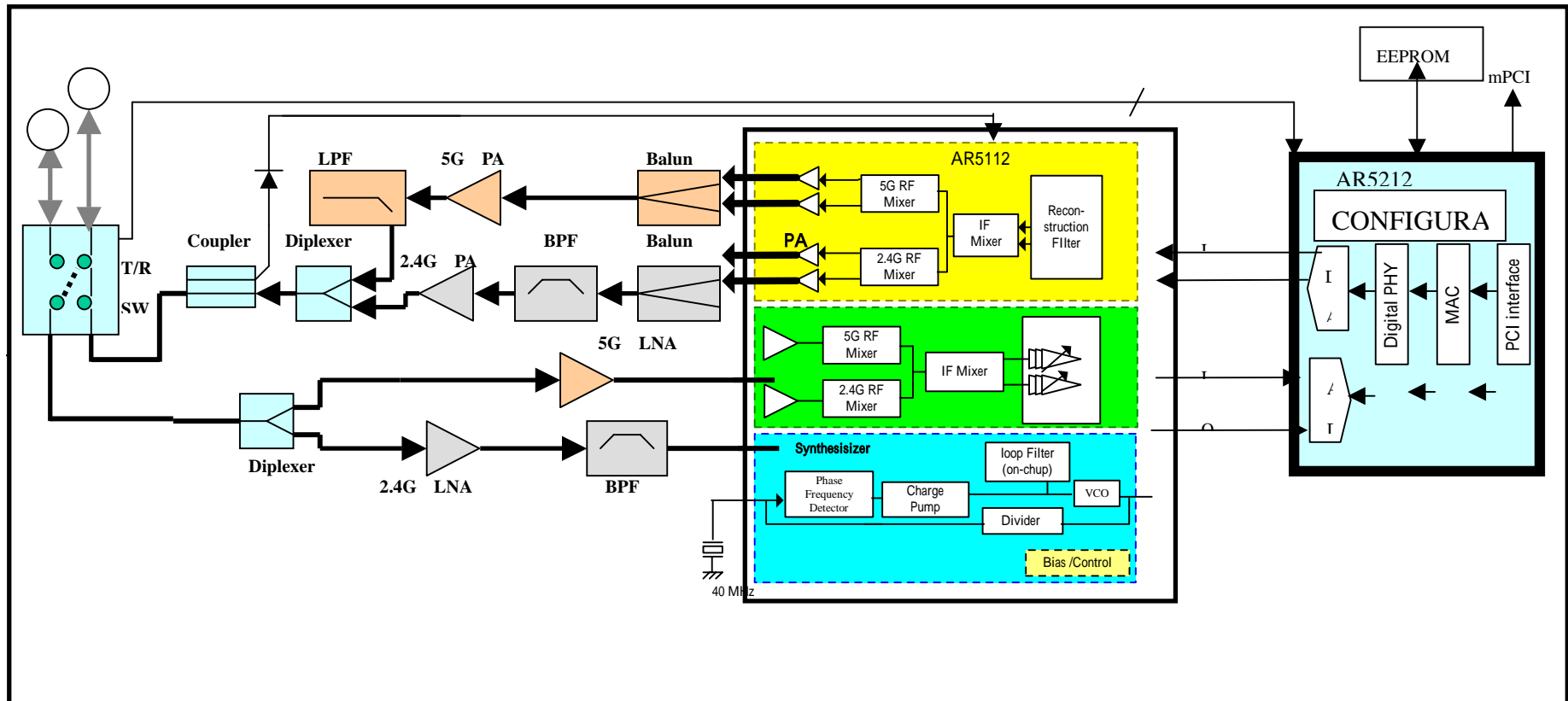


# The Circuit description of XA-621



### **MAC/Baseband Processor(AR5212)**

The AR5212 is a highly integrated chip containing a Card-Bus/PCI interface, media access control (MAC) and a base-band processor (PLCP/PHY). The AR5212 runs on 1.8V(digital and analog) core and 3.3V I/O, and is packaged in 15\*15\*1.5 mm 196plastic ball grid array(PBGA).

### **5GHz Single-Chip Radio Transceiver (AR5112)**

The AR5112 chip is an integrated CMOS radio transceiver that supports the IEEE 802.11a, IEEE 802.11b, and IEEE802.11g standard. The AR5112 supports connection to an external output booster for high performance. The transceiver core, digital logic, and VCO are powered by 2.5V. The tolerances on the 2.5V supply need to be +/-5%. The I/Os are powered by 3.3V. The AR5112 is packaged in a 64-pin, 9\*9\*1 mm lead-less plastic chip carrier (LPCC).

### **5GHz Tx Balun**

The output of the AR5112 is directed to a multi-layer ceramic Balun. This Balun support to transfer unbalance signal to balance signal. The impedance of unbalance port is 50ohm, and the balance port is 100ohm.

### **5GHz Power Booster(OPB)**

The 5GHz power booster is intended to provide a linear gain boost to the AR5112 transmitter outputs, thereby improving overall system performance.

### **5GHz Tx Low Pass Filter(LPF)**

The 5GHz Low pass filter between the output of the OPB and the Diplexer, This Low pass filter is intended to reduce spurious emissions from the 5GHz Power Booster.

## **Tx Diplexer**

The Tx diplexer is a frequency selective, three-port circuit that combines the 5GHz and 2.4GHz transmit signals at their respective power booster outputs before they proceed to the rest of the Tx chain. It serves as a partial low-pass filter to reject 2.4GHz harmonics, and as a band-pass filter for the 5GHz Tx path, providing both low frequency signal rejection and additional 5GHz harmonic rejection.

## **Coupler**

The directional coupler is a dual-band printed micro-strip structure that samples the transmit signal energy and directs it to a diode detector. Because wave propagation in micro-strip is not TEM, the phase velocities of the even and odd modes are different. This fact causes degradation in the coupler's directivity. EM simulations were used in the coupler design to introduce "fingers" that equalize the coupler/detector phase velocities.

The output of the coupler is directed to the dual-band switch where the transmit signal is directed to the antennas.

## **Dual Band Switch**

The dual band switch is a DC-6GHz, pHEMT GaAs MMIC device. It is a DPDT configuration that provides Tx/Rx and antenna diversity switch functions in a package.

## **Rx Diplexer**

The Rx diplexer is a frequency selective, three-port circuit that separates the 5GHz and 2.4GHz receive signals at the Rx output port of the dual-band switch. It serves as a partial filter for rejection external signal. It employs a semi-lumped design (3 discrete components and one printed inductive element), which provide high-pass filtering for the 5GHz path, and low-pass filtering for 2.4GHz path.

## **External Low Noise Amplifiers(XLNA)**

The XLNAs for the 5GHz receive chains are designed to improve overall system sensitivity by minimizing front end noise figure.