SPECIFICATIONS

Customer	
Product Name	**High Surge Type Multilayer Chip Varistor for Surge Current Suppression**
Sunlord Part Number	**SDVL4532SD260PTHS142**
Customer Part Number	

[☒New Released, ☐Revised] **SPEC No.:**

【This SPEC is total 9 pages including specifications and appendix.】

【ROHS, Halogen-Free and SVHC Compliant Parts】

Approved By	Checked By	Issued By

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【For Customer approval Only】 Date:_____

Qualification Status: ☐ Full ☐ Restricted ☐ Rejected

Approved By	Verified By	Re-checked By	Checked By

Comments:

_____

【Version change history】

Rev.	Effective Date	Changed Contents	Change Reasons	Approved By
01	Jan.06,2021	New release	/	Xu Liu

Caution

All products listed in this specification are developed, designed and intended for use in general electronics equipment. The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require especially high reliability, or whose failure, malfunction or trouble might directly cause damage to society, person, or property. Please understand that we are not responsible for any damage or liability caused by use of the products in any of the applications below. Please contact us for more details if you intend to use our products in the following applications.

1. Aircraft equipment
2. Aerospace equipment
3. Undersea equipment
4. nuclear control equipment
5. military equipment
6. Power plant equipment
7. Medical equipment
8. Transportation equipment (automobiles, trains, ships,etc.)
9. Traffic signal equipment
10. Disaster prevention / crime prevention equipment
11. Data-processing equipment
12. Applications of similar complexity or with reliability requirements comparable to the applications listed in the above

1. Scope

This specification applies to SDVL4532SD260PTHS142 high surge type multi-layer chip Varistors for surge current suppression.

2. Product Description and Identification (Part Number)

1) Description

SDVL4532SD260PTHS142 high surge type multi-layer chip Varistors for surge current suppression.

2) Product Identification (Part Number)

SDVL ※※※※ ◎ ◇ ××× ◇ ○ □□□ ●●●

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①

Type	
SDVL	Chip Varistor for Surge Current Suppression

②

External Dimensions (L×W) (mm)	
4532 [1812]	4.50 × 3.20

③

Tolerance of Varistor Voltage	
S	Special

④

Type of Working Voltage	
D	DC Working Voltage

⑤

Max. Continuous Working Voltage	
Example	Nominal Value
260	26V

⑦

Packing	
T	Tape & Reel

⑧

Series	
HS	High-surge type

⑥

Terminal Code	
P	Ni, Sn Plating

⑨

Peak Surge Current 8/20μs	
Example	Nominal Value
142	1400A

3. Electrical Characteristics

Part Number	Max. Working Voltage		Varistor Voltage	Max. Clamping Voltage		Rated Single Pulse Transient			Typical Capacitance
Test Condition	<40 μ A		@1mA DC	8/20μs		Energy 10/1000μs	Peak Current 8/20μs	Nominal Current 8/20μs	@1V_{rms}, 1kHz
	DC	AC RMS							
Units	Volts	Volts	Volts	Volts	Amps	Joules	Amps	Amps	pF
Symbol	V_{WDC}	V_{WAC}	V_B	V_C	I_C	E_T	I_P	I_n	Cp
SDVL4532SD260PTHS142	26	18.4	35.0 [31.0-38.0]	65	5	3.6	1400	1000	3000

1) Operating and storage temperature range (individual chip without packing): -55℃ ~ +125℃.
2) Storage temperature range (packaging conditions): -10℃~+40℃ RH 70% (Max.).
3) VDC : Max DC working voltage of varistor must exceed or equal to 1.2 times that of the application circuit voltage, VDC≥1.2 Vn.
4) IP : Rated single pulse current at 8/20us of Varistor must exceed or equal to 1.2 times that of the application circuit pulse current, IP ≥1.2 IPn.

4. Shape and Dimensions

1) Dimensions and recommended PCB pattern for reflow soldering: See **Fig.4-1**, **Fig.4-2** and **Table 4-1.**
2) Structure: See **Fig. 4-3** and **Fig. 4-4**.

