InfiniBand Trade Association Integrators' List

May 2024 - PF41

IBTA Compliance Integrators' List

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Manufacturer	Description	Model	Type	Speed	FW	SW
Broadcom	PCM957608-N1400GDP00 1x400G OCP (QSFP-DD)	N1400-OCP	RNIC	400 GbE	230.1.38.0	230.1.38.0
Broadcom	BCM957608-P1400GQF00 1x400G PCIE (QSFP-112)	P1400-PCIE	RNIC	400 GbE		
Broadcom	PCM957608-P2200GQF00 2x200G PCIE (QSFP-112)	P2200-PCIE	RNIC	200 GbE		
Broadcom	BCM957508-P1200 1x200G PCIE (QSFP-56)	P1200-PCIE	RNIC	200 GbE		
Nvidia	Nvidia BlueField-3 B3140H 400GbE/NDR IB, Single-port QSFP112	900-9D3D4-00EN-HA0	HCA	400 GbE	32.40.100	MLNX-OS 24.01-0.3.3.1
Nvidia	Nvidia ConnectX-7 400GbE/ NDR IB, Single-port QSFP112	MCX715105AS-WEAT	HCA	400 GbE	28.40.1000	
Nvidia	Nvidia ConnectX-7 400GbE/NDR IB Single-port OSFP	MCX75310AAS-NEAT	HCA	400 GbE	28.40.1000	
Nvidia	Quantum 2 NDR InfiniBand Switch; 64 NDR ports; 32 OSFP ports	MQM9700	Switch	400 GbE	27.2010.6102	MLNX-OS 3.10.6000

Software	Versions
Operating System	Rocky Linux 9.3
INBOX IB Support	Rocky Linux 9.3
Mellanox OFED	MLNX_OFED_LINUX-24.01-0.3.3.1-rhel9.3-x86_64.tgz
CTS	Compliance Test Suite Version 1.1.5

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IBTA Compliance Integrators' List
InifiniBand NDR HCAs

Nvidia InfiniBand HCAs		Model	900-9D3D4-00EN-HA0	MCX715105AS-WEAT	MCX75310AAS-NEAT
		Date	2024-04-16-01	2024-04-19-01	2024-04-19-01
		Firmware Version	32.37.1009.001	28.40.1000	28.40.1000
		Overall Results	Pass	Pass	Pass
Test Class	Name	Number	Results	Results	Results
Management	ResponseTimeValue	C13-013	Pass	Pass	Pass
	ResponseTimeValue - Single Packet	C13-014_01	Pass	Pass	Pass
Subnet Management	No M_Key Checking	C14-015	Pass	Pass	Pass
	M_Key Checking - SubnGet	C14-016_Get	Pass	Pass	Pass
	M_Key Checking - SubnSet	C-14-016_Set	Pass	Pass	Pass
	M_Key Lease Period Timer - Part 1	C-14-017	Pass	Pass	Pass
	M_Key Lease Period Timer - Part 2		Pass	Pass	Pass
	M_Key Lease Period Timer - Part 3		Pass	Pass	Pass
	M_Key Lease Period Timer - Part 4		Pass	Pass	Pass
	M_Key Lease Period Timer - Part 5		Pass	Pass	Pass
	M_Key Violation Counter	C14-018	Pass	Pass	Pass
	M_Key Components in NVRAM	C14-023	Pass	Pass	Pass
	Node Description	C14-024#02	Pass	Pass	Pass
	NodeInfo	C14-024#03	Pass	Pass	Pass
	GUIDInfo	C14-024#05	Pass	Pass	Pass
	PortInfo xCA - Part 1	C14-024#06_CA_01	Pass	Pass	Pass
	PortInfo xCA - Part 2	C14-024#06_CA_02	Pass	Pass	Pass
	PortInfo xCA - Part 3	C14-024#06_CA_03	Pass	Pass	Pass
	PortInfo xCA - Part 4	C14-024#06_CA_04	N/A	N/A	N/A
	PortInfo xCA - Part 5	C14-024#06_CA_05	N/A	N/A	N/A
	PortInfo xCA - Part 6	C14-024#06_CA_06	Pass	Pass	Pass
	PortInfo LocalPortNum	C14_024_06_LocalPortNum	Pass	Pass	Pass
	P_Key - Part 1	C14-024#07_01	Pass	Pass	Pass

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IBTA Compliance Integrators' List
InifiniBand NDR HCAs

Nvidia InfiniBand HCAs		Model	900-9D3D4-00EN-HA0	MCX715105AS-WEAT	MCX75310AAS-NEAT
		Date	2024-04-16-01	2024-04-19-01	2024-04-19-01
		Firmware Version	32.37.1009.001	28.40.1000	28.40.1000
		Overall Results	Pass	Pass	Pass
Test Class	Name	Number	Results	Results	Results
Subnet Management	SLToVL Mapping - Part 1	C14-024#08_01	Pass	Pass	Pass
	SLToVL Mapping - Part 2	C14-024#08_02	N/A	N/A	N/A
	VLArbitration - CA	C14-024#09_xCA	Pass	Pass	Pass
	LedInfo	C14-024#15	Pass	Pass	Pass
Subnet Manager	SMInfo - Supported	C14-024#13-01	Pass	Pass	Pass
	SMInfo - Unsupported	C14-024#13-03	N/A	N/A	N/A
Subnet Administration	SubnAdminGet(ServiceRecord)	C15-0.1.012#15	Pass	Pass	Pass
	SubnAdminGet(PathRecord)	C15-0.1.012#17.01	Pass	Pass	Pass
	SubnAdminGet(PathRecord) - Part 1	C15-0.1-012#17.02 - Part 1	Pass	Not-Imp	Pass
	SubnAdminGet(PathRecord) - Part 2	C15-0.1-012#17.02 - Part 2	Pass	Not-Imp	Pass
	SubnAdminGet(PathRecord) - Part 3	C15-0.1-012#17.02 - Part 3	Pass	Not-Imp	Pass
	SM-SA Validation	SM-SA Validation	Pass	Pass	Pass

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IBTA Compliance Integrators' List
InifiniBand NDR Switches

Nvidia InfiniBand Switches		Model	MQM9700-NS2F
		Date	2024-04-19-01
		Firmware Version	31.2010.6102
		Overall Results	Pass
Test Class	Name	Number	Results
Management	ResponseTimeValue	C13-013	Pass
	ResponseTimeValue - Single Packet	C13-014_01	Pass
Subnet Management	No M_Key Checking	C14-015	Pass
	M_Key Checking - SubnGet	C14-016_Get	Pass
	M_Key Checking - SubnSet	C-14-016_Set	Pass
	M_Key Lease Period Timer - Part 1	C-14-017	Pass
	M_Key Lease Period Timer - Part 2		Pass
	M_Key Lease Period Timer - Part 3		Pass
	M_Key Lease Period Timer - Part 4		Pass
	M_Key Lease Period Timer - Part 5		Pass
	M_Key Violation Counter	C14-018	Pass
	M_Key Components in NVRAM	C14-023	Pass
	Node Description	C14-024#02	Pass
	NodeInfo	C14-024#03	Pass
	SwitchInfo - RO	C14-024#04_SW_01	Pass
	SwitchInfo - Part 1	C14-024#04_SW_02	Pass
	SwitchInfo - Part 2	C14-024#04_SW_03	Pass
	GUIDInfo	C14-024#05	Pass
	PortInfo Switch - Part 1	C14-024#06_SW_01	Pass
	PortInfo Switch - Part 2	C14-024#06_SW_02	Pass
	PortInfo Switch - Part 3	C14-024#06_SW_03	N/A
	PortInfo Switch - Part 4	C14-024#06_SW_04	Pass
	PortInfo Switch - Part 5	C14-024#06_SW_05	Pass
	PortInfo Switch - Part 6	C14-024#06_SW_06	Pass
	PortInfo Switch - Part 7	C14-024#06_SW_07	Pass
	PortInfo LocalPortNum	C14_024_06_LocalPortNum	Pass

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IBTA Compliance Integrators' List
InifiniBand NDR Switches

Nvidia InfiniBand Switches		Model	MQM9700-NS2F
		Date	2024-04-19-01
		Firmware Version	31.2010.6102
		Overall Results	Pass
Subnet Management	P_Key - Part 1	C14-024#07_01	Pass
	P_Key - Part 2	C14-024#07_02	N/A
	P_Key - Part 3	C14-024#07_03	Pass
	P_Key - Part 4	C14-024#07_04	Pass
	P_Key - Part 5	C14-024#07_05	Pass
	SLToVL Mapping - Part 3	C14-024#08_03	Pass
	SLToVL Mapping - Part 4	C14-024#08_04	N/A
	SLToVL Mapping - Part 5	C14-024#08_05	Pass
	VLArbitration - SW	C14-024#09_SW	Pass
	LFT - Unsupported	C14-024#10_01	N/A
	LFT Supported - Valid Ports	C14-024#10_02	Pass
	LFT Supported - Invalid Ports	C14-024#10_03	Pass
	Random Forwarding Table	C14-024#11	Pass
	Mcast Forwarding Table	C14-024#12	Pass
	LedInfo	C14-024#15	Pass
Subnet Manager	SMInfo - Supported	C14-024#13-01	Pass
	SMInfo - Unsupported	C14-024#13-03	N/A
Subnet Administration	SubnAdminGet(ServiceRecord)	C15-0.1.012#15	Pass
	SubnAdminGet(PathRecord)	C15-0.1.012#17.01	Pass
	SubnAdminGet(PathRecord) - Part 1	C15-0.1-012#17.02 - Part 1	Not-Imp
	SubnAdminGet(PathRecord) - Part 2	C15-0.1-012#17.02 - Part 2	Not-Imp
	SubnAdminGet(PathRecord) - Part 3	C15-0.1-012#17.02 - Part 3	Not-Imp
	SM-SA Validation	SM-SA Validation	Pass

IBTA RoCE Transport Compliance

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Manufacturer	Product Description	Model	FW	SW	Transport
Broadcom	PCM957608-N1400GDP00 1x400G OCP (QSFP-DD)	N1400-OCP	230.0.86.0	230.0.86.0	✓
Broadcom	BCM957608-P1400GQF00 1x400G PCIE (QSFP-112)	P1400-PCIE			✓
Broadcom	PCM957608-P2200GQF00 2x200G PCIE (QSFP-112)	P2200-PCIE			✓
Broadcom	BCM957508-P1200 1x200G PCIE (QSFP-56)	P1200-PCIE			✓

Broadcom RoCE NICs		Model	N1400GDP00	P1400GQF00	P2200GQPF00	P1200G
		Date	2024-06-06-01	2024-06-06-01	2024-06-06-01	2024-06-06-07
		Firmware Version	230.0.86.0	230.0.86.0	230.0.86.0	230.0.86.0
		Overall Results	Pass	Pass	Pass	Pass
Test Class	Name	Number	Results	Results	Results	Results
Transport Layer	RC RDMA Send Only after RDMA Read	C09_027_01	Pass	Pass	Pass	Pass
	RC RDMA Write Only after RDMA Read	C09_027_02	Pass	Pass	Pass	Pass
	RC RDMARead Only after RDMA Read	C09_027_03	Pass	Pass	Pass	Pass
	RC Atomic FetchAdd after RDMA Read	C09_027_04	Pass	Pass	Pass	Pass
	RC Atomic CompSwap after RDMA Read	C09_027_05	Pass	Pass	Pass	Pass
	RC Atomic CompSwap after Atomic CompSwap	C09_027_06	Pass	Pass	Pass	Pass
	RC Atomic FetchAdd after Atomic CompSwap	C09_027_07	Pass	Pass	Pass	Pass
	RC Atomic FetchAdd after Atomic FetchAdd	C09_027_08	Pass	Pass	Pass	Pass
	RC Atomic CompSwap after Atomic FetchAdd	C09_027_09	Pass	Pass	Pass	Pass
	RC RDMA Send Only after Atomic CompSwap	C09_027_10	Pass	Pass	Pass	Pass
	RC RDMA Write Only after Atomic CompSwap	C09_027_11	Pass	Pass	Pass	Pass
	RC RDMA Send Only after Atomic FetchAdd	C09_027_12	Pass	Pass	Pass	Pass
	RC RDMA Write Only after Atomic Fetch Add	C09_027_13	Pass	Pass	Pass	Pass
	Completion Rules - RC RDMA Send Case	C09_060_01	Pass	Pass	Pass	Pass
	Completion Rules - RC RDMA Send Case (inverted)	C09_060_01_01	Pass	Pass	Pass	Pass
	Completion Rules - RC RDMA Write Case	C09_060_03	Pass	Pass	Pass	Pass
	Completion Rules - RC RDMA Write Case (inverted)	C09_060_03_01	Pass	Pass	Pass	Pass
	Completion Rules - RC RDMA Read Case	C09_060_05	Pass	Pass	Pass	Pass
	Completion Rules - RC RDMA Read Case (inverted)	C09_060_05_01	Pass	Pass	Pass	Pass
	Completion Rules - Atomic FetchAdd Case	C09_060_07	Pass	Pass	Pass	Pass
	Completion Rules - Atomic FethcAdd Case (inverted)	C09_060_07_01	Pass	Pass	Pass	Pass
	Completion Rules - Atomic CompSwap Case	C09_060_09	Pass	Pass	Pass	Pass
	Completion Rules - Atomic CompSwap Case (inverted)	C09_060_09_01	Pass	Pass	Pass	Pass
	Requester/Responder RNR NAK Behavior	C09_130_01	Pass	Pass	Pass	Pass
	Outstanding Request Timeout	C09_142_01	Pass	Pass	Pass	Pass

