8PSK X-BAND TRANSMITTER
CCSDS packets data handling, Reed-Solomon encoding and Trellis Coded Modulation, RF direct PSK-modulation and power amplification

Applications
- Observation satellite payloads
- Scientific satellite payloads

Main features
- X-band transmission capability (8025-8400 MHz)
- Quick customization thanks to flexible design
- Wideband operation handling up to 175 Mbps information rate
- Higher data rate available with four transmitters (up to 622 Mbps)
- Automatic Earth station acquisition mode at equipment switch-ON
- Efficient EDAC circuits (Reed-Solomon 239/255, trellis coding) and frame interleaving capabilities
- Spectrally-optimized modulation schemes (Trellis Coded Modulation 5/6 or 2/3 8-PSK)
- High RF output power (6 W)
- Compatible with main bus interfaces (command & telemetry formats, 22 to 100 V range)
- Optimized heat flux density

Background since 1990
- Telecommunications programs: Worldstar (L band modulator), Stentor (Ku band modulator), Amerhis (Ku band modulator).
- Observation programs: SPOT5, Demeter, Essaim, Parasol, Pléiades, SMOS.
- Baseline for CNES micro satellite line.

Key Benefits
- High data rate telemetry
- CCSDS compliant
- New standard
- Flight proven

Technical description
- Very compact design
- Large scale of integration of the digital circuits (ASIC)
- Simple digital interfaces (parallel bus) and robust synchronization principle
- Parallel digital processing within the equipment
- Low and medium RF section based on MMIC chips
- In house power hybrids
- Automatic operational modes limiting the TM/TC interfaces
- Up to date overall power efficiency
- Control section and EPC based on surface mounted devices

Production
- Typical schedule: 12 months
Block Diagram

Typical performances

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Performance 8PSK (1)</th>
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<tbody>
<tr>
<td>Output power</td>
<td>0 dBm to 38 dBm (6.3 W)</td>
</tr>
<tr>
<td>Useful data rate</td>
<td>Up to 175 Mbps for 5/6 coding rate (3)</td>
</tr>
<tr>
<td>Frequency</td>
<td>Up to 140 Mbps for 2/3 coding rate (3)</td>
</tr>
<tr>
<td>Frequency Stability</td>
<td>Between 8025 and 8400 MHz, +/-13 ppm EOL</td>
</tr>
<tr>
<td>Eb/No @ BER = 10^-9 &amp; 75 Mbauds</td>
<td>6.6 dB (TCM 2/3)</td>
</tr>
<tr>
<td>DC power consumption</td>
<td>8.4 dB (TCM 5/6)</td>
</tr>
<tr>
<td>Mass</td>
<td>&lt; 35 W (2)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>241<em>90</em>125 mm³</td>
</tr>
<tr>
<td>Thermal environment</td>
<td>-10/+50 °C (operating)</td>
</tr>
<tr>
<td>Reliability</td>
<td>-20/+60 °C (qualification)</td>
</tr>
<tr>
<td></td>
<td>600 fits @ 40 °C</td>
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</table>

(1) Possible evolution : QPSK modulation
(2) 6 W RF output power.
(3) 75 Mbauds symbol rate

This datasheet is not contractual and can be changed without any notice.

Updated, September 2012

For further information, please contact
Thales Alenia Space France
Equipment Sales Department
26 avenue J.F. Champollion
B.P. 33787
31037 Toulouse Cedex 1
France
Tél.: + 33(0)5 34 35 36 37
Fax: + 33(0)5 61 44 48 90
Website: www.thalesalenia-space.com