



QSFP - DD Passive

Data Center cable assemblies for 400Gbps

Emaxx[®]

lorom.com

QSFP - DD



LOROM's passive QSFP Double Density or QSFP -DD Direct Attached Copper (DAC) cable assemblies, part of Lorom's Emaxx® product family, are the latest development in high-density, high-bandwidth I/O interconnects. They support data center applications requiring state-of-the-art 400Gbps (4x100Gbps PAM4) data rates and beyond.

Our QSFP- DD cable assemblies are developed and produced to the highest international standards. These standards are IEEE 802.3cd. Emaxx® passive QSFP – DD 400Gbps cable assemblies are also available as break-out cables. This offering includes QSFP-DD to two QSFP. Custom pull-tab options for material, color, length and text are available.

Product Features & Benefits

- New patent pending EMAXX-25 bulk cable structure
- Lower insertion loss enabling longer cable reach
- Broadband operation capabilities for data rate 200Gbps and 400Gbps
- Available in two styles of cable assemblies
- Best in class SI performance providing system overhead, SNR [Signal to Noise Ratio]
- QSFP-DD to 2 QSFP
- Unparalleled EMI/EMC performance, 360 degree cable shield termination
- Automated advanced assembly technologies
- Installation "Gorilla proof" by design
- Small bend radius for higher density and easier management
- Over mould termination increases mechanical robustness. Available in AWG34 through AWG28
- Actively equalized versions will be released in 2017 for application in need of increased cable length



Applications

- Next generation high speed cable assemblies
- Higher density and data rate I/O in Data center interconnect
- Networking switches, routers and storage devices
- High-density interconnects for networking equipment and HPC high performance computing
- Military applications
- Test and Measurement Equipment

QSFP DD Performance Characteristics

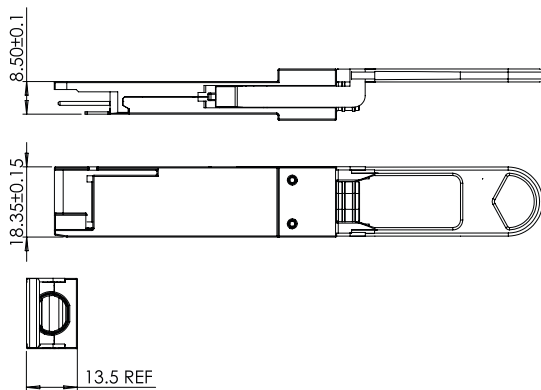
Characteristics	Value
Differential Impedance	100 +/- 10ohms
Differential insertion loss	16.06dB @ 13.26GHz IEEE 802.3cd
Differential Return Loss	> 6dB @ 12.89GHz
Common Mode Return loss	> 2dB
Near-end crosstalk	> 35dB
Channel operating margin (COM)	> 3dB
Power supply voltage	3.3V +/- 5%
Power dissipation	>10mW
Hot Plug in-rush Current	< 400 mA
SCL, SDA input capacitance	< 100 pF
Operating Voltage	< 30V
Keying	None
Latch Type	Pull to release
Minimum Bend radius	5x cable OD
Operating Temperature	-10°C to +70°C
Storage Temperature	-20°C to +80°C
Flammability rating	CM, CL2, FT4 IEC 60331.3 Cat C

IEEE802.3cd Assemblies

Lorom Part Number	Length (meters)	Signal Conductor (AWG)	Cable OD (mm)	Differential Insertion Loss (dB)	Application FEC Mode
LRHSPF50F005	0.5m	34	7.4	13.5	Non FEC
LRHSPF50D010	1.0m	30	7.6	12.6	
LRHSPF50D015	1.5m	30	7.6	14.4	
LRHSPF50C020	2.0m	28	9.2	15	
LRHSPF50C025	2.5m	28	9.2	16	
LRHSPF50C030	3.0m	28	9.2	18	

