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# HD64570/HD64572

SCA Series (SCA-I SCA-II)

## HITACHI

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### Description

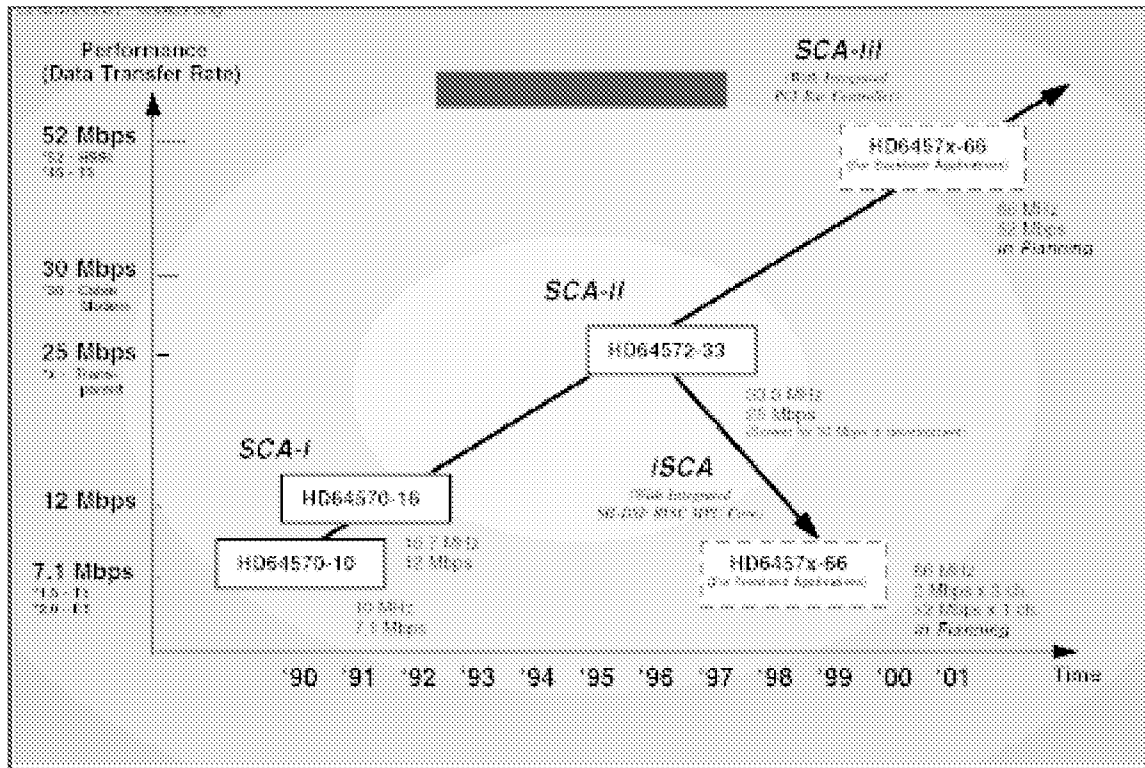
The SCA Series of devices converts parallel data to serial data, and serial data to parallel data for communication with other devices. The HD64570 and HD64572 Serial Communications Adapter (SCA-I and SCA-II, respectively) peripheral chips enable a host microprocessor to perform asynchronous, byte synchronous, or bit synchronous serial communication. The SCA-II can also perform transparent communication.

Both chips have two independent full-duplex, multiprotocol serial channels that support a wide variety of communications protocols such as frame relay, HDLC, SDLC<sup>a</sup>, X.25, LAPB, LAPD, mono sync, bisync, X.21, DDCMP, asynch, etc. Both chips also include a built-in direct memory access controller (DMAC) with deep FIFOs that can execute chained-block transfers, enabling high-speed transfers of data between an SCA device and memory. Due to the on-chip DMAC, the SCA Series can support very high data rates without monopolizing the bus, even in full-duplex communication. Other on-chip features of the SCA Series include direct MPU interfaces, a bus arbiter, timers, and an interrupt controller.

