HTLx

Miniature Quad Transceiver

HTLx Core Radio Module
-Shown with HTC M9

FEATURES

- Wideband Quad Transceiver
- 2 MHz – 18000 MHz RX/TX
- 4 independent or phase coherent channels
- Ethernet or USB Control
- 2 x VRT 10 GigE Data via SFP+ connections

DESCRIPTION

Small Form-Factor Multichannel VHF/UHF/Microwave Transceiver

The HTLx is a 4 channel Software Defined Radio designed to support various missions.

- Extended frequency range 2 MHz-18000 MHz
- 4 Phase Coherent or Independent Transceivers
- Each channel can be remotely configured
- Integrated Selective Availability Anti-Spoofing Module (SAASM) GPS*, Chip Scale Atomic Clock (CSAC) and Inertial Navigation System (INS) device.
    - Provides operation under jamming and/or spoofing
    - TFNG compliant timing precision.
- High performance FPGA including integrated ARM9 cores with NEON coprocessors enable high performance signal processing applications against modern waveforms. Upgradable via replacement of the digital board.
- Open Architecture including an SDK with Board Support Package and REDHAWK interface to enable rapid development of new capabilities.
- Web Based services for mission set-up and configuration
- Theater Netcentric Geolocation (TNG) compliant
    - Time and frequency disciplining and time-stamping of pre-detection data to Industry TFNG Standard.
    - Provision for Timing and Phase calibration.
    - Ability to support Narrowband Archives
    - JICD v4.x compatible Interface
- Output is compliant with AF DCGS enterprise data flow, NSA enterprise TSDF data flow and REDBUS framework
- Ability to interoperate with external devices, such as, Power Amplifier, SAASM GPS, Industry EA devices.
- Ability to comply with Common Timing Protocol
- Removable or Encrypted Program and Data Storage Media for compliance with IA requirements.

*Optional SAASM GPS requires U S Government approval

Specifications subject to change without notice
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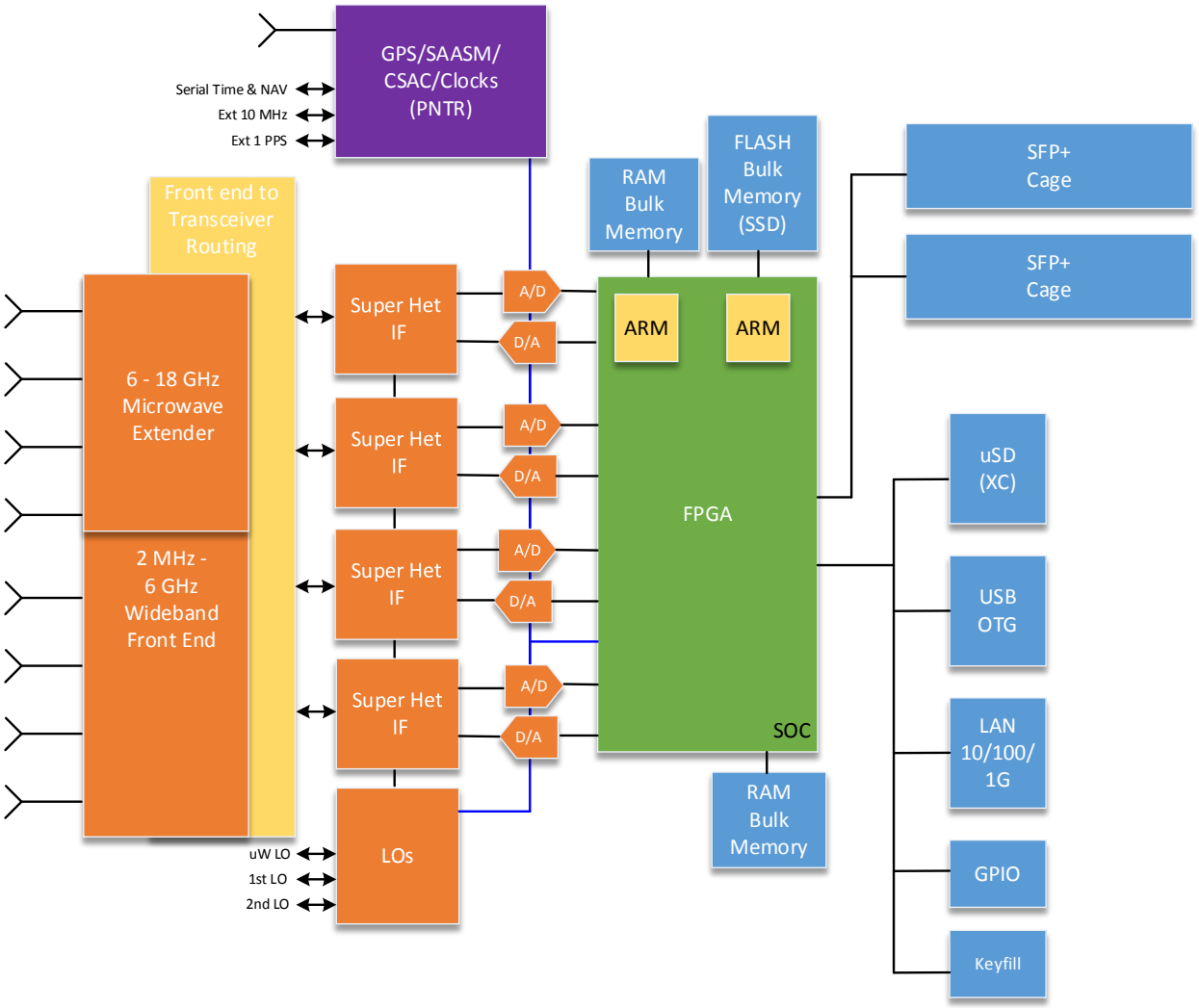
SYSTEM BLOCK DIAGRAM



