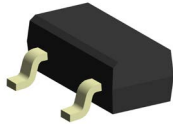


STS23 2XXXXXXAH

Automotive TVS diode ESD suppressor



Product features

- AEC-Q101
- Protects two I/O lines
- Uni-directional and bi-directional options
- Meets moisture sensitivity level (MSL) 1
- Molding compound flammability rating: UL 94V-0

Applications

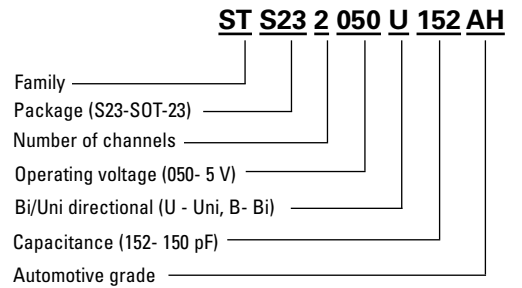
- Automotive chassis and safety systems
- Advanced driver assistance systems (ADAS)
- Communication and infotainment systems
- CAN-bus, LIN and Ethernet communication modules
- Network systems and body electronics
- Power train controls
- Automotive lighting

Environmental compliance and general specifications

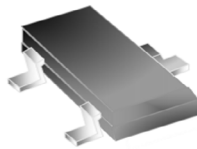
- IEC61000-4-2 (ESD) ± 30 kV (air), ± 30 kV (contact)
- IEC61000-4-4 (EFT) 40 A (5/50 ns)
- IEC61000-4-5 (Lightning) up to 18 A (8/20 μ s)



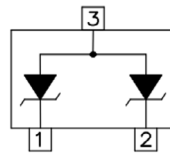
Ordering part number



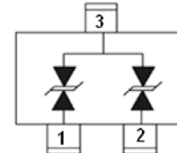
SOT-23



Pin configuration
Uni-directional



Pin configuration
Bi-directional



Product specifications

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

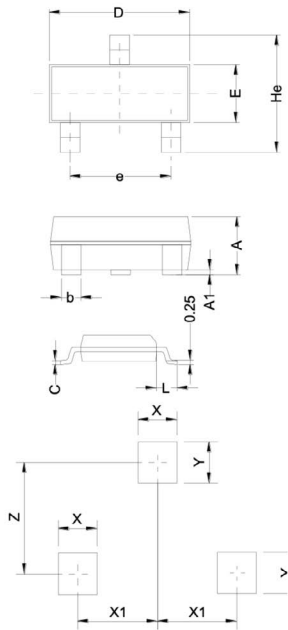
STS232050U152AH

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Peak pulse power dissipation	8/20 μ s waveform	-	350	-	P_{PP} (W)
ESD per IEC 61000-4-2 (Air)	-	-	± 30	-	V_{ESD} (kV)
ESD per IEC 61000-4-2 (Contact)	-	-	± 30	-	V_{ESD} (kV)
Lead soldering temperature	-	-	-	+260 (10 seconds)	T_L ($^{\circ}$ C)
Operating junction temperature range	-	-55	-	+150	T_J ($^{\circ}$ C)
Storage temperature range	-	-55	-	+150	T_{STB} ($^{\circ}$ C)
Reverse working voltage	-	-	-	5.0	V_{RWM} (V)
Reverse breakdown voltage	$I_T = 1$ mA	6.0	-	-	V_{BR} (V)
Reverse leakage current	$V_{RWM} = 5$ V	-	-	1	I_R (μ A)
Clamping voltage	$I_{PP} = 1$ A, $t_p = 8/20$ μ s	-	-	9.8	V_C (V)
	$I_{PP} = 18$ A, $t_p = 8/20$ μ s	-	-	16.7	V_C (V)
Junction capacitance	$V_{RWM} = 0$ V, $f = 1$ MHz	-	150	180	C_j (pF)

