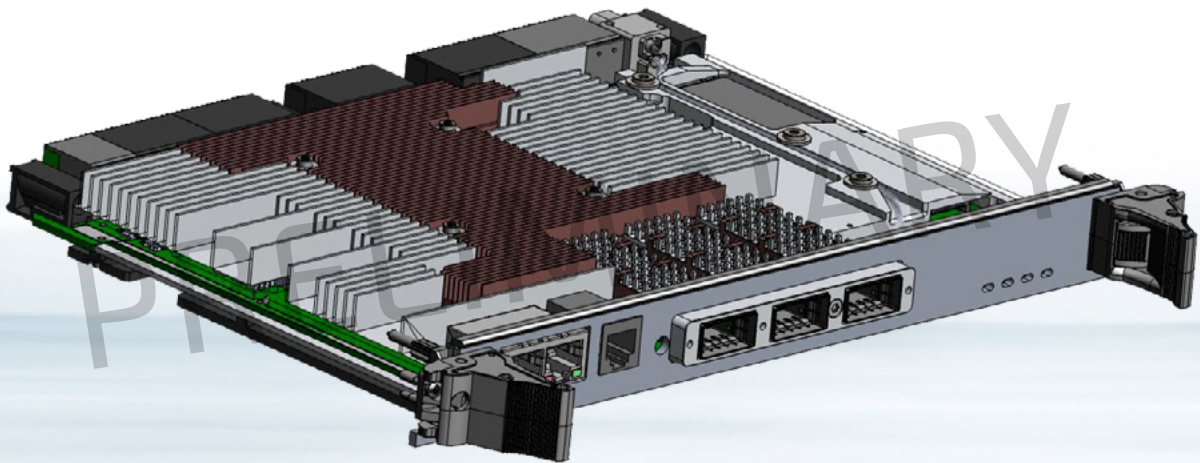


VX6940

40GETH/100 GETH L2/L3 Network Switch



OpenVPX 1/10/40/100 Gigabit Ethernet Switch

- ▶ L2/L3 switch for long term programs and harsh environments
- ▶ VITA65 / SLT6-SWH-14F16U1U15U1J-10.8.1 slot profile
- ▶ Data Center Version with SDN capabilities
- ▶ QSFP28, QSFP+, RJ45 Uplinks
- ▶ European design and manufacturing

POSSIBILITIES START HERE

VX6940

Fully Managed L2&L3 Switching and Routing

- ▶ Based on the Broadcom® BCM56760 high-density 72 x 10GbE port switch with 100 GbE capability
- ▶ 2 front QSFP28 for 10G/40G/100G optical or passive copper connections. (each allowing 4 ports 10GB or SFP+ via COTS liaison cables)
- ▶ 1 front QSFP+ multi-rate for 1G/10G
- ▶ Optimized for multicast traffic
- ▶ Robust: VITA 47 extended temperature
- ▶ Reliable: IPMI, SNMP, built-in tests, maintenance

Kontron's VX6940 is a non blocking* fully managed layer 2&3 1/10/40/100 Gigabit Ethernet Switch series. It provides rich and versatile feature support by using highest integration of Ethernet switch silicon. VX6940 is designed for long term programs and harsh environments, for applications requiring outstanding bandwidth and communication safety and compatibility with the new VPX system open architecture specifications (SOSA)

