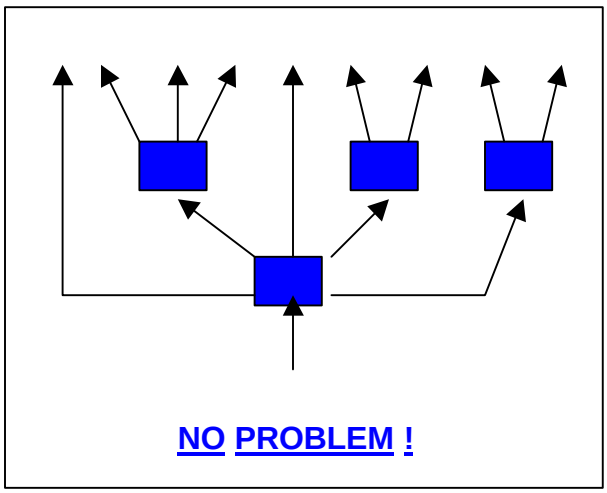
Impellimax

Decoding Chip Sets for Multi-throw Switches



NO PROBLEM !

Multi-throw microwave switches are sometimes made in a "tree-style" structure, in which there is an input multi-throw switch that feeds one or more multi-throws. Driving such a switch requires a special arrangement of logic decoding. This note introduces products and methods for dealing with such circumstances.

We are pleased to offer a range of useful PIN switch driver alternatives for designers of multi-throw switches.

The standard DS (Decoder Slow) and DF (Decoder Fast) PIN diode driver styles are well suited for multi-throw switches which have all of the switch arms converging at a common junction. In such a configuration, the truth table is basically that one arm is energized while the others are at the opposite state.

It is frequently useful, however, to design multi-throw switches in a "tree" formation, in which the main "trunk" splits into two or more branches, and some of the branches in turn split again one or more times to achieve the desired number of throws.

Of course, the simplest way to set this up, from a DC standpoint, is to make all of the splits be 2, 4, or 8-throws. This allows the binary selection word bits to directly control the tiers in the switch. As a simple example, consider an SP8T configured as a group of seven SP2T switches. The first tier is the single input SP2T. The second tier consists of two SP2T's fed by the first tier. Lastly, the third tier is a set of four SP2T's, all fed by the outputs of the second tier of switches. This configuration can be simply driven by using the MSB to control the first tier switches, the middle bit to control the second tier, and lastly the LSB to control the third tier.

This arrangement does not provide optimal isolation, however, because there will always be arms that are in insertion loss, despite the fact that they are in off-selected RF paths. Also, RF or mechanical considerations may require that the switch arrangement should be more exotic. If, for example, there are SP3T switches that must be configured into a binary-selected SP8T, or even an SP9T, this can be accommodated with appropriate driver logic.

At this writing, there exists a wide range of semi-custom decoded drivers with auxiliary TTL inputs and outputs to make these sorts of arrangements simple. We frequently embed "glue logic" for our customers, so that the simplest assemblies result.

Please feel free to call Impellimax early in your design cycle, so that we can provide the best driver solution to your multi-throw switch driver requirements. Fax us your set-up or your logic table. We may have just what you need. If not, we'll work at it until we do.

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