

# Display driver module

32 SPI-driven displays

## Schematic

The concept is to buffer the time-critical clock signal. A wire connected directly to the MCU is loaded by the long distance (resistance in the connectors and wires) and could be susceptible to noise. Using a 541 buffer and shunt resistors controls this impedance. The serial data and data/command (DC) signals are also buffered to avoid time propagation errors.

The second purpose is to use a chain of shift registers to provide chip select (CS) signals. It is functionally equivalent to a DOUT module, but the header is directly compatible with GPIO on the Core.

## BOM v1.0

| Type    | Part | Value          | Device         |
|---------|------|----------------|----------------|
| Caps    | C1   | 100n           | C025-025×050   |
|         | C2   | 100n           | C025-025×050   |
|         | C3   | 100n           | C025-025×050   |
|         | C4   | 100n           | C025-025×050   |
|         | C5   | 100n           | C025-025×050   |
|         | C6   | 100n           | C025-025×050   |
|         | C7   | 100n           | C025-025×050   |
| ICs     | IC1  | 74HC541N       | 74HC541N       |
|         | IC2  | 74HC541N       | 74HC541N       |
|         | IC3  | 74HC541N       | 74HC541N       |
|         | IC4  | 74HC595N       | 74HC595N       |
|         | IC5  | 74HC595N       | 74HC595N       |
|         | IC6  | 74HC595N       | 74HC595N       |
|         | IC7  | 74HC595N       | 74HC595N       |
| Headers | J1   | PINHD-2X54WALL | PAK100/2500-10 |
|         | J2   | PINHD-2X54WALL | PAK100/2500-10 |
|         | J3   | PINHD-2X54WALL | PAK100/2500-10 |
|         | J4   | PINHD-2X54WALL | PAK100/2500-10 |
|         | J5   | PINHD-2X54WALL | PAK100/2500-10 |
|         | J6   | PINHD-2X54WALL | PAK100/2500-10 |
|         | J7   | PINHD-2X54WALL | PAK100/2500-10 |
|         | J8   | PINHD-2X54WALL | PAK100/2500-10 |
|         | J9   | +5V            | 22-23-2031     |
|         | J10B | PINHD-2X54WALL | PAK100/2500-10 |

| Type      | Part  | Value           | Device         |
|-----------|-------|-----------------|----------------|
|           | J10B1 | PINHD-2X54WALL  | PAK100/2500-10 |
|           | J15A  | PINHD-2X8THTTHT | PAK100/2500-16 |
|           | J15A1 | PINHD-2X8THTTHT | PAK100/2500-16 |
| Resistors | R1    | ~220R           | 0207/10        |
|           | R2    | ~220R           | 0207/10        |
|           | R3    | ~220R           | 0207/10        |
|           | R4    | ~220R           | 0207/10        |
|           | R5    | ~220R           | 0207/10        |
|           | R6    | ~220R           | 0207/10        |
|           | R7    | ~220R           | 0207/10        |
|           | R8    | ~220R           | 0207/10        |
|           | R9    | ~220R           | 0207/10        |
|           | R10   | ~220R           | 0207/10        |
|           | R11   | ~220R           | 0207/10        |
|           | R12   | ~220R           | 0207/10        |
|           | R13   | ~220R           | 0207/10        |
|           | R14   | ~220R           | 0207/10        |
|           | R15   | ~220R           | 0207/10        |
|           | R16   | ~220R           | 0207/10        |
|           | R17   | ~220R           | 0207/10        |
|           | R18   | ~220R           | 0207/10        |
|           | R19   | ~220R           | 0207/10        |
|           | R20   | ~220R           | 0207/10        |
|           | R21   | ~220R           | 0207/10        |
|           | R22   | ~220R           | 0207/10        |
|           | R23   | ~220R           | 0207/10        |
|           | R24   | ~220R           | 0207/10        |
|           | R25   | ~1k             | 0207/10        |
|           | R26   | ~1k             | 0207/10        |
|           | R27   | ~1k             | 0207/10        |
|           | R28   | ~1k             | 0207/10        |
|           | R29   | ~1k             | 0207/10        |
|           | R30   | ~1k             | 0207/10        |
|           | R31   | ~1k             | 0207/10        |
|           | R32   | ~1k             | 0207/10        |
|           | R33   | ~1k             | 0207/10        |
|           | R34   | ~1k             | 0207/10        |
|           | R35   | ~1k             | 0207/10        |
|           | R36   | ~1k             | 0207/10        |
|           | R37   | ~1k             | 0207/10        |
|           | R38   | ~1k             | 0207/10        |
|           | R39   | ~1k             | 0207/10        |
|           | R40   | ~1k             | 0207/10        |
|           | R41   | ~1k             | 0207/10        |
|           | R42   | ~1k             | 0207/10        |

| Type | Part | Value | Device  |
|------|------|-------|---------|
|      | R43  | ~1k   | 0207/10 |
|      | R44  | ~1k   | 0207/10 |
|      | R45  | ~1k   | 0207/10 |
|      | R46  | ~1k   | 0207/10 |
|      | R47  | ~1k   | 0207/10 |
|      | R48  | ~1k   | 0207/10 |
|      | R49  | ~1k   | 0207/10 |
|      | R50  | ~1k   | 0207/10 |
|      | R51  | ~1k   | 0207/10 |
|      | R52  | ~1k   | 0207/10 |
|      | R53  | ~1k   | 0207/10 |
|      | R54  | ~1k   | 0207/10 |
|      | R55  | ~1k   | 0207/10 |
|      | R56  | ~1k   | 0207/10 |

## Versions

v1.0: first release. Erratum: there is a significant error in that J15 is mirrored. The simplest way to get it working is to swap pairs of the ribbon wires as shown:



Here the header notches are aligned with the silkscreen. Only the first six wires are required.

## Assembly

All parts are THT, start with resistors and caps, IC sockets then headers.

## Interconnection to Core

J10B connects to J10B. J15A to J15A. Note the mirrored connection on v1.0

J15A1/J10B1 chain another Display Driver. Note that the J15 connection should not be mirrored for subsequent boards.

## Dimensions

The PCB is 100\*100mm with 3.2mm diameter holes centred 3.5mm from the edges.

---

## License

Currently the design is © 2018 antilog devices with all rights reserved; all documentation is CC BY-NC-SA 3.0.

From:

<https://wiki.midibox.org/> - **MIDIbox**

Permanent link:

[https://wiki.midibox.org/doku.php?id=display\\_driver&rev=1520495593](https://wiki.midibox.org/doku.php?id=display_driver&rev=1520495593)

Last update: **2018/03/08 07:53**

