



# COAXIAL CONNECTIVITY SOLUTIONS FOR AUTOMOTIVE CAMERAS

A growth in the deployment of ADAS technologies is leading to an increase in the number of cameras within vehicles.

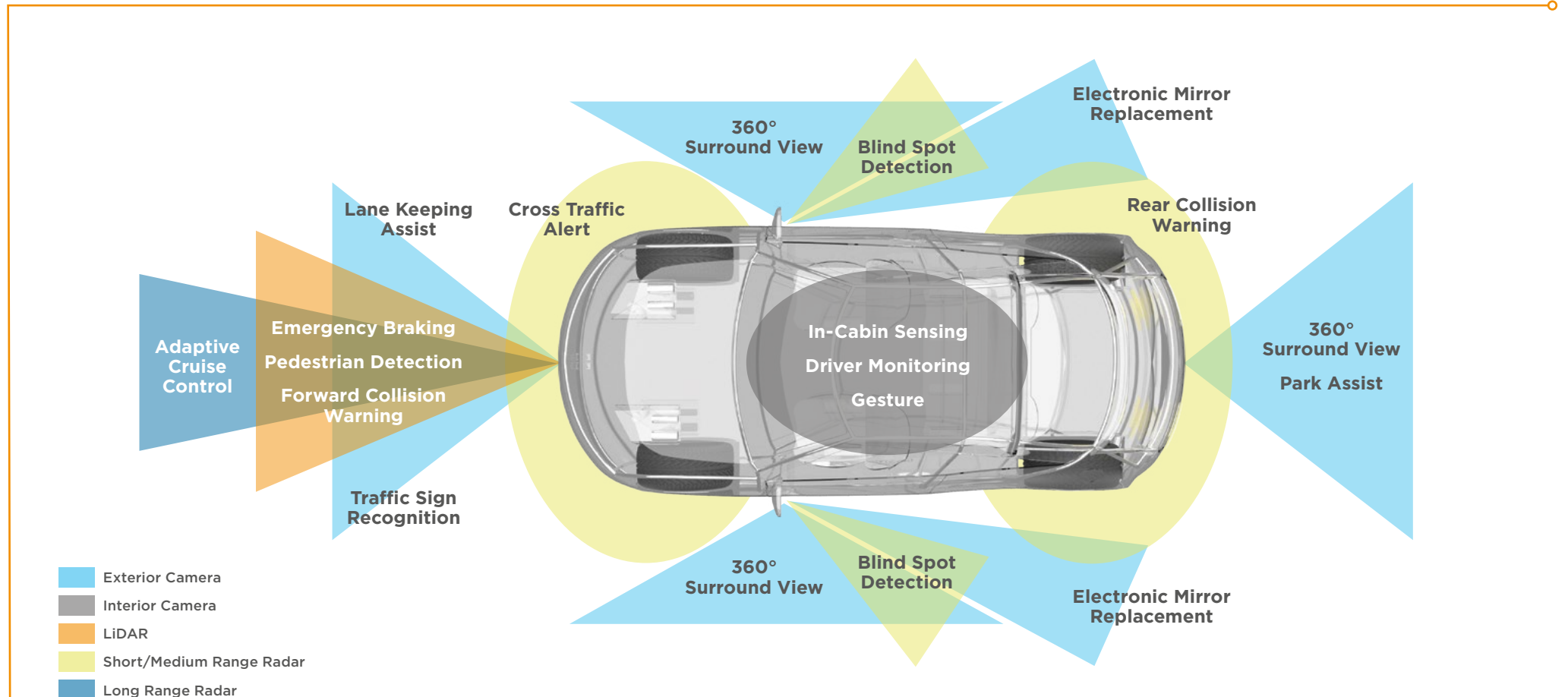
Compared to LiDAR (Light Detection and Ranging) and RADAR (Radio Detection and Ranging), cameras offer a number of advantages such as being able to see colors, making them an optimal solution for environmental interpretation. They can also be

deployed as a stereo vision system or in conjunction with LiDAR and RADAR for advanced driver assistance applications that provide accurate information about objects' distance and speed. Applications include surround view, lane departure warning, adaptive cruise control, blind spot recognition and smart cameras that recognize the environment.

Increased ADAS (Advanced Driver Assistant Systems) safety levels, including increasing vehicle automation,

is driving the need for advanced camera capabilities with higher resolution and frame rates. This leads to an increased amount of data that must be reliably transmitted from the ADAS system, including the camera itself, to the signal-processing control unit.

To meet these increasing demands, TE Connectivity (TE) offers an innovative broadband coaxial connector portfolio that is precisely tailored to the requirements of next-generation automotive camera systems.



The safety relevance of camera modules presents some specific requirements and challenges in relation to data connectivity performance, robustness and reliability.

TE Connectivity offers a comprehensive portfolio of broadband coaxial camera connectivity solutions covering the requirements of almost all automotive cameras available on the market.

