





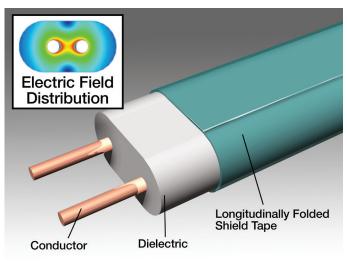
Copper Based Direct Attach Cables (DAC)

Regardless of the industry, the location, whether it is a data center or call center, commercial or industrial, it is an indisputable fact that bandwidth and data storage needs are always increasing. To satisfy our never ending hunger for more data and quicker access to it, technology manufacturers must constantly develop and release newer, faster technologies. One popular and proven technology is Direct Attach Cables. Direct Attach Cables offer pre-terminated connection solutions for 25Gbit/s, 50Gbit/s and 100 Gbit/s. Utilizing the same port as an optical transceiver, the copper based DAC is a more cost effective solution for short run applications, up to 5 meters, than fiber since it does not require power for signal conversion from electrons to photons.

With the convenience of plug and play technology, Hitachi's family of Direct Attach Cables (DAC) delivers throughput that exceeds those of industry standards. Hitachi's patented OMNIBIT® high-performance twin-axial (twinax) cable designs offer very competitive performance. Hitachi's leading edge OMNIBIT® high-speed copper cable assemblies meet the highest performance levels (QSFP28 & SFP28) and are cost effective I/O solutions supporting Ethernet and InfiniBand applications. Hitachi's OMNIBIT® Technology for QSFP28 and SFP28 Direct Attach Copper cable assemblies provide a high-density, high-bandwidth solution with broadly recognized Hitachi performance and reliability. Hitachi's OMNIBIT® high-speed cable assemblies provide excellent performance and reliability as per SFF-8436 & IEEE 802.3bj at speeds up to 28Gbps per channel.

OMNIBIT® supports 25 Gbit/s interconnections

- One-batch core configuration diminishes dielectric performance variation
- High electromagnetic coupling within pair provides balanced electrical performance
- No drain wire and no air cavity simplifies manufacturing



Hitachi OMNIBIT®

Conductor Dielectric Helically Wrapped Shield Tape

Drain

Wire

Conventional Cables

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Electric Field

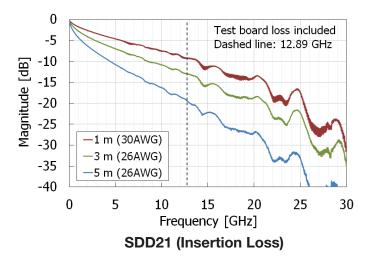
Distribution



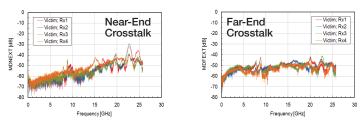
QSFP28 DIRECT ATTACH CABLE 100G QSFP28 - 100G QSFP28

Features

- IEEE 802.3by 100GBASE-CR4 & InfiniBand EDR
- Reach for 25 Gbit/s/ch passive interconnection
 - 5 meters with 26AWG
 - 3 meters with 30AWG
- · Excellent signal integrity, low insertion loss and low crosstalk
- Enabled by OMNIBIT[®] High Performance Twinax-Cable







Crosstalk, 26AWG, 3 meters

Product Selection

| AWG | Length [m] | Part Number | Standards ¹ | |
|-------|------------|--------------|--|--|
| | 0.5 | 25QSFP30B-05 | 25GBASE-CR CA-25G-N (IEEE802.3by) | |
| 30AWG | 1.0 | 25QSFP30B-10 | InfiniBand [®] EDR | |
| | 2.0 | 25QSFP30B-20 | 100GBASE-CR4 (IEEE802.3bj) | |
| | 1.5 | 25QSFP26C-15 | | |
| | 2.0 | 25QSFP26C-20 | 25GBASE-CR CA-25G-N (IEEE802.3by) InfiniBand® EDR | |
| 26AWG | 3.0 | 25QSFP26C-30 | 100GBASE-CR4 (IEEE802.3bj) | |
| | 4.0 | 25QSFP26C-40 | 25GBASE-CR CA-25G-L (IEEE802.3by) | |
| | 5.0 | 25QSFP26C-50 | 100GBASE-CR4 (IEEE802.3bj) | |

¹To achieve the rated reach, passive cables meeting; - 25GBASE-CR CA-25G-N do not require FEC,

- 25GBASE-CR CA-25G-L do require FEC on the switch/server mother board.

