

PHISON PS7161 PCIe 6.0 REDRIVER IC DATASHEET

V1.8 Mar. 3, 2026

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REVISION HISTORY

Revision	Description	Draft Date
1.0	● Initial release for public	Jan. 26, 2026
1.8	● Minor content update	Mar. 3 2026

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About Us

Phison Electronics Corporation was established in November 2000 in Hsinchu, Taiwan. Starting with the world's first single-chip USB flash drive IC, Phison is now a market leader in NAND Flash controllers and high speed interface IC including retimer and redrivers. The company has shipped million NAND controllers and high speed interface IC solutions worldwide. As a ASIC solution provider, Phison also offers IP services for customers.

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PREFACE

About this Document

This document is to describe the PCIe Gen6 Redriver IC and the corresponded control signals. In addition, it discusses how to apply the functions and illustrates the status register reported by these functions.

Definition of Acronyms and Abbreviations

All acronyms and abbreviations used in place of the full definition in this document are listed in [Table 1](#) below:

Table 1: Definition of Acronyms and Abbreviations

Item	Definitions
AIC	Add-In Card
EP	Endpoint
EQ	Equalization
EVB	Evaluation Board
FEXT	Far-End Cross Talk
FG	Flat Gain
NEXT	Near-End Cross Talk
PCIe	Peripheral Component Interconnect Express
RC	Root Complex
RX	Receiver
SL	Stripline
TX	Transmitter

1. OVERVIEW

1.1 General Description

The Phison PS7161 is a 4-channel high performance linear Redriver IC designed for Peripheral Component Interconnect Express (PCIe) 6.0 applications that supports up to 64 Gbps data rate. The Redriver provides programmable equalization, output swing, and flat gain to optimize performance over a variety of physical mediums, such as PCB traces, and transmission cables.

The PS7161 featuring high frequency boosting, low channel-channel cross-talk, low additive jitter and low return loss makes the device almost a passive element in the link. The programmable setting can be applied easily by either pin control or I²C control. With signal adjustment flexibility of I²C Mode, each channel has a set of independent control pins to make signal optimization possible.

Phison's exclusive technology "PHiTUNE" with our own SSD is able to collect and demonstrate the compulsory data, such as lane margining and eye opening, on the GUI for users and further to help to save tremendous efforts on system tuning by converging Redriver parameters.

1.2 Features

- Compliant with PCIe Gen 6.0 Standard up to 64 Gbps interfaces
- Four-channel linear pure PCIe Gen6 Redriver IC
- EQ boosting up to 20 dB at 16 GHz
- Low-latency of 70ps
- Adjustable output linear swing, flat gain, and equalization via Pin control and I²C
- 4 level I/O for EQ and Gain setting to reduce pin count
- Supports I²C and Phison PHiTUNE Technology for proper EQ setting
- Automatic receiver detection
- Rate and coding agnostic
- Transparent to link training
- Supply voltage: 3.3V
- Junction temperature: -40°C ~ +125°C
- Case temperature: -40°C ~ +115°C
- Package: FCLGA40, 6 mm x 4 mm

1.3 Application

- Rack Server / Blade Server / Tower Server
- Server Motherboard
- Data Center
- Workstation
- Desktop PC / Motherboard

