

SST01: Cubesat Secure Transceiver

The EXA's SST01 is a highly integrated, low cost, 240/433/868/915MHZ wireless transceiver module. Designed for CubeSat and SmallSat missions, is ideal for space missions where a low data-rate uplink and downlink are required and can be used as a robust lower data-rate back-up radio for a higher data-rate

The very low receive sensitivity (-120dBm) coupled with industry leading $+30\text{dBm}$ output power ensures extended range and improved link performance. Built-in antenna diversity and support for frequency hopping can be used to further extend range and enhance performance.

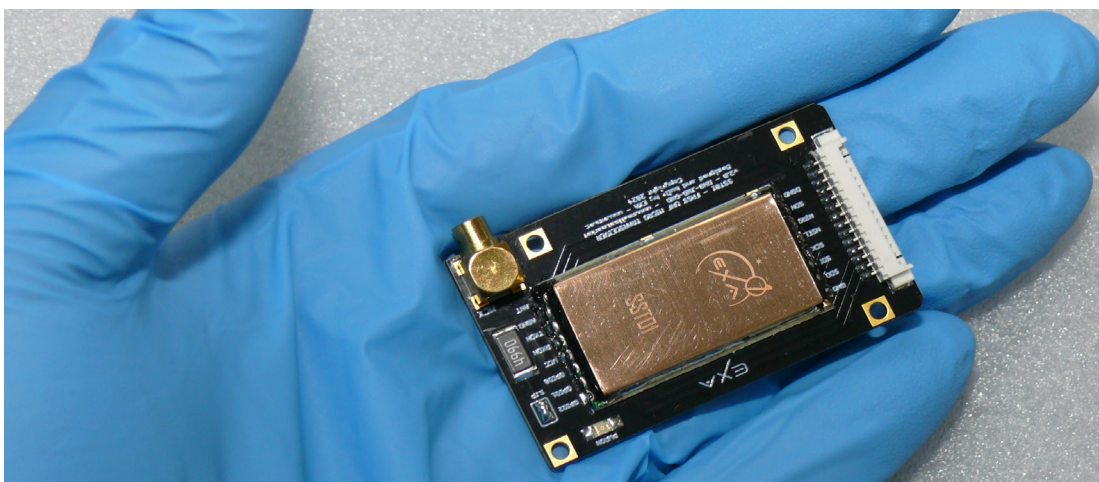
Additional system features such as an automatic wake-up timer, low battery detector, 64 byte TX/RX FIFOs, automatic packet handling, and preamble detection reduce overall current consumption and allow the use of lower-cost system MCUs. An integrated temperature sensor, general purpose ADC, power-on-reset (POR), and GPIOs further reduce overall system cost and size.

The SST01 digital receiver architecture features a high-performance ADC and DSP based modem which performs demodulation, filtering, and packet handling for increased flexibility and performance. The direct digital transmit modulation and automatic PA power ramping ensure precise transmit modulation and reduced spectral spreading ensuring compliance with global regulations including FCC, ETSI.

For high security applications, the SST01 is FHSS capable and programmable in steps from 10 kHz to 2.56 MHz allowing Anti-Jam implementations for additional levels of security in mission critical applications.

KEY FEATURES:

1. Space Qualified (Many Units On Orbit)
2. Compact Single Board Design
3. Up to 48 Programmable Channels
4. Up to $+30\text{dBm}$ RF Output
5. CubeSat Compatible



SST01 - TECHNICAL SPECIFICATIONS

General	
Frequency	240 MHz to 960MHz
Transmit Power:	1 Watt RF Output
Transmit Data Rate:	Customer Defined Between 0.123 and 256 Kbps
Receive Data Rate:	Customer Defined Between 0.123 and 256 Kbps
Channels:	1 to 48 Channels, Custom Programmed in 10 MHz Steps
Modulation:	FSK, GFSK, OOK, FHSS
Sensors:	Temperature
ADC:	8-bit SAR
GPIO	3 channels

Electrical and RF Specifications	
Input Voltage:	3.3 to 6.0 Volts
Power Consumption:	RX: 125 mW @ 5.0V, 82.5 mW @3.3V TX: 2.75 W for 1 WRF Out with 5.0 V Input
Clock and Data Output:	3.3 Volt CMOS
Power and Data Connector:	14 Pin PicoBlade
RF Connector:	MCX Socket
Nominal Sensitivity (BER 10-4):	-120dBm @ 9600 bps -110dBm @ 19.2 Kbps
Front-end Noise Figure:	< 2 dB with built in LNA and Filter
Modem:	DSP, demodulation, filtering, and packet handling.
RF Impedance:	50 Ohms Nominal (Input and Output)
Max VSWR:	1.5:1 at All Phase Angles
Automatic Control:	Built in AGC and AFC for Gain and Doppler Control
Digital RSSI:	-120 dBm to +30 dBm
Data Interface:	SPI: (SDO, SDI, SCLK, nSEL, nIRQ)
PA ramp up:	8 levels manual/auto
Antenna Diversity & Control	1~2 antennas, SPDT RF switch control trough GPIO pins
Programmable Gain Amplifier	3 dB steps, +10 to +30 dB
FHSS (programmable):	10 kHz increment, 2.56 MHz max channel step size



Mechanical and Environmental	
Mass:	50 grams
Size:	63 mm x 41 mm x 12 mm
Operating Temperature:	-40°C to +85°C
Storage Temperature:	-55°C to +125°C
Vibration:	20GRMS (20-2000 Hz)

