Quadrature Hybrid, 250 - 500 MHz

**Features**
- Octave Bandwidth
- Low VSWR: 1.1:1 Typical
- High Isolation: 30 dB Typical
- Impedance: 50 Ohms Nominal
- Input Power: 4 Watts Max.@ 25°C, Derated to 1 Watt @ 85°C
- MIL-STD-202 Screening Available

**Description**
3 dB Hybrids are ideal for dividing a signal into two signals of equal amplitude and a constant 90° or 180° phase differential and for Quadrature combining or performing summation/differential combining.

**Pin Configuration (JH-139)**

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Function</th>
<th>Pin No.</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>5</td>
<td>D</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>6</td>
<td>GND</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>7</td>
<td>GND</td>
</tr>
<tr>
<td>4</td>
<td>B</td>
<td>8</td>
<td>C</td>
</tr>
</tbody>
</table>
Electrical Specifications: $T_A = -55^\circ C$ to $+85^\circ C$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Frequency</th>
<th>Units</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insertion Loss 2</td>
<td>Less Coupling</td>
<td>250 - 500 MHz</td>
<td>dB</td>
<td>—</td>
<td>—</td>
<td>0.5</td>
</tr>
<tr>
<td>Isolation</td>
<td>—</td>
<td>250 - 500 MHz</td>
<td>dB</td>
<td>15</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Amplitude Balance</td>
<td>—</td>
<td>250 - 500 MHz</td>
<td>dB</td>
<td>—</td>
<td>—</td>
<td>1.0</td>
</tr>
<tr>
<td>VSWR</td>
<td>—</td>
<td>250 - 500 MHz</td>
<td>Ratio</td>
<td>—</td>
<td>—</td>
<td>1.5:1</td>
</tr>
<tr>
<td>Deviation from Quadrature</td>
<td>—</td>
<td>250 - 500 MHz</td>
<td>°</td>
<td>—</td>
<td>—</td>
<td>4</td>
</tr>
</tbody>
</table>

1. All specifications apply with 50 ohm source and load impedance.
2. Average of coupled output less 3 dB.

This product contains elements protected by United States Patent Number 3,484,724

Phasing Diagram

Typical Performance Curves

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Typical Performance Curves

**Transmission Phase**

```
Frequency (MHz) | Transmission Phase (Degrees)
----------------|-----------------------------
200             | -180.00
250             | -150.00
300             | -120.00
325             | -100.00
375             | -90.00
400             | -75.00
425             | -60.00
450             | -45.00
475             | -30.00
500             | 0.00
525             | 15.00
550             | 30.00
```

**Coupling**

```
Frequency (MHz) | Coupling (dB)
----------------|--------------
200             | 5.0
250             | 4.0
300             | 3.0
325             | 2.0
375             | 1.0
400             | 0.0
425             | -1.0
450             | -2.0
475             | -3.0
500             | -4.0
525             | -5.0
550             | -6.0
```

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>JH-139 PIN</td>
<td>FP-2</td>
</tr>
<tr>
<td>JHS-139 PIN</td>
<td>SF-1</td>
</tr>
</tbody>
</table>

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