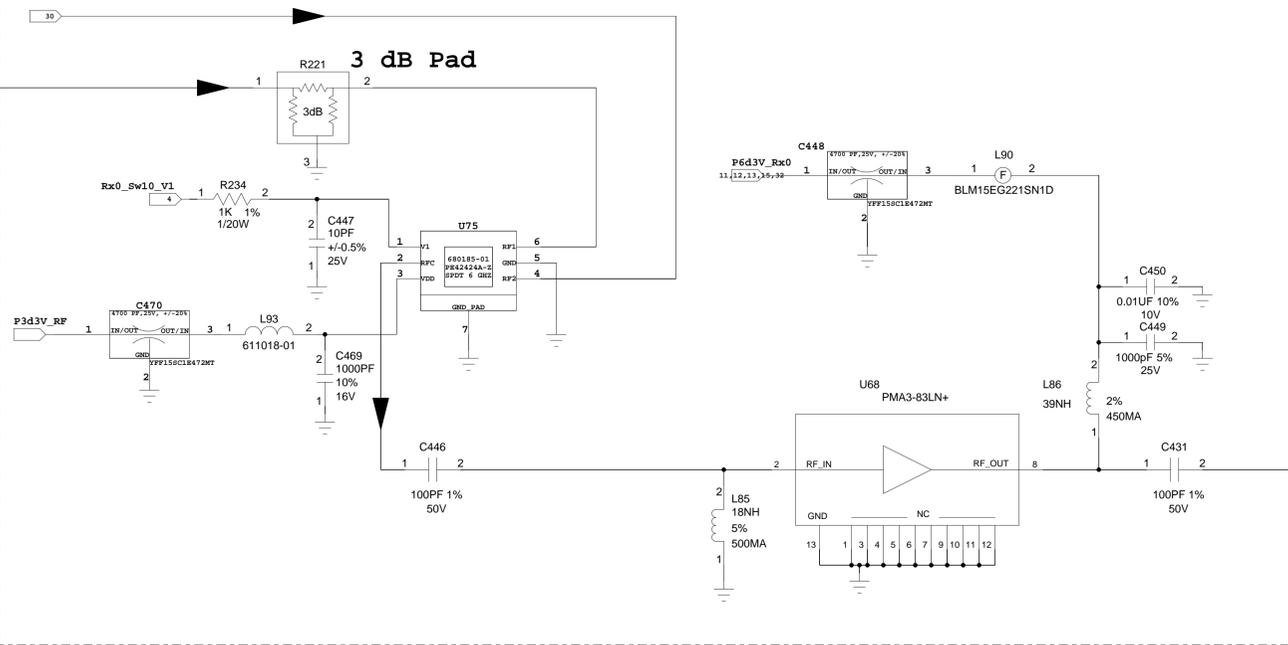
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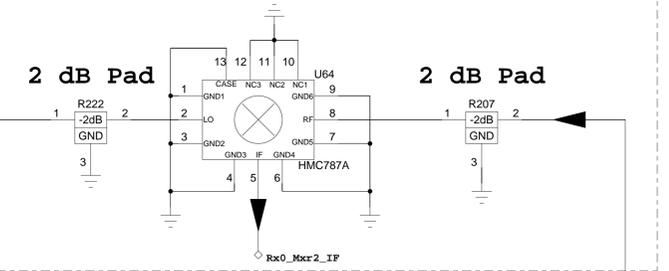
Rx0 LO2 Power Splitter



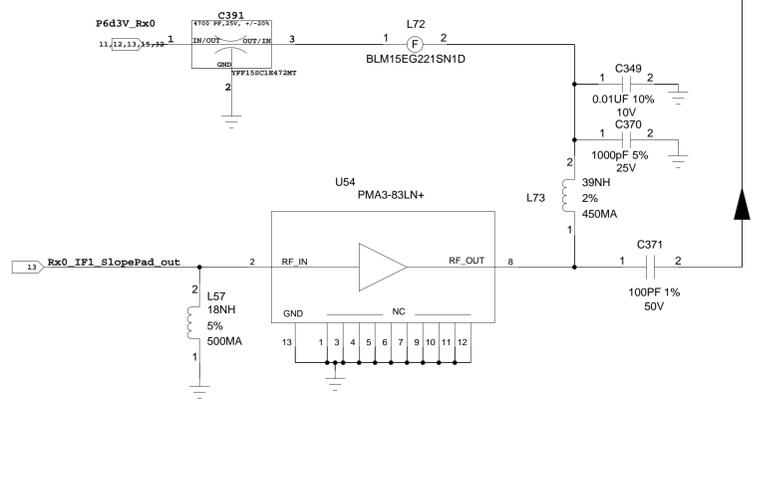
Rx0 LO2 Amplifier



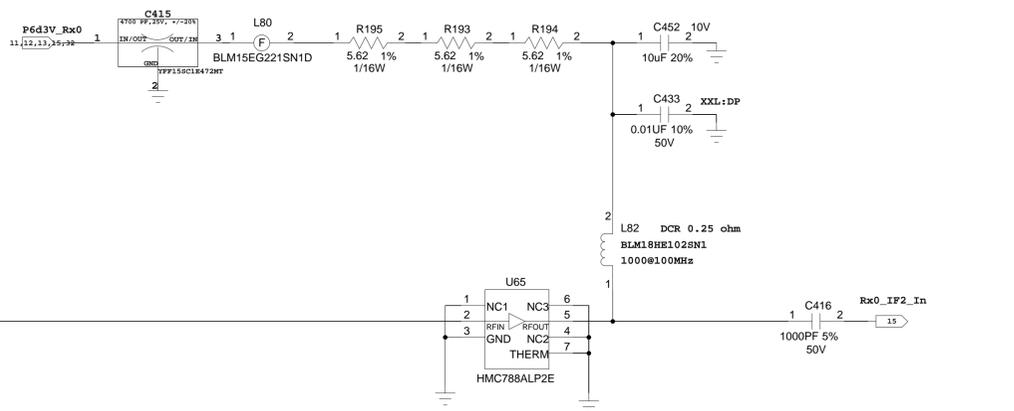
Rx0 Second Mixer



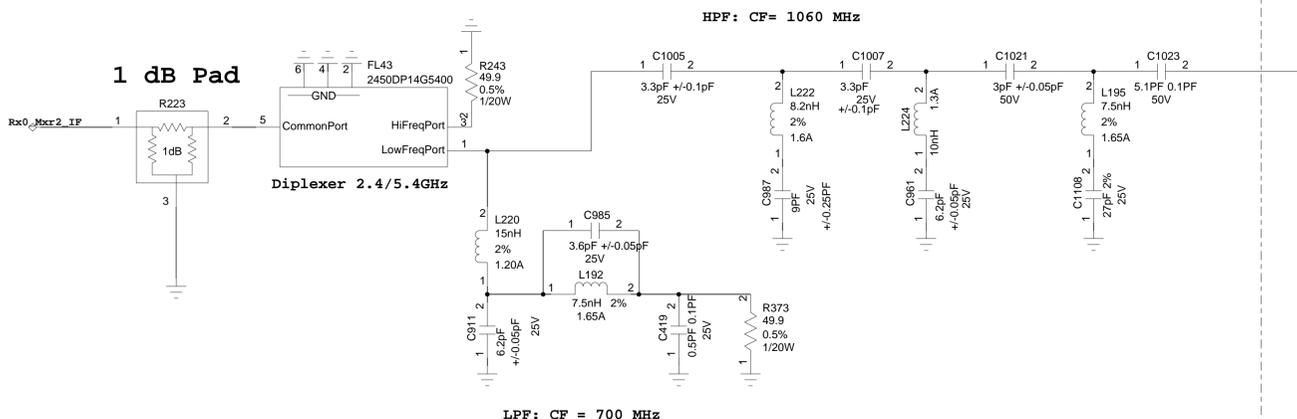
Rx0 IF1 Amplifier 2



Rx0 IF2 Amplifier 1



Rx0 IF2 Triplexer



Rx0 2nd Mixer

ZBX RF Daughterboard

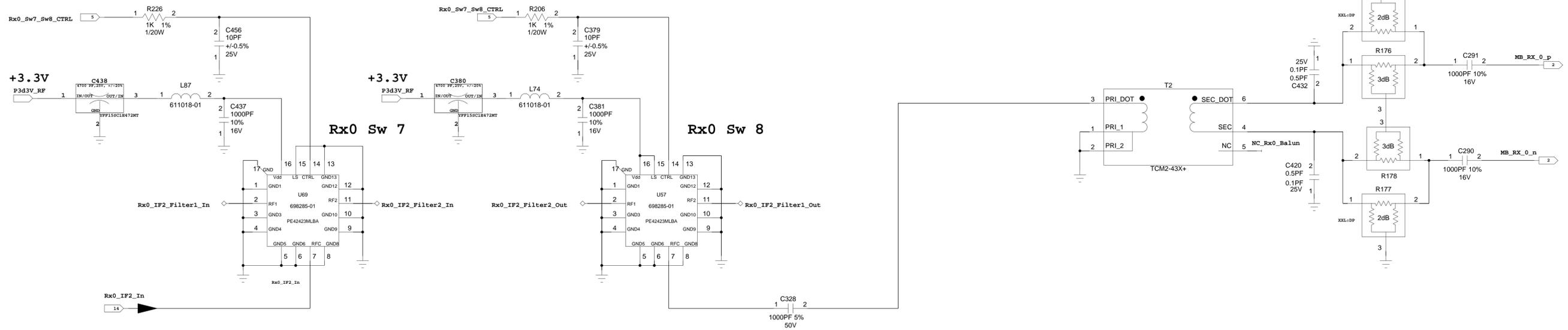
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE			SHEET 14 OF 33

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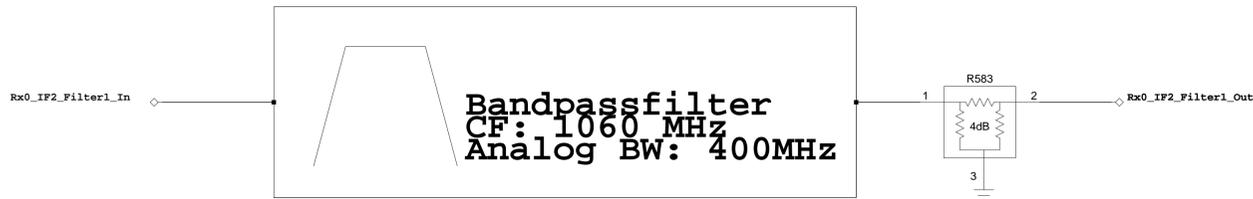
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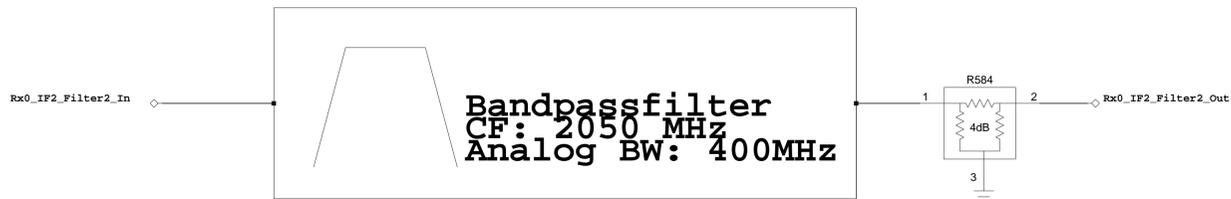
Rx0 IF2 Filter Switches



Rx0 IF2 Filter 1



Rx0 IF2 Filter 2



Rx0 IF2 Filters			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE			SHEET 15 OF 33

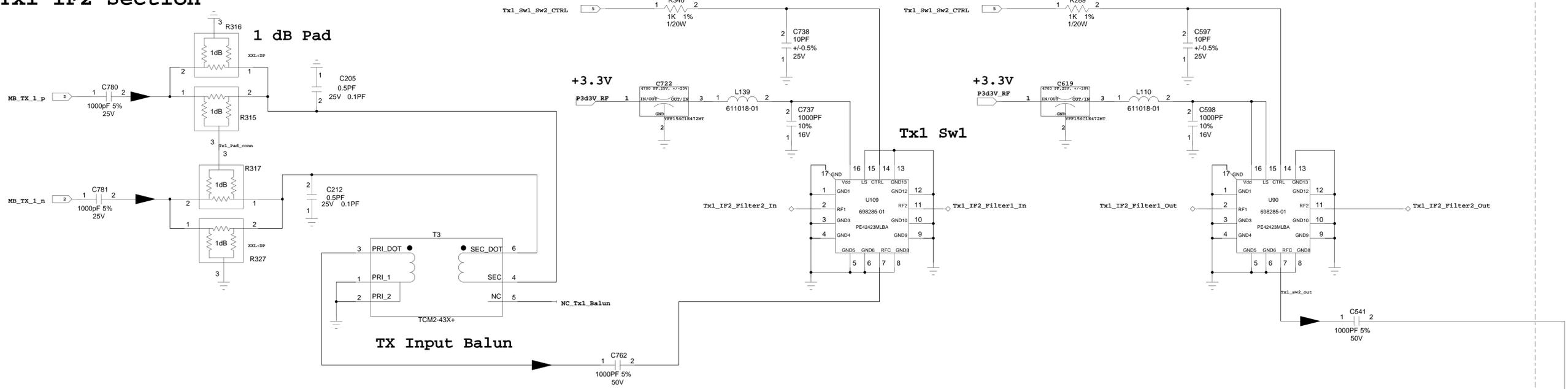
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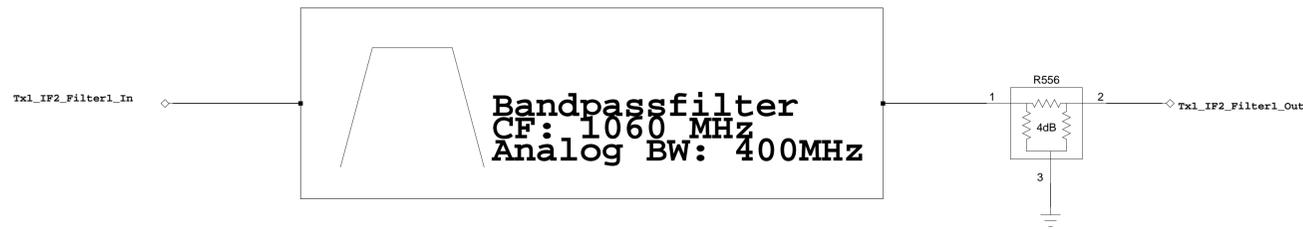
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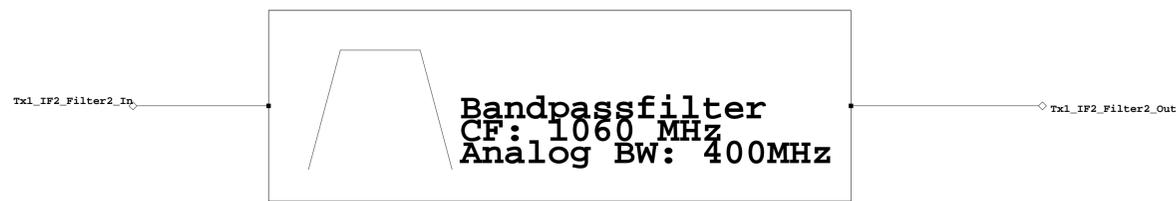
Tx1 IF2 Section



