

NHD-1.69-160128UGC3

Graphic Color OLED Display Module

| | |
|---------|---------------------|
| NHD- | Newhaven Display |
| 1.69- | 1.69" Diagonal Size |
| 160128- | 160 x 128 Pixels |
| UG- | Model |
| C- | Full Color |
| 3- | +3V Power Supply |

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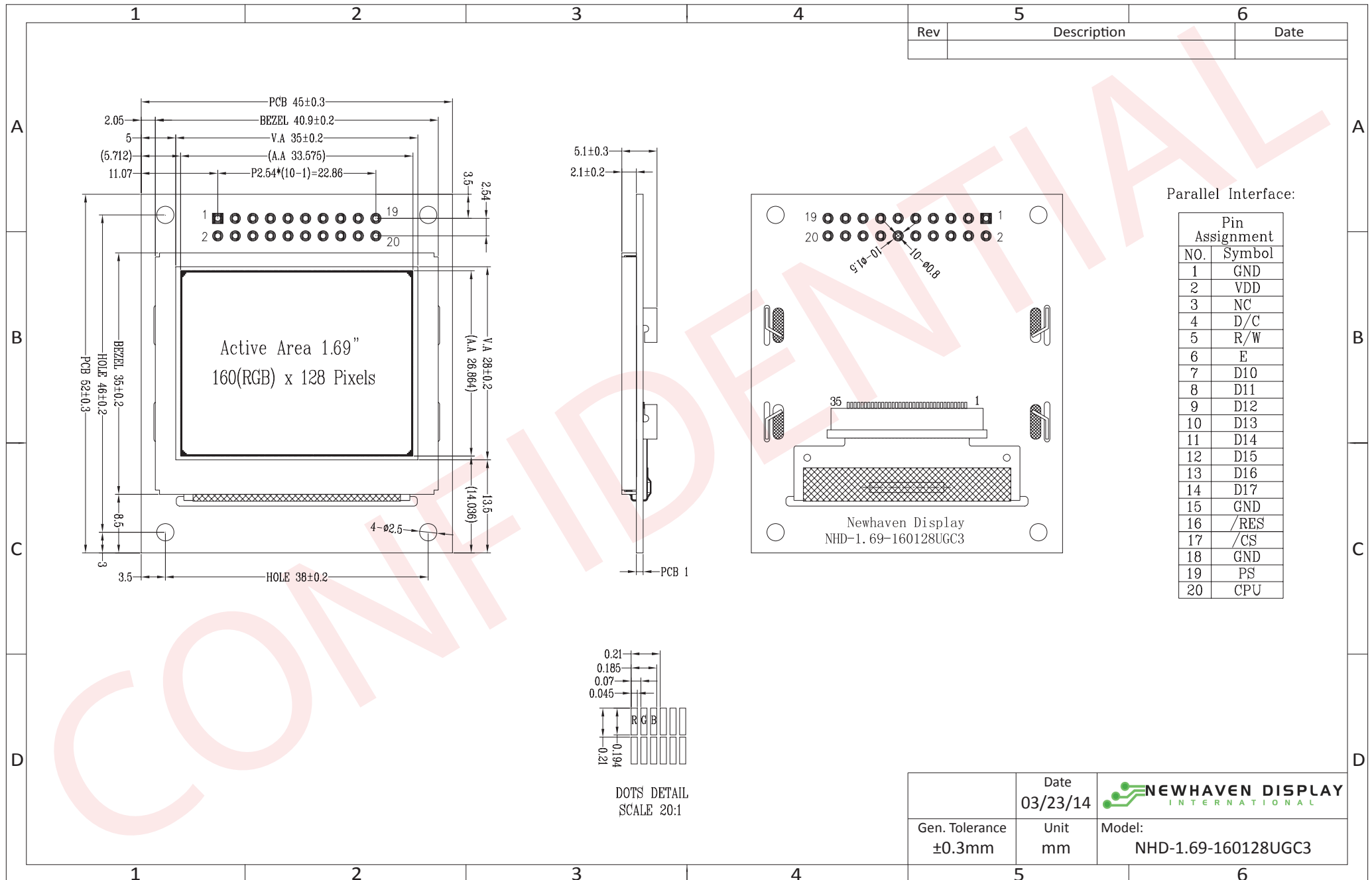
Document Revision History

| Revision | Date | Description | Changed by |
|----------|-----------|-------------------------------|------------|
| 0 | 3/23/2014 | Initial Release | AK |
| 1 | 5/1/2015 | Interface Description Updated | PB |

Functions and Features

- 160 x 128 pixel resolution
- Built-in SEPS525 controller
- Parallel or Serial MPU interface
- Single, low voltage power supply
- RoHS compliant

Mechanical Drawing



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Interface Description

Parallel Interface:

| Pin No. | Symbol | External Connection | Function Description |
|---------|-------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 1 | GND | Power Supply | Ground |
| 2 | VDD | Power Supply | Supply Voltage for OLED and logic. |
| 3 | NC | - | No Connect |
| 4 | D/C | MPU | Register select signal. D/C=0: Command, D/C=1: Data |
| 5 | R/W or /WR | MPU | 6800-interface: Read/Write select signal, R/W=1: Read R/W: =0: Write 8080-interface: Active LOW Write signal. |
| 6 | E or /RD | MPU | 6800-interface: Operation enable signal. Falling edge triggered. 8080-interface: Active LOW Read signal. |
| 7-14 | DB10 – DB17 | MPU | 8-bit Bi-directional data bus lines. |
| 15 | GND | Power Supply | Ground |
| 16 | /RES | MPU | Active LOW Reset signal. |
| 17 | /CS | MPU | Active LOW Chip Select signal. |
| 18 | GND | Power Supply | Ground |
| 19 | PS | MPU | Parallel/Serial select. HIGH: Parallel. LOW: Serial |
| 20 | CPU | MPU | Interface select. HIGH: 6800 interface. LOW: 8080 interface |