Hitachi recognizes that certain switch and server equipment manufacturers implement module identification lockout codes in their firmware. Suitability of these assemblies in those implementations is not guaranteed. Please contact your switch equipment vendor to determine suitability.

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Hitachi Cable America Inc.

SFP28 DIRECT ATTACH CABLE 25G SFP28 - 25G SFP28

Features

- IEEE 802.3by
- Excellent signal integrity and low insertion loss
- Enabled by OMNIBIT® High Performance Twinax-Cable





Applications

• 25G Server Cabling for Data Center Networks (25GbE)

Product Selection

| AWG | Length [m] | Part Number | Standard ¹ |
|---------|------------|-------------|-----------------------------------|
| | 1.0 | 25SFP30B-10 | |
| 30AWG | 2.0 | 25SFP30B-20 | 25GBASE-CR CA-25G-N (IEEE802.3by) |
| | 3.0 | 25SFP30B-30 | 25GBASE-CR CA-25G-L (IEEE802.3by) |
| | 2.0 | 25SFP26C-20 | |
| 06414/0 | 3.0 | 25SFP26C-30 | 25GBASE-CR CA-25G-N (IEEE802.3by) |
| 26AWG | 4.0 | 25SFP26C-40 | |
| | 5.0 | 25SFP26C-50 | 25GBASE-CR CA-25G-L (IEEE802.3by) |

¹To achieve the rated reach, passive cables meeting;

- 25GBASE-CR CA-25G-N do not require FEC,

- 25GBASE-CR CA-25G-L do require FEC on the switch/server mother board.

Hitachi recognizes that certain switch and server equipment manufacturers implement module identification lockout codes in their firmware. Suitability of these assemblies in those implementations is not guaranteed. Please contact your switch equipment vendor to determine suitability.

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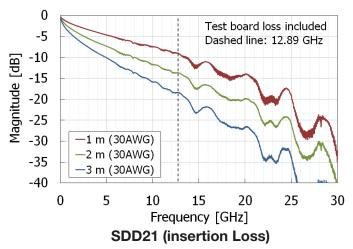
Hitachi Cable America Inc.

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1x2 BREAKOUT CABLE 100G QSFP28 - 50G QSFP28

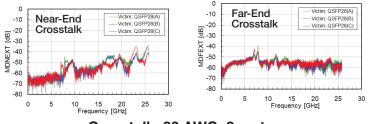
Features

- 25G/50G Ethernet
- Excellent signal integrity, low insertion loss and low crosstalk
- Enabled by OMNIBIT[®] High Performance Twinax-Cable



Applications

• Switch-to-Server Cabling for Data Center Networks (50G)



Crosstalk, 30 AWG, 3 meters

Product Selection

| AWG | Length [m] | Part Number | Standard ¹ | | | | | |
|-------|---------------|-------------|-----------------------------------|--|--|--|--|--|
| | 1.0 | 25B2P30B-10 | | | | | | |
| | 1.5 | 25B2P30B-15 | 25GBASE-CR CA-25G-N (IEEE802.3by) | | | | | |
| 30AWG | 2.0 | 25B2P30B-20 | | | | | | |
| | 2.5 | 25B2P30B-25 | | | | | | |
| | 3.0 | 25B2P30B-30 | 25GBASE-CR CA-25G-L (IEEE802.3by) | | | | | |
| | 1.0 | 25B2P26C-10 | | | | | | |
| | 1.5 | 25B2P26C-15 | | | | | | |
| 26AWG | 2.0 | 25B2P26C-20 | 25GBASE-CR CA-25G-N (IEEE802.3by) | | | | | |
| | 2.5 | 25B2P26C-25 | | | | | | |
| | 3.0 | 25B2P26C-30 | | | | | | |

¹To achieve the rated reach, passive cables meeting;

- 25GBASE-CR CA-25G-N do not require FEC,

- 25GBASE-CR CA-25G-L do require FEC on the switch/server mother board.

