

Lightning protection for LNB power supply

Features

- 1 kV, 500 A protection (8/20 μ s 1.2/50 μ s)
- SMC package
- Unidirectional and low V_F
($V_F = 1.2$ V at $I_F = 9$ A)
- Low clamping factor
- Fast response time

Description

The LNBTVSx-304 is a dedicated lightning and electrical overstress surge protection for LNB voltage regulators in satellite set top box applications.

This device provides lightning protection based on the IEEE C62.41.2 standard.

Available in the SMC package, this device is compatible with industry standard mounting processes.

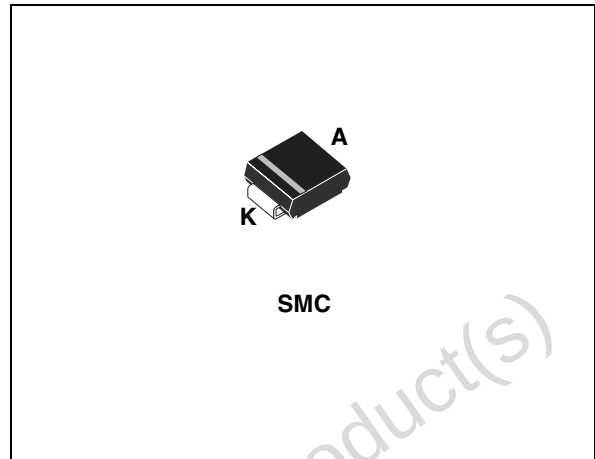


Table 1. Device summary

Characteristic	LNBTVS4-304S	LNBTVS6-304S
Lightning surge level (8/20 μ s 1.2/50 μ s combination wave)	700 V, 350 A	1000 V, 500 A
Clamping voltage (max)	45 V @ 333 A	45 V @ 500 A

1 Characteristics

Table 2. Absolute maximum ratings ($T_{amb} = 25^{\circ} \text{C}$)

Symbol	Parameter			Value	Unit
P _{PP}	Peak pulse power dissipation ⁽¹⁾	T _j initial = T _{amb}		up to 3 kW	W
P	Peak dissipation on infinite heatsink	T _{amb} = 75° C		5	W
I _{FSM}	Non repetitive surge peak forward current for unidirectional types	T _p = 10 ms	LNBTVS4-304S	250	A
		T _j initial = T _{amb}	LNBTVS6-304S	300	A
T _{stg}	Storage temperature range			-65 to + 175	° C
T _j	Maximum junction temperature			150	° C
T _L	Maximum lead temperature for soldering during 10 s at 5 mm from case			260	° C

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

Table 3. Thermal resistance

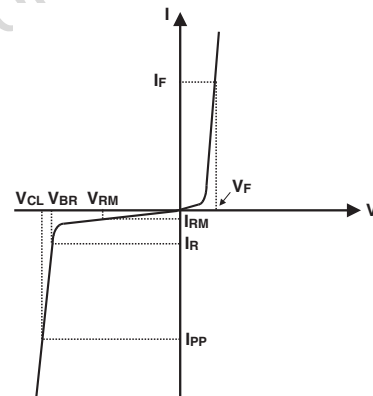
Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction to case	20	$^{\circ} \text{C/W}$
$R_{th(j-a)}$	Junction to ambient on printed circuit	75	$^{\circ} \text{C/W}$

Table 4. Electrical characteristics ($T_{amb} = 25^{\circ} \text{C}$)

Symbol	Parameter					
V _{BR}	Breakdown voltage					
I _{RM}	Leakage current @ V _{RM}					
V _{RM}	Stand-off voltage					
V _{CL}	Clamping voltage					
I _{PP}	Peak pulse current					
R _{I/O}	Series resistance between Input & Output					
C _{line}	Input capacitance per line					
I _F	Forward current					
V _F	Forward voltage					

