# Rugged, Miniature Connectors Designed for Automotive LED Lighting

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The automotive market is driven by electronics manufacturers to deliver advanced components and systems that enable significant improvements in functionality, driver safety and infotainment. Keeping up with dynamic technology innovations is a challenge, particularly when it comes to safety and driver assistance systems. One example is intelligent headlight systems that deliver dynamic cornering and turning lighting. Just like airbag intelligent systems that can determine how heavy the passengers are, allowing them to adapt to the individual precisely, the enhanced lighting systems angle the light precisely where the driver needs to see. These driver assistance systems require more advanced interconnect systems that meet a plethora of design criteria including ruggedness, reliability, size, and performance.

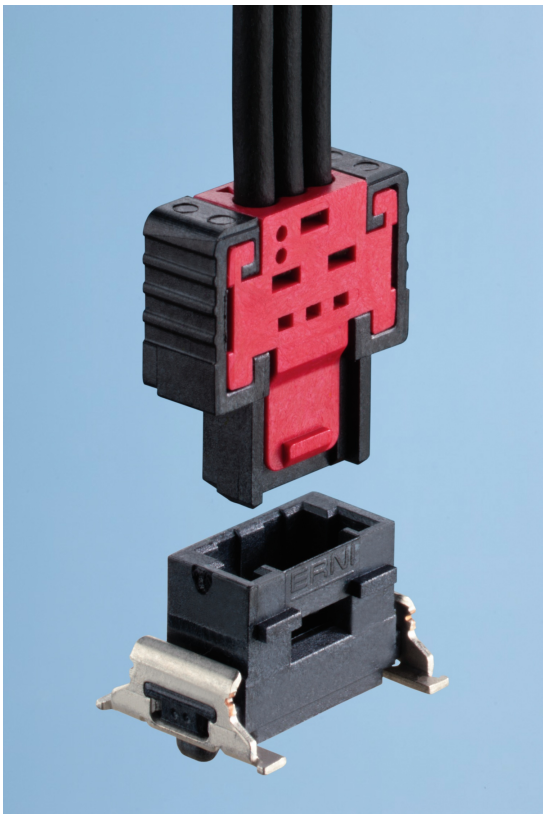
Finding the right connector for these LED lighting systems continues to be a challenge for designers. Connectors designed for automotive applications, like the ones that meet Koshiri Security requirements, deliver the necessary functionality and guarantee the highest levels of reliability in active and passive safety and driver assistance systems.

**LED Lighting Systems**

Intelligent LED headlight systems actively direct the headlights based on the road conditions and environment including curves, oncoming vehicles and pedestrians. The advanced lighting systems automatically control a vehicle's beam state, high beam or low beam, during nighttime driving based on the detection of oncoming vehicles and leading vehicles via video captured by a camera.

**Koshiri Security**

The automotive industry has high demands on process reliability for connectors. For example, during a skewed connection process of the male and female parts, it is imperative the male connectors are not damaged. Koshiri Security connectors feature a unique housing design with distinctive guides that prevent mismating and protect exposed contact pins. Also known as “scoop proof”, the pin contacts are recessed sufficiently so they cannot be damaged if the mating connector shell is scooped into it during the mating process. More specifically, the Koshiri Security design prevents pins from being bent and contacts from being shorted during mating. Featuring an active latch, Koshiri Security connectors, like ERNI’s single row MiniBridge connector family, offer significantly higher mating integrity and protection from improper skew insertion.



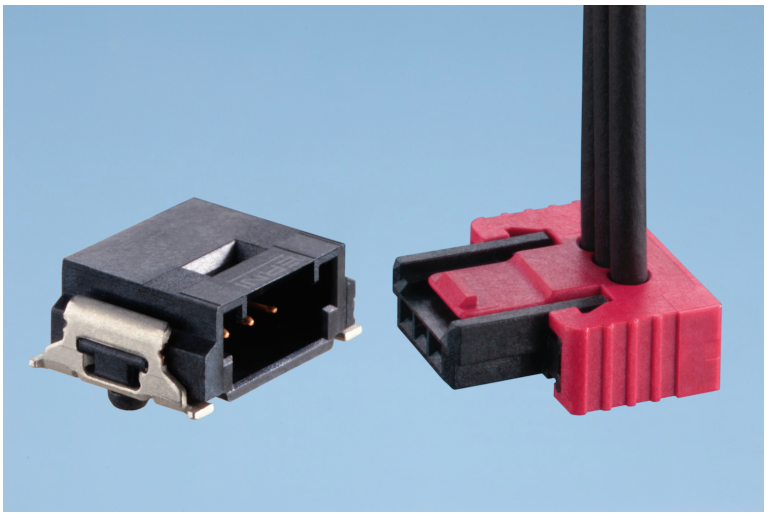

**Miniaturization**

Size and form factor is always a significant challenge for designers of automotive applications, and LED lighting systems are no different. Featuring a compact, scalable design with a pitch as fine as 1.27mm, ERNI's MiniBridge Koshiri connectors are ideally suited for space saving connections between PCBs and decentralized function units. This is particularly important in the automotive market. In addition to size constraints, manufacturing and installation can be an issue for designers. The miniature plug connector and enhanced mechanical features simplifies assembly and ease-of-use during integration.

**Flexibility**

Offering design flexibility, MiniBridge Koshiri variants are available with 2, 3, 4, 6, 8, 10 and 12 pins, and have a high current carrying capacity extending up to 4 amps per contact depending on the cable plant employed. The male connectors feature SMT termination, while

the female parts offer IDC terminations, accepting either ribbon or discrete wire cable. Single wire stranded cables ranging from AWG 22 to AWG 26 can also be used. For these LED lighting applications, a white version is available to eliminate shadowing effects that can be caused by the connector system.



**Conclusion**

Interconnects are a vital component for the lighting system. Finding a connector that will last as long as the LEDs is not an easy task. The robust MiniBridge Koshiri connectors are increasing in popularity in automotive LED/lighting applications due to its rugged and durable design. In addition to meeting size constraints and a wide variety of harsh environmental specifications, MiniBridge Koshiri connectors simplify assembly and ensure a safe and reliable connection.

For more information, visit:
https://www.erni.com/en/industries/compact-automotive-connectors/