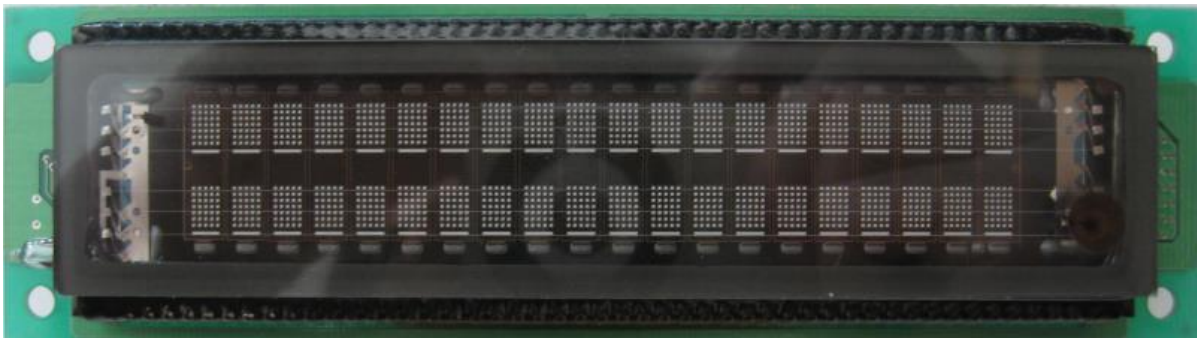


Samtron/Samsung **20S204DA2**



Disclaimer

This documentation based on try & error and should never be treated as official documentation. There is no guarantee that information listed in this document is complete and there is no warranty about correctness of the information. The documentation is distributed as it is, no warranty implied or otherwise is given. The author is not liable for any loss or damage of data or hardware and other things caused by use of this documentation.

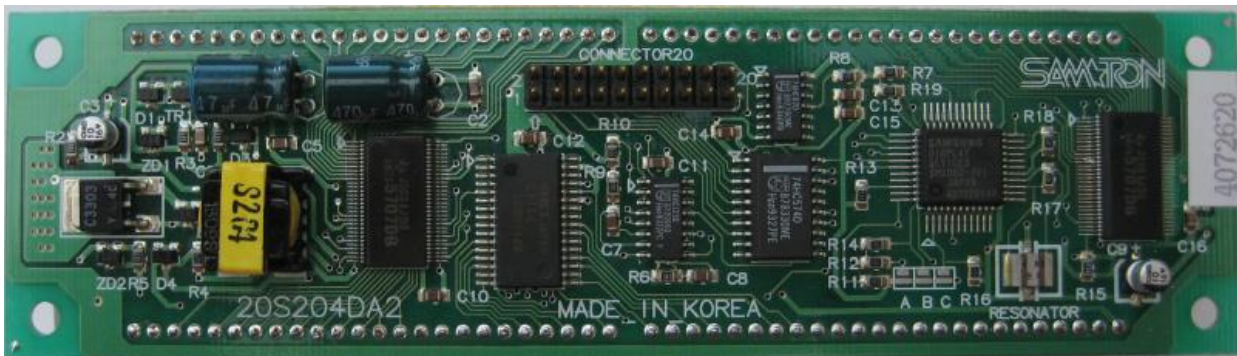
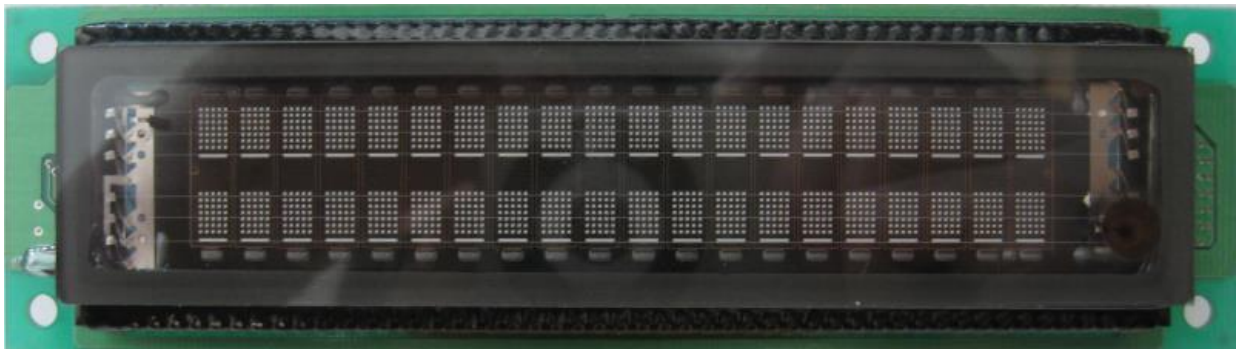
If there are any errors or more commands/information for this display, feel free to inform me and I will update this documentation. Please note that this documentation can be used for free but is **not** released as public domain.