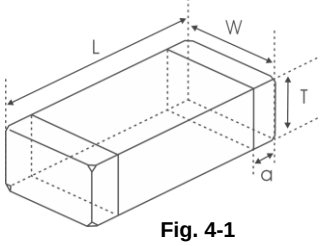


Fig. 4-1

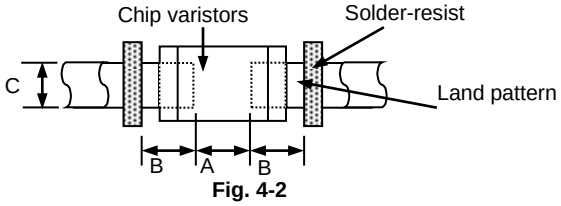


Fig. 4-2

[Table 4-1] Unit: mm [inch]

Type	L	W	T	a	A	B	C
4532 [1812]	4.50±0.40 [0.177±0.016]	3.20±0.30 [0.126±0.012]	2.50 Max [0.098]	0.25~1.00 [0.010~0.039]	2.8~3.0	1.5~1.8	3.3~3.6

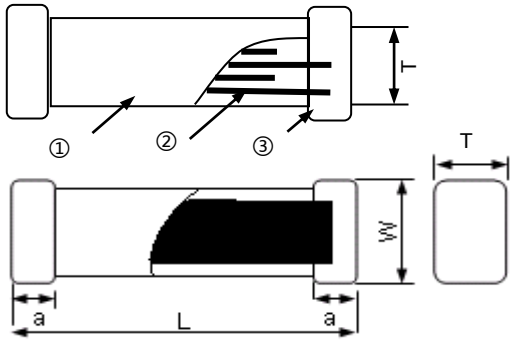
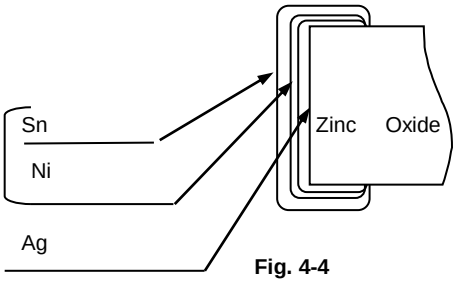


Fig. 4-3



① ZnO for chip varistor
② Internal electrode (Ag-Pd)
③-1 Terminal electrode: Inside (Ag)
③-2 Outside (Electro-plating Ni-Sn)

Fig. 4-4

5. Test and Measurement Procedures

5.1 Test Conditions

5.1.1.Unless otherwise specified, the standard atmospheric conditions for measurement/test as:

a. Ambient Temperature: 20±15℃.
b. Relative Humidity: 65±20%.
c. Air Pressure: 86kPa to 106kPa.

5.1.2.If any doubt on the results, measurements/tests should be made within the following limits:

a. Ambient Temperature: 20±2℃
b. Relative Humidity: 65±5%.
c. Air Pressure: 86kPa to 106kPa.

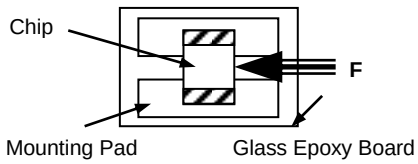
5.2 Visual Examination

a. Inspection Equipment: 20× magnifier.

5.3 Electrical Test

Items	Requirements	Test Methods and Remarks
5.3.1 Varistor Voltage at 1mA DC (V_B)	Refer to **Electrical Characteristics**	Measuring current: 1mA DC Duration: 0.2 to 2 sec
5.3.2 Capacitance (C)	Refer to **Electrical Characteristics**	Measure source: 1.0 V_{RMS} Test frequency: 1KHz.
5.3.3 leakage current（IL）	Refer to **Electrical Characteristics**	Measure source: 26.0V DC

5.4 Reliability Test

Items	Requirements	Test Methods and Remarks
5.4.1. Terminal Strength	No removal or split of the termination or other defects shall occur.  **Fig.5.4.1-1**	① Solder the chip to the testing jig (glass epoxy board shown in **Fig.5.4.1-1**) using eutectic solder. Then apply a force in the direction of the arrow. ② 10N force for SDVL4532SD260PTHS142. Keep time: 10±1s.

