



PCMFxDFN1 Common mode filter with integrated ESD protection

Best-in-class common mode filtering and ESD protection for MIPI and HDMI

Offering the largest bandwidth for common mode suppression, the PCMFxDFN1 devices combine common mode filtering with strong system level ESD protection in a single package. These devices address the need for new filtering concepts to minimize EMI-emission and susceptibility from datalines due to the high level of integration, together with high-speed data rates, in smartphones and tablets. As EMI issues can never be planned in advance, the PCMF-series offers industry leading bandwidth for common mode suppression covering all typical data rates and their higher harmonics.

PRODUCT TYPES

- ▶ PCMF2DFN1 protects and filters two differential line pairs
- ▶ PCMF3DFN1 protects and filters three differential line pairs

KEY FEATURES

- ▶ Industry leading common mode suppression
- ▶ Best-in-class ESD protection due to deep snapback
- ▶ Industry standard footprint
- ▶ Very thin package: 0.5 mm maximum



KEY BENEFITS

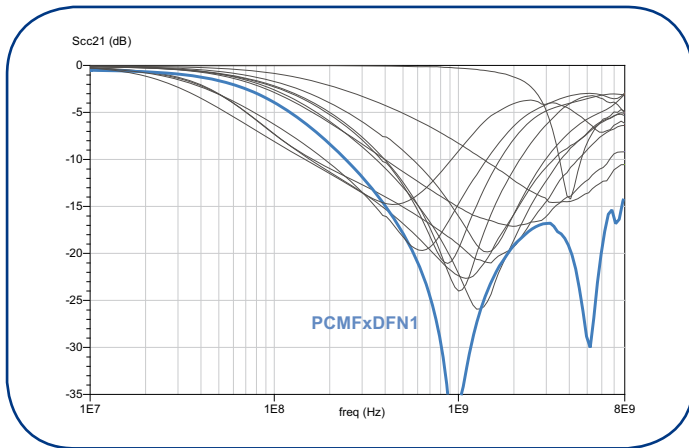
- ▶ Minimized EMI-emission and susceptibility saves time-consuming searches for EMI-sources
- ▶ Stronger system ESD robustness due to optimized SoC protection
- ▶ Shorter time-to-market due to minimized impact on signal integrity and simplified 'out-of-the-box' design

KEY APPLICATIONS

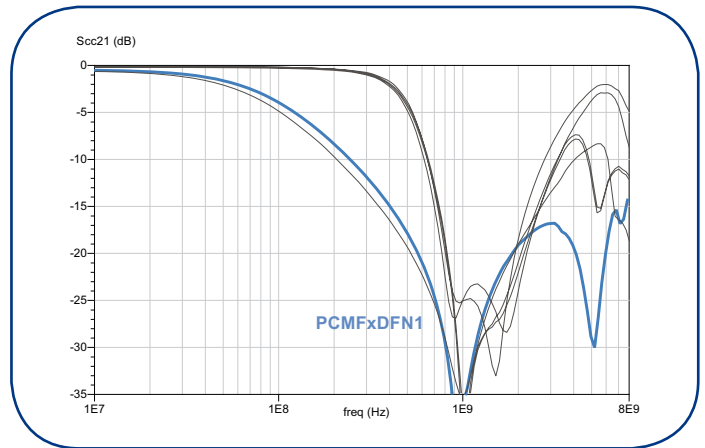
- ▶ MIPI Camera Serial Interface (CSI) and Display Serial Interface (DSI) in smartphones, tablets / Mobile Internet Devices (MIDs) and other portable devices
- ▶ HDMI interfaces



COMMON MODE SUPPRESSION PERFORMANCE

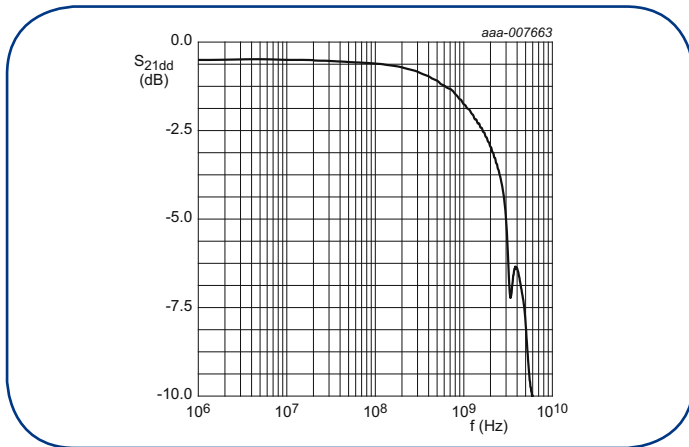


Comparison of PCMFxDFN1 CM suppression against Ferrite- or Ceramic-based common mode filters



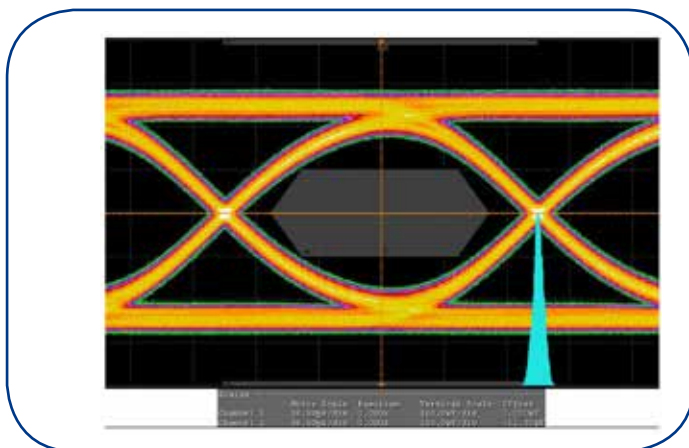
Comparison of PCMFxDFN1 CM suppression against Silicon-based solutions from other suppliers

RF PERFORMANCE

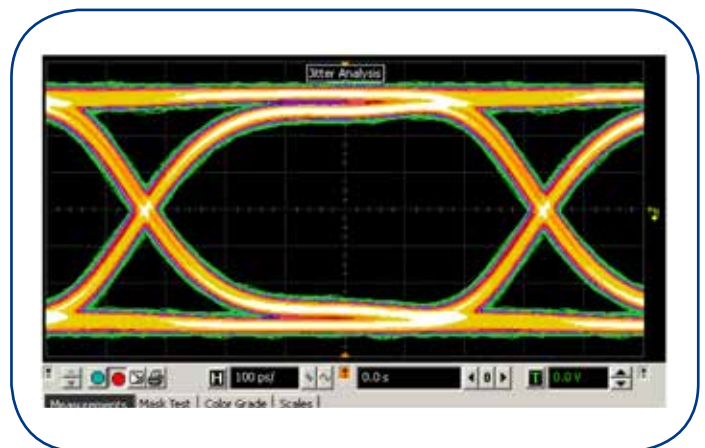


PCMFxDFN1 – Differential Mode pass-band (S21dd)

Compared to the whole field of ceramic and silicon-based common mode filters, the PCMFxDFN1 devices offer a much wider and deeper common mode suppression across the full range of possible EMI frequencies and their higher harmonics.



HDMI compliance test eye diagram @ 3.4 Gb/s



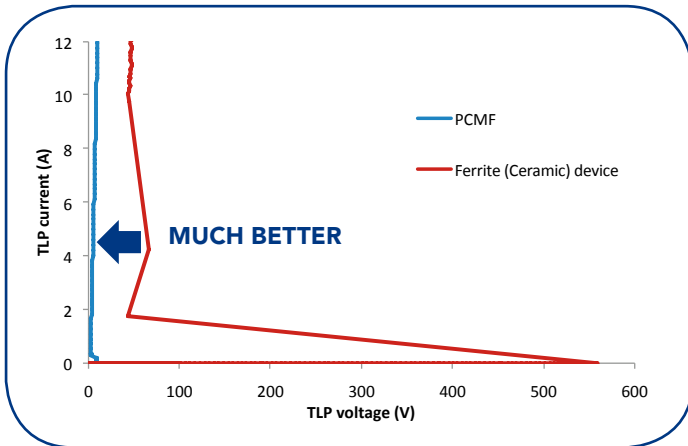
MIPI eye diagram @ 1.5 Gb/s

With a 3 dB bandwidth > 2 GHz, the PCMFxDFN1 surpass the requirements for all MIPI D-PHY frequencies and passes the compliance test for HDMI at full 3.4 Gb/s.

