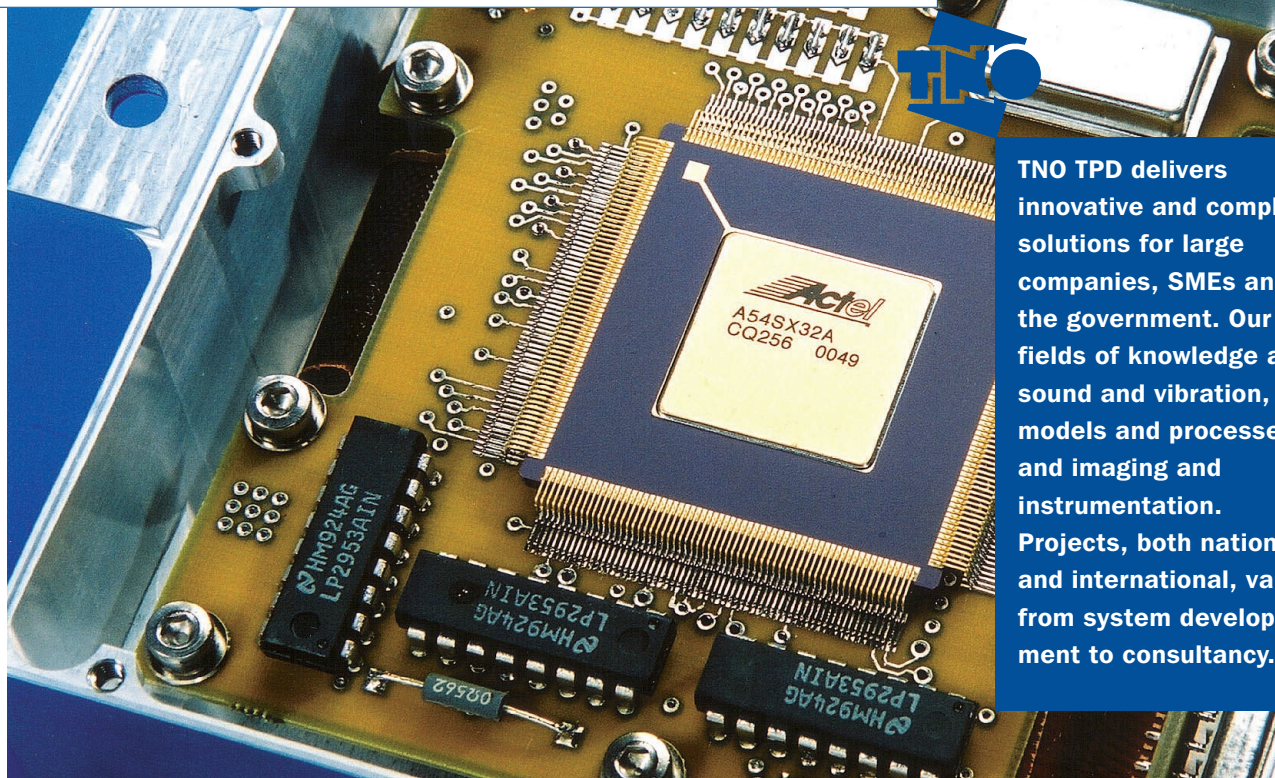


# Low Cost Digital Sun Sensor



TNO TPD delivers innovative and complete solutions for large companies, SMEs and the government. Our fields of knowledge are: sound and vibration, models and processes, and imaging and instrumentation. Projects, both national and international, vary from system development to consultancy.

Rear view without bottom cover

*The Digital Sun Sensor (DSS) is an autonomous accurate sun tracker of a new generation for attitude control from low Earth orbit missions to deep space exploration (50 AU). This equipment provides 2-axis attitude information to the attitude control subsystem at a very high frame rate so that it is suitable also for application in spinning spacecraft.*

Via telemetry the sensor provides continuously:

- Pixel coordinates of sun spot
- Unit specific scale factors derived from on-ground calibration for residual error correction
- Status information and housekeeping for performance monitoring

Telemetry via RS422 hardware interface; protocol can be easily tailored to meet mission requirements (e.g. RS232, OBDH,...).