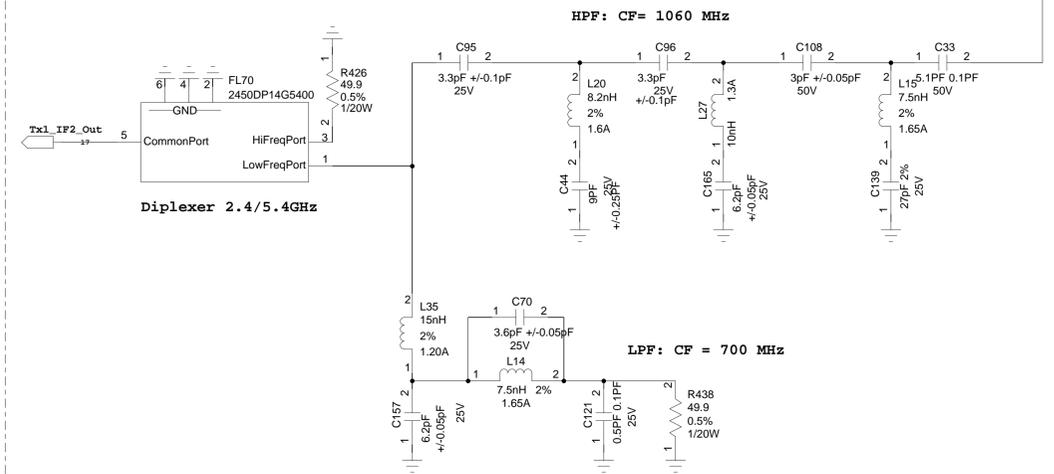
Tx1 IF2 Filter 1



Tx1 IF2 Filter 2



Tx1 IF2 Triplexer



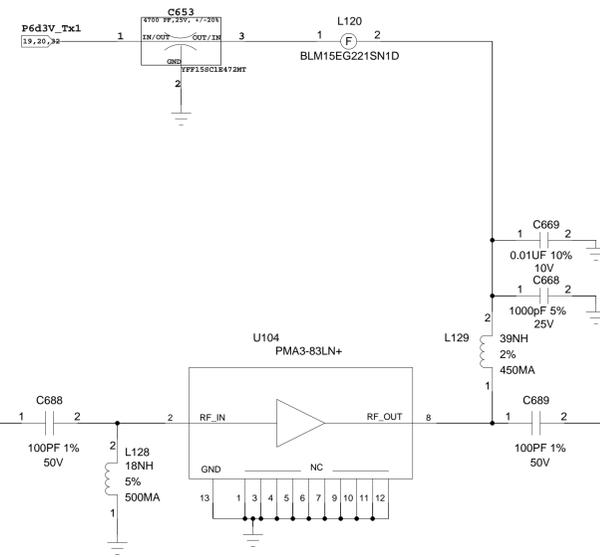
Tx1 IF2 Filters			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
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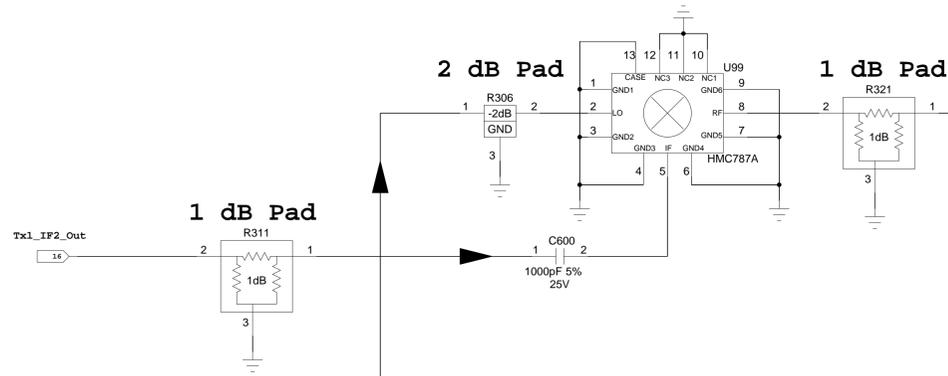
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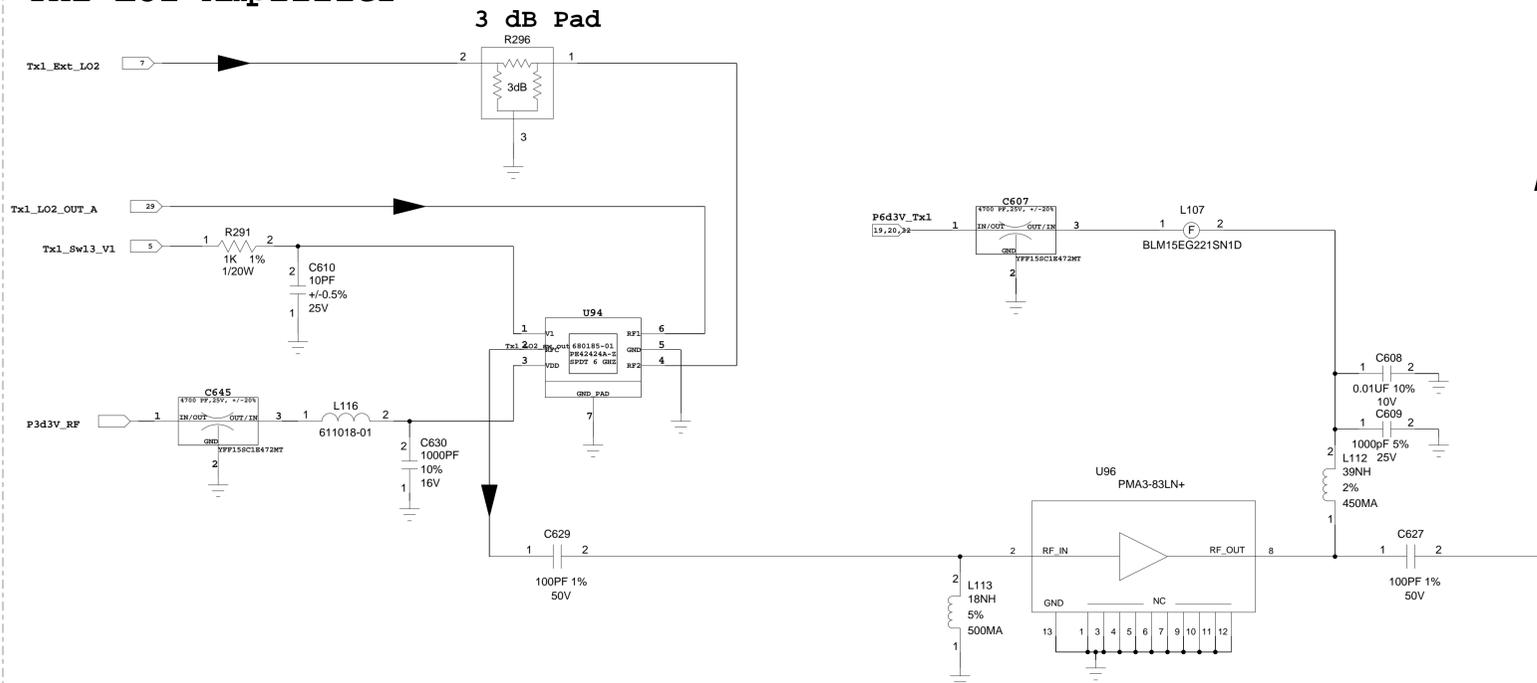
Tx1 IF1 Amplifier 1



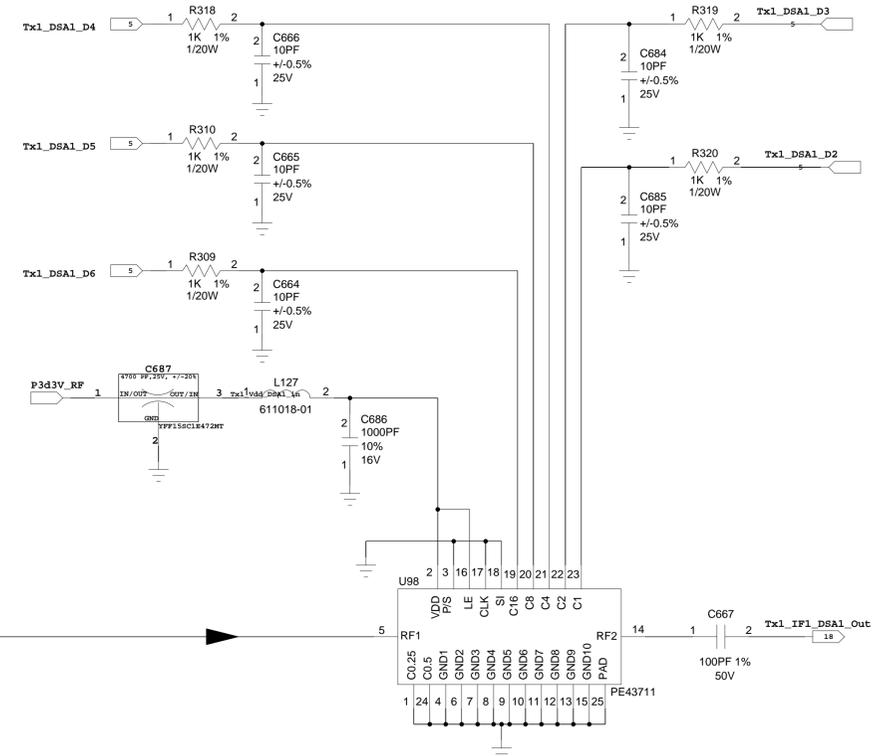
Tx1 Second Mixer



Tx1 LO2 Amplifier



Tx1 DSA1



Tx1 2nd Mixer

ZBX RF Daughterboard

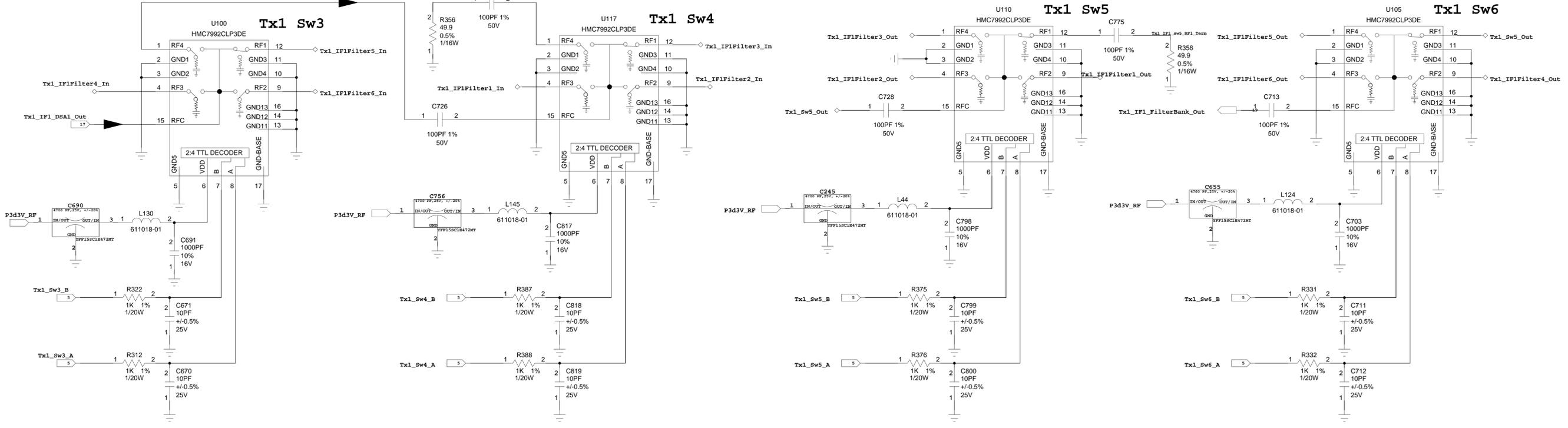
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
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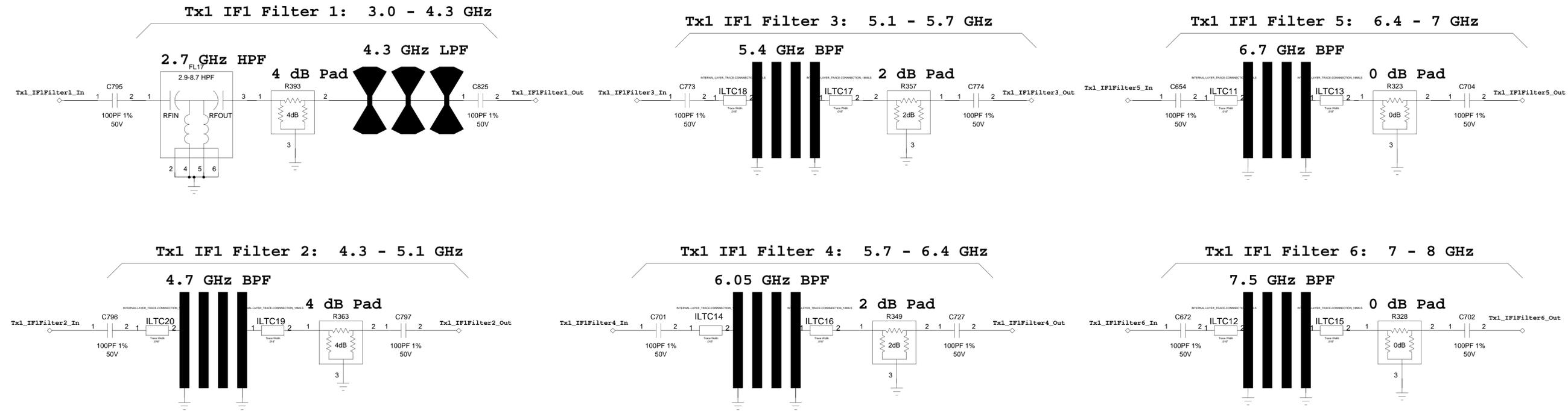
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Tx1 IF1 Filter Switches



Tx1 IF1 Filters



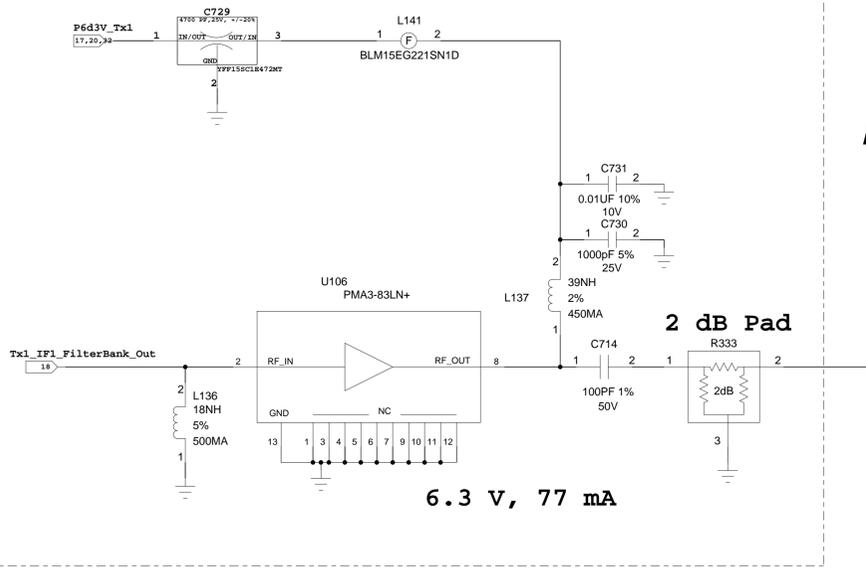
Tx1 IF1 Filters			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
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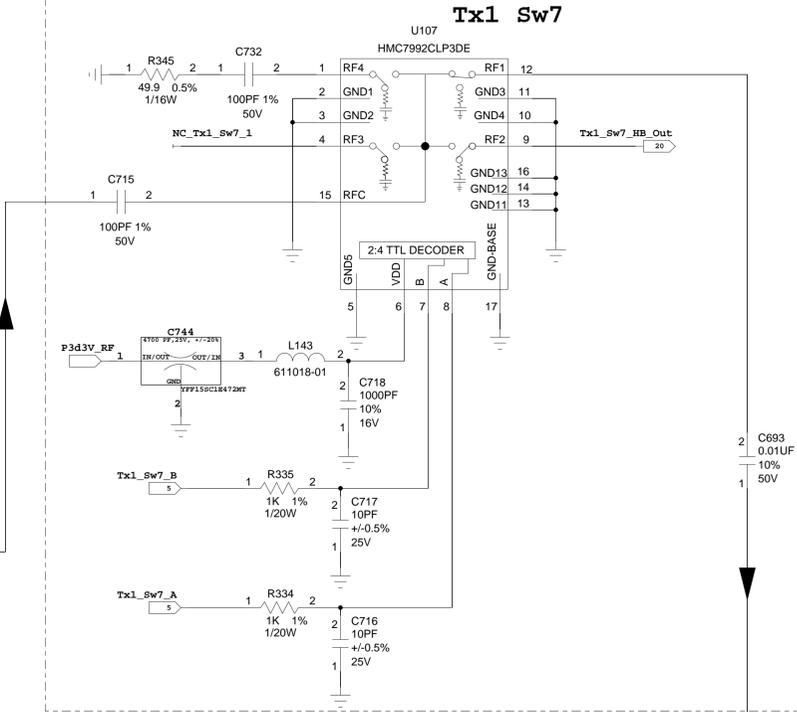
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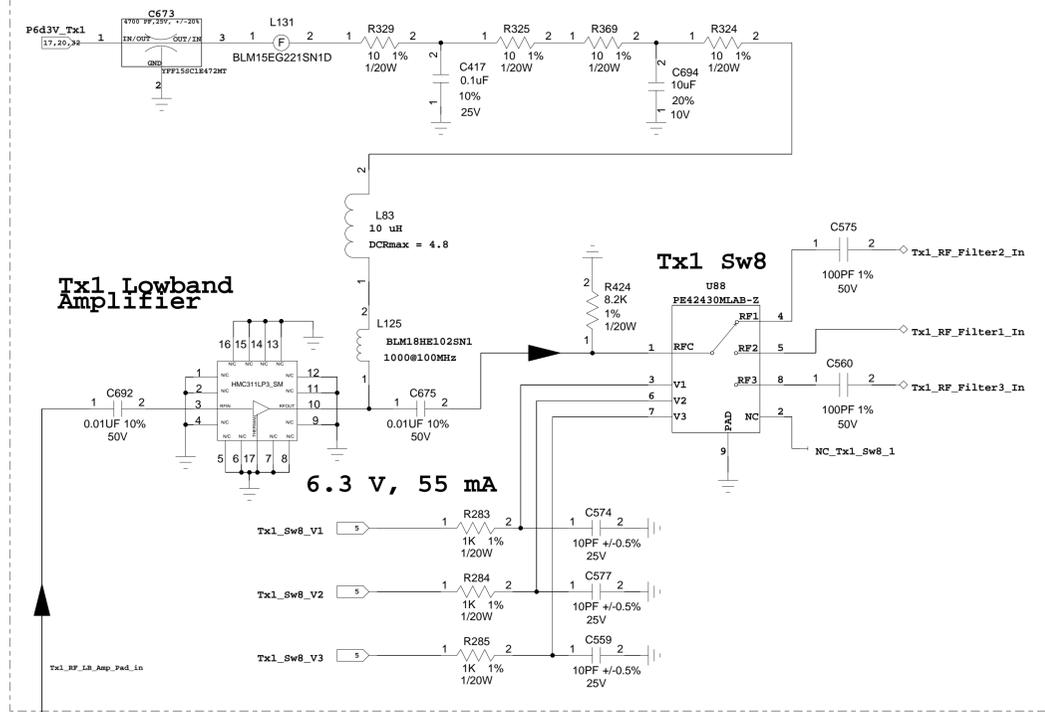
Tx1 IF1 Amplifier 2



