

# GreenPAK™

## Configurable Mixed-Signal Matrix

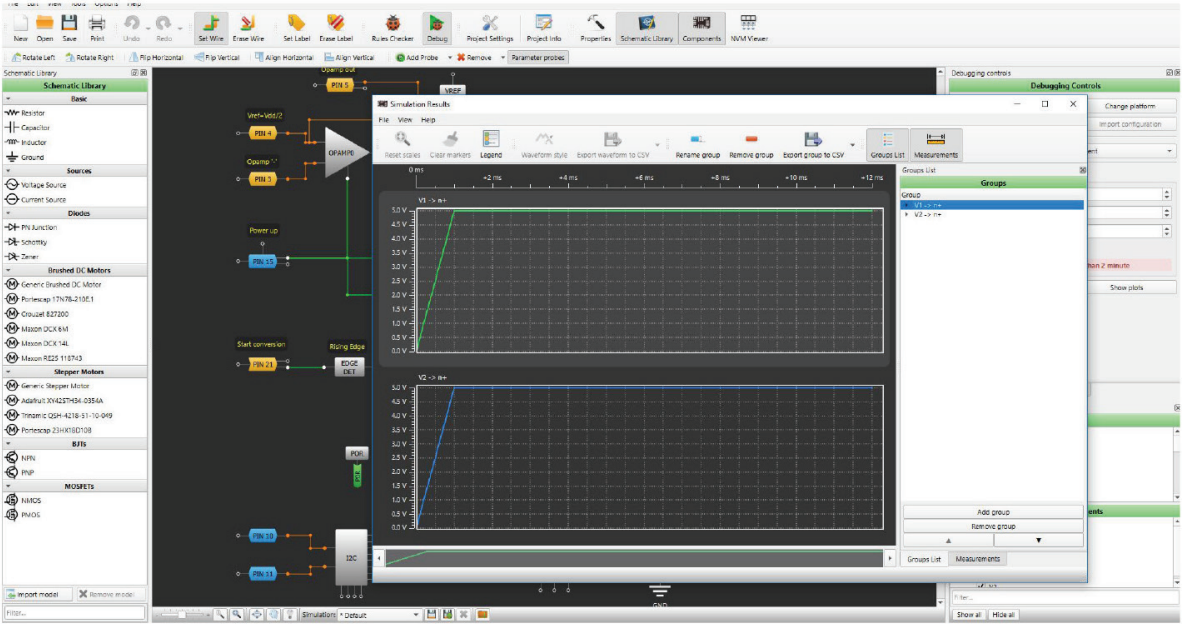




# 开发软件

瑞萨的 Go Configure™ 软件中心开发软件提供完全图形化的设计过程, 无需编程语言或编译器, 让设计人员可以在几分钟内配置、编程和测试自定义的 GreenPAK 样本。

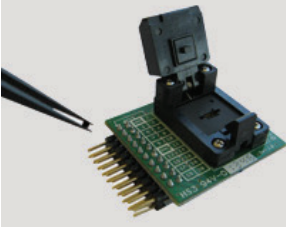
- 类似原理图捕获的设计和布线
- 显示每个设备可用资源的完整组件库
- 易于配置的组件
- 示例项目和支持文档
- 支持与外部元件联动的仿真功能



Download Go Configure™ Software Hub

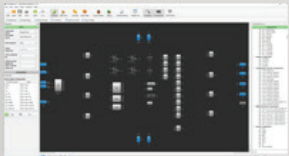
View the Software User Guide

Step 1



Place unprogrammed GreenPAK into socket

Step 2



Design your IC with GreenPAK GUI

Step 3

Program

Click **Program** to freeze GreenPAK's NVM

Step 4



Your custom IC is ready for use

# GREENPAK 工具

开发板可供工程师使用 GreenPAK 混合信号 IC 开发自定义设计。您可以从空白项目开始设计自己的工程, 或通过修改 Renesas 官网 [renesas.com](https://www.renesas.com) 提供的示例项目进行开发。

| Board                                                        | Functions/Features                                                                                                                                                                                                                                 |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SLG4DVKLITE</b><br>GreenPAK Lite 开发板                      | <ul style="list-style-type: none"><li>可在几分钟内完成自定义样品的烧录, 并兼容 DIP 封装和插座适配器</li><li>通过 USB Type-C 供电并进行通信</li><li>支持双 VDD ICs</li><li>板上有 PIN LED 状态指示、上拉、下拉、GND、VDD</li><li>HHI-Z, VDD2, 和一个可编程的软件按钮</li><li>用于连接外部测试设备的门控扩展头</li></ul>              |
| <b>SLG4DVKADV</b><br>GreenPAK Advanced开发板                    | <ul style="list-style-type: none"><li>使用任何 GreenPAK 器件, 在几分钟内即可烧录自定义样品</li><li>USB接口</li><li>支持 MacOS、Windows 和 Linux</li><li>烧录和仿真</li><li>带门控的扩展排针接口, 可连接外部测试设备</li><li>集成信号与逻辑发生器, 配备 LED 进行可视化指示</li></ul>                                     |
| <b>SLG4DVKGSD</b><br>GreenPAK 串行调试器板                         | <ul style="list-style-type: none"><li>支持通过 I²C 对所有 GreenPAK 器件进行串行调试</li><li>USB 接口用于供电和控制</li><li>带有 I²C 接口的 4 针连接头, 用于与目标系统连接</li><li>支持 MacOS、Windows 和 Linux</li><li>为 SLG46824、SLG46826 和 SLG47004 提供串行烧录支持</li></ul>                         |
| <b>SLG47105V-DMO</b><br>HVPAK™ SLG47105直流/步进电机及 LED 控制演示板    | <ul style="list-style-type: none"><li>HVPAK SLG47105 演示板用于测试基于 SLG47105 的设计, 该芯片内置了直流电机, 步进电机和 LED控制器</li></ul>                                                                                                                                    |
| <b>SLG47003V-DMO</b><br>AnalogPAK SLG47003开发板                | <ul style="list-style-type: none"><li>通过 USB Type-C 接口为外部电路板供电</li><li>支持 GreenPAK 串行调试器</li><li>支持GreenPAK Advanced 开发板</li><li>支持GreenPAK Lite 开发板</li><li>兼容 Go Configure 软件中心</li><li>两个测试点 (TS), 用于内部运算放大器的输出</li><li>用于调节原理图参数的编码器</li></ul> |
| <b>SLG47011V-USBPWR-DMO</b><br>AnalogPAK SLG47011V USB 电源演示板 | <ul style="list-style-type: none"><li>支持 USB PD (电力传输) 协议(最高支持 20V, 5A)</li><li>电压、电流、功率和温度测量</li><li>支持双向测量 (插头和插座方向均可)</li><li>128x32 OLED 单色显示屏</li><li>用于翻转显示和切换屏幕的按钮</li></ul>                                                                |
| <b>SLG51003V-EVB</b><br>SLG51003V Power GreenPAK评估板          | <ul style="list-style-type: none"><li>带有开尔文感测的 LDO 输入输出连接器</li><li>每个 LDO 输入和输出通道配备射频连接器</li><li>通用输入输出 (GPIO) 连接器</li><li>支持GreenPAK串行调试板</li><li>支持 Power GreenPAK 开发主板</li></ul>                                                                |

