Hello OMs,

I'm going to share some measurements made on my UHF Duplexer that will be installed on my MMDVM equipment for the upgrade from simple hotspot to a repeater, using a Diamond X-510 antenna.

I bought this very cheap Duplexer from the Chinese e-shop "409Shop", at only 97$:
http://www.409shop.com/409shop_product.php?id=104460

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**Specifications:**

- 50W RF power Handling
- 6 cavity Design
- Minimum Tx and Rx frequency difference: UHF 5Mhz
- Maximum Tx and Rx frequency difference: UHF 12Mhz
- Power isolation >75dB
- Power loss <1dB
- Easy to build your repeater
- Support Frequency: UHF 380-485Mhz
- Free Frequency Tuning - send me the high / low frequency
- N connector
- Size: 22.2cm X 19.5cm X 3.5cm
It’s a 6 cavity Duplexer (3 notch filters for each path), so I expected a very good out-of-band attenuation, which is a very interesting feature in installation sites with strong RF signals coming from other transmitters.

I choose the 50W version, because the price difference between the 35W and 50W was only 14$.

For the payment, I used paypal, without any problem. As suggested on the site, I specified the Low and High Frequencies of my repeater in the order notes.

The Duplexer arrived very quickly. The order dates are the following:

- Order and Payment: **14 November 2017**
- Order Confirmation: **15 November 2017**
- Shipment confirmation and Tracking Number: **18 November 2017**
- Arrival: **01 December 2017**

Before the installation, I took some measurement with a Vector Network Analyzer, at ambient temperature and at cold and hot temperatures in a climatic chamber, in order to verify the tuning made by the seller, and the temperature drifts, which affects most of the low-cost Duplexers.

I choose +55°C and -25°C as worst case temperature, although my region has a very mild climate and probably we’ll never reach these temperaturas.

Note: during every measurement, the third port (not connected to the VNA) is connected to a 50ohm dummy load.

The frequency of my repeater are:

- Low (TX): 430.325 MHz
- High (RX): 435.325 MHz

The more interesting measurements which I’ll report hereafter, are:

- Attenuation from Antenna port to RX port;
- Attenuation from TX port to Antenna port;
- Matching at RX, TX, and Antenna ports;
- Isolation between TX and RX ports;

Here below, the ambient temperature measurements are reported:
Considerations about performances at ambient temperature

- The isolation between RX and TX ports is >70db, as declared on the datasheet.
- The loss from ANT to RX port and from TX port to ANT is <1db.
- The resonance at RX and TX ports are slightly different from the desired frequencies, but the matching is very good anyway (>20dB).
- The matching at antenna port is good (>20dB).

Here below, the temperature drifts of the main measurements are reported:

**Note:** the attenuation @435.325MHz is 1.2dB at +55°C and 1.1dB at -25°C

![ATTENUATION FROM ANTENNA TO RX PORT](image1)

**Note:** the attenuation @435.325MHz is 1.1dB at both +55°C and -25°C

![ATTENUATION FROM TX PORT TO ANTENNA](image2)
Considerations about performances at cold and hot temperatures

- In all the cases, the responses moves up in frequency when the temperature increases.
- The isolation is still >=70dB also at hot and cold temperatures.
- The attenuation from ANT to RX port and from TX to ANT increases slightly (1.2dB), but is still very good, even if the curves move in frequency.

Conclusions

Here below, I judged and assigned a score for every aspect of Duplexer, from 0 (min) to 5 (max):

- **Shipment speed**: ★★★★★
- **Tuning accuracy**: ★★★★★
- **RF Performance at T amb**: ★★★★★
- **RF Performance at extreme temperatures**: ★★★★★

Considering the cost, this Duplexer is a good compromise between cost and performances, and I suggest this product for hamradio applications.

The out-of-band rejection is good as well as the temperature stability, so it can be used also in mountain sites or in RF polluted sites.

Contacts

For any further question, please write at iz7boj@gmail.com

Best 73’

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