

## QDD-200G-2Q28-O15M-C

MSA and TAA Compliant 200GBase-AOC QSFP28-DD to 2xQSFP28 NRZ Active Optical Cable (850nm, MMF, 15m)

### Features

- Up to 25.78 Gbps per channel
- 2 independent full-duplex
- Single Power Supply: +3.3V
- Low-power consumption: 3.3W on QSFP28DD end, 1.65W on QSFP28 end
- Hot-pluggable QSFP-DD/QSFP28
- 15m with OM3 fibers
- Operating Temperature: 0°C to 70°C
- OFNP-rated cable
- TUV certified
- ROHS/Reach Compliant



### Applications

- 100Gigabit Ethernet
- InfiniBand EDR
- Datacenter
- Proprietary HPC interconnections

### Product Description

This is an MSA Compliant compatible 200GBase-AOC QSFP28-DD to 2xQSFP28 NRZ active optical cable that operates over active fiber with a maximum reach of 15m. At a wavelength of 850nm, it has been programmed, uniquely serialized, and data-traffic and application tested to ensure it is 100% compliant and functional. This NRZ active optical cable is TAA (Trade Agreements Act) compliant, and is built to comply with MSA (Multi-Source Agreement) standards. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' active optical cables are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."



## General Specifications

| Parameter                  | Symbol | Min. | Typ.  | Max. | Unit | Notes |
|----------------------------|--------|------|-------|------|------|-------|
| Storage Temperature        | Tstg   | -40  |       | 85   | °C   | 1     |
| Operating Case Temperature | Tc     | 0    |       | 70   | °C   |       |
| Supply Voltage             | Vcc    | 0    |       | 4    | V    |       |
| Relative Humidity          | RH     | 0    |       | 85   | %    |       |
| Data Rate (Per Channel)    | BR     |      | 35.78 |      | Gbps |       |

### Notes:

1. Ambient temperature.

## Electrical Characteristics

| Parameter                        | Symbol    | Min. | Typ. | Max.              | Unit | Notes   |
|----------------------------------|-----------|------|------|-------------------|------|---------|
| Power Supply Voltage             | Vcc       | 3.13 | 3.3  | 3.47              | V    |         |
| Power Supply Current             | QSFP28-DD | Icc  | 1000 |                   | mA   | Per End |
|                                  | QSFP28    | Icc  | 500  |                   | mA   | Per End |
| Power Consumption                | QSFP28-DD |      | 3.3  | 3.47              | W    | Per End |
|                                  | QSFP28    |      | 1.65 | 1.73              | W    | Per End |
| <b>Transmitter</b>               |           |      |      |                   |      |         |
| Input Differential Impedance     | RIN       | 90   | 100  | 110               | Ω    |         |
| Differential Data Input Voltage  | VIN,pp    | 200  |      | 900               | mV   |         |
| <b>Receiver</b>                  |           |      |      |                   |      |         |
| Output Differential Impedance    | ROUT      | 90   | 100  | 110               |      |         |
| Differential Data Output Voltage | VOUT,pp   |      | 800  | mV                |      |         |
| Bit Error Ratio (At 25.78 Gbps)  |           |      |      | 10 <sup>-12</sup> |      | 1       |

### Notes:

1. Pre-FEC Bit Error Ratio with a PRBS 2<sup>31</sup> – 1 test pattern.

## Cable Specifications

| Parameter           | Value                            | Unit | Notes |
|---------------------|----------------------------------|------|-------|
| Cable Diameter      | OFNP: $\varnothing 3.0 \pm 0.20$ | mm   |       |
| Minimum Bend Radius | 30                               | mm   | 1     |
|                     | 60                               | mm   | 2     |
| Length Tolerance    | +300 / -0                        | mm   |       |
| Cable Jacket        | OFNP-Rated (Aqua)                |      |       |

