ESDLIN1524BJ

Transil™, transient voltage surge suppressor diode for ESD protection

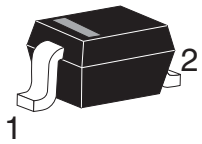
Datasheet – production data

Features

- Max peak pulse power 160 W (8/20 µs)
- Asymmetrical bidirectional device
- Stand-off voltage: 15 and 24 V
- Low clamping factor V_{CL}/V_{BR}
- Low Leakage current
- AEC-Q101 qualified

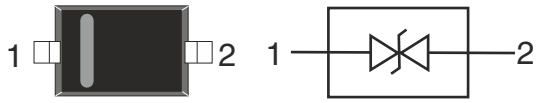
Complies with the following standards:

- ISO 10605 (C = 150 pF, R = 330 Ω)
  - 30 kV (air discharge)
  - 30 kV (contact discharge)
- ISO 10605 (C = 330 pF, R = 330 Ω)
  - 30 kV (air discharge)
  - 30 kV (contact discharge)
- ISO 7637-2
  - Pulse 3a: V_S = -150 V
  - Pulse 3b: V_S = 100 V
- IEC 61000-4-5: IPP = 3 A (8/20 µs)
- HBM MIL STD 833, class 3 (> 4 kV)



SOD323

Figure 1. Pin configuration



Cathode 1 (15 V reverse stand-off voltage)
Cathode 2 (24 V reverse stand-off voltage)

Description

The ESDLIN1524BJ is an asymmetrical Transil diode designed specifically for protecting one automotive LIN bus line against electrostatic discharge (ESD). The SOD323 is a very small package which allows space saving on high density printed circuit board.

Transil diodes provide high overvoltage protection by clamping action and have instantaneous response to transient overvoltages.

TM: Transil is a trademark of STMicroelectronics.

1 Characteristics

Table 1. Absolute maximum ratings (limiting values) T_{amb} = 25° C

Symbol	Parameter		Value	Unit
P_{PP}	Peak pulse power dissipation 8/20 µs (1)	T_j initial = T_{amb}	160	W
T_{stg} T_j	Storage temperature range Operating junction temperature range		-65 to +175 -40 to 150	° C
T_L	Maximum lead temperature for soldering during 10 s		260	° C

1. For a surge greater than maximum values, the diode will fail in short-circuit

Table 2. ESD maximum ratings

Symbol	Parameter	Conditions	Value	Unit
ESD	Electrostatic discharge capability	ISO 10605 (C = 150 pF, R = 330 Ω) air discharge contact discharge ISO 10605 (C = 330 pF, R = 330 Ω) air discharge contact discharge	 30 30 30 30	kV
		HBM MIL STD 833	10	

Table 3. Electrical characteristics (definitions)

Symbol	Parameter
V_{RM}	Stand-off voltage
V_{BR}	Breakdown voltage
V_{CL}	Clamping voltage
I_{RM}	Leakage current @ V_{RM}
I_R	Breakdown current @ V_{BR}
I_{PP}	Peak pulse current
C	Junction capacitance

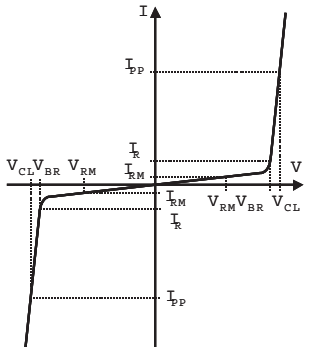


Table 4. Electrical characteristics (values, T_{amb} = 25° C)

Order code	I_{RM} @ V_{RM}			V_{BR} @ I_R (1)				$V_{CL\ max}$ @ I_{PP} 8/20 µs				C (2)		αT(3)
	nA		V	V			mA	V	A	V	A	pF		10^{-4}/°C
	Typ	Max		Min	Typ	Max						Typ	Max	Max
ESDLIN1524BJ (15 V)	1	50	15	17.1	18.9	20.3	5	25	1	35	5	16	20	8.8
ESDLIN1524BJ (24 CV)	1	50	24	25.4	27.8	30.3	5	40	1	50	3			9.6

