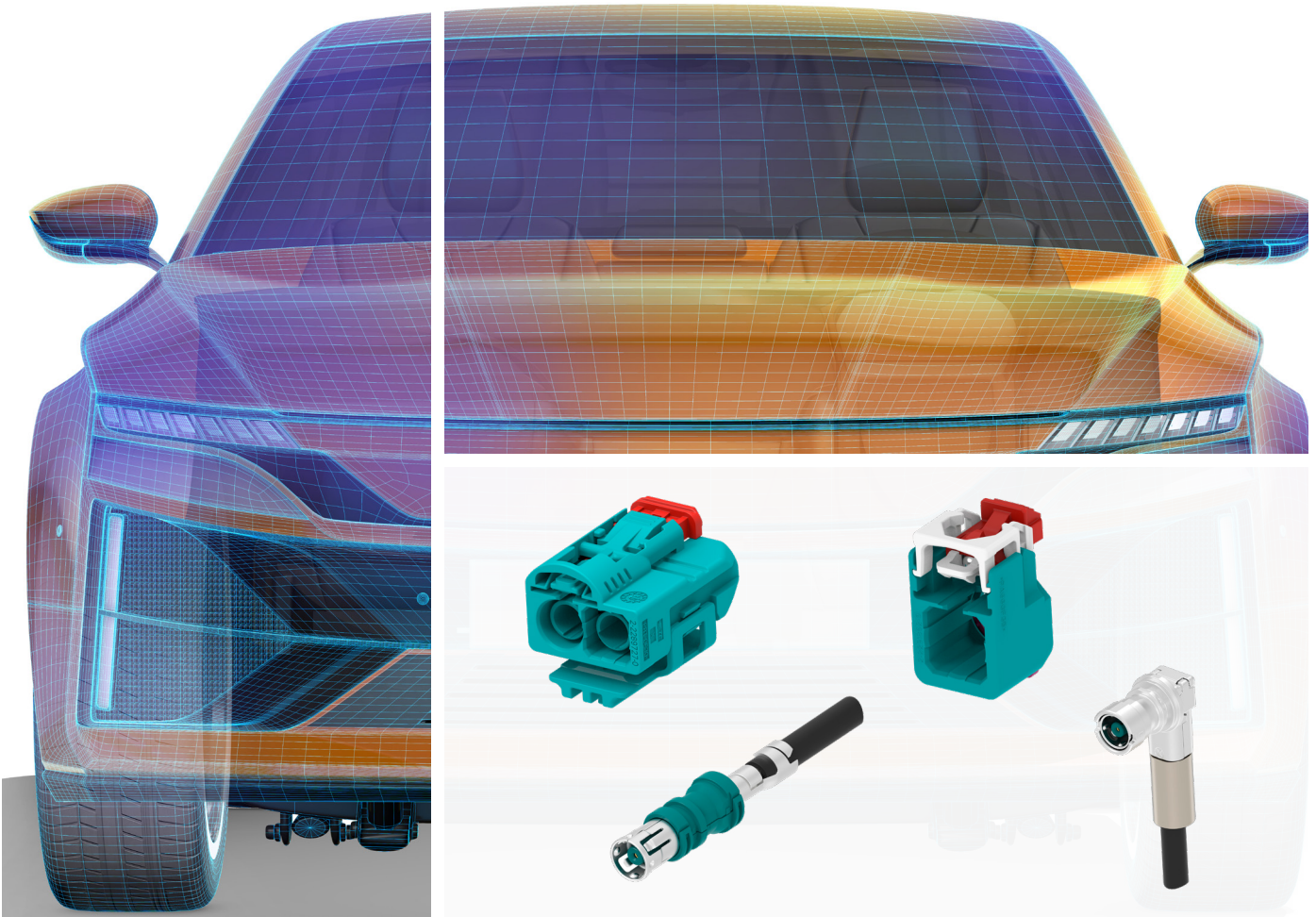


FAKRA COAXIAL SYSTEM FOR RADIO FREQUENCY



Automotive manufacturers are increasingly designing safety and vehicle connectivity applications based on high frequency data connections. These include cameras, sensors, antennas that require real-time data transmission where safety is the number one priority.

