Introduction

Many applications require a controlled cycle during power-up and power-down.

The GreenPAK2 controls the starting time of each of 3 power rails, and the shutdown time.

Description

Pins 3, 4 each have an internal 300KΩ resistor, and 300KΩ external resistors in the schematic to make a voltage divider at the analog inputs to the analog comparators. The circuit then determines if the previous channel got started up based on the voltage, and whether to start the next channel. (outputs at pins 10, 11, 12).

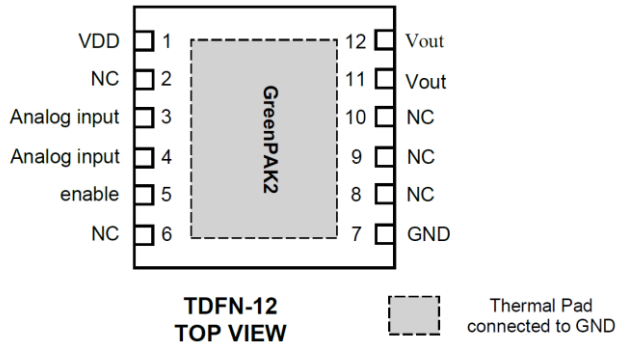

Figure 1. Pin configuration

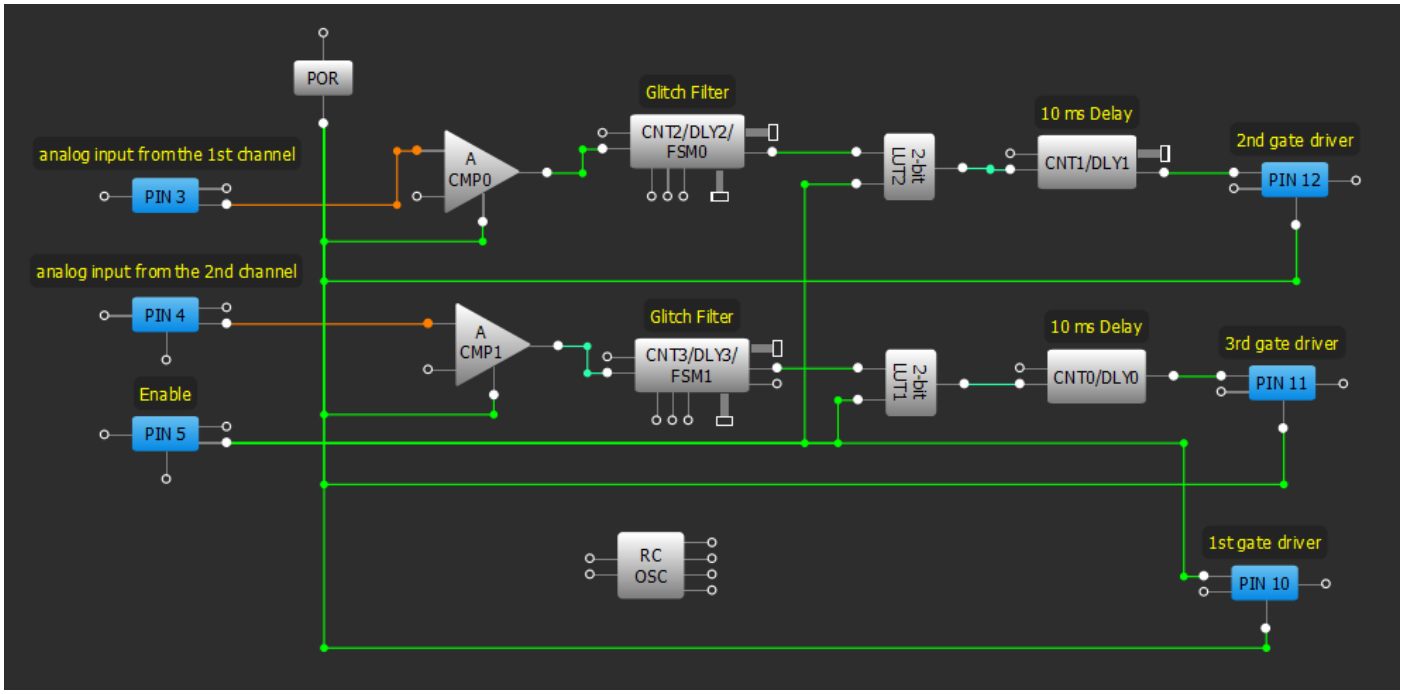

Figure 2. Design connections in GreenPAK2 Designer

The enable switch starts the circuit by pin 5, and drives the 1st channel signal through pin 10, and on to a loadswitch (SLG59M301V).

