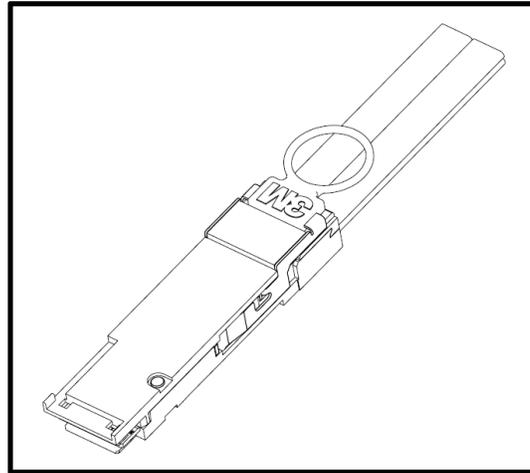
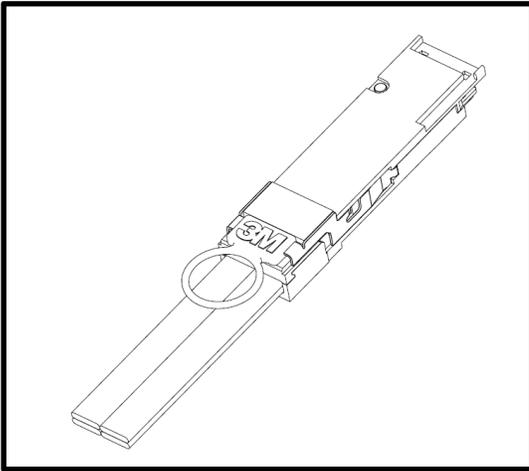




3M™ 100G QSFP28 Direct Attach Copper Cable Assemblies, 9Q Series



Scope

This document summarizes test methods, test conditions, and product performance requirements for 3M™ 100G QSFP28 Direct Attach Copper Cable Assemblies, 9Q Series.

Reference Documents

Note: Unless otherwise specified, latest edition of the reference documents applies. In the event of conflict between requirements of the references and 3M specification, 3M specification shall take precedence. Commercial standards, specifications and report

EIA-364
EIA TS-1000.01
SFF-8436, SFF8661

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| Literature Code | Document Title |
|-----------------|--|
| 78-5100-2672-3 | Customer Drawing, 3M™ 100G QSFP28 Direct Attach Copper Cable Assemblies, 9Q Series |

Performance Testing

Unless otherwise specified, all tests shall be performed on some kind of sockets mated to some kind of headers using some cable at conditions per EIA-364. Unless otherwise specified, all values and limits are typical of those obtained by qualification testing of the subject product. All specifications are subject to revision and change without notice from 3M.

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Ratings

| 3M™ 100G QSFP28 Direct Attach Copper Cable Assemblies, 9Q Series | |
|--|---------------|
| Feature | Value |
| Impedance | 100ohms |
| Operating Temperature | 0°C to 70°C |
| Storage Temperature | -20°C to 85°C |
| Humidity | 0% to 80% RH |

Materials

| 3M™ 100G QSFP28 Direct Attach Copper Cable Assemblies, 9Q Series | |
|--|--|
| Part | Material |
| Shell | Die Case Zinc |
| Pull Tab | Thermoplastic |
| Latch | Stainless Steel |
| Spring | Stainless Steel |
| Paddle Card | FR Mating pads under plate: 1.27 µm (50 µ0) Ni MIN Mating pads finishing: 0.76 µm (30 µ0) Au MIN |
| High Speed Ribbon Twin Axial Cable | See applicable 3M™ Twin Axial Ribbon Cable drawing for ribbon cable specification |

Regulatory Compliance

For regulatory information, visit [3M.com/regs](https://www.3m.com/regs) or contact your 3M representative. See customer drawings for regulatory specifics on each connector.