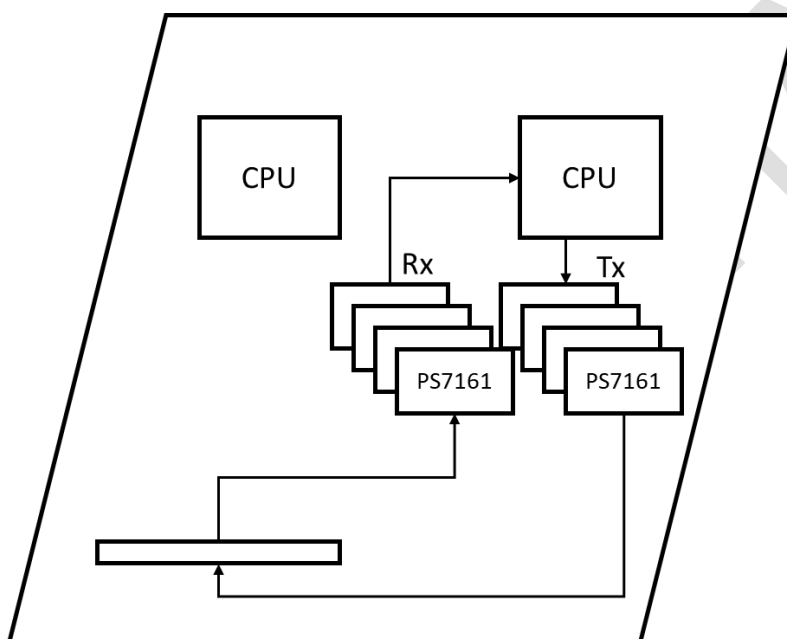


Figure 1: Motherboard Application

1.4 Product Family Information

Table 2: Product Family

Part#	Equalization	PCIe	Lanes / Channel	Status
PS7163	Up to 20dB at 16GHz	Designed to support PCIe 6.0 and other interfaces up to 64Gbps	16 Lanes	Production
PS7161	Up to 20dB at 16GHz		4 Channel	Production
PS7151	Up to 20dB at 16GHz	Designed to support PCIe 5.0 and other interfaces up to 32Gbps	4 Channel	Production
PS7103	Up to 28.5dB at 16GHz		16 Lanes	Production
PS7102	Up to 28.5dB at 16GHz		8 Channel	Production
PS7101	Up to 20dB at 16GHz		4 Channel	Production

