

GEMnet

Multi-gigabit Differential Data
Connectivity System

EVERY CONNECTION COUNTS

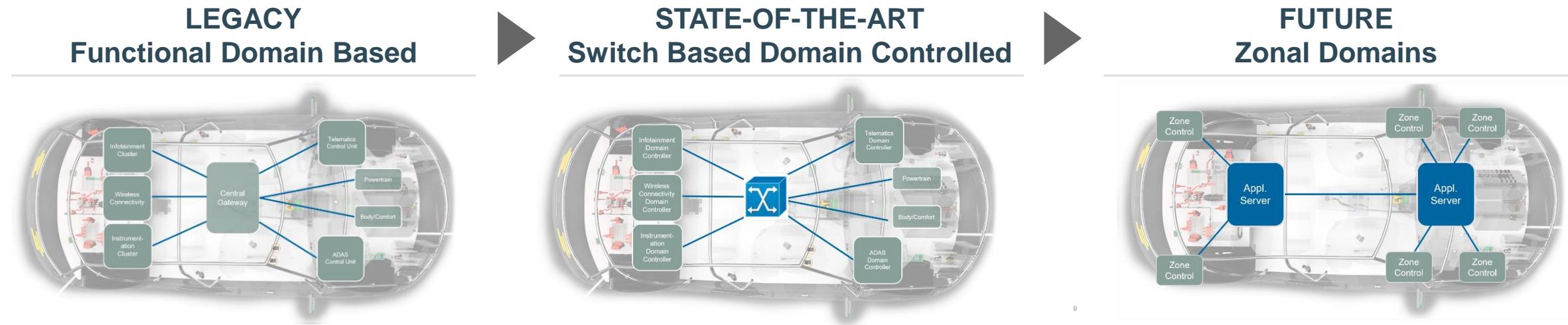


Market and Technology Trends

EVERY CONNECTION COUNTS



Automotive Architectural Evolution



TE Data Connectivity Portfolio



HSD



FAKRA



MOST



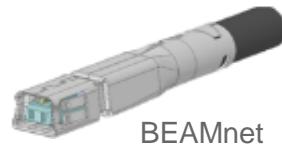
MATE-AX



MATEnet



GEMnet



BEAMnet



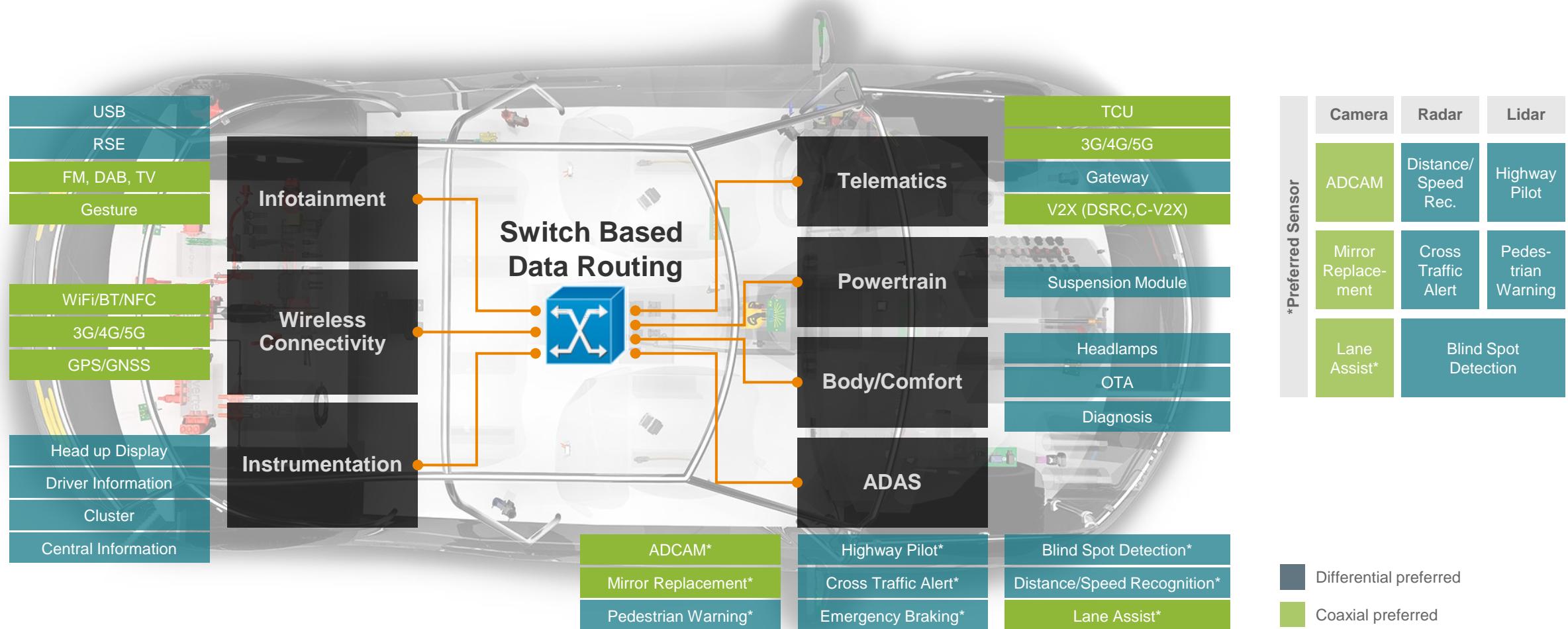
Backplane



Multi-hybrid connector

- Differential
- Coaxial
- Power

Current Application Landscape



High Performance Automotive Grade Portfolio

COAXIAL

FAKRA

Coaxial connector system supporting frequencies up to 6 GHz



MATE-AX

Miniaturized coaxial connector system for high-end multi-Gigabit applications and high frequency radio signals up to 15 GHz