1. Pulse test: t_p < 50 ms
2. V_R = 0 V, F= 1 MHz
3. $\Delta V_{BR} = \alpha T \times (T_{amb} - 25) \times V_{BR(25° C)}$

Figure 2. Relative variation of peak pulse power versus initial junction temperature

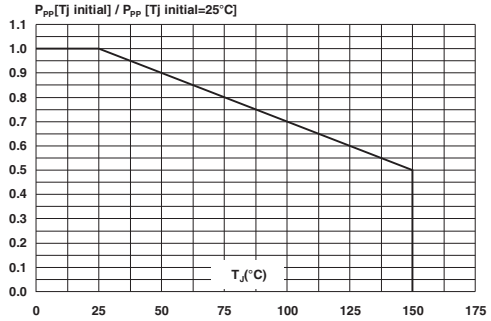


Figure 3. Peak pulse power versus exponential pulse duration

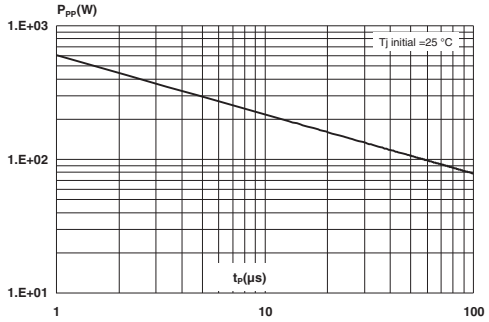


Figure 4. Junction capacitance versus line voltage (typical values), 15 V side

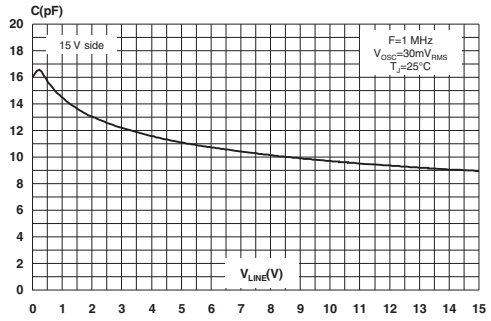


Figure 5. Junction capacitance versus line voltage (typical values), 24 V side

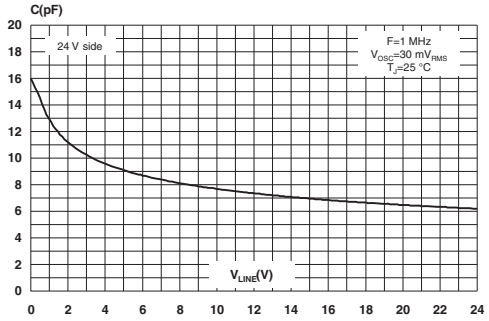
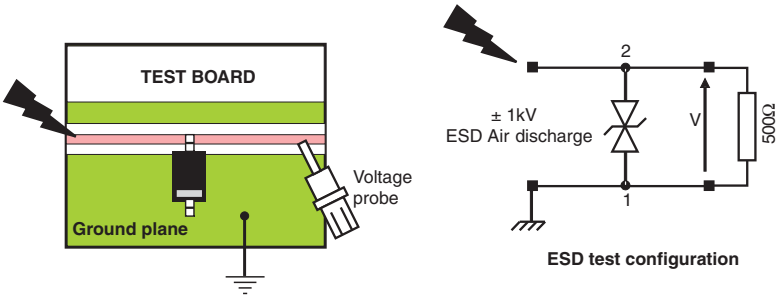
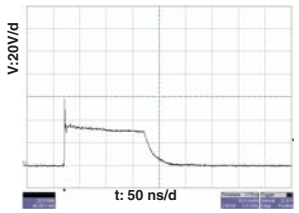
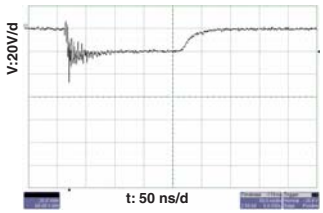