* Insertion Loss values are typical values at 12.89GHz

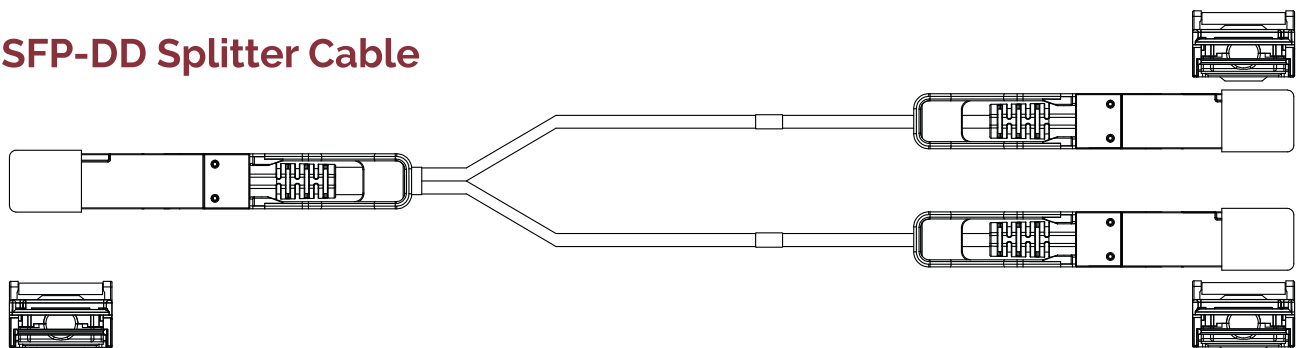
Custom length and gauge combinations available upon request.



Back Shell Assembly

Housing Material: Zinc die-cast
 Housing Plating: Copper under plate with a nickel over plate
 Pull Tab Material: Santoprene®
 Pull Tab Color: Black, other colors on request
 Pull Tab Length/Design: Customizable on request
 Pull Tab Text: Customizable on request
 Dimensions: Compliant to QSFP-DD MSA REV 1.0

QSFP-DD Splitter Cable



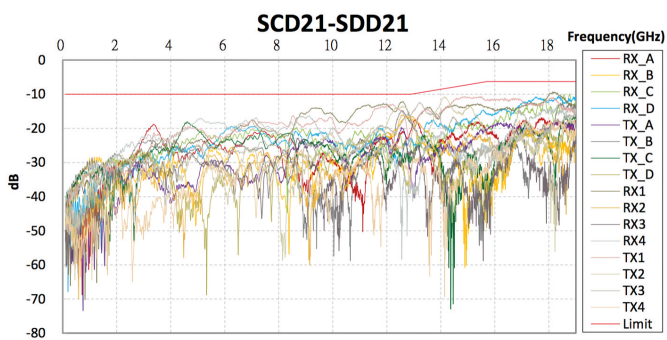
Pair	AWG	Braid TC	Wall Thickness		UL
			Jacket	OD mm	
16	32	16C/AWG38	0.6 mm	6.75	CL2
16	30	16C/AWG38	0.6 mm	7.6	CL2
16	29	16C/AWG38	0.6 mm	8.1	CL2
16	28	16C/AWG38	0.6 mm	9.2	CL2

Emaxx[®] QSFP-DD PERFORMANCE EXAMPLE

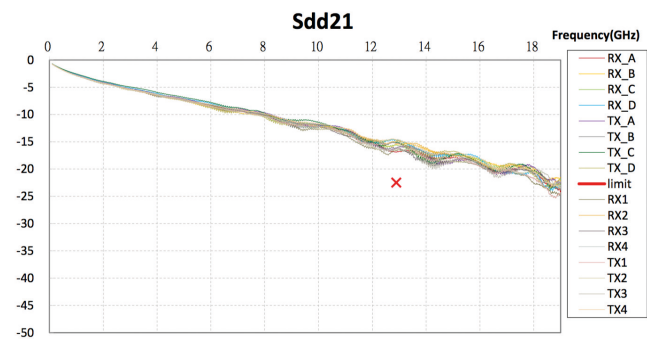
Signal Integrity Performance for a 1.5m 30AWG, compliant to IEEE802.3cd

COM	Spec	sdd21@12.89GHz	Case_1	Case_2	Pass/Fail
Rx1-a	3dB Min 2.2dB Min if Sdd21 is greater than 12dB. IEEE802.3by Table 110-1	14.56	4.1	3.4	Pass
Rx2-a		14.25	4.3	3.9	Pass
Rx3-a		14.02	3.8	3.1	Pass
Rx4-a		13.88	4	3.8	Pass
Tx1-a		14.51	3.6	3.4	Pass
Tx2-a		14.34	4.1	3.3	Pass
Tx3-a		14.45	3.5	2.8	Pass
Tx4-a		14.06	3.9	3.2	Pass
Rx1-b		14.71	4	3.3	Pass
Rx2-b		14.4	4.1	3.2	Pass
Rx3-b		14.17	3.7	3.3	Pass
Rx4-b		14.03	3.9	3.1	Pass
Tx1-b		14.66	3.4	3	Pass
Tx2-b		14.45	3.8	3.2	Pass
Tx3-b		14.21	3.3	2.9	Pass
Tx4-b		14.86	3.7	2.8	Pass

Signal Integrity Performance for a 2.5m 28AWG, compliant to IEEE802.3cd



Mode Conversion - Thru



Differential Insertion Loss

COMPLETE MANUFACTURING

What percentage of the manufacturing processes does your supplier actually control?

