



- State-of-the-art in academia:
  - 70%, 20-50 Watts at X-Band
  - 50%, 10 Watts at Ka-Band
- State-of-the-art in industry
  - production:
    - 50% at X-Band
    - 30% at Ka-Band
    - But industry geared towards mobile telephony and broadband applications (production volume)
      - Non-constant envelope, high peak-to-average power modulations
- State-of-the-art in tubes:
  - 55%, 300 W at Ka-Band
  - But tubes become more inefficient under 100 W (40-50%)
- State-of-the-art currently in flight:
  - 25%, 15 W at X-Band (Mars Odyssey)
  - Draws 60 Watts of DC power from spacecraft bus

### Highlight:

- State-of-the-art for flight qualified SSPA will soon (next five years?) be 10 W with  $\leq 50\%$  efficiency
- Key industries are in the US, Japan and Europe