

**APPLICATIONS:**  
 Medical  
 Industrial Control  
 Instrumentation  
 Test & Measurement  
 Security



**SHARP's New Line  
 of MCUs and  
 System-on-Chips**

## LH75401 16/32-bit Microcontroller with Color LCD Controller

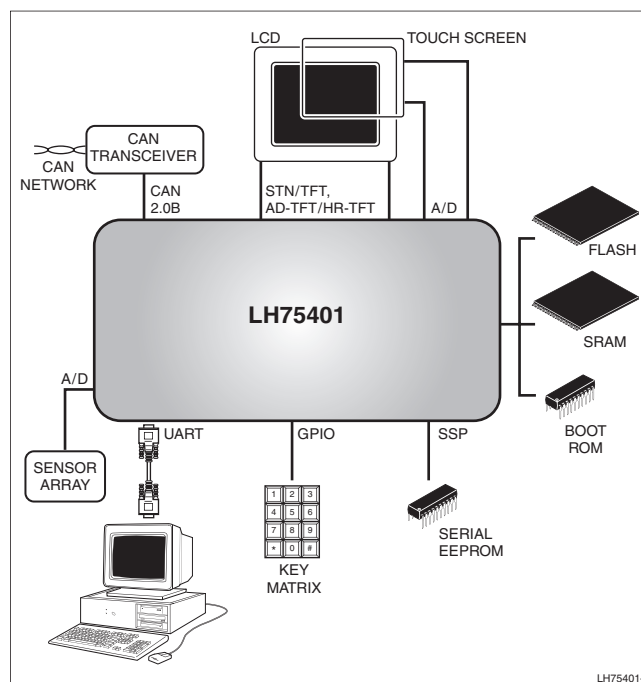
### FEATURES

- ARM7TDMI-S™ Core
- High Performance (Up to 90 MHz)
  - Internal PLL-driven or External Clock
- 32KB On-chip SRAM
  - 16KB TCM (0 Wait State) SRAM
  - 16KB Internal SRAM
- Clock and Power Management
  - Low Power Modes: Standby, Sleep, Stop1, Stop2
- Color and Grayscale LCD Controller
  - 12-bit (4,096) Direct Mode Color
    - Up to VGA (640 × 480)
  - 8-bit (256) Direct or Palletized Color
    - Up to SVGA (800 × 600)
  - 4-bit (16) Direct Mode Color/Grayscale
    - Up to XGA (1,204 × 768)
  - Supports STN, TFT, HR-TFT, AD-TFT Displays
- Eight Channel, 10-bit A/D Converter
- Four DMA Channels
- Integrated Touch Screen Controller
- Serial Interfaces
  - 3 × UARTs
  - SSP
- Full-featured Real Time Clock (RTC)
  - Operates from 32 kHz XTAL
- CAN Version 2.0b\*
- Three 16-bit Counter/Timers with Capture/Compare/PWM Capability
- Watchdog Timer
- Low Voltage Detector
- JTAG Debug Interface and Boundary Scan
- 3.3 V Operating Voltage
- -40°C to +85°C Operating Temperature
- 144-pin LQFP Package

### DESCRIPTION

The LH75401 is a low cost microcontroller that utilizes the ARM7TDMI-S core integrated with a wide variety of functions including the ability to control STN, color STN, TFT, HR-TFT, and Advanced-TFT displays with up to 4,096 colors. Other functions include: 32KB of on-chip SRAM, three UARTs, SSP, CAN version 2.0b, three 16-bit Counter/Timers, Analog to Digital Converter with integrated touch screen controller, Watchdog Timer, and Low Voltage Detector. The LH75401 operates up to 90 MHz at 3.3 V over the industrial temperature range of -40°C to +85°C and is offered in a 144-pin LQFP package.