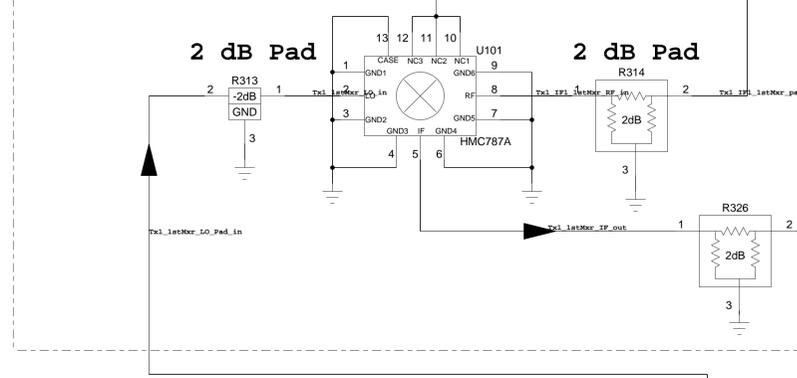
Tx1 Switch 7



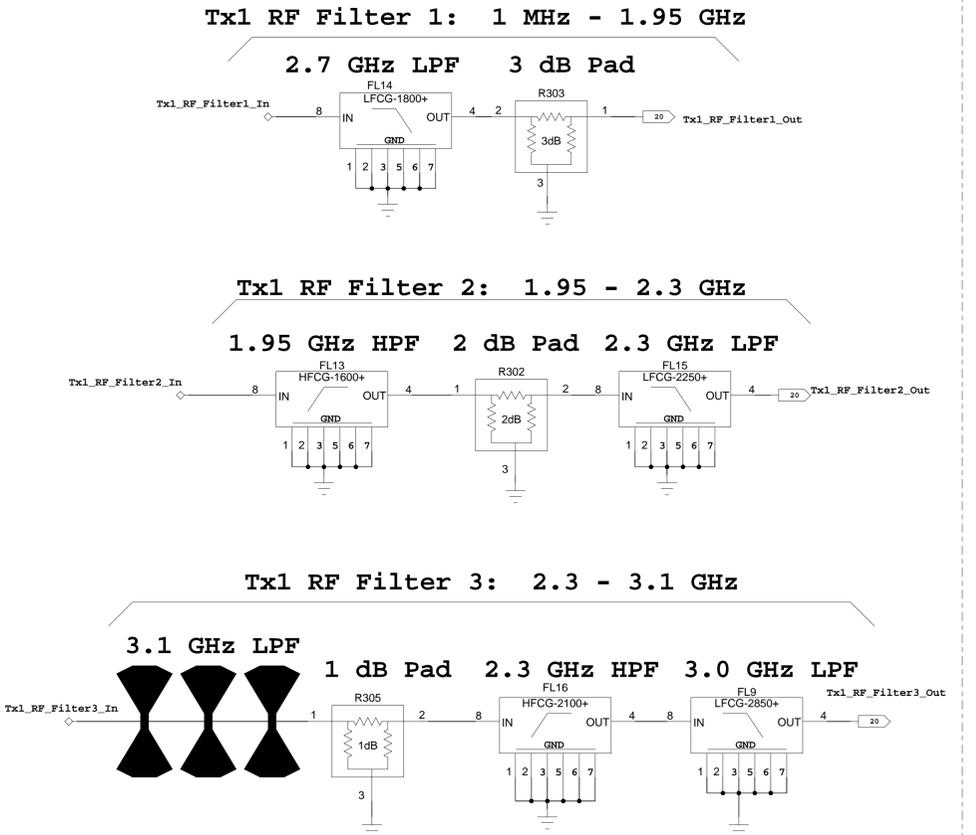
Tx1 Lowband Amp



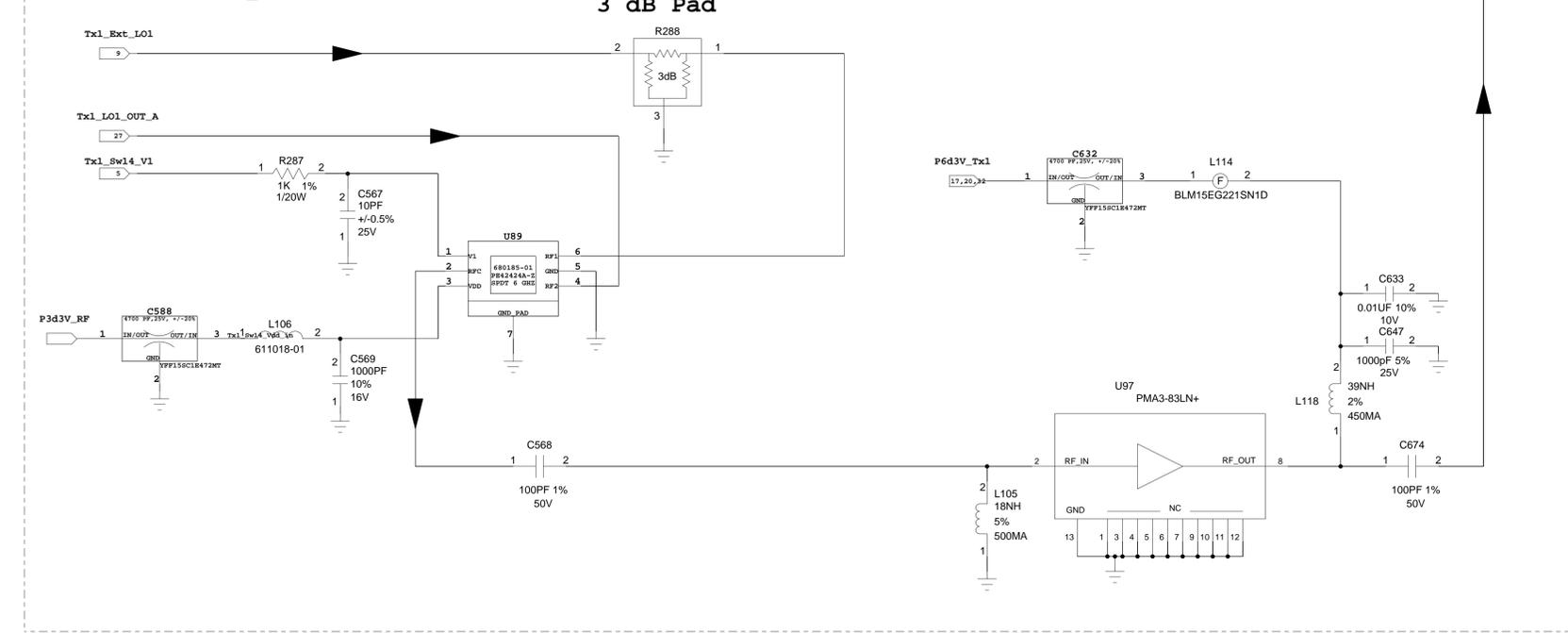
Tx1 First Mixer



Tx1 RF Filters



Tx1 LO1 Amplifier



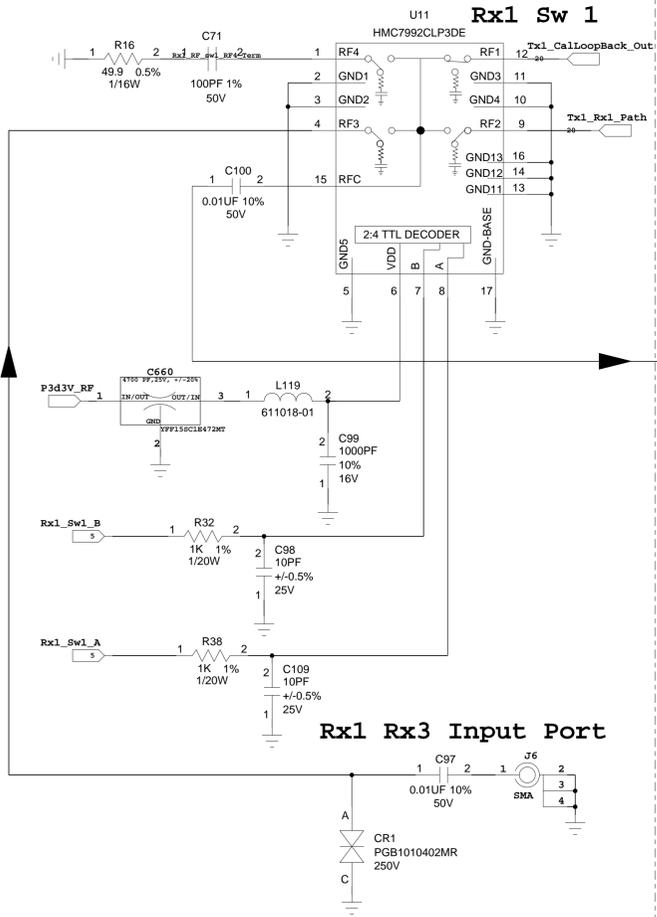
Tx1 Lowband			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE			SHEET 19 OF 33

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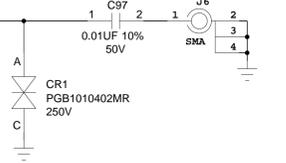
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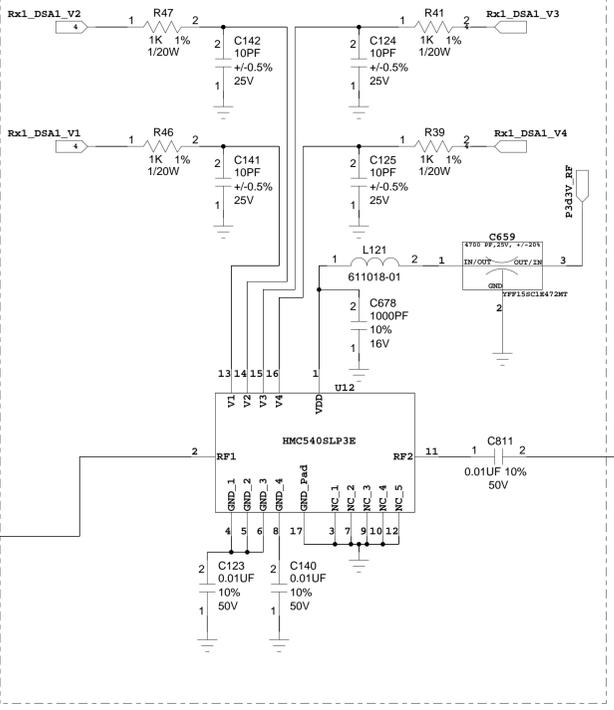
Rx1 Switch 1



