

Y-junction Circulators

Micro Harmonics offers a line of millimeter-wave Y-junction circulators in the WR-15, WR-12, WR-10 and WR-8 bands covering the spectrum from 50-140 GHz. These circulators exhibit state-of-the-art performance in terms of low-insertion loss, broad-bandwidth, low port reflections, and the highest frequency coverage in the industry.

Our circulators do not use any complicated dielectric matching elements. Rather, all of the impedance matching circuitry is implemented through precision CNC machined features in the waveguide block which are highly repeatable and tightly controlled. The machined structures also make it easy to align the ferrite cores with some precision and obtain a high degree of uniformity between the three circulator ports.



Y-junction circulators

Model	Flange (EIA)	Frequency (GHz)	Insertion Loss (dB, max)	Isolation (dB, min)
YC148-61	WR-15	58 – 64	0.4	20
*YC148-68	WR-15	65 – 71	0.5	20
YC122-73	WR-12	71 – 76	0.5	20
*YC122-78	WR-12	75 – 81	0.5	20
YC122-83	WR-12	81 – 86	0.6	20
YC100-93	WR-10	90 – 95	0.7	20
*YC100-95	WR-10	92 – 98	0.7	20
*YC100-97	WR-10	94 – 100	0.7	20
*YC80-110	WR-8	107 – 113	1.1	20
YC80-118	WR-8	115 – 120	1.1	20

*These models have been fully designed but have not yet been built.

Our initial offerings are targeted to bands where there is widespread interest in the millimeter wave community. Over time we will continue to add products tuned to other sub-bands within the 50-170 GHz window in response to customer requests. Please do not hesitate to contact us to discuss how we can apply our capabilities to your requirements. We typically do not charge a design fee (NRE) to develop a circulator tuned to a specific sub-band. Our primary concern is to identify bands of interest and provide components to serve the broader community.

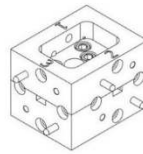
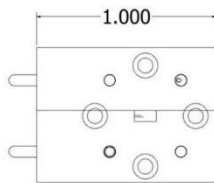
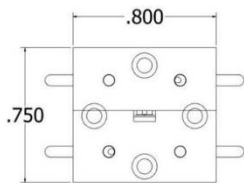
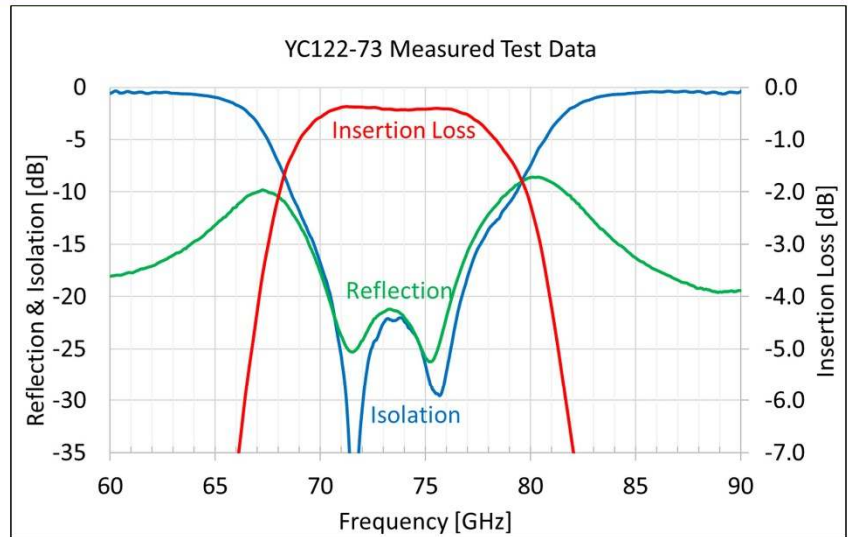
“We couldn’t find anybody that was capable of producing circulators in the frequency band we required, much less with the high isolation and wide bandwidth we wanted... Micro Harmonics fine-tuned the design to meet the performance characteristics we needed within a very precise band.”

Dr. Fred Daneshgaran, Professor, Chairman
California State University, Los Angeles

A typical Y-junction circulator specification sheet is shown below. We define the bandwidth as the band over which the circulator yields more than 20 dB isolation. The circulators are normally designed for broad 20-dB bandwidths but can also be tuned for higher levels of isolation over more narrow bandwidths. The waveguide blocks are designed so that the three flanges are equidistant from the Y-junction.

Model: YC122-73

Specifications	
Flange	WR-12
Frequency (GHz)	71-76
Insertion Loss (dB, typ)	0.4
Insertion Loss (dB, max)	0.6
Isolation (dB, min)	20
VSWR (max)	1.3:1



Micro Harmonics designs and manufactures all of our products in the United States. We do reliability testing (Belcore) and cryogenic cycling tests. Nylon thread lockers are used to ensure that our components stay assembled in the field. Every component is thoroughly RF tested and the data is shared with the customer.

Every component is fully warranted. When you purchase a Micro Harmonics component you can rest assured that you are receiving the highest quality and best performance available on the global commercial market. Please give us a call.

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