| Configurable Mixed-Signal Matrix     | SLG46108                    | SLG46110                    | SLG46120                          | SLG46140                    | SLG46169                    |
|--------------------------------------|-----------------------------|-----------------------------|-----------------------------------|-----------------------------|-----------------------------|
| Memory Type                          | OTP                         | OTP                         | OTP                               | OTP                         | OTP                         |
| Temperature Range (°C)               | -40 to +85                  | -40 to +85                  | -40 to +85                        | -40 to +85                  | -40 to +85                  |
| # of GPIOs                           | 6                           | 8                           | 10 *                              | 12                          | 12                          |
| Operating Voltage (V)                | 1.71 to 5.5                 | 1.71 to 5.5                 | 1.71 to 5.5                       | 1.71 to 5.5                 | 1.71 to 5.5                 |
| Dual Supply (VDD2 1.8 V to VDD)      | –                           | –                           | SLG46121 *                        | –                           | –                           |
| 8-bit SAR ADC                        | –                           | –                           | –                                 | –                           | –                           |
| Analog/Digital Comparators           | –                           | 2/0                         | 2/0                               | 2/3                         | 2/3                         |
| Maximum Look Up Tables (LUTs)        | 10                          | 10                          | 16                                | 16                          | 18                          |
| Maximum Counters/Delays              | 4                           | 4                           | 4                                 | 4                           | 7                           |
| Maximum DFF / Latch                  | 4                           | 4                           | 8                                 | 6                           | 6                           |
| PWMs                                 | –                           | –                           | –                                 | 3                           | –                           |
| Pipe Delay                           | –                           | 8-stage                     | 8-stage                           | 16-stage                    | 16-stage                    |
| Programmable Delay                   | 1                           | 1                           | 1                                 | 1                           | 1                           |
| Internal Oscillator (Hz)             | 25 k / 2 M                  | 25 k / 2 M                  | 25 k / 2 M                        | 1.7 k / 25 k / 2 M / 27 M   | 25 k / 2 M                  |
| Asynchronous State Machine           | –                           | –                           | –                                 | –                           | –                           |
| Communication Interface              | –                           | –                           | –                                 | SPI                         | –                           |
| QFN Part Number                      | SLG46108V                   | SLG46110V                   | SLG46120V<br>SLG46121V            | SLG46140V                   | SLG46169V                   |
| QFN Package Size (mm)                | 1.0 x 1.2 x 0.55, 0.4 pitch | 1.6 x 1.6 x 0.55, 0.4 pitch | 1.6 x 1.6 x 0.55, 0.4 pitch       | 1.6 x 2.0 x 0.55, 0.4 pitch | 2.0 x 2.2 x 0.55, 0.4 pitch |
| Alternate Package Part Number        | –                           | –                           | SLG46120P                         | –                           | –                           |
| Alternate Package Type and Size (mm) | –                           | –                           | STQFN 2.0 x 2.0 x 0.55, 0.5 pitch | –                           | –                           |

| Configurable Mixed-Signal Matrix     | SLG46170                    | SLG46533                           | SLG46534                    | SLG46536                    | SLG46537                           |
|--------------------------------------|-----------------------------|------------------------------------|-----------------------------|-----------------------------|------------------------------------|
| Memory Type                          | OTP                         | OTP                                | OTP                         | OTP                         | OTP                                |
| Temperature Range (°C)               | -40 to +85                  | -40 to +85                         | -40 to +85                  | -40 to +85                  | -40 to +85                         |
| # of GPIOs                           | 12                          | 18                                 | 12 *                        | 12                          | 18 *                               |
| Operating Voltage (V)                | 1.71 to 5.5                 | 1.71 to 5.5                        | 1.71 to 5.5                 | 1.71 to 5.5                 | 1.71 to 5.5                        |
| Dual Supply (VDD2 1.8 V to VDD)      | –                           | –                                  | SLG46535 *                  | –                           | SLG46538 *                         |
| 8-bit SAR ADC                        | –                           | –                                  | –                           | –                           | –                                  |
| Analog/Digital Comparators           | –                           | 4/0                                | 3/0                         | 3/0                         | 4/0                                |
| Maximum Look Up Tables (LUTs)        | 17                          | 25                                 | 17                          | 25                          | 17                                 |
| Maximum Counters/Delays              | 8                           | 7                                  | 7                           | 7                           | 7                                  |
| Maximum DFF / Latch                  | 6                           | 15                                 | 8                           | 15                          | 8                                  |
| PWMs                                 | –                           | –                                  | –                           | –                           | –                                  |
| Pipe Delay                           | 16-stage                    | 16-stage                           | 16-stage                    | 16-stage                    | 16-stage                           |
| Programmable Delay                   | 1                           | 1                                  | 1                           | 1                           | 1                                  |
| Internal Oscillator (Hz)             | 25 k / 2 M                  | 25 k / 2 M / 25 M                  | 25 k / 2 M / 25 M           | 25 k / 2 M / 25 M           | 25 k / 2 M / 25 M                  |
| Asynchronous State Machine           | –                           | –                                  | 8-State                     | –                           | 8-State                            |
| Communication Interface              | –                           | I²C                                | I²C                         | I²C                         | I²C                                |
| QFN Part Number                      | SLG46170V                   | SLG46533V                          | SLG46534V<br>SLG46535V      | SLG46536V                   | SLG46537V<br>SLG46538V             |
| QFN Package Size (mm)                | 2.0 x 2.2 x 0.55, 0.4 pitch | 2.0 x 3.0 x 0.55, 0.4 pitch        | 2.0 x 2.2 x 0.55, 0.4 pitch | 2.0 x 2.2 x 0.55, 0.4 pitch | 2.0 x 3.0 x 0.55, 0.4 pitch        |
| Alternate Package Part Number        | –                           | SLG46533M                          | –                           | –                           | SLG46537M<br>SLG46538M             |
| Alternate Package Type and Size (mm) | –                           | MSTQFN 2.0 x 2.2 x 0.55, 0.4 pitch | –                           | –                           | MSTQFN 2.0 x 2.2 x 0.55, 0.4 pitch |