### DSS Proven Technologies for Accurate Measuring

Accuracy and reliability of this equipment is made possible by means of:

- Rad-tolerant and Low Noise Active Pixel Sensor
- Latch up protection
- Sun image digital processing with dark current mitigation algorithm

### Performances

Sun distance: up to 50 AU  
 Field of view: up to 128° x 128°  
 Output data rate: >400Hz  
 Accuracy budget: bias error=0.02° at 2σ (with calibration) in entire Field of View  
 random error=0.01° at 3σ

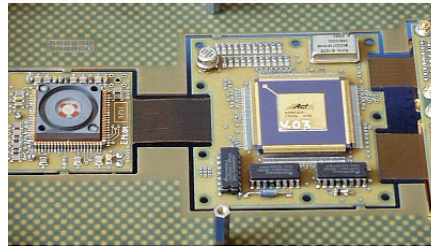
## Low Cost Digital Sun Sensor

### Environmental Characteristics

Operating temp: -50°C to +80°C  
 Vibration: typical ARIANE 5 environment

### Life Span

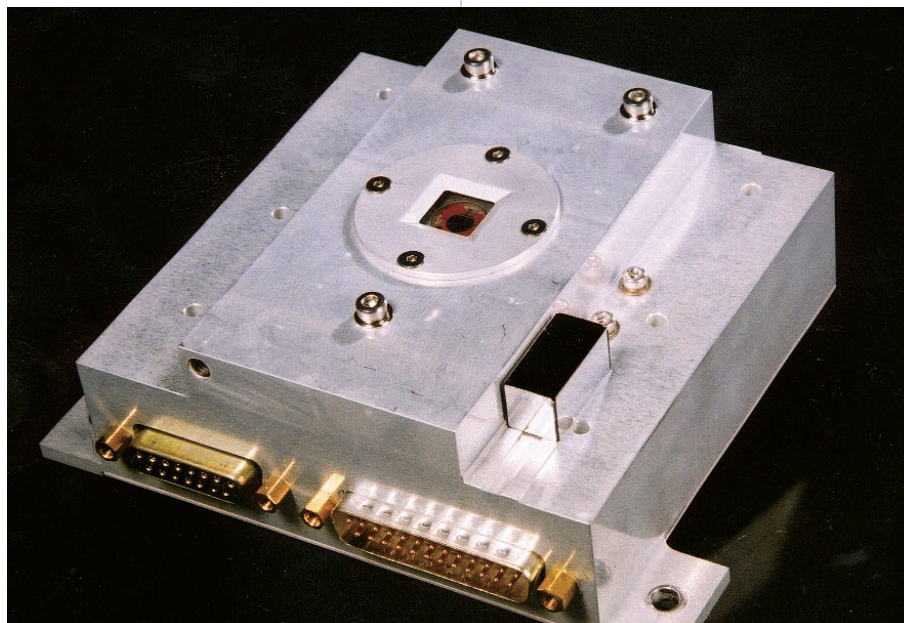
15 years (GEO)



Electronics on flex-rigid multilayer PCB

### Mechanical Interface

	Without DC/DC converter	With DC/DC converter
Mass:	<0.32 kg	<0.50kg
Dimensions (w x l x h)	130 x 120 x 45 mm	130 x 120 x 65 mm



Digital Sun Sensor (DSS)

### Electrical Interface

	Without DC/DC converter	With DC/DC converter
Typical power consumption:	1W	1.7W
Supply voltage range:	From 7V to 10V	From 20V to 50V
Reliability:	740 Fits	850 Fits
Output data:	RS422 8 bits serial link	RS422 8 bits serial link
Temperature sensing included		

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