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Electrical

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

| 3M™ 100G QSFP28 Direct Attach Copper Cable Assemblies, 9Q Series | | | | |
|--|-----------|-------------------|---|-------------------------|
| Description or Parameter | Units | Values and Limits | Requirement or Conditions | Test Standard or Method |
| Dielectric Withstanding Voltage | V DC | 300 | EIA-364-20, Method B Subject a voltage of 300 VDC for 1 minute at sea level between adjacent contacts of mated and unmated connector assemblies. | EIA-364-20B |
| Low level contact resistance (LLCR) | Milliohms | <20 | Subject a voltage of 20 mV max open circuit at a current of 10 mA max on mated connector assemblies. | EIA-364-23A |
| Insulation Resistance | Mega ohms | >1000 | Measured between adjacent and opposing contacts with 300 V applied for 1 minute. | EIA-364-21C |

Mechanical

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

| 3M™ 100G QSFP28 Direct Attach Copper Cable Assemblies, 9Q Series | | | | |
|--|---------------------------------|-------------------|---|-------------------------|
| Description or Parameter | Units | Values and Limits | Requirement or Conditions | Test Standard or Method |
| Mating force | Newtons | 40N Max. | Refer to SFF8436 Spec. Tested without latch feature | EIA-364-13 |
| Unmating force | Newtons | 30N Max. | Refer to SFF8436 Spec. Tested without latch feature | EIA-364-13 |
| Latched plug retention force | Newtons | 90N Min. | Refer to SFF8436 Spec. Tested with latch feature | EIA-364-98 |
| Mechanical shock | Milliohms | ≤20 | Mated connectors shall exhibit no damage. 20 milliohm maximum ΔR contact resistance per mated interface throughout testing. | EIA-364-27 |
| Durability (preconditioning) | No evidence of physical damage. | Nil | Perform 50 unplug/plug cycles. | EIA-364-09 |
| Durability | No evidence of physical damage. | Nil | Perform 250 unplug/plug cycles. | EIA-364-09 |
| Reseating | Milliohms | ≤20 | Perform 3 unplug/plug cycles. | EIA-364-09 |

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Environmental

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

| 3M™ 100G QSFP28 Direct Attach Copper Cable Assemblies, 9Q Series | | | | |
|--|-----------------------------|-----------------------------|--|--|
| Description or Parameter | Units | Values and Limits | Requirement or Conditions | Test Standard or Method |
| Temperature Life (Thermal Aging) | Degrees C Hours | 105 240 | No physical abnormalities. 20 milliohm maximum ΔR contact resistance initial testing. | EIA-364-17B Method A |
| Thermal Shock | Degrees C Cycles | -55 & 85 10 | No physical abnormalities. 20 milliohm maximum ΔR contact resistance throughout testing. Half hour each at extreme temp. | EIA-364-32A Condition I |
| Humidity-Temperature Cycling | Degrees C % RH Cycles | 65 to 25 80 to 50% 24 | 1 cycle - 25°C, 80%RH to 65°C, 50RH to 25°C 80%. Ramp time – 0.5 hour Dwell time – 1.0 hour. | EIA-364-31B Condition B Method III 24 cycles. |
| Vibration | Milliohm | <20m Ω | 3.10G RMS between 20 and 500 Hz at 15 minutes in each of 3 mutually perpendicular directions. No damage. No discontinuity longer than 1 μ sec allowed. | EIA-364-28 Condition VII D |

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Qualification Test Groups and Sequenced Tests

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

| 3M™ 100G QSFP28 Direct Attach Copper Cable Assemblies, 9Q Series | | | | |
|--|---------------|-------|-------|-------|
| Test Description | Test Group | | | |
| | 1 | 2 | 3 | 4 |
| | Test Sequence | | | |
| Visual | 1,8 | 1,8 | 1,8 | 1,8 |
| Low Level contact Resistance | 2,5,7 | | 2,5,7 | 2,4,6 |
| Dielectric Withstanding Voltage | | | | 3,7 |
| Vibration | | | 6 | |
| Durability (preconditioning) | | 3 | 3 | |
| Durability | 3 | | | 5 |
| Reseating | 6 | | | |
| Temperature Life | 4 | | 4 | |
| Cyclic temperature and Humidity | | 6 | | |
| Thermal Shock | | 4 | | |
| SI measurement SDD21,SDD11 | | 2,5,7 | | |

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For regulatory information, visit [3M.com/regs](https://www.3m.com/regs) or contact your 3M representative.

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