InfiniBand Trade Association Integrators' List

October 2018

IBTA InfiniBand Integrators' List

October 2018

Manufacturer	Description	Model	Type	Speed	FW	SW
Mellanox	ConnectX®-3 Pro VPI, FDR IB (56Gb/s) and 40/56GbE Dual-port QSFP, PCIe3.0 x8	MCX354A-FCCT	HCA	FDR	2.42.5000	MLNX_OFED_LINUX 4.4-2.0.7.0
Mellanox	ConnectX®-4 VPI, EDR IB (100Gb/s) and 100GbE Dual-port QSFP28, PCIe3.0 x16	MCX456A-ECAT	HCA	EDR	12.23.1020	MLNX_OFED_LINUX 4.4-2.0.7.0
Mellanox	ConnectX-5 VPI, EDR IB (100Gb/s) and 100GbE Dual-port QSFP28, PCIe4.0 x16	MCX556A-EDAT	HCA	EDR	16.23.1020	MLNX_OFED_LINUX 4.4-2.0.7.0
Mellanox	SwitchX®2 InfiniBand to Ethernet gateway, 36 QSFP ports, Managed Switch	MSX6036G-2SFS	Switch	FDR	9.4.5070	3.6.8010
Mellanox	Switch-IB 2 based EDR InfiniBand 1U Switch, 36 QSFP28 ports	MSB7800-ES2F	Switch	EDR	15.1703.0002	3.6.8010
NetApp	Dual Controllers iSER EDR Target	E5700	iSER Target	EDR	8.5	11.5

Software	Versions	Diagnostic Software	
Operating System	Cent OS 7.5.1804	ibutils2	MLNX OFED 4.4-2.0.7.0
Mellanox OFED	MLNX OFED 4.4-2.0.7.0	Compliance Test Suite	v. 1.0.48
Open MPII	Open MPI 3.1.2		
Benchmark	Intel MPI Benchmarks	**Benchmarks Performed**	
Test Plan	Software Forge IBTA MOI Suite	PingPong	Gather
Duration	3-10 minutes	PingPing	Gatherv
		Sendrecv	Scatter
Conditions for Passing Testing		Exchange	Scatterv
Link Width	Link width is @ expected width - i.e. 1x,4x, etc	Allreduce	Alltoall
Link Speed	Link speed is @ expected speed - e.g. 100 GbE	Reduce	Alltoallv
Errors	There must be no errors recorded during any test phases	Reduce_scatter	Bcast
MPI Test	The MPI Benchmark must run to completion	Allgather	Barrier

Mellanox HCAs		Model	MCX354A-FCCT	MCX456A-ECAT	MCX556A-EDAT
		Date	2018-06-07-01	2018-10-17-01	2018-10-17-01
		Firmware Version	2.42.5000	12.23.1020	16.23.1020
		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	Pass	N/A	N/A
	PortInfo xCA - Part 5	C14-024#06_CA_05	Pass	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
	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(PatheRecord)	C15-0.1.012#17.01	Pass	Pass	Pass
	SubnAdminGet(PathRecord) - Part 1	C15-0.1-012#17.02 - Part 1	Pass	Pass	Pass
	SubnAdminGet(PathRecord) - Part 2	C15-0.1-012#17.02 - Part 2	Pass	Pass	Pass
	SubnAdminGet(PathRecord) - Part 3	C15-0.1-012#17.02 - Part 3	Pass	Pass	Pass
	SM-SA Validation	SM-SA Validation	Pass	Pass	Pass

Mellanox Switches		Model	MSX6036G-2SFS	MSB7800-ES2F
		Date	2018-04-20-01	2018-10-17-01
		Firmware Version	9.4.5070	15.1703.0002
		Overall Results	Pass	Pass
Test Class	Name	Number	Results	Results
Management	ResponseTimeValue	C13-013	Pass	Pass
	ResponseTimeValue - Single Packet	C13-014_01	Pass	Pass
Subnet Management	No M_Key Checking	C14-015	Pass	Pass
	M_Key Checking - SubnGet	C14-016_Get	Pass	Pass
	M_Key Checking - SubnSet	C-14-016_Set	Pass	Pass
	M_Key Lease Period Timer - Part 1	C-14-017	Pass	Pass
	M_Key Lease Period Timer - Part 2		Pass	Pass
	M_Key Lease Period Timer - Part 3		Pass	Pass
	M_Key Lease Period Timer - Part 4		Pass	Pass
	M_Key Lease Period Timer - Part 5		Pass	Pass
	M_Key Violation Counter	C14-018	Pass	Pass
	M_Key Components in NVRAM	C14-023	Pass	Pass
	Node Description	C14-024#02	Pass	Pass
	NodeInfo	C14-024#03	Pass	Pass
	SwitchInfo - RO	C14-024#04_SW_01	Pass	Pass
	SwitchInfo - Part 1	C14-024#04_SW_02	Pass	Pass
	SwitchInfo - Part 2	C14-024#04_SW_03	Pass	Pass
	GUIDInfo	C14-024#05	Pass	Pass
	PortInfo Switch - Part 1	C14-024#06_SW_01	Pass	Pass
	PortInfo Switch - Part 2	C14-024#06_SW_02	Pass	Pass
	PortInfo Switch - Part 3	C14-024#06_SW_03	N/A	N/A
	PortInfo Switch - Part 4	C14-024#06_SW_04	Pass	Pass
	PortInfo Switch - Part 5	C14-024#06_SW_05	Pass	Pass
	PortInfo Switch - Part 6	C14-024#06_SW_06	Pass	Pass
	PortInfo Switch - Part 7	C14-024#06_SW_07	Pass	Pass
	PortInfo LocalPortNum	C14_024_06_LocalPortNum	Pass	Pass

Mellanox Switches		Model	MSX6036G-2SFS	MSB7800-ES2F
		Date	2018-04-20-01	2018-10-17-01
		Firmware Version	9.4.5070	15.1703.0002
		Overall Results	Pass	Pass
Test Class	Name	Number	Results	Results
Subnet Management Continued	P_Key - Part 1	C14-024#07_01	Pass	Pass
	P_Key - Part 2	C14-024#07_02	Pass	N/A
	P_Key - Part 3	C14-024#07_03	N/A	Pass
	P_Key - Part 4	C14-024#07_04	N/A	Pass
	P_Key - Part 5	C14-024#07_05	N/A	Pass
	SLToVL Mapping - Part 3	C14-024#08_03	Pass	Pass
	SLToVL Mapping - Part 4	C14-024#08_04	N/A	N/A
	SLToVL Mapping - Part 5	C14-024#08_05	Pass	Pass
	VLArbitration - SW	C14-024#09_SW	Pass	Pass
	LFT - Unsupported	C14-024#10_01	N/A	N/A
	LFT Supported - Valid Ports	C14-024#10_02	Pass	Pass
	LFT Supported - Invalid Ports	C14-024#10_03	Pass	Pass
	Random Forwarding Table	C14-024#11	Pass	Pass
	Mcast Forwarding Table	C14-024#12	Pass	Pass
	LedInfo	C14-024#15	Pass	Pass
Subnet Manager	SMInfo - Supported	C14-024#13-01	Pass	Pass
	SMInfo - Unsupported	C14-024#13-03	N/A	N/A
Subnet Administration	SubnAdminGet(ServiceRecord)	C15-0.1.012#15	Pass	Pass
	SubnAdminGet(PathRecord)	C15-0.1.012#17.01	Pass	Pass
	SubnAdminGet(PathRecord) - Part 1	C15-0.1-012#17.02 - Part 1	Pass	Pass
	SubnAdminGet(PathRecord) - Part 2	C15-0.1-012#17.02 - Part 2	Pass	Pass
	SubnAdminGet(PathRecord) - Part 3	C15-0.1-012#17.02 - Part 3	Pass	Pass
	SM-SA Validation	SM-SA Validation	Pass	Pass

NetApp
EDR iSER Target

		Model	**E5700**
		Date	2018-10-16-14
		Firmware Version	8.5
		Software Version	11.5
		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**
	GUIDInfo	C14-024#05	**Pass**
	PortInfo xCA - Part 1	C14-024#06_CA_01	**Pass**
	PortInfo xCA - Part 2	C14-024#06_CA_02	**Pass**
	PortInfo xCA - Part 3	C14-024#06_CA_03	**Pass**
	PortInfo xCA - Part 4	C14-024#06_CA_04	**N/A**
	PortInfo xCA - Part 5	C14-024#06_CA_05	**N/A**
	PortInfo xCA - Part 6	C14-024#06_CA_06	**Pass**

NetApp EDR iSER Target		Model	E5700
		Date	2018-10-16-14
		Firmware Version	8.5
		Software Version	11.5
		Overall Results	Pass
Subnet Management Continued	PortInfo LocalPortNum	C14_024_06_LocalPortNum	Pass
	P_Key - Part 1	C14-024#07_01	Pass
	SLToVL Mapping - Part 1	C14-024#08_01	Pass
	SLToVL Mapping - Part 2	C14-024#08_02	N/A
	VLArbitration - CA	C14-024#09_xCA	Pass
	LedInfo	C14-024#15	Pass
Subnet Manager Subnet Administration	SMInfo - Supported	C14-024#13-01	N/A
	SMInfo - Unsupported	C14-024#13-03	Pass
	SubnAdminGet(ServiceRecord)	C15-0.1.012#15	N/A
	SubnAdminGet(PatheRecord)	C15-0.1.012#17.01	N/A
	SubnAdminGet(PathRecord) - Part 1	C15-0.1-012#17.02 - Part 1	N/A
	SubnAdminGet(PathRecord) - Part 2	C15-0.1-012#17.02 - Part 2	N/A
	SubnAdminGet(PathRecord) - Part 3	C15-0.1-012#17.02 - Part 3	N/A
	SM-SA Validation	SM-SA Validation	N/A