### Floating Header Solutions

Our standard floating connectors support high-end 8-12 megapixel cameras with frame rates of 30-60 frames per second (fps). They combine compact design with high bandwidth and a high-level misalignment compensation.\*

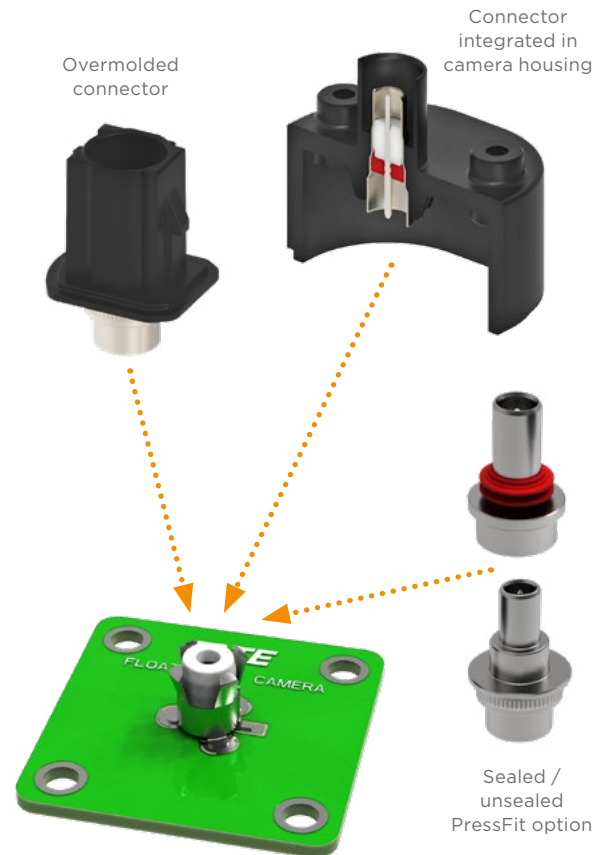
We offer 2-piece and 1-piece HD connectors that support a bandwidth of 6 GHz and beyond providing misalignment compensation of  $\pm 0.5$  mm in all directions.

The 2-piece floating solution is designed for very low normal insertion forces to the PCB and is therefore an optimal solution for a one-PCB camera design, with an imaging sensor positioned opposite the floating header.

In addition, TE offers a solderless 1-piece solution offering the same bandwidth and levels of misalignment compensation. With this solution, the complete coaxial connection is integrated within the camera housing and requires no additional part soldered to the PCB.

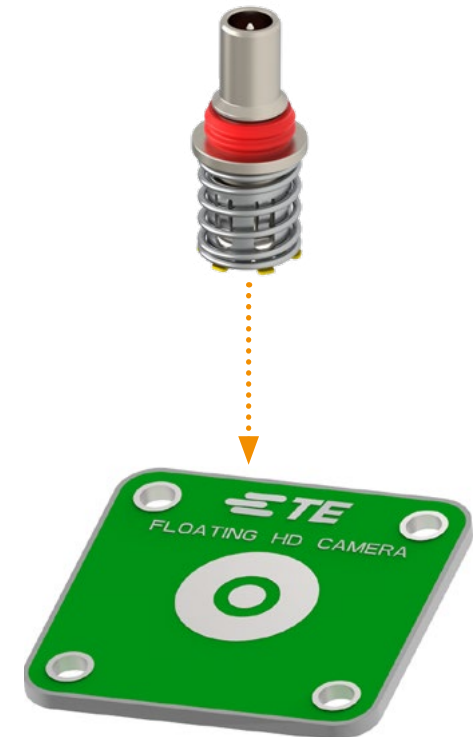
\* Further compact solutions for specific assembly space requirements are available on request

### 2-Piece Floating Header Solution



- Misalignment compensation of  $\pm 0.5$  mm in all dimensions
- 6 GHz for HD camera systems
- Customizable housing including press-fit and over-moulded options
- Choice of FAKRA interconnection system or MATE-AX interconnection system interfaces
- High sealing class: Up to IP6K9K

### 1-Piece Floating Header Solution



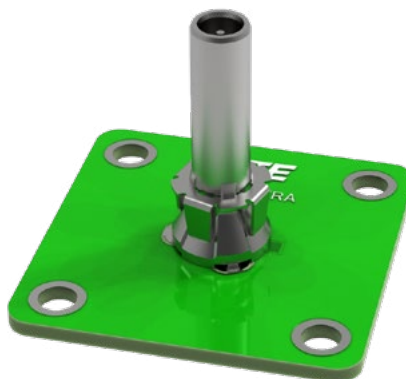
- Integrated solderless housing solution
- Misalignment compensation of  $\pm 0.5$  mm in all dimensions
- 6 GHz for HD camera systems
- Choice of interfaces: FAKRA interconnection system or MATE-AX interconnection system
- High sealing class: Up to IP6K9K

### Fixed Header Solutions

Our fixed header solutions combine the best RF and optimum EMI performance. The header is soldered directly to the PCB and, with the availability of SMT (Surface Mounted Technology) and through-hole (TH) variants, are highly suited to both single or multi-PCB cameras.

In addition, optimal EMI shielding can be warranted with a spring-loaded connection between the connector grounding to a metal camera housing.

