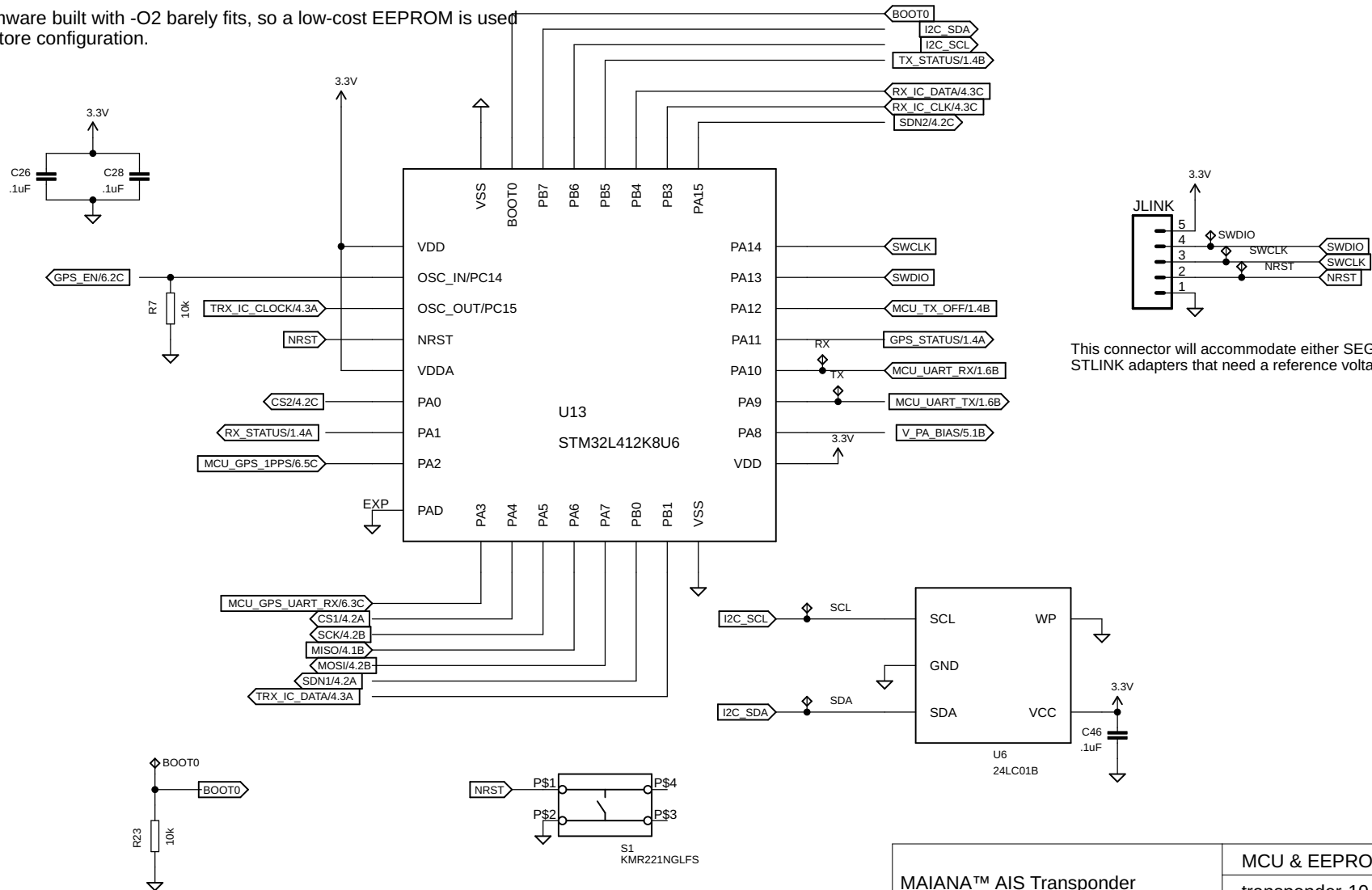


The STM32L412K8U6 is a reasonably priced M4 MCU with 64K of flash.

Firmware built with -O2 barely fits, so a low-cost EEPROM is used to store configuration.

