

Exhibit 4

Exhibit 4 – Claim Chart Showing Amphenol’s Infringement of U.S. Patent 10,877,233 (“’233 Patent”)

















































As outlined in the below claim chart, the Accused Products infringe, either literally or under the doctrine of equivalents, at least Claim 1 of the ’233 patent.



<u>’233 Patent</u>	Accused Products
<u>Claim 1</u>	
[1pre] A cable that comprises:	The Accused Products comprise a cable. See, e.g.:

'233 Patent	Accused Products
Claim 1	<div data-bbox="722 293 1549 391"> <h2>OSFP (Octal Small Form Factor Pluggable) Copper Cable Assemblies</h2> </div> <div data-bbox="722 448 1100 524"> <h3>200G / 400G / 800G / 1.6T SOLUTIONS</h3> </div> <div data-bbox="722 553 1230 756"> <p>Amphenol is leading the industry in OSFP cable development. Our Electronics Products 'Product of the Year' award-winning OSFP (Octal Small Form Factor Pluggable) cable assemblies are compatible with 25G/lane channel NRZ up to 224G/lane channel PAM4 signaling protocols that allow the cables to deliver aggregate bandwidths of 200G, 400G, 800G, and 1.6T per cable assembly. Available in both Passive and Active variants.</p> </div> <div data-bbox="722 781 1230 1084"> <ul style="list-style-type: none"> ▪ Comprehensive system integrated interconnect design for copper or optical based cable solutions ▪ Addresses current and future market desired bandwidth port capability requirements ▪ Optimized heat dissipative and airflow features to maximize the heat dissipative properties of the system ▪ Data Rate: 25G NRZ / 56G PAM4 / 112G PAM4 / 224G PAM4 ▪ Cable sizes: 25AWG – 32AWG ▪ 112G Passive cable lengths up to 2 meters ▪ 112G Active cable lengths up to 4 meters ▪ 224G Passive cable lengths up to 1 meter </div> <div data-bbox="1266 456 1772 938">  <p>TARGET MARKETS</p>  </div> <div data-bbox="688 1114 1829 1179"> <p><i>Amphenol OSFP Copper Cable Assemblies Datasheet</i> at https://cdn.amphenol-cs.com/media/wysiwyg/files/documentation/datasheet/cableassemblies/hsio_ca_osfp.pdf.</p> </div>

'233 Patent	Accused Products
<p>Claim 1</p>	<div data-bbox="709 280 1293 329" data-label="Section-Header"> <h2>QSFP DD Cable Assemblies</h2> </div> <div data-bbox="709 375 1234 415" data-label="Section-Header"> <h3>200G / 400G / 800G SOLUTIONS</h3> </div> <div data-bbox="709 440 1262 699" data-label="Text"> <p>Amphenol's QSFP DD (Double Density) copper cable assemblies double the number of channels from 4 to 8 lanes when compared to the existing QSFP cabling systems, enabling more bandwidth within the same mechanical envelope. Compatible with 25G/Lane NRZ up to 112G/Lane PAM4 signaling protocols that allow cables to deliver aggregate bandwidths of 200G, 400G, and 800G per cable assembly. Available in both Passive and Active variants.</p> </div> <div data-bbox="709 719 1251 1016" data-label="List-Group"> <ul style="list-style-type: none"> ▪ Addresses current and future market desired bandwidth port capability requirements ▪ Backwards mate compatible with QSFP receptacles ▪ Data Rate: 25G NRZ / 56G PAM4 / 112G PAM4 ▪ Cable sizes: 25AWG – 32AWG ▪ 112G Passive cable lengths up to 2 meters ▪ 112G Active cable lengths up to 4 meters ▪ Ultra-low-power Active Electrical Cable featuring Smart CDR SoC up to 3 meters at only 4.5W per side </div> <div data-bbox="1297 380 1852 963" data-label="Image"> </div> <div data-bbox="688 1040 1877 1109" data-label="Text"> <p><i>Amphenol QSFP DD Cable Assemblies Datasheet</i> at https://cdn.amphenol-cs.com/media/wysiwyg/files/documentation/datasheet/cableassemblies/hsio_ca_qsfp_dd.pdf.</p> </div>
<p>[1a] a first data recovery and re-modulation (DRR) device that exchanges inbound and outbound multi-lane data streams with a first host interface port via a first end connector plug;</p>	<p>The Accused Products comprise a first data recovery and re-modulation (DRR) device that exchanges inbound and outbound multi-lane data streams with a first host interface port via a first end connector plug.</p> <p>For example, the first DRR device is a first digital signal processor (“DSP”) at one end of the active cable.</p>