\*Dual Supply versions lose one GPIO for VDD2

| Configurable Mixed-Signal Matrix     | SLG46620                          | SLG46721                    | SLG46722                    | SLG46811                    | SLG46855                    |
|--------------------------------------|-----------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Memory Type                          | OTP                               | OTP                         | OTP                         | OTP                         | OTP                         |
| Temperature Range (°C)               | -40 to +85                        | -40 to +85                  | -40 to +85                  | -40 to +85                  | -40 to +85                  |
| # of GPIOs                           | 18 *                              | 18                          | 18                          | 10                          | 12                          |
| Operating Voltage (V)                | 1.8 to 5.5                        | 1.8 to 5.5                  | 1.8 to 5.5                  | 2.3 to 5.5                  | 2.3 to 5.5                  |
| Dual Supply (VDD2 1.8 V to VDD)      | SLG46621 *                        | –                           | –                           | –                           | –                           |
| 8-bit SAR ADC                        | 1                                 | –                           | –                           | –                           | –                           |
| Analog/Digital Comparators           | 6/3                               | 4/0                         | –                           | 1(4)/0                      | 4/0                         |
| Maximum Look Up Tables (LUTs)        | 26                                | 18                          | 17                          | 18                          | 23                          |
| Maximum Counters/Delays              | 10                                | 7                           | 8                           | 6                           | 8                           |
| Maximum DFF / Latch                  | 12                                | 6                           | 6                           | 17                          | 21                          |
| PWMs                                 | 3                                 | –                           | –                           | –                           | –                           |
| Pipe Delay                           | 2 x 16-stage                      | 16-stage                    | 16-stage                    | 4 Shift Registers           | 16-stage                    |
| Programmable Delay                   | 2                                 | 1                           | 1                           | 1                           | 1                           |
| Internal Oscillator (Hz)             | 1.7 k / 25 k / 2 M / 27 M         | 25 k / 2 M                  | 25 k / 2 M                  | 2 k / 10 k / 25 M           | 2 k / 2 M / 25 M            |
| Asynchronous State Machine           | –                                 | –                           | –                           | –                           | –                           |
| Communication Interface              | SPI                               | –                           | –                           | –                           | I²C                         |
| QFN Part Number                      | SLG46620V<br>SLG46621V            | SLG46721V                   | SLG46722V                   | SLG46811V                   | SLG46855V                   |
| QFN Package Size (mm)                | 2.0 x 3.0 x 0.55, 0.4 pitch       | 2.0 x 3.0 x 0.55, 0.4 pitch | 2.0 x 3.0 x 0.55, 0.4 pitch | 1.6 x 1.6 x 0.55, 0.4 pitch | 1.6 x 2.0 x 0.55, 0.4 pitch |
| Alternate Package Part Number        | SLG46620G                         | –                           | –                           | –                           | –                           |
| Alternate Package Type and Size (mm) | TSSOP 6.5 x 6.4 x 1.2, 0.65 pitch | –                           | –                           | –                           | –                           |