IBTA RoCE Transport Compliance

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Manufacturer	Product Description	Model	FW	SW	Transport
NVIDIA	NVIDIA ConnectX-7 HHHL Adapter Card, 400GbE/NDR IB, Single-port QSFP112	MCX715105AS-WEAT	28.40.1000	MLNX_OFED_LINUX-24.01-0.3.3.1	✓
NVIDIA	NVIDIA ConnectX-7 HHHL Adapter Card, 400GbE/NDR IB, Single-port OSFP	MCX75310AAS-NEAT	28.40.1000	MLNX_OFED_LINUX-24.01-0.3.3.1	✓
NVIDIA	Nvidia BlueField-3 B3140H E-series HHHL SuperNIC, 400GbE/NDR IB, Single-port QSFP112	900-9D3D4-00EN-HA0	32.40.1000	MLNX_OFED_LINUX-24.01-0.3.3.1	✓

NVIDIA RoCE NICs		Model	MCX715105AS-WEAT	MCX75310AAS-NEAT	900-9D3D4-00EN-HA0
		Date	2024-05-31-01	2024-05-31-01	2024-05-31-03
		Firmware Version	28.40.1000	28.40.1000	32.40.1000
		Overall Results	Pass	Pass	Pass
Test Class	Name	Number	Results	Results	Results
Transport Layer	RC RDMA Send Only after RDMA Read	C09_027_01	Pass	Pass	Pass
	RC RDMA Write Only after RDMA Read	C09_027_02	Pass	Pass	Pass
	RC RDMARead Only after RDMA Read	C09_027_03	Pass	Pass	Pass
	RC Atomic FetchAdd after RDMA Read	C09_027_04	Pass	Pass	Pass
	RC Atomic CompSwap after RDMA Read	C09_027_05	Pass	Pass	Pass
	RC Atomic CompSwap after Atomic CompSwap	C09_027_06	Pass	Pass	Pass
	RC Atomic FetchAdd after Atomic CompSwap	C09_027_07	Pass	Pass	Pass
	RC Atomic FetchAdd after Atomic FetchAdd	C09_027_08	Pass	Pass	Pass
	RC Atomic CompSwap after Atomic FetchAdd	C09_027_09	Pass	Pass	Pass
	RC RDMA Send Only after Atomic CompSwap	C09_027_10	Pass	Pass	Pass
	RC RDMA Write Only after Atomic CompSwap	C09_027_11	Pass	Pass	Pass
	RC RDMA Send Only after Atomic FetchAdd	C09_027_12	Pass	Pass	Pass
	RC RDMA Write Only after Atomic Fetch Add	C09_027_13	Pass	Pass	Pass
	Completion Rules - RC RDMA Send Case	C09_060_01	Pass	Pass	Pass
	Completion Rules - RC RDMA Send Case (inverted)	C09_060_01_01	Pass	Pass	Pass
	Completion Rules - RC RDMA Write Case	C09_060_03	Pass	Pass	Pass
	Completion Rules - RC RDMA Write Case (inverted)	C09_060_03_01	Pass	Pass	Pass
	Completion Rules - RC RDMA Read Case	C09_060_05	Pass	Pass	Pass
	Completion Rules - RC RDMA Read Case (inverted)	C09_060_05_01	Pass	Pass	Pass
	Completion Rules - Atomic FetchAdd Case	C09_060_07	Pass	Pass	Pass
	Completion Rules - Atomic FetchAdd Case (inverted)	C09_060_07_01	Pass	Pass	Pass
	Completion Rules - Atomic CompSwap Case	C09_060_09	Pass	Pass	Pass
	Completion Rules - Atomic CompSwap Case (inverted)	C09_060_09_01	Pass	Pass	Pass
	Requester/Responder RNR NAK Behavior	C09_130_01	Pass	Pass	Pass
	Outstanding Request Timeout	C09_142_01	Pass	Pass	Pass

May 2024 IBTA Integrators' List
Active NDR
Compliant Cables

Company Info		Cable Information							
Company	Part Number	Width	Speed	Len (m)	AWG	Type	Equalization	Side A	Side B
Cisco Systems, Inc	M850P1CA-820M030	8x	400G	2000	N/A	Transceiver	Fiber - Active	OSFP-RHS	OSFP-RHS
Cisco Systems, Inc	M850P1CA-820M030	8x	400G	2000	N/A	Transceiver	Fiber - Active	OSFP-RHS	OSFP-RHS
Cisco Systems, Inc	CMUIAX5CAA	8x	400G	2000	N/A	Transceiver	Fiber - Active	OSFP-IHS	OSFP-IHS
Cloud Light	9643-R1-1001	8x		2000	N/A	Transceiver	Fiber Module Only	OSFP-IHS	OSFP-IHS
Cloud Light	9643-R1-1001	8x		2000	N/A	Transceiver	Fiber Module Only	OSFP-IHS	OSFP-IHS
Cloud Light	8654-W1-1302	8x	400G	50	N/A	Transceiver	Fiber Module Only	OSFP-IHS	OSFP-IHS
Cloud Light	8654-W1-1302	8x	400G	50	N/A	Transceiver	Fiber Module Only	OSFP-IHS	OSFP-IHS
Cloud Light	9642-W1-1001	4x	400G	2000	N/A	Transceiver	Fiber Module Only	OSFP-RHS	OSFP
Cloud Light	9642-W1-1001	4x	400G	2000	N/A	Transceiver	Fiber Module Only	OSFP-RHS	OSFP
Cloud Light	8353-S1-1302	4x	400G	50	N/A	Transceiver	Fiber Module Only	QSFP112	QSFP112
Cloud Light	8353-S1-1302	4x	400G	50	N/A	Transceiver	Fiber Module Only	QSFP112	QSFP112
Molex	1837280023	4x	400G	N/A	N/A	Transceiver	Fiber Module Only	OSFP-RHS	OSFP-RHS
Molex	1837280023	4x	400G	N/A	N/A	Transceiver	Fiber Module Only	OSFP-RHS	OSFP-RHS
Molex	1837290000	8x	400G	N/A	N/A	Transceiver	Fiber Module Only	OSFP-IHS	OSFP-IHS
Molex	1837290000	8x	400G	N/A	N/A	Transceiver	Fiber Module Only	OSFP-IHS	OSFP-IHS
Molex	1064286000	8x	400G	N/A	N/A	Transceiver	Fiber Module Only	OSFP-IHS	OSFP-IHS
Molex	1064286000	8x	400G	N/A	N/A	Transceiver	Fiber Module Only	OSFP-IHS	OSFP-IHS
Molex	1837280024	4x	400G	N/A	N/A	Transceiver	Fiber Module Only	QSFP112	QSFP112
Molex	1837280024	4x	400G	N/A	N/A	Transceiver	Fiber Module Only	QSFP112	QSFP112
Nvidia	MMA4Z00-NS	8x	400G	N/A	N/A	Transceiver	Fiber Module Only	OSFP-IHS	OSFP-IHS
Nvidia	MMA4Z00-NS	8x	400G	N/A	N/A	Transceiver	Fiber Module Only	OSFP-IHS	OSFP-IHS
Nvidia	MMS4X00-NS	8x	400G	N/A	N/A	Transceiver	Fiber Module Only	OSFP-IHS	OSFP-IHS
Nvidia	MMS4X00-NS	8x	400G	N/A	N/A	Transceiver	Fiber Module Only	OSFP-IHS	OSFP-IHS
Nvidia	MMA4Z00-NS400	8x	400G	N/A	N/A	Transceiver	Fiber Module Only	OSFP-RHS	OSFP-RHS
Nvidia	MMA4Z00-NS400	8x	400G	N/A	N/A	Transceiver	Fiber Module Only	OSFP-RHS	OSFP-RHS
Nvidia	MMS4X00-NS400	8x	400G	N/A	N/A	Transceiver	Fiber Module Only	OSFP-RHS	OSFP-RHS
Nvidia	MMS4X00-NS400	8x	400G	N/A	N/A	Transceiver	Fiber Module Only	OSFP-RHS	OSFP-RHS
Optomind Inc.	T8F8NHFN000DZZ	8x	400G	50	N/A	Transceiver	Fiber - Active	OSFP-IHS	OSFP-IHS

May 2024 IBTA Integrators' List
Active NDR
Compliant Cables

Company Info		Cable Information							
Company	**Part Number**	**Width**	**Speed**	**Len (m)**	**AWG**	**Type**	**Equalization**	**Side A**	**Side B**
Optomind Inc.	T8F8NHFN000DZZ	8x	400G	50	N/A	Transceiver	Fiber - Active	OSFP-IHS	OSFP-IHS
Optomind Inc.	T8F4NHFL000SZZ	4x	400G	50	N/A	Transceiver	Fiber - Active	OSFP-RHS	OSFP-RHS
Optomind Inc.	T8F4NHFL000SZZ	4x	400G	50	N/A	Transceiver	Fiber - Active	OSFP-RHS	OSFP-RHS
The Siemon Company	F1F112F10.0-2YQ	8x	400G	15	N/A	*AOC*	Fiber - Active	OSFP-IHS	OSFP-IHS
The Siemon Company	F1F112F10.0-2YQ	8x	400G	15	N/A	*AOC*	Fiber - Active	OSFP-IHS	OSFP-IHS
The Siemon Company	F2R112F10.0-2YQ	8x	400G	15	N/A	*AOC*	Fiber - Active	OSFP-IHS	Hybrid - OSFP-IHS-2-OSFP-RHS
The Siemon Company	F2R112F10.0-2YQ	8x	400G	15	N/A	*AOC*	Fiber - Active	OSFP-IHS	Hybrid - OSFP-IHS-2-OSFP-RHS
The Siemon Company	F2R112F10.0-2YQ	8x	400G	15	N/A	*AOC*	Fiber - Active	OSFP-IHS	Hybrid - OSFP-IHS-2-OSFP-RHS
Volex	DQ68BDG50BE	8x	400G	5	28	AEC	Copper - Full Active	QSFP-DD	QSFP-DD
Volex	DQ68BDG50BE	8x	400G	5	28	AEC	Copper - Full Active	QSFP-DD	QSFP-DD
Volex	DQ62BDG10BE	8x	400G	1	32	AEC	Copper - Full Active	QSFP-DD	QSFP-DD
Volex	DQ62BDG10BE	8x	400G	1	32	AEC	Copper - Full Active	QSFP-DD	QSFP-DD

