TFT
STANDARD MODULE

Thin packages High brightness High saturation
SII’s eco-friendly LCD Module

January 2011
SII develops, produces and markets TFT standard modules for a broad range of customer applications!

### Standard Products Spec List

<table>
<thead>
<tr>
<th>Panel Size</th>
<th>2.0”</th>
<th>2.4”</th>
<th>2.8”</th>
<th>3.0”</th>
<th>32WQF0H (Development)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product name</td>
<td>20QVF0H</td>
<td>24QVF1H</td>
<td>24QWV1H (Development)</td>
<td>28QVF1H</td>
<td>30WQF0H</td>
</tr>
<tr>
<td>General Specification</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Pixel</td>
<td>240 (RGB) x 320 Stripe</td>
<td>240 (RGB) x 320 Stripe</td>
<td>240 (RGB) x 320 Stripe</td>
<td>240 (RGB) x 320 Stripe</td>
<td>240 (RGB) x 400 Stripe</td>
</tr>
<tr>
<td>Display Mode</td>
<td>a-Si TFT (FFS) Transmissive, Normally Black</td>
<td>a-Si TFT (FFS) Transmissive, Normally Black</td>
<td>a-Si TFT (TN), Transmissive, Normally White</td>
<td>a-Si TFT (FFS) Transmissive, Normally Black</td>
<td>a-Si TFT (FFS) Transmissive, Normally Black</td>
</tr>
<tr>
<td>Number of Color</td>
<td>262K colors</td>
<td>262K colors</td>
<td>262K colors</td>
<td>262K colors</td>
<td>262K colors</td>
</tr>
<tr>
<td>Active Area (W x H) mm</td>
<td>30.6 x 40.8</td>
<td>36.72 x 48.96</td>
<td>36.72 x 48.96</td>
<td>43.2 x 57.6</td>
<td>39.24 x 65.4</td>
</tr>
<tr>
<td>Dot Pitch (W x H) mm</td>
<td>0.1275 (RGB)x 0.1275</td>
<td>0.153 (RGB)x 0.153</td>
<td>0.153 (RGB)x 0.153</td>
<td>0.180 (RGB)x 0.180</td>
<td>0.1635 (RGB)x 0.1635</td>
</tr>
<tr>
<td>Module Size (W x H x T) mm</td>
<td>35.8 x 54.12 x 1.75</td>
<td>42.72 x 60.4 x 1.93</td>
<td>42.06 x 60.26 x 2.71</td>
<td>49.0 x 69.0 x 2.06</td>
<td>44.5 x 77.1 x 1.882</td>
</tr>
<tr>
<td>Interface</td>
<td>RGB (16/18bit)+SPI</td>
<td>CPU (8/9/16 bit)</td>
<td>CPU (8/9/16 bit)</td>
<td>CPU (8/9/16 bit)</td>
<td>RGB (16/18bit)+SPI</td>
</tr>
<tr>
<td>Backlight</td>
<td>3LEDS Serial</td>
<td>4LEDS Serial</td>
<td>3LEDS Serial</td>
<td>4LEDS Serial</td>
<td>5LEDS Serial</td>
</tr>
<tr>
<td>Operating Temp. (℃)</td>
<td>-20 to +70</td>
<td>-20 to +70</td>
<td>-20 to +70</td>
<td>-20 to +70</td>
<td>-20 to +70</td>
</tr>
<tr>
<td>Storage Temp. (℃)</td>
<td>-30 to +80</td>
<td>-30 to +80</td>
<td>-30 to +80</td>
<td>-30 to +80</td>
<td>-30 to +80</td>
</tr>
<tr>
<td>Optical &amp; Electrical Specification</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contrast Ratio (Typ.)</td>
<td>800 : 1</td>
<td>800 : 1</td>
<td>400 : 1</td>
<td>800 : 1</td>
<td>800 : 1</td>
</tr>
<tr>
<td>Luminance cd/m² (Lux)</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>450</td>
<td>350</td>
</tr>
<tr>
<td>NTSC Ratio (Typ.)</td>
<td>70%</td>
<td>72%</td>
<td>50%</td>
<td>72%</td>
<td>68%</td>
</tr>
<tr>
<td>Viewing Angle (UD/UL/HR)</td>
<td>80°/80°/80°</td>
<td>80°/80°/80°</td>
<td>70°/60°/70°</td>
<td>80°/80°/80°</td>
<td>80°/80°/80°</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>1.65 to 3.3</td>
<td>1.65 to 3.3</td>
<td>1.65 to 3.3</td>
<td>1.65 to 3.3</td>
<td>1.65 to 3.3</td>
</tr>
<tr>
<td>Remarks</td>
<td>Other Interface: 24QVF1H (CPU / IF)</td>
<td>Other Interface: 24QVF1H (RGB + SPI / IF)</td>
<td>Other Interface: 24QVF2H (RGB + SPI / IF)</td>
<td>Other Interface: 24QVF1H (RGB + SPI / IF)</td>
<td>Other Interface: 24QVF2H (RGB + SPI / IF)</td>
</tr>
</tbody>
</table>