TE Connectivity (TE) addresses this demand with a comprehensive portfolio of RF (Radio Frequency) solutions, including cable assemblies, terminals, and housings designed to meet stringent FAKRA RF requirements. Our products are engineered for harsh environments and support RF signal transmission up to 6 GHz. In addition to that, TE's FAKRA Automated RF connectors offer a robust, automotive-grade design that combines reliability with cost-effectiveness, leveraging full automation in the manufacturing process.

TE's FAKRA connector system meets or exceeds ISO20860-1 (50 Ohms Impedance RF Connection System Interface), SAE/USCAR-17, SAE/USCAR-18, and SAE/USCAR-2 (Performance specifications for Automotive RF Connector Systems). These connectors are crucial for high-speed data transmission in in-vehicle networks, infotainment systems, and safety domains.

Key features and benefits

- Automotive-grade robustness
 - Fully compliant with LV214 requirements
 - Fully compliant to USCAR requirements
- Manufacturing Efficiency
 - Stamped and formed terminal variants available optimized for automated manufacturing
 - Global manufacturing footprint
- Extensive portfolio
 - 1, 2 position male/female connectors and headers

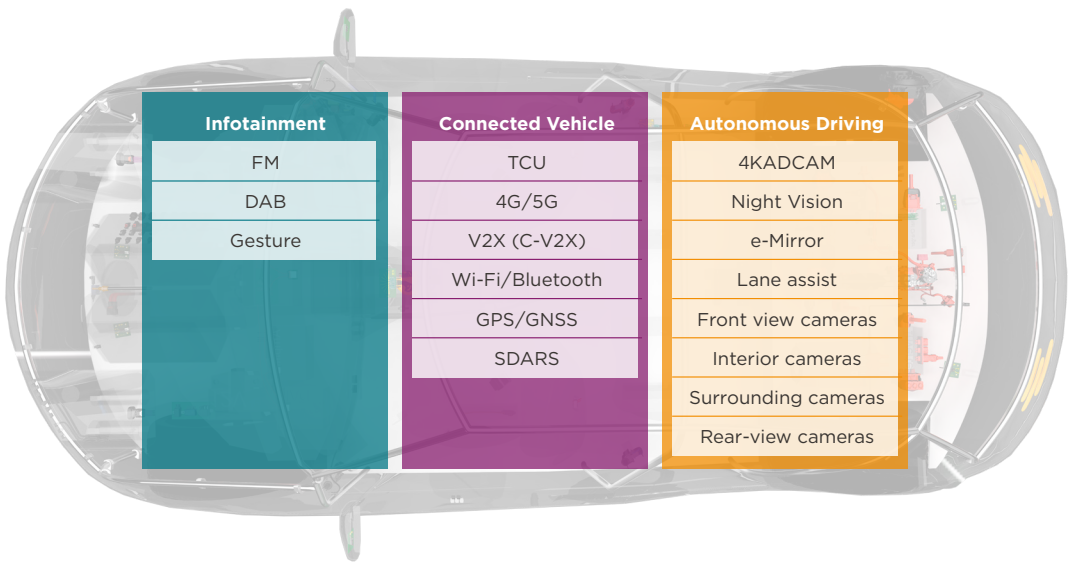
- 14 key codes
- Sealed/unsealed
- 180°/90° orientations
- Primary and secondary locks
- CPA variants

Market Compatibility:

- Serializer/Deserializer (SerDes)
- GMSL 2/3
- FPD-Link IV
- APIX3

Applications

- Autonomous driving: 4KADCAM, Night Vision, e-Mirror, Lane Assist, front view cameras, interior cameras, surrounding cameras, rear-view cameras
- Connected vehicle: TCU, 4G/5G, V2X, Bluetooth Low Energy, Wi-Fi/Bluetooth, GPS/GNSS, SDARS
- Infotainment: FM, DAB, Gesture



FAKRA COAXIAL SYSTEM FOR RADIO FREQUENCY

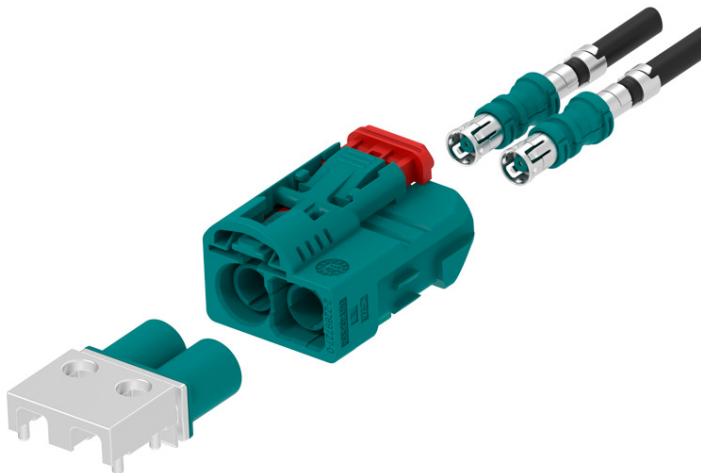
Voltage	Current	Temperature
800 VAC	1 amp maximum	Connector: -40 to 125°C Max temp is cable dependent

Terminals

Test Description	Requirement	Procedure
Contact Resistance	24mΩ maximum for signal contacts. 5mΩ initial maximum, 6mΩ maximum after environmental testing for ground contacts.	SAE/USCAR-17 Rev 5, 4.3.1.2
Circuit Continuity Monitoring	No loss of electrical continuity for > 1μs	SAE/USCAR-2 Rev 6, 5.1.9.3
Dielectric Withstanding Voltage	≥800 VAC	SAE/USCAR-17 Rev 5, 4.3.2.2
Voltage Standing Wave Ratio (VSWR)	SWR ≤ 1.4 0 to 2 GHz SWR ≤ 1.5 2 to 3 GHz SWR ≤ 1.6 3 to 6 GHz	SAE/USCAR-17 Rev 5, 4.4.2.2
Insertion Loss (IL)	IL ≤ 0.3 0 to 3 GHz IL ≤ 0.45 3 to 6 GHz	SAE/USCAR-17 Rev 5, 4.4.2.2
Insulation Resistance	>100MΩ	SAE/USCAR-17 Rev 5, 4.4.1.2
RF Leakage Leakage	≤ 45 dB 0 to 3 GHz Leakage ≤ 40 dB 3 to 6 GHz	SAE/USCAR-17 Rev 5, 4.4.3.2
Capacitance	<6.0 pF for in-line connectors	SAE/USCAR-17 Rev 5, 4.4.4.2

Mechanical Parameters

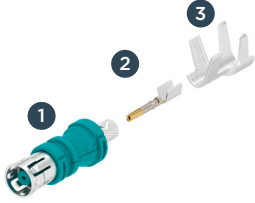
Test Description	Requirement	Procedure
Terminal Bend Resistance (Center Contacts)	No tear or crack at 3 N	SAE/USCAR-2 Rev 6, 5.2.2.3
Terminal to Connector Engage/Disengage	Disengage w Retainer ≥ 110 N Disengage w Retainer after conditioning ≥ 80 N Disengage w Retainer after vibration ≥ 70 N Disengage w Retainer after temp/ humidity ≥ 70 N Disengage w Retainer after heat age ≥ 70 N	SAE/USCAR-2 Rev 6, 5.4.1
Connector to Connector Mating/Unmating	Mating Force ≤ 25 N (1 Position) Mating Force ≤ 45 N (2 Position) Connector Disengage with Lock ≥ 110 N Force to disengage lock ≥ 6N and ≤ 51 N Unmating Force with Lock disengaged ≤ 75 N	SAE/USCAR-2 Rev 6, 5.4.2
Mechanical Pull Force	≥ 110 N Axial force, 5 second hold IL and VSWR, before and after. See Electrical section	SAE/USCAR-17 Rev 4, 4.2.1.2



