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Third-Party 400G Testing of Siemon's Singlemode Ultra Low Loss System

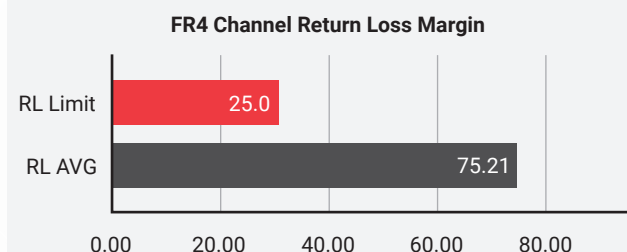
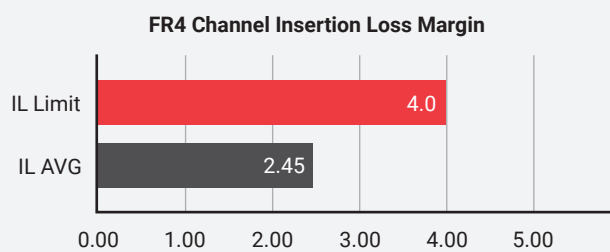
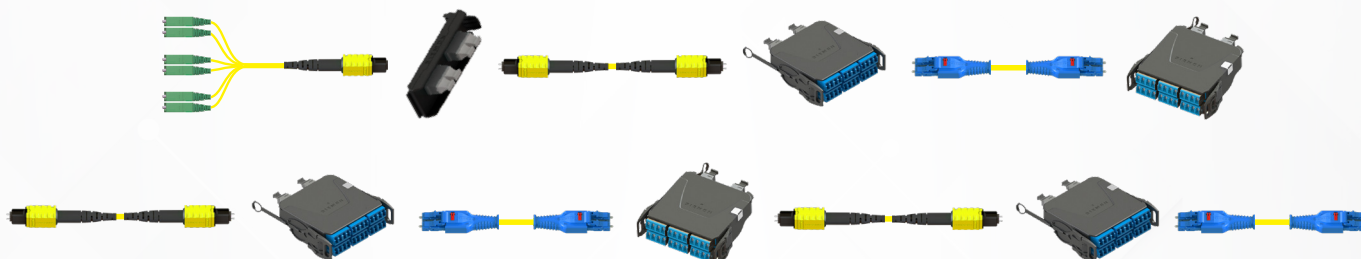
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What testing was done?

Insertion Loss and Return Loss testing to 400GBASE-DR4 as defined in IEEE 802.3bs™-2017 and 400GBASE-FR4 as defined in IEEE 802.3cu™-2021. All fibers in the channels were tested at 1310 and 1550nm to confirm compliance to channel limits. All testing was witnessed and certified by Intertek Testing Services on January 14, 2022.

What cabling channels were tested?

400G-FR4 channel with 5 x MTP-LC modules and 1 x MTP over max allowed channel of 2km

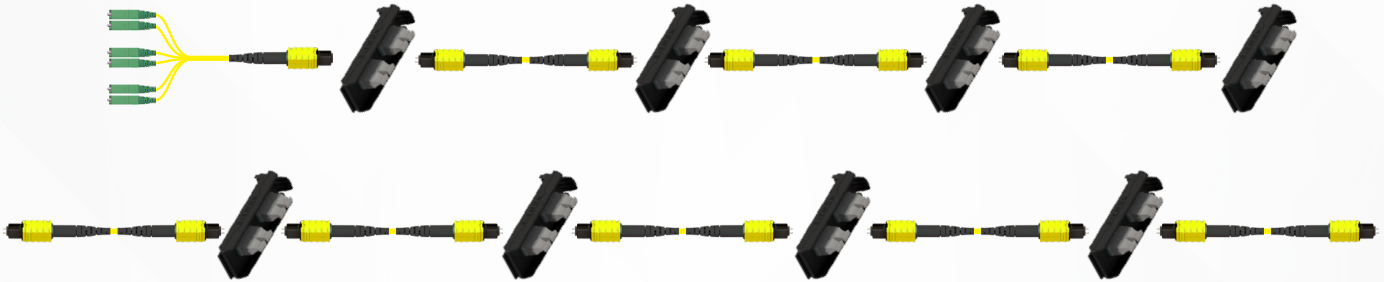


Siemon Singlemode Ultra Low Loss Part Numbers & Quantities

Part Number	Description	Qty
RF-MMFASM-010M	10-meter FC-APC/MTP Low Loss Launch Cord	1
LBP-LCULCUL-20H	20-meter LC BladePatch® SM Ultra Low Loss Patch Cord, LSOH	12
LBP-LCULCUL-10H	10-meter LC BladePatch SM Ultra Low Loss Patch Cord, LSOH	6
LVM12TMLCU-BSCA	LightVerse™ Ultra Low Loss MTP-LC Cassette	5
FL12-SMP650M-A	650-meter MTP-MTP SM Ultra Low Loss Trunk, Plenum	3
LVAM4-MPB-BN-A	LightVerse MTP Adapter Plate	1