STS232240B151AH

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Peak pulse power dissipation	8/20 μ s waveform	-	350	-	P_{PP} (W)
ESD per IEC 61000-4-2 (Air)	-	-	± 30	-	V_{ESD} (kV)
ESD per IEC 61000-4-2 (Contact)	-	-	± 30	-	V_{ESD} (kV)
Lead soldering temperature	-	-	-	+260 (10 seconds)	T_L ($^{\circ}$ C)
Operating junction temperature range	-	-55	-	+150	T_J ($^{\circ}$ C)
Storage temperature range	-	-55	-	+150	T_{STB} ($^{\circ}$ C)
Reverse working voltage	-	-	-	24	V_{RWM} (V)
Reverse breakdown voltage	$I_T = 1$ mA	26.7	-	-	V_{BR} (V)
Reverse leakage current	$V_{RWM} = 24$ V	-	-	1.0	I_R (μ A)
Clamping voltage	$I_{PP} = 1$ A, $t_p = 8/20$ μ s	-	-	43	V_C (V)
	$I_{PP} = 6$ A, $t_p = 8/20$ μ s	-	-	60	V_C (V)
Junction capacitance	$V_{RWM} = 0$ V, $f = 1$ MHz	-	15	-	C_j (pF)

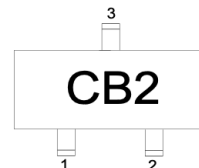
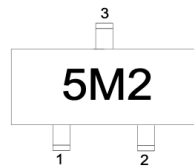
Mechanical parameters, pad layout- mm/inches



Dimension	Millimeters			Inches		
	Minimum	Typical	Maximum	Minimum	Typical	Maximum
A	0.9	1.063	1.15	0.035	0.042	0.045
A1	-	0.075	0.14	-	0.003	0.006
b	0.3	0.4	0.50	0.012	0.016	0.02
C	0.07	0.1	0.15	0.003	0.004	0.006
D	2.8	2.9	3	0.11	0.114	0.118
e	1.8	1.9	2	0.071	0.075	0.079
E	1.2	1.3	1.40	0.047	0.051	0.055
L	-	0.55 ref	-	-	0.022 ref	-
He	2.25	2.40	2.55	0.089	0.094	0.100
X	-	0.80	-	-	0.031	-
X1	-	0.95	-	-	0.037	-
Y	-	0.80	-	-	0.031	-
Z	-	2.02	-	-	0.080	-

Marking code
STS232050U152AH

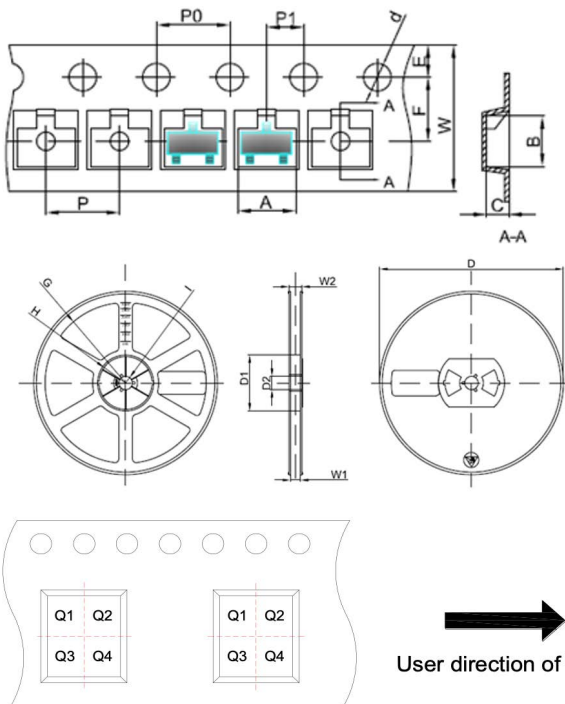
Marking code
STS232240B151AH



Packaging information mm/inches

Drawing not to scale.

