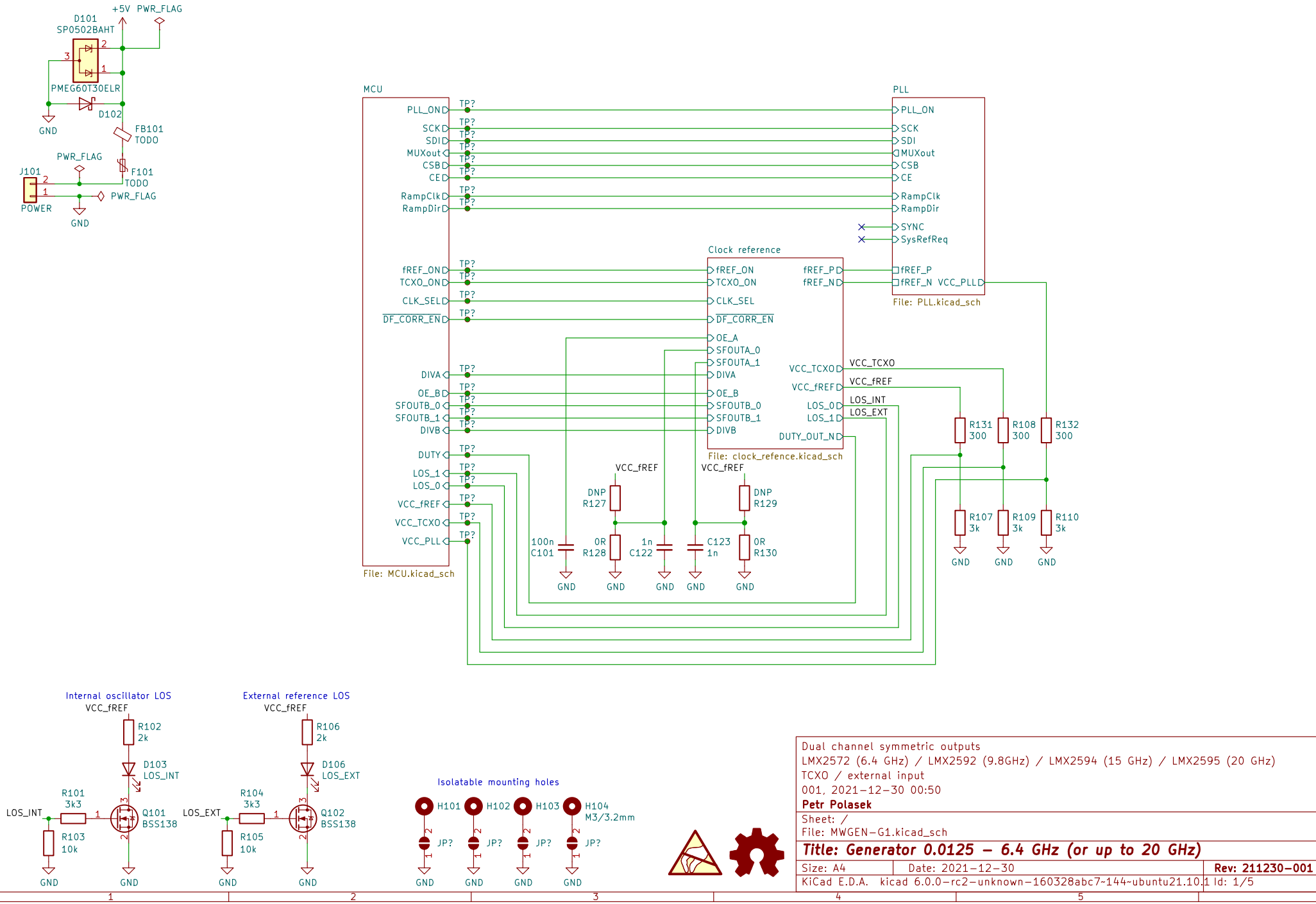


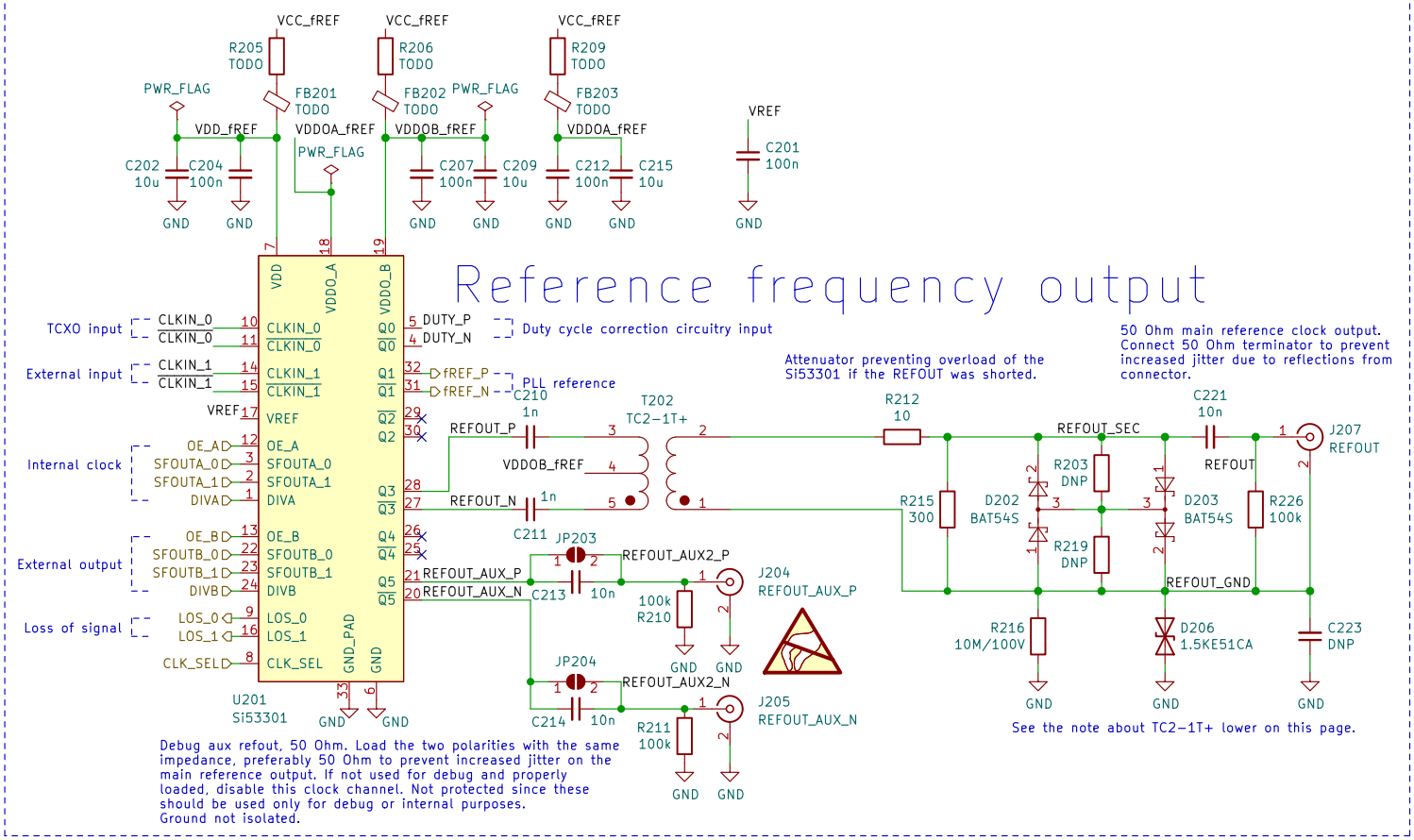
Dual channel symmetric outputs
LMX2572 (6.4 GHz) / LMX2592 (9.8GHz) / LMX2594 (15 GHz) / LMX2595 (20 GHz)
TCXO / external input
001, 2021-12-30 00:50
Petr Polasek

Sheet: /
File: MWGEN-G1.kicad_sch

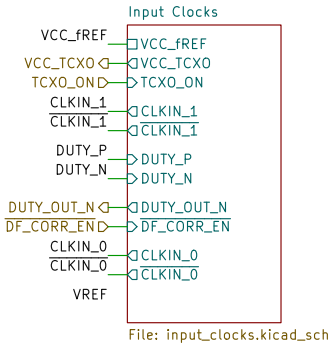
Title: Generator 0.0125 – 6.4 GHz (or up to 20 GHz)

