Optisys ESA Solutions  

Optisys’ NAPA (Novel Active Phased Array) product line leverages our metal 3D printing antenna design expertise to create high-performance broadband antennas with integrated diplexers, thermal and structural features. Our approach to electronically scanned arrays gives customers the exact specifications they need.

Performance

- High efficiency arrays with low power consumption, low heat, longer range
- High bandwidth of >2:1, high cross-pol discrimination across entire band
- Customizations to frequency, bandwidth, gain, etc. are simple and modular

Key Benefits

- Initial offering in X, Ku, Ka-bands
- Hybrid 1-axis ESA for best balance of performance, power, and price
- High instantaneous bandwidth
- Modular antenna design
  - Scalable gain (2 in to ≥72 in aperture sizes)
- Temperature stability
  - Metal structure
  - High power capability
- Single-piece components
  - Integrated diplexers, polarizers, combiners, antenna
  - Embedded thermal management
  - Integrated mounting and structural features
- Transmit and receive in one aperture
  - Full duplex structures
  - High cross-pol discrimination and isolation
  - Tx and Rx beams aligned
  - Dual Polarization

ESA Products:
- SATCOM (Aircraft)
- LEO/MEO/GEO (Satellite)
- On-the-Move (Vehicle)
- Radar / SAR
- 5G / Telecom

Mass Customization:
- Frequencies (6 - 43.5 GHz)
- Thermal Integration
- Structural Integration

Features Overview:
- High Performance
- Fast-to-market
- Hybrid Designs
- Low DC Power

Upcoming Designs:
- Above 43.5 GHz
- Dual Axis Scanning
- Multibeam Designs
## NAPA Performance
### (Novel Active Phased Array)

<table>
<thead>
<tr>
<th>Frequency Options</th>
<th>C/X-Band</th>
<th>Ku-Band</th>
<th>K/Ka-Band</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6 – 12 GHz</td>
<td>12 – 18 GHz</td>
<td>17.5 – 43.5 GHz</td>
</tr>
<tr>
<td># of Tiles</td>
<td>1</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Rx Frequency (typ.)</td>
<td>7.25 – 7.75 GHz</td>
<td>10.95 – 12.75 GHz</td>
<td>17.7 – 21.2 GHz</td>
</tr>
<tr>
<td>Tx Frequency (typ.)</td>
<td>7.90 – 8.40 GHz</td>
<td>13.75 – 14.50 GHz</td>
<td>27.5 – 31.0 GHz</td>
</tr>
<tr>
<td>EIRP P1dB [dBW]</td>
<td>28.6</td>
<td>46.2</td>
<td>54</td>
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<tr>
<td>G/T Max [dB/k]</td>
<td>4</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Cosine Taper</td>
<td>≤ 1.3</td>
<td>≤ 1.3</td>
<td>≤ 1.3</td>
</tr>
<tr>
<td>Aperture Efficiency</td>
<td>&gt; 65%</td>
<td>&gt; 65%</td>
<td>&gt; 65%</td>
</tr>
<tr>
<td>Integrated Diplexer</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Polarization</td>
<td>Dual Circular (RHCP and LHCP)</td>
<td>Dual Linear (H and V)</td>
<td>Dual Circular (RHCP and LHCP)</td>
</tr>
<tr>
<td>Cross Pol Rejection</td>
<td>&gt; 24</td>
<td>&gt; 24</td>
<td>&gt; 24</td>
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<tr>
<td>Beam Width (typ.)</td>
<td>5.5</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>Aperture Bandwidth</td>
<td>&gt; 2:1</td>
<td>&gt; 2:1</td>
<td>&gt; 2:1</td>
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<tr>
<td>Pointing Accuracy [*]</td>
<td>&lt; 0.5</td>
<td>&lt; 0.2</td>
<td>&lt; 0.2</td>
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<tr>
<td>Azimuth</td>
<td>360°</td>
<td>360°</td>
<td>360°</td>
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<tr>
<td>Elevation</td>
<td>0 – 75°</td>
<td>0 – 75°</td>
<td>0 – 75°</td>
</tr>
<tr>
<td>Array Weight [lb.]</td>
<td>14</td>
<td>116</td>
<td>6</td>
</tr>
<tr>
<td>Aperture Size [in]</td>
<td>12 x 12 x 6</td>
<td>24 x 48 x 6</td>
<td>10 x 7 x 3</td>
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<tr>
<td>Number of elements</td>
<td>256</td>
<td>2048</td>
<td>1536</td>
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<tr>
<td>DC Power Consumption [W]</td>
<td>64</td>
<td>512</td>
<td>100</td>
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</tbody>
</table>

All values are customizable to customer requirements.

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### Scanned Gain Pattern (30 GHz)

**Theta [deg]**

**Gain**

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