IBTA Integrators' List
October 2018 **FDR** Compliant Cables

Company Info		Cable Information					Integrators' List	Qualification
Company	Part Number	Width	Len (m)	AWG	Equalization	Type	FDR	Tested at
Finisar	FCBN425QP1C01	4x	1	NA	Fiber - Active	QSFP28	Yes	PF34
Finisar	FCBN425QP1CX0	4x	100	NA	Fiber - Active	QSFP28	Yes	PF34
Finisar	FCBR425QB1C01	4x	1	NA	Fiber - Active	QSFP28	Yes	PF34
Finisar	FCBR425QB1CX0	4x	100	NA	Fiber - Active	QSFP28	Yes	PF34
Fujitsu	FPD-208R008-04	4x	4	NA	Fiber - Active	QSFP28	Yes	PF34
Fujitsu	FPD-208R008-05	4x	5	NA	Fiber - Active	QSFP28	Yes	PF34
Fujitsu	FPD-208R008-A0	4x	100	NA	Fiber - Active	QSFP28	Yes	PF34
Luxshare-ICT	PCRQQ1904-SD-R/A891A002	4x	100	n/a	Fiber - Active	QSFP28	Yes	PF34
Luxshare-ICT	PCRQQ1904-SD-R/A891A003	4x	100	n/a	Fiber - Active	QSFP28	Yes	PF34
Mellanox	MC220731V-003	4x	3	N/A	Fiber - Active	QSFP	Yes	PF33
Mellanox	MC220731V-030	4x	30	N/A	Fiber - Active	QSFP	Yes	PF33
Mellanox	MC220731V-100	4x	100	N/A	Fiber - Active	QSFP	Yes	PF33
Mellanox	MFS1200-E003	4x	3	N/A	Fiber - Active	QSFP	Yes	PF33
Mellanox	MFS1200-E200	4x	200	N/A	Fiber - Active	QSFP	Yes	PF33
Mellanox	MC2207130-001	4x	1	30	Copper - Unequalized	QSFP	Yes	PF33
Mellanox	MC2207130-0A1	4x	1.5	30	Copper - Unequalized	QSFP	Yes	PF33
Mellanox	MC2207130-002	4x	2	30	Copper - Unequalized	QSFP+	Yes	PF33
Mellanox	MC2207128-0A2	4x	2.5	28	Copper - Unequalized	QSFP+	Yes	PF33
Mellanox	MC2207128-003	4x	3	28	Copper - Unequalized	QSFP+	Yes	PF33
Mellanox	MCP1600-E00A	4X	0.5	30	Copper - Unequalized	QSFP28	Yes	PF33
Mellanox	MCP1600-E001	4X	1	30	Copper - Unequalized	QSFP28	Yes	PF33
Mellanox	MCP1600-E003	4X	3	26	Copper - Unequalized	QSFP28	Yes	PF33
Mellanox	MCP1600-E03A	4X	3.5	24	Copper - Unequalized	QSFP28	Yes	PF33
Mellanox	MFA1A00-E003	4X	3	N/A	Fiber - Active	QSFP28	Yes	PF33
Mellanox	MFA1A00-E030	4X	30	N/A	Fiber - Active	QSFP28	Yes	PF33
Mellanox	MFA1A00-E050	4X	50	N/A	Fiber - Active	QSFP28	Yes	PF33
Mellanox	MFA1A00-E100	4X	100	N/A	Fiber - Active	QSFP28	Yes	PF33
Mellanox	MCP1650-H00AE30	4x	0.5	30	Copper - Unequalized	QSFP56	Yes	PF34
Mellanox	MCP1650-H001E30	4x	1	30	Copper - Unequalized	QSFP56	Yes	PF34
Mellanox	MCP1650-H002E26	4x	2	26	Copper - Unequalized	QSFP56	Yes	PF34
Mellanox	MCP1650-H003E26	4x	3	26	Copper - Unequalized	QSFP56	Yes	PF34
Volex	VAHS-30-0572	4x	2	30	Copper - Unequalized	QSFP28	Yes	PF33
Volex	VAHS-26-0354	4x	2.5	26	Copper - Unequalized	QSFP28	Yes	PF33
Volex	VAHS-26-0355	4x	3	26	Copper - Unequalized	QSFP28	Yes	PF33

IBTA Integrators' List
October 2018 **EDR** Compliant Cables

Company Info		Cable Information					Integrators' List	Qualification
Company	Part Number	Width	Len (m)	AWG	Equalization	Type	EDR	Tested at
Finisar	FCBR425QB1C01	4x	1	NA	Fiber - Active	QSFP28	Yes	PF34
Finisar	FCBR425QB1CX0	4x	100	NA	Fiber - Active	QSFP28	Yes	PF34
Fujitsu	FPD-208R008-04	4x	4	NA	Fiber - Active	QSFP28	Yes	PF34
Fujitsu	FPD-208R008-05	4x	5	NA	Fiber - Active	QSFP28	Yes	PF34
Fujitsu	FPD-208R008-A0	4x	100	NA	Fiber - Active	QSFP28	Yes	PF34
Luxshare-ICT	PCRQQ1904-SD-R/A891A002	4x	100	n/a	Fiber - Active	QSFP28	Yes	PF34
Luxshare-ICT	PCRQQ1904-SD-R/A891A003	4x	100	n/a	Fiber - Active	QSFP28	Yes	PF34
Mellanox	MFS1200-E003	4x	3	N/A	Fiber - Active	QSFP	Yes	PF33
Mellanox	MFS1200-E200	4x	200	N/A	Fiber - Active	QSFP	Yes	PF33
Mellanox	MCP1600-E00A	4X	0.5	30	Copper - Unequalized	QSFP28	Yes	PF33
Mellanox	MCP1600-E001	4X	1	30	Copper - Unequalized	QSFP28	Yes	PF33
Mellanox	MCP1600-E003	4X	3	26	Copper - Unequalized	QSFP28	Yes	PF33
Mellanox	MCP1600-E03A	4X	3.5	24	Copper - Unequalized	QSFP28	Yes	PF33
Mellanox	MFA1A00-E003	4X	3	N/A	Fiber - Active	QSFP28	Yes	PF33
Mellanox	MFA1A00-E030	4X	30	N/A	Fiber - Active	QSFP28	Yes	PF33
Mellanox	MFA1A00-E050	4X	50	N/A	Fiber - Active	QSFP28	Yes	PF33
Mellanox	MFA1A00-E100	4X	100	N/A	Fiber - Active	QSFP28	Yes	PF33
Mellanox	MCP1650-H00AE30	4x	0.5	30	Copper - Unequalized	QSFP56	Yes	PF34
Mellanox	MCP1650-H001E30	4x	1	30	Copper - Unequalized	QSFP56	Yes	PF34
Mellanox	MCP1650-H002E26	4x	2	26	Copper - Unequalized	QSFP56	Yes	PF34
Mellanox	MCP1650-H003E26	4x	3	26	Copper - Unequalized	QSFP56	Yes	PF34
Volex	VAHS-26-0354	4x	2.5	26	Copper - Unequalized	QSFP28	Yes	PF33
Volex	VAHS-26-0355	4x	3	26	Copper - Unequalized	QSFP28	Yes	PF33

IBTA Integrators' List
October 2018 FDR Interoperability List

The following Interoperability results are provided in addiiton to the compliance results provided in the Integrators List. The Interoperability results are informative only and are not a pre-requisite for devices or cable assemblies to be listed in the Compliance section of the Integrators List. These results represent system tests and include the testing of the entire environment including device transmitters, cable media and device receivers. The Interoperability results include both FDR devices and cables.

While every effort was made to test worst-case conditions, results may vary with alternative port configurations, device and cable manufacturing variation, device firmware and software, traffic density and data patterns, temperature variation, etc. The following information identifies the test conditions used to obtain these Interoperability results.

Hardware used to test Interoperability

Interop Legend	Description
MSX6036G-2SFS MCX556A-EDAT	Mellanox FDR Sw to Mellanox EDR ConnectIX5 HCA
MSX6036G-2SFS MSB7800-ES2F	Mellanox FDR Sw to Mellanox EDR Sw
MSX6036G2SFS MSB7800-ES2F	Mellanox FDR Sw to Mellanox EDR Sw
MCX354A-FCCT MSB7800-ES2F	Mellanox FDR ConnectX3 HCA to Mellanox EDR Sw

Conditions for passing Interop	
Link Width	Link width is @ expected width - i.e. 1x,4x, etc
Link Speed	Link speed is @ expected speed - i.e. FDR
Link Recovery	There must be no errors during the MPI Run
Port Receive Errors	There must be no errors during the MPI Run
Symbol Errors	There must be no errors during the MPI Run
Port xmit Discard	There must be no discards during the MPI Run
MPI Test	The MPI test must run to completion without error

Manufacturer	Description of Hardware	Model	Type	HW	FW	SW	Speed	Status
Mellanox	ConnectX®-3 VPI card, 4X QSFP 56Gb/s	MCX354A-FCCT	HCA		2.42.5000	4.4.2.0.7.0	FDR	Compliant
Mellanox	ConnectX-4 VPI adapter card, EDR IB (100Gb/s) and	MCX456A-ECAT	HCA		12.23.1020	4.4.2.0.7.0	EDR	Compliant
Mellanox	ConnectX®-5 Ex VPI adapter card, EDR IB (100Gb/s)	MCX556A-EDAT	HCA		16.23.1020	4.4.2.0.7.0	EDR	Compliant
Mellanox	SwitchX® FDR Switch, 36 QSFP ports. Managed GW	MSX6036G-2SFS	Switch	X2	9.4.5070	3.6.8010	FDR	Compliant
Mellanox	SwitchX® EDR Switch, 36 QSFP ports. Managed	MSB7800-ES2F	Switch	X2	15.1703.000	3.6.8010	EDR	Compliant

Software Used to Test Interoperability

Software	Versions
Operating System	CentOS 7.5
OFED Version	MLNX_OFED_LINUX-4.4-2.0.7.0
Open MPI Used	Open MPI 3.1.2
Open MPI Documentation	https://www.open-mpi.org/doc/
Intel Benchmarks	https://software.intel.com/en-us/imb-user-guide
Test Plan version	IB Interop Testing MOI-2018-03-12.pdf
Test Duration	3-15 minutes

Open MPI Intel Benchmark Tests	
PingPong	Gather
PingPing	Gatherv
Sendrecv	Scatter
Exchange	Scatterv
Allreduce	Alltoall
Reduce	Alltoallv
Reduce_scatter	Bcast
Allgather	Barrier
Allgatherv	