SPECIFICATIONS

GPS/Reference Specifications

Parameter	Value	Comments
Frequency Accuracy	+/- 0.025 ppb +/- 1.0 ppb	Embedded CSAC & GPS Over unit temperature range
Timing Accuracy – 1 sigma	+/- 4 ns	GPS Training for 30 minutes
Holdover Time Accuracy	7 us	Over 24 hr period
*SAASM	Contact HTL	Contact HTL

*Optional SAASM GPS requires U S Government approval

PHYSICAL APPLICATIONS

Core Radio Requires external Thermal Management Contact HTL for thermal and mechanical interface requirements for specific use applications	
Dimensions:	1.6” H x 3.5” W x 8.0” D
Weight:	2.8 lbs

The ‘Core Concept’ is intended for man and platform-based use scenarios where external thermal management is viable option or is presently available. For these applications the outer surfaces of chassis shall be employed as the primary thermal interfaces to platform installed/integrated heatsinks or cold-plate(s), or for man-based applications, as the interface to thermal ‘holster’ assembly comprised of heatsink(s) and fan.

Contact HTL for definition of thermal and mechanical interface requirements as well as available thermal solutions for specific use applications.

Forced Convection Form Factors Requires 300 LFM airflow directed through heatsinks	
Dimensions:	2.7” H x 4.1” W x 8.0” D
Weight:	4.5 lbs

The ‘Forced Convection Form Factor’ is an example form factor of a ‘Core Radio’ module packaged with an integrated thermal solution to provide an out-of-box solution for specific use scenarios. This example incorporates heatsink fins on top and bottom surfaces in direction of platform-based airflow of 300lfm.

Alternate mechanical form factors (e.g. shorter height, but wider) and thermal solutions can be designed and packaged per defined set of use scenario parameters specific to use application. Contact HTL for design limitations and required use scenario parameters.

