CMOSS Interoperability Requirements Specification v 1.2

APPROVED FOR PUBLIC RELEASE

U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND
C5ISR CENTER

C5ISR/EW Modular Open Suite of Standards (CMOSS) Interoperability Requirements Specification (IRS)

Version 1.2

30 September 2024

Controlled by:

Office of the MOSA Chief Engineer, MOSA Management Office (MMO) FCDD-ISE-FD

U.S. ARMY

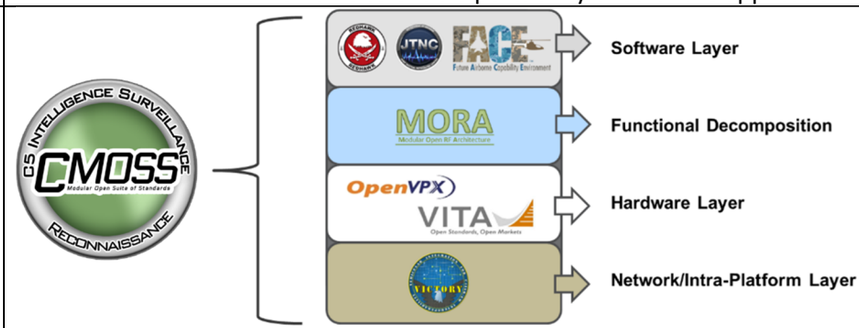
APPROVED FOR PUBLIC RELEASE

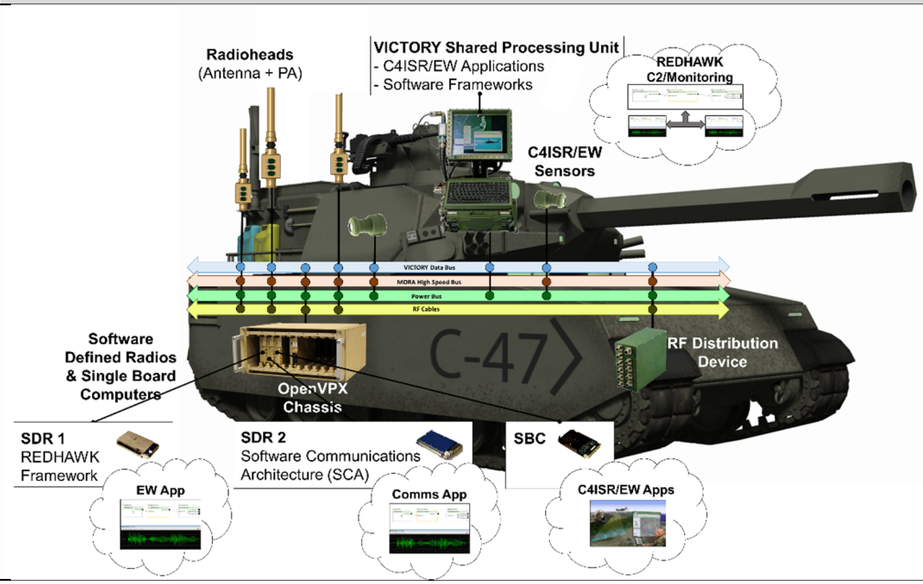
<table>
<tr><th>ParentID</th><th>UID</th><th>Content</th><th>Type</th><th>Strength</th></tr>
<tr><td></td><td>CMOSS0001</td><td>C5ISR/EW Modular Open Suite of Standards (CMOSS) Interoperability Requirements Specification (IRS)</td><td>Information</td><td></td></tr>
<tr><td></td><td>CMOSS0002</td><td>Version 1.2</td><td>Information</td><td></td></tr>
<tr><td></td><td>CMOSS0003</td><td>Dated 20240930</td><td>Information</td><td></td></tr>
<tr><td></td><td>CMOSS0004</td><td>
<table>
<tr><th colspan="2">CMOSS IRS v1.2 Change Log</th></tr>
<tr><th>UIDs</th><th>Change from IRS v1.1</th></tr>
<tr><td>All</td><td>Updated VICTORY references to V1.10</td></tr>
<tr><td>All</td><td>Updated MORA references to V2.5</td></tr>
<tr><td>All</td><td>Updated SOSA references to SOSA Technical Standard Edition 2.0, Version 2</td></tr>
<tr><td>CMOSS0039
CMOSS0040
CMOSS0041
CMOSS0042
CMOSS0043
CMOSS0045
CMOSS0046
CMOSS0047
CMOSS0048
CMOSS0049
CMOSS0050
CMOSS0051
CMOSS0052
CMOSS0053
CMOSS0054
CMOSS0055
CMOSS0056
CMOSS0057</td><td>Updated to be standalone to faciliate compliance verification.</td></tr>
</table>
</td><td>Information</td><td></td></tr>
</table>

ParentID	UID	Content		Type	Strength
		CMOSS0058	Deprecated Legacy Radio		
		CMOSS0139 CMOSS0140	Added requirements for Streaming Audio Data Source		
		CMOSS0141 CMOSS0142	Added requirements for Single-Instance Audio Data Source		
		CMOSS0068 CMOSS0069 CMOSS0070 CMOSS0075 CMOSS0076 CMOSS0077	MORA clarifications regarding resource and client requirements		
		CMOSS0085	Changed type and strength to objective and should, respectively		
		CMOSS0087	Added card front panel connection for discrete signals that can't be sent over the ML2B		
		CMOSS0088 CMOSS0101 CMOSS0120	Updated 14.6.11 SMPM-14 pinout to identify RX/TX		
		CMOSS0143 CMOSS0144 CMOSS0145 CMOSS0154 CMOSS0155	Added 14.6.11 support for video coax/fiber connector		
		CMOSS0146 CMOSS0156 CMOSS0157	Updated 14.9.2 SMPM-10 pinout to include Signals of Opportunity		
		CMOSS0147	Added requirement for switch card Data Plane Fat Pipe repartitioning order		
		CMOSS0148	Added requirement specifying all cards are unkeyed		
		CMOSS0149	Updated Maintenance Console voltages to align with VITA 65.0		
		CMOSS0150	Added requirement for SOSA Environmental Ruggedization		
		CMOSS0151	Added requirement for SOSA SOSA Non-Switch Plug-In Card Backplane Interfaces Supporting Inter-Module Interactions		