Optimized for multicast traffic

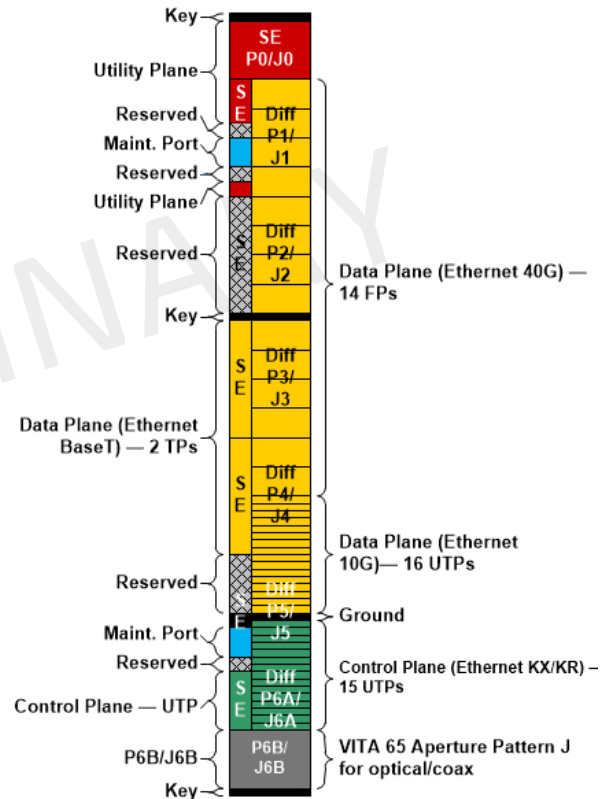
The Kontron design is populated with a powerful QorIQ® LS1 family processor. This onboard processor enables faster setup of routings, higher performance in protocol handling, especially higher throughput of Multicast traffic. The heart of the switch is the Broadcom® BCM956760 offering Up to a maximum of 720 Gbps Ethernet switching capability, with native (100G) support, line-rate switching for all packet sizes and ultra-low port-to-port latency.

Full L2/L3 Management

The VX6940 can be monitored via SNMP. A comprehensive command line interface provides easy management and remote configuration by either serial or network interface. Supported features are: IPv4/IPv6 forwarding & multicast, routing & switching, Quality of Service, VLANs, Spanning tree (STP, RSTP, MSTP), access control, extended user management and many more.

OPEN VPX / Interoperability

VX6940 features 12*40G data plane ports (of which 2 are 100G) and 12*10G control planes. Additional 2 100G front panel ports can be routed to the back. The 14*40G data plane ports and 12*10G control plane ports meet the requirement of VITA65 / OpenVPX architectures.



Reliability and Robustness

VX6940 Rugged air cooled is made for harsh environments and meet VITA 47 class EAC6 V2 and can operate in extended temperature environments up to of -40°C/+75°C. Built-In test capabilities enable effective switch maintenance.

VX6940 Embedded version

The embedded version VX6940-EM is tailored for cost sensitive HPEC blade systems, when most data transfers occur within the system and network configuration is rather static during the system operation, allowing for classical SNMP, CLI configuration.

VX6940 data center version

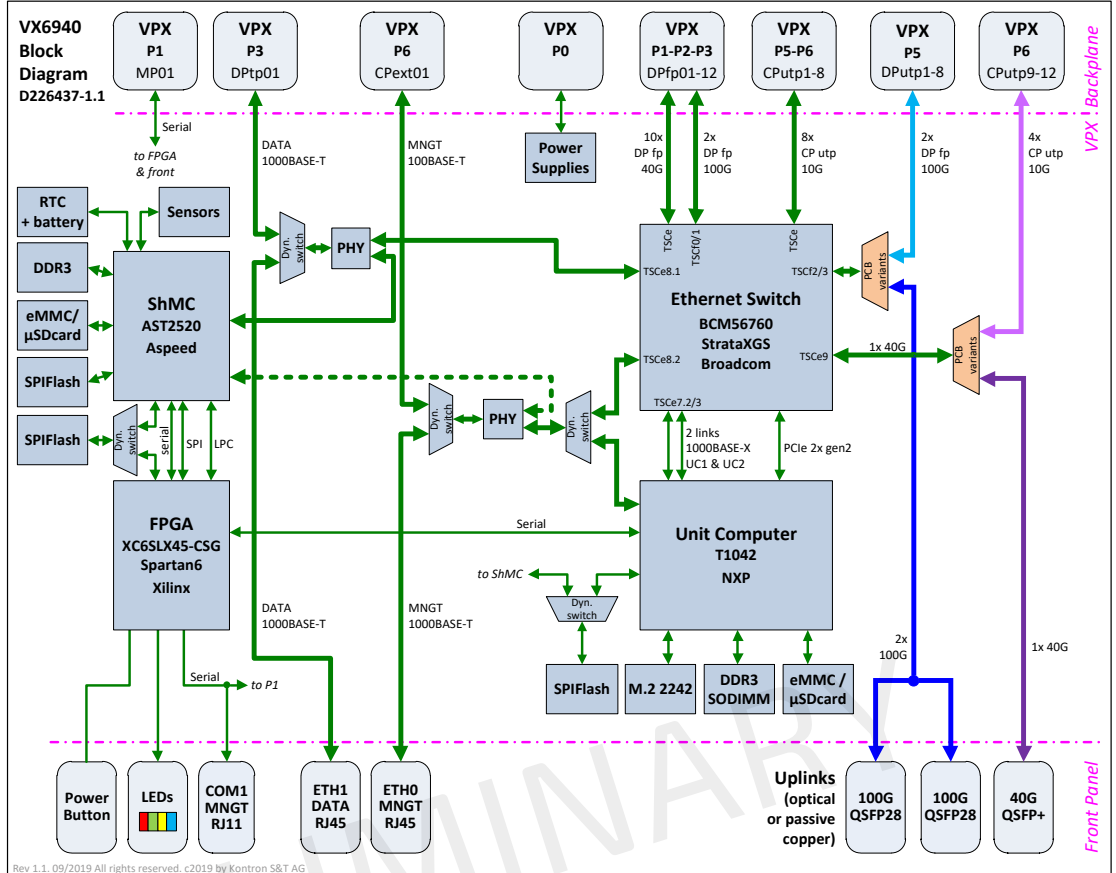
VX6940-DC is dedicated to systems of systems where SD-WAN capabilities are required for the system to dynamically configure the network under control of higher level network controllers. (See the SD-WAN feature chapter below)

VX6940 ARCHITECTURE

Legend:
 - DP : Data Plane
 - CP : Control Plane
 - fp : Fat Pipe (8 pairs)
 - utp : Ultra Thin Pipe (2 pairs)
 - ShMC : Shelf Management Controller

Speed capabilities:
 > TSCe (Eagle core, 4 SerDes) :
 - Individual SerDes lane:
 . 10GBASE-KR: 10.3125G
 . 100BASE-X: 1.25G
 . SGMII: 10/100/1000BASE-T: up to 1.25G
 - Four SerDes aggregated:
 . 40GBASE-KR4: 4x10.3125G (or lower speed selected)
 > TSCf (Falcon core, 4 SerDes):
 - Individual SerDes lane:
 . 25GBASE-KR: 25.7813G
 . 10GBASE-KR: 10.3125G
 . 100BASE-X: 1.25G (with limitations, contact Kontron)
 - Four SerDes aggregated:
 . 100BASE-KR4: 4x25.7813G (or lower speed selected)

PCB variants & options
 - Common configuration
 > Routing of TSCf2/3 (100G):
 - to front (SA/RA class)
 - to rear (RC class)
 > Routing of TSCe9:
 - to front (40G to QSFP+)
 - to rear P6 (4x 10G CP UTP)



// VX6940 Block Diagram

A unique design able to offer top performance on various port routing options, according to the system architecture.

With FASTPATH (Advanced management software) Multiple front panel options can be envisaged (contact Kontron for details)

