



## DC-BUS Power line Communication Shield for Arduino MEGA 2560 V3

*This information is preliminary and may be changed without notice*

### 1 General

This app note describes the DC-BUS power line communication shield for Arduino Mega 2560 V3 board. The DC-BUS shield interfaces with the DC-BUS shield with MEGA board via the Arduino UART port. The DC-BUS shield is a UART protocol physical layer for data communication over the powerline.

### 2 The DC-BUS MEGA Shield

The DC-BUS MEGA shield consists of on-board 12V to 3.3V supply (LDO), Yamar's DCB/SIG Family powerline transceiver (PLC IC), and optional LIN/RS485 transceiver.

Table 1 describes the MEGA to DC-BUS shield digital interface connections.

**Table 1 - MEGA - DC-BUS Shield digital pins connection**

MEGA Pin #	Description	Comments
D0	Reserved for Arduino RX Serial monitoring	
D1	Reserved for Arduino TX Serial monitoring	
D4	EN_LIN_TRANSC	When on-board LIN/RS485 transceiver is in use, pull this pin high to enable transceiver DATA OUT routing to the PLC IC. Else, Keep this pin low.
D5	HDC	Data/Command pin. When low it is possible to R/W to/from the device internal registers.
D6	NLOOPBACK	When high PLC IC loopback is disabled, when low loopback is enabled.
D7	SLEEP	
D10	NRESET	
D16	HDI	UART MEGA TX using Serial2.
D17	HDO	UART MEGA RX using Serial2.
D18	EN_RS485 Slave	When RS485 is in use, pull up this pin to enable RS485 DE or pull down for RS485 ~RE enable.
D19	RTR	User control digital Input
D62	SW1	User control digital Input
D63	SW2	User control digital Input
D64	SW3	User control digital Input
D65	SW4	User control digital Input
D66	SW5	User control digital Input
D67	SW6	User control digital Input
D68	SW7	User control digital Input
D69	SW8	User control digital Input
VIN	Connected to powerline connectors J4/J2.	<b>Powerline voltage 5V to 12V</b> for MEGA VIN supply and for powerline communication.
5V	Output 5V from the MEGA board.	Not in use

## 2.1 Connectors

**Table 2 - J4 - JACK PLUG - DC Power Line**

Name	Pin #
GND	1
GND	2
POWRIN (VBAT) <sup>1</sup>	3

**Table 3 - J2 - MTA - DC Power Line**

Name	Pin #
POWRIN (VBAT) <sup>1</sup>	1
GND	2

<sup>1</sup> VBAT input connects the shield to the DC powerline for communication and power supply for on-board 3.3V LDO and for MEGA board VIN supply.

Power supply requirements: 5V to 12V, minimum 250mA.

**Table 4 - J5 - LIN Transceiver interface**

Name	Pin #
LIN	3
POWRIN (VBAT)	2
GND	1

**Table 5 - J6 - RS485 Transceiver interface**

Name	Pin #
GND	1
EN_RS485_SLAVE (~RE/DE control).	2
RS485 +	3
RS485 -	4

## 2.2 Display LEDs

- TX LED - Indicates transmission.
- RX LED - Data output, indicates reception.
- ON LED - Indicates 3.3V power on.

### 3 PCB Layout

The PCB Layout is depicted in Figure 1 and Figure 2.