Hitachi recognizes that certain switch and server equipment manufacturers implement module identification lockout codes in their firmware. Suitability of these assemblies in those implementations is not guaranteed. Please contact your switch equipment vendor to determine suitability.



| SFP2 | 28 (A) | | | | | | Pad | 8 (C) Symbol | Pad | Symbo |
|--|--|-----|-----------|---|-----|----------|--|--|---|---|
| Pad | Symbol | - | | | | | 1 Pad | GND | Pad | N.C. |
| 1 | GND | - | | | | | 2 | TX2n | 6 | N.C. |
| 2 | TX2n | - | | Г | | | 2 | TX2n TX2p | | GND |
| 2 | TX2p | | 7 | | | | 4 | | | ModselL |
| 4 | GND | | | | | | | GND SCL | 8 | |
| 5 | TX4n | - | | | | | 11 12 | SCL | 10 | ResetL VccRX |
| 6 | TX4p | | | | | | 12 | | | N.C. |
| 7 | GND | | | | | | 13 | GND GND | 14 15 | N.C. N.C. |
| 8 | ModselL | - 1 | | | | | 16 | | 24 | N.C. |
| 9 | ResetL | - 1 | | | | | 17 | RX1p RX1n | 24 | N.C. |
| 10 | VccRX | - 1 | | | ΙΙГ | | 18 | GND | 25 | GND |
| 11 | SCL | - 1 | | | | | 20 | GND | 26 | ModPrsL |
| 12 | SDA | - 1 | | | | | 20 | | 27 | |
| 12 | GND | - | | | | | 21 | RX2n | | IntL |
| 13 | RX3p | - 1 | | | | <u> </u> | 22 | RX2p | 29 30 | VccTX Vcc1 |
| 14 | RX3p RX3n | | | | | | | GND | | |
| 15 | GND | | | | Ш | | 35 | GND | 31 | LPMode |
| 17 | RX1p | - 1 | | | | | 36 37 | TX1p TX1n | 32 33 | GND N.C. |
| | RX1p RX1n | | | | | <u> </u> | 37 | | | |
| | | | | | | | 38 | GND | 34 | N.C. |
| | | | \square | | | | | | | - |
| 18 19 | GND | | \square | | | | | | | |
| 19 20 | GND GND | | | | | | | | | |
| 19 20 21 | GND GND RX2n | | | | | | | | 1 | |
| 19 20 21 22 | GND GND RX2n RX2p | - | | | | | | | | |
| 19 20 21 22 23 | GND GND RX2n RX2p GND | | | | | | | 28 (B) | | |
| 19 20 21 22 23 24 | GND GND RX2n RX2p GND RX4n | | | | | | QSFP | 28 (B) | Pad | Sumbo |
| 19 20 21 22 23 24 25 | GND GND RX2n RX2p GND RX4n RX4p | | | | | | QSFP: Pad | Symbol | Pad | |
| 19 20 21 22 23 24 25 26 | GND GND RX2n RX2p GND RX4n RX4p GND | | | | | | QSFP Pad | Symbol GND | 5 | N.C. |
| 19 20 21 22 23 24 25 26 27 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL | | | | | | QSFP Pad 1 2 | Symbol GND TX2n | 5 6 | N.C. N.C. |
| 19 20 21 22 23 24 25 26 27 28 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL | | | | | | QSFP Pad 1 2 3 | Symbol GND TX2n TX2p | 5 6 7 | N.C. N.C. GND |
