Matched Hybrid Tees (Magic Tees)

**FEATURES**
- High isolation
- Low insertion loss
- Excellent port balance
- Wide bandwidth
- Rugged mechanical construction

**APPLICATIONS**
- Power splitting & combining
- Phase & frequency discriminating

**DESCRIPTION**

**PCT** series waveguide matched hybrid tees (Magic Tees) are available in microwave and millimeterwave frequency bands up to 110 GHz. These hybrid tees are matched power dividers or combiners for many system applications. These hybrid tees are four port couplers. A signal inputting to H-plane port is equally split into two amplitude balanced, in phase signals at colinear ports (H-arms) and isolated from the E-plane port, while a signal inputting to E-plane port is equally split into two amplitude balanced, 180° out of phase signals at colinear ports (H-arms) and isolated from the E-plane port. The in-phase and equal amplitude signals inputting into two colinear ports can result combined signal at H-plane port and cancelled signal at E-plane port. This feature is widely used in the monopulse antenna feed structure and phase testing setup. The typical operating bandwidth of the matched hybrid tees is up 80% of waveguide bandwidth while it can cover full waveguide bandwidth with slight performance degradation at band edge. The matched hybrid tees are readily to be used to configure 4, 8 and 16 way power dividers.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Frequency Band</th>
<th>K</th>
<th>KA</th>
<th>Q</th>
<th>U</th>
<th>V</th>
<th>E</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waveguide Size</td>
<td>WR-42</td>
<td>WR-28</td>
<td>WR-22</td>
<td>WR-19</td>
<td>WR-15</td>
<td>WR-12</td>
<td>WR-10</td>
</tr>
<tr>
<td>Frequency Range (GHz)</td>
<td>18 to 26.5</td>
<td>26.5 to 40</td>
<td>33 to 50</td>
<td>40 to 60</td>
<td>50 to 75</td>
<td>60 to 90</td>
<td>75 to 110</td>
</tr>
<tr>
<td>Insertion Loss (dB, Typ)*</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Ports Isolation (dB, Min)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Amplitude Un-Balance (dB, Max)</td>
<td>± 0.1</td>
<td>± 0.1</td>
<td>± 0.2</td>
<td>± 0.2</td>
<td>± 0.2</td>
<td>± 0.3</td>
<td>± 0.3</td>
</tr>
<tr>
<td>VSWR (Typ)</td>
<td>1.5:1</td>
<td>1.5:1</td>
<td>1.5:1</td>
<td>1.5:1</td>
<td>1.5:1</td>
<td>1.5:1</td>
<td></td>
</tr>
<tr>
<td>Outline Drawing</td>
<td>WT-E-1</td>
<td>WT-E-1</td>
<td>WT-E-1</td>
<td>WT-E-1</td>
<td>WT-E-1</td>
<td>WT-E-1</td>
<td></td>
</tr>
</tbody>
</table>

* Insertion loss is defined as the power loss in addition to the coupling loss. Contact factory for other waveguide size.

**HOW TO ORDER**

Specify Model Number

```
PCT-WG CF BW-XX
```

WG Size

Center Frequency in GHz

Bandwidth in GHz

Factory Reserve
WT-E-1

WT-E-2

WT-E-3

WT-E-4

WT-E-5

WT-E-6

The flange pattern shown is for illustration purpose. Refer to Technical Reference Section for flange pattern details. The outline drawings shown are standard versions. Contact factory for your specific package requirements.
The flange pattern shown is for illustration purpose. Refer to Technical Reference Section for flange pattern details. The outline drawings shown are standard versions. Contact factory for your specific package requirements.