STS321XXXUXXX

TVS Diode ESD suppressor

Applications

- Cellular handsets and accessories
- Microprocessor based equipment
- Portable electronics
- Notebooks, desktops, and servers
- Portable instrumentation

Product features

- Protects one bi-directional I/O line
- Low clamping voltage
- Low leakage current
- Meets moisture sensitivity level (MSL) 3
- Molding compound flammability rating: UL 94V-0
- Termination finish: Tin

Environmental compliance and general specifications

- IEC61000-4-2 (ESD)
  - Up to ±30 kV (air)
  - Up to ±30 kV (contact)
- IEC61000-4-5 (Lightning) Up to 25 A (8/20 µs)

Ordering part number

ST S32 1 033 U 202

- Family
- Package (S32- SOD-323)
- Number of channels (1-1)
- Operating voltage (033- 3.3 V)
- Bi/Uni directional (U- Uni)
- Capacitance (202- 200 pF)

Pin out/functional diagram

SOD-323

Pin Configuration

Powering Business Worldwide

Absolute maximum ratings

(+25 °C, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value			Unit
		STS321033U202 STS321050U182 STS321070U162 STS321120U901 STS321240U401	STS321150U751	STS321360U351	
Peak pulse power dissipation on 8/20 µs waveform	P_{pp}	350	350	500	W
ESD per IEC 61000-4-2 (Air)	V_{ESD}	+/-30	+/-30	+/-15	kV
ESD per IEC 61000-4-2 (Contact)		+/-30	+/-25	+/-8	
Lead soldering temperature	T_L	+260 (10 seconds)	+260 (10 seconds)	+260 (10 seconds)	°C
Operating junction temperature range	T_J	-55 to +125	-55 to +125	-55 to +125	°C
Storage temperature range	T_{STG}	-55 to +150	-55 to +150	-55 to +150	°C

Electrical characteristics

(+25 °C)

STS321033U202

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	3.3	V_{RWM} (V)
Reverse breakdown voltage	I_T = 1 mA	4	-	-	V_{BR} (V)
Reverse leakage current	V_{RWM} = 3.3 V	-	1	5	I_R (µA)
Peak pulse current	t_p = 8/20 µs	-	-	25	I_{PP} (A)
Clamping voltage	I_{PP} = 1 A, t_p = 8/20 µs	-	5.5	6.5	V_C (V)
	I_{PP} = 25 A, t_p = 8/20 µs	-	10	15	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	-	200	250	C_J (pF)

STS321050U182

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	5.0	V_{RWM} (V)
Reverse breakdown voltage	I_T = 1 mA	6.0	-	-	V_{BR} (V)
Reverse leakage current	V_{RWM} = 5.0 V	-		1	I_R (µA)
Clamping voltage	I_{PP} = 1 A, t_p = 8/20 µs	-	-	9.0	V_C (V)
	I_{PP} = 22 A, t_p = 8/20 µs	-	12	15	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	-	180		C_J (pF)

STS321070U162

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	7	V_{RWM} (V)
Reverse breakdown voltage	I_T = 1 mA	7.5	8.5	9	V_{BR} (V)
Reverse leakage current	V_{RWM} = 7 V	-	0.1	0.5	I_R (µA)
Clamping voltage	I_{PP} = 1 A, t_p = 8/20 µs	-	11.5	15	V_C (V)
	I_{PP} = 25 A, t_p = 8/20 µs	-	15.5	20	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	-	165	200	C_J (pF)

STS321120U901

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	12	V_{RWM} (V)
Reverse breakdown voltage	I_T = 1 mA	13.3	13.5	16	V_{BR} (V)
Reverse leakage current	V_{RWM} = 12 V	-	0.01	0.1	I_R (µA)
Clamping voltage	I_{PP} = 1 A, t_p = 8/20 µs	-	15	18	V_C (V)
	I_{PP} = 15 A, t_p = 8/20 µs	-	21	24	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	-	90	100	C_J (pF)

STS321150U751

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	15	V_{RWM} (V)
Reverse breakdown voltage	I_T = 1 mA	16	17	19	V_{BR} (V)
Reverse leakage current	V_{RWM} = 15 V	-	0.1	0.2	I_R (µA)
Clamping voltage	I_{PP} = 1 A, t_p = 8/20 µs	-	20	23	V_C (V)
	I_{PP} = 13 A, t_p = 8/20 µs	-	27	30	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	-	75	90	C_J (pF)