| 19 20 21 22 23 24 25 26 27 28 29 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX | | | | | | QSFP. Pad 1 2 3 4 | Symbol GND TX2n TX2p GND | 5 6 7 8 | N.C. N.C. GND ModselL |
| 19 20 21 22 23 24 25 26 27 28 29 30 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX Vcc1 | | | | | | QSFP. Pad 1 2 3 4 11 | Symbol GND TX2n TX2p GND SCL | 5 6 7 8 9 | N.C. N.C. GND ModselL ResetL |
| 19 20 21 22 23 24 25 26 27 28 27 28 29 30 31 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX Vcc1 LPMode | | | | | | QSFP. Pad 1 2 3 4 11 12 | Symbol GND TX2n TX2p GND SCL SDA | 5 6 7 8 9 10 | N.C. N.C. GND ModselL ResetL VccRX |
| 19 20 21 22 23 24 25 26 27 28 29 30 31 32 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX Vcc1 LPMode GND | | | | | | QSFP. Pad 1 2 3 4 111 122 13 | Symbol GND TX2n TX2p GND SCL SDA GND | 5 6 7 8 9 10 14 | N.C. N.C. GND ModselL ResetL VccRX N.C. |
| 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX Vcc1 LPMode GND TX3p | | | | | | QSFP Pad 1 2 3 4 11 12 13 16 | Symbol GND TX2n TX2p GND SCL SDA GND GND | 5 6 7 8 9 10 14 15 | N.C. N.C. GND ModselL ResetL VccRX N.C. N.C. |
| 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 33 33 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX Vcc1 LPMode GND TX3p TX3n | | | | | | QSFP Pad 1 2 3 4 11 12 13 16 17 | Symbol GND TX2n TX2p GND SCL SDA GND GND RX1p | 5 6 7 8 9 10 14 15 24 | N.C. N.C. GND ModselL ResetL VccRX N.C. N.C. N.C. |
| 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 33 34 35 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX Vcc1 LPMode GND TX3p TX3n GND | | | | | | QSFP Pad 1 2 3 4 11 12 13 16 17 18 | Symbol GND TX2n TX2p GND SCL SDA GND RX1p RX1p RX1n | 5 6 7 8 9 10 14 15 24 25 | N.C. N.C. GND ModselL ResetL VccRX N.C. N.C. N.C. N.C. N.C. |
| 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX Vcc1 LPMode GND TX3p TX3n GND TX1p | | | | | | QSFP Pad 1 2 3 4 11 12 13 16 17 18 19 | Symbol GND TX2n TX2p GND SCL SDA GND GND RX1p RX1n GND | 5 6 7 8 9 10 14 15 24 25 26 | N.C. N.C. GND ModselL ResetL VccRX N.C. N.C. N.C. N.C. GND |
| 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX Vcc1 LPMode GND TX3p TX3n GND TX1p TX1n | | | | | | QSFP: Pad 1 2 3 4 11 12 13 16 17 18 19 20 | Symbol GND TX2n TX2p GND SCL SDA GND GND RX1p RX1n GND GND | 5 6 7 8 9 10 14 15 24 25 26 27 | N.C. N.C. GND ModselL ResetL VccRX N.C. N.C. N.C. N.C. GND ModPrsL |
