

**Cost Competitive  
ARCNET (ANSI 878.1)  
Controller with 2K x 8  
On-Chip RAM**

**Data Brief**

**Product Features**

---

- New Features:
  - Data Rates up to 312.5 Kbps
  - Programmable Reconfiguration Times
- 28 Pin PLCC and 48 Pin TQFP packages; Lead-Free RoHS Compliant packages also available
- Ideal for Industrial/Factory/Building Automation and Transportation Applications
- Deterministic, (ANSI 878.1), Token Passing ARCNET Protocol
- Minimal Microcontroller and Media Interface Logic Required
- Flexible Interface For Use With All Microcontrollers or Microprocessors
- Automatically Detects Type of Microcontroller Interface
- 2Kx8 On-Chip Dual Port RAM
- Command Chaining for Packet Queuing
- Sequential Access to Internal RAM
- Software Programmable Node ID
- Eight, 256 Byte Pages Allow Four Pages TX and RX Plus Scratch-Pad Memory
- Next ID Readable
- Internal Clock Scaler for Adjusting Network Speed
- Operating Temperature Range of -40°C to +85°C
- 3.3V power supply with 5V tolerant I/O
- Self-Reconfiguration Protocol
- Supports up to 255 Nodes
- Supports Various Network Topologies (Star, Tree, Bus...)
- CMOS, Single +3.3V Supply
- Duplicate Node ID Detection
- Powerful Diagnostics
- Receive All Packets Mode
- Flexible Media Interface:
  - RS485 Differential Driver Interface For Cost Competitive, Low Power, High Reliability

**ORDERING INFORMATION**

**Order Number(s):**

COM20019I 3VLJP for 28 pin PLCC \* package

COM20019I 3V-DZD for 28 pin PLCC \* Lead-Free RoHS Compliant package

COM20019I 3V-HD for 48 pin TQFP package

COM20019I 3V-HT for 48 pin TQFP Lead-Free RoHS Compliant package

**\* TQFP package is recommended for new design**



80 ARKAY DRIVE, HAUPPAUGE, NY 11788 (631) 435-6000, FAX (631) 273-3123

Copyright © 2008 SMSC or its subsidiaries. All rights reserved.

Circuit diagrams and other information relating to SMSC products are included as a means of illustrating typical applications. Consequently, complete information sufficient for construction purposes is not necessarily given. Although the information has been checked and is believed to be accurate, no responsibility is assumed for inaccuracies. SMSC reserves the right to make changes to specifications and product descriptions at any time without notice. Contact your local SMSC sales office to obtain the latest specifications before placing your product order. The provision of this information does not convey to the purchaser of the described semiconductor devices any licenses under any patent rights or other intellectual property rights of SMSC or others. All sales are expressly conditional on your agreement to the terms and conditions of the most recently dated version of SMSC's standard Terms of Sale Agreement dated before the date of your order (the "Terms of Sale Agreement"). The product may contain design defects or errors known as anomalies which may cause the product's functions to deviate from published specifications. Anomaly sheets are available upon request. SMSC products are not designed, intended, authorized or warranted for use in any life support or other application where product failure could cause or contribute to personal injury or severe property damage. Any and all such uses without prior written approval of an Officer of SMSC and further testing and/or modification will be fully at the risk of the customer. Copies of this document or other SMSC literature, as well as the Terms of Sale Agreement, may be obtained by visiting SMSC's website at <http://www.smcs.com>. SMSC is a registered trademark of Standard Microsystems Corporation ("SMSC"). Product names and company names are the trademarks of their respective holders.

**SMSC DISCLAIMS AND EXCLUDES ANY AND ALL WARRANTIES, INCLUDING WITHOUT LIMITATION ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, AND AGAINST INFRINGEMENT AND THE LIKE, AND ANY AND ALL WARRANTIES ARISING FROM ANY COURSE OF DEALING OR USAGE OF TRADE. IN NO EVENT SHALL SMSC BE LIABLE FOR ANY DIRECT, INCIDENTAL, INDIRECT, SPECIAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES; OR FOR LOST DATA, PROFITS, SAVINGS OR REVENUES OF ANY KIND; REGARDLESS OF THE FORM OF ACTION, WHETHER BASED ON CONTRACT; TORT; NEGLIGENCE OF SMSC OR OTHERS; STRICT LIABILITY; BREACH OF WARRANTY; OR OTHERWISE; WHETHER OR NOT ANY REMEDY OF BUYER IS HELD TO HAVE FAILED OF ITS ESSENTIAL PURPOSE, AND WHETHER OR NOT SMSC HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.**