| Configurable Mixed-Signal Matrix     | SLG46824                          | SLG46826                          | SLG46880                    | SLG46881                    | SLG47512<br>SLG47513                  | SLG47525<br>SLG47528              |
|--------------------------------------|-----------------------------------|-----------------------------------|-----------------------------|-----------------------------|---------------------------------------|-----------------------------------|
| Memory Type                          | MTP                               | MTP                               | OTP                         | OTP                         | OTP                                   | OTP                               |
| Temperature Range (°C)               | -40 to +85                        | -40 to +85                        | -40 to +85                  | -40 to +85                  | -40 to +85                            | -40 to +85                        |
| # of GPIOs                           | 17                                | 17                                | 28                          | 28                          | 10 (SLG47512)<br>14 (SLG47513)        | 17/11                             |
| Operating Voltage (V)                | 2.3 to 5.0                        | 2.3 to 5.0                        | 2.3 to 5.0                  | 2.3 to 5.0                  | 1.0 to 1.65                           | 1.71 to 5.5                       |
| Dual Supply (VDD2 1.8 V to VDD)      | 1.71 to VDD                       | 1.71 to VDD                       | 2.3 to 5.0                  | 0.95 to 1.98                | –                                     | 0.95 to 1.98                      |
| 8-bit SAR ADC                        | –                                 | –                                 | –                           | –                           | –                                     | –                                 |
| Analog/Digital Comparators           | 2/0                               | 4/0                               | 5/0                         | 5/0                         | 2/0                                   | 4                                 |
| Maximum Look Up Tables (LUTs)        | 19                                | 19                                | 12                          | 12                          | 23                                    | 17                                |
| Maximum Counters/Delays              | 8                                 | 8                                 | 5                           | 5                           | 8                                     | 7                                 |
| Maximum DFF / Latch                  | 17                                | 17                                | 5                           | 5                           | 15                                    | 8                                 |
| PWMs                                 | –                                 | –                                 | –                           | –                           | –                                     | –                                 |
| Pipe Delay                           | 16-stage                          | 16-stage                          | 16-stage                    | 16-stage                    | 14 Shift Registers                    | 16-stage                          |
| Programmable Delay                   | 1                                 | 1                                 | 1                           | 1                           | 1                                     | 1                                 |
| Internal Oscillator (Hz)             | 2 k / 2 M / 25 M                  | 2 k / 2 M / 25 M                  | 2 k / 2 M / 25 M            | 2 k / 2 M / 25 M            | 2 k / 25 M                            | 25 k / 2 M / 25 M                 |
| Asynchronous State Machine           | –                                 | –                                 | 12-State                    | 12-State                    | –                                     | 8-State                           |
| Communication Interface              | I²C                               | I²C                               | I²C                         | I²C                         | I²C                                   | I²C                               |
| QFN Part Number                      | SLG46824V                         | SLG46826V                         | SLG46880V                   | SLG46881V                   | SLG47512V                             | SLG47525V                         |
| QFN Package Size (mm)                | 2.0 x 3.0 x 0.55, 0.4 pitch       | 2.0 x 3.0 x 0.55, 0.4 pitch       | 4.0 x 4.0 x 0.55, 0.4 pitch | 4.0 x 4.0 x 0.55, 0.4 pitch | 1.6 x 1.6 x 0.55, 0.4 mm pitch        | 2.0 x 2.2 x 0.55, 0.4 pitch       |
| Alternate Package Part Number        | SLG46824G                         | SLG46826G                         | –                           | –                           | SLG47513M                             | SLG47528V                         |
| Alternate Package Type and Size (mm) | TSSOP 6.5 x 6.4 x 1.2, 0.65 pitch | TSSOP 6.5 x 6.4 x 1.2, 0.65 pitch | –                           | –                           | MSTQFN 1.6 x 1.6 x 0.55, 0.4 mm pitch | STQFN 2.0 x 3.0 x 0.55, 0.4 pitch |

\* Dual Supply versions lose one GPIO for VDD2

| GreenPAK with Extended Temperature Range | SLG46534-E           | SLG46620-E             | SLG46826-E                                    | SLG47105-E/<br>SLG47115-E    |
|------------------------------------------|----------------------|------------------------|-----------------------------------------------|------------------------------|
| Temperature Range                        | -40 to +105          | -40 to +105            | -40 to +105                                   | -40 to +105                  |
| Memory Type                              | OTP                  | OTP                    | MTP                                           | OTP                          |
| # of Pins / # of GPIOs                   | 14/11                | 20/18                  | 20/17                                         | 20/8 + 4 x HD/ 20/8 + 2 x HD |
| Operating Voltage, VDD (V)               | 1.8 to 5.0           | 1.8 to 5.0             | 2.3 to 5.5                                    | 2.3 to 5.5                   |
| Dual Supply, VDD2 (V)                    | –                    | –                      | 1.71 to VDD                                   | 3.0 to 13.2/4.5 to 26.4      |
| Analog/Digital Comparators               | 3/0                  | 6/3                    | 4/0                                           | 4/0/3/0                      |
| Voltage Reference                        | Trimmed              | Trimmed                | Trimmed                                       | Trimmed                      |
| Combo Function Macro-cells               | 17 Total             | 2 Total                | 11 Total                                      | 12 Total                     |
| Multi-Function Macro-cells               | –                    | –                      | 8 Total                                       | 5 Total                      |
| PWMs                                     | –                    | 3                      | –                                             | 2                            |
| Special Features                         | ASM (8 states)       | 8-bit ADC and 2x DAC   | 2-kbit I2C compatible serial EEPROM emulation | HV outputs                   |
| Counters/Delays                          | 7                    | 10                     | 8                                             | 5                            |
| DFF / Latch                              | 8                    | 12                     | 17                                            | 15                           |
| Pipe Delay                               | 16-stage (3 outputs) | 2x16-stage (2 outputs) | 16-stage (3 outputs)                          | 16-stage (3 outputs)         |
| Programmable Delay                       | 1                    | 2                      | 1                                             | 1                            |
| Internal Oscillator (Hz)                 | 25k / 2M / 25M       | 1.7k / 25k / 2M / 27M  | 2k / 2M / 25M                                 | 2k / 25M                     |
| Temp Sensor                              | No                   | No                     | Yes                                           | Yes                          |
| Communication Interface                  | I <sup>2</sup> C     | SPI                    | I <sup>2</sup> C                              | I <sup>2</sup> C             |
| Package Size (mm)                        | 2.0 x 2.2            | 2.0 x 3.0              | 2.0 x 3.0                                     | 2.0 x 3.0                    |
| Package Type                             | STQFN                | STQFN                  | STQFN                                         | STQFN                        |

