



**Technical Description  
WLAN6100**

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*Confidential Information*

## Table of Contents

Introduction.....	4
Introduction.....	4
1.1    Scope.....	4
1.2    Acronyms.....	4
2    General Specifications .....	5
2.1    WLAN features.....	5
2.2    Antenna configurations.....	5
2.3    EEPROM .....	5
3    Block Diagram .....	6
4    WLAN Specifications.....	7
4.1    RF Operation Frequency Range and IEEE 802.11g Channels .....	7
4.2    Receiver Specifications.....	7
4.2.1    Receiver Minimum Input Level Sensitivity.....	7
1Mbps of BPSK mode .....	7
11 Mbps of CCK mode.....	7
6, 9, 12, 18, 24, 36, 48, 54 Mbps of OFDM mode.....	7
4.3    Transmit Specifications .....	8
4.3.1    Typical Transmit Output Power.....	8
4.3.2    Transmit Center Frequency Tolerance.....	8
4.3.3    Symbol Clock Frequency Tolerance.....	8
4.3.4    Transmit Spectral Mask .....	8
1Mbps of DPSK mode, 2 Mbps of QPSK mode and 5.5 and 11 Mbps of CCK	
modes .....	8
OFDM modes.....	9
4.3.5    Transmit Modulation Accuracy .....	10
EVM for 1Mbps DPSK, 2 Mbps QPSK and 5.5 and 11 Mbps CCK .....	10
EVM for OFDM modes .....	10
5    DC Electrical Specifications .....	11
5.1.1    Absolute Maximum Ratings .....	11
6    Operation modes .....	11
7    I/O Interface .....	11
7.1    Host Interfaces .....	11
7.1.1    WLAN.....	11
8    Operation and Storage Conditions .....	11

## Table of Figures

Figure 1	Block diagram of 8100 combo module.....	6
Figure 2	Transmit Spectrum Mask for 1, 2, 5.5 and 11 Mbps Data Rates.....	9
Figure 3	Transmit Spectrum Mask for OFDM Modes.....	9

## Table of Tables

Table 1	IEEE 802.11g Channels.....	7
Table 2	Receiver Minimum Input Level Sensitivity for OFDM mode.....	8
Table 4	Transmitter Power Output.....	8
Table 5	Allowed Relative Constellation Error Versus Data Rate.....	10
Table 8	Absolute Maximum Ratings.....	11
Table 10	Operation and Storage Conditions.....	11

# Introduction

The document provides a brief technical description for the WLAN6100 802.11b/g Evaluation Card. This card is used by SyChip's customers for the purpose of module evaluation and software development. The purpose of FCC certification on the EVK is to provide our customers with confidence that our module product will pass their end device certification. Therefore, the WLAN6100 EVK is not intended for used as is in the end customers portable device. The module portion of the EVK is what our customers will embed directly onto their host PCB.

## 1.1 Scope

This document describes the WLAN 6100 EVK.

## 1.2 Acronyms

WLAN	Wireless Local Area Network
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## 2 General Specifications

### 2.1 WLAN features

- 802.11b/g
- Support Independent Basic Service Set (IBSS), e.g. *ad hoc*, BSS and Extended Service Set (ESS) network configurations.
- Support the following data rates with three different modulation modes:
  - 1 Mbps (BPSK modulation)
  - 2 Mbps (QPSK modulation)
  - 5.5 and 11 Mbps (CCK modulation)
  - 6 and 9 Mbps (OFDM with BPSK carrier modulation)
  - 12 Mbps (OFDM with QPSK carrier modulation)
  - 24 and 36 Mbps (OFDM with 16QAM carrier modulation)
  - 48 and 54 Mbps (OFDM with 64QAM carrier modulation)
- Intelligent power control, including IEEE802.11 power saving mode.
- CF, SDIO and GSPI will be employed to interface with host device.
- Support open system and shared key authentication services.
- Internal WEP engine allows 64 or 128 bit Encryption with Temporal Key Integrity Protocol (TKIP)
- Support 802.11i security:
  - Advanced encryption standard (AES) / Carrier controlled modulation (CCM).
- Support WPA (Wi-Fi protected access).
- Support 802.11e Quality of Service (QoS) for voice, video and multimedia applications.