## General Description

---

SMSC's COM20019I 3V is a member of the family of Embedded ARCNET Controllers from Standard Microsystems Corporation. The device is a general purpose communications controller for networking microcontrollers and intelligent peripherals in industrial and embedded control environments using an ARCNET protocol engine. The flexible microcontroller and media interfaces, eight-page message support, and extended temperature range of the COM20019I 3V make it the only true network controller optimized for use in industrial and embedded applications. Using an ARCNET protocol engine is the ideal solution for embedded control applications because it provides a deterministic token-passing protocol, a highly reliable and proven networking scheme, and a data rate of up to 312.5 Kbps when using the COM20019I 3V.

A token-passing protocol provides predictable response times because each network event occurs within a predetermined time interval, based upon the number of nodes on the network. The deterministic nature of ARCNET is essential in real time applications. The integration of the 2Kx8 RAM buffer on-chip, the Command Chaining feature, the maximum data rate, and the internal diagnostics make the COM20019I 3V the highest performance embedded communications device available. With only one COM20019I 3V and one microcontroller, a complete communications node may be implemented.

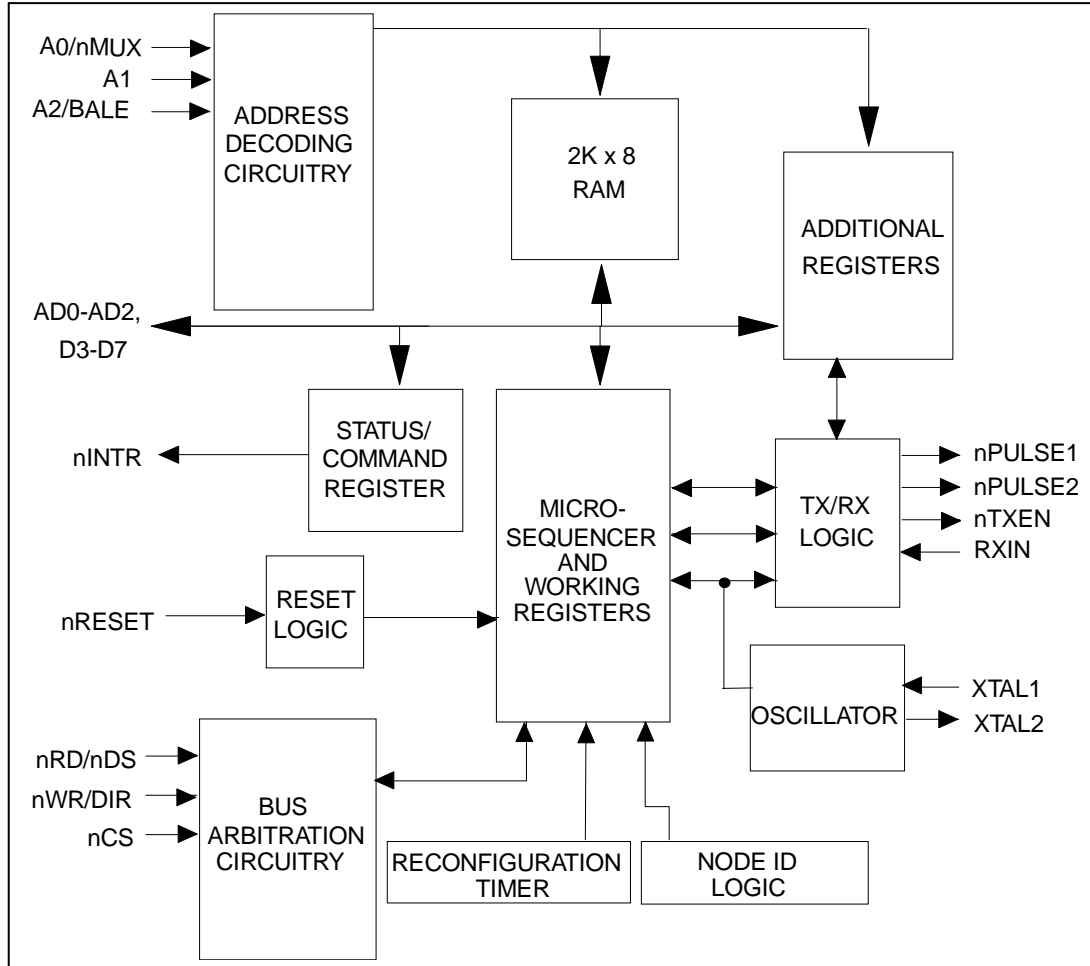
**For more details on the ARCNET protocol engine and traditional dipulse signaling schemes, please refer to the ARCNET Local Area Network Standard, available from Standard Microsystems Corporation or the ARCNET Designer's Handbook, available from Datapoint Corporation.**

