NanoAmp Solutions, Inc.
1982 Zanker Road, San Jose, CA 95112
ph: 408-573-8878, FAX: 408-573-8877
www.nanoamp.com

EM02R206 - Combination SRAM with Chinese Character ROM

Low Power 32Kx8 SRAM with on board 256Kx8 Mask ROM containing dot matrix chinese character code conforming to standard GB2312 (Horizontal Sequence)

Overview

The EM02R206 is an integrated memory device containing both a low power 256 Kbit Static Random Access Memory (organized as 32,768 words by 8 bits), and a 2 Mbit Mask ROM (organized as 262,144 words by 8 bits). It is fabricated using an advanced CMOS process and NanoAmp's high-speed/low-Power circuit technology.

This device contains pre-programmed information to display chinese characters in a dot matrix format. Characters are displayed by applying a character address on the most significant address lines and a consecutive serial binary sequence on the five least significant address bits to output the 16 by 16 dot matrix character. In other words, the most-significant 13 address lines select the character and the least-significant 5 address lines select one of the 32 data bytes within a character (see Figures 1 and 2). All unused character code spaces are filled with data value 0 - representing blanks.

The EM02R206 implements the GB2312.1989 standard code between A1A1h and F7FEh (h representing "hex" format). Conversion of the 16 bit GB character code to the 13 bit character address for the EM02R206 uses a mathematical offset to reduce the required address lines (see next page). This version outputs the data horizontally (each two bytes generate one horizontal data line).

FIGURE 1: Example Character Display

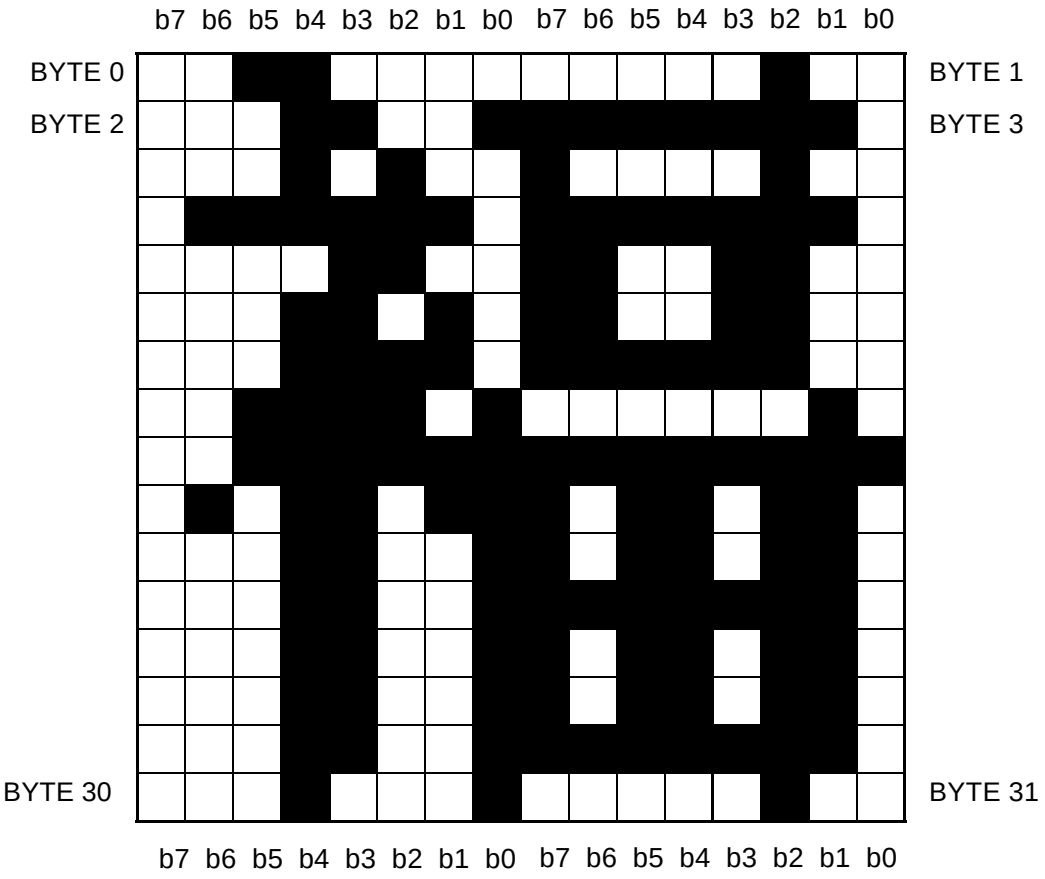
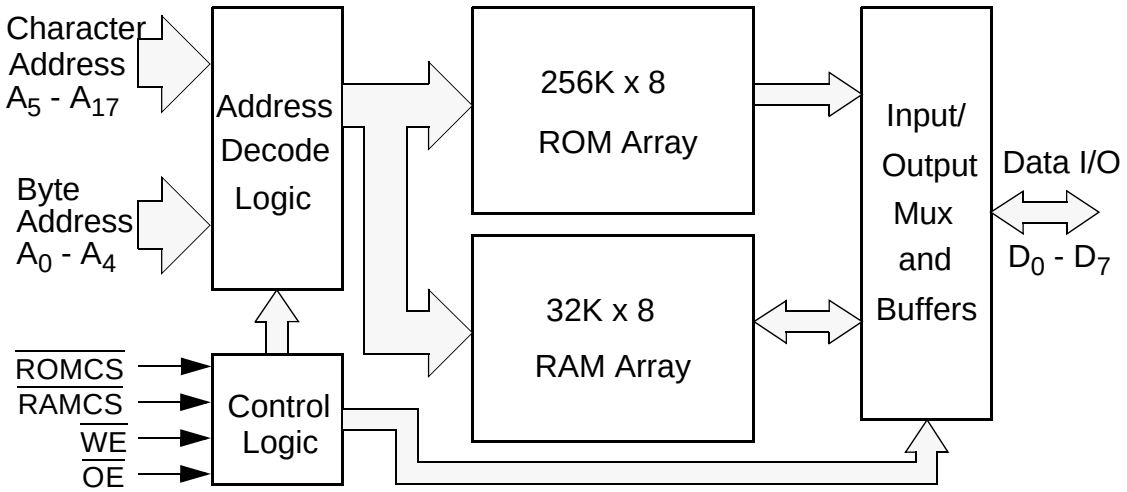


