



HIGH-SPEED DATA (HSD) COMMUNICATION CONNECTORS

INNOVATIVE TECHNOLOGIES

TE Connectivity (TE) is a leader in automotive connectivity and sensor technology. Our engineers are always working to meet complex requirements. We connect nearly every electronic function in the vehicle - from alternative power systems to infotainment and sensor technologies. Our technologies withstand harsh environments and tolerate high temperature, vibration, shock, pressure and long-life in electronic control systems.



INTERCONNECTION SYSTEMS

Our electrical and electronic interconnection products and solutions are used to electrically and mechanically connect wires and cables, printed circuit boards, integrated circuit packages, batteries and more.



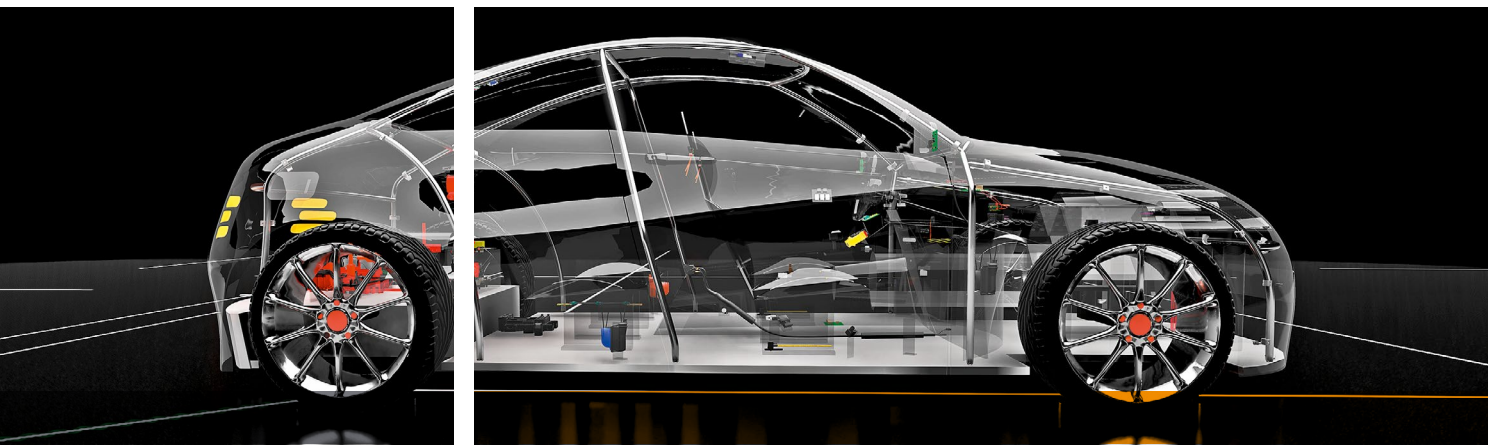
CABLE ASSEMBLIES

TE is your partner for vehicle-specific cable assemblies. We offer research and development capabilities, prototypes and samples, as well as manufacturing facilities.



HYBRID & ELECTRIC MOBILITY SOLUTIONS

Our technologies leverage decades of innovation and experience with high-voltage transmission and distribution. Our hybrid and electric mobility solutions include a complete line of connectors, terminals, sensors, cable assemblies, contactors, and battery connection protection to help safeguard the flow of power in hybrid and electric vehicles. Connection after connection, you can count on TE for smaller, greener, lighter and smarter solutions you can trust.



SENSOR SOLUTIONS

Data is critical for making vehicles safer, greener, smarter and more connected. Customers rely on our sensor technology to provide data for control, adaptation and response of vehicle functions and features that increase safety, comfort, efficiency, and more. We collaborate to provide solutions for demanding and harsh applications such as automated transmissions, engines, chassis, clutch, brake and exhaust. Our products can be found in vehicles traveling the world's roads and highways.




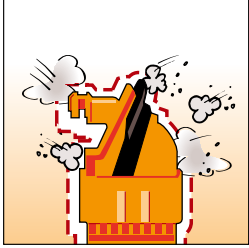
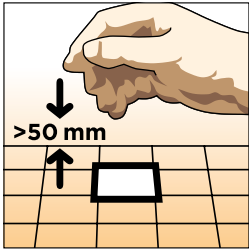
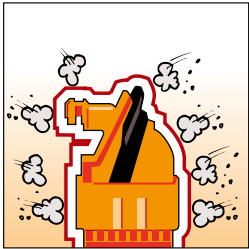
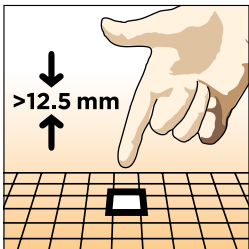
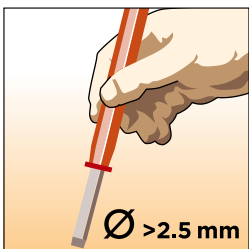
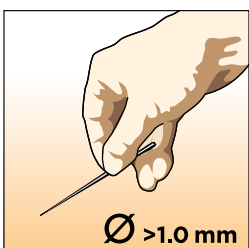
INFOTAINMENT


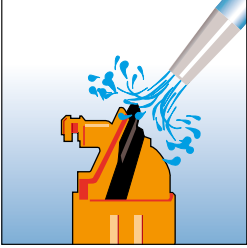

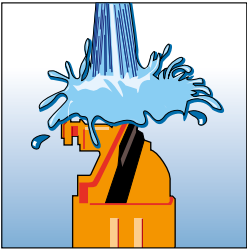
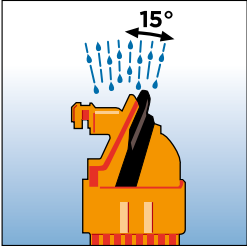
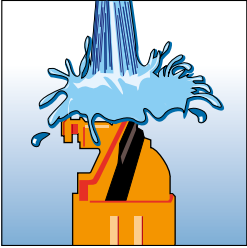
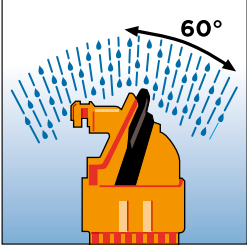
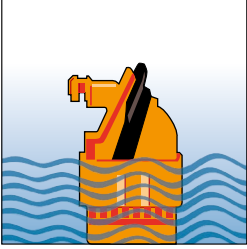
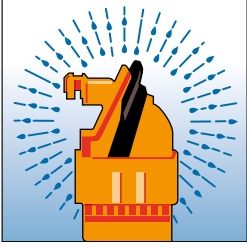
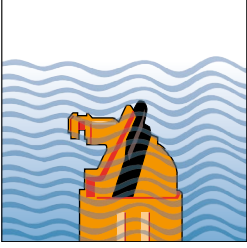
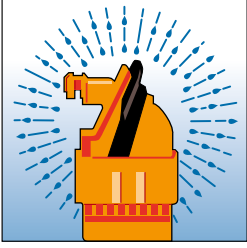

Our wide range of infotainment solutions are ideal for consumer port connections, high data rate applications, next-generation harness architecture, board-to-board connections and vehicle-to-vehicle communication.



RELAYS

From passenger comfort and infotainment to higher DC voltages and power levels to harsh environments, our relays and contactors provide critical switching functions in multiple vehicle applications. With increased contact gaps and other key design features, our relays are ideal for harsh environments such as shock and vibration.

1st Digit Against Foreign Objects (incl. Dust)	1st Digit Against Foreign Objects (incl. Dust)
<p>0</p>  <p>Not protected.</p>	<p>5K</p>  <p>Dust protected.</p>
<p>1</p>  <p>Protected against solid objects greater than 50 mm (ex. back of hand).</p>	<p>6K</p>  <p>Dust tight.</p>
<p>2</p>  <p>Protected against solid objects greater than 12.5 mm (ex. finger).</p>	
<p>3</p>  <p>Protected against solid objects greater than 2.5 mm (ex. tool).</p>	
<p>4</p>  <p>Protected against solid objects greater than 1.0 mm (ex. wire).</p>	

2nd Digit	Against Water	2nd Digit	Against Water
0	 <p>Not protected.</p>	5	 <p>Protected against jetting water.</p>
1	 <p>Protected against vertically dripping water.</p>	6	 <p>Protected against powerfully jetting water.</p>
2	 <p>Protected against dripping water when tilted up to 15°.</p>	6K	 <p>Protected against powerfully jetting water with increased pressure (Automotive).</p>
3	 <p>Protected against spraying water (up to 60° inclination).</p>	7	 <p>Protected against the temporary effects of immersion up to 1 meter.</p>
4	 <p>Protected against splashing water.</p>	8	 <p>Protected against continuous submersion agreed with customer, but more severe than code 7.</p>
4K	 <p>Protected against splashing water with increased pressure.</p>	9K	 <p>Protected against high-pressure/steam-jet cleaning (Automotive).</p>

Good Crimp Quality

<p>Bellmouth permissible</p> <p>Bellmouth must always be present</p> <p>Cut-off tab present</p>	F-CRIMP	<p>Crimp barrel closed</p> <p>Insulation is securely held</p>
<p>Insulation visible</p> <p>Conductor visible</p> <p>Locking lances and terminal body not deformed</p>	OVERLAP CRIMP	<p>Crimp legs overlap</p> <p>Insulation is securely held</p>
<p>Anvil imprint symmetrical</p>	WRAP OVER CRIMP	<p>Crimp legs must pass each other</p> <p>Insulation is securely held</p>
<p>Correct selection</p> <p>of wire, terminal and applicator</p> <p>Crimp barrel is closed, legs support each other, sufficient gap between legs and bottom of crimp, all strands are equally distributed and deformed</p>		

Test

WIRE CRIMP	<p>Crimp heights and tolerances</p> <p>For crimp height tolerances for any given contact, please refer to the relevant application specification.</p> <p>Examples</p> <table border="1"> <thead> <tr> <th>Contact</th> <th>P/N</th> <th>Wire Range</th> <th>Tolerance</th> <th>Spec.</th> </tr> </thead> <tbody> <tr> <td>JJPT</td> <td>927775</td> <td>0.50-1.00 mm²</td> <td>±0.05 mm</td> <td>114-18050</td> </tr> <tr> <td>JPT</td> <td>927773</td> <td>1.50-2.50 mm²</td> <td>±0.05 mm</td> <td>114-18050</td> </tr> <tr> <td>MQS</td> <td>962885</td> <td>0.20-0.50 mm²</td> <td>±0.03 mm</td> <td>114-18025</td> </tr> </tbody> </table>	Contact	P/N	Wire Range	Tolerance	Spec.	JJPT	927775	0.50-1.00 mm ²	±0.05 mm	114-18050	JPT	927773	1.50-2.50 mm ²	±0.05 mm	114-18050	MQS	962885	0.20-0.50 mm ²	±0.03 mm	114-18025	WIRE CRIMP
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INSULATION CRIMP	<p>Wire crimp without conductor</p> <p>Insulation must be securely held after bend test (one bend cycle)</p>	<p>Digital crimp height micrometer (0.001 mm increments) according to DIN ISO 9001 Part number: 547203-1</p>																				

Incorrect Crimp Quality

<p>Terminal body damaged</p>	<p>F-CRIMP</p>	<p>Crimp legs are not closed</p> <p>Insulation is pierced</p>
<p>Single core crimped on terminal</p>	<p>INSULATION CRIMP OVERLAP CRIMP</p>	<p>Crimp legs do not overlap</p> <p>Insulation is pierced</p>
<p>Terminal twisted</p>	<p>WRAP OVER CRIMP</p>	<p>Insulation is not securely held</p> <p>Insulation is over crimped</p>
<p>Cut off tab too long</p>	<p>Conductor brush protrudes into terminal body</p> <p>Insulation inside the wire crimp</p>	
<p>Crimp barrel distorted</p>	<p>Wire bent</p>	
<p>Terminal bent</p>	<p>Terminal bent</p>	

Correct
Incorrect
Test

At TE Connectivity, we support your RoHS requirements. We've assessed more than 1.5 million end items/components for RoHS compliance, and issued new part numbers where any change was required to eliminate the restricted materials. Part numbers in this catalog are identified as:

RoHS Compliant

Part numbers in this catalog are RoHS Compliant, unless marked otherwise. These products comply with European Union Directive 2002/95/EC as amended 1 January 2006 that restricts the use of lead, mercury, cadmium, hexavalent chromium, PBB, and PBDE in certain electrical and electronic products sold into the EU as of 1 July 2006.

Note: For purposes of this Catalog, included within the definition of RoHS Compliant are products that are clearly "Out of Scope" of the RoHS Directive such as hand tools and other non-electrical accessories.

Non-RoHS Compliant

These part numbers are identified with a "t" symbol. These products do not comply with the material restrictions of the European Union Directive 2002/95/EC.

5 of 6 Compliant

A "l" symbol identifies these part numbers. These products do not fully comply with the European Union Directive 2002/95/EC because they contain lead in solderable interfaces (they do not contain any of the other five restricted substances above allowable limits). However, these products may be suitable for use in RoHS applications where there is an application-based exception for lead in solders, such as the server, storage, or networking infrastructure exemption.