| 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX Vcc1 LPMode GND TX3p TX3n GND TX1p | | | | | | QSFP: Pad 1 2 3 4 11 12 13 16 17 18 19 20 21 | Symbol GND TX2n TX2p GND SCL SDA GND RX1p RX1n GND GND RX2n | 5 6 7 8 9 10 14 15 24 25 26 27 28 | N.C. N.C. GND ModselL ResetL VccRX N.C. N.C. N.C. N.C. GND ModPrsL IntL |
| 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX Vcc1 LPMode GND TX3p TX3n GND TX1p TX1n | | | | | | QSFP Pad 1 2 3 4 11 12 13 16 17 18 19 20 20 21 22 | Symbol GND TX2n TX2p GND SCL SDA GND GND RX1p RX1n GND GND RX2n RX2p | 5 6 7 8 9 10 14 15 24 25 26 27 28 29 | N.C. N.C. GND ModselL ResetL VccRX N.C. N.C. N.C. N.C. GND ModPrsL IntL VccTX |
| 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX Vcc1 LPMode GND TX3p TX3n GND TX1p TX1n | | | | | | QSFP Pad 1 2 3 4 4 11 12 13 16 17 18 19 20 21 22 22 23 | Symbol GND TX2n TX2p GND SCL SDA GND GND RX1p RX1n GND GND RX1n GND RX2p GND | 5 6 7 8 9 10 14 15 24 25 26 27 28 29 30 | N.C. N.C. GND ModselL ResetL VccRX N.C. N.C. N.C. N.C. M.C. ModPrsL IntL VccTX VccTX |
| 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX Vcc1 LPMode GND TX3p TX3n GND TX1p TX1n | | | | | | QSFP. Pad 1 2 3 4 11 12 13 16 17 18 19 20 21 22 23 35 | Symbol GND TX2n TX2p GND SCL SDA GND GND GND RX1p RX1n GND GND RX2n RX2n RX2n RX2p GND GND GND | 5 6 7 8 9 10 14 15 24 25 26 27 28 29 30 31 | N.C. N.C. GND ModselL ResetL VccRX N.C. N.C. N.C. N.C. ModPrsL IntL VccTX Vcc1 LPMode |
| 19 20 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX Vcc1 LPMode GND TX3p TX3n GND TX1p TX1n | | | | | | QSFP. Pad 1 2 3 4 11 12 13 16 17 18 19 20 21 22 23 35 36 | Symbol GND TX2n TX2p GND SCL SDA GND GND RX1p RX1n GND RX1n GND RX2n RX2n RX2n RX2p GND GND TX1p | 5 6 7 8 9 10 14 15 24 25 26 27 28 29 30 31 32 | N.C. GND ModselL ResetL VccRX N.C. N.C. N.C. M.C. GND ModPrsL IntL VccTX Vcc1 LPMode GND |
| 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 | GND GND RX2n RX2p GND RX4n RX4p GND ModPrsL IntL VccTX Vcc1 LPMode GND TX3p TX3n GND TX1p TX1n | | | | | | QSFP. Pad 1 2 3 4 11 12 13 16 17 18 19 20 21 22 23 35 | Symbol GND TX2n TX2p GND SCL SDA GND GND GND RX1p RX1n GND GND RX2n RX2n RX2n RX2p GND GND GND | 5 6 7 8 9 10 14 15 24 25 26 27 28 29 30 31 | N.C. N.C. GND ModselL ResetL VccRX N.C. N.C. N.C. N.C. N.C. ModPrsL IntL VccTX Vcc1 LPMode |