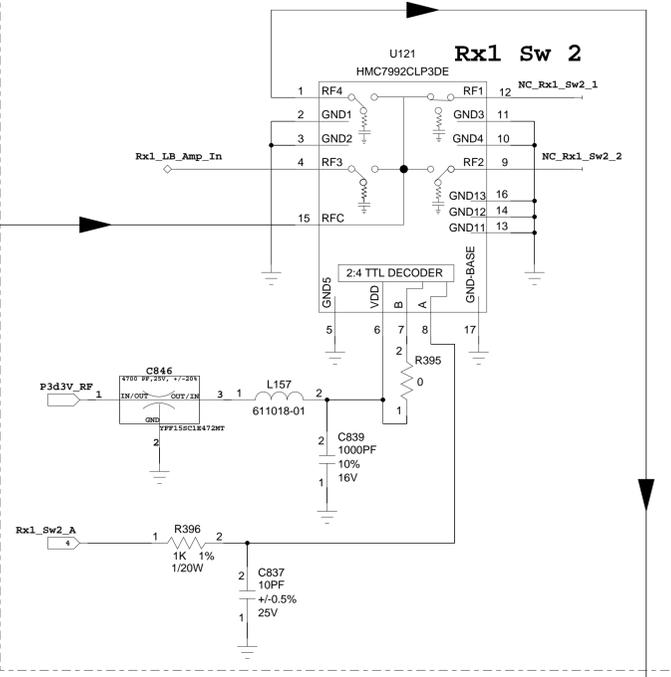
Rx1 Rx3 Input Port



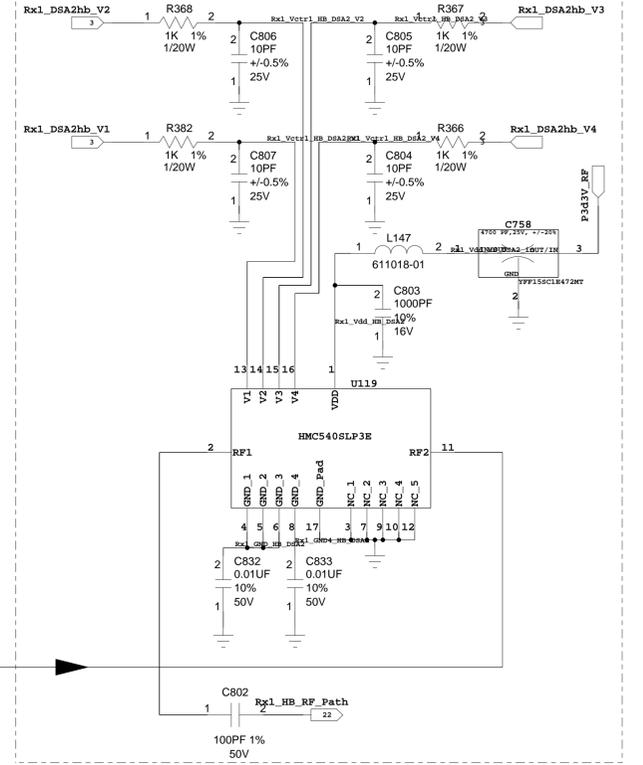
Rx1 DSA 1



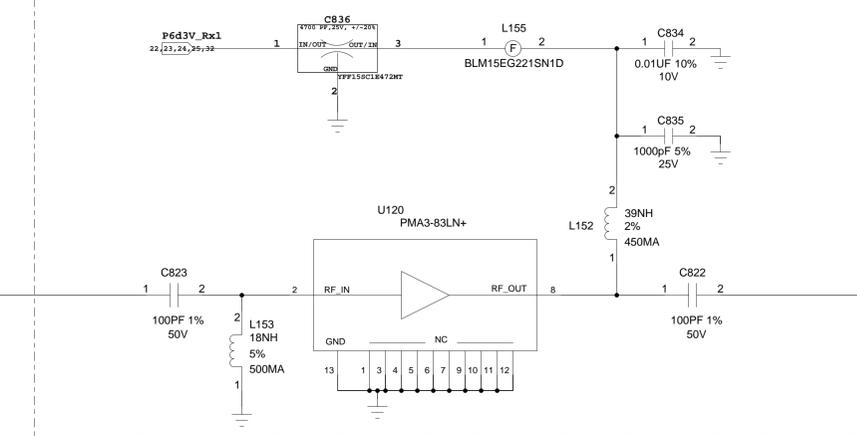
Rx1 Switch 2



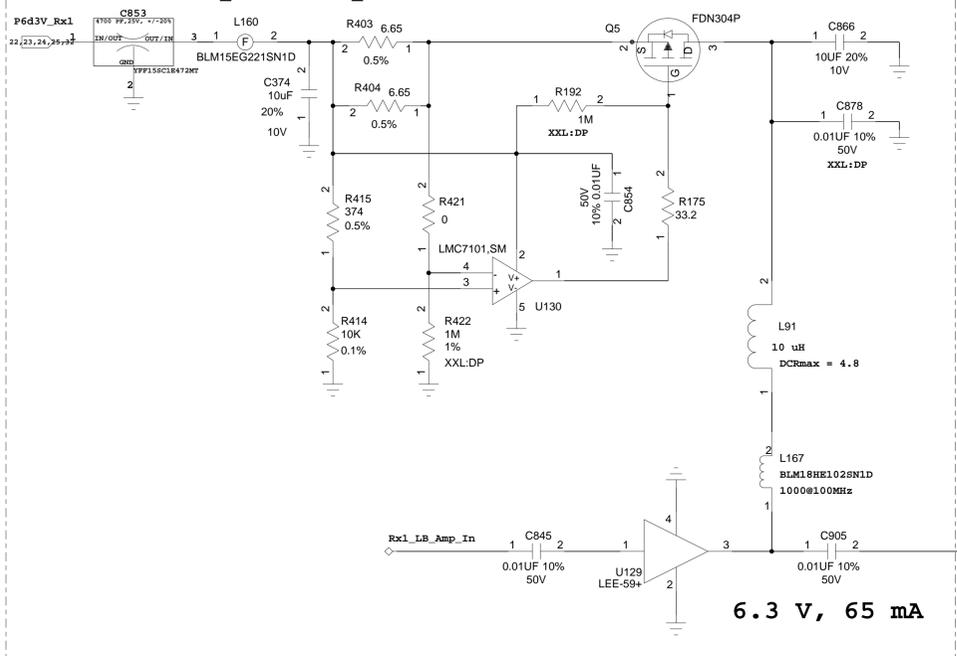
Rx1 Highband DSA 2



Rx1 HB Input Amplifier

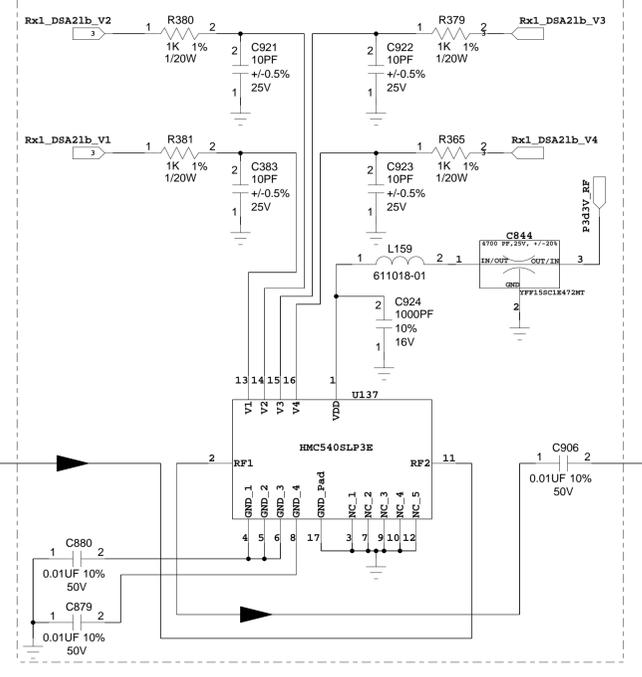


Rx1 LB Input Amplifier

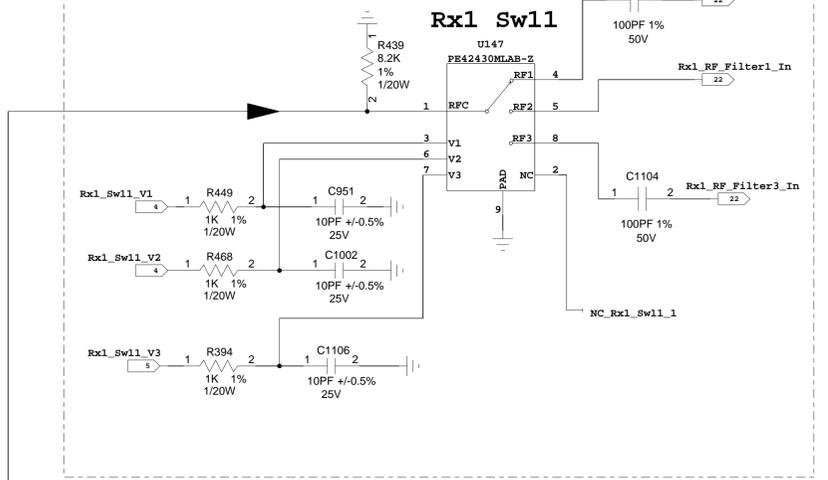


6.3 V, 65 mA

Rx1 Lowband DSA 2



Rx1 Switch 11



Rx1 Input			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE			SHEET 21 OF 33

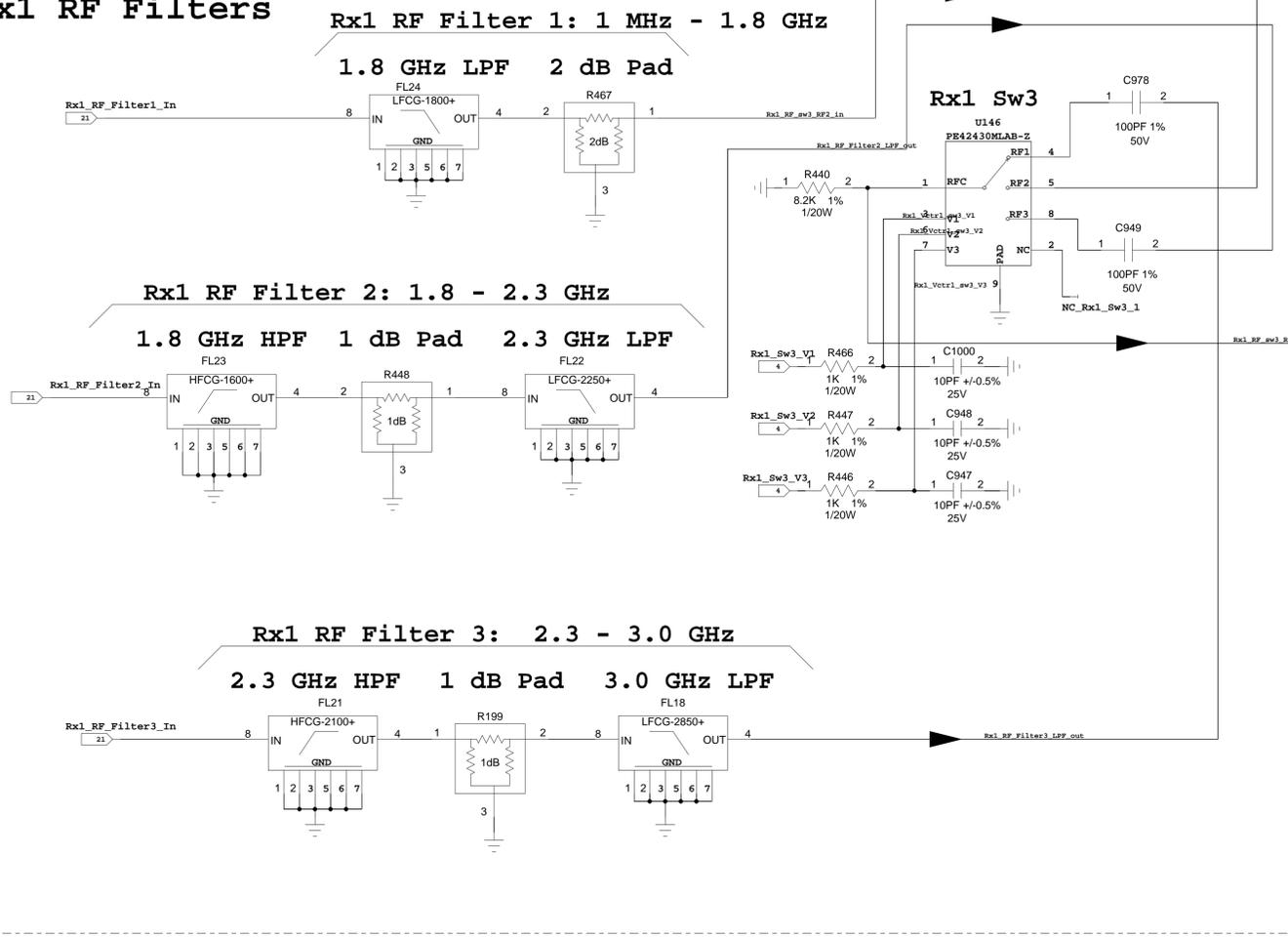
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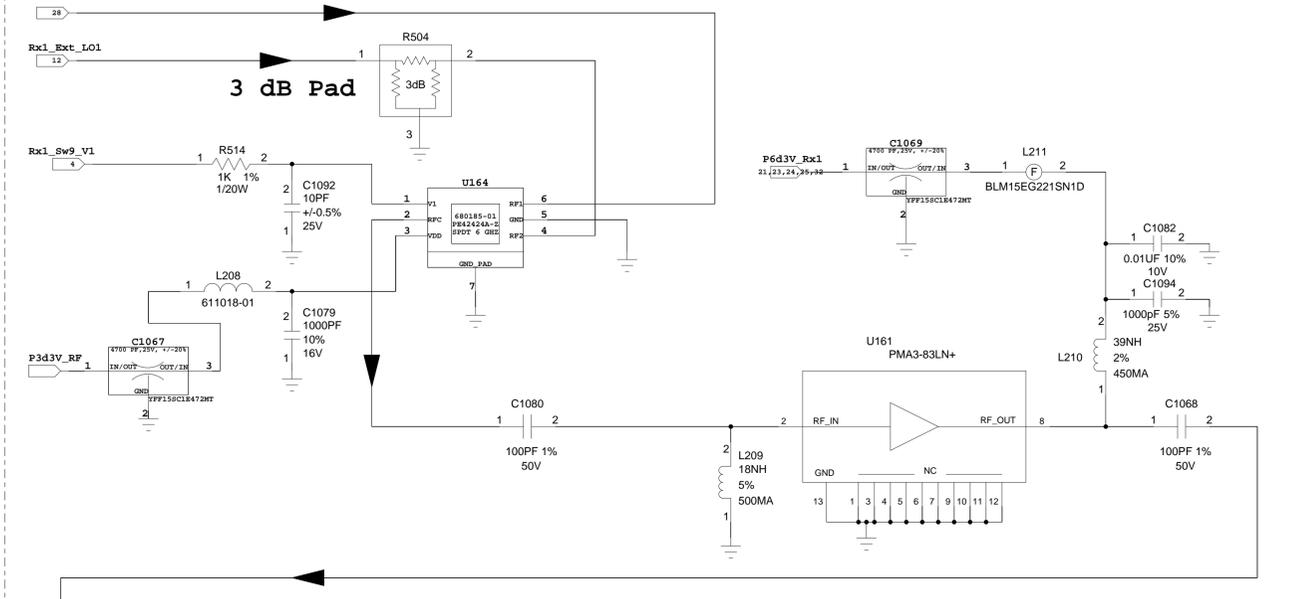
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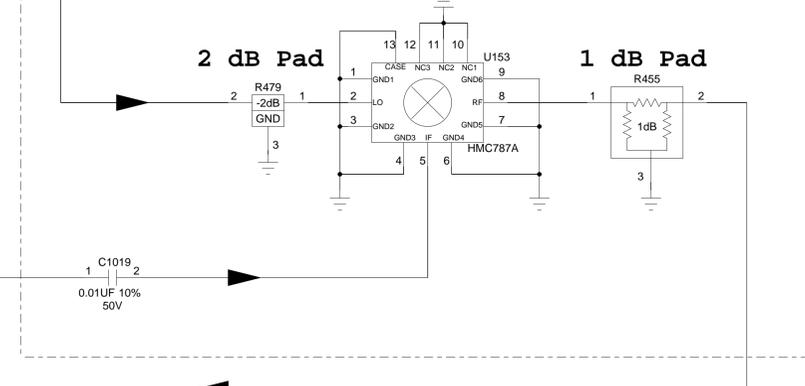
Rx1 RF Filters



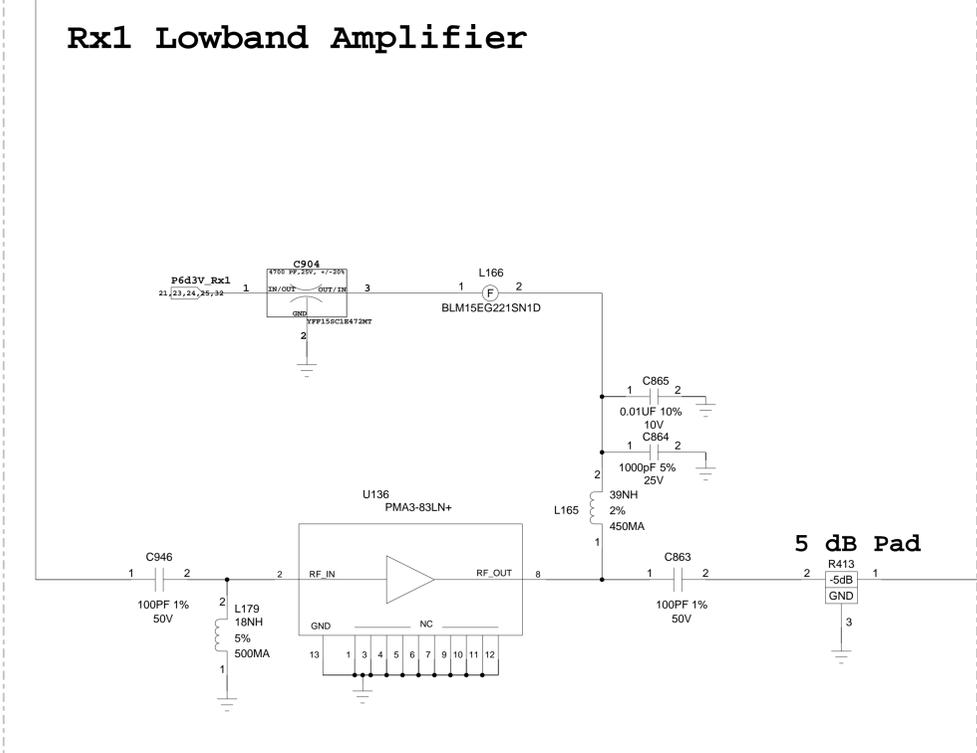
Rx1 LO1 Amplifier



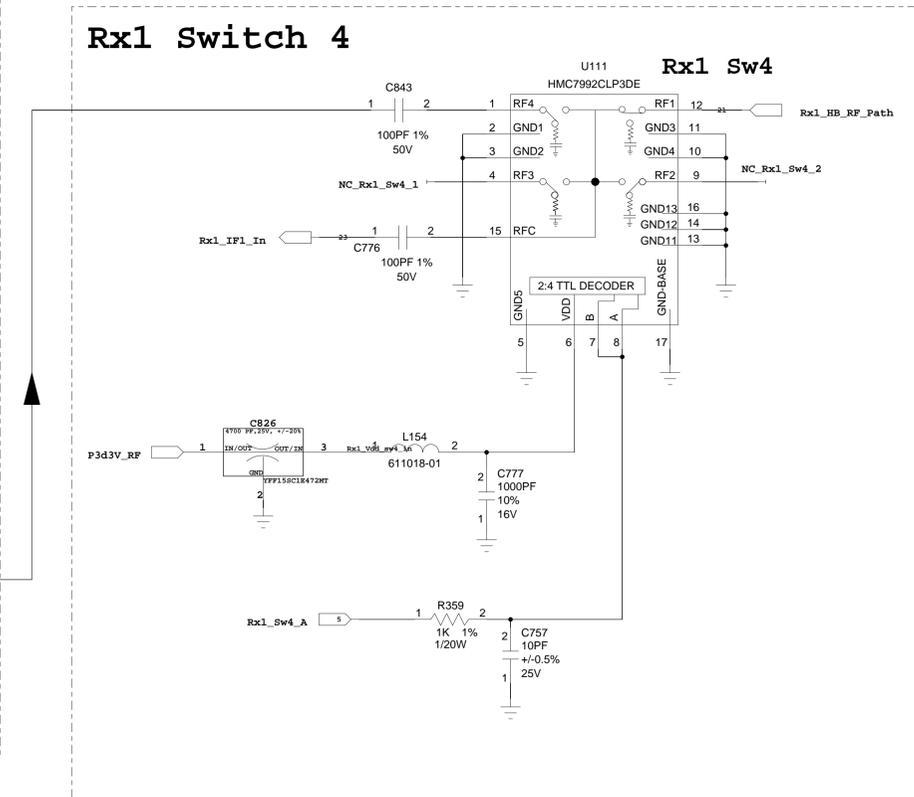
Rx1 First Mixer



Rx1 Lowband Amplifier



Rx1 Switch 4



Rx1 Lowband			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE		SHEET 22 OF 33	

