

## Transmitter for the Moon Spacecraft

The X-band transmitter designed for the lunar spacecraft (Luna-25 lander and Luna-26 orbiter).

### Applications

- Lunar landers
- Lunar orbiters
- Lagrange-point spacecraft

### Features

- State-of-the-art modulation and error correction coding to ensure maximum throughput in the frequency-limited channel
- Two redundant transmitters (channels) in the single case
- Customizable data and control interfaces



### Specifications

	Lander	Orbiter
Frequency band		8450 – 8500 MHz
Frequency stability, including temperature and aging		±4 ppm
Output power		8 W (max T, EOL)
Modulation	QPSK	8PSK / QPSK
Symbol rate	4 Msymb/s / 500 ksymb/s	7.2 Msymb/s
Channel bandwidth (SCPG compatible)	5.5 MHz	10 MHz
Error correction coding and framing	CCSDS 131.0-B-2 par.7.2 (AR4J LDPC 1/2)	CCSDS 131.0-B-2 par.7.3 (LDPC (8160,7136))
Throughput	4 Mbps / 500 kbps	18.9 Mbps / 12.2 Mbps
Power consumption		70 W
Power supply		27 V (22-35 V)
Weight	2.9 kg	Size
Operating temperature		290x238x45 mm
Survival temperature		-20 °C to +50 °C
MTBF	250k hours	Design life
Radiation at the component level		3 years
SEL tolerance		>6 krad (average enclosure shielding 1.5 g/cm <sup>2</sup> )
Data interface (each channel)		>40 MeV·cm <sup>2</sup> /mg
Control and telemetry interface (each channel)		LVDS. Six ports (3 primary and 3 redundant) with 4 pairs each (clock output, data, enable output/input). Customizable.
Discrete telemetry (each channel)		MIL-STD-1553 (dual redundant buses), optional RS-422
		2 temperature sensors, 3 optoisolated outputs (OK, overheat, output power loss)