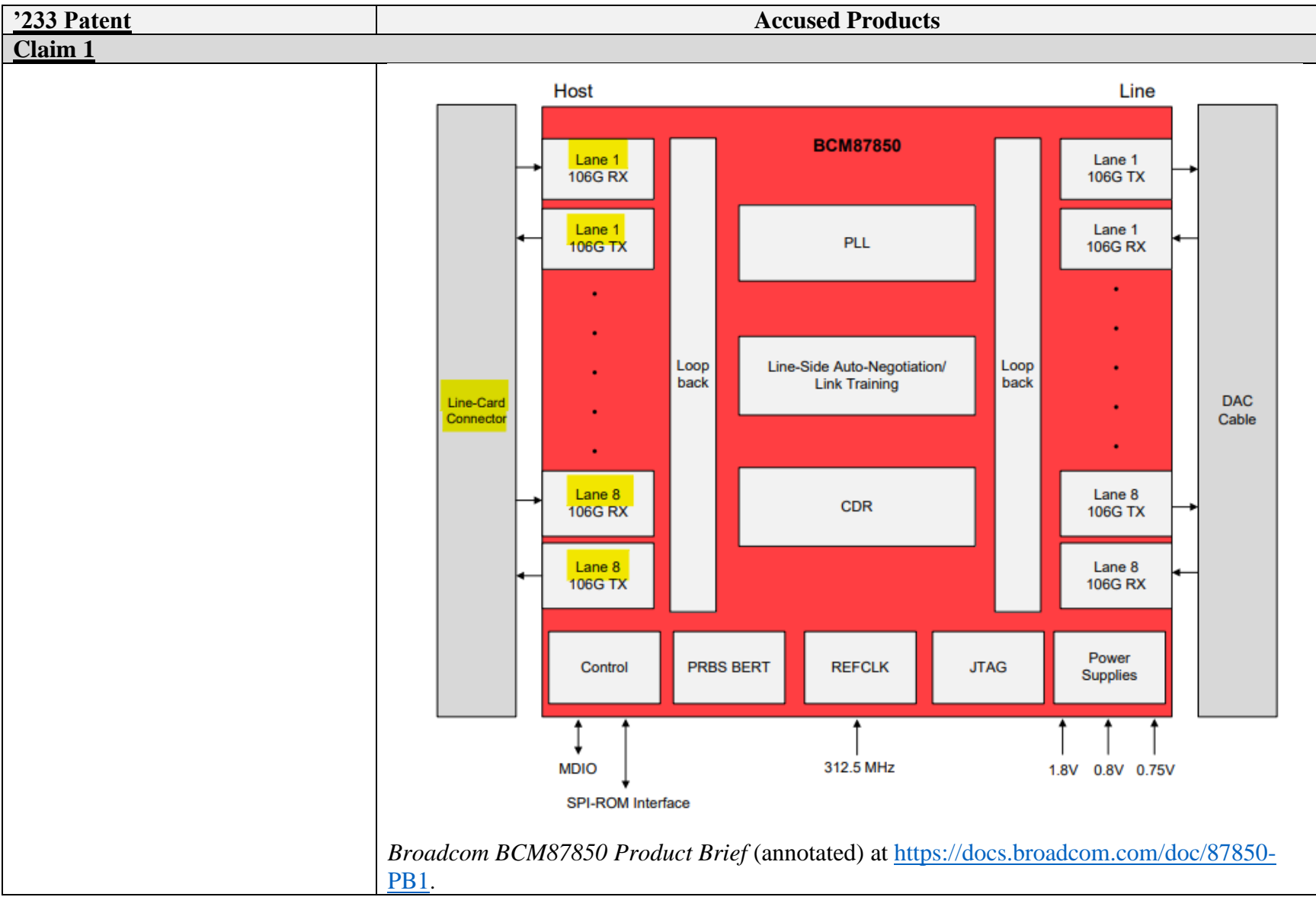
'233 Patent	Accused Products
<p>Claim 1</p>	<p>See, e.g.:</p> <p>OSFP (Octal Small Form Factor Pluggable) Copper Cable Assemblies</p> <p>200G / 400G / 800G / 1.6T SOLUTIONS</p> <p>Amphenol is leading the industry in OSFP cable development. Our Electronics Products 'Product of the Year' award-winning OSFP (Octal Small Form Factor Pluggable) cable assemblies are compatible with 25G/lane channel NRZ up to 224G/lane channel PAM4 signaling protocols that allow the cables to deliver aggregate bandwidths of 200G, 400G, 800G, and 1.6T per cable assembly. Available in both Passive and Active variants.</p> <ul style="list-style-type: none"> ▪ Comprehensive system integrated interconnect design for copper or optical based cable solutions ▪ Addresses current and future market desired bandwidth port capability requirements ▪ Optimized heat dissipative and airflow features to maximize the heat dissipative properties of the system ▪ Data Rate: 25G NRZ / 56G PAM4 / 112G PAM4 / 224G PAM4 ▪ Cable sizes: 25AWG – 32AWG ▪ 112G Passive cable lengths up to 2 meters ▪ 112G Active cable lengths up to 4 meters ▪ 224G Passive cable lengths up to 1 meter <p><i>Amphenol OSFP Copper Cable Assemblies Datasheet</i> at https://cdn.amphenol-cs.com/media/wysiwyg/files/documentation/datasheet/cableassemblies/hsio_ca_osfp.pdf.</p> <div data-bbox="1262 527 1772 1015" style="border: 1px solid #ccc; padding: 10px;">  <p>TARGET MARKETS</p> <div style="display: flex; gap: 10px;">   </div> </div>