In order to rise above the standard Lorom has developed processes and equipment which are not currently available in the marketplace, in doing so are able to develop processing and manufacturing skills in every component of our SFP/ QSFP products.

Lorom views the cable assembly as an electromechanical device, and in doing so, has created a product with the highest bandwidth in the industry while also maintaining the smallest backshell currently available in the marketplace.

Our highly automated and controlled cable assembly capability uses the worlds first automatic soldering process, optimising the termination between the wire & PCB.

PCB-A

Lorom has invested significant resources over the last 10 years in PCB assemblies in order to offer our Customer complete Turn-Key solutions and One-Stop Shopping.

TOOLING

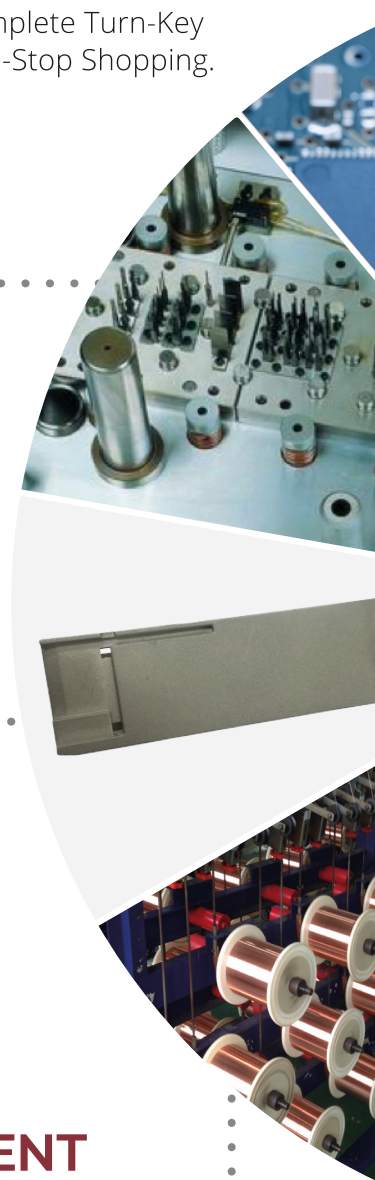
With the latest 2D & 3D technology and state of the art facilities, Lorom produces tooling for all of our in-house requirements, including injection mouldings & die casting.

DIE CAST

Our unique high-speed multi-slide die-casting process lends itself to the manufacture of intricate three dimensional connector housings and assemblies.

EQUIPMENT

Off the shelf processing equipment does not always produce consistent results... So we made our own!



INJECTION MOULDINGS

We assist and help guide our customers through the technical process of selecting the best-suited polymers for the injection moulded parts necessary to meet their application.

BULK CABLE

Lorom offers "Best-in-class" mode conversion (balance) due to proprietary manufacturing processes and equipment.

SIGNAL INTEGRITY

Lorom provides fully-equipped Signal Integrity & EMC testing labs in the USA & China, where our SI Engineers work to ensure consistent repeatability in performance.

TEST & MEASUREMENT

Lorom is proud to offer the Best Performing QSFP to the market, with exceptionally good ICR, (Insertion loss to Crosstalk Ratio) providing increased system budget, smaller physical size, as well as longer cable assembly length.

CABLE ASSEMBLY

LOROM QSFP DD cable assemblies comprise the use of unique world-class, state-of-the-art, in-house developed E-MAXX® bulk cable, providing the highest level of signal integrity performance.



PART NUMBERS

e.g. "LRHSP F50 D 005"

LRHSP

Name

LoRom
High
Speed
Products

F50

Application

F50: QSFP-DD to QSFP-DD
F51: QSFP-DD to 2x QSFP

D

Gauge size

C => AWG28
D => AWG30

005

Length (MT)

005 => 0,5m
010 => 1,0m
020 => 2,0m
025 => 2,5m

QSFP-DD to QSFP-DD

Lorom P/N	Length	AWG
LRHSPF50D005	0.5m +/-0.03m	30
LRHSPF50D010	1.0m +/-0.03m	30
LRHSPF50C020	2.0m +/-0.05m	28
LRHSPF50C025	2.5m +/-0.05m	28

QSFP-DD to 2x QSFP

Lorom P/N	Length	AWG
LRHSPF51D005	0.5m +/-0.03m	30
LRHSPF51D010	1.0m +/-0.03m	30
LRHSPF51C020	2.0m +/-0.05m	28
LRHSPF51C025	2.5m +/-0.05m	28

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