

SPECIFICATIONS

Customer	
Product Name	Multi-layer Chip Antenna
Sunlord Part Number	SLDA31-2R450G-S1TF
Customer Part Number	

New Released, Revised]

SPEC No.: **SLDA**

【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	May.07,2020	New release	/	Jimmy Ko
02	Oct. 04, 2023	Changed the picture/data	Internal Changed	Jimmy Ko

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 SLDA31-2R450G-S1TF of Multilayer Chip Antenna.

2. Product Description and Identification (Part Number)

1) Description

Multi-layer Chip Antenna

2) Product Identification (Part Number)

SLDA 31 2R450G S1 I E
 ① ② ③ ④ ⑤ ⑥

①	Type
SLDA	Multilayer Chip Antenna

②	External Dimensions (LxW) (mm)
31	3.2 x 1.6

③	Center Frequency
2R450G	2450 MHz

④	Series Code
	S1

⑤	Packing
T	Tape Carrier Package

⑥	Hazardous Substance Free Products
	F

3. Electrical Characteristics

Part Number	SLDA31-2R450G-S1TF
Bandwidth (BW)	2400~2500 MHz
Peak Gain	1.0 dBi
Return Loss in BW	10 dB min.
Characteristic Impedance (Nom.)	50 ohm
Power Capacity	3.0 W max.

- a) Operating and storage temperature range (individual chip without packing): -40°C~ +85°C.
- b) Storage temperature range (packaging conditions): -10°C~ +40°C and RH 70% (Max.).
- c) Test equipment: Network Analyzer: E5071C.
- d) Electrical Performance: See Fig. 3-1.