*Channel: Non-interleave redrivers

1.5 Function Block Diagram

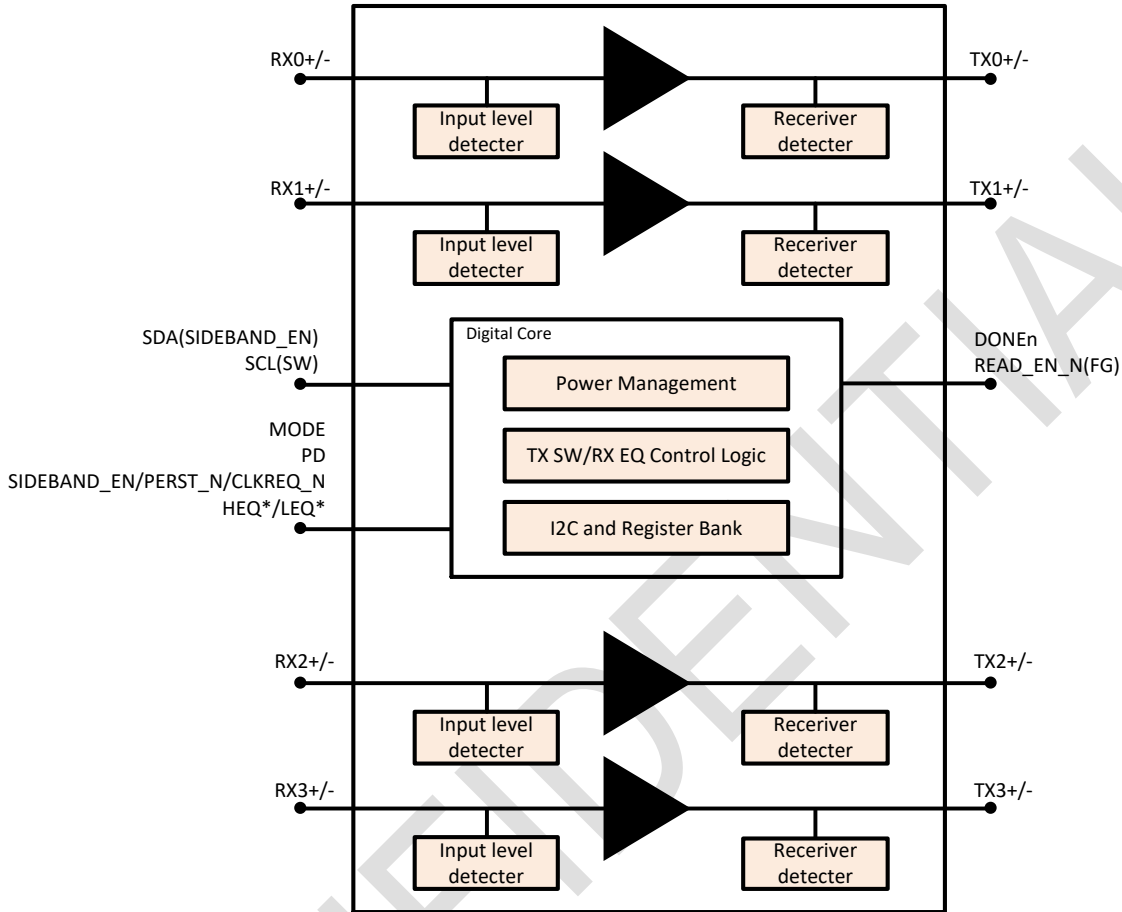


Figure 1: Block Diagram of PS7161

2. PHiTUNE Auto EQ Tuning Tool

Phison's PHiTUNE tool is a Phison propriety Redriver tuning software, pairing with Phison SSD as an endpoint it enables the redriver which by comparing with Link speed/Width, Eye Width, RX recovery times, TX recovery times by different EQ setting via the SSD it will automatically optimize redriver EQ settings

Key features

1. Upstream path is monitoring the TX recovery counter
2. Downstream path is monitoring the eye width

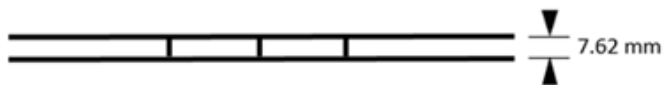
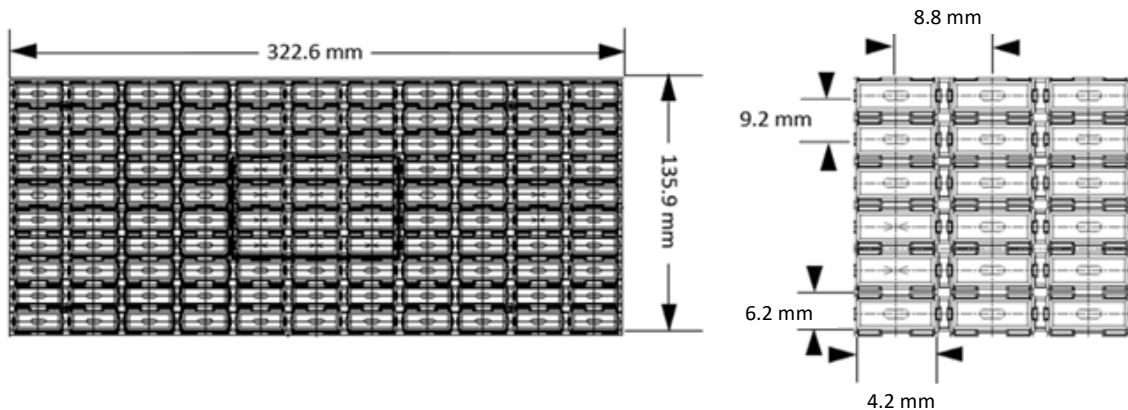
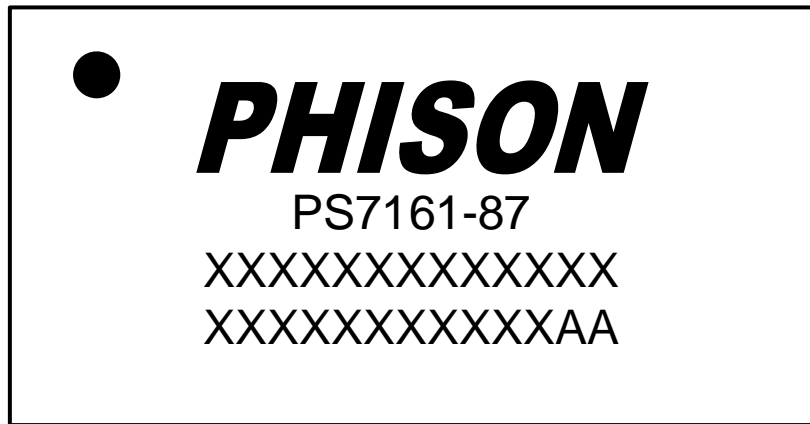


Figure 3: Auto Mode result of PHiTUNE

3. ORDERING INFORMATION

Table 3: Ordering Information

Part Number	Marking	Version	Package Type	Package Size	Packing
PS7161-87	PS7161-87	AA	FC-LGA-40	6.0mm x 4.0mm	Tray



Package	Q'TY/Tray
FC-LGA-40	490