



EPD_COMPACT

Small size E-paper development
platform

Rev.1.2

Records of Revision

No Rev.	Date	Description
1.0	2018-01-05	Initial Release

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1) General Specification

Item	Contents
Compatible Display Types	Holitech e-paper displays
Driver IC	STM32F031C6T6
Interface	4-wire serial

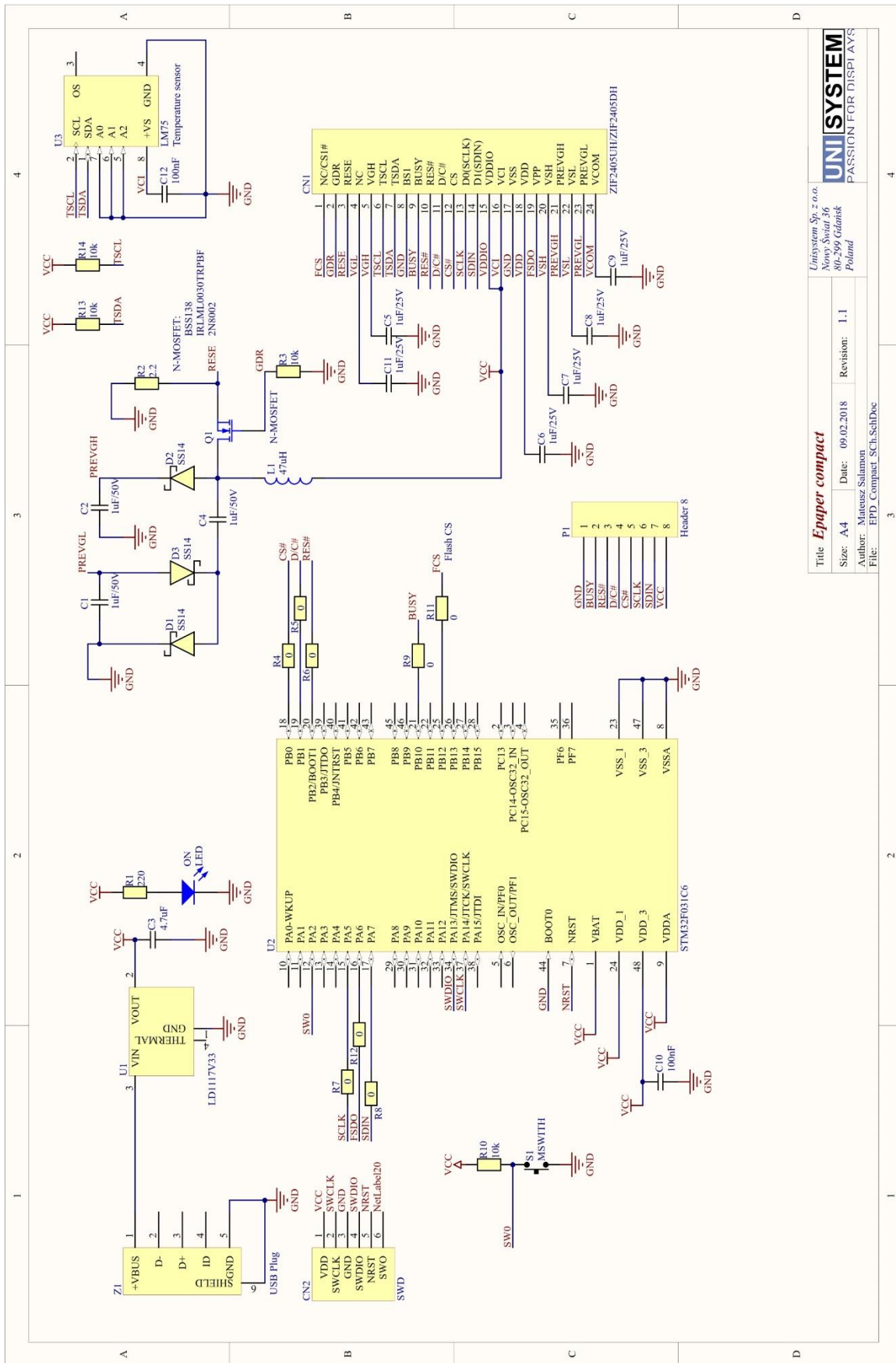
2) Mechanical Specification

Item	Value	Unit
Outline Dimension w/o goldpins	34(L) x 25(W) x 9(T)	mm
Outline Dimension	34(L) x 25(W) x 12.5(T)	mm

3) Electrical Specification

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
System Power Supply Voltage	VCC	3	3.3	3.6	V	-
USB Power Supply	VUSB	4.75	5	5.25	V	-
Interface Input Voltage		0		VDD	V	-

