

23cm Circulator C1214 and Isolator I1214 from BONN Elektronik

December 10th 2020, Matthias, DD1US

Hi,

Recently a friend helped me to get some circulators and isolators for the 23cm band at reasonable cost. They are surplus devices (about 26 years old) from a German company called Bonn Elektronik. The circulators have the part number C1214 and the isolators have the part number I1214. They have SMA connectors. They kindly provided the following specifications from them:

- Frequency 1.2-1.4 GHz
- Isolation 20dB min.
- Insertion loss 0.35dB max.
- Return loss 20dB min.
- Power ca. 100W CW

This is a picture of the circulator:

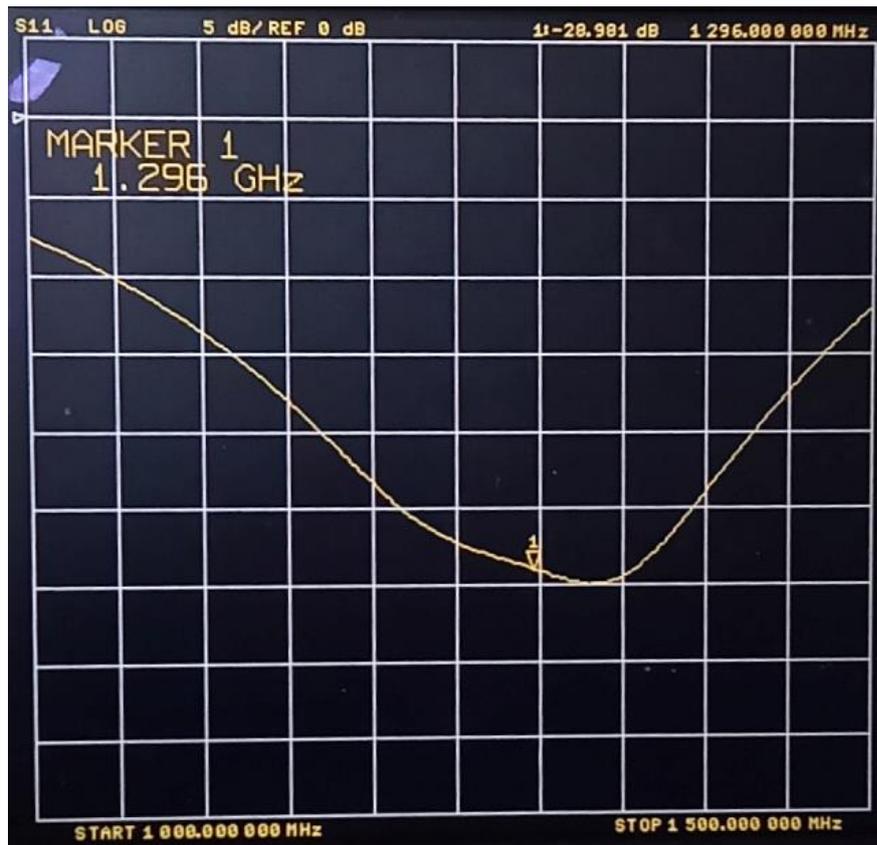


This is a picture of the isolator (already hooked up for the measurements):

