

ICE E INK EVALUATION SHIELD COMPATIBLE BOARD

1 Features

- Supports E Ink panels up to 2200x1650
- ITE IT8951E-64 EPD timing controller
- Texas Instruments TPS651851 power management IC
- 3 Multipurpose hardware buttons
- MicroSD card support
- 40 pin 0.5mm FPC connector for TTL interfaces
- Three power inputs – header pins, USBx2
- SPI interface to microcontroller
- USB interface to compatible Windows PC
- Arduino Shield form factor



Figure 1 ICE Shield top view

- IT8951 firmware programming via USB, microcontroller, and 2.54mm header
- ROHS compliant

2 Description

E Ink's ICE Shield is a development platform capable of driving E Ink displays with a TTL interface. The platform is based on the popular Shield form factor and can plug directly into a compatible microcontroller board.

3 System Requirements

The ICE Shield is intended to be programmed and controlled by microcontroller over SPI. The default firmware is also compatible with Windows based PC's over USB.

MCU Operation

- 4 wire SPI communication interface
- 3.3V VDD supply
- GND
- 2 GPIO ports (HRDY and RESET_)

PC Operation

- Windows® OS (XP, 7, 8 and 10)
- USB Type-A to Micro USB cable



4 Hardware Description

4.1 Block Diagram

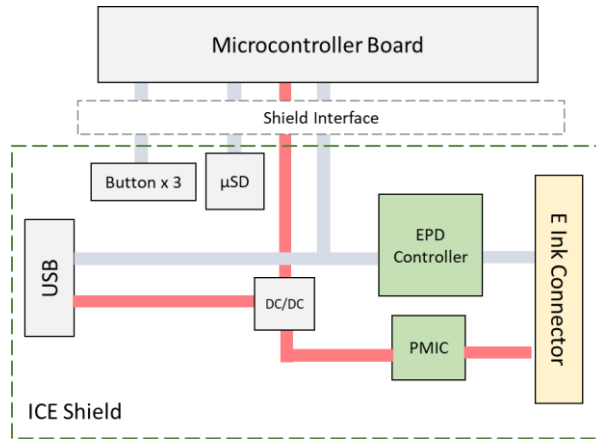


Figure 2 ICE Shield Block Diagram

4.2 Pin Description

Table 4-1 ICE Shield Pin Definitions

STM32 Shield Pin Label	Pin Description
3.3V	3.3V
5V	5V
D10	IT8951 SPI CS
D9	IT8951 HRDY
D8	FLASH CS
D4	FLASH MISO
D5	FLASH MOSI
D7	FLASH SCLK
GND	GND
D3	IT8951 RESET
D12	MISO
D11	MOSI
D13	SPI CLOCK
D6	SD CS

4.3 J4 Header

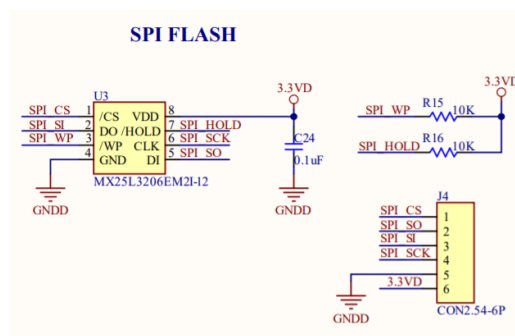


Figure 3 J4 Header Pin Definition

5 Evaluation MCU Firmware

The ICE Shield is compatible with many microcontroller development boards that support the Shield interface. Note that some Arduino based development boards have an ICSP header for SPI that ICE Shield does not support.

5.1 Display Drivers

Display software drivers are available as a reference to control the IT8951 timing controller over an SPI interface. Sample firmware for STMicroelectronics STM32L4 Discovery kit IOT node (B-L475E-IOT01) is available, please contact E Ink Sales for access.

A SPI Programming Guide is available for users who want to write their own display driver.

6 Evaluation PC Software

The ICE Shield can be evaluated with a PC over USB and the corresponding PC software.

6.1 Windows Mode via Windows Application

ICE Shield can be evaluated as a standalone unit by using the Windows GUI software. A microcontroller board is not required if the Windows GUI software is used. Please refer to the ICE Shield User Guide for additional information.

6.2 Command Line Interface

Along with the Windows GUI software, a command line interface can be used to control ICE Shield in combination with a microcontroller board. Please refer to the ICE Shield User Guide for additional information.

Revision History

Version	Date	Page	Description
1.0	2022/04/19		Initial