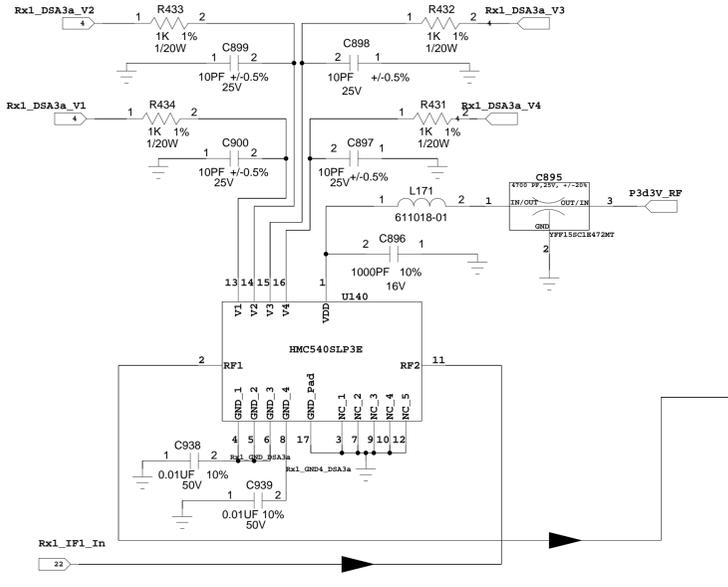
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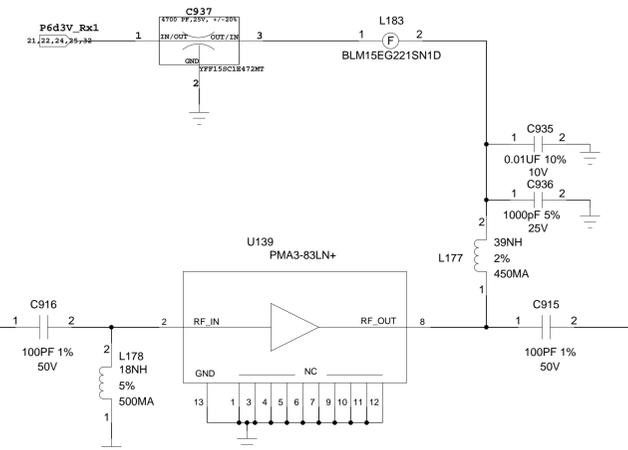
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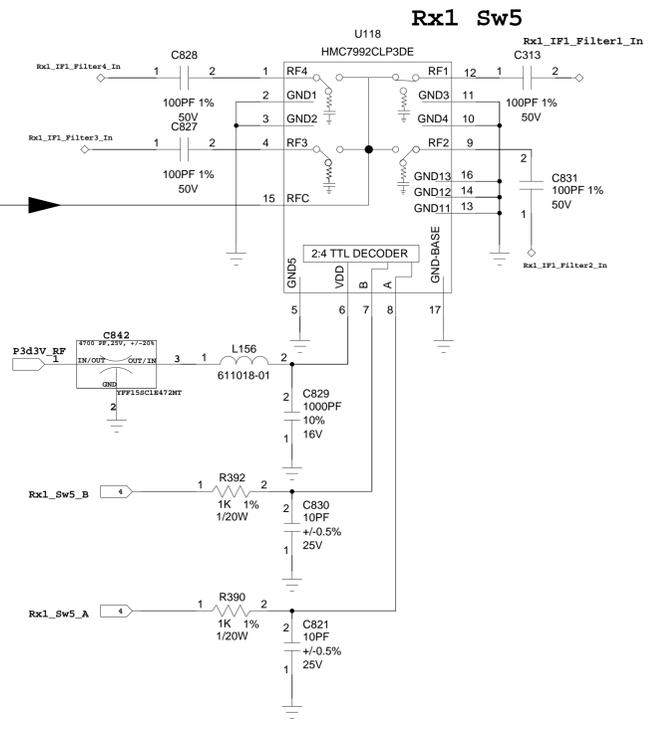
Rx1 DSA 3a



Rx1 IF1 Amplifier 1



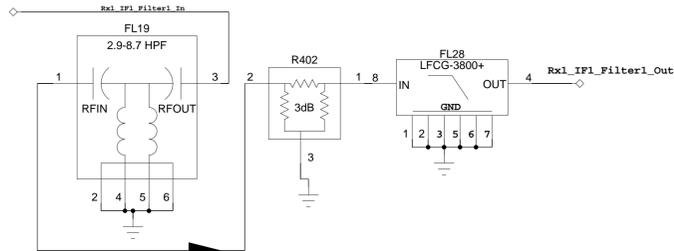
Rx1 Switch 5



Rx1 IF1 Filters

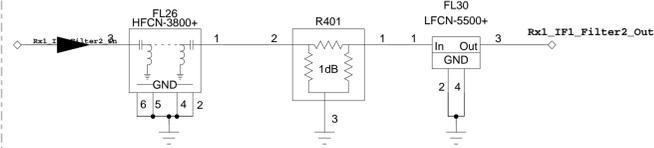
Rx1 RF Filter 1: 3.0 - 4.2 GHz

3.0 GHz HPF 3 dB Pad 4.2 GHz LPF



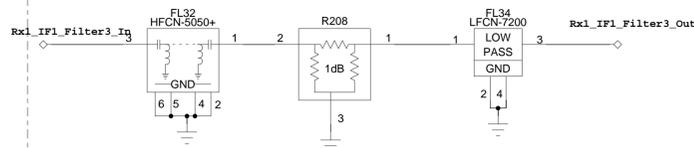
Rx1 RF Filter 2: 4.2 - 5.6 GHz

4.2 GHz HPF 1 dB Pad 5.6 GHz LPF



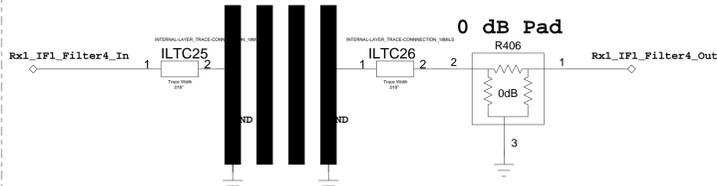
Rx1 IF1 Filter 3: 5.6 - 8 GHz

5.6 GHz HPF 1 dB Pad 8 GHz LPF



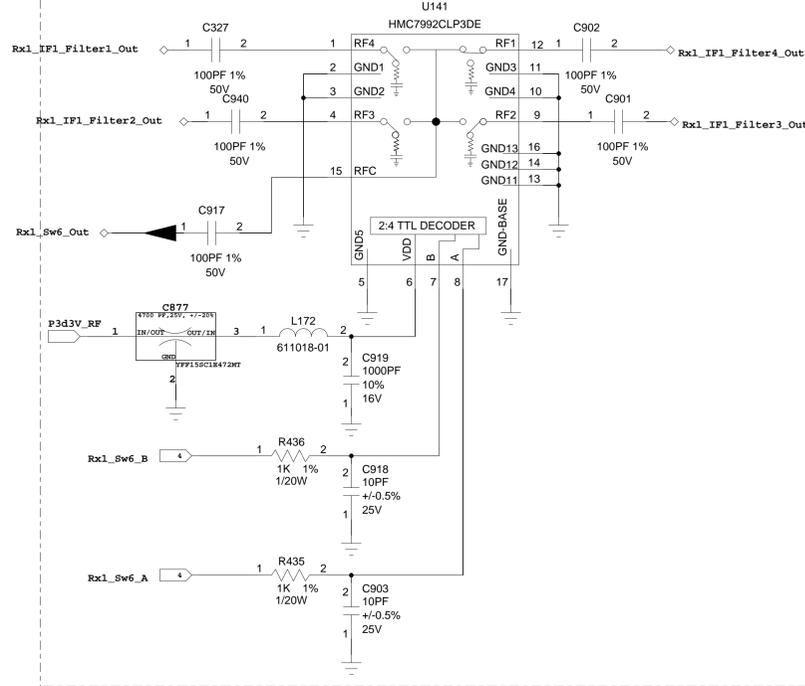
Tx0 IF1 Filter 6: 7 - 8 GHz

7.5 GHz BPF 0 dB Pad

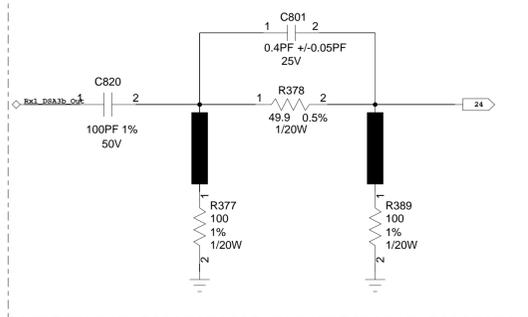


Rx1 Switch 6

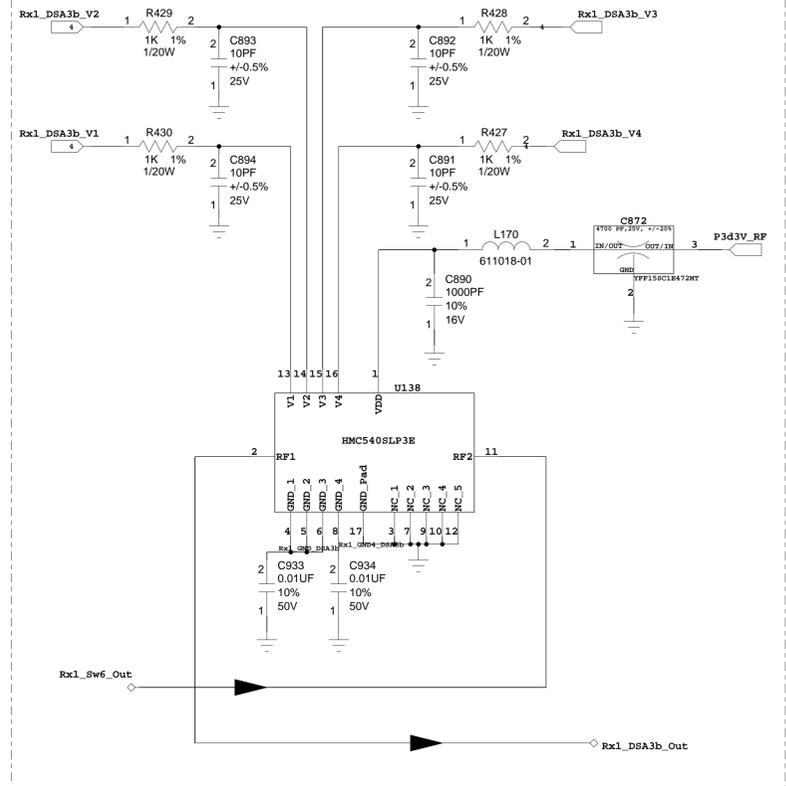
Rx1 Sw6



Rx1 IF1 Slope Pad



Rx1 DSA 3b



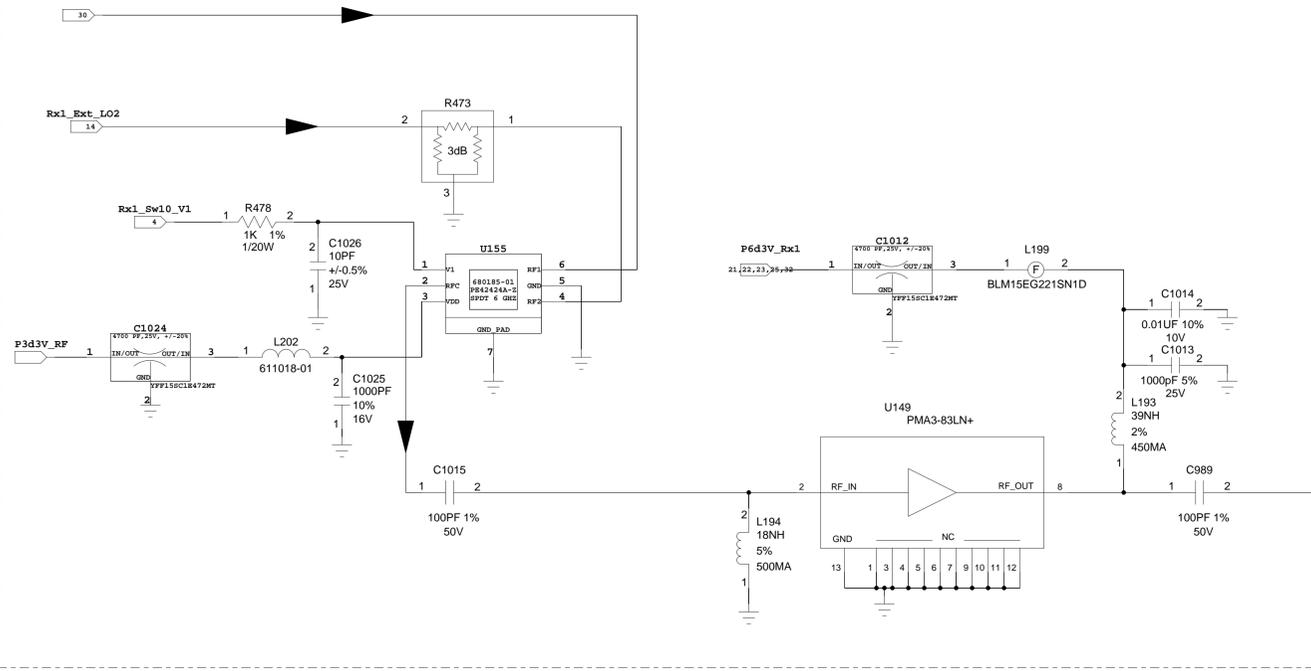
Rx1 IF1			
ZBX RF Daughterboard			
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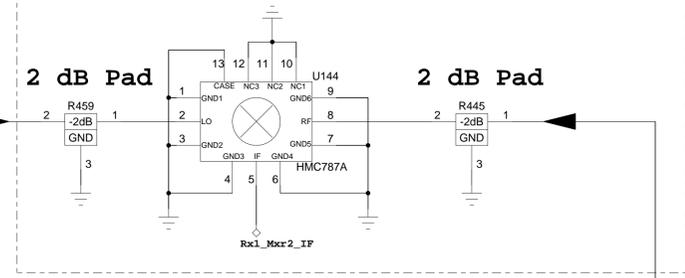
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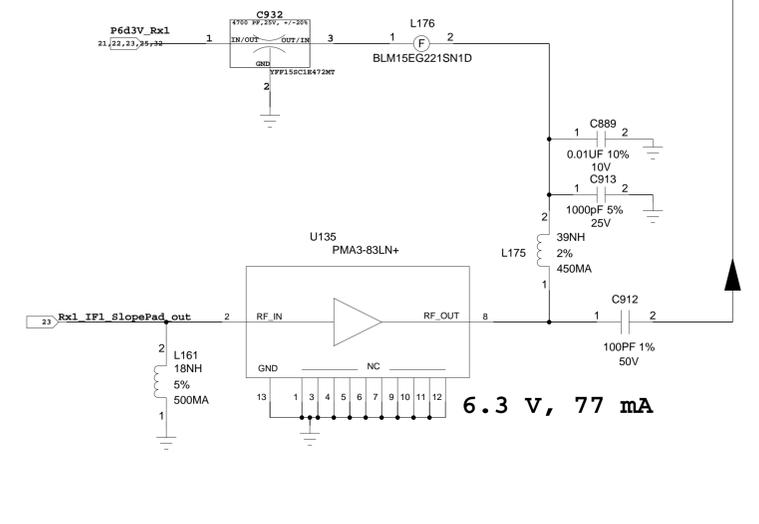
Rx1 LO2 Amplifier 3 dB Pad



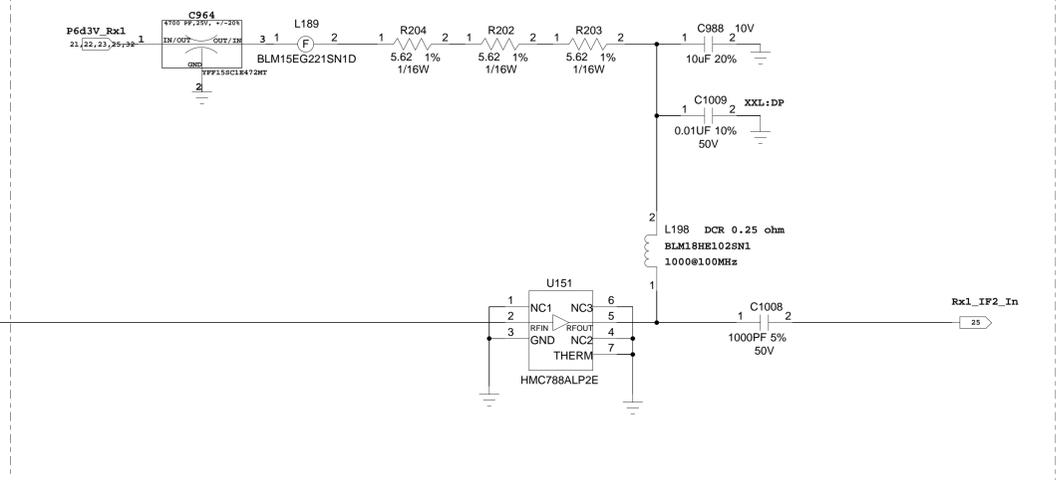
Rx1 Second Mixer



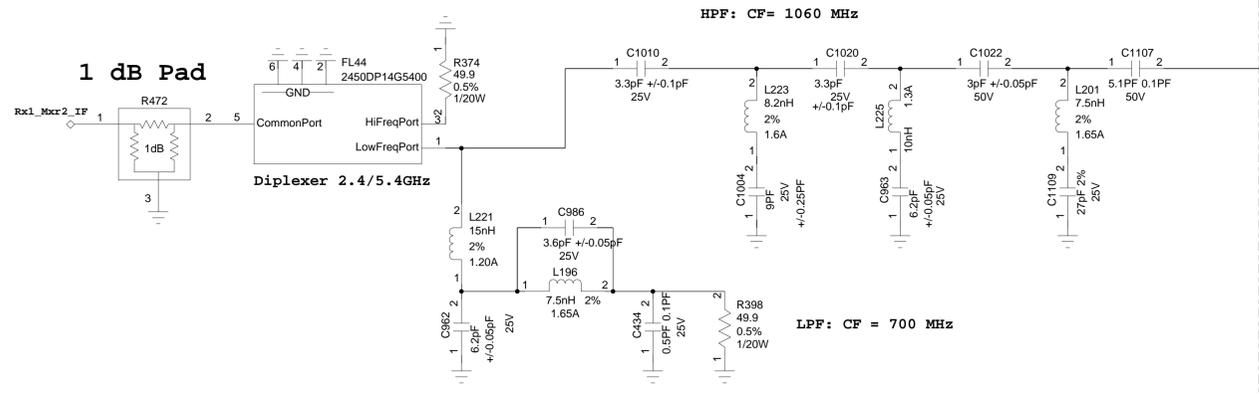
Rx1 IF1 Amplifier 2



Rx1 IF2 Amplifier



Rx1 IF2 Triplexer



Rx1 2nd Mixer			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE		SHEET 24 OF 33	