FAKRA COAXIAL SYSTEM FOR RADIO FREQUENCY

Unsealed | 180°

180° Unsealed Female Terminal Applicable per Cable Type

Contact subassembly	Cable Type	Cable Diameter	Terminal kit drawing No. *	Cavity Insert Subassembly ①	Center Contact ②	Outer Ferrule ③
	1.5DS, 462-1/2/5/6,	2.67 to 2.86 mm (0.105 to 0.113 in)	2203275-2	2393151-3	2203270-4	2203259-2
	RG-174, RG-174LL,					
	RG 316					
	RTK-031	3.3 mm (0.13 in)	2344361-2	2393151-2	2203270-8	2338011-5
	2DS-PPFW(TA), 2DS	4.20 mm (0.165 in)	2344361-4	2393151-2	2203270-8	2338011-4
	RG- 58,	4.95 mm (0.195 in)	2344361-1	2393151-1	1-2203270-9	2338011-4
	RG-58 LL/037-6					
	RTK 044	3.55 mm (0.14 in)	2344361-3	2393151-4**	2203270-8	2338011-3

* Unsellable part

**In development

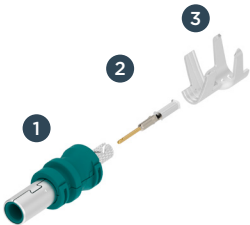
180° Unsealed Female Housings

	Description	TE Part Number		Description	TE Part Number
	1P 180° Female housing (No clip slot)	2410915-X		2P 180° Female housing (No Clip Gen. 3.0)	2410913-X
	1P 180° Female housing (with clip)	2410914-X		2P 180° Female housing (with clip)	2410912-X
	1P 180° Female housing (with CPA, no clip)	2289729-X		2P 180° Female housing (with CPA, no clip)	2289731-X
	1P 180° Female housing (with CPA, with clip)	2289730-X		2P 180° Female housing (with CPA, with clip)	2289732-X

Key Code	A	B	C	D	E	F	G	H	I	K	L	M	N	Z
Suffix (tray)	-1	-2	-3	-4	-5	-6	-7	-8	-9	1-/-0	1-/-1	1-/-2	1-/-3	2-/-0
Suffix (Tape & Reel)	5-/-1	5-/-2	5-/-3	5-/-4	5-/-5	5-/-6	5-/-7	5-/-8	5-/-9	6-/-0	6-/-1	6-/-2	6-/-3	7-/-0

FAKRA COAXIAL SYSTEM FOR RADIO FREQUENCY

180° Unsealed Male Terminal Applicable per Cable Type

Contact subassembly	Cable Type	Cable Diameter	Terminal kit drawing No.*	Cavity Insert Subassembly ①	Center Contact ②	Outer Ferrule ③
	1.5DS, 462-1/2/5/6,	2.67 to 2.86 mm (0.105 to 0.113 in)	2203265-2	2203264-7	2203260-4	2203259-2
	RG-174, RG-174LL,					
	RG 316					
	RTK-031	3.3 mm (0.13 in)	2344360-2	2203264-8	2203260-8	2338011-5
	2DS-PPFW(TA), 2DS	4.20 mm (0.165 in)	2344360-4	2203264-8	2203260-8	2338011-4
	RG- 58,	4.95 mm (0.195 in)	2344360-1	2203264-9	1-2203260-9	2338011-4
	RG-58 LL/037-6					
	RTK 044	3.55 mm (0.14 in)	2344360-3	1-2203264-0	2203260-8	2338011-3