Revision: 1.1 (2016-04-01)

Urheber nach § 7 UrhG/© by Muetze1 (info@muetze1.de)

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Pictures



Mechanical Properties

Rows x Columns	2 x 20
Char Set	5 x 7 dots
Special Features	Underline Cursor below matrix
Character size	3 x 5 mm
Character size (including cursor)	3 x 6 mm
Module size	155 x 43 mm
Mounting holes	at each corner, 145 x 33 mm, \varnothing 4 mm

Electrical Properties

Supply voltage	5 V DC
Supply current	0.5 A (measured: 420 mA)
Interfaces	parallel, asynchronous serial

Protocol Properties

Character Fonts	European General Font, Japanese Katakana Font supported, 4 levels
Dimming	supported, 4 levels
User Definable Font (UDF)	supported, 4 characters
Cursor Modes	on, off, blinking
Cursor positioning	supported
Scroll modes	normal, vertical, horizontal

Interface

Connector20, 20-pin dual line pinheader

Pin	Signal	Description	Pin	Signal	Description
1	DB7	data bit 7	2	Vcc	
3	DB6	data bit 6	4	Vcc	
5	DB5	data bit 5	6	Vcc	
7	DB4	data bit 4	8	Gnd	
9	DB3	data bit 3	10	Gnd	
11	DB2	data bit 2	12	Gnd	
13	DB1	data bit 1	14	Gnd	
15	DB0	data bit 0	16	/TEST	Test display
17	WR	Write Signal	18	/SEL	Select
19	RxD	TTL Level	20	BUSY	busy signal (output)

All pins are input signals except pin 20 (BUSY). When the test signal (pin 16) is low, all characters of the font table will be output on the display. Leave the test mode by assigning a high level again.

Parallel Interface

To write a character to the display, set the WR and /SEL signal to low (WR inactive, SEL active) and assign the data to write on the data lines (DB0 .. 7). Set WR to high to signal the data input. Wait till the BUSY signal is high to reset the /SEL signal back to high (SEL inactive). Next data can be written, when the BUSY signal is low again.

The execution of commands can take up to 500 μ S. If busy signal is not used, wait at least for this amount of time before initiating the next command. Each signal change has to be valid for at least 50 ns.

Serial Interface

The serial interface is RS232 with TTL level. The default communication settings are 1200 Baud, 8 bits, no parity, 1 stop bit.

Jumper

A	B	C	Funktion
1	1	1	Factory Setting

0: Short 1: Open X: Don't Care

Protocol

Code	Bezeichnung	Beschreibung
DIM (0x04) DL	Dimming	DL dimming level value 100 % 0x80 .. 0xFF 60 % 0x60 .. 0x7F 40 % 0x40 .. 0x5F 20 % 0x00 .. 0x3F
BS (0x08)	Back Space	Cursor left, removing character
HT (0x09)	Horizontal Tab	Cursor right
LF (0x0A)	Line Feed	Cursor one line down
CR (0x0D)	Carriage Return	Cursor left, same line
DP (0x10) POS	Display Position	POS position of cursor: 1 st line: 0x00 .. 0x13 2 nd line: 0x14 .. 0x27
DC1 (0x11)	Device Control 1	Normal Display Mode
DC2 (0x12)	Device Control 2	Vertical Scroll Mode
DC3 (0x13)	Device Control 3	Cursor On Mode
DC4 (0x14)	Device Control 4	Cursor Off Mode
DC5 (0x15)	Device Control 5	Cursor Blinking Mode
DC6 (0x16)	Device Control 6	Horizontal Scroll Mode
FA (0x18)	Font A	General European Font
FB (0x19)	Font B	Japanese Katakana Font
RST (0x1F)	Reset	Reset all settings, UDF, display content, etc
UDF (0x1B) CHR PT1 PT2 PT3 PT4 PT5	User Definable Font	CHR char code to define (0x00 .. 0xFF) PT1 – PT5 Character pixel data

Example code

```
/*
 * Samsung 20S204DA2.c
 *
 * Created: 01.04.2016 15:18:49
 * Author : Muetzel
 *
 */

#include <avr/io.h>
#include <util/delay.h>

// connection:
// PORTB[0..7] = DB[0..7]
// PORTC      = control lines (see below)

#define PIN_WR    PC0
#define PIN_SEL   PC1
#define PIN_BUSY  PC2

void outc(char a)
{
    PORTC &= ~(_BV(PIN_WR) | _BV(PIN_SEL));
    PORTB = a;

    _delay_us(1); // delay 50 ns

    PORTC |= _BV(PIN_WR);

    _delay_us(1); // delay 50 ns

    PORTC |= _BV(PIN_SEL);

    // check BUSY signal
    // while ( PINC & _BV(PIN_BUSY) )
    //     ;
    // or wait max time
    _delay_us(500);
}

void outs(const char * s)
{
    while ( s && *s )
        outc(*s++);
}

int main(void)
{
    DDRB = 0xFF; // data port (PB0..7 = DB0..7)
    DDRC = _BV(PIN_SEL) | _BV(PIN_WR); // control lines (/SEL, WR)
    //PORTC = _BV(PIN_BUSY); // enable pull-up on BUSY

    _delay_ms(10);

    outs("\x1FSamsung/Samtron\x0d\x0a");
    outs("20S204DA2");
}
```

Example Code output:

