

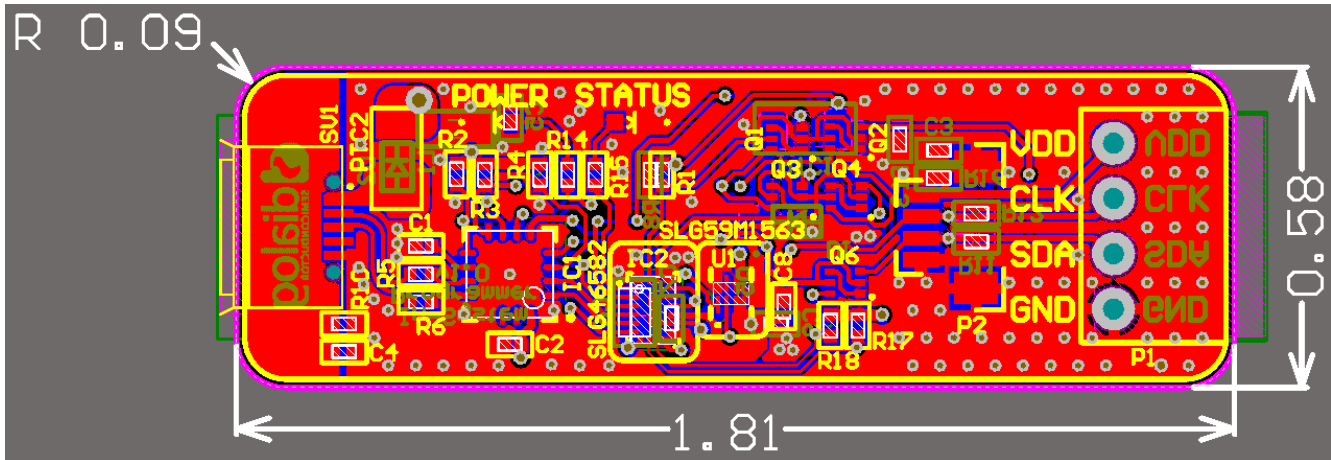
# **Quick Start Guide**

## **GreenPAK In-System Programming Board**

## GreenPAK In-System Programming Board

### Description

The In-System Programming (ISP) Board is a small PCB that allows to emulate and program the SLG46826/4 chip without using the Universal Development Board. The chip is programmed/emulated through the I<sup>2</sup>C protocol via four SLG46826/4 pins: VDD, SCL, SDA and GND.



**Note 1** All sizes in inches

**Figure 1: PCB**

The ISP board can be used with GreenPAK Designer version 6.xx and above. Select "ISP" in the "Development Platform Selector" window and click on the "Program" or "Emulate" button.

When the ISP board is connected to USB port, "Power" LED turns on. The ISP Programmer connector (P1 or P2) pins should be connected to the external board in order to SLG46826/4 (programmed) chip could be powered from the ISP or from external power supply. The ISP board detects external power and switches off its VDD line (in this case, I<sup>2</sup>C pull-up resistors are connected to the external power).

There are two options for the user to make a connection between the ISP board and their target board:

- 1)The P1 connector has four signals for SDA, SCL, power and ground. This connector can be used to make physical and electrical connection to the target board. To enable this, the user should place a duplicate of this connector on the target board. The part number of this connector is Molex Connector Corporation 0022152046. This connector was chosen for its small physical size.
- 2)The P2 connector also has the same four signals for SDA, SCL, power and ground. This connector has 0.1" spacing, which will support a variety of industry standard cabling options. Additionally Target Board Cable is included with the ISP Board. If the user prefers to use this option, the cabling mating connector on the target board must be chosen. The part number for this connector is BM04B-SRSS-TB(LF)(SN).