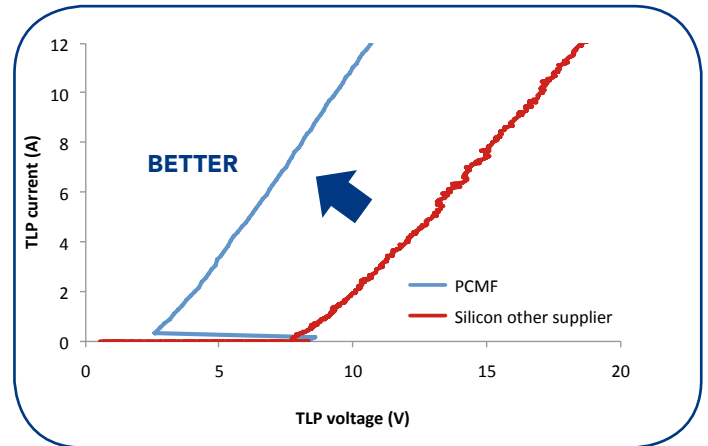
ESD PROTECTION PERFORMANCE

Efficient ESD protection is a requirement, since ESD pulses enter the circuitry of portable applications through gaps like the camera fitting and portable applications are constantly exposed to ESD in the field. PCMFxDFN1 common mode filters have an ESD ruggedness of 15 kV contact discharge according to IEC61000-4-2. This is minimum discharge that the protection device itself can survive. The protection provided

to the protected SoC is underlined by the very low dynamic resistance of 0.6 Ohms. Additional stress is taken away from the SoC by NXP's proven deep-snapback technology. As a result, the system-level ESD protection provided by the PCMFxDFN1 devices surpasses all silicon-based common mode filters on the market, which already deliver clamping voltages that are an order of magnitude better than ceramic-based filters.



PCMFxDFN1 offers a much better system-level ESD protection compared to Ceramic-based Common-Mode filters with ESD protection.



PCMFxDFN1 offers a better system-level ESD protection compared to other Silicon-based Common-Mode filters with ESD protection due to its deep snapback and lower dynamic resistance.

PACKAGE DETAILS

- ▶ DFN2520-9 package, 2.5 x 2.0 mm² for 2 differential channels
- ▶ DFN4020-14 package, 4.0 x 2.0 mm² for 3 differential channels
- ▶ Height: 0.5 mm maximum
- ▶ Industry standard footprint

