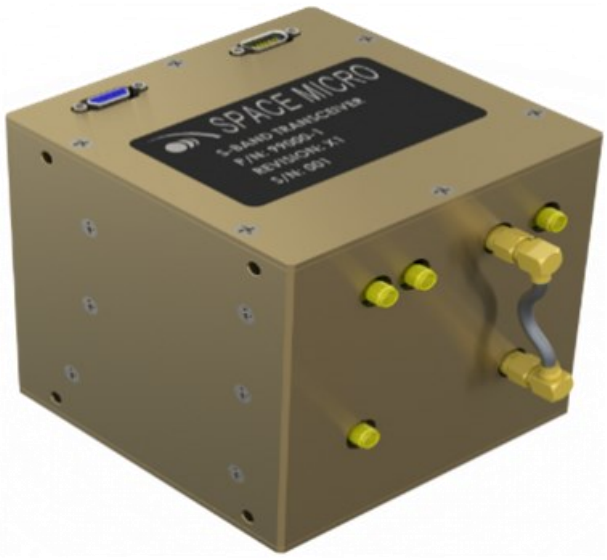
μSDR-C™ Software Defined Radio

SPACE MICRO

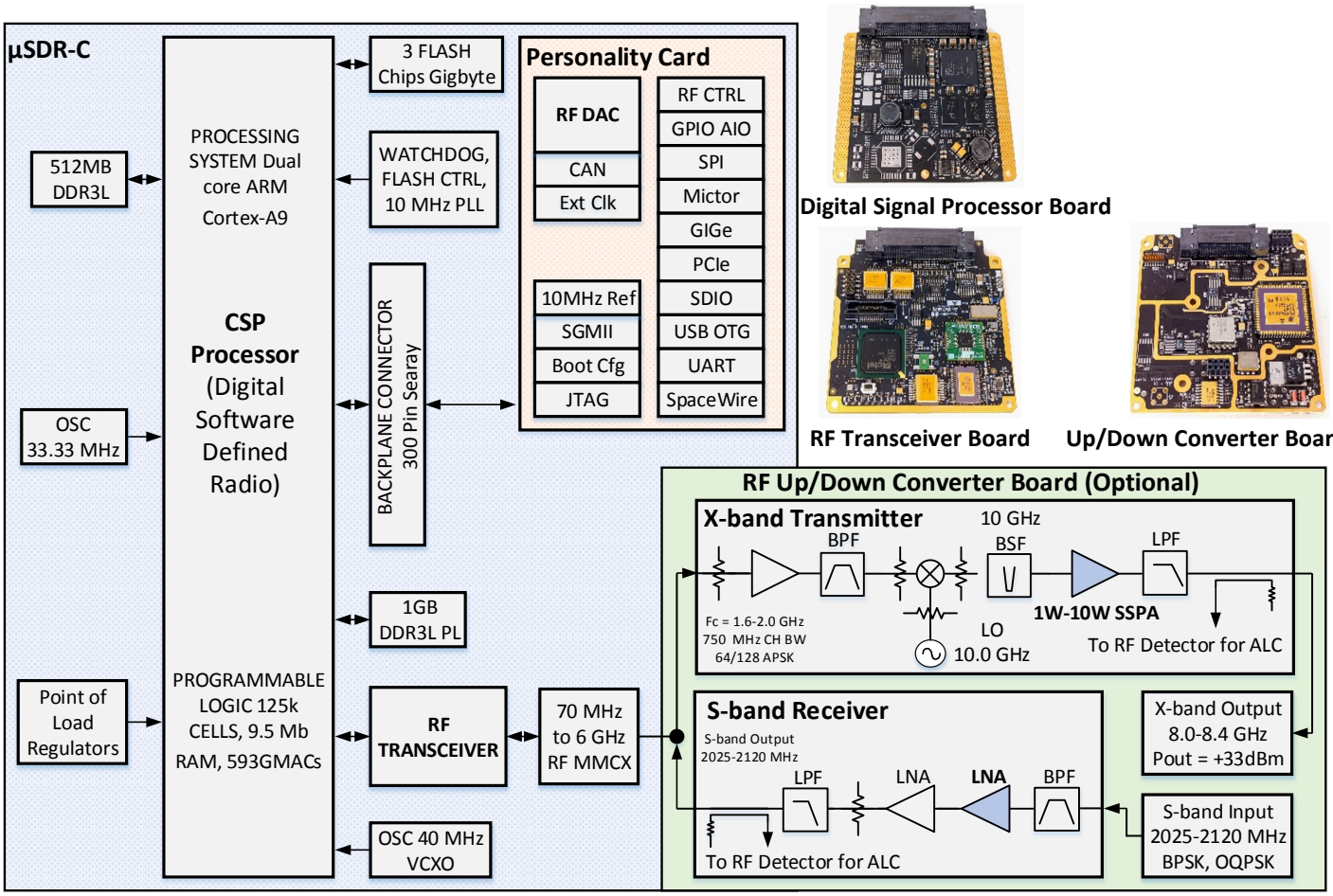


μSDR-C Dimensions: 10 cm x 10 cm x 8 cm

Key Features

- Small Form Factor Software Defined Radio
- Radiation Hardened
- Suitable for LEO, GEO
- FPGA Reconfigurable Resources, Transceiver Chip
- Base μSDR-C using 2 Board Set (DPS + RF Transceiver) provides 150 MHz to 6 GHz operation
- Optional Up/Down Converter Board with Low Noise Amplifier (LNA), Power Amplifier (PA) available
- Interfaced with KG-250 NSA Type 1 Cryptographic Unit (Option)

Block Diagram



Digital Signal Processor Board

RF Transceiver Board

Up/Down Converter Board

Transceiver Features

Carrier Frequency	150 MHz — 6 GHz
Tunable Channel Bandwidth	<200kHz to 56 MHz
Data rate	1 kbps to 42 Mbps using Higher Modulation Codes
RF Output Power Varies at Different LO Selections	User configurable: 6.5 dBm to 8 dBm from RF Transceiver Optional Power Amplifier: 1 to 10 Watts RF Power
LO step size	< 2.4 Hz
Encoding	CCSDS ReedSolomon(255,223), Interleave=5, CONVO (7,1/2), LDPC and User Provided Options Available
Modulation	BPSK, OQPSK, 8PSK, 16APSK, FSK
ADC/DAC	12-bits, Optimized Sample Rate of 30.72 Msps Optional Sample Rate up to 61.44 Msps

Receiver Section

Noise Figure	UHF: < 2.5 dB S-band: 3 dB C-band: 3.8 dB
Dynamic Range	Threshold (Minimum) -21 dBm (Maximum)
Sensitivity **100 kbps, 16-ary FSK, 1E-6 BER**	-109 dBm (Maximum)
Range	Dependent on RF Power Output and Antenna Selection
Power—Receiver Only	4 W (Typical) 5 W (Maximum) Transmitter Power Determined by Required Output Power Needed

