ATMEL OPERATION DESCRIPTION for USB Adapter

Project name : 11WU-511A

1: T/R switch:

a: TX or RX multiplexing switch, TX/RX are half duplex.
B: Antenna A or B switch.

2: RF5117 : 2.4GHz Power Amplifier

RF5117 is a linear, medium-power, high-efficiency amplifier IC designed specifically for battery-powered WLAN applications .The
devices manufactured on an advanced Gallium Arsendie Heterojunction Bipolar Transistor(HBT) process, and has been designed for use as the Final RF amplifier in 2.5GHz WLAN and other spread-spectrum transmitters. The device is provider in a 3mmX3mm, 16 pin, leadless chip carrier with a backside ground. The RF5117 is designed to maintain linearity over a wide range of supply voltage and power output.
RF5117 requires only a single positive supply of 3.0V nominal(or greater) to operate to full specifications. Power control is provided through two bias control input pins (Vreg1 and Vreg2).
External matching on the input and output . Both the input and the output of the device need a series DC-blocking capacitor.
Capacitor used as a matching component can also serve as the blocking Cap.
Features:
--Single 3.3V Power Supply
--+30dBm Saturated Output Power
--26dB Small Signal Gain

3: RF2948 2.4GHz SPREAD-SPECTRUM TRANSCEIVER

RF2948 is a monolithic integrated circuit specifically designed for Direct-sequence spread-spectrum systems operating in a 2.4GHz ISM band. The part include: a direct conversion from IF receiver With variable gain control; quadrature demodulator; I/Q baseband amplifier, and on chip programmable baseband filter. For the transmit side, a QPSK modulator and the upconverter are provided. The design reuses the IF SAW filter for transmit and receive deducing the number of SAW filters required. RF2948 is also designed to be of a 2.4GHz chipset consisting of the RF2494 LNA/Mixer.

Features:
--45MHz to 500MHz IF Quad Demod
--On-chip Variable Baseband Filters
--Quadrature Modulator and Upconverter
--2.7V to 3.6V Operation
--2.4GHz PA Driver

4: RF2494 : HIGH FREQUENCY LNA/MIXER

RF2494 is a monolithic integrated UHF receiver front end suitable for 2.4GHz ISM band applications. The IC contains all of the required components to implement the RF functions of the receiver except for the passive filtering and LO generation. It contains an LNA, a second RF amplifier and a doubly balanced mixer. The output of the LNA is made available as an output to permit the insertion of a bandpass filter between the LNA and the RF/Mixer section. The mixer outputs can beselectively disabled to allow for the IF filter to be used in the transmit mode. The cascaded power gain of the LNA/Mixer is 29dB, which after insertion loss in the image filter(`3dB) and IF SAW filter(~1-dB), still gives 16dB of gain prior to the IF Amps. Because of this, the noise figure of the IF Amps should not significantly degrade system noise figure.
Features:
--Single 2.7V to 3.6V Power Supply.

--2400MHz to 2500MHz Operation.
--Two Gain setting: 28dB or 12dB.
--4.5dB Cascaded NF, high Gain Mode.
--20mA DC Current Consumption
--Input IP3: -23dBm or –8dBm

5: RF3000 : SPREAD-SPECTRUM BASEBAND MODEM

RF3000 is a monolithic CMOS baseband processor. It is suitable for use in 11Mbps IEEE802.11b wireless LNA systems and general purpose ISM band radios, and contains all functions required to convert a spread-spectrum signal to bit stream. PN code lengths up to 64 bits allows increased processing gain. The on-chip equalizer provides protection against multi-path in the data rate modes. All functions are configurable via SPI port. A complete 2.4GHz radio reference design is available from RFMD.RF300 receiver port provides a clear channel assessment(CCA) to the MAC and supports PSK and CCK DSSS mode.

Features:
--On-chip ADCs and DACs, RSSI, AGC
--BPSK/QPSK/CCK
--250ns Dealy spread Equalizer
--Supports Antenna Diversity
--PN Sequences Up To 64Bits Long

6: AT76C503A WIRELESS NETWORK INTERFACE

Universal Serial Bus 11-Mbps MEDIA ACCESS

CONTROLLER

The Atmel AT76C503A is a network card with a rate of 1, 2, 5.5, and 11 Mbps operating in the ISM band using Direct Sequence Spread Spectrum(DSSS) transmission, implementing the IEEE802.11b and 802.11 standard.

AT76C503A is a single-chip controller that provides all processing and functionality needed for the MAC protocol of wireless LANs(focusing on, but not limited to the IEEE802.11b standard). It provides a glueless interface conforming to 12-Mbit universal serial bus specification and can control a variety of physical interfaces. AT76C503A chip contains a USB interface, a MAC control unit and a physical attachment interface(PAI). The PAI supports direct-sequence spread spectrum and frequency-hopping spread spectrum(2 Mbps) physical interfaces, providing flexibility to end users. The ARM7TDMI core supports two alternative instruction sets. Powerful 32-bit code can be executed by the processor in ARM operating mode. However, a 16-bit instruction subset is also available in Thumb mode. Thumb mode can be selected to exploit full processor power with limited external memory resources. Note that ARM7TDMI operating mode can be changed at run time with negligible overhead.

Features:

IEEE 802.11b Direct Sequence high rate compatible
--High data rate, 11/5.5/2/1 Mbps
--Auto Rate fallback
--IPX, NetBEUI, TCP/IP protocols supported.
--Wired Equivalent Privacy Algorithm (WEP) (64 bits/128 bits)
--802.11 Power save in infrastructure mode
--Passive/Active scan. Long/Short preamble
--RTS/CTS handshake
--Site Survey
--Roaming
--Dynamic configuration
--Beacon and Probe response generation in an IBSS.
--Plug-and-Play and easy setup