ParentID	UID	Content	Type	Strength
		CMOSS0152 CMOSS0153 — Added requirement to use thin-wall right end VITA 46.X connector adjacent to VITA 66 and/or VITA 67 connectors CMOSS0113 — Added missing strength CMOSS0115 — Updated SOSA Out-of-Band System Management to required CMOSS0122 — Added single lane Ethernet on the Data Plane Fat Pipe CMOSS0122 CMOSS0124 — Added Ethernet on the Expansion Plane (configurable between PCIe and Ethernet) CMOSS0158 — Added clarification regarding red strikethrough and green entries in AMPS tables CMOSS0131 — Added Tactical Assault Kit (TAK) to software frameworks CMOSS0159 — Added recommendation for SOSA Run-Time Environments CMOSS0137 — Updated SOSA mechanical and electrical specifications to required CMOSS0160 CMOSS0161 CMOSS0162 — Added requirements for SOSA In-Band System Management CMOSS0163 CMOSS0164 CMOSS0165 CMOSS0166 CMOSS0167 CMOSS0168 CMOSS0169 — Added requirements for Modular Radio Architecture (MRA) Waveform Card Specification		
	CMOSS0005	Table 1 - Change Log	Information	
	CMOSS0006	Purpose	Information	

ParentID	UID	Content	Type	Strength
	CMOSS0007	The purpose of the CMOSS Interoperability Requirements Specification is to provide a common, configuration-controlled, Science, Technology, Engineering, Experimentation, Test & Evaluation and Acquisition minimum baseline technical requirements document. This allows US Army (T), and Joint, Interagency, Intergovernmental, Multinational (JIIM) (O), materiel developers and integrators to ensure CMOSS compliant/conformant solutions are over-the-interface(s)-interoperable with other components/systems developed to the same "shalls". This document also addresses the need for the US Army (T), and JIIM (O), to have a mechanism to codify critical, Government interoperability design choices at the 'speed of relevance', in the event that public-private consortium governance processes/timelines would negatively impact Army Modernization. It also allows the Government to add additional specificity above and beyond consortium-based standards in order to achieve the portability and reuse objectives of the US Army. Although there are significant benefits from leveraging Public-Private consortium-based open standards approaches, the Government must always maintain the ability to make and coordinate inherently Governmental decisions in the best interests of the Warfighter. The requirements within this document should be incorporated by reference in contracts, citing the document title, revision number, and effective date of publication. 'CMOSS#####' Unique Identifiers (UID) will typically be linked as 'parent requirements' from which materiel system, subsystem, component, etc. 'child requirements' are derived. This CMOSS Interoperability Requirements Specification is under the configuration control of the chartered C5ISR Center MOSA Management Office (MMO).	Information	
	CMOSS0008	Background	Information	
	CMOSS0009	In January 2019, the secretaries of the Army, Navy, and Air Force signed a memo entitled, “Modular Open Systems Approaches (MOSA) for our Weapon Systems is a Warfighting Imperative,” directing MOSA standards to be included in all requirements, programming, and development activities for future weapon system modifications and new-start development. This direction was reinforced by the House Armed Services Committee report for the FY21 National Defense Authorization Act, which recommended that “CMOSS and SOSA military electronics standards be more tightly connected to use the same hardware pinout standards and, more importantly, the same software data transport protocols, such as the Modular Open RF Architecture (MORA), to further solidify a common Department of Defense-wide technical approach to create an open systems architecture standard by which small businesses and large primes can compete”.	Information	
	CMOSS0010	Capability Overview and Benefits	Information	
	CMOSS0011	The Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) Center-developed and managed C5ISR/Electronic Warfare Modular Open Suite of Standards (CMOSS) delivers on that intent. This MOSA approach:	Information	
CMOSS0011	CMOSS0012	• Reduces the size, weight and power (SWaP) footprint of C5ISR systems by enabling integration and hardware sharing for communications, position, navigation and timing (PNT), mission command, and electronic warfare (EW) capabilities.	Information	

ParentID	UID	Content	Type	Strength
CMOSS0011	CMOSS0013	• Allows for rapid technology insertion to keep pace with emerging needs, permitting capabilities that are innovative, yet unanticipated, to be quickly implemented using well-defined components with open interfaces. The components are commonly referred to as “cards” and “radioheads”.	Information	
	CMOSS0014	CMOSS consists of the following suite of layered standards that are individually useful and can be combined to form a holistic converged architecture:	Information	
CMOSS0014	CMOSS0015	• Network-based interoperability to enable sharing of services, such as time and position.	Information	
CMOSS0014	CMOSS0016	• Hardware form factor to enable capability fielding using cards in a common chassis.	Information	
CMOSS0014	CMOSS0017	• Functional decomposition to allow for sharing of resources, such as antennas and amplifiers.	Information	
CMOSS0014	CMOSS0018	• Software frameworks to enable portability of software applications.	Information	
	CMOSS0019		Information	
	CMOSS0020	Figure 1 - Layered Standards	Information	
	CMOSS0021	The overall approach has been referred to as the "Universal A-Kit," where platforms come with one or more standard chassis and are already plumbed for power, networks, and radio frequency (RF) distribution. Hardware for capabilities such as communications, PNT, mission command, and EW can then be fielded in the form of cards physically inserted in a common chassis and radioheads bolted to standard mount points.	Information	
	CMOSS0022	CMOSS has the potential to significantly reduce costs over the lifecycle of a system.	Information	
	CMOSS0023	Logistics tails can be smaller due to common spares.	Information	
	CMOSS0024	Unit costs can be reduced due to greater competition among vendors and economies of scale.	Information	
	CMOSS0025	Sustainment organizations can avoid purchasing spares intended to last 30+ years and instead perform modernization by upgrading to the latest hardware as components are replaced.	Information	

ParentID	UID	Content	Type	Strength
	CMOSS0026		Information	
	CMOSS0027	Figure 2 - The image above represents a notional portrayal of a Next Generation Optionally Manned Fighting Vehicle featuring a CMOSS-based chassis and capability cards.	Information	
	CMOSS0028	CMOSS Requirements	Information	
	CMOSS0029	The following describes the CMOSS requirements for systems and associated components.	Information	
	CMOSS0030	CMOSS supports systems ranging in scale from a fully integrated platform to a dismounted manpack chassis.	Information	
	CMOSS0031	Examples of components within systems include chassis, transceiver cards, single board computers, timing cards, radioheads, and C5ISR applications.	Information	
	CMOSS0032	Vehicular Integration for C4ISR/EW Interoperability (VICTORY)	Information	
	CMOSS0033	Background: The Vehicular Integration for C4ISR/EW Interoperability (VICTORY) initiative was started as a way to correct the problems created by the "bolt-on" approach to fielding equipment on US Army vehicles.	Information	
	CMOSS0034	Implementation of VICTORY allows tactical platforms and systems to recover lost space while reducing weight and saving power.	Information	
	CMOSS0035	Additionally, implementation allows platform systems to share information and provide an integrated picture to the crews.	Information	
	CMOSS0036	Finally, implementation provides an open architecture that will allow platforms to accept future technologies without the need for significant re-design.	Information	

ParentID	UID	Content	Type	Strength
	CMOSS0037	Under the initiative, a framework for integration of C4ISR/EW and other electronic mission equipment on tactical platforms continues to be developed.	Information	
	CMOSS0038	Additional information is available at SAM.gov (https://sam.gov/opp/889a0f920a5f4e8db99b9ee5d35d329c/view) and the Joint Communications Marketplace (https://jtnc.experience.crmforce.mil/JTNC/s/cmoss).	Information	
	CMOSS0039	When in a vehicle mounted configuration, systems implement a VICTORY Data Bus that complies with the following VICTORY specifications:	Information	
CMOSS0039	CMOSS0040	When in a vehicle mounted configuration, systems shall implement a VICTORY Data Bus that complies with Switch <VT50900-V1.9> to provide core network transport.	Threshold	shall
CMOSS0039	CMOSS0041	When in a vehicle mounted configuration, systems shall implement a VICTORY Data Bus that complies with Shared Processing Unit <VT51900-V1.10> to host portable software.	Threshold	shall
CMOSS0039	CMOSS0042	When in a vehicle mounted configuration, systems shall implement a VICTORY Data Bus that complies with VDB Management Service <VT52200-V1.10> to enable basic network management functions.	Threshold	shall
CMOSS0039	CMOSS0043	When in a vehicle mounted configuration, systems shall implement a VICTORY Data Bus that supports a minimum of 10/100 Base-T Ethernet interfaces as specified in VICTORY <VT52303-V1.2> and <VT52101-V1.9>.	Threshold	shall
	CMOSS0044	All systems and components shall implement services to receive/consume external PNT data from authorized source such as PNT Mounted system.	Threshold	shall
CMOSS0044	CMOSS0045	All systems and components comply with the following VICTORY specifications:	Information	
CMOSS0045	CMOSS0046	Whenever position data is required, all systems and components shall comply with Position Service <VT50100-V1.10>.	Threshold	shall
CMOSS0045	CMOSS0047	Whenever time synchronization is required, all systems and components shall comply with Time Synchronization Service <VT50000-V1.7> with Precision Time Protocol (PTP) per <VT50001.T2-V1.7> or Network Time Protocol (NTP) per <VT50001.T1-V1.4>.	Threshold	shall
CMOSS0045	CMOSS0048	Whenever orientation data is required, all systems and components shall comply with Orientation Service <VT50200-V1.10>.	Threshold	shall
CMOSS0045	CMOSS0049	Whenever direction of travel (heading) data is required, all systems and components shall comply with Direction of Travel Service <VT50300-V1.10>.	Threshold	shall
	CMOSS0050	Position, Navigation, and Timing (PNT) systems implement the following services to distribute PNT data for other client systems' consumption:	Information	
CMOSS0050	CMOSS0051	PNT systems shall implement Position Service <VT50100-V1.10> to distribute position data for other client systems' consumption.	Threshold	shall
CMOSS0050	CMOSS0052	PNT systems shall implement Time Synchronization Service <VT50000-V1.7> to provide time synchronization for other client systems' consumption.	Threshold	shall

ParentID	UID	Content	Type	Strength
CMOSS0050	CMOSS0053	PNT systems shall implement Orientation Service <VT50200-V1.10> to distribute orientation data for other client systems' consumption.	Threshold	shall
CMOSS0050	CMOSS0054	PNT systems shall implement Direction of Travel Service <VT50300-V1.10> to distribute direction of travel (heading) data for other client systems' consumption.	Threshold	shall
	CMOSS0055	PNT systems implement the following services to enable remote management & control functions:	Information	
CMOSS0055	CMOSS0056	PNT systems shall implement Global Positioning Service (GPS) Receiver < VT61000-V1.10> to enable remote management & control functions.	Threshold	shall
CMOSS0055	CMOSS0057	PNT systems shall implement Assured PNT <VT61600-V1.10> to enable remote management & control functions.	Threshold	shall
	CMOSS0058	Tactical radios shall implement Data Radio <VT60800-V1.9> to enable remote management & control functions.	Threshold	shall
	CMOSS0059	Electronic Warfare (EW) and Signals Intelligence (SIGINT) systems shall implement Electronic Warfare Device <VT60900-V1.10> to enable remote management & control functions.	Threshold	shall
CMOSS0059	CMOSS0060	Note that the Electronic Warfare Device component type will be deprecated in the future as the corresponding functionality will be provided by additional MORA Processing Resource component types.	Information	
	CMOSS0139	Systems that require digital voice shall implement Streaming Audio Data Source <VT60001-V1.10> to communicate with other voice endpoints.	Threshold	shall
CMOSS0139	CMOSS0140	Voice clients shall use the Streaming Audio Management Interface <VT60005-V1.10> to determine the address of the other voice endpoint for the session.	Threshold	shall
	CMOSS0141	Systems that need to play audio alarms or notifications shall implement Single-Instance Audio Data Source <VT60000-V1.10> to communicate with other audio endpoints.	Threshold	shall
CMOSS0141	CMOSS0142	Audio clients shall use the Single-Instance Audio Management Interface <VT60003-V1.10> to determine the address of the audio server.	Threshold	shall
	CMOSS0061	Modular Open RF Architecture (MORA)	Information	
	CMOSS0062	Background: MORA extends VICTORY to support radio frequency (RF) systems.	Information	
	CMOSS0063	MORA decomposes monolithic radio systems into high-level devices, signal ports, and switch groups with well-defined functions and interfaces.	Information	
	CMOSS0064	Device types include Software Defined Radios (SDRs), RF Conditioning and Distribution (RCD), and Radioheads (RHDs).	Information	
	CMOSS0065	Additional information is available at SAM.gov (https://sam.gov/opp/889a0f920a5f4e8db99b9ee5d35d329c/view) and the Joint Communications Marketplace (https://jtnc.experience.crmforce.mil/JTNC/s/cmoss).	Information	
	CMOSS0066	Please refer to "MORA VDL Instructions" to request an account for access to the MORA Wiki, File Share, and GitLab spaces on VDL.	Information	
	CMOSS0067	Systems with RF resources shall comply with the MORA functional decomposition and interfaces.	Threshold	shall

ParentID	UID	Content	Type	Strength
	CMOSS0068	Devices containing signal resources such as but not limited to RF amplifiers, RF antennas, RF filters and RF switches shall implement the MORA Device <MT92010-V2.5> component type resource interfaces as specified in the MORA Specification.	Threshold	shall
	CMOSS0069	Devices containing signal resources such as but not limited to RF amplifiers, RF antennas, RF filters and RF switches shall implement the MORA Signal Resource Manager <MT92013-V2.5> component type resource interfaces as specified in the MORA Specification.	Threshold	shall
	CMOSS0070	Devices containing signal resources such as but not limited to RF amplifiers, RF antennas, RF filters and RF switches shall implement the MORA Signal Port Manager <MT92016-V2.5> component type resource interfaces as specified in the MORA Specification.	Threshold	shall
	CMOSS0071	MORA implementations shall include all required interfaces as well as any optional interfaces that correspond to functionality provided by the device.	Threshold	shall
	CMOSS0072	Cascaded signal resources on different devices shall communicate exclusively using MORA standard interfaces over the VICTORY Data Bus (VDB) and MORA Low Latency Bus (ML2B).	Threshold	shall
CMOSS0072	CMOSS0073	Devices and signal resources shall be discovered and allocated over the VICTORY Data Bus (VDB).	Threshold	shall
CMOSS0072	CMOSS0074	Signal resources shall be controlled over the MORA Low Latency Bus (ML2B).	Threshold	shall
	CMOSS0075	Clients including applications and processing resources shall interface with signal resources exclusively using MORA standard interfaces.	Threshold	shall
CMOSS0075	CMOSS0076	Devices and signal resources shall be discovered and allocated by clients using the MORA Device <MT92010-V2.5> component type and MORA Signal Resource Manager <MT92013-V2.5> component type client interfaces over the VDB.	Threshold	shall
CMOSS0075	CMOSS0077	Signal resources shall be controlled by clients using the MORA Signal Port Manager <MT92016-V2.5> component type client interfaces over the ML2B.	Threshold	shall
	CMOSS0078	Systems and devices should implement separate domains where the VDB is Domain 1 and the ML2B is Domain 2.	Objective	should
	CMOSS0079	OpenVPX	Information	
	CMOSS0080	Background: OpenVPX is a Backplane standard that uses serial fabrics with a high density connector, coupled with a systems level approach that defines standard profiles for pins, protocols, and interconnections.	Information	
	CMOSS0081	Additional information is available at http://www.vita.com/ and http://www.opengroup.org/sosa	Information	
	CMOSS0082	Systems shall contain an OpenVPX chassis with modular hardware resources that complies with the slot and module profiles in this specification to facilitate interoperability with cards developed by third-party vendors.	Threshold	shall
CMOSS0082	CMOSS0083	System should use 3U OpenVPX whenever possible.	Objective	should
	CMOSS0084	Systems and components shall use the Control Plane for the VICTORY Data Bus (VDB) and the Data Plane for the MORA Low Latency Bus (ML2B).	Threshold	shall
	CMOSS0085	Systems and components should implement separate domains on the backplane and plug-in cards where the Control Plane and Expansion Plane are Domain 1, while the Data Plane and Utility Plane are Domain 2.	Objective	should

ParentID	UID	Content	Type	Strength
	CMOSS0086	3U payload cards such as RF transceivers that require RF connections shall comply with a slot profile of SLT3-PAY-1F1U1S1S1U1U2F1H-14.6.11-4 as defined in ANSI/VITA 65.0, and shall have an Alternate Module Profile Scheme (AMPS) string that conforms to Table 2.	Threshold	shall
CMOSS0086	CMOSS0087	Connections on the front of these payload cards shall only be used for key fill, maintenance, and discrete signals that can't be sent over the ML2B.	Threshold	shall
CMOSS0086	CMOSS0088	RF connections shall comply with Pinout D1 as specified by Table 13.3.7.4-1 (ANSI/VITA 67.3 14_SMPM_contacts-6.4.5.6.4 Coaxial Pin Designations) in SOSA Technical Standard Edition 2.0, Snapshot 2 and repeated in Figure 3.	Threshold	shall
	CMOSS0089	3U payload cards such as single board computers (SBCs) and general-purpose graphics processing units (GPGPUs) that don't require RF connections shall comply with a slot profile of SLT3-PAY-1F1U1S1S1U1U2F1H-14.6.11-0 as defined in ANSI/VITA 65.0, and shall have an AMPS string that conforms to Table 2.	Threshold	shall
CMOSS0089	CMOSS0090	Connections on the front of these payload cards shall only be used for key fill and maintenance.	Threshold	shall
	CMOSS0143	3U payload cards such as SBCs and GPGPUs that require coax and/or optical video connections shall comply with a slot profile of SLT3-PAY-1F1U1S1S1U1U2F1H-14.6.11-17 as defined in ANSI/VITA 65.0, and shall have an AMPS string that conforms to Table 2.	Threshold	shall
CMOSS0143	CMOSS0144	Connections on the front of these payload cards shall only be used for maintenance.	Threshold	shall
CMOSS0143	CMOSS0145	RF connections shall comply with one of the pinouts specified by Table 13.3.7.7-1 (Coaxial Pin Designations for ANSI/VITA 65.1 2_Style_C_inserts_and_12_75-OhmNanoRF contacts-6.4.5.6.12) in SOSA Technical Standard Edition 2.0, Snapshot 2 and repeated in Figure 4.	Threshold	shall
	CMOSS0091	3U payload cards that require standard I/O such as USB, DisplayPort, and serial ports or are intended to be used for system-specified interfaces shall comply with a slot profile of SLT3-PAY-1F1F2U1TU1T1U1T-14.2.16 as defined in ANSI/VITA 65.0, and shall have an Alternate Module Profile Scheme (AMPS) string that conforms to Table 2.	Threshold	shall
CMOSS0091	CMOSS0092	Connections on the front of these payload cards shall only be used for key fill and maintenance.	Threshold	shall
	CMOSS0093	Systems that require more system-specific interfaces than can be accommodated by 14.2.16 may use a dedicated external I/O card. This card shall comply with a slot profile of SLT3-PAY-2U2U-14.2.17 as defined in ANSI/VITA 65.0, and shall have an Alternate Module Profile Scheme (AMPS) string that conforms to Table 2.	Threshold	shall
CMOSS0093	CMOSS0094	Connections on the front of these payload cards shall only be used for maintenance.	Threshold	shall
	CMOSS0095	3U Ethernet switch cards shall comply with a slot profile of SLT3-SWH-6F1U7U-14.4.14 or SLT3-SWH-4F1U7U1J-14.8.7-n as defined in ANSI/VITA 65.0, and shall have an AMPS string that conforms to Table 3.	Threshold	shall
CMOSS0095	CMOSS0096	Connections on the front of Ethernet switch cards shall only be used for external Ethernet connections, key fill, and maintenance.	Threshold	shall
	CMOSS0097	3U PCIe/Ethernet switch cards shall comply with a slot profile of SLT3-SWH-6F8U-14.4.15 as defined in ANSI/VITA 65.0, and shall have an AMPS string that conforms to Table 3.	Threshold	shall
CMOSS0097	CMOSS0098	Connections on the front of PCIe/Ethernet switch cards shall only be used for maintenance.	Threshold	shall

ParentID	UID	Content	Type	Strength
	CMOSS0099	6U payload cards such as RF transceivers that require RF connections shall comply with a slot profile of SLT6-PAY-4F2Q1H4U1T1S1S1TU2U2T1H-10.6.4-2 as defined in ANSI/VITA 65.0, and shall have an AMPS string that conforms to Table 13.3.4-2 in SOSA Technical Standard Edition 2.0, Version 2.	Threshold	shall
CMOSS0099	CMOSS0100	Connections on the front of these payload cards shall only be used for key fill and maintenance.	Threshold	shall
CMOSS0099	CMOSS0101	RF connections shall comply with Pinout D1 as specified by Table 13.3.7.4-1 (ANSI/VITA 67.3 14_SMPM_contacts-6.4.5.6.4 Coaxial Pin Designations) in SOSA Technical Standard Edition 2.0, Snapshot 2 and repeated in Figure 3.	Threshold	shall
	CMOSS0102	6U payload cards such as SBCs and GPGPUs that don't require RF connections shall comply with a slot profile of SLT6-PAY-4F2Q1H4U1T1S1S1TU2U2T1H-10.6.4-0 as defined in ANSI/VITA 65.0, and shall have an AMPS string that conforms to Table 13.3.4-2 in SOSA Technical Standard Edition 2.0, Version 2.	Threshold	shall
CMOSS0102	CMOSS0103	Connections on the front of payload cards shall only be used for key fill and maintenance.	Threshold	shall
	CMOSS0104	6U Ethernet switch cards shall comply with a slot profile of SLT6-SWH-14F16U1U15U1J-10.8.1-n as defined in ANSI/VITA 65.0, and shall have an AMPS string that conforms to Table 13.3.5-1 in SOSA Technical Standard Edition 2.0, Version 2.	Threshold	shall
CMOSS0104	CMOSS0105	Connections on the front of Ethernet switch cards shall only be used for external Ethernet connections, key fill, and maintenance.	Threshold	shall
	CMOSS0106	Timing cards shall comply with a slot profile of SLT3x-TIM-2S1U22S1U2U1H-14.9.2-1 as defined in ANSI/VITA 65.0, and shall have an AMPS string that conforms to Table 2.	Threshold	shall
CMOSS0106	CMOSS0107	Connections on the front of timing cards shall only be used for key fill and maintenance.	Threshold	shall
CMOSS0106	CMOSS0146	RF connections shall comply with Pinout A1 as specified by Table 13.3.7.3-2 (ANSI/VITA 67.3 10_SMPM_contacts-6.4.5.6.3 Coaxial Pin Designations) in SOSA Technical Standard Edition 2.0, Snapshot 2 and repeated in Figure 5.	Threshold	shall
	CMOSS0147	Repartitioning of Data Plane Fat Pipes on switch cards shall start with the highest numbered pipes first.	Threshold	shall
	CMOSS0108	Switch cards shall support auto-negotiation and fixed rates.	Threshold	shall
	CMOSS0109	Non-switch cards should support auto-negotiation and fixed rates.	Objective	should
	CMOSS0110	All cards shall only use the following power inputs from the backplane: 12 VDC (Vs1), 3.3V_AUX, and VBAT.	Threshold	shall
	CMOSS0111	Payload cards and timing cards shall support a 100 MHz REF_CLK and 1 PPS AUX_CLK that are distributed radially over the backplane.	Threshold	shall
	CMOSS0112	All cards shall zeroize when GDiscrete1 is asserted.	Threshold	shall
	CMOSS0148	Cards shall be unkeyed.	Threshold	shall
	CMOSS0149	All maintenance ports shall conform to the Maintenance Console Port requirements in Section 13.2.8 of SOSA Technical Standard Edition 2.0, Snapshot 2.	Threshold	shall
	CMOSS0150	All cards shall conform to the Environmental Ruggedization requirements in Section 13.2.14 of SOSA Technical Standard Edition 2.0, Snapshot 2 and provide their Product Environmental Specification table as part of CMOSS-related proposals.	Threshold	shall
	CMOSS0151	All cards shall conform to the SOSA Non-Switch Plug-In Card Backplane Interfaces Supporting Inter-Module Interactions in Section 13.3.6.1 of SOSA Technical Standard Edition 2.0, Snapshot 2.	Threshold	shall

ParentID	UID	Content	Type	Strength
	CMOSS0152	Backplanes shall use a thin-wall right end version of the [VITA 46.X] connector adjacent to the VITA 66 and/or VITA 67 Connector Modules.	Threshold	shall
CMOSS0152	CMOSS0153	This allows backplane payload slots to support 14.6.11 and 14.6.13 plug-in cards without damage.	Information	
	CMOSS0113	All cards shall be Type 1, 1.0 in. pitch conduction cooled plug-in units per ANSI/VITA 48.2 or Type 1, 1.5 in. pitch air flow through plug-in units per ANSI/VITA 48.8 to support 2 Level Maintenance.	Threshold	shall
CMOSS0113	CMOSS0114	Cards should use ANSI/VITA 48.2 whenever possible.	Objective	should
	CMOSS0115	Systems shall conform to the Out-of-Band Hardware Management Definitions within the Sensor Open Systems Architecture (SOSA) Technical Standard whenever possible.	Threshold	shall
CMOSS0115	CMOSS0116	These requirements can be found in Section 6.4 (Out-of-Band Hardware Management Definitions) of SOSA Technical Standard Edition 2.0, Version 2 and are based on the Hardware Open Systems Technology (HOST) and ANSI/VITA 46.11 standards.	Information	
	CMOSS0117	All cards shall conform to the plug-in card specifications within the Sensor Open Systems Architecture (SOSA) Technical Standard that don’t conflict with requirements within this document.	Threshold	shall
CMOSS0117	CMOSS0118	These requirements can be found in Section 13 (Hardware Element) of SOSA Technical Standard Edition 2.0, Version 2.	Information	
	CMOSS0119	In the case of a conflict, this document shall supersede the SOSA Technical Standard.	Threshold	shall

