

BC211: Bidirectional Coupler for R-9 Waveguide

General Description

BC211 (

Fig. 1) is a dual directional coupler intended for simultaneous sampling of both incident and reflected waves in high-power 900 MHz industrial applications using R-9 (WR-975) rectangular waveguide.

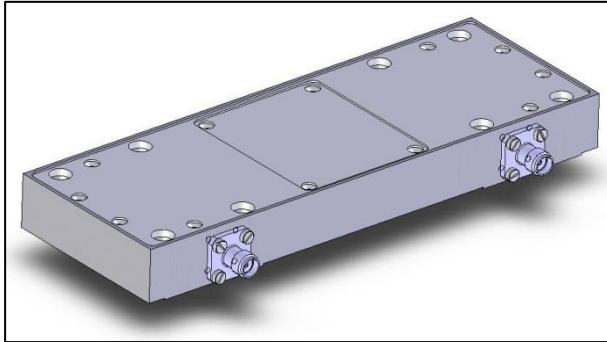


Fig. 1. Bidirectional coupler BC211.

The coupler integrates two attenuators to isolate the internal coupling structure from coupled port loads and to improve the coupled port match.

Two coupling factor options are available: -60 dB for maximal input power 10 kW in the waveguide, and -70 dB for maximal input power 100 kW.

The coupler module is fastened to a parent waveguide by means of six M3 or similar-diameter screws after machining of appropriate holes in the waveguide wall.

Alternatively, a calibrated assembly consisting of a BC211 fixed to a precisely machined parent waveguide with standard or customized length can be provided (Fig. 2). The standard length is 300 mm.

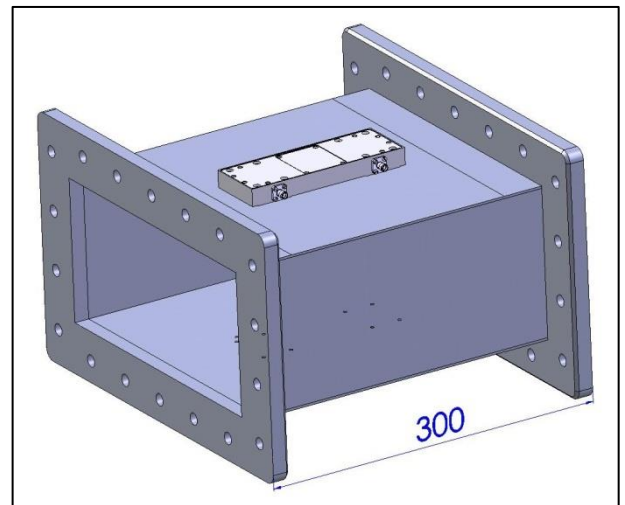


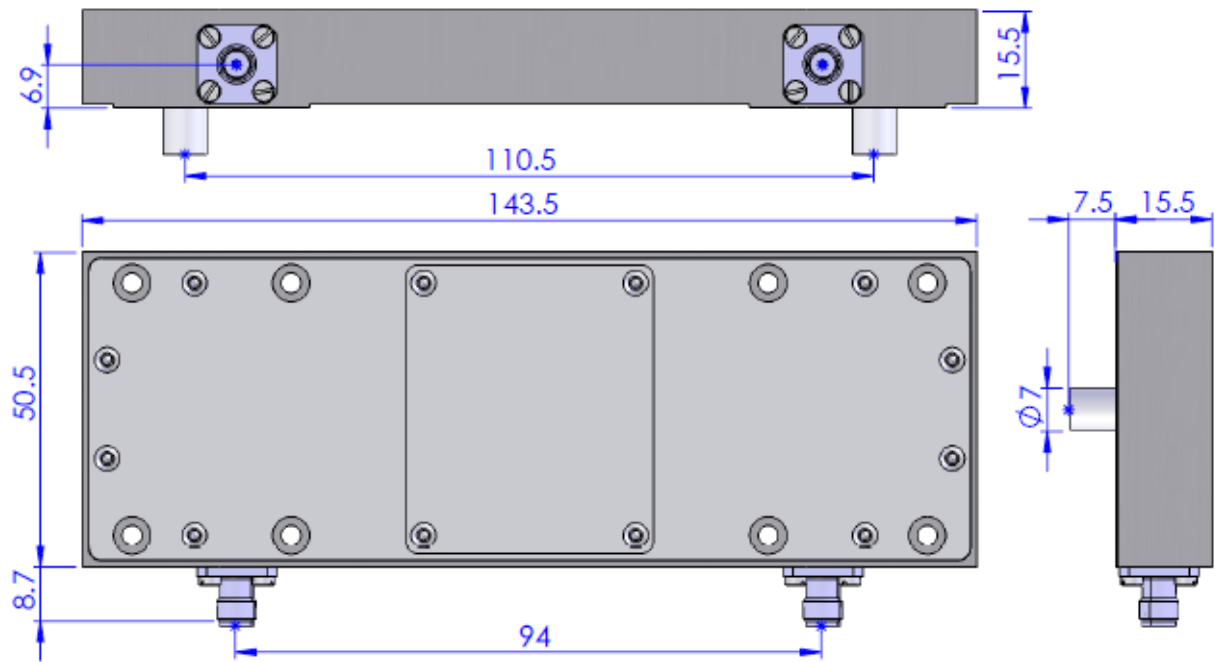
Fig. 2. BC211 installed on the standard-length waveguide.

