

Lighting modules for a safety system

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Intended use and function

The MID assembly is used as interior ceiling lighting for passenger compartments in cars. The LED lighting module offers freely controllable lighting of the vehicle interior while offering an extremely flat design.



Figure 1: Lighting module exterior (left) and interior (right)

Advantages of the MID solution

- The MID allows a higher operating temperature of more than 85° C. The previous standard solution switches off at 65° C.
- The MID technology allows a flatter overall height. It also reduces the number of components.
- The MID provides warm white LEDs with high output to an exactly targeted injection molded surface.
- The MID technology allows a flat design and defined guidance of the light.

Application area	Automobile
Users	Various OEMs (Original Equipment Manufacturers)
Product	Lighting module for the vehicle passenger compartment
Main function	Optical function

Project implementation

The project to implement interior lighting for the cockpit in MID technology kicked off in December 2011. The design review was conducted in March 2012. The first prototypes were produced and delivered to the OEM in September and October 2012. Trade fair samples were manufactured in February 2013 and the automotive qualification was completed in the third quarter of 2013.

Functions of the MID component

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Pushing Performance

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- Spatial interconnect device for up to 12 components.
- Implementation of extended capacitive control panels and FSR (Force Resistant Sensitive) switches (switching threshold parameterized according to customer specifications)
- Freely programmable lighting (using integrated microchip).

Manufacturing aspects

- LPKF-LDS technology is used to structure the injection molded part from the material LCP. Metallization is performed without external current and consists of Cu-Ni-Au, which is a typical layer composition for MIDs. The two process steps are based on automotive production standards.
- A fully automated manufacturing process was implemented for the assembly and interconnection technology.

Substrate material	LCP (Vectra E 840i LDS)
Structuring	LDS
Metallization	Chemical Cu-Ni-Au
Connection technology	Soldering (vapor phase)
Number of components	Up to 12 (depending on model)
Production run	350,000 p.a.
Development period	14 months