May 2024 IBTA Integrators' List
Copper NDR
Compliant Cables

Company Info		Cable Information							
Company	**Part Number**	**Width**	**Speed**	**Len (m)**	**AWG**	**Type**	**Equalization**	**Side A**	**Side B**
Amphenol	NJMMEN-0002	8x	NDR	2	25	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS
Amphenol	NJMMEN-0002	8x	NDR	2	25	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS
Amphenol	NJMMER-0004	8x	NDR	1.5	30	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS
Amphenol	NJMYE6-0001	8x	NDR	1	26	DAC	Copper - Unequalized	OSFP-IHS	QSFP-DD
Amphenol	NJMYE6-0007	8x	NDR	1.5	26	DAC	Copper - Unequalized	OSFP-IHS	QSFP-DD
Amphenol	NJAALR-0002	4x	HDR	2	30	ACC	Copper - Linear Active	QSFP112	QSFP112
Amphenol	NJAALK-0003	4x	HDR	3	32	ACC	Copper - Linear Active	QSFP112	QSFP112
Amphenol	NJMMLR-0008	8x	NDR	2.5	30	ACC	Copper - Linear Active	OSFP-IHS	OSFP-IHS
Amphenol	NJMMLR-0003	8x	NDR	3	30	ACC	Copper - Linear Active	OSFP-IHS	OSFP-IHS
Amphenol	NJMMLK-0008	8x	NDR	2.5	32	ACC	Copper - Linear Active	OSFP-IHS	OSFP-IHS
Amphenol	NJMMLK-0008	8x	NDR	2.5	32	ACC	Copper - Linear Active	OSFP-IHS	OSFP-IHS
Amphenol	NJAAK6-0002	4x	HDR	2	26	DAC	Copper - Unequalized	QSFP112	QSFP112
Amphenol	NJAAK6-0002	4x	HDR	2	26	DAC	Copper - Unequalized	QSFP112	QSFP112
Amphenol	NJMMRU-0001	8x	NDR	1	26	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS
Amphenol	NJMMRU-0007	8x	NDR	1.5	26	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS
BizLink	L45593-M880-C10	8x	800 GbE	1	28	DAC	Copper - Unequalized	OSFP-IHS	QSFP-DD
BizLink	L45593-M880-C15	8x	800 GbE	1.5	28	DAC	Copper - Unequalized	OSFP-IHS	QSFP-DD
BizLink	L45593-M881-C10	8x	800 GbE	1	28	DAC	Copper - Unequalized	OSFP-RHS	QSFP-DD
BizLink	L45593-M881-C15	8x	800 GbE	1.5	28	DAC	Copper - Unequalized	OSFP-RHS	QSFP-DD
BizLink	L45593-K880-C15	8x	800 GbE	1.5	28	DAC	Copper - Unequalized	QSFP-DD	QSFP-DD
BizLink	L45593-K880-C15	8x	800 GbE	1.5	28	DAC	Copper - Unequalized	QSFP-DD	QSFP-DD
BizLink	L45593-K880-C10	8x	800 GbE	1	28	DAC	Copper - Unequalized	QSFP-DD	QSFP-DD
BizLink	L45593-L880-C10	8x	800 GbE	1	28	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS
BizLink	L45593-L880-C10	8x	800 GbE	1	28	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS
BizLink	L45593-D880-B15	4x	400 GbE	1.5	26	DAC	Copper - Unequalized	QSFP112	QSFP112
BizLink	L45593-L880-B20	8x	800 GbE	2	28	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS

May 2024 IBTA Integrators' List
Copper NDR
Compliant Cables

Company Info		Cable Information							
Company	Part Number	Width	Speed	Len (m)	AWG	Type	Equalization	Side A	Side B
FIT Electronics	CUKKP73-1ZZ10-EF	8x	NDR	1	28	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS
Molex	2126754120	8x	NDR	1	30	DAC	Copper - Unequalized	QSFP-DD	QSFP-DD
Molex	2126754120	8x	NDR	1	30	DAC	Copper - Unequalized	QSFP-DD	QSFP-DD
Molex	2181641110	4x	NDR	2	26	DAC	Copper - Unequalized	QSFP112	QSFP112
Molex	2181641110	4x	NDR	2	26	DAC	Copper - Unequalized	QSFP112	QSFP112
Molex	2181644120	4x	NDR	2	30	DAC	Copper - Unequalized	QSFP112	QSFP112
Molex	2181644120	4x	NDR	2	30	DAC	Copper - Unequalized	QSFP112	QSFP112
Molex	2111664220	8x	NDR	2	26	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS
Molex	2111664220	8x	NDR	2	26	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS
Molex	2111661210	8x	NDR	1	30	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS
Molex	2111661210	8x	NDR	1	30	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS
Volex	DQ66BDA15BS	8x	NDR	1.5	26	DAC	Copper - Unequalized	QSFP-DD	QSFP-DD
Volex	DE56BDG20BS	8x	HDR	2	26	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS
Volex	DE66BDA15BS	8x	NDR	1.5	26	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS
Volex	DA66BDG20BS	4x	400 GbE	2	26	DAC	Copper - Unequalized	QSFP	QSFP
Volex	DE66BDG20BS	8x	800 GbE	2	26	DAC	Copper - Unequalized	OSFP-IHS	OSFP-IHS

InfiniBand Trade Association

Plugfest 41
Test Equipment
Providers

The **IBTA** wishes to thank **Anritsu, Keysight, Software Forge, Ace Unitech** and **Wilder Technologies** for providing the following test equipment and software for the IBTA Plugfests. All this equipment is provided free of charge for the benefit of the InfiniBand community and the IBTA Plugfests would not be possible without this equipment.

Anritsu - Signal Quality Analyzer MP1900A

The MP1900A Signal Quality Analyzer is an expandable modular NRZ and PAM4 BERT supporting wideband bit rates from 2.4Gb/s to 128Gb/s for versatile signal integrity analysis applications. Supports IBTA and IEEE rates such as HDR (PAM4 26.56Gbaud x4), EDR (NRZ 25.78Gb/s x4). Supports all 200G/400G PAM4 and NRZ rates defined by IBTA, IEEE, OIF-CEI, Fiber Channel standards.

MP1900A System Features:

- Pulse Pattern Generator supports output of high-quality / low jitter NRZ and PAM4 waveforms. Integrated emphasis and flexible pattern generation for PAM4 applications.
- Error Detector with high input sensitivity and integrated clock recovery. Includes signal analysis tools such as Bathtub, Jitter Decomposition, and Eye Contour. Integrated real-time PAM4 decoding for BER/SER and powerful jitter tolerance applications.
- Integrated Jitter Modulation for SJ/RJ/BUJ/SSC generation and supporting Jitter Tolerance tests.
- Integrated Noise injection to address standards-based stressed signal requirements. (CM, DM, White)

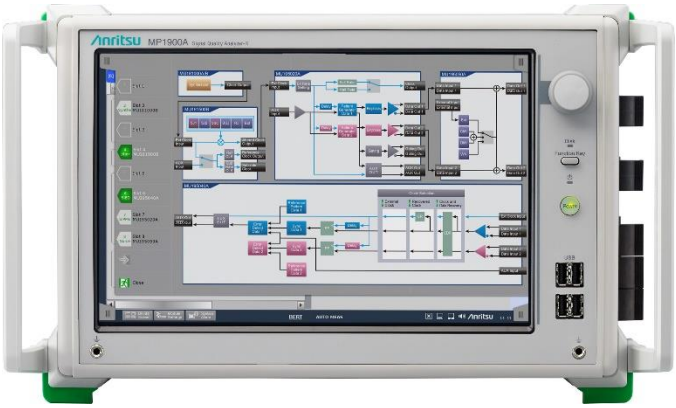
IBTA Application:

- Supports HDR, EDR, FDR, QDR Active Cable Time Domain Testing (ATD).
- Multi-channel PPG to create victim and aggressor traffic.
- Jitter Modulation Source to inject jitter onto the victim channel to create stressed conditions.
- Multi-Channel error detection for BER analysis during stressed receiver testing.

MP1900A Literature: (hyperlink)

Signal Quality Analyzer-R MP1900A - 32G/64G NRZ/PAM4 Signal Integrity Test Solution

Signal Quality Analyzer-R MP1900A - PCIe/USB/Thunderbolt Test Solutions



Anritsu – MP2110A- BERTWave

The MP2110A BERTWave supports simultaneous 4 channel pattern generation and BER measurements with sampling scope eye pattern analysis for evaluating optical and electrical signals. Enhanced sampling scope measurements available with Jitter Analysis and PAM4 Analysis software.

IBTA Application:

- Aggressor traffic for HDR, EDR, FDR, QDR ATD Testing
- Simultaneous 4 channel BER measurements for EDR, FDR, QDR ATD Testing
- 40GHz BW Sampling Scope with Jitter Analysis and Precision Trigger
- Eye Mask functions for DUT measurements
- Jitter Decomposition (TJ, DJ, J2, J9, DDWPS) for DUT measurements

MP2110A - BERTWave Literature:

View Product Brochure ***UPDATED*** Video

MP2110A Front View with External Monitor

Anritsu – MT1000A Network Master Pro

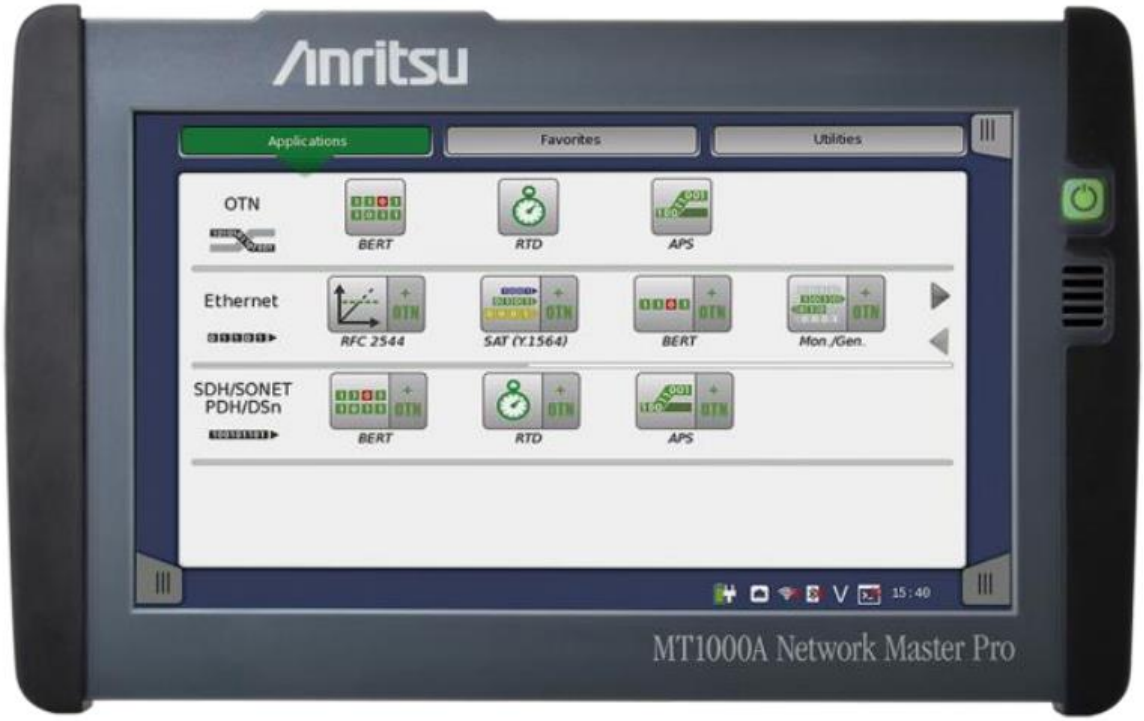
The MT1000A is an all-in-one portable tester with expandability and operability for speeds up to 100Gb/s. The compact, battery-powered and easy-to-use Anritsu MT1000A provides everything needed to install and maintain communication networks in a rugged, field portable package. This lightweight instrument simplifies the task of collecting and interpreting data with an easy-to-use GUI and clear summaries allowing users of any skill level to operate the instrument to its full potential. The MT1000A's installed MU100011A module provides the appropriate signal interfaces for testing performed at IBTA Plugfests.