| Automotive Configurable Mixed-Signal Matrix | SLG46620-A                        | SLG46625-A                  | SLG46827-A                        | SLG46855-A               | SLG46857-A                 | SLG46880-A              | SLG47004-A                                                            |
|---------------------------------------------|-----------------------------------|-----------------------------|-----------------------------------|--------------------------|----------------------------|-------------------------|-----------------------------------------------------------------------|
| Memory Type                                 | OTP                               | OTP                         | MTP                               | OTP                      | OTP                        | OTP                     | MTP                                                                   |
| Temperature Range (°C)                      | -40 to +105                       | -40 to +125                 | -40 to +105                       | -40 to +105              | -40 to +125                | -40 to +125             | -40 to +125                                                           |
| # of GPIOs                                  | 20/18                             | 20/18                       | 20/17                             | 14/12                    | 14/12                      | 32/28                   | 24/8                                                                  |
| Operating Voltage (V)                       | 1.71 to 3.6                       | 1.71 to 5.0                 | 2.3 to 5.5                        | 2.3 to 5.5               | 2.3 to 5.5                 | 2.3 to 5.5              | 2.4 to 5.5                                                            |
| Dual Supply                                 | –                                 | –                           | 1.71 to VDD                       | –                        | –                          | 2.3 to VDD              | –                                                                     |
| 8-bit SAR ADC                               | 1                                 | 1                           | –                                 | –                        | –                          | –                       | –                                                                     |
| Analog/Digital Comparators                  | 6/3                               | 6/3                         | 4/0                               | 4/0                      | 4/0                        | 5/0                     | 3                                                                     |
| Maximum Look Up Tables (LUTs)               | 26                                | 26                          | 19                                | 23                       | 23                         | 12                      | 20                                                                    |
| Maximum Counters / Delays                   | 10                                | 10                          | 8                                 | 8                        | 8                          | 5                       | 7                                                                     |
| Maximum DFF / Latch                         | 12                                | 12                          | 17                                | 21                       | 21                         | 5                       | 18                                                                    |
| PWMs                                        | 3                                 | 3                           | –                                 | –                        | –                          | –                       | –                                                                     |
| Pipe Delay                                  | 2 x 16-stage                      | 2 x 16-stage                | 16-stage                          | 16-stage                 | 16-stage                   | 16-stage                | 16-stage                                                              |
| Programmable Delay                          | 2                                 | 2                           | 1                                 | 1                        | 1                          | 1                       | 1                                                                     |
| Internal Oscillator (Hz)                    | 1.7 k / 25 k / 2 M / 27 M         | 1.7 k / 25 k / 2 M / 27 M   | 2 k / 2 M / 25 M                  | 2 k / 2 M / 25 M         | 2 k / 2 M / 25 M           | 2 k / 2 M / 25 M        | 2 k / 2 M / 25 M                                                      |
| Asynchronous State Machine                  | –                                 | –                           | –                                 | –                        | –                          | 12-State                | –                                                                     |
| Special Features                            | 2 x DAC                           | 2 x DAC                     | –                                 | –                        | –                          | –                       | 2 x Op-AMP or 1 x In-AMP; 2 x Rheostat; 2 x An Switch; 2-Ch Auto-Trim |
| Communication Interface                     | SPI                               | SPI                         | I <sup>2</sup> C                  | I <sup>2</sup> C         | I <sup>2</sup> C           | I <sup>2</sup> C        | I <sup>2</sup> C                                                      |
| QFN Part Number                             | –                                 | SLG46625-AP                 | –                                 | SLG46855-AP              | SLG45857-AP                | SLG46880-AP             | SLG47004-AP                                                           |
| QFN Package Size (mm)                       | –                                 | 3.5 x 3.5 x 0.75, 0.5 pitch | –                                 | 3 x 3 x 0.55, 0.65 pitch | 3 x 3.1 x 0.75, 0.65 pitch | 5 x 5 x 0.75, 0.5 pitch | 4 x 4 x 0.75, 0.5 pitch                                               |
| Alternate Package Type and Size (mm)        | TSSOP 6.4 x 6.5 x 1.2, 0.65 pitch | –                           | TSSOP 6.5 x 6.4 x 1.2, 0.65 pitch | –                        | –                          | –                       | –                                                                     |