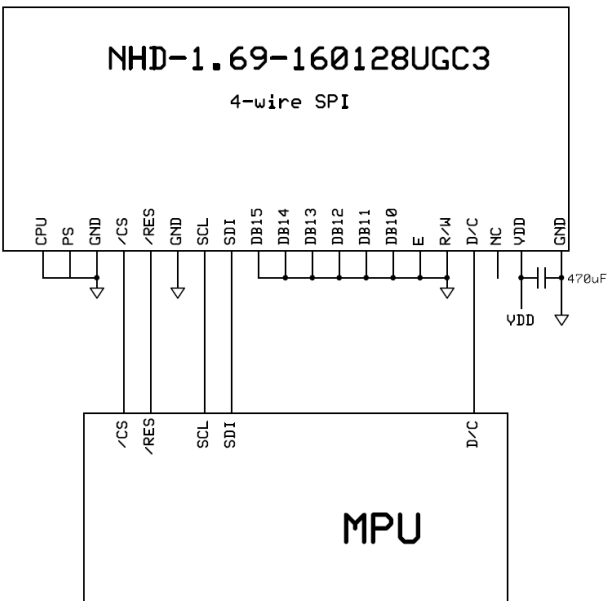
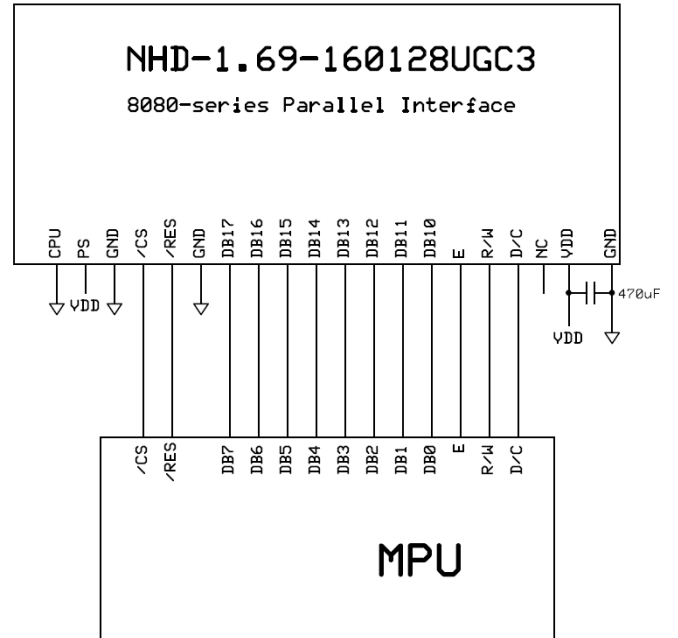
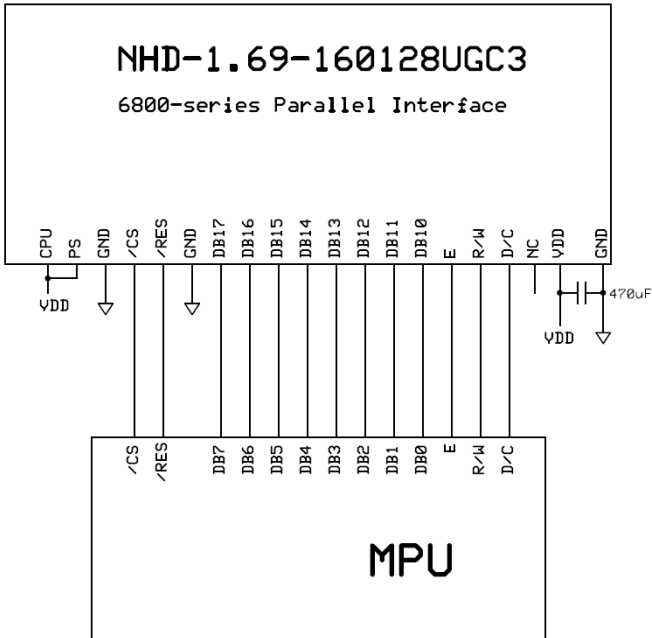
Serial Interface:

| Pin No. | Symbol | External Connection | Function Description |
|---------|--------|---------------------|-------------------------------------------------------------|
| 1 | GND | Power Supply | Ground |
| 2 | VDD | Power Supply | Supply Voltage for OLED and logic. |
| 3 | NC | - | No Connect |
| 4 | D/C | MPU | Register select signal. D/C=0: Command, D/C=1: Data |
| 5-6 | VSS | Power Supply | Ground |
| 7-12 | GND | Power Supply | Ground |
| 13 | SDI | MPU | Serial Data Input signal. |
| 14 | SCL | MPU | Serial Clock signal. |
| 15 | GND | Power Supply | Ground |
| 16 | /RES | MPU | Active LOW Reset signal. |
| 17 | /CS | MPU | Active LOW Chip Select signal. |
| 18 | GND | Power Supply | Ground |
| 19 | PS | MPU | Parallel/Serial select. HIGH: Parallel. LOW: Serial |
| 20 | CPU | MPU | Interface select. HIGH: 6800 interface. LOW: 8080 interface |

MPU Interface Pin Assignment Summary

| Bus Interface | Data/Command Interface | | | | | | | | Control Signals | | | | |
|---------------|------------------------|-----|---------|-----|-----|-----|-----|-----|-----------------|-----|------|-----|------|
| | D17 | D16 | D15 | D14 | D13 | D12 | D11 | D10 | E | R/W | /CS | D/C | /RES |
| 8-bit 6800 | D[17:10] | | | | | | | | E | R/W | /CS | D/C | /RES |
| 8-bit 8080 | D[17:10] | | | | | | | | /RD | /WR | /CS | D/C | /RES |
| 4-wire SPI | SCL | SDI | Tie LOW | | | | | | /CS | D/C | /RES | | |

Wiring Diagrams



Electrical Characteristics

| Item | Symbol | Condition | Min. | Typ. | Max. | Unit |
|-----------------------------|--------------------------|--------------|---------|------|------|------|
| Operating Temperature Range | Top | Absolute Max | -30 | - | +70 | °C |
| Storage Temperature Range | Tst | Absolute Max | -40 | - | +80 | °C |
| Supply Voltage | VDD | | 2.6 | 2.8 | 3.3 | V |
| Supply Current (logic) | IDD | VDD=2.8V | - | 6 | 12 | mA |
| Supply Current (display) | ICC | VDD=2.8V | - | 180 | 330 | mA |
| Sleep Mode Current | IDD+ICC _{SLEEP} | | - | 5 | 10 | µA |
| "H" Level input | Vih | | 0.8*VDD | - | VDD | V |
| "L" Level input | Vil | | 0 | - | 0.4 | V |
| "H" Level output | Voh | | VDD-0.4 | - | - | V |
| "L" Level output | Vol | | - | - | 0.4 | V |

Optical Characteristics

| Item | Symbol | Condition | Min. | Typ. | Max. | Unit |
|------------------------|--------|-----------------------------------------------------|--------|--------|------|-------------------|
| Viewing Angle – Top | | | 80 | - | - | ° |
| Viewing Angle – Bottom | | | 80 | - | - | ° |
| Viewing Angle – Left | | | 80 | - | - | ° |
| Viewing Angle – Right | | | 80 | - | - | ° |
| Contrast Ratio | Cr | | - | 2000:1 | - | - |
| Response Time (rise) | Tr | - | - | 10 | - | us |
| Response Time (fall) | Tf | - | - | 10 | - | us |
| Brightness | | 50% checkerboard | 60 | 75 | - | cd/m ² |
| Lifetime | | 90 cd/m ² , Ta=25°C, 50% checkerboard | 10,000 | - | - | Hrs |

Note: Lifetime at typical temperature is based on accelerated high-temperature operation. Lifetime is tested at average 50% pixels on and is rated as Hours until **Half-Brightness**. The Display OFF command can be used to extend the lifetime of the display.

Luminance of active pixels will degrade faster than inactive pixels. Residual (burn-in) images may occur. To avoid this, every pixel should be illuminated uniformly.

Controller information

Built-in SEPS525 controller.