Highly optimized, the SCA Series of devices are used in a large number of datacommunication and networking applications such as bridges, routers, multiplexers, switches, frame relay exchanges, broad band and Internet access products, LAN/WAN interface cards, T1/E1 applications, fractional T3 applications, protocol converters, repeaters, frame relay over ATM applications, remote access LAN products, etc.

SDLC<sup>a</sup> is a trademark of International Business Machines (IBM).

## HD64570/HD64572



### SCA-I (HD64570) Features:

#### Data Transfer Rate:

- 50 bits/sec to 7.1 Mbits/sec ( $f = 10$  MHz)
- 50 bits/sec to 12 Mbits/sec ( $f = 16.7$  MHz, the high speed version)

#### Data and Address Bus Widths:

- Data bus: 8/16-bit
- Address bus: 24-bit

#### Protocol Support:

- Asynchronous (ASYNC): 5 to 8 bits + parity (odd, even, or none)
- Byte Synchronous (COP): mono synch, bisynch, X.21, DDCMP, external sync modes, etc.
- Bit Synchronous (BOP): frame relay, HDLC, SDLC<sup>a</sup>, X.25 link level (LAPB), LAPD, BOP loop, etc.

#### Highly Efficient Data Transfer:

- Two 32-byte FIFOs (transmit/receive) per channel

**Transmission Error Detection:**

- Parity (asynchronous), CRC-16, CRC-CCITT (byte and bit synchronous)

**Transmission Codes:**

- NRZ, NRZI, FM0, FM1, Manchester

**Operating Modes:**

- Normal operating mode (full-duplex), auto echo, local loop back

**DMA Transfer:**

- On-chip DMAC with four channels and single/chained-block transfer capability
- DMA transfer rate (max.) at 10 MHz: 11.1 MBytes/sec
- DMA transfer rate (max.) at 16.7 MHz:  
18.4 MBytes/sec

**Address Space:**

- 16 MBytes

**MPU Bus Interface:**

- Connects to 64180, 80x86, and 680x0 systems;  
8/16-bit MPU systems

**Timers:**

- On-chip timers with four 16-bit channels
- Time-out detection, etc.

**Power Supply:**

- 5V +/- 10% (-20°C to +75°C) for the 10 MHz chip
- 5V +/- 5% (0 to +70°C) for the 16.7 MHz chip