Figure 6. Clamping test conditions and results





Remaining voltage after +1 kV ESD voltage waveform (IEC 61000-4-2 conditions)

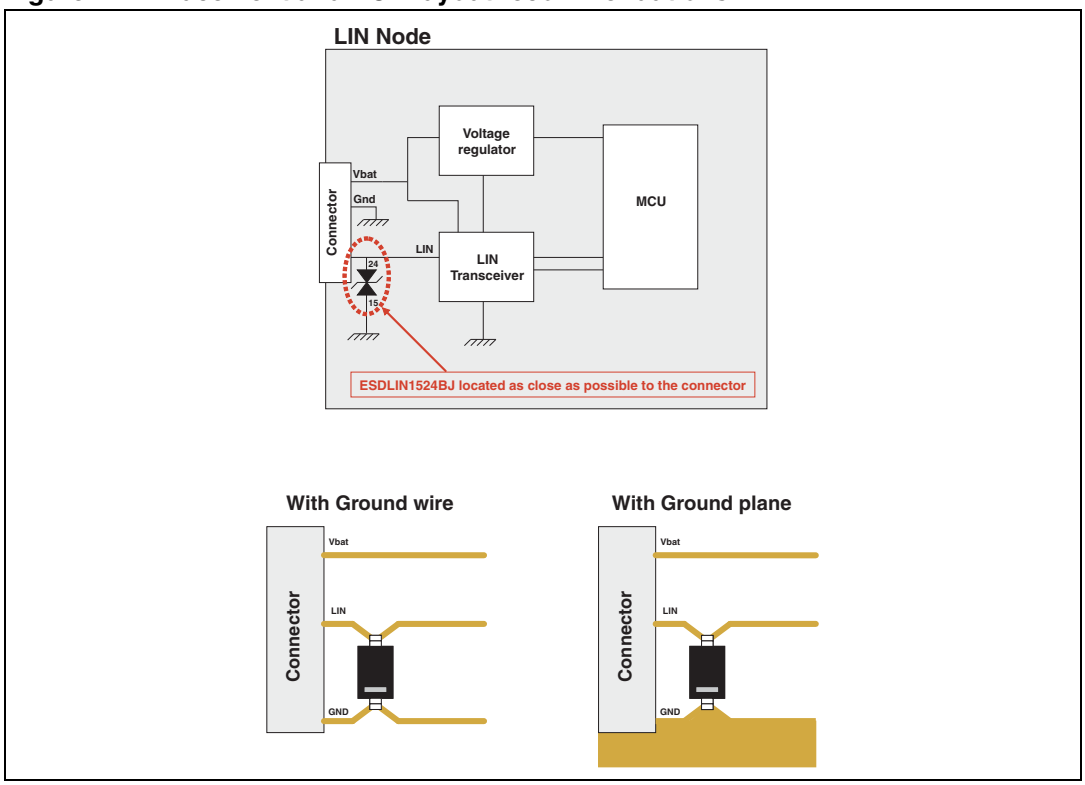


Remaining voltage after -1 kV ESD voltage waveform (IEC 61000-4-2 conditions)