HTLx-FA, HTLx Core Module in Forced Air Housing
-Shown with HTC M9

HTLx Core Module in Forced Convection Tactical Housing
-Shown with Motorola Razr XT910

Power Input:

9-48 VDC External Power
100-240 VAC (with external adapter)

Power Consumption:

Operational Mode Dependent
The following represent operation with Power Saving Mode turned OFF

Output VITA49 data only (no DSP)

38.6 W	(20M-6G)
41.6 W	(6G-18G)

Typical Internal Signal Processing Application

41.6 W	(20M-6G)
44.6 W	(6G-18G)

Interfaces:

- DC IN, 4 Position Circular
- 2x SFP+ 10GigE
- Removable micro SD(XC) (TBD UHS-104 104MB/s)
- M.2 2280 SSD (500MB/s Sequential Write)
- Ethernet 10/100/1G
- Micro-USB 2.0 OTG
- SMA - 50Ω RF In / Out
- SMA - GPS Antenna Input
- 6 Position SMPM – Ext. Cal., 1 PPS, In/Out, 10 MHz In/Out
- Keyfill/USB, 10 Position Circular
- 51 Position Micro-D
  - Host USB
  - RS-232
  - JTAG
  - SPI
  - GPIO of FPGA
  - Keyfill Connectivity

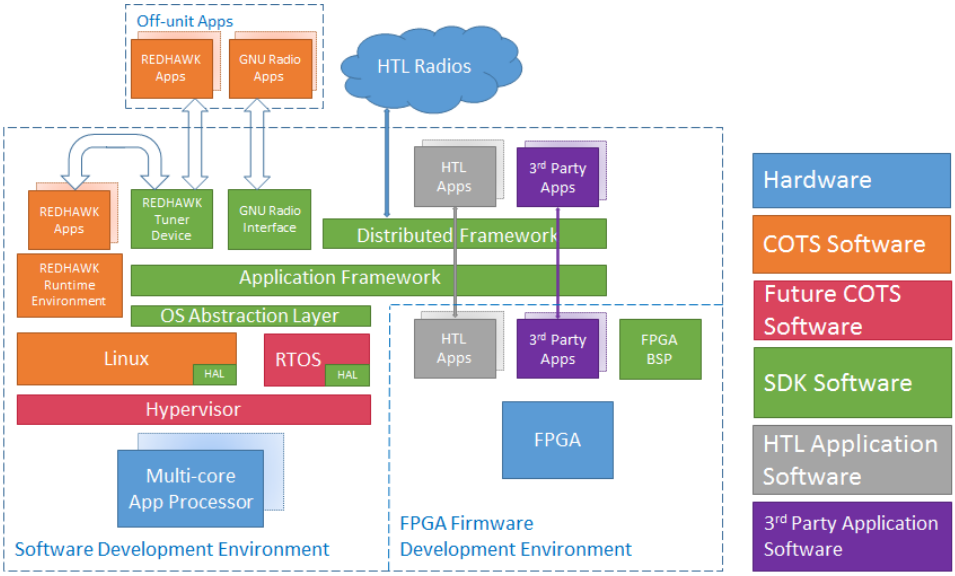
Front Panel Interfaces

Rear Panel Interfaces

Operating Temperature (Ambient):

–20°C to +60°C

SOFTWARE Development Environment



Open architecture to support 3rd party development:

- Enterprise Interfaces
  - Redhawk support
  - GNU Radio support
  - JICD 4.2 node compliance
- Enterprise Output
  - VITA-49 output
  - TSDF output (signal specific)
- Open Software
  - SDK/BSP with documentation provided
  - Source code with documentation provided

Information Assurance Provided Features:

- Secure Boot – ***Protection against malicious code insertion***
  - Signed Bootloader
  - Chain-of-Trust measurements of code
  - Volatile credentials
- Data Encryption – ***Protection for Data at Rest***
  - Hardware Media Encryption Controller
  - Entire File System real-time encryption
  - Volatile credentials
  - Wrapped Credentials
- Anti-Tamper and Zeroize – ***Credential deletion for instant data obfuscation***
  - Non-imprinting SRAM – Quick Erase
  - Multiple-sensor tamper supervisor
  - Hardware Zeroize actuators
  - Software Zeroize commands
  - Hold-up Battery
- Software Security Supervisor – ***Application Integration and Policy Enforcement***
  - Geolocation-Based Authorization/Zeroization
  - Remote Zeroize
  - Remote Attestation