DIFFERENTIAL

HSD/HSL

Star-Quad fully shielded connector system, supports up to 6 Gbps



MATEnet

Scalable and modular connector system for high volume applications (e.g., 100/1000BASE-T1)



GEMnet

High performance differential connector system for high-end multi-Gigabit applications up to 56 Gbps



BEAMnet

Miniaturized high performance differential connector system for high-end multi-Gigabit applications up to 56 Gbps



HYBRID

NET-AX+*

Supports high performance coaxial and differential connectivity (up to 56Gbps) for Ethernet, SerDes and other protocols and can integrate signal and power connections



*SOP mm/yy

Primary Design Drivers

Performance		●		●		●		●	
Miniaturization		●		●		●		●	
Robustness	●		●		●		●		●

GEMnet – Industry Compatible Robust Multi-Gigabit Automotive Connectors with 90° and 180° Terminals

PERFORMANCE	CONFORMANCE
<ul style="list-style-type: none"> • 25 Gbps • 15 GHz • 100 Ohm impedance 	<ul style="list-style-type: none"> • OPEN Alliance TC9, IEEE802.3ch • USCAR interface standards
KEY FEATURES	
<ul style="list-style-type: none"> • Robust automotive design • High cable retention force • Scoop proof 	<ul style="list-style-type: none"> • Anti-stubbing features • CPA • ≥ 25 mating cycles
TYPICAL APPLICATIONS	
<p>Automotive Ethernet: 100BASE-T1, 1000BASE-T1, 2.5/5/10GBASE-T1</p> <p>SerDes: GMSL, APIX, GVIF, FPD-Link, ASA Motion Link, MiPi, HDBase-T</p> <p>Others: USB, PCIe</p>	

90° / 180° TERMINALS					
Housing Portfolio	180° male and female housing (sealed & unsealed)				
	1 port	2 port	4 port	6 port	
Header Portfolio	90° female (sealed & unsealed)				
	1 port	2 port	4 port		
Header Portfolio	90° & 180° header (sealed & unsealed)				
	1 port	2 port	4 port	6 port	



*Hybrid Housing and Headers on demand

GEMnet – Connector Portfolio

Terminals

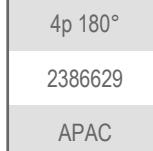
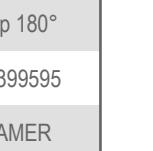
	90° female S/F		90° female Diecast		180° female		180° male
 2024	2390999	 2024	2405986	 2023	2394484	 2023	2394485
	EMEA		APAC		EMEA		EMEA

Housings

Unsealed

Sealed

Female

	1p 90° 2391002		2p 90° 2400802
 2024	APAC	 On request	TBD
	1p 180° 2368022		2p 180° 2386612
 2022	APAC	 2022	APAC
	4p 180° 2386629		6p 180° 2399595
 2022	APAC	 2022	AMER

Male

	1p 180° 2368003		2p 180° 2386606		4p 180° 2386622
 2022	APAC	 2022	APAC	 On request	TBD
	1p 180° 2368033		2p 180° 2386608		4p 180° 2386625
  2022	APAC	  2022	APAC	  On request	TBD

 Shielded

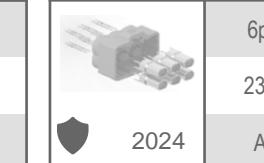
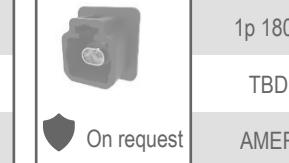
 CPA Available

 Clip Slot Available

 Multiple Clip Slot Options

202x: Planned SOP

GEMnet – Header Portfolio

Header							
Unsealed				Sealed			
	1p 90° 2374901		2p 90° 2374902		4p 90° 2374900		6p 90° 2397129
 2022	China	 TBD	China	 TBD	China	 2023	AMER
	1p 180° 2397137		2p 180° 2409685		4p 180° 2408290		6p 180° 2390045
 2023	AMER	 2022	AMER	 2022	China	 2024	AMER
	1p 90° 2397207		1p 180° TBD		4p 90° 2397322		1p 180° On request
 2024	APAC	 On request	AMER	 2023	China	 On request	AMER



Shielded



CPA Available



Clip Slot Available

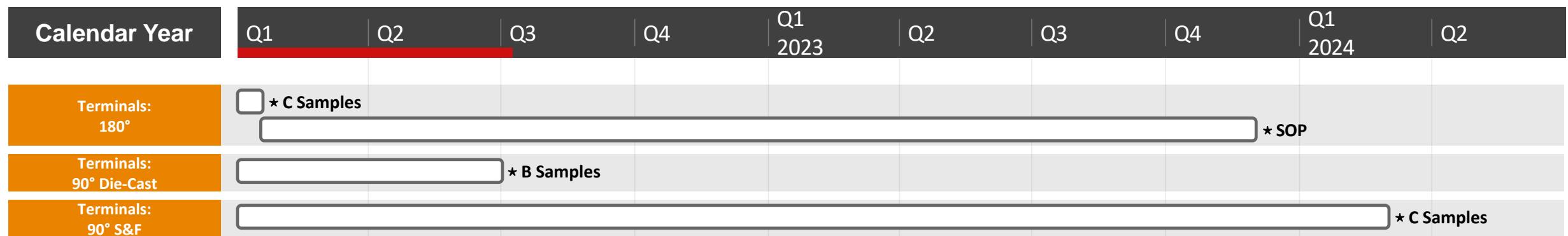


Multiple Clip Slot Options

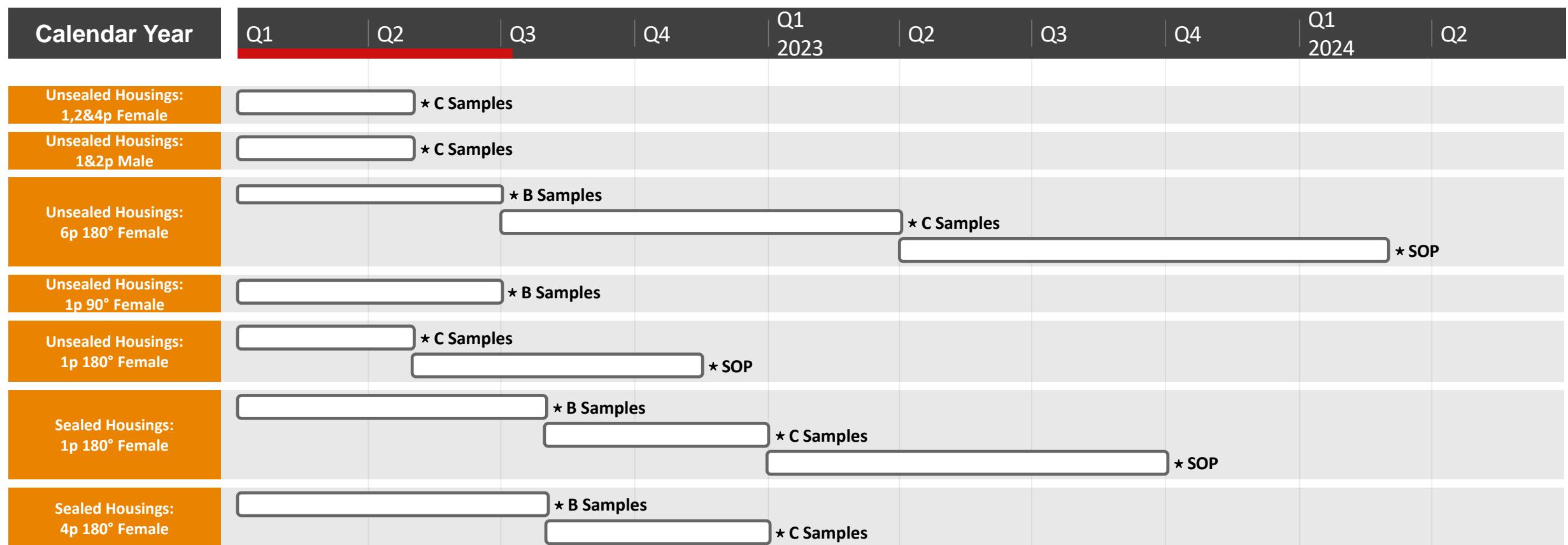


202x: Planned SOP

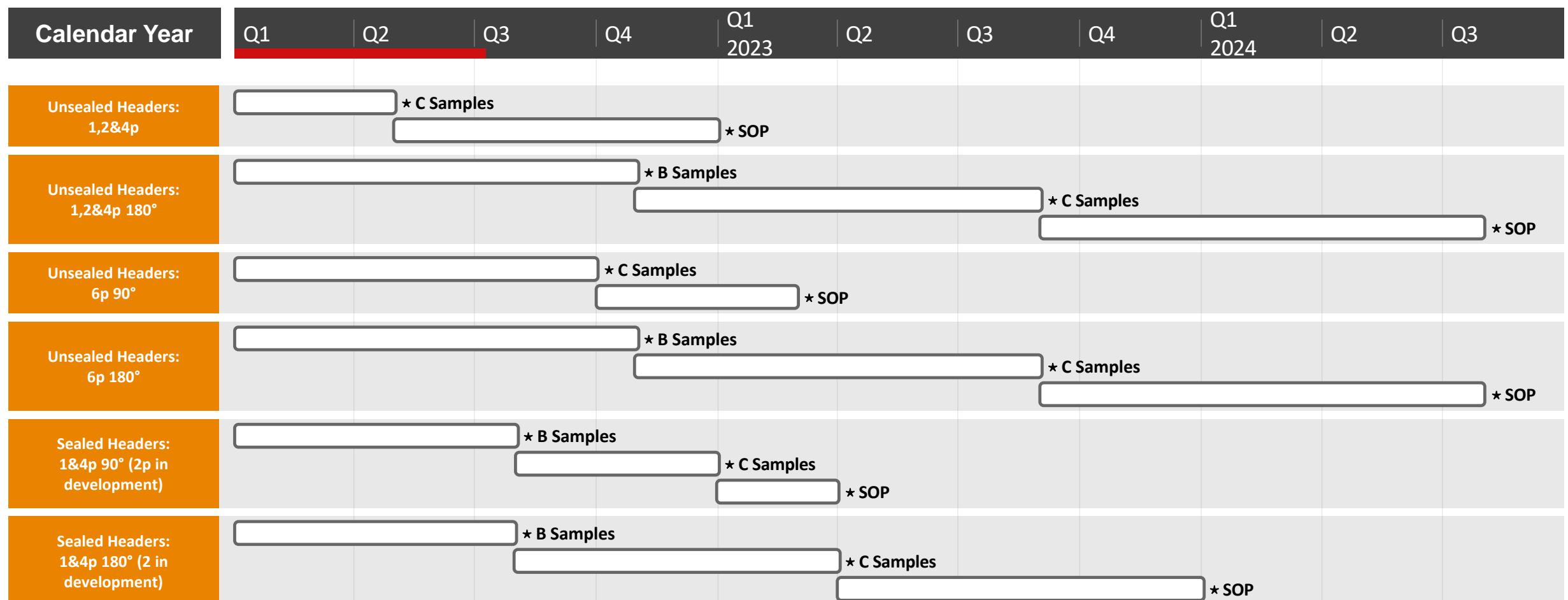
GEMnet Product Line Roadmap – Connectors: Terminals