* Unsellable part

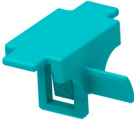
180° Unsealed Male Housings

	Description	TE Part Number
	1P 180° male housing kit (No clip slot)	2359318-X
	1P 180° male housing kit (with clip)	2359320-X

	Description	TE Part Number
	2P 180° male housing kit (No clip slot)	2359322-X
	2P 180° male housing kit (with clip)	2359324-X
	2P 180° male housing (Alt clip)	2272922-X

Key Code	A	B	C	D	E	F	G	H	I	K	L	M	N	Z
Suffix (tray)	-1	-2	-3	-4	-5	-6	-7	-8	-9	1/-0	1/-1	1/-2	1/-3	2/-0
Suffix (Tape & Reel)	5/-1	5/-2	5/-3	5/-4	5/-5	5/-6	5/-7	5/-8	5/-9	6/-0	6/-1	6/-2	6/-3	7/-0

Retainer

	TE Part Number
	2312640-1
	2314550-1

Unsealed | 90°
90° Unsealed Female Terminal Applicable per Cable Type

Contact subassembly	Cable Type	Cable Diameter	Terminal kit drawing No.*	Front Shell Subassembly ①	Center Contact ②	Rear shell ③	Outer Ferule ④
	1.5DS, RG-174LL, RG 316	2.67 to 2.86 mm (0.105 to 0.113 in)	2306475-1	2306474-1	2304634-4	2306472-1	1418993-1
	RTK-031	3.3 mm (0.13 in)	2304626-1	2304628-1	2304634-8	2304631-1	1418993-1
	RG-58, RG-58 LL	4.95 mm (0.195 in)	2306490-1	2306489-1	1-2304634-0	2306487-1	1488499-3

* Unsellable part

90° Unsealed female Housing

	Description	TE Part Number
	1P 90 deg unsealed male housing kit	2291859-X

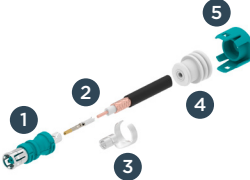
Key Code	A	B	C	D	E	F	G	H	I	K	L	M	N	Z
Suffix (tray)	-1	-2	-3	-4	-5	-6	-7	-8	-9	1-/-0	1-/-1	1-/-2	1-/-3	2-/-0
Suffix (Tape & Reel)	5-/-1	5-/-2	5-/-3	5-/-4	5-/-5	5-/-6	5-/-7	5-/-8	5-/-9	6-/-0	6-/-1	6-/-2	6-/-3	7-/-0

Retainer

	TE Part Number
	2291861-1

FAKRA COAXIAL SYSTEM FOR RADIO FREQUENCY

Sealed | 180°
180° Sealed Female Terminal Applicable per Cable Type

Contact subassembly	Cable Type	Cable Diameter	Connector assembly drawing No*	Terminal kit PN	Cavity Insert Subassembly ①	Center Contact ②	Outer Ferrule ③	Wire Seal ④	Seal Cover ⑤
	.5DS, 462-1/2/5/6, RG-174,	2.67 to 2.86 mm (0.105 to 0.113 in)	2304242-X (No clip slot) 2-2304242-X (With clip)	2272870-X	2393151-3	2203270-4	2272633-2	963244-1	2289592-2
	RG-174LL, RG 316								
	RTK-031	3.3 mm (0.13 in)			2393151-2	2203270-8	2272633-3	963245-1	2289592-3
	2DS	4.20 mm (0.165 in)			2393151-2	2203270-8	2272633-5	967011-1	2289592-5
	RG-58, RG-58 LL	4.95 mm (0.195 in)			2393151-1	1-2203270-9	2272633-4	968043-1	2289592-4
	462-6	2.8 mm (0.11 in)			2393151-3	2203270-4	2272633-2	963244-1	2289592-2
	037-6	4.95 mm (0.195 in)			2393151-1	1-2203270-9	2272633-4	968043-1	2289592-4
	RTK044	3.55 mm (0.14 in)			2393151-4	2203270-8	2272633-4	963245-1	2289592-3