| Configurable Mixed-Signal Matrix | Power GreenPAK with Load Switches |                                  |                                  |                             |                             |                             |                             |                            |
|----------------------------------|-----------------------------------|----------------------------------|----------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|----------------------------|
| Part Number                      | SLG51000                          | SLG51001                         | SLG51002                         | SLG51003                    | SLG46116/7                  | SLG46127                    | SLG46517                    | SLG46867                   |
| General Parameters               |                                   |                                  |                                  |                             |                             |                             |                             |                            |
| Memory Type                      | OTP                               | OTP                              | OTP                              | OTP                         | OTP                         | OTP                         | OTP                         | OTP                        |
| # of Pins / # of GPIOs           | 20 / 6                            | 16 / 4                           | 25 / 6                           | 14 / 5                      | 14 / 7                      | 16 / 6                      | 28 / 16                     | 20 /12                     |
| Operating Voltage (V)            | 2.8 to 5                          | 2.8 to 5                         | 2.8 to 5                         | 2.8 to 5                    | 1.71 to 5.5                 | 1.71 to 5.5                 | 1.71 to 5.5                 | 2.3 to 5.5                 |
| Communication Interface Type     | I²C                               | I²C                              | I²C                              | I²C                         | –                           | –                           | I²C                         | I²C                        |
| Communication Interface Voltage  | 1.2 V - 1.8 V                     | 1.2 V - 1.8 V                    | 1.2 V - 1.8 V                    | 1.2 V - 5 V                 | –                           | –                           | 1.2 V - 5 V                 | 1.2 V - 5 V                |
| GPIO Voltage                     | 1.2 V to 1.8 V                    | 1.2 V to 1.8 V                   | 1.2 V to 5.0 V                   | 1.2 V to 5.0 V              | 1.71 to 5.5 V               | 1.2 V to 5.0 V              | 1.2 V to 5 V                | 1.2 V to 5 V               |
| Package Type                     | WLCSP                             | WLCSP                            | WLCSP                            | TQFN                        | TQFN                        | TQFN                        | TQFN                        | TQFN                       |
| Package Size (mm)                | 1.675 x 2.075 x 0.465, 0.4 pitch  | 1.675 x 1.675 x 0.465, 0.4 pitch | 1.992 x 1.992 x 0.44, 0.35 pitch | 2.0 x 2.2 x 0.55, 0.4 pitch | 1.6 x 2.5 x 0.55, 0.4 pitch | 1.6 x 2.0 x 0.55, 0.4 pitch | 2.0 x 3.0 x 0.55, 0.4 pitch | 1.6 x 3.0 x 0.4, 0.4 pitch |
| Operating temperature (°C)       | -40 to +85                        | -40 to +85                       | -40 to +85                       | -40 to +85                  | -40 to +85                  | -40 to +85                  | -40 to +85                  | -40 to +85                 |
| Combinatorial logic              |                                   |                                  |                                  |                             |                             |                             |                             |                            |
| Analog Comparators               | –                                 | –                                | –                                | –                           | 2                           | 2                           | 4                           | 4                          |
| Max. Look Up Tables (LUTs) / DFF | 12 / -                            | 12 / -                           | 8 / 8                            | 8 / 8                       | 10 / 4                      | 10 / 4                      | 17 / 8                      | 23 / 21                    |
| Pipe Delay                       | –                                 | –                                | –                                | –                           | 8-stage                     | 8-stage                     | 16-stage                    | 16-stage                   |
| Internal Oscillator (Hz)         | 8 M                               | 8 M                              | 8 M                              | 8 M                         | 25 k / 2 M                  | 25 k / 2 M                  | 25 k / 2 M / 25 M           | 25 k / 2 M / 25 M          |
| Max. Counters/Delays             | –                                 | –                                | 1 / 4                            | 1 / 4                       | 4                           | 4                           | 7                           | 8                          |
| Combination Function Macro-cells | –                                 | –                                | 7                                | 7                           | 6                           | 6                           | 17                          | 15                         |
| State Machine                    | Power Sequencer                   | Power Sequencer                  | Power Sequencer                  | –                           | –                           | –                           | 8-state ASM                 | –                          |
| Power Parameters                 |                                   |                                  |                                  |                             |                             |                             |                             |                            |
| # of Load Switches               | 2                                 | 1                                | 5                                | 1                           | 1 Total                     | 2 Total                     | 2 Total                     | 2 x PFET                   |
| Load Switch Type (PMOS / NMOS)   | 2 x NMOS                          | 1 x NMOS                         | 3 x NMOS, 2 x PMOS               | 1 x NMOS                    | 1 x PMOS                    | 2 x PMOS                    | 2 x PMOS                    | 2 x PMOS                   |
| Max Iout                         | 0.8 A                             | 1 A                              | 1.3 A                            | 0.8 A                       | 1.25 A                      | 2 A                         | 2 A                         | 2 A                        |
| RON                              | 40 mOhm                           | 40 mOhm                          | 40 mOhm                          | 40 mOhm                     | 28.5 mOhm                   | 44 mOhm                     | 44 mOhm                     | 44 mOhm                    |
| Programmable Current Limit       | Yes                               | Yes                              | Yes                              | Yes                         | –                           | –                           | –                           | –                          |
| Slew Rate                        | Yes                               | Yes                              | Yes                              | Yes                         | Fixed                       | –                           | –                           | –                          |
| # of LDOs                        | 7                                 | 6                                | 8                                | 3                           | –                           | –                           | –                           | –                          |
| Protection Features              | ESD, OCP, OTP, UVLO               | ESD, OCP, OTP, UVLO              | ESD, OCP, OTP, UVLO              | ESD, OCP, OTP, UVLO         | ESD, Read Lock              | ESD, Read Lock              | ESD, Read Lock              | ESD, Read Lock             |
| Discharge Resistance             | Fixed                             | Fixed                            | Programmable                     | Programmable                | W/O Fixed                   | –                           | –                           | –                          |

