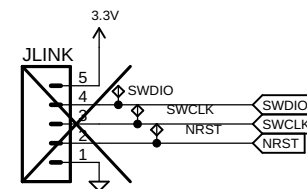
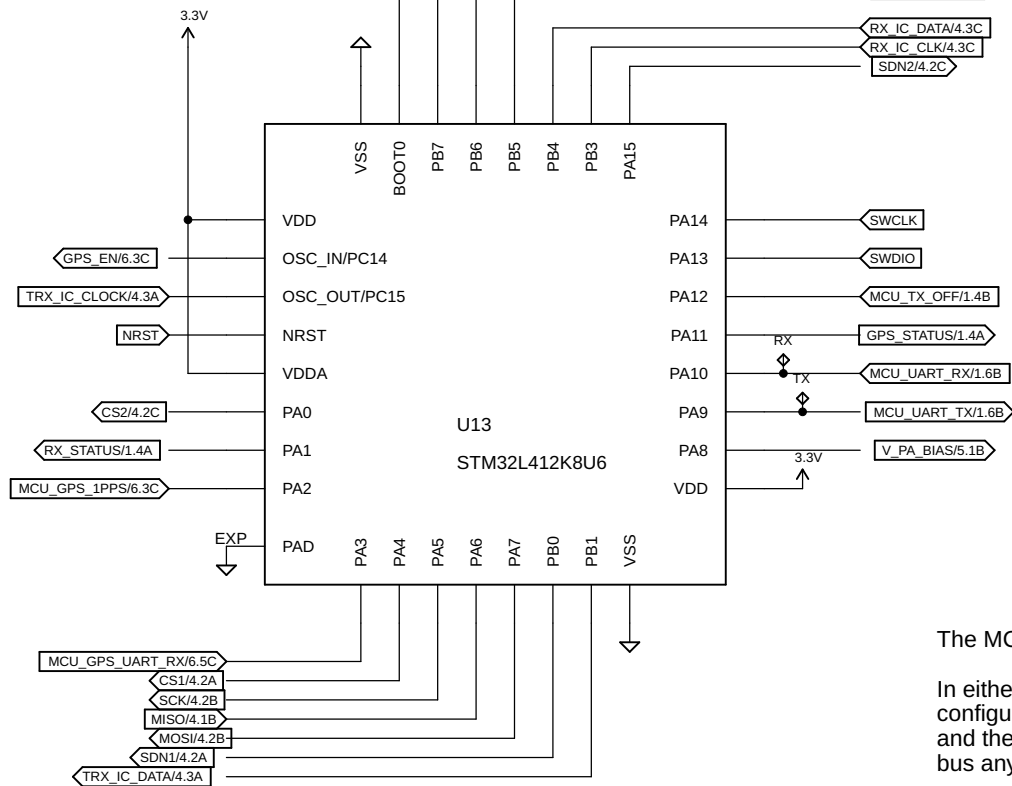
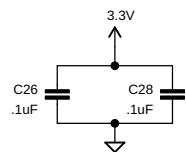


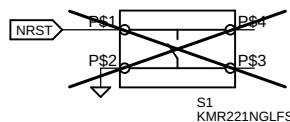
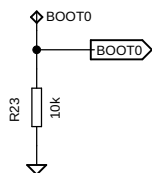
MAIANA™ AIS Transponder Copyright © 2015-2020 Peter Antypas Licensed under GPLv3		Connections & Power	
		transponder-10.9.0	
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Sheet: 1/7			



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

The MCU can be any of L412/L422/L431/L432.

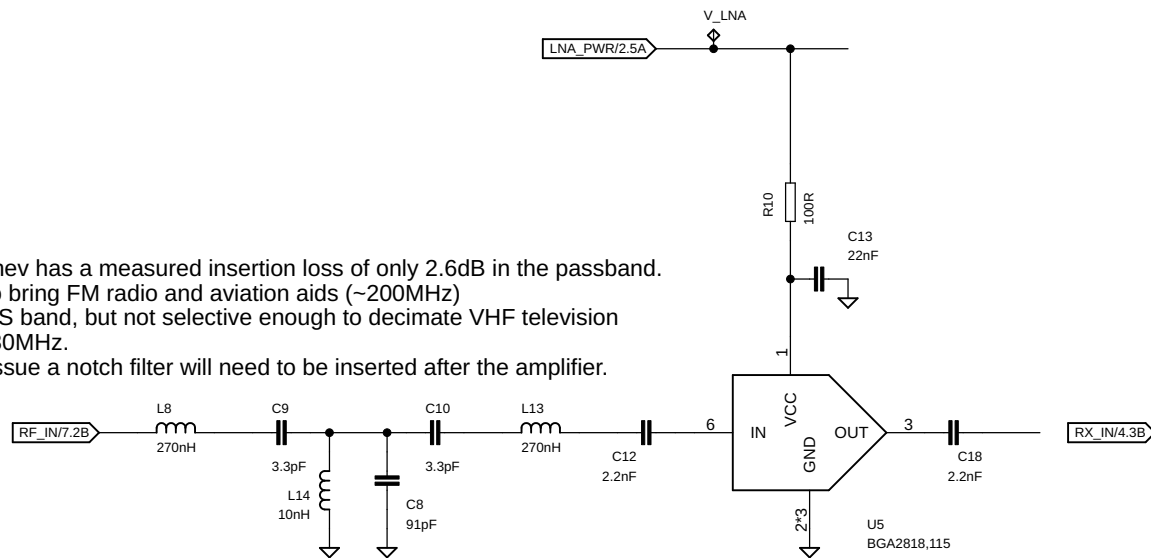
In either case, firmware fits well within 60K, so configuration is persisted at flash address 0x0800F800 and there is no need for an external EEPROM or I2C bus anymore.