GEMnet Product Line Roadmap – Connectors: Housings



GEMnet Product Line Roadmap – Headers



Technical slides Differential: GEMnet

April 2022

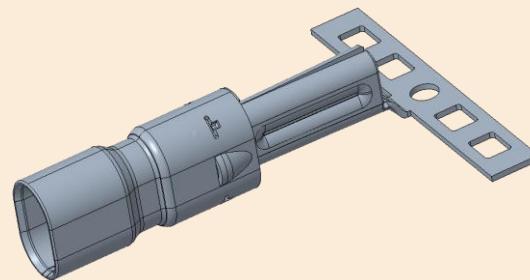
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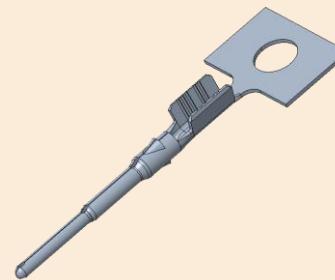
HMTE Terminals

Pin (HEADER) Terminal

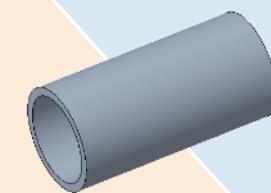
Outer contact pin
(outer terminals + dielectric)



Center
contact pin



Ferrule

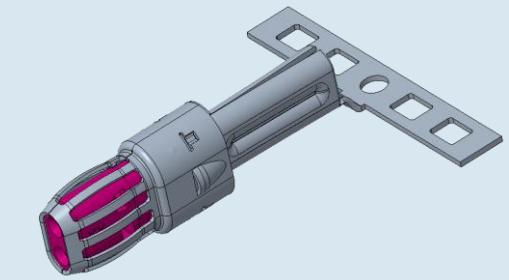


Female (PLUG) Terminal

Outer contact plug
(outer terminals + dielectric)

