

# PRM2141X mmWave Module

## PRODUCT BRIEF

### OVERVIEW

The PRM2141X is a member of the Perspectus module series which provides a complete USB 3.0 to 802.11ad module with advanced features for long range, outdoor applications. It utilizes the Peraso X720 802.11ad 60 GHz phased array chipset which includes a baseband processor and a high-power mmWave beamforming transceiver RFIC.

The PRM2141X incorporates a 16-element phased array antenna which can be used with or without a dish reflector. The antenna is integrated into the PCB and provides uniform performance over the entire 802.11ad band from 57 to 71 GHz.

The Baseband processor is the PRS4601-B2E. This provides all MAC and PHY layer functionality necessary for 802.11ad operation and supports point-to-point or point-to-multipoint capability.

The PRS1165 RFIC provides 16 RF chains with high transmit power levels. It supports all 6 of the 802.11ad defined channels.

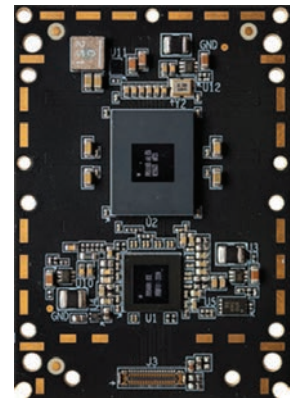


Figure 1: PRM2141X

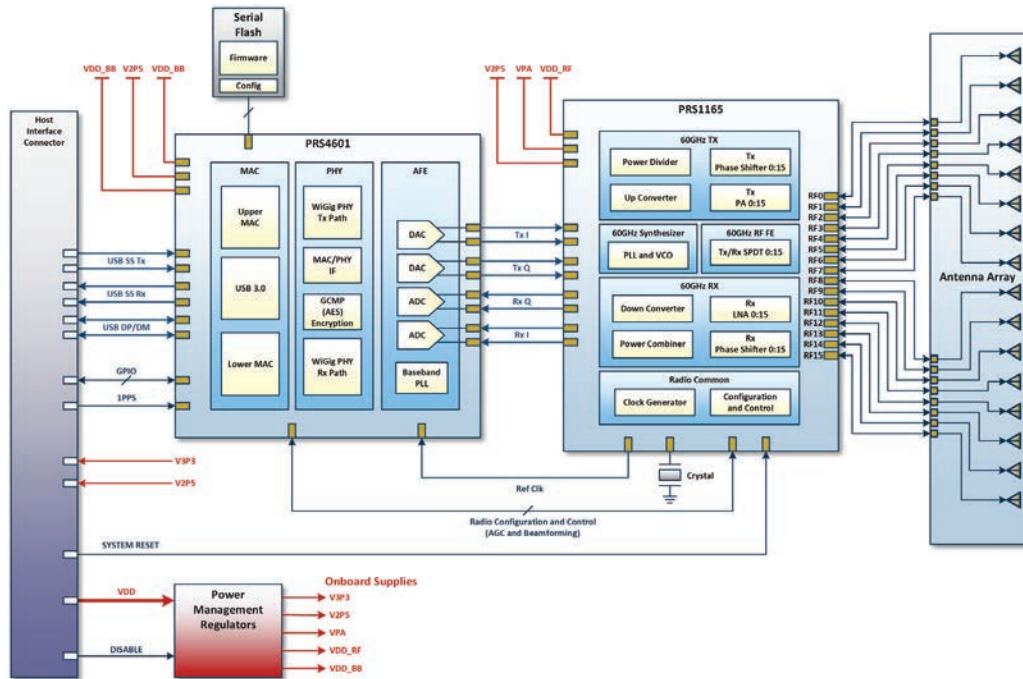
### TARGET APPLICATIONS

- Point-to-multipoint Fixed Wireless Access Networks
- Point-to-Point Backhaul / Fiber alternative

### FEATURES

- Operates in the unlicensed 57 to 71 GHz band
- 2.16 GHz channel bandwidth
- pi/2-BPSK, pi/2-QPSK modulation support
- Fully integrated MAC, PHY, radio, and antenna
- 802.11ad MAC and PHY compliance
- Automatic rate adaptation
- Dynamic beamforming
- Automatic calibrations
- AES 128 bit data encryption
- WPA3 Authentication
- 1PPS synchronization support
- A- MSDU, A-MPDU data aggregation
- Peraso Directional Beam Scan and Connect (DBSC) for establishing long-range PtP links
- USB 3.0 data and control interface
- Integrated power management
- 16-element integrated phased array antenna
- -86 dBm receive sensitivity @MCS4
- 2Gbps maximum data rate
- 38 dBm EIRP with 16-elements active (higher gains supported using a dish reflector)
- Total system DC power:
  - Tx: 13W (at QPSK, 16 elements active)
  - Rx: 5W (at QPSK, 16 elements active)
  - Tx 6.8W (at QPSK, 4 elements active)
  - Rx 4.7W (at QPSK, 4 elements active)
- -40°C to 85°C operation
- Single 5V power supply input
- Compact 35mm x 50mm form factor

## BLOCK DIAGRAM



## KEY SPECIFICATIONS

Parameter	Value		
Data Interface	USB3.0		
Air Protocol	802.11ad		
Modulation Schemes	MCS0-9 (pi/2-BPSK, pi/2-QPSK)		
Multiple Access Modes	CBAP, proprietary Long Range CBAP and Controlled Access protocols		
Security Modes	128-bit AES WPA3		
Networking Support	infrastructure , peer-to-peer, standard WLAN		
	Conditions	Value (Typ.)	Units
RF Frequency		57 to 71	GHz
Channel bandwidth	802.11ad Channels 1-6	2.16 or 1.08	GHz
Module size	Length x Width	50 x 35	mm
Operating Temperature Range		-40 to 85	°C
TX Parameters			
EIRP	Tamb=25°C, Channel 4, MCS9	38	dBm
Total Radiated Power	Tamb=25°C, Channel 4, MCS9,	22	dBm
RX Parameters			
Sensitivity	Tamb=25°C, Channel 4, MCS4	-86	dBm
Beam Forming Parameters			
Azimuth Scan Range	-3dB edge, Channel 4	+/-45	deg
Elevation Scan Range	-3dB edge, Channel 4	+/-45	deg
DC Power Consumption			
16 antenna elements	TX DC Power	13	W
	RX DC power	5	W
4 antenna elements	TX DC Power	6.8	W
	RX DC power	4.7	W

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