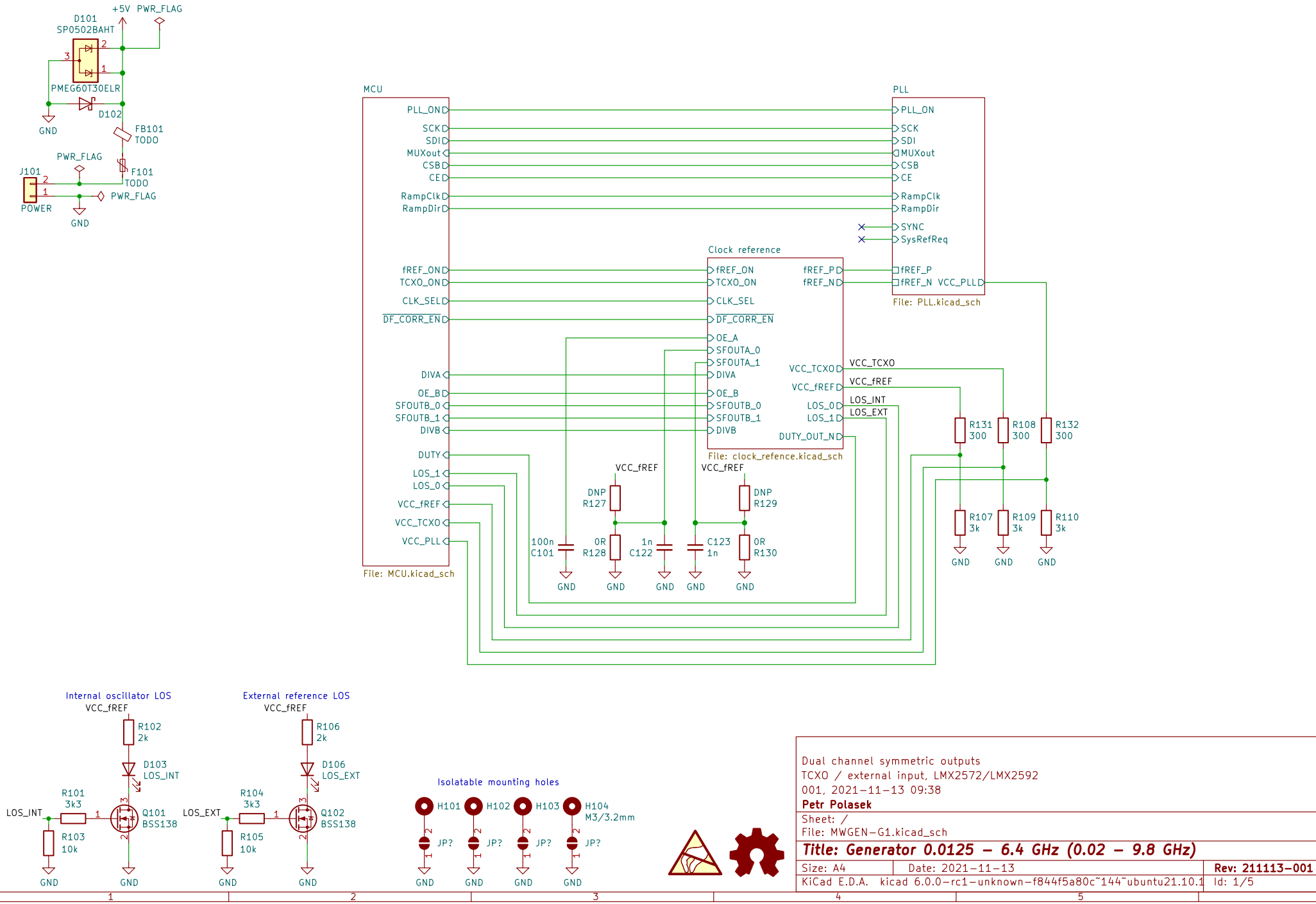
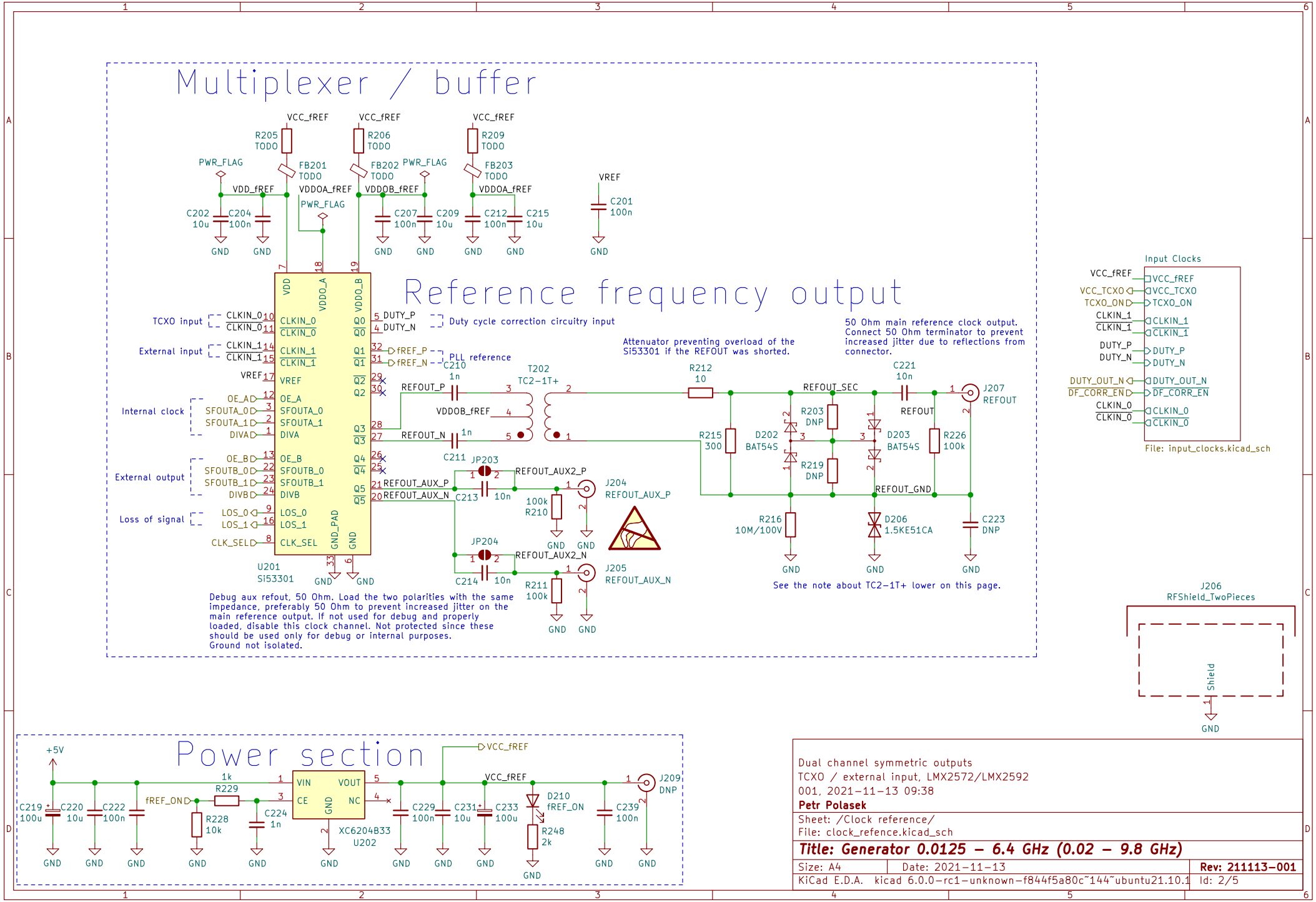
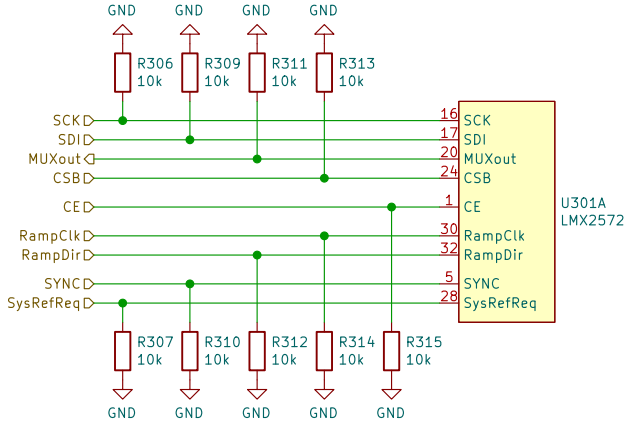
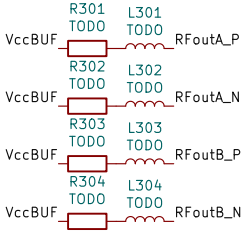