IBTA Integrators' List
October 2018 FDR Interoperability List

Company Info		Cable Information					FDR Interop				Qualification
Company	Part Number	Width	Len (m)	AWG	Equalization	Connector Type	MSX6036G-SW MCX556A-HCA	MSX6036G-SW MSB7800-SW	MSX6036G-SW MSB7800-SW	MCX354A-HCA MSB7800-SW	Tested at Plugfest
Finisar	FCBN425QP1C01	4x	1	NA	Fiber - Active	QSFP28	Yes	No	No	No	PF34
Finisar	FCBN425QP1CX0	4x	100	NA	Fiber - Active	QSFP28	Yes	No	No	No	PF34
Finisar	FCBR425QB1C01	4x	1	NA	Fiber - Active	QSFP28	Yes	Yes	Yes	No	PF34
Finisar	FCBR425QB1CX0	4x	100	NA	Fiber - Active	QSFP28	Yes	Yes	Yes	No	PF34
Fujitsu	FPD-208R008-04	4x	4	NA	Fiber - Active	QSFP28	Yes	Yes	Yes	No	PF34
Fujitsu	FPD-208R008-05	4x	5	NA	Fiber - Active	QSFP28	Yes	Yes	Yes	No	PF34
Fujitsu	FPD-208R008-A0	4x	100	NA	Fiber - Active	QSFP28	Yes	Yes	Yes	No	PF34
Luxshare-ICT	CRQQ1904-SD-R/A891A0	4x	100	n/a	Fiber - Active	QSFP28	Yes	Yes	Yes	Yes	PF34
Luxshare-ICT	CRQQ1904-SD-R/A891A0	4x	100	n/a	Fiber - Active	QSFP28	Yes	Yes	Yes	Yes	PF34
Mellanox	MC220731V-003	4x	3	N/A	Fiber - Active	QSFP	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MC220731V-030	4x	30	N/A	Fiber - Active	QSFP	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MC220731V-100	4x	100	N/A	Fiber - Active	QSFP	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MFS1200-E003	4x	3	N/A	Fiber - Active	QSFP	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MFS1200-E200	4x	200	N/A	Fiber - Active	QSFP	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MC2207130-001	4x	1	30	Copper - Unequalized	QSFP	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MC2207130-0A1	4x	1.5	30	Copper - Unequalized	QSFP	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MC2207130-002	4x	2	30	Copper - Unequalized	QSFP+	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MC2207128-0A2	4x	2.5	28	Copper - Unequalized	QSFP+	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MC2207128-003	4x	3	28	Copper - Unequalized	QSFP+	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MCP1600-E00A	4X	0.5	30	Copper - Unequalized	QSFP28	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MCP1600-E001	4X	1	30	Copper - Unequalized	QSFP28	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MCP1600-E003	4X	3	26	Copper - Unequalized	QSFP28	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MCP1600-E03A	4X	3.5	24	Copper - Unequalized	QSFP28	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MFA1A00-E003	4X	3	N/A	Fiber - Active	QSFP28	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MFA1A00-E030	4X	30	N/A	Fiber - Active	QSFP28	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MFA1A00-E050	4X	50	N/A	Fiber - Active	QSFP28	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MFA1A00-E100	4X	100	N/A	Fiber - Active	QSFP28	See PF33	See PF33	See PF33	See PF33	*PF33*
Mellanox	MCP1650-H00AE30	4x	0.5	30	Copper - Unequalized	*QSFP56*	Yes	Yes	Yes	Yes	PF34
Mellanox	MCP1650-H001E30	4x	1	30	Copper - Unequalized	*QSFP56*	Yes	Yes	Yes	Yes	PF34
Mellanox	MCP1650-H002E26	4x	2	26	Copper - Unequalized	*QSFP56*	Yes	Yes	Yes	Yes	PF34
Mellanox	MCP1650-H003E26	4x	3	26	Copper - Unequalized	*QSFP56*	Yes	Yes	Yes	Yes	PF34
Volex	VAHS-30-0572	4x	2	30	Copper - Unequalized	QSFP28	See PF33	See PF33	See PF33	See PF33	*PF33*
Volex	VAHS-26-0354	4x	2.5	26	Copper - Unequalized	QSFP28	See PF33	See PF33	See PF33	See PF33	*PF33*
Volex	VAHS-26-0355	4x	3	26	Copper - Unequalized	QSFP28	See PF33	See PF33	See PF33	See PF33	*PF33*

IBTA Integrators' List
October 2018 EDR Interoperability List

The following Interoperability results are provided in addiiton to the compliance results provided in the Integrators List. The Interoperability results are informative only and are not a pre-requisite for devices or cable assemblies to be listed in the Compliance section of the Integrators List. These results represent system tests and include the testing of the entire environment including device transmitters, cable media and device receivers. The Interoperability results include both FDR devices and cables.

While every effort was made to test worst-case conditions, results may vary with alternative port configurations, device and cable manufacturing variation, device firmware and software, traffic density and data patterns, temperature variation, etc. The following information identifies the test conditions used to obtain these Interoperability results.

Hardware used to test Interoperability

Interop Legend	Description
MSB7800-ES2F MCX556A-EDAT	Mellanox **FDR** Sw to Mellanox **EDR** ConnectX5 HCA
MCX456A-ECAT MCX556A-EDAT	Mellanox **EDR** HCA to Mellanox **EDR** HCA

Conditions for passing Interop	
Link Width	Link width is @ expected width - i.e. 1x,4x, etc
Link Speed	Link speed is @ expected speed - i.e. FDR
Link Recovery	There must be no errors during the MPI Run
Port Receive Errors	There must be no errors during the MPI Run
Symbol Errors	There must be no errors during the MPI Run
Port xmit Discard	There must be no discards during the MPI Run
MPI Test	The MPI test must run to completion without error

Manufacturer	Description of Hardware	Model	Type	HW	FW	SW	Speed	Status
Mellanox	ConnectX-4 VPI adapter card, EDR IB (100Gb/s) and 100GbE, dual-port	MCX456A-ECAT	HCA		12.23.1020	4.4.2.0.7.0	**EDR**	**Compliant**
Mellanox	ConnectX-5 VPI adapter card; EDR IB (100Gb/s) and 100GbE; dual-port	MCX556A-EDAT	HCA		16.23.1020	4.4.2.0.7.0	**EDR**	**Compliant**
Mellanox	Switch-IB 2 based EDR InfiniBand 1U Switch; 36 QSFP28 ports	MSB7800-ES2F	Switch		15.1703.0002	3.6.8010	**EDR**	**Compliant**

Software Used to Test Interoperability

Software	Versions
Operating System	CentOS 7.5
OFED Version	MLNX_OFED_LINUX-4.4-2.0.7.0
Open MPI Used	Open MPI 3.1.2
Open MPI Documentation	https://www.open-mpi.org/doc/
Intel Benchmarks	https://software.intel.com/en-us/imb-user-guide
Test Plan version	IB Interop Testing MOI-2018-03-12.pdf
Test Duration	3-15 minutes

Open MPI Intel Benchmark Tests	
PingPong	Gather
PingPing	Gatherv
Sendrecv	Scatter
Exchange	Scatterv
Allreduce	Alltoall
Reduce	Alltoallv
Reduce_scatter	Bcast
Allgather	Barrier
Allgatherv	

IBTA Integrators' List
October 2018 EDR Interoperability List

Company Info		Cable Information					EDR Interop		Qualification
Company	Part Number	Width	Len (m)	AWG	Equalization	Connector Type	MSB7800-SW MCX556A-HCA	MCX456A-HCA MCX556A-HCA	Tested at Plugfest
Finisar	FCBR425QB1C01	4x	1	NA	Fiber - Active	QSFP28	Yes	Yes	PF34
Finisar	FCBR425QB1CX0	4x	100	NA	Fiber - Active	QSFP28	Yes	Yes	PF34
Fujitsu	FPD-208R008-04	4x	4	NA	Fiber - Active	QSFP28	Yes	Yes	PF34
Fujitsu	FPD-208R008-05	4x	5	NA	Fiber - Active	QSFP28	Yes	Yes	PF34
Fujitsu	FPD-208R008-A0	4x	100	NA	Fiber - Active	QSFP28	Yes	Yes	PF34
Luxshare-ICT	PCRQQ1904-SD-R/A891A002	4x	100	n/a	Fiber - Active	QSFP28	Yes	Yes	PF34
Luxshare-ICT	PCRQQ1904-SD-R/A891A003	4x	100	n/a	Fiber - Active	QSFP28	Yes	Yes	PF34
Mellanox	MFS1200-E003	4x	3	N/A	Fiber - Active	QSFP	See PF33	See PF33	PF33
Mellanox	MFS1200-E200	4x	200	N/A	Fiber - Active	QSFP	See PF33	See PF33	PF33
Mellanox	MCP1600-E00A	4X	0.5	30	Copper - Unequalized	QSFP28	See PF33	See PF33	PF33
Mellanox	MCP1600-E001	4X	1	30	Copper - Unequalized	QSFP28	See PF33	See PF33	PF33
Mellanox	MCP1600-E003	4X	3	26	Copper - Unequalized	QSFP28	See PF33	See PF33	PF33
Mellanox	MCP1600-E03A	4X	3.5	24	Copper - Unequalized	QSFP28	See PF33	See PF33	PF33
Mellanox	MFA1A00-E003	4X	3	N/A	Fiber - Active	QSFP28	See PF33	See PF33	PF33
Mellanox	MFA1A00-E030	4X	30	N/A	Fiber - Active	QSFP28	See PF33	See PF33	PF33
Mellanox	MFA1A00-E050	4X	50	N/A	Fiber - Active	QSFP28	See PF33	See PF33	PF33
Mellanox	MFA1A00-E100	4X	100	N/A	Fiber - Active	QSFP28	See PF33	See PF33	PF33
Mellanox	MCP1650-H00AE30	4x	0.5	30	Copper - Unequalized	QSFP56	Yes	Yes	PF34
Mellanox	MCP1650-H001E30	4x	1	30	Copper - Unequalized	QSFP56	Yes	Yes	PF34
Mellanox	MCP1650-H002E26	4x	2	26	Copper - Unequalized	QSFP56	Yes	Yes	PF34
Mellanox	MCP1650-H003E26	4x	3	26	Copper - Unequalized	QSFP56	Yes	Yes	PF34
Volex	VAHS-26-0354	4x	2.5	26	Copper - Unequalized	QSFP28	See PF33	See PF33	PF33
Volex	VAHS-26-0355	4x	3	26	Copper - Unequalized	QSFP28	See PF33	See PF33	PF33

InfiniBand Trade Association

Plugfest 34
Test Equipment
Providers

The **IBTA** wishes to thank **Anritsu, Keysight, Molex, 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:

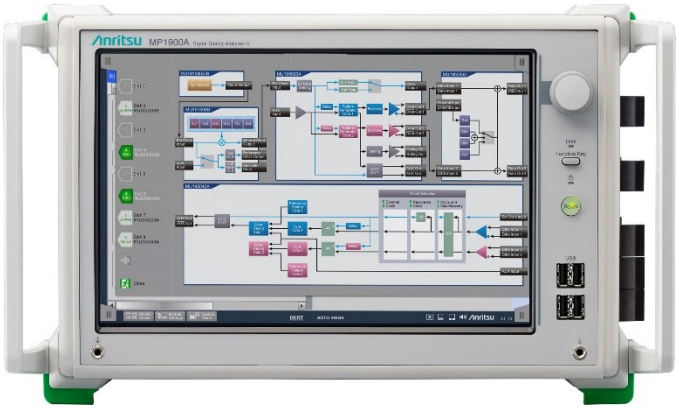
- Pulse Pattern Generator supports output of high-quality / low jitter NRZ and PAM4 waveforms. Integrated emphasis and flexible pattern generation for PAM4 applications.
- Error Detector with high input sensitivity and integrated clock recovery. Includes signal analysis tools such as Bathtub, Jitter 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:

1. https://www.anritsu.com/en-US/test-measurement/products/MP1900A
2. https://dl.cdn-anritsu.com/en-en/test-measurement/files/Product-Introductions/Product-Introduction/mp1900a-64g-el1200.pdf
3. https://dl.cdn-anritsu.com/en-en/test-measurement/files/Brochures-Datasheets-Catalogs/Brochure/mp1900a-64g-e1100.pdf



Anritsu - Signal Quality Analyzer MP1800A

The MP1800A Signal Quality Analyzer is an expandable plug-in modular BERT supporting wideband bit rates from 0.1 to 32.1 Gb/s for versatile signal integrity analysis applications, such as InfiniBand EDR (26G x 4), 100 GbE (25G x 4), OTU-4 (28G x 4), 32G DP-QPSK, CEI-28G and 32G FC.

