



PESD1FLEX  
PESD1LIN  
PESD1CAN  
PESD2CAN

## ESD protection diodes for automotive applications

Protecting an Electronic Control Unit (ECU) against ElectroStatic Discharge (ESD) and other transient pulses is one of the most important ways to reduce failures in automotive applications. These pulses can enter the ECU via the battery line as well as the data bus lines.

NXP Semiconductors offers a series of ESD protection diodes designed to protect FlexRay bus transceivers, Local Interconnect Network (LIN) and Controller Area Network (CAN) as well as other ESD sensitive automotive electronic components.

All these devices deliver MIL-STD-883 class 3-compliant human body protection and meet the IEC 61000-4-2 (air and contact discharge) and IEC 61000-4-5 standards.

## PESD1FLEX

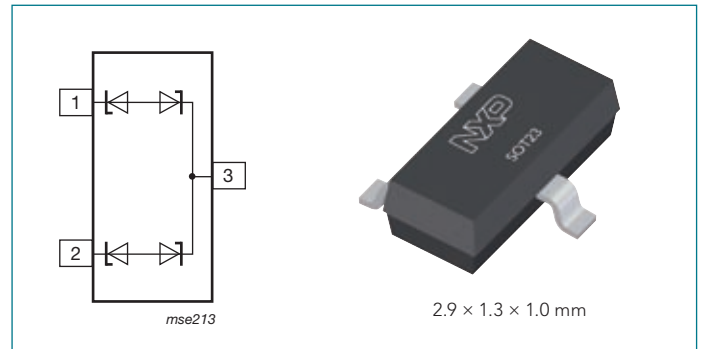
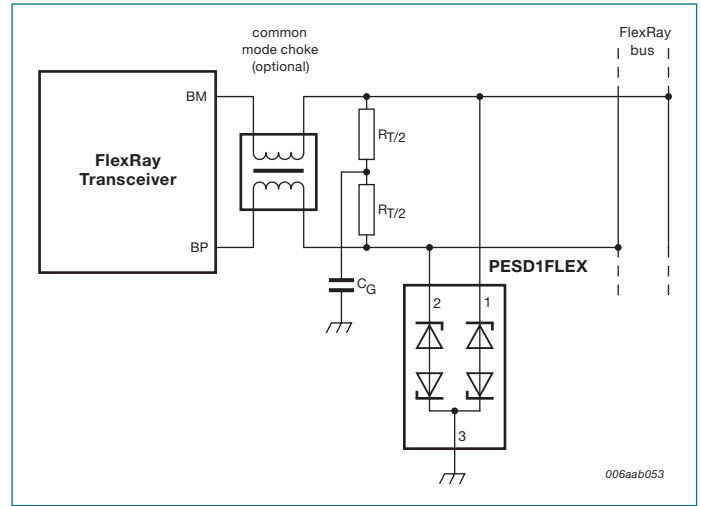


### FlexRay bus protection

The PESD1FLEX protects two automotive FlexRay data lines from the damage caused by ESD and other transients. It supports the FlexRay data rate of 10 Mbit/s and provides a surge capability of up to 200 W per line for an 8/20  $\mu$ s waveform.

#### Key features

- ▶ bidirectional protection for two FlexRay bus lines in one small SOT23 package
- ▶ very low capacitance:  $C_d = 11$  pF at  $V_R = 0$  V,  $f = 5$  MHz
- ▶ ultra low leakage current:  $I_{RM} < 1$  nA
- ▶ ESD protection up to 23 kV



## PESD1LIN

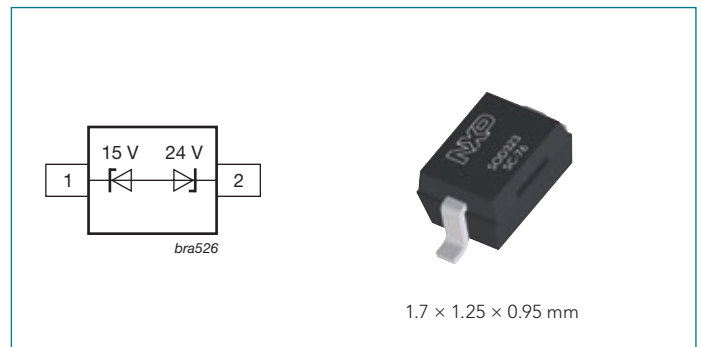
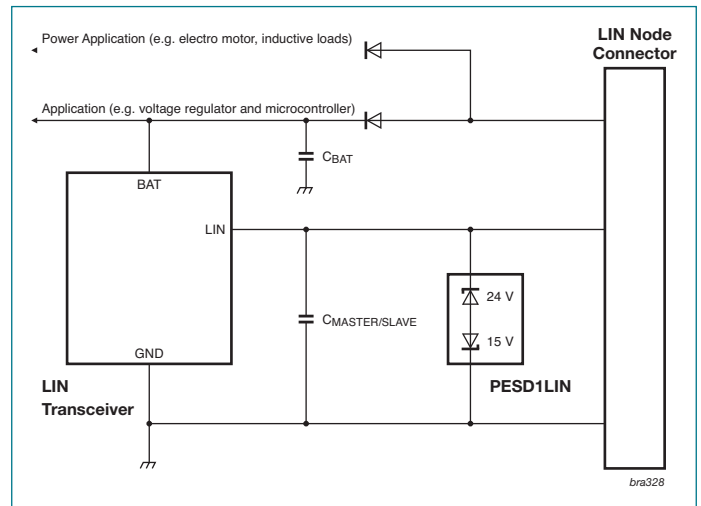


### Local Interconnect Network (LIN) bus protection

The PESD1LIN protects one automotive LIN bus line from the damage caused by ESD and other transients. Its asymmetrical internal diode configuration ensures optimized electromagnetic immunity for the protected LIN ECU.