**Note:** Options are available (Please see the Remarks for details)
<table>
<thead>
<tr>
<th>Size &amp; Number of Pixel</th>
<th>TN</th>
<th>E-mode</th>
<th>FFS</th>
<th>With Touch Panel</th>
<th>Portrait</th>
<th>Landscape</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0” QVGA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4” QVGA</td>
<td></td>
<td></td>
<td>20QVF0H/1H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8” QVGA</td>
<td></td>
<td>24QVW1H/2H</td>
<td>24QVF1H/2H</td>
<td>24QVF1J/2J</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.0” WVQGA</td>
<td></td>
<td></td>
<td>28QVF1H/2H</td>
<td>28QVF1J/2J</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2” WVQGA</td>
<td></td>
<td></td>
<td>30WQFOH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2” nHD</td>
<td></td>
<td></td>
<td>32WQFOH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2” WVGA</td>
<td></td>
<td></td>
<td>32NHFOH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5” WVGA</td>
<td></td>
<td></td>
<td>32WF0H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5” HVGA</td>
<td></td>
<td></td>
<td>35QWW1H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5” WVGA</td>
<td></td>
<td></td>
<td>35HVE0H/1H</td>
<td>35HVF0H</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.7” WVGA</td>
<td></td>
<td></td>
<td>35WF0H/1H/2H</td>
<td>37WF0H</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.3” WVQGA</td>
<td></td>
<td></td>
<td>43WQW3H/4H</td>
<td>43WQW3T/4T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.3” WVGA</td>
<td></td>
<td></td>
<td>43WVF2H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.0” WVGA</td>
<td></td>
<td></td>
<td>70WVW1A/2A/3A/4A/5A</td>
<td>70WVW1T/2T/3T</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3.2”

- **32NF0H**
  - FFS: 360 (RGB) x 640 Stripe a-Si TFT (FFS) Transmissive, Normally Black
  - 16.7M colors
  - 39.96 x 71.04
- **32WF0H**
  - FFS: 480 (RGB) x 800 Stripe a-Si TFT (FFS) Transmissive, Normally Black
  - 16.2M colors
  - 41.76 x 69.6
- **35QWW1H**
  - 16.2M colors
  - 70.08 x 52.56
  - 262k colors
- **35HVE0H**
  - E-mode: 320 (RGB) x 240 Stripe a-Si TFT (FFS) Transmissive, Normally White
  - 262K colors
  - 48.96 x 73.44
  - 49.44 x 74.16
- **35HVF0H**
  - 262K colors
  - 45.36 x 75.6
  - 48.24 x 80.44
- **35WF0H**
  - 16.2M colors
  - 55.34 x 84.55 x 2.08
  - 51.46 x 90.55 x 2.0
  - 53.84 x 95.1 x 2.0

