

Waveguide Magic Tees, SWM Series

FEATURES:

- ◆ Frequency coverage: 18 to 170 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
- ◆ Instrumentation
- ◆ Subassemblies

DESCRIPTION:

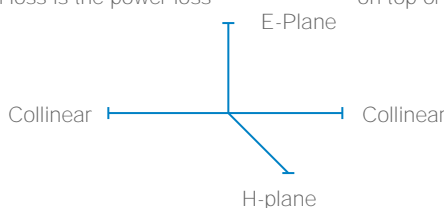
SWM series magic tees are offered in both waveguide and split block versions. The below models cover 18 to 110 GHz, however, additional models can be offered for frequencies up to 170 GHz. While the waveguide version features flange interfaces for a convenient integration from both directions, the split block version boasts a more compact size for system integrations. Through a detailed design and fabrication process, the catalog models offer up to full waveguide band operations with slight performance degradation at the band edges.

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

CATALOG MODELS:

| Band | Model Number | Waveguide | Frequency Range (GHz) | Insertion Loss (dB) ¹ | Isolation (dB) | Amplitude Balance (dB) | VSWR | Outline | Feature |
|------|--------------------|-----------|-----------------------|----------------------------------|----------------|------------------------|-------|---------|-----------|
| K | SWM-18327320-42-SB | WR-42 | 18.0 to 26.5 | 0.15 | 20.0 | ±0.10 | 1.5:1 | WM-BK | Block |
| K | SWM-18327320-42-SW | WR-42 | 18.0 to 26.5 | 0.20 | 20.0 | ±0.10 | 1.5:1 | WM-WK | Waveguide |
| Ka | SWM-27340320-28-SB | WR-28 | 26.5 to 40.0 | 0.20 | 20.0 | ±0.15 | 1.5:1 | WM-BA | Block |
| Ka | SWM-27340320-28-SW | WR-28 | 26.5 to 40.0 | 0.25 | 20.0 | ±0.15 | 1.5:1 | WM-WA | Waveguide |
| Q | SWM-33350320-22-SB | WR-22 | 33.0 to 50.0 | 0.25 | 20.0 | ±0.15 | 1.5:1 | WM-BQ | Block |
| Q | SWM-33350320-22-SW | WR-22 | 33.0 to 50.0 | 0.30 | 20.0 | ±0.15 | 1.5:1 | WM-WQ | Waveguide |
| U | SWM-40360320-19-SB | WR-19 | 40.0 to 60.0 | 0.25 | 20.0 | ±0.20 | 1.5:1 | WM-BU | Block |
| U | SWM-40360320-19-SW | WR-19 | 40.0 to 60.0 | 0.30 | 20.0 | ±0.20 | 1.5:1 | WM-WU | Waveguide |
| V | SWM-50375320-15-SB | WR-15 | 50.0 to 75.0 | 0.30 | 20.0 | ±0.25 | 1.5:1 | WM-BV | Block |
| V | SWM-50375320-15-SW | WR-15 | 50.0 to 75.0 | 0.35 | 20.0 | ±0.25 | 1.5:1 | WM-WV | Waveguide |
| E | SWM-60390320-12-SB | WR-12 | 60.0 to 90.0 | 0.30 | 20.0 | ±0.30 | 1.5:1 | WM-BE | Block |
| E | SWM-60390320-12-SW | WR-12 | 60.0 to 90.0 | 0.35 | 20.0 | ±0.30 | 1.5:1 | WM-WE | Waveguide |
| W | SWM-75311420-10-SB | WR-10 | 75.0 to 110.0 | 0.30 | 20.0 | ±0.30 | 1.5:1 | WM-BW | Block |
| W | SWM-75311420-10-SW | WR-10 | 75.0 to 110.0 | 0.35 | 20.0 | ±0.30 | 1.5:1 | WM-WW | Waveguide |

Note: 1) Insertion loss is the power loss



on top of the loss due to the power