IBTA Application:

- 4 Channel Pattern Generator provides required signal activity for DUTs measured on VNA Station.
- 4 Channel Pattern Generator can provide Aggressor traffic for EDR ATD Station.
- 4 Channel Error Detector can provide BER measurements for EDR ATD Station.
- ***Wilder HCB used for interconnect between QSFP28 and SMA.***

MT1000A Network Master Pro Literature:

1. https://www.anritsu.com/en-us/test-measurement/products/mt1000a
2. https://www.anritsu.com/en-US/test-measurement/support/downloads/brochures-datasheets-and-catalogs/dwl010587
3. https://www.anritsu.com/en-US/test-measurement/support/downloads/brochures-datasheets-and-catalogs/dwl010570



MT1000A Front View

Anritsu – MT1040A Network Master Pro

The MT1040A is an all-in-one portable tester with expandability and operability for speeds up to 400Gb/s. The compact, battery-powered and easy-to-use Anritsu MT1040A provides everything needed to install and maintain communication networks in a rugged, field portable package. This lightweight instrument simplifies the task of collecting and interpreting data with an easy-to-use GUI and clear summaries allowing users of any skill level to operate the instrument to its full potential. The MT1040A can support multiple ports of QSFP+, QSFP28, QSFP-DD and OSFP interfaces, depending on its transport module configuration (illustrated below). MT1040A mainframe will support up to 2 transport modules listed below (MU104014A / 15A / 11A)

IBTA Application:

- Dual channel 100G / 200G configurations can support EDR & HDR cable testing with FEC in a single mainframe.

MT1040A Network Master Pro Literature:

1. https://www.anritsu.com/en-us/test-measurement/products/mt1040a
2. https://dl.cdn-anritsu.com/en-en/test-measurement/files/Brochures-Datasheets-Catalogs/Brochure/mt1040a-400g-brochure-e1101.pdf
3. https://dl.cdn-anritsu.com/en-en/test-measurement/files/Product-Introductions/Product-Introduction/mt1040a-400g-product-intro-el4101.pdf

MT1040A Outline

MU104011A 100G

Test interface
100G/40G/25G/10G/1G/100M/10M 2port

MU104014A 400G (QSFP-DD)

Test Interface
200/ 400G 1port (QSFP-DD)
100G/40G/25G/10G/1G/100M/10M 2port

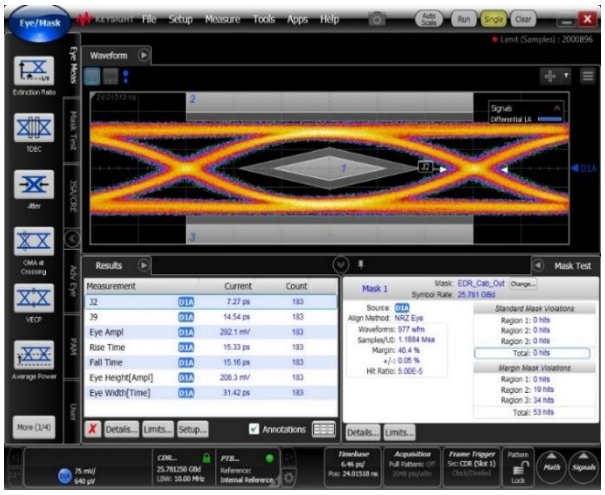
Keysight - Wide-Bandwidth Equivalent-Time (Sampling) Oscilloscope (DCA-X)

The Keysight N1000A/86100D DCA-X family of oscilloscopes, together with the N1060A Precision Waveform Analyzer (aka "MegaModule") plug-in module, has been engineered to provide precision measurements on high-speed electrical communications systems and components:

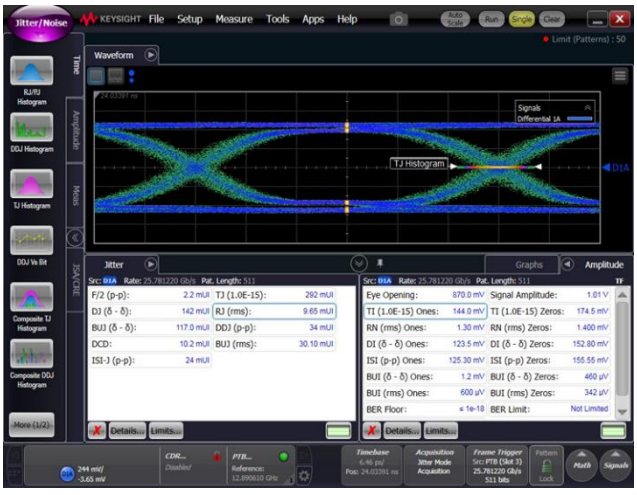
- Fast and accurate jitter/eye/analysis of NRZ and PAM4 signals
- Bandwidth: 50 GHz / 85 GHz (95 GHz typ)
- Intrinsic random jitter (RJ): 50 fs rms (typ)
- Built-in clock recovery: 150 MBd to 64 GBd (continuous), with integrated EQ for "closed eye" analysis

The N1060A provides accurate jitter analysis, eye diagram, and waveform characterization on InfiniBand (HDR, EDR, FDR, QDR ATD Testing), Ethernet, OIF-CEI, and Fibre Channel applications to 64 GBd.

N1000A_DCA-X_with_N1060A_module



Eye Mask, J2, J9, Time Domain



Eye Width & Height, Jitter Analysis

Links

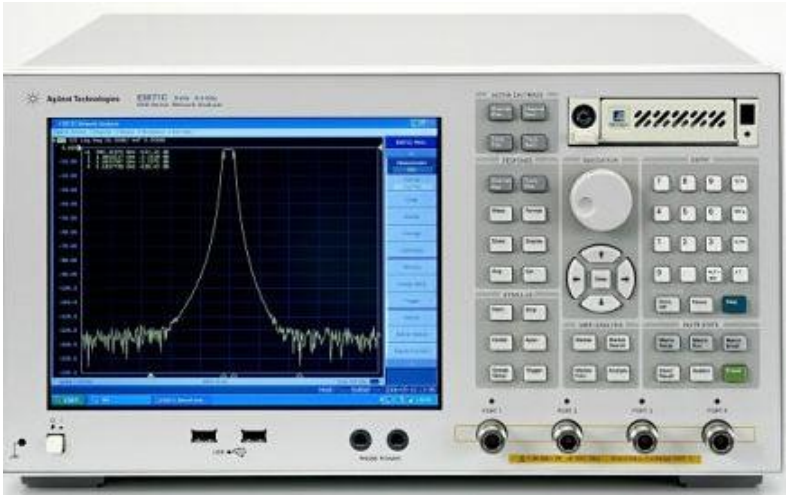
1. **N1000A DCA-X Wide-Bandwidth Oscilloscope**: N1000A
2. **N1060A Precision Waveform Analyzer ("MegaModule")**: N1060A
3. **Software Compliance Applications for the DCA-X platform:** SW Apps

IBTA Application: FDR/EDR/HDR HCA and Switch physical layer testing, and EDR/HDR Active Cable Time Domain testing.

Keysight - Network Analyzers

1) ENA used in FDR Cables testing

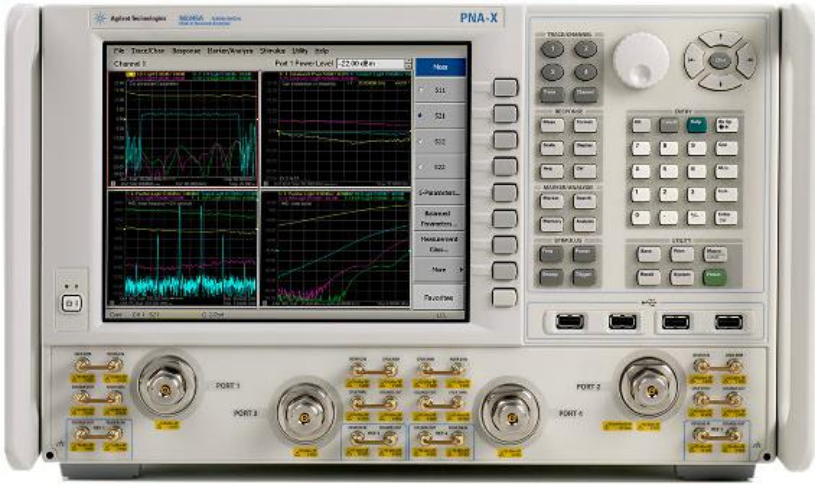
a) E5071C: 20 GHZ ENA Series Network Analyzer
b) E5071C Data Sheet: http://literature.cdn.keysight.com/litweb/pdf/5989-5479EN.pdf



20 GHZ ENA Series Network Analyzer

2) N5244A PNA-X Microwave Network Analyzer used in EDR Cables testing

a) N5244A.: 43.5 GHZ ENA Series Network Analyzer
b) N5244A PNA-X Data Sheet: http://literature.cdn.keysight.com/litweb/pdf/N5245-90008.pdf

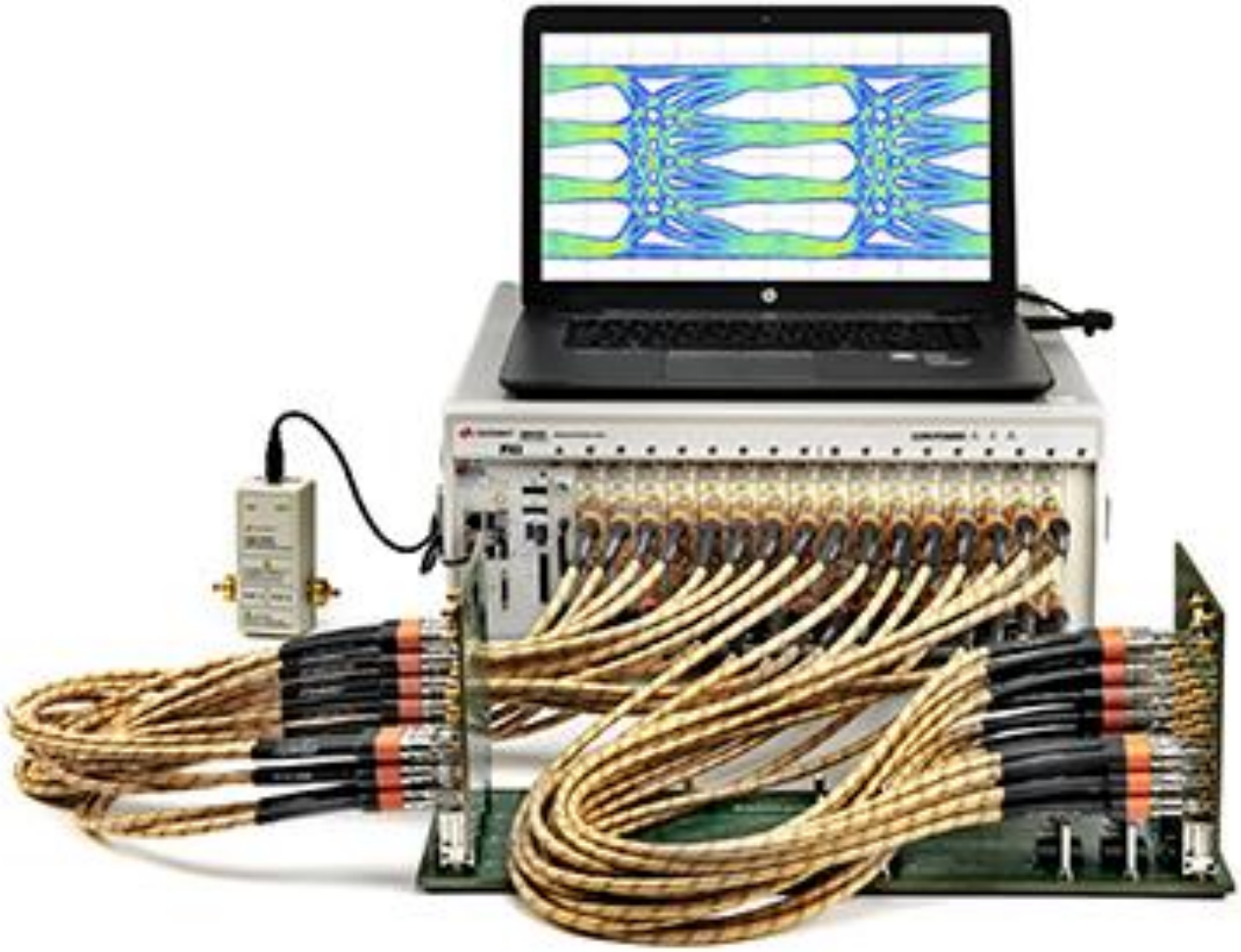


IBTA Application:

- FDR Device Physical Layer testing: SDDxx, SCCxx and SDCxx
- FDR and EDR Cable testing. ICN, ICMCN, SDDxx, SCCxx and SDCxx

3) 32 Port VNA used in FDR and EDR Cable testing since PF29

a) M9375A: PXIe Vector Network Analyzer
b) M9019A: M9019A PXIe Chassis
c) PLTS: Physical Layer Test Suite – software to process s32p files

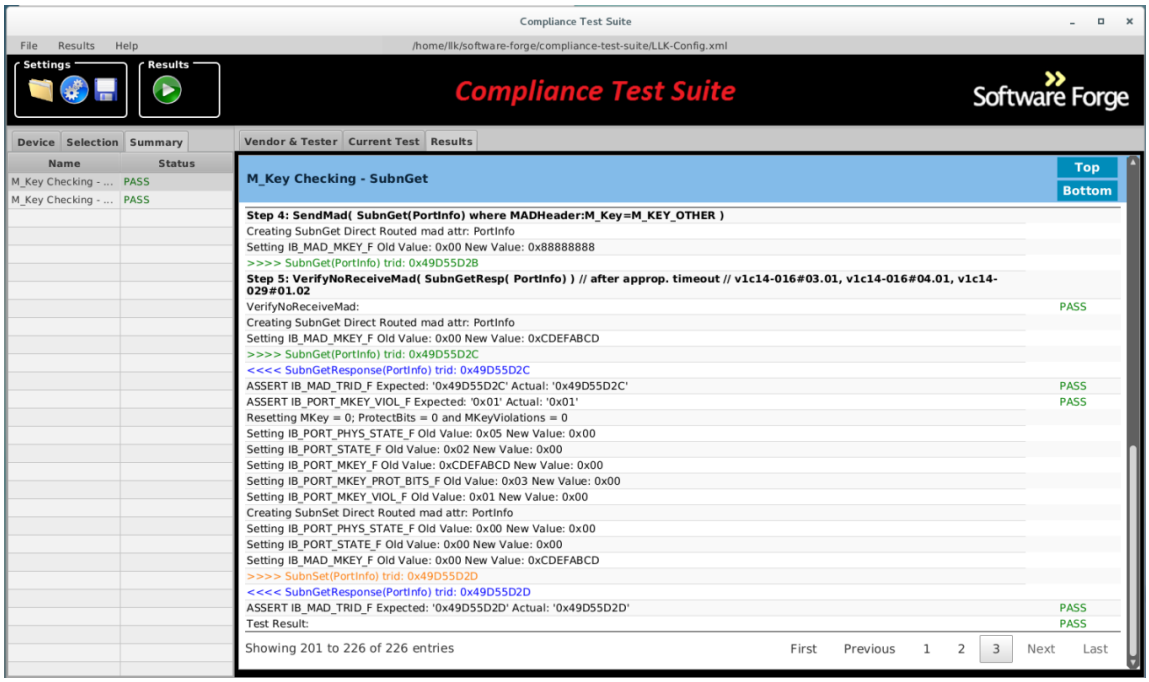


IBTA Application:

- FDR and EDR Cable testing. ICN, ICMCN, ILD, SDDxx, SCCxx and SDCxx

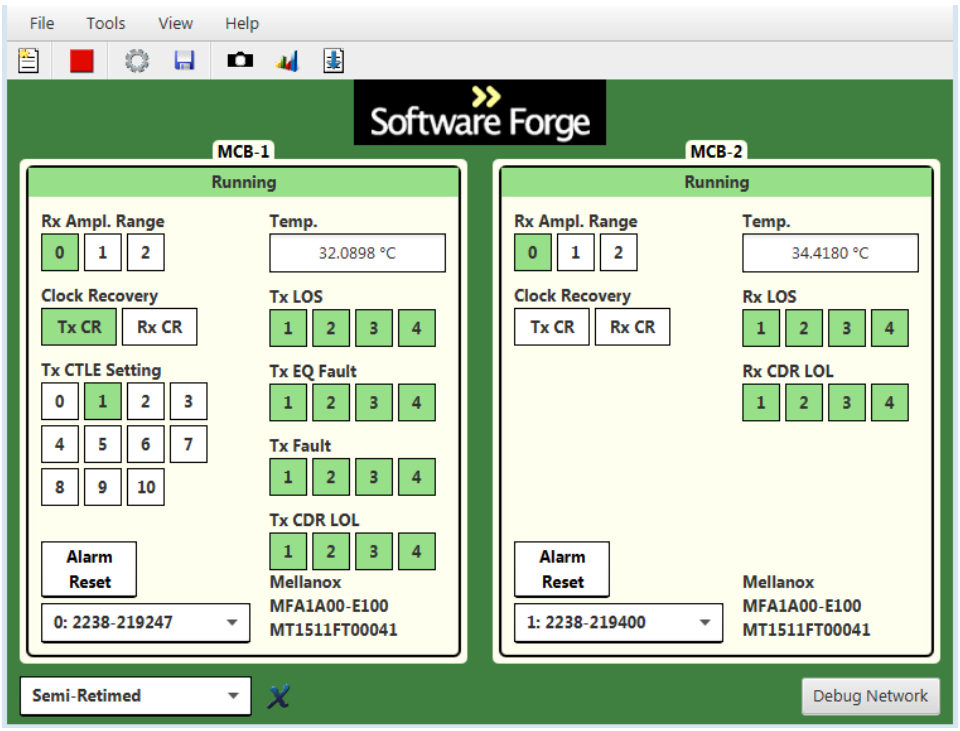
Software Forge – Compliance Test Suite (CTS)

The current version of CTS provides InfiniBand Protocol Layer testing. It is based on the Compliance and Interoperability Working Group InfiniBand Test Specification (Volume 3). This tool has replaced the old Agilent TCL test suite.



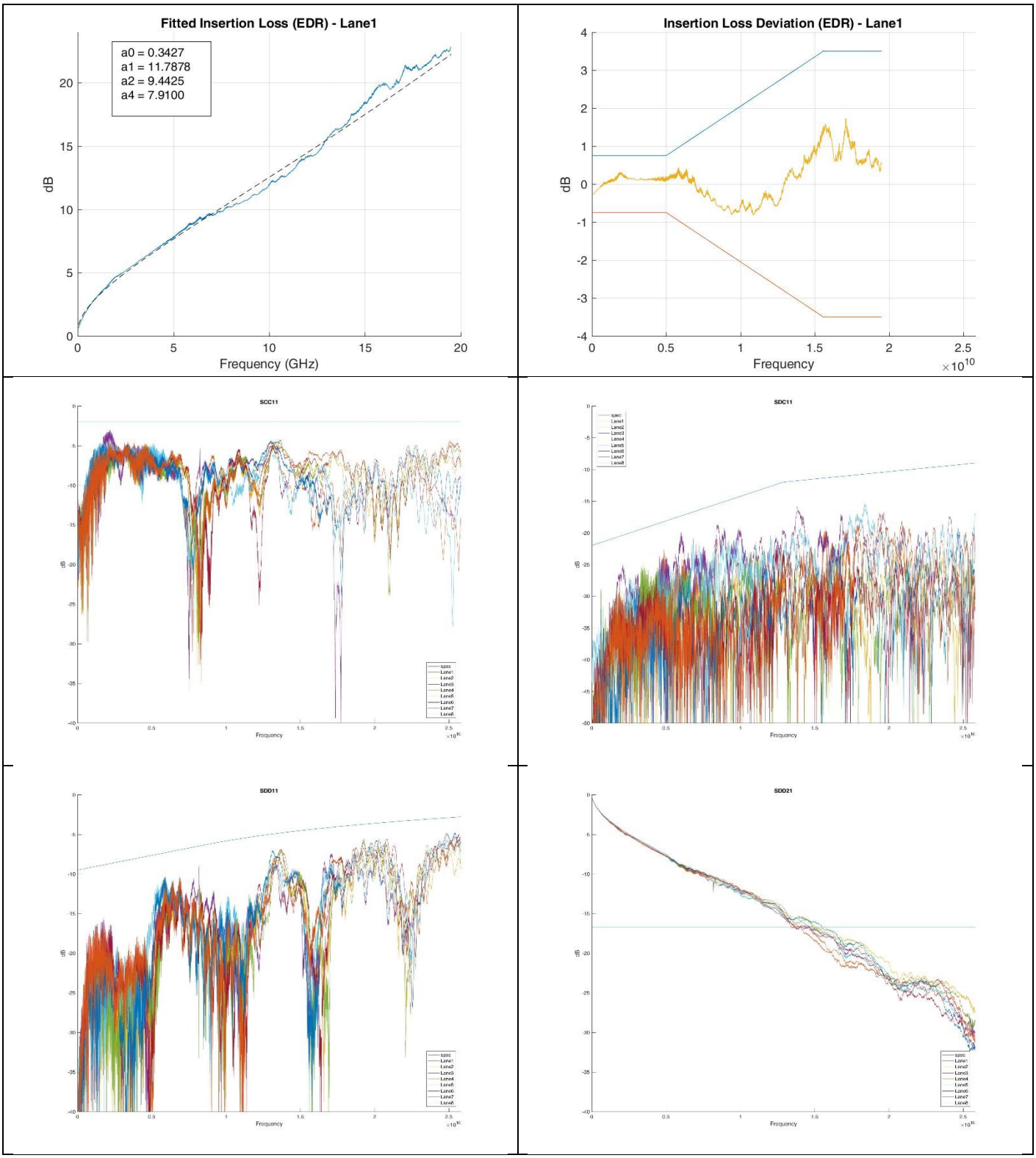
Software Forge – EEPROM Command Center (ECC)

The EEPROM Command Center is an application which enables the user to control and monitor the status of the QSFP memory maps. The user can write to writable fields of the QSFP memory map and easily export summaries of the results.