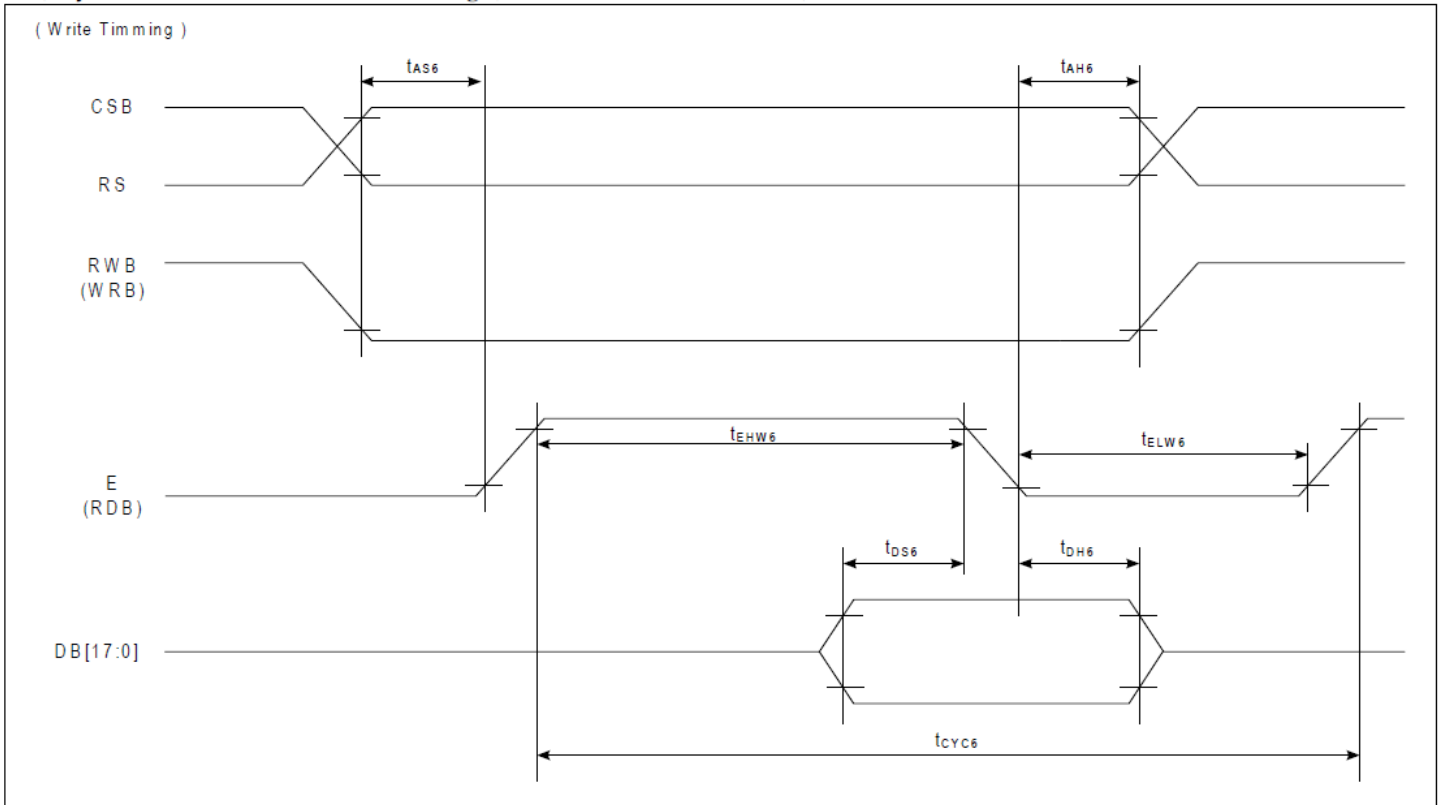
Please download specification at www.newhavendisplay.com/app_notes/SEPS525.pdf