#### Key features

- ▶ bidirectional protection for one LIN bus line in a very small SOD323 (SC-76) SMD plastic package
- ▶ max. peak pulse power:  $P_{PP} = 160$  W at  $t_p = 8/20$   $\mu$ s
- ▶ low clamping voltage:  $V_{(CL)R} = 40$  V at  $I_{PP} = 1$  A
- ▶ ultra low leakage current:  $I_{RM} < 1$  nA
- ▶ ESD protection up to 23 kV



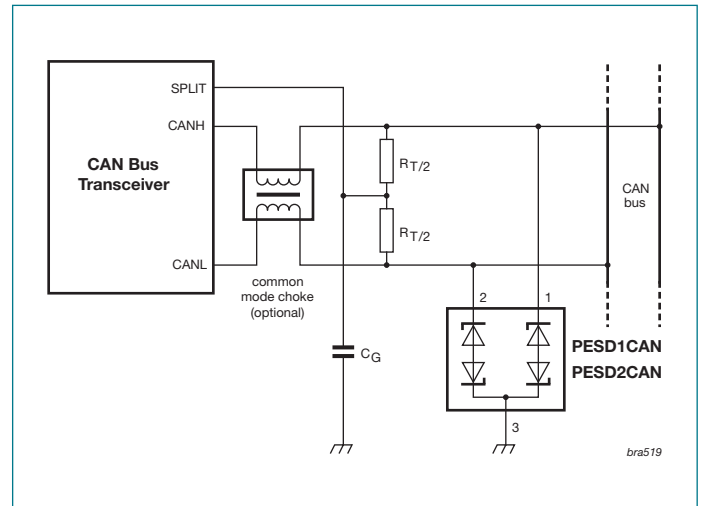
## PESD1CAN and PESD2CAN

### Controller Area Network (CAN) bus protection

The PESD1CAN and PESD2CAN protect two automotive CAN bus lines from the damage caused by ESD and other transients. They can be used with both high-speed and fault-tolerant CAN buses.

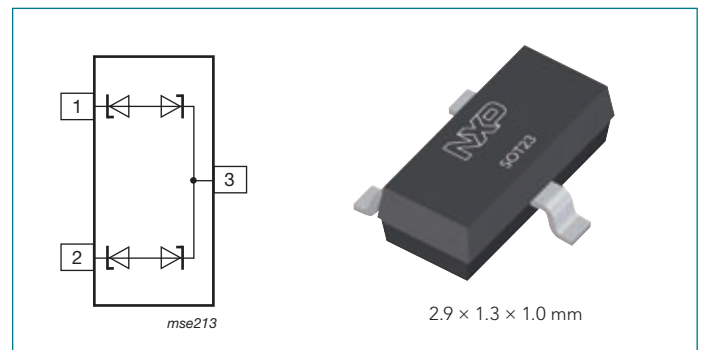
#### Key features PESD1CAN

- ▶ bidirectional protection for two CAN bus lines in one small SOT23 package
- ▶ very low capacitance:  $C_d = 11 \text{ pF}$
- ▶ ESD protection up to 23 kV



#### Key features PESD2CAN

- ▶ bidirectional protection for two CAN bus lines in one small SOT23 package
- ▶ max. peak pulse power:  $P_{pp} = 230 \text{ W}$  at  $t_p = 8/20 \mu\text{s}$
- ▶ low clamping voltage:  $V_{(CL)R} = 34 \text{ V}$  at  $I_{pp} = 1 \text{ A}$
- ▶ ESD protection up to 30 kV



## Automotive selection guide



Configuration	Number of lines		$I_{RM}$ max @ $V_{RWM}$		C typ (pF)	$P_{PP}$ max 8/20 $\mu$ s pulse (W)	ESD rating acc. to IEC 61000-4-2 (kV)	SOT23	SOD323 (SC-76)
	uni- directional	bi- directional	( $\mu$ A)	(V)					
		2	0.05	24	11*	200	23	<b>PESD1FLEX</b>	
		1	0.05	15	13	160	23		<b>PESD1LIN</b>
			0.05	24					
		2	0.05	24	11	200	23	<b>PESD1CAN</b>	
			0.01	24	25	230	30	<b>PESD2CAN</b>	
		1	1	5	75	500	30		PESD5V0L1BA
		1	0.05	12	19	200	30		PESD12VL1BA
		1	0.05	24	11	200	23		PESD24VL1BA
	2	1	1	5	152	260	30	PESD5V0S2UAT	
	2	1	0.05	12	38	180	30	PESD12VS2UAT	
	2	1	0.05	24	23	160	23	PESD24VS2UAT	
	2	1	1	5.2	152	260	30	PESD5V2S2UT	
	2	1	1	12	38	180	30	PESD12VS2UT	
	2	1	1	24	23	160	23	PESD24VS2UT	

\*  $f = 5$  MHz;  $V_R = 0$  V

*Bold types - samples included.*



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