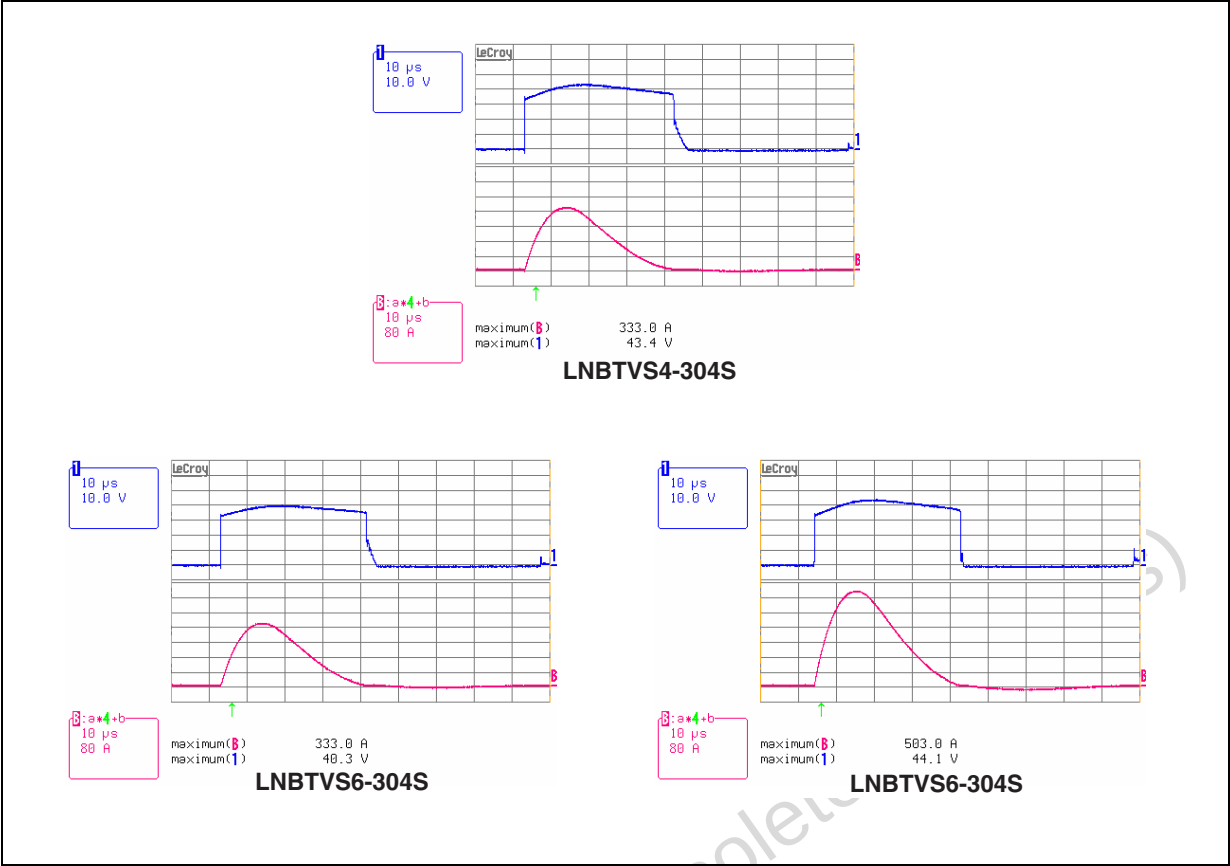
The graph illustrates the diode's current-voltage (I-V) characteristics. In reverse bias, the current is near zero until the breakdown voltage V_{BR}, after which it increases sharply. The leakage current I_{RM} is measured at V_{RM}. In forward bias, the current remains near zero until the forward voltage V_F, after which it increases. The peak pulse current I_{PP} is shown at the maximum forward current. The clamping voltage V_{CL} is indicated at the transition point between reverse and forward bias.

Type	I _{RM} @ V _{RM}		V _{BR} @ I _R				P _{PP} 10/1000 μS	V _{CL} @ I _{pp} 10/1000 μs		V _{CL} @ I _{pp} 8/20 μs ⁽¹⁾		αT	C
	Max		Min	Typ	Max			Max		Max		Max	Typ
	μA	V	V	V	V	mA	W	V	A	V	A	10 ⁻⁴ /°C	pF
LNBTVS4-304S	1	28	30	31.5	33	1	2500	45	56	45	333	9.6	4000
LNBTVS6-304S	1	28	30	31.5	33	1	3000	45	67	45	500	9.6	5000