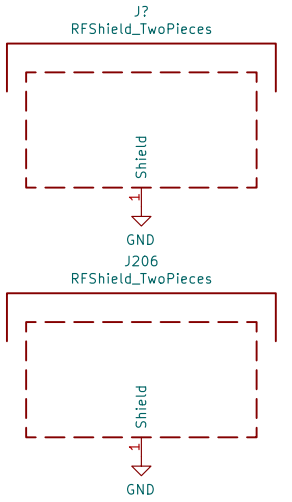
Size: A4	Date: 2021-12-30	**Rev: 211230-001**
KiCad E.D.A. kicad 6.0.0-rc2-unknown-160328abc7~144~ubuntu21.10.1		Id: 1/5

Multiplexer / buffer

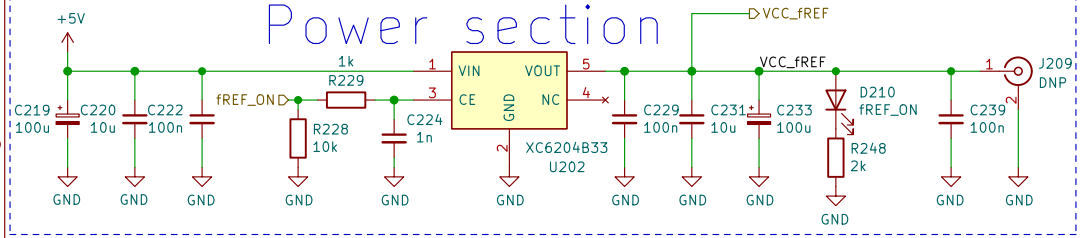


Reference frequency output





Power section



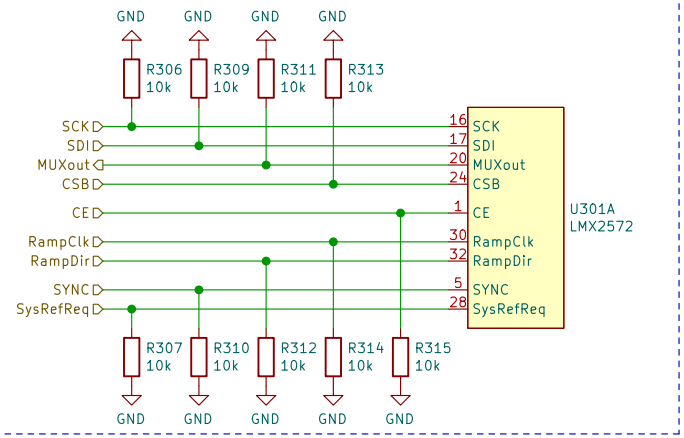
LMX2572 (6.4 GHz) / LMX2592 (9.8GHz) / LMX2594 (15 GHz) / LMX2595 (20 GHz)
TCXO / external input
001, 2021-12-30 00:50
Petr Polasek

Sheet: /Clock reference/
File: clock_refence.kicad_sch

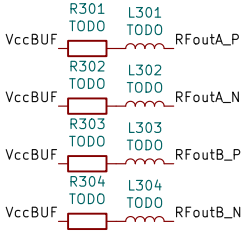
Title: Generator 0.0125 – 6.4 GHz (or up to 20 GHz)

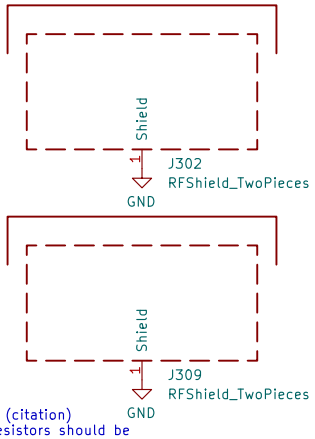
Size: A4	Date: 2021-12-30	**Rev: 211230-001**
KiCad E.D.A. kicad 6.0.0-rc2-unknown-160328abc7~144~ubuntu21.10.1	Id: 2/5	