### SYSTEM APPLICATION EXAMPLE



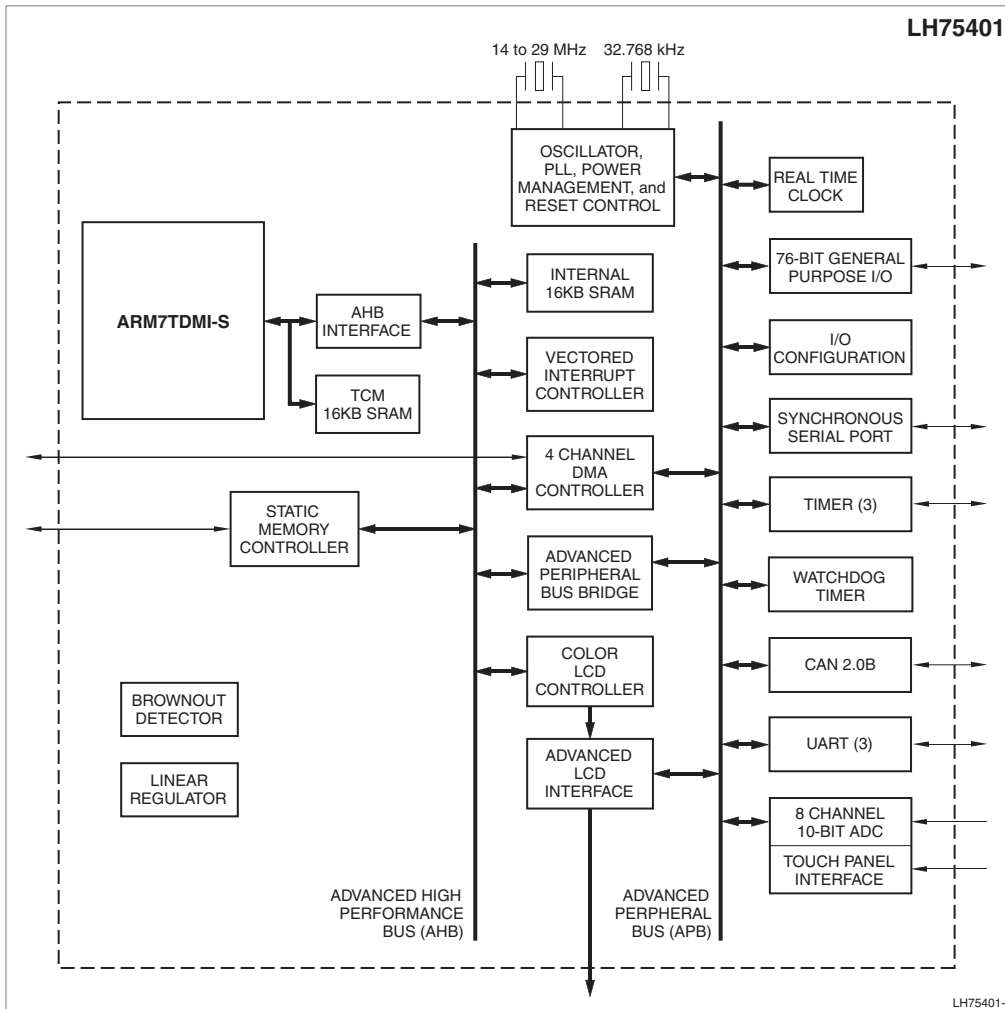
LH75401-2

\*Controller Area Network (CAN)

# PRODUCT INFORMATION

# SHARP

## LH75401 BLOCK DIAGRAM



## SHARP<sup>®</sup>

### MICROELECTRONICS OF THE AMERICAS

#### Regional Sales Offices

##### North American Headquarters

Camas, WA  
Ph (360) 834-2500  
Fax (360) 834-8903

##### West

Huntington Beach, CA  
Ph (714) 903-4600  
Fax (714) 903-0295  
San Diego, CA  
Ph (858) 597-0982  
Fax (858) 597-8701  
San Jose, CA  
Ph (408) 436-4900  
Fax (408) 436-0924

##### East

Ft. Lauderdale, FL  
Ph (954) 267-8883  
Fax (954) 267-0254  
Burlington, MA  
Ph (781) 270-7979  
Fax (781) 229-9117  
Carey, NC  
Ph (919) 460-0695  
Fax (919) 460-0795  
Pittsburgh, PA  
Ph (412) 381-1191  
Fax (412) 381-1192  
Yardley, PA  
Ph (215) 321-5530  
Fax (215) 321-5534

##### Central

Schaumburg, IL  
Ph (847) 925-9150  
Fax (847) 925-9172  
Troy, MI  
Ph (248) 458-1527  
Fax (248) 391-6165  
Austin, TX  
Ph (512) 349-7262  
Fax (512) 349-7002  
Irving, TX  
Ph (972) 582-1712  
Fax (972) 580-7537  
Houston, TX  
Ph (281) 955-9909  
Fax (281) 955-9910  
Muskego, WI  
Ph (414) 529-9568  
Fax (414) 529-9569

#### Europe

SHARP Microelectronics  
Europe  
Hamburg, Germany  
Ph (49) 40-2376-2286  
Fax (49) 40-2376-2232

#### Asia

SHARP Corporation  
Osaka, Japan  
Ph (81) 6-6621-1221  
Fax (81) 6117-725300

Product Information: 1-800-642-0261

World Wide Website: <http://www.sharpsma.com>

Specifications are subject to change without notice. Suggested applications (if any) are for standard use; See Important Restrictions for limitations on special applications. See Limited Warranty for SHARP's product warranty. The Limited Warranty is in lieu, and exclusive of, all other warranties, express or implied. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR USE AND FITNESS FOR A PARTICULAR PURPOSE, ARE SPECIFICALLY EXCLUDED. In no event will SHARP be liable, or in any way responsible, for any incidental or consequential economic or property damage.