2 Placement and PCB layout recommendations

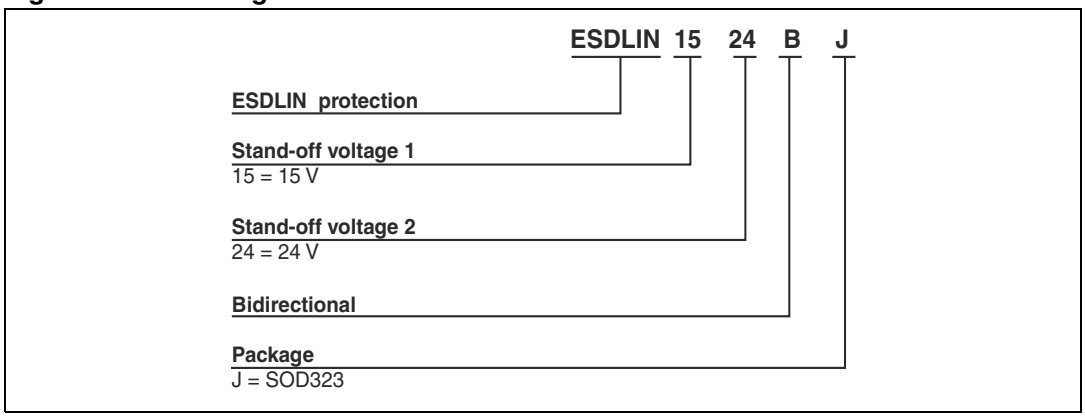
Figure 7 illustrates recommendations for the placement and layout of the PCB for optimum benefit of the ESDLIN1524BJ.

Figure 7. Placement and PCB layout recommendations



3 Ordering information scheme

Figure 8. Ordering information scheme

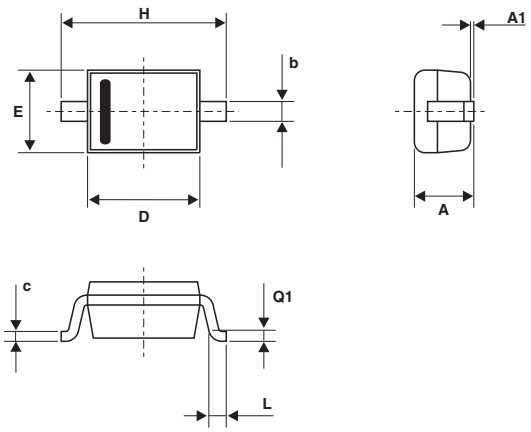


4 Package information

- Epoxy meets UL94, V0
- Lead-free package

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com.* ECOPACK® is an ST trademark.

Table 5. SOD323 dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		1.17		0.046
A1	0	0.1	0	0.004
b	0.25	0.44	0.01	0.017
c	0.1	0.25	0.004	0.01
D	1.52	1.8	0.06	0.071
E	1.11	1.45	0.044	0.057
H	2.3	2.7	0.09	0.106
L	0.1	0.46	0.004	0.02
Q1	0.1	0.41	0.004	0.016

Figure 9. SOD323 footprint (dimensions in millimeters)

