TMC20073

CircLink^{TM} Communications Controller LSI

Data Brief

Product Features

- 3.3V (3.0 to 3.6V) Power Supply Voltage (Vdd)
- 128 Pin TQFP Package (14x14, 0.4 pitch)
- Supports 8/16-Bit Data Bus (Selectable)
- Full 1K On-Chip Dual-Port Buffer RAM
- Supports Sequential I/O Mapped Access to Internal RAM Buffer
- Supports up to 31 Nodes
- Low Power CMOS, 3.3V Operation with 5V Tolerance

- Cabling Options
  — Fiber Optics, RS485 Twisted Pair
- High Speed: Up to 5 Mbps
- Include 3 Port HUB
- Can operate with or without CPU
  — With CPU: Support interface to multiple CPU's
    – Intel (80XX) and Motorola (68XXX)
  — Without CPU: Support general purpose I/O ports
    – 16 bit input and 16 bit output
- Support multi-topology
  — Bus, Star and Mixed type
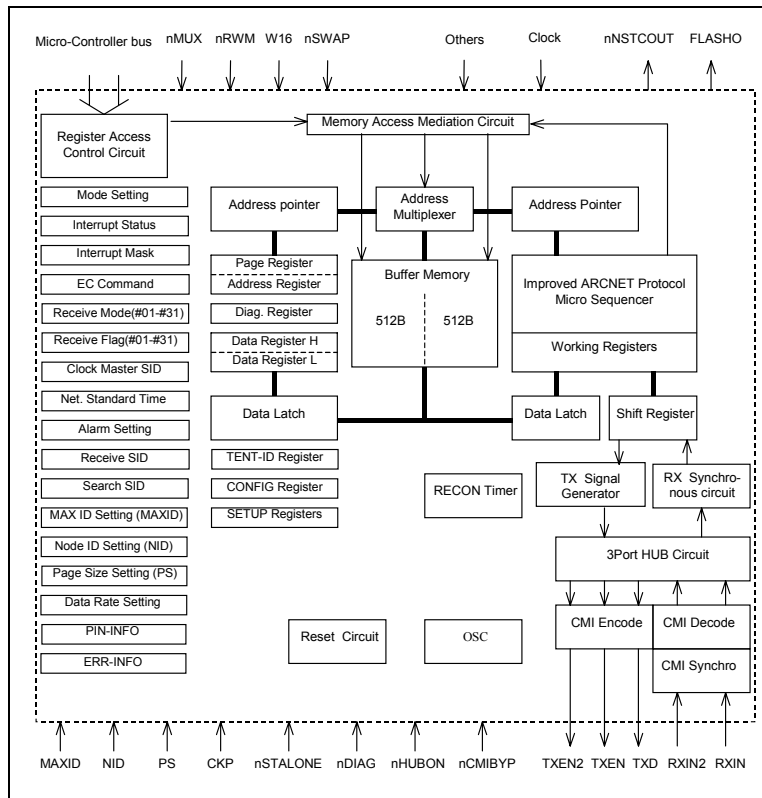- Temperature Range from -20° to 85°

Figure 1 Internal Block Diagram of LSI

ORDERING INFORMATION

Order Number(s):

TMC20073-NT for 128 pin TQFP package (Lead-Free)

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General Description

The CircLink^{TM} TMC20073 controller is an LSI device developed for DATA COMMUNICATION control using a modified ARCNET base token passing protocol guaranteeing message integrity and maximum delivery times which can be calculated.

In an ARCNET based network when a node receives the token it becomes the temporary master of the network, this time frame is however, of short duration. The length of messages are limited and therefore, no one node can dominate the network since it must relinquish control of the token. Once a message has been sent the token is sent to the next logical node allowing it to be come the master.

By using this token passing scheme for mediating access of the network by any one node, the time performance of the network becomes predictable or DETERMINISTIC.

Industrial network applications require predictable performance to ensure that controlled events occur when required. The TMC20073 CircLink controller with it's token passing protocol is therefore the ideal solution for real time control systems.

The TMC20073 incorporates 1 kilobyte of buffer RAM which is portioned from 4 to a maximum of 32 pages. In a network which has up to 31 nodes, the data being sent by the controlling node is also received by all other nodes of the network and stored according to node source ID. For the target node the received data is executed per the ARCNET flow control and the data is stored in it's buffer RAM. Thus the receiving node acts on the data while the remaining nodes on the network discard the data once the receiving node has executed the instruction. This redundancy assures higher reliability.

Reconfiguration of a CircLink network becomes necessary when the token is destroyed. Accordingly, the maximum wait time for sending end will not be guaranteed during this moment and the feature of real-time processing is impaired. To cope with the disability of real-time feature, the ARCNET protocol is modified to avoid token missing as much as possible and reduce the network reconfiguration time in token missing.

CircLink also uses CMI code for transmitting signals, rather than the dipulse or bipolar signals which are the standard ARCNET signals. Since the CMI signal eliminates the DC element, a simple combination of a standard RS485 IC and a pulse transformer can be used to implement a transformer coupled network.
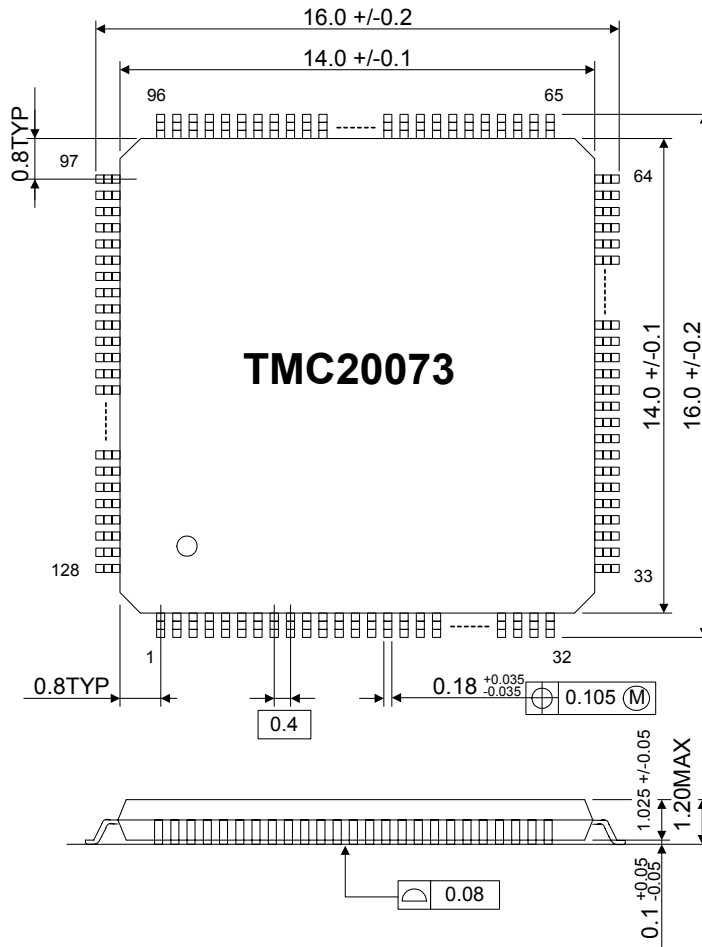
PRODUCT PREVIEW

Package Outline

Figure 2 128 Pin TQFP Package Outline, 14x14, 0.4 pitch (Lead-Free)