FIGURE 2: Functional Block Diagram



* Note: Addresses A0 through A14 are shared by both RAM and Character Rom

Character Code Translation

The GB 2312 standard defines a unique 16 bit binary code to identify each character. Because NanoAmp Solutions implements only the GB codes between hex A1A1 and hex F7FE, the 16 bit code can be mathematically translated to a 13 bit binary code. The address translation formula used in the EM02R206 is:

Address = (MSBh - A1h)*5Eh + (LSBh - A1h)

Where MSB is the most significant byte of the GB address and LSB is the least significant byte of the GB address.

Example:

GB character address A2A2h translates as follows:

(A2 - A1) * 5E + (A2 -A1)

= (1) * 5E + (1) = 5F (hex)

or binary 0 0000 0101 1111

Application of this binary code to the most significant bits of the device (A17 to A5) with addresses A4 to A0 set to 00000 will cause the byte 0 of GB character A2A2 to be presented. The balance of the character data is obtained by sequencing the byte addresses A0 to A4.

Character Viewing Software

NanoAmp Solutions provides viewing software that will allow you to view the full set of characters implemented in NanoAmp character ROMs. You may download this software from the NanoAmp website product section (www.nanoamp.com). Downloading this software will place the following file in your target directory:

esi_gb.exe (DOS display program)

To view characters, run the **.**exe file. Keying a hex representation of the most significant 8 bits of the 16 bit GB code (key in two hex characters representing the 8 bits intended) will display the character set that shares the 8 most significant bits used. A complete datafile of the ROM contents can be

TABLE 1: Revision History

Revision #	Date	Change Description
01	Mar 2, 1998	Initial Formal Release
02	Apr 15, 1998	• Corrected Address Assignment of Figure 2 (A5 is Character Address) • Corrected Title to Reference GB2312