The loadswitches used in this design are Silego GreenFETs. They have integrated MOSFETs, short/thermal protection, and slew rate control based on capacitors C2, C3, C4.

In this example, the RC OSC is set to be always ON by choosing the option Force Power On, and it will provide a 28.34 KHz clock frequency.

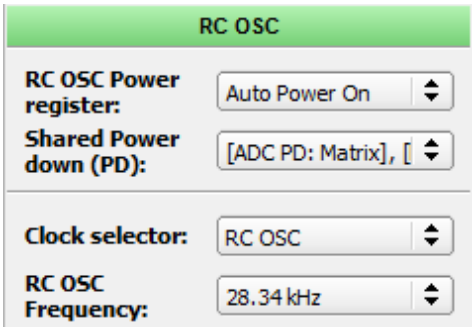

Figure 3. RC OSC properties

The ACMP0 and ACMP1 properties are set as 600mV reference voltage to make delay equal to the input ramp time reaching the 600mV x 2 (because of the 300K external resistor voltage dividers). Also, the Hysteresis is set to 50 mV to reduce effect of input glitches.

POR is used to remove any ACMP glitch during powerup. ACMP0 is configured to auto power detect.

Figure 4. POR properties

Pins 3, 4 are configured as analog inputs with floating pull down resistor. Pin 5 is configured as digital input with 300k pull down resistor (figure 7)

The pins 10, 11, 12 are configured as 1X push pull with floating pull down resistor (figure 8).

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{THD}	ACMP0 Voltage Threshold	575	-	625	mV
V_{THD}	ACMP1 Voltage Threshold	575	-	625	mV
V_{AIR}	ACMP Analog Input Voltage Range	0	-	1000	mV
T_{DLY0}	DLY0 Time Delay	-	10.0917	-	ms
T_{DLY1}	DLY1 Time Delay	-	10.0917	-	ms
T_{DLY2}	DLY2 Time Delay	-	0.1059	-	ms
T_{DLY3}	DLY3 Time Delay	-	0.1059	-	ms