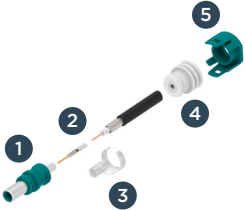
* Unsellable part

180° Sealed Female Housing

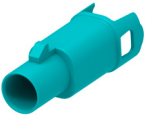
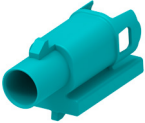
	Description	TE Part Number
	1P 180° sealed female housing (with CPA, no clip)	2307383-X
	1P 180° sealed female housing (with CPA, with clip)	2307361-X
	1P 180° sealed female inner housing	2307194-2

Key Code	A	B	C	D	E	F	G	H	I	K	L	M	N	Z
Suffix (tray)	-1	-2	-3	-4	-5	-6	-7	-8	-9	1-/-0	1-/-1	1-/-2	1-/-3	2-/-0
Suffix (Tape & Reel)	5-/-1	5-/-2	5-/-3	5-/-4	5-/-5	5-/-6	5-/-7	5-/-8	5-/-9	6-/-0	6-/-1	6-/-2	6-/-3	7-/-0

180° Sealed Male Terminal Applicable per Cable Type

Contact subassembly	Cable Type	Cable Diameter	Inner housing	Cavity Insert Subassembly ①	Center Contact ②	Outer Ferrule ③	Wire Seal ④	Seal Cover ⑤
	1.5DS, 462-5, RG-174, RG-174LL, RG 316	2.67 to 2.86 mm (0.105 to 0.113 in)	2307193-1	2203264-7	2203260-4	2272633-2	963244-1	2289592-2
	RTK-031	3.3 mm (0.13 in)		2203264-8	2203260-8	2272633-3	963245-1	2289592-3
	2DS	4.20 mm (0.165 in)		2203264-8	2203260-8	2272633-5	967011-1	2289592-5
	RG-58, RG-58 LL	4.95 mm (0.195 in)		2203264-9	1-2203260-9	2272633-4	968043-1	2289592-4
	462-6	2.8 mm (0.11 in)		2203264-7	2203260-4	2272633-2	963244-1	2289592-2
	O37-6	4.95 mm (0.195 in)		2203264-9	1-2203260-0	2272633-4	968043-1	2289592-4
	RTK 044	3.55 mm (0.14 in)		1-2203264-0	2203260-8	2272633-4	963245-1	2289592-3

180° Sealed Male Housing

	Description	TE Part Number
	1P 180° sealed male housing (no clip)	2307198-X
	1P 180° sealed male housing (with clip)	2307199-X
	1P 180° sealed male inner housing	2307193-1

Key Code	A	B	C	D	E	F	G	H	I	K	L	M	N	Z
Suffix (tray)	-1	-2	-3	-4	-5	-6	-7	-8	-9	1-/-0	1-/-1	1-/-2	1-/-3	2-/-0
Suffix (Tape & Reel)	5-/-1	5-/-2	5-/-3	5-/-4	5-/-5	5-/-6	5-/-7	5-/-8	5-/-9	6-/-0	6-/-1	6-/-2	6-/-3	7-/-0

Sealed | 90°
90° Sealed Female Terminal Applicable per Cable Type

Contact subassembly	Cable Type	Cable Diameter	Terminal Kit Part Number	Plug Sub-Assy	Male Contact	Ferrule	Heat Shrink
	RG-174LL, RG 316	2.67 to 2.86 mm (0.105 to 0.113 in)	2301906-1	2301903-1	1-2297252-2	1-413889-3	543633P062
	1.5DS	3.0 mm (0.118 in)	2299077-1	2298742-1	1-2297252-2	1-413889-4	
	RTK-031	3.3 mm (0.13 in)	2301907-1	2301904-1	1-2297252-4	1418993-1	
	RG-58, RG-58 LL	4.95 mm (0.195 in)	2301908-1	2301905-1	1-2297252-5	1488499-3	