D101
SP0502BAHT
+5V
PWR_FLAG
PMEG60T30ELR
D102
GND
FB101
TODO
PWR_FLAG
J101
F101
TODO
POWER
PWR_FLAG
GND
MCU
PLL_ON
SCK
SDI
MUXout
CSB
CE
RampClk
RampDir
fREF_ON
TCXO_ON
CLK_SEL
DF_CORR_EN
DIVA
OE_B
SFOUTB_0
SFOUTB_1
DIVB
DUTY
LOS_1
LOS_0
VCC_fREF
VCC_TCXO
VCC_PLL
File: MCU.kicad_sch
PLL
PLL_ON
SCK
SDI
MUXout
CSB
CE
RampClk
RampDir
SYNC
SysRefReq
fREF_P
fREF_N
VCC_PLL
File: PLL.kicad_sch
Clock reference
fREF_ON
TCXO_ON
CLK_SEL
DF_CORR_EN
OE_A
SFOUTA_0
SFOUTA_1
DIVA
OE_B
SFOUTB_0
SFOUTB_1
DIVB
fREF_P
fREF_N
VCC_TCXO
VCC_fREF
LOS_0
LOS_1
DUTY_OUT_N
File: clock_refence.kicad_sch
VCC_TCXO
VCC_fREF
LOS_INT
LOS_EXT
R131 300
R108 300
R132 300
R107 3k
R109 3k
R110 3k
GND
VCC_fREF
DNP R127
DNP R129
100n C101
0R R128
1n C122
C123 1n
0R R130
Internal oscillator LOS
VCC_fREF
R102 2k
D103 LOS_INT
R101 3k3
LOS_INT
Q101 BSS138
R103 10k
External reference LOS
VCC_fREF
R106 2k
D106 LOS_EXT
R104 3k3
LOS_EXT
Q102 BSS138
R105 10k
Isolatable mounting holes
H101
H102
H103
H104 M3/3.2mm
JP?
Dual channel symmetric outputs
TCXO / external input, LMX2572/LMX2592
001, 2021-11-13 09:38
Petr Polasek
Sheet: /
File: MWGEN-G1.kicad_sch
Title: Generator 0.0125 - 6.4 GHz (0.02 - 9.8 GHz)
Size: A4
Date: 2021-11-13
Rev: 211113-001
KiCad E.D.A. kicad 6.0.0-rc1-unknown-f844f5a80c~144~ubuntu21.10.1
Id: 1/5