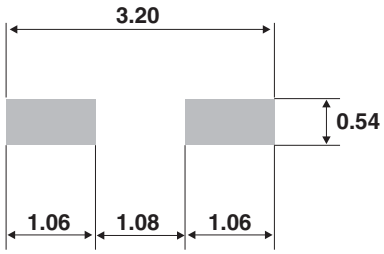


Figure 10. Tape dimensions

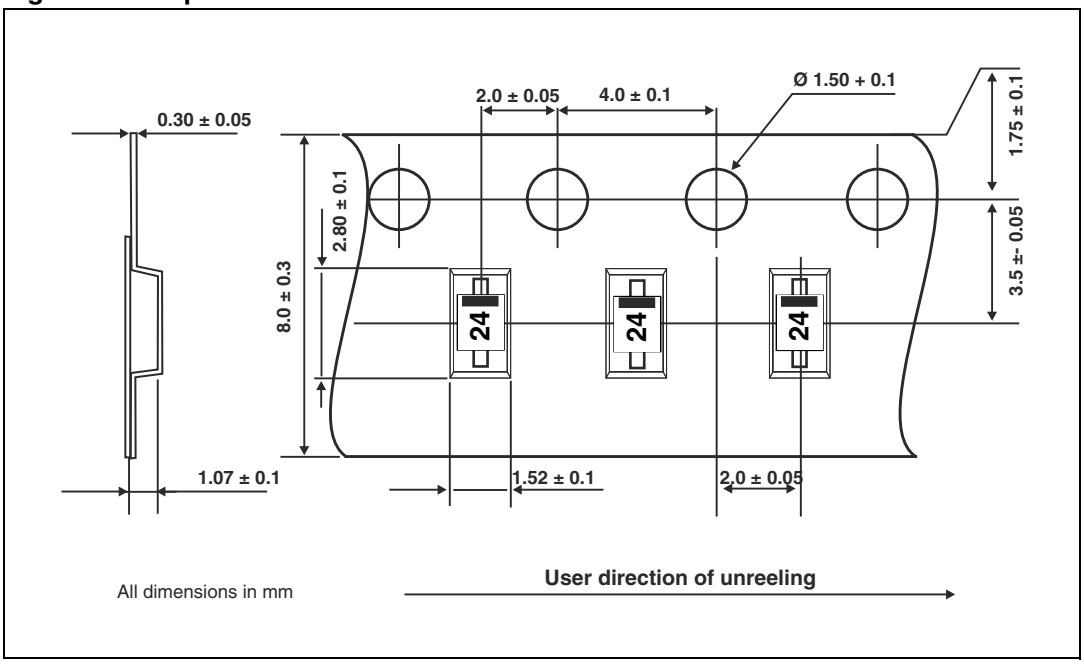
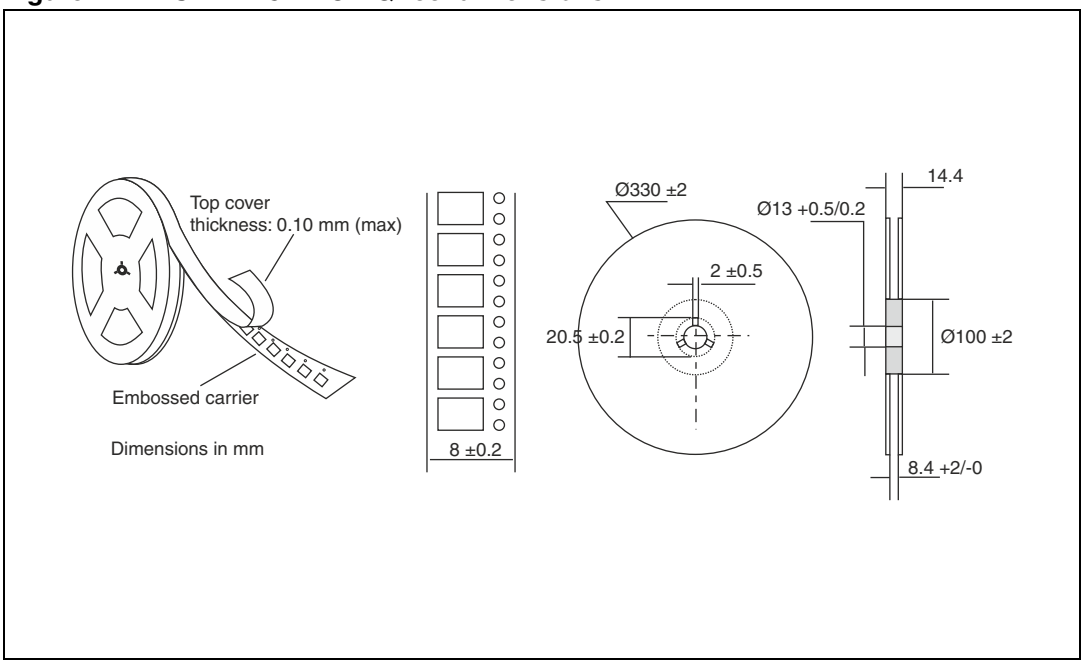


Figure 11. ESDLIN1524BJ-HQ reel dimensions



5 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
ESDLIN1524BJ	24	SOD323	5 mg	3000	Tape and reel
ESDLIN1524BJ-HQ	24	SOD323	5 mg	10000	Tape and reel

6 Revision history

Table 7. Document revision history

Date	Revision	Changes
28-Aug-2006	1	Initial release
22-Sep-2006	2	Added Figure 6 Placement and layout recommendations
18-Jan-2013	3	Updated *Table 6*. Added *Figure 10* and *Figure 11*.

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