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# **Embedded Demonstration Board Product Datasheet**

## **EMB043INTDEMO**

4.3" Integrated TFT Demonstration Board

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## 1. Introduction

The Displaytech EMB043INTDEMO is a demonstration board for the Displaytech INT043BTFT integrated driver board. The EMB043INTDEMO is controlled by a Microchip PIC32MX460F512L MCU and includes a USB connection, 2Mbyte SPI flash, and an SD card slot.

The INT043BTFT integrated display module powers and controls a Displaytech DT043BTFT TFT display with a 480 x 272 RGB resolution. The TFT module is mounted on a PCB on which is mounted a Solomon SSD1961 controller with integrated touch screen control and LED backlight power circuitry. Please see the [INT043BTFT Datasheet](#) for more information.

The EMB043INTDEMO is powered via a 5v USB connection, with a power switch (SW2) to turn the device on and off. All power levels required by the INT043TFT are generated and regulated by on-board voltage

regulators (see the [schematic](#) for more information).

## 2. INT Module Auto-Initialization

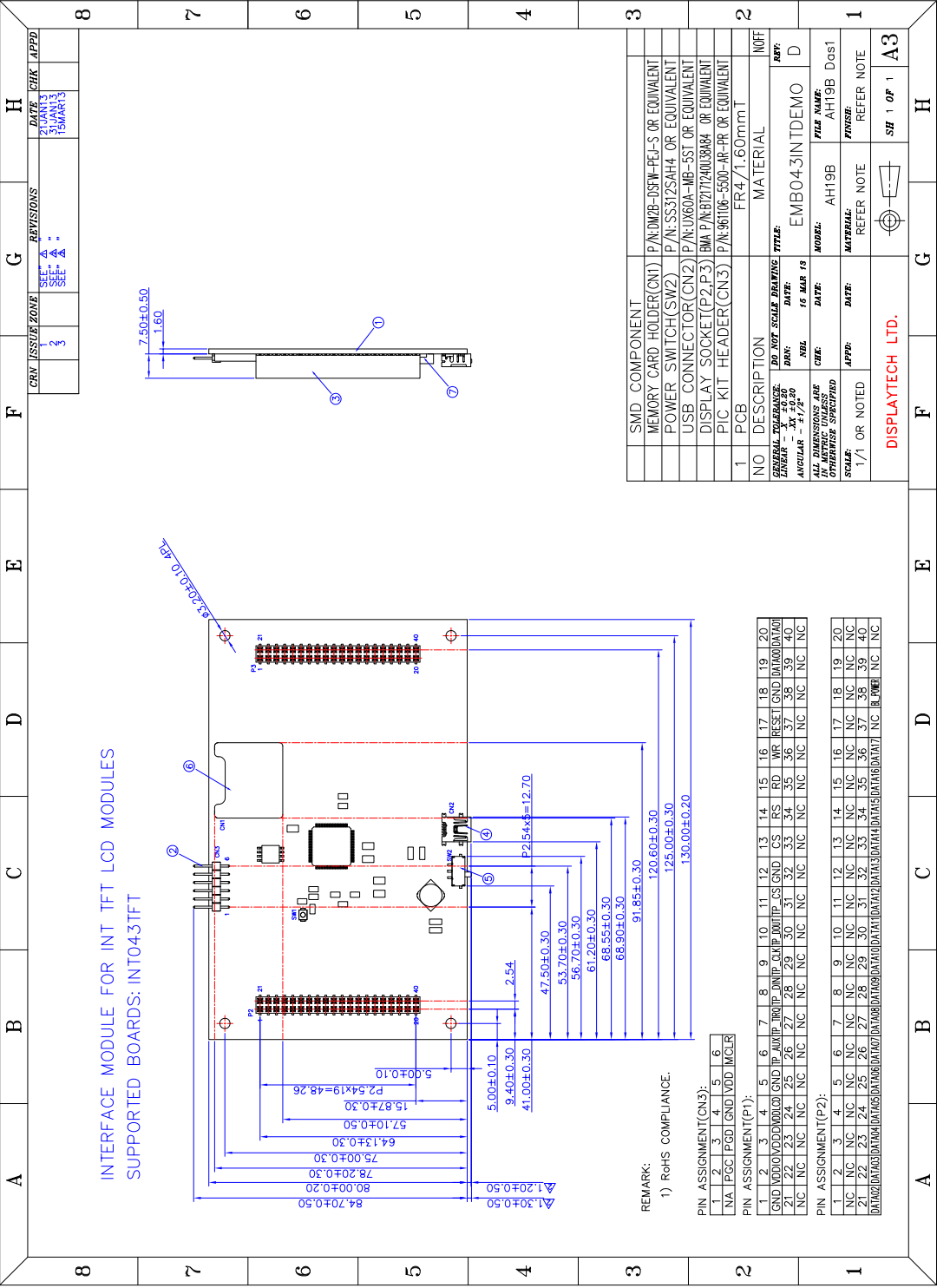
The SSD1961 as well as the Himax HX8257-A COG TFT Controller/Driver on-board the TFT module are automatically initialized upon power-up of the integrated module by an on-board ATmega8 microcontroller.