### 2.2 Antenna configurations

### 2.3 EEPROM

WLAN MAC address, CIS and calibration data should be stored in a EEPROM.

### 3 Block Diagram

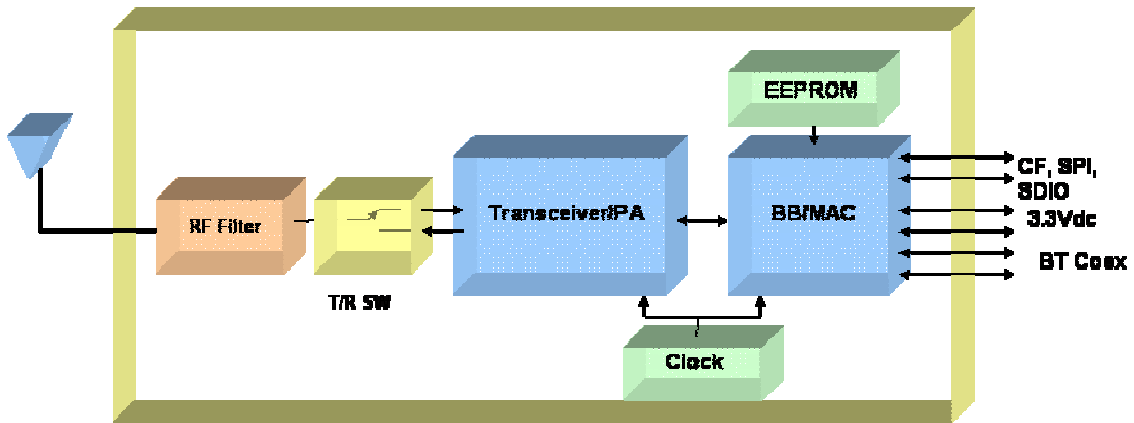


Figure 1 Block diagram of 8100 combo module

## 4 WLAN Specifications

### 4.1 RF Operation Frequency Range and IEEE 802.11g Channels

The RF function provides programming of the RF channels center frequencies from 2.412 GHz to 2.484 GHz. This covers all of the 14 RF channels frequencies specified in the 802.11 standard for DSSS signaling mode.

Table 1 IEEE 802.11g Channels

Channel Number	Channels Frequency (MHz)	Geographic Usage
1	2412	US, CA, ETSI, TELEC
2	2417	US, CA, ETSI, TELEC
3	2422	US, CA, ETSI, TELEC
4	2427	US, CA, ETSI, TELEC
5	2432	US, CA, ETSI, TELEC
6	2437	US, CA, ETSI, TELEC
7	2442	US, CA, ETSI, TELEC
8	2447	US, CA, ETSI, TELEC
9	2452	US, CA, ETSI, TELEC
10	2457	US, CA, ETSI, TELEC, FR, SP
11	2462	US, CA, ETSI, TELEC, FR, SP
12	2467	ETSI, TELEC, FR
13	2472	ETSI, TELEC, FR
14	2484	TELEC

US = United States,

CA = Canada,

ETSI = ETSI countries (except France and Spain)

FR = France,

SP = Spain,

TELEC = Japan.

### 4.2 Receiver Specifications

#### 4.2.1 Receiver Minimum Input Level Sensitivity

*1Mbps of BPSK mode*

**-80 dBm** @ frame error ratio (FER) less than **8 %** at an MPDU length of 1024 bytes. (This FER is specified for 2 Mbits/s DQPSK modulation.)

*11 Mbps of CCK mode*

**-76 dBm** @ frame error ratio (FER) less than **8 %** at a PSDU length of 1024 octets. (This FER is specified for 11 Mbits/s CCK modulation.)