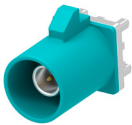
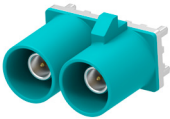
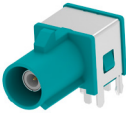
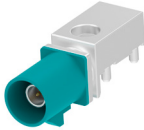
90° Sealed Female Terminal Applicable per Cable Type

	Description	TE Part Number
	1P 90° sealed female housing (with CPA, no clip)	2291859-X

Key Code	A	B	C	D	E	F	G	H	I	K	L	M	N	Z
Suffix (tray)	-1	-2	-3	-4	-5	-6	-7	-8	-9	1-/-0	1-/-1	1-/-2	1-/-3	2-/-0
Suffix (Tape & Reel)	5-/-1	5-/-2	5-/-3	5-/-4	5-/-5	5-/-6	5-/-7	5-/-8	5-/-9	6-/-0	6-/-1	6-/-2	6-/-3	7-/-0

FAKRA COAXIAL SYSTEM FOR RADIO FREQUENCY

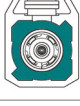
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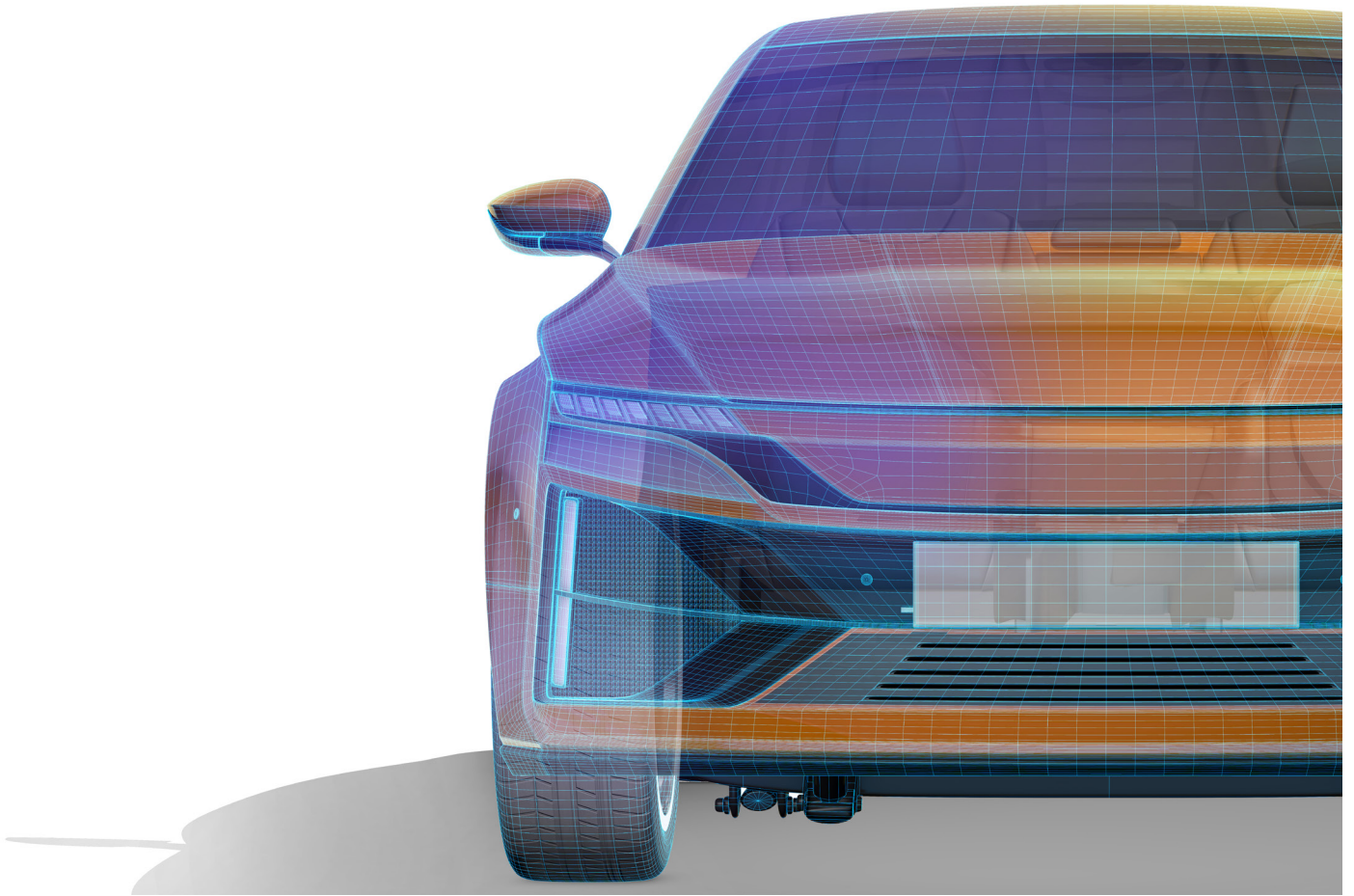
	Description	TE Part Number
	1P 180° FAKRA Header	X-2203452-X
	2P 180° FAKRA Header	X-2272788-X
	1P 90° FAKRA Header	X-2291392-X (Tape & Reel)
	1P 90° FAKRA Header	X- 2209201-X
	1P 90 deg FAKRA Header, 3 O'clock	X-2287907-X
	1P 90° FAKRA Header, 6 O'clock	X-2287903-X
	1P 90° FAKRA Header, 9 O'clock	X-2287908-X
	1P 90° FAKRA Header, 9 O'clock	X- 2287906-X
	2P 90° FAKRA Header, 6 O'clock	X-2287922-X
	2P 90° FAKRA Header, 12 O'clock	X- 2287923-X

