Overview

The PRM2136X *Versatus* module comprises a highly integrated 60 GHz chipset compliant with the IEEE 802.11ad specifications. This platform gives a complete USB 3.0 to 60 GHz solution. The module supports operation over 57- 66 GHz (CH 1-4) and provides user throughput rates over 3Gbps.

The PRM2136X utilizes a phased array antenna integrated in the circuit board which includes polarization diversity allowing optimal signal reception for any signal polarization. It is capable of 2-D beam steering in azimuth and elevation planes.

This module contains the PRS4601-B2E baseband IC, and PRS1145 radio IC. These ICs provide all the radio and baseband functionality necessary for IEEE 802.11ad operation.

Target Applications

- Consumer electronics
- Wireless video
- AR/VR
- Secure/tactical communications

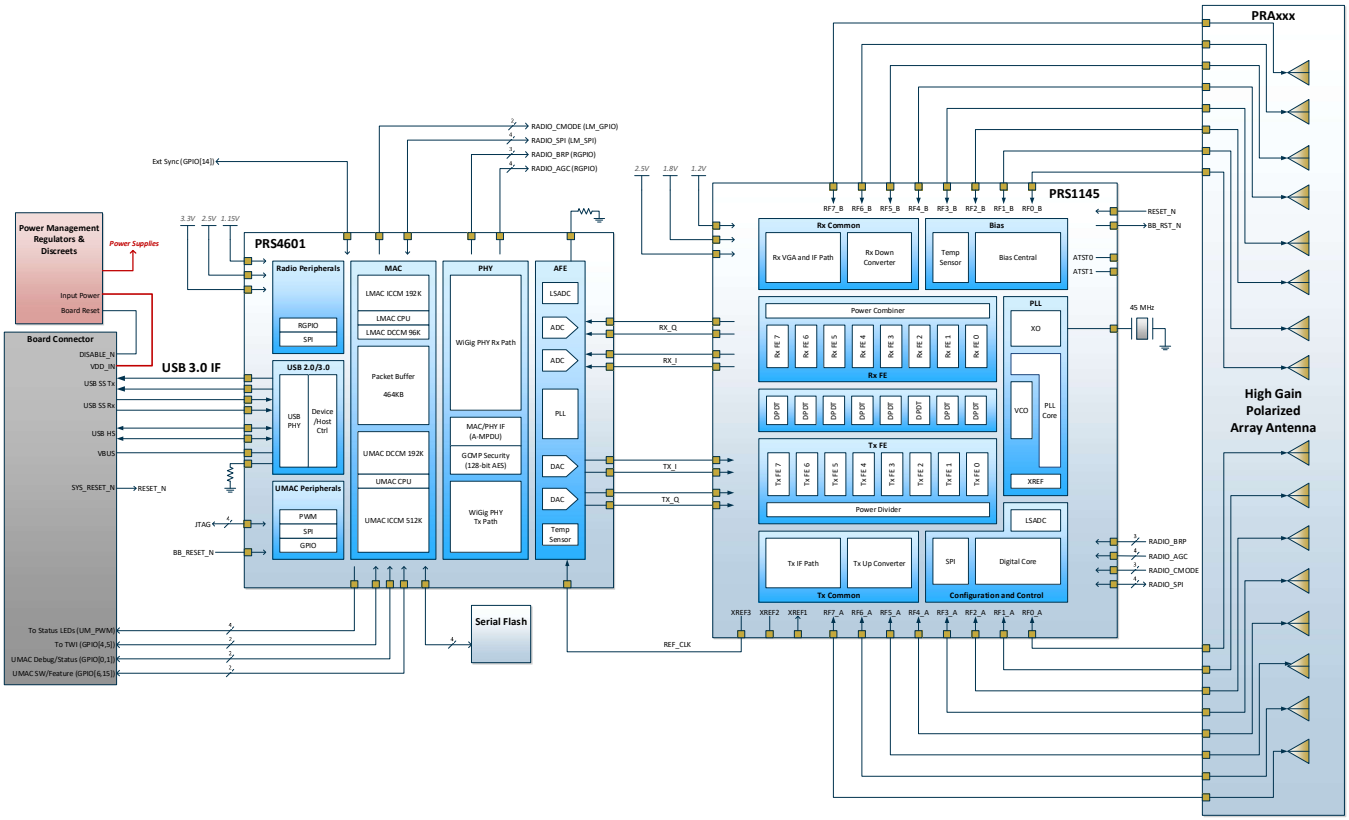
Features

- Operates in the unlicensed 57 to 66 GHz band
- Full and ½ channel support
- 16-element dual-polarized PCB integrated antenna
- MCS 1 (BPSK) to MCS 12 (16QAM) support
- Fully integrated MAC, PHY, radio, and antenna
- IEEE 802.11ad MAC and PHY compliance
- 31 dBm EIRP with 8-elements active
- Total system DC power
  - Tx: 3.2W
  - Rx: 2.9 W
- Automatic rate adaptation
- Dynamic beamforming
- AES 128-bit data encryption
- Automatic calibrations
- WPA2 and WPA3 Authentication
- 1PPS synchronization support*
- Multi-user support up to 30 STA
- A-MSDU, A-MPDU data aggregation
- USB 3.0 data and control interface
- Integrated power management
- -82 dBm receive sensitivity @MCS1**
- Up to 3.5 Gbps bidirectional TCP/UDP throughput
- -20°C to 70°C operation
- Single 5V power supply input
- Compact 45mm x 22mm form factor

* Optional firmware enabled feature. Contact Peraso sales support for more information.

** incident at the module antenna

Block Diagram



General Description

The PRM2136X high performance, 60GHz transceiver module provides full IEEE 802.11ad functionality from a USB data and control interface to an over-the-air antenna. The module has a compact 45mm x 20mm form factor.

