The SRC6458 CMOSS/SOSA-Aligned card is a **3U OpenVPX payload** designed to support the DoD hardware and software convergence initiative.

### Small Form Factor Transceiver Design
3U VPX payload, conduction cooled
- VPX profile: 1F1U1S1U2F1H-14.6.11-0 (also known as SLT3r-1F1U2SG1U2F1H)
- VITA 67.1 RF and VITA 66.4 fiber optic connectors, for interfacing with VITA 67.3 module C backplane connector
- Designed for use with Elma backplane profile BKP3-TIM12-15.3.6-3, part number 10VX312V3K-1X11
- Built with compliance to MORA, VICTORY, VITA 46.0, VITA 48.2, VITA 49, VITA 57.1, VITA 65, VITA 66.4, VITA 67.1/67.3
- Supports backplane ethernet 802.3ap, with 1000BASE-BX/KX, 10GBASE-KR, 10GBASE-KX4 and support for 40GBASE-KR4

### Base-Mezzanine Architecture
- Accepts 100 MHz LVDS system clock (VPX REF_CLK) and 1 LVDS PPS (VPX AUX_CLK)
- Backplane synchronization trigger allows for multi-payload synchronization capability
- VITA 57.1 FMC interface from base card to RF mezzanine

### Baseband Processor Card
- 1.5 TFlop Altera Arria 10 SoC
- Multiple console access via microUSB port
- High speed RAM and flash access
- Ultra-low power MCU for health and security monitoring

### RF Mezzanine
- Two effective RF paths (configurable as 1 TX and 1 RX, 2 TX, or 2 RX) with two separately tunable phase coherent or two phase coherent channels
- 11 selectable sub-octave filters per RF channel
- 70 – 6000 MHz up to 112 MHz IBW
- Noise figure 5 dB (50 MHz) to 15 dB (6 GHz)
- +20dBm max input

### SRC6458 RCAD 3U VPX Payload Assembly Card

- **FMC**
  - Integrated Transceiver 70-6000 MHz
  - Integrated Transceiver 70-6000 MHz
  - Tx/Rx Analog Filter Front End
  - Tx/Rx Analog Filter Front End

- **Base Processor**
  - RAM Altera Arria 10 SoC
  - Clock Dist.
  - Firefly (HSS)
  - Health, Status, Security
  - Freescale MCU
  - JTAG/Debug

- **Power Plant**
SRC6458 CMOSS/SOSA-ALIGNED 3U VPX PAYLOAD CARD

Size, Weight and Power Specifications
- Input range: VS1 +12V, 3.3V_AUX, P1_VBAT
- Backup battery support (through P1_VBAT backplane pin)
- Typical power consumption: 30W
- Dimensions: 6.72in x 3.94in x 1in
- Weight: 1 lb 3.8 oz
- Operating temperature: -40°C/65°C (ambient; conduction cooled)

Transceiver RF Specifications
- Tuning range: 70 MHz – 6 GHz
- Tuning step-size: < 3 Hz
- RF channel bandwidth: 200 kHz to 112 MHz
- Typical I/Q balance: > 50 dB
- A/D converter sample rate: 233 Ksamples/sec to 61.44 Msamples/sec
- A/D converter sample width: 12 bits
- RF I/O: VITA 67.1 blind-mate coax module, 4 position SMPM ports
- Number of RF transceivers: 4 (independently configurable to receive or transmit)
- Receive input: +20 dBm max input
- Transmit output: ≥ 0 dBm up to 6 GHz
- Tuning time: < 50 us
- Pre-select filter bank: 11 internal sub octave filter paths
- Typical noise figure: 8.5 dB [LNA], 22 dB [BYP] (2.4 GHz estimate used)
- Typical IIP3: -20 dB [LNA], -5 dB [BYP] (2.4 GHz estimate used)
- Gain control: 0 to 96 dB (0 to 76 from AD9361 with bypassable amplifier > 20 dB)

Digital Specifications
- SoC: Altera Arria 10 SX 660 (Dual-Core ARM Cortex A9)
- MCU: Freescale Kinetis K65 MCU (ARM Cortex-M4F) for health and security monitoring
- RAM: 2GB DDR3L-1866 SDRAM with ECC
- Internal flash storage: 64GB eMMC for Linux and root filesystem
- Operating System: Linux Kernel 4.0
  - Two 10 gigabit ethernet (10GbE) ports through VITA 66.4 F/O Interface, with 8 auxiliary LVDS lanes capable of 1.25 gigabit data transfer rates
  - 2x 1000BASE-KX/10GBASE-KR ethernet for command and control
  - 1x 10GBASE-KX4 (XAUJ) ethernet for near real-time data transfers
  - 2x PCIe Gen2 interfaces for further expansion
- IQ Streaming using VITA 49.0 over UDP
- USB
  - USB to UART bridge allows console access to MCU and SoC
  - USB mass storage device interface
  - USB headphone/microphone accessory interface
- IEEE 1588 precision timing protocol capability through the backplane, with additional integrated GNSS/GPS receiver for tracking time

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