

10.7 GHz to 14.5 GHz, 4-Channel Half-Duplex Beamformer

FEATURES

- ▶ 4-channel T/R
- ▶ SPI control and single pin T/R control
- ▶ Common SPI bus for up to 32 beamformer chips
- ▶ Integrated power detector
- ▶ Flip-chip design
- ▶ 3.19 mm × 2.49 mm die size

APPLICATIONS

- ▶ 10 GHz to 15 GHz satellite communication system

GENERAL DESCRIPTION

The ADMV4680 is a Ku frequency band, half-duplex beamforming chip. The chip contains a single port network interface that is used for both transmit and receive, a four-way splitter for both transmit and receive, and a T/R switch to separate transmit and receive circuits. A central digital controller allows the core chip to adjust gain and phase of each channel. In a four-channel configuration, the core chip receive path combines the four phase-adjusted signals into a common RF port.

In the transmit mode, the four-channel chip distributes the signal from the common RF port to four different antenna ports, adjusting the gain and phase for each path. Transmit and receive signals can be combined with the signals from other beamformer chips to form a full phased array antenna. The ADMV4680 contains four detectors at the four outputs. Each detector can be turned off/on separately to save the power consumption. In addition, the ADMV4680 has an integrated temperature sensor with less than 10°C accuracy.

In the receive mode, the ADMV4680 shows a typical noise figure of 1.9 dB at 25°C and 12.7 GHz, including the off-chip input matching network, and typically consumes 78 mW. In the transmit mode, the beamformer shows a typical output compression point (P1dB) of 9.5 dBm while the typical power consumption is 108 mW.

For gain and phase programmability, the ADMV4680 has several control options requiring at least 72 serial port interface (SPI) clock cycles to program for 6-bit and 8-bit phase resolution.

FUNCTIONAL BLOCK DIAGRAM

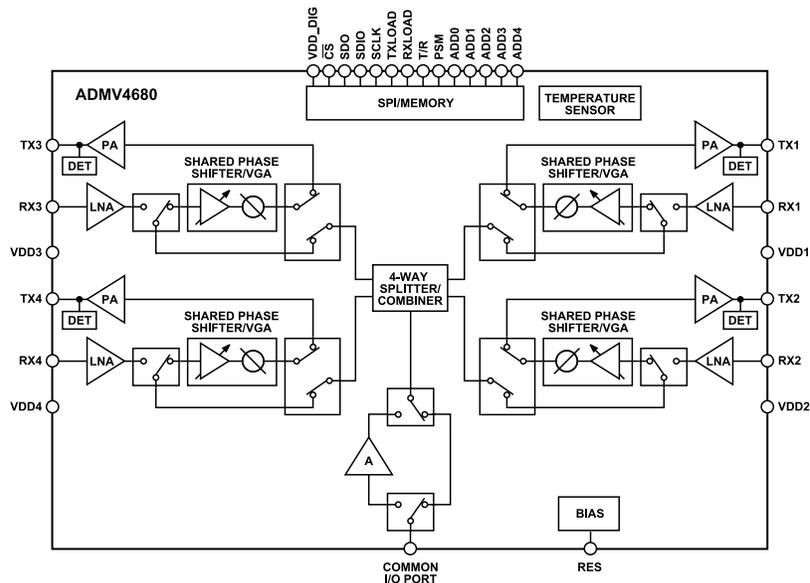


Figure 1. Functional Block Diagram

For more information on the ADMV4680, contact Analog Devices, Inc., at satcom@analog.com

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