Specifications

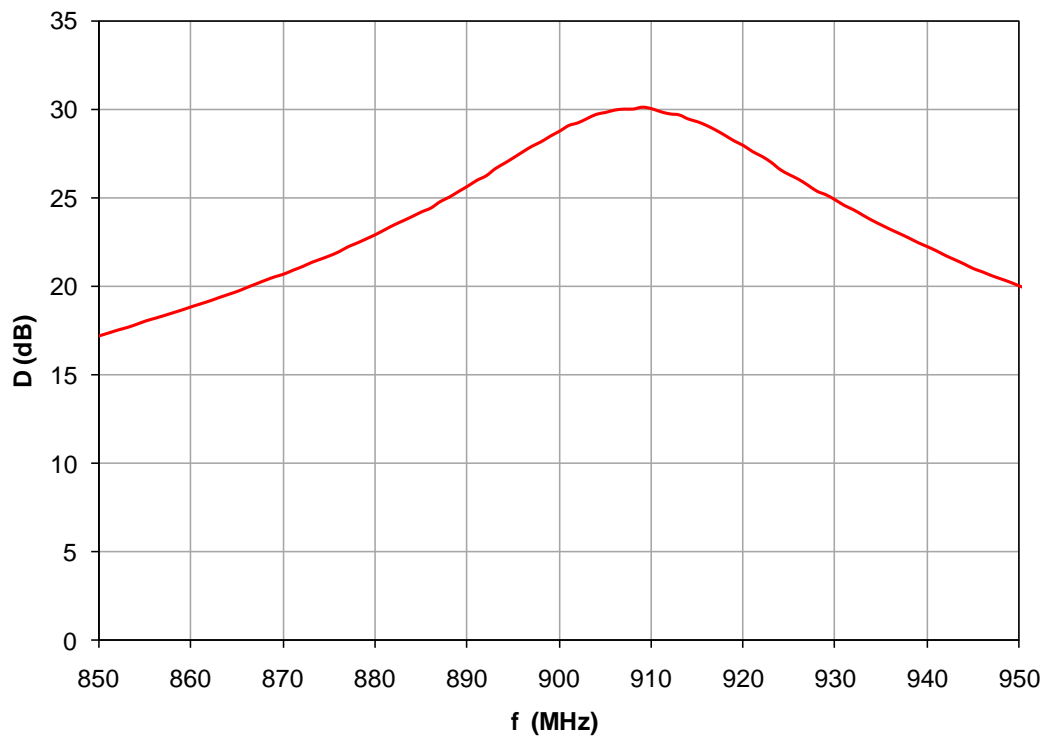
Waveguide of destination	WR-430, R-22 (109.22 mm × 54.61 mm)
Waveguide wall thickness	4 mm standard (on request 0.125")
Waveguide surface flatness at BPM interface	0.04 mm
Frequency range	895 – 925 MHz
Coupling factor/Max input power	-60 dB / 10 kW -70 dB / 100 kW
Coupling factor uncertainty limits	±1 dB (3-σ deviation)
Directivity	25 dB min
Coupled ports connectors	SMA-F, 50 Ω