ParentID	UID	Content	Type	Strength
	CMOSS0120		Threshold	shall

Type		unspecified	Digitizer					Signal Conditioning Cards			Clock Distribution	
RF Chain	location	unspecified	End					Middle			N/A	
	direction	unspecified	RX	RX/TX			TX	RX	RX/TX	TX	N/A	
Pinout/ID		8RF or 4RF/4IF	8IN/2OUT	5IN/5OUT	4IN/4OUT	4IN/4OUT	8OUT/2IN	5IN/5OUT	Dual 2OUT/2IN	5OUT/5IN	Clock OUT	REF OUT
Contact	Signal	A1	B1	C1	D1	F1	E1	C2	F2	G2	H1	H2
B1	1	RF1	AIN1	AIN1	AOUT1	AIN1	AOUT1	USFIN1	USFIN1	USFOUT1	CLKOUT1	REFOUT1
B4	2	RF2	AIN2	AIN2	AIN1	AIN2	AOUT2	USFIN2	USFIN2	USFOUT2	CLKOUT2	REFOUT2
D1	3	RF3	AIN3	AIN3	AOUT2	AOUT1	AOUT3	USFIN3	USFOUT1	USFOUT3	CLKOUT3	REFOUT3
D4	4	RF4	AIN4	AIN4	AIN2	AOUT2	AOUT4	USFIN4	USFOUT2	USFOUT4	CLKOUT4	REFOUT4
B2	5	RF5/IF1	AIN5	AOUT1	AOUT3	AOUT3	AOUT5	DSFOUT1	DSFOUT1	DSFIN1	CLKOUT5	REFOUT5
B3	6	RF6/IF2	AIN6	AOUT2	AIN3	AOUT4	AOUT6	DSFOUT2	DSFOUT2	DSFIN2	CLKOUT6	REFOUT6
D2	7	RF7/IF3	AIN7	AOUT3	AOUT4	AIN3	AOUT7	DSFOUT3	DSFIN1	DSFIN3	CLKOUT7	REFOUT7
D3	8	RF8/IF4	AIN8	AOUT4	AIN4	AIN4	AOUT8	DSFOUT4	DSFIN2	DSFIN4	CLKOUT8	REFOUT8
C1	9	UD1	AOUT1/UD1	AOUT5/UD1	UD1	UD1	AIN1/UD1	USFOUT1/UD1	UD1	USFIN1/UD1	CLKOUT9	REFOUT9
C2	10	UD2	AOUT2/UD2	AIN5/UD2	UD2	UD2	AIN2/UD2	DSFIN1/UD2	UD2	DSFOUT1/UD2	CLKOUT10	REFOUT10
C3	11	UD3	UD3	UD3	UD3	UD3	UD3	UD3	UD3	UD3	CLKOUT11	REFOUT11
A1	12	UD4	UD4	UD4	UD4	UD4	UD4	UD4	UD4	UD4	CLKIN	CLKIN
A2	13	UD5	UD5	UD5	UD5	UD5	UD5	UD5	UD5	UD5	TRIGIN	TRIGIN
A3	14	UD6	UD6	UD6	UD6	UD6	UD6	UD6	UD6	UD6	REFIN	REFIN
Supported VPX Slot Profiles		16.6.11-4	14.6.11-4	14.6.11-4	14.6.11-4	14.6.11-4	14.6.11-4	14.6.11-4	14.6.11-4	14.6.11-4	14.9.2-2	14.9.2-2
		16.6.14-11	14.6.14-11	14.6.14-11	14.6.14-11	14.6.14-11	14.6.14-11	14.6.14-11	14.6.14-11	14.6.14-11	✗	✗
		10.6.3-2	10.6.3-2	10.6.3-2	10.6.3-2	10.6.3-2	10.6.3-2	10.6.3-2	10.6.3-2	10.6.3-2	✗	✗
		10.6.4-2	10.6.4-2	10.6.4-2	10.6.4-2	10.6.4-2	10.6.4-2	10.6.4-2	10.6.4-2	10.6.4-2	✗	✗
		10.6.5-9	10.6.5-9	10.6.5-9	10.6.5-9	10.6.5-9	10.6.5-9	10.6.5-9	10.6.5-9	10.6.5-9	✗	✗
Use Case(s)		Input/ Output	Lots of Inputs	Transceiver	Transceiver	Transceiver	Lots of Outputs	Downconverter	Transverter	Upconverter	Full Rate Clock	Reference

	CMOSS0121	Figure 3 - 3U Payload Card RF Coaxial Pin Assignment (taken from Figure 13.3.7.4-1 in SOSA Technical Standard Edition 2.0, Version 2)	Information	

ParentID	UID	Content	Type	Strength
	CMOSS0154		Threshold	shall

Loc	Pinout/ID Contact	Pinout/ID Signal	All In A1	All Out B1	4 In/8 Out C1	6 In/6 Out D1	8 In/4 Out E1
P2B	C1	1	IN1	OUT1	OUT1	OUT1	OUT1
	C2	2	IN2	OUT2	OUT2	OUT2	OUT2
	C3	3	IN3	OUT3	OUT3	OUT3	IN1
	D1	4	IN4	OUT4	OUT4	IN1	IN2
	D2	5	IN5	OUT5	IN1	IN2	IN3
	D3	6	IN6	OUT6	IN2	IN3	IN4
P2A	C4	7	IN7	OUT7	OUT5	OUT4	OUT3
	C5	8	IN8	OUT8	OUT6	OUT5	OUT4
	C6	9	IN9	OUT9	OUT7	OUT6	IN5
	D4	10	IN10	OUT10	OUT8	IN4	IN6
	D5	11	IN11	OUT11	IN3	IN5	IN7
	D6	12	IN12	OUT12	IN4	IN6	IN8
Supported VPX Slot Profiles			14.6.11-16 14.6.11-17 14.6.13-10 14.6.13-11	14.6.11-16 14.6.11-17 14.6.13-10 14.6.13-11	14.6.11-16 14.6.11-17 14.6.13-10 14.6.13-11	14.6.11-16 14.6.11-17 14.6.13-10 14.6.13-11	14.6.11-16 14.6.11-17 14.6.13-10 14.6.13-11

	CMOSS0155	Figure 4 - 3U Payload Video Coaxial Pin Assignment (taken from Figure 13.3.7.7-1 in SOSA Technical Standard Edition 2.0, Version 2)	Information	

ParentID	UID	Content	Type	Strength
	CMOSS0156		Threshold	shall

Type		PNT	Clock Distribution	
		PNT	Clock OUT	Ref OUT
Pinout/ID				
Contact	Signal	A1	B1	B2
A1	1	REFOUT	CLKOUT1	REFOUT1
A2	2	TRIGOUT	CLKOUT2	REFOUT2
A3	3	RSVD	CLKOUT3	REFOUT3
B1	4	TRIGIN	TRIGIN	TRIGIN
B2	5	REFIN	REFIN/CLKIN	REFIN
B3	6	RSVD	CLKOUT4	REFOUT4
B4	7	RSVD	CLKOUT5	REFOUT5
C1	8	RSVD	CLKOUT6	REFOUT6
C2: SOOP_ANT	9	GPSIN2	RSVD	RSVD
C3: GPS_ANT	10	GPSIN1	RSVD	RSVD
Supported VPX Slot Profiles		14.9.2-1	14.9.2-1	14.9.2-1
Use Case(s)		PNT	Full Rate Clock	Reference

	CMOSS0157	Figure 5 - 3U Timing Card Coaxial Pin Assignment (taken from Figure 13.3.7.3-2 in SOSA Technical Standard Edition 2.0, Version 2)	Information	

| | | Payload Type | | Physical Definition | | | | | | Backplane Copper Protocol/Speed/Width Defintion | | | | | | | | | | | | VITA 66/67 | | | | | | | | | | | |

Payload Type		Physical Definition							Backplane Copper Protocol/Speed/Width								VITA 66/67				
									Data Plane		Exp Plane	Control Plane	Misc				VITA 66		SOSA ONLY VITA 67 RF Pinout		
Payload Card Type	VITA 65 Slot Profile	VITA 65 Alternate Naming Structure				VITA 65 Slot Profile Aperature		Depth, Cooling, Pitch		FP	UTP	UTP	UTP	CLK1orGP			1		1	2	
~~3U RF/Optical Switch~~	~~14.6.14~~	~~MODA3 MODA3 p~~	~~-~~	~~16.6.14-1~~	~~-~~	~~0 6 11 12 13~~	~~-~~	~~F2C F4C F8H S2E~~	~~-~~	~~(~~	~~E8 E18 N~~	~~-~~	~~E1* E2 E7 E15 N~~	~~)(~~	~~E1* E2 E7 E15 N~~	~~)(~~	~~G2 G5 G6 N~~	~~)~~	~~[~~	~~P3F P4F E12 E19 A5F A6F N~~	~~]<~~	~~P1B RF0 RFx N~~	~~-~~	~~P2 RF0 RFx N~~	~~>~~
3U Radial Clock	14.9.2	MODA3 MODA3 p	-	16.9.2-1	-	~~0~~ 1* ~~2~~ ~~3~~	-	F2C ~~F4C F8H S2E~~	-	(		E1* E2 E7 E15 N	)(		2E1* 2E2 2E7 2E15 N		)	[	~~E12 E19 A5F A6F N~~	]<	P2 RF0 RFx N		>	
3U External I/O	14.2.17	MODA3 MODA3 p	-	16.2.16-1		-		F2C ~~F4C F8H S2E~~	-	(			2P3U	)(	2E1* 2E2 2E7 N		)							

ParentID	UID	Content	Type	Strength

Payload Type			Physical Definition						Backplane Copper Protocol/Speed/Width Defintion																								XMC SOSA Only XMC Overlay		
Payload Card Type		VITA 65 Slot Profile	VITA 65 Alternate Naming Structure				Depth, Cooling, Pitch			Data Plane		Expansion Plane		Control Plane			CPU Interface/Misc																		
										FP		EP1		UTP	TP		STR		VID 01		USB 01		USB 02		SER 01		GPIO				A		
3U	I/O intensive	14.2.16	MODA3 MODA3p	-	16.2.15-1	-	F2C ~~F4C~~ ~~F8H~~ ~~S2E~~	-	(	P2F* P3F* E8 E18 N	)(	P2F P3F P4F N	)(	2E1* 2E2 2E7 E15 N	-	E3 N	)(	S2 S3 N	-	D1 N	-	U1 U2 N	-	U1 N	-	M3 M4 M5 N	-	~~G1~~ N	)	<	XA0 XA1 XA2 N	>	
												*-Legacy																								

	CMOSS0123	Table 2 - AMPS Strings for 3U Payload Plug-In Card Profiles (adapted from Table 13.3.4-1 in SOSA Technical Standard Edition 2.0, Version 2)	Information	

ParentID	UID	Content	Type	Strength
	CMOSS0124		Threshold	shall

Payload Card Type			Physical Definition							Backplane Copper										VITA 66		Front Panel Optical						
										Data Plane				Exp. Plane	Control Plane							SOSA ONLY						
																						Data Plane		Control Plane				
Payload Card Type		VITA 65 Slot Profile	VITA 65 Alternate Naming Structure				VITA 65 Slot Profile Aperature		Depth, Cooling, Pitch		FP	UTP	TP	EP	CP	TP	EXT		FP (MT)		FP (MPO)	UTP (LC)	FP (MPO)	UTP (LC)	
	3U DP Switch DP: 6 FP/Ethernet CP: 7 UTP/Ethernet	14.4.14	MODA3 MODA3p	-	16.4.15-1		-		F2C ~~F4C~~ ~~F8H~~ ~~S2E~~	-	(E5 E8 E18 N	- E1* E2 E7 E15 N	)(		E1* E2 E7 E15 N	)			<		E12 E19 N	-	E11 E17 N	-	E12 E19 N	-	E11 E17 N	>
3U	3U EP Switch EP: 6 FP/PCIe CP: 8 UTP/Ethernet	14.4.15	MODA3 MODA3p	-	16.4.16-1		-		F2C ~~F4C~~ ~~F8H~~ ~~S2E~~	-	(			P2F P3F P4F E8 E18 N	)(E1* E2 E7 E15 N	- E3 N	)		<		E12 E19 P3F P4F N	-	E11 E17 N	-	E12 E19 P3F P4F N	-	E11 E17 N	>
	3U DP Switch/V66 DP: 4 FP/Ethernet CP: 7 UTP/Ethernet	14.8.7	MODA3 MODA3p	-	16.8.7-1	-	0 4 5	-	F2C ~~F4C~~ ~~F8H~~ ~~S2E~~	-	(E5 E8 E18 N	- E1* E2 E7 E15 N	)(		E1* E2 E7 E15 N	)		[	E12 E19 N	]<	E12 E19 N	-	E11 E17 N	-	E12 E19 N	-	E11 E17 N	>
~~6U~~	~~6U DP Switch~~ ~~DP: 18 FP/Ethernet~~ ~~CP: 15 UTP/Ethernet~~	~~10.8.1~~	~~MODA3~~ ~~MODA3p~~	-	~~12.8.1 1~~	-	~~0~~ ~~3~~	-	~~F2C~~ ~~F4C~~ ~~F8H~~	-	~~(~~ ~~E5~~ ~~E8~~ ~~E18~~ ~~N~~	- ~~E1*~~ ~~E2~~ ~~E7~~ ~~E15~~ ~~N~~	- ~~E3~~ ~~N~~	~~)(~~	~~E1*~~ ~~E2~~ ~~E7~~ ~~E15~~ ~~N~~	-	~~E14~~ ~~N~~	~~)~~ ~~[~~	~~E12~~ ~~E19~~ ~~N~~	~~]<~~	~~E12~~ ~~E19~~ ~~N~~	-	~~E11~~ ~~E17~~ ~~N~~	-	~~E12~~ ~~E19~~ ~~N~~	-	~~E11~~ ~~E17~~ ~~N~~	~~>~~