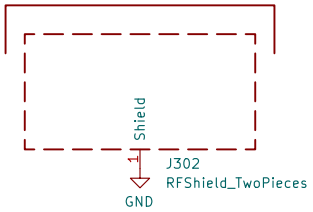

Multiplexer / buffer
Reference frequency output
Power section
Input Clocks
VCC_fREF
VCC_TCXO
TCXO_ON
CLKIN_1
DUTY_P
DUTY_N
DUTY_OUT_N
DF_CORR_EN
CLKIN_0
File: input_clocks.kicad_sch
U201
Si53301
XC6204B33
U202
TCXO input
External input
Internal clock
External output
Loss of signal
Duty cycle correction circuitry input
PLL reference
Attenuator preventing overload of the Si53301 if the REFOUT was shorted.
50 Ohm main reference clock output. Connect 50 Ohm terminator to prevent increased jitter due to reflections from connector.
Debug aux refout, 50 Ohm. Load the two polarities with the same impedance, preferably 50 Ohm to prevent increased jitter on the main reference output. If not used for debug and properly loaded, disable this clock channel. Not protected since these should be used only for debug or internal purposes. Ground not isolated.
See the note about TC2-1T+ lower on this page.
J206
RFShield_TwoPieces
Dual channel symmetric outputs
TCXO / external input, LMX2572/LMX2592
001, 2021-11-13 09:38
Petr Polasek
Sheet: /Clock reference/
File: clock_refence.kicad_sch
Title: Generator 0.0125 – 6.4 GHz (0.02 – 9.8 GHz)
Size: A4
Date: 2021-11-13
Rev: 211113-001
KiCad E.D.A. kicad 6.0.0-rc1-unknown-f844f5a80c~144~ubuntu21.10.1
Id: 2/5

