Transceiver platform touts world’s highest bit rate

Semtech Corp. today announced the SX1233, a programmable ISM-band transceiver that combines the world’s highest bit rate (600 kbps) with a world-class link budget (137 dB), ultra-low power consumption, excellent ACR (adjacent channel rejection) and blocking immunity. This combination of features provides high-bandwidth, radio link reliability, RF robustness and strong interference immunity.
These are needed for long-range wireless video and imaging applications in home and building automation systems, smart meter readers, sensors, alarms, security systems, wireless monitoring and remote data measurement networks.

“Today’s pervasive wireless networking environment has paved the way for advanced monitoring and control of home and industrial energy, security and data measurement systems,” said Marc Pegulu, Marketing Director for Semtech’s Industrial Analog Product Line. “The SX1233 provides the high, 600 kbps bit rate needed to accommodate features like remote imaging and video for the next wave of applications in these markets, while maintaining a very high link budget that is 10 dB more than competing devices, along with high immunity to interfering signals -- all critical factors for reliable RF transmission over longer ranges.”

The SX1233 offers high receive (RX) sensitivity to enhance reception of weaker signals, as well as a high transmitter (TX) output power programmable in 1 dB steps. High RX sensitivity and high TX output power equate to reliable transmission over greater distances and cost savings compared to traditional radio systems which require RF repeaters.

Strong blocking immunity of 80dB and high linearity give the SX1233 transceiver

"bullet-proof" front-end protection from both in-band and out-of-band interference (including cellular and devices sharing the 2.4 GHz band), enabling the device to meet stringent RX robustness requirements. The zero-IF architecture of the SX1233 uses a smart AFC (automatic frequency control) engine to ensure optimum performance for low modulation index signals without susceptibility to undesirable image and half-IF spurious products.

The SX1233 extends battery life with its low power consumption in transmit, receive and sleep modes. Constant RF performance over the 1.8V to 3.6V operating range guaranties stable communication even as the battery approaches end-of-life, without using a voltage regulator. Additionally, TrueRF™ technology eliminates the need for a SAW filter, enabling a low-cost external component count while still satisfying ETSI and FCC regulations. The SX1233 also integrates the VCO tank, PLL loop filter and an RF switch, further reducing the overall bill-of-materials.

An integrated packet engine in the SX1233 offloads RF packetization from a microcontroller, freeing up this resource or allowing designers to choose a lower cost or lower power alternative. The packet engine also provides packet transmission security via CRC error checking, AES-128 encryption and a 66-byte FIFO.

The SX1233 has a frequency range of 290 MHz to 1020 MHz and is certified for worldwide regulations, including European (ETSI EN 300-220-1), North American (FCC part 15), and Korean and Japanese ARIB regulatory standards.
It also supports global modulation formats (FSK, GFSK, MSK, GMSK, OOK).

The SX1233 comes in a small, 5mm x 5mm, 24-pad QFN package, offering designers the benefit of significant board space savings and small size.
For consumer applications with Li-Ion or alkaline batteries, the SX1233 can be bundled with Semtech's SC120 – the world's smallest low low-voltage boost converter in a 1.5 x 2 x 0.6mm package to allow for true single-cell operation in a very small form factor.

Key Features of the SX1233
- Saves design cost, time -- one design supports worldwide ISM-band and modulation formats
- World's highest bit rate up to 600 kbps (FSK) for shorter on-time transmission, lower risk of RF collusion and reduced average current consumption
- World-class link budget of 137 dB guaranties the best range efficiency
- High receive sensitivity: down to -120 dBm at 1.2 kbps with AFC features for receive automatic center frequency alignment
- Self-adaptive, third-order intercept point (IIP3) from -18 dBm to 8 dBm and +35 dBm second-order intercept point (IIP2) response provide high linearity to eliminate signal distortion
- Low current for extended battery life: RX = 16 mA, TX = 33 mA @ +10 dBm, 100nA register retention
- Programmable RF output power: -20 to +17 dBm
- Pin-to-pin and register compatible with SX1231 (300 kbps)

Applications
Home and Building Automation Systems: Wireless Alarm, Wireless Light Control, Wireless Access Control – Key Fob, Garage Door Opener Smart Energy Meters: Water and Gas Meters, Electric Meters

Pricing and Availability
The SX1233 (ordering code SX1233IMLTRT) is available immediately in production quantities and is priced at $1.87 each in 3,000-piece lots.
Ordering codes for starter kits are SX1231-31SKB433 for 433 MHz, SX1231-31SKB868 for 868 MHz and SX1231-31SKB915 for 915 MHz. Semtech offers comprehensive design assistance, including field- and factory-based support. Data sheets, volume pricing, and delivery quotes, as well as evaluation kits and samples, are available at http://www.semtech.com/info [1].

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[1] http://www.semtech.com/info