*-Legacy

	CMOSS0125	Table 3 - AMPS Strings for 3U Switch Plug-In Card Profiles (adapted from Table 13.3.5-1 in SOSA Technical Standard Edition 1.0)	Information	
	CMOSS0158	Note: Strikethrough red entries in Table 2 and Table 3 are not valid options in the CMOSS IRS even though they are valid options in the SOSA Technical Standard. Green entries in Table 2 and Table 3 are valid options in the CMOSS IRS that are not yet included in the SOSA Technical Standard.	Information	
	CMOSS0126	Software Frameworks	Information	
	CMOSS0127	Background: Software frameworks enable portability of applications between hardware platforms.	Information	
	CMOSS0128	CMOSS leverages prominent software frameworks within each mission area to maximize reuse of existing software capabilities.	Information	

ParentID	UID	Content	Type	Strength
	CMOSS0129	Software frameworks can be integrated with underlying specifications such as VICTORY and MORA which provide standard interfaces to sensors and services on the platform.	Information	
	CMOSS0130	Additional information is available at https://redhawksdr.github.io/Documentation/, http://www.public.navy.mil/jtnc/, and http://www.opengroup.org/face/.	Information	
	CMOSS0131	Systems shall implement applications within REDHAWK/TOA, SALVAGE, X-Midas, Photon, Software Communications Architecture (SCA), Future Airborne Capability Environment (FACE), and/or Tactical Assault Kit (TAK) when appropriate.	Threshold	shall
	CMOSS0132	Where existing Government frameworks are determined to be insufficient for a required application, such as in cases where hardware acceleration is used, the contractor shall document the design choices and provide the explanation to the Government for their concurrence.	Threshold	shall
	CMOSS0133	The contractor shall deliver a Software Development Kit (SDK) or Integrated Development Environment (IDE) to facilitate development and deployment of applications for lower level processing hardware, such as hardware accelerators, that may not be covered by existing Government frameworks.	Threshold	shall
	CMOSS0159	Systems should conform to one or more of the SOSA Run-Time Environments specified in Section 14 (SOSA Run-Time Environment) of SOSA Technical Standard Edition 2.0, Snapshot 2.	Objective	should
	CMOSS0134	Mechanical and Electrical Interfaces	Information	
	CMOSS0135	Background: The Sensor Open Systems Architecture (SOSA TM) Technical Standard defines standard mounts and connectors in order to facilitate platform integration and maximize cable reuse.	Information	
	CMOSS0136	Additional information is available at http://www.opengroup.org/sosa/.	Information	
	CMOSS0137	Systems shall conform to the mechanical and electrical specifications within the SOSA Technical Standard whenever possible.	Threshold	shall
CMOSS0137	CMOSS0138	These requirements can be found in Section 13.5 (SOSA Aperture and Chassis Electrical and Mechanical Interface Standard) of SOSA Technical Standard Edition 2.0, Version 2.	Information	
	CMOSS0160	Additional SOSA Requirements	Information	
	CMOSS0161	Systems shall conform to the In-Band System Management Definitions within the SOSA Technical Standard.	Threshold	shall
CMOSS0161	CMOSS0162	These requirements can be found in Section 6.2 (In-Band System Management Definitions) of SOSA Technical Standard Edition 2.0, Version 2.	Information	
	CMOSS0163	Modular Radio Architecture (MRA) Waveform Card Specification	Information	
	CMOSS0164	The Modular Radio Architecture (MRA) Waveform Card Specification provides additional guidance for implementing a Communications Waveform Application (WFA) on a payload card. Additional information is available on the Joint Communications Marketplace (https://jtnc.experience.crmforce.mil).	Information	
	CMOSS0165	Waveform cards should use Scenario 3A as defined in the MRA Waveform Card Specification Version 2.00.	Objective	should

ParentID	UID	Content	Type	Strength
	CMOSS0166	Waveform cards shall conform to requirements within Section 4 (Waveform Card Requirements) of the MRA Waveform Card Specification Version 2.00 that don't conflict with requirements within this document. Requirements are identified and numbered using the convention [WC-NNN]. In the event of a conflict, the CMOSS IRS supersedes the MRA Waveform Card Specification.	Threshold	shall
	CMOSS0167	This requirement supersedes WC-010. Waveforms cards shall comply with a slot profile of SLT3-PAY-1F1U1S1S1U1U2F1H-14.6.11-4 as defined in ANSI/VITA 65.0, and shall have an Alternate Module Profile Scheme (AMPS) string that conforms to Table 2.	Threshold	shall
	CMOSS0168	This requirement is in addition to Section 4.5 (COMSEC Interactions). Waveforms cards shall communicate with a shared COMSEC capability using the Protocol Buffer binding of the RSS API as defined by the SOSA Technical Standard.	Threshold	shall
	CMOSS0169	WC-096 (VICTORY Legacy Radio) has been deprecated and will be replaced by corresponding specifications within the SOSA Technical Standard.	Information	

Auto-generated from Authoritative Source: https://armyeitaas.sharepoint-mil.us/teams/MMO/Lists/cmossIRS/

Data is valid as of: 2024-09-30_0937EDT

CMOSS IRS v1.2 supersedes the C5ISR/EW Modular Open Suite of Standards (CMOSS) Interoperability Requirements Specification

Version 1.1

10 March 2022

JOSEPH D. WELCH
Director
C5ISR Center

Controlled by:
Office of the MOSA Chief Engineer, MOSA Management Office (MMO) FCDD-ISE-FD