Note: Information regarding RoHS compliance is provided based on reasonable inquiry of our suppliers and represents our current actual knowledge based on the information provided by our suppliers. This information is subject to change. For latest compliance status, refer to our website referenced below. So whatever your questions when it comes to RoHS, we've got the answers at <http://www.TE.com/customersupport/rohssupportcenter/>

Getting the information you need

Our comprehensive on-line RoHS Customer Support Center provides a forum to answer your questions and support your RoHS needs. A RoHS FAQ (Frequently Asked Questions) is available with links to more detailed information. You can also submit RoHS questions and receive a response within 24 hours during a normal work week. The Support Center also provides:

- Cross-Reference from Non-compliant to Compliant Products
- Ability to browse RoHS Compliant Products in our on-line catalog:
www.TE.com/commerce/alt/RohsAltHome.do
- Downloadable Technical Data Customer Information Presentation
- More detailed information regarding the definitions used above

AWG Code	Diameter (Inch)	Diameter (mm)	F (mm ²)
000000	0.5800	14.733	170.0
00000	0.5165	13.13	135.0
0000	0.4600	11.684	103.8
000	0.4096	10.40	79.0
00	0.3648	9.27	67.5
0	0.3249	8.25	53.4
1	0.2893	7.34	42.2
2	0.2576	6.55	33.7
3	0.2294	5.82	26.6
4	0.2043	5.18	21.0
5	0.1819	4.62	16.9
6	0.1620	4.115	13.25
7	0.1443	3.66	10.25
8	0.1285	3.26	8.34
9	0.1144	2.90	6.6
10	0.1019	2.59	5.27
11	0.0907	2.30	4.15
12	0.0808	2.05	3.3
13	0.0720	1.83	2.63
14	0.0641	1.63	2.08
15	0.0571	1.45	1.65
16	0.0508	1.29	1.305
17	0.0453	1.14	1.01
18	0.0403	1.02	0.79
19	0.0359	0.91	0.65
20	0.0320	0.81	0.51
21	0.0285	0.72	0.407
22	0.0253	0.64	0.32
23	0.0226	0.57	0.255
24	0.0201	0.51	0.205
25	0.0179	0.455	0.162
26	0.0159	0.40	0.125
27	0.0142	0.36	0.102
28	0.0126	0.320	0.08
29	0.0113	0.287	0.0646
30	0.0100	0.254	0.0516
31	0.0089	0.226	0.04
32	0.0080	0.203	0.0324
33	0.0071	0.180	0.0255
34	0.0063	0.160	0.02
35	0.0056	0.142	0.0158
36	0.0050	0.127	0.0127
37	0.0045	0.114	0.01
38	0.0040	0.101	0.008
39	0.0035	0.089	0.0062
40	0.0031	0.079	0.0049
41	0.0028	0.071	0.00395
42	0.0025	0.064	0.00321
43	0.0022	0.056	0.00246
44	0.00198	0.050	0.00196
45	0.00176	0.045	
46	0.00157	0.040	
47	0.00140	0.036	
48	0.00124	0.031	
49	0.00110	0.028	
50	0.00099	0.025	

Remark: Starting from 0.03 mm² (AWG 32) a wire can be crimped.

**High-Speed Data (HSD)
Communication Connectors**

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SAFETY & SECURITY SYSTEMS



CONVENIENCE



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High-Speed Data (HSD) Communication Connectors

INTRODUCTION

Data connection systems based on Shielded Twisted Pair (STP) or Shielded Star Quad (SSQ) cable is increasing greatly. These requirements are being driven by the growth and complexity of Telematic and Information applications being introduced in the automobile.

TE Connectivity's commitment to support this technology segment has been strengthened with the introduction of the HSD (High Speed Data) product portfolio.

The HSD (High Speed Data) product portfolio is focused on various application areas in the automobile, such as the inside compartment for connections to displays, head units, cluster displays and rear seat infotainment modules. Additionally the portfolio covers harsh environment conditions for camera applications such as bumper zones or side mirrors.

The product portfolio can be used in combination with a variety of protocols such as LVDS (Low Voltage Differential Signaling), GVIF (Gigabit Video Interface), USB, IEEE 1394 as well as Ethernet protocols.

TE Connectivity has incorporated its broad spectrum of knowledge and experience in the development of this product portfolio. This knowledge and experience is not just restricted to over 40 years automotive experience, supporting every global OEM in their connection requirements, but also supporting the Infotainment requirements of OEM's and Tier 1's for over 12 years with coaxial, optical as well as connection systems based on STP.

Once more, TE Connectivity offers a world class product portfolio exceeding the market requirements, offering a full product spectrum covering connectors and if required cable assemblies.

Product Features

- Full product range of header connections based on the planned AK (German OEM Working Group) Interface
- Full product range of connectors based on the planned AK (German OEM Working Group) Interface
- Sealed applications ideal for camera connections
- All connections available through cable assemblies if required
- Products compatible to AK (German OEM Working Group) as well as USCAR requirements

Standardized data transmission systems are using the serial data processing

Today standard data transmission systems are using the serial data processing. Due to the serial data processing the number of conductors and single contacts in a connector can be drastically reduced. This is necessary due to proceeding miniaturization of connecting devices. On the other hand the whole data processing will be transmitted by one (or only a few) cable therefore a higher bandwidth is mandatory. In the following the fundamentals of serial data processing and influences will be described.

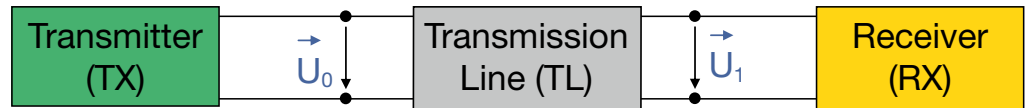


Fig. 1

Differential Data Transmission

The differential data transmission offers an advantage over the noise immunity combined with a low emitted interference compared to the asymmetrical signal transmission. The reason for that is, that the differential data signal is lead through twisted pair wires and an external interference affects both wires with the same intensity. This results in a constant differential signal under ideal conditions.

$$\Delta U = (U_+ + U_{interfer}) - (U_- + U_{interfer}) = \text{const.}$$

Emissions are minimized due to the erasement of the electromagnetic fields beyond the twisted cable affiliation.

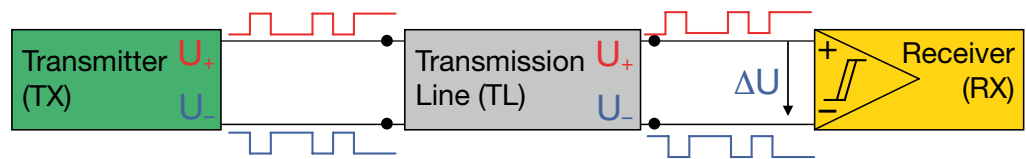


Fig. 2

Parameters of Data Transmission Cables in the Time Domain

Impedance

The impedance in the Time Domain describes the current/voltage ratio along the signal propagation direction on a data transmission channel. The impedance is not the same as the ohmic resistance. The absolute value needs to be constant in common with the system impedance along the whole data transmission line in order to avoid signal reflections. Due to connector-mechanic reasons this target is not achievable at all times. Target is to minimize the impedance aberration and the spatial width in the connector. The impedance is largely defined by the connector geometry, the distance between the conductors and the dielectric constant. Therefore the impedance will be influenced by an appropriate insulation material (ϵ_r) (see Formula 1).

$$Z \sim \sqrt{\frac{1}{\epsilon_r}}$$

Formula 1

Time Delay

Time Delay describes the time it takes for an electrical signal to pass through a specific distance. With s = distance and v = velocity \rightarrow time delay $t = v \cdot s$. The typical velocity of the HSD system is about 2/3 of the speed of light in vacuum ($c_0 = 300000 \text{ km/s}$). This is caused by the mechanical additive length of the wire conditioned by the twist on one hand and by the material properties of the transmission line on the other hand. The velocity (v) is mainly influenced by the dielectric constant (see Formula 2).

$$v \approx c_0 \cdot \frac{1}{\sqrt{\epsilon_r}}$$

Formula 2

Intra Pair Skew

Intra Pair Skew describes the difference of the propagation delay between electrical signals within a signal wire pair. This will be influenced by the mechanical length differences of conductors within a signal pair or by different dielectric constants. This mainly appears in 90° variants of connectors. HSD 90° headers have a basic grid of 2 mm which results in a length difference of 4 mm between 2 conductors of a pair. This implicates approximately 20 ps difference in time delay. Intra Pair Skew causes signal distortions and a decrease of the transmission bandwidth. Furthermore higher electromagnetic emissions and lower noise immunity takes place.

Inter Pair Skew

Inter Pair Skew describes the difference of the propagation delay between two or more signal wire pairs in one cable. The reasons for Inter Pair Skew are comparable with Intra Pair Skew. Inter Pair Skew leads into a reduction of bandwidth due to the fact that with most of the multi-channel data bus systems all datas must be valid simultaneously. Otherwise the time frames for a secure acceptance of valid information must be set unnecessary high.

Eye Diagram

The graph of the eye diagram (Fig. 3) of digital signals provides a first quantification of the signal quality. Therefore an array of curves will be superposed. The time trigger can be chosen as fixed or regained out of the signal. This depends on the parameter chosen to be measured. An ideal signal quality is indicated by an eye of rectangular form that means with high signal rise time and a constant amplitude. For the appraisal of the eye diagram it is of importance that a high signal rise time or a flat amplitude response with a visible noise may cause a high bit error rate. Therefore the probable bit error rate will be calculated via the eye diagram using statistical methods.

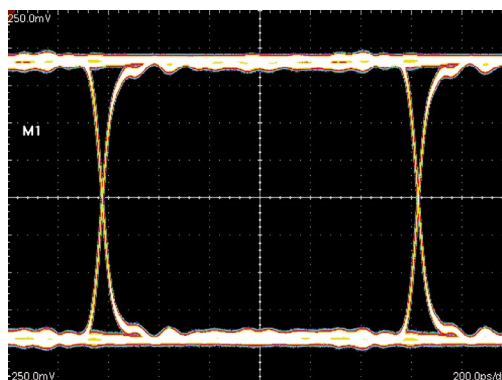


Fig. 3

From Time Domain to Frequency Domain

In order to get a sufficient description of the data transmission line in the frequency range it is useful to have a look at the frequency spectrum which has to be transmitted. A continuing rectangular pulse pattern consists of (referring to Fourier) a sum of sinus and cosinus functions (Fourier composition). Every signal in the time domain can be degraded in its several spectral frequency shares. The decay of the amplitudes of each spectral frequency will be determined by the signal rise time. The fundamental frequency will be determined by the signal period time.

Regarding the outcome of Fourier's decomposition with a finite number of harmonics (5. harmonic = 11 * f₀). The superposition of the several harmonics will lead into a continuing rectangular pulse pattern again (see Fig. 4, Fig. 5). As a result a data transmission line must not transmit only the fundamental wave but also even higher frequencies to avoid signal distortion.

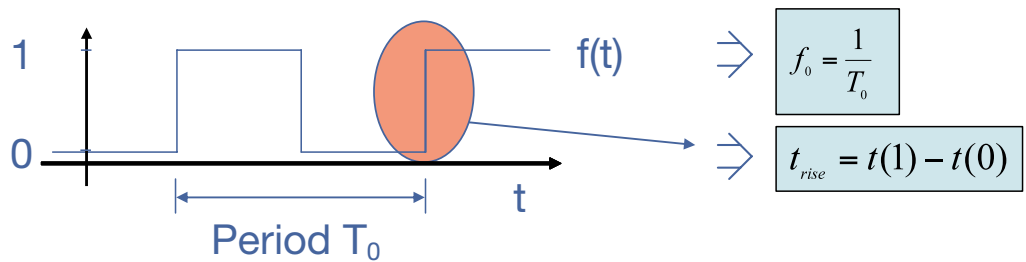


Fig. 4

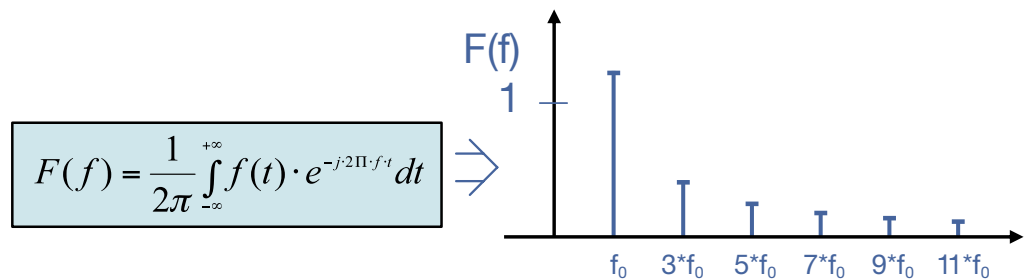


Fig. 5

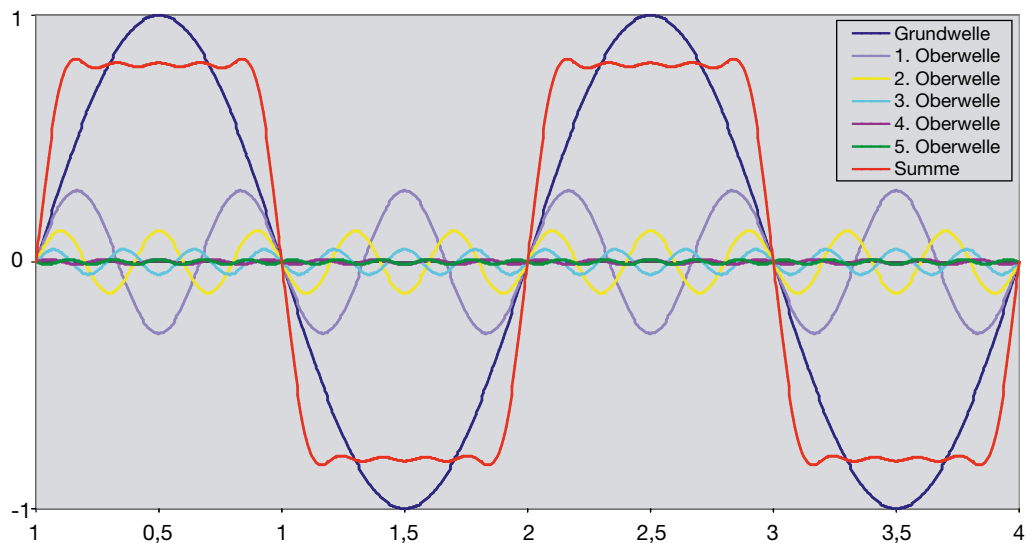


Fig. 6

Important Parameters of the Frequency Range

The description of a time discrete signal with the aid of the Fourier composition shows the importance of analysing parameters in the frequency range.

