

Simultaneous Path Selection in a Dual-switch Configuration



Application Note 68

Summary

This application note describes how to enable simultaneous path selection in a dual-switch configuration using the mirror port capabilities supported by Peregrine's high-throw count RF switch family.

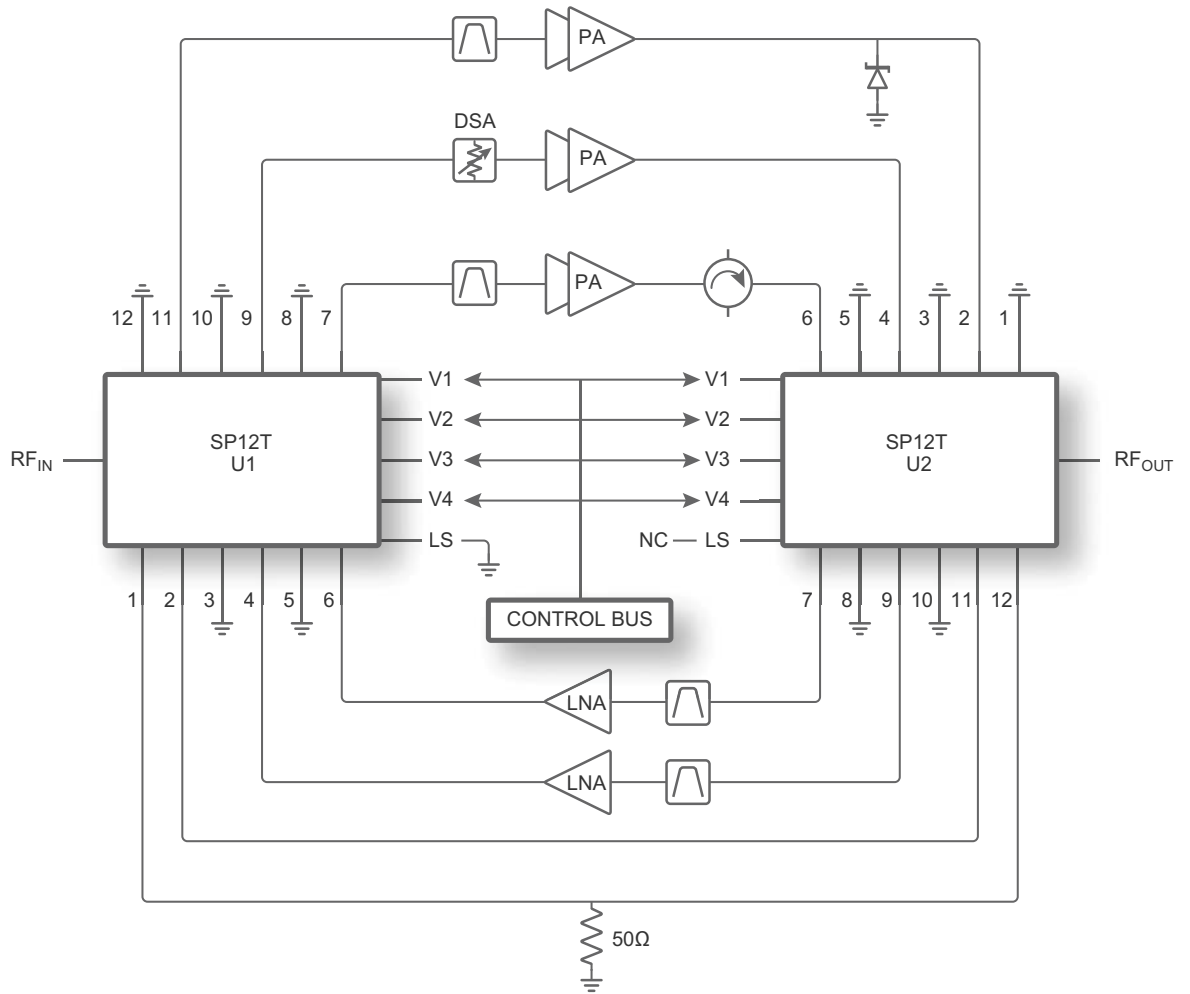
The recent growth of the Internet of Things (IoT) and its wide-ranging applications are driving an increasing number of products to support more frequency bands than ever before. Peregrine's line of SP6T, SP8T and SP12T switches combine high performance and unparalleled flexibility by using only one control signal to enable simultaneous path selection in a dual-switch configuration. Switching between multiple Tx/Rx bands, selecting appropriate filter banks or diverting to a high voltage standing wave ratio (VSWR) protection path has never been easier to achieve.