### Notes:

1. Without tension.
2. Under maximum tension.

## Pin Descriptions: QSFP28-DD End

| Pin | Name    | Name/Descriptions                    | Ref. |
|-----|---------|--------------------------------------|------|
| 1   | GND     | Module Ground.                       | 1    |
| 2   | Tx2-    | Transmitter Inverted Data Input.     |      |
| 3   | Tx2+    | Transmitter Non-Inverted Data Input. |      |
| 4   | GND     | Module Ground.                       | 1    |
| 5   | Tx4-    | Transmitter Inverted Data Input.     |      |
| 6   | Tx4+    | Transmitter Non-Inverted Data Input. |      |
| 7   | GND     | Module Ground.                       | 1    |
| 8   | ModSelL | Module Select.                       |      |
| 9   | ResetL  | Module Reset.                        |      |
| 10  | VccRx   | +3.3V Power Supply Receiver.         | 2    |
| 11  | SCL     | 2-Wire Serial Interface Clock.       |      |
| 12  | SDA     | 2-Wire Serial Interface Data.        |      |
| 13  | GND     | Module Ground.                       | 1    |
| 14  | Rx3+    | Receiver Non-Inverted Data Output.   |      |
| 15  | Rx3-    | Receiver Inverted Data Output.       |      |
| 16  | GND     | Module Ground.                       | 1    |
| 17  | Rx1+    | Receiver Non-Inverted Data Output.   |      |
| 18  | Rx1-    | Receiver Inverted Data Output.       |      |
| 19  | GND     | Module Ground.                       | 1    |
| 20  | GND     | Module Ground.                       | 1    |
| 21  | Rx2-    | Receiver Inverted Data Output.       |      |
| 22  | Rx2+    | Receiver Non-Inverted Data Output.   |      |
| 23  | GND     | Module Ground.                       | 1    |
| 24  | Rx4-    | Receiver Inverted Data Output.       |      |

|    |          |  |   |
|----|----------|--|---|
| 25 | Rx4+     | Receiver Non-Inverted Data Output.   |   |
| 26 | GND      | Module Ground.   | 1 |
| 27 | ModPrsL  | Module Present.  |   |
| 28 | IntL     | Interrupt.   |   |
| 29 | VccTx    | +3.3V Power Supply Transmitter.  | 2 |
| 30 | Vcc1     | +3.3V Power Supply.  | 2 |
| 31 | InitMode | Initialization Mode. In legacy QSPF applications, InitMode is listed as Low-Power Mode (LPMode). |   |
| 32 | GND      | Module Ground.   | 1 |
| 33 | Tx3+     | Transmitter Non-Inverted Data Input.   |   |
| 34 | Tx3-     | Transmitter Inverted Data Input.   |   |
| 35 | GND      | Module Ground.   | 1 |
| 36 | Tx1+     | Transmitter Non-Inverted Data Input.   |   |
| 37 | Tx1-     | Transmitter Inverted Data Input.   |   |
| 38 | GND      | Module Ground.   | 1 |
| 39 | GND      | Module Ground.   | 1 |
| 40 | Tx6-     | Transmitter Inverted Data Input.   |   |
| 41 | Tx6+     | Transmitter Non-Inverted Data Input.   |   |
| 42 | GND      | Module Ground.   | 1 |
| 43 | Tx8-     | Transmitter Inverted Data Input.   |   |
| 44 | Tx8+     | Transmitter Non-Inverted Data Input.   |   |
| 45 | GND      | Module Ground.   | 1 |
| 46 | Reserved | For Future Use.  | 3 |
| 47 | VS1      | Module Vendor-Specific 1.  | 3 |
| 48 | VccRx1   | +3.3V Receiver Power Supply.   | 2 |
| 49 | VS2      | Module Vendor-Specific 2.  | 3 |
| 50 | VS3      | Module Vendor-Specific 3.  | 3 |
| 51 | GND      | Module Ground.   | 1 |
| 52 | Rx7+     | Receiver Non-Inverted Data Output.   |   |
| 53 | Rx7-     | Receiver Inverted Data Output.   |   |
| 54 | GND      | Module Ground.   | 1 |
| 55 | Rx5+     | Receiver Non-Inverted Data Output.   |   |
| 56 | Rx5-     | Receiver Inverted Data Output.   |   |
| 57 | GND      | Module Ground.   | 1 |
| 58 | GND      | Module Ground.   | 1 |
| 59 | Rx6-     | Receiver Inverted Data Output.   |   |
| 60 | Rx6+     | Receiver Non-Inverted Data Output.   |   |
| 61 | GND      | Module Ground.   | 1 |
| 62 | Rx8-     | Receiver Inverted Data Output.   |   |
| 63 | Rx8+     | Receiver Non-Inverted Data Output.   |   |

