

Wireless Receivers Intended for Automotive and Consumer Applications



Infineon Technologies AG introduced an enhanced family of three wireless control receivers offering highest available sensitivity and low power consumption. The TDA5240, TDA5235 and TDA5225 devices provide multi-band support (315MHz, 434MHz, 868MHz and 915MHz) for worldwide coverage and are well-suited for use in various automotive applications, including Remote Keyless Entry (RKE) systems, Tire Pressure Monitoring Systems (TPMS), remote start, control, status and alarm functions. In addition, industrial and consumer systems such as short range radio data transmission, garage door openers, cordless alarm systems, remote metering and low-power telemetry will benefit from the high-integrated wireless control devices. The receivers also are capable of taking over some of the tasks that are typically performed by the system's microcontroller.

The TDA5240, TDA5235 and TDA5225 are successors to the TDA5230/31 receiver family. Two of the devices include the powerful digital data processing introduced with the TDA5230/31, with overall performance and feature set enhancements. Functionalities like IF filter (optional usage of external filter is possible) and level shifters are now integrated. Only a few external components are needed which leads to reduced BOM. An innovative integrated Low Noise Amplifier (LNA) concept provides the system developers with enhanced design alternatives. Depending on the application needs this LNA can extend the system range or eliminate the need for an external LNA to reduce system complexity and costs.

“Introduction of this new series of wireless control receivers underlines Infineon’s market leadership in the RKE receiver segment,” said Matthias Halsband, Director Wireless Sense and Control within the Automotive division at Infineon Technologies.

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“The new devices combine highest sensitivity and low power consumption with multi-protocol handling to increase performance and reduce system cost.”

High sensitivity of the new family (typically -119dBm for FSK and typically -116dBm for ASK) is due to a reduced noise figure and noise bandwidth using improved digital signal processing. Compared to Infineon’s current receiver products, which offer an average data rate of 40kchip/s, the TDA5240/35/25 devices provide a data rate with several embedded encodings and modulation schemes specified at up to 112kchip/s (FSK).

System designers can use the multi-band, multi-channel receivers for systems operating at frequency bands 315/434/868/915MHz, with one crystal for all supported frequency bands. A high-resolution sigma-delta fractional-N PLL synthesizer provides a fine multi-channel resolution of 10.5Hz.

Multi-protocol handling enables flexible designs based on one platform. The receivers are able to handle data from both RKE and TPMS transmitters, even when they have different modulation, bit rate, and data format. Therefore only one device can be used for multiple applications (RKE, TPMS, remote start, etc.) where today there is the need for two.

The wireless control receivers are based on a CMOS process providing low power consumption. The supply current is only 0.8mA in power down and 12mA in run mode. An ultrafast fallback to sleep function reduces the receiver’s active time, when no data is available for further reduction of the average power consumption. Up to four parallel parameter sets for autonomous scanning and reception from different sources reduce significantly the host processor and system standby power consumption.

The TDA5240 and TDA5235 support an autonomous receive mode where desired payload is automatically extracted and interrupts can trigger the host controller to read payload from the FIFO memory. The host controller remains asleep when unwanted RF-signals are received. This reduces noise from the host controller, which further improves sensitivity and reduces power consumption of the system. Support for additional encodings (bi-phase, NRZ) and market-leading coverage of automotive RKE/PASE/TPMS protocols results in high flexibility while minimizing software development effort. The TDA5225 comes without digital baseband processing to support designs based on standard concepts with data processed in the microcontroller.

Availability and Pricing

The product family members differentiate mainly in the multi-channel and digital baseband functionality. The new pin-compatible TDA5240/35/25 wireless control receivers in TSSOP-28 packages are available in volume production. The automotive qualified devices operate at a supply voltage of 3.3V or 5.0V and at the temperature range of -40 °C to 105 °C. Single unit price for 50k ordering quantities starts at Euro 0.80 (US \$1.10) for the TDA5225. In addition, Infineon provides starter kits and tools to support the design-in of the new devices.

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Further information on the TDA5240/35/25 wireless control receivers is available at www.infineon.com/wirelesscontrol [1] and at www.infineon.com/TDA5240 [2]

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[1] <http://www.infineon.com/wirelesscontrol>

[2] <http://www.infineon.com/TDA5240>