| Configurable Mixed-Signal Matrix            | Power GreenPAK with LDOs            |                                     |                                     |                                     |                                                      |                                                      |                                                      |                                                      |
|---------------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|
| Part Number                                 | SLG51000                            | SLG51001                            | SLG51002                            | SLG51003                            | SLG46580                                             | SLG46582                                             | SLG46583                                             | SLG46585                                             |
| General Parameters                          |                                     |                                     |                                     |                                     |                                                      |                                                      |                                                      |                                                      |
| Memory Type                                 | OTP                                 | OTP                                 | OTP                                 | OTP                                 | OTP                                                  | OTP                                                  | OTP                                                  | OTP                                                  |
| # of Pins / # of GPIOs                      | 20 / 6                              | 16 / 4                              | 25 / 6                              | 14 / 5                              | 20 / 9                                               | 20 / 9                                               | 20 / 9                                               | 29 / 7                                               |
| Operating Voltage (V)                       | 2.8 - 5.0                           | 2.8 - 5.0                           | 2.8 - 5.0                           | 2.8 - 5.0                           | 2.3 - 5.5                                            | 2.3 - 5.5                                            | 2.3 - 5.5                                            | 2.5 - 5.5                                            |
| Communication Interface Type                | I <sup>2</sup> C                    | I <sup>2</sup> C                    | I <sup>2</sup> C                    | I <sup>2</sup> C                    | I <sup>2</sup> C                                     | I <sup>2</sup> C                                     | I <sup>2</sup> C                                     | I <sup>2</sup> C                                     |
| Communication Interface Voltage             | 1.2 V - 1.8 V                       | 1.2 V - 1.8 V                       | 1.2 V - 1.8 V                       | 1.2 V - 5.0 V                       | 1.2 V - 5.5 V                                        | 1.2 V - 5.5 V                                        | 1.2 V - 5.5 V                                        | 1.2 V - 5.5 V                                        |
| GPIO Voltage                                | 1.2 V to 1.8 V                      | 1.2 V to 1.8 V                      | 1.2 V to 5.0 V                      | 1.2 V - 5.0 V                       | 1.2 V to 5.5 V                                       | 1.2 V to 5.5 V                                       | 1.2 V to 5.5 V                                       | 1.2 V to 5.5 V                                       |
| Package Type                                | WLCSP                               | WLCSP                               | WLCSP                               | TQFN                                | TQFN                                                 | TQFN                                                 | TQFN                                                 | TQFN                                                 |
| Package Size (mm)                           | 1.675 x 2.075 x 0.465, 0.4 pitch    | 1.675 x 1.675 x 0.465, 0.4 pitch    | 1.992 x 1.992 x 0.44, 0.35 pitch    | 2.0 x 2.2 x 0.55, 0.4 pitch         | 2 x 3 x 0.55, 0.4 pitch                              | 2 x 3 x 0.55, 0.4 pitch                              | 2 x 3 x 0.55, 0.4 pitch                              | 3 x 3 x 0.55, 0.4 pitch                              |
| Operating temperature (°C)                  | -40 to +85                          | -40 to +85                          | -40 to +85                          | -40 to +85                          | -40 to +85                                           | -40 to +85                                           | -40 to +85                                           | -40 to +85                                           |
|                                             |                                     |                                     |                                     |                                     |                                                      |                                                      |                                                      |                                                      |
| Analog Comparators                          | –                                   | –                                   | –                                   | –                                   | 4                                                    | 4                                                    | 4                                                    | 4                                                    |
| Max. Look Up Tables (LUTs) / DFF            | 12 / -                              | 12 / -                              | 8 / 8                               | 8 / 8                               | 15 / 9                                               | 15 / 9                                               | 15 / 9                                               | 16 / 9                                               |
| Pipe Delay                                  | –                                   | –                                   | –                                   | –                                   | 16 - stage                                           | 16 - stage                                           | 16 - stage                                           | 16 - stage                                           |
| Internal Oscillator (Hz)                    | 8 M                                 | 8 M                                 | 8 M                                 | 8 M                                 | 1.73 k / 25 k / 2 M                                  | 25 k / 2 M                                           | 25 k / 2 M                                           | 25 k / 2 M                                           |
| Max. Counters/Delays                        | –                                   | –                                   | 1 / 4                               | 1 / 4                               | 5                                                    | 5                                                    | 5                                                    | 5                                                    |
| Combination Function Macro-cells            | –                                   | –                                   | 8                                   | 7                                   | 15                                                   | 15                                                   | 15                                                   | 15                                                   |
| State Machine                               | Power Sequencer                     | Power Sequencer                     | Power Sequencer                     | –                                   | 8-state ASM                                          | 8-state ASM                                          | 8-state ASM                                          | 8-state ASM                                          |
| Flexible Timing & Event-Triggered Sequencer | Yes                                 | Yes                                 | Yes                                 | Yes                                 | Yes                                                  | Yes                                                  | Yes                                                  | Yes                                                  |
| Power Parameters                            |                                     |                                     |                                     |                                     |                                                      |                                                      |                                                      |                                                      |
| # LDOs                                      | 7                                   | 6                                   | 8                                   | 3                                   | 4                                                    | 2                                                    | 2                                                    | 4                                                    |
| VIN total range                             | 0.8 V - 5.0 V                       | 0.8 V - 5.0 V                       | 0.8 V - 5.0 V                       | 0.8 V - 5.0 V                       | 2.3 V - 5.5 V                                        | 2.3 V - 5.5 V                                        | 2.3 V - 5.5 V                                        | 2.5 V - 5.5 V                                        |
| VOUT total range                            | 0.5 V - 3.75 V                      | 0.5 V - 3.75 V                      | 0.5 V - 3.75 V                      | 0.5 V - 3.75 V                      | 0.9 V to 4.35 V                                      | 0.9 V to 4.35 V                                      | 0.9 V to 4.35 V                                      | 0.9 V to 4.2 V                                       |
| Output Current Max (A)                      | 0.8                                 | 1                                   | 1.3                                 | 0.8                                 | 0.15                                                 | 0.3                                                  | 0.6                                                  | 0.15                                                 |
| Max Iout_LDO1 (mA)                          | 475 (High PSRR)                     | 475 (High PSRR)                     | 500                                 | 475 (High PSRR)                     | 150                                                  | 300                                                  | 600                                                  | 150                                                  |
| Max Iout_LDO2 (mA)                          | 475 (High PSRR)                     | 500                                 | 500                                 | 500                                 | 150                                                  | 300                                                  | –                                                    | 150                                                  |
| Max Iout_LDO3 (mA)                          | 500                                 | 500                                 | 500                                 | 800                                 | 150                                                  | –                                                    | –                                                    | 150                                                  |
| Max Iout_LDO4 (mA)                          | 500                                 | 500                                 | 500                                 | –                                   | 150                                                  | –                                                    | –                                                    | 150                                                  |
| Max Iout_LDO5 (mA)                          | 800                                 | 500                                 | 500                                 | –                                   | –                                                    | –                                                    | –                                                    | –                                                    |
| Max Iout_LDO6 (mA)                          | 800                                 | 1000                                | 1A                                  | –                                   | –                                                    | –                                                    | –                                                    | –                                                    |
| Max Iout_LDO7 (mA)                          | 500                                 | –                                   | 1 A                                 | –                                   | –                                                    | –                                                    | –                                                    | –                                                    |
| Max Iout_LDO8 (mA)                          | –                                   | –                                   | 1.3 A                               | –                                   | –                                                    | –                                                    | –                                                    | –                                                    |
| # of Load Switches                          | 2                                   | 1                                   | 5                                   | 1                                   | 4                                                    | 2                                                    | 1                                                    | 1                                                    |
| Vdropout                                    | 80 mV @ 0.8A (LV LDO)               | 100 mV @1 A (LV LDO)                | 130 mV @ 1.3 A (LV LDO)             | 100 mV @ 0.8 A (LV LDO)             | 250 mV                                               | 250 mV                                               | 250 mV                                               | 250 mV                                               |
| PSRR                                        | 87 dB @ 100 kHz (HP LDO)            | 87 dB @ 100 kHz (HP LDO)            | 65 dB @ 100 kHz (HV LDO)            | 87 dB @ 100 kHz (HP LDO)            | 50 dB @ 100 Hz to 100k Hz                            | 50 dB @ 100 Hz to 100k Hz                            | 50 dB @ 100 Hz to 100k Hz                            | 50 dB @ 100 Hz to 100k Hz                            |
| Output Noise                                | 13 uV @ 10 Hz to 100 kHz (HP LDO)   | 13 uV @ 10 Hz to 100 kHz (HP LDO)   | 152 uV @ 10 Hz to 100 kHz (HV LDO)  | 18 uV @ 10 Hz to 100 kHz (HP LDO)   | 75 uV @ 10 Hz to 100 kHz                             | 75 uV @ 10 Hz to 100 kHz                             | 75 uV @ 10 Hz to 100 kHz                             | 75 uV @ 10 Hz to 100 kHz                             |
| Current limit                               | Startup & Functional (Programmable) | Startup & Functional (Programmable) | Startup & Functional (Programmable) | Startup & Functional (Programmable) | Over-current & Short-Circuit Detection Current Limit | Over-current & Short-Circuit Detection Current Limit | Over-current & Short-Circuit Detection Current Limit | Over-current & Short-Circuit Detection Current Limit |
| Protection Features                         | ESD, OCL, OTP, UVLO                 | ESD, OCL, OTP, UVLO                 | ESD, OCL, OTP, UVLO                 | ESD, OCL, OTP, UVLO                 | ESD, OCL, SCD, OTP, Read Lock                        | ESD, OCL, SCD, OTP, Read Lock                        | ESD, OCL, SCD, OTP, Read Lock                        | ESD, OCL, SCD, OTP, Read Lock                        |