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	<table border="1"> <thead> <tr> <th data-bbox="699 282 856 305"><input type="checkbox"/> PART NUMBER</th> <th data-bbox="856 282 1373 305">DESCRIPTION</th> <th data-bbox="1373 282 1444 305">PRODUCT DRAWING</th> <th data-bbox="1444 282 1570 305">3D MODEL (STP)</th> <th data-bbox="1570 282 1675 305">STATUS</th> <th data-bbox="1675 282 1875 305">DISTRIBUTOR STOCK CHECK</th> </tr> </thead> <tbody> <tr> <td data-bbox="699 337 856 360"><input type="checkbox"/> NJJJN8-0004</td> <td data-bbox="856 337 1373 360">  OSFP Cable Assembly, DSP Active, 32AWG, 4M, 112G / Lane, Flex Sleeve </td> <td data-bbox="1373 337 1444 360"></td> <td data-bbox="1444 337 1570 360"></td> <td data-bbox="1570 337 1675 360">Active</td> <td data-bbox="1675 337 1875 360"></td> </tr> <tr> <td data-bbox="699 402 856 425"><input type="checkbox"/> NJJJN8-0007</td> <td data-bbox="856 402 1373 425">  OSFP Cable Assembly, DSP Active, 32AWG, 1.5M, 112G / Lane, Flex Sleeve </td> <td data-bbox="1373 402 1444 425"></td> <td data-bbox="1444 402 1570 425"></td> <td data-bbox="1570 402 1675 425">Active</td> <td data-bbox="1675 402 1875 425"></td> </tr> <tr> <td data-bbox="699 467 856 490"><input type="checkbox"/> NJJJN8-0008</td> <td data-bbox="856 467 1373 490">  OSFP Cable Assembly, DSP Active, 32AWG, 2.5M, 112G / Lane, Flex Sleeve </td> <td data-bbox="1373 467 1444 490"></td> <td data-bbox="1444 467 1570 490"></td> <td data-bbox="1570 467 1675 490">Active</td> <td data-bbox="1675 467 1875 490"></td> </tr> <tr> <td data-bbox="699 532 856 555"><input type="checkbox"/> NJJJN8-0009</td> <td data-bbox="856 532 1373 555">  OSFP Cable Assembly, DSP Active, 32AWG, 3.5M, 112G / Lane, Flex Sleeve </td> <td data-bbox="1373 532 1444 555"></td> <td data-bbox="1444 532 1570 555"></td> <td data-bbox="1570 532 1675 555">Active</td> <td data-bbox="1675 532 1875 555"></td> </tr> <tr> <td data-bbox="699 597 856 620"><input type="checkbox"/> NJJJN80001</td> <td data-bbox="856 597 1373 620">  OSFP Cable Assembly, DSP Active, 32AWG, 1M, 112G / Lane, Flex Sleeve </td> <td data-bbox="1373 597 1444 620"></td> <td data-bbox="1444 597 1570 620"></td> <td data-bbox="1570 597 1675 620">Active</td> <td data-bbox="1675 597 1875 620"></td> </tr> <tr> <td data-bbox="699 662 856 685"><input type="checkbox"/> NJJJN80002</td> <td data-bbox="856 662 1373 685">  OSFP Cable Assembly, DSP Active, 32AWG, 2M, 112G / Lane, Flex Sleeve </td> <td data-bbox="1373 662 1444 685"></td> <td data-bbox="1444 662 1570 685"></td> <td data-bbox="1570 662 1675 685">Active</td> <td data-bbox="1675 662 1875 685"></td> </tr> <tr> <td data-bbox="699 727 856 750"><input type="checkbox"/> NJJJN80003</td> <td data-bbox="856 727 1373 750">  OSFP Cable Assembly, DSP Active, 32AWG, 3M, 112G / Lane, Flex Sleeve </td> <td data-bbox="1373 727 1444 750"></td> <td data-bbox="1444 727 1570 750"></td> <td data-bbox="1570 727 1675 750">Active</td> <td data-bbox="1675 727 1875 750"></td> </tr> <tr> <td data-bbox="699 792 856 815"><input type="checkbox"/> NJJJN80010</td> <td data-bbox="856 792 1373 815">  OSFP Cable Assembly, DSP Active, 32AWG, 4.5M, 112G / Lane, Flex Sleeve </td> <td data-bbox="1373 792 1444 815"></td> <td data-bbox="1444 792 1570 815"></td> <td data-bbox="1570 792 1675 815">Active</td> <td data-bbox="1675 792 1875 815"></td> </tr> </tbody> </table> <p data-bbox="688 857 1766 927"><i>Amphenol OSFP Cable Assemblies Webpage</i> (annotated) at https://www.amphenol-cs.com/product-series/osfp-cable-assemblies.html#.</p>	<input type="checkbox"/> PART NUMBER	DESCRIPTION	PRODUCT DRAWING	3D MODEL (STP)	STATUS	DISTRIBUTOR STOCK CHECK	<input type="checkbox"/> NJJJN8-0004	 OSFP Cable Assembly, DSP Active, 32AWG, 4M, 112G / Lane, Flex Sleeve			Active		<input type="checkbox"/> NJJJN8-0007	 OSFP Cable Assembly, DSP Active, 32AWG, 1.5M, 112G / Lane, Flex Sleeve			Active		<input type="checkbox"/> NJJJN8-0008	 OSFP Cable Assembly, DSP Active, 32AWG, 2.5M, 112G / Lane, Flex Sleeve			Active		<input type="checkbox"/> NJJJN8-0009	 OSFP Cable Assembly, DSP Active, 32AWG, 3.5M, 112G / Lane, Flex Sleeve			Active		<input type="checkbox"/> NJJJN80001	 OSFP Cable Assembly, DSP Active, 32AWG, 1M, 112G / Lane, Flex Sleeve			Active		<input type="checkbox"/> NJJJN80002	 OSFP Cable Assembly, DSP Active, 32AWG, 2M, 112G / Lane, Flex Sleeve			Active		<input type="checkbox"/> NJJJN80003	 OSFP Cable Assembly, DSP Active, 32AWG, 3M, 112G / Lane, Flex Sleeve			Active		<input type="checkbox"/> NJJJN80010	 OSFP Cable Assembly, DSP Active, 32AWG, 4.5M, 112G / Lane, Flex Sleeve			Active	
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'233 Patent	Accused Products
<p>Claim 1</p>	<div data-bbox="709 280 1293 329"> <h2>QSFP DD Cable Assemblies</h2> </div> <div data-bbox="709 375 1234 415"> <h3>200G / 400G / 800G SOLUTIONS</h3> </div> <div data-bbox="709 440 1262 699"> <p>Amphenol's QSFP DD (Double Density) copper cable assemblies double the number of channels from 4 to 8 lanes when compared to the existing QSFP cabling systems, enabling more bandwidth within the same mechanical envelope. Compatible with 25G/Lane NRZ up to 112G/Lane PAM4 signaling protocols that allow cables to deliver aggregate bandwidths of 200G, 400G, and 800G per cable assembly. Available in both Passive and Active variants.</p> </div> <div data-bbox="709 719 1251 1016"> <ul style="list-style-type: none"> ▪ Addresses current and future market desired bandwidth port capability requirements ▪ Backwards mate compatible with QSFP receptacles ▪ Data Rate: 25G NRZ / 56G PAM4 / 112G PAM4 ▪ Cable sizes: 25AWG – 32AWG ▪ 112G Passive cable lengths up to 2 meters ▪ 112G Active cable lengths up to 4 meters ▪ Ultra-low-power Active Electrical Cable featuring Smart CDR SoC up to 3 meters at only 4.5W per side </div> <div data-bbox="1297 380 1852 963">  <div data-bbox="1320 841 1530 865"> <p>TARGET MARKETS</p> </div> <div data-bbox="1320 878 1478 946">  </div> </div> <div data-bbox="688 1040 1877 1109"> <p><i>Amphenol QSFP DD Cable Assemblies Datasheet</i> at https://cdn.amphenol-cs.com/media/wysiwyg/files/documentation/datasheet/cableassemblies/hsio_ca_qsfp_dd.pdf.</p> </div> <div data-bbox="688 1149 1860 1256"> <p>For example, the DSPs in the Accused Products are manufactured by Broadcom and others. The first DSP in the Accused Products is a retimer that exchanges inbound and outbound multi-lane data streams with a first host interface port via a first end connector plug.</p> </div> <div data-bbox="688 1297 810 1330"> <p>See, e.g.:</p> </div>