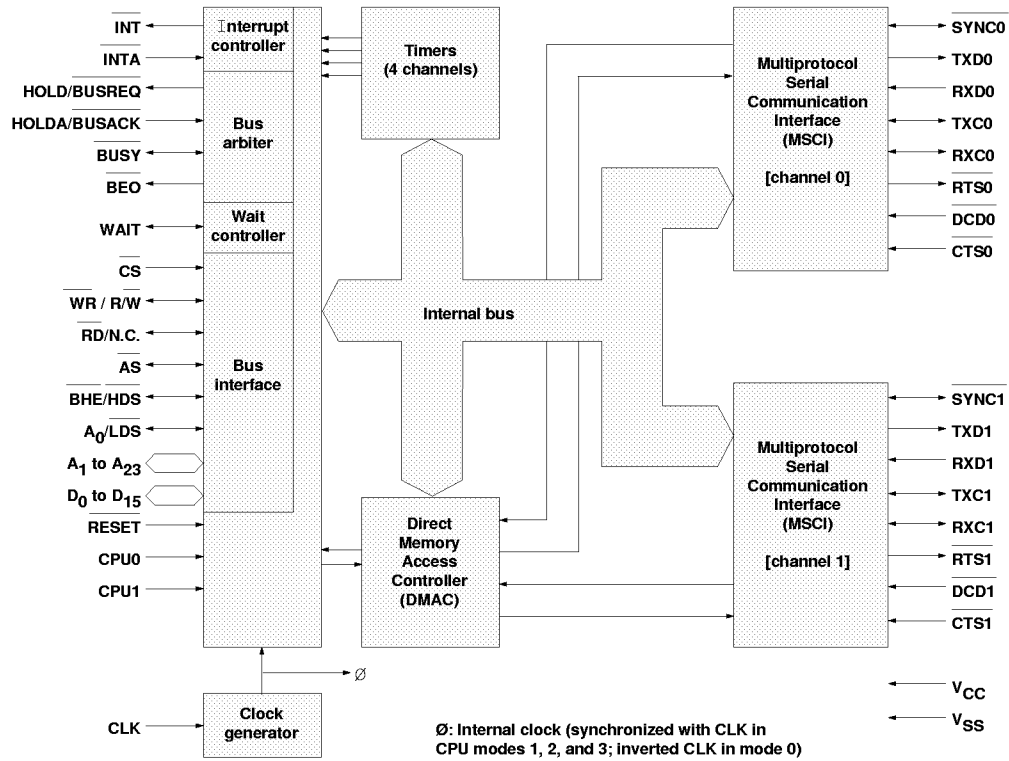
**Process Technology:**

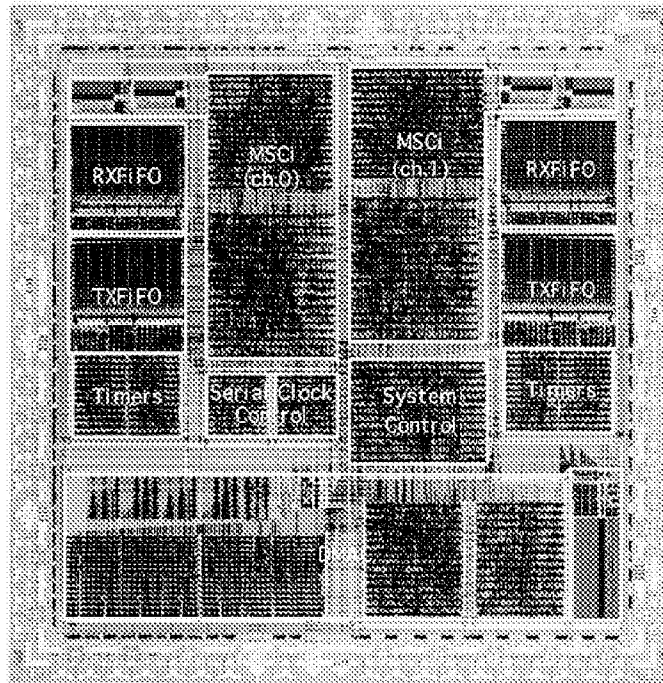
- 1.0µm CMOS

# HD64570/HD64572

## Packaging:

- 84-pin PLCC (CP-84)
- 88-pin QFP (FP-88)





**SCA-II (HD64572) Features:**

**Data Transfer Rate:**

- 50 bits/sec to 25 Mbits/sec ( $f = 33.3$  MHz)
- 50 bits/sec to 30 Mbits/sec ( $f = 33.3$  MHz, the high-speed version)

**Data and Address Bus Widths:**

- Data bus: 32-bit
- Address bus: 32-bit

**Protocol Support:**

- Asynchronous (ASYNC): 5 to 8 bits + parity (odd, even, or none)
- Byte Synchronous (COP): mono synch, bisynch, X.21, DDCMP, external sync modes, etc.
- Bit Synchronous (BOP): frame relay, HDLC, SDLC<sup>a</sup>, X.25 link level (LAPB), LAPD, BOP loop, etc.
- Transparent: T-1 multiplexer, ATM

**Highly Efficient Data Transfer:**

- Two 64-byte FIFOs (transmit/receive) per channel

**Transmission Error Detection:**

- Parity (asynchronous), CRC-16, CRC-CCITT, CRC-32 (byte and bit synchronous)

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## HD64570/HD64572

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### Transmission Codes:

- NRZ, NRZI, NRZI (IEEE), FM0, FM1, Manchester

### Operating Modes:

- Normal operating mode (full-duplex), auto echo, local loop back (two types)

### DMA Transfer:

- On-chip DMAC with four channels and single/chained-block transfer capability
- DMA transfer rate (max.) at 33.3 MHz: 66.6 MBytes/sec

### Address Space:

- 4 GBytes

### MPU Bus Interface:

- Connects to 80x86 (two types\*), 680x0, and RISC systems; 32-bit MPU systems

\* Note: The SCA-II $\bar{O}$ s 8086 bus interface control signals correspond to those of the 8086 CPU, but both the address bus and the data bus are 32-bits wide.

