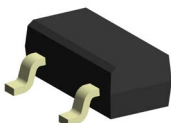


STS232XXXXXXAH

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

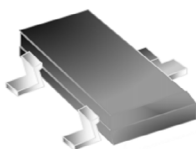
- IEC61000-4-2 (ESD) ± 30 kV (air), ± 30 kV (contact)
- IEC61000-4-4 (EFT) 40 A (5/50 ns)
- IEC61000-4-5 (Lightning) up to 18 A (8/20 μ s)



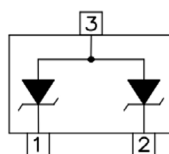
Ordering part number

	ST	S23	2	050	U	152	AH
Family	ST						
Package (S23-SOT-23)		S23					
Number of channels			2				
Operating voltage (050- 5 V)				050			
Bi/Uni directional (U - Uni, B- Bi)					U		
Capacitance (152- 150 pF)						152	
Automotive grade							AH

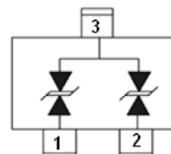
SOT-23



Pin configuration Uni-directional



Pin configuration Bi-directional



Powering Business Worldwide

Product specifications

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

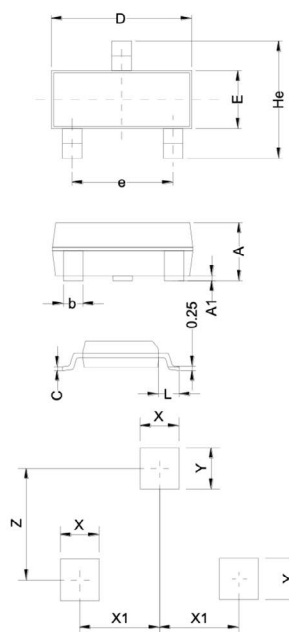
STS232050U152AH

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 (°C)
Operating junction temperature range	-	-55	-	+150	T_J (°C)
Storage temperature range	-	-55	-	+150	T_{STB} (°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

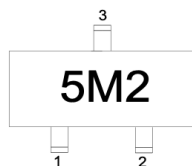
Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Peak pulse power dissipation	8/20 μ s waveform	-	350	-	P_{PP} (W)
ESD per IEC 61000-4-2 (Air)	-	-	± 30	-	V_{ESD} (kV)
ESD per IEC 61000-4-2 (Contact)	-	-	± 30	-	V_{ESD} (kV)
Lead soldering temperature	-	-	-	+260 (10 seconds)	T_L (°C)
Operating junction temperature range	-	-55	-	+150	T_J (°C)
Storage temperature range	-	-55	-	+150	T_{STB} (°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

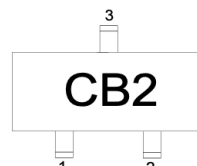


Dimension	Millimeters			Inches		
	Minimum	Typical	Maximum	Minimum	Typical	Maximum
A	0.9	1.063	1.15	0.035	0.042	0.045
A1	-	0.075	0.14	-	0.003	0.006
b	0.3	0.4	0.50	0.012	0.016	0.02
C	0.07	0.1	0.15	0.003	0.004	0.006
D	2.8	2.9	3	0.11	0.114	0.118
e	1.8	1.9	2	0.071	0.075	0.079
E	1.2	1.3	1.40	0.047	0.051	0.055
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