# GreenPAK PORTFOLIO

|                                                             | HVPACK™                             |                                     |
|-------------------------------------------------------------|-------------------------------------|-------------------------------------|
| Configurable Mixed-Signal Matrix                            | SLG47105                            | SLG47115                            |
| Memory Type                                                 | OTP                                 | OTP                                 |
| Temperature Range (°C)                                      | -40 to +85                          | -40 to +85                          |
| # of GPIOs                                                  | 8                                   | 8                                   |
| High Voltage High Current Output (HV_GPO_HD)                | 4 x 1.5 A RMS (2 A Peak) HV_GPO_HD  | 2 x 1.5 A RMS (3 A Peak) HV_GPO_HD  |
| Operating Voltage (V)                                       | 2.3 to 5.5                          | 2.3 to 5.5                          |
| Dual Supply (VDD2, V)                                       | 3.0 to 13.2                         | 4.5 to 26.4                         |
| Abs Max (VDD2, V)                                           | 18                                  | 32                                  |
| Analog / Current Sense Comparators / Differential Amplifier | 2/2/1                               | 2/1/1                               |
| Maximum Look Up Tables (LUTs)                               | 17                                  | 17                                  |
| Maximum Counters/Delays                                     | 5                                   | 5                                   |
| Maximum DFF / Latch                                         | 15                                  | 15                                  |
| PWMs                                                        | 2                                   | 2                                   |
| Pipe Delay                                                  | 16-stage                            | 16-stage                            |
| Programmable Delay                                          | 1                                   | 1                                   |
| Internal Oscillator (Hz)                                    | 2 k / 25 M                          | 2 k / 25 M                          |
| Communication Interface                                     | I²C                                 | I²C                                 |
| QFN Package Size (mm)                                       | 20-pin, 2.0 x 3.0 x 0.55, 0.4 pitch | 20-pin, 2.0 x 3.0 x 0.55, 0.4 pitch |

|                                                             | AnalogPAK™                                                                |                                     |                                         |
|-------------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------|-----------------------------------------|
| Configurable Mixed-Signal Matrix                            | SLG47001/SLG47003                                                         | SLG47004                            | SLG47011                                |
| Memory Type                                                 | OTP                                                                       | MTP                                 | OTP                                     |
| Temperature Range (°C)                                      | -40 to +85/-40 to +105 (for -E version)                                   | -40 to +85                          | -40 to +85/-40 to +105 (for -E version) |
| # of GPIOs                                                  | 6/10                                                                      | 8                                   | 13                                      |
| Operating Voltage (V)                                       | 2.3 to 5.5                                                                | 2.4 to 5.5                          | 1.71 to 3.60                            |
| Operational Amplifiers                                      | 2                                                                         | 3                                   | —                                       |
| Digital Rheostats (1024 Position), resistance               | 2 x 100 kΩ                                                                | 2 x 100 kΩ                          | —                                       |
| Analog Switch                                               | 1                                                                         | 2                                   | —                                       |
| Analog / Current Sense Comparators / Differential Amplifier | 6 (1 multi-channel)/0/0                                                   | 3/0/0                               | 1/0/0                                   |
| Width Converter                                             | 1 x 8-bit                                                                 | —                                   | 1 x 12-bit                              |
| Memory Table                                                | —                                                                         | —                                   | 4096 x 12-bit words                     |
| ADC                                                         | —                                                                         | —                                   | 1 x 14-bit                              |
| DAC                                                         | —                                                                         | —                                   | 1 x 12-bit                              |
| Data Buffer                                                 | —                                                                         | —                                   | 4 x 16-bit                              |
| MathCore                                                    | —                                                                         | —                                   | 4 math operations (+, -, x, /)          |
| Maximum Look Up Tables (LUTs)                               | 16                                                                        | 20                                  | 31                                      |
| Maximum Counters/Delays                                     | 5                                                                         | 7                                   | 13                                      |
| Maximum DFF / Latch                                         | 16                                                                        | 18                                  | 31                                      |
| PWMs                                                        | —                                                                         | —                                   | 1                                       |
| Pipe Delay                                                  | —                                                                         | 16-stage                            | —                                       |
| Programmable Delay                                          | 1                                                                         | 1                                   | 1                                       |
| Internal Oscillator (Hz)                                    | 2 k or 10 k / 25 M                                                        | 2.048 k / 2.048 M / 25 M            | 2 k or 10 k / 20 M or 40 M              |
| Communication Interface                                     | I²C                                                                       | I²C                                 | I²C                                     |
| QFN Package Size (mm)                                       | 20-pin 2.0 x 3.0 x 0.55, 0.4 pitch/<br>24-pin 3.0 x 3.0 x 0.55, 0.4 pitch | 24-pin, 3.0 x 3.0 x 0.55, 0.4 pitch | 16-pin 2.0 x 2.0 x 0.55, 0.4 pitch      |

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