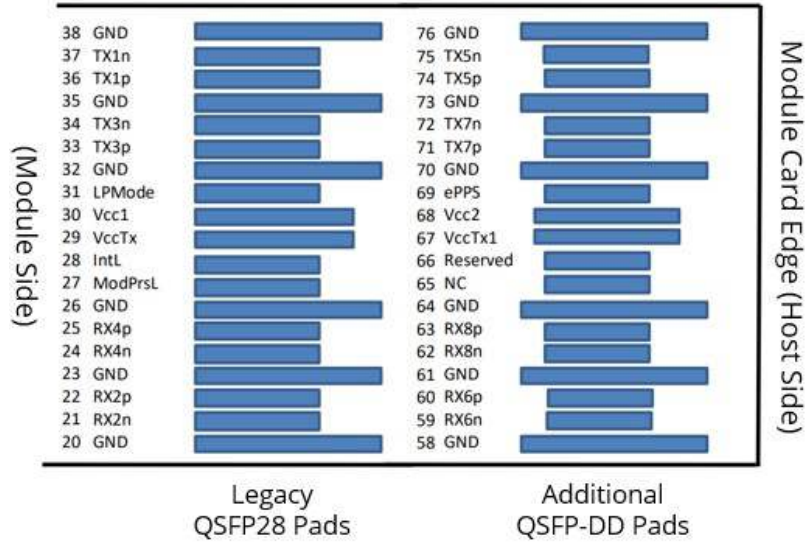
|    |          |  |   |
|----|----------|--|---|
| 64 | GND      | Module Ground.                                       | 1 |
| 65 | NC       | Not Connected.                                       | 3 |
| 66 | Reserved | For Future Use.                                      | 3 |
| 67 | VccTx1   | +3.3V Transmitter Power Supply.                      | 2 |
| 68 | Vcc2     | +3.3V Power Supply.                                  | 2 |
| 69 | ePPS     | Precision Time Protocol (PTP) Reference Clock Input. | 3 |
| 70 | GND      | Module Ground.                                       | 1 |
| 71 | Tx7+     | Transmitter Non-Inverted Data Input.                 |   |
| 72 | Tx7-     | Transmitter Inverted Data Input.                     |   |
| 73 | GND      | Module Ground.                                       | 1 |
| 74 | Tx5+     | Transmitter Non-Inverted Data Input.                 |   |
| 75 | Tx5-     | Transmitter Inverted Data Input.                     |   |
| 76 | GND      | Module Ground.                                       | 1 |

**Notes:**

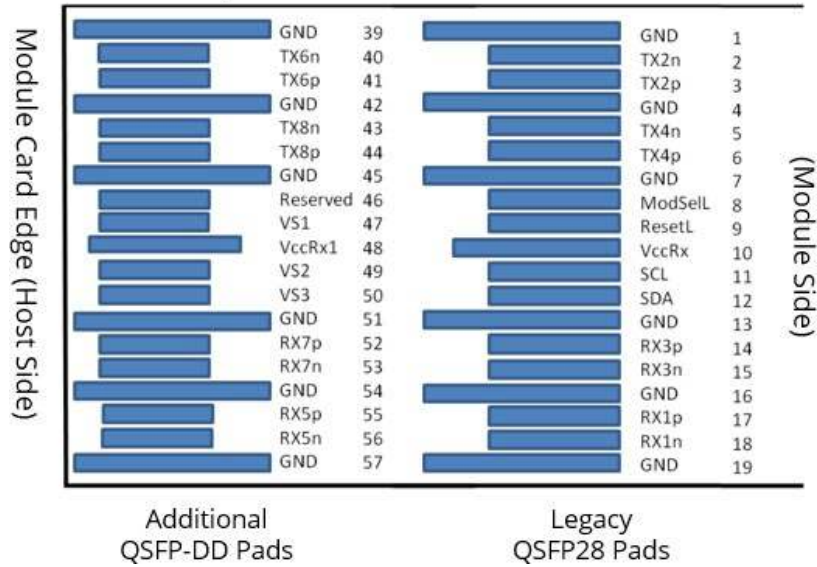
1. GND is the symbol for signal and supply (power) common for the QSFP-DD module. All are common within the QSFP-DD module, and all module voltages are referenced to this potential unless otherwise noted.
2. VccRx, VccRx1, Vcc1, Vcc2, VccTx, and VccTx1 shall be applied concurrently. The connector pins are each rated for a maximum current of 1000mA.
3. All Vendor-Specific, Reserved, No Connect, and ePPS (if not used) pins may be terminated with 50Ω to ground on the host, and Pad 65 (No Connect) shall be left unconnected within the module.