Pin Function and Wiring Diagram for High-Speed Lanes

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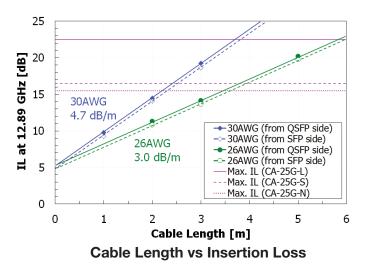
1x4 BREAKOUT CABLE 100G QSFP28 - 25G SFP28

Features

- IEEE 802.3bv
- Excellent signal integrity, low insertion loss and low crosstalk •
- Enabled by OMNIBIT[®] High Performance Twinax-Cable

Applications

Switch-to-Server Cabling for Data Center Networks (25G)





| AWG | Length [m] | Part Number | Standard ¹ | | | |
|-------|---------------|-------------|-----------------------------------|--|--|--|
| | 1.0 | 25B4P30B-10 | | | | |
| 30AWG | 2.0 | 25B4P30B-20 | 25GBASE-CR CA-25G-N (IEEE802.3by) | | | |
| | 3.0 | 25B4P30B-30 | 25GBASE-CR CA-25G-L (IEEE802.3by) | | | |
| | 2.0 | 25B4P26C-20 | 25GBASE-CR CA-25G-N (IEEE802.3by) | | | |
| 26AWG | 3.0 | 25B4P26C-30 | 2566ASE-CR CA-256-N (IEEE602.30) | | | |
| ZOAWG | 4.0 | 25B4P26C-40 | 25GBASE-CR CA-25G-L (IEEE802.3by) | | | |
| | 5.0 | 25B4P26C-50 | 25GBASE-CR CA-25G-L (IEEE602.3Dy) | | | |

¹To achieve the rated reach, passive cables meeting;

- 25GBASE-CR CA-25G-N do not require FEC,

- 25GBASE-CR CA-25G-L do require FEC on the switch/server mother board.

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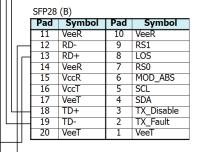
Hitachi Cable America Inc.



| 1 | Symbol GND | | | | |
|----|---------------|----------|---------|---|---|
| 2 | TX2n | | | | |
| 2 | TX2p | | | | |
| 3 | GND | | | | |
| 5 | TX4n | | $ _{r}$ | | |
| 6 | TX40 TX4p | T | Π | _ | |
| 7 | GND | H | Ħ | T | ٦ |
| 8 | ModselL | 1 | | | |
| 9 | ResetL | | | | |
| 10 | VccRX | | | | |
| 11 | SCL | | | | |
| 12 | SDA | | | | |
| 13 | GND | | | | |
| 13 | RX3p | Ш | Ц | | L |
| 15 | RX3n | | | | |
| 16 | GND | П | | | |
| 17 | RX1p | | | | |
| 18 | RX1n | | | | |
| 19 | GND | 1 | | | |
| 20 | GND | 1 | | | _ |
| 21 | RX2n | Ш | | | L |
| 22 | RX2p | 4 | | | Ļ |
| 23 | GND | 1 | | | |
| 24 | RX4n | | | | |
| 25 | RX4p | Ш | | | |
| 26 | GND | 11 | | | |
| 27 | ModPrsL | 11 | | | |
| 28 | IntL | | | | |
| 29 | VccTX | 1 | | | |
| 30 | Vcc1 | 11 | | | |
| 31 | LPMode | 11 | | | |
| 32 | GND | 11 | | | |
| 33 | ТХ3р | Ш | | | |
| 34 | TX3n | <u> </u> | J | | |
| 35 | GND | 1 | | | |
| 36 | TX1p | 1 | | | |
| 37 | TX1n | ⊢ | | | |
| 38 | GND | 4 | | | |

| SFP28 (D) | | | | | | | | | |
|-----------|--------|-----|------------|--|--|--|--|--|--|
| Pad | Symbol | Pad | Symbol | | | | | | |
| 11 | VeeR | 10 | VeeR | | | | | | |
| 12 | RD- | 9 | RS1 | | | | | | |
| 13 | RD+ | 8 | LOS | | | | | | |
| 14 | VeeR | 7 | RS0 | | | | | | |
| 15 | VccR | 6 | MOD_ABS | | | | | | |
| 16 | VccT | 5 | SCL | | | | | | |
| 17 | VeeT | 4 | SDA | | | | | | |
| 18 | TD+ | 3 | TX_Disable | | | | | | |
| 19 | TD- | 2 | TX_Fault | | | | | | |
| 20 | VeeT | 1 | VeeT | | | | | | |