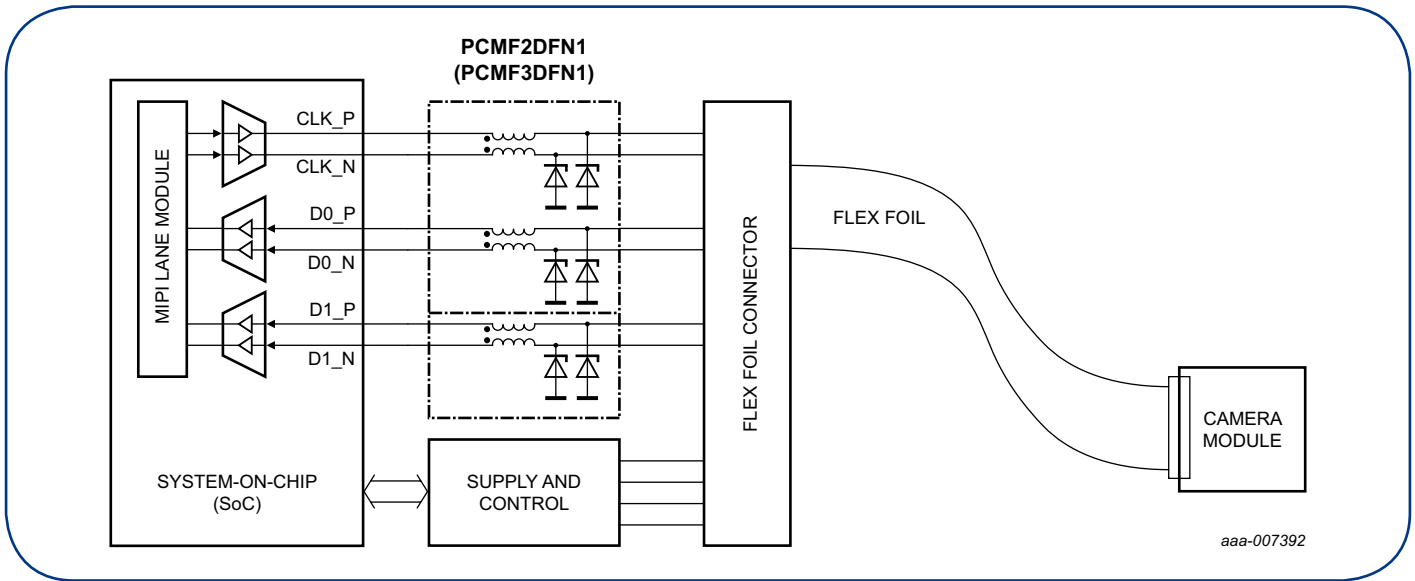


PCMF2DFN1

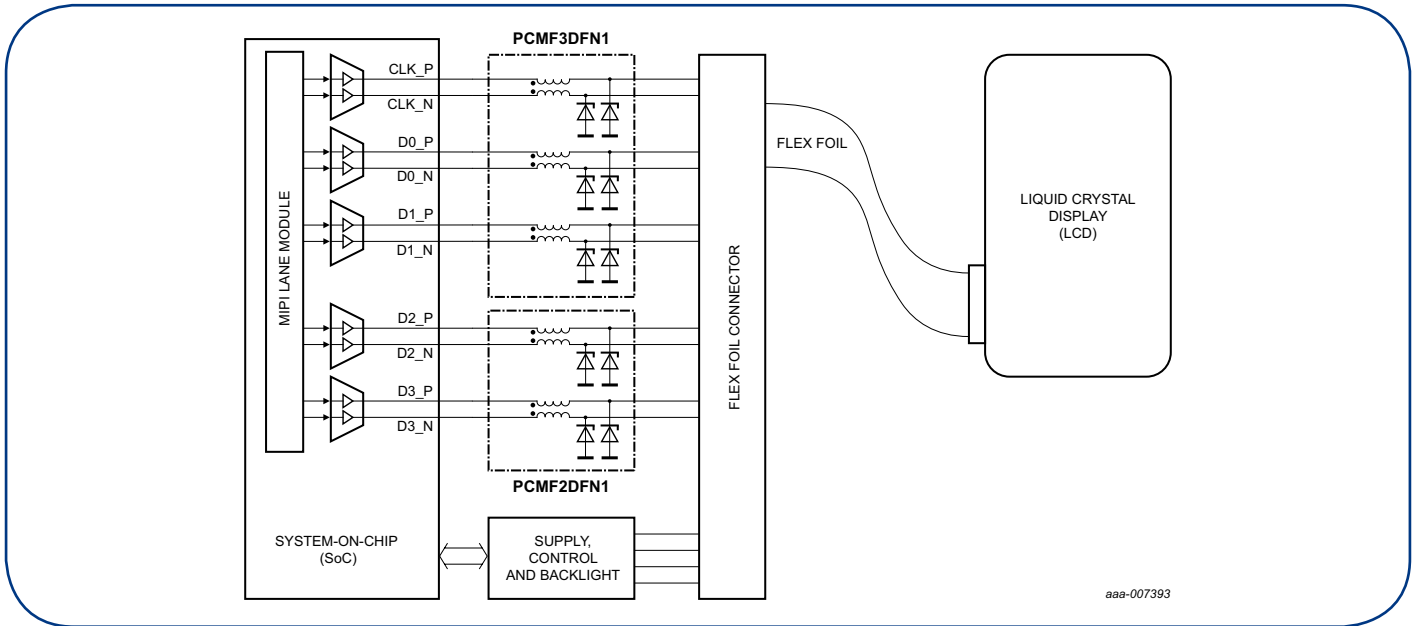


PCMF3DFN1

APPLICATION DIAGRAMS FOR MIPI CAMERA AND DISPLAY INTERFACES



Using PCMF3DFN1 to filter and protect a MIPI CSI camera interface



Using PCMF2DFN1 and PCMF3DFN1 to filter and protect a MIPI DSI display interface