Table of Commands

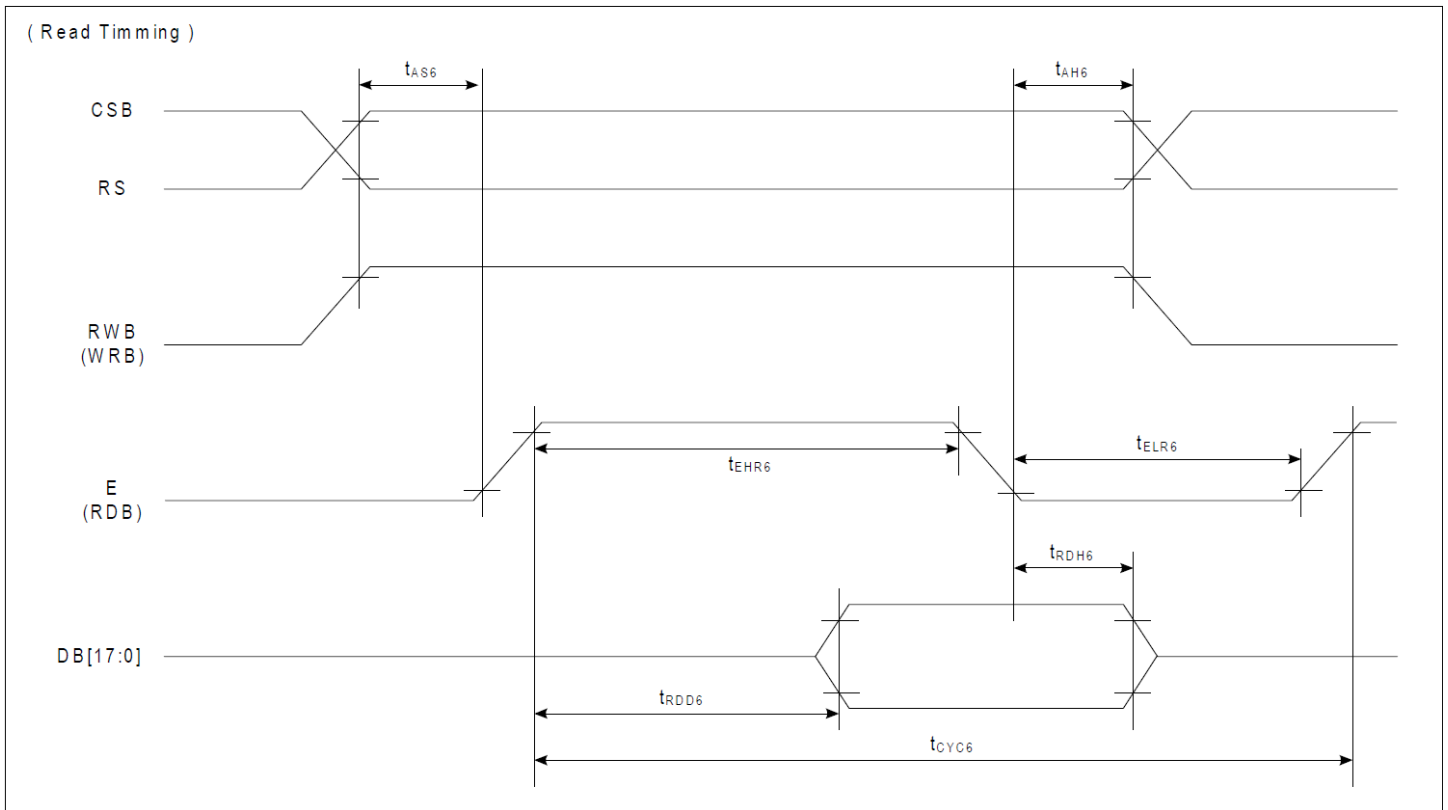
| ADDR | RW | IB7 | IB6 | IB5 | IB4 | IB3 | IB2 | IB1 | IB0 | Description | Default |
|------|-----|-------------|---------|---------|---------|---------|---------|---------|---------|-------------------------|---------|
| 00h | R | IDX7 | IDX6 | IDX5 | IDX4 | IDX3 | IDX2 | IDX1 | IDX0 | INDEX | 00h |
| 01h | R | HC | VC | HV | SWAP | RD | CD | DC1 | DC0 | STATUS_RD | C0h |
| 02h | R/W | SELEXP | SELRES | - | - | - | - | SELCLK | OSCD5B | OSC_CTL | C0h |
| 80h | R/W | - | - | - | - | - | - | - | IREF | IREF | 00h |
| 03h | R/W | FR3 | FR2 | FR1 | FR0 | DFR3 | DFR2 | DFR1 | DFR0 | CLOCK_DIV | 30h |
| 04h | R/W | - | - | - | - | - | RC | OSCP5 | PS | REDUCE_CURRENT | 00h |
| 05h | R/W | - | - | - | - | - | - | - | SRN | SOFT_RST | 00h |
| 06h | R/W | PREM | - | - | - | - | - | - | DON | DISP_ON_OFF | 00h |
| 08h | R/W | - | - | - | - | PTR3 | PTR2 | PTR1 | PTR0 | PRECHARGE_TIME_R | 00h |
| 09h | R/W | - | - | - | - | PTG3 | PTG2 | PTG1 | PTG0 | PRECHARGE_TIME_G | 00h |
| 0Ah | R/W | - | - | - | 0 | PTB3 | PTB2 | PTB1 | PTB0 | PRECHARGE_TIME_B | 00h |
| 0Bh | R/W | PCR7 | PCR6 | PCR5 | PCR4 | PCR3 | PCR2 | PCR1 | PCR0 | PRECHARGE_CURRENT_R | 00h |
| 0Ch | R/W | PCG7 | PCC6 | PCG5 | PCC4 | PCG3 | PCG2 | PCG1 | PCG0 | PRECHARGE_CURRENT_G | 00h |
| 0Dh | R/W | PCB7 | PCB6 | PCB5 | PCB4 | PCB3 | PCB2 | PCB1 | PCB0 | PRECHARGE_CURRENT_B | 00h |
| 10h | R/W | DCR7 | DCR6 | DCR5 | DCR4 | DCR3 | DCR2 | DCR1 | DCR0 | DRIVING_CURRENT_R | 00h |
| 11h | R/W | DCG7 | DCC6 | DCG5 | DCG4 | DCG3 | DCG2 | DCG1 | DCG0 | DRIVING_CURRENT_G | 00h |
| 12h | R/W | DCB7 | DCB6 | DCB5 | DCB4 | DCB3 | DCB2 | DCB1 | DCB0 | DRIVING_CURRENT_B | 00h |
| 13h | R/W | SWAP | SM | RD | CD | - | SPT | DC1 | DC0 | DISPLAY_MODE_SET | 00h |
| 14h | R/W | - | - | RIM1 | RIM0 | - | - | - | EDM | RGB_IF | 11h |
| 15h | R/W | RES | RES | ENP | DOP | VSYOEN | RES | RES | RES | RGB_POL | 00h |
| 16h | R/W | - | DFM1 | DFM0 | TRI | - | HC | VC | HV | MEMORY_WRITE_MODE | 06h |
| 17h | R/W | MX1_7 | MX1_6 | MX1_5 | MX1_4 | MX1_3 | MX1_2 | MX1_1 | MX1_0 | MX1_ADDR | 00h |
| 18h | R/W | MX2_7 | MX2_6 | MX2_5 | MX2_4 | MX2_3 | MX2_2 | MX2_1 | MX2_0 | MX2_ADDR | 9Fh |
| 19h | R/W | MY1_7 | MY1_6 | MY1_5 | MY1_4 | MY1_3 | MY1_2 | MY1_1 | MY1_0 | MY1_ADDR | 00h |
| 1Ah | R/W | MY2_7 | MY2_6 | MY2_5 | MY2_4 | MY2_3 | MY2_2 | MY2_1 | MY2_0 | MY2_ADDR | 7Fh |
| 20h | R/W | MAC7 | MAC6 | MAC5 | MAC4 | MAC3 | MAC2 | MAC1 | MAC0 | MEMORY_ACCESS_POINTER X | 00h |
| 21h | R/W | MAR7 | MAR6 | MAR5 | MAR4 | MAR3 | MAR2 | MAR1 | MAR0 | MEMORY_ACCESS_POINTER Y | 00h |
| 22h | | DDRAM[17:0] | | | | | | | | DDRAM_DATA_ACCESS_PORT | |
| 50h | R/W | IGAMMA7 | IGAMMA6 | IGAMMA5 | IGAMMA4 | IGAMMA3 | IGAMMA2 | IGAMMA1 | IGAMMA0 | GRAY_SCALE_TABLE_INDEX | 00h |
| 51h | R/W | DGAMMA7 | DGAMMA6 | DGAMMA5 | DGAMMA4 | DGAMMA3 | DGAMMA2 | DGAMMA1 | DGAMMA0 | GRAY_SCALE_TABLE_DATA | |
| 28h | R/W | DUTY7 | DUTY6 | DUTY5 | DUTY4 | DUTY3 | DUTY2 | DUTY1 | DUTY0 | DUTY | 7Fh |
| 29h | R/W | DSL7 | DSL6 | DSL5 | DSL4 | DSL3 | DSL2 | DSL1 | DSL0 | DSL | 00h |
| 2Eh | R/W | FAC7 | FAC6 | FAC5 | FAC4 | FAC3 | FAC2 | FAC1 | FAC0 | D1_DDRAM_FAC | 00h |
| 2Fh | R/W | FAR7 | FAR6 | FAR5 | FAR4 | FAR3 | FAR2 | FAR1 | FAR0 | D1_DDRAM_FAR | 00h |
| 31h | R/W | SAC7 | SAC6 | SAC5 | SAC4 | SAC3 | SAC2 | SAC1 | SAC0 | D2_DDRAM_SAC | 00h |
| 32h | R/W | SAR7 | SAR6 | SAR5 | SAR4 | SAR3 | SAR2 | SAR1 | SAR0 | D2_DDRAM_SAR | 00h |
| 33h | R/W | FX1_7 | FX1_6 | FX1_5 | FX1_4 | FX1_3 | FX1_2 | FX1_1 | FX1_0 | SCR1_FX1 | 00h |
| 34h | R/W | FX2_7 | FX2_6 | FX2_5 | FX2_4 | FX2_3 | FX2_2 | FX2_1 | FX2_0 | SCR1_FX2 | 9Fh |
| 35h | R/W | FY1_7 | FY1_6 | FY1_5 | FY1_4 | FY1_3 | FY1_2 | FY1_1 | FY1_0 | SCR1_FY1 | 00h |
| 36h | R/W | FY2_7 | FY2_6 | FY2_5 | FY2_4 | FY2_3 | FY2_2 | FY2_1 | FY2_0 | SCR1_FY2 | 7Fh |
| 37h | R/W | SX1_7 | SX1_6 | SX1_5 | SX1_4 | SX1_3 | SX1_2 | SX1_1 | SX1_0 | SCR2_SX1 | 00h |
| 38h | R/W | SX2_7 | SX2_6 | SX2_5 | SX2_4 | SX2_3 | SX2_2 | SX2_1 | SX2_0 | SCR2_SX2 | 9Fh |
| 39h | R/W | SY1_7 | SY1_6 | SY1_5 | SY1_4 | SY1_3 | SY1_2 | SY1_1 | SY1_0 | SCR2_SY1 | 00h |
| 3Ah | R/W | SY2_7 | SY2_6 | SY2_5 | SY2_4 | SY2_3 | SY2_2 | SY2_1 | SY2_0 | SCR2_SY2 | 7Fh |
| 3Bh | R/W | - | SSA1 | SSA0 | - | SSC1 | SSC0 | - | SSM | SCREEN_SAVER_CONTEROL | 00h |
| 3Ch | R/W | SST7 | SST6 | SST5 | SST4 | SST3 | SST2 | SST1 | SST0 | SS_SLEEP_TIMER | 00h |
| 3Dh | R/W | - | - | SMS1 | SMS0 | - | - | SMP1 | SMP0 | SCREEN_SAVER_MODE | 00h |
| 3Eh | R/W | FSUT7 | FSUT6 | FSUT5 | FSUT4 | FSUT3 | FSUT2 | FSUT1 | FSUT0 | SS_SCR1_FU | 00h |
| 3Fh | R/W | - | - | - | - | FSMS3 | FSMS2 | FSMS1 | FSMS0 | SS_SCR1_MXY | 00h |
| 40h | R/W | SSUT7 | SSUT6 | SSUT5 | SSUT4 | SSUT3 | SSUT2 | SSUT1 | SSUT0 | SS_SCR2_FU | 00h |
| 41h | R/W | SSMS7 | SSMS6 | SSMS5 | SSMS4 | SSMS3 | SSMS2 | SSMS1 | SSMS0 | SS_SCR2_MXY | 00h |
| 42h | R/W | - | - | SSMD1 | SSMD0 | - | - | - | - | MOVING_DIRECTION | 00h |
| 47h | R/W | ISX1_7 | ISX1_6 | ISX1_5 | ISX1_4 | ISX1_3 | ISX1_2 | ISX1_1 | ISX1_0 | SS_SCR2_SX1 | 00h |
| 48h | R/W | ISX2_7 | ISX2_6 | ISX2_5 | ISX2_4 | ISX2_3 | ISX2_2 | ISX2_1 | ISX2_0 | SS_SCR2_SX2 | 00h |
| 49h | R/W | ISY1_7 | ISY1_6 | ISY1_5 | ISY1_4 | ISY1_3 | ISY1_2 | ISY1_1 | ISY1_0 | SS_SCR2_SY1 | 00h |
| 4Ah | R/W | ISY2_7 | ISY2_6 | ISY2_5 | ISY2_4 | ISY2_3 | ISY2_2 | ISY2_1 | ISY2_0 | SS_SCR2_SY2 | 00h |

Timing Characteristics

6800-Series MCU Parallel Interface:

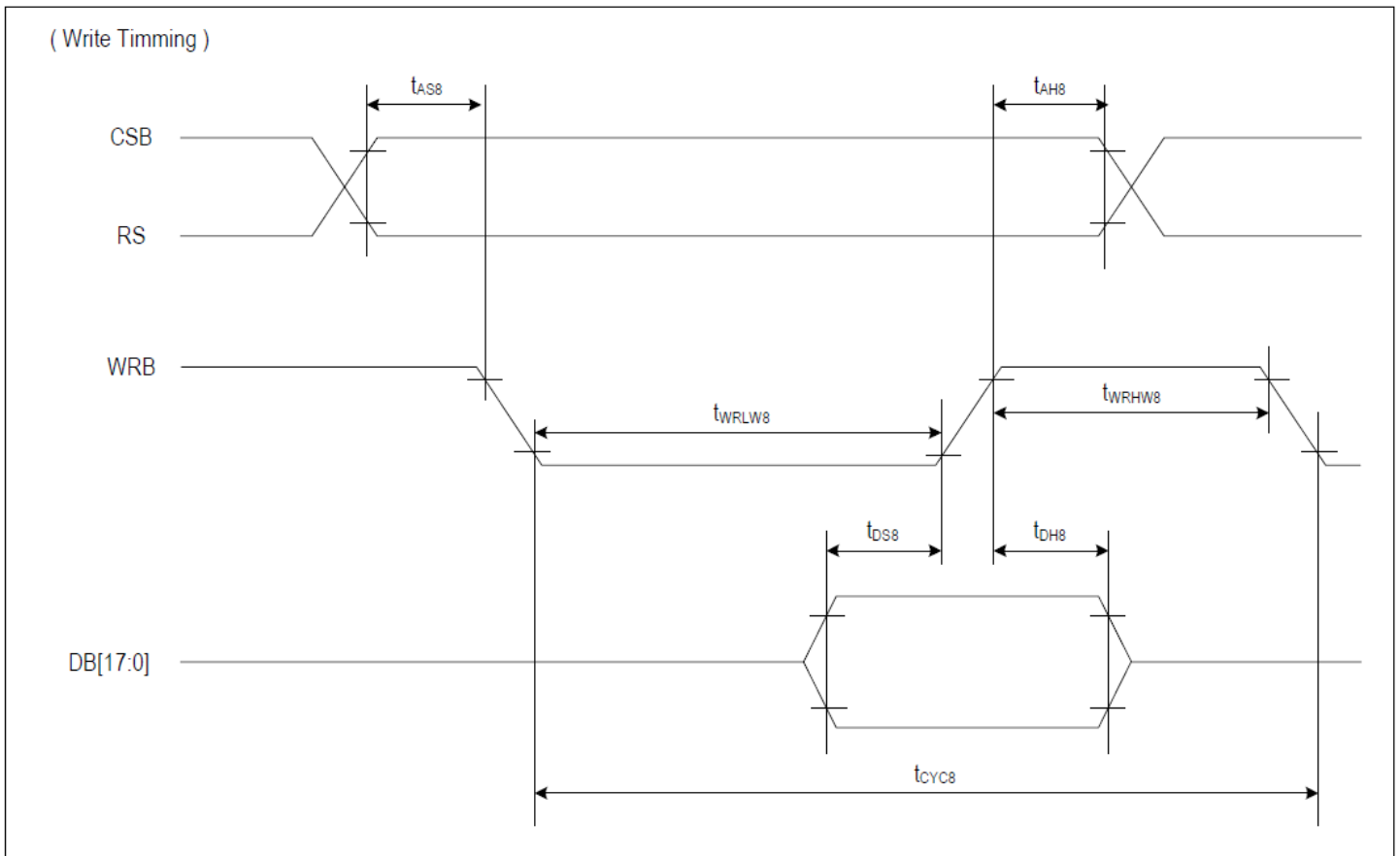


| ITEM | SYMBOL | CONDITION | MIN | MAX | UNIT | PORT |
|-----------------------|------------|-----------|-----|-----|------|----------|
| Address hold timing | t_{AH6} | - | 5 | - | ns | CSB |
| Address setup timing | t_{AS6} | - | 5 | - | ns | RS |
| System cycle timing | t_{CYC6} | - | 100 | - | ns | |
| Write "L" pulse width | t_{ELW6} | - | 45 | - | ns | E |
| Write "H" pulse width | t_{EHW6} | - | 45 | - | ns | |
| Data setup timing | t_{DS6} | - | 40 | - | ns | DB[17:0] |
| Data hold timing | t_{DH6} | - | 10 | - | ns | |

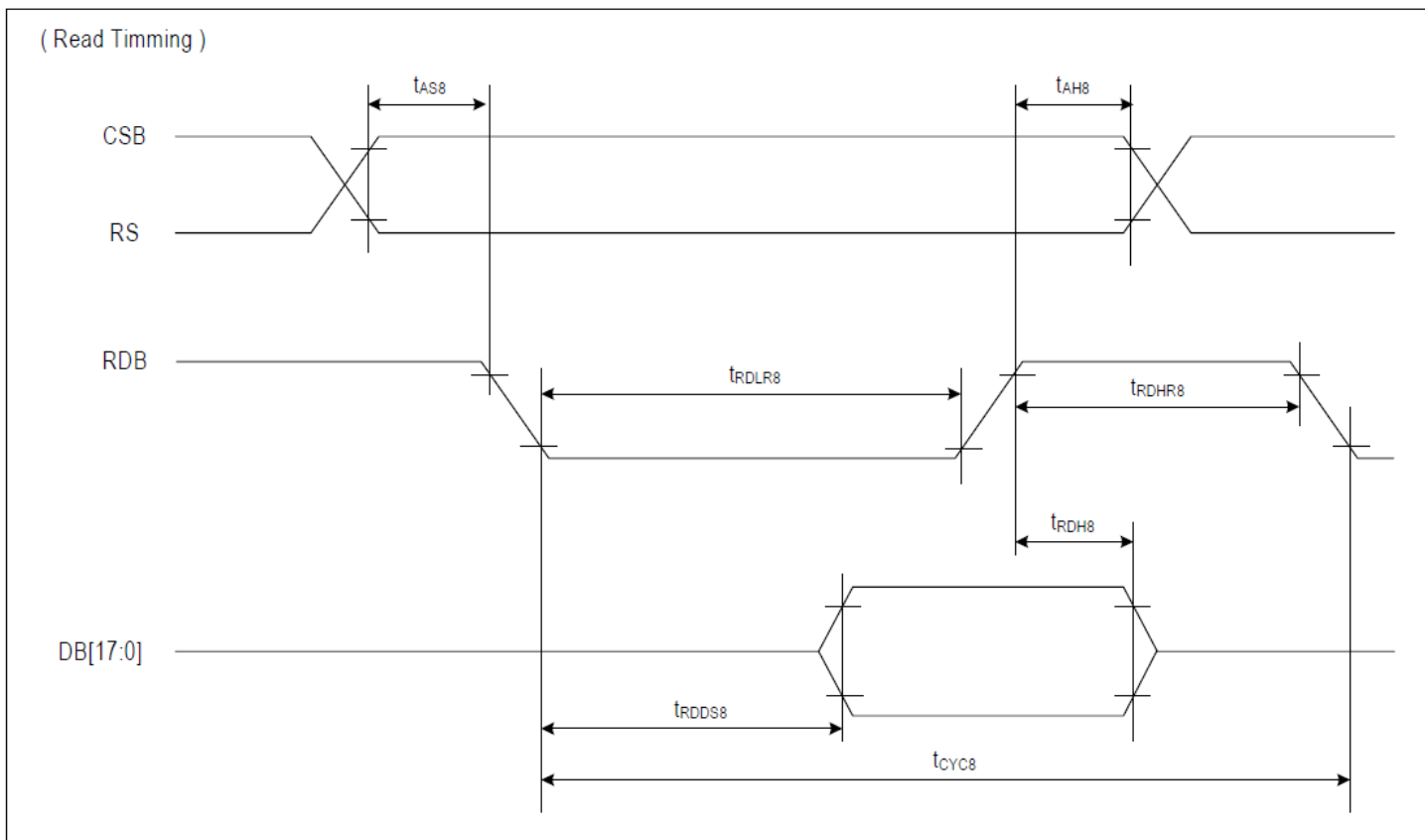


| ITEM | SYMBOL | CONDITION | MIN | MAX | UNIT | PORT |
|-----------------------------|------------|------------|-----|-----|------|----------|
| Address hold timing | t_{AH6} | - | 10 | - | ns | CSB |
| Address setup timing | t_{AS6} | - | 10 | - | ns | RS |
| System cycle timing | t_{CYC6} | - | 200 | - | ns | |
| Read "L" pulse width | t_{ELR6} | - | 90 | - | ns | E |
| Read "H" pulse width | t_{EHR6} | - | 90 | - | ns | |
| Read data output delay time | t_{RDD6} | CL = 15 pF | 0 | 70 | ns | DB[17:0] |
| Data hold timing | t_{RDH6} | CL = 15 pF | 0 | 70 | ns | DB[17:0] |

8080-Series MCU Parallel Interface:

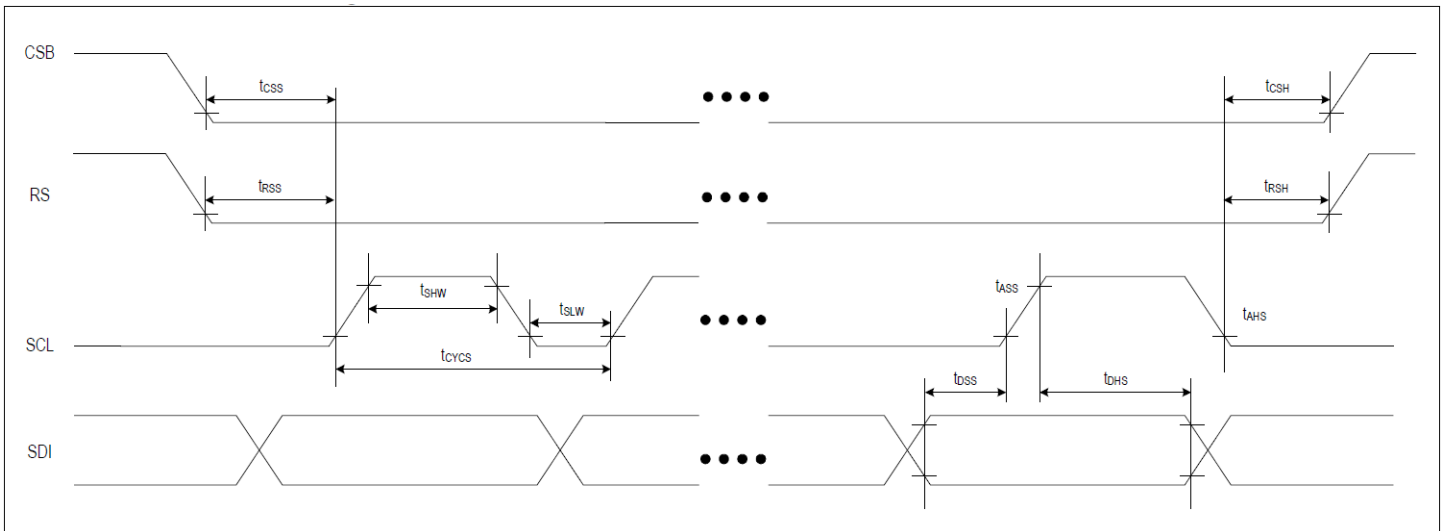


| ITEM | SYMBOL | CONDITION | MIN | MAX | UNIT | PORT |
|-----------------------|-------------|-----------|-----|-----|------|----------|
| Address hold timing | t_{AH8} | - | 5 | - | ns | CSB |
| Address setup timing | t_{AS8} | - | 5 | - | ns | RS |
| System cycle timing | t_{CYC8} | - | 100 | - | ns | |
| Write "L" pulse width | t_{WRLW8} | - | 45 | - | ns | WRB |
| Write "H" pulse width | t_{WRHW8} | - | 45 | - | ns | |
| Data setup timing | t_{DS8} | - | 30 | - | ns | DB[17:0] |
| Data hold timing | t_{DH8} | - | 10 | - | ns | |



| ITEM | SYMBOL | CONDITION | MIN | MAX | UNIT | PORT |
|-----------------------------|-------------|------------|-----|-----|------|----------|
| Address hold timing | t_{AH8} | - | 5 | - | ns | CSB |
| Address setup timing | t_{AS8} | - | 5 | - | ns | RS |
| System cycle timing | t_{CYC8} | - | 200 | - | ns | |
| Read "L" pulse width | t_{RDLR8} | - | 90 | - | ns | RDB |
| Read "H" pulse width | t_{RDHR8} | - | 90 | - | ns | |
| Read data output delay time | t_{RDDS8} | CL = 15 pF | - | 60 | ns | DB[17:0] |
| Data hold timing | t_{RDH8} | CL = 15 pF | 0 | - | ns | |

4-wire SPI:



| ITEM | SYMBOL | CONDITION | MIN | MAX | UNIT | PORT |
|---------------------|------------|-----------|-----|-----|------|------|
| Serial clock cycle | t_{CYCS} | | 100 | - | ns | SCL |
| SCL "H" pulse width | t_{SHW} | - | 45 | - | ns | SCL |
| SCL "L" pulse width | t_{SLW} | | 45 | | ns | |
| Data setup timing | t_{DSS} | - | 5 | - | ns | SDI |
| Data hold timing | t_{DHS} | | 5 | | ns | |
| CSB-SCL timing | t_{CSS} | - | 5 | - | ns | CSB |
| CSB-hold timing | t_{CSH} | | 5 | | ns | |
| RS-SCL timing | T_{RSS} | - | 5 | - | ns | RS |
| RS-hold timing | T_{RSH} | | 5 | | ns | |

Example Initialization Sequence:

```
void oled_Data_160128RGB(unsigned char Data)
{
  GPIO_ResetBits(GPIOC, CS1);
  GPIO_SetBits(GPIOC, RS);
  GPIO_Write(GPIOB, Data);
  GPIO_ResetBits(GPIOC, RW);
  GPIO_SetBits(GPIOC, E1);
  GPIO_ResetBits(GPIOC, E1);
}
```

```
void oled_Command_160128RGB(unsigned char Data)
{
  GPIO_ResetBits(GPIOC, CS1);
  GPIO_ResetBits(GPIOC, RS);
  GPIO_Write(GPIOB, Data);
  GPIO_ResetBits(GPIOC, RW);
  GPIO_SetBits(GPIOC, E1);
  GPIO_ResetBits(GPIOC, E1);
}
```

```
void OLED_Init_160128RGB(void)
{
  int i,j;
  GPIO_ResetBits(GPIOC, RES);
  graphic_delay(500000);
  GPIO_SetBits(GPIOC, RES);
  graphic_delay(500000);
```

```
oled_Command_160128RGB(0x04); // Set Normal Driving Current
oled_Data_160128RGB(0x03); // Disable Oscillator Power Down
graphic_delay(2000);
```

```
oled_Command_160128RGB(0x04); // Enable Power Save Mode
oled_Data_160128RGB(0x00); // Set Normal Driving Current
graphic_delay(2000); // Disable Oscillator Power Down
```

```
oled_Command_160128RGB(0x3B);
oled_Data_160128RGB(0x00);
```

```
oled_Command_160128RGB(0x02);
oled_Data_160128RGB(0x01); // Set EXPORT1 Pin at Internal Clock
// Oscillator operates with external resister.
// Internal Oscillator On
```

```
oled_Command_160128RGB(0x03);
oled_Data_160128RGB(0x90); // Set Frame Rate as 120Hz
```

```

oled_Command_160128RGB(0x80);
oled_Data_160128RGB(0x01);           // Set Reference Voltage Controlled by External Resister

oled_Command_160128RGB(0x08); // Set Pre-Charge Time of Red
oled_Data_160128RGB(0x04);
oled_Command_160128RGB(0x09); // Set Pre-Charge Time of Green
oled_Data_160128RGB(0x05);
oled_Command_160128RGB(0x0A); // Set Pre-Charge Time of Blue
oled_Data_160128RGB(0x05);

oled_Command_160128RGB(0x0B); // Set Pre-Charge Current of Red
oled_Data_160128RGB(0x9D);
oled_Command_160128RGB(0x0C); // Set Pre-Charge Current of Green
oled_Data_160128RGB(0x8C);
oled_Command_160128RGB(0x0D); // Set Pre-Charge Current of Blue
oled_Data_160128RGB(0x57);

oled_Command_160128RGB(0x10); // Set Driving Current of Red
oled_Data_160128RGB(0x56);
oled_Command_160128RGB(0x11); // Set Driving Current of Green
oled_Data_160128RGB(0x4D);
oled_Command_160128RGB(0x12); // Set Driving Current of Blue
oled_Data_160128RGB(0x46);

oled_Command_160128RGB(0x13);
oled_Data_160128RGB(0xa0);           // Set Color Sequence

oled_Command_160128RGB(0x14);
oled_Data_160128RGB(0x01);           // Set MCU Interface Mode
oled_Command_160128RGB(0x16);
oled_Data_160128RGB(0x76);

oled_Command_160128RGB(0x20);
oled_Data_160128RGB(0x00);           // Shift Mapping RAM Counter
oled_Command_160128RGB(0x21);
oled_Data_160128RGB(0x00);           // Shift Mapping RAM Counter

oled_Command_160128RGB(0x28);
oled_Data_160128RGB(0x7F);           // 1/128 Duty (0x0F~0x7F)

oled_Command_160128RGB(0x29);
oled_Data_160128RGB(0x00);           // Set Mapping RAM Display Start Line (0x00~0x7F)

oled_Command_160128RGB(0x06);
oled_Data_160128RGB(0x01);           // Display On (0x00/0x01)

oled_Command_160128RGB(0x05);           // Disable Power Save Mode
oled_Data_160128RGB(0x00);           // Set All Internal Register Value as Normal Mode

```

```

oled_Command_160128RGB(0x15);
oled_Data_160128RGB(0x00);          // Set RGB Interface Polarity as Active Low

}

int oled_160128RGB(void)
{
oled_Command_160128RGB(0x17);      //set column start address
oled_Data_160128RGB(0x00);        //

oled_Command_160128RGB(0x18);      //set column end address
oled_Data_160128RGB(0x9F);        //

oled_Command_160128RGB(0x19);      //set row start address
oled_Data_160128RGB(0x00);        //

oled_Command_160128RGB(0x1A);      //set row end address
oled_Data_160128RGB(0x7F);        //

oled_Command_160128RGB(0x22);      //write to RAM command

for (i=0;i<20480;i++) //for each 24-bit pixel...160*128=20480
{
    oled_Data_160128RGB(red);
    oled_Data_160128RGB(green);
    oled_Data_160128RGB(blue);
}

/*if(image==screenSaverRequired){          //screen saver example--!
    //First Screen
    oled_Command_160128RGB(0x2E);          //first screen horizontal address
    oled_Data_160128RGB(0x00);            //
    oled_Command_160128RGB(0x2F);          //first screen vertical address
    oled_Data_160128RGB(0x00);            //
    oled_Command_160128RGB(0x33);          //first screen start column
    oled_Data_160128RGB(0x00);            //
    oled_Command_160128RGB(0x34);          //first screen end column
    oled_Data_160128RGB(0x9F);            //
    oled_Command_160128RGB(0x35);          //first screen start row
    oled_Data_160128RGB(0x00);            //
    oled_Command_160128RGB(0x36);          //first screen end row
    oled_Data_160128RGB(0x36);            //

    //Second_Screen(0x00,0x9F,0x3C,0x7F,0x20,0x7F,0x3C,0x5F);
    oled_Command_160128RGB(0x31);          //second screen horizontal address
    oled_Data_160128RGB(0x00);            //
    oled_Command_160128RGB(0x32);          //second screen vertical address

```

```

oled_Data_160128RGB(0x37);      //
oled_Command_160128RGB(0x37);  //second screen start column
oled_Data_160128RGB(0x00);      //
oled_Command_160128RGB(0x38);  //second screen end column
oled_Data_160128RGB(0x9F);      //
oled_Command_160128RGB(0x39);  //second screen start row
oled_Data_160128RGB(0x37);      //
oled_Command_160128RGB(0x3A);  //second screen end row
oled_Data_160128RGB(0x7F);      //
oled_Command_160128RGB(0x47);  //second screen      box start column
oled_Data_160128RGB(0x60);      //
oled_Command_160128RGB(0x48);  //second screen box end column
oled_Data_160128RGB(0x7F);      //
oled_Command_160128RGB(0x49);  //second screen box start row
oled_Data_160128RGB(0x37);      //
oled_Command_160128RGB(0x4A);  //second screen box end row
oled_Data_160128RGB(0x37);      //

oled_Command_160128RGB(0x3E);//first screen update timer
oled_Data_160128RGB(0x04);
oled_Command_160128RGB(0x3F);//horizontal step
oled_Data_160128RGB(0x01);
oled_Command_160128RGB(0x40);//second screen update timer
oled_Data_160128RGB(0x01);
oled_Command_160128RGB(0x41);//second screen vertical and horizontal step
oled_Data_160128RGB(0x11);
oled_Command_160128RGB(0x42);//moving direction
oled_Data_160128RGB(0x00);
oled_Command_160128RGB(0x3C);//sleep timer
oled_Data_160128RGB(0xF0);
oled_Command_160128RGB(0x3D);//Screen saver      mode
oled_Data_160128RGB(0x01);
oled_Command_160128RGB(0x13);
oled_Data_160128RGB(0xa4);
oled_Command_160128RGB(0x3B);//Screen saver control
oled_Data_160128RGB(0x0D);
} */
/*else {                          //Screen Saver example #2--!
oled_Command_160128RGB(0x2E);    //First Screen      First_Screen(0x00,0x9F,0x00,0x7F);
oled_Data_160128RGB(0x00);      //
oled_Command_160128RGB(0x2F);    //
oled_Data_160128RGB(0x00);      //
oled_Command_160128RGB(0x33);    //
oled_Data_160128RGB(0x00);      //
oled_Command_160128RGB(0x34);    //
oled_Data_160128RGB(0x9F);      //
oled_Command_160128RGB(0x35);    //
oled_Data_160128RGB(0x00);      //
oled_Command_160128RGB(0x36);    //
oled_Data_160128RGB(0x7F);      //

```



```

oled_Command_160128RGB(0x13);
oled_Data_160128RGB(0xa0);
//Screen_Saver_(full screen to the right)
oled_Command_160128RGB(0x3E);//Screen saver
oled_Data_160128RGB(0x01);
oled_Command_160128RGB(0x3F);//Screen saver
oled_Data_160128RGB(0x01);
oled_Command_160128RGB(0x40);//Screen saver
oled_Data_160128RGB(0x01);
oled_Command_160128RGB(0x41);//Screen saver
oled_Data_160128RGB(0x01);
oled_Command_160128RGB(0x42);//Screen saver
oled_Data_160128RGB(0x10);
oled_Command_160128RGB(0x3C);//Screen saver timer
oled_Data_160128RGB(0x80);
oled_Command_160128RGB(0x3D);//Screen saver timer
oled_Data_160128RGB(0x32);
oled_Command_160128RGB(0x3B);//Screen saver
oled_Data_160128RGB(0x05);
}*/

```

```

/* //turn off screen saver example --!
oled_Command_160128RGB(0x3D);//Screen saver timer
oled_Data_160128RGB(0x00);
oled_Command_160128RGB(0x3C);//Screen saver timer
oled_Data_160128RGB(0x00);
oled_Command_160128RGB(0x3B);//Screen saver
oled_Data_160128RGB(0x00);
oled_Command_160128RGB(0x42);//Screen saver
oled_Data_160128RGB(0x00);
*/

```

```

}return 1;}

```

```

////////////////////////////////////

```

Quality Information

| Test Item | Content of Test | Test Condition | Note |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------|
| High Temperature storage | Test the endurance of the display at high storage temperature. | +80°C , 96hrs | 2 |
| Low Temperature storage | Test the endurance of the display at low storage temperature. | -40°C , 96hrs | 1,2 |
| High Temperature Operation | Test the endurance of the display by applying electric stress (voltage & current) at high temperature. | +70°C 96hrs | 2 |
| Low Temperature Operation | Test the endurance of the display by applying electric stress (voltage & current) at low temperature. | -30°C , 96hrs | 1,2 |
| High Temperature / Humidity Operation | Test the endurance of the display by applying electric stress (voltage & current) at high temperature with high humidity. | +60°C , 90% RH , 96hrs | 1,2 |
| Thermal Shock resistance | Test the endurance of the display by applying electric stress (voltage & current) during a cycle of low and high temperatures. | -30°C,30min -> 25°C,5min -> 70°C,30min = 1 cycle 100 cycles | |
| Vibration test | Test the endurance of the display by applying vibration to simulate transportation and use. | 10-22Hz , 15mm amplitude. 22-500Hz, 1.5G 30min in each of 3 directions X,Y,Z | 3 |
| Atmospheric Pressure test | Test the endurance of the display by applying atmospheric pressure to simulate transportation by air. | 115mbar, 40hrs | 3 |
| Static electricity test | Test the endurance of the display by applying electric static discharge. | VS=800V, RS=1.5kΩ, CS=100pF One time | |

Note 1: No condensation to be observed.

Note 2: Conducted after 2 hours of storage at 25°C, 0%RH.

Note 3: Test performed on product itself, not inside a container.

Evaluation Criteria:

- 1: Display is fully functional during operational tests and after all tests, at room temperature.
- 2: No observable defects.
- 3: Luminance >50% of initial value.
- 4: Current consumption within 50% of initial value

Precautions for using OLEDs/LCDs/LCMs

See Precautions at www.newhavendisplay.com/specs/precautions.pdf

Warranty Information and Terms & Conditions

http://www.newhavendisplay.com/index.php?main_page=terms

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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JONHON

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Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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