Attenuation:

Attenuation is the ratio of output voltage to input voltage of a transmission network $D = U_1/U_0$ (see Fig. 1). Normally the logarithmic voltage ratio is declared (see Formula. 3). In the lower frequency range attenuation is mainly caused by ohmic loss (conductance, conductor cross-section). With increasing frequency the dielectric losses and current displacement (Skin Effect) will be added.

$$D[dB] = -20 \cdot \log \left[\frac{U_1}{U_0} \right]$$

Formula 3

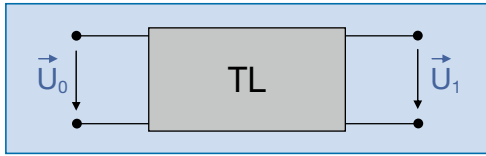


Fig. 7

Reflection Loss

Reflection loss is the ratio between the reflecting signal amplitude $U_{refl.}$ and the transmitted signal amplitude U_0 (see Formula 4, Fig. 8). Reasons for bad reflection loss ratio are inhomogeneities of the impedance on the transmission network. These are mainly caused by inhomogeneous geometries, inhomogeneous dielectrics and frequency depend dielectric constants of the insulating material.

Good Reflection loss values, even at higher frequencies, imply short lateral dimensions of possible impedance fluctuations.

$$A_{refl.}[dB] = -20 \cdot \log \left[\frac{U_{refl.}}{U_0} \right]$$

Formula 4

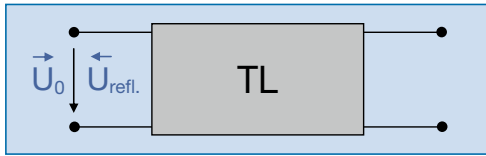


Fig. 8

Crosstalk

Crosstalk is an undesirable transmission of electrical signals between two or more transmission media due to inductive or capacitive coupling. More reasons are inhomogeneities of the transmission media and Skew effects in the signal transmission pair. Crosstalk causes on the one hand additional attenuation on the transmitted signal and on the other hand undesirable signal distortion on the adjoining signal channels. There are two different kinds of Crosstalk:

- Near End Crosstalk (NEXT, see Fig. 9)
- Far End Crosstalk (FEXT, see Fig. 10).

$$NEXT[dB] = 20 \cdot \log \left[\frac{U_{NEXT}}{U_0} \right]$$

Formula 5

$$FEXT[dB] = 20 \cdot \log \left[\frac{U_{FEXT}}{U_0} \right]$$

Formula 6

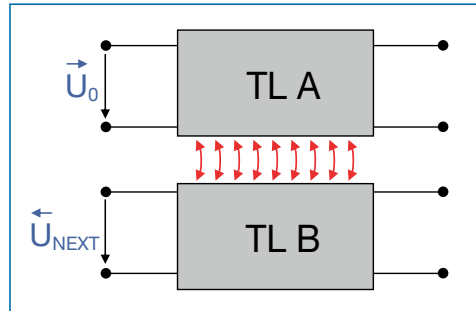


Fig. 9

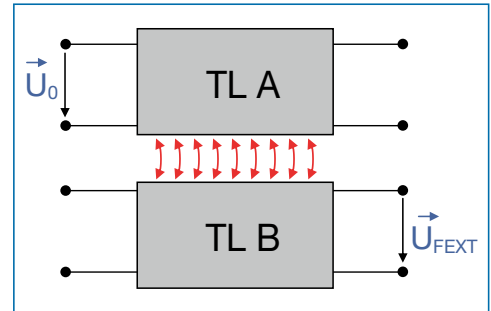


Fig. 10

EMC

EMC is the generic term of radiation and immunity of electrical systems. Radiation may cause a negative influence on adjoining systems. A high immunity is a fundamental assumption to avoid erroneous data transmission. Missing or insufficient shielding causes also a bad EMC performance, this will be improved by using twisted pair cables. Aside from optimal requirements a bad connection of the component shields, connectors, housings and wires also causes a bad EMC performance. Furthermore Skew effects will influence the EMC performance negative. For passive components as connectors and wires it is necessary to mention the shielding effectiveness. There must be differentiated between shielding effectiveness and coupling attenuation. Shielding effectiveness describes the behaviour of the shielding of the “coaxial” cable shield only. Coupling attenuation is the combination of the shielding effectiveness and the common mode rejection of the signal pair. The performance of the shielding connectivity of PCB connectors (pin header) relating to a metallic device housing is very important for the shielding performance. The quality of such a connection can be described with the parameter bulkhead feed-through.

Cable

The applied interconnection cable is designed as a star quad. Detailed information concerning the cable are listed in several data sheets of the cable manufacturers. The construction shown in Fig. 10 shows the principle construction of the star quad cable.

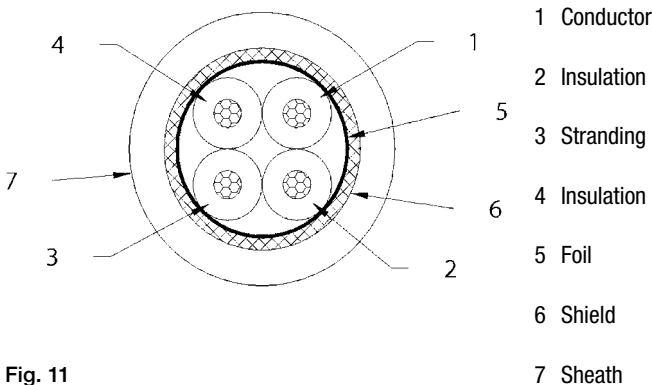


Fig. 11

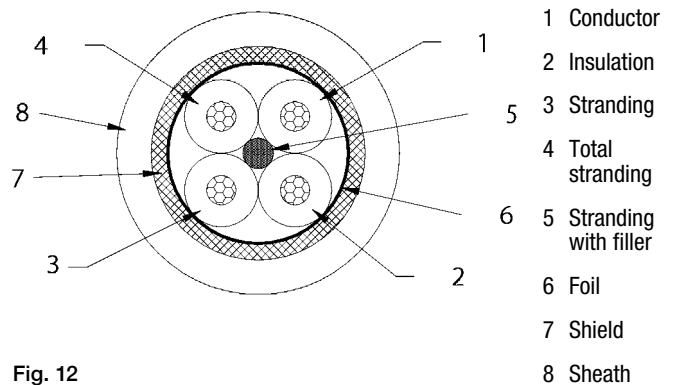


Fig. 12

Documents

Application Specification
114-18867 HSD Pin Header

Product Specification
108-94331 HSD
Connector System

Interface

According to
HSD Interface Drawing
114-18950

Mechanical Data

Mating Cycles
min. 25 (Contact Surface: Gold)

Mating and Unmating Force
max. 30N

Coding Efficiency
min. 80N

Pin Retention Force
min. 25N

Environmental Data

Temperature Range
-40°C to +105°C

Thermal Shock
DIN IEC 60068-2-14

Temperature and Humidity
DIN IEC 60068-2-30

High Temperature Exposure
DIN IEC 60068-2-2

**Vibration (Random)
and Mechanical Shock**
DIN IEC 60068-2-64

Soldering Profile
Lead-free wave and reflow
soldering according
Specification 114-18867

2002/95/EC (RoHS)
compliant

Material and Plating

Center Contact
CuZn35Pbz
CuSn4

Outer Contact
CuZn30
CuSn4
CuSn6

Dielectric
LCP-GF30
LCP-GF15

Housing
LCP-GF30
PPA-GF25
PBT-GF10
PA46

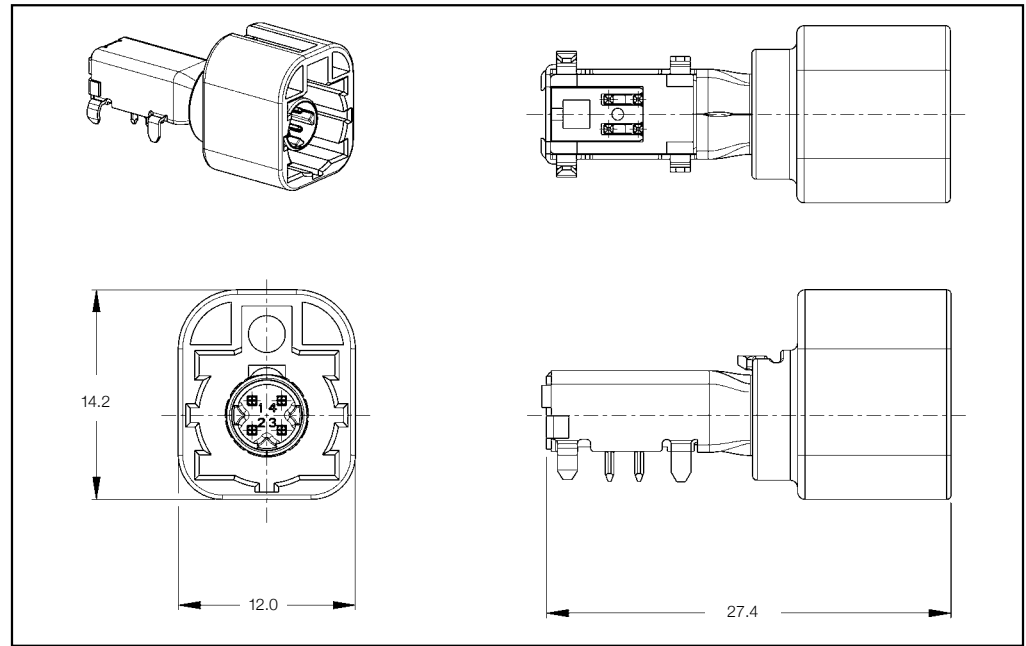
Header – Electrical Data

Test Case	Condition	Limit		
		PN 1823071/ PN 2141966	PN 2112507	PN 1823271/ PN 1823361-1 PN 2177258
Impedance	-	100 Ω ± 15 %	100 Ω ± 15 %	100 Ω ± 15 %
Propagation Delay	-	≤ 100 ps	≤ 125 ps	≤ 50 ps
Intra-pair Skew	-	≤ 25 ps	≤ 20 ps	≤ 5 ps
Inter-pair Skew	-	≤ 5 ps	≤ 5 ps	≤ 5 ps
Attenuation	≤ 1 GHz	≤ 0.1 dB	≤ 0.1 dB	≤ 0.1 dB
Reflection Loss	≤ 1 GHz	≥ 20 dB	≥ 20 dB	≥ 20 dB
	≤ 2 GHz	≥ 17 dB	≥ 17 dB	≥ 17 dB
Cross Talk	≤ 1 GHz	≤ -40 dB	≤ -35 dB	≤ -40 dB
Differential Shielding Effectiveness	≤ 1 GHz	≥ 70 dB	≥ 70 dB	≥ 70 dB
	≤ 2 GHz	≥ 65 dB	≥ 65 dB	≥ 60 dB
Bulkhead Feed-Through	≤ 1 GHz	-	≥ 75 dB	-
	≤ 2 GHz	-	≥ 65 dB	-


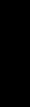














Pin Header 90°

Assembly

Part No. 1823071



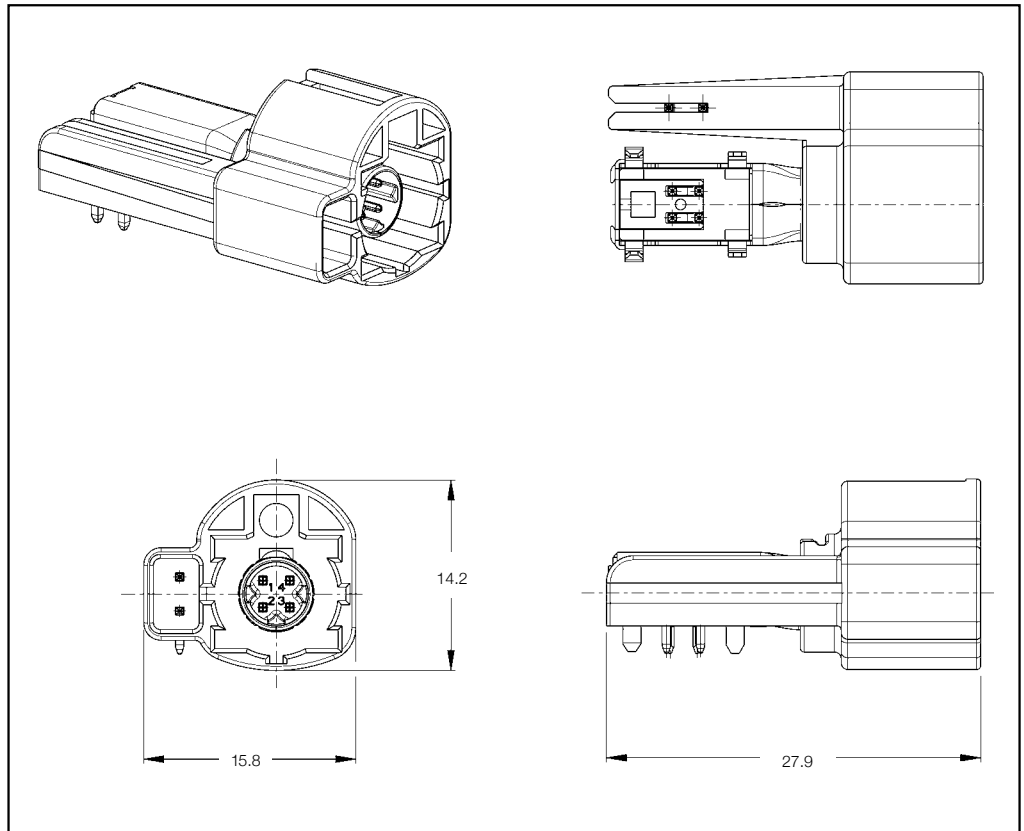
Coding

Coding	Plug	Color	RAL		Part Number
A		Black	9011		0-1823071-1
B		Natural	-		0-1823071-2
C		Blue	5012		0-1823071-3
D		Claret Violet	4004		0-1823071-4
E		Green	6001		0-1823071-5
F		Brown	8011		0-1823071-6
H		Heather Violet	4003		1-1823071-2
K		Curry	1027		1-1823071-4