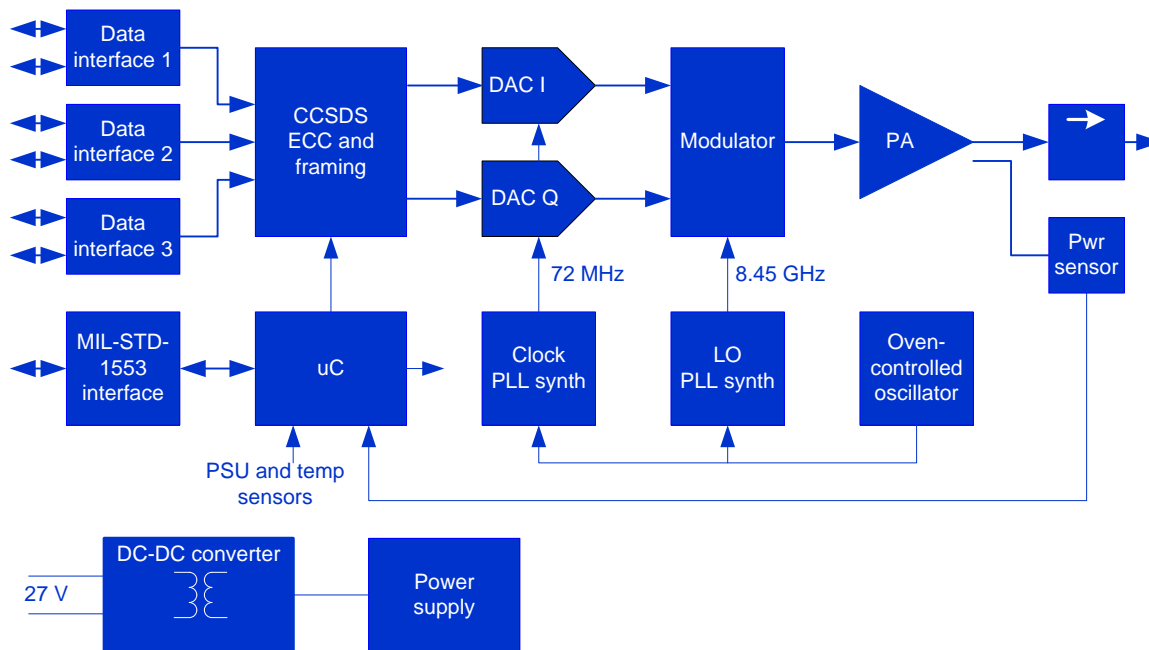
SAIT Ltd

6 Solnechaya al. Zelenograd, Moscow, 124527 Russia

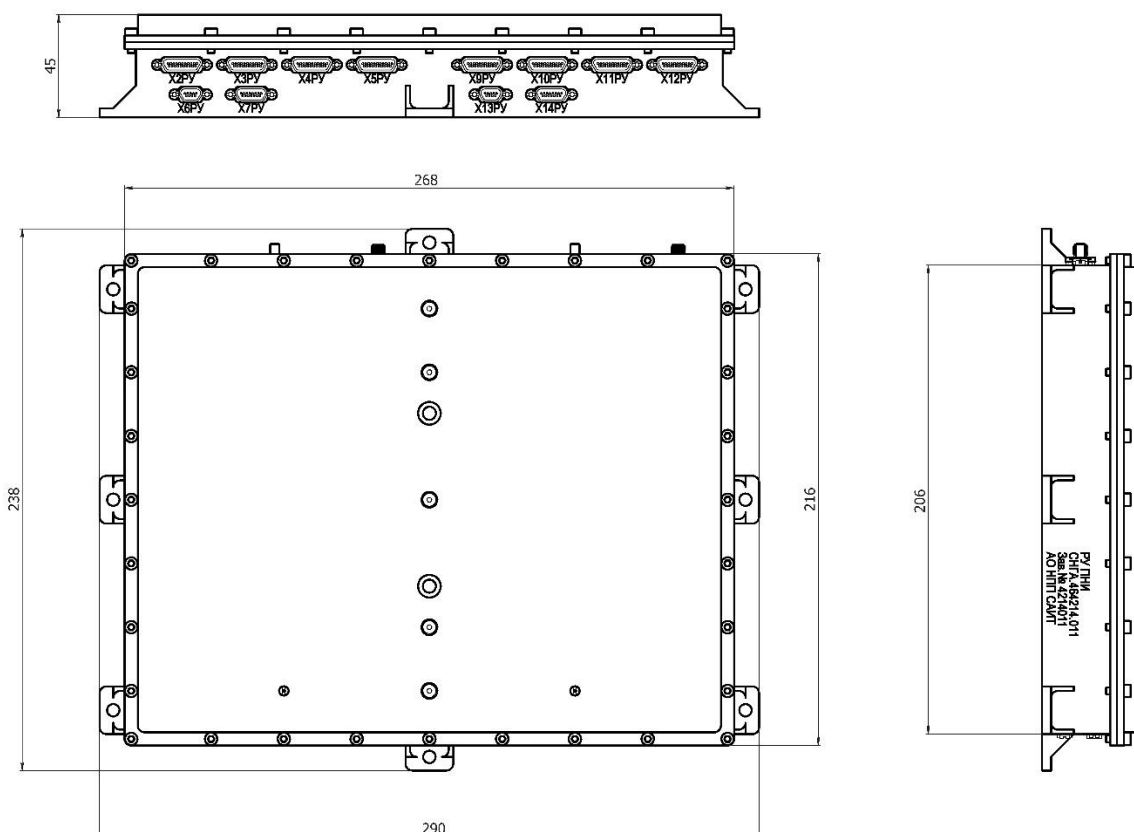
T: +7-499-720-6941 E: office@sait-ltd.com W: www.sait-ltd.com

© SAIT Ltd 05/18

## Block diagram



## Mechanical outline drawing



## Heritage

Lunar transmitter is based on the extensive heritage of the SAIT X-band transmitters that successfully work on the low-orbit satellites: ISS (previous generation transmitter) – 7.5 years, AIST-2D – 2 years, and others.