**For more detailed information on cabling options including RS485, transformer-coupled RS-485 and Fiber Optic interfaces, please refer to the following technical note which is available from Standard Microsystems Corporation: Technical Note 7-5 - Cabling Guidelines for the COM20020 ULANC.**

To accommodate transceivers with active high ENABLE pins, the COM20019I 3V contains a programmable TXEN output. To program the TXEN pin for an active high pulse, the nPULSE2 pin should be connected to ground. To retain the normal active low polarity, nPULSE2 should be left open. The polarity determination is made at power on reset and is valid only for Backplane Mode operation. The nPULSE2 pin should remain grounded at all times if an active high polarity is desired.

# Block Diagram

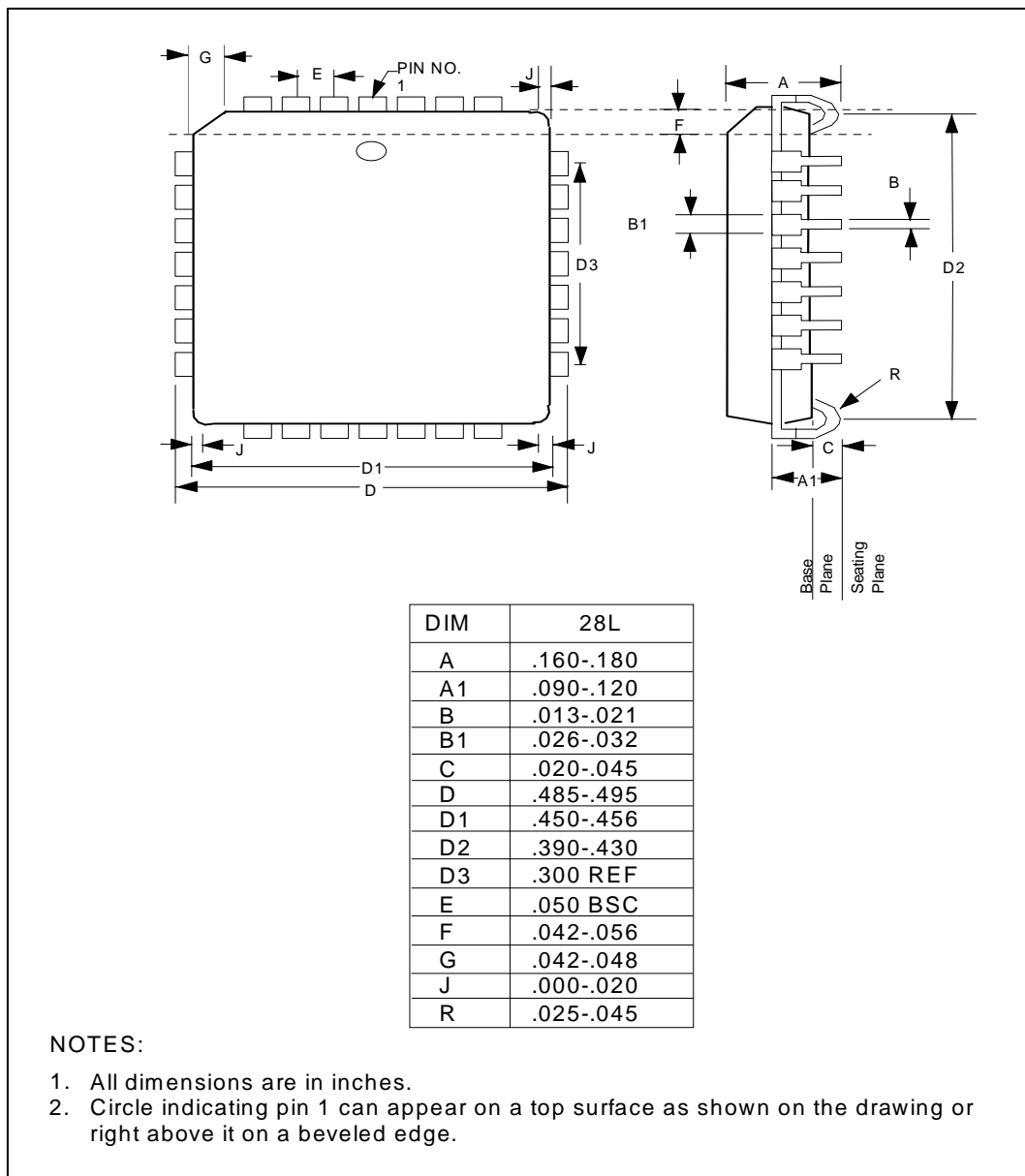
---



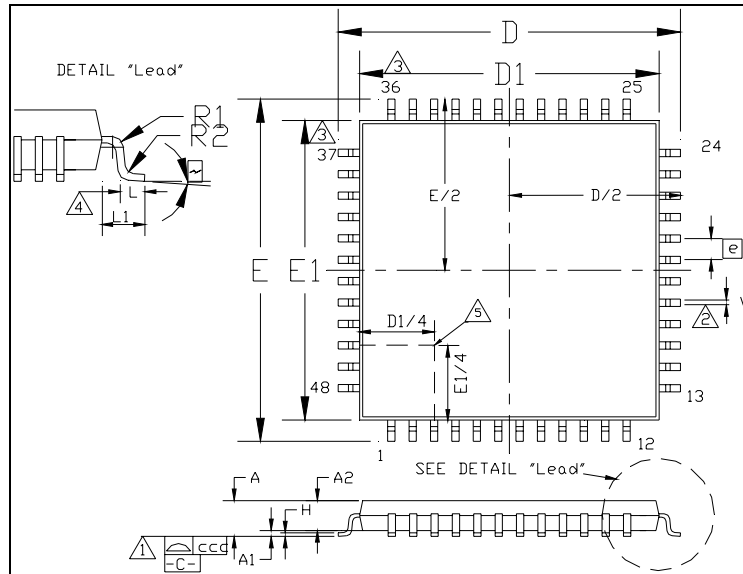