Communication section



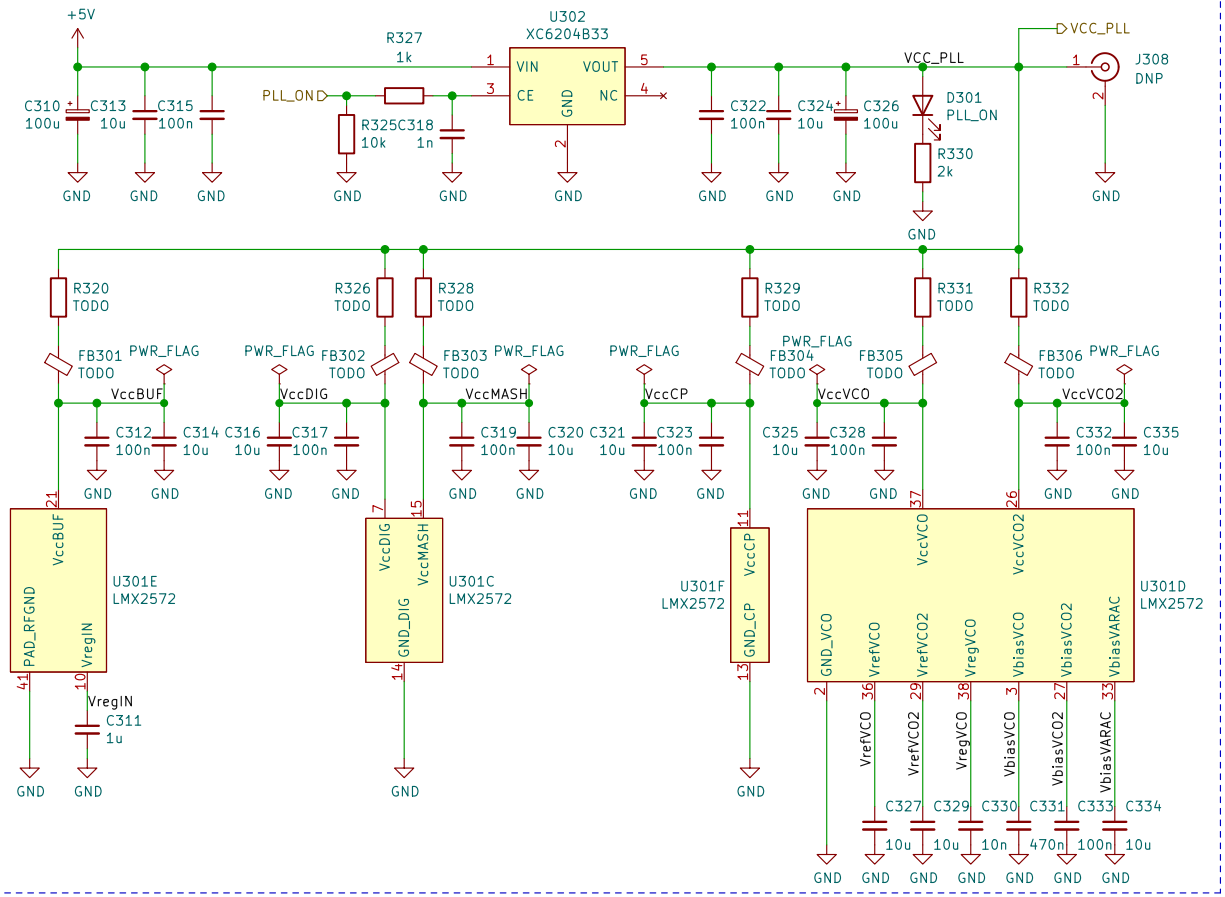
Place these pullups only in case LMX2592 is used.
Do not place them when LMX2572 is used!