Key Code	A	B	C	D	E	F	G	H	I	K	L	M	N	Z
Suffix (tray)	-1	-2	-3	-4	-5	-6	-7	-8	-9	1-/-0	1-/-1	1-/-2	1-/-3	2-/-0
Suffix (Tape & Reel)	5-/-1	5-/-2	5-/-3	5-/-4	5-/-5	5-/-6	5-/-7	5-/-8	5-/-9	6-/-0	6-/-1	6-/-2	6-/-3	7-/-0

FAKRA COAXIAL SYSTEM FOR RADIO FREQUENCY

Coding Versions

Female	Male	Keying Code	Color	TE Part Number	Single-way Application in	
					Europe	USCAR
		A	Jet Black	9005	Radio without phantom supply	
		B	Cream	9001	Radio with phantom supply	
		C	Signal Blue	5005	GPS telematics or navigation	GPS
		D	Claret Violet	4004	GSM	
		E	Leaf Green	6002	TV1	TV (UHF) / SDARS terrestrial (XM)
		F	Nut Brown	8011	TV2	TV (VHF) / SDARS terrestrial (Sirius)
		G	Blue Gray	7031	Remote Keyless Entry	SDARS terrestrial (interoperable)
		H	Heather Violet	4003	GPS telematics and navigation	
		I	Beige	1001	Remote	Bluetooth Controlled Parking Heating
		K	Curry	1027	Diversity radio	SDARS satellite
		L	Carmine Red	3002	Not defined	
		M	Pastel Orange	2003	Not defined	Keyless Entry Tire pressure Monitoring
		N	Pastel Green	6019	Not defined	
		Z	Water Blue	5021	Neutral (fits all)	



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