By routing the same set of control bits to both switches, the corresponding ports are activated simultaneously. This is enabled by grounding the Logic Select (LS) pin of just one switch to activate mirror port selection. In this way, a simple layout becomes possible for dual-switch configurations, without requiring excessive trace routing or logic inversions for the switches to work in tandem. The mirror port selection feature is standard for any Peregrine switch with a LS pin.

Introduction

The newest additions to Peregrine's high-performing line of products are the high-throw count absorptive RF switches. Unique in their feature set, these switches offer top-notch performance in a multi-throw solution. Featuring HaRP™ technology, these switches support IIP3 of +60 dBm with 6, 8 and 12 throw counts. Operational switch frequencies range from 9 kHz up to 8 GHz. Power handling is rated up to +33 dBm continuous wave (CW) with just a 3.3V power supply. Refer to **Figure 1** for an example of a dual-switch configuration using two SP12T switches.

Figure 1 • Dual-switch Configuration Example with SP12T



Control Signal Routing

Sending one control signal, or the same set of bits, to both switches and grounding the LS pin of just one switch enables a logic state that activates the mirror ports and permits simultaneous RF path selection.

The implementation of control signal routing depends on the throw count.

- A SP12T switch allows up to four control bits to be used.
- SP6T and SP8T switches need only three control bits.

The number of selectable paths corresponds to the throw count of the switch. A SP12T switch used in a dual-switch configuration, for example, may have up to 12 selectable paths.

The mirror port selection feature is standard for any Peregrine switch with a LS pin. Refer to **Figure 2** for the pinout diagram and LS pin implementation. For a list of SPDT switches featuring the LS pin, refer to **Table 1**. For a list of Multithrow switches featuring the LS pin, refer to **Table 2**.

