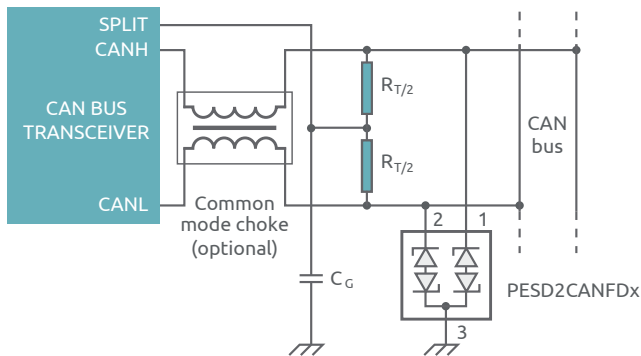


# CAN-FD protection solutions for Automotive applications

As data payload in vehicles increases, high-speed data transmission becomes essential and new protocols find their way into in-vehicle networks. The CAN protocol is famous but limited to 1Mbit/s whereas CAN-FD (Flexible Data) covers speeds up to 5 Mbit/s. 2 Mbit/s is the typical implementation limit suitable for many applications that do not require higher data rates.



## Application diagram

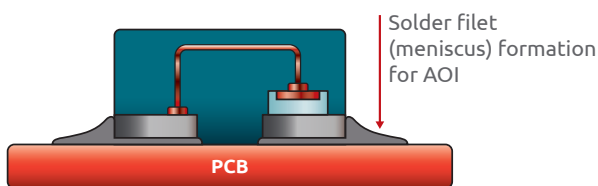


## Space efficient designs

Up to 90% space-saving

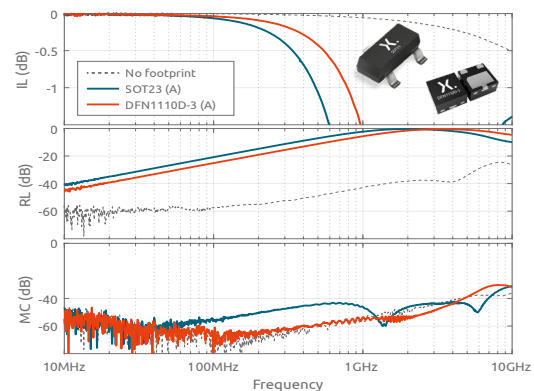
- › Ultra-compact footprint
- › Very low height (only 50% of SOT23)

## AOI capable and reliable



- › Side-wettable flanks for easy automated optical inspection (AOI)
- › Robust solder joints, high reliability
- › Pitch of 0.6 mm (min)

## Improved signal integrity



## Key features:

- › Reverse stand-off voltage:  $V_{RWM} = 24\text{ V}$  or  $27\text{ V}$
- › Low clamping voltage:  $V_{CL}$  down to  $30\text{ V}$  at  $I_{PP} = 1\text{ A}$
- › Three capacitance classes:  $C_D = 3.5\text{ pF}$ ,  $6\text{ pF}$  and  $10\text{ pF}$
- › Improved ESD protection up to  $30\text{ kV}$  (IEC61000-4-2, ISO10605)
- › High temperature capability:  
 $T_j = 150\text{ °C}$  (DFN) and  $T_j = 175\text{ °C}$  (SMD)
- › AEC-Q101 qualification grade/PPAP capability
- › CAN-FD solutions are available in automotive grade, extreme-robustness leaded SMD and leadless DFN plastic packages

## Advantage of leadless CAN-FD in DFN packages over classical SOT packages:





- › Up to 90% smaller package
- › Very low height (50% of SOT23)
- › Side Wettable Flanks (SWF) for AOI compatibility
- › Improved signal integrity

## Functions & Applications:

ESD protection for two in-vehicle bus lines:

- › CAN-FD
- › CAN
- › FlexRay
- › SENT

## Portfolio overview

Package (Body size in mm)	Recommended protection devices for CAN-FD bus	No. of channels	$V_{RWM}$	$C_D$ max	ESD robustness (IEC61000-4-2)	$I_{PPM}$ at $t(p) = 8/20\mu\text{s}$	$T_j$ max (°C)	AEC-Q101 PPAP capable						
SOT23 2.9x1.3x1.0 	PESD2CANFD24U-T	2x bidirectional	24 V	3.5 pF	15 kV	1.5 A	175 °C	yes						
	PESD2CANFD24V-T			6 pF	23 kV	2.6 A								
	PESD2CANFD24L-T			10 pF	30 kV	4.0 A								
	PESD2CANFD27U-T		4 pF	15 kV	1.8 A									
	PESD2CANFD27V-T		6 pF	20 kV	2.5 A									
	PESD2CANFD27L-T		10 pF	30 kV	3.9 A									
SOT323 2.0x1.25x0.95 	PESD2CANFD24U-U		2x bidirectional	24 V	3.5 pF	15 kV			1.9 A	175 °C	yes			
	PESD2CANFD24V-U				6 pF	23 kV			2.6 A					
	PESD2CANFD24L-U				10 pF	30 kV			4.0 A					
	PESD2CANFD27U-U			4 pF	15 kV	1.8 A								
	PESD2CANFD27V-U			6 pF	20 kV	2.5 A								
	PESD2CANFD27L-U			10 pF	30 kV	4.0 A								
DFN1412D-3 (SOT8009) 1.4x1.2x0.48 	PESD2CANFD24U-QC	2x bidirectional		24 V	3.5 pF	15 kV	1.9 A	150 °C	yes					
	PESD2CANFD24V-QC				6 pF	23 kV	2.6 A							
	PESD2CANFD27U-QC			4 pF	15 kV	1.8 A								
	PESD2CANFD27V-QC			6 pF	20 kV	2.5 A								
DFN1110D-3 (SOT8015) 1.1x1.0x0.48 	PESD2CANFD24U-QB			2x bidirectional	24 V	3.5 pF	15kV					1.9 A	150 °C	yes
	PESD2CANFD24V-QB					6 pF	23 kV					2.6 A		
	PESD2CANFD27U-QB		4 pF		15 kV	1.8 A								
	PESD2CANFD27V-QB		6 pF		20 kV	2.5 A								



For further information visit [nexperia.com/esdprotection](https://www.nexperia.com/esdprotection)

© 2020 Nexperia B.V.

All rights reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Date of release:

November 2020

Printed:

In the Netherlands