Pin Header 90° + 2 MQS

Assembly

Part No. **2141966**



Coding

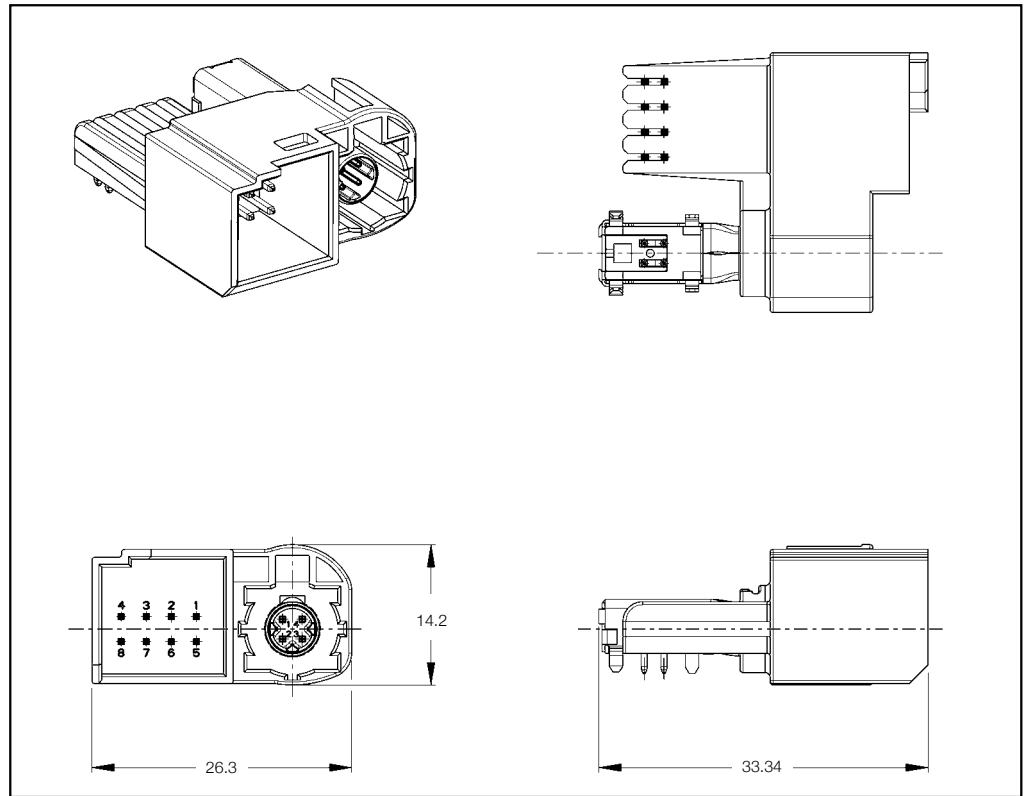
Coding	Plug	Color	RAL	Part Number
Z		Water Blue	5021	8-2141966-9

Additional Codings on request

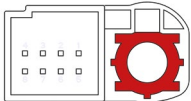
Pin Header 90° + 8 MQS

Assembly

Part No. **2177258**



Coding

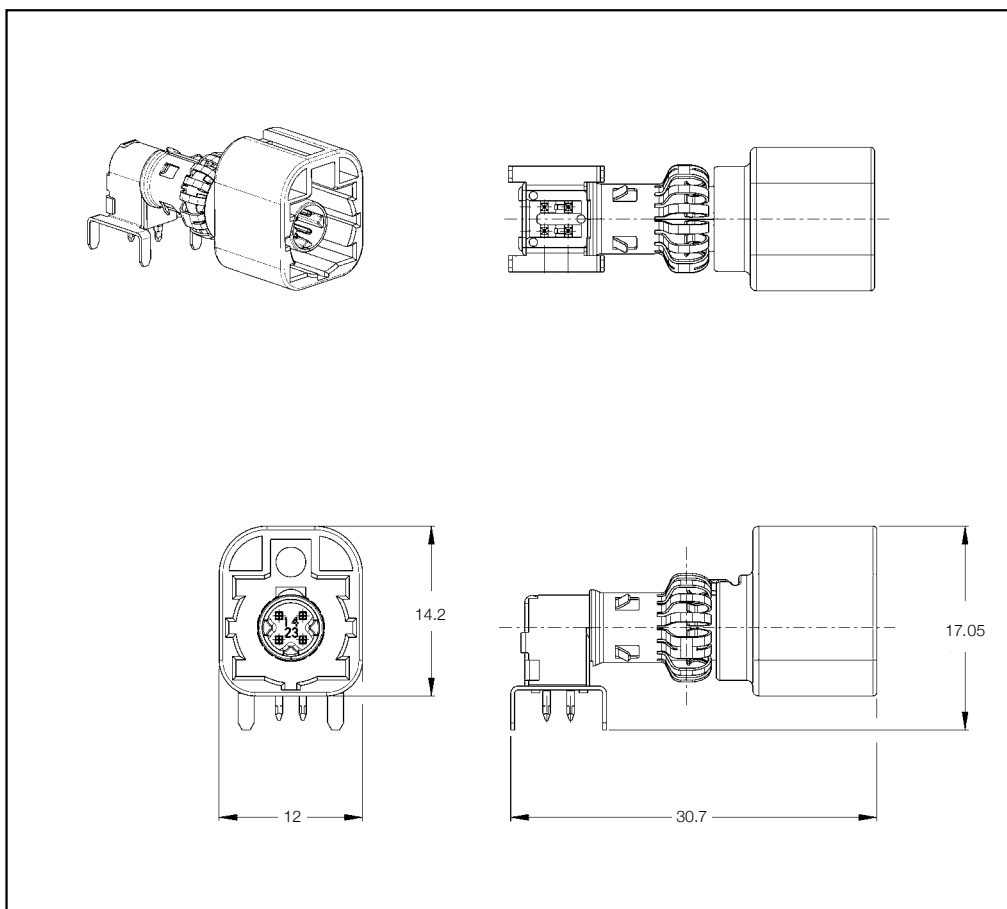
Coding	Plug	Color	RAL	Part Number
Z		Water Blue	5021	8-2177258-9

Additional Codings on request






Pin Header 90° with Shielding Device

Pin Connector

Part No. 2112507



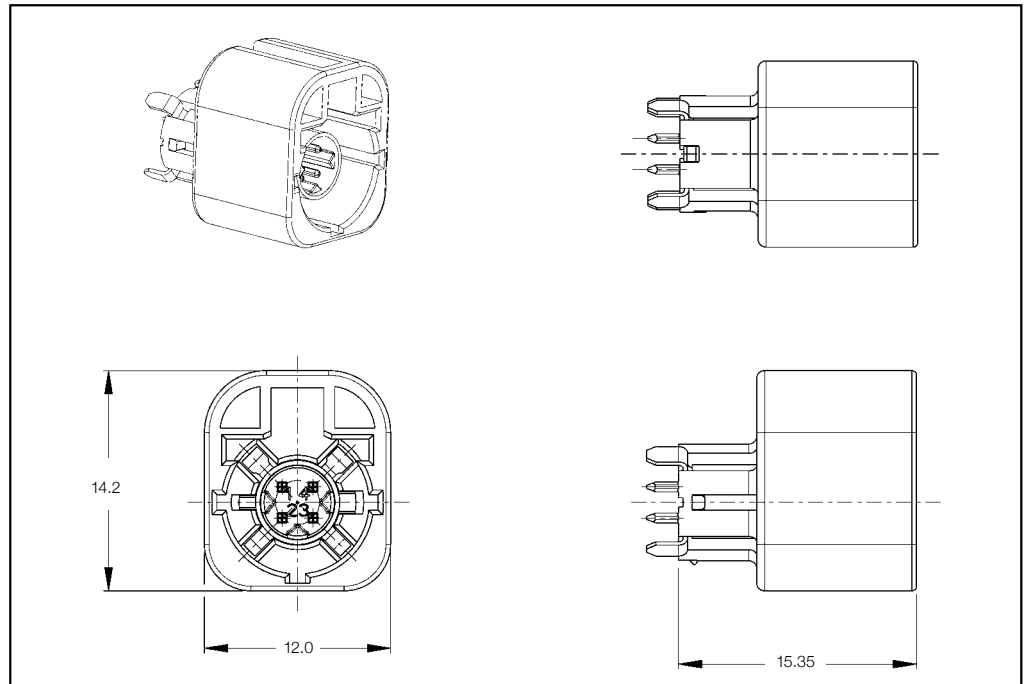
Coding

Coding	Plug	Color	RAL	Part Number
A		Black	9011	0-2112507-1
B		Natural	-	0-2112507-2
C		Blue	5012	0-2112507-3
D		Claret Violet	4004	0-2112507-4
E		Green	6001	0-2112507-5

Pin Header 180°

Assembly

Part No. **1823271**



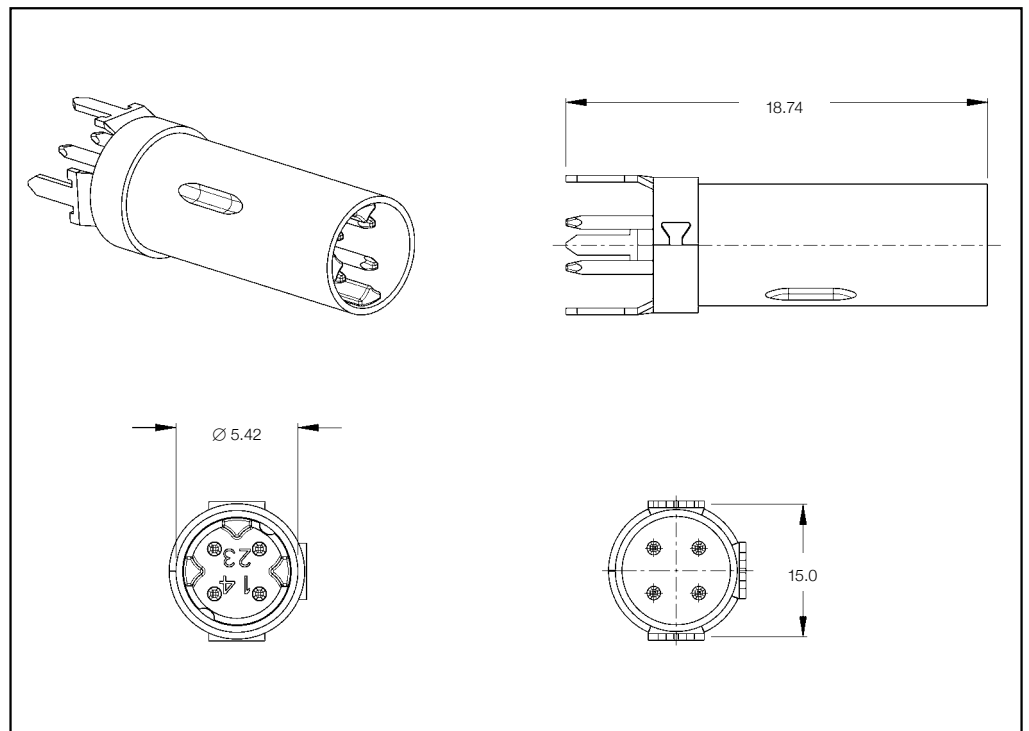
Coding

Coding	Plug	Color	RAL		Part Number
A		Black	9011		0-1823271-1
B		Natural	-		0-1823271-2
C		Blue	5012		0-1823271-3
D		Claret Violet	4004		0-1823271-4
E		Green	6001		0-1823271-5
F		Brown	8011		0-1823271-6
Z		Water Blue	5021		0-1823271-9

Pin Header 180°, Sealed

Pin Connector

Part No. **1823361-1**



No Serial Parts

Technical Data

Documents

Product Specification

90°
 108-94105 HSD
 Connector System
 180°
 108-94334 HSD
 Connector System

Test Specification

108-94106 HSD
 Connector System

Interface

Mating Interface

114-18950 HSD
 Interface Drawing

Mechanical Data

Mating Cycles

min. 25 (Contact Surface: Gold)

Mating and Unmating Force

max. 30N

Coding Efficiency

min. 80N

Pin Retention Force

min. 25N

Environmental Data

Temperature Range

-40°C to +105°C

Thermal Shock

DIN IEC 60068-2-14

Temperature and Humidity

DIN IEC 60068-2-30

High Temperature Exposure

DIN IEC 60068-2-2

Vibration (Random) and Mechanical Shock

DIN IEC 60068-2-64

2002/95/EC (RoHS)

compliant

Material and Plating

Connector Parts HSD

Center Contact
 CuZn35Pb2, gold (Au)