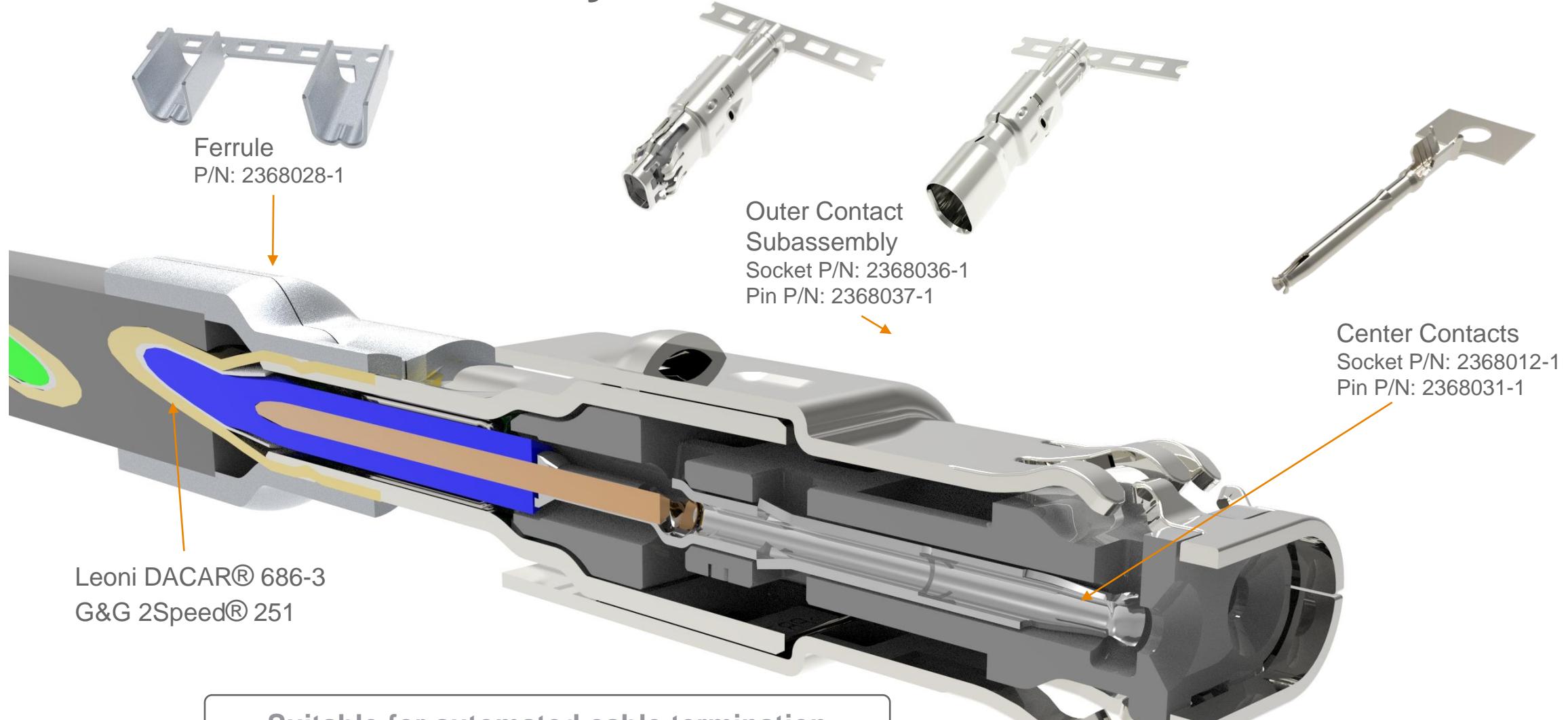


Center
contact socket



**Suitable for
automated cable
termination**
**Interface & cavity
compatible to
H-MTD**

GEMnet 180° Terminal System

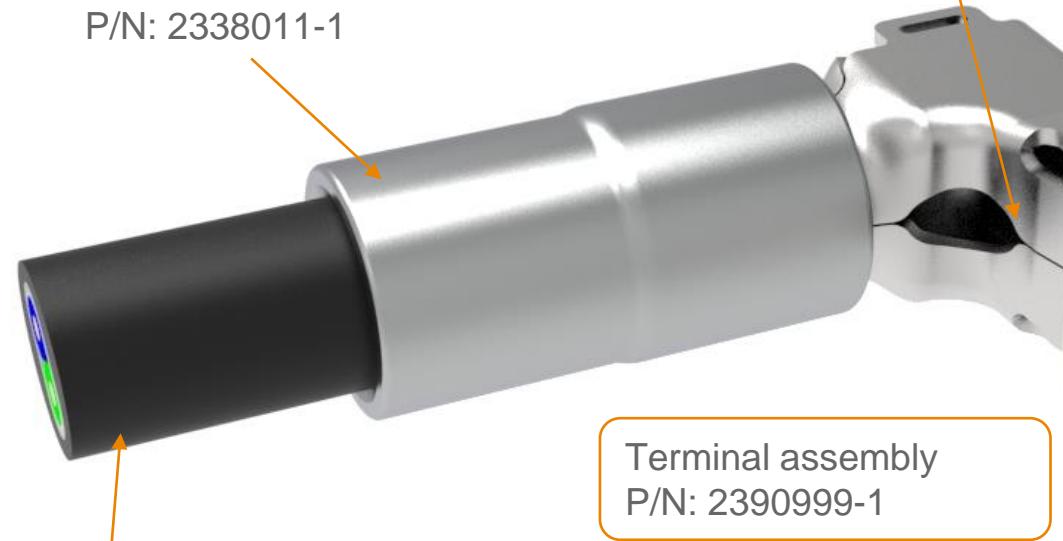


Suitable for automated cable termination
