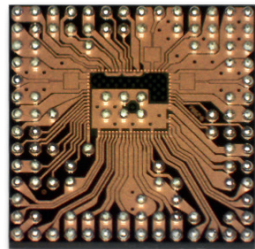


V-band transceiver chip for point to point backhaul



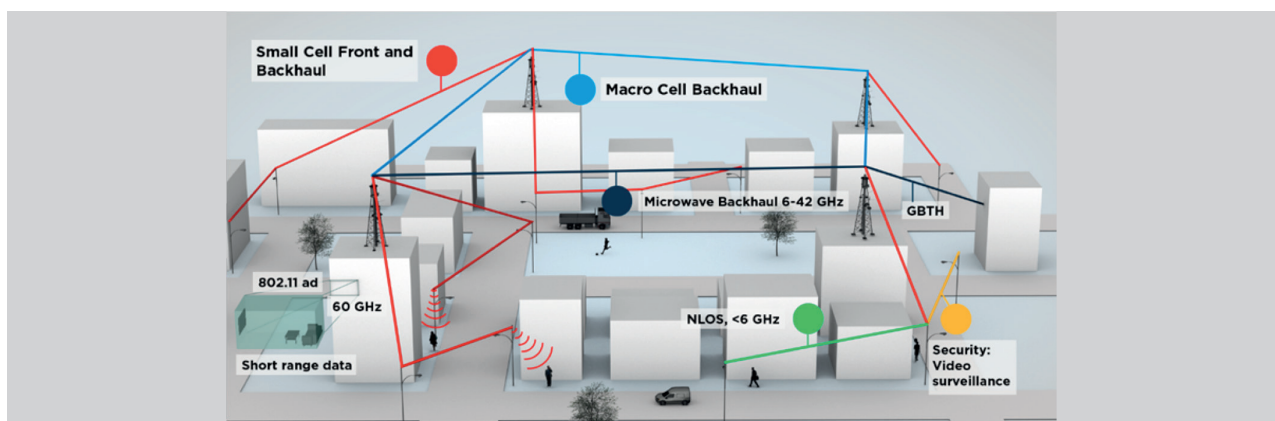
Microwave backhaul is reaching its maximum capacity, there is not enough available bandwidth for microwave links to backhaul all the data from the base stations/access point (BTS/AP). Traditional microwave links offer typically up to 1 Gbps backhaul using very high modulation schemes like 4096-QAM. If the modulation in the next generation microwave links would be increased to 8192 QAM, the capacity would be increased by a mere 8%. Therefore, it is quite clear that microwave links for point to point has reached its limits. However millimeter wave based communication can support 5-10x larger throughput than microwave links. In the US, FCC recently added 7 GHz license to the license free V-band, which now includes a 14 GHz band ranging from 57-71 GHz. Using only 1 GHz bandwidth and 64 QAM modulation, you will ideally achieve at least 4-5 Gbps.

By introducing a highly integrated transceiver for millimeter wave applications, Sivers IMA will offer a unique price-performance ratio, which should be of great interest to all data and telecom point to point

Features

- FDD
- Frequency band: 57 up to 71 GHz
- Modulation schemes: QPSK up to 64QAM (with internal LO) -higher modulations schemes with external LO
- Speed up to 4.5 Gbps (with internal LO)
- Universal analog I/Q base band interface
- IF bandwidth up to 500MHz
- RF Bandwidth up to 1000 MHz
- Analog RF and IF gain control
- Integrated Voltage Controller Oscillator (VCO)
- Support external local oscillator (LO)
- Up to 15dBm P1dB output power
- Typical 6.5dB NF
- Digital Interfaces: SPI, General Purpose Input Output (GPIO) interface
- Internal Register Map
- Integrated power detection function
- On-chip temperature sensor
- 111 pin, Embedded Wafer Level Ball Grid Array

radio link vendors, and cut their time to market for a V-band link by at least 18 months compared to making their own transceiver chip. The circuit includes a complete millimeter wave transceiver, digital control, signal source and a complete analog baseband. This is the first 3rd party millimeter wave transceiver that has full support for the market leading 85100 millimeter wave baseband/modem from MaxLinear (former Broadcom). By having fully integrated analog



baseband (RX_BB and TX_BB) support we can offer even better total cost of ownership for the wireless backhaul.

We see several point to point use cases where you can use our TRX 1608-LT6275. To mention a few: macro cell backhaul, small cell backhaul, Remote Radio Head (RRH) fronthaul for C-RAN, Wireless gigabit to home (GBTH), and Video surveillance backhaul applications.

The LT6275/1608 is a highly integrated state of the art transceiver for the frequency range from 57 GHz to 71 GHz manufactured in advanced Silicon Germanium (SiGe) technology, with an f_{max} 300 GHz. The highly integrated transceiver chip includes a Power Amplifier (PA), Low Noise Amplifier (LNA), RF Programmable Gain Amplifier (RF PGA), Quad Up/Down Converter, Voltage Controlled Oscillator (VCO), X6 multiplier and an analog base band voltage controlled amplifiers (BB VGA). The integrated VCO provides tuning in 250 MHz steps with excellent phase noise to support up to 64 QAM modulation. Optionally, an external LO can be injected allowing for user selectable LO characteristics even high modulation.

Control of the on-chip registers is via a digital SPI or GPIO interface. The devices operate with a power supply ranging from 1.2 V to 3.3 V and can be powered down when not in use.

Sivers IMA has been able to integrate the SiGe transceiver chip into a 7mm x 7mm embedded Wafer Level Ball Grid Array (eWLB) packaged device, which offers excellent mm-wave performance at 57-71 GHz, in a production friendly packaging

technology. All process steps on the eWLB package are performed on the wafer, which gives a small and flat package with excellent electrical and thermal properties.

Benefits of V-band Radio

- Packaged solution, easy to use and standard SMT flow for mounting on customer system
- Highly integrated RF transceiver
- Architecture of Direct Conversion Zero IF eases interface to latest modem/BB designs
- Very low interference between the PTP links or other 60 GHz devices in the field
- High bandwidth for up to 4-5Gbps (full duplex) per link
- V-band offers license free spectrum in many markets
- Covers 14 GHz (US only) of continuous spectrum for optimal frequency planning