**Electrical Pin-Out: QSFP28-DD**

**Top Side Viewed From Top**



**Top Side Viewed From Bottom**



## Pin Descriptions: QSFP28 End

| Pin | Name    | Name/Descriptions                    | Ref. |
|-----|---------|--------------------------------------|------|
| 1   | GND     | Module Ground.                       | 1    |
| 2   | Tx2-    | Transmitter Inverted Data Input.     |      |
| 3   | Tx2+    | Transmitter Non-Inverted Data Input. |      |
| 4   | GND     | Module Ground.                       | 1    |
| 5   | Tx4-    | Transmitter Inverted Data Input.     |      |
| 6   | Tx4+    | Transmitter Non-Inverted Data Input. |      |
| 7   | GND     | Module Ground.                       | 1    |
| 8   | ModSelL | Module Select.                       |      |
| 9   | ResetL  | Module Reset.                        |      |
| 10  | VccRx   | +3.3V Receiver Power Supply.         | 2    |
| 11  | SCL     | 2-Wire Serial Interface Clock.       |      |
| 12  | SDA     | 2-Wire Serial Interface Data.        |      |
| 13  | GND     | Module Ground.                       | 1    |
| 14  | Rx3+    | Receiver Non-Inverted Data Output.   |      |
| 15  | Rx3-    | Receiver Inverted Data Output.       |      |
| 16  | GND     | Module Ground.                       | 1    |
| 17  | Rx1+    | Receiver Non-Inverted Data Output.   |      |
| 18  | Rx1-    | Receiver Inverted Data Output.       |      |
| 19  | GND     | Module Ground.                       | 1    |
| 20  | GND     | Module Ground.                       | 1    |
| 21  | Rx2-    | Receiver Inverted Data Output.       |      |
| 22  | Rx2+    | Receiver Non-Inverted Data Output.   |      |
| 23  | GND     | Module Ground.                       | 1    |
| 24  | Rx4-    | Receiver Inverted Data Output.       |      |
| 25  | Rx4+    | Receiver Non-Inverted Data Output.   |      |
| 26  | GND     | Module Ground.                       | 1    |
| 27  | ModPrsL | Module Present.                      |      |
| 28  | IntL    | Interrupt.                           |      |
| 29  | VccTx   | +3.3V Transmitter Power Supply.      | 2    |
| 30  | Vcc1    | +3.3V Power Supply.                  | 2    |
| 31  | LPMoDe  | Low-Power Mode.                      | 3    |
| 32  | GND     | Module Ground.                       | 1    |
| 33  | Tx3+    | Transmitter Non-Inverted Data Input. |      |
| 34  | Tx3-    | Transmitter Inverted Data Input.     |      |

|    |      |                                      |   |
|----|------|--------------------------------------|---|
| 35 | GND  | Module Ground.                       | 1 |
| 36 | Tx1+ | Transmitter Non-Inverted Data Input. |   |
| 37 | Tx1- | Transmitter Inverted Data Input.     |   |
| 38 | GND  | Module Ground.                       | 1 |