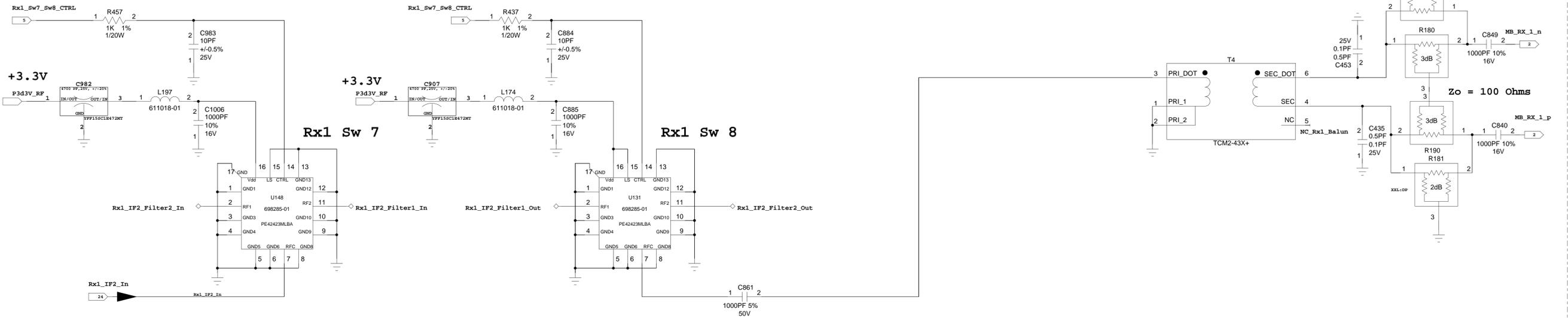
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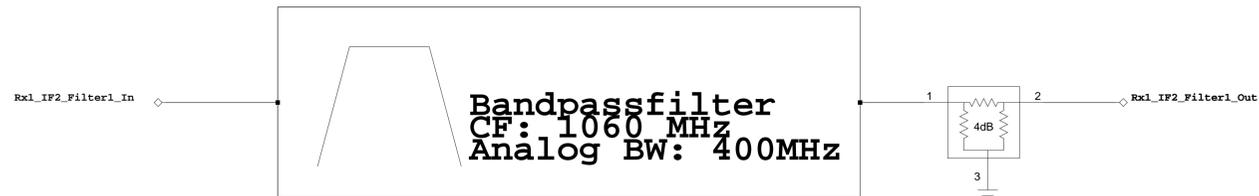
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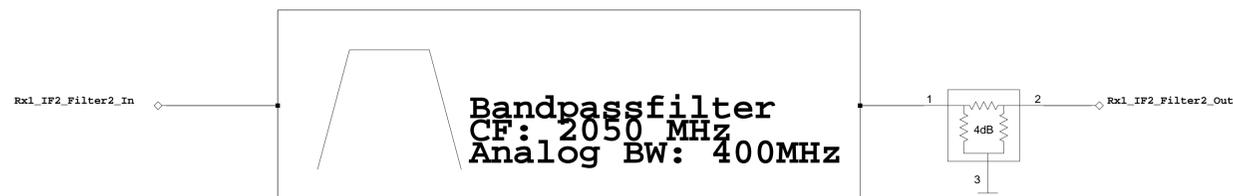
Rx1 IF1 Filter Switches



Rx1 IF2 Filter 1



Rx1 IF2 Filter 2



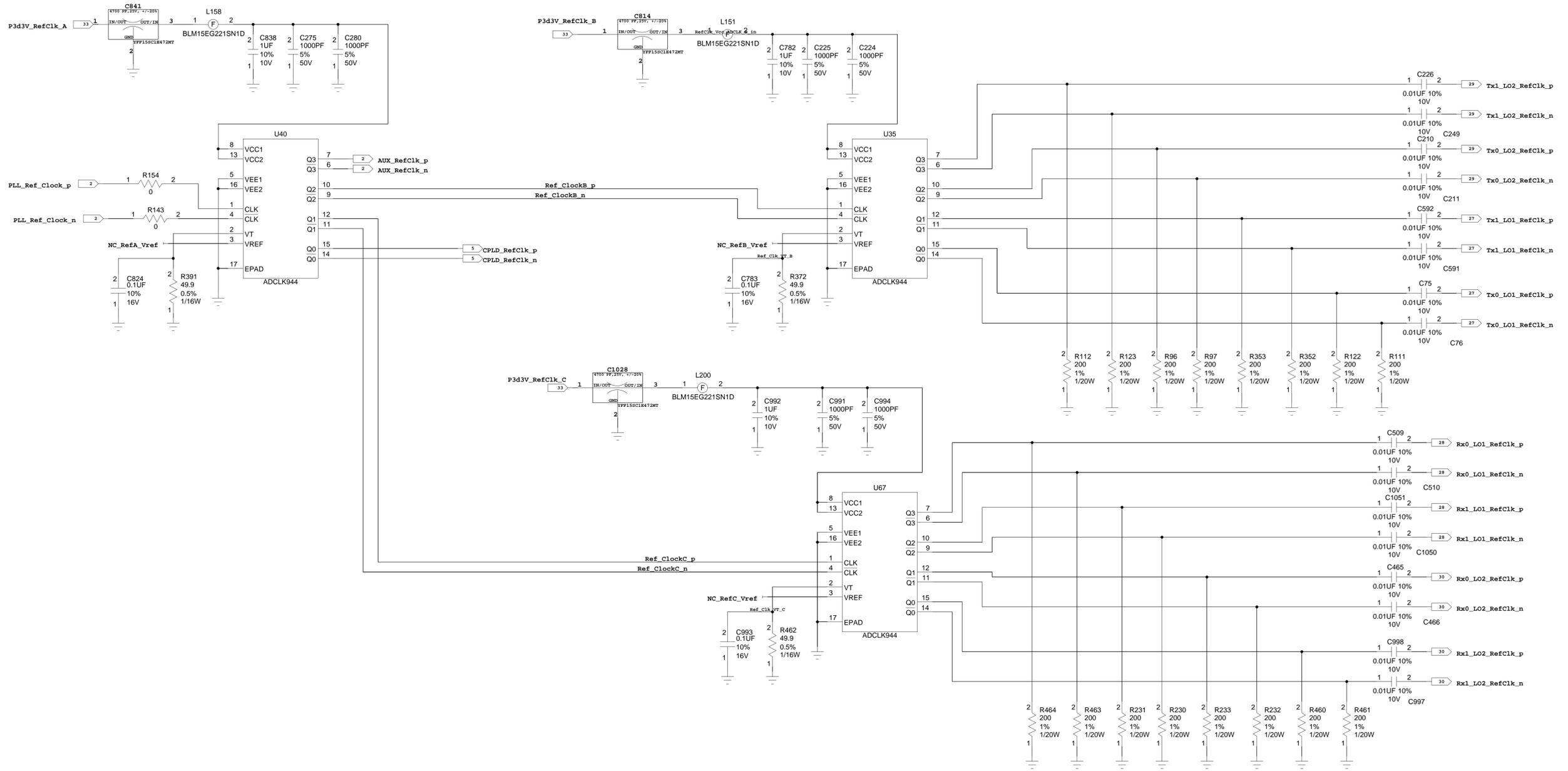
Rx1 IF2 Filters			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
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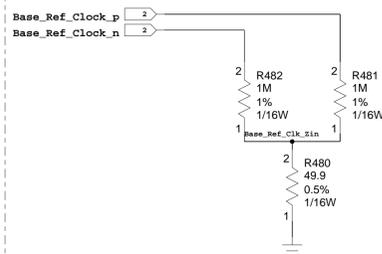
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Ref Clock Distribution



Base Ref Clock Termination



Replace 1 MOhms with
49.9 Ohms for proper LVPECL
1 Meg Ohm is proper for
shutting off LVPECL signal

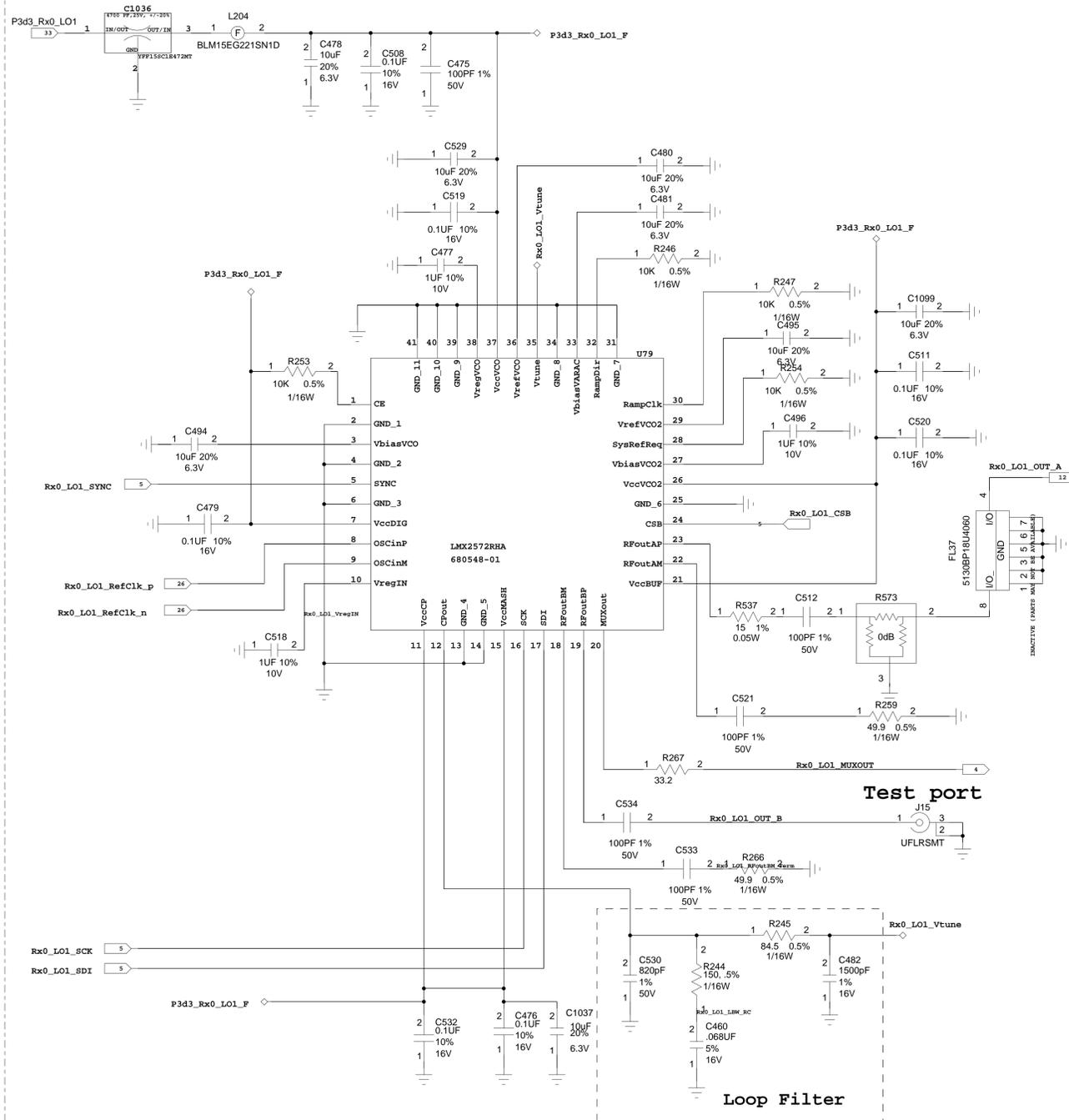
Ref Clocks			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
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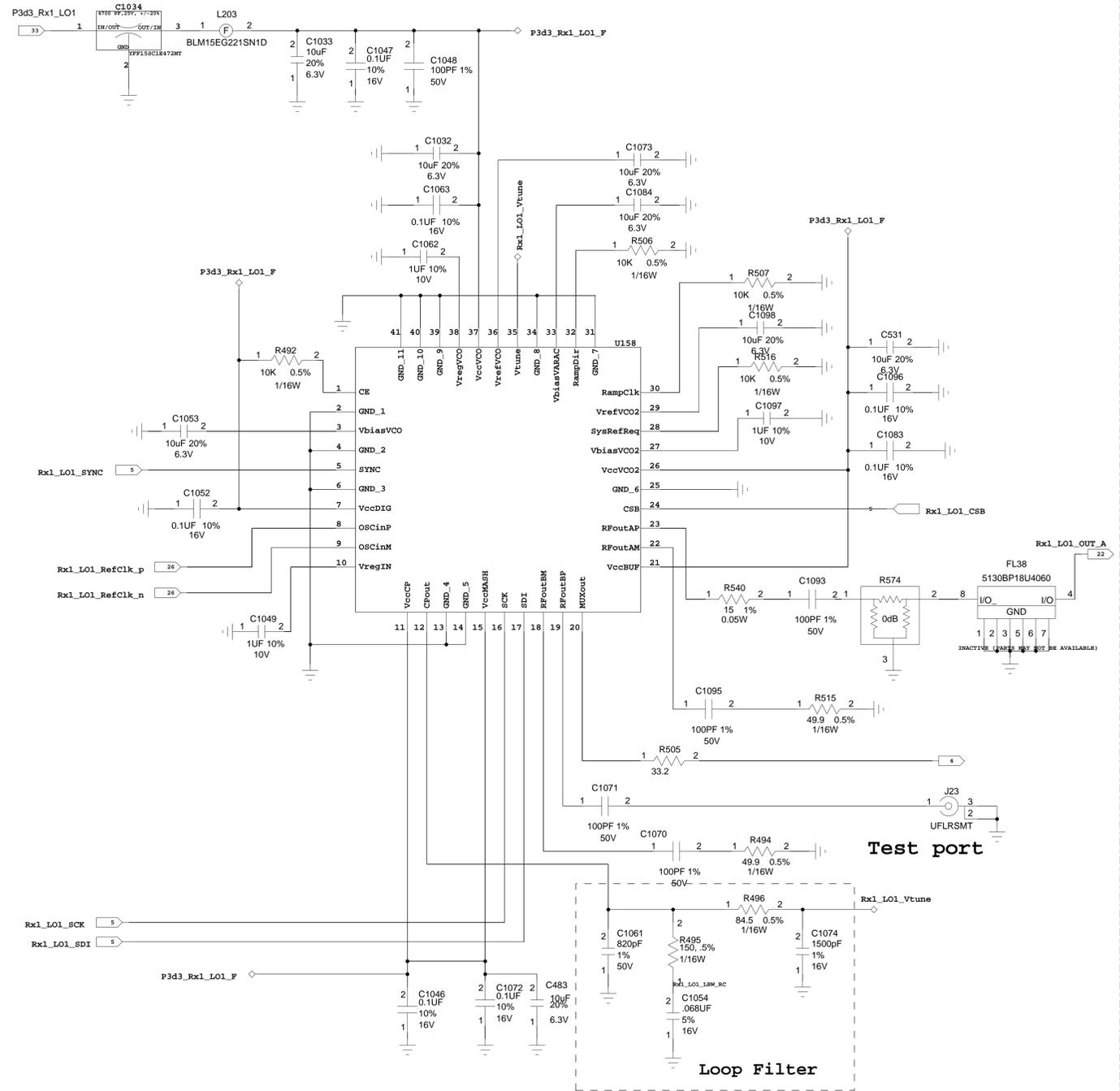
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Rx0 LO1



