

# Sivers Semiconductors

at the heart of innovation

The worldwide 5G race pushes the industry to use more cost-effective solutions and the ever-increasing appetite for broadband increases the demand for high capacity wireless solutions. Sivers Semiconductors together with MaxLinear can now provide a unique solution combining two market leading technologies to enable cost effective 10 Gbps wireless transmission systems.

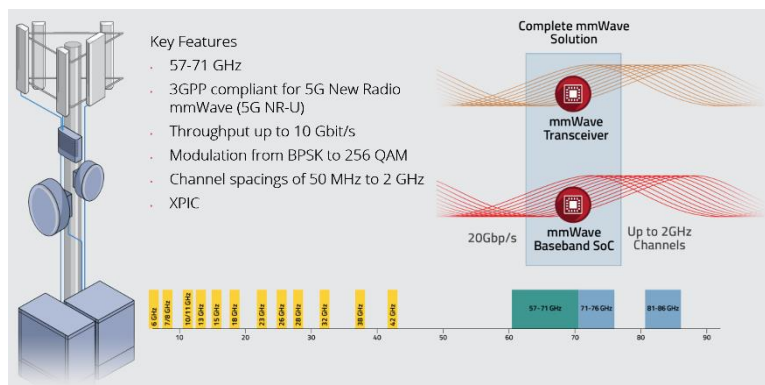


Figure 1. Disruptive use of the unlicensed 60 GHz band

By combining the MaxLinear MxL85110 baseband SoC with Sivers Semiconductors TRXBF/01 RFIC, customers can build flexible and cost effective products meeting the demands by fronthaul and backhaul applications. This combined solution will operate on the unlicensed 60 GHz band, supporting the full 14 GHz of available bandwidth. By means of channel bandwidths up to 2 GHz in combination with modulation rates from binary phase-shift keying (BPSK) to 256-QAM link capacities of 10 Gbps can be achieved.

By using the unlicensed 60 GHz band, it is possible to benefit from the unique characteristics given 14 GHz of available spectrum. The lower band (57-64 GHz) represent higher attenuation per km, making it suitable when you have a need for shorter link distances and higher level of frequency re-use, whereas the upper part of the spectrum (64-71 GHz) has characteristics similar to the E-band (71-76/81-86 GHz), which opens up for longer distances and more attractive link budgets. By using the 60 GHz spectrum, you will not only enjoy the simplicity of using an unlicensed band, you will also get access to truly wide channels of 2 GHz, which opens up tremendous possibilities for increased throughput.

## Key features

- 57-71 GHz
- 3GPP compliant for 5G New Radio (NR) mmWave
- Throughput up to 10 Gbit/s
- Modulation from BPSK to 256 QAM
- Channel spacings of 50 MHz to 2 GHz
- XPIC
- Full duplex, single carrier, FDD modem combined with
- Highly integrated “all inclusive” mmWave transceiver IC
- Synchronous Ethernet (SyncE)
- 1588v2, transparent clock (TC) mode
- Ethernet, GPIO and SPI interfaces
- Fixed mode and low latency mode

Combining one MxL85110 together with 2 TRXBF/01 RFICs, one configured as TX and one as RX in the FDD configuration a compelling cost effective, yet high performing solution can be realized. The comprehensive functionality supported by the MxL85110 and the TRXBF/01 includes a complete signal and processing chain, from the various user IP interface technologies via the analog baseband signals through to the RF signal generation, up- and down conversion and the mmWave front end amplifiers.

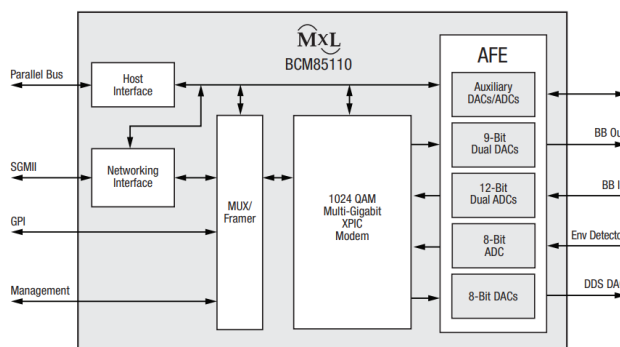


Figure 2 Block schematics overview MxL85110.

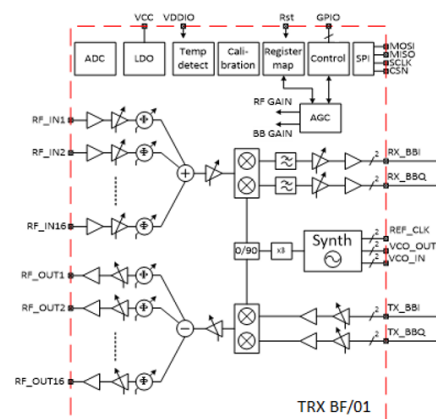


Figure 3. Block schematics overview TRXBF/01

### MxL85110 Technical Features

- Glueless connectivity to the RF/IF analog circuitry via integrated AFE DACs and ADCs
- Synchronous Ethernet (SyncE)
- 1588v2, transparent clock (TC) mode
- Full-duplex, single carrier, FDD modem
- XPIC
- Bit rates up to 10Gbps
- Modulation from BPSK to 1024 QAM
- Channels spacing of 50MHz to 2GHz
- Baud rate up to 1600 Mbaud
- Configurable LDPC or RS FEC channel codes
- High phase noise immunity
- Ethernet and GPI interfaces
- In-band management link

### TRXBF/01 Technical features

- 57-71GHz with 2.16GHz RF channel spacing
- 16 Receive and 16 Transmit Beamforming Transceiver
- RF tiling for 32/48/64 element arrays
- Excellent RF performance providing best in class EVM performance
- Integrated Fixed-N synthesizer
- Integrated analog Receive channel filter
- DC connection to the baseband modem
- Pout1dB > +10 dBm per antenna path, providing a combined output power of > +22dBm from the chip
- 7 dB noise figure
- EVM performance in both receive and transmit mode: -27dB