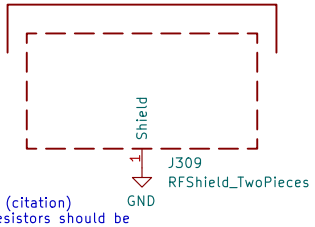
Communication section



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

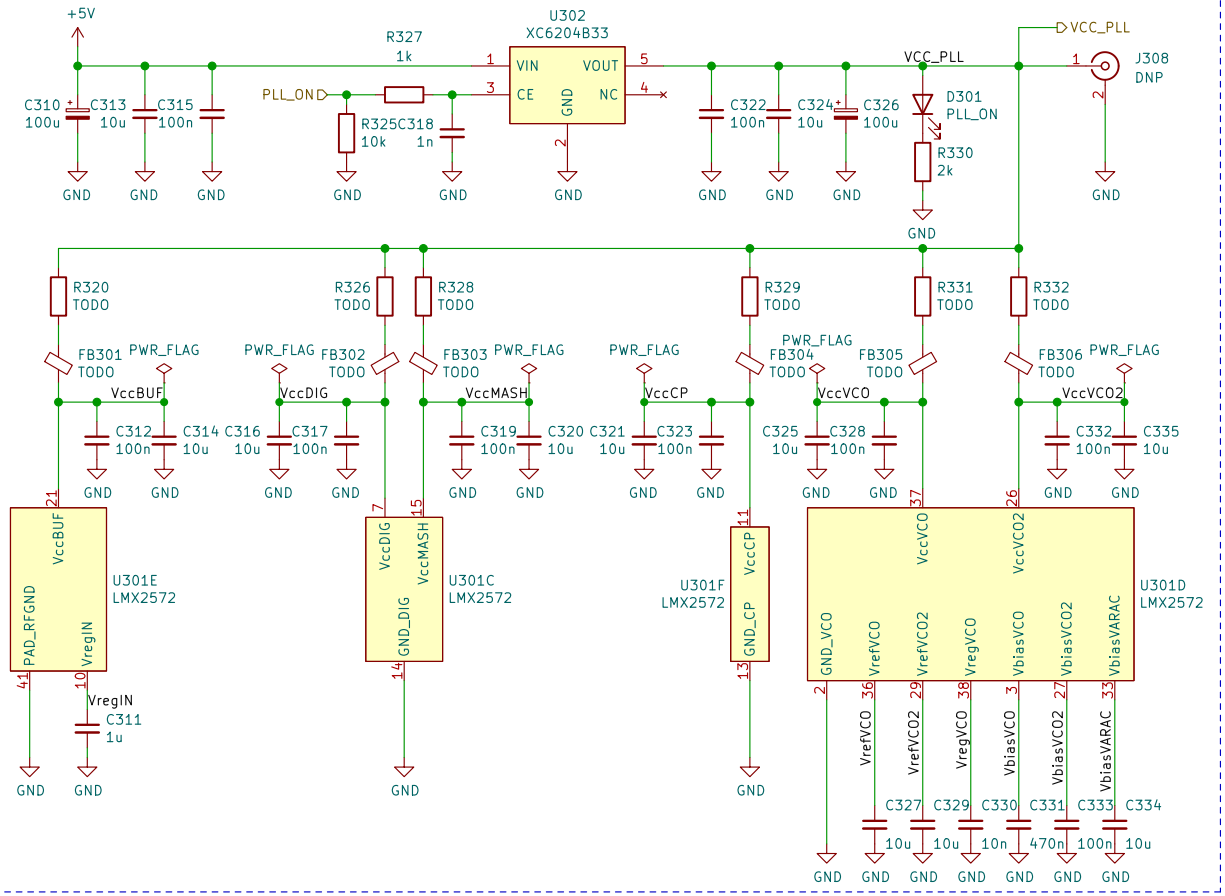




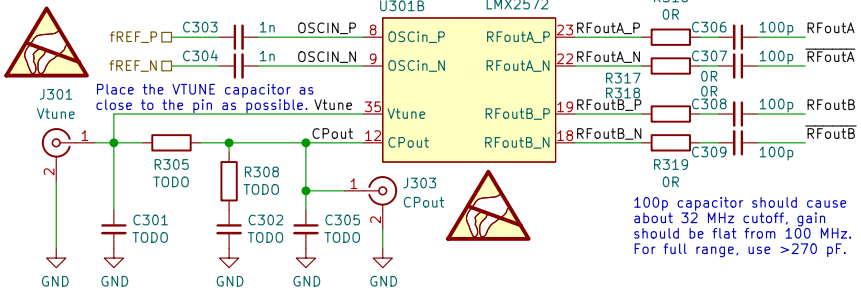


The output impedance of LMX2572 is "... just a few ohms." (citation)
The impedance should be measured and according series resistors should be placed to get 50R output. Place the resistors as close as possible to the PLL.