MP1800A System Features:

- Pulse Pattern Generator (PPG) supports output of high-quality, low jitter, and high amplitude signals.
- Error Detector (ED) with high input sensitivity supporting signal analysis, such as Bathtub Jitter and Eye Diagram Measurements. 32G Clock Recovery.
- Error Detector Bathtub measurements for jitter (J2 & J9) measurements.
- Jitter Modulation for SJ/RJ/BUJ/SSC generation and supporting Jitter Tolerance tests.

IBTA Application:

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

MP1800A Literature:

1. http://www.anritsu.com/en-US/Products-Solutions/Products/MP1800A.aspx
2. https://dl.cdn-anritsu.com/en-en/test-measurement/files/Brochures-Datasheets-Catalogs/Brochure/mp1800a-32g-e11601.pdf

MP1800A Front View

Anritsu - MP1825B - 4Tap Emphasis

Combined use of the MP1800A and the MP1825B 4Tap Emphasis generates 2 and 3-tap pre-emphasis signals for high speed interconnects up to 32.1 Gb/s, such as InfiniBand EDR (26G x 4), CEI-28G and 32G FC, as well as 4-tap signals.

As a compact remote unit, the MP1825 4Tap Emphasis can be placed very close to the DUT, keeping cables short and preserving high signal quality. Precision signal integrity analysis is supported by pre-emphasis. In addition, MP1825 supports highly accurate Jitter Tolerance measurements due to transparency of the clock and data paths through the unit.

IBTA Application:

- QDR, FDR and EDR Active Cable Time Domain Testing (ATD)
- Precise adjustment of victim input signal characteristics such as DDWPS and Eye Mask parameters

MP1825B - 4Tap Emphasis Literature:

1. http://www.anritsu.com/en-US/Products-Solutions/Products/MP1825B.aspx
2. http://www.anritsu.com/en-US/Downloads/Brochures-Datasheets-and-Catalogs/Brochure/DWL8910.aspx

MP1825B Front View

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:

1. https://www.anritsu.com/en-US/test-measurement/products/mp2110a
2. https://www.anritsu.com/en-US/test-measurement/support/downloads/brochures-datasheets-and-catalogs/dwl18237
3. https://www.anritsu.com/en-US/test-measurement/support/downloads/brochures-datasheets-and-catalogs/dwl18236

MP2110A Front View with External Monitor

Anritsu – MP2100B- BERTWave

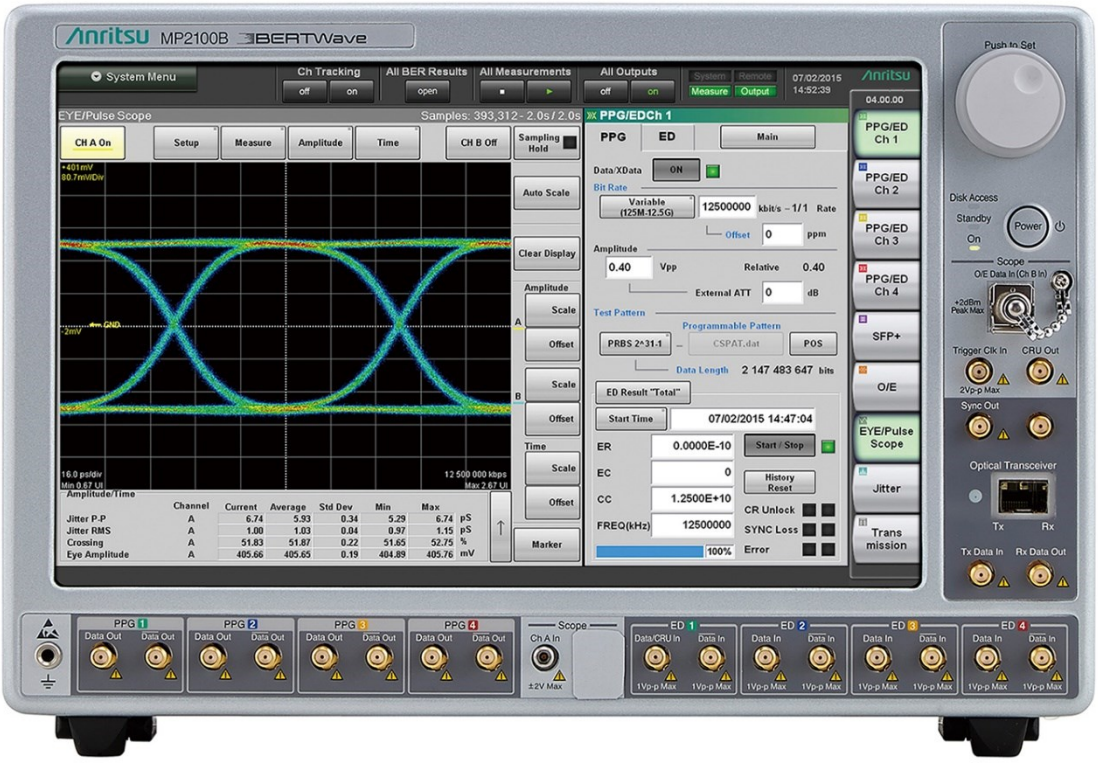
The MP2100B BERTWave supports simultaneous BER measurements and eye pattern analysis for evaluating active optical devices. The Jitter Analysis Software provides accurate jitter analysis and decomposition.

IBTA Application:

- QDR / FDR Active Cable Time Domain Testing (ATD).
- 25GHz BW Sampling Scope
- Eye Mask functions for Victim Input calibration and DUT Output measurements
- Jitter Decomposition (TJ, DJ, J2, J9, DDWPS) for Victim Input Calibration / DUT Output measurements

MP2100B - BERTWave Literature:

1. https://www.anritsu.com/en-US/test-measurement/products/mp2100b
2. https://dl.cdn-anritsu.com/en-en/test-measurement/files/Brochures-Datasheets-Catalogs/Brochure/mp2100b-e1300.pdf



MP2100B Front View

Anritsu – MT1000A Network Master Pro

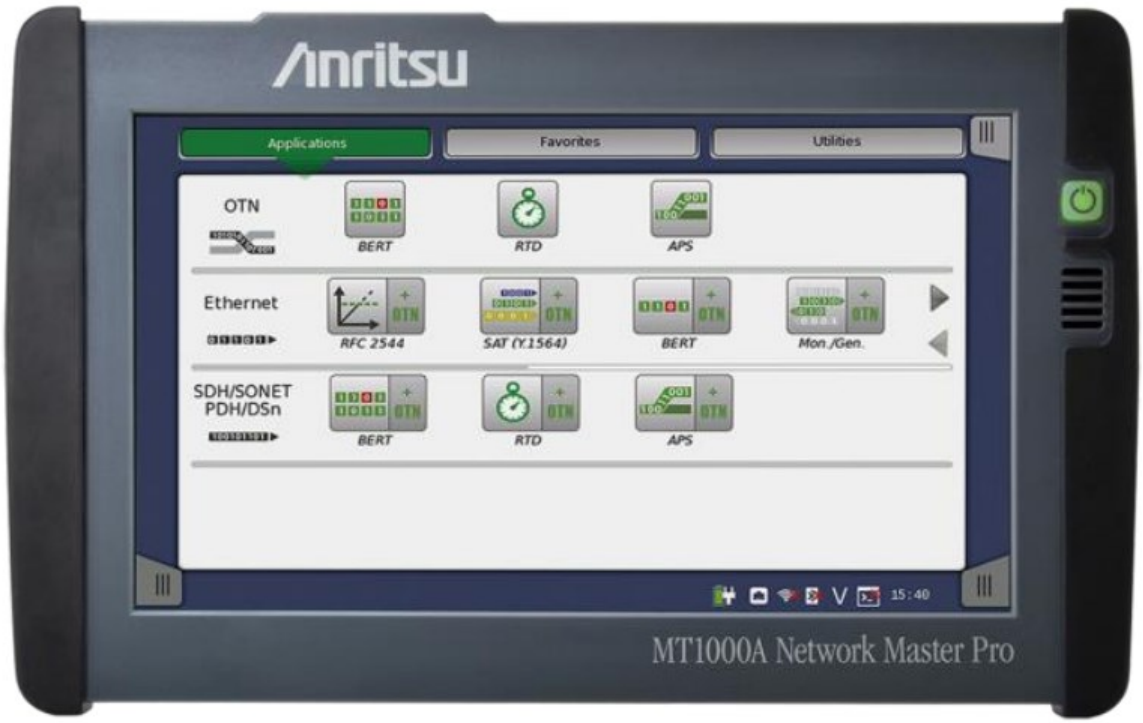
The MT1000A is an all-in-one portable tester with expandability and operability for speeds up to 100Gb/s. The compact, battery-powered and easy-to-use Anritsu MT1000A provides everything needed to install and maintain communication networks in a rugged, field portable package. This lightweight instrument 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:

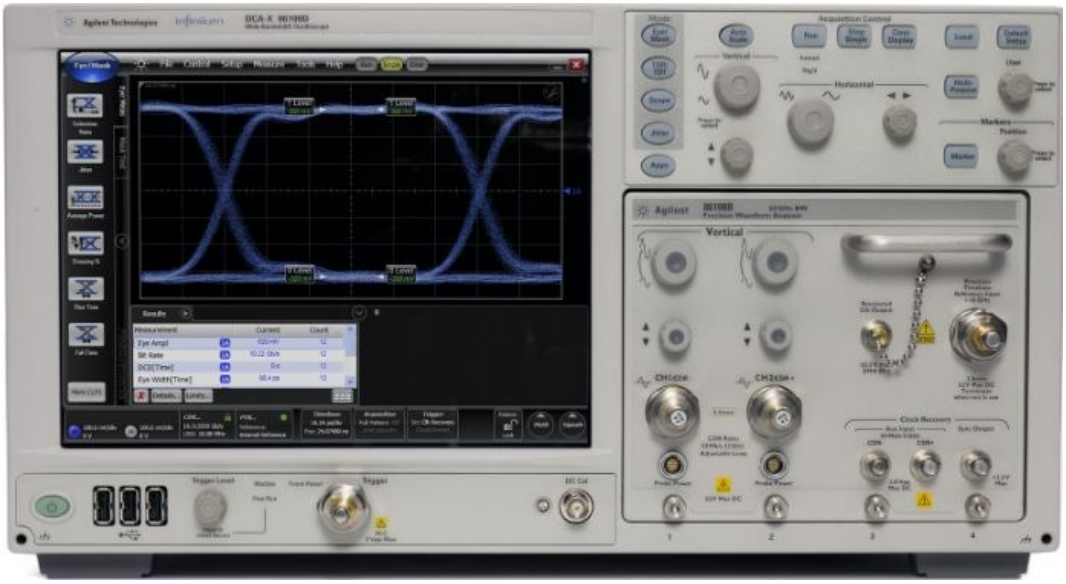
1. https://www.anritsu.com/en-us/test-measurement/products/mt1000a
2. https://dl.cdn-anritsu.com/en-en/test-measurement/files/Brochures-Datasheets-Catalogs/Brochure/mt1000a-10g100g-brochure-e12100.pdf
3. https://dl.cdn-anritsu.com/en-en/test-measurement/files/Product-Introductions/Product-Introduction/mt1000a-100g-product-intro-el1200.pdf



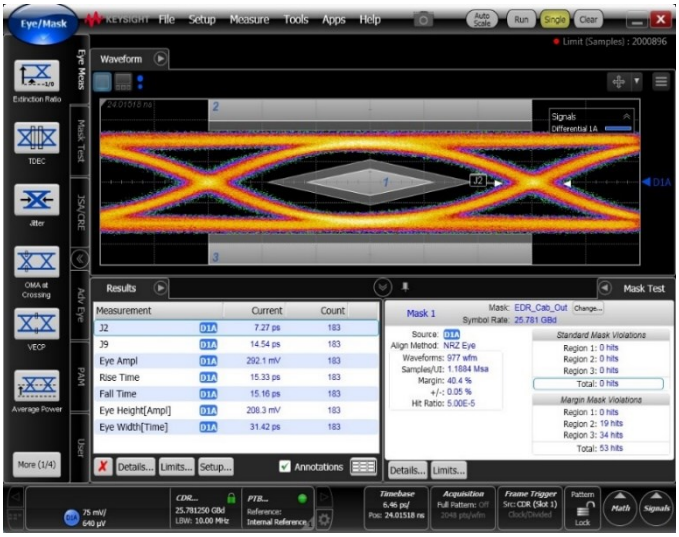
MT1000A Front View

Keysight - Sampling Scope

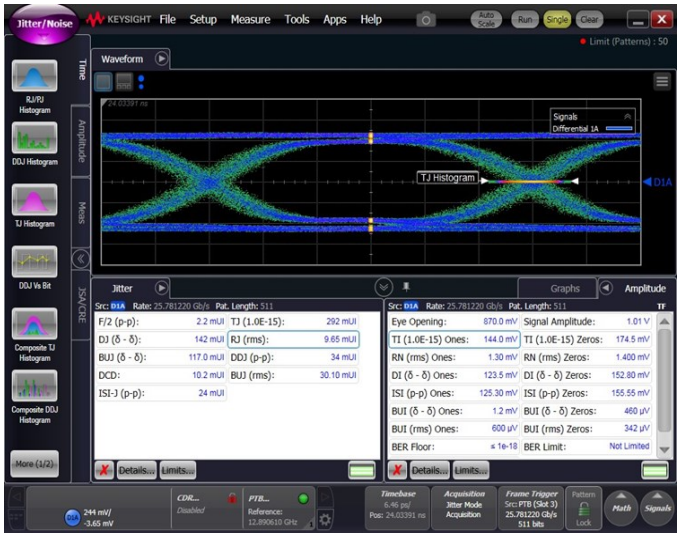
The 86108B Precision Waveform Analyzer, a plug-in module used with the Keysight 86100C/D Infiniium DCA family of oscilloscopes, has been engineered to provide precision measurements on high-speed electrical communications systems and components. With industry-best residual jitter below 50 fs rms (typical), channel bandwidths to 50 GHz, and an integrated instrumentation grade hardware clock recovery circuit, the 86108B provides accurate jitter analysis, eye diagram, and waveform characterization on signals from 50 Mb/s to 32 Gb/s.



86100D_DCA-X_with_86108B_module



Eye Mask, J2, J9, Time Domain



Eye Width & Height, Jitter Analysis

Links

1. **86100D DCA-X Wide-Bandwidth Oscilloscope**: 86100D
2. **86108B Precision Waveform Analyzer**: 86108B

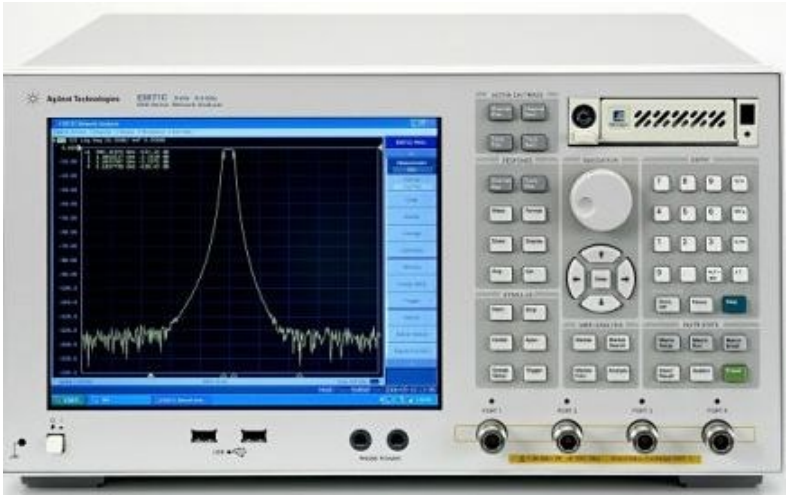
IBTA Application: FDR and EDR HCA and Switch physical layer testing, and EDR Active Cable Time Domain testing.

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

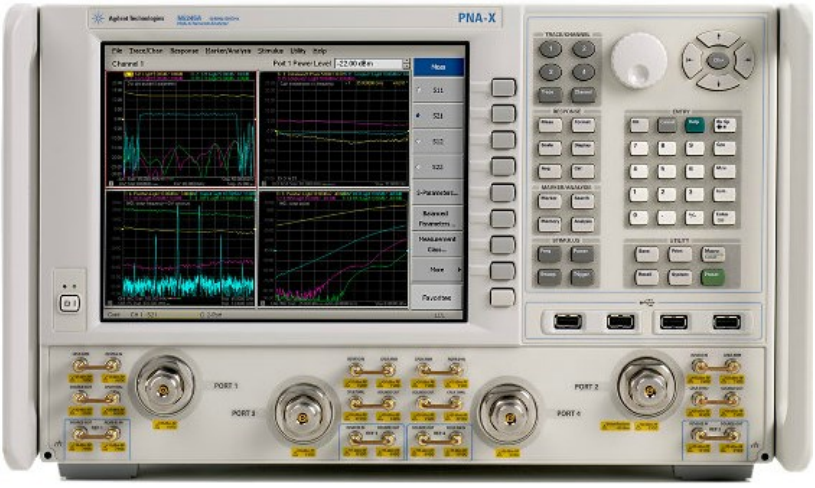


20 GHZ ENA Series Network Analyzer

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

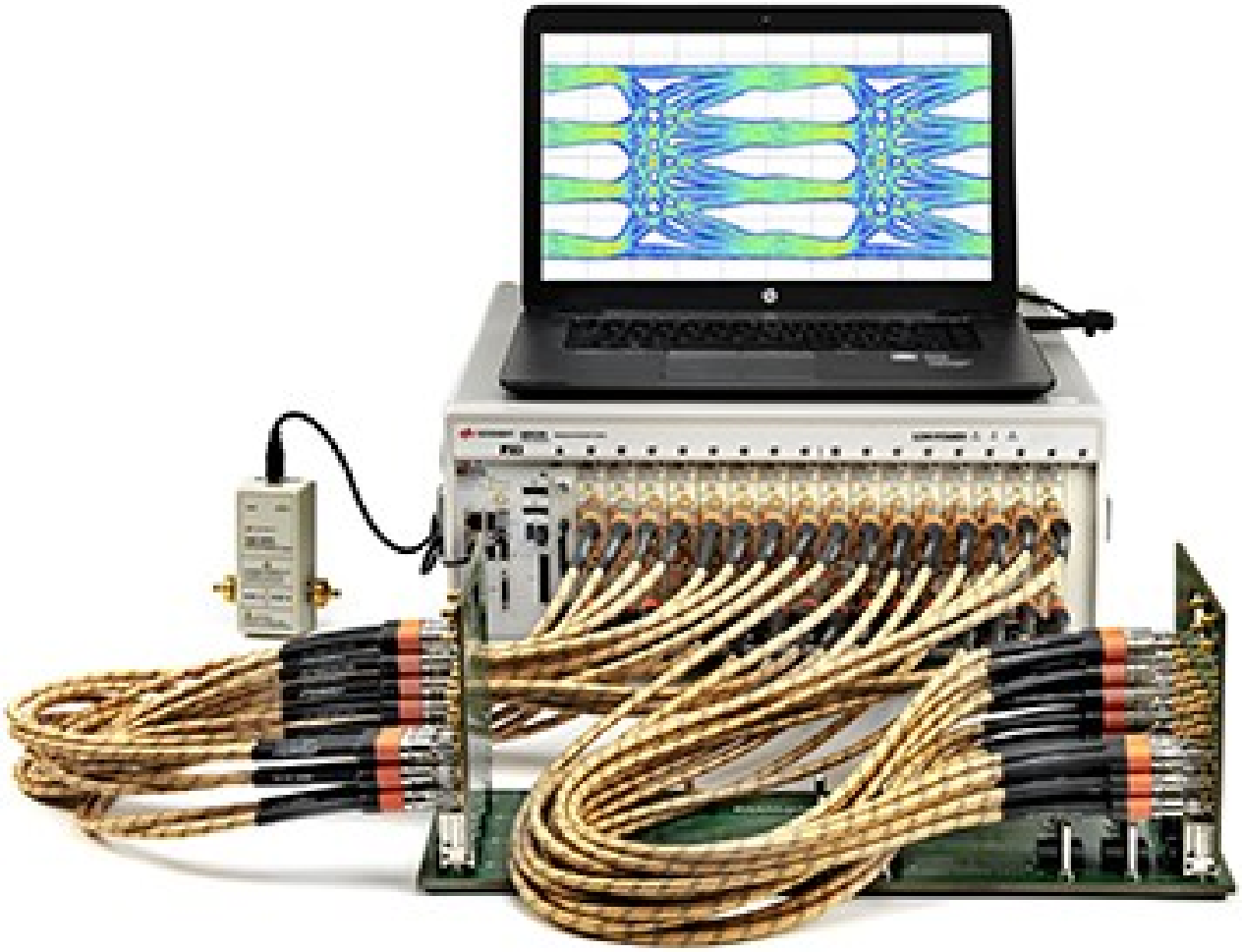


IBTA Application:

- 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:

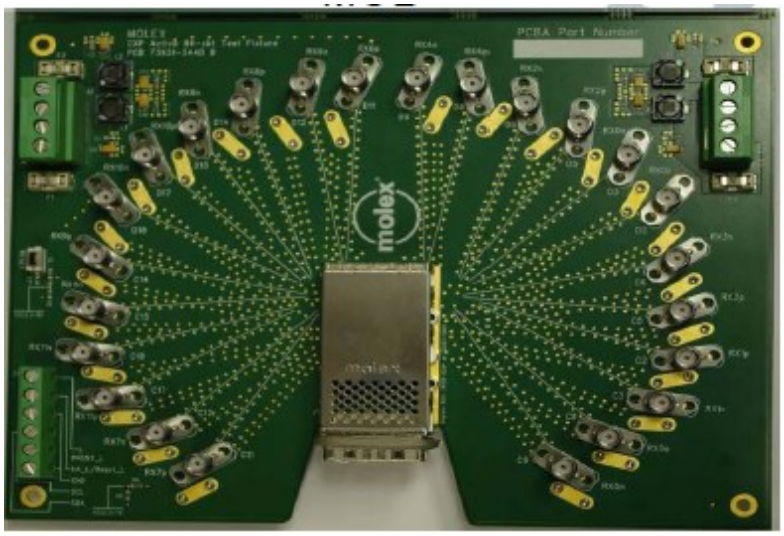
- FDR and EDR Cable testing. ICN, ICMCN, ILD, SDDxx, SCCxx and SDCxx

Molex – Module Compliance Boards (MCB)

Molex QDR QSFP Test Board
0739313022 QDR QSFP Evaluation Board

Molex FDR & EDR zQSFP+ Test Board
1111143022 zQSFP+ Evaluation Board

Molex QDR CXP Test Board
Part Number: 73931-3442



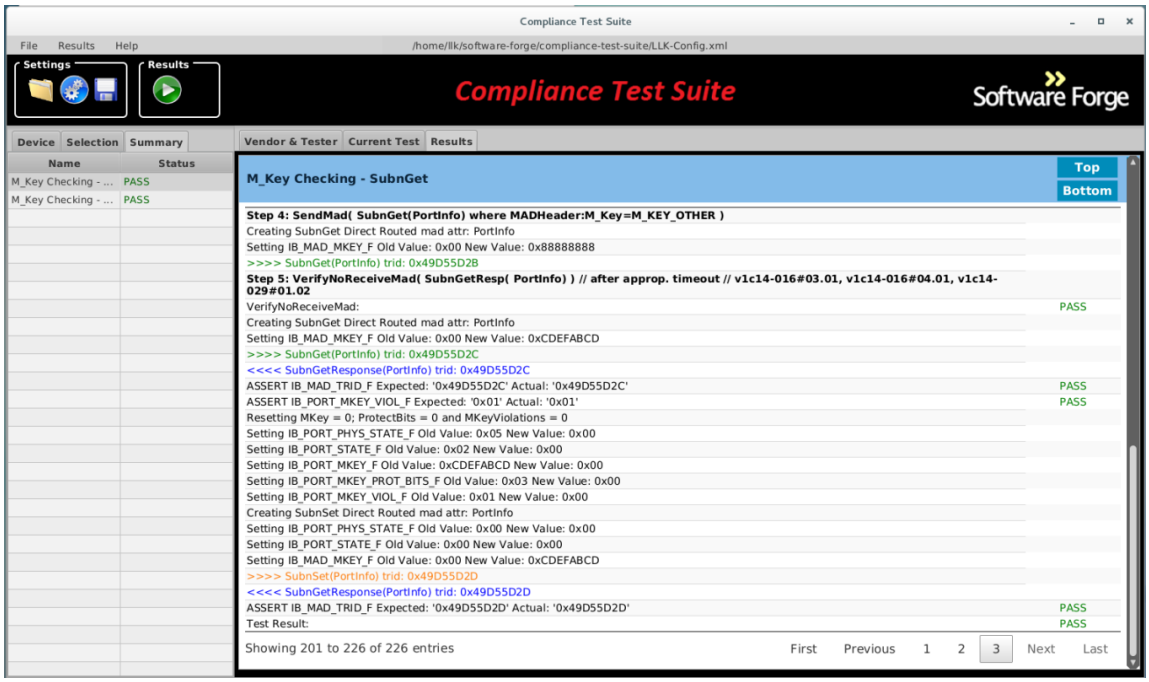
Please contact a Molex Representative via www.molex.com to purchase this board.

IBTA Applications:

- CXP & QSFP MCB
  - QDR TDR Cable Testing
- zQSFP+
  - QDR, FDR and EDR Active Cable Time Domain Testing (ATD)
  - FDR and EDR VNA testing

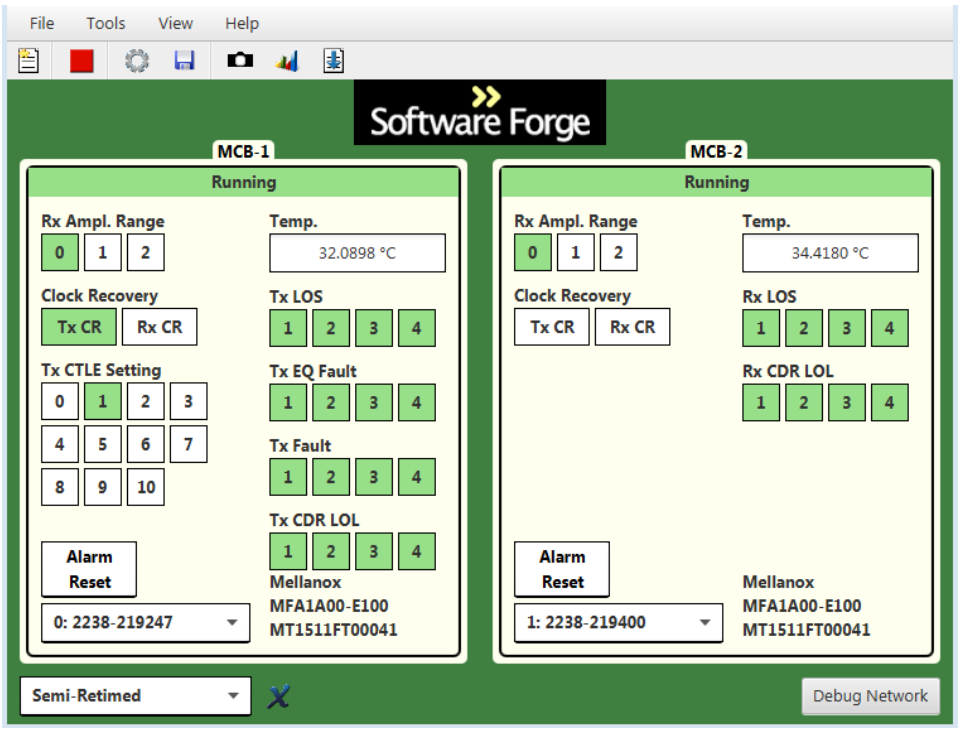
Software Forge – Compliance Test Suite (CTS)

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.



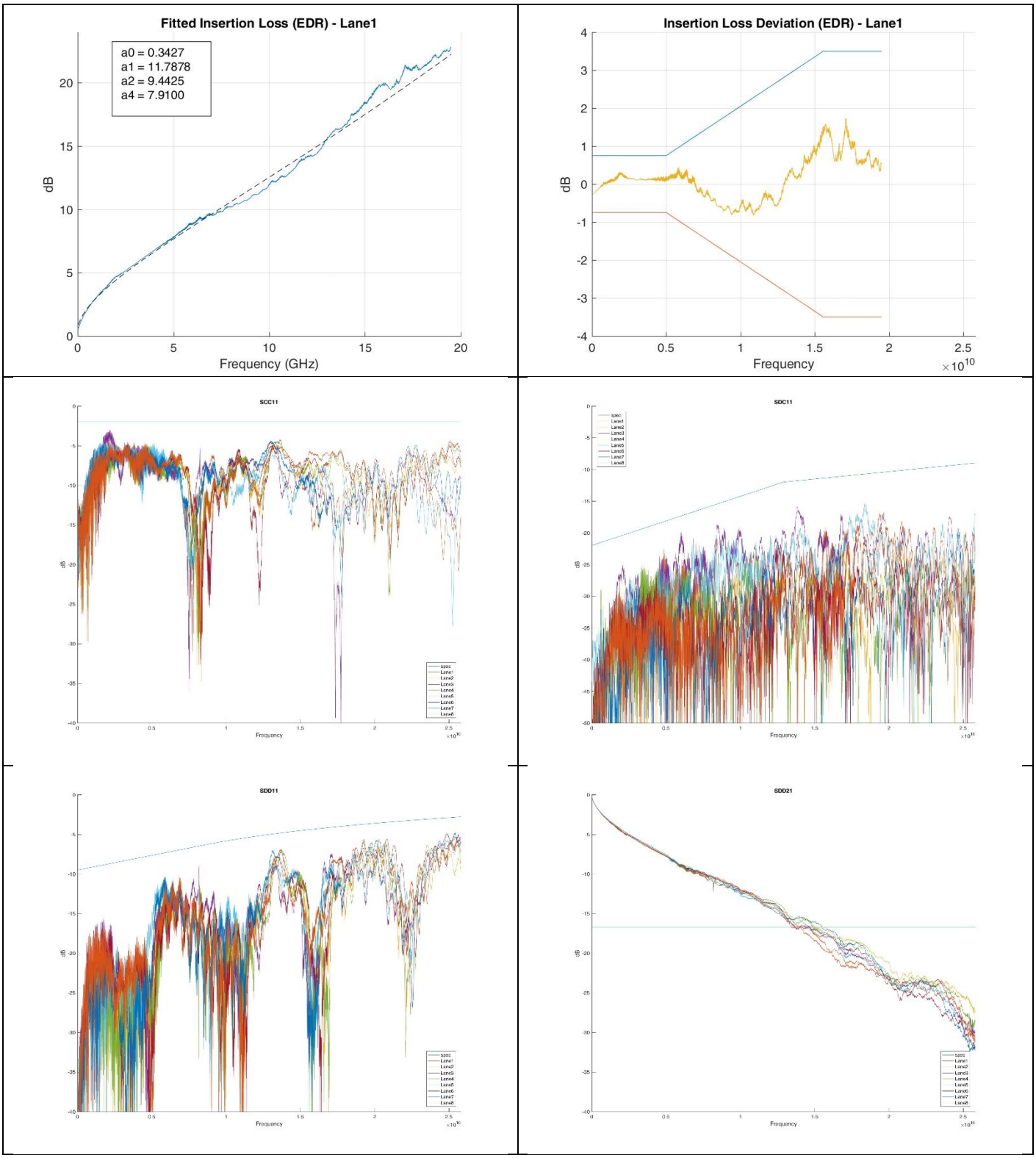
Software Forge – EEPROM Command Center (ECC)

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.



