Operation Description

The EUT has a Wireless Wi-Fi adapter with 11 channels (802.11b, g, n (20MHz)) or 7 channels(802.11n (40MHz)). After the product has been connected to DC 3.3V, product will start to work through XTAL 40MHz (XTAL1) vibration. During transmitting, transceiver (U1 RTL8188CUS), and then eradiate signals to the space through Antenna network. During receiving signal, antenna will send electromagnetic wave signal to the Low Noise Amplifier for enlarging, and then signal will be sent to transceiver to demodulate.

The Realtek RTL8188CUS-GR is a highly integrated single-chip QFN-46 pin Wireless LAN (WLAN) USB2.0 network interface controller compatible with the 802.11n specification. It combines a MAC, a 1T1R capable baseband, and RF in a single chip. The RTL8188CUS provides a complete solution for a high throughput performance wireless client.

The RTL8188CUS baseband implements Orthogonal Frequency Division Multiplexing (OFDM) with 1 transmit and 1 receive path and is compatible with the IEEE 802.11n specification. Features include one spatial stream transmission, short guard interval (GI) of 400ns, spatial spreading, and transmission over 20MHz and 40MHz bandwidth.

For legacy compatibility, Direct Sequence Spread Spectrum (DSSS), Complementary Code Keying (CCK) and OFDM baseband processing are included to support all IEEE 802.11b and 802.11g data rates. Differential phase shift keying modulation schemes, DBPSK and DQPSK with data scrambling capability, are available, and CCK provides support for legacy data rates, with long or short preamble. The high-speed FFT/IFFT paths, combined with BPSK, QPSK, 16QAM, and 64QAM modulation of the individual subcarriers and rate compatible punctured convolutional coding with coding rate of 1/2, 2/3, 3/4, and 5/6, provide higher data rates of 54Mbps and 150Mbps for IEEE 802.11g and 802.11n OFDM respectively.

The RTL8188CUS builds in an enhanced signal detector, an adaptive frequency domain equalizer, and a soft-decision Viterbi decoder to alleviate severe multi-path effects and mutual interference in the reception of multiple streams. Robust interference detection and suppression are provided to protect against Bluetooth, cordless phone, and microwave oven interference.

Efficient IQ-imbalance, DC offset, phase noise, frequency offset, and timing offset compensations are provided for the radio frequency front-end. Selectable digital transmit and receive FIR filters are provided to meet transmit spectrum mask requirements and to reject adjacent channel interference, respectively.

The RTL8188CUS supports fast receiver Automatic Gain Control (AGC) with synchronous and asynchronous control loops among antennas, antenna diversity functions, and adaptive transmit power control function to obtain the better performance in the analog portions of the transceiver.

The RTL8188CUS MAC supports 802.11e for multimedia applications, 802.11i for security, and 802.11n for enhanced MAC protocol efficiency. Using packet aggregation techniques such as A-MPDU with BA and A-MSDU, protocol efficiency is significantly improved. Power saving mechanisms such as Legacy Power Save, and U-APSD, and APSD, reduce the power wasted during idle time, and compensates for the extra power required to transmit

OFDM. The RTL8188CUS provides simple legacy and 20MHz/40MHz co-existence mechanisms to ensure backward and network compatibility.