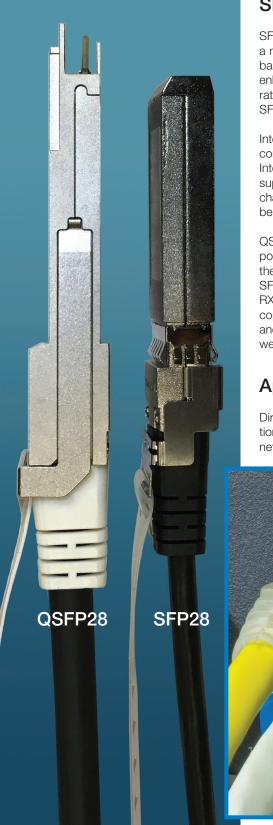
| SFP28 | (E) | | |
|--------|--------|-----|------------|
| Pad | Symbol | Pad | Symbol |
| 11 | VeeR | 10 | VeeR |
| 12 | RD- | 9 | RS1 |
| 13 | RD+ | 8 | LOS |
| 14 | VeeR | 7 | RS0 |
| 15 | VccR | 6 | MOD_ABS |
| 16 | VccT | 5 | SCL |
| 17 | VeeT | 4 | SDA |
| 18 | TD+ | 3 | TX_Disable |
| 19 | TD- | 2 | TX_Fault |
| 20 | VeeT | 1 | VeeT |



| SFP28 (C) | | | | | | | | | |
|-----------|--------|-----|------------|--|--|--|--|--|--|
| Pad | Symbol | Pad | Symbol | | | | | | |
| 11 | VeeR | 10 | VeeR | | | | | | |
| 12 | RD- | 9 | RS1 | | | | | | |
| 13 | RD+ | 8 | LOS | | | | | | |
| 14 | VeeR | 7 | RS0 | | | | | | |
| 15 | VccR | 6 | MOD_ABS | | | | | | |
| 16 | VccT | 5 | SCL | | | | | | |
| 17 | VeeT | 4 | SDA | | | | | | |
| 18 | TD+ | 3 | TX_Disable | | | | | | |
| 19 | TD- | 2 | TX_Fault | | | | | | |
| 20 | VeeT | 1 | VeeT | | | | | | |

Pin Function and Wiring Diagram for High-Speed Lanes

Direct Attach Cables



SFP28 and QSFP28 Defined

SFP28 (Small Form Pluggable) is a title applied to both a network connector and a network port. SFP28 is a type of link utilized for both fiber cables, and copperbased Direct Attach Cables (DACs). As a connector, SFP28 defines a type of enhanced hot-swappable connector designed to support switch and server data rates of 25 Gbit/s Ethernet. It contains 20 pins. It is backwards compatible with all SFP ports.

Intended for short runs (up to 5 meters), Hitachi's copper DACs featuring SFP28 connectors can each support single channels with data rates up to 25 Gbit/s. Integrating multiple SFP28 connectors with a single QSFP28 connector can enable support of up to 100 Gbit/s per cable assembly (4 x 25G channels). This 1x4 configuration is advantageous since four 10/25G servers can be consolidated onto one 40/100G switch.

QSFP28 (Quad Small Form Pluggable), like SFP28 refers to both a plug and port. As the name implies, it can accommodate 4x the SFP28 data rate through the utilization of 4 distinct data channels. The connector is slightly larger than an SFP28 connector. It contains 38 pins with 4 high-speed TX pairs and 4 high-speed RX pairs. Like the SFP28 connector, it can be utilized for both fiber cables, and copper-based DACs. Hitachi's copper DACs featuring QSFP28 connectors are rate and protocol agnostic and support data rates of 25, 50 and 100 Gbit/s Ethernet as well as InfiniBand EDR.

Applications for DACs

Direct Attach Cables are ideal for high density, high speed I/O data center applications in the networking, telecom and data storage markets where maximum overall network efficiency and lower overall cost are desired.



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Hitachi Cable America Inc.

900 Holt Avenue, East Industrial Park • Manchester, New Hampshire 03109 USA Tel: +1.603.669.4347 • Sales: +1.800.772.0116 • Fax: +1.603.669.9621 www.hca.hitachi-cable.com