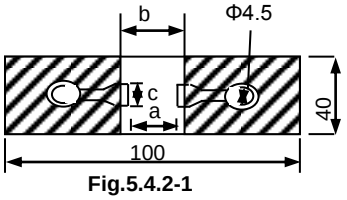
<table>
<tr>
<td>5.4.2 Resistance to Flexure</td>
<td>No visible mechanical damage.
<table>
<tr><th>Type</th><th>a</th><th>b</th><th>c</th></tr>
<tr><td>4532[1812]</td><td>3.0</td><td>6.0</td><td>3.8</td></tr>
</table>
Unit: mm


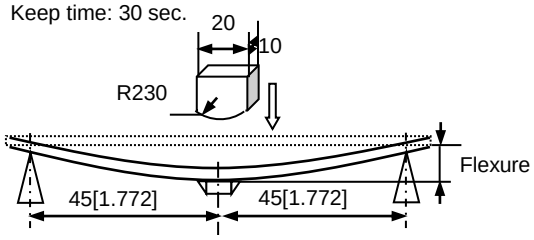
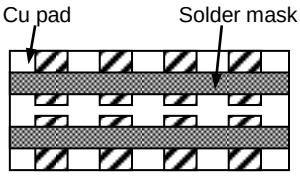
Fig.5.4.2-1</td>
<td>① Solder the chip to the test jig (glass epoxy board shown in Fig.5.4.2-1) using a eutectic solder. Then apply a force in the direction shown in Fig.5.4.2-2.
② Flexure: 2mm.
③ Pressurizing Speed: 0.5mm/sec.
④ Keep time: 30 sec.


Fig.5.4.2-2</td>
</tr>
<tr>
<td>5.4.3 Vibration</td>
<td>No visible mechanical damage.


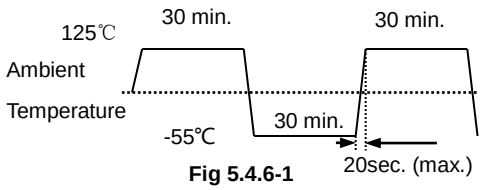
Glass Epoxy Board
Fig. 5.4.3-1</td>
<td>① Solder the chip to the testing jig (glass epoxy board shown in Fig.5.4.3-1) using eutectic solder.
② The chip shall be subjected to a simple harmonic motion having total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55 Hz.
③ The frequency range from 10 to 55 Hz and return to 10 Hz shall be traversed in approximately 1 minute. This motion shall be applied for a period of 2 hours in each 3 mutually perpendicular directions (total of 6 hours).</td>
</tr>
<tr>
<td>5.4.4 Solderability</td>
<td>① No visible mechanical damage.
② Wetting shall exceed 90% coverage.</td>
<td>① Solder temperature: 240±2℃
② Duration: 3 sec.
③ Solder: Sn/3.0Ag/0.5Cu.
④ Flux: 25% Resin and 75% ethanol in weight.</td>
</tr>
<tr>
<td>5.4.5 Resistance To Soldering Heat</td>
<td>① No visible mechanical damage.
② Varistor voltage change: within ±10%.</td>
<td>① Solder temperature: 260±3℃
② Duration: 5 sec.
③ The chip shall be stabilized at normal condition for 1~2hours before measuring.
④ Solder: Sn/3.0Ag/0.5Cu.
⑤ Flux: 25% Resin and 75% ethanol in weight.</td>
</tr>
<tr>
<td>5.4.6 Thermal Shock</td>
<td>① No visible mechanical damage.
② Varistor voltage change: within ±10%.


Fig 5.4.6-1</td>
<td>① Temperature, Time: -55℃ for 30±3 min→125℃ for 30±3min.
② Transforming interval: 20sec. (Max.)
③ Tested cycle: 100 cycles.
④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.</td>
</tr>
<tr>
<td>5.4.7 Resistance to Low Temperature</td>
<td>① No visible mechanical damage.
② Varistor voltage change: within ±10%.</td>
<td>① Temperature: -55±2℃
② Duration: 1000^{+24} hours.
③ The chip shall be stabilized at normal condition for 1~2 hours before measuring.</td>
</tr>
<tr>
<td>5.4.8 Resistance to High Temperature</td>
<td>① No visible mechanical damage.
② Varistor voltage change: within ±10%.</td>
<td>① Temperature: 125±2℃.
② Duration: 1000^{+24} hours.
③ The chip shall be stabilized at normal condition for 1~2 hours before measuring.</td>
</tr>
<tr>
<td>5.4.9 Damp Heat (Steady States)</td>
<td>① No visible mechanical damage.
② Varistor voltage change: within ±10%.</td>
<td>① Temperature: 60±2℃
② Humidity: 90% to 95% RH.
③ Duration: 1000^{+24} hours.
④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.</td>
</tr>
</table>