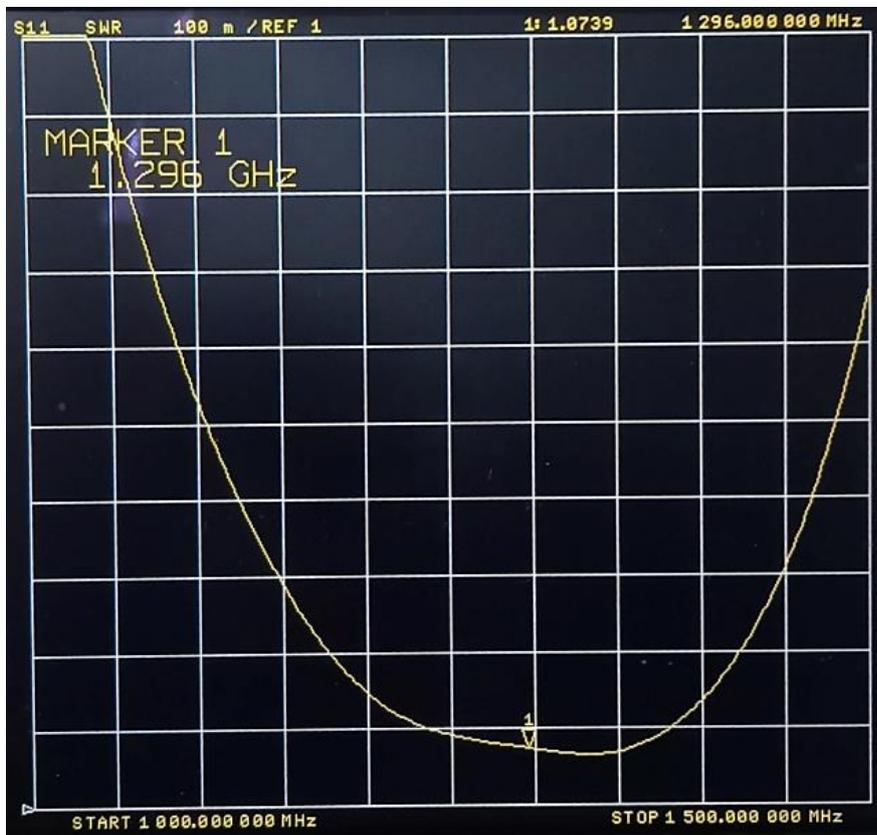


As I needed an isolator for a 23cm power amplifier which I am presently building I measured one of the isolators. I performed measurements of the S-parameters in the frequency range 1000 – 1500 MHz.

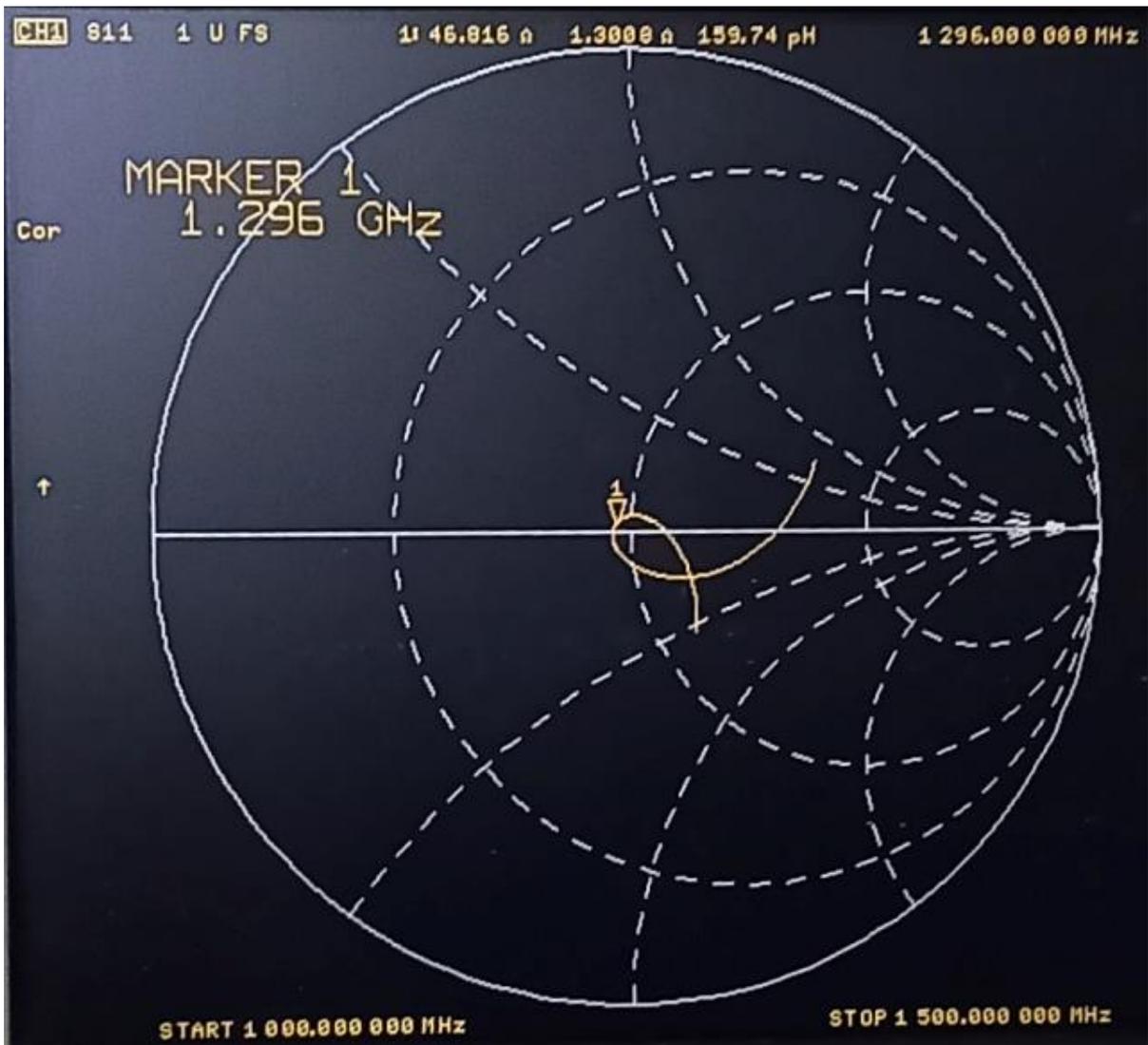
Input matching S11:



The isolator shows a nice return loss of RL=29dB at 1296MHz. The optimum is at 1330MHz with RL=30dB.



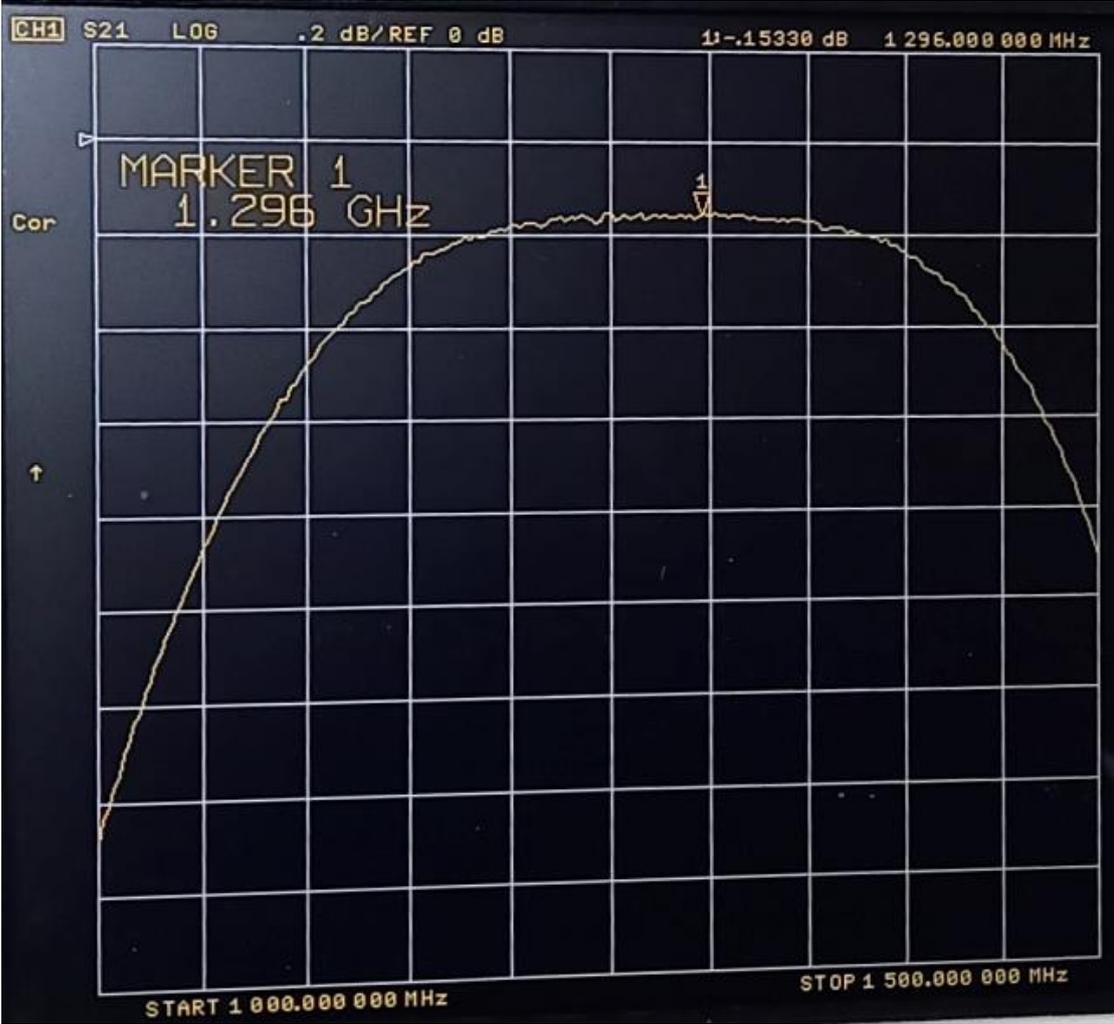
The SWR at 1296MHz is 1.07.