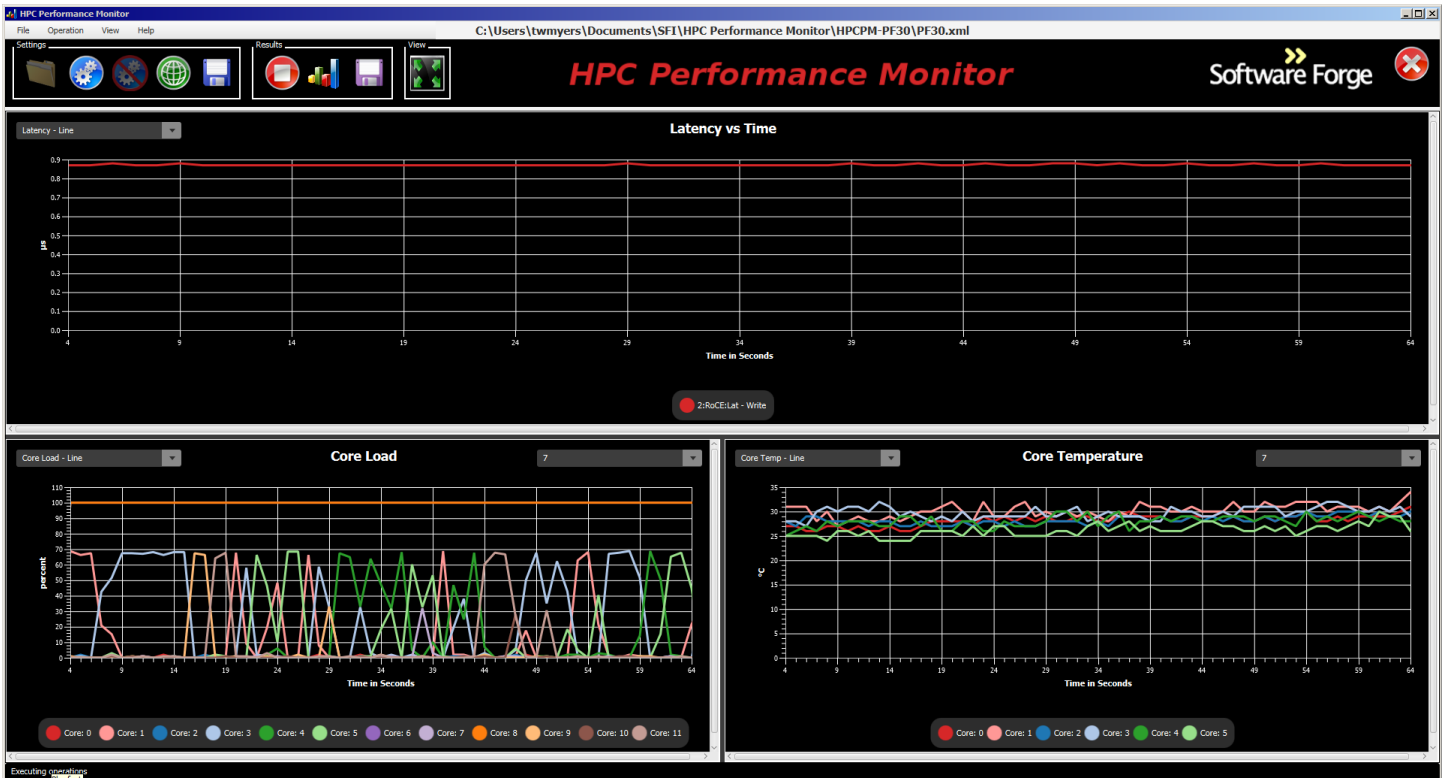
Software Forge – Vector Network Analyzer (VNA) MATLAB Application

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:

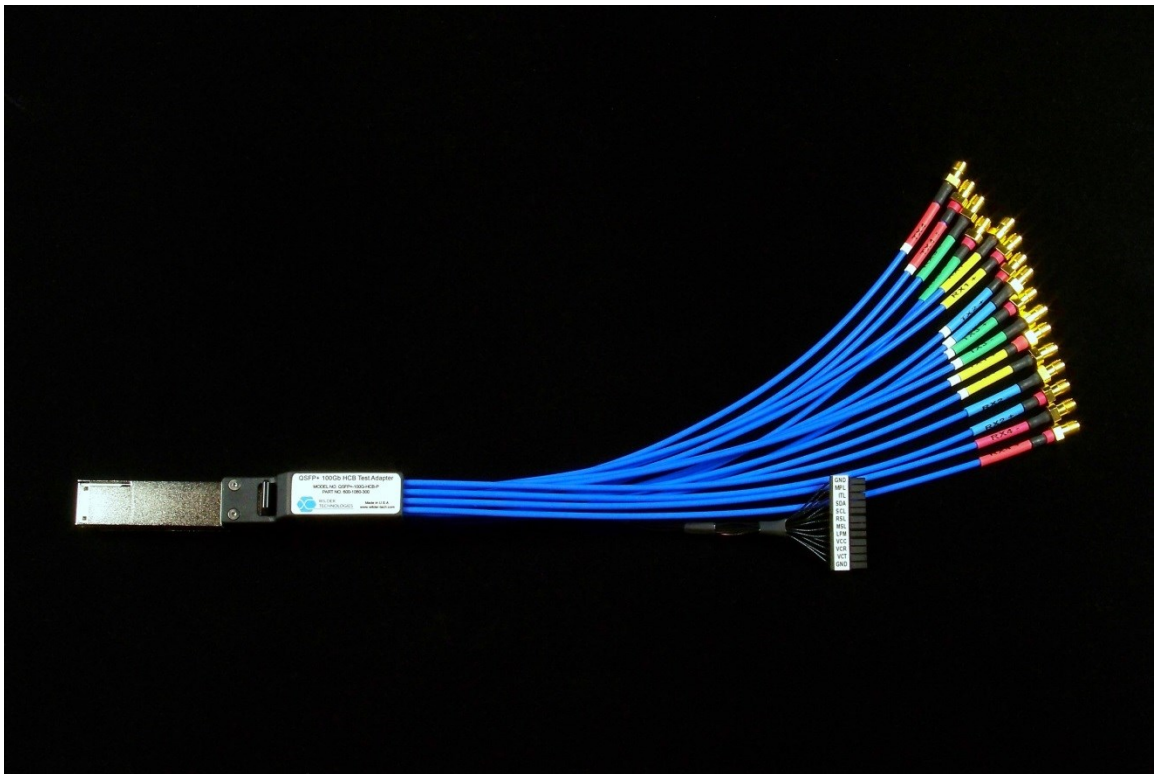
- EDR Active Cable Time Domain Testing (ATD)
- Precise adjustment of frequency-dependent input channel loss.

CLE-1000-S2

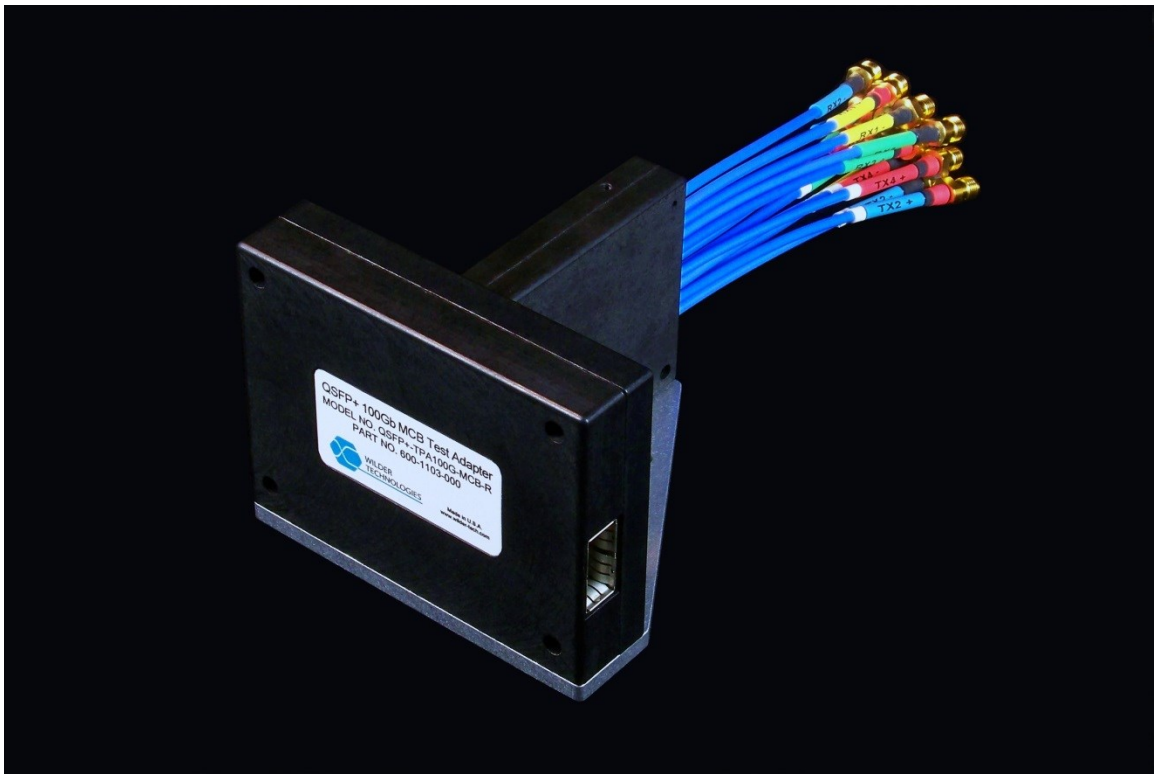
1. http://www.aceunitech.com/index.html
2. http://www.aceunitech.com/docs/support/cl1000_datasheet.pdf