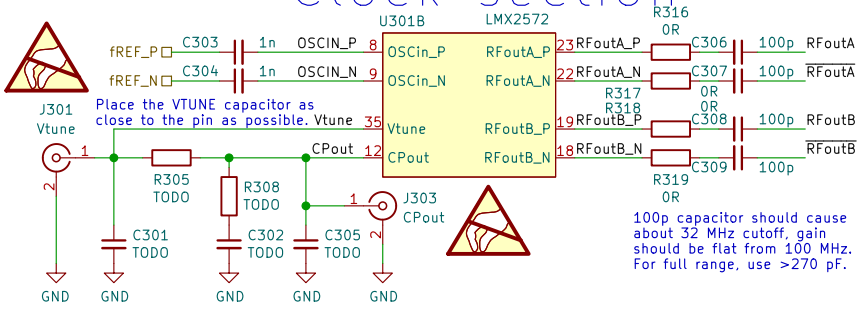


The output impedance of LMX2572 is "... just a few ohms." (citation)
The impedance should be measured and according series resistors should be placed to get 50R output. Place the resistors as close as possible to the PLL.
https://e2e.ti.com/support/clock-and-timing/f/48/t/833789?LMX2572-LMX2572-RF-output-impedance-
For LMX2592, place 0R resistors.

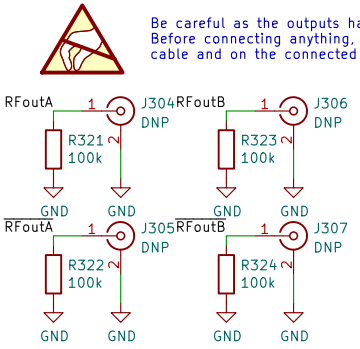
Power section



Clock section



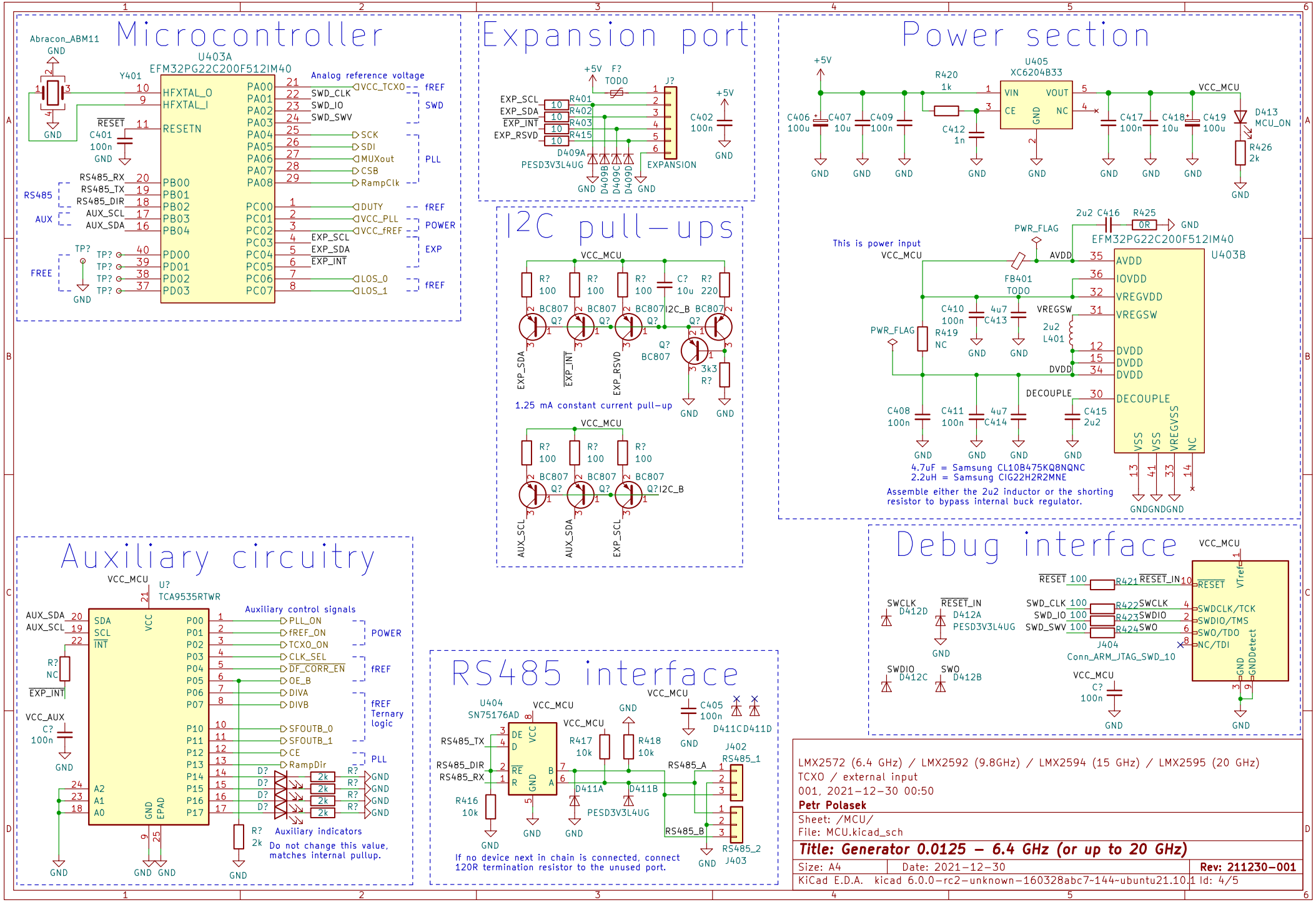
100p capacitor should cause about 32 MHz cutoff, gain should be flat from 100 MHz. For full range, use >270 pF.