Interface & cavity compatible to H-MTD

GEMnet 90° Terminal System



Outer Ferrule
P/N: 2338011-1



Terminal assembly
P/N: 2390999-1

Inner Ferrule
P/N: 2401034-1



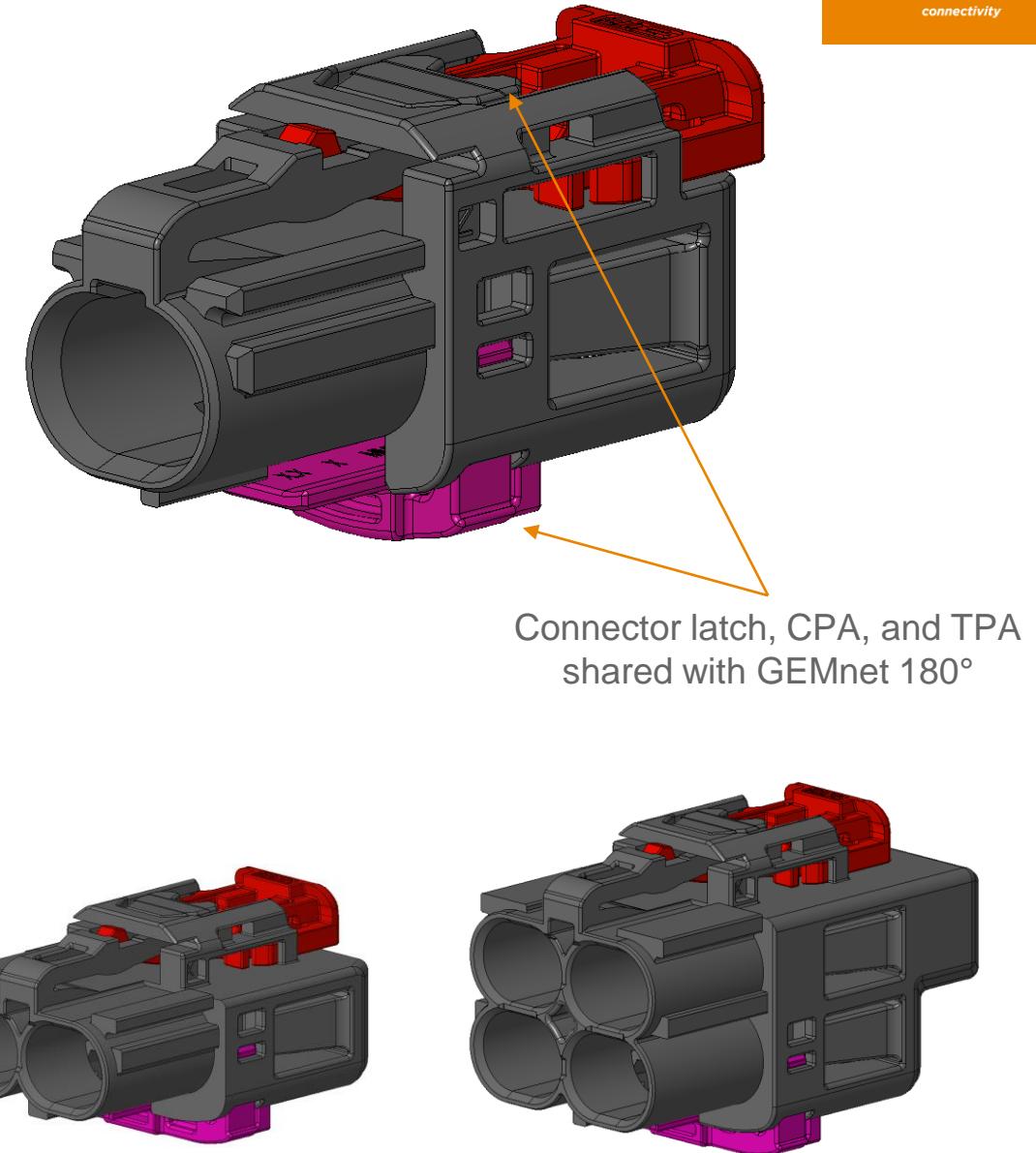
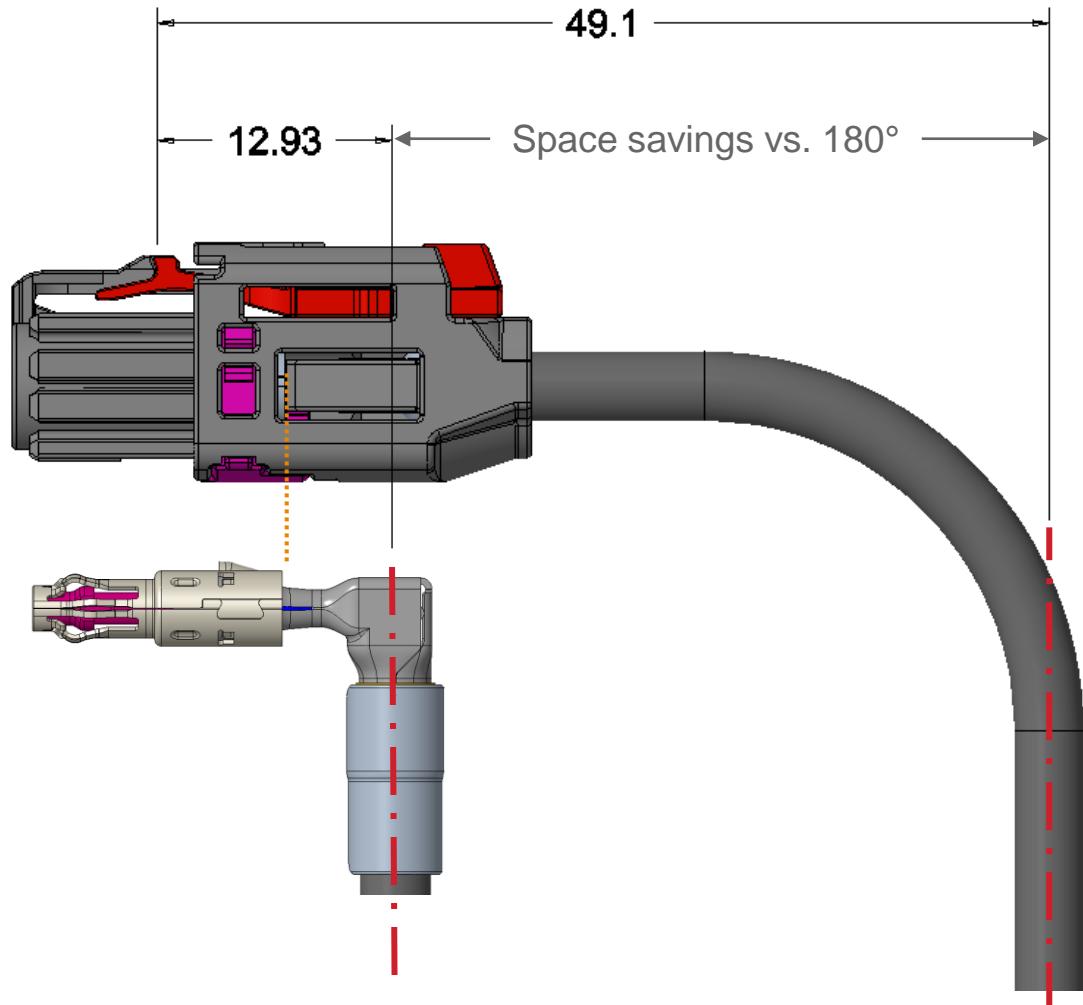
Outer Contact Subassembly
P/N: 2390998-1