During the auto-initialization time, the PIC MCU should configure all I/O pins connected to the integrated board as inputs, as the on-board ATmega8 asserts control over these pins to configure the controller and driver. Please see the [INT043BTFT datasheet](#) for more details.

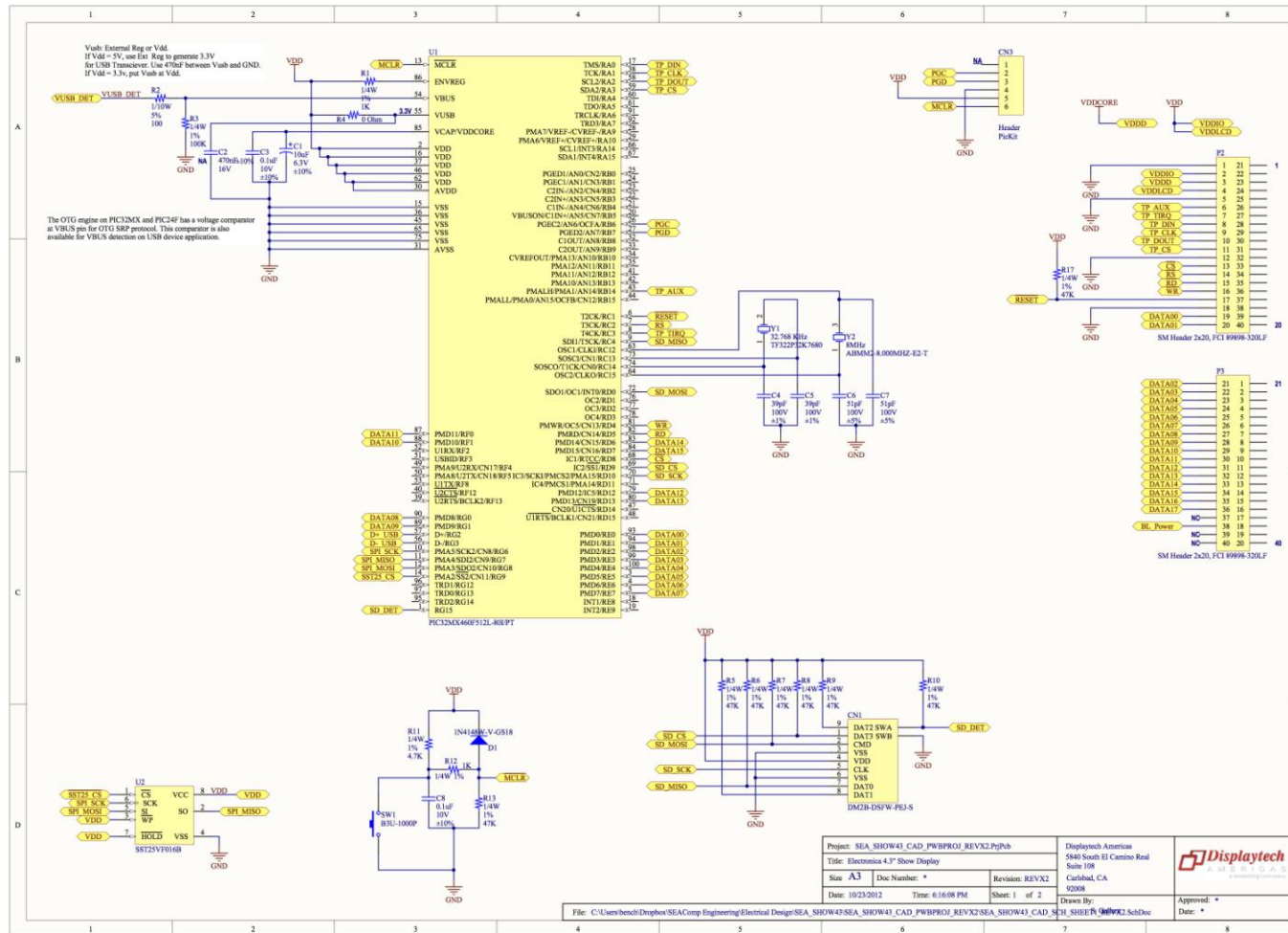
## 3. Example Software

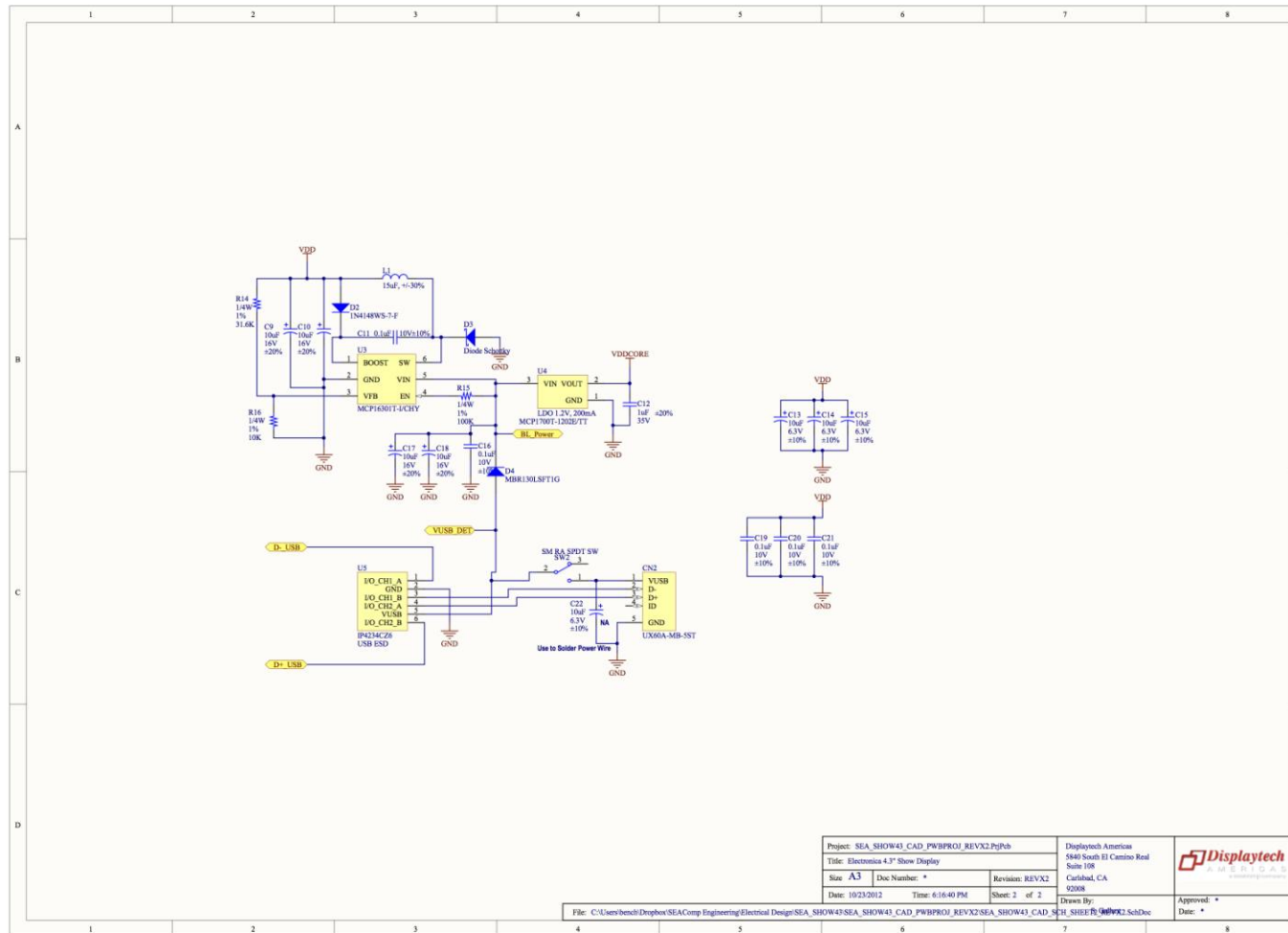
Example software is available from Displaytech upon request. Please contact Displaytech at [sales@displaytech-us.com](mailto:sales@displaytech-us.com).