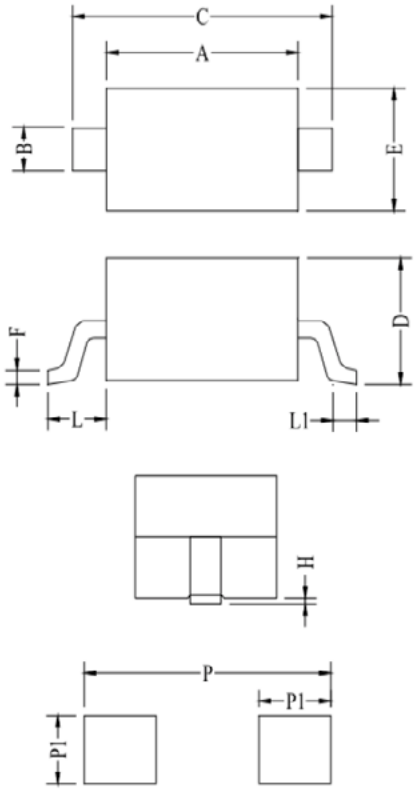
STS321240U401

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	24	V_{RWM} (V)
Reverse breakdown voltage	I_T = 1 mA	26.4	28	32	V_{BR} (V)
Reverse leakage current	V_{RWM} = 24 V	-	-	0.1	I_R (µA)
Clamping voltage	I_{PP} = 1 A, t_p = 8/20 µs	-	-	32	V_C (V)
	I_{PP} = 8 A, t_p = 8/20 µs	-	-	45	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	-	40	70	C_J (pF)

STS321360U351

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	36	V_{RWM} (V)
Reverse breakdown voltage	I_T = 1 mA	39	-	-	V_{BR} (V)
Reverse leakage current	V_{RWM} = 36 V	-	-	0.1	I_R (µA)
Clamping voltage	I_{PP} = 1 A, t_p = 8/20 µs	-	45	55	V_C (V)
	I_{PP} = 6 A, t_p = 8/20 µs	-	60	65	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	-	35	45	C_J (pF)

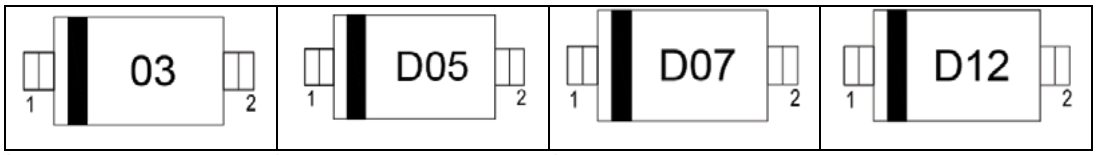
Mechanical parameters, pad layout- mm



Land Pattern

	Millimeters		Inches	
Dimension	**Minimum**	**Maximum**	**Minimum**	**Maximum**
A	1.60	1.80	0.063	0.071
B	0.25	0.35	0.010	0.014
C	2.50	2.75	0.098	0.108
D	0.00	1.00	0.000	0.039
E	1.20	1.40	0.047	0.055
F	0.08	0.15	0.003	0.006
L	0.475 REF		0.019 REF	
L1	0.25	0.40	0.010	0.016
H	0.00	0.10	0.000	0.004
P	3.00		0.118	
P1	0.80		0.031	

Part marking

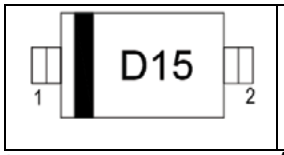


(STS321033U202)

(STS321050U182)

(STS321070U162)

(STS321120U901)



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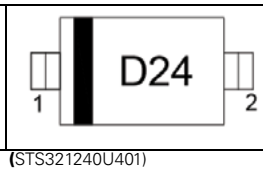
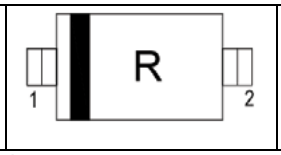


(STS321240U401)

