ELVA-1 MICROWAVE HANDELSBOLAG
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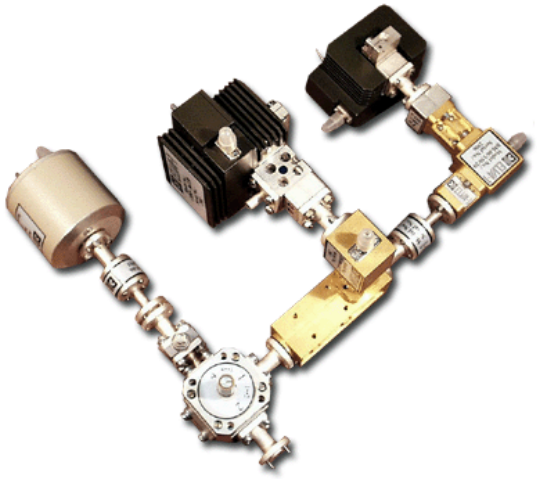
130-170GHz Front-End for D-band ECE Radiometer.

Description.



Applications:
Electron cyclotron emission (ECE) measurements

130-170GHz Front-End for D-band ECE Radiometer is another yet example of custom-designed equipment developed by ELVA-1. The front-end consist of two broadband downconverters, the first one for 130-150GHz and the second one 150-170GHz. Both of the donconverters have IF frequency band 1-20GHz. General design features of the front end included high operating frequency combined with high sensitivity. Each of the downconverters designed as an integrated module combined local oscillator with balanced mixer, filters and isolator (for high frequency channel only).

For calibration purposes the Front-end downconverter assembly unit is supplied with wideband noise source for 130-170GHz. A waveguide switch also included to the assembly unit (see photo) to switch between input ECE signal and noise source signal.

ELVA-1 has a wide experience in designing either front-ends and turnkey systems for measurements of mm-wave radiation for different scientific applications. Previous released projects were for EFDA-JET (JET, the Joint European Torus), FTU tokamak (Frascati, Italy), TCV (Lausanne), IPP Garching (Germany).

Downconverter assembly unit Specifications

Operating Frequency Band:	130-170 GHz
IF Frequency Band:	1-20 GHz
Out Off Band Rejection	45 dB (min)
Conversion Losses (131-150 GHz Low Band Channel):	16 dB (max)*
Conversion Losses (151-170 GHz High Band Channel):	21 dB (max)**
Operating Temperature:	+10 to +40 deg. C
IF Connectors:	SMA, female
RF Waveguide, Flange:	WR-06, UG-387/U-M

* conversion losses value included waveguide switch, directional coupler, high pass filter
** conversion losses value included waveguide switch, directional coupler, isolator, high pass filter

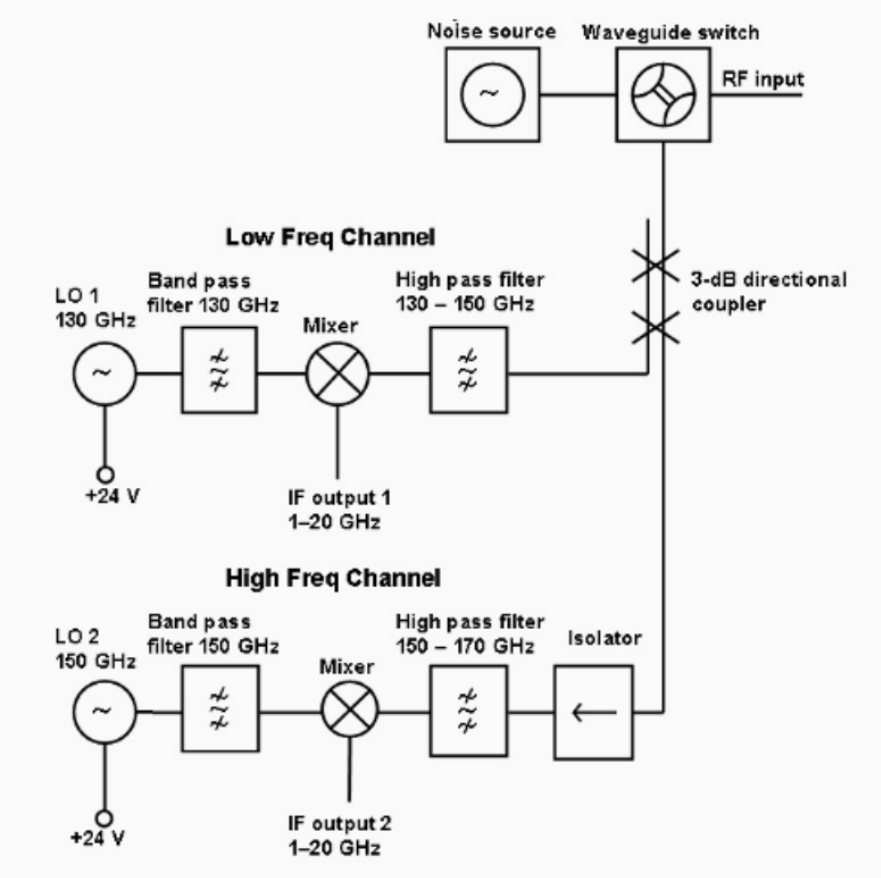


Fig.1. Block diagram of the 130-170GHz downconverter assembly

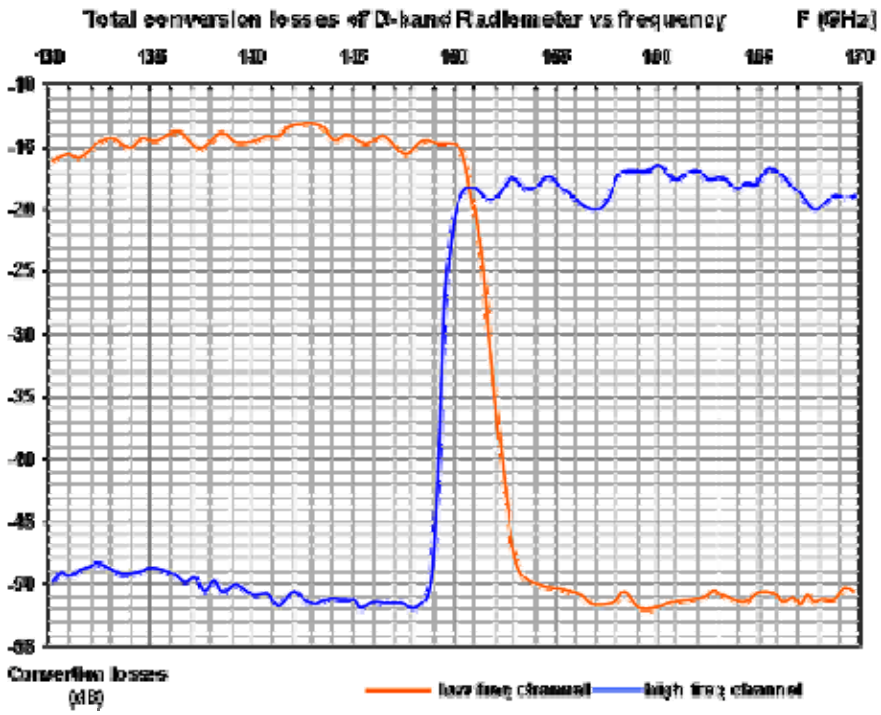


Fig. 2. Conversion losses vs frequency for 130-170GHz downconverter assembly diagram