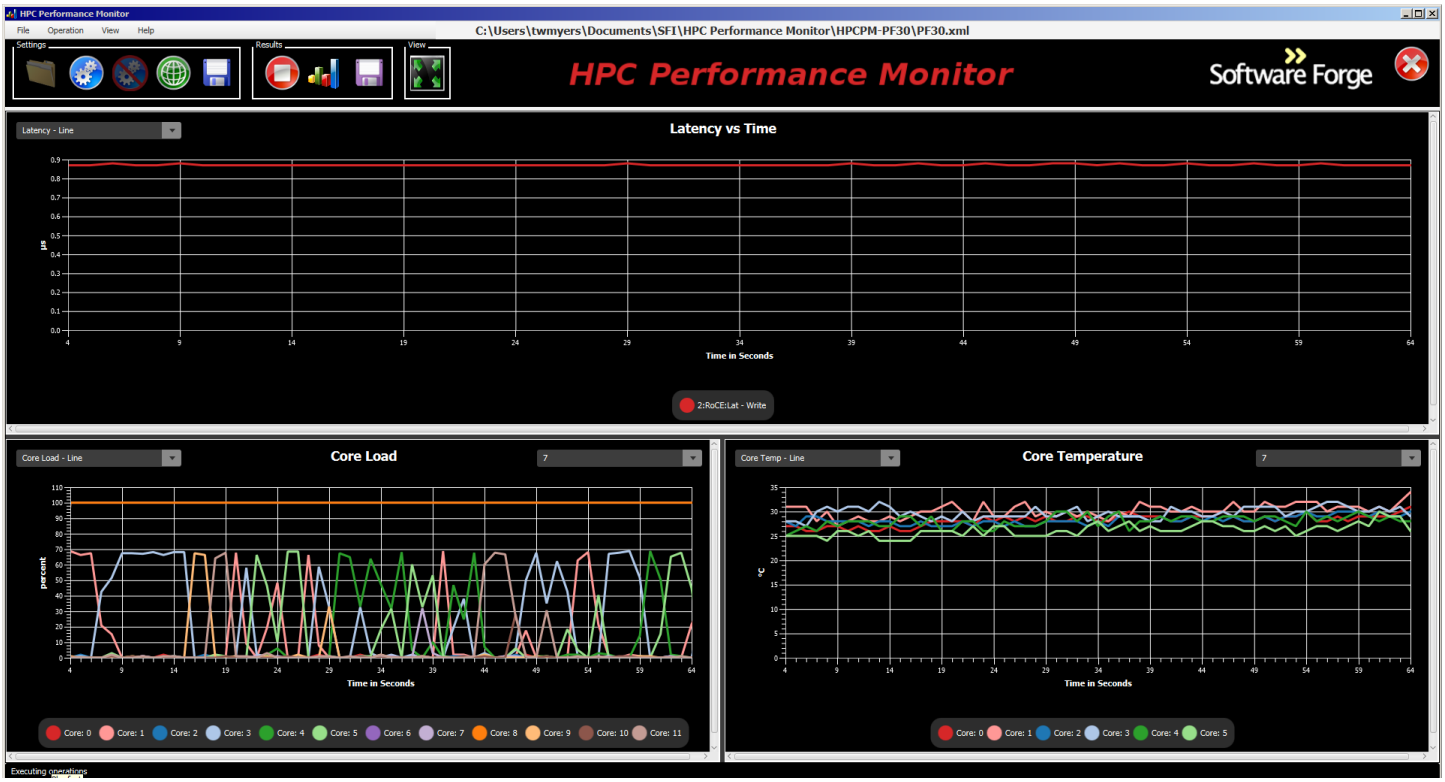
Software Forge – Vector Network Analyzer (VNA) MATLAB Application

This Application analyzes and processes the s32p VNA data so that the results are available immediately after the data is collected. This has helped reduce the data analysis time from months to minutes.



Software Forge – High Performance Computing – Performance Monitor (HPC-PM)

The High Performance Computing – Performance Monitor (HPC-PM) measures network performance of RDMA and/or TCP connections. The tool can be used for network diagnostics as well as engineering.



Total Phase

I2C/SPI Host Adapter Test fixture

The Aardvark I2C/SPI Host Adapter is a fast and powerful I2C bus and SPI bus host adapter through USB. It allows a developer to interface a Windows, Linux, or Mac OS X PC via USB to a downstream embedded system environment and transfer serial messages using the I2C and SPI protocols.

http://www.totalphase.com/products/aardvark-i2cspi/?gclid=CIzW2sDjg8QCFWQV7Aod3RwAvA

EEPROM Programming Kit

Total Phase has bundled together a complete set of development tools and accessories that allow developers to erase, program, and verify serial EEPROMs.

http://www.totalphase.com/catalog/product/view/id/24/s/eeprom-devkit/category/4/

IBTA Application: Used to program EEPROM cable modules when doing ATD testing and in general for reprogramming EEPROMs as needed.

Ace Unitech – Variable ISI Channel

CLE-1000-S2

Designed as a variable Inter-Symbol-Interference (ISI) channel for high speed serial interface stress tests. It controls the insertion loss continuously at 0.1% step (1,000 steps) in its dynamic range for fine adjustment. The differential transmission lines are totally passive and DC coupled. The adjusted insertion loss amount is reliably repeatable and stable for secure test results. The control is done by the volume dial on the front panel and/or PC remote via USB for automated calibration. Three (3) models of different loss range are prepared to cover various data rates. 4ch versions are also available. The CLE1000 is a convenient ISI channel, applicable for various standard stress tests and compliance tests.

IBTA Application:

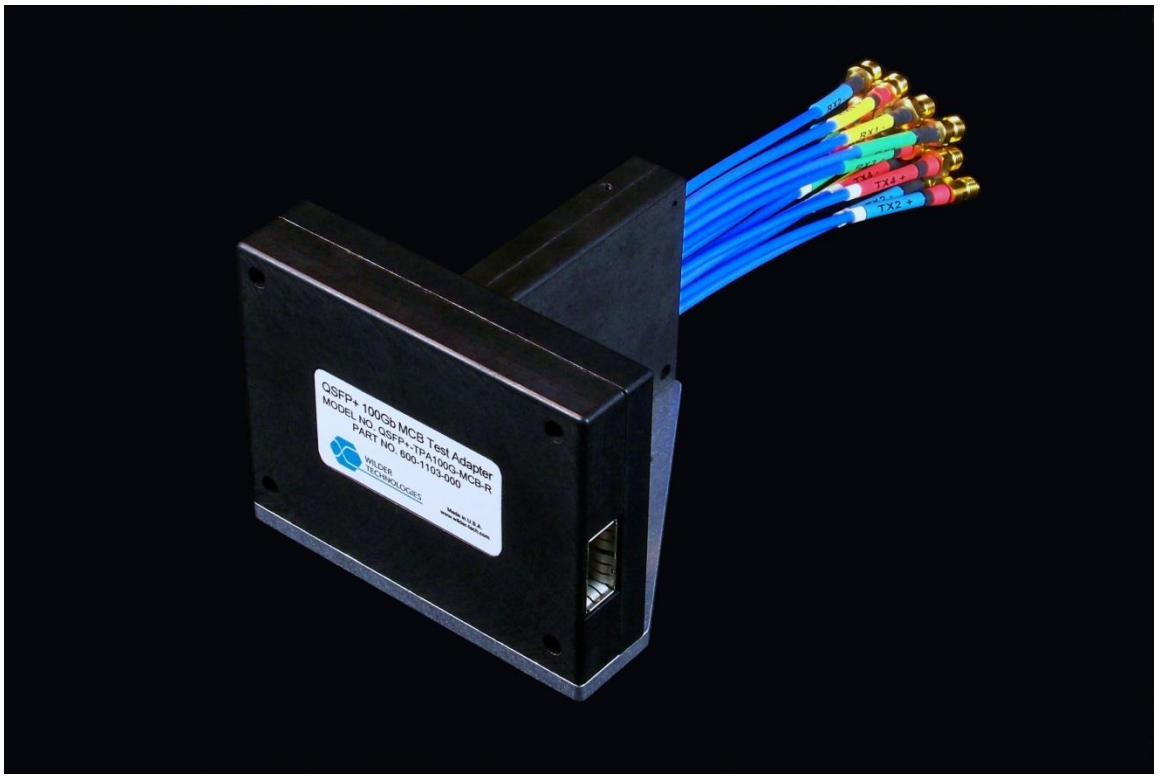
- EDR Active Cable Time Domain Testing (ATD)
- Precise adjustment of frequency-dependent input channel loss.

CLE-1000-S2

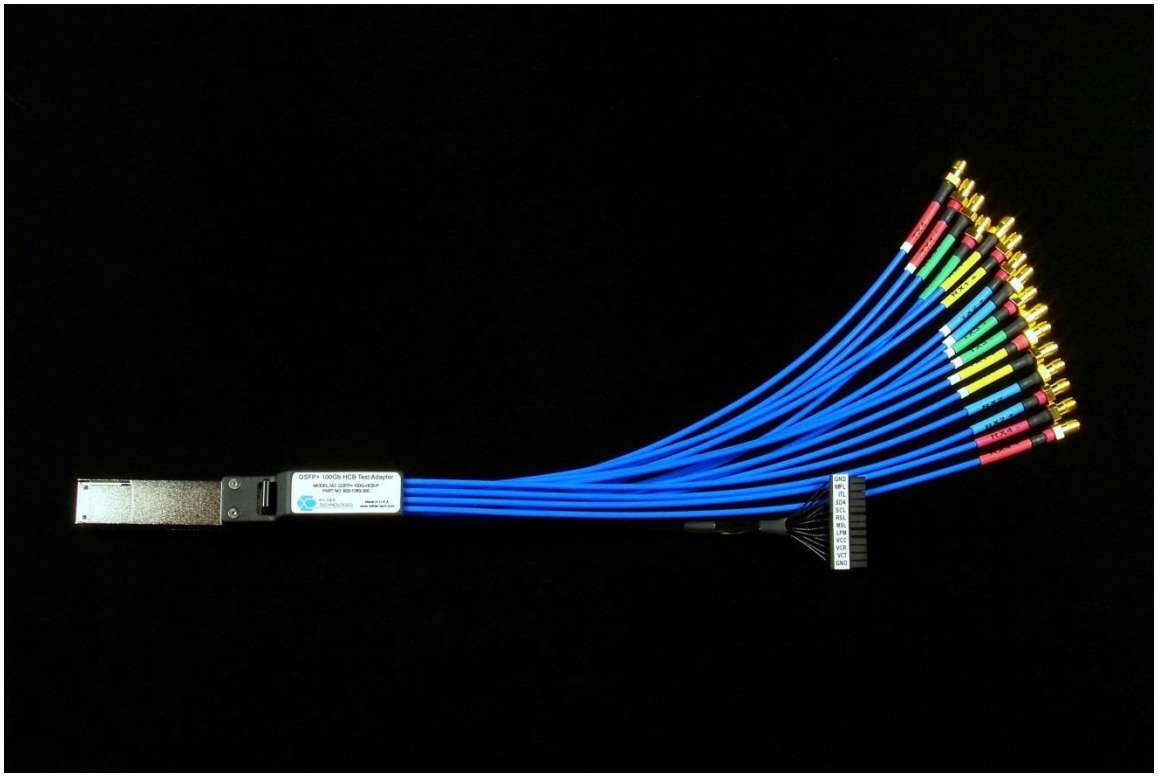
1. http://www.aceunitech.com/index.html
2. http://www.aceunitech.com/docs/support/cl1000_datasheet.pdf

CLE-1000-S2 Front View

Wilder QSFP28 Test fixture:
https://www.wilder-tech.com/en/products/datacomm#qsfp-28



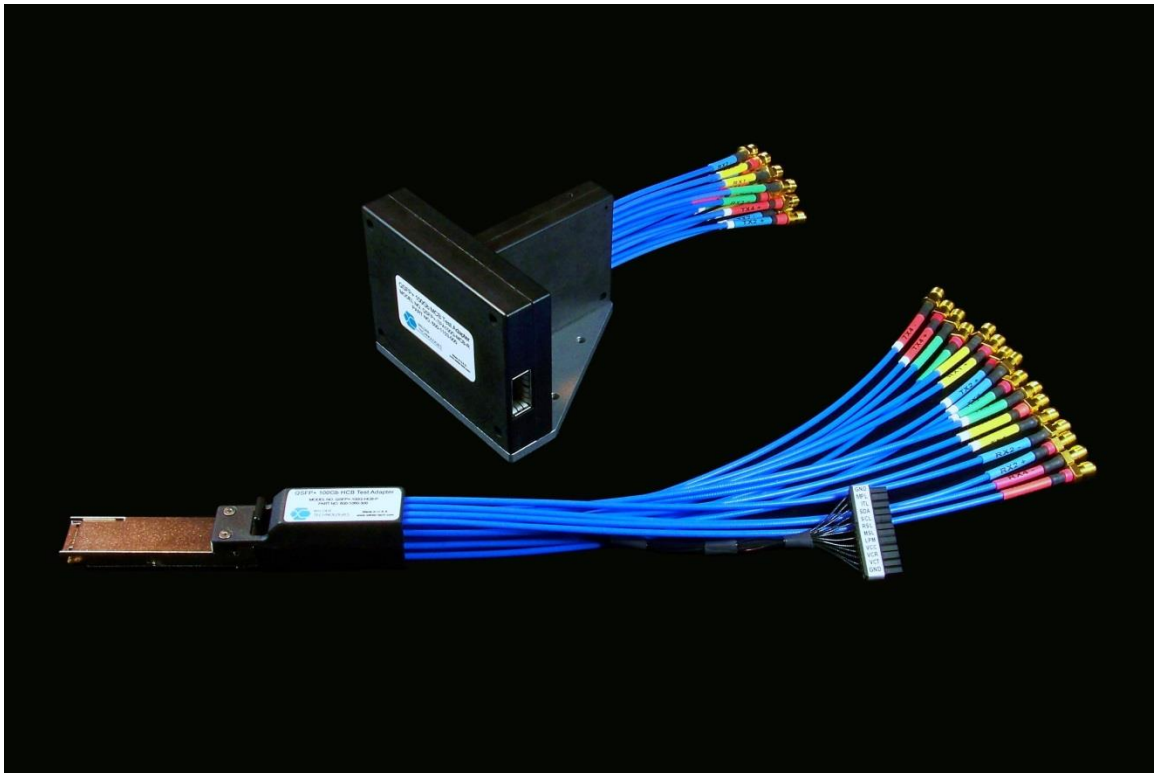
Wilder QSFP28 Module Compliance Board (MCB)