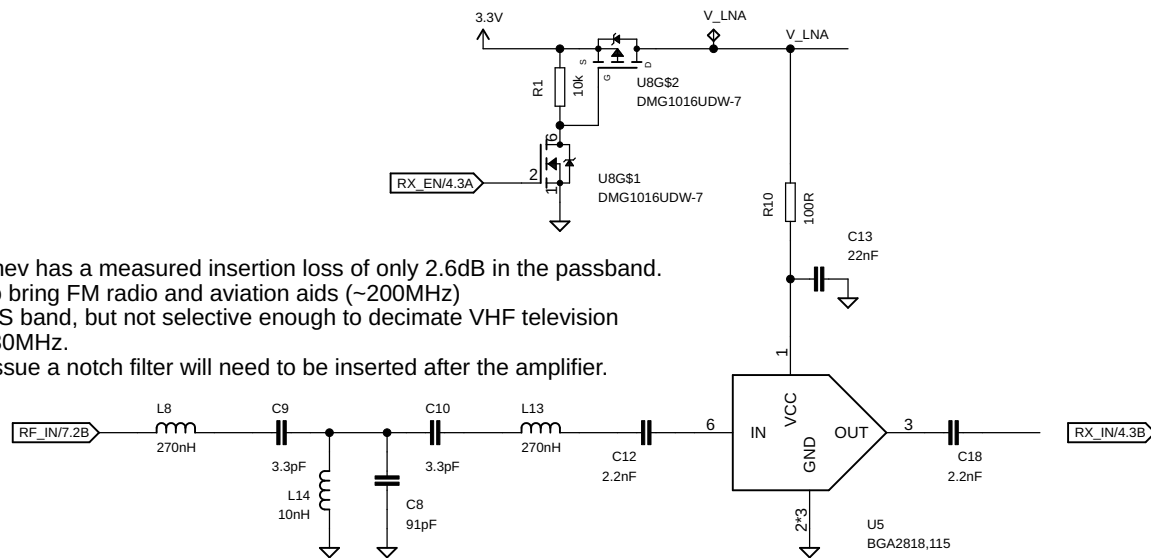


This connector will accommodate either SEGGER or STLINK adapters that need a reference voltage.

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MCU & EEPROM	
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This 3-pole Chebyshev has a measured insertion loss of only 2.6dB in the passband.
It is sharp enough to bring FM radio and aviation aids (~200MHz)
near or below the AIS band, but not selective enough to decimate VHF television
between 174 and 180MHz.
If this becomes an issue a notch filter will need to be inserted after the amplifier.



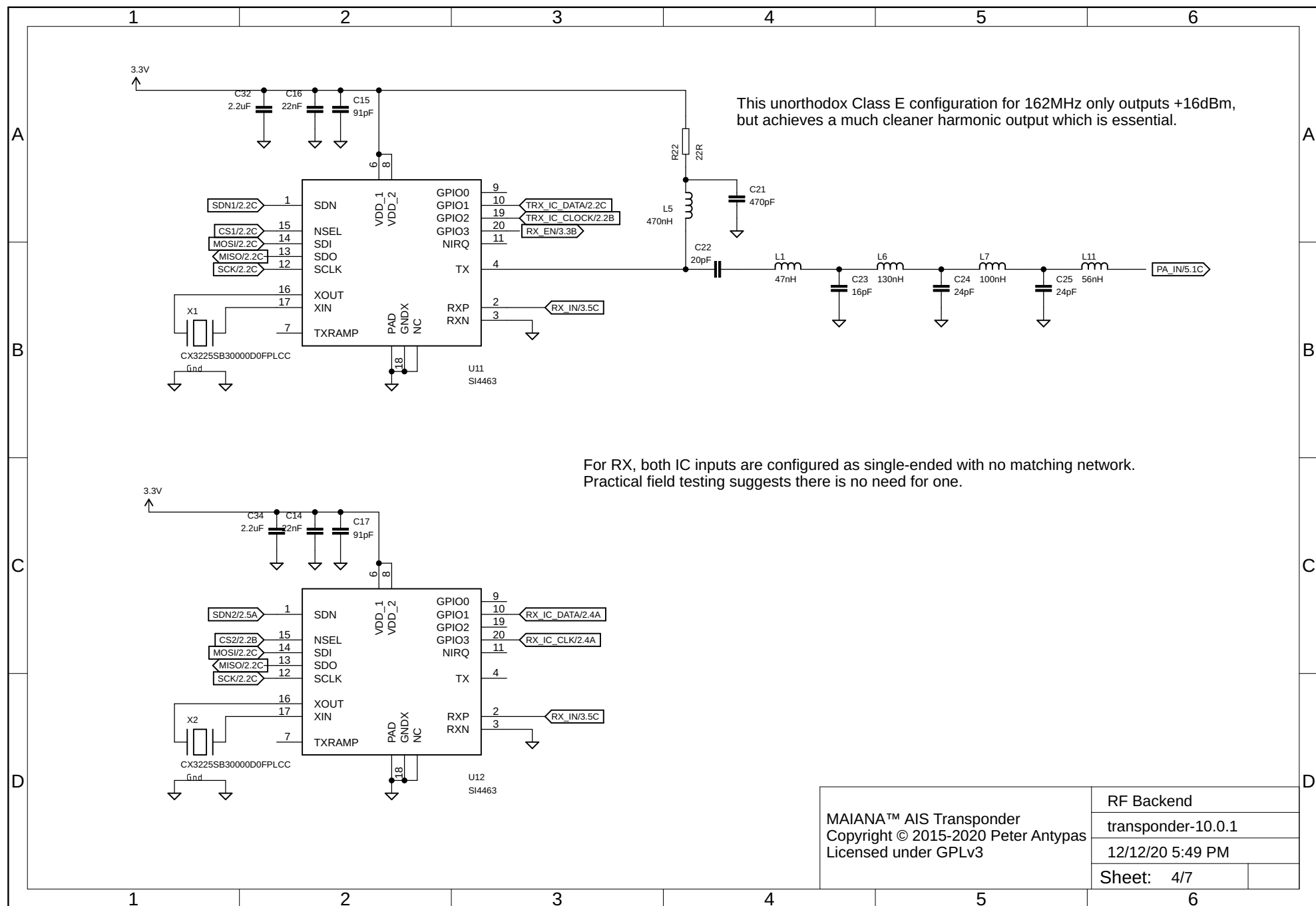
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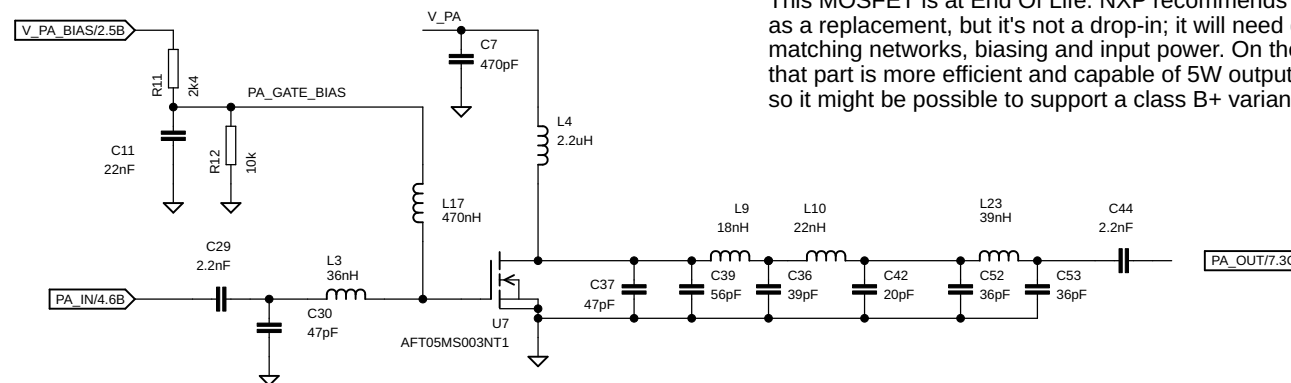
LNA & Bandpass

