**Description**

The F6501 is an 8-channel transmitter (TX) silicon IC designed using a SiGe BiCMOS process for Ku-Band SATCOM phased array applications. The core IC has 360° 6-bit phase control coupled with 35dB 6-bit gain control on each channel to achieve fine beam steering and gain compensation between radiating channels. The device has a 25dB nominal gain and 13dBm OP1dB. The core chip achieves an RMS phase error of 3° and an RMS gain error of 0.4dB over the frequency of operation. The typical total power consumption is 1.4W (175mW per channel) at OP1dB.

**Competitive Advantage**

- High integration
- Orthogonality of phase and amplitude control
- Advanced Serial Peripheral Interface (SPI) with 4 state memory
- Superior channel-to-channel isolation
- Minimal footprint

**Features**

- 12.5GHz to 15GHz operation
- 8 radiation channels
- 6-bit phase control
- 6-bit gain control
- 50ns typical gain settling time
- 20ns typical phase settling time
- 3° typical RMS phase error
- 0.4dB typical RMS gain error
- 35dB gain attenuation range
- 5-bit IC address
- Integrated proportional-to-absolute temperature (PTAT) sensor with external biasing
- -40°C to +95°C Internal temperature sensor
- Programmable 4-state on-chip memory
- Supply voltage: +2.1V to +2.5V
- -40°C to +95°C ambient operating temperature range
- 27°C typical ambient operating temperature
- 3.8mm x 4.6mm, 62-BGA package

**Typical Applications**

- Ku-Band SATCOM
- Aerospace and Maritime
- Weather Radar
- Beam Steering
- Test and Measurement

**Block Diagram**

*Figure 1. Block Diagram*
## Ordering Information

<table>
<thead>
<tr>
<th>Orderable Part Number</th>
<th>Package</th>
<th>MSL Rating</th>
<th>Carrier Type</th>
<th>Temperature</th>
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</thead>
<tbody>
<tr>
<td>F6501AVGK</td>
<td>3.8mm x 4.6mm 62-BGA</td>
<td>MSL 3</td>
<td>Loose Parts</td>
<td>-40° to +95°C</td>
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<tr>
<td>F6501AVGK8</td>
<td>3.8mm x 4.6mm 62-BGA</td>
<td>MSL 3</td>
<td>Reel</td>
<td>-40° to +95°C</td>
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<tr>
<td>F6501EVB</td>
<td>Evaluation Board</td>
<td></td>
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</tr>
<tr>
<td>F6501EVS</td>
<td>F6501 Evaluation Kit System, including Evaluation Board, 2x THRU Reference Fixture, FT2232H Mini-Module Microcontroller, Digital Cable, Power Cable, and USB-to-Mini Cable</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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