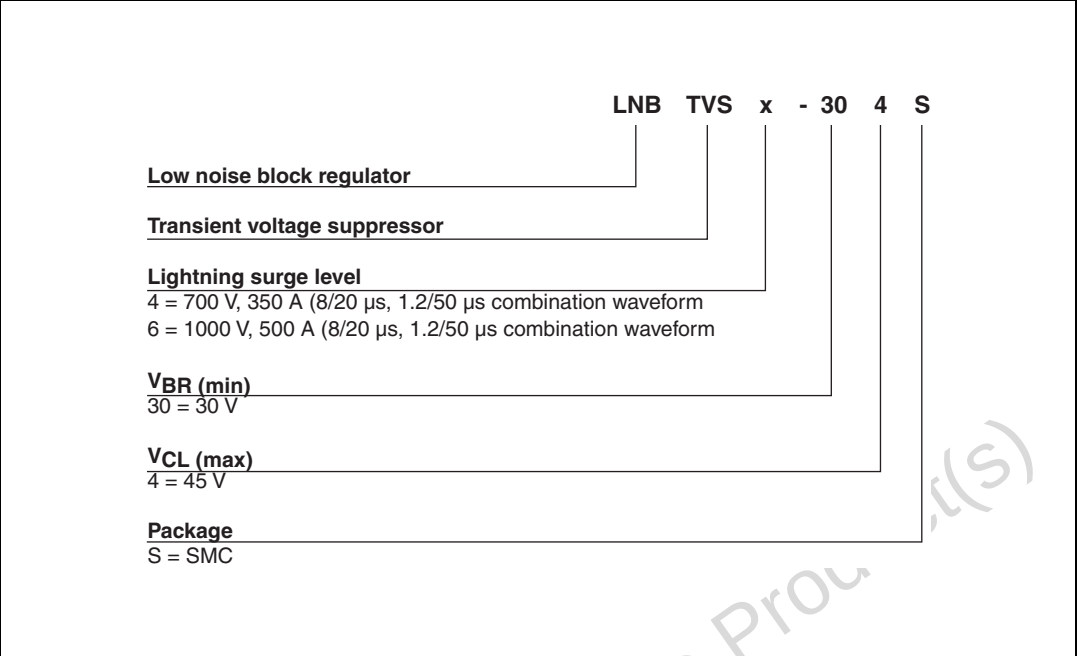
1. IEEE C62.41.2, $R = 2 \Omega$

Figure 1. Surge test examples at 300 A and 500 A according to IEEE C62.41.2 standard



2 **Ordering information scheme**

Figure 2. Ordering information scheme



3 Package information

- Epoxy meets UL 94, V0

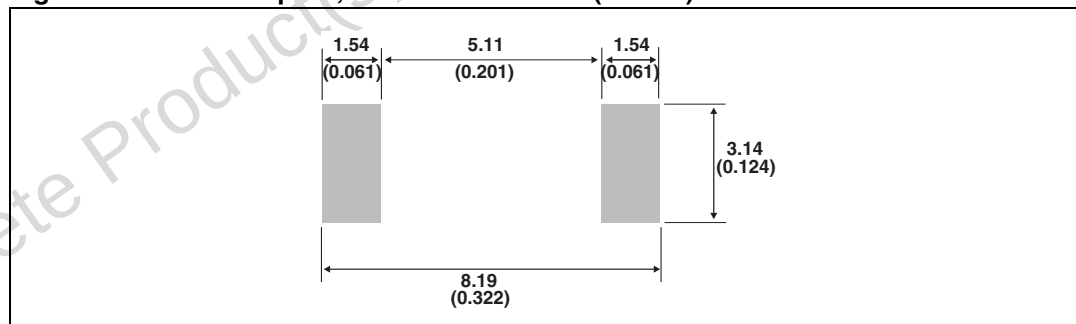
In order to meet environmental requirements, ST offers these devices in ECOPACK[®] packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at www.st.com.

Table 5. SMC dimensions

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b ⁽¹⁾	2.90	3.20	0.114	0.126
c ⁽¹⁾	0.15	0.40	0.006	0.016
D	5.55	6.25	0.218	0.246
E	7.75	8.15	0.305	0.321
E1	6.60	7.15	0.260	0.281
E2	4.40	4.70	0.173	0.185
L	0.75	1.50	0.030	0.059

1. Dimensions b and c apply to plated leads

Figure 3. SMC footprint, dimensions in mm (inches)



4 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
LNBTVS4-304S	LAD	SMC	0.245	2500	Tape and reel
LNBTVS6-304S	LBC	SMC	0.245	2500	Tape and reel

5 Revision history

Table 7. Revision history

Date	Revision	Changes
1-Apr-2008	1	First release

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