https://e2e.ti.com/support/clock-and-timing/f/48/t/833789?LMX2572-LMX2572-RF-output-impedance-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

Power section

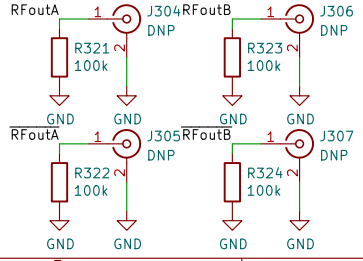


Clock section



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

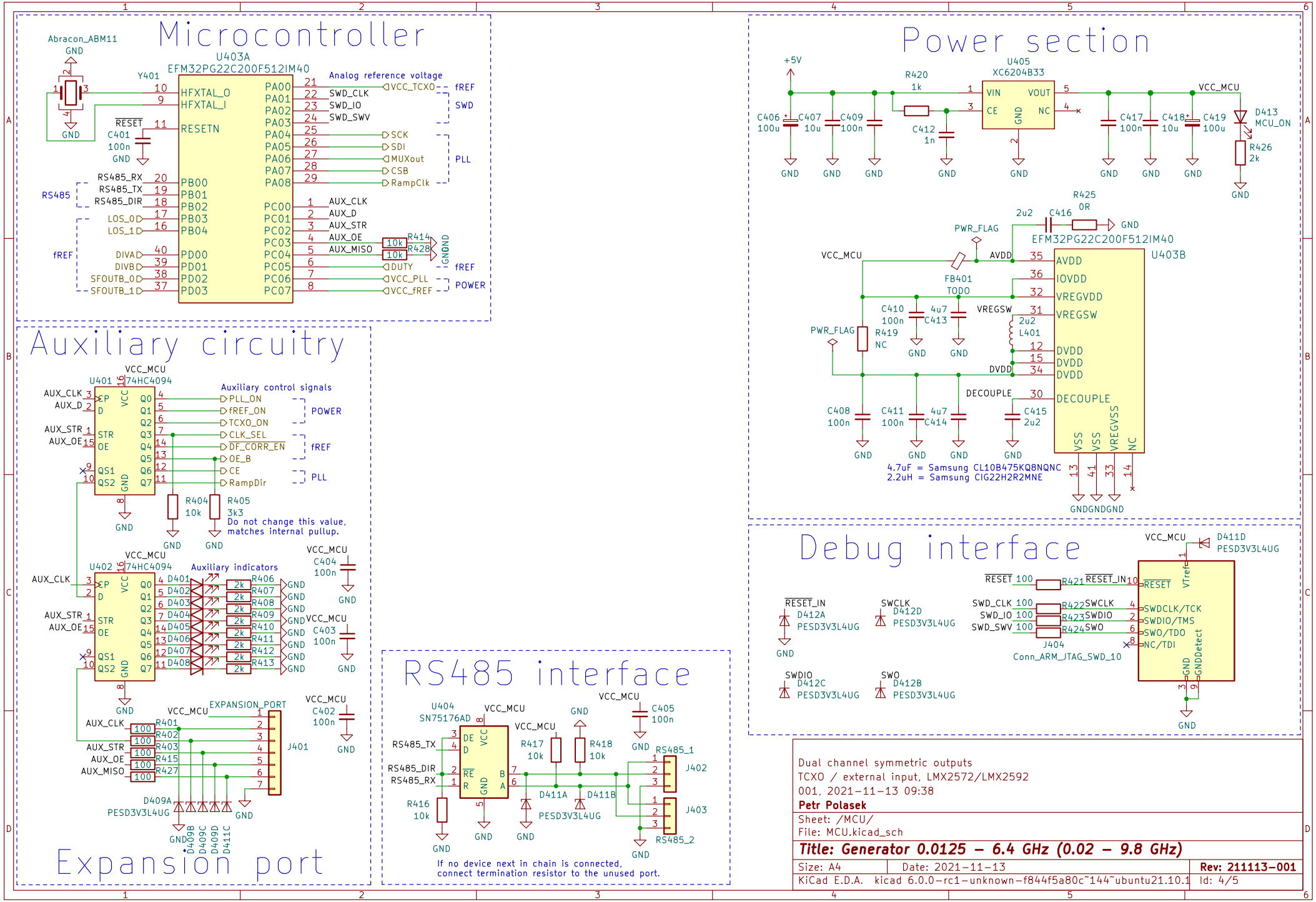
Be careful as the outputs have no protections and can be sensitive to ESD or devices with DC offset. Before connecting anything, first be sure to discharge any charge present on the core of the connecting cable and on the connected device!