'233 Patent	Accused Products
Claim 1	
	<ul style="list-style-type: none"> Amphenol will highlight OAI expansion version 1.0, featuring Broadcom's 1.6T (2x800G), 5nm retimer PHY, ExaMAX2[®] 112G backplane connector, OSFP 112 I/O connector and Mini Cool Edge, Expo Hall, Booth A8. <p><i>Broadcom 2022 OCP Global Summit Press Release</i> at https://investors.broadcom.com/news-releases/news-release-details/broadcom-showcases-industry-leading-hyperscale-solutions-2022.</p> <p>Key components used for validation include (1) Broadcom's BCM85361 1.6Tbps retimer/crossbar and Amphenol's ExaMAX2 112Gb/s high-speed backplane connector system.</p> <ul style="list-style-type: none"> Broadcom's BCM85361 is a 16 lane, 112G SerDes retimer with support for long-reach backplanes with ~45dB of insertion loss and passive DAC cables up to 3 meters. The retimer supports Ethernet rates up to 2 x 800 GbE for scale-out and can also be configured as a flexible crossbar for scale-up requirements. BCM85361 is designed in the advanced 5nm process node, delivering low power to meet the challenges of increasing energy consumption in data centers. Amphenol's ExaMAX2 connector system delivers industry leading SI performance needed to support OAI applications. The Vertical Header (VH) P/N: 10167063c and Right-Angle Receptacle (RAR) P/N:10167059c are configured as 4x16 and provide the connectivity to support both scale-out and switch implementations of the Expansion Card. The innovative beam-on-beam mating interface of the ExaMAX2 solution demonstrates a resonance-free Insertion Loss profile thru 60GHz and superb Return Loss performance. <p><i>Broadcom B-Connected Blog Post</i> at https://www.broadcom.com/blog/broadcoms-112g-serdes-connects-generative-ai.</p>

'233 Patent	Accused Products
<u>Claim 1</u>	<p data-bbox="705 285 890 321">Overview</p> <p data-bbox="705 342 1780 521">The Broadcom® BCM87850 is a single-chip, eight-lane, ultra-low power, ultra-low latency PHY that integrates retimer and equalizer to support active cable applications. The BCM87850 is capable of equalizing 22 dB of loss on both the client-side and line-side interfaces. Each lane is capable of multiple data rates, including 106.25 Gb/s.</p> <p data-bbox="705 557 1698 659">The on-chip clock synthesis is performed by a low-cost 312.5-MHz reference clock through high-frequency, low jitter phase-locked loops (PLLs).</p> <p data-bbox="705 695 1780 797">The BCM87850 is fabricated in low-power 7-nm CMOS technology and is available in a 12 mm × 12 mm, 0.5-mm pitch, 485-ball BGA, RoHS-compliant package.</p> <p data-bbox="705 816 1850 881"><i>Broadcom BCM87850 Product Brief</i> (annotated) at https://docs.broadcom.com/doc/87850-PB1.</p>