Dimensional Drawing

(All dimensions in millimeters)



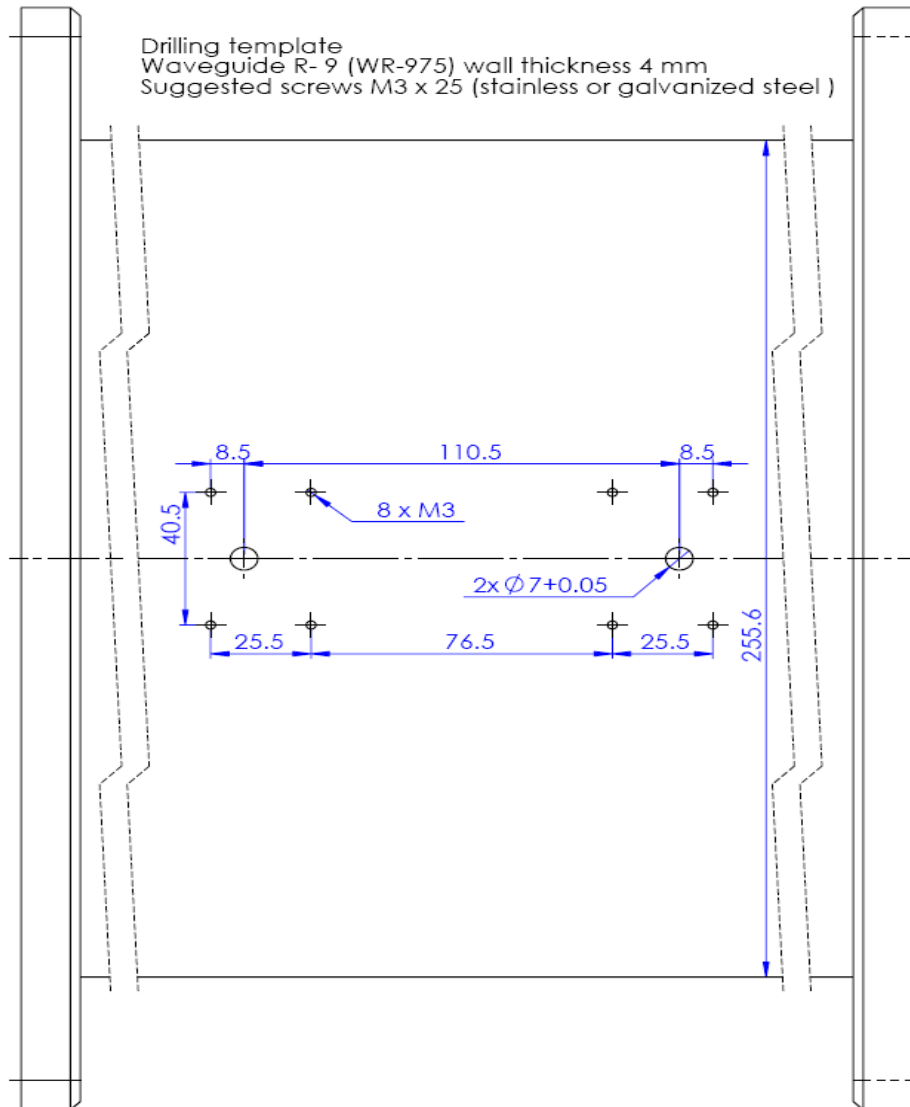
Typical Directivity (Both Directions)



Waveguide Machining Template

All dimensions are in millimeters. The pattern is centered about the guide axis.

Unless the option 0.125" is requested, waveguide wall thickness **must be 4 mm**.



Important Note

Complying with the specified waveguide wall thickness and flatness of its interface with BC211 is essential for the specified coupling factor accuracy. The slope of the coupling factor as a function of the wall thickness is about -0.6 dB/mm (increasing wall thickness decreases the coupling).

If the wall thickness differs from the specified figure but is known, user-defined correction based on the above slope can be applied. Nevertheless, the wall thickness should not deviate from the specification by more than ± 0.3 mm, otherwise the directivity will deteriorate.

To avoid problems with manufacturing precision waveguide components, a calibrated assembly consisting of a BC211 module fixed to a parent waveguide can be ordered. Standard waveguide length is 300 mm; customizing the length is possible.