The baseband connector provides the interface for USB3.0 data and additional control signals. The module is powered from a single 5-volt supply on the same connector.

The PRM2136X uses the PRS4601-B2E baseband processor, and the PRS1145 RFIC.

The PRS4601 802.11ad Baseband incorporates the Analog Front End, BB PHY/ MAC, and two RISC CPU cores. It utilizes a highly flexible, dual CPU soft MAC integrates all IEEE 802.11ad MAC functions. This includes A-MSDU, A-MPDU, and WPA2 security.

This module operates in the unlicensed 57 to 66 GHz band, IEEE 802.11ad channels 1-4.

The PRM2136X utilizes a phased array antenna. The antenna is capable of beamforming to optimize the wireless connection. In the stand-alone application, the antenna has a 90° azimuth and 80° elevation steering range.

Peraso modules are fully tested to an over-the-air antenna input/output specification, thus relieving OEMs from the complexities of ensuring the integrity of the mmWave RF performance.

Key Specifications

Parameter	Value			
Data Interface	USB 3.0			
Air Protocol	IEEE 802.11ad			
Modulation Schemes	MCS 1 (BPSK) to MCS 12 (16QAM)			
Multiple Access Modes	CBAP, proprietary Long Range CBAP and Controlled Access protocols			
Security Modes	128-bit AES WPA2 WPA3			
Networking Support	Infrastructure , peer-to-peer, standard WLAN, point-to-multipoint			
	Conditions		**Value (Typ.)**	**Units**
RF Frequency			57 to 66	GHz
Channel bandwidth	IEEE 802.11ad Channels 1-4		2.16	GHz
Module size	Length x Width		45 x 20	mm
Operating Temperature Range			-20 to 70	°C
TX Parameters				
EIRP	T_{amb}=25˚C, Channel 4, MCS9		31	dBm
RX Parameters				
Sensitivity	T_{amb}=25˚C, Channel 4, MCS1		-82	dBm
Beam Forming Parameters				
Azimuth Scan Range	-3dB edge	H-pol V-pol	±40 ±40	deg
Elevation Scan Range	-3dB edge	H-pol V-pol	±35 ±30	deg
DC Power Consumption				
TX DC Power	MCS9 operation. 100% duty cycle		3.2	W
RX DC power			2.9	W

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