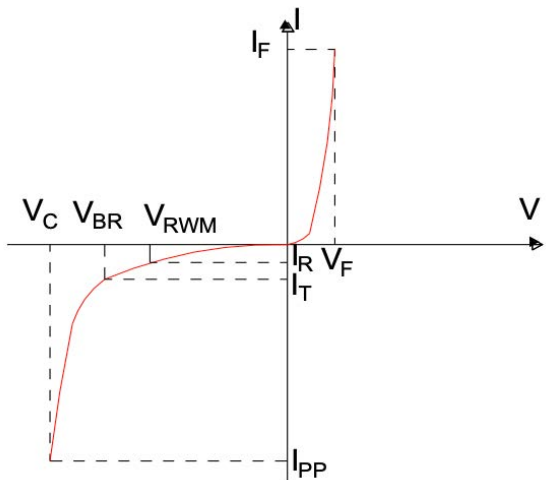
Supplied in tape and reel packaging, 5,000 parts per 7" diameter reel (EIA-481 compliant)



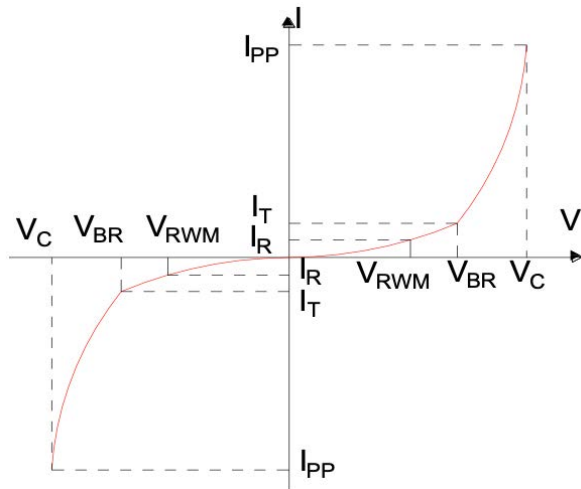
Dimension	Millimeter (typical)	Inches (typical)
A	3.15	0.124
B	2.77	0.109
C	1.22	0.048
d	1.50	0.059
E	1.75	0.069
F	3.5	0.138
P0	4	0.157
P	4	0.157
P1	2	0.079
W	8	0.315
D	178	7.008
D1	54.4	2.142
D2	13	0.512
G	R78.00	R3.071
H	R25.60	R1.008
I	R6.50	R0.256
W1	9.5	0.374
W2	12.3	0.484

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

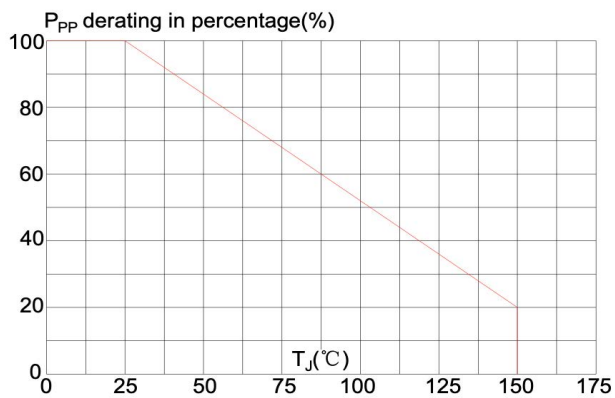
V- I curve characteristics (Uni-directional)



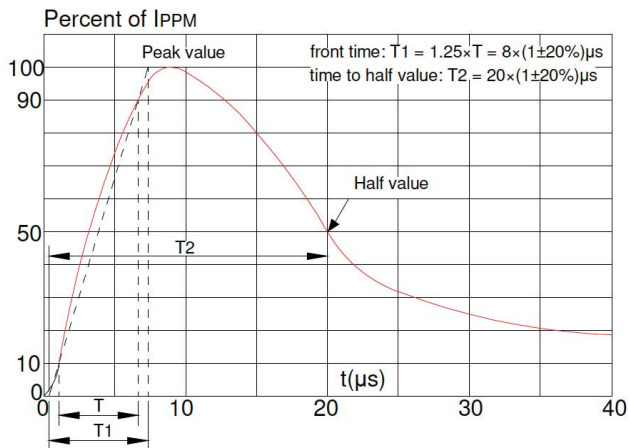
V- I curve characteristics (Bi-directional)



