

## **DAY #5- Task - 3**

### **Team- 2**

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### **Report on SLG46824 GreenPAK Programmable Mixed-Signal Matrix IC**

#### **1. Introduction**

The SLG46824 is a versatile, low-power programmable mixed-signal matrix IC from Renesas Electronics. It is designed to provide a highly flexible platform for implementing a variety of mixed-signal functions in compact electronic devices.

#### **2. Key Features**

##### ***2.1 Analog Components***

- Analog Comparators : The IC includes two low power general-purpose rail-to-rail analog comparators (ACMPxL), useful for various analog signal processing tasks.
- Voltage Reference : It has one voltage reference with a Vref output for stable voltage supply.

##### ***2.2 Digital Components***

- Combination Function Macrocells : The device features eleven combination function macrocells which can be configured for a variety of logic functions.
- Selectable DFF/LATCH or LUTs : Includes multiple configurable DFF (D-type Flip-Flop)/LATCH or Look-Up Tables (LUTs):
  - Three selectable DFF/LATCH or 2-bit LUTs
  - One selectable programmable pattern generator or 2-bit LUT
  - Six selectable DFF/LATCH or 3-bit LUTs
  - One selectable pipe delay or ripple counter, or 3-bit LUT
  - Seven selectable DFF/LATCH or 3-bit LUTs with 8-bit delay/counters
  - One selectable DFF/LATCH or 4-bit LUT with 16-bit delay/counter
- Deglitch Filter and Edge Detector : Includes a programmable delay with edge detector output, useful for noise reduction and signal conditioning.

##### ***2.3 Oscillators***

Internal Oscillators : The IC is equipped with three internal oscillators:

- 2.048 kHz oscillator
- 2.048 MHz oscillator

- 25 MHz oscillator

## **2.4 Power Management**

- Dual Power Supply : Supports dual power supply for flexible interfacing between two voltage domains (2.5 V to 5 V for VDD, 1.8 V to 5 V for VDD2).
- Low Power Consumption : Designed for low power operation, suitable for battery-powered applications.
- Power-on Reset : Ensures the device starts in a known state after power-up.
- In-System Programmability : Allows programming of the device while in operation, facilitated by multiple-time programmable memory.

## **2.5 Interface**

- I2C Interface : Supports I2C protocol for easy communication with other devices.

## **3. Applications**

- The SLG46824 is suitable for a wide range of applications due to its flexibility and low power consumption. Some key application areas include:
- Personal Computers and Servers : Used in various control and interface functions.
- PC Peripherals : Ideal for keyboards, mice, and other peripheral devices.
- Consumer Electronics : Suitable for smart home devices, entertainment systems, and appliances.
- Data Communications Equipment : Used in networking devices and communication modules.
- Handheld and Portable Electronics : Perfect for smartphones, tablets, fitness bands, and portable medical devices.
- Notebook and Tablet PCs : Utilized in various control and interface circuits.

## **4. Overview and Conclusion**

The SLG46824 GreenPAK Programmable Mixed-Signal Matrix IC provides a highly flexible, low-power platform for implementing a variety of mixed-signal functions in compact electronic devices. With its rich set of analog and digital components, programmable logic, internal oscillators, and dual power supply capability, the SLG46824 is an excellent choice for developers looking to design innovative and efficient electronic systems.

## **5. References**

- Renesas Electronics, "SLG46824 Datasheet," Version 3.20, November 30, 2023.