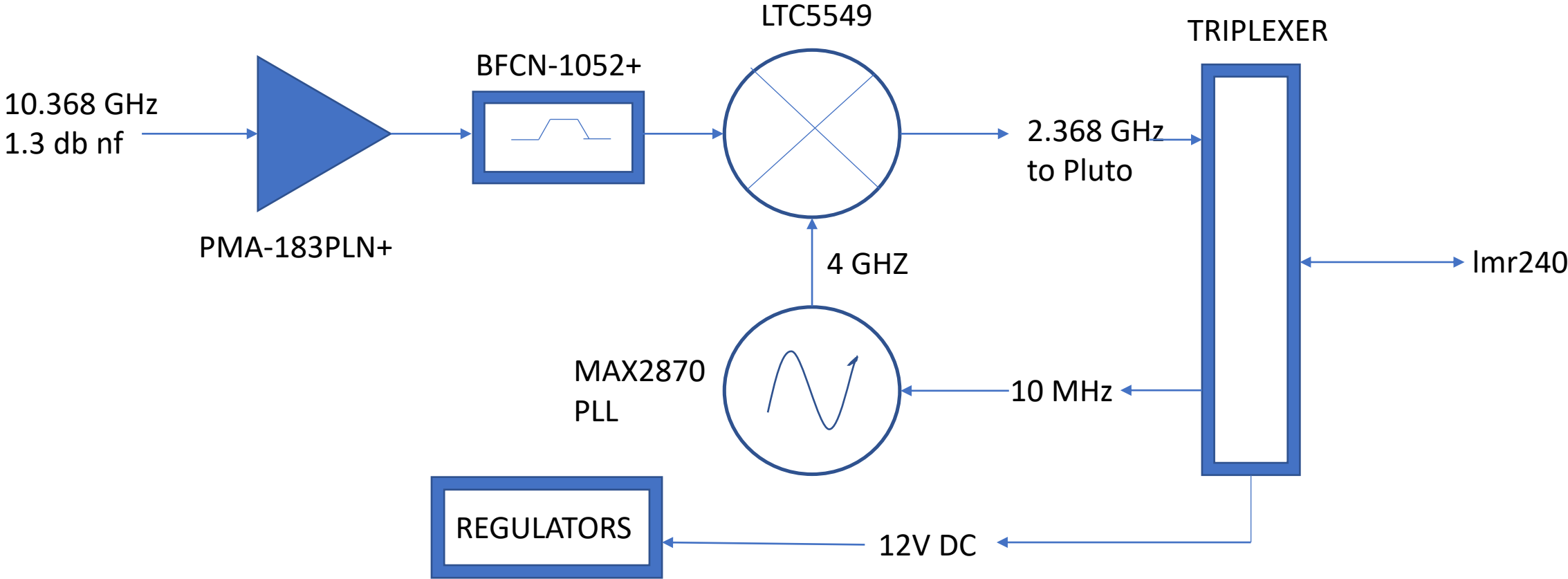
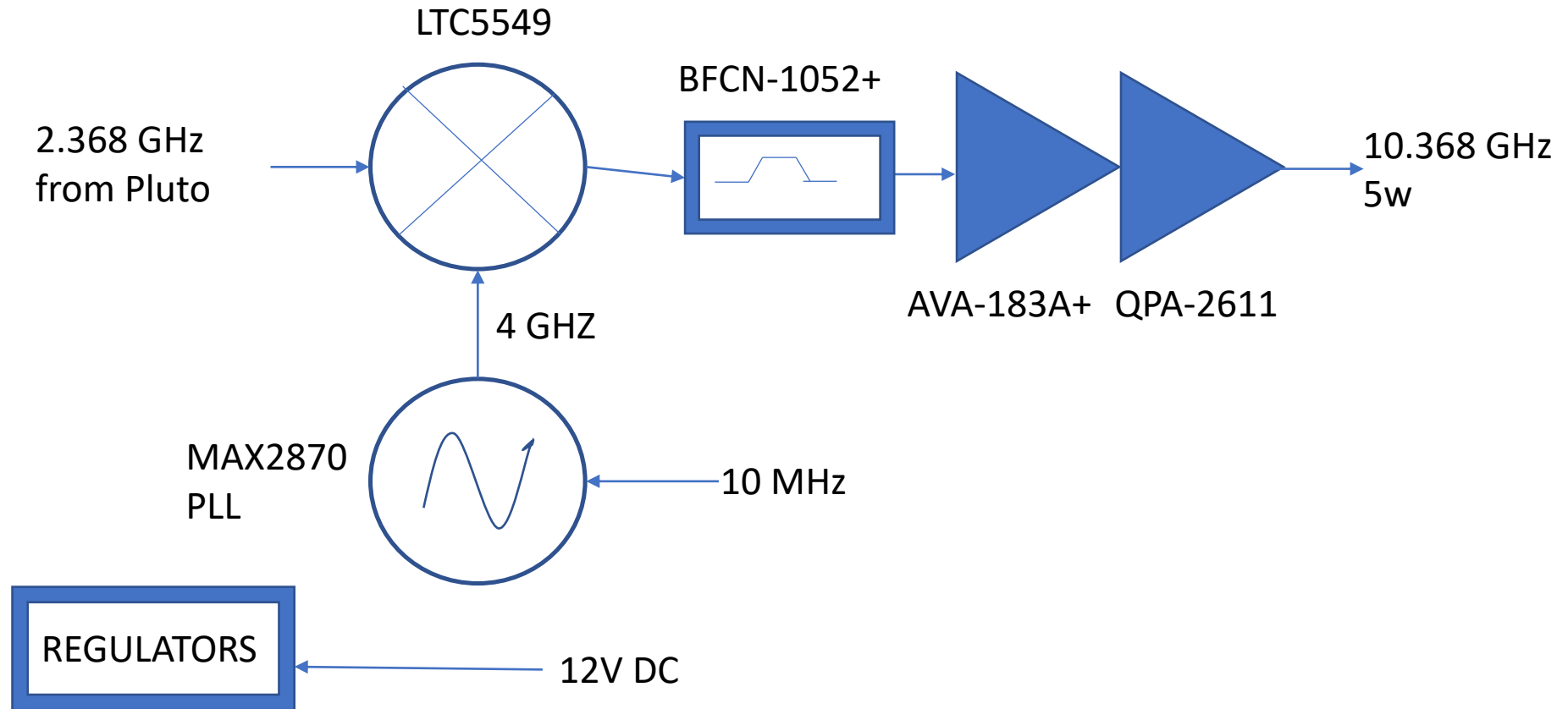