Rx1 LO1

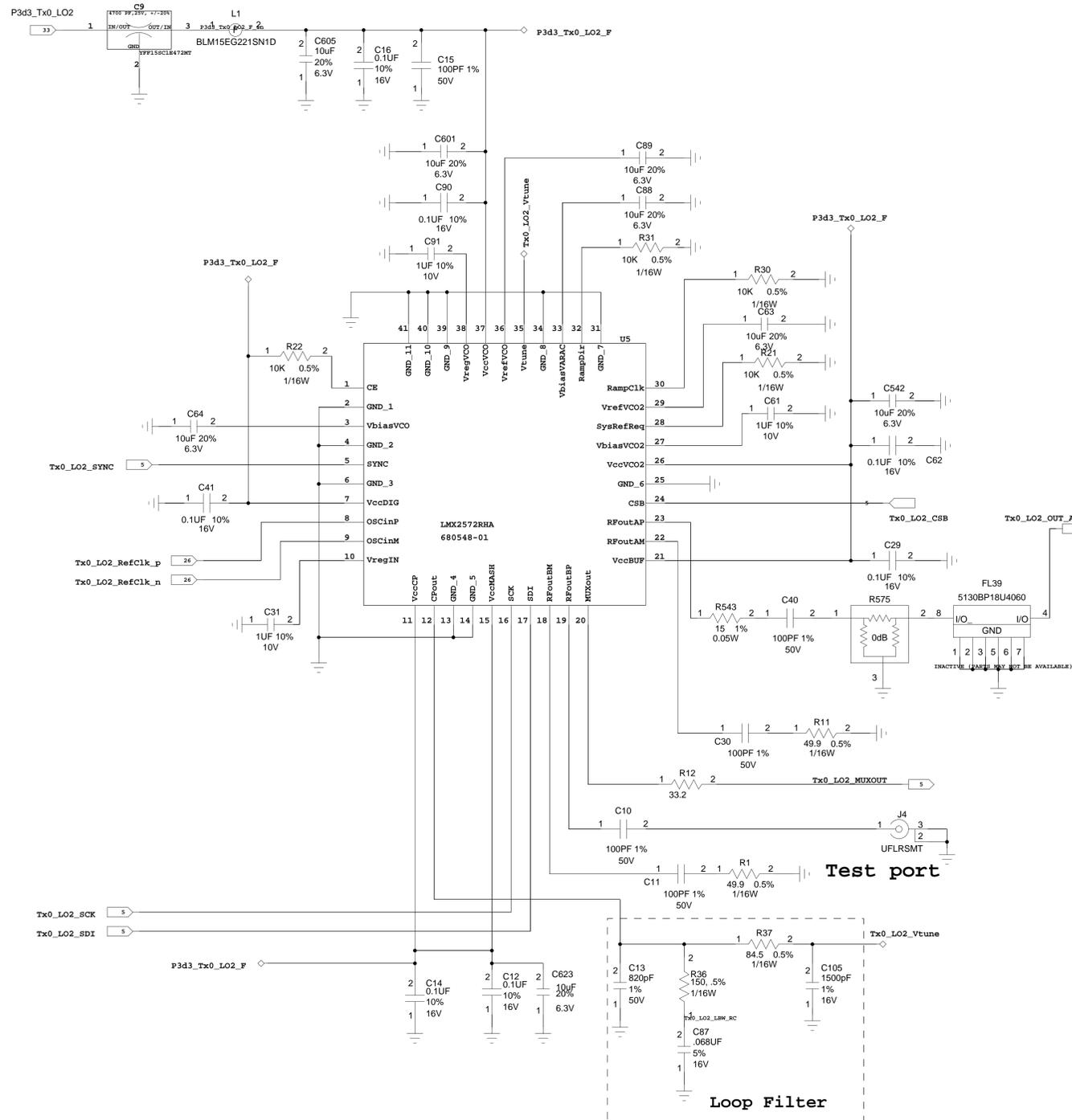


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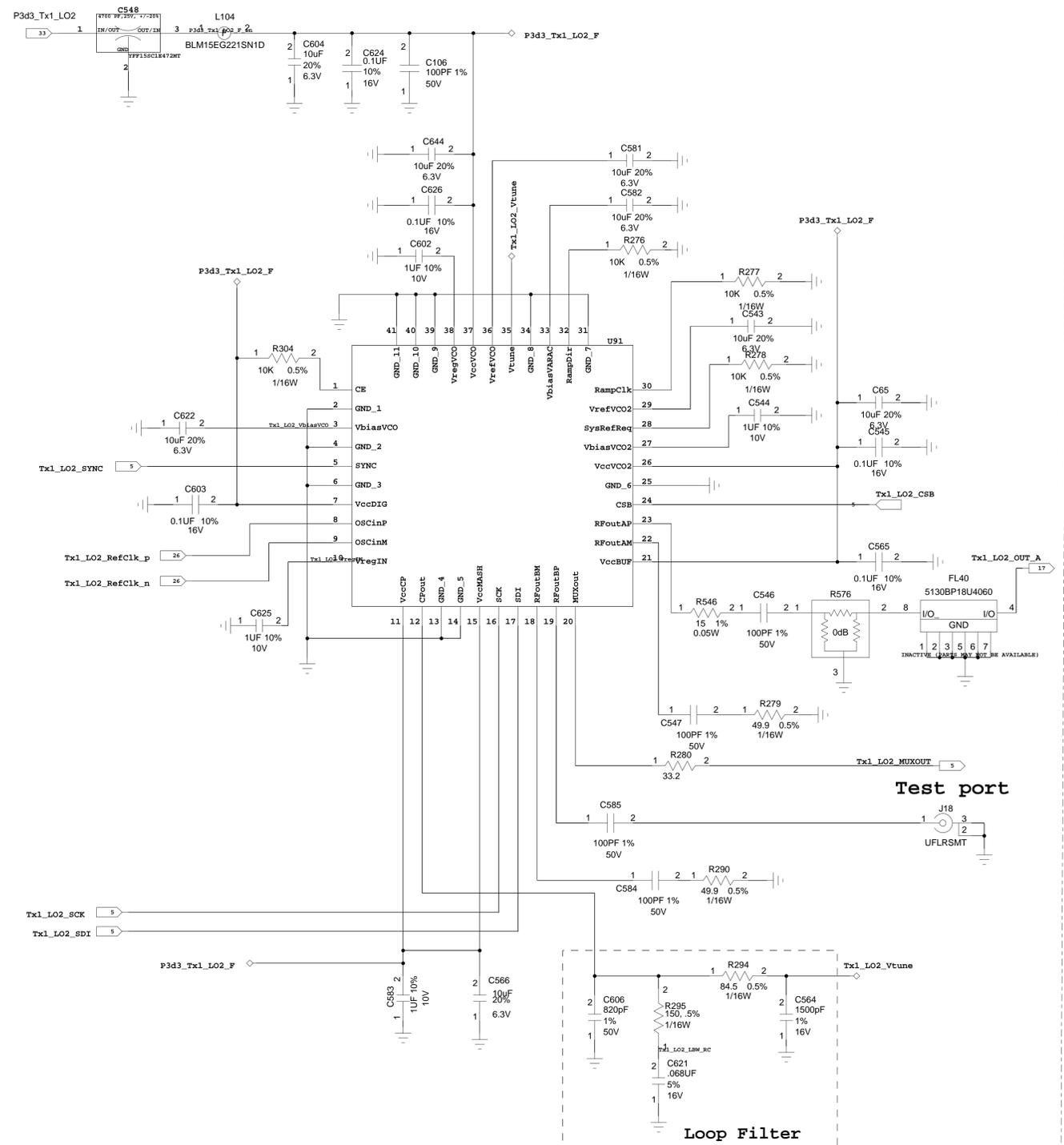
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Tx0 LO2



Tx1 LO2



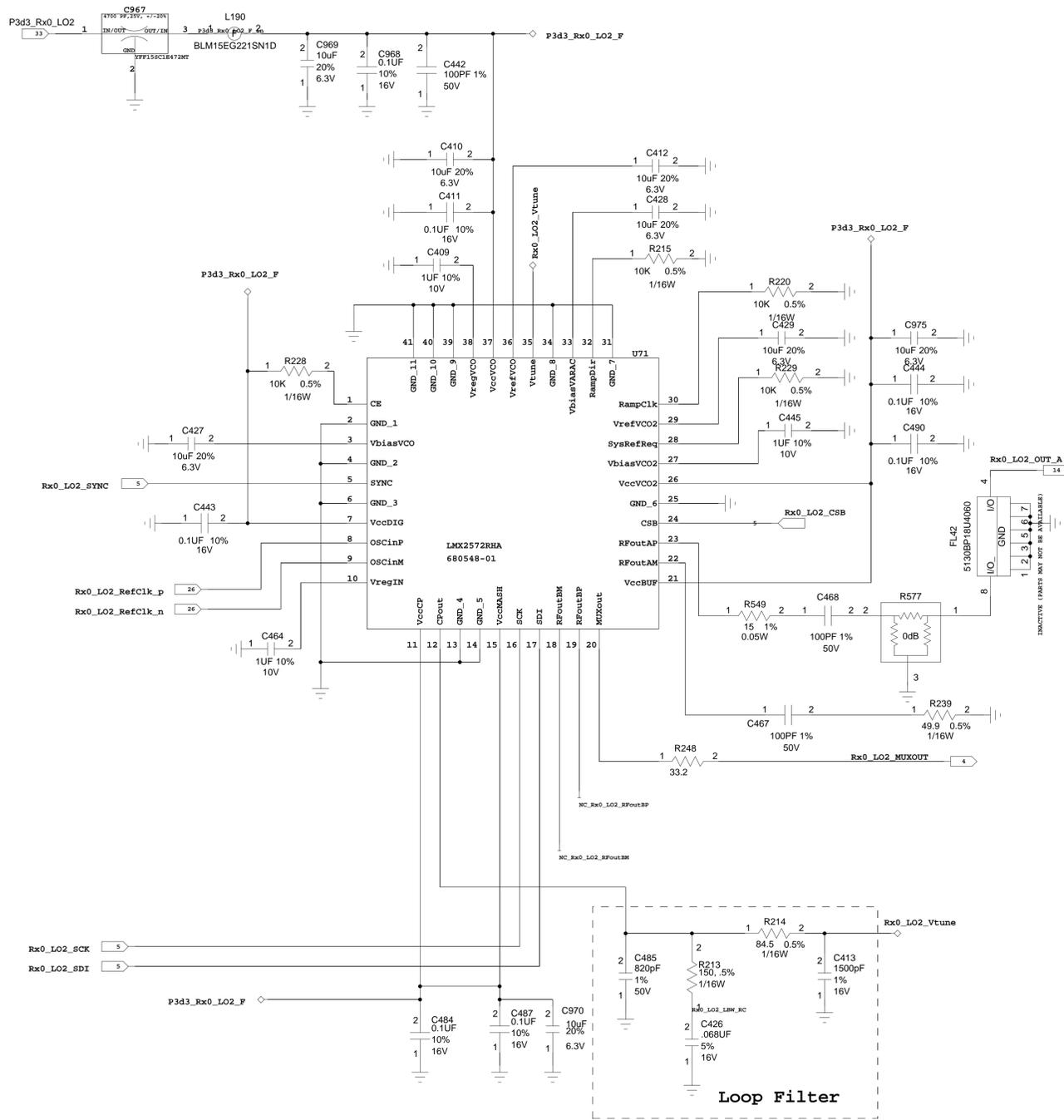
Tx LO2			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE			SHEET 29 OF 33

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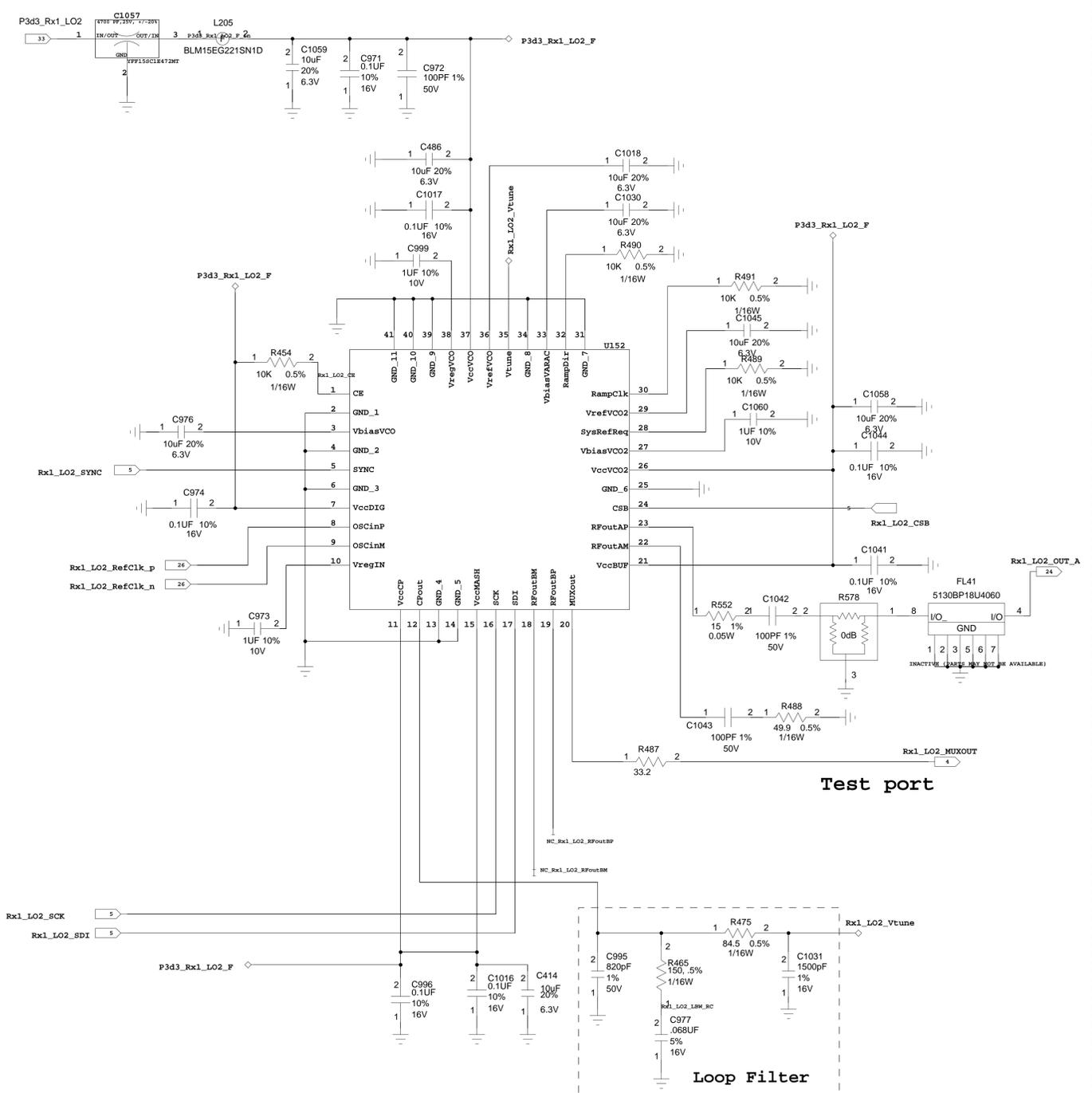
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Rx0 LO2



Rx1 LO2

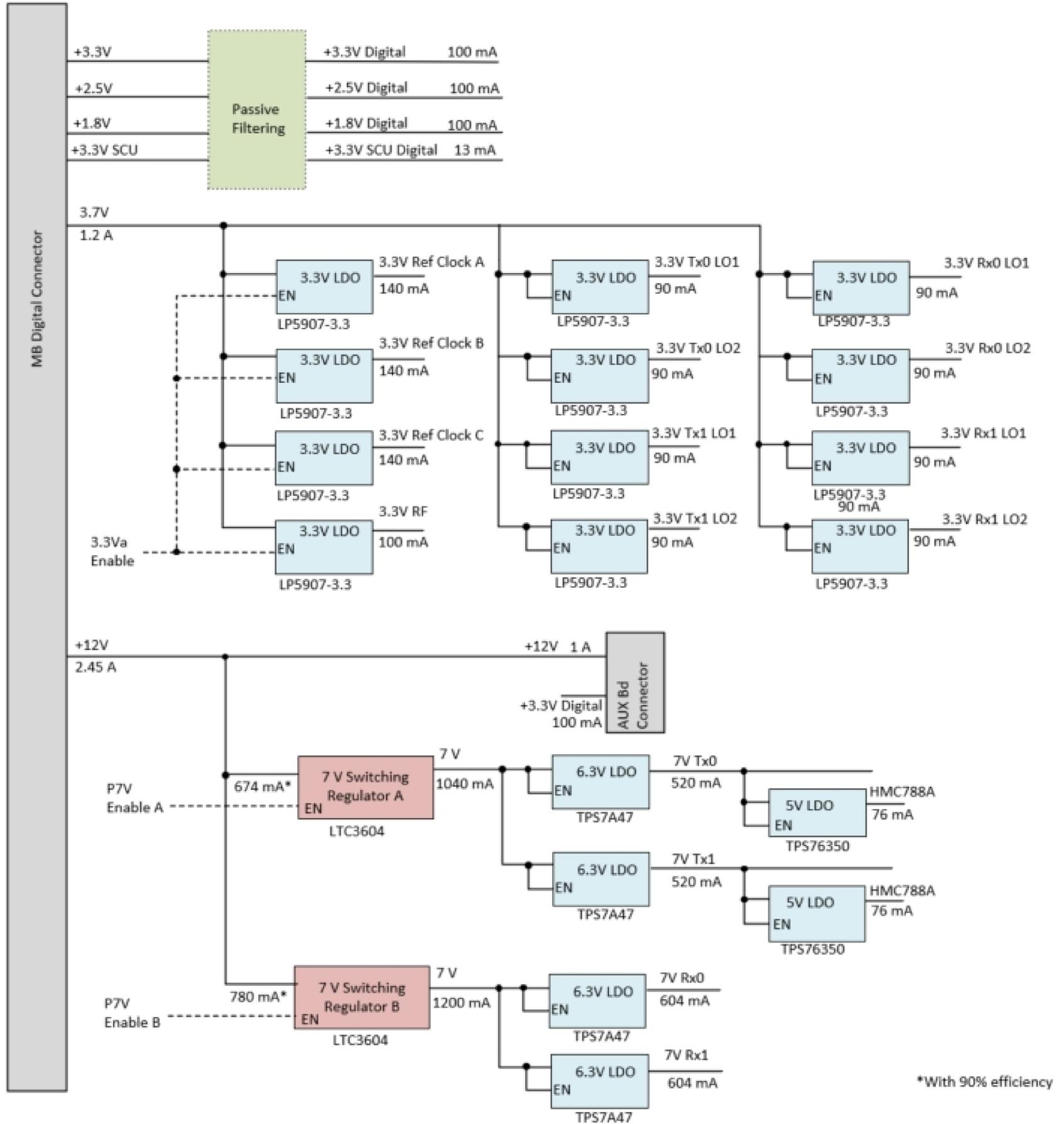


Rx LO2			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE		SHEET 30 OF 33	

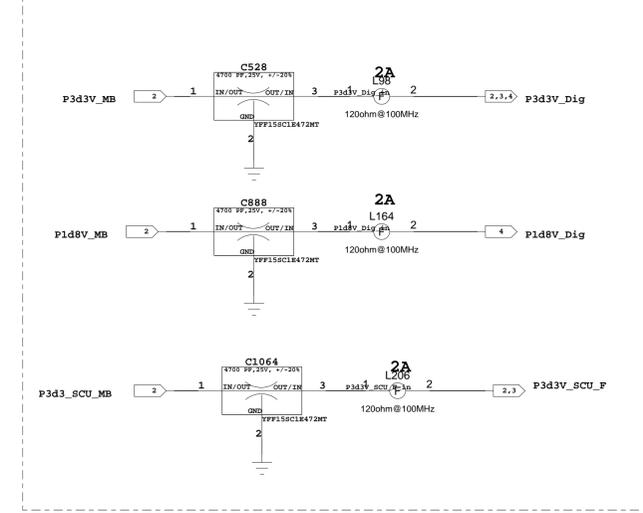
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Digital Power Supplies