### Timers/Counters:

- On-chip timers with four 16-bit channels
- Time-out detection, etc.
- Count occurrences of various kinds of MSCI status (interrupt sources)
- Count EOMs and transmission errors detected (underrun frames, overrun frames, CRC error frames, etc.)

### Power Supply:

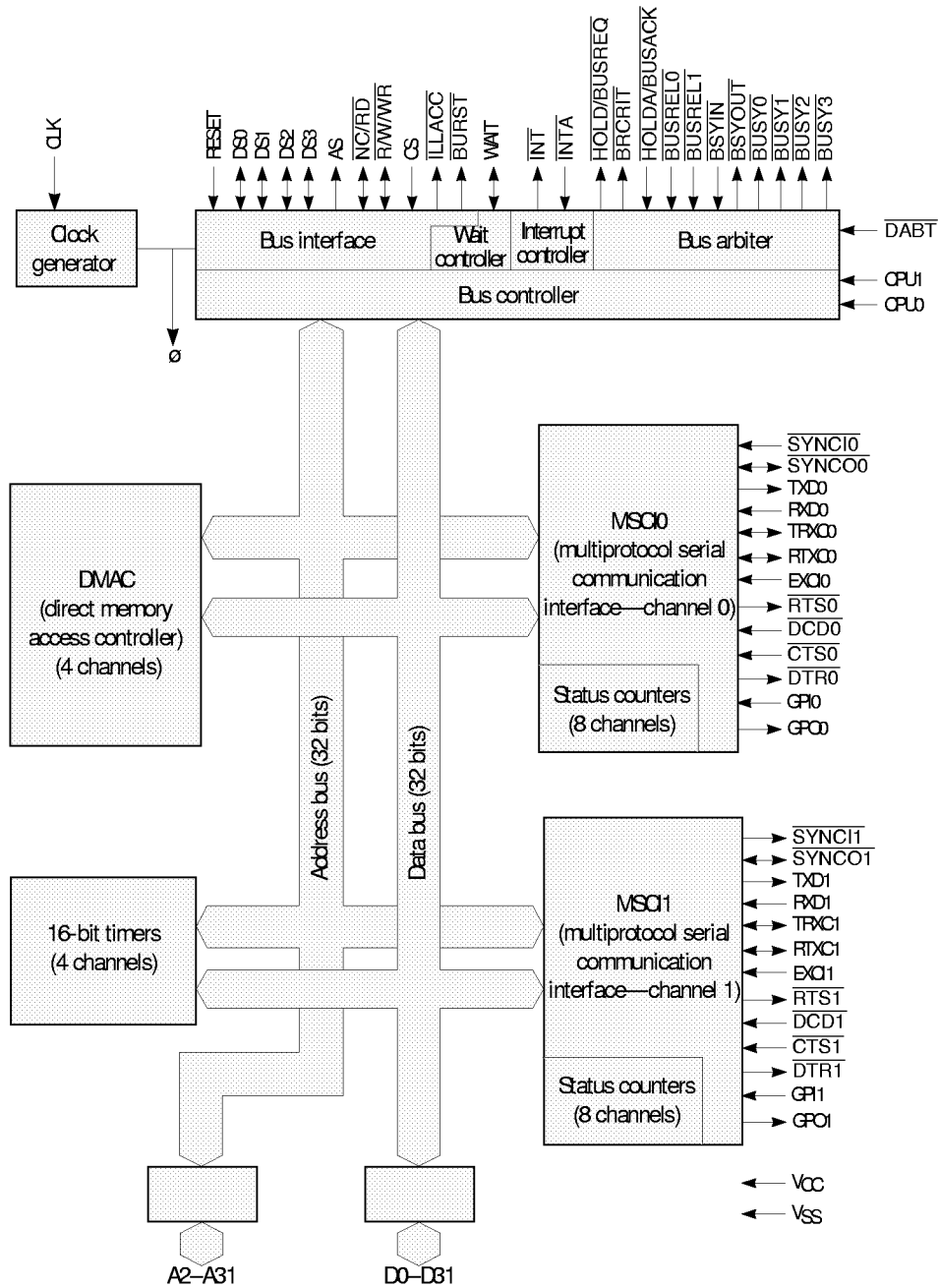
- 5V +/- 5% (-20 $\hat{u}$ C to +75 $\hat{u}$ C)