Wilder QSFP28 Host Compliance Board (HCB)

Wilder QSFP28 Test fixture:

https://www.wilder-tech.com/en/products/datacomm#qsfp-28

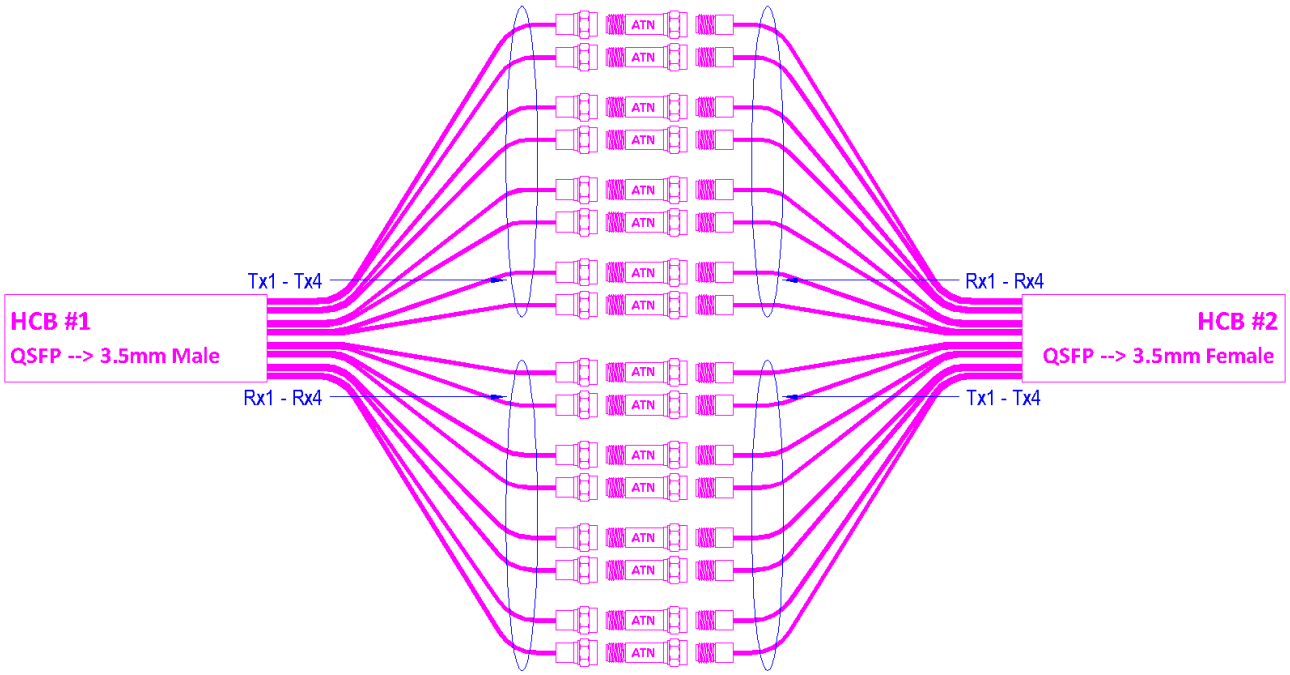


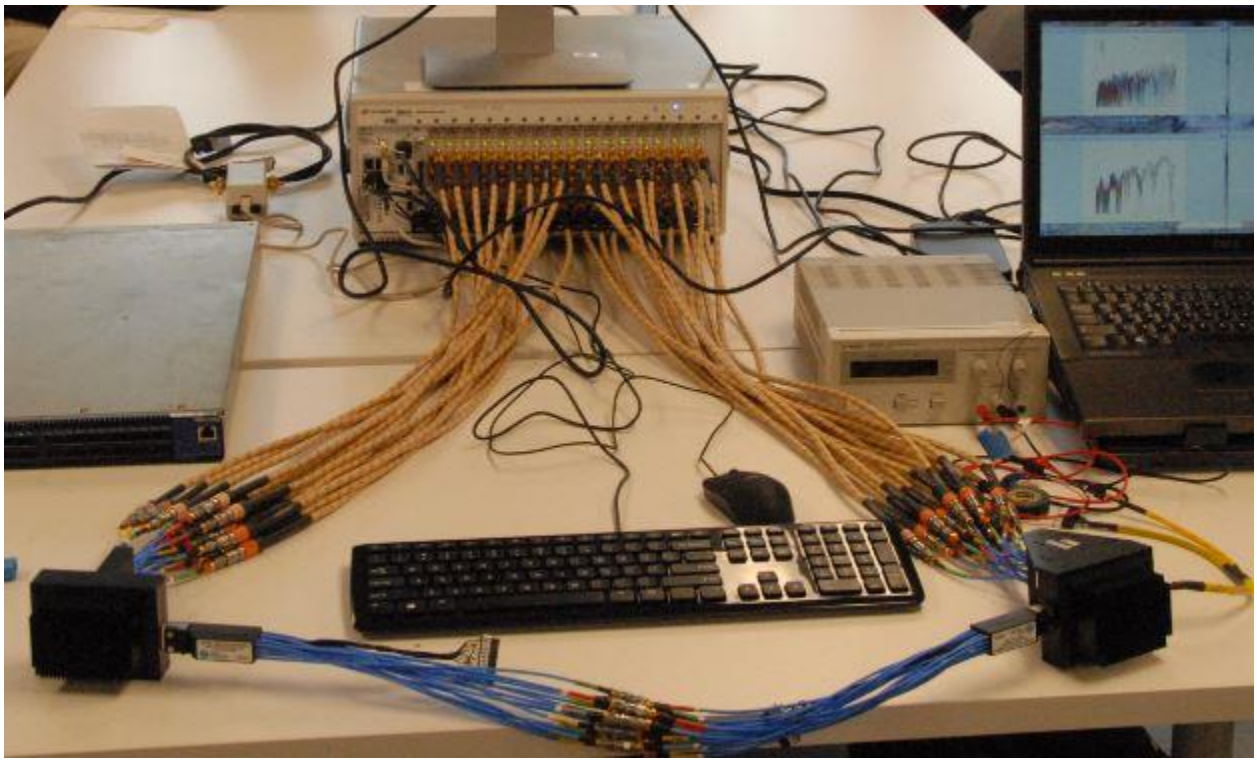
Wilder QSFP28 Module Compliance Board (MCB) / Host Compliance Board (HCB)

IBTA Applications:

- Wilder HCB
  - QDR, FDR, EDR and HDR device physical layer testing
  - QDR, FDR, EDR and HDR Active Cable Time Domain testing
- Wilder MCB
  - QDR, FDR, EDR and HDR Active Cable Time Domain testing
  - QDR, FDR, EDR and HDR VNA testing

Wilder Dual Headed HCBs for VNA MCB verification

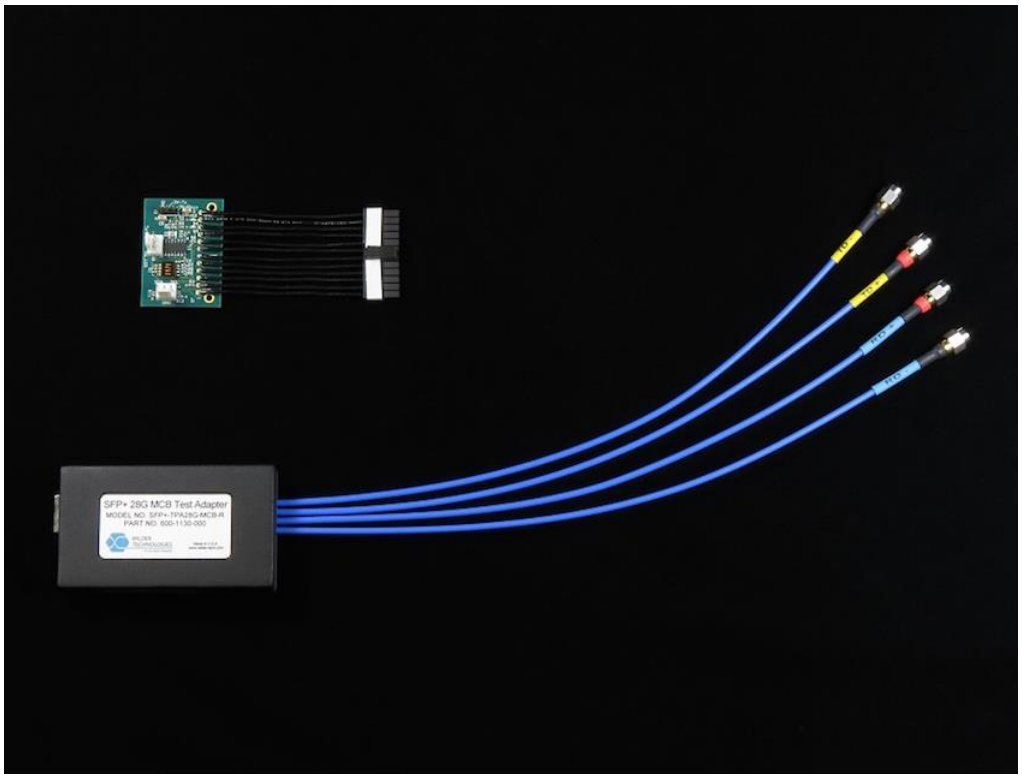




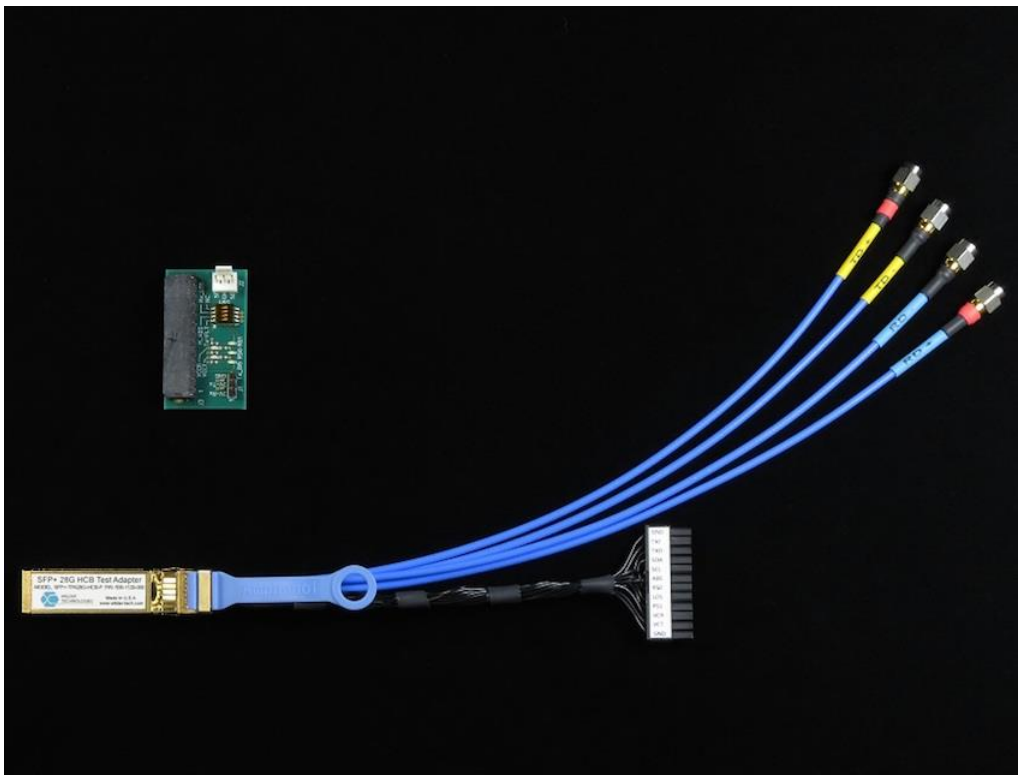
IBTA Application:

- Wilder Dual HCBs with 10 dB Attenuators used for VNA fixture validation

Wilder SFP28 Test fixture:
https://www.wilder-tech.com/en/products/datacomm/sfp-28

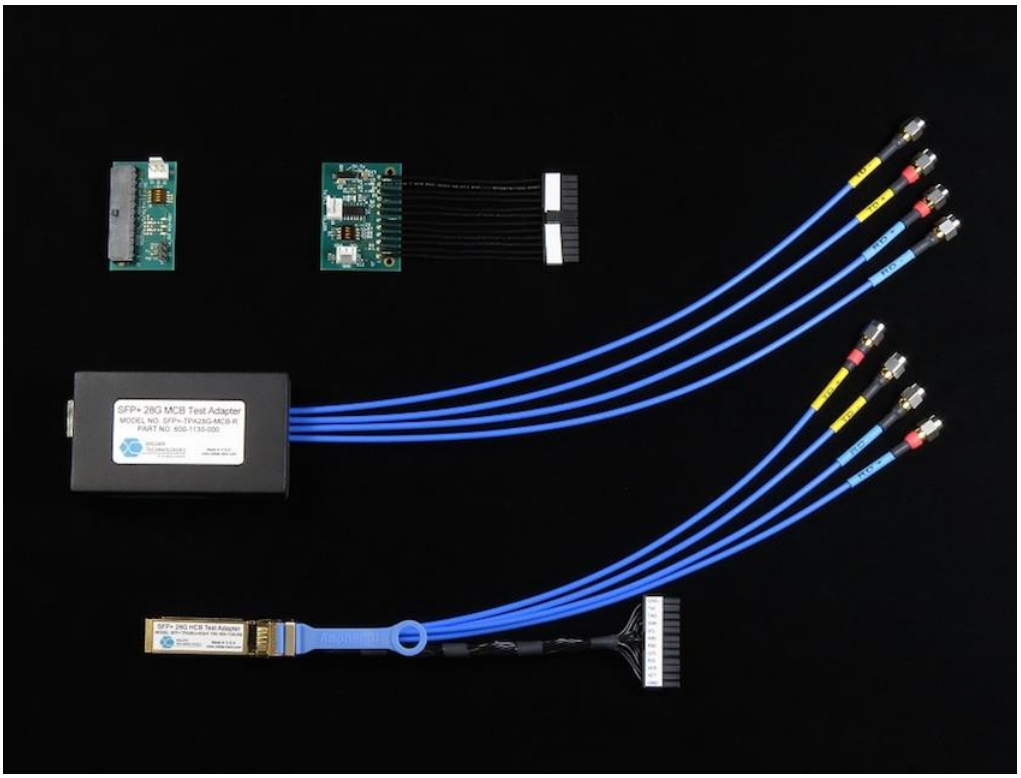


Wilder SFP28 Module Compliance Board (MCB) and MCB Switch Module



Wilder SFP28 Host Compliance Board (HCB) and HCB Switch Module

Wilder SFP28 Test fixture:
https://www.wilder-tech.com/en/products/datacomm/sfp-28



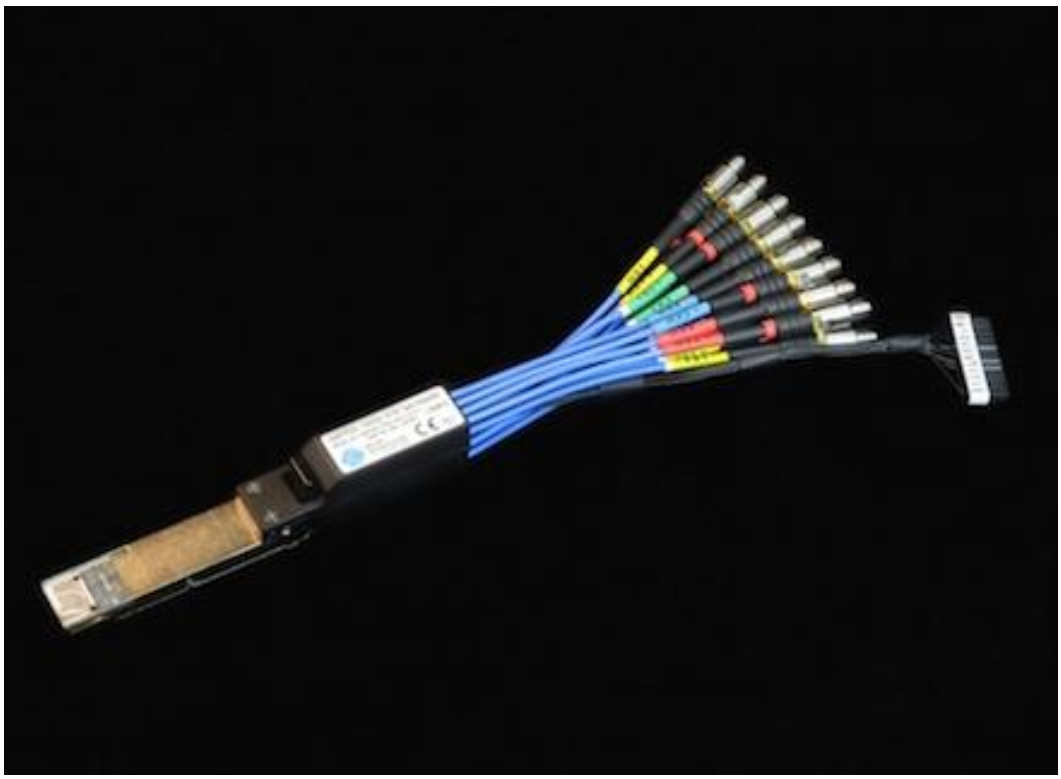
Wilder SFP28 Module Compliance Board (MCB) / Host Compliance Board (HCB)

IBTA Applications:

- Wilder HCB
  - Port type 2
    - QDR, FDR, EDR and HDR device physical layer testing
    - QDR, FDR, EDR and HDR Active Cable Time Domain testing
- Wilder MCB
  - Port type 2
    - QDR, FDR, EDR and HDR Active Cable Time Domain testing
    - QDR, FDR, EDR and HDR VNA testing

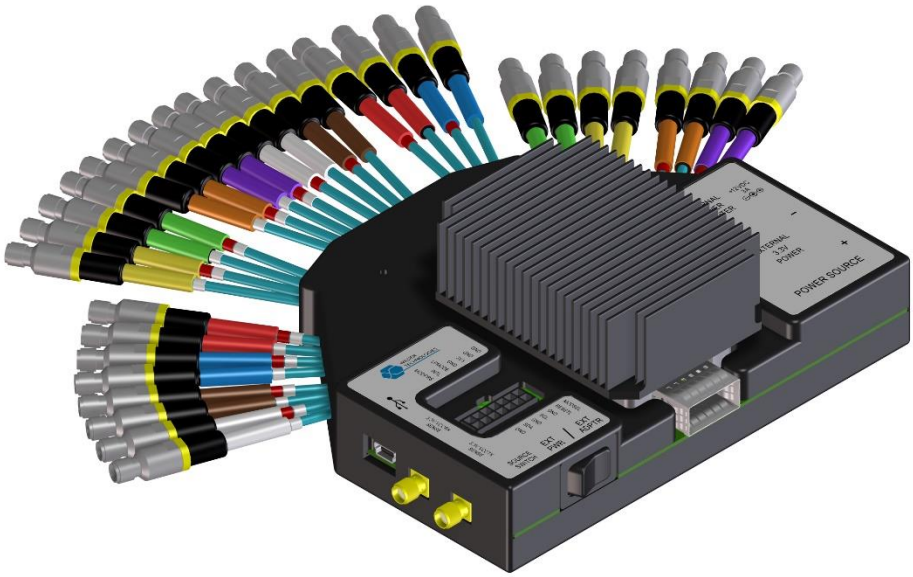
Wilder QSFP-DD 56G fixture:
https://www.wilder-tech.com/en/products/datacomm#qsfpdd

Wilder QSFP-DD 56G Module Compliance Board (MCB)



Wilder QSFP-DD 56G Host Compliance Board (HCB)

Wilder QSFP-DD 112G Test fixture
https://www.wilder-tech.com/en/products/datacomm#qsfp-dd



Wilder QSFP-DD 112G Module Compliance Board (MCB)

Wilder QSFP-DD 112G Host Compliance Board (HCB)

Wilder OSFP 112G Test fixture:
https://www.wilder-tech.com/en/products/datacomm#osfp

Wilder OSFP 112G Module Compliance Board (MCB)

Wilder OSFP 112G mated Module Compliance Board (MCB) / Host Compliance Board (HCB)

Physical layer Test Equipment Methods of Implementation (MOI)

IBTA Active Time Domain (ATD) Testing for Cables

- Anritsu ATD MOI for Active FDR Cables
- Anritsu Keysight ATD MOI for Active EDR Cables
- Anritsu Keysight ATD MOI for Active HDR Cables

IBTA VNA Testing for FDR and EDR Cables

- Keysight 4 Port VNA Testing
- Keysight 32 Port VNA Testing

IBTA Testing for FDR Devices (HCAs and Switches)

- Agilent Transmitter MOI
- Agilent-Anritsu Receiver MOI

Protocol Layer Test Equipment used in the IBTA Plugfests

InfiniBand Protocol Analyzers

- LeCroy IBTracer 4x
  - http://www.lecroy.com/protocolanalyzer/protocoloverview.aspx?seriesid=128
- NVIDIA ibdump used with Wireshark
  - http://www.mellanox.com/page/products_dyn?product_family=110&mtag=monitoring_debug
- Wireshark Network Analyzer
  - https://www.wireshark.org/download.html

Software Tools to test Systems and interconnects

- Software Forge EEPROM Memory Map test suite
- Software Forge Cable Interoperability test suite
- Software Forge Compliance Test Suite (CTS)
  a) IB Protocol Layer Tester
  b) RoCE Transport Tester

Compliance & Interoperability Testing - IBTA Integrators List

- https://www.infinibandta.org/integrators-list/
- This site includes a list of all the devices and cables that have passed both the Physical and Protocol Layer testing from June 2003 through May 2021.

Information about the InfiniBand Trade Association (IBTA)

- **Main IBTA Website Link:**
  - http://www.infinibandta.org/
- **Membership Link**:
  - https://www.infinibandta.org/membership/
  - https://www.infinibandta.org/about-the-ibta/
- **Presentations, Events and Information**:
  - https://www.infinibandta.org/press-room/
- **IBTA Specifications**:
  - https://www.infinibandta.org/ibta-specification/
  - Volume 1 – this is the protocol layer spec that covers from Layer 3 and up.
  - Volume 2 – this is the physical layer spec that covers Layers 1-2.
  - Volume 3 – this is the test specification. There are many more test documents that are only available to the Compliance and Interoperability Working Group Members (CIWG)
- **IBTA Working Groups**
  - https://cw.infinibandta.org/workgroup/index
  - Compliance and Interoperability Working Group
  - ElectroMechanical Working Group
  - Link Working Group
  - Management Working Group
  - Marketing Working Group
  - Software Working Group
  - Steering Committee
  - Technical Working Group
- **IBTA Roadmap**:
  - https://www.infinibandta.org/infiniband-roadmap/
- **IBTA Integrators' List Program:** (some links require membership)
  - Integrators' List
    - https://www.infinibandta.org/integrators-list/
  - IL Policy
    - https://cw.infinibandta.org/wg/CIWG/document/8298
  - Plugfest Information:
    - https://www.infinibandta.org/plugfest/
- **Test Methods of Implementation**
  - https://www.infinibandta.org/methods-of-implementation/