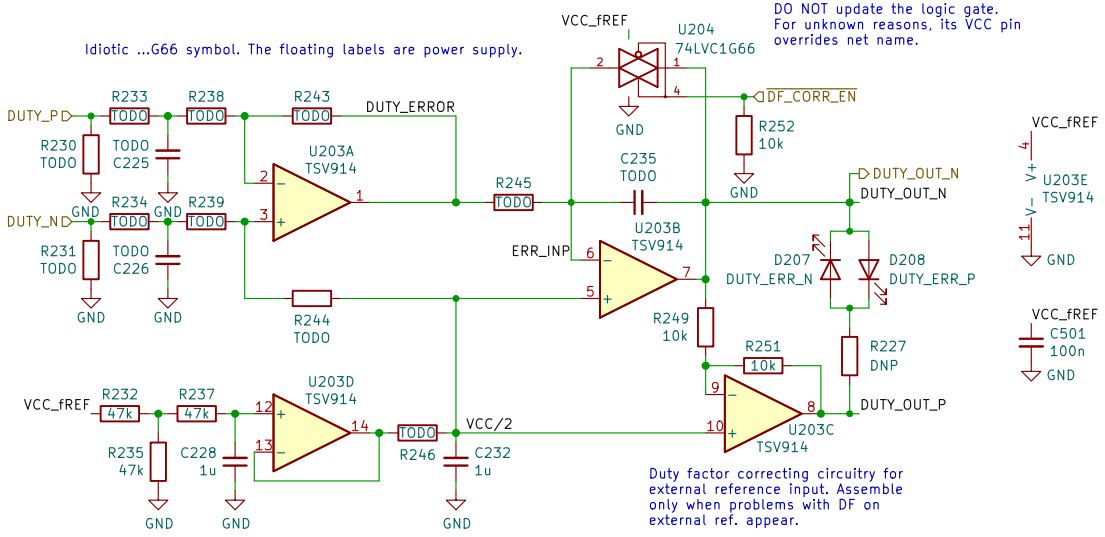
Dual channel symmetric outputs
TCXO / external input, LMX2572/LMX2592
001, 2021-11-13 09:38
Petr Polasek
Sheet: /PLL/
File: PLL.kicad_sch

Title: Generator 0.0125 – 6.4 GHz (0.02 – 9.8 GHz)

Size: A4	Date: 2021-11-13	**Rev: 211113-001**
KiCad E.D.A. kicad 6.0.0-rc1-unknown-f844f5a80c~144~ubuntu21.10.1		Id: 3/5