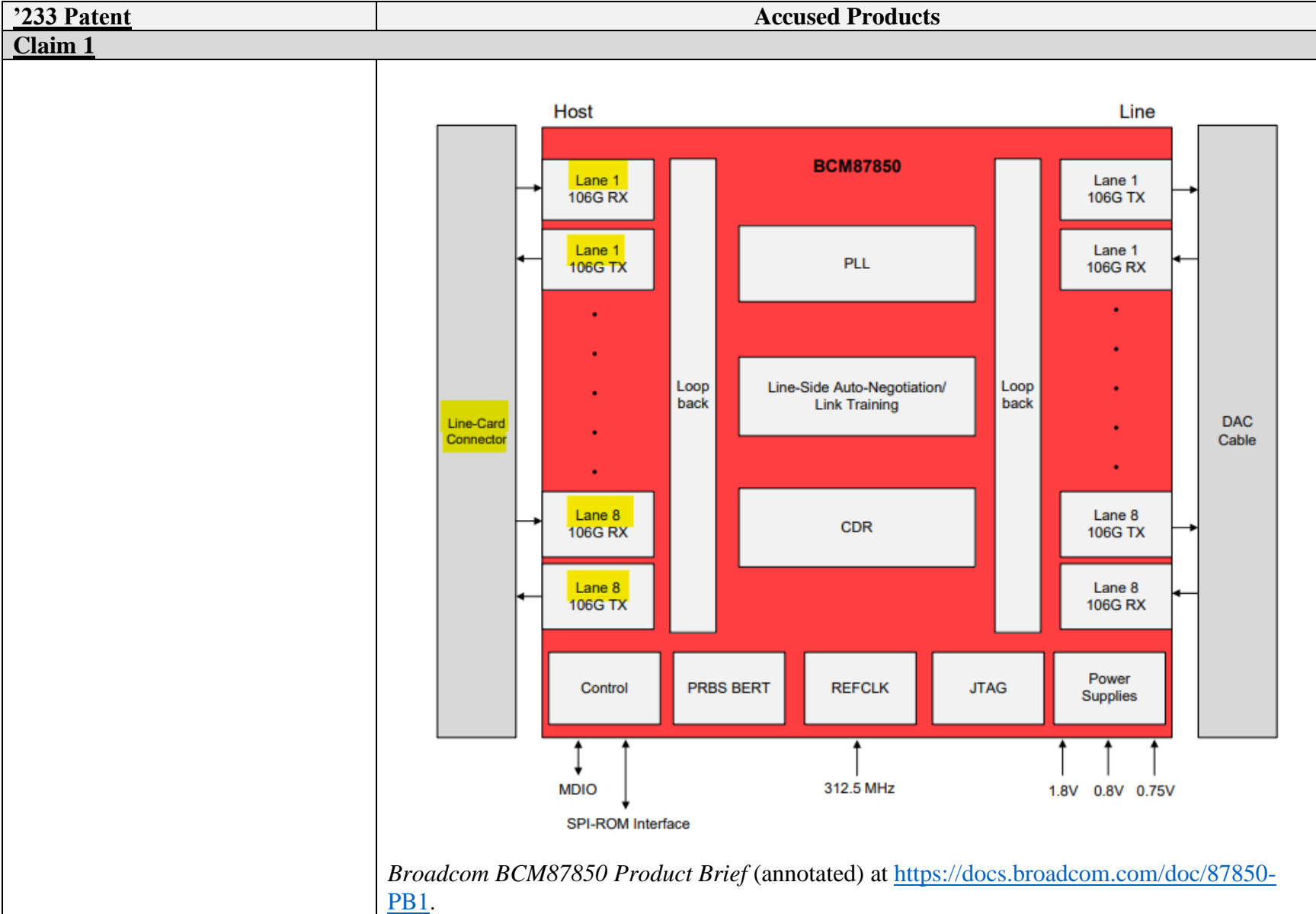


'233 Patent	Accused Products
<u>Claim 1</u>	
	<p data-bbox="722 315 863 345">Overview</p> <p data-bbox="722 370 1352 537">The Marvell Alaska A MV-CHA180C0C 800G is a PAM4 DSP retimer for 800G Active Electrical Cable (AEC) application, optimized for Switch to Switch and Switch to Server connectivity inside next generation cloud data center, high-performance computing and AI systems.</p> <p data-bbox="722 566 1398 734">Alaska A 800G is a retimer device which utilizes a 112G Gbps PAM4 DSP SERDES. There are 8-host and 8-line ports with each receiver port being able to recover 112Gbps PAM-4 signals and transmit to partnered TX. It can provide up to 800G (8 x 112G) full duplex mission mode traffic.</p>

'233 Patent	Accused Products
Claim 1	
	<p><i>Marvell Alaska Product Brief</i> (annotated) at https://www.marvell.com/content/dam/marvell/en/public-collateral/phys-transceivers/marvell-alaska-a-800g-pam4-dsp-product-brief.pdf.</p>
<p>[1b] a second DRR device that exchanges inbound and outbound multi-lane data streams with a second host interface port via a second end connector plug; and</p>	<p>The Accused Products comprise a second DRR device that exchanges inbound and outbound multi-lane data streams with a second host interface port via a second end connector plug.</p> <p>For example, the second DRR device is a second DSP retimer at the other end of the cable. As shown below, each end of the cable has a symmetrical connector containing a DSP.</p> <p>See, e.g.:</p>