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MCU & EEPROM	
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Sheet: 2/7	

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.



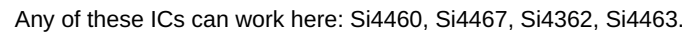
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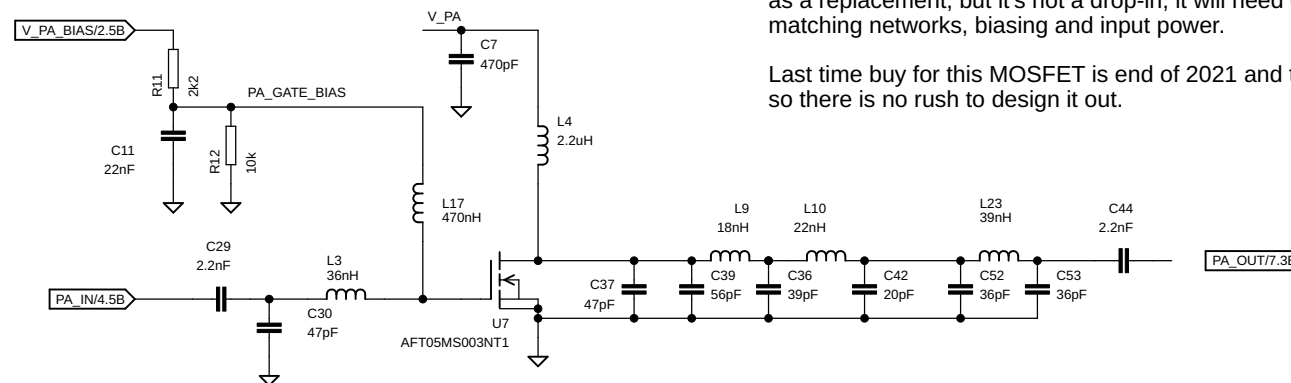
LNA & Bandpass

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Sheet: 3/7





This power amplifier adds almost 20dB 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.

Last time buy for this MOSFET is end of 2021 and there is ample supply, so there is no rush to design it out.

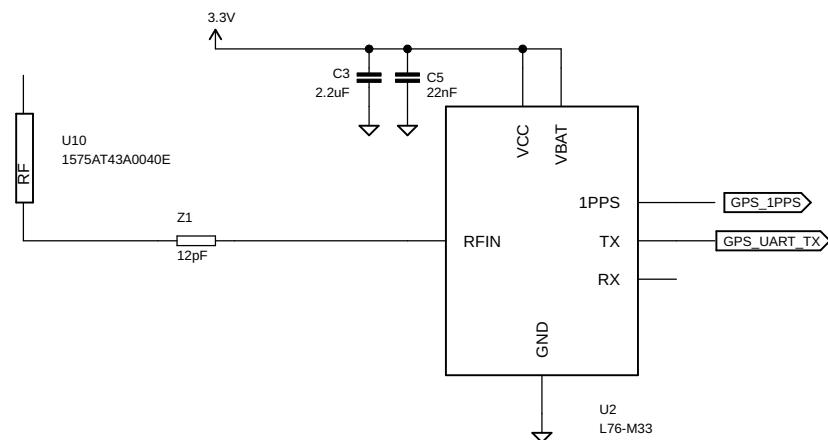
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RF Power Amplifier

transponder-10.9.0

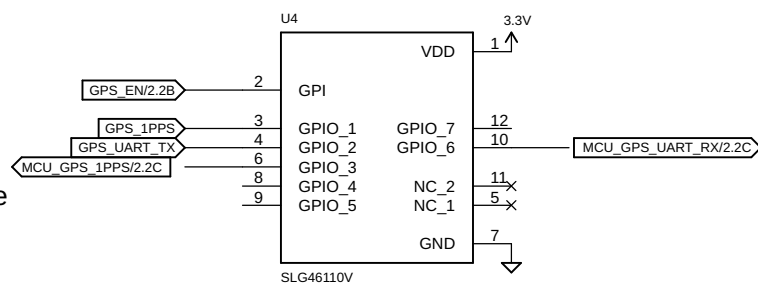
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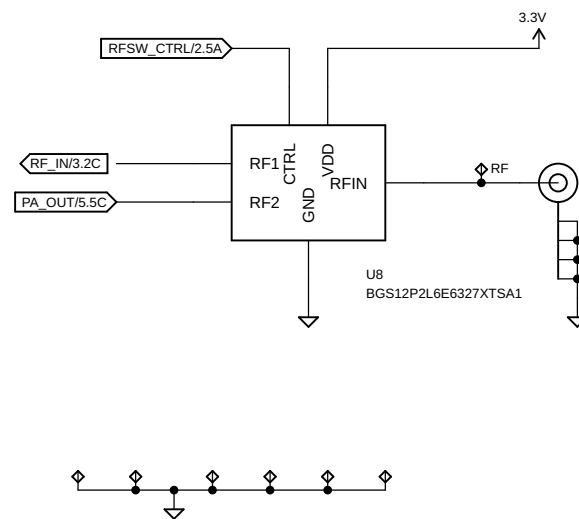
Sheet: 5/7



This custom GreenPAK IC is a buffer for the UART and PPS signals coming from the GNSS.

The GPS\_EN signal must be pushed high in firmware to enable the buffer. When the MCU enters the ROM bootloader these signals are not present and therefore they don't interfere with DFU.





This switch does not need DC blocking caps.

RFSW\_CTRL must be low during RX.

The 9 test pads here form a footprint for a coaxial pogo pin probe in the test jig.

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Sheet: 7/7	