LMX2572 (6.4 GHz) / LMX2592 (9.8GHz) / LMX2594 (15 GHz) / LMX2595 (20 GHz)
TCXO / external input
001, 2021-12-30 00:50
Petr Polasek
Sheet: /PLL/
File: PLL.kicad_sch

Title: Generator 0.0125 – 6.4 GHz (or up to 20 GHz)

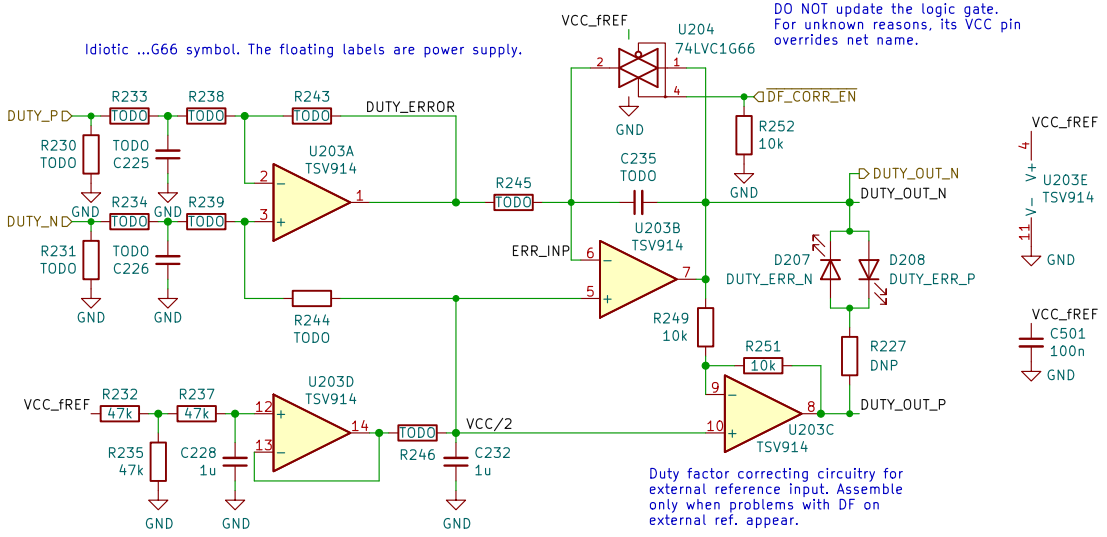
Size: A4	Date: 2021-12-30	**Rev: 211230-001**
KiCad E.D.A. kicad 6.0.0-rc2-unknown-160328abc7~144~ubuntu21.10.1	Id: 3/5	


