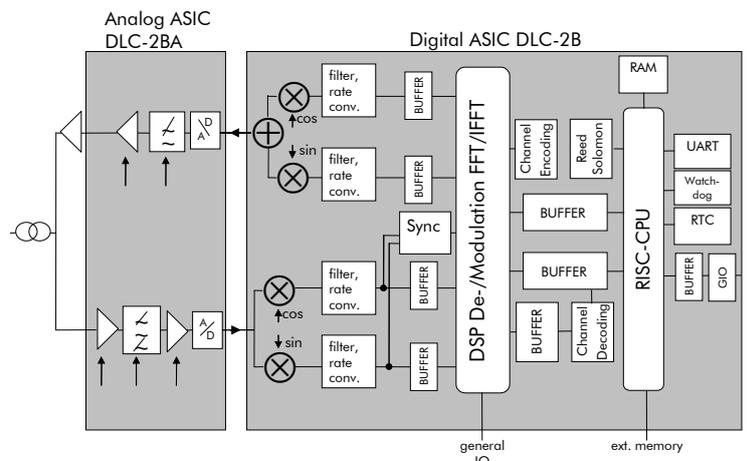# DLC-2B / BA

Low Cost Narrow Band Communication Controller MCM (Multi Carrier Modulation)
and Power Line Chipset

➢ **Highly integrated System on Chip helps to reduce application costs**
➢ **Excellent RISC and DSP performance**
➢ **High speed 8052 derivate, many applications can be adopted**
➢ **Versatile interface options**
➢ **Easy programming of RISC and DSP**
➢ **Programmable Logic Controller**
➢ **Communication via different media**
  ➢ **high, medium and low voltage**
  ➢ **special distribution lines (e.g. emergency power supply lines)**
  ➢ **long distance or heavily disturbed 2-wire line**
  ➢ **pipelines**
➢ **data rates up to 576 kbps**
➢ **regulation compliant communication (CENELEC / FCC)**

DLC-2B / BA

■ The ASIC DLC-2B / BA

is a low cost narrow band communication controller MCM (Multi Carrier Modulation) and power line chipset. It includes all required parts. Since 128 kbyte SRAM for internal MCU, working as control system, is also implemented as 77 kbyte SRAM for digital signal processing system. For communication with DLC-2B the most popular interfaces like 8052 serial interfaces and fast UART (for example: connection to RS232 xmitter), CAN, SPI, 8052 memory interface and a general IO interface for MCU and DSP are included. The complete chipset consists of a digital and an analog ASIC.

■ Features

- Communication via different media
    - high, medium and low voltage
    - special distribution lines (e.g. emergency power supply lines)
    - long distance or heavily disturbed 2-wire line
    - pipelines
- a frequency range of 9 to 490 kHz
- a bandwidth of 4 to 400 kHz freely configurable
- carriers frequencies freely configurable
- bandwidth efficiency from 0.5 to 2.9 bit/Hz/s
- data rates from 9.6 to 576 (288 CENELEC) kbps
- transmission with OFDM and FEC
- synchronous and asynchronous transfer mode
- compatible to Standards EN 50065(CENELEC), IEC 61000-3, FCC part 15 subpart B
- Watchdog
- Real Time Clock
- BGA256 Package (digital chip)
- QFP64 Package (analog chip)

■ Modulation

- digital mixing to equivalent baseband channel
- OFDM performed by complex FFT (128 ... 1024)
- cyclic prefix as guard interval
- differentially encoded symbols along subcarriers
- amplitude and phase shift keying
- demodulation for power-line typical noise

■ Coding

- 64-state convolutional code
- basic code rates 1/2 and 1/3
- several other code rates possible
- bit interleaving with soft information
- trace-back MLSE-decoder (Viterbi)
- each OFDM-symbol corresponds to a code word
- 32 bit CRC for error detection, or
- Reed Solomon code as 2nd FEC supported (only useful over long or several symbols)

■ Applications

- Power line communication via high, medium and low voltage
- Sensor (Sensor data algorithm can be performed by DSP)
- Actor (MCU/DSP can control external devices)
- Metering
- Electric quality monitoring
- Energy Management
- Security Systems
- Control Systems
- Telecontrol
- Home Automation

Technical Data

Microprocessor

8-Bit RISC Processor	44-88 MHz
8052 compatible, single instruction fetch	
16-Bit DSP	

Hardwired Digital Signal Processing:	Encoder/Decoder
	Digital Filter
	AGC
	Synchronisation
	CRC
	Reed Solomon

Peripherals	2nd UART
	DMA-Controller
	Interrupt-Controller
	Watchdog
	Real Time Clock
	Power Management
	Additional Processor Interface

Interfaces

RS232
8052 memory interface
GIO

Memory

SRAM	128 Kbyte (CPU)
	77 Kbyte (DSP)

Operational Voltage

1.8 V Core (DLC-2B), 3.3 V Core (DLC-2BA)
3.3 V I/O (DLC-2B/BA)

Analog Chip

Band-pass filter with programmable cut-off frequencies, for the transmission band ca. 30-490 kHz, respectively (digitally) programmable gain in the range of ca. -20 dB to 64 dB, high resolution ADC and DAC

Package

BGA256 (digital part)
QFP64 (analog part)

Dimension (L x W x H) DLC-2B digital part

17 x 17 x 1.81 (digital part), 13 x 13 x 1.2 (analog part)