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<u>Claim 1</u>	 <p data-bbox="688 792 1835 862"><i>Amphenol OSFP Copper Cable Assemblies Datasheet at https://cdn.amphenol-cs.com/media/wysiwyg/files/documentation/datasheet/cableassemblies/hsio_ca_osfp.pdf.</i></p>

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<p>Claim 1</p>	<div data-bbox="709 315 1293 363"> <h2>QSFP DD Cable Assemblies</h2> </div> <div data-bbox="709 407 1234 444"> <h3>200G / 400G / 800G SOLUTIONS</h3> </div> <div data-bbox="709 475 1262 732"> <p>Amphenol's QSFP DD (Double Density) copper cable assemblies double the number of channels from 4 to 8 lanes when compared to the existing QSFP cabling systems, enabling more bandwidth within the same mechanical envelope. Compatible with 25G/Lane NRZ up to 112G/Lane PAM4 signaling protocols that allow cables to deliver aggregate bandwidths of 200G, 400G, and 800G per cable assembly. Available in both Passive and Active variants.</p> </div> <div data-bbox="709 751 1262 1049"> <ul style="list-style-type: none"> ▪ Addresses current and future market desired bandwidth port capability requirements ▪ Backwards mate compatible with QSFP receptacles ▪ Data Rate: 25G NRZ / 56G PAM4 / 112G PAM4 ▪ Cable sizes: 25AWG – 32AWG ▪ 112G Passive cable lengths up to 2 meters ▪ 112G Active cable lengths up to 4 meters ▪ Ultra-low-power Active Electrical Cable featuring Smart CDR SoC up to 3 meters at only 4.5W per side </div> <div data-bbox="1297 412 1852 993">  <div data-bbox="1320 873 1528 898"> <p>TARGET MARKETS</p> </div> <div data-bbox="1325 911 1478 979">  </div> </div> <div data-bbox="688 1073 1877 1143"> <p><i>Amphenol QSFP DD Cable Assemblies Datasheet</i> at https://cdn.amphenol-cs.com/media/wysiwyg/files/documentation/datasheet/cableassemblies/hsio_ca_qsfp_dd.pdf.</p> </div> <div data-bbox="688 1183 1892 1253"> <p>The second DSP exchanges inbound and outbound multi-lane data streams with a second host interface port via a second end connector plug:</p> </div>

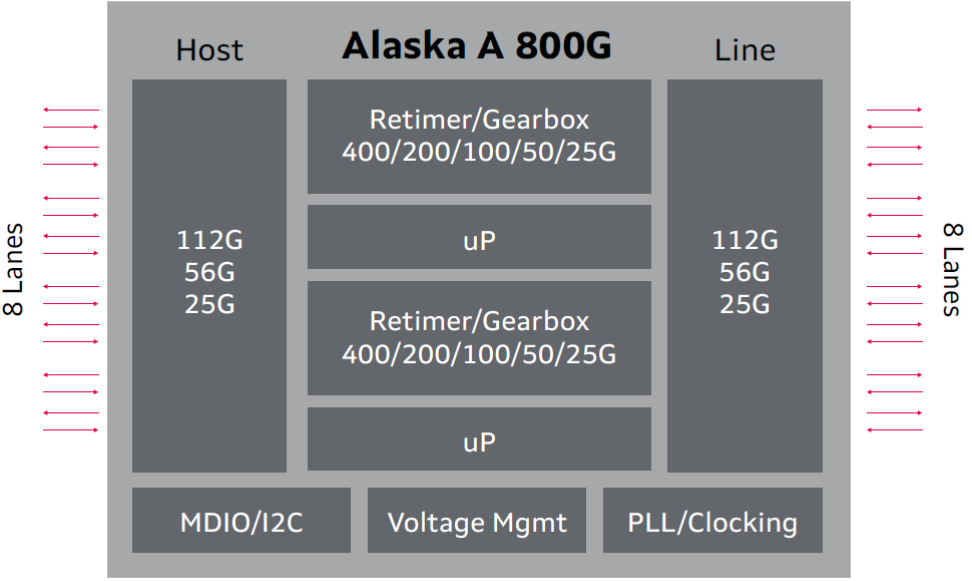


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<u>Claim 1</u>	
	<p data-bbox="722 315 863 345">Overview</p> <p data-bbox="722 370 1352 537">The Marvell Alaska A MV-CHA180C0C 800G is a PAM4 DSP retimer for 800G Active Electrical Cable (AEC) application, optimized for Switch to Switch and Switch to Server connectivity inside next generation cloud data center, high-performance computing and AI systems.</p> <p data-bbox="722 566 1398 734">Alaska A 800G is a retimer device which utilizes a 112G Gbps PAM4 DSP SERDES. There are 8-host and 8-line ports with each receiver port being able to recover 112Gbps PAM-4 signals and transmit to partnered TX. It can provide up to 800G (8 x 112G) full duplex mission mode traffic.</p>