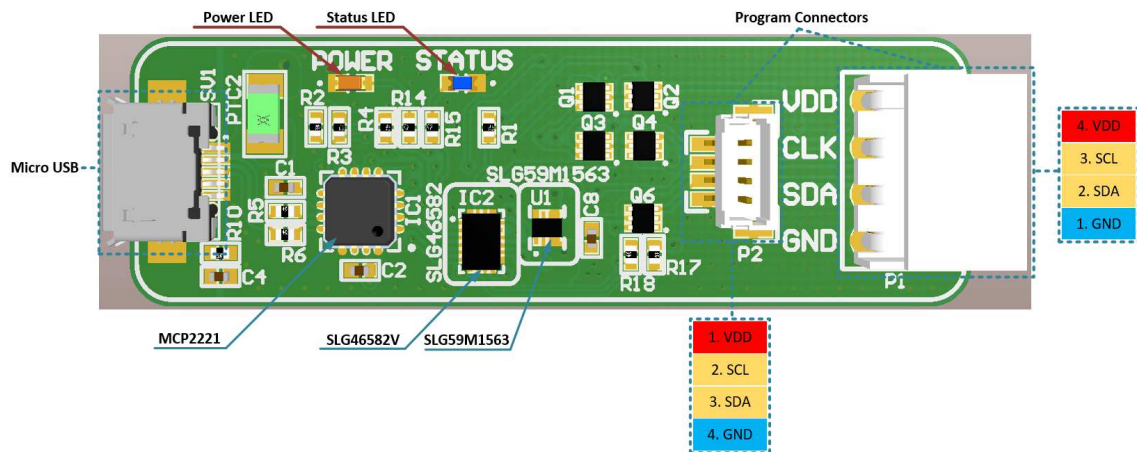
**Table 1: ISP States Board**

| ISP State                           | Power LED | Status LED |
|-------------------------------------|-----------|------------|
| Standby mode                        | On        | Off        |
| Emulation mode                      | On        | Blink      |
| Program mode                        | On        | Blink      |
| Over voltage protection at VDD line | Blink     | Off        |
| Over temperature protection         | Off       | Off        |

## GreenPAK In-System Programming Board

**Table 2: Board Protections**

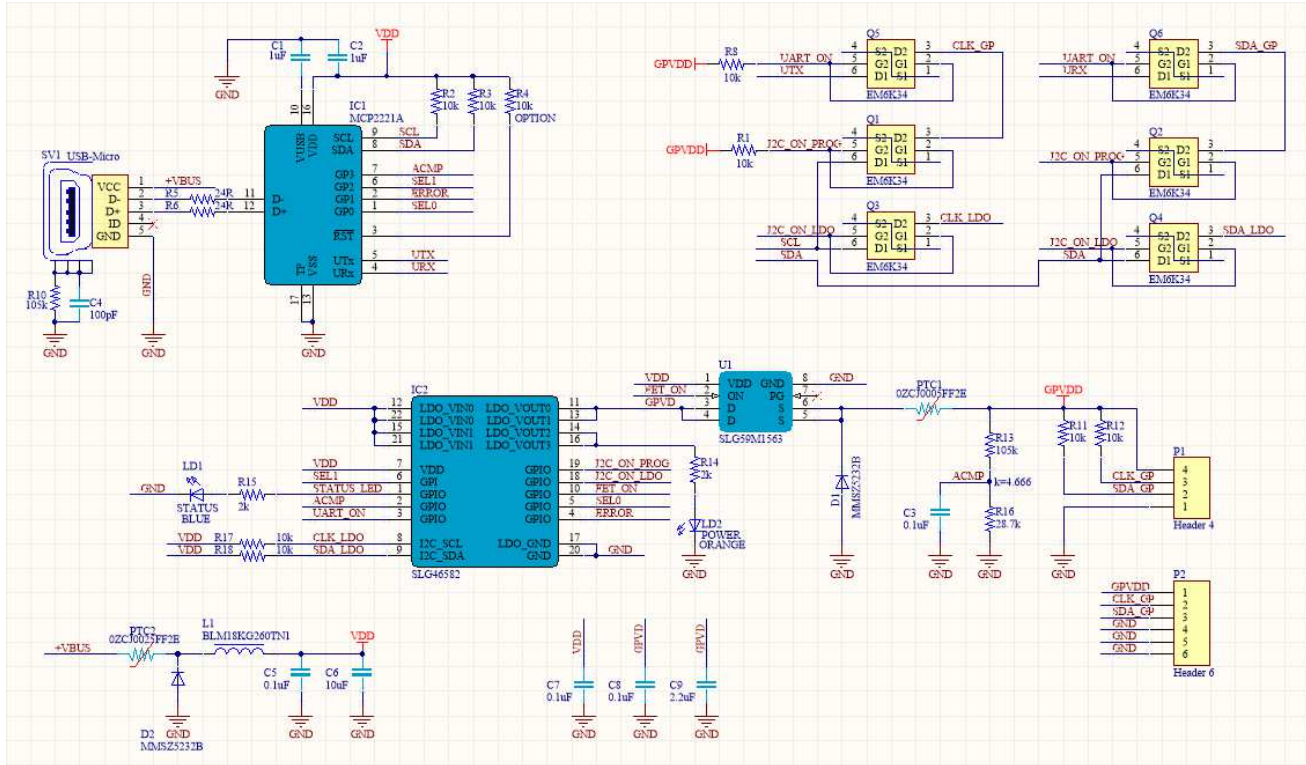
| Protection                        | Description   |
|-----------------------------------|---|
| Over current protection (OCP)     | PTC limits maximum VDD current equals 100 mA  |
| Short circuit protection (SCP)    | PTC limits maximum VDD current equals 100 mA  |
| Over voltage protection (OVP)     | When the external power supply voltage exceeded 5.6 V, FET U1 and power supply LDO IC2 are turned off and Power LED starts to blink.  |
| Over temperature protection (OTP) | When the IC2 temperature exceeds 75 °C, FET U1 and power supply LDO IC2 are turned off and Power and Status LEDs are also turned off. |



