Excellent 13cm isolator of unknow type and brand

Matthias, DD1US, February 9th 2023

Hello,

Cleaning up my drawer with surplus components I found a circulator which I probably bought some time ago at a flea market. The unit has not markings at all. The size is approx. 60mm x 60mm x 26mm. Input and output ports are SMA jacks. The unit is quite solid and has a weight of approx. 350g.

Here are some pictures of the device. The labels are from me.



There are 3 tuning screws on the top of the isolator and another 3 tuning screws at its bottom. After tuning the device to 2.4GHz I sealed the tuning screws with green tamper-proof-sealant.



When I received the isolator, it was tuned to approx. 2.6GHz. I retuned it for optimum results at 2.4GHz while it has still excellent data at 2.32GHz. Below you will find my measurement results of this S-band isolator. All measurements were done in the frequency range 2.0GHz to 2.8GHz. Please excuse the strange nomenclature input return loss S22, output return loss S11, insertion loss S12, isolation S21. I had not know which is the input and which is the output port when I started my measurements **(c)**

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First, I measured the input return loss / input matching S22:

The measured input return loss values are 29.3dB@2320MHz and 34.2dB@2400MHz.



The input SWR values are 1.07dB@2320MHz and 1.04dB@2400MHz.



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Next, I measured the insertion loss S12:

The measured insertion loss values are 0.20dB@2320MHz and 0.18dB@2400MHz.

I then measured the isolation S21 of the circulator:

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The measured isolation values are 30.3dB@2320MHz and 35.8@2400MHz.



Finally, I measured the output return loss / output matching S11:

The measured return loss values are: 35.1dB@2320MHz, 43.7dB@2400MHz



Output SWR results are: 1.04@2320MHz, 1.01@2400MHz



This isolator is so far the best device which I measured for 2.4GHz.

Input and output matching as well as insertion loss and isolation are fantastic:

Input return loss:	34.2dB (SWR 1.04)
Output return loss:	43.7dB (SWR 1.01)
Insertion loss:	0.18dB (4%)
Isolation:	35.8dB (0.026%)

If you can get hold of such a surplus device, I strongly recommend to buy it (and send it to me 😉).

I wonder what the source / supplier of this isolator is and what the maximum power handling of this circulator might be. Based on low insertion loss of 0.18dB I assume that this unit should be able to handle at least 100W CW. From an input power of 100W only 4W are dissipated in the unit which should not be a problem based on the massive built.

I will be happy to answer questions and always appreciate feedback. Many thanks in advance.

Best regards

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