

Supply

The diagram illustrates a 5V regulator supply circuit. It features a 1N5819 diode (DS1) connected to a 100nF capacitor (CS1) at the input. The input is also connected to a 5V source. The diode's output goes to the IN pin of an ICS LD1117 V50 voltage regulator (ADJ). The regulator's OUT pin is connected to a 100nF capacitor (CS2) and a 47µF capacitor (CS3) in parallel, which is then connected to a 5V output. A red LED (LS) is connected to the output through a 2k resistor (RS).

Buttons

Programmer

The diagram illustrates the wiring for a programmer. A central JP connector is connected to a 5V supply and GND. On the left, RP1 (300) connects PROG_MISO to MISO, PROG_SCK_AND_DISP_COL_SCK to SCK, and RESET to RST. On the right, RP2 (300) connects PROG_MOSI_AND_DISP_COL_SER to MOSI.

Logic

The logic diagram shows two inverters, ICLA and ICLD, both labeled 74HC04N. The input to ICLA is BUS_RGB (pin 1) and its output is BUS_RGB (pin 2). The input to ICLD is RETURN_RGB (pin 8) and its output is RETURN_RGB (pin 9).

The circuit schematic shows a 74HC04N package with pins 14 (VCC) connected to +5V and pins 7 (GND) connected to GND. A capacitor CS4 (100nF) is connected between pins 14 and 7. The output of the first inverter (pin 2) is labeled ICLP.

Out Display

Diagram illustrating the display output circuit connections:

- Power supply: PSS 254/8G
- Ground: GND
- Resistors: R1, R2, R3, R4, R5, R6 (all 120 ohms)
- Connections:
 - DISP_ROW_SER (Green line) connected to R1, which is connected to JD-1 (+5V).
 - PROG_MOSI_AND_DISP_COL_SER (Green line) connected to R2, which is connected to JD-2 (+5V).
 - DISP_ROW_SCK (Green line) connected to R3, which is connected to JD-3 (+12V).
 - PROG_SCK_AND_DISP_COL_SCK (Green line) connected to R4, which is connected to JD-4 (+12V).
 - DISP_RCK (Green line) connected to R5, which is connected to JD-5 (+12V).
 - DISP_ENABLE (Green line) connected to R6, which is connected to JD-6 (+12V).

MEGA328P-PU

RESET

PC6(RESET)

GND

AREF

AVCC

PC0(ADC0)

PC1(ADC1)

PC2(ADC2)

PC3(ADC3)

PC4(ADC4/SDA)

PC5(ADC5/SCL)

PB6(XTAL1/TOSC1)

PB7(XTAL2/TOSC2)

GND

VCC

PD0(RXD)

PD1(TXD)

PD2(INT0)

PD3(INT1)

PD4(XCK/T0)

PD5(T1)

PD6(AIN0)

PD7(AIN1)

PB0(ICP)

PB1(OC1A)

PB2(SS/OC1B)

PB3(MOSI/OC2)

PB4(MISO)

PB5(SCK)

23

24

25

26

27

28

DISP_ROW_SER

DISP_ROW_SCK

DISP_RCK

DISP_ENABLE

BTN2

2

3

4

5

6

11

12

13

14

15

16

17

18

19

RETURN_RGB

BUS_RGB

BUS_BTN_DATA

BUS_BTN_LOAD

BUS_IR_CLK

BUS_LED_DATA

BUS_LED_LOAD

RETURN_BTN_DATA

BTN3

PROG_MOSI_AND_DISP_COL_SER

PROG_MISO

PROG_SCK_AND_DISP_COL_SCK

OC0B
(also OC0A)

Additional

indicator for
sending data
to RGB-leds

indicator for
receiving data
from last RGB-led

indicator for
turning IR-leds on

indicator for
receiving a
pushed button

1. Inversion of UART:
bus-protocol for RGB-LED (WS2812B)
is invers to UART-Protocol
i.e. idle is low instead of high
2. Additional features:
power supply
button 3
data leds (RGB, IR, Button)
3. only for self-test:
BUS_BTN_DATA
RETURN_RGB
RETURN_LED_DATA

In/Out Bus

The top diagram shows the connection for SV1. It includes the following components and connections:

- BUS_LED_DATA** (R7, 120) connected to pin 1.
- BUS_BTN_DATA** (R9, 120) connected to pin 3.
- BUS_IR_CLK** (R10, 120) connected to pin 5.
- BUS_RGB** (R20, 120) connected to pin 7.
- BUS_CLK** (R21, 120) connected to pin 9.
- BUS_LED_LOAD** (R12, 120) connected to pin 2.
- BUS_BTN_LOAD** (R13, 120) connected to pin 4.
- GROUND** connected to pin 10.

The bottom diagram shows the connection for SV2. It includes the following components and connections:

- RETURN_LED_DATA** (R18, 120) connected to pin 1.
- RETURN_BTN_DATA** (R19, 120) connected to pin 3.
- RETURN_IR_CLK** (R20, 120) connected to pin 5.
- RETURN_RGB** (R21, 120) connected to pin 7.
- RETURN_CLK** (R22, 120) connected to pin 9.
- RETURN_LED_LOAD** (R12, 120) connected to pin 2.
- RETURN_BTN_LOAD** (R13, 120) connected to pin 4.
- GROUND** connected to pin 10.

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