*6, 9, 12, 18, 24, 36, 48, 54 Mbps of OFDM mode*

The receiver minimum input level sensitivities @ Packet Error Rate (PER) less than **10%** at a PSDC length of 1000 bytes for rate-dependent input levels is listed in Table 4.

**Table 2 Receiver Minimum Input Level Sensitivity for OFDM mode**

<b>Data Rate (Mbps)</b>	<b>Minimum Input Level Sensitivity (dBm)</b>
54	-65

### **4.3 Transmit Specifications**

#### **4.3.1 Typical Transmit Output Power**

**Table 3 Transmitter Power Output**

<b>Date Rate (Mbps) and Modulations</b>	<b>Output Power (dBm)</b>
1 Mbps BPSK and 2 Mbps QPSK	16
5.5 and 11 Mbps CKK	16
6, 9, 12, 24, 36, 48 and 54 Mbps OFDM	13

#### **4.3.2 Transmit Center Frequency Tolerance**

The maximum transmit center frequency tolerance is **± 25 ppm**. The transmit center frequency and symbol clock frequency should be derived from the same reference oscillator (locked).

#### **4.3.3 Symbol Clock Frequency Tolerance**

The maximum symbol clock frequency tolerance is **± 25 ppm**. The symbol clock frequency and transmit center frequency should be derived from the same reference oscillator (locked).

#### **4.3.4 Transmit Spectral Mask**

*1Mbps of DPSK mode, 2 Mbps of QPSK mode and 5.5 and 11 Mbps of CKK modes*

The transmitted spectral products shall be less than **-30 dBr** (dB relative to the SIN<sub>x</sub>/x peak) for

$f_c - 22 \text{ MHz} < f < f_c - 11 \text{ MHz}$ ; and  
 $f_c + 11 \text{ MHz}, f, f_c + 22 \text{ MHz}$ .