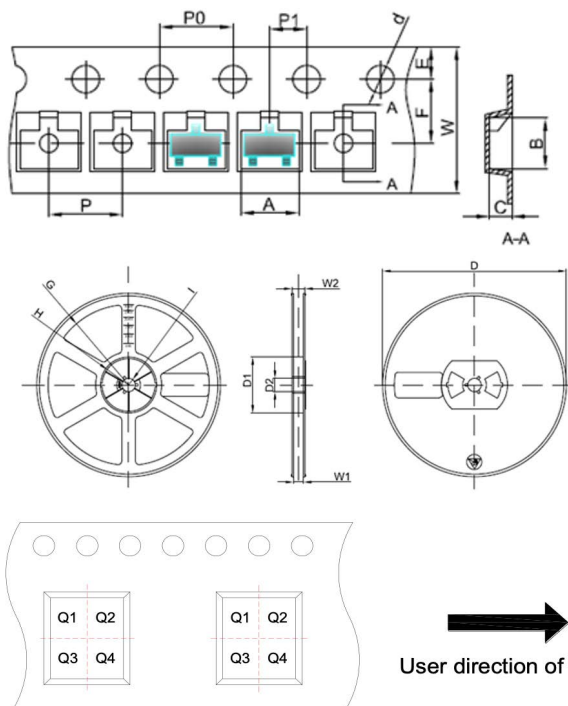
Marking code
STS232240B151AH



Packaging information mm/inches

Drawing not to scale.

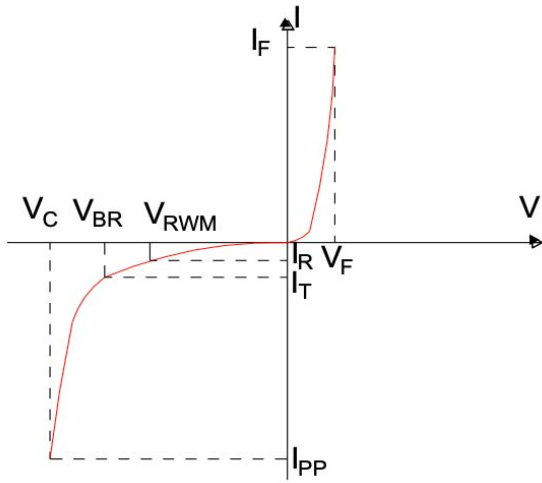
Supplied in tape and reel packaging, 5,000 parts per 7" diameter reel (EIA-481 compliant)



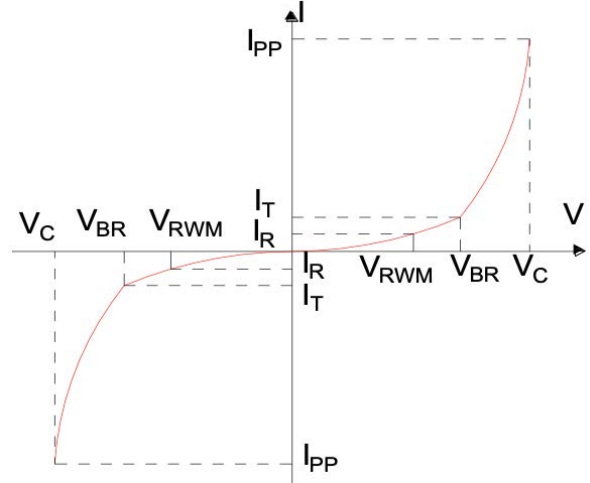
Dimension	Millimeter (typical)	Inches (typical)
A	3.15	0.124
B	2.77	0.109
C	1.22	0.048
d	1.50	0.059
E	1.75	0.069
F	3.5	0.138
P0	4	0.157
P	4	0.157
P1	2	0.079
W	8	0.315
D	178	7.008
D1	54.4	2.142
D2	13	0.512
G	R78.00	R3.071
H	R25.60	R1.008
I	R6.50	R0.256
W1	9.5	0.374
W2	12.3	0.484

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

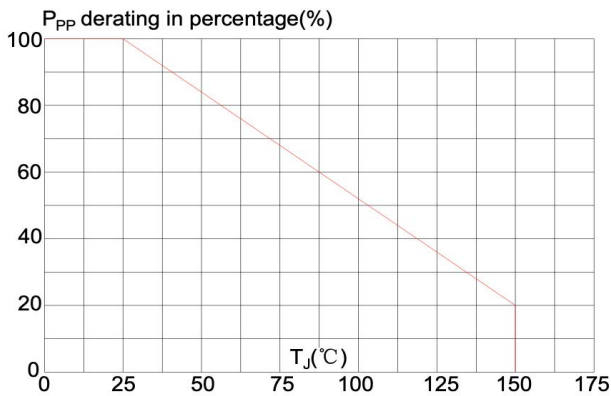
V- I curve characteristics (Uni-directional)



