

Press Release

February 1, 2010

## **Narrow band multi-channel transceiver LMD-400-R conforms to EN300113 and FCC Part 90**

Circuit Design, Inc. the leading supplier of narrowband radio modules has developed and released the data transceiver LMD-400-R, designed for use under the European Land Mobile Service specification EN 300-113 and Private Land Mobile Services FCC Part 90 in the U.S. market. The LMD-400-R is the same size and pin-compatible with Circuit Design's EN 300220 compliant license-exempt transceiver model STD-302N-R that has been widely used in Europe as a standard transceiver for remote control in industrial radio applications.



LMD-400-R is a synthesized transceiver with 10 mW RF power, 4800 bps data rate and GFSK modulation. It is designed for use in the license bands in Europe and the U.S.A. that require the high receiver performance and narrow band transmission shown below.

The European Land Mobile Service Specification for data radio defined in EN 300113 requires high resistance against interference typically represented by the parameters shown below. LMD-400-R fulfills those specifications.

- Adjacent channel selectivity: Limit =  $\geq 60$  dB @ 12,5 kHz (Receiver)
- Intermodulation response rejection: Limit for mobile & portable equipment =  $\geq 65$  dB (Receiver)
- Blocking: Limit =  $\geq 84$  dB (Receiver)
- Spurious response rejection: Limit =  $\geq 70$  dB (Receiver)
- Adjacent channel power: Limit = -60 dB or <-36 dBm (Transmitter)

Unlike typical low-cost wide band radios under Part 15, Part 90 licensed band radio must be narrow band radio with 6.5 kHz, 12.5 kHz or 25 kHz channel spacing. Frequency stability must be 2.5 ppm for the 12.5 kHz channel spacing system. This is a stringent requirement for a small-sized OEM SRD transceiver module. The LMD-400-R fulfills these requirements for frequency stability in a 12.5 kHz channel spacing system.

High-power, highly functional, large and expensive Voice/Data PLMR products (end products) with wide tuning bandwidth are very common in the European and North American Land Mobile Service radio market. In contrast, the LMD-400-R is a simple, very compact, low-power and comparatively low-priced OEM transceiver module for integration in user systems.

European users of Circuit Design's EN300220 compliant transceiver STD-302N-R have eagerly awaited the release of the LMD-400-R. They plan to expand their business into the U.S. market and European licensed band market with LMD-400-R.

Now, three frequency versions are available, in 438-442 MHz, 458-462 MHz (EN 300113 compliant model) and 458-462.5 MHz versions (FCC Part 90 certified model). A custom variant in the 400 MHz band, with 4 MHz switching range is available for volume orders.

### **Features**

- Applicable standard: EN 300113 (compliant) and FCC Part 90 (certified)
- Operating frequency (EN 300113 version): 438 - 442 MHz and 458-462 MHz
- Operating frequency (FCC version): 458 - 462.5 MHz
- RF channel: Programmable using PLL Synthesizer with TCXO, 12.5 kHz channel space

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- RF output power: 10 mW
- Data bit rate: Up to 4800 bps
- Modulation: GFSK
- Supply range and consumption: 3 to 5.5 V, 52 mA / TX, 42 mA / RX
- Operating temperature range: -20 to +60°C
- Size and weight: 50 x 30 x 9 mm, 25 g
- UART compatible digital data interface (no modem chip needed)
- Excellent vibration & shock resistance / Mechanical durability
- European and U.S. versions have the same pin configuration.
- The small, highly-integrated and fully shielded module is designed for embedding in user equipment.

### **Applications**

Good for battery powered mobile/portable operation, or solar cell and battery powered operation where a power supply is not available. Typical applications include industrial radio remote control and industrial telemetry.

### **For higher power applications**

The LMD-400-R is intended for use in battery-powered portable applications. To reduce current consumption and limit mechanical size as far as possible, the RF output power of LMD-400-R is set at 10 mW. To increase the operating range, it is possible to add an external power amplifier to the LMD-400. The clean 10 mW transmitter signal of the LMD-400-R can easily be amplified by 20 to 30 dB without exceeding the adjacent channel power limits. Circuit Design, Inc. is working with the following engineering service partner on the design and supply of an external PA and control board for the LMD-400-R to meet the requirements of customers for a higher power modem. Their service is provided direct to the customer.

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### **About Circuit Design**

Circuit Design, Inc. designs and supplies low power radio modules for various application fields such as telecontrol, telemetry, alarms, serial data transmission and audio. The products comply with European ETSI, US FCC and Japanese ARIB standards. Quality is assured with an ISO 9001-certified design and manufacturing process based in Japan.

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