



125 South Market Street, Suite 400 • San Jose, CA 95113

[www.gainspan.com](http://www.gainspan.com)

## Theory of Operation

The GS1011 is a single chip system on chip solution that includes an internal 2.45GHz RF transceiver which is IEEE 802.11b/g – compatible and supports direct sequence spread spectrum (DSSS). Both the transmitter and receiver utilize a direct conversion (Zero IF architecture) of base band to RF signal. The transceiver supports BPSK/QPSK/CCK modulation with data rates up to 11 Mb/s (802.11b). The GS1011 transmitter can be configured to use its internal power amplifier (Mlx series) or an optional external PA (MEx series). (The internal power amplifier is not used when the system is configured for an external PA.). The GS1011 internal power amplifier delivers 9 dBm (typical) into a differential balanced 100  $\Omega$  load. Its outputs are merged with the LNA inputs through a transistor structure replacing the traditional external TX/RX switch. The Low Noise Amplifier, LNA, has balanced inputs which are matched to 100 Ohms. An external balun or balanced filter provides the right matching for a 50 ohm single ended connection to an antenna. The RF section includes a programmable gain LNA and a quadrature demodulator for the frequency band, covering the 2400 MHz band for WLAN 802.11b/g (2400 to 2497 MHz).

The GS1011 RF interface integrates the baseband RX channel filter and TX channel filter, along with the synthesizer, VCO, loop filter and XO. It also has a fully integrated DC offset cancellation featuring low transmit EVM, adjacent channel rejection and low power consumption.