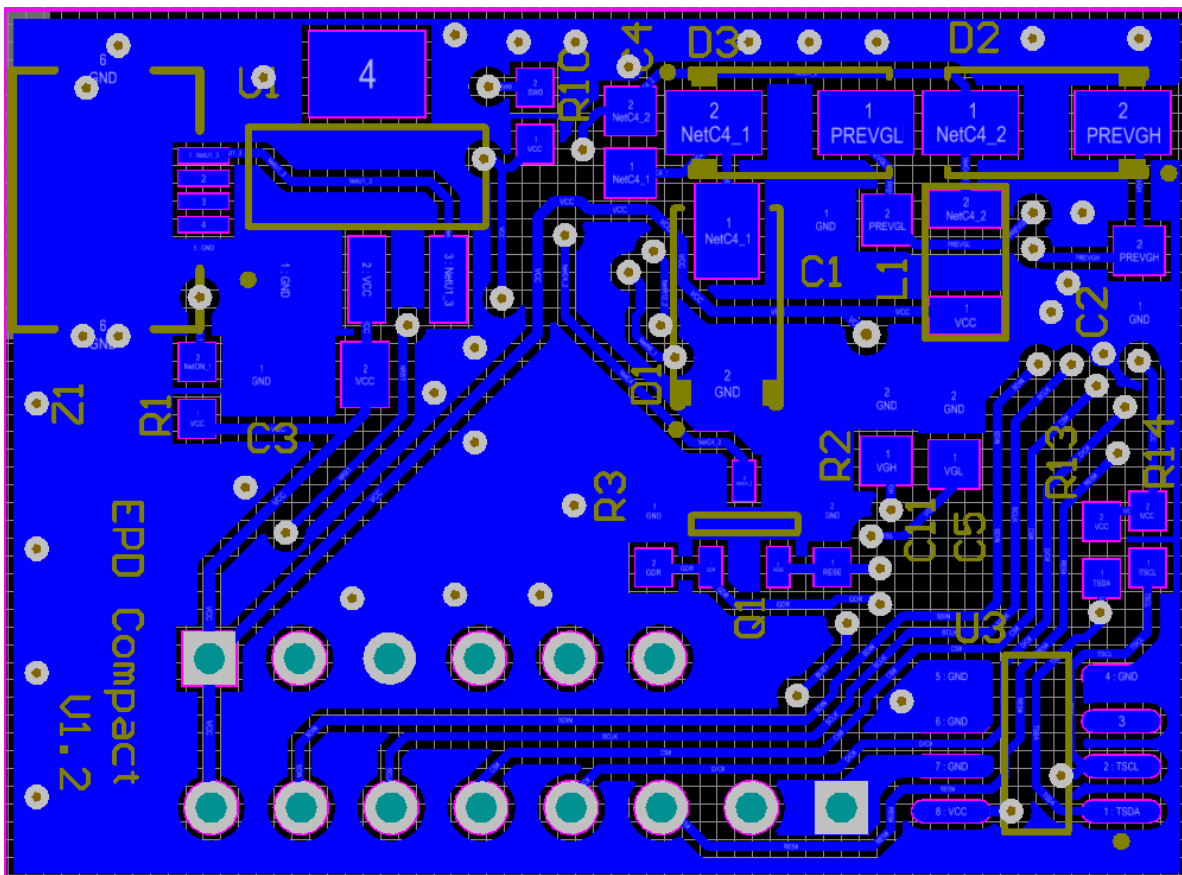
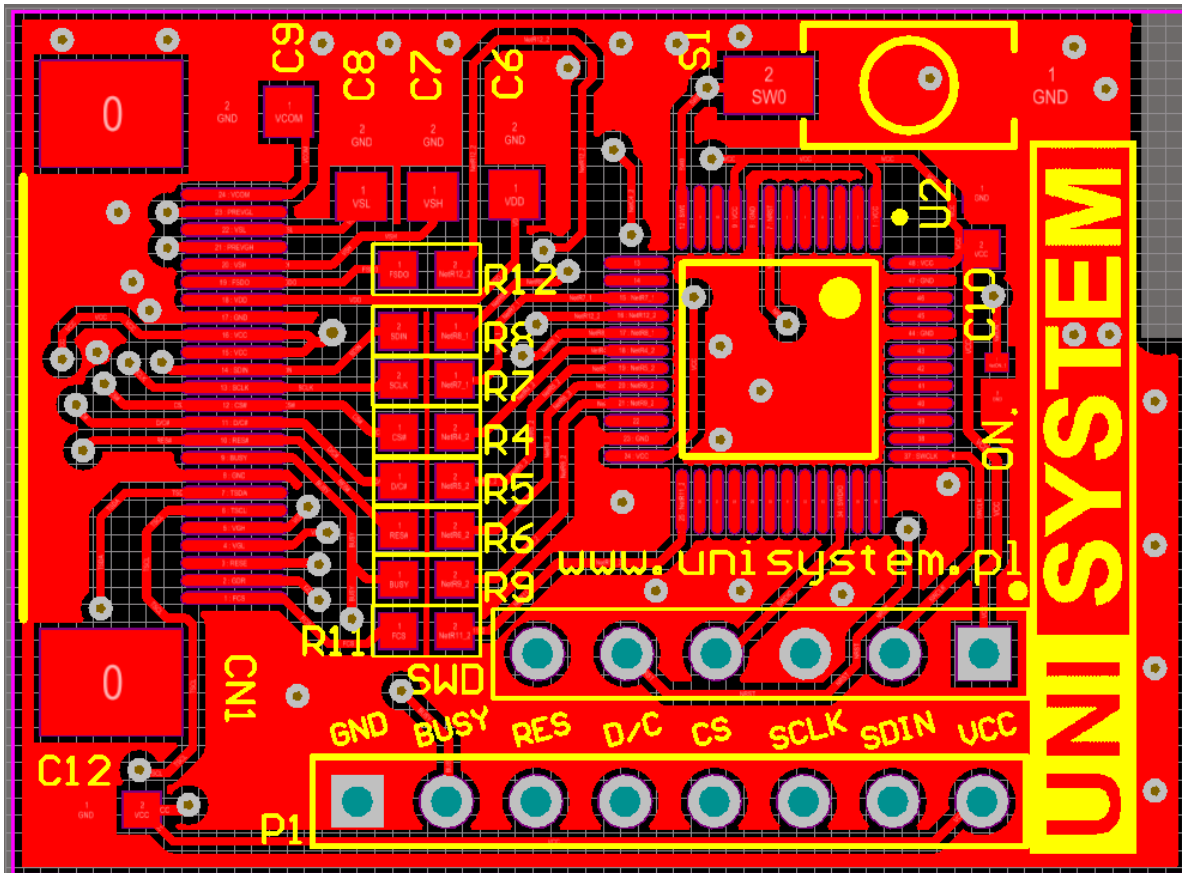
4) Schematic