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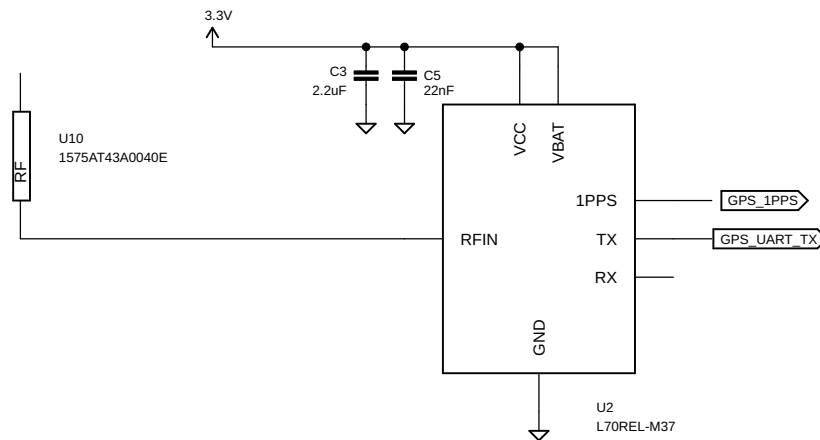


This power amplifier adds 17dB of gain for a total conducted output power of +33dBm.

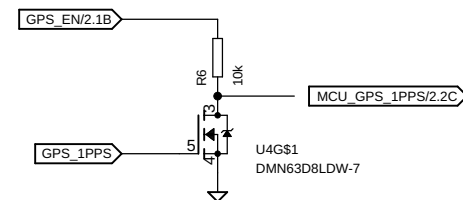
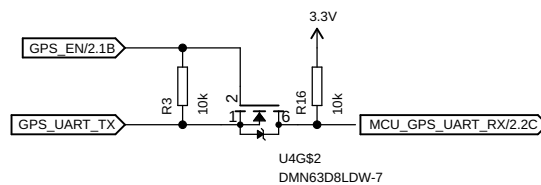
It is based on the reference designs in the datasheet, but includes a narrowband input matching network to reduce BOM and a very steep Chebyshev low pass filter to deal with a pesky 2nd harmonic that falls in the restricted aviation band (324MHz).

The MOSFET drain is always powered, but the gate bias voltage is turned on via R11, R12, C11 and L17. The RC delay is essential for suppressing spurious emissions during ramp up and ramp down.

This MOSFET is at End Of Life. NXP recommends the AFT05MS004N as a replacement, but it's not a drop-in; it will need different matching networks, biasing and input power. On the upside, that part is more efficient and capable of 5W output, so it might be possible to support a class B+ variant.



This buffer enables DFU via the ROM bootloader, as it effectively shuts down the GPS UART without powering the module off. GPS_EN is pulled down in hardware and only firmware can push it high.



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GPS
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