**Figure 2: PCB Top View**

GreenPAK In-System Programming Board

Appendix A - Board Schematic Diagram



## GreenPAK In-System Programming Board

## Appendix B - BOM

| #  | Designator                            | Description   | Footprint         | Quantity |
|----|---------------------------------------|---|-------------------|----------|
| 1  | C1, C2                                | CAP CER 1 $\mu$ F 10V Y5V 0402                                    | C0402             | 2        |
| 2  | C3, C4                                | CAP CER 100 pF 10V X7R 0402                                       | C0402             | 2        |
| 3  | C5, C7, C8                            | CAP CER 0.1 $\mu$ F 10V X5R 0402                                  | C0402             | 3        |
| 4  | C6                                    | CAP CER 10 $\mu$ F 10V X5R 0805                                   | C0805             | 1        |
| 5  | C9                                    | CAP CER 2.2 $\mu$ F 10V X5R 0402                                  | C0402             | 1        |
| 6  | D1, D2                                | TVS DIODE 5VWM<br>9.2VC SOD123W                                   | SOD123            | 2        |
| 7  | IC1                                   | IC USB TO I2C BRIDGE DEVICE 16QF                                  | QFN16-4.0x4.0     | 1        |
| 8  | IC2                                   |   | STQFN-20L-2.0x3.0 | 1        |
| 9  | L1                                    | FERRITE BEAD 26 $\Omega$ 0603 1LN                                 | F0603             | 1        |
| 10 | LD1                                   | LED BLUE CLEAR 0603 SMD   | LED0603_BLUE      | 1        |
| 11 | LD2                                   | Orange 605nm LED Indication - Discrete<br>2.2V 0603 (1608 Metric) | LED0603_ORANGE    | 1        |
| 12 | P1                                    | Molex Connector Corporation<br>0022152046                         | MOLEX_4pin        | 1        |
| 13 | PTC1                                  | PTC RESET FUSE 60V 50MA 1206                                      | R_1206            | 1        |
| 14 | PTC2                                  | PTC RESET FUSE 16V 250MA 1206                                     | R_1206            | 1        |
| 15 | Q1, Q2, Q3,<br>Q4, Q5, Q6             | MOSFET 2N-CH 50V 0.2A EMT6  | SOT-563           | 6        |
| 16 | R1, R2, R3, R8, R11, R12,<br>R17, R18 | RES SMD 24 $\Omega$ 5% 1/16W 0402                                 | RES 0402L (1005)  | 8        |
| 17 | R5, R6                                | RES SMD 100 k $\Omega$ 1% 1/16W 040                               | RES 0402L (1005)  | 2        |
| 18 | R10, R13                              | RES SMD 100 k $\Omega$ 1% 1/16W 0402                              | RES 0402L (1005)  | 2        |
| 19 | R14, R15                              | RES SMD 2 k $\Omega$ 1% 1/16W 0402                                | RES 0402L (1005)  | 2        |
| 20 | R16                                   | RES SMD 21.5 $\Omega$ 1% 1/16W 0402                               | RES 0402L (1005)  | 1        |
| 21 | SV1                                   | CONN USB MICRO B RECPT SMT R/A                                    | Micro USB         | 1        |
| 22 | U1                                    |   | WLCSP_0.8X0.8_4L  | 1        |
| 23 | P2                                    | BM04B-SRSS-TB(LF)(SN)   | BM04B_WHITE       | 1        |

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