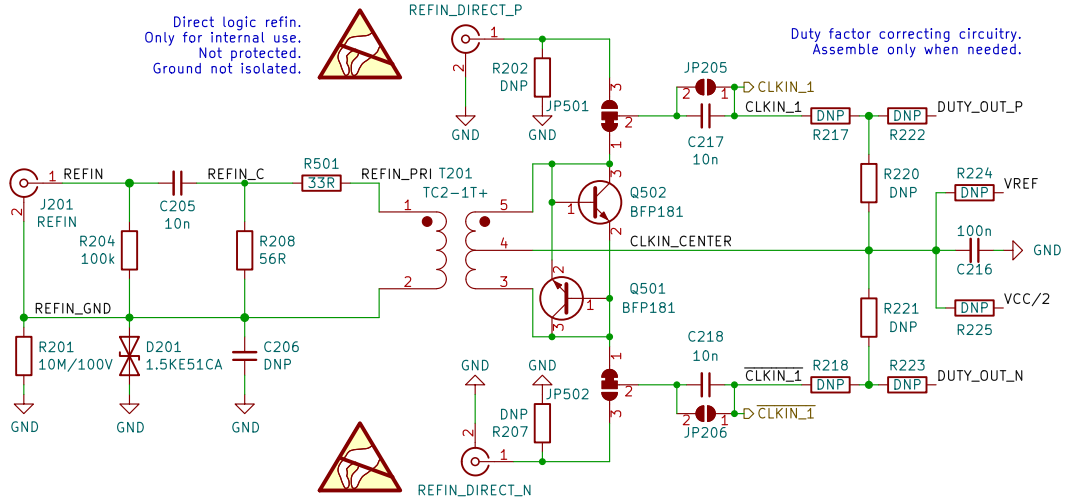

Microcontroller
Abracon_ABM11
U403A
EFM32PG22C200F512IM40
Y401
HFXTAL_O
HFXTAL_I
RESETN
PA00
PA01
PA02
PA03
PA04
PA05
PA06
PA07
PA08
PB00
PB01
PB02
PB03
PB04
PC00
PC01
PC02
PC03
PC04
PC05
PC06
PC07
PD00
PD01
PD02
PD03
Analog reference voltage
VCC_TCXO
SWD_CLK
SWD_IO
SWD_SWV
SCK
SDI
MUXout
CSB
RampClk
AUX_CLK
AUX_D
AUX_STR
AUX_OE
AUX_MISO
DUTY
VCC_PLL
VCC_fREF
RS485_RX
RS485_TX
RS485_DIR
LOS_0
LOS_1
DIVA
DIVB
SFOUTB_0
SFOUTB_1
fREF
SWD
PLL
RS485
POWER
C401
100n
R414
10k
R428
Auxiliary circuitry
U401
74HC4094
U402
Auxiliary control signals
PLL_ON
fREF_ON
TCXO_ON
CLK_SEL
DF_CORR_EN
OE_B
CE
RampDir
R404
10k
R405
3k3
Do not change this value,
matches internal pullup.
Auxiliary indicators
D401
D402
D403
D404
D405
D406
D407
D408
R406
R407
R408
R409
R410
R411
R412
R413
2k
C404
C403
C402
100n
EXPANSION_PORT
J401
R401
R402
R403
R415
R427
100
D409A
PESD3V3L4UG
D409B
D409C
D409D
D411C
Expansion port
RS485 interface
U404
SN75176AD
RS485_TX
RS485_DIR
RS485_RX
R416
10k
R417
10k
R418
10k
C405
100n
D411A
D411B
PESD3V3L4UG
RS485_1
RS485_2
J402
J403
If no device next in chain is connected,
connect termination resistor to the unused port.
Power section
+5V
U405
XC6204B33
VIN
VOUT
CE
GND
NC
R420
1k
R412
1n
C406
100u
C407
10u
C409
100n
C417
100n
C418
10u
C419
100u
D413
MCU_ON
R426
2k
VCC_MCU
R425
0R
C416
2u2
PWR_FLAG
EFM32PG22C200F512IM40
U403B
AVDD
IOVDD
VREGVDD
VREGSW
DVDD
DECOUPLE
VSS
VREGVSS
NC
FB401
TODO
C410
100n
C413
4u7
R419
NC
L401
2u2
C408
100n
C411
100n
C414
4u7
C415
2u2
4.7uF = Samsung CL10B475KQ8NQNC
2.2uH = Samsung CIG22H2R2MNE
Debug interface
D412A
D412D
D412C
D412B
PESD3V3L4UG
RESET_IN
SWCLK
SWDIO
SWO
SWD_CLK
SWD_IO
SWD_SWV
R421
R422
R423
R424
J404
Conn_ARM_JTAG_SWD_10
D411D
VTref
SWDCLK/TCK
SWDIO/TMS
SWO/TDO
NC/TDI
GNDDetect
Dual channel symmetric outputs
TCXO / external input, LMX2572/LMX2592
001, 2021-11-13 09:38
Petr Polasek
Sheet: /MCU/
File: MCU.kicad_sch
Title: Generator 0.0125 - 6.4 GHz (0.02 - 9.8 GHz)
Size: A4
Date: 2021-11-13
Rev: 211113-001
KiCad E.D.A. kicad 6.0.0-rc1-unknown-f844f5a80c~144~ubuntu21.10.1
Id: 4/5