*With 90% efficiency

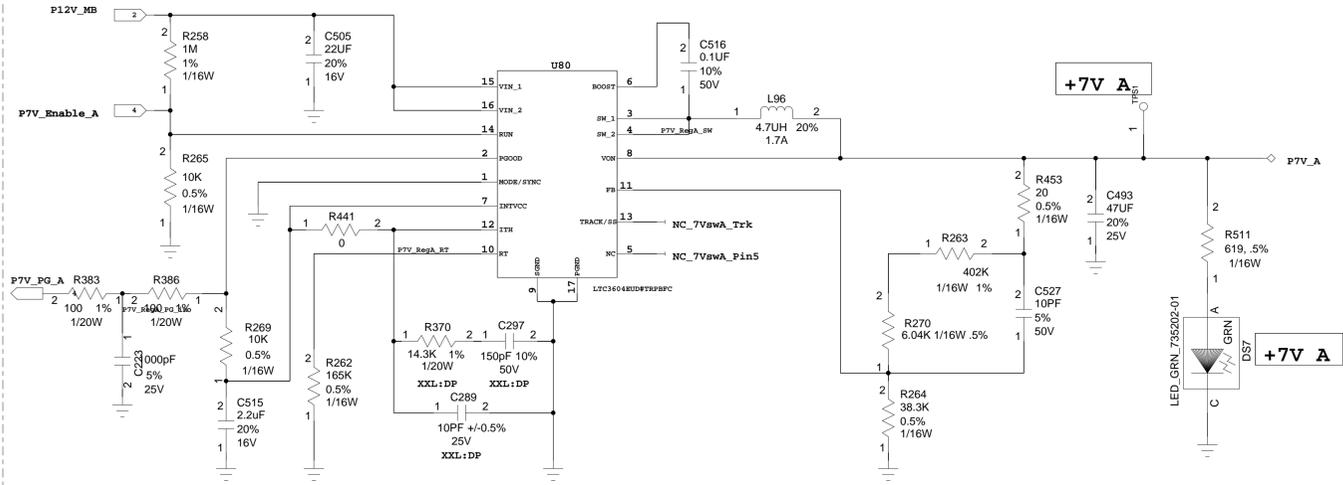
Power Supplies A			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
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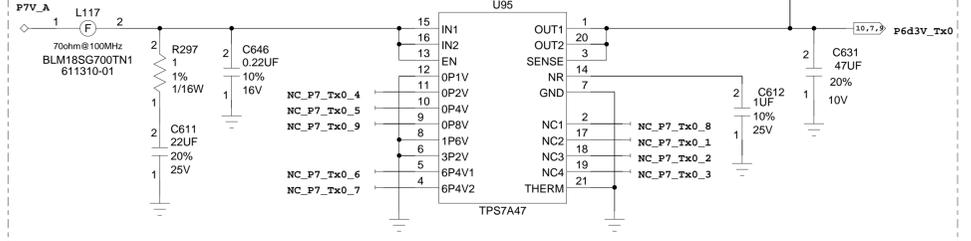
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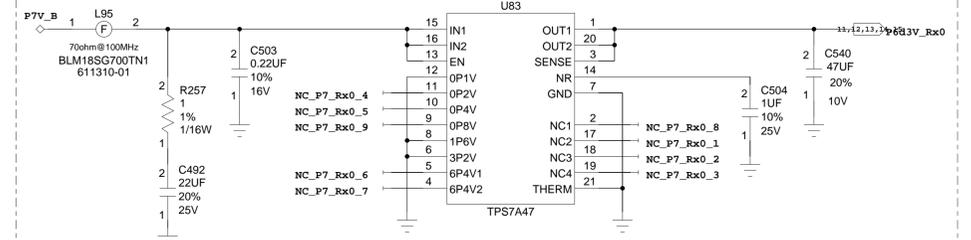
7V Switching Regulator A



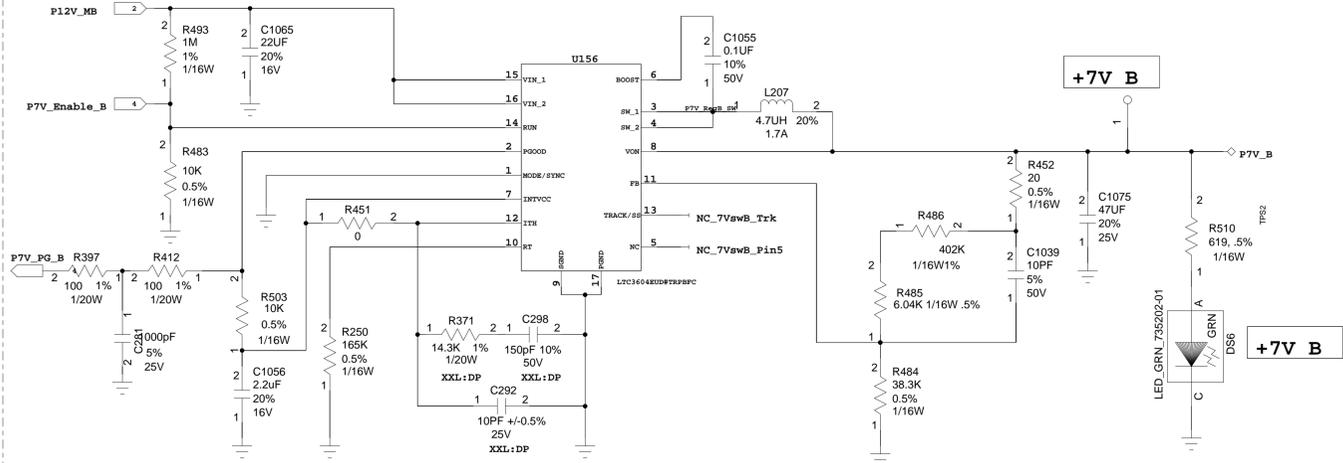
6.3V Tx0 Linear Regulator



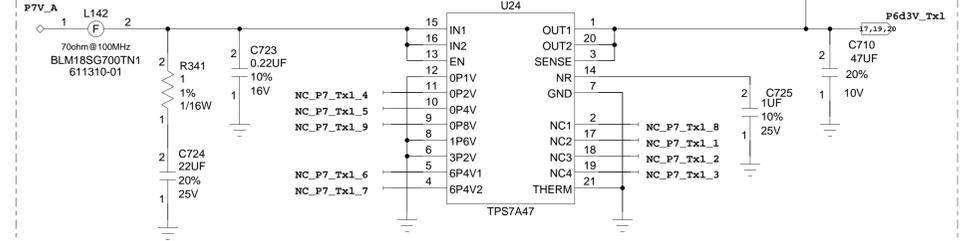
6.3V Rx0 Linear Regulator



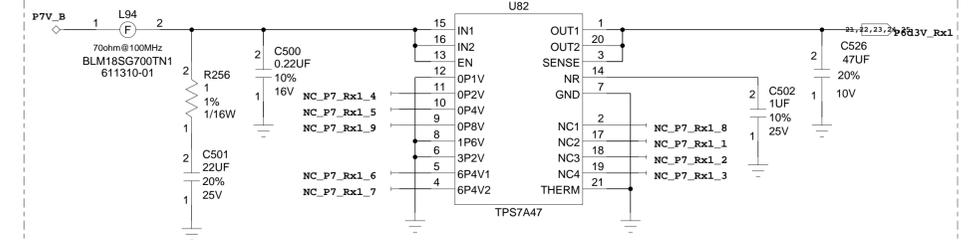
7V Switching Regulator B



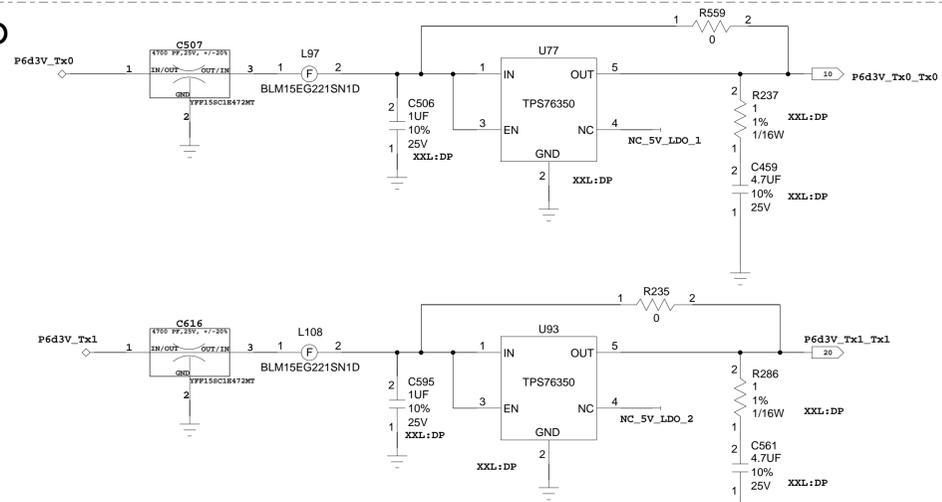
6.3V Tx1 Linear Regulator



6.3V Rx1 Linear Regulator



+5V LDO



Power Supplies B			
ZBX RF Daughterboard			
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE			SHEET 32 OF 33

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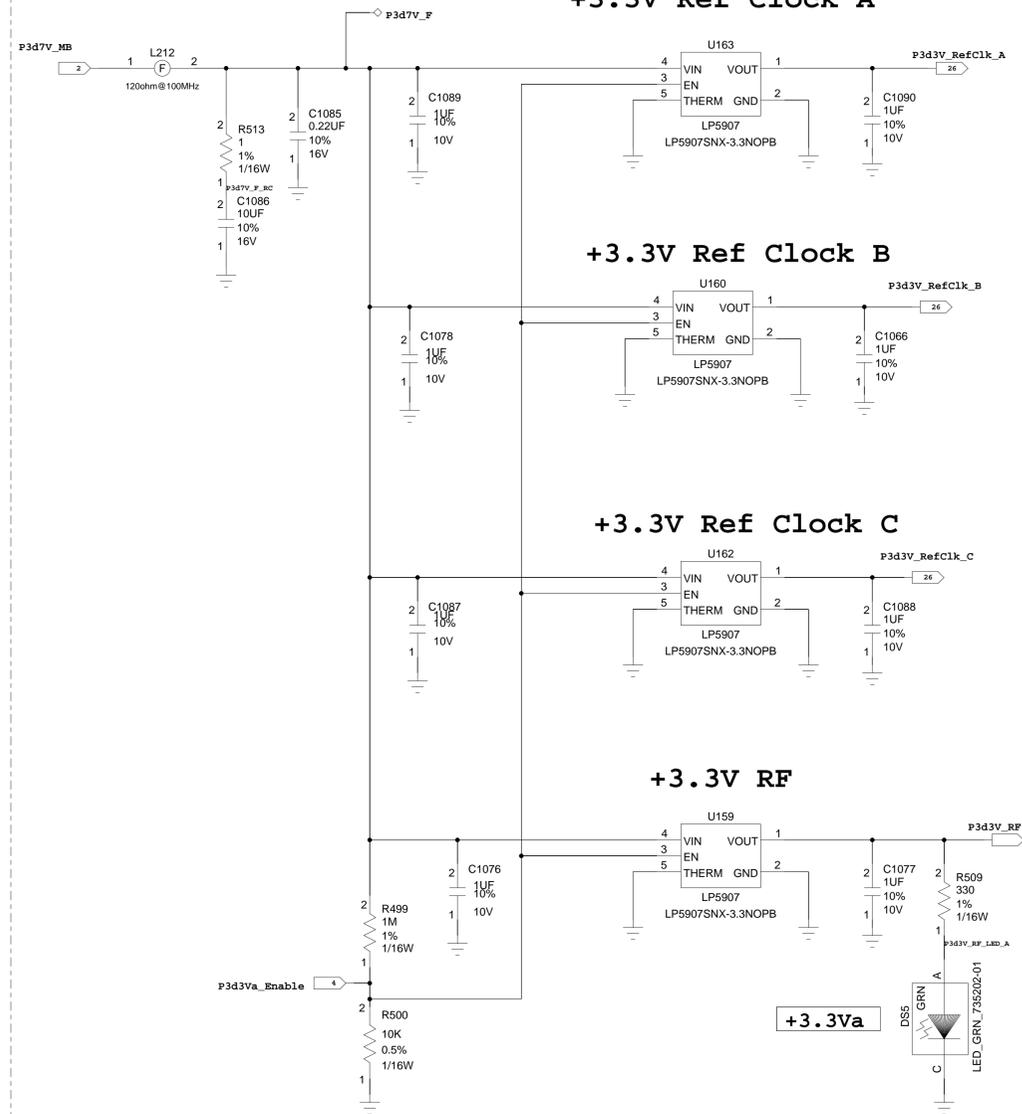
3.3V Linear Regulators

+3.3V Ref Clock A

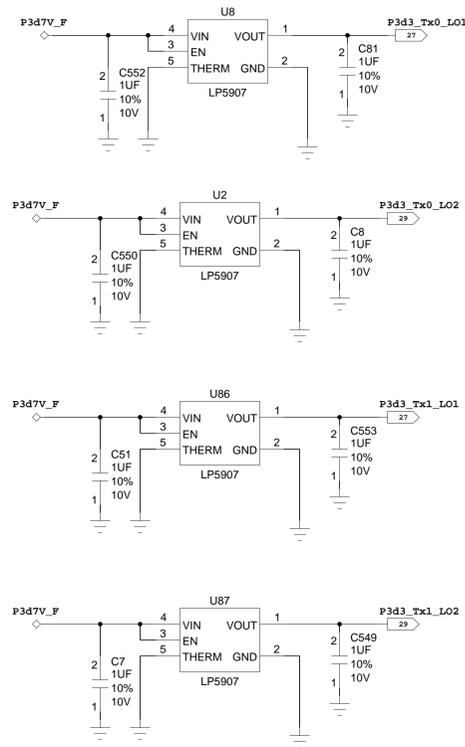
+3.3V Ref Clock B

+3.3V Ref Clock C

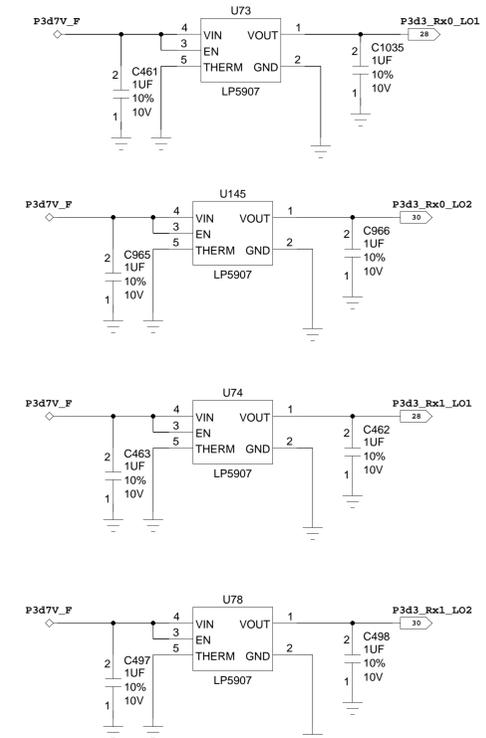
+3.3V RF



Tx LO 3.3V Linear Regulators



Rx LO 3.3V Linear Regulators



Power Supplies C

ZBX RF Daughterboard

SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	7U296	130019C-01	1
SCALE: NONE			SHEET 33 OF 33