### 3.5”

- **32NF0H**
  - FFS: 360 (RGB) x 640 Stripe a-Si TFT (FFS) Transmissive, Normally Black
  - 16.7M colors
  - 39.96 x 71.04
- **32WF0H**
  - FFS: 480 (RGB) x 800 Stripe a-Si TFT (FFS) Transmissive, Normally Black
  - 16.2M colors
  - 41.76 x 69.6
- **35QWW1H**
  - 16.2M colors
  - 70.08 x 52.56
  - 262k colors
- **35HVE0H**
  - E-mode: 320 (RGB) x 240 Stripe a-Si TFT (FFS) Transmissive, Normally White
  - 262K colors
  - 48.96 x 73.44
  - 49.44 x 74.16
- **35HVF0H**
  - 262K colors
  - 45.36 x 75.6
  - 48.24 x 80.44
- **35WF0H**
  - 16.2M colors
  - 55.34 x 84.55 x 2.08
  - 51.46 x 90.55 x 2.0
  - 53.84 x 95.1 x 2.0

### 3.7”

- **32NF0H**
  - FFS: 480 (RGB) x 800 Stripe a-Si TFT (FFS) Transmissive, Normally Black
  - 16.7M colors
  - 39.96 x 71.04
- **32WF0H**
  - FFS: 480 (RGB) x 800 Stripe a-Si TFT (FFS) Transmissive, Normally Black
  - 16.2M colors
  - 41.76 x 69.6
- **35QWW1H**
  - 16.2M colors
  - 70.08 x 52.56
  - 262k colors
- **35HVE0H**
  - E-mode: 320 (RGB) x 240 Stripe a-Si TFT (FFS) Transmissive, Normally White
  - 262K colors
  - 48.96 x 73.44
  - 49.44 x 74.16
- **35HVF0H**
  - 262K colors
  - 45.36 x 75.6
  - 48.24 x 80.44
- **35WF0H**
  - 16.2M colors
  - 55.34 x 84.55 x 2.08
  - 51.46 x 90.55 x 2.0
  - 53.84 x 95.1 x 2.0

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**Note:**
- **FFS**: Field-Sequence Filtered Serial Interface
- **E-mode**: Extended Mode
- **Other Interface**: 35WVFH (CPU I/F) 35WVF2H (MII I/F)
### Custom and Semi-custom

SII works with custom and semi-custom requests. Speak with your SII representative for details.

#### FPC/Connector
- Interface: RGB, CPU, RGB-SPI, YUV (Under development: LVDS, MDDI, MIPI)
- Pin Arrangement
- Connector Type
- Shape

#### Touch Panel
- Resistive Touch Panel
- Capacitive Touch Panel

#### Backlight
- Luminance
- Frame Shape

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### Bonding

SII has a unique bonding technique (ADB: Airless Direct Bonding) which enables better optical and mechanical performance. We also offer custom bonding with client specific touch panels or front glass overlays.

---

<table>
<thead>
<tr>
<th>Panel Size</th>
<th>4.3”</th>
<th>7.0”</th>
</tr>
</thead>
<tbody>
<tr>
<td>43WQW3H/4H</td>
<td>43WVF2H</td>
<td>70WVW1A</td>
</tr>
</tbody>
</table>

#### General Specification
- Number of Pixel
- Display Mode
- Number of Color
- Active Area (W x H) mm
- Dot Pitch (W x H) mm
- Module Size (W x H x T) mm
- Interface
- Backlight
- Module Surface
- Operating Temp. (°C)
- Storage Temp. (°C)
- Optical & Electrical Specification
  - Contrast Ratio (Typ.)
  - NTSC Ratio (Typ.)
  - Viewing Angle (L/R): 90°/60°
  - VDD (Digital/V)
  - VCI (Analog/V)

#### Remarks

- A composite picture.
Thin package, High brightness, High saturation
SII’s eco-friendly LCD Module

Advanced Technical Information

**LCD**

**SII panel type**
SII manufactures a variety of LCD module types – providing clients the best options for their intended applications.

<table>
<thead>
<tr>
<th>LCD Panel Type</th>
<th>TN</th>
<th>TN-W</th>
<th>E-mode</th>
<th>FFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twisted Nematic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TN-Wide View</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-mode</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fringe Field Switching</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Contrast**
Better Better Better Best

**Thinness**
Best Good Better Best

**Viewing Angle**
Good Good Better Best

**TN and FFS : Difference of Viewing Angle**

The wide viewing angle and enhanced contrast ratio of the FFS technology displays offer minimal color shifting at the outer boundaries of the display’s viewing angle.