# RX down converter



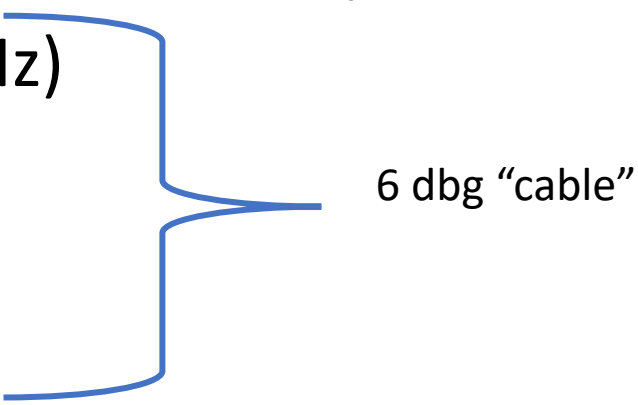
# TX up converter



# Proposed Modules

- Mixer/LO Module: -11 dbg, RF 8-14 GHz, IF 0.5-6 GHz, estimated BOM \$75
  - LTC5549 bilateral mixer & LO amplifier/doubler
  - MAX2870 PLL
  - Seeduino XIAO for PLL programming and status reporting
  - SMT filter on mixer RF & IF (optional) ports (mini-circuits BFCN footprint)
  - SMA connectors for RF, IF and PLL reference, solder pads for DC power and status data
  - Linear voltage regulators for 10-15v supply
- LNA Module: 24 dbg, 1.3 db nf, 6-18 GHz, estimated BOM \$50
  - PMA-183PLN+ Amplifier
  - Linear voltage regulator for 10-15v supply
  - SMA connectors RF in/out, solder pads for DC power
- PA Module: 45 dbg, >2W out saturated, 8-12 GHz, estimated BOM \$80
  - AVA-183A+ driver, QPA-2610 PA
  - Switching regulator for 10-15v supply
  - SMA connectors RF in/out, solder pads for DC power
- Quadplexer Module, estimated BOM \$25
  - SMA in/out
  - SMA out/in:  $\geq 1\text{GHz}$ ,  $\geq 10\text{ MHz}$  &&  $\leq 40\text{ MHz}$
  - Solder pads for DC out/in 2A
  - Solder pads for Data in/out  $\leq 100\text{ KHz}$   $\geq 1\text{ KHz}$

# Transmit power levels

- Pluto -2 dbm (capable of +2 dbm @ 2.4 GHz)
  - ERA5 +14 dbm (16 dbg @ 2.4 GHz)
  - 4plexer +12 dbm (-2 dbg )
  - LMR400 +6 dbm (-6 dbg, 100')
  - 4plexer +4 dbm (-2 dbg)
  - Mixer -7 dbm (-11 dbg @ 10GHz)
  - Cable + PCB + Wilk -12 dbm (-5 dbg @ 10 GHz)
  - AVA183 +1 dbm (13 dbg @ 10 GHz)
  - QPA2610 +33 dbm (32 dbg @ 10 GHz)
- 
- 6 dbg "cable"

# Receiver NF

- 24 dbg @ 1.3 db nf
- -11 dbg mixer
- 6 dbg @ 3.5 db nf “cable”
- 3.5db nf Pluto
- Cascade => 1.5 db nf

# BOM cost

- Mixer ~\$75
- LNA ~\$50
- PA ~\$80
- 4plexer ~\$25
- Transceiver : Mixer + LNA + PA = \$205
- Repeater: 2x Mixer + LNA + PA + 4x 4plexer = \$380