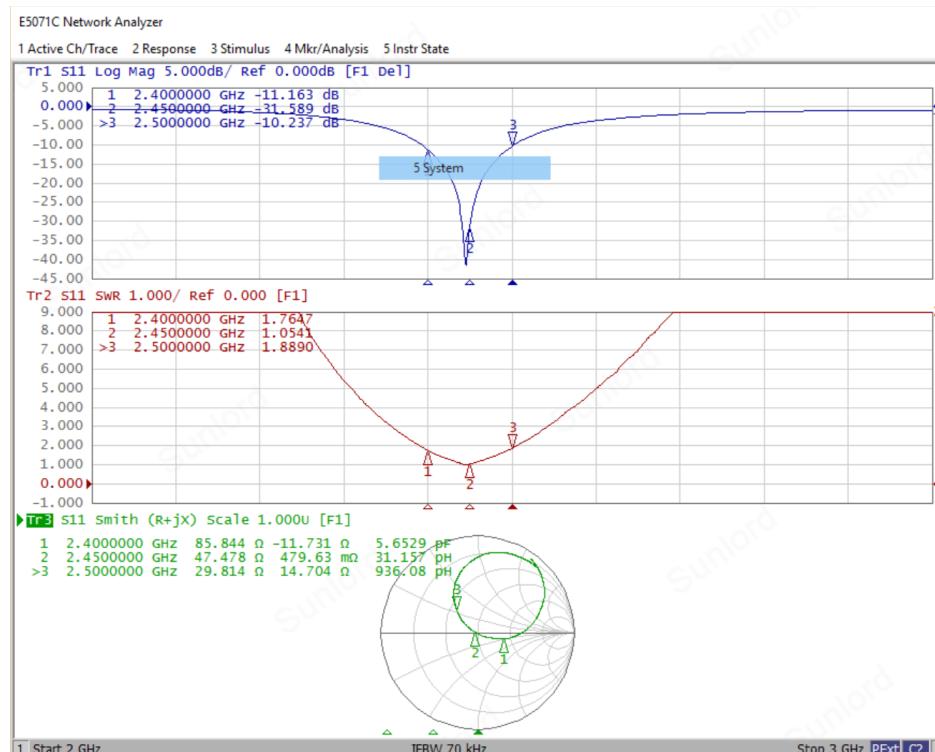


Fig. 3-1

4. Shape and Dimensions

1) Dimensions and terminal configuration: See **Fig. 4-1**

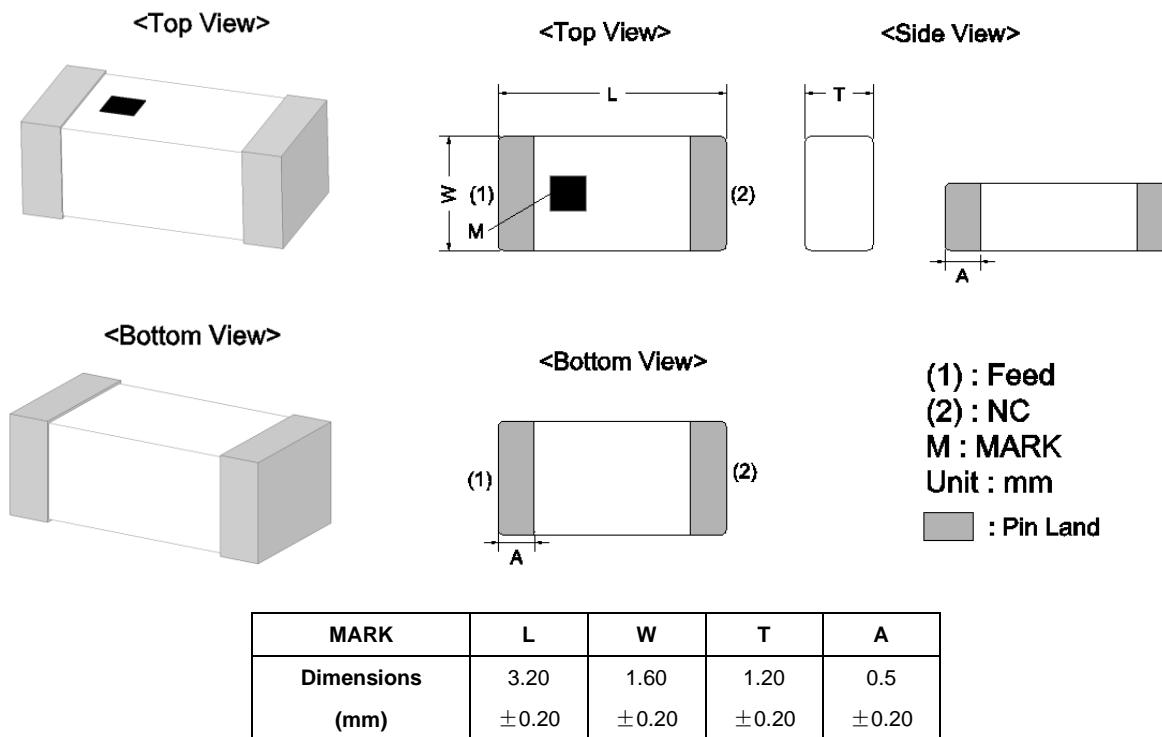


Fig. 4-1

2) Recommended Land Pattern: See **Fig.4-2**

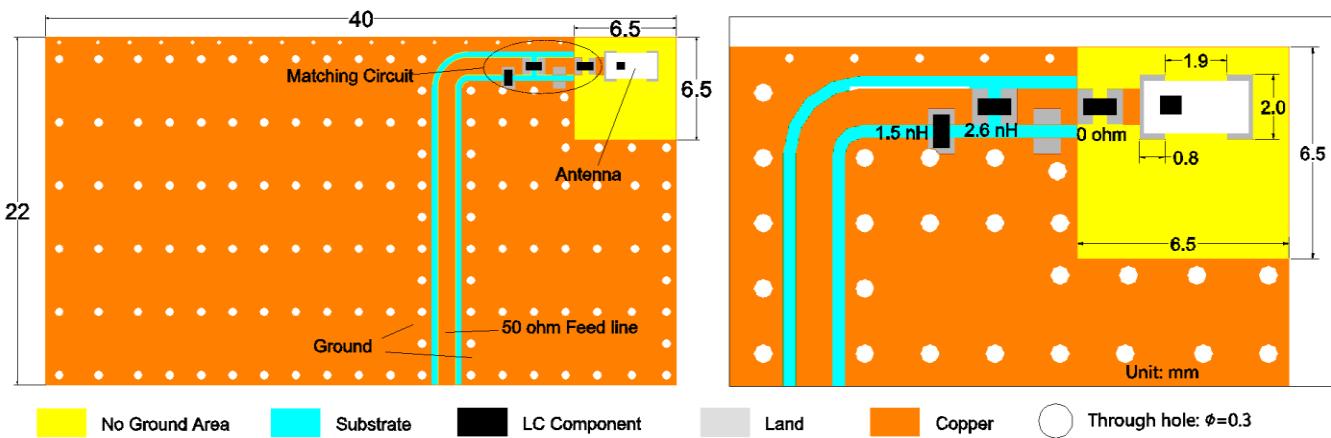


Fig. 4-2

* The proposed pi-shaped matching circuits and LC component values in Fig.4-2 are based on our evaluation board. The actual matching circuits need to be adjusted when the antenna is applied in the client's design, because the antenna impedance is easily affected by PCB layout.

5. Test and Measurement Procedures

5.1 Test Conditions

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

- Ambient Temperature: $20\pm15^{\circ}\text{C}$
- Relative Humidity: $65\pm20\%$
- Air Pressure: 86 KPa to 106 KPa

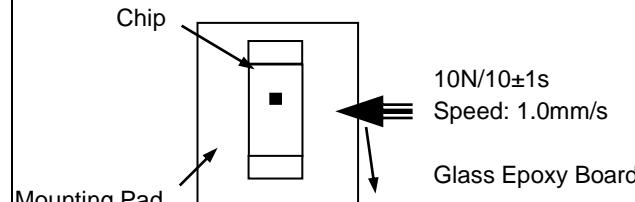