Center Contacts
P/N: 2368012-1

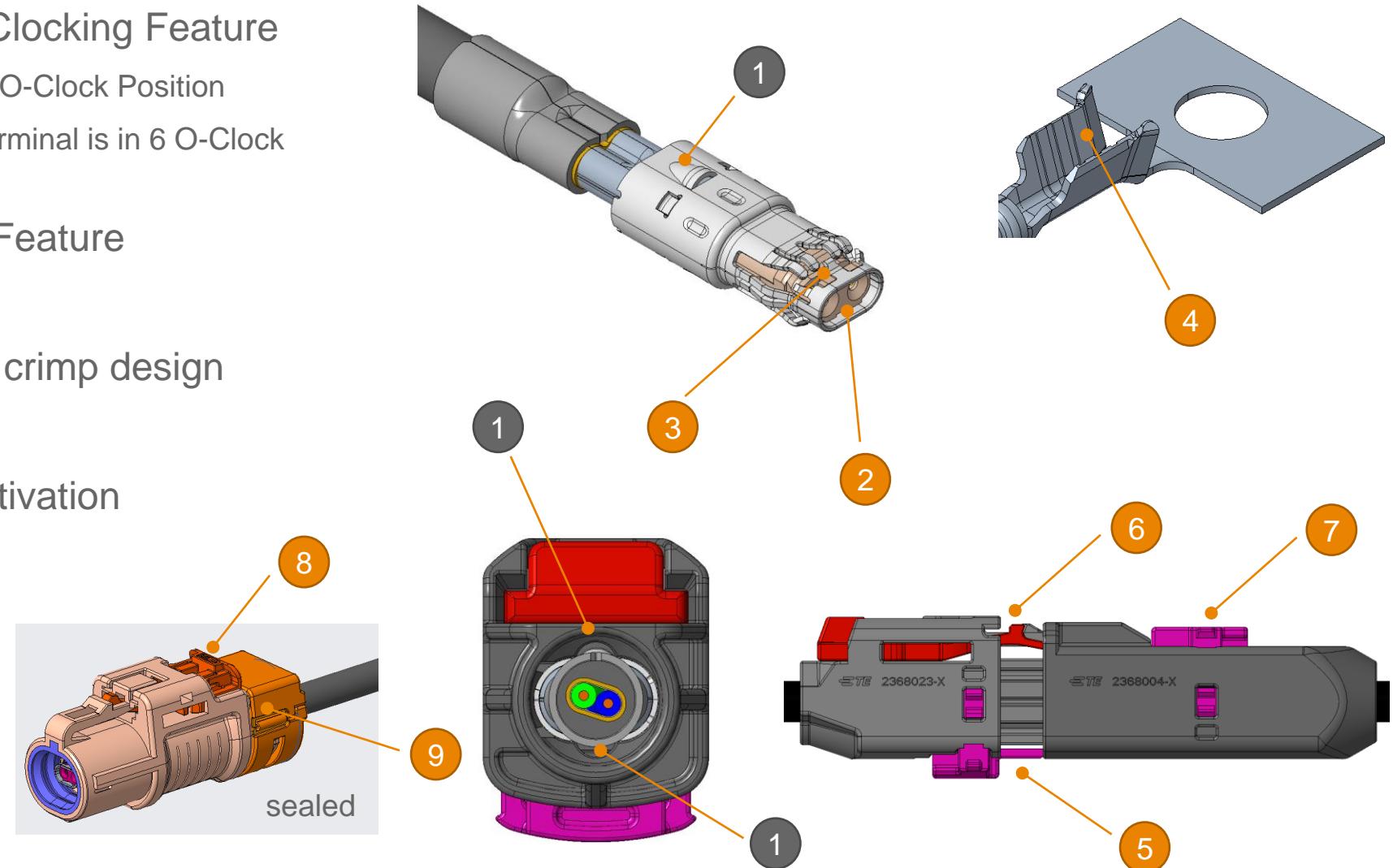
Interface per SAE/USCAR
Cavity per TE 2368038 / TE 2368039
Application Specification: 114-32334
Product Specification: 108-160097

