The AQA-2040 is a specially designed high efficiency amplified quadrupler that can provide a high output power suitable for driving an intermediate level millimeter wave mixer from 20-40 GHz. It uses banded amplifiers with doublers in stages to maximize the 4th harmonic output power. It simultaneously minimizes the first, second, and third harmonics, allowing filtering requirements to be relaxed. It is an excellent alternative to expensive millimeter wave synthesizers for lab use.

### Features
- Input 5.0 to 10.0 GHz
- Output 20.0 to 40.0 GHz
- +20 dBm Typical Output Power
- 45 dBC Typical Fundamental Suppression
- 30 dBC Typical 2nd Harmonic Suppression
- 25 dBC Typical 3rd Harmonic Suppression

### Electrical Specifications
- Specifications guaranteed from -30 to +70°C, measured in a 50-Ohm system.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>INPUT (GHz)</th>
<th>OUTPUT (GHz)</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input (dBm)</td>
<td>5.0-10.0</td>
<td>+5</td>
<td></td>
<td></td>
<td>+8</td>
</tr>
<tr>
<td>Output Converted Power (dBm)</td>
<td>20.0-40.0</td>
<td>+13</td>
<td></td>
<td>See</td>
<td>Plots</td>
</tr>
<tr>
<td>Suppressions (dBc)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F(in) Fundamental</td>
<td>5.0-10.0</td>
<td>See</td>
<td></td>
<td>Plots</td>
<td></td>
</tr>
<tr>
<td>2F(out) Second Harmonic</td>
<td>10.0-20.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3F(out) Third Harmonic</td>
<td>15.0-30.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bias Requirements (mA)(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+5 Volts DC</td>
<td>400</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-5 Volts DC</td>
<td>15</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\)The negative bias must be applied before or concurrent with the positive bias to avoid damage. A heat sink is required. Amplifier is NOT guaranteed to be unconditionally stable. Broadband 50 Ω loading conditions without feedback are required to prevent irreparable damage.

### Part Number Options

Please specify package style by adding to model number.

<table>
<thead>
<tr>
<th>Package Style(s)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM, CMV EOL</td>
<td>AQA-2040 CM</td>
</tr>
</tbody>
</table>

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AMPLIFIER/QUADRUPLER/AMPLIFIER

Input 5.0 to 10.0 GHz
Output 20.0 to 40.0 GHz

Schematic

Typical Performance

Harmonic Power Outputs (dBm) with +8 dBm Input

4th Power Output (dBm)

Fundamental Suppression (dBc)

2nd Harmonic Suppression (dBc)

3rd Harmonic Suppression (dBc)

5th Harmonic Suppression (dBc)
AMPLIFIER/QUADRUPLER/AMPLIFIER  
AQA-2040  
Input 5.0 to 10.0 GHz  
Output 20.0 to 40.0 GHz  

Typical Performance (cont.)

6th Harmonic Suppression (dBc)

7th Harmonic Suppression (dBc)

8th Harmonic Suppression (dBc)

9th Harmonic Suppression (dBc)

Input VSWR

Output VSWR

DATA SHEET NOTES:

1. Maximum input power without damage is +13 dBm at +70°C.
2. A heat sink is required for sustained operation.
3. Specifications are subject to change without notice. Contact Marki Microwave for the most recent specifications and data sheets.

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