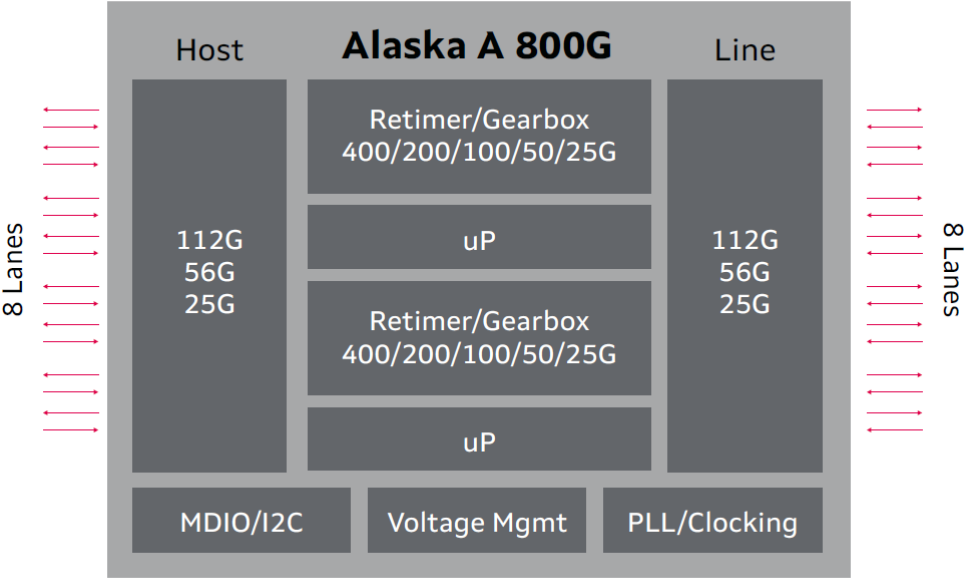
'233 Patent	Accused Products
Claim 1	
	<div data-bbox="693 354 1669 933" data-label="Diagram"> </div> <p data-bbox="688 982 1627 1096"><i>Marvell Alaska Product Brief</i> (annotated) at https://www.marvell.com/content/dam/marvell/en/public-collateral/phys-transceivers/marvell-alaska-a-800g-pam4-dsp-product-brief.pdf.</p> <p data-bbox="688 1128 1092 1161"><i>See also</i> [1pre] and [1a] above.</p>
[1c] electrical conductors connecting the first and second DRR devices to convey electrical transit signals therebetween,	<p data-bbox="688 1209 1858 1274">The Accused Products comprise electrical conductors connecting the first and second DRR devices to convey electrical transit signals therebetween.</p> <p data-bbox="688 1315 1879 1388">For example, the electrical conductors are dual-axial, differential-pair copper wires (one per lane) that connect the first and second DSPs to convey electrical transit signals therebetween.</p>

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Claim 1	
	<p>See, e.g.:</p> <ul style="list-style-type: none"> ▪ Assembled with industry leading twin-axial SKEWCLEAR® 8-pair or 16-pair wire <p><i>Amphenol OSFP Copper Cable Assemblies Datasheet</i> at https://cdn.amphenol-cs.com/media/wysiwyg/files/documentation/datasheet/cableassemblies/hsio_ca_osfp.pdf.</p> <ul style="list-style-type: none"> ▪ Assembled with industry leading twin-axial SKEWCLEAR® 8-pair or 16-pair wire <p><i>Amphenol QSFP DD Cable Assemblies Datasheet</i> at https://cdn.amphenol-cs.com/media/wysiwyg/files/documentation/datasheet/cableassemblies/hsio_ca_qsfp_dd.pdf.</p>
<p>[1d] the first DRR device converting between said electrical transit signals and said inbound and outbound multi-lane data streams for the first host interface port, and</p>	<p>The first DRR device in the Accused Products converts between said electrical transit signals and said inbound and outbound multi-lane data streams for the first host interface port.</p> <p>For example, the first DSP receives electrical transit signals from the cable and converts them (via the retimer) into multi-lane data streams that are sent to the host. The first DSP also receives multi-lane data streams from the host and converts them (via the retimer) into electrical transit signals that are sent to the cable.</p> <p>See, e.g.:</p>

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'233 Patent	Accused Products
Claim 1	
	 <p data-bbox="688 609 724 706">8 Lanes</p> <p data-bbox="1627 609 1663 706">8 Lanes</p> <p data-bbox="688 1015 1627 1120"> <i>Marvell Alaska Product Brief</i> (annotated) at https://www.marvell.com/content/dam/marvell/en/public-collateral/phys-transceivers/marvell-alaska-a-800g-pam4-dsp-product-brief.pdf. </p>
<p>[1e] the second DRR device converting between said electrical transit signals and said inbound and outbound multi-lane data streams for the second host interface port,</p>	<p>The second DRR device in the Accused Products converts between said electrical transit signals and said inbound and outbound multi-lane data streams for the second host interface port.</p> <p>For example, the second DSP at the other end of the cable also converts between said electrical transit signals and said inbound and outbound multi-lane data streams for the first host interface port via the retimer.</p>