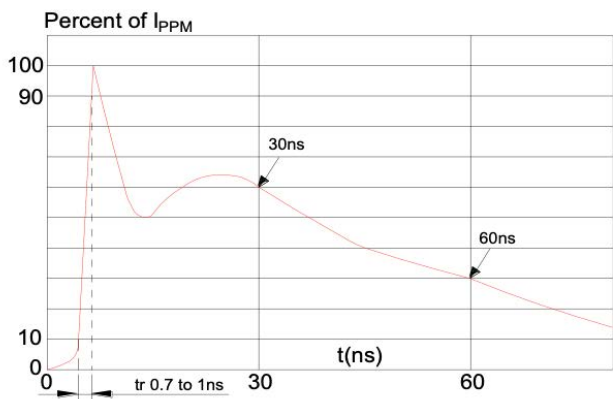
Pulse derating curve



Pulse waveform (8/20 μs)



ESD waveform (30 kV contact)



Solder reflow profile

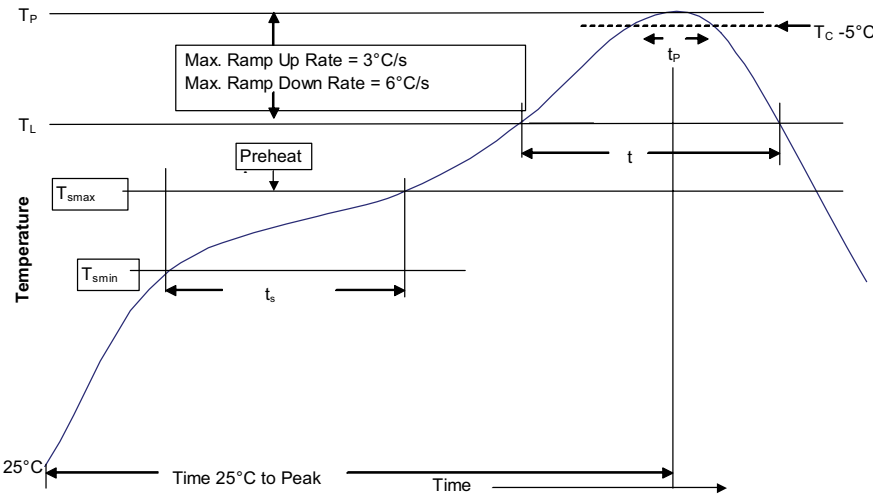


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm ³ <350	Volume mm ³ ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder (T_C)

Package thickness	Volume mm ³ <350	Volume mm ³ 350 - 2000	Volume mm ³ >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference J-STD-020

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat and soak	<ul style="list-style-type: none"> Temperature min. (T_{smin}) 100 °C Temperature max. (T_{smax}) 150 °C Time (T_{smin} to T_{smax}) (t_s) 60-120 seconds 	<ul style="list-style-type: none"> 150 °C 200 °C 60-120 seconds
Ramp up rate T _L to T _p	3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T _L)	183 °C	217 °C
Time (t _L) maintained above T _L	60-150 seconds	60-150 seconds
Peak package body temperature (T _p)*	Table 1	Table 2
Time (t _p)* within 5 °C of the specified classification temperature (T _C)	20 seconds*	30 seconds*
Ramp-down rate (T _p to T _L)	6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

Life Support Policy: Eaton does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

Eaton reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Eaton also reserves the right to change or update, without notice, any technical information contained in this bulletin.

Eaton
Electronics Division
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com/electronics

© 2023 Eaton
All Rights Reserved
Printed in USA
Publication No. ELX1277 BU-ELX22140
January 2023

Eaton is a registered trademark.
All other trademarks are property of their respective owners.

Follow us on social media to get the latest product and support information.