Outer Contact

CuZn30, tin (Sn)

Dielectric

LCP-GF30, black

Housing

PPA-GF25, see drawing

Connector Parts USB

Contacts

CuNiSi, gold (Au)

Housing

PA66-GF13, black

EMI Shielding

CuSn4, tin (Sn)

Cable Assemblies – Electrical Data

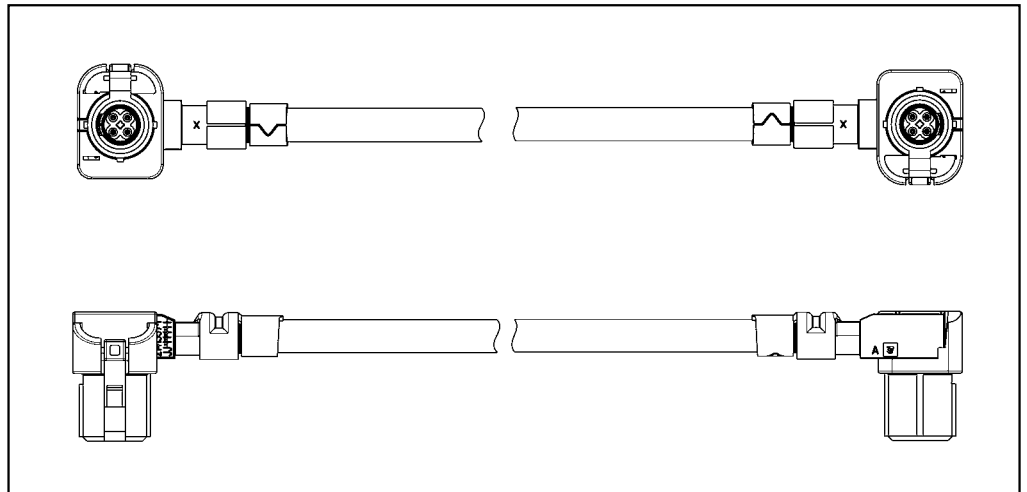
Test Case	Condition	Limit	
Impedance	-	100 Ω ±15 %	
Propagation Delay	-	≤ 5.05 ns/m	
Intra-pair Skew Connector Connectors straight – straight Connectors straight – angled	-	≤ 5 ps	
	-	≤ 25 ps	
Intra-pair Skew Cable	-	≤ 25 ps/m	
Inter-pair Skew Connector Connectors straight – straight Connectors straight – angled	-	≤ 5 ps	
	-	≤ 5 ps	
Inter-pair Skew Cable	-	≤ 25 ps/m	
Attenuation mated Cable Assembly	F [MHz]	D @ 5.0 m	D @ 10.0 m
	250 MHz	≤ 3.10 dB	≤ 6.10 dB
	400 MHz	≤ 3.80 dB	≤ 7.60 dB
	500 MHz	≤ 4.40 dB	≤ 8.60 dB
	800 MHz	≤ 5.90 dB	≤ 11.60 dB
	1000 MHz	≤ 6.80 dB	≤ 13.20 dB
Reflection Loss	≤ 1 GHz	≥ 20 dB	
	≤ 2 GHz	≥ 17 dB	
Near End Cross Talk	≤ 1 GHz	≤ -30 dB	
Far End Cross Talk	≤ 1 GHz	≤ -35 dB	
Cable Assembly Differential Shielding Effectiveness	≤ 1 GHz	≥ 75 dB	
	≤ 2 GHz	≥ 65 dB	

Cable Assemblies

Assembly

Part No. **2177131**

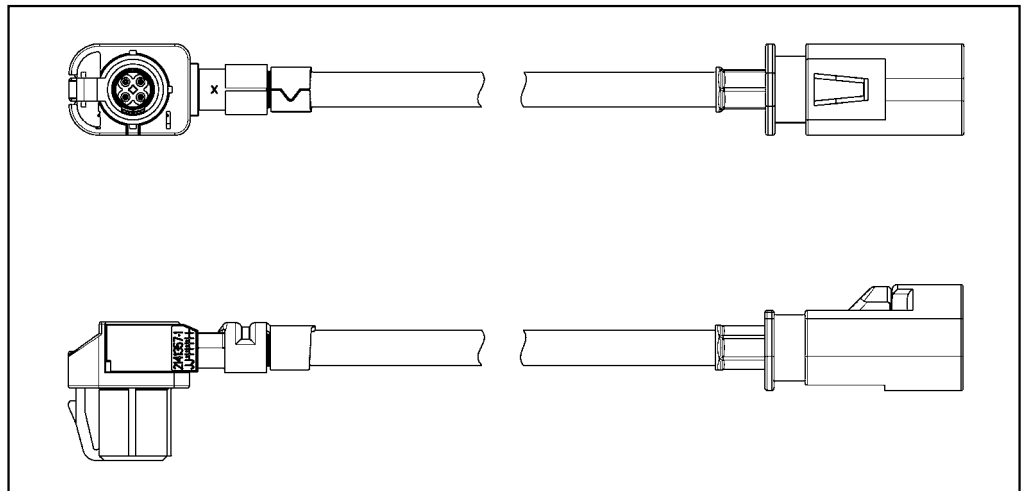
Cable Assembly
90° Jack (Female) /
90° Jack (Female)



Assembly

Part No. **2177132**

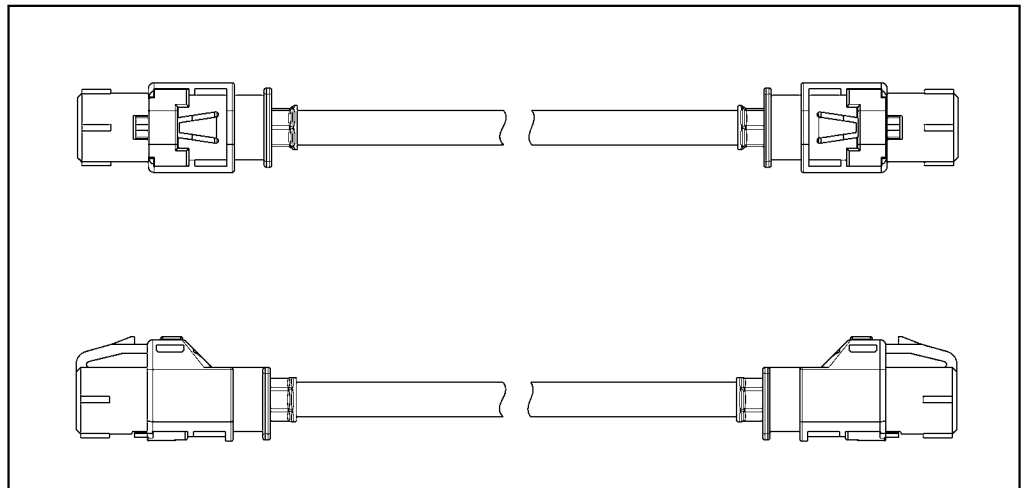
Cable Assembly
90° Jack (Female) /
AK 180° Plug (Male)



Assembly

Part No. **2141723**

Cable Assembly
AK 180° Jack (Female) /
AK 180° Jack (Female)

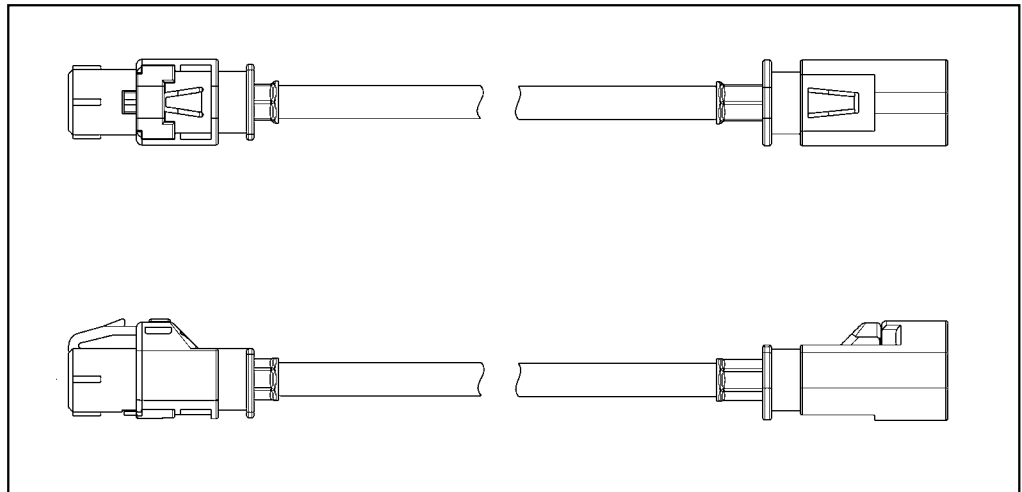


Cable Assemblies

Assembly

Part No. **2141724**

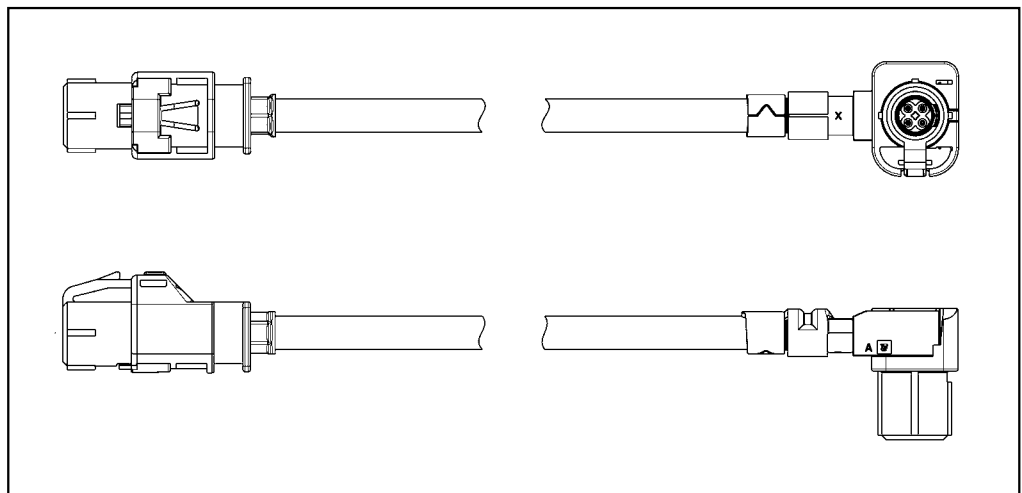
Cable Assembly
AK 180° Jack (Female) /
AK 180° Plug (Male)



Assembly

Part No. **2177130**

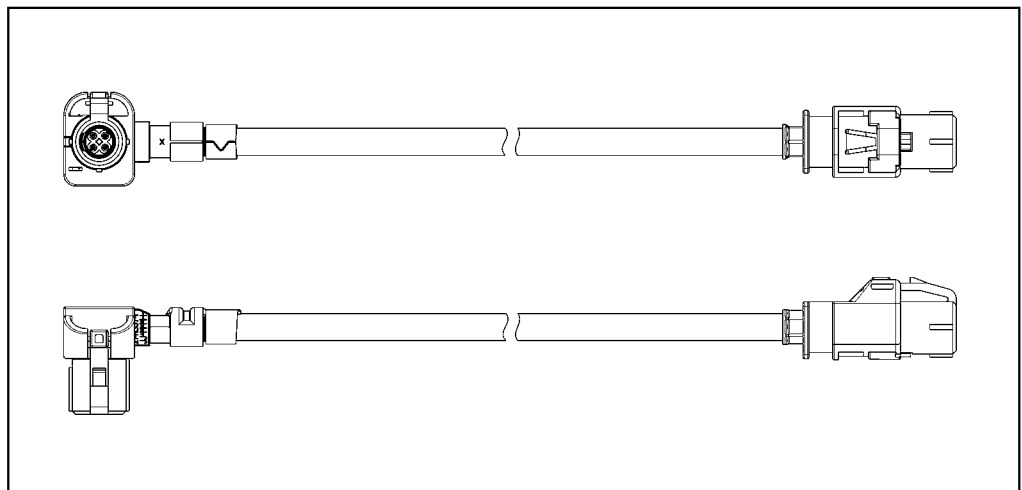
Cable Assembly
AK 180° Jack (Female) /
90° Jack (Female)



Assembly

Part No. **2177257**

Cable Assembly
90° Jack (Female) /
AK 180° Jack (Female)

