

JEDEC STANDARD

Interoperability and Compliance Technical Requirements for JEDEC Standard JESD96A – Recommended Practice for use with IEEE 802.11n

JESD96A-1

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INTEROPERABILITY AND COMPLIANCE FOR THE RADIO FRONT END–BASEBAND (RF-BB) INTERFACE STANDARD (JESD96)

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INTEROPERABILITY AND COMPLIANCE FOR THE RADIO FRONT END-BASEBAND (RF-BB) INTERFACE STANDARD (JESD96)

Foreword

This publication provides recommendations for the interface between Radio Front End (RF) and Baseband (BB) integrated circuits (IC) for use of JEDEC standard JESD96A in the proposed wireless local area network system IEEE 802.11n. Note that at the time of this publication, the IEEE 802.11n standard has not been approved or published. However, in this publication we assume that systems based on IEEE 802.11n, if it becomes a standard, will be similar to the standards IEEE 802.11a/g, and will use spatial multiplexing with data rates in excess of 100 Mbps. Therefore, we have developed recommendations for such a system, with these recommendations not dependent on the finer details of the IEEE 802.11n standard. Furthermore, these recommendations should also be applicable to other wireless systems, including IEEE 802.16 and cellular systems. These recommendations are intended to ensure that multiple RF and baseband IC vendors can design IC's with a common IC interface allowing each of the devices to work with each other. Included are requirements for electrical signaling, link layer state machines and register map definitions.

Introduction

The RF to baseband interface specified in the JEDEC standard JESD96A is briefly described as follows. This interface is a high-speed, low latency digital interface that has been defined primarily for wireless local area networking applications but can be used for other RF to BB links such as used in metro area networking and wide area networking applications. This interface allows the radio front end of a wireless network controller to be separated from the base-band and MAC device(s) by up to 50 cm. A typical example is to connect a radio front end in the upper (screen) portion of a laptop computer to a base-band device on the motherboard. Lower power options are also defined for shorter distances.

The basic interface consists of three differential signals totaling to six pins. A clock signal must be provided by the FED on one pair of pins along with two pairs of pins for data transfers from the FED to BED and in the reverse direction. A separate pair is dedicated for either direction.

Figure 1 illustrates the pin connections for the RF-BB interface. An optional pair of pins can be assigned for a return clock from the BED to the FED.

The interface provides three, concurrent, logical channels for communication: a streaming data channel, a control channel and a register access channel. Each of these channels can be programmed by the BED, subject to the constraints indicated by the FED in its capability registers. The FED determines the clock frequency, while the BED can select the data frame formats subject to the constraints indicated by the FED in its capability registers.

For 802.11n, we make further recommendations concerning the following items:

- 1) Device discovery process
- 2) System loops
- 3) 802.11n modularity
- 4) Basic configuration
- 5) Basic parameters
- 6) Frame formats
- 7) Register sub-packet format
- 8) Control field
- 9) Signal characteristics

It is the goal of this I&C that following these recommendations will result in RF and baseband ICs that can work together.