DATA SHEET

SKYFR-001688: 2110 to 2170 MHz Single-Junction Robust Lead Circulator

Applications

- Power amplifiers

Features

- Operating frequency range: 2110 MHz to 2170 MHz
- BeO free
- RoHS compliant
- Parts delivered on tape and reel

Skyworks Green™ products are compliant with all applicable legislation and are halogen-free. For additional information, refer to Skyworks Definition of Green™, document number SQ04-0074.

Description

The SKYFR-001688 is a single-junction circulator designed for power-amplifier applications. It operates over the frequency range of 2110 MHz to 2170 MHz with an operating temperature range of -40 °C to +105 °C.

A block diagram of the SKYFR-001688 is shown in Figure 1.

For tape and reel information, refer to the Tape and Reel Guidelines for Isolators and Circulators Application Note.

Figure 1. SKYFR-001688 Block Diagram
Electrical and Mechanical Specifications

The absolute maximum ratings of the SKYFR-001688 are provided in Table 1. Electrical specifications are provided in Table 2.

Plating information is shown in Table 3. Figure 2 shows the package dimensions and PCB footprint information.

Table 1. SKYFR-001688 Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average power</td>
<td>P_{AV}</td>
<td>70</td>
<td>500</td>
<td>W</td>
</tr>
<tr>
<td>Peak power</td>
<td>P_{PK}</td>
<td>-40</td>
<td>+105</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>T_{STOR}</td>
<td>-65</td>
<td>+150</td>
<td>°C</td>
</tr>
</tbody>
</table>

1 Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to device with only one parameter set at the limit and all other parameters set at or below their nominal value. Exceeding any of the limits listed here may result in permanent damage to the device.

Table 2. SKYFR-001688 Electrical Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Test Condition</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>f</td>
<td>2110 to 2170 MHz</td>
<td>210</td>
<td>210</td>
<td>210</td>
<td>MHz</td>
</tr>
<tr>
<td>Impedance</td>
<td></td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td>Ω</td>
</tr>
<tr>
<td>Insertion loss</td>
<td>IL</td>
<td>0.20 dB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolation</td>
<td>ISO</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Return loss</td>
<td>RL</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Group delay</td>
<td></td>
<td>2.0 ns</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd harmonic attenuation</td>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>3rd harmonic attenuation</td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Intermodulation distortion</td>
<td>IMD</td>
<td>2 x 20 W CW tones, 1 MHz spacing</td>
<td>60</td>
<td></td>
<td></td>
<td>dBC</td>
</tr>
</tbody>
</table>

1 Performance is guaranteed under the conditions listed in this table and over the operating temperature range.


Table 3. SKYFR-001688 Plating Specification

<table>
<thead>
<tr>
<th>Section</th>
<th>Base Material</th>
<th>Plating</th>
</tr>
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<tbody>
<tr>
<td>Pins</td>
<td>Bronze</td>
<td>Silver</td>
</tr>
<tr>
<td>Housing</td>
<td>Steel</td>
<td>Silver</td>
</tr>
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</table>
Figure 2. SKYFR-001688 Package Dimensions and PCB Footprint

Notes:
1. All dimensions are in millimeters.
2. Tolerance: ± 0.2 mm unless otherwise specified.
3. Model number, lot code, and port designation are printed on top side of the device.
### Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Product Description</th>
<th>Evaluation Board Part Number</th>
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<tbody>
<tr>
<td>SKYFR-001688</td>
<td>2110 to 2170 MHz Single-Junction Robust Lead Circulator</td>
<td>TFX-00118</td>
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