### Fixed Header Solution



- Non-floating design
- SMT or TH variant available
- Optimal signal integrity and shielding
- Optional spring-loaded GND connection
- Choice of interfaces (FAKRA interconnection system or MATE-AX interconnection system)
- High sealing class: IP6K9K

## Overview

All our solution variants are customizable and adaptable for an optimal fit to your camera module, including: length; interface (FAKRA interconnection system or MATE-AX interconnection system) or PCB mounting technology (surface-mounted, through-hole or solderless).




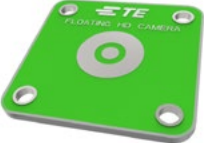

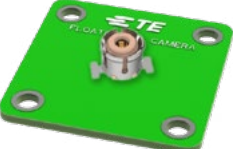

All connectors' interfaces are interchangeable between FAKRA interconnection system and TE's MATE-AX interconnection system and are available with 180° and 90° mounting direction.

In addition to an outer sealing, all variants feature an inner sealing for water proofing IP6K9K.

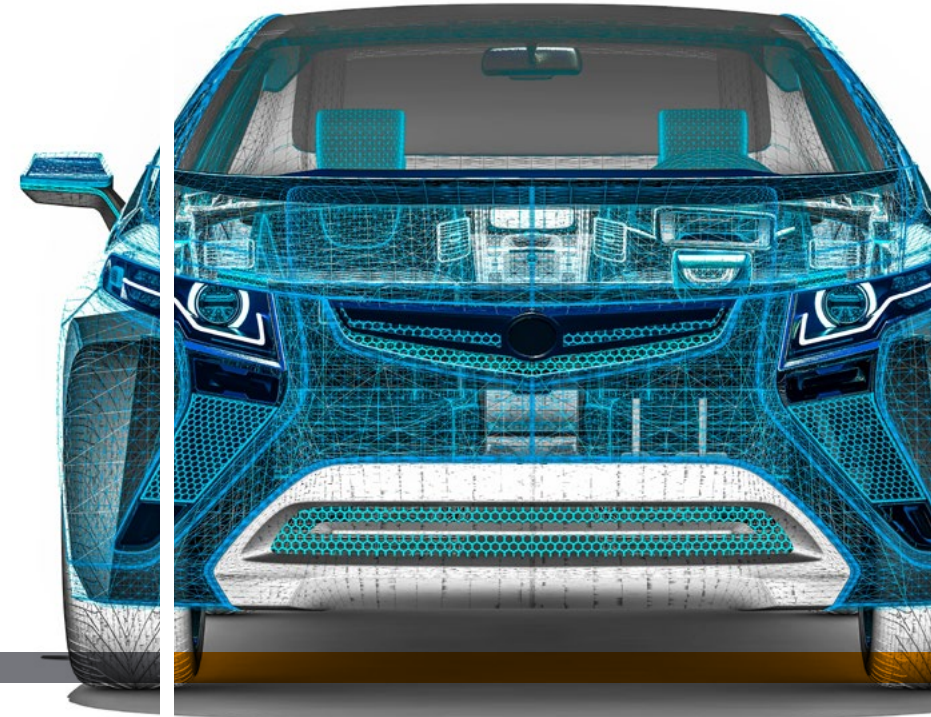
## TE Connectivity's Coaxial Connectivity Solutions at a Glance

- Floating and fixed header solutions
- Single and multi-PCB support
- High-level of misalignment compensation:  $\pm 0.5$  mm in all directions for floating solutions
- Highly compact design
- Broadband connectivity to support 8-12 megapixel HD cameras with up to 60 frames per second
- Waterproofing of IP6K9K
- Support all current and next-generation automotive coaxial SerDes protocols
- Supports phantom power supply
- Compatible to metal and plastic camera housings

## TE Connectivity's Coaxial Connectivity Solutions at a Glance

Solution	HD Floating Header 2 Piece	HD Floating Header 1 Piece	HD Floating Header 2 Piece Compact	HD Fixed Header 1 Piece
<b>Part Number</b>	Floating part 2338810  PCB Socket SMT 2338801 	Floating part 2381177  	Floating part 2327435  PCB socket SMT PCB 2327462 	TH PCB Socket (SMT optional) 2278742 
<b>Performance</b>	up to 6 GHz (12 Megapixel, 4k and beyond)			
<b>Typical SerDes-Protocols</b>	FPD-Link III/IV   GMSL 2/3   MIPI   ASA   GVIF   ...			
<b>Misalignment Compensation</b>	Max. $\pm 0.5$ mm in x-, y- and z-direction	Max. $\pm 0.5$ mm in x-, y- and z-direction	Max. $\pm 0.2$ mm in x-, y- / $\pm 0.5$ mm in z-direction	NA
<b>Socket <math>\varnothing</math></b>	5.7 mm	6.3 mm	4.0 mm	6.3 mm
<b>Key Feature</b>	Combines high bandwidth with high misalignment compensation	Solderless solution	Compact size, but great RF-performance	Spring-loaded GND connection to metal housing (optional)

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