#### Top Layer

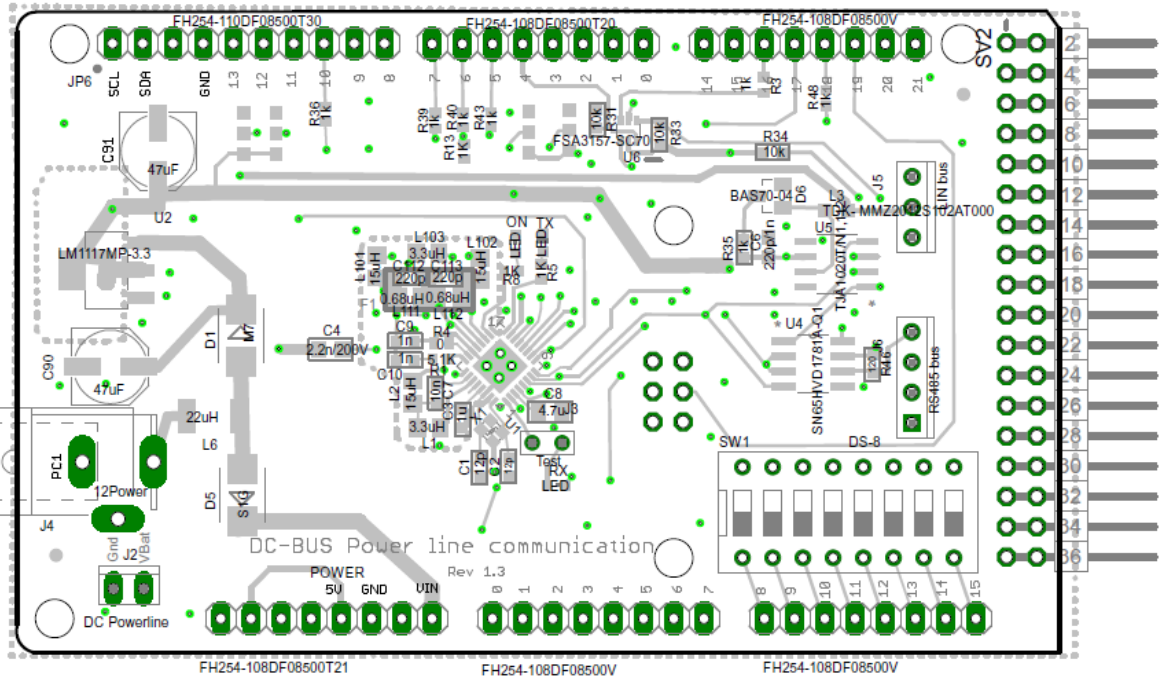


Figure 1 - Top layer

#### Bottom Layer

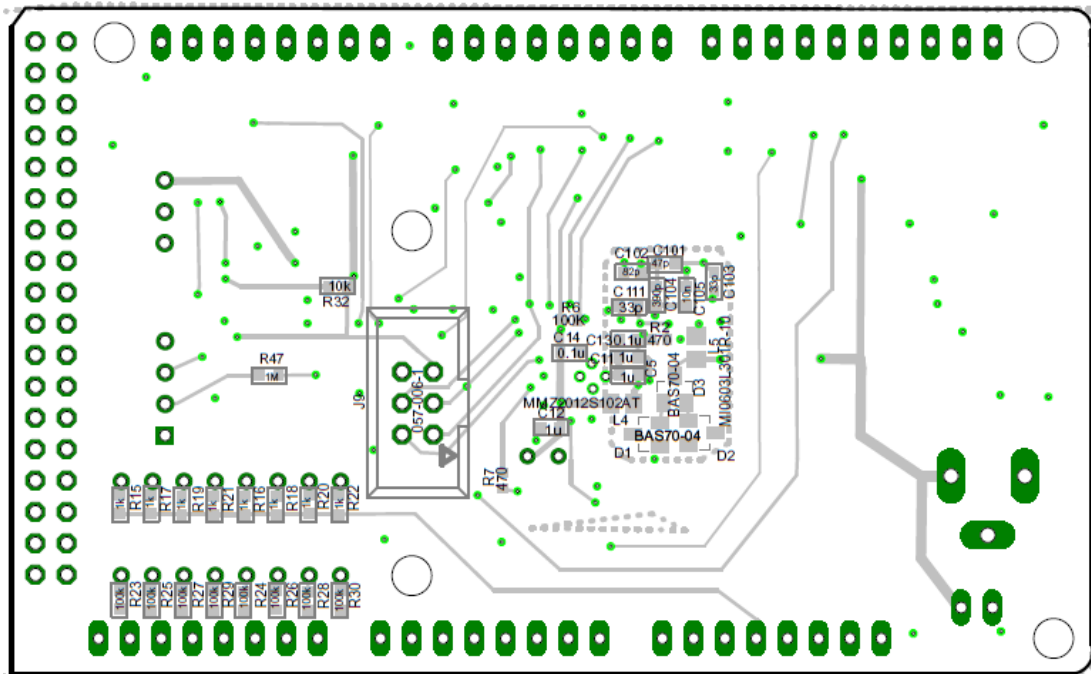


Figure 2 - Bottom layer

## 4 Schematics

Figure 3 depicts the PCB schematic.