Row G	P1		P2		P3		P4		P5		P6		
	Rows F-E-D-C-B-A	VITA	Rows F-E-D-C-B-A	VITA	Rows F-E-D-C-B-A	VITA	Rows F-E-D-C-B-A	VITA	Rows F-E-D-C-B-A	VITA	Rows F-E-D-C-B-A	VITA	
Misc. Signals	TSCf0 1x 100BASE-KR4.1 4x 25GBASE-KR SA RC 3	DPFp01	Rsvd	TSCe6 1x 40GBASE-KR4.1 4x 10GBASE-KR SA RC 3	DPFp05	TSCe1 1x 40GBASE-KR4.1 4x 10GBASE-KR SA RC 3	DPFp09	NC	NC	TSCf1 1x 40GBASE-KR4.1 4x 10GBASE-KR RC 3	DPutp08	VITA 10GBASE-KR TSCe10.3 SA RC 10GBASE-KR TSCe9.0 SA RC 10GBASE-KR TSCe9.1 SA RC	CPutp08 CPutp09 CPutp10
Misc. Signals	TSCe5 1x 40GBASE-KR4.1 4x 10GBASE-KR SA RC 3	DPFp02	Rsvd	TSCe2 1x 40GBASE-KR4.1 4x 10GBASE-KR SA RC 3	DPFp6	TSCe0 1x 40GBASE-KR4.1 4x 10GBASE-KR SA RC 3	DPFp10	NC	NC	TSCf2 1x 40GBASE-KR4.1 4x 10GBASE-KR RC 3	DPutp04 DPutp05 DPutp06 DPutp07	ETH0 MNGT 100BASE-T RC	CPutp11 CPutp12 CPutp13
VITA: MPO1 VX6940: COM1	TSCe4 1x 40GBASE-KR4.1 4x 10GBASE-KR SA RC 3	DPFp03	Rsvd	TSCe12 1x 40GBASE-KR4.1 4x 10GBASE-KR SA RC 3	DPFp07	1000BASE-T TSCe11 1x 40GBASE-KR4.1 4x 10GBASE-KR SA RC 3	DPFp11	NC	NC	GND 10GBASE-KR TSCe8.0 SA RC 10GBASE-KR TSCe8.3 SA RC 10GBASE-KR TSCe7.0 SA RC 10GBASE-KR TSCe7.3 SA RC	DPutp01 CPutp01 CPutp02 CPutp03	12 CP option RC	CPutp14 CPutp15
Misc. Signals	TSCe3 1x 40GBASE-KR4.1 4x 10GBASE-KR SA RC 3	DPFp04	Rsvd	TSCe13 1x 40GBASE-KR4.1 4x 10GBASE-KR SA RC 3	DPFp08	RC TSCf3 1x 100BASE-KR4.1 4x 25GBASE-KR SA RC 3	DPFp12	NC	NC	10GBASE-KR TSCe7.1 SA RC 10GBASE-KR TSCe10.0 SA RC 10GBASE-KR TSCe10.1 SA RC 10GBASE-KR TSCe10.2 SA RC	DPutp01 CPutp04 CPutp05 CPutp06 CPutp07	Optical	

Other ports from BCM56760 Switch:	SGMII TSCe8.2	ETH0 MNGT
	SGMII TSCe8.1	ETH1 ShMC/Data
	1000BASE-X TSCe7.2	UCI/T1042

VITA conventions:
Data Plane 1
Data Plane 2
Control Plane
Optical

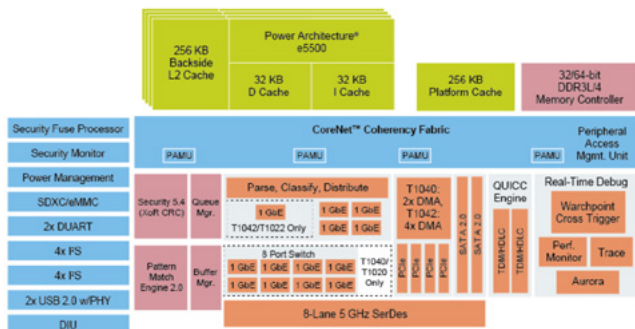
Notes:
 - In VPX connectors, only the fastest protocols are mentioned. Slower speeds are possible. See BCM56760 datasheet and VX6940 User Guide.
 - RC stands for RC class (conduction cooled, no front panel) and corresponds to "Rear Option".
 - SA stands for SA Class (air cooled, front panel present) and corresponds to "Front Option".
 - "12 CP Option" features 12 Control Planes (one for each Data Plane) as opposed to "QSFP+ Option" with only 8 Control Planes.
 - Misc. Signals: Miscellaneous signals defined by VITA 46.

// VX6940 Port Distribution

Lane allocation for VITA65/SLT6-SWH-14F16U1U5U1J-10.8.1 BP and front panel.