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5) PCB View



6) Display Interface Pin Description – P1

Pin No.	Symbol	Description
1	GND	Ground
2	BUSY	Busy State Output Pin
3	RES	Reset
4	D/C	Data /Command Control Pin
5	CS	Chip Select Input Pin
6	SCLK	Serial Clock Pin
7	SDIN	Serial Data Pin
8	VCC	Power Supply

7) SWD Interface Pin Description

Pin No.	Symbol	Description
1	VDD	Power Supply (VCC)
2	SWCLK	SWD Clock Line
3	GND	Ground
4	SWDIO	SWD Data Line
5	NRST	SWD Reset
6	NC	Not Connected

8) Board Working modes

The board could be set to two working modes.

1. Independent Display Control.

Connected display is controlled by onboard MCU. This mode is active when R4-R9 and R11 jumpers are shorted. With this mode is available to analyse built-in interface signals by P1 connector. It's nice way for debugging if prototype doesn't work as is expected.

2. External Display Control

Connected display is controlled by external MCU by P1 interface connector. Remove R4-R9 and R11 jumpers to set this mode.

9) Independent Display Control

This mode is best way for fast display's tests. Unisystem already prepared demo codes for all Holitech's displays. Please contact us on tech@unisystem.pl to get sample codes.

Sample codes are written with System Workbench for STM32 using STM32CubeMX with STM32 HAL libraries. Please visit STMicroelectronic for appropriate software. The development board programming is performed by ST-Link V2 programmer and SWD connector.

The example code shows general work e-paper display. Display's content is changing after button pressed by default. For most Black/White displays there are implement two refreshing modes – blinking and flashless.

Flashing mode is classic e-paper refreshing mode. There is visible characteristic blinking when content is changing.

Flashless mode provides fast refreshing with no blinking. It's very comfortable to use with interfaces to make them responsible.

For Black/White/Red displays only blinking mode is available.

The code provides basic functions described below. They may vary depending on the display.

void EPD_Init(); - Display's initialization.

void EPD_Write_LUT(const uint8_t* lut); - Writing waveform's Look Up Table. It's useful to change display mode between blinking and flashless modes. LUT is predefined and provided by display's producer.

void EPD_Clear(); - Clear whole display(set pixels as white).

void EPD_Full(); - Fulfill whole display by black pixels.

void EPD_Image(const uint8_t* img); - Put image data for whole screen. Image have to be same resolution as display.

void EPD_Image_partial(uint16_t size_x, uint16_t size_y, const uint8_t* img); - Put image data for smaller image than display's resolution. There is need to set display's RAM area and pointer before send data.

void EPD_Update_Display(); - Lunch display's refresh procedure.

void EPD_RAM_Addr_Set(uint8_t addrxh_s, uint8_t addrxh_e, uint8_t addryh_s, uint8_t addryl_s, uint8_t addryh_e, uint8_t addryl_e); - Set display's RAM window for image data.

void EPD_RAM_Pointer_Set(uint8_t start_addrxh, uint8_t start_addryh, uint8_t start_addryl); - Set display's RAM pointer.

10) External Display Control

This board was also created for easy use in development stages when new device is built. When jumpers are removed, P1 connector allows to display control with external MCU for example device's prototype. There is no button available in this mode. It's highly recommended to base on example code when external MCU is configured to work with e-paper.



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