Microcontroller
Abracon_ABM11
U403A
EFM32PG22C200F512IM40
Y401
HFXTAL_O
HFXTAL_I
RESETN
PA00
PA01
PA02
PA03
PA04
PA05
PA06
PA07
PA08
PB00
PB01
PB02
PB03
PB04
PC00
PC01
PC02
PC03
PC04
PC05
PC06
PC07
PD00
PD01
PD02
PD03
Analog reference voltage
VCC_TCXO
SWD_CLK
SWD_IO
SWD_SWV
SCK
SDI
MUXout
CSB
RampClk
DUTY
VCC_PLL
VCC_fREF
EXP_SCL
EXP_SDA
EXP_INT
LOS_0
LOS_1
RS485_RX
RS485_TX
RS485_DIR
AUX_SCL
AUX_SDA
fREF
SWD
PLL
POWER
EXP
RS485
AUX
FREE
Expansion port
EXPANSION
PESD3V3L4UG
I2C pull-ups
1.25 mA constant current pull-up
Power section
XC6204B33
EFM32PG22C200F512IM40
U403B
This is power input
FB401
4.7uF = Samsung CL10B475KQ8NQNC
2.2uH = Samsung CIG22H2R2MNE
Assemble either the 2u2 inductor or the shorting resistor to bypass internal buck regulator.
Auxiliary circuitry
TCA9535RTWR
Auxiliary control signals
PLL_ON
fREF_ON
TCXO_ON
CLK_SEL
DF_CORR_EN
OE_B
DIVA
DIVB
SFOUTB_0
SFOUTB_1
CE
RampDir
Auxiliary indicators
Do not change this value, matches internal pullup.
RS485 interface
SN75176AD
If no device next in chain is connected, connect 120R termination resistor to the unused port.
Debug interface
Conn_ARM_JTAG_SWD_10
LMX2572 (6.4 GHz) / LMX2592 (9.8GHz) / LMX2594 (15 GHz) / LMX2595 (20 GHz)
TCXO / external input
001, 2021-12-30 00:50
Petr Polasek
Sheet: /MCU/
File: MCU.kicad_sch
Title: Generator 0.0125 – 6.4 GHz (or up to 20 GHz)
Size: A4
Date: 2021-12-30
Rev: 211230-001
KiCad E.D.A. kicad 6.0.0-rc2-unknown-160328abc7~144~ubuntu21.10.1 Id: 4/5

Duty factor / DC corrector

Idiotic ...G66 symbol. The floating labels are power supply.

DO NOT update the logic gate.
For unknown reasons, its VCC pin
overrides net name.



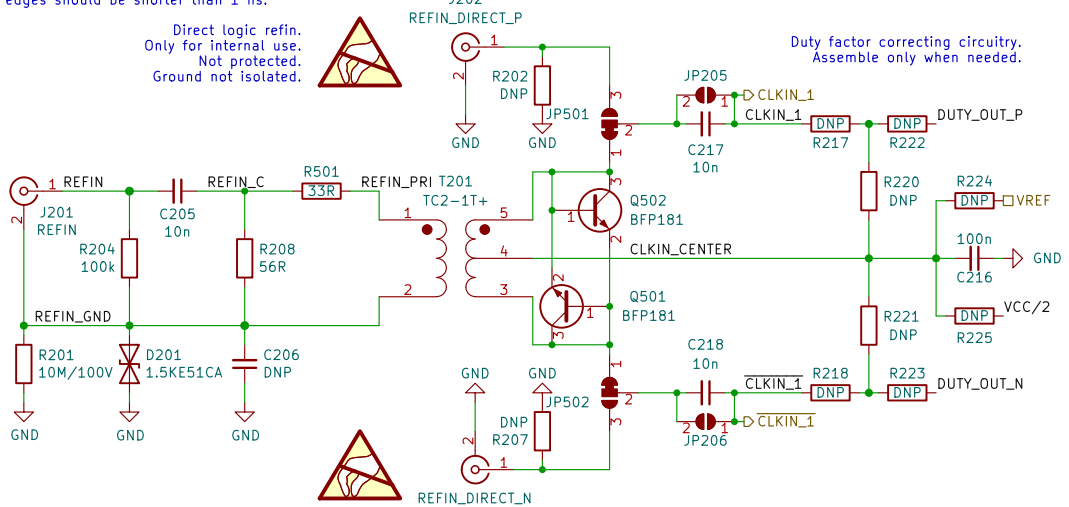
Duty factor correcting circuitry for
external reference input. Assemble
only when problems with DF on
external ref. appear.