4. Mechanical Drawing



## 5. Schematic





## 6. Bill of Materials

| Manufacturer | Part Number            | Package   | Qty | Value           | Designator                         | Description                                                       |
|--------------|------------------------|-----------|-----|-----------------|------------------------------------|-------------------------------------------------------------------|
| Kemet        | T491A106M016AT         | 1206      | 5   | 10uF            | C1, C13, C14, C15, C22             | Polarized Capacitor (Axial)                                       |
| TDK          | C1608X7R1C474K         | 0603      | 1   | 470nF           | C2                                 | Ceramic Capacitor                                                 |
| Kemet        | C0603C104K8RAC<br>TU   | 0603      | 7   | 0.1uF           | C3, C8, C11, C16, C19,<br>C20, C21 | Polarized Capacitor (Axial)                                       |
| AVX          | 06031A390FAT2A         | 0603      | 2   | 39pF            | C4, C5                             | Polarized Capacitor (Axial)                                       |
| AVX          | 06031A510JAT2A         | 0603      | 2   | 51pF            | C6, C7                             | Polarized Capacitor (Axial)                                       |
| Kemet        | T491A106M016AT         | 1206      | 4   | 10uF            | C9, C10, C17, C18                  | Polarized Capacitor (Axial)                                       |
| TDK          | C1608X7R1V105M         | 0603      | 1   | 1uF             | C12                                | Ceramic Capacitor                                                 |
| Hirose       | DM2B-DSFW-PEJ-S        | -         | 1   | -               | CN1                                | CONN MEMORY MINI SD BOTTM MT<br>SMD                               |
| Hirose       | UX60A-MB-5ST           | -         | 1   | -               | CN2                                | USB 2.0, Right Angle, SMT, MINI-B Type,<br>Receptacle, 5 Position |
| 3M           | 961106-5500-AR-<br>PR  | -         | 1   | -               | CN3                                | SM Header, 1x6-Pin, Right Angle, 0.1"                             |
| Vishay       | 1N4148W-V-GS18         | SOD-123-2 | 1   | -               | D1                                 | High Conductance Fast Diode                                       |
| Vishay       | 1N4148WS-7-F           | SOD-323   | 1   | -               | D2                                 | High Conductance Fast Diode                                       |
| Diodes       | ZLLS400TA              | SOD-323   | 1   | -               | D3                                 | Schottky Rectifier                                                |
| ON Semi      | MBR130LSFT1G           | SOD-123FL | 1   | -               | D4                                 | High Conductance Fast Diode                                       |
| Sumida       | CDRH6D28NP-<br>150NC   | -         | 1   | 15uF,<br>+/-30% | L1                                 | Inductor                                                          |
| FCI          | 89898-320LF            | -         | 2   | -               | P2, P3                             | Header, SMT, 2x20-Pin, 0.1"                                       |
| Vishay       | CRCW06031K00FK<br>EAHP | 0603      | 2   | 1K              | R1, R12                            | Resistor                                                          |
| Yageo        | RC0603JR-<br>07100RL   | 0603      | 1   | 100             | R2                                 | Resistor                                                          |