The smith chart shows a perfect curve for S11 well centered at 1296MHz.

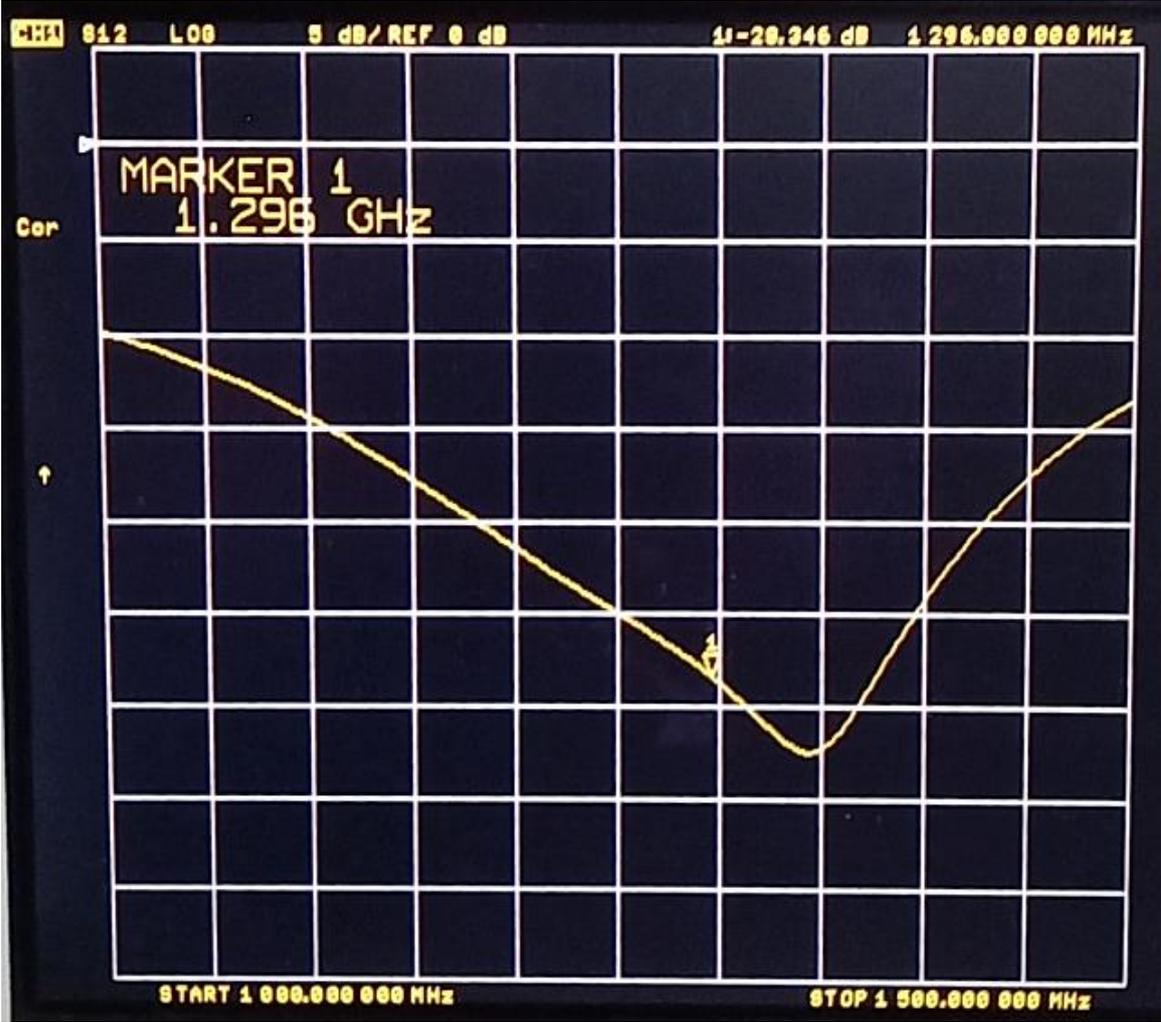
In summary the input matching is well centered at the 23cm band and the return loss is excellent (RL=28dB).