Reference frequency input

The Si53301 requires slew rate at least 750 V/us to meet 50 fs additive jitter.
This would require 5.5 Vpk-pk @ 10 MHz or 1.45 Vpk-pk at 40 MHz for sine wave.
Therefore, clipped sine wave or rectangle is required for best jitter performance.
The clipped sine should have slew rate at least 400 V/us and voltage at least 150 mVpp,
edges should be shorter than 1 ns.

Direct logic refin.
Only for internal use.
Not protected.
Ground not isolated.

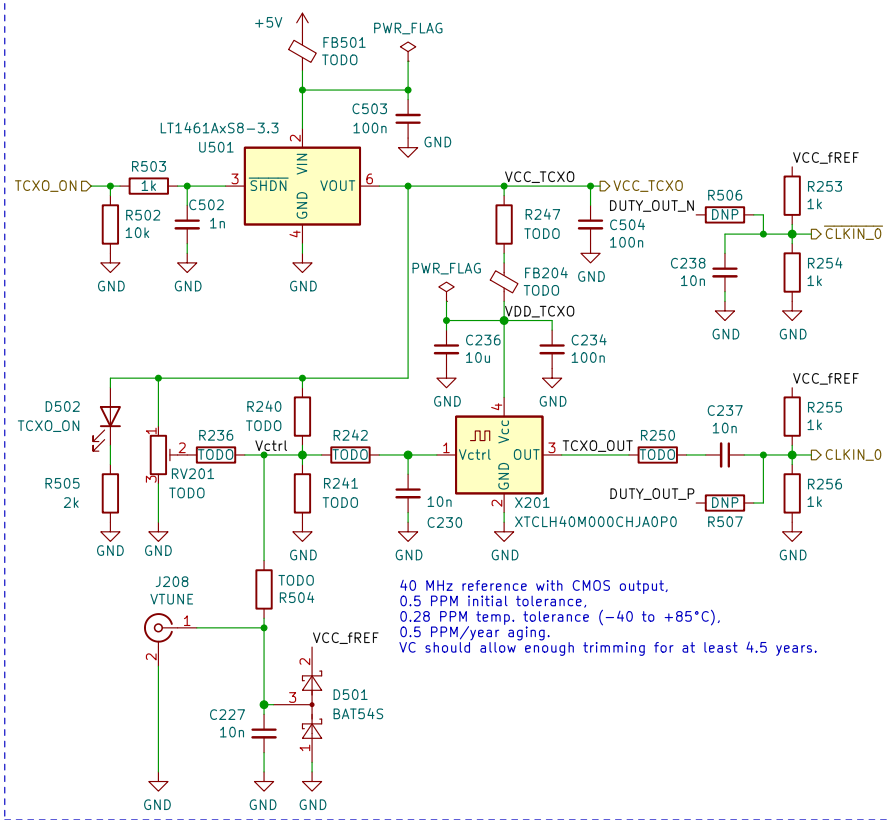
Duty factor correcting circuitry.
Assemble only when needed.



48V overvoltage protection.
The TC2-1T+ doesn't have pri-sec voltage rating!
Before assembling the TVS, check that the
TC2-1T+ can withstand at least 75 V DC.
Check by test, check every unit for one minute (before assembly).

Differential overvoltage protection. Clips large signals
without lowering slew rate. Can be replaced by most
microwave NPN transistors. Do not use diodes as these
tend to be too slow or have high capacitance except for
special types.

VCTCXO



40 MHz reference with CMOS output,
0.5 PPM initial tolerance,
0.28 PPM temp. tolerance (-40 to +85°C),
0.5 PPM/year aging.
VC should allow enough trimming for at least 4.5 years.

LMX2572 (6.4 GHz) / LMX2592 (9.8GHz) / LMX2594 (15 GHz) / LMX2595 (20 GHz)
TCXO / external input
001, 2021-12-30 00:50
Petr Polasek

Sheet: /Clock reference/Input Clocks/
File: input_clocks.kicad_sch

Title: Generator 0.0125 - 6.4 GHz (or up to 20 GHz)

Size: A4	Date: 2021-12-30	**Rev: 211230-001**
KiCad E.D.A.	kicad 6.0.0-rc2-unknown-160328abc7~144~ubuntu21.10.1	Id: 5/5