| Manufacturer | Part Number                | Package        | Qty | Value | Designator                      | Description                                                               |
|--------------|----------------------------|----------------|-----|-------|---------------------------------|---------------------------------------------------------------------------|
| Vishay       | CRCW0603100KFK<br>EAHP     | 0603           | 2   | 100K  | R3, R15                         | Resistor                                                                  |
| Yageo        | RC0603JR-070RL             | 0603           | 1   | 0 Ohm | R4                              | Resistor                                                                  |
| Vishay       | CRCW060347K0FK<br>EAHP     | 0603           | 7   | 47K   | R5, R6, R7, R8, R9,<br>R10, R13 | Resistor                                                                  |
| Vishay       | CRCW06034K70FK<br>EAHP     | 0603           | 1   | 4.7K  | R11                             | Resistor                                                                  |
| Vishay       | CRCW060331K6FK<br>EA       | 0603           | 1   | 31.6K | R14                             | Resistor                                                                  |
| Vishay       | CRCW060310K0FK<br>EAHP     | 0603           | 1   | 10K   | R16                             | Resistor                                                                  |
| Omron        | B3U-1000P                  | ELTSM-65       | 1   | -     | SW1                             | Switch                                                                    |
| NKK Switches | SS312SAH4                  | -              | 1   | -     | SW2                             | SM SPDT Sub Min Tog Switch, Right Angle                                   |
| Microchip    | PIC32MX460F512L<br>-80I/PT | TQFP-PT100     | 1   | -     | U1                              | 80 MHz32-Bit Microcontroller with USB, 512KB Program Memory, 100-pin TQFP |
| Microchip    | SST25VF016B-75-4I-S2AF     | SOIJ-SM8       | 1   | -     | U2                              | 16mbit SPI Bus Serial flash, 8-Pin SOIJ, Industrial Temperature           |
| Microchip    | MCP16301T-I/CHY            | SOT-23-6       | 1   | -     | U3                              | Buck Adj 0.6A SOT23-6 Regulator. 2-15Vout, 4-30Vin                        |
| Microchip    | MCP1700T-1202E/TT          | SOT23-3        | 1   | -     | U4                              | LDO, 3-Pin SOT-23, 1.2V Out, 200mA                                        |
| NXP          | IP4234CZ6                  | SC-74, SOT-457 | 1   | -     | U5                              | Single USB 2.0 ESD protection to IEC 61000-4-2 level 4                    |
| CTS          | TF322P32K7680              | 3215           | 1   | -     | Y1                              | Crystal Oscillator                                                        |
| CTS          | ABMM2-8.000MHZ-E2-T        | SMD 6mmx3.6mm  | 1   | -     | Y2                              | Crystal Oscillator                                                        |

## 7. Component Datasheets

|                                           |                      |
|-------------------------------------------|----------------------|
| Displaytech INT043BTFT                    | <a href="#">Link</a> |
| Displaytech DT043BTFT                     | <a href="#">Link</a> |
| Solomon Systech SSD1961                   | <a href="#">Link</a> |
| Maximum Integrated MAX11802               | <a href="#">Link</a> |
| Microchip PIC32MX460F512L Microcontroller | <a href="#">Link</a> |
| SST SST25VF016B 16 Mbit SPI Serial Flash  | <a href="#">Link</a> |
| Hirose DM2B-DSFW-PEJ-S                    | <a href="#">Link</a> |
| Microchip MCP16301T-I/CHY                 | <a href="#">Link</a> |
| Microchip MCP1700T-1202E/TT               | <a href="#">Link</a> |

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