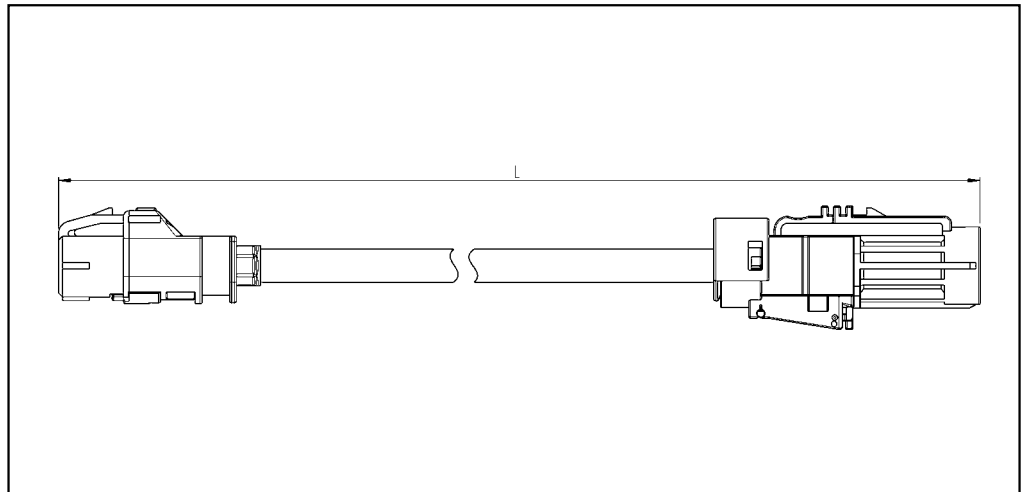


Cable Assemblies

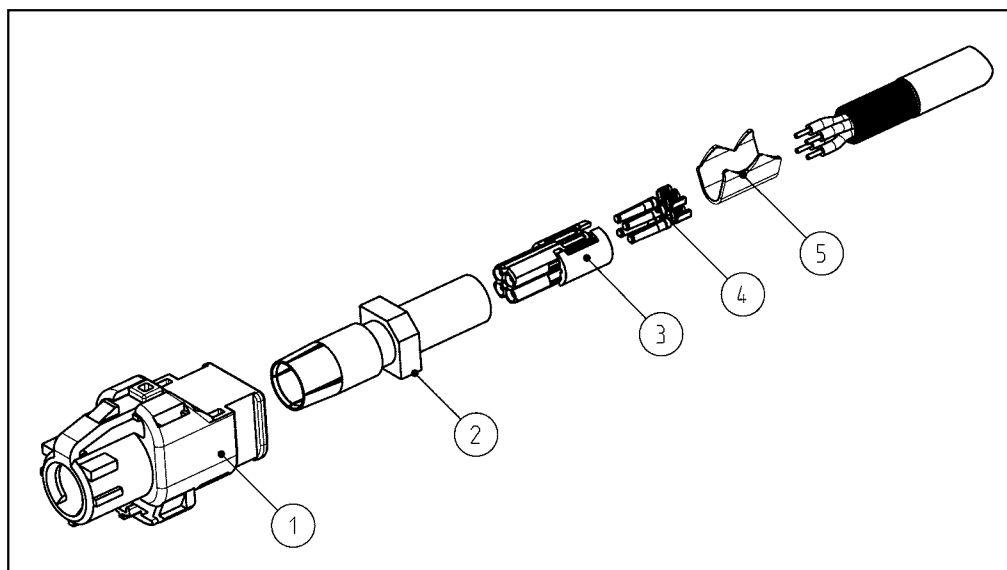
Assembly

Part No. **2112030**

Cable Assembly
AK 180° Jack (Female) /
180° watersealed (Female)



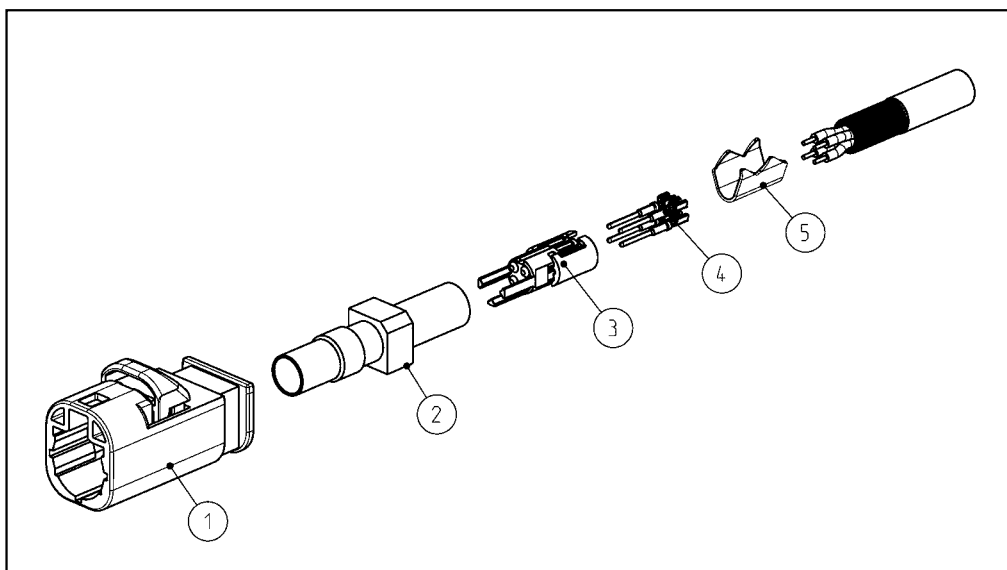
HSD 180° Contact (female)



Position	Part Number	Description
1	1823898	Pin Housing Assembly
2	1823895	Shield Female
3	1823894	Cavity Block
4	2112028	Female Contact
5	1823899	Impedance Crimp

Keying Options	Subassy Hsg / Ret	Shield Contact	Contact Carrier	Contact	Impedance Crimp
A	0-1823898-1				
B	0-1823898-2				
C	0-1823898-3				
D	0-1823898-4	0-1823895-1	0-1823894-1	0-2112028-1	0-1823899-1
E	0-1823898-5				
F	0-1823898-6				
Z	0-1823898-9				

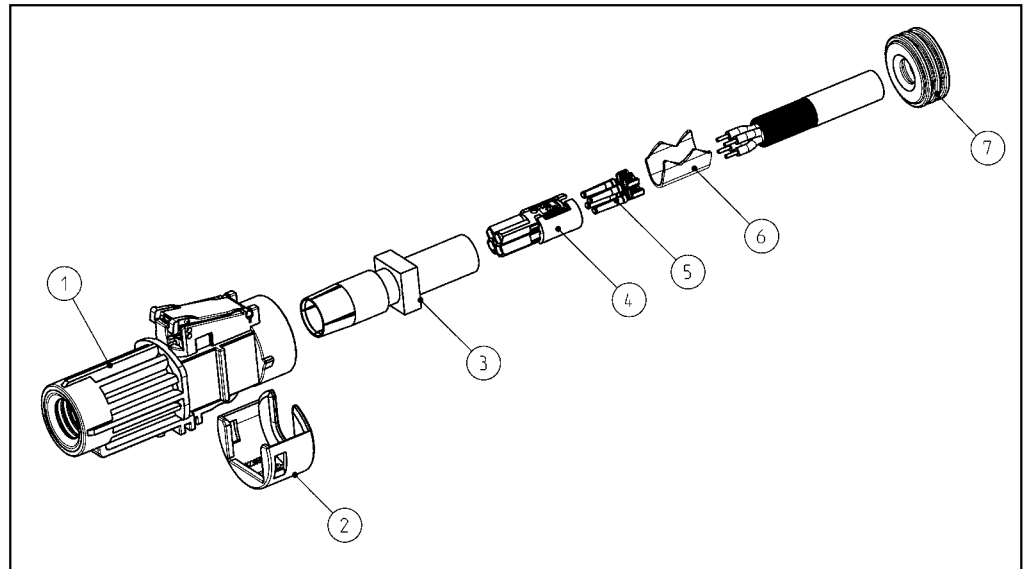
HSD 180° Contact (male)



Position	Part Number	Description
1	1823905	Receptacle Housing Assembly
2	1823902	Shield Male
3	1823901	Cavity Block
4	2112027	Male Contact
5	1823899	Impedance Crimp

Keying Options	Subassy Hsg / Ret	Shield Contact	Contact Carrier	Contact	Impedance Crimp
A	0-1823905-1				
B	0-1823905-2				
C	0-1823905-3				
D	0-1823905-4	0-1823902-1	0-1823901-1	0-2112028-1	0-1823899-1
E	0-1823905-5				
F	0-1823905-6				
Z	0-1823905-9				

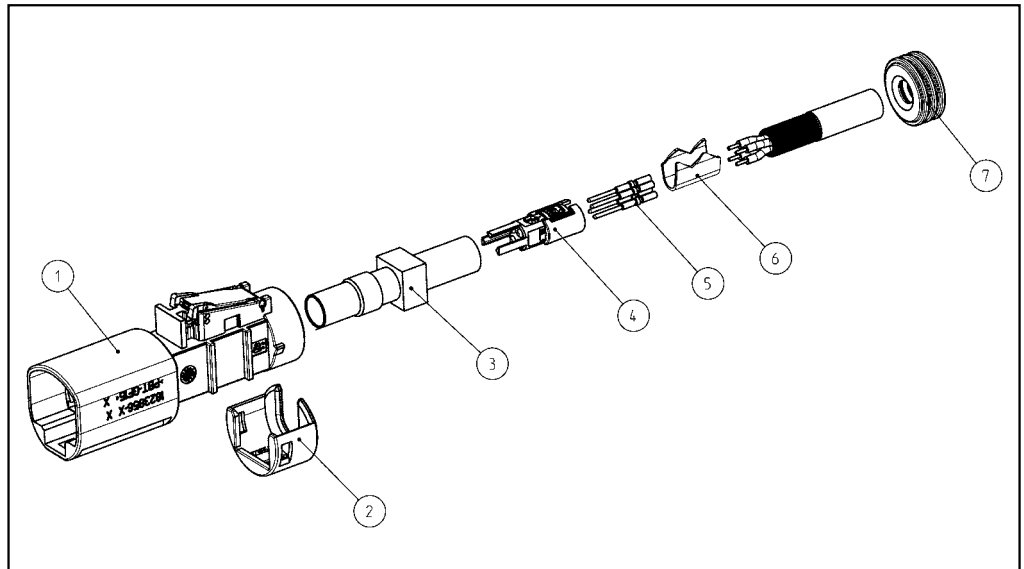
HSD 180° Contact - watersealed (female)



Position	Part Number	Description
1	1823853	Housing Assembly
2	1823855	Seal Holder
3	1823895	Shield Female
4	1823894	Cavity Block
5	2112028	Female Contact
6	1823899	Impedance Crimp
7	1823854	Radial Seal

Keying Options	Subassy Hsg / Ret	Seal Holder	Reuse of 180° female	Radio Seal
Z	0-1823853-1			
A	0-1823853-2			
B	0-1823853-3			
C	0-1823853-4	0-1823855-1	–	0-1823854-1
D	0-1823853-5			
E	0-1823853-6			
F	0-1823853-7			

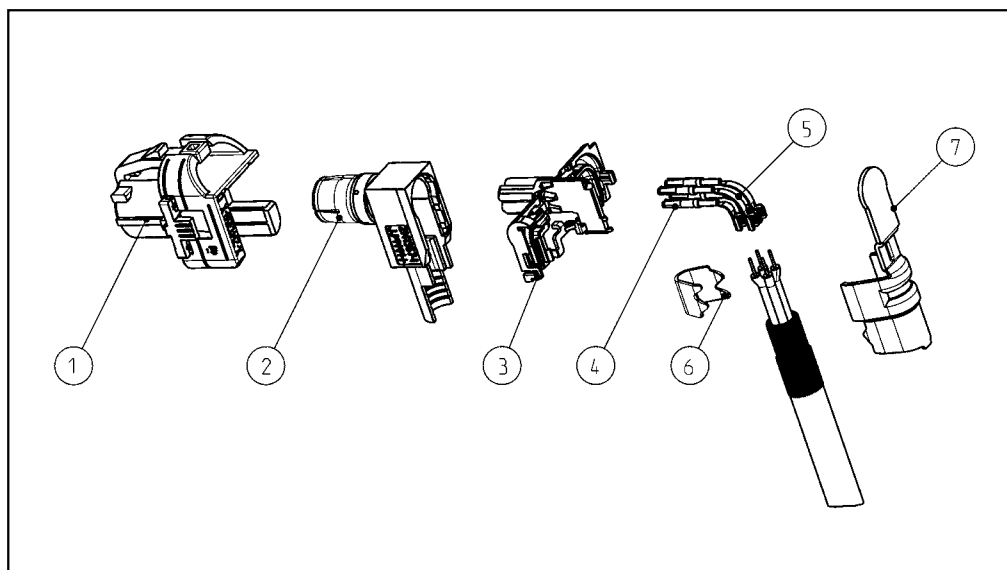
HSD 180° Contact - watersealed (male)



Position	Part Number	Description
1	1823857	Housing Assembly
2	1823855	Seal Holder
3	1823902	Shield Male
4	1823901	Cavity Block
5	2112027	Male Contact
6	1823899	Impedance Crimp
7	1823854	Radial Seal

Keying Options	Subassy Hsg / Ret	Seal Holder	Reuse of 180° female	Radio Seal
Z	0-1823857-1			
A	0-1823857-2			
B	0-1823857-3			
C	0-1823857-4	0-1823855-1	—	0-1823854-1
D	0-1823857-5			
E	0-1823857-6			
F	0-1823857-7			

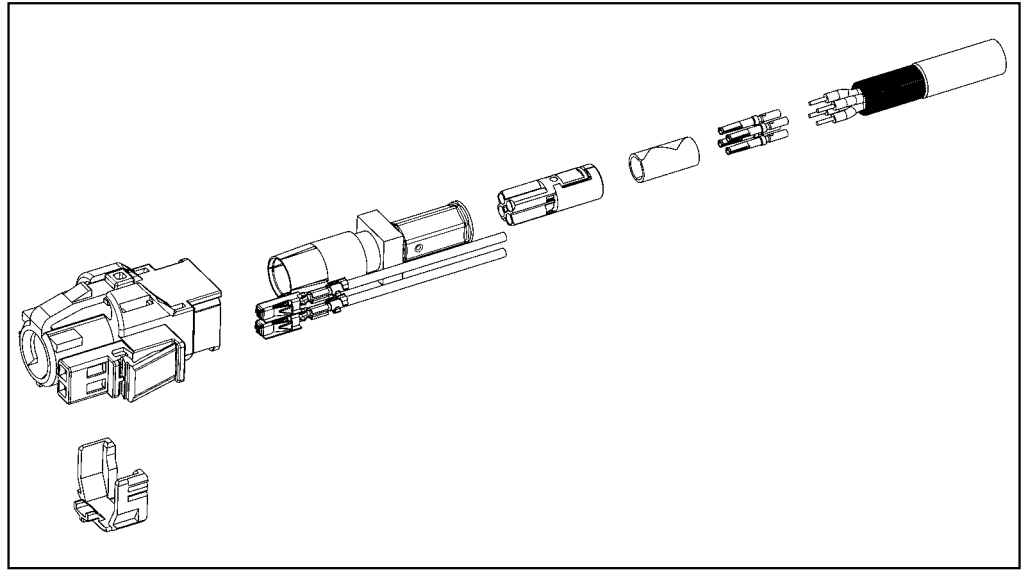
HSD 90° Contact (female)