Table 1. Design Main Electrical Characteristics

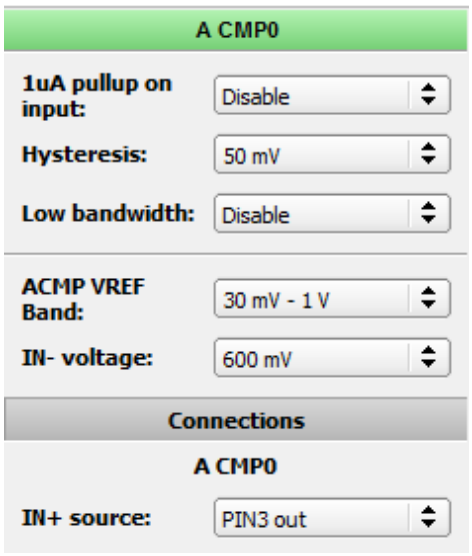

Figure 5. A CMP0 properties

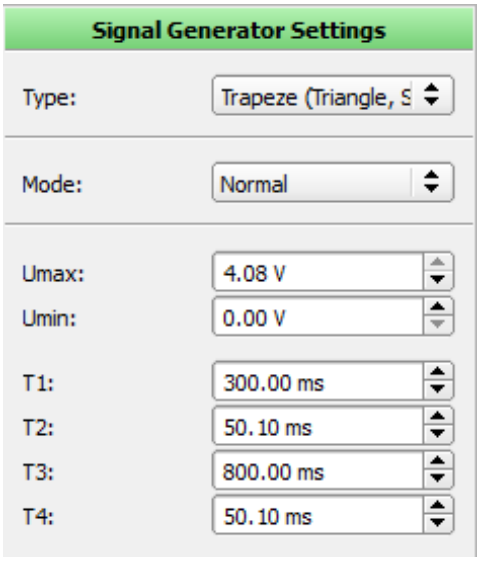

Figure 6. Signal Generator Settings

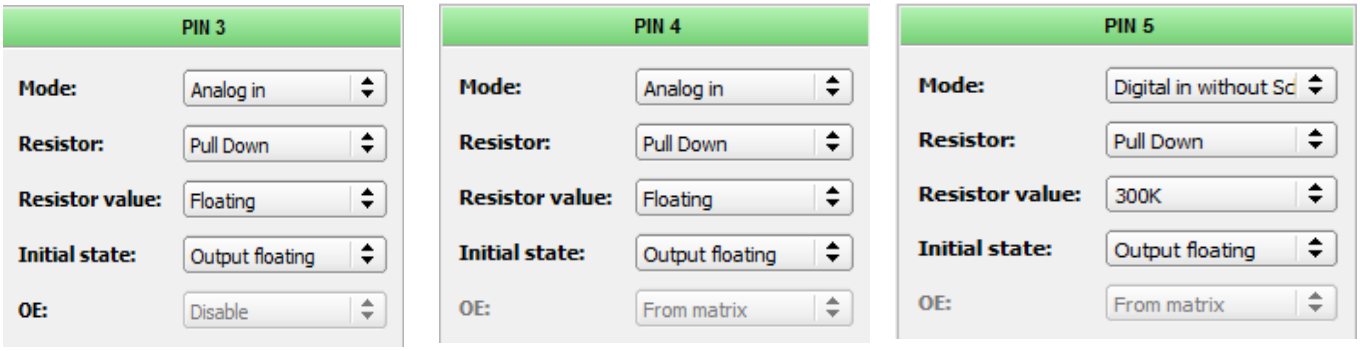

Figure 7. PIN 3, PIN 4 and PIN 5 properties

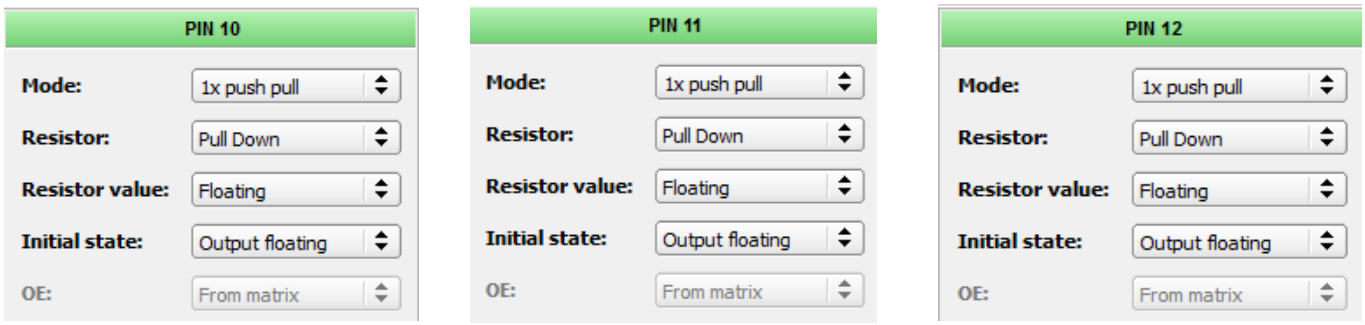

Figure 8. PIN 10, PIN 11 and PIN 12 properties