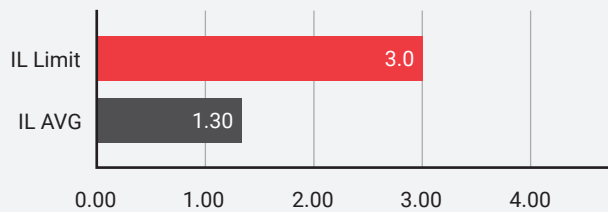
Note: Cable used in tested assemblies were of various jacket flammability types, performance is representative for all jacket types including plenum, LSOH & riser.

400G-DR4 channel with 8 x MTP mated pairs over max allowed channel of 500m

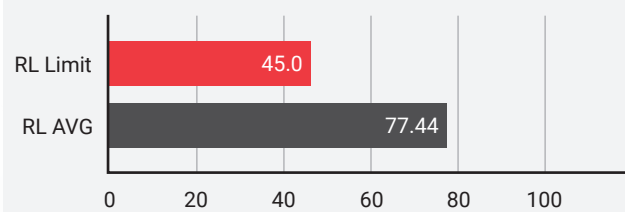


Note: DR4 channel tested was using all 12-fibers, or a Base12 system, to test 100% of fibers in the link. Typically it would be recommended to use a Base8 system for a DR4 application.

DR4 Channel Insertion Loss Margin



DR4 Channel Return Loss Margin



Siemon Singlemode Ultra Low Loss Part Numbers & Quantities

Part Number	Description	Qty
RF-MMFASM-010M	10-meter FC-APC/MTP Low Loss Launch Cord	1
FL12M-SMP050M-A	50-meter MTP-MTP SM Ultra Low Loss Trunk, Plenum	7
FL12M-SMP075M-A	65-meter MTP-MTP SM Ultra Low Loss Trunk, Plenum	2
LVAM4-MPB-BN-A	LightVerse™ MTP Adapter Plate	8

Note: Cable used in tested assemblies were of various jacket flammability types, performance is representative for all jacket types including plenum, LSOH & riser.

What were the results?

All fiber channels were found compliant within the very stringent channel configurations with actual loss values considerably below manufacturer's specifications. Siemon's typical performance was 0.14 dB per MTP connector and 0.30 dB per MTP-LC module.



What does this mean for data center operators?

By demonstrating the capability of our Ultra Low Loss components to support multiple mated connections in 400 Gigabit channels and still meet stringent IEEE requirements, data center operators can have peace of mind that Siemon's solutions can deliver flexibility over a range of distances and configurations, including the use of convenient cross-connects that facilitate management, upgrades, and reconfigurations—all while remaining within their loss budget.

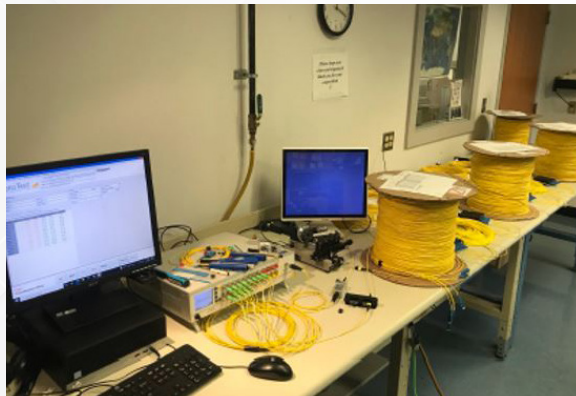
Data center operators can be confident that Siemon's ULL SM system will support their current or future 400G applications.

Siemon's ULL System includes:

- Singlemode MTP-MTP fiber trunks & jumpers with max IL of 0.30 dB per connector
- LightVerse™ MTP-LC modules with max IL of 0.50 dB per module
- LightVerse MTP adapter plates
- LC BladePatch® Jumpers with max IL of 0.20 dB per connector



Test set-up below - FR4 channel in front, DR4 channel in rear.



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