ETC4-1-2TR

E-Series RF 1:4 Flux Coupled Step-up Transformer
2 - 800 MHz

Rev. V8

Features
- 1:4 Impedance Ratio
- CT on Secondary
- Surface Mount
- Tape and Reel Packaging Available
- RoHS Compliant, Pb Free
- Termination Finish - Sn

Description
The ETC4-1-2 is a 1:4 RF flux coupled step-up transformer in a surface mount package. Ideally suited for high volume cellular and wireless applications. Typical applications include single to balanced mode conversion and impedance matching. Parts are packaged in tape & reel.

Functional Schematic

Pin Configuration

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Function</th>
<th>Pin #</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Secondary</td>
<td>4</td>
<td>Primary dot</td>
</tr>
<tr>
<td>2</td>
<td>Secondary CT</td>
<td>5</td>
<td>Primary</td>
</tr>
<tr>
<td>3</td>
<td>Secondary Dot</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. MACOM recommends connecting unused package pins to ground.

Electrical Specifications: Freq = 2 - 800 MHz, $T_A = 25^\circ C$, $Z_0 = 50 \, \Omega$, $P_{IN} = 0 \, \text{dBm}$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions &amp; Frequency (MHz)</th>
<th>Units</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
</tr>
</thead>
</table>
| Insertion Loss      | $F_L - F_U$
  10 - 100
  5 - 600
  2 - 800            | dB     | —    | 1.21 | 2.0  | 3.0  |
| Amplitude Balance   | 10 - 100
  2 - 800              | dB     | —    | —    | 0.25 | 1.0  |
| Phase Balance       | 10 - 500
  2 - 800              | Degrees | —    | —    | 2.0  | 10.0 |

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETC4-1-2TR</td>
<td>2000 piece reel</td>
</tr>
</tbody>
</table>

1. Reference Application Note M513 for reel size information.

Recommended Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Power</td>
<td>250 mW</td>
</tr>
<tr>
<td>DC Current</td>
<td>30 mA</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-55°C to +85°C</td>
</tr>
</tbody>
</table>

3. Exceeding anyone or combination of these limits may cause permanent damage to this device.
4. MACOM does not recommend sustained operation near these survivability limits.
5. Specified at $+25^\circ C$ only.
## ETC4-1-2TR

**E-Series RF 1:4 Flux Coupled Step-up Transformer**  
2 - 800 MHz

**Typical Performance Curves**

- $T_A = 25^\circ C$, $Z_0 = 50 \, \Omega$, $P_{IN} = 0 \, \text{dBm}$

### Insertion Loss

![Insertion Loss Graph](image)

**Insertion Loss** (-3 to -13 dB) vs FREQ (30 kHz to 1 GHz)

### Phase Balance

![Phase Balance Graph](image)

**Phase Unbalance** (0 to 360 deg) vs FREQ (30 kHz to 1 GHz)

### Amplitude Balance

![Amplitude Balance Graph](image)

**Amplitude Unbalance** (5 to -5 dB) vs FREQ (30 kHz to 1 GHz)

### Input Impedance

![Input Impedance Graph](image)

**Input Impedance on Smith Chart; FREQ (30 kHz to 1 GHz)**

6. Full temperature plots available on request.
Tape & Reel Information

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty per reel</td>
<td>-</td>
<td>2000</td>
</tr>
<tr>
<td>Reel Size</td>
<td>mm</td>
<td>330</td>
</tr>
<tr>
<td>Tape Width</td>
<td>mm</td>
<td>12.00</td>
</tr>
<tr>
<td>Pitch</td>
<td>mm</td>
<td>8.00</td>
</tr>
<tr>
<td>Orientation</td>
<td>-</td>
<td>F5</td>
</tr>
</tbody>
</table>

Reference Application Note ANI-019 for orientation

7. Dimensions in mm.
8. Tolerance: ±0.2 mm unless otherwise noted.
9. Model number and lot code are printed on the reel.
10. Finish: Tin (Sn).

PCB Layout

11. Recommended PCB layout shown above uses 0.8 mm FR4, grounded coplanar waveguide, transmission line width 0.25 mm and gap 0.90 mm.