Duty factor / DC corrector

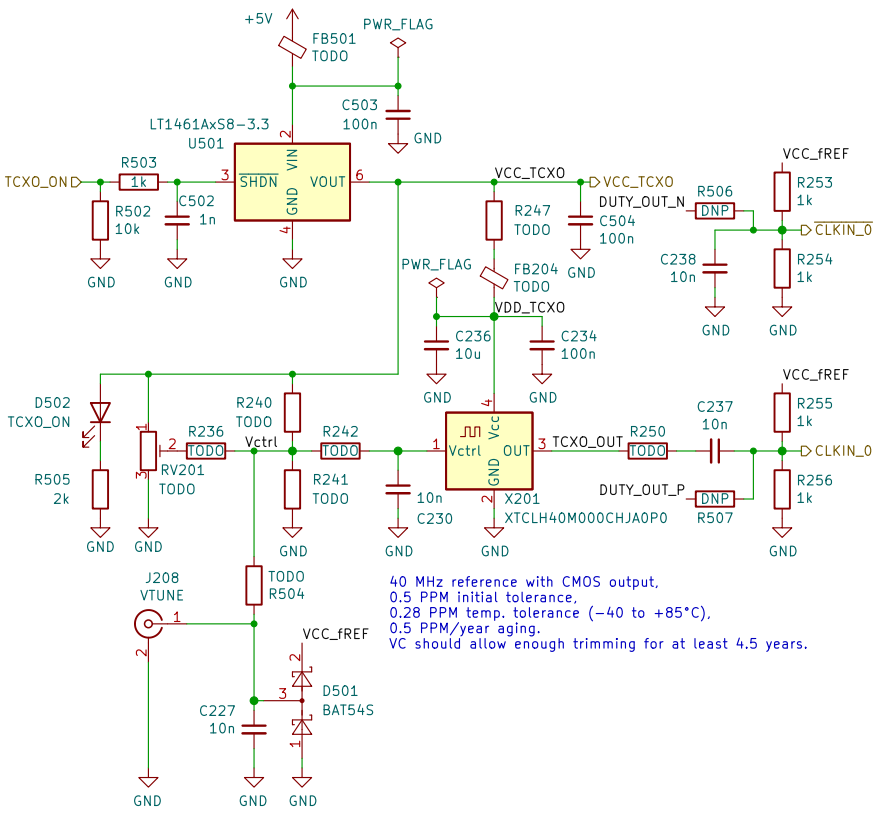


Reference frequency input

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.



VCTCXO



Dual channel symmetric outputs
TCXO / external input, LMX2572/LMX2592
001, 2021-11-13 09:38
Petr Polasek

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

Title: Generator 0.0125 – 6.4 GHz (0.02 – 9.8 GHz)

Size: A4	Date: 2021-11-13	**Rev: 211113-001**
KiCad E.D.A.	kicad 6.0.0-rc1-unknown-f844f5a80c~144~ubuntu21.10.1	Id: 5/5