Transfer Characteristic S21:



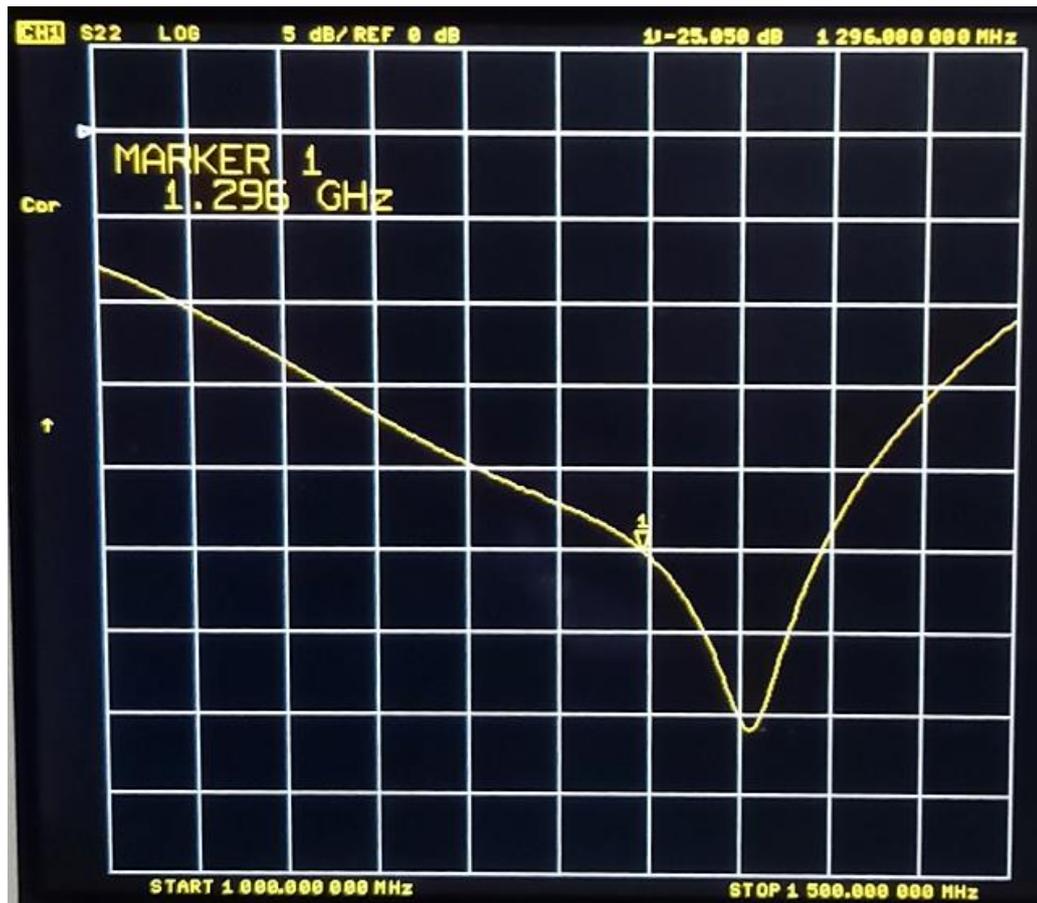
The center frequency of the transfer curve is approximately $f_c = 1275\text{MHz}$. The curve is very flat between 1200 and 1370 MHz (variation about 0.05dB). The insertion at 1296MHz is $IL = 0.15\text{dB}$. This is excellent.

Isolation S12:



The maximum isolation is achieved at $f_c = 1340$ MHz with the maximum isolation of $Isol = 33$ dB. At 1296 MHz I measured an isolation $Isol = 28.3$ dB which is still very good and more than sufficient for my application.

Output matching S22:



The maximum return loss is achieved at $f_c = 1360$ MHz with $RL = 36$ dB. At 1296 MHz I measured a return loss of $RL = 25$ dB. Also this is very good.

If anyone has experience with such a unit, I appreciate any information. Please send it to my Email address below.

Kind regards

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