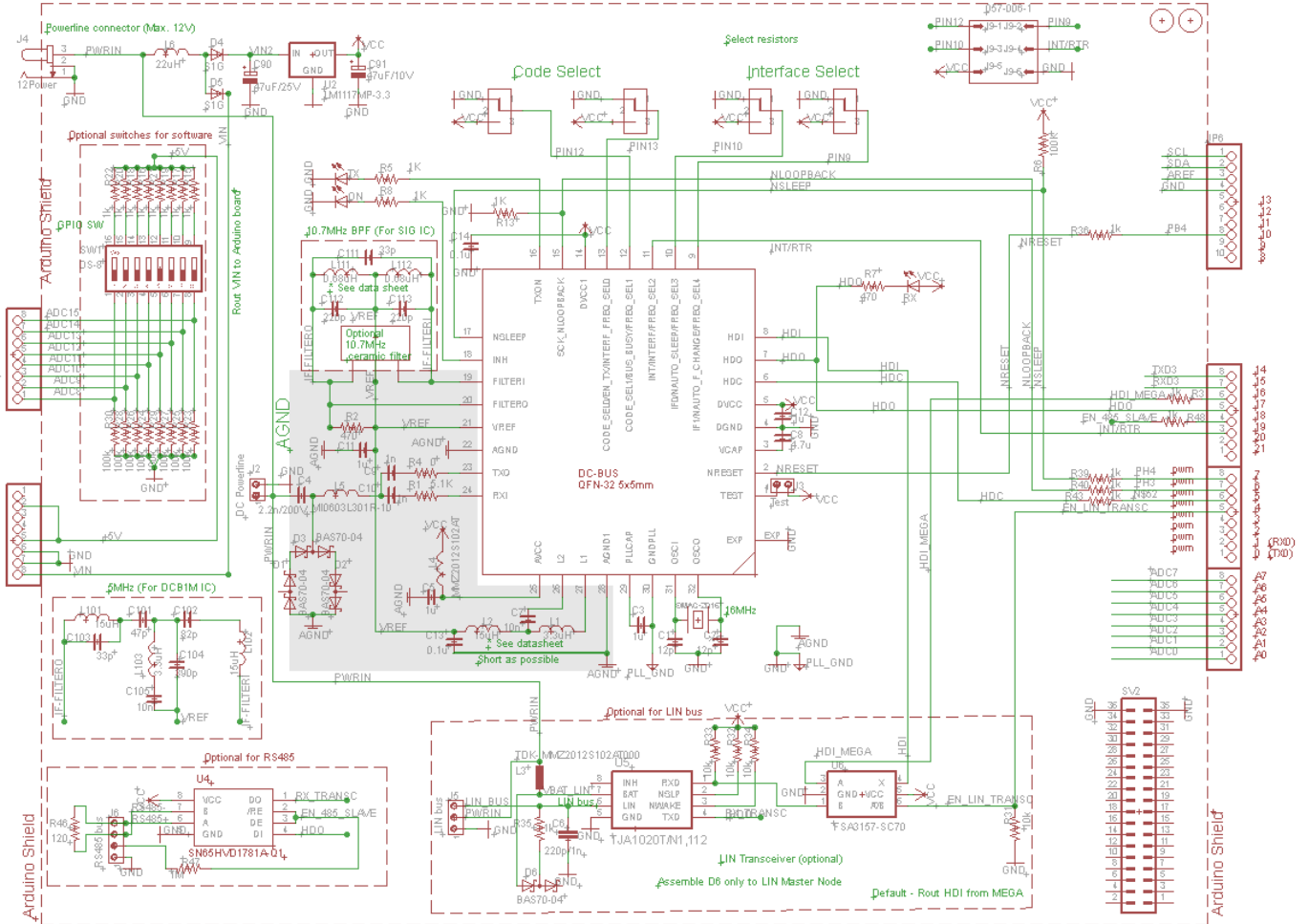


Figure 3 - MEGA - DC-BUS shield schematic