General Specifications

- Size: 10 x 10 x 5 cm (2 Board Base Model); 10 x 10 x 8 cm (3 Board Model)
- Weight: <0.6 kg (2 Board Model); < 0.75 kg (3 Board Model)
- Operating Remperature: -30º C to +60º C (contact factory for other temperature ranges)
- Storage Temperature: 50°C to + 85°C
- Vacuum Environment: 10E-5 Torr
- Power consumption: 8 Watt
- Radiation
  - 30, 50 and 100 krad models available
  - No SEL <70 MeV/mg/cm2
  - No unrecoverable SEFI

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I/O and Interfaces

Telemetry Outputs

- Received Signal Strength Indicator (RSSI)
- Automatic Gain Control (AGC)
- Carrier and Demod Lock
- Frequency and Time Offset
- Critical Voltages
- Critical Temperatures

Programmable I/O

- 14 User Programmable I/O Pins on μD 15-pin Header
- Differential Routed Pairs on 2.5 V Bank
- LVDS25 or LVCMOS25 Standards
- Bus Routed

Standards Available on μD 15-pin connector

- Standards available in Zynq EMIO
- SPI
- UART
- I2C
- CAN (Phy not on backplane)
- No Ethernet
- SpaceWire (tested to 100 Mbps) Core Provided
- EtherWire

Telemetry Interface

User Defined

Input Voltage

Maximum Input Power

2.5 dBm to the Transceiver
Slice Available for Signal Conditioning of Power Prior to Entering the Transceiver Chip

Power Consumption

Element	Tx & Rx Power	Tx Power	Rx Power
Digital Processing	1.8	1.3	1.3
Agile Converter	2.1	1.3	1.3
Up convert	1.6	1.6	0
Down convert	1.6	0	1.6
Freq Synthesis	1.0	1.0	1.0
Power Amp (2W)	6.6	6.6	0
LNA	0.3	0	0.3
Misc	0.5	0.5	0.5
TOTAL	15.5	12.3	6
Option:			
+28V DC-DC Conversion	25%	25%	25%