Measurement condition
Ambient temperature: 23 °C
Input power level: 0 dBm
Terminating impedance:
  Input: 590 Ω || -1.1 pF
  Output: 590 Ω || -1.1 pF
Source impedance: 50 Ω
Load impedance: 50 Ω

Characteristics

Remark:
The minimum of the attenuation $a_{\min}$ is defined as the insertion loss $a_{e}$. The centre frequency $f_{c}$ is the arithmetic mean value of the upper and lower frequencies at the 3 dB filter attenuation level relative to the insertion loss $a_{e}$. The temperature coefficient of frequency $T_{c}$ is valid for both the centre frequency $f_{c}$ and the frequency response of the filter within the operating temperature range.

<table>
<thead>
<tr>
<th>Data</th>
<th>typ. value</th>
<th>tolerance / limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insertion loss $a_{e}$</td>
<td>3.6 dB</td>
<td>max. 6 dB</td>
</tr>
<tr>
<td>Centre frequency $f_{c}$</td>
<td>100.000 MHz</td>
<td>-5 kHz +3 kHz</td>
</tr>
<tr>
<td>Bandwidth $BW$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 dB</td>
<td>39 kHz</td>
<td>min. 33 kHz max. 78 kHz</td>
</tr>
<tr>
<td>20 dB</td>
<td>66 kHz</td>
<td></td>
</tr>
<tr>
<td>Group delay at $f_{c}$</td>
<td>22.6 µs</td>
<td>min. 20 µs max. 23 dBm</td>
</tr>
<tr>
<td>Input power level $**$</td>
<td>- max. 23 dBm</td>
<td></td>
</tr>
<tr>
<td>Temperature coefficient of frequency $T_{c}$</td>
<td>-0.035 ppm/K²</td>
<td></td>
</tr>
<tr>
<td>Frequency inversion temperature $T_{o}$</td>
<td>45 °C min. 40 °C max. 50 °C</td>
<td></td>
</tr>
<tr>
<td>Operating temperature range OTR</td>
<td>-</td>
<td>0 °C ... + 70 °C</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>-</td>
<td>-40 °C ... + 85 °C</td>
</tr>
</tbody>
</table>

$\Delta f(\text{Hz}) = T_{c}(\text{ppm/K}^2) \times (T-T_{o})^2 \times f_{o}(\text{MHz})$.

$**$ TFS100L can be operated continuously at the specified power level with a 100 MHz signal for a period of at least 10 years as long as operating temperatures are below specified maximum.

Generated:

Checked / Approved:
Filter characteristic

Construction and pin connection

(All dimensions in mm)

50 Ω Test circuit

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Vectron International GmbH reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.
Stability characteristics, reliability

After the following tests the filter shall meet the whole specification:

1. Shock: 500g, 1 ms, half sine wave, 3 shocks each plane; DIN IEC 68 T2 - 27

2. Vibration: 10 Hz to 500 Hz, 0.35 mm or 5 g respectively, 1 octave per min, 10 cycles per plane, 3 planes; DIN IEC 68 T2 - 6

3. Change of temperature: -55 °C to 125 °C / 15 min. each / 100 cycles DIN IEC 68 part 2 – 14 Test N

4. Resistance to solder heat (reflow): reflow possible: three times max.; for temperature conditions, see page 4: “Air reflow temperature conditions”

5. ESD ANSI/ESD S20.20-1999, class 1A for HBM

This filter is RoHS compliant (2011/65/EU)

Packing

Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius; tape type II, embossed carrier tape with top cover tape on the upper side;

max. pieces of filters per reel: 2000
reel of empty components at start: min. 300 mm
reel of empty components at start including leader: min. 500 mm
trainer: min. 300 mm

Tape (all dimensions in mm)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>16.00 ± 0.3</td>
</tr>
<tr>
<td>Po</td>
<td>4.00 ± 0.1</td>
</tr>
<tr>
<td>Do</td>
<td>1.50 ±0.1/-0</td>
</tr>
<tr>
<td>E</td>
<td>1.75 ± 0.10</td>
</tr>
<tr>
<td>F</td>
<td>7.50 ± 0.10</td>
</tr>
<tr>
<td>G(min)</td>
<td>0.60</td>
</tr>
<tr>
<td>P2</td>
<td>2.00 ± 0.1</td>
</tr>
<tr>
<td>P1</td>
<td>12.00 ± 0.1</td>
</tr>
<tr>
<td>D1(min)</td>
<td>1.50</td>
</tr>
<tr>
<td>Ao</td>
<td>7.60 ± 0.10</td>
</tr>
<tr>
<td>Bo</td>
<td>9.60 ± 0.10</td>
</tr>
<tr>
<td>Ct</td>
<td>13.3</td>
</tr>
</tbody>
</table>

Reel (all dimensions in mm)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>330 or 180</td>
</tr>
<tr>
<td>W1</td>
<td>16.4</td>
</tr>
<tr>
<td>W2(max)</td>
<td>22.4</td>
</tr>
<tr>
<td>N(min)</td>
<td>50</td>
</tr>
<tr>
<td>C</td>
<td>13.0</td>
</tr>
</tbody>
</table>

The minimum bending radius is 45 mm.
Air reflow temperature conditions

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average ramp-up rate (30°C to 217°C)</td>
<td>less than 3°C/second</td>
</tr>
<tr>
<td>&gt; 100°C</td>
<td>between 300 and 600 seconds</td>
</tr>
<tr>
<td>&gt; 150°C</td>
<td>between 240 and 500 seconds</td>
</tr>
<tr>
<td>&gt; 217°C</td>
<td>between 30 and 150 seconds</td>
</tr>
<tr>
<td>Peak temperature</td>
<td>max. 260°C</td>
</tr>
<tr>
<td>Time within 5°C of actual peak temperature</td>
<td>between 10 and 30 seconds</td>
</tr>
<tr>
<td>Cool-down rate (Peak to 50°C)</td>
<td>less than 6°C/second</td>
</tr>
<tr>
<td>Time from 30°C to Peak temperature</td>
<td>no greater than 300 seconds</td>
</tr>
</tbody>
</table>

Chip-mount air reflow profile

Temperature / °C

max. 260°C

217°C

max. 300 s

10 ... 30 s

30 ... 150 s

Time / s
### History

<table>
<thead>
<tr>
<th>Version</th>
<th>Reason of Changes</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>- Generation of specification.</td>
<td>Dr. Bert Wall</td>
<td>13.11.2013</td>
</tr>
</tbody>
</table>
| 2.0     | - Replace T.B.D. by preliminary values  
          - Add source and load impedance  
          - Add comment for input power level  
          - Remove 170 kHz bandwidth and pass band variation | Dr. Bert Wall | 15.11.2013 |
| 2.1     | - Add asterix for remark 2 | Dr. Bert Wall | 15.11.2013 |
| 2.2     | - Add limit for group delay | Dr. Bert Wall | 13.12.2013 |
| 2.3     | - Correct description of pin 3 in “Construction and pin connection” | Fredrick Raura | 19.12.2013 |
| 3.0     | - Add typical values  
          - Change terminating impedance  
          - Change from development to filter specification  
          - Clarify comment concerning maximum input power | Silas Bonnen | 20.08.2014 |