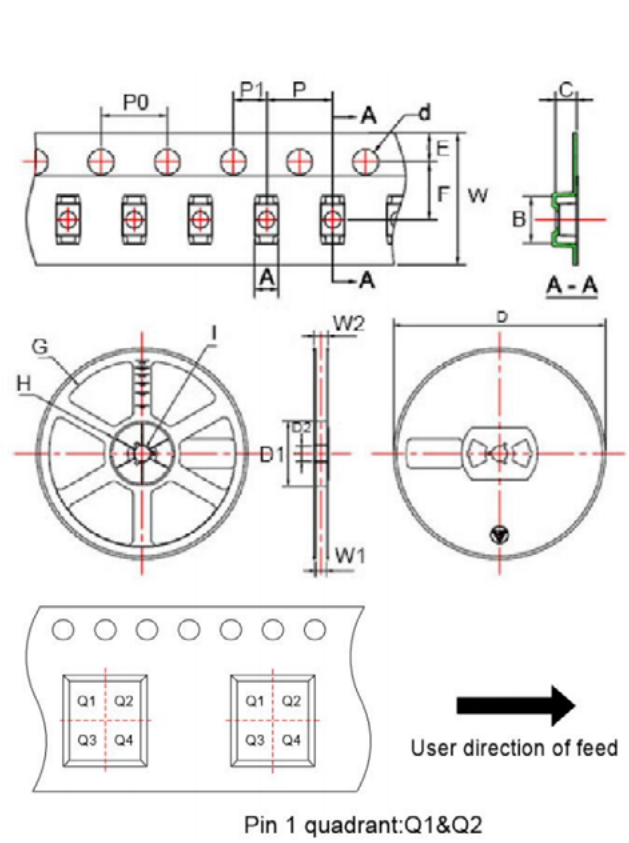


(STS321360U351)

Packaging information mm/inches

Drawing not to scale.

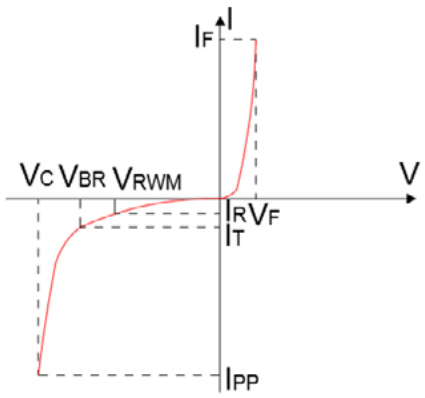
Supplied in tape and reel packaging, 3,000 parts per 7" diameter reel (EIA-481 compliant)



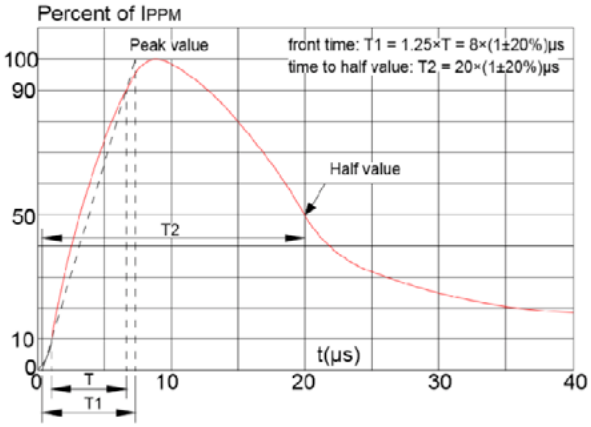
Symbol	Millimeters	Inches
A	1.46±0.05	0.057±0.002
B	2.90±0.05	0.114±0.002
C	1.25±0.05	0.049±0.002
d	ø1.50±0.1	ø0.059±0.004
E	1.75±0.1	0.069±0.004
F	3.50±0.1	0.138±0.004
P0	4.0±0.1	0.157±0.004
P	4.0±0.1	0.157±0.004
P1	2.0±0.1	0.079±0.004
W	8.00+0.3/-0.1	0.315+0.012/-0.004
D	ø178.0±2	ø7.008±0.079
D1	54.40±1	2.142±0.039
D2	13.0±1	0.512±0.039
G	R78.0±1	R3.071±0.039
H	R25.60±1	R1.008±0.039
I	R6.50±1	R0.256±0.039
W1	9.50±1	0.374±0.039
W2	12.30±1	0.484±0.039

Ratings and V-I characteristic curves (+25 °C unless otherwise noted)

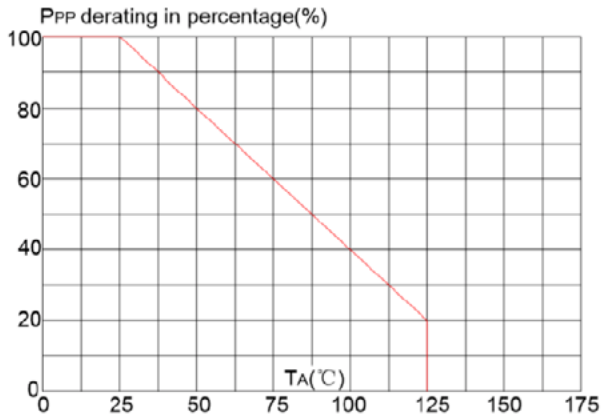
V- I curve characteristics (Uni-directional)



Pulse waveform (8/20 µs)



Pulse derating curve



ESD waveform