CLE-1000-S2 Front View

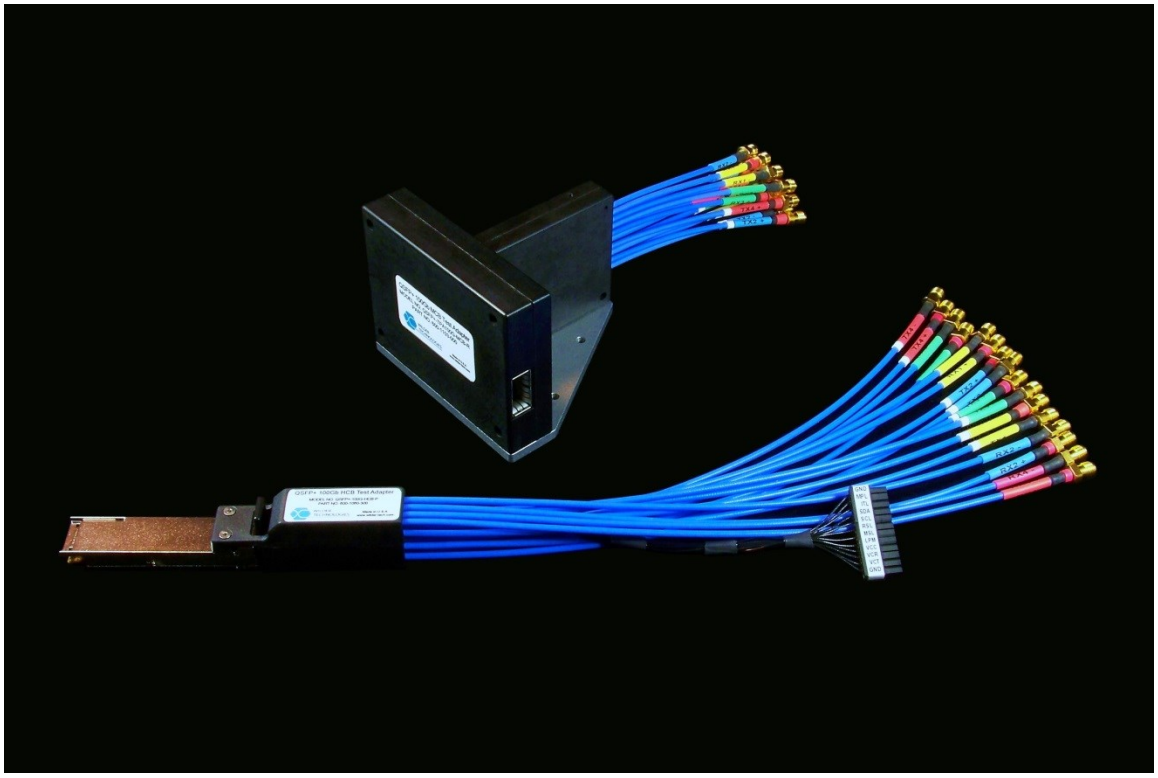
Wilder QSFP 28 Test fixture: https://www.wilder-tech.com/en/products/datacomm#qsfp-28



Wilder Host Compliance Board (HCB)



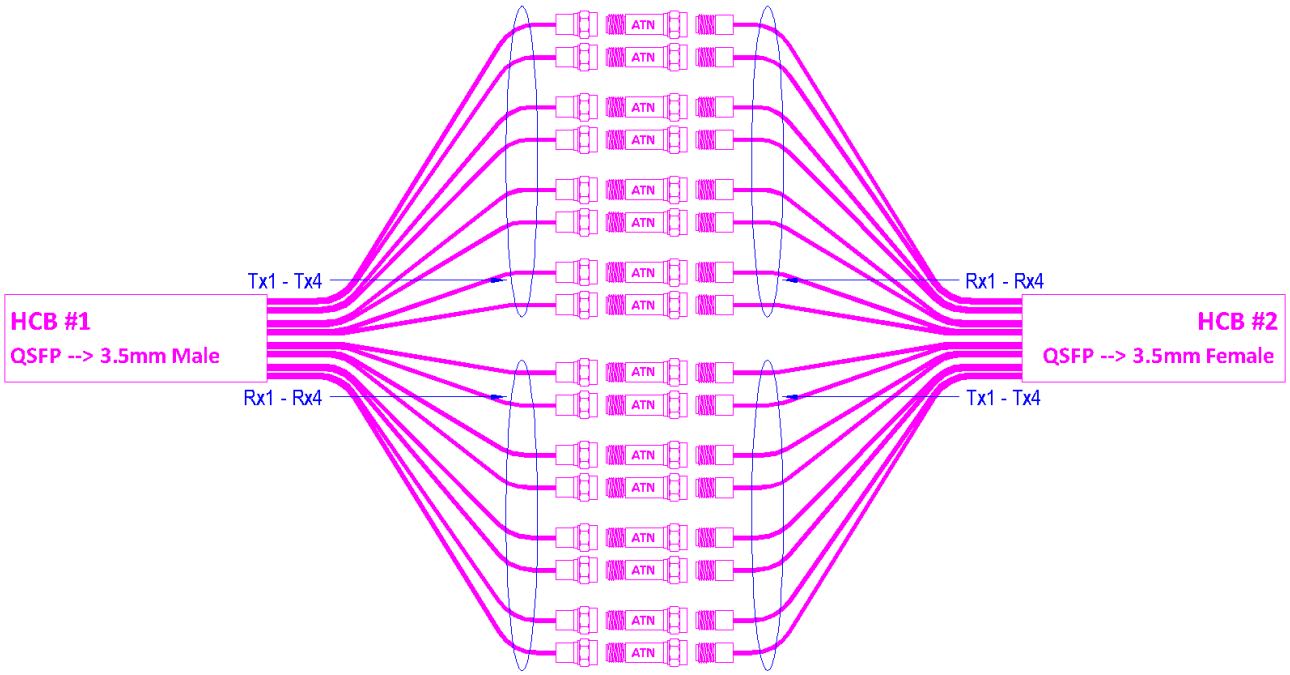
Wilder Module Compliance Board (MCB)

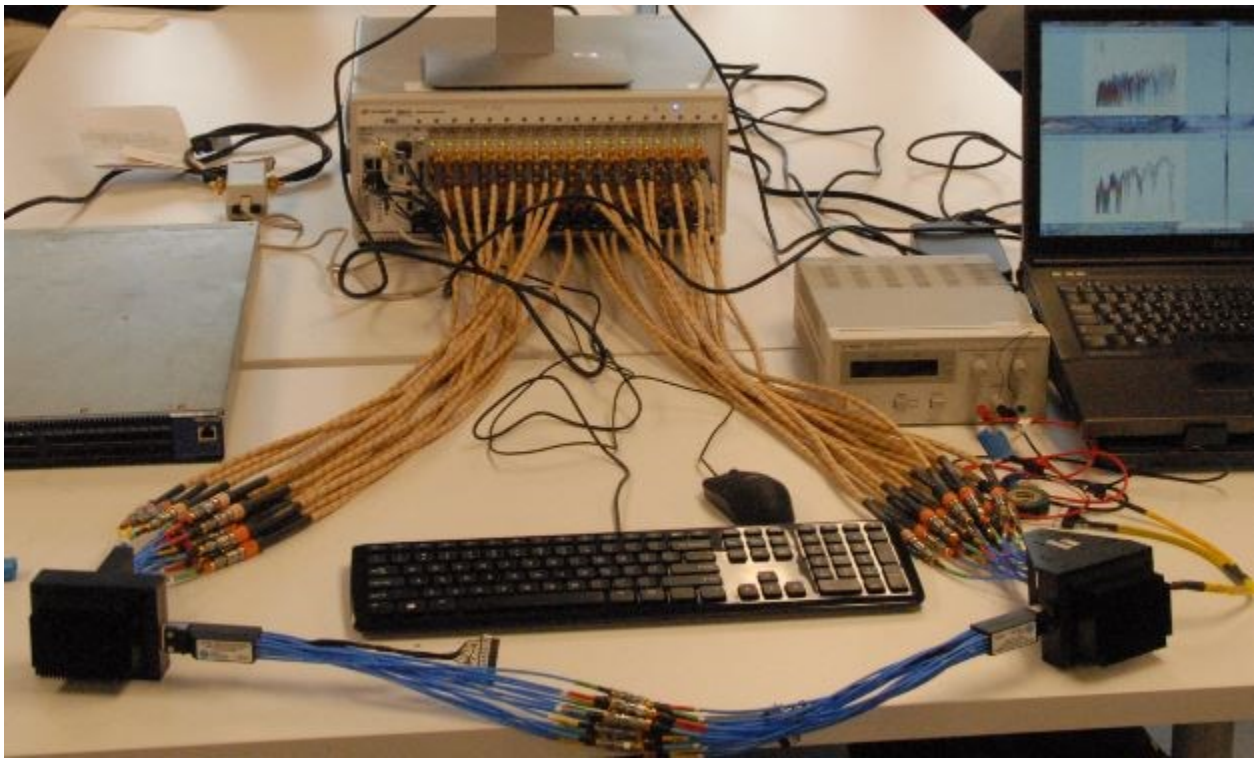


IBTA Applications:

- 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

Physical layer Test Equipment Methods of Implementation (MOI)

IBTA Active Time Domain (ATD) Testing for FDR Cables

- Anritsu ATD MOI for Active FDR Cables
- Tektronix ATD MOI for FDR Active Cables

IBTA Active Time Domain (ATD) Testing for EDR Cables

- Anritsu ATD MOI for Active EDR Cables
- Tektronix ATD MOI for Active EDR 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-Tektronix Receiver MOI
- Agilent-Anritsu Receiver MOI

Protocol Layer Test Equipment used in the IBTA Plugfests

InfiniBand Protocol Analyzers

- LeCroy IBTracer 4x - SDR
  - http://www.lecroy.com/protocolanalyzer/protocoloverview.aspx?seriesid=128
- Mellanox ibdump used with Wireshark
  - http://www.mellanox.com/page/products_dyn?product_family=110&mtag=monitoring_debug
  - http://www.wireshark.com/

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 October 2017.

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/blog/
  - https://www.infinibandta.org/events/
- **IBTA Specifications**:
  - https://cw.infinibandta.org/wg/Members/home/Member_Specifications
  - Volume 1 – this is the protocol layer spec that covers from Layer 3 and up.
  - Volume 2 – this covers Layers 1-2. The updated draft includes all the specs for FDR.
  - 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)
  - Annex A 16: RoCE
  - Annex A 17: RoCEv2
  - Annex A 18: Virtualization
- **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/document/dl/7937
  - Plugfest Information:
    - https://www.infinibandta.org/plugfest/
- **Test Methods of Implementation**
  - https://www.infinibandta.org/methods-of-implementation/
- **IBTA Site Map**
  - https://www.infinibandta.org/page/2/?s=site+map