GEMnet 90° Connector Packaging

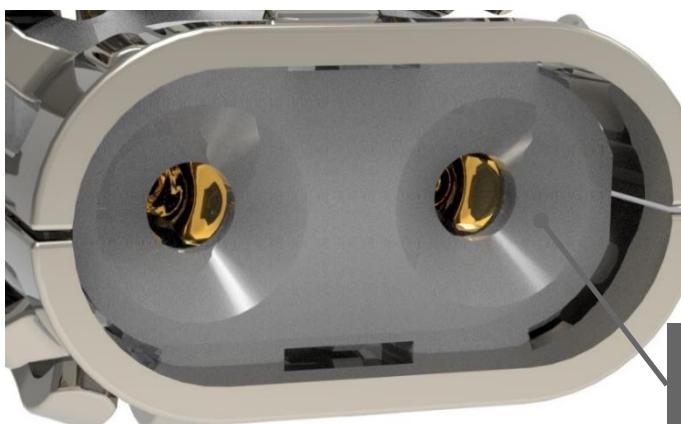
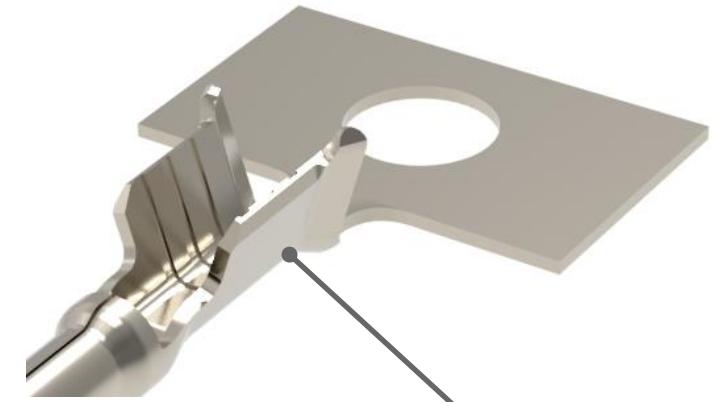
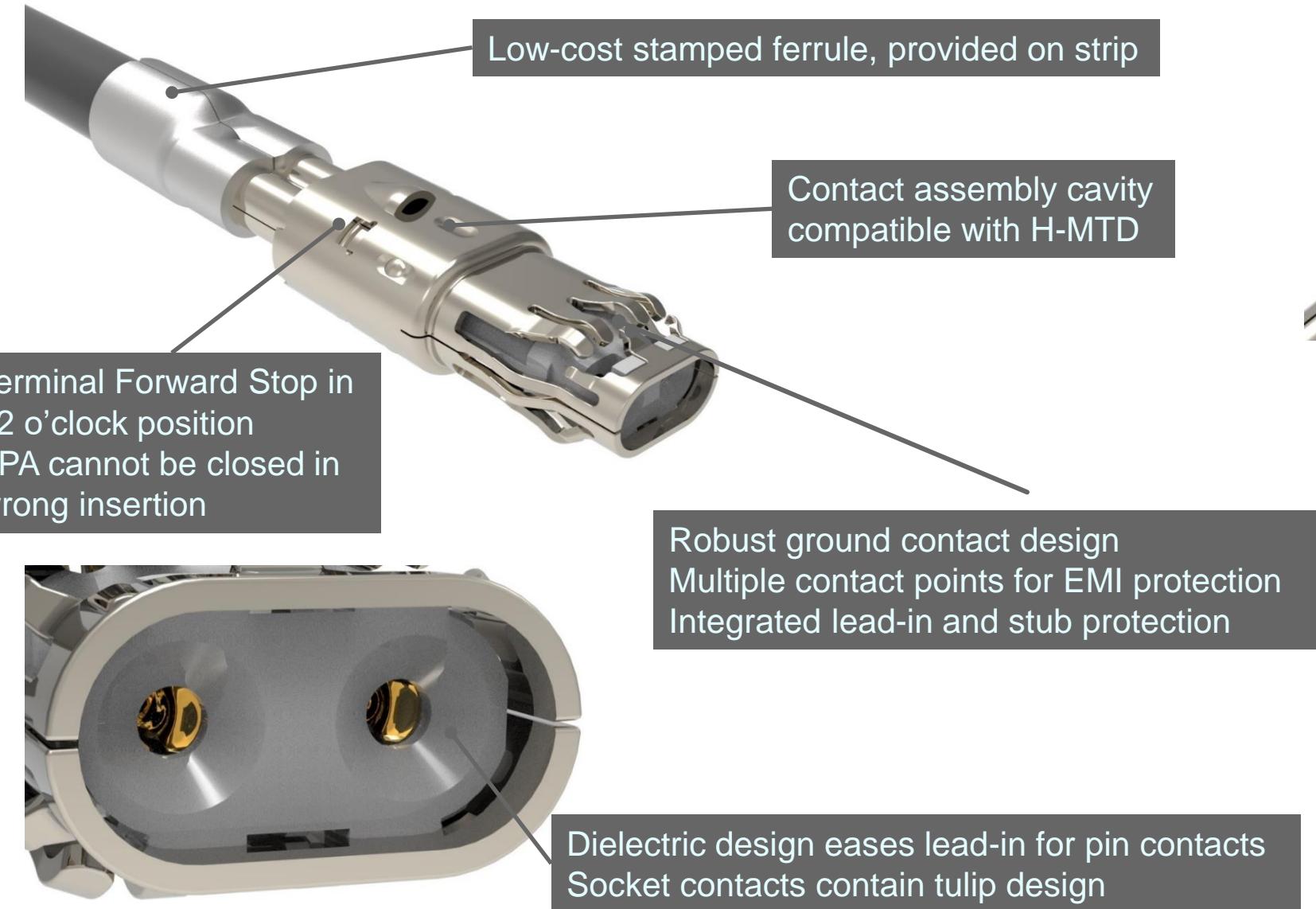


GEMnet Design Advantages

1. Forward Stop and Terminal Clocking Feature
 1. Terminal & Forward Stop in 12 O-Clock Position
 2. TPA cannot be closed when Terminal is in 6 O-Clock Position
2. Integrated Lead-in Terminal Feature
3. Integrated Stub Protection
4. Enhanced proven MATE-AX crimp design
5. Plug TPA Mating Block
6. CPA protection from false activation
7. TPA function
8. Identical CPA to unsealed
9. Hinge design on rear cover
(for maintenance purpose)



GEMnet – Terminal Advantages



Interface per SAE/USCAR
Cavity per TE 2368038 / TE 2368039
Application Specification: 114-32334
Product Specification: 108-160097

GEMnet – Header Portfolio (Tilted View)



1p 90° (2374901)



2p 90° (2374902)



4p 90° (2374900)



6p 90° (2397129)



Sealed 4p 90° (2374902)