VX6940 SWITCH SOFTWARE

The VX6940 runs Broadcom FASTPATH (Version 8.7.x) at full speed thanks to the powerful T1042 processor. This QorIQ quad-core communication processor supports four integrated 64-bit e5500 Power Architecture® processor cores with high-performance data path acceleration architecture (DPAA) and network peripheral interfaces required for networking and telecommunications.



// T1042 Communication Processor

FASTPATH CLI main interface is available on a serial line on the front panel, or through TCP/IP remote shell also on the front panel RJ45 management port.

Broadcom® FASTPATH® networking software extensive feature set and integration capabilities are perfectly suited for demanding networking use cases such as high performance computing.

The FASTPATH software supports a broad array of field-proven Ethernet solutions, including:

- ▶ 10G/40G/25G/50G/100G blade server switches for chassis solutions or data center type deployments.

The FASTPATH software operates on the Linux operating system and has been integrated with Broadcom's market-leading switching silicon.

The FASTPATH software supports numerous industry RFCs, standards, and protocols. In the VX6940, FASTPATH has been built with the following modules:

- ▶ Switching
- ▶ Stacking
- ▶ Routing
- ▶ IPv6 Routing
- ▶ Management
- ▶ Quality of Service
- ▶ Multicast

OPENFLOW CONTROLLERS

The VX6940 Special Data Center version provides technologies and management interfaces expected in datacenter applications such as connecting a SDN controller. Its software distribution implements certain enhancements to the OpenFlow protocol to optimize it for the Data Center environment and to make it compatible with Open vSwitch.

VX6940 Data Center version can interact with any OpenFlow controller that supports OpenFlow 1.0 and OpenFlow 1.3 standards. Management interfaces include NETCONF (and RESTCONF) and OpenFlow. (contact us for details). Interoperability is verified with the Open Daylight Controller only.

NETCONF

NETCONF provides partial support for IEEE defined YANG modes, Fastpath proprietary ones and based on the OPENCONFIG (<http://www.openconfig.net/>) project.

OpenFlow

The OpenFlow feature enables the switch to be managed by a centralized OpenFlow Controller using the OpenFlow protocol. FASTPATH supports the OpenFlow 1.0 and OpenFlow 1.3 standards. The OpenFlow 1.0 standard supports a single-table data forwarding path. However FASTPATH supports OpenVswitch proprietary extensions to enable the OpenFlow controller to access multiple forwarding tables.*

The OpenFlow feature has the following major functions:

- ▶ Enable and disable OpenFlow
- ▶ Deploy OpenFlow configuration
- ▶ Interact with the OpenFlow controllers
- ▶ Deploy OpenFlow controller flows
- ▶ Collect port and queue status and statistics
- ▶ Support OpenFlow controller group tables
- ▶ Support hardware network address translation
- ▶ OpenFlow is supported on both standalone switches and switch stacks.

* The OpenFlow 1.3 standard enables a multi-table data forwarding path. However, FASTPATH supports a single-table OpenFlow 1.3 data forwarding path. Support for additional hardware tables in the OpenFlow 1.3 data path may be added in future releases.

▶ ENVIRONMENTAL SPECIFICATIONS

	RUGGED AIR-COOLED
CONFORMAL COATING	Standard
AIRFLOW	30 CFM
COOLING METHOD	Convection
OPERATING	-25 °C to +55 °C
STORAGE	-45 °C to +100 °C
VIBRATION SINE (OPERATING)	5-2,000 Hz - 3 g
RANDOM	VITA 47-Class V2
SHOCK (OPERATING)	20 g/18 ms Half Sine
ALTITUDE (OPERATING)	-1,500 to 60,000 ft
RELATIVE HUMIDITY	95% without condensation

▶ ORDERING INFORMATION

ARTICLE	DESCRIPTION
VX6940-RA-OC-EP	5HP 6U VPX 100 Gigabit Ethernet Switch - Embedded Version
VX6940-RA-OC-DS	5HP 6U VPX 100 Gigabit Ethernet Switch - Data Center Version

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