**Unique Bonding**
SII has a unique bonding technique ADB (Airless Direct Bonding). ADB enables low-cost but high-quality bonding. We also offer custom bonding with client specific touch panels or front glass overlays.

**Features**
- High Sunlight Readability: SII’s LCD direct bonding process ensures very good sunlight readability by effectively managing reflectivity.
- Slim: SII’s Bonding process enables both a thin and strong LCD module.
- High Reliability /Durability: SII’s Bonding process increases the impact strength of the LCD Module.
- Dust-less: SII’s Bonding process eliminates dust between the LCD and front glass/touch panel.

**Backlight**
Choose best LCD with SII’s original backlight “M-DANNY” and “Ti-SOL”!

**M-DANNY**
Simple structure without a prism sheet. M-DANNY enables an even light distribution and clear LCD panel, while offering slim packaging.

**Ti-SOL**
SII’s original Ti-SOL film widens the NTSC ratio more than 100%.

**Capacitive Touch Panel**
SII develops, produces and markets capacitive touch panel modules – either integrated with one of our LCD Modules or as a stand-alone product offering.

**Features**
- Controller IC Mounting: SII prepares the most suitable controller IC for client’s application. Multi-touch or gesture is available depend on the controller IC.
- Shape Customizing: SII processes the glass shape according to client’s request.
- Bonding Option: Bonding is available with SII’s LCD or client specific LCD.
- Matching Support with LCD: SII supports the matching with LCD including noise cancellation.
Environmental Activities

SII Group Environmental Policy

Environmental Concept
As a good corporate citizen, the SII Group will continue to harmonize its corporate activities with the global environment, protect and improve the environment, and contribute to the establishment of a sustainable society that can coexist with all nature.

[SII LCD Environmental Policy]
SII LCD Device is implementing the energy-saving actions, the reduction of waste, the reduction of hazardous materials, the effective use of paper resources and the development of environmental friendly products based on the SII Group Environmental Policy.

[Four Specific Actions to Protect the Environment from SII LCD Device]

1. **Energy Saving**
   - Energy Saving in Manufacturing Process
     Our factories, which manufacture our products, are implementing energy saving procedures in their manufacturing process.
   - Energy Saving through Low Power Consumption
     By design, LCD Device is an energy saving product. We are continuously improving.
     Our products for lower current consumption, resulting in further energy saving.

2. **Resource Saving**
   We set the resource saving targets and control the amount of raw materials, water used in processing, office resource and indirect materials in both the factory and our administrative offices.

3. **Manufacturing an Environmentally Friendly Product**
   - RoHS Compliance*1 and other nations’ directive (including REACH: Registration, Evaluation, Authorization and restriction of Chemicals) Before adopting new materials or processes, we make sure the material or process is not using any prohibited or restricted materials including RoHS designation. (The RoHS Directive has some exemptions. Some materials might be applied to them.)
   - *1 The RoHS Directive stands for: [The Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment]
     This is a directive which the EU (European Union) set for the restriction of the use of certain hazardous substances in electrical and electronic device and equipment, and it was issued in February 2003 together with the WEEE Directive. Accordingly, the directive has banned the use of the certain 6 substances in EU member nations since July 2006.
   - Halogen free
     Incinerating Plastics with halogen elements (which also include bromine or chlorine) produce poisonous gases (dioxin). We are addressing the demand for Halogen free products and aim to manufacture these eco-friendly products. (Halogen free products are presently custom only)
   - Compliant with SII Green Product Label
     To raise public awareness of our eco-friendly products, SII introduced the SII Green Product Label System. All the LCD Device products satisfy certain criteria and are certified as SII Green Products.

4. **Green Purchase**
   We promote "Green Purchase" along with "Green Purchase Guidelines". These are two innovative programs established by SII Group.

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(Specifications are subject to change without notice.)

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