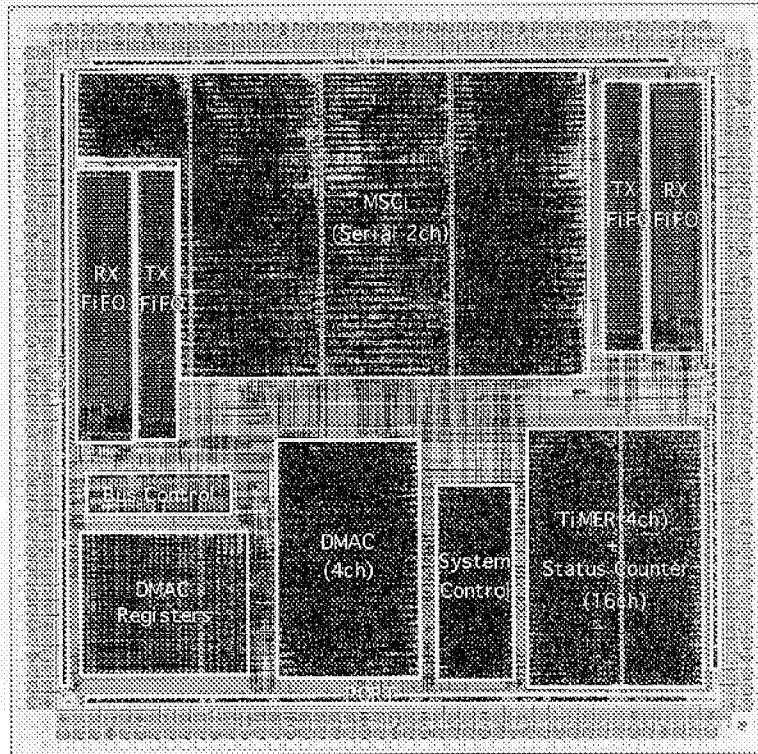
### Process Technology:

- 0.6 $\mu$ m CMOS

### Packaging:

- 176-pin LQFP (FP-176)