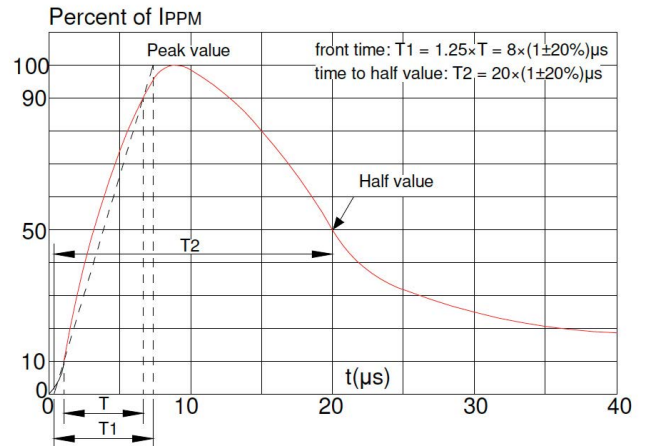
V- I curve characteristics (Bi-directional)



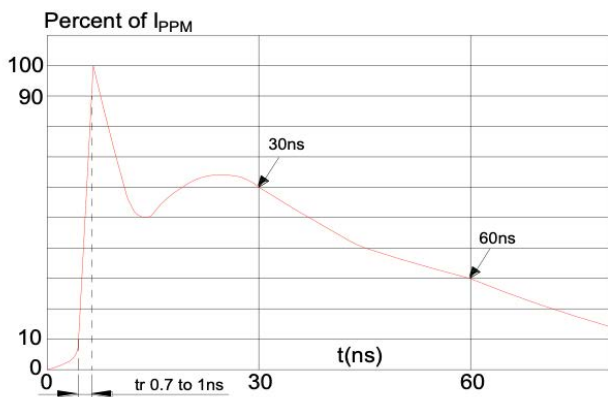
Pulse derating curve



Pulse waveform (8/20 μ s)



ESD waveform (30 kV contact)



Solder reflow profile

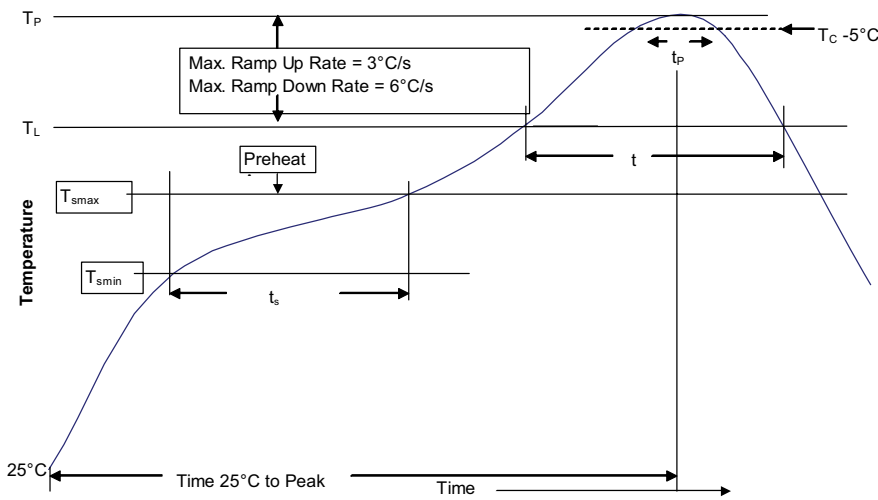


Table 1 - Standard SnPb solder (T_C)

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		
• Temperature min. (T_{smin})	100 °C	150 °C
• Temperature max. (T_{smax})	150 °C	200 °C
• Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	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.

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