**Figure 0.1 – Internal Block Diagram**

# Package Outlines

## 28 Pin PLCC Package Outline and Parameters



## 48 Pin TQFP Package Outline and Parameters



	MIN	NOMINAL	MAX	REMARK
<b>A</b>	~	~	1.6	Overall Package Height
<b>A1</b>	0.05	0.10	0.15	Standoff
<b>A2</b>	1.35	1.40	1.45	Body Thickness
<b>D</b>	8.80	9.00	9.20	X Span
<b>D/2</b>	4.40	4.50	4.60	$\frac{1}{2}$ X Span Measure from Centerline
<b>D1</b>	6.90	7.00	7.10	X body Size
<b>E</b>	8.80	9.00	9.10	Y Span
<b>E/2</b>	4.40	4.50	4.60	$\frac{1}{2}$ Y Span Measure from Centerline
<b>E1</b>	6.90	7.00	7.10	Y body Size
<b>H</b>	0.09	~	0.20	Lead Frame Thickness
<b>L</b>	0.45	0.60	0.75	Lead Foot Length from Centerline
<b>L1</b>	~	1.00	~	Lead Length
<b>e</b>	0.50 Basic			Lead Pitch
$\theta$	0°	~	7°	Lead Foot Angle
<b>W</b>	0.17	~	0.27	Lead Width
<b>R1</b>	0.08	~	~	Lead Shoulder Radius
<b>R2</b>	0.08	~	0.20	Lead Foot Radius
<b>ccc</b>	~	~	0.0762	Coplanarity (Assemblers)
<b>ccc</b>	~	~	0.08	Coplanarity (Test House)

**Note 1:** Controlling Unit: millimeter