## Literature

SCA-I (HD64570) User's Manual: PMHKSTH001D2

- Includes User's Manual, Application Note and Technical Q&A

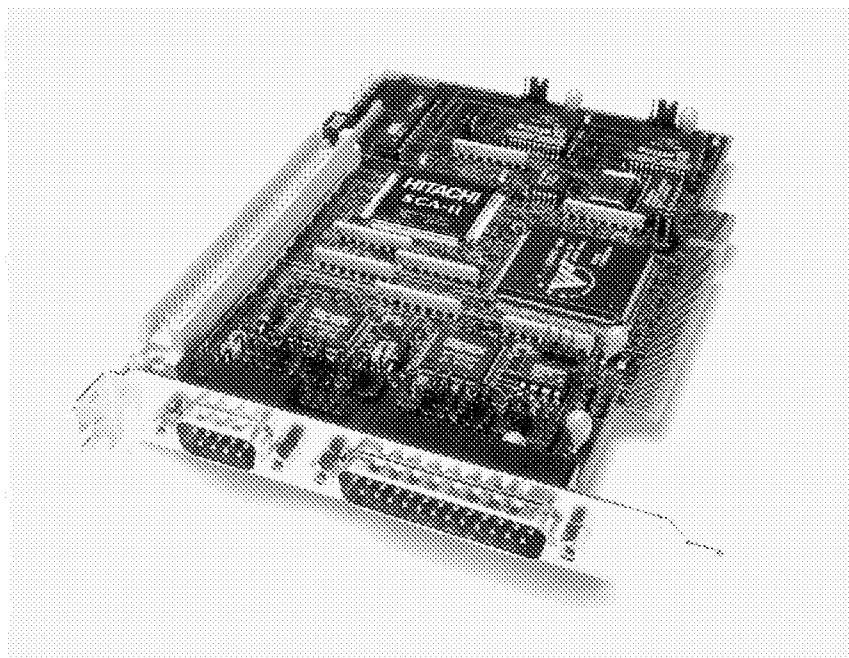
## SCA-II Evaluation/Demo Board Support

SCA-II Engineering Design Kit (EDK)

Please contact Marketing for availability!

- Hitachi SCA-II (HD64572)
- V3 Semiconductor PCI Bus Controller (V292PBC)
- Gcom demonstration software with drivers
- Windows<sup>®</sup> 95 and Windows<sup>®</sup> NT support





### **Software Support**

#### **Gcom, Inc.**

1800 Woodfield Drive

Savoy, IL 61874

Phone: (217) 351-4241

Web Site Address:

[www.gcom.com](http://www.gcom.com)

#### **SDL Communications**

46 Eastman Street

Easton, MA 02334

Phone: (508) 238-4490

Web Site Address:

[www.sdlcomm.com](http://www.sdlcomm.com)

# HD64570/HD64572

## Ordering Information SCA Series (HD64570 and HD64572)

Series	Part Number	Maximum Operating Frequency	Maximum Data Transfer	Operating Voltage	Package Type*		
					PLCC	QFP	LQFP
SCA-I	HD64570CP	10 MHz	7.1 Mbits/sec	+5V +/- 10% (-20°C to +75°C)	84		
	HD64570F					88	
High Speed SCA-I	HD64570CP16	16.7 MHz	12 Mbits/sec	+5V +/- 5% (0 to +70°C)	84		
	HD64570F16					88	
SCA-II	HD64572FL33	33.3 MHz	25 Mbits/sec	+5V +/- 5% (-20°C to +75°C)			176
High-Speed	HD64572AFL33	33.3 MHz	30 Mbits/sec	+5V +/- 5%			176

### Sales & Marketing Headquarters

Hitachi Semiconductor (America) Inc.  
2000 Sierra Point Parkway  
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Literature Requests:  
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www.hitachi.com/semiconductor

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290 Town Center Drive  
Dearborn, MI 48126  
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Hitachi Semiconductor (America) Inc.  
6907 Capitol of Texas Hwy  
Suite 210  
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(512) 418-9360

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Hitachi Semiconductor (America) Inc.  
4901 N.W. 17<sup>th</sup> Way  
Suite 302  
Ft. Lauderdale, FL 33309  
(305) 491-6154

### Toronto

Hitachi (Canadian), Ltd.  
6740 Campobello Road  
Mississauga, Ontario  
Canada L5N 2L8  
(416) 826-4100

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Hitachi Semiconductor (America) Inc.  
Two Lincoln Centre  
5420 LBJ Freeway  
Suite 1446  
Dallas, TX 75240  
(214) 991-4510

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Hitachi Semiconductor (America) Inc.  
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Suite 415  
Itasca, IL 60143  
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### South Eastern/IBM Labs

Hitachi Semiconductor (America) Inc.  
5511 Capitol Center Dr.  
Suite 204  
Raleigh, NC 27606  
(919) 233-0800

### IBM

Hitachi Semiconductor (America) Inc.  
21 Old Main Street  
Suite 206  
Fishkill, NY 12524  
(914) 897-3000

### Calgary

Hitachi (Canadian), Ltd.  
10655 Southport Road S.W.,  
Suite 460  
Calgary, Alberta  
Canada T2W4Y1  
(403) 278-1881