Figure 2 • Pinout Diagram with Dual SP12T

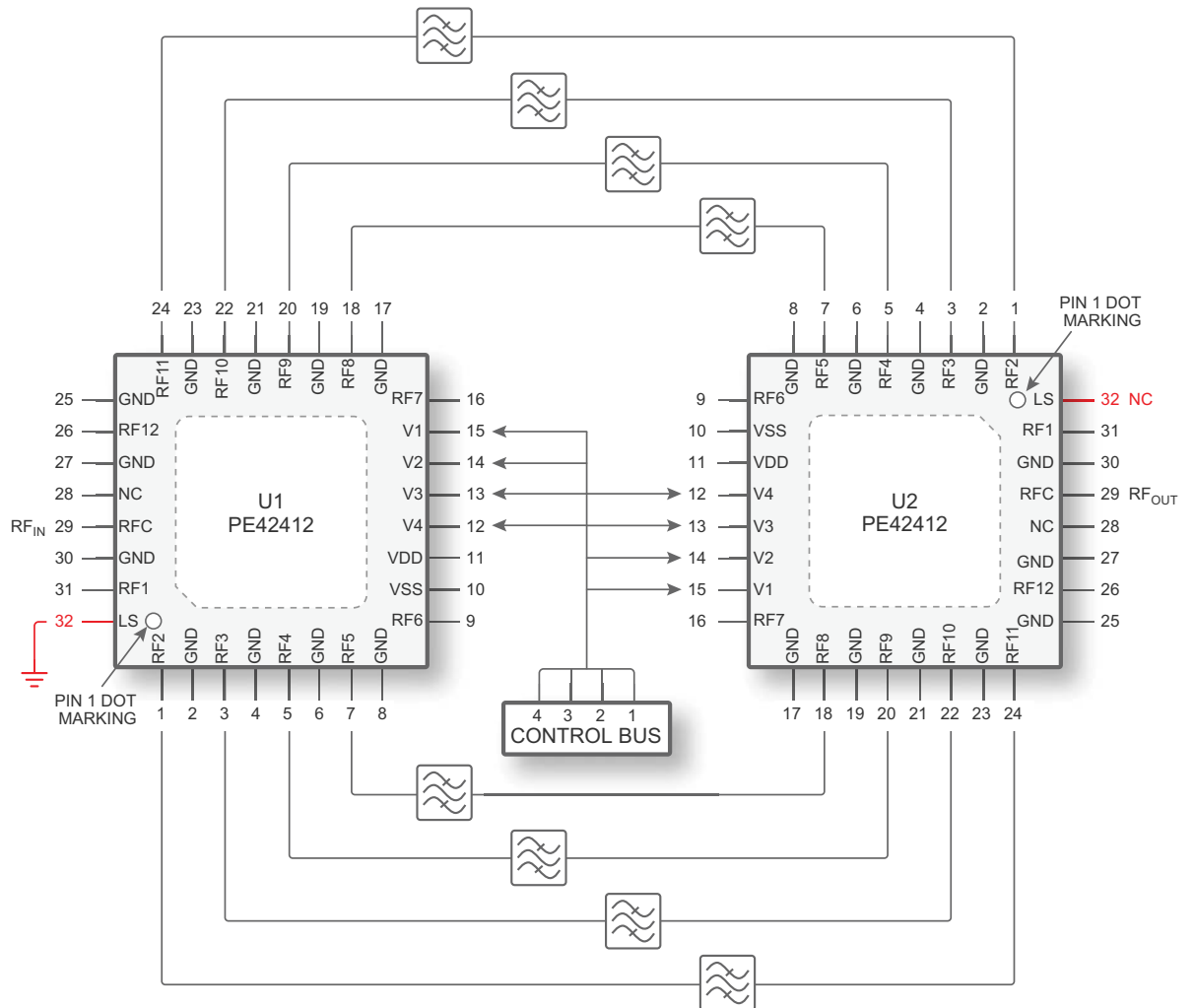


Table 1 • RF Switches with LS Pin (SPDT)

Product Description	Product Part Number
Reflective	PE42422
Reflective	PE423422
Absorptive	PE42020 ^(*)
Absorptive	PE42423
Absorptive	PE42520 ^(*)
Absorptive	PE42521 ^(*)
Absorptive	PE42553 ^(*)
Absorptive	PE42822

Note: * External V_{SS} negative voltage control

Table 2 • RF Switches with LS Pin (Multithrow)

Product Description	Product Part Number		
Absorptive, SP6T	PE42462	PE42562 ⁽¹⁾	PE426462 ⁽²⁾
Absorptive, SP8T	PE42482	PE42582 ⁽¹⁾	PE426482 ⁽²⁾
Absorptive, SP12T	PE42412	PE42512 ⁽¹⁾	PE426412 ⁽²⁾

Notes:
 1) External V_{SS} negative voltage control
 2) Extended temperature range, -55 to +125 °C

Conclusion

Peregrine's high-throw count RF switch family is the most flexible and highest performing line of multi-throw switches, featuring mirror port selection and best in class linearity. Frequency band and/or path selection in a dual-switch configuration are now possible thanks to the LS pin. A simplified layout to send one logic control signal to both switches saves board space and design time. With SP6T, SP8T and SP12T options, the high-throw count RF switch family delivers unparalleled flexibility without compromising performance.

Sales Contact

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