**Notes:**

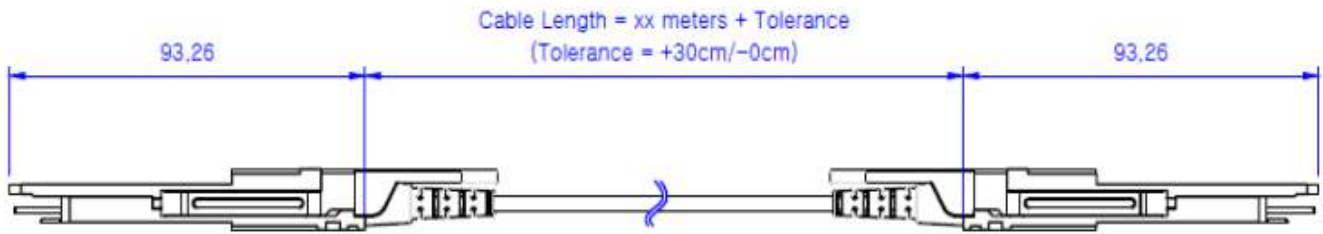
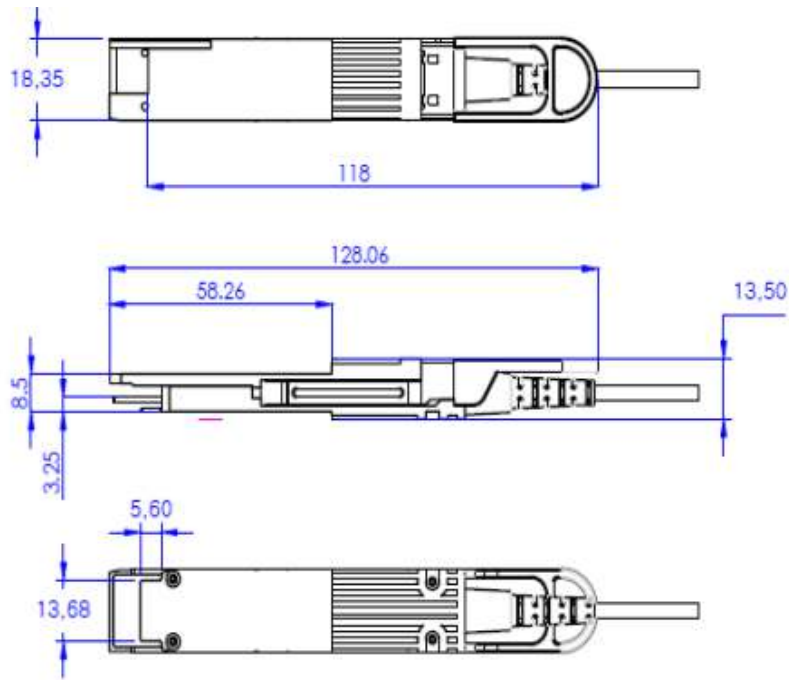
1. GND is the symbol for signal and supply (power) common for the QSFP module. All are common within the QSFP module, and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. VccRx, Vcc1, and VccTx are the receiver and transmitter power supplies and shall be applied concurrently. VccRx, Vcc1, and VccTx may be internally connected within the QSFP transceiver module in any combination. The connector pins are each rated for a maximum current of 500mA.
3. Not in use.

