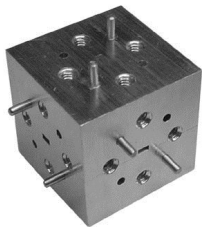
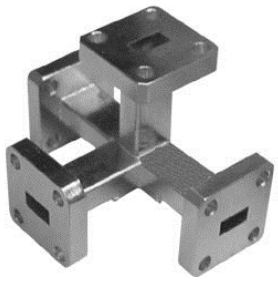
Waveguide Magic Tees, SWM Series

FEATURES:

- Frequency coverage: 18 to 110 GHz
- Waveguide or split block configurations
- Low insertion loss and even port balance
- High isolation
- Up to full waveguide band operations
- Instrumentation grade





APPLICATIONS:

- Test labs
- Instrumentations
- Sub-assemblies

DESCRIPTION:

SWM series magic tees are offered in both waveguide and split block versions to cover the frequency range from 18 to 110 GHz in seven waveguide bands. While the waveguide version features flange interface for convenient connection from both directions, the split block version boasts a more compact size for system integrations. Through a detailed design and fabrication process, the catalog models offer 80% waveguide bandwidth and up to full waveguide operations with slight performance degradation at band edges.

The magic tee is a four port devices. Its collinear ports are perfectly matched so that it is also referred as matched hybrid tees. The port relationship of the magic tee is illustrated in the figure below. When two equal amplitudes, in phase signals are fed into the collinear ports, the resultant output signal appears at H-plane port only. On the other hand, the resultant output signal appears at E-plane port only if the input signals are equal amplitude, 180° out phase signals. Consequently, the signal entering the H-plane port is split into two equal amplitudes, in phase signals at collinear ports or two equal amplitude, 180° out phase signals at collinear ports if the signal is fed into the E-plane port. The H-plane and E-plane ports are isolated. Because of the feature, the magic tees are widely used in monopulse radar antenna systems and many other systems where phase and port isolations are critical. When either H-plane port or E-plane port is terminated, these magic tees are readily used as in-phase or out-phase power splitters or power combiners. Furthermore, the magic tees can be used to construct multi-way power combiners or dividers.

CATALOG MODELS:

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Band	Model Number[1]	Waveguide	Frequency Range (GHz)	Insertion Loss (dB)[2]	Isolation (dB)	Amplitude Balance (dB)	VSWR	Outline	Feature
K	SWM-F1NF2N20-42-SB	WR-42	18.0 to 26.5	0.15	20.0	± 0.10	1.5:1	WM-BK	Block
K	SWM-F1NF2N20-42-SW	WR-42	18.0 to 26.5	0.20	20.0	± 0.10	1.5:1	WM-WK	Waveguide
Ka	SWM-F1NF2N20-28-SB	WR-28	26.5 to 40.0	0.20	20.0	± 0.15	1.5:1	WM-BA	Block
Ka	SWM-F1NF2N20-28-SW	WR-28	26.5 to 40.0	0.25	20.0	± 0.15	1.5:1	WM-WA	Waveguide
Q	SWM-F1NF2N20-22-SB	WR-22	33.0 to 50.0	0.25	20.0	± 0.15	1.5:1	WM-BQ	Block
Q	SWM-F1NF2N20-22-SW	WR-22	33.0 to 50.0	0.30	20.0	± 0.15	1.5:1	WM-WQ	Waveguide
U	SWM-F1NF2N20-19-SB	WR-19	40.0 to 60.0	0.25	20.0	± 0.20	1.5:1	WM-BU	Block
U	SWM-F1NF2N20-19-SW	WR-19	40.0 to 60.0	0.30	20.0	± 0.20	1.5:1	WM-WU	Waveguide
V	SWM-F1NF2N20-15-SB	WR-15	50.0 to 75.0	0.30	20.0	± 0.25	1.5:1	WM-BV	Block
V	SWM-F1NF2N20-15-SW	WR-15	50.0 to 75.0	0.35	20.0	± 0.25	1.5:1	WM-WV	Waveguide
E	SWM-F1NF2N20-12-SB	WR-12	60.0 to 90.0	0.30	20.0	± 0.30	1.5:1	WM-BE	Block
E	SWM-F1NF2N20-12-SW	WR-12	60.0 to 90.0	0.35	20.0	± 0.30	1.5:1	WM-WE	Waveguide
W	SWM-F1NF2N20-10-SB	WR-10	75.0 to 110	0.30	20.0	± 0.30	1.5:1	WM-BW	Block
W	SWM-F1NF2N20-10-SW	WR-10	75.0 to 110	0.35	20.0	± 0.30	1.5:1	WM-WW	Waveguide

Note: 1) The F1N and F2N in the model number are the start and stop frequencies in MHz x 10N. For example, SWM-8030420-10-SB is a 80 to 100 GHz standard magic tee, block type.
2) Insertion loss is the power loss on top of the loss due to the power splitting.