

## Checking the Isolation of the Heathkit HD-1234 Coaxial Switch

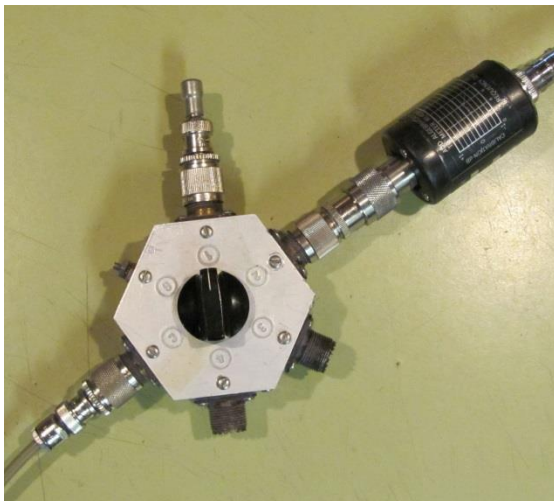
I have a couple of these switches and was interested in using them with my Icom-7300 and my SDRPLAY RSP1A receiver. I wanted to know the isolation between the ports so I wouldn't overload the RSP1A when the Icom was in use.

The measuring equipment used was a Wavetek 3000 series signal generator and a Boonton RF millivolt meter. Two different set ups were used. The first set up (Table 1) had the common port connected to the signal generator and the isolation measured between ports 1 and 2. In other words when the switch was in position 1 the meter was measuring the output of position two. Port 1 would be terminated into 50 Ohms. When the switch was in position 2 the meter was connected to port 1 and port 2 was terminated into 50 Ohms. There are 4 positions on this switch but I only tested 1 and 2. Measurements were taken between 150 and 7 MHz. Insertion loss between the common port and the others was quite low even at 150 MHz, about 0.1 dB at 150 MHz.

Table 1

FREQUENCY	ISOLATION PORT 2 Port 1 terminated (SW in pos. 1)	ISOLATION PORT 1 Port 2 terminated (SW in pos. 2)
150 MHz	26 dB	24.5 dB
50 MHz	41 dB	36.5 dB
30 MHz	46.5 dB	41.5 dB
21 MHz	49 dB	44.5 dB
14 MHz	53 dB	47 dB
7 MHz	57 dB	53 dB

As can be see the isolation is not equal between ports. The tests were done twice for both tables to confirm they were repeatable.



The photo to the left shows the set up for the first configuration.

The table below has the switch common port terminated into 50 Ohms and the signal generator connected to either input 1 or 2. These are the results that directly affect my application.

Table 2

FREQUENCY	ISOLATION PORT 2 Port 1 input (SW in pos. 1)	ISOLATION PORT 1 Port 2 input (SW in pos. 2)
150 MHz	25.5 dB	27 dB
50 MHz	36 dB	41 dB
30 MHz	41.5 dB	46 dB
21 MHz	45 dB	49 dB
14 MHz	48 dB	52 dB
7 MHz	53 dB	57 dB

So what can we make of the results? The spec. for the RSP1A (max. rated input 0 dBm continuous or +10dBm for a short duration). The 150 MHz isolation is not an issue as the Icom-7300 doesn't go to 2 meters. 50 MHz is an issue as the worst case of 36 dB isn't enough. 100 Watts output (of the Icom) equals +50dBm. The 36 dB of isolation brings the level to +14dBm. The isolation at 30 MHz worst case would bring the level to 8.5dBm.

As mentioned earlier I did not check switch positions 3 and 4 so the isolation is unknown. In conclusion I would not feel comfortable using this switch above 7 MHz for my application. You would need a minimum of 50 dB isolation to meet the maximum accepted continuous level for operation of the RSP1A.

**DISCLAIMER:** Use this information at your own risk. Your situation may vary.

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