

PROTECTION AROUND AUTOMOTIVE MCUs



Ensuring safe driving with a wide range of ESD protection devices



STMicroelectronics ESD protection devices are manufactured using automotive-grade processes and are qualified to AEC-Q101 standards

Automotive ICs embedded in electronic control units (ECU) are usually rated against human body model (HBM) ESD, which is not sufficient for harsh environments like cars.

Adding ESD protection and TVS around automotive ICs is crucial for safeguarding sensitive components from the electrostatic discharges and transient voltage spikes that are prevalent in automotive environments.

These protections enhance the performance and safety of vehicle electronic systems by increasing ECU reliability and longevity and minimizing vehicle downtime and maintenance costs, while helping manufacturers comply with industry standards such as **ISO 10605** (ESD), **ISO 7637** (transient disturbances) and **ISO 16750-2**.

KEY FEATURE AND BENEFITS

For compliance with stringent standards, including ISO 7637, ISO 10605, and ISO 16750, ST ESD protection devices combine:

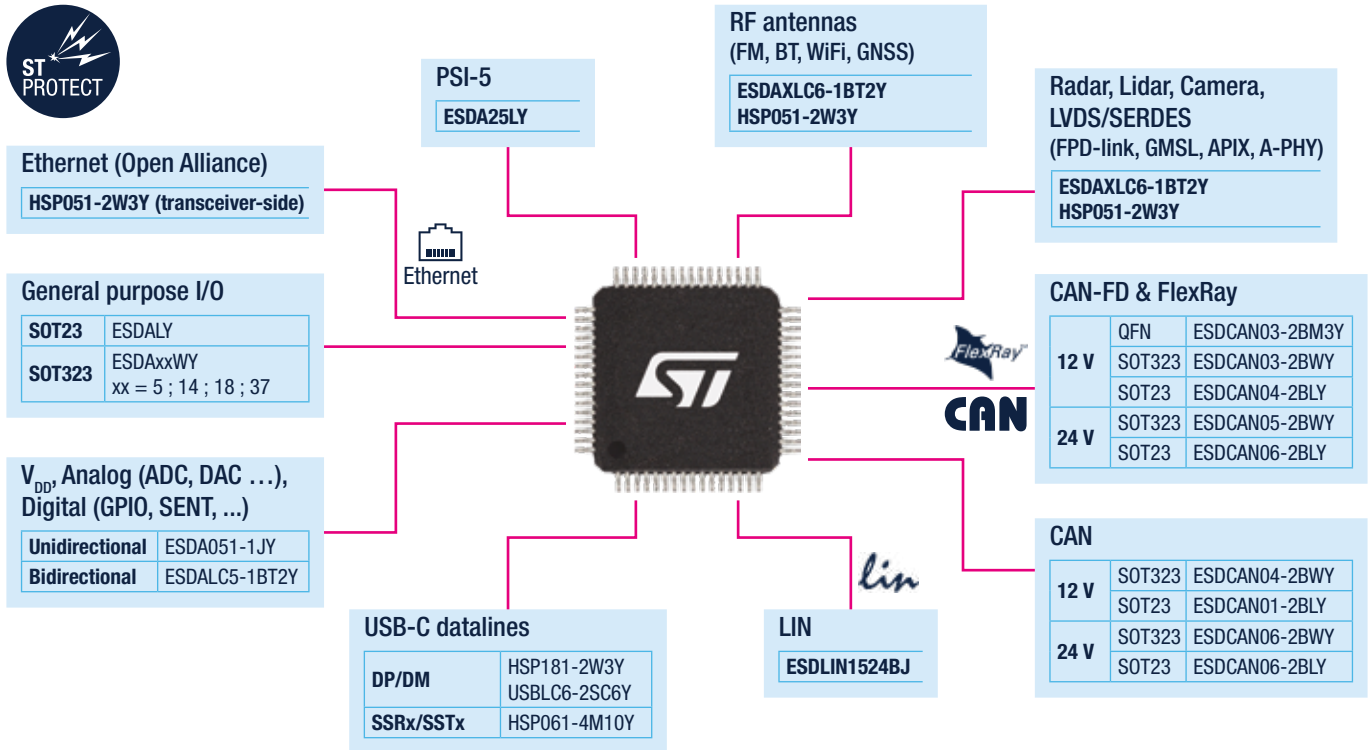
- Protection efficiency with low clamping voltage (V_{CL})
- Protection transparency with low leakage current (I_{RM})
- Signal integrity with ultralow capacitance and ultrawide bandwidth

Designed for automotive applications:

- Certified against the AEC-Q101 standards
- 10-year longevity commitment
- Easy assembly with packages compatible with automatic optical inspection

Referenced in ST hardware boards

Recommended protections around automotive MCUs and ICs



To protect against all EMC risks encountered in high-speed differential lines, such as serializer/deserializer (SerDes) applications, STMicroelectronics offers integrated solutions combining ESD protection and EMI filters. These solutions help designers ensure system immunity and achieve fast EMC compliance by mitigating radiated emissions in cars.

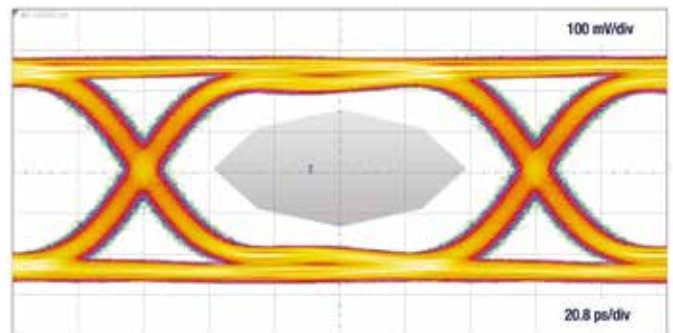
ECMFY series

Combining ESD protection and common-mode filter in a single package

The ECMFY series provides common-mode attenuation while maintaining useful signal integrity. Thanks to its dual clamping structure, it improves clamping voltage and robustness against electrostatic discharges. The latest **ECMF2-40A100M6Y** has a differential bandwidth of 12.5 GHz in compliance with a full range of applications using high-speed differential lines, including USB4, HDMI 2.1, and serializer/deserializer (SerDes) applications such as FPD-Link III, GMSL3, APIX3, MIPI CSI/DSI, and MIPI A-PHY. It rejects unwanted RF frequencies for effective noise radiation suppression.

The ECMFY series features include:

- Large differential bandwidth specified for both CMF and ESD protection.
- High immunity against ESD
- Design and layout simplification
- Reduce the footprint up to 70%
- Improved reliability compared to discretes



MIPI A-PHY G3 eye diagram 8 Gbps with ECMFY2-40A100M6Y

For more details, visit our website:

www.st.com/en/protections-and-emi-filters/automotive-esd-protection.html



© STMicroelectronics - November 2024 - Printed in the United Kingdom - All rights reserved
ST and the ST logo are registered and/or unregistered trademarks of STMicroelectronics International NV or its affiliates in the EU and/or elsewhere. In particular, ST and the ST logo are Registered in the US Patent and Trademark Office.
For additional information about ST trademarks, please refer to www.st.com/trademarks.
All other product or service names are the property of their respective owners.