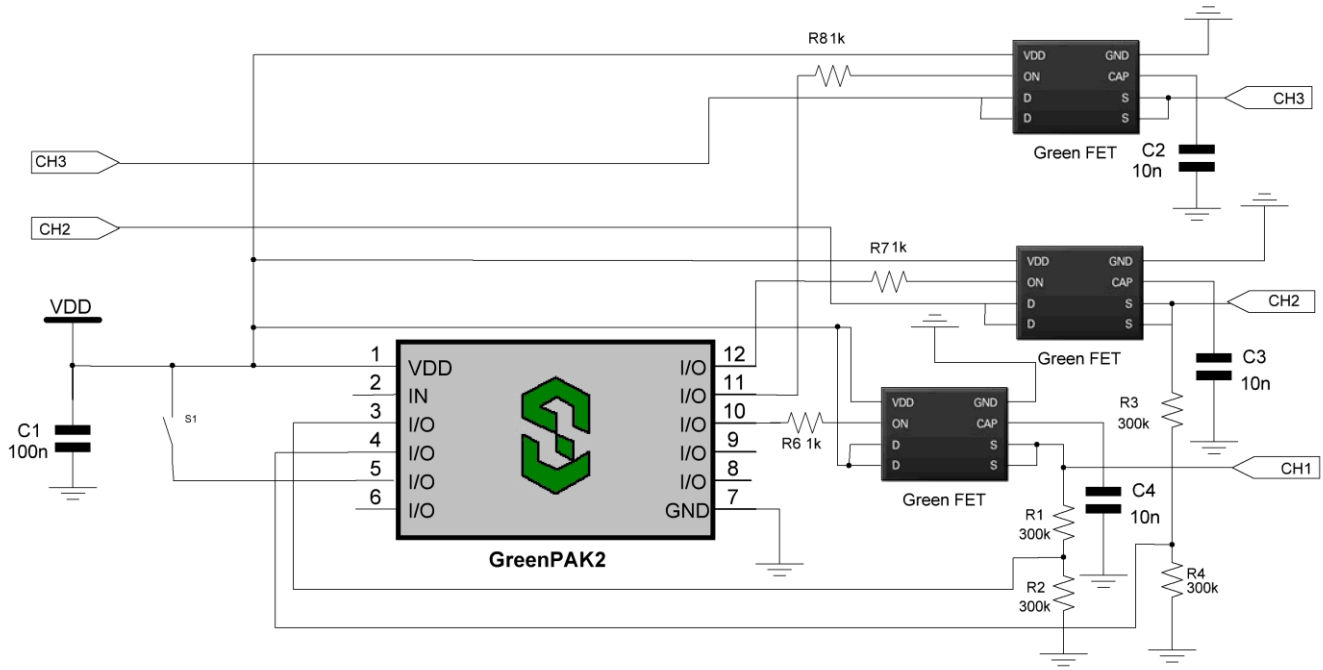

Figure 9. Typical Application Circuit

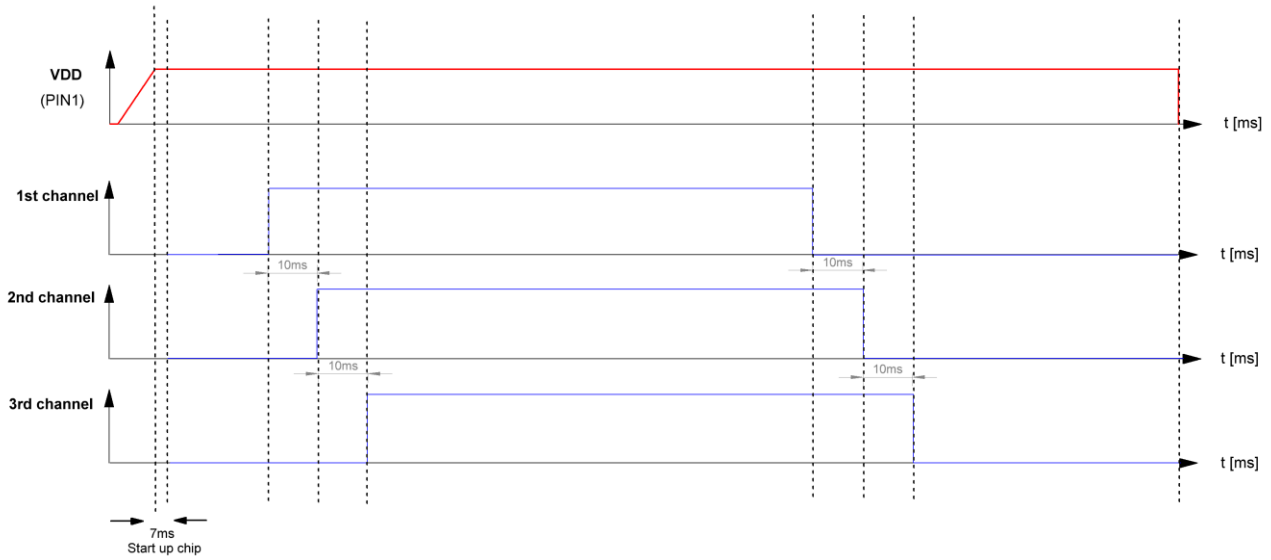

Figure 10. Timing Diagram

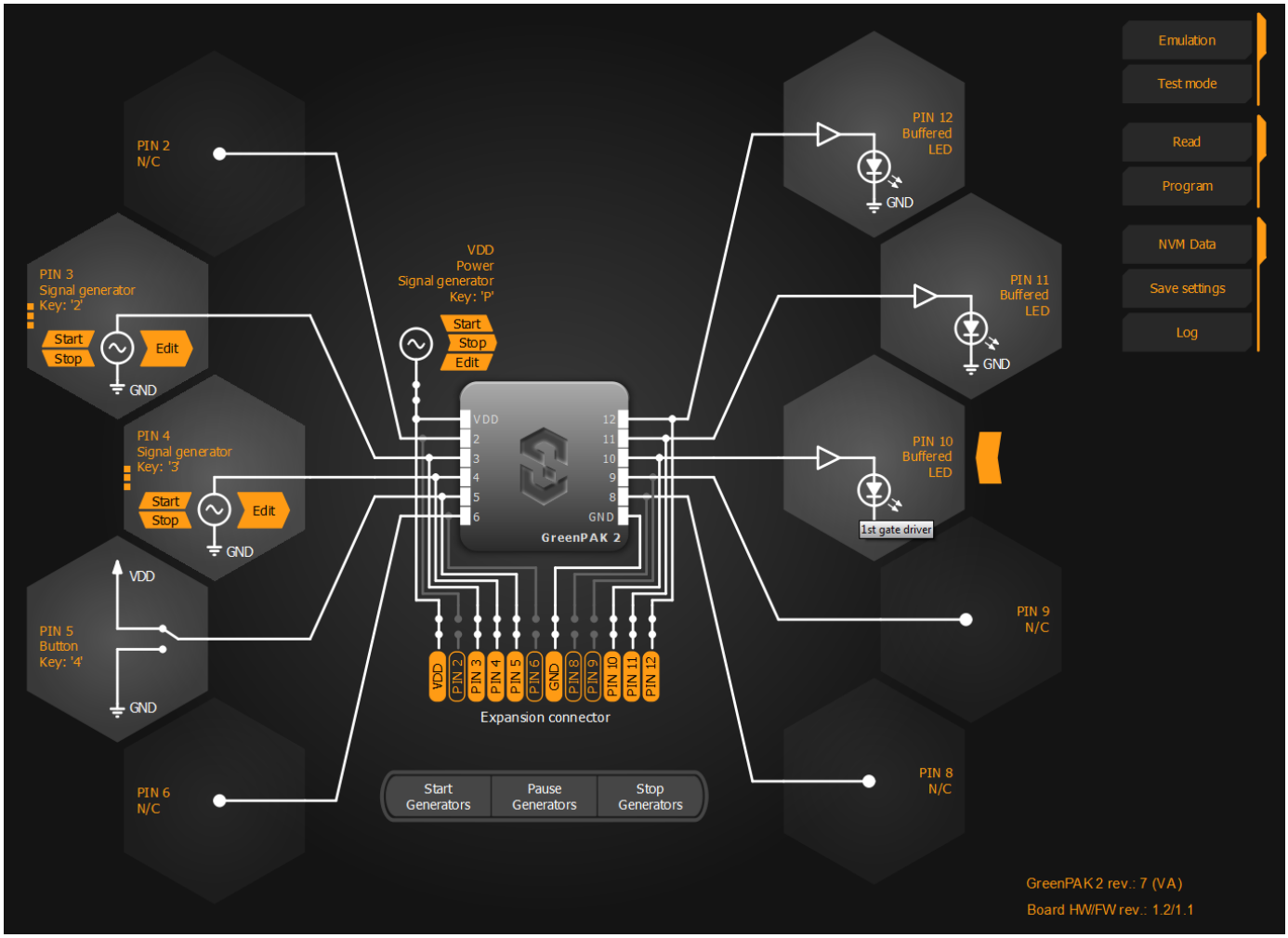

Figure 11. GreenPAK2 Emulation Tool

Conclusion

A GreenPAK2 was configured to control the power sequence of several power rails. This is useful for power management or system control considerations.

About the Author

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Document History

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Revision	Orig. of Change	Submission Date	Description of Change
A	Saif Abu Baker	3/26/2014	New application note

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