**Electrical Pin-Out: QSFP28**

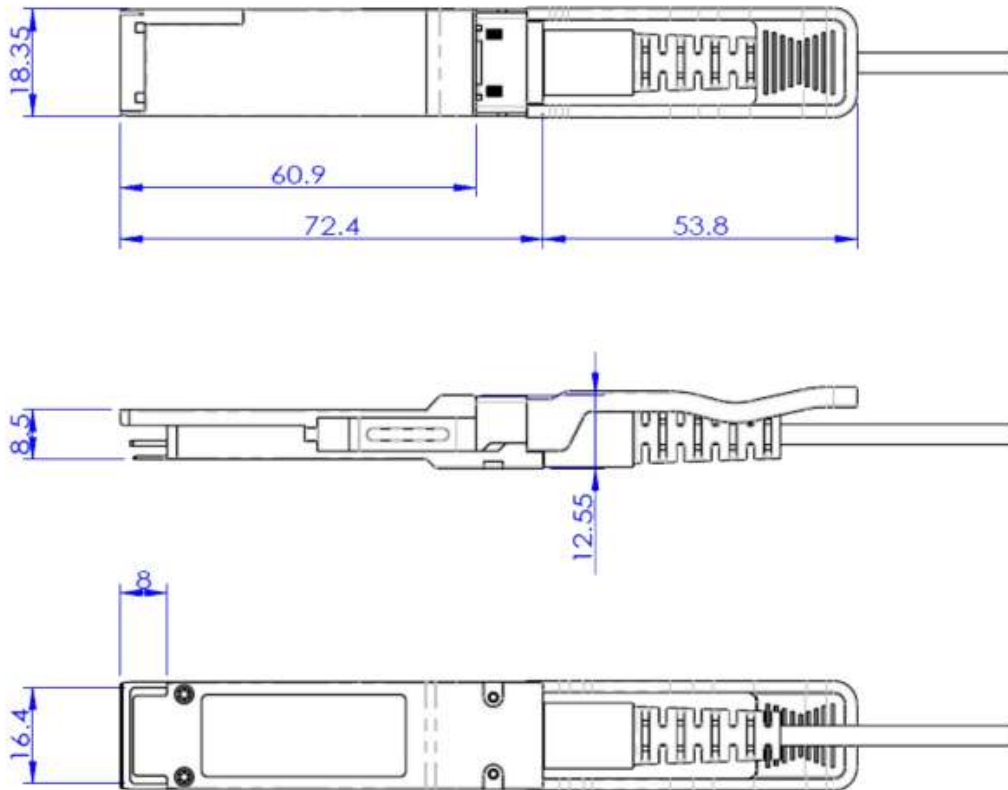




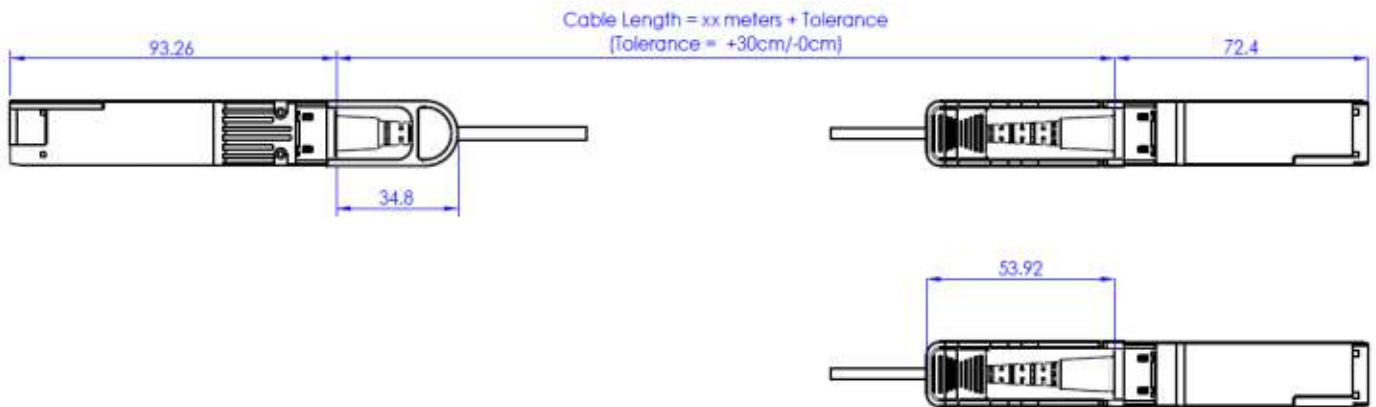
**Mechanical Specifications: QSFP28-DD**



**Mechanical Specifications: QSFP28**



**Mechanical Specifications: QSFP28-DD to 2x QSFP28 Breakout**



**About ProLabs**

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

**Complete Portfolio of Network Solutions**

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

**Trusted Partner**

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.

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