Keying Options	① Subassy Hsg / Ret	② Hsg Shield	③ Contact Carrier	④⑤ Contact	⑥ Impedance Crimp	⑦ Cover
Z	2/0-2208145-1					
A	2/0-2208145-2					
B	2/0-2208145-3					
C	2/0-2208145-4	1-2141366-1	2141361-1	2141373-2 2141374-2	2141360-1	2141356-1
D	2/0-2208145-5					
E	2/0-2208145-6					
F	2/0-2208145-7					

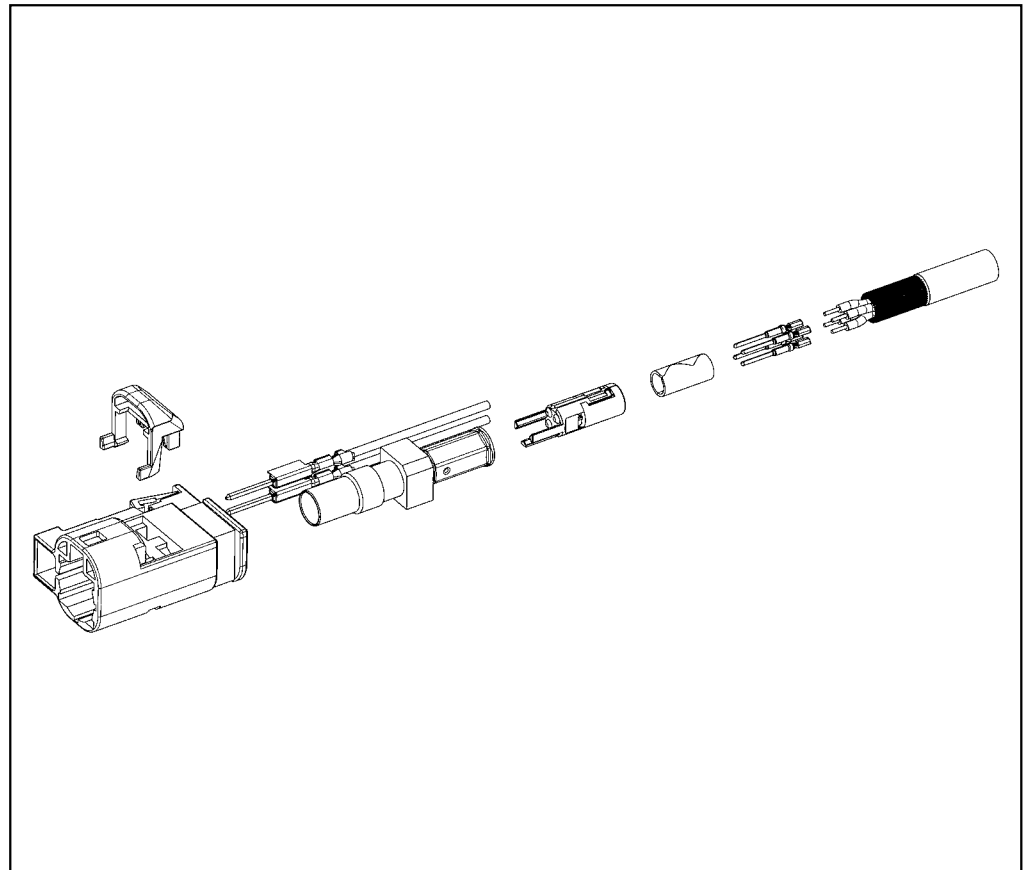
Keying Options	① Subassy Hsg / Ret	② Hsg Shield	③ Contact Carrier	④⑤ Contact	⑥ Impedance Crimp	⑦ Cover
O	3-2208145-1					
G	3-2208145-2					
H	3-2208145-3					
J	3-2208145-4	1-2141366-1	2141361-1	2141373-2 2141374-2	2141360-1	2141356-1
K	3-2208145-4					
L	3-2208145-6					
M	3-2208145-7					

HSD 90° Contact (male)



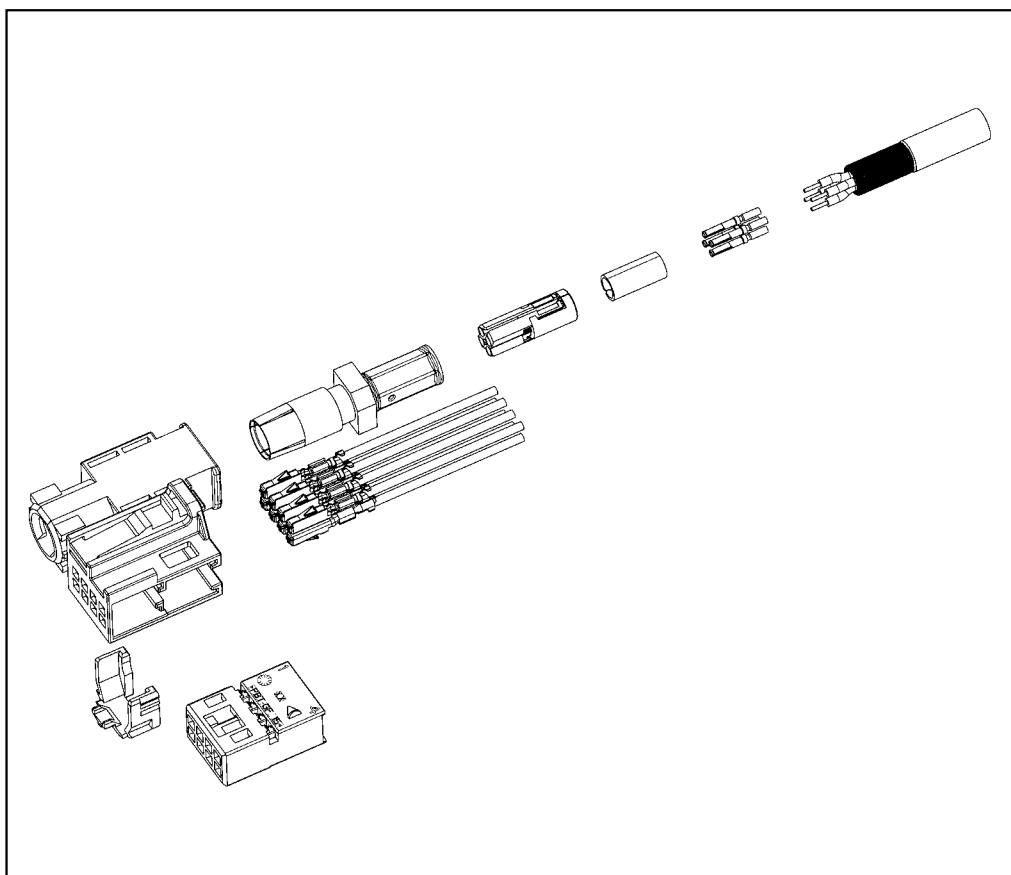
Keying Options	HSD + 2 MQS female	MQS Contact	Cavity block	Shield	HSD Contact
Z	2177694	144969	1823894	1823895	2112028

HSD 180° + 2 MQS Contact (male)



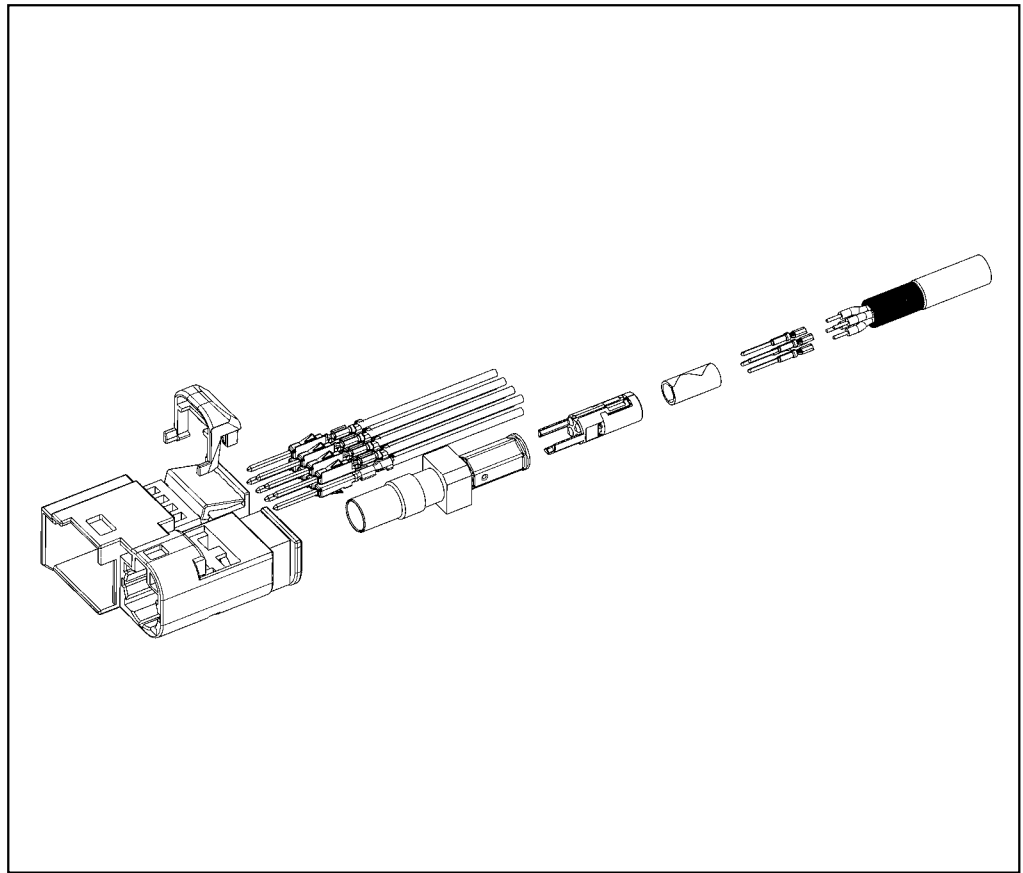
Keying Options	HSD + 2 MQS Pin Connector	MQS Contact	Cavity block	Shield	HSD Contact
Z	2177954	963716	1823901	1823902	2112027

HSD 180° + 2 MQS Contact (female)



Keying Options	HSD + 8 MQS female	8 MQS HSG	MQS Contact	Cavity block	Shield	HSD Contact
Z	2177754	965601	144969	1823894	1823895	2112028

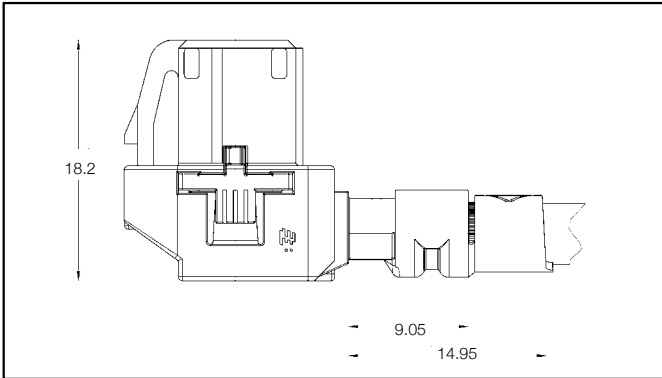
HSD 180° + 8 MQS Contact (male)



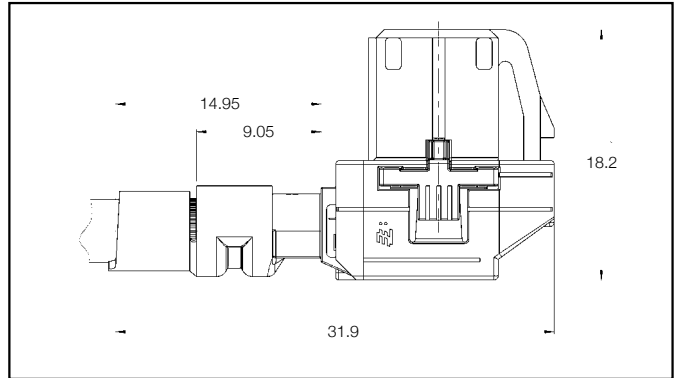
Keying Options	HSD + 8 MQS Pin Connector	MQS Contact	Cavity block	Shield	HSD Contact
Z	2177956	963716	1823901	1823902	2112027