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Claim 1	<p>Overview</p> <p>The Broadcom® BCM87850 is a single-chip, eight-lane, ultra-low power, ultra-low latency PHY that integrates retimer and equalizer to support active cable applications. The BCM87850 is capable of equalizing 22 dB of loss on both the client-side and line-side interfaces. Each lane is capable of multiple data rates, including 106.25 Gb/s.</p> <p>The on-chip clock synthesis is performed by a low-cost 312.5-MHz reference clock through high-frequency, low jitter phase-locked loops (PLLs).</p> <p>The BCM87850 is fabricated in low-power 7-nm CMOS technology and is available in a 12 mm × 12 mm, 0.5-mm pitch, 485-ball BGA, RoHS-compliant package.</p> <p><i>Broadcom BCM87850 Product Brief</i> (annotated) at https://docs.broadcom.com/doc/87850-PB1.</p> <p>Overview</p> <p>The Marvell Alaska A MV-CHA180C0C 800G is a PAM4 DSP retimer for 800G Active Electrical Cable (AEC) application, optimized for Switch to Switch and Switch to Server connectivity inside next generation cloud data center, high-performance computing and AI systems.</p> <p>Alaska A 800G is a retimer device which utilizes a 112G Gbps PAM4 DSP SERDES. There are 8-host and 8-line ports with each receiver port being able to recover 112Gbps PAM-4 signals and transmit to partnered TX. It can provide up to 800G (8 x 112G) full duplex mission mode traffic.</p>

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	 <p><i>Marvell Alaska Product Brief</i> (annotated) at https://www.marvell.com/content/dam/marvell/en/public-collateral/phys-transceivers/marvell-alaska-a-800g-pam4-dsp-product-brief.pdf.</p> <p><i>See also</i> 1[b] and 1[d] above.</p>
<p>[1f] the first and second DRR devices providing pre-equalization of the electrical transit signals using transmit filter coefficient values stored in nonvolatile memories.</p>	<p>The first and second DRR devices in the Accused Products provide pre-equalization of the electrical transit signals using transmit filter coefficient values stored in nonvolatile memories.</p> <p>For example, the first and second DSPs provide different levels of pre-equalization corresponding to “short” and “long” modes used for 112G-per-lane chip-to-module (C2M) transmission, per the IEEE 802.3ck standard. On information and belief, the transmit filter</p>

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Claim 1	<p>coefficient values used for short-channel and long-channel pre-equalization are stored in nonvolatile memories so they are available for C2M communications when the cable is connected to the host.</p> <p>See, e.g.:</p> <p>120G.3.2.1 Module output modes</p> <p>The module output shall support two modes: short and long. The means of controlling the module output mode is implementation dependent. For each output mode, the module shall meet the requirements for eye height (min) and VEC (max) in Table 120G-3 for both near-end and far-end measurements (see 120G.3.2.2.1).</p> <p><i>IEEE 802.3ck Specification</i> at 7275 (annotated).</p> <p>The datasheet for the exemplary Accused Products notes that they support the IEEE 802.3ck standard:¹</p>

¹ The Accused Products that use a QSFP form factor likewise comply with the IEEE 802.3ck standard. See *Amphenol QSFP DD Cable Assemblies Datasheet* at https://cdn.amphenol-cs.com/media/wysiwyg/files/documentation/datasheet/cableassemblies/hsio_ca_qsfp_dd.pdf. (noting compliance with IEEE 802.3ck); *QSFP-DD Specification*, <http://www.qsfp-dd.com/wp-content/uploads/2024/07/QSFP-DD-Hardware-Rev7.1.pdf> at 34; *QSFP112 Specification*, http://www.qsfp112.com/QSFP112_MSA_Specification_Rev2.1.1.pdf at 10.

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	<p>SPECIFICATIONS</p> <ul style="list-style-type: none"> ▪ Refer to the latest revision specification of the OSFP octal small form factor pluggable module ▪ Applicable IEEE specifications ▪ IEEE802.3by ▪ IEEE802.3bj ▪ IEEE802.3cd ▪ IEEE802.3ck ▪ The InfiniBand™ architecture specification and annexes <p><i>Amphenol OSFP Copper Cable Assemblies Datasheet</i> (annotated) at https://cdn.amphenol-cs.com/media/wysiwyg/files/documentation/datasheet/cableassemblies/hsio_ca_osfp.pdf.</p> <p>SPECIFICATIONS</p> <ul style="list-style-type: none"> ▪ Refer to the latest revision of the QSFP-DD hardware specification for QSFP double density 8X pluggable transceiver ▪ Applicable IEEE specifications ▪ IEEE802.3by ▪ IEEE802.3bj ▪ IEEE802.3cd ▪ IEEE802.3ck ▪ The InfiniBand™ architecture specification and annexes <p><i>Amphenol QSFP DD Cable Assemblies Datasheet</i> at https://cdn.amphenol-cs.com/media/wysiwyg/files/documentation/datasheet/cableassemblies/hsio_ca_qsfp_dd.pdf.</p>

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<u>Claim 1</u>	
	<p>The datasheet also notes that a nonvolatile memory (an EEPROM) is integrated into the cable assembly:</p> <p><i>Amphenol OSFP Copper Cable Assemblies Datasheet</i> (annotated) at https://cdn.amphenol-cs.com/media/wysiwyg/files/documentation/datasheet/cableassemblies/hsio_ca_osfp.pdf.</p> <ul style="list-style-type: none"> ▪ EEPROM in cable assembly <p><i>Amphenol QSFP DD Cable Assemblies Datasheet</i> at https://cdn.amphenol-cs.com/media/wysiwyg/files/documentation/datasheet/cableassemblies/hsio_ca_qsfp_dd.pdf.</p>