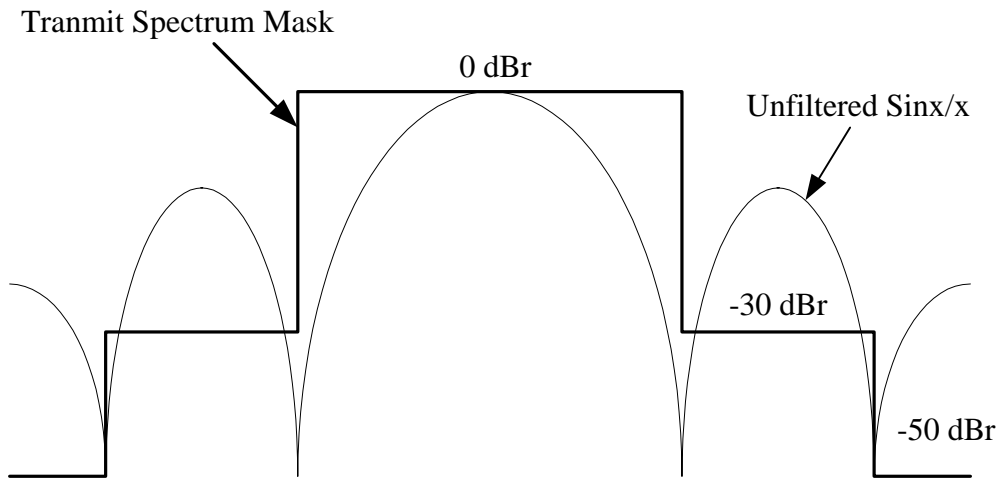
and should be less than **-50 dBr** for



$f < f_c - 22 \text{ MHz}$ ; and  
 $f > f_c + 22 \text{ MHz}$ ,

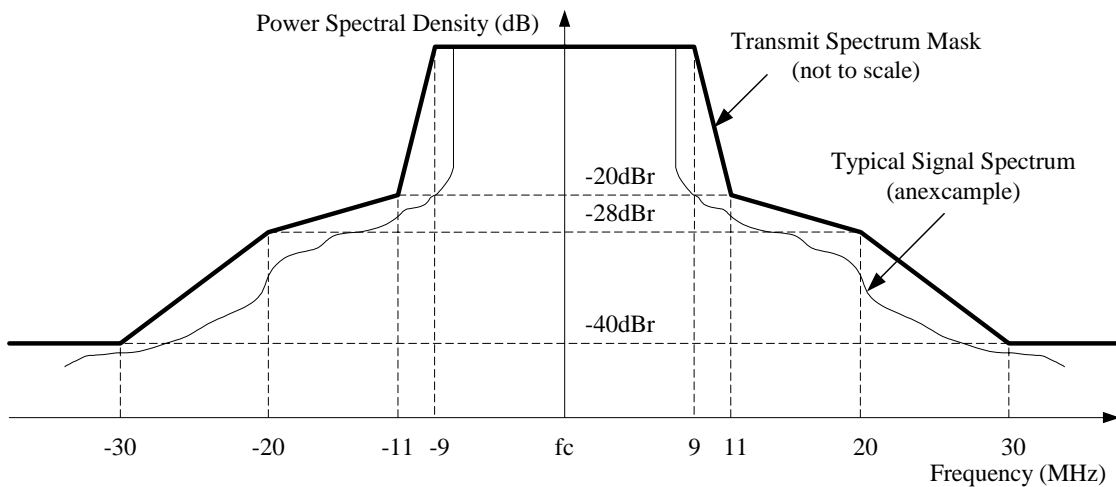
where  $f_c$  is the channel center frequency.

The transmit spectrum mask is shown in Figure 3. The measurement shall be made using 100 KHz resolution bandwidth and 30 KHz video bandwidth for 1 and 2 Mbps data rate, and using 100 KHz resolution bandwidth and 100 KHz video bandwidth for 5.5 and 11 Mbps.



**Figure 2** Transmit Spectrum Mask for 1, 2, 5.5 and 11 Mbps Data Rates

*OFDM modes*



**Figure 3** Transmit Spectrum Mask for OFDM Modes

The transmitted spectrum shall have a 0 dBr bandwidth not exceeding 18 MHz, -20 dBr at 11 MHz frequency offset, -28 dBr at 20 MHz frequency offset and -40 dBr at 30 MHz frequency offset and above. The transmitted spectral density of the transmitted signal shall fall within the spectral mask, as shown in Figure 4. The measurements shall be made using a 100 KHz resolution bandwidth and a 30 KHz video bandwidth.

#### 4.3.5 Transmit Modulation Accuracy

*EVM for 1Mbps DPSK, 2 Mbps QPSK and 5.5 and 11 Mbps CCK*

$$V_{err}(n) < 0.35$$

where n = 1000 samples.

*EVM for OFDM modes*

**Table 4 Allowed Relative Constellation Error Versus Data Rate**

<b>Data Rate (Mbps)</b>	<b>Relative Constellation Error (dB)</b>
6	-5
9	-8
12	-10
18	-13
24	-16
36	-19
48	-22
54	-25

## 5 DC Electrical Specifications

### 5.1.1 Absolute Maximum Ratings

Table 5 Absolute Maximum Ratings

Parameters	Conditions	Min	Max	Units
V_Bat		-0.3	5.5	V
V_1.8		-0.4	2.2	V
V_3.0		-0.4	3.7	V

## 6 Operation modes

Normal mode

IEEE Power Saving Mode

Deep Sleep Mode

Power Down Mode

## 7 I/O Interface

### 7.1 Host Interfaces

#### 7.1.1 WLAN

CF

SDIO

G-SPI

## 8 Operation and Storage Conditions

Table 6 Operation and Storage Conditions

Parameters	Conditions	Min	Max	Units
<i>Operating Conditions</i>				
Ambient Temperature Range		-30	85	°C
<i>Storage Conditions</i>				
Temperature Range		-40	125	°C
Humidity Range		TBD	TBD	