HSD 90° and 180°

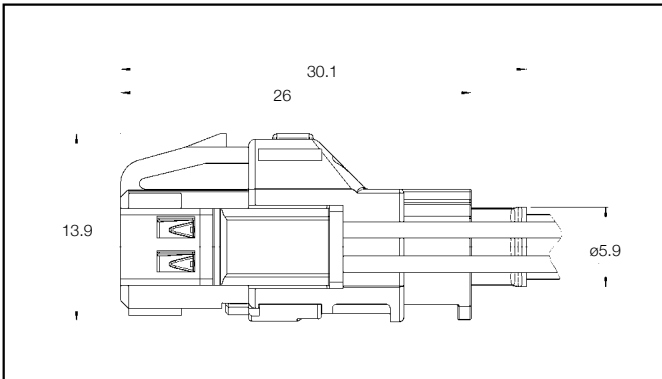
HSD 90° Receptacle Up



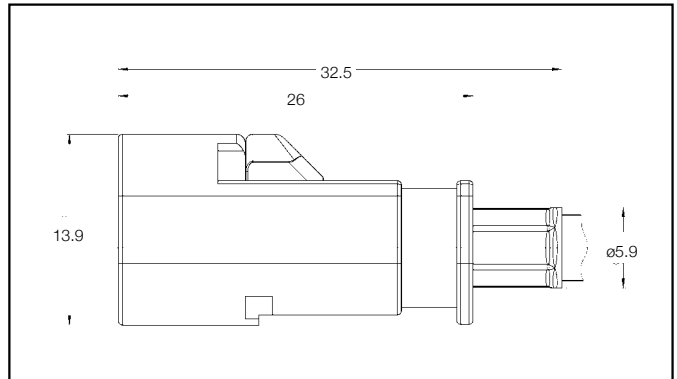
HSD 90° Receptacle Down



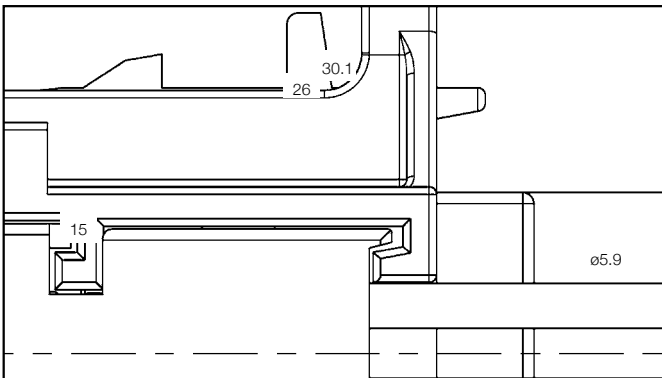
HSD 180° + 2 MQS Female



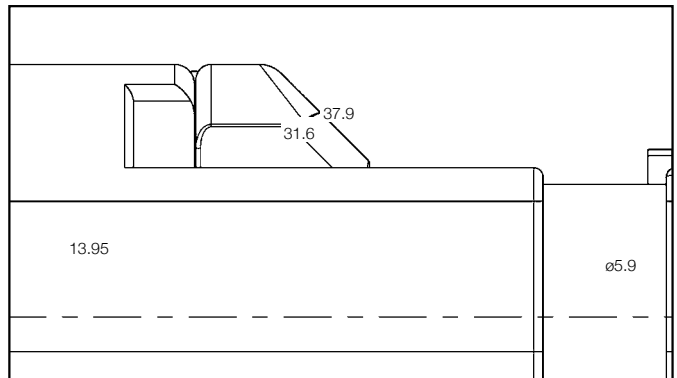
HSD 180° + 2 MQS Male



HSD 180° + 8 MQS Female

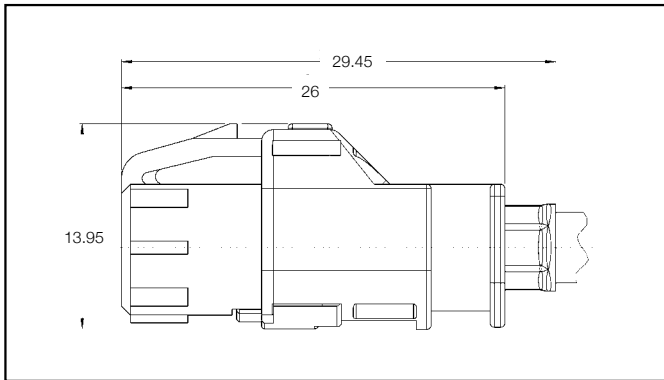


HSD 180° + 8 MQS Male

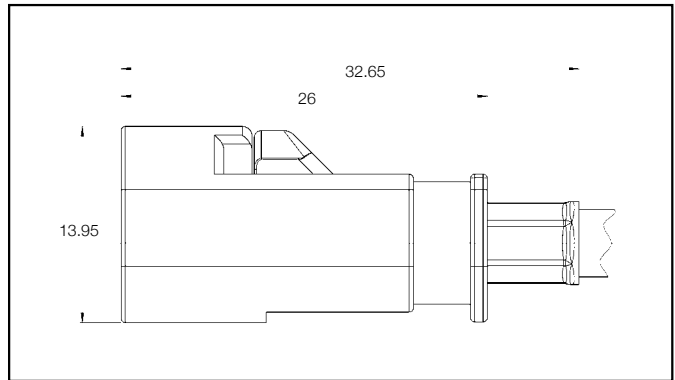


HSD 180°

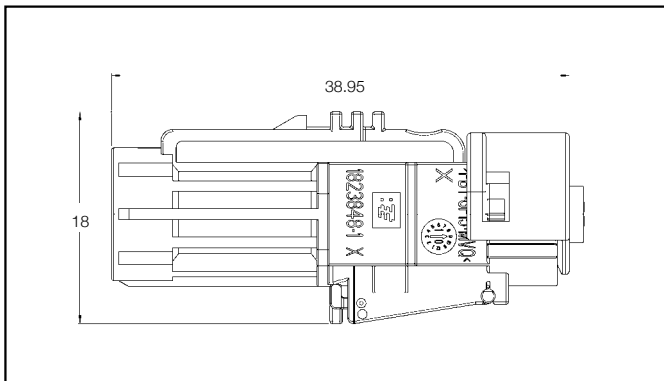
HSD 180° unsealed, Female



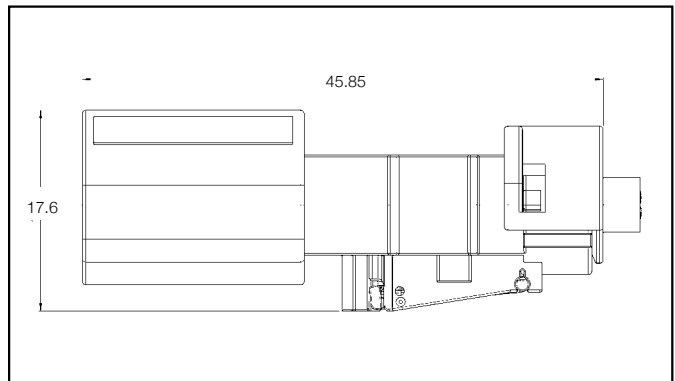
HSD 180° unsealed, Male

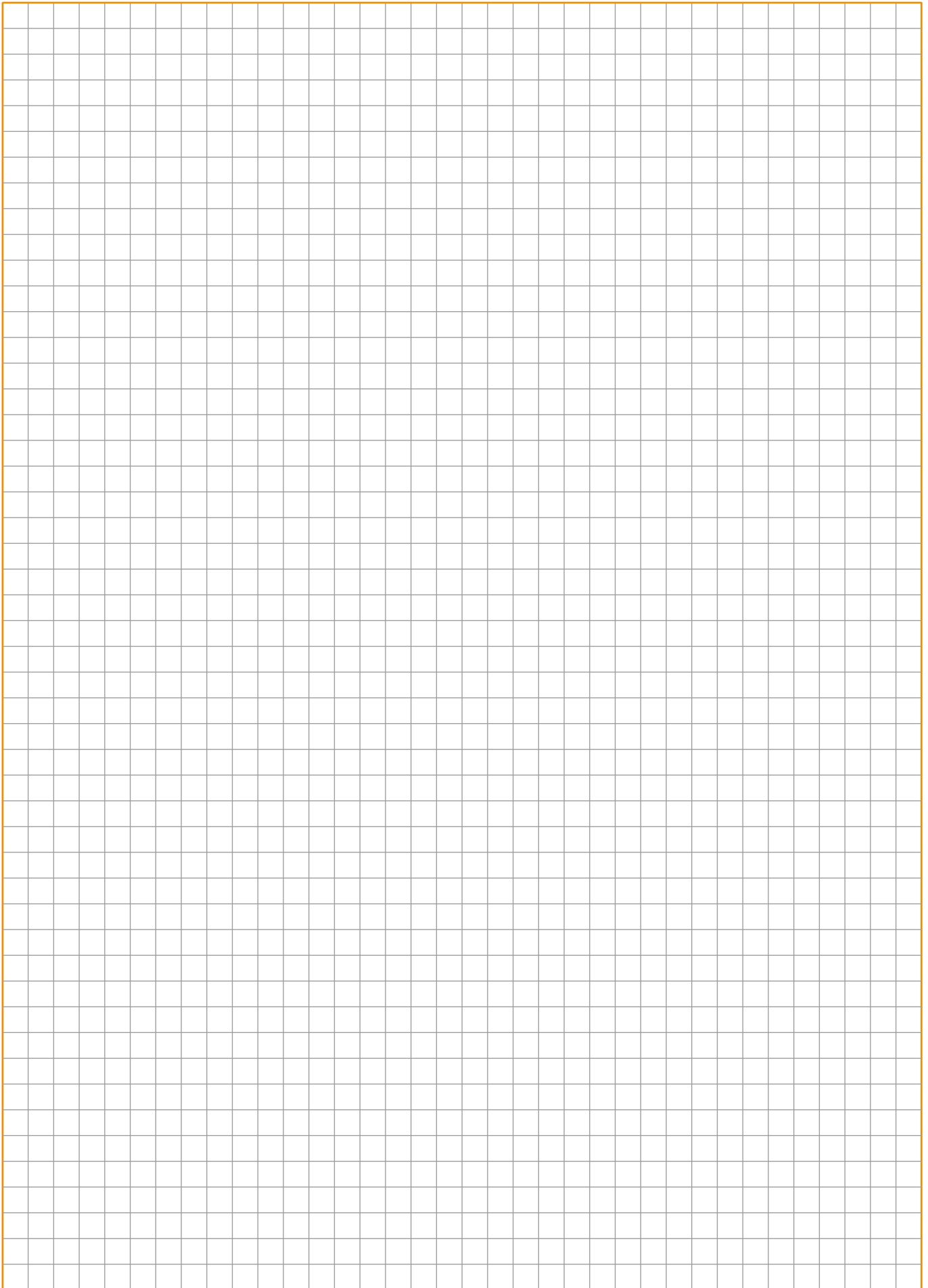


HSD 180° sealed, Female



HSD 180° sealed, Male





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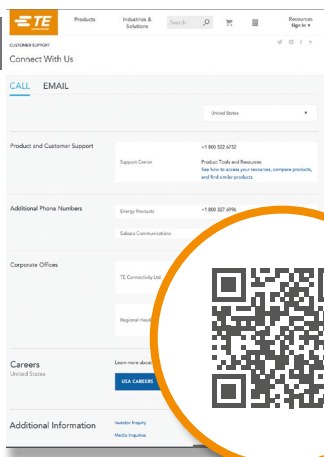
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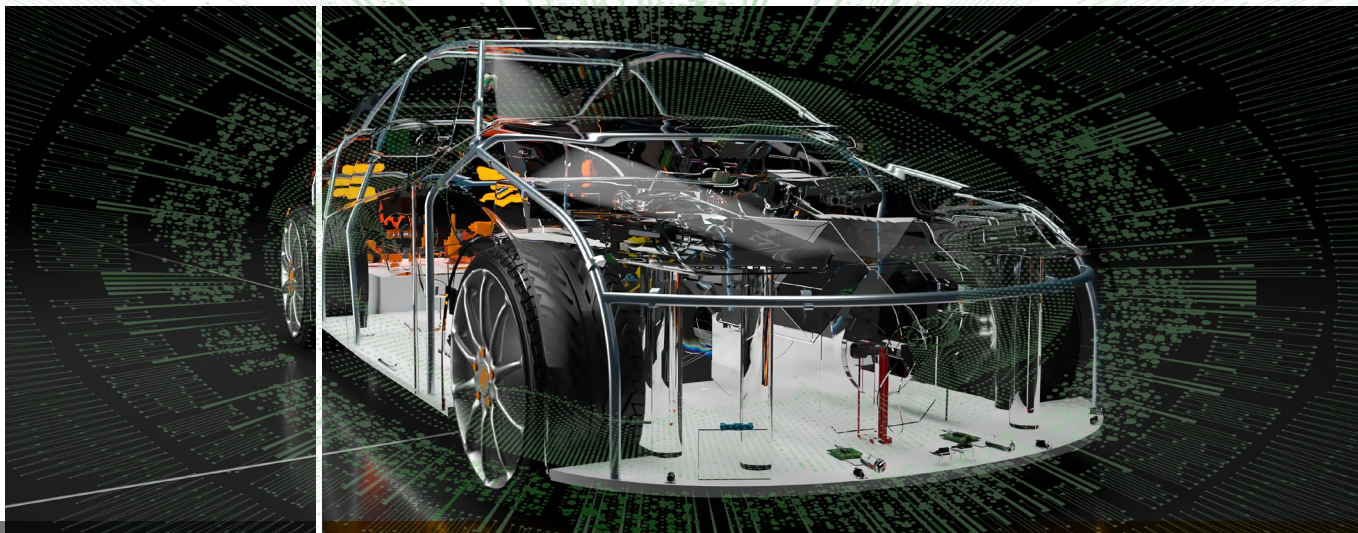
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1308074-2 | Revised 11-2012 | PoD • RRD