5.4.10 Loading Under Damp Heat	① No visible mechanical damage. ② Varistor voltage change: within ±10%.	① Temperature: 60±2℃ ② Humidity: 90% to 95% RH. ③ Duration: 1000^{+24} hours. ④ Applied voltage: DC Working Voltage. ⑤ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
5.4.11 Loading at High Temperature (Life Test)	① No visible mechanical damage. ② Varistor voltage change: within ±10%.	① Temperature: 125±2℃ ② Duration: 1000^{+24} hours. ③ Applied voltage: DC Working Voltage. ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
5.4.12 Maximum Surge Current	① No visible mechanical damage. ② Varistor voltage change: within ±10%. IEC61000-4-5 standard 1.2/50us-8/20us voltage-current combination pulse	① Temperature: 25±5℃ ② Humidity: 30% to 65% RH. ③ Number of hit: 1 time ④ Pulse waveform: 8/20 us. ⑤ Applied current: maximum surge current (I_P). ⑥ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
5.4.13 Maximum Surge Energy	① No visible mechanical damage. ② Varistor voltage change: within ±10%. IEC61000-4-5 standard 10/1000us current pulse	① Temperature :25±5℃ ② Humidity: 30% to 65% RH. ③ Number of hit: 1 time. ④ Pulse waveform: 10/1000 us. ⑤ Applied energy: maximum surge energy (E_T). ⑥ The chip shall be stabilized at normal condition for 1~2 hours before measuring.

6. Packaging, Storage and Transportation

6.1 Packaging

6.1.1 Tape Carrier Packaging:

Packaging code: T

a. Tape carrier packaging are specified in attached figure **Fig.6.1-1~3**

b. Tape carrier packaging quantity please see the following table:

Type	SDVL4532
Tape	Embossed Tape
Quantity	4K

(1) Taping Drawings (Unit: mm)

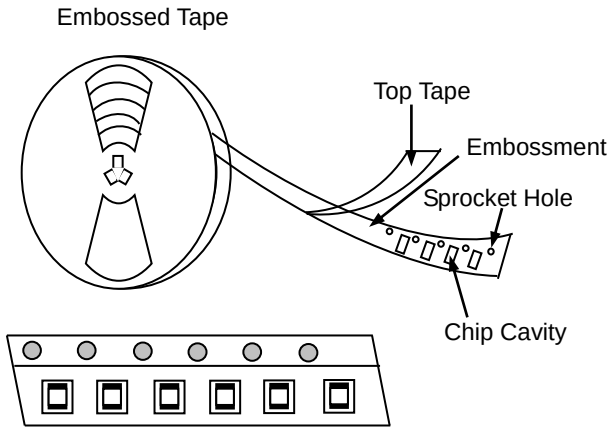


Fig 6.1-1

Remark: The sprocket holes are to the right as the tape is pulled toward the user.

(2) Taping Dimensions (Unit: mm)

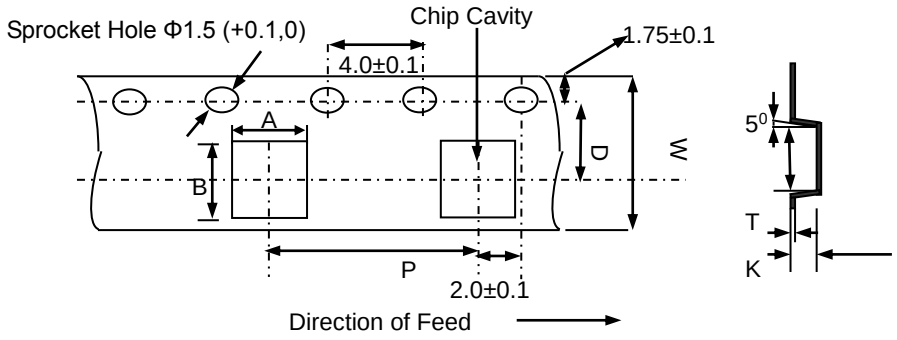


Fig. 6.1-2

Type	Chip Thickness	W	A	B	D	P	K max	T max
SDVL4532	2.50 max.	12.0	3.50	4.80	5.50	8.00	2.70	0.33

(3) Reel Dimensions (Unit: mm)

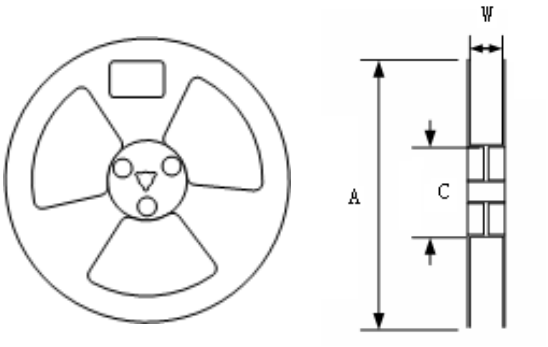


Fig. 6.1-3

Type	Spec.	Dimensions(mm)		
		A	W	C
SDVL4532	13"*12mm	330	12.4+2.0/-0.0	100

6.2 Storage

a. The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to high humidity. Package must be stored at 40℃ or less and 70% RH or less.

b. The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to dust of harmful gas (e.g. HCl, sulfurous gas of H_2S).

c. Packaging material may be deformed if package are stored where they are exposed to heat of direct sunlight.

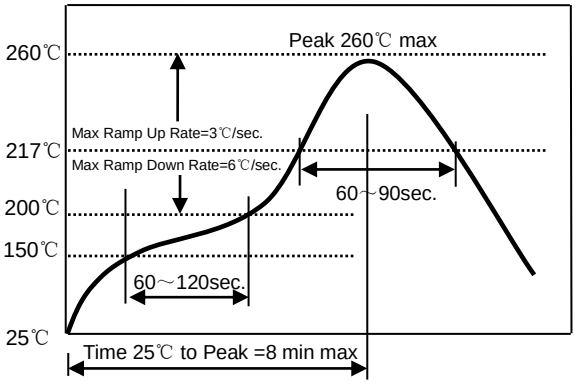
d. Solderability specified in **Clause 5.4.4** shall be guaranteed for 9 months from the date of delivery on condition that they are stored at the environment specified in **Clause 3**. For those parts, which passed more than 9 months shall be checked solder-ability before use.

7. Recommended Soldering Technologies

7.1 Reflow Profile:

△ Preheat condition: 150 ~200℃/60~120sec.
△ Allowed time above 217℃: 60~90sec.
△ Max temp: 260℃
△ Max time at max temp: 10sec.
△ Solder paste: Sn/3.0Ag/0.5Cu
△ Allowed Reflow time: 2x max

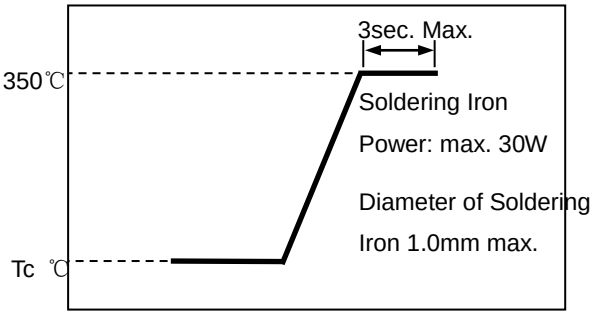
[Note: The reflow profile in the above table is only for qualification and is not meant to specify board assembly profiles. Actual board assembly profiles must be based on the customer's specific board design, solder paste and process, and should not exceed the parameters as the Reflow profile shows.]



7.2 Iron Soldering Profile.

△ Iron soldering power: Max. 30W
△ Pre-heating: 150℃/60sec.
△ Soldering Tip temperature: 350℃ Max.
△ Soldering time: 3sec. Max.
△ Solder paste: Sn/3.0Ag/0.5Cu
△ Max.1 times for iron soldering

[Note: Take care not to apply the tip of the soldering iron to the terminal electrodes.]



8. Supplier Information

a) Supplier:
Shenzhen Sunlord Electronics Co., Ltd.
b) Manufacturer:
Shenzhen Sunlord Electronics Co., Ltd.
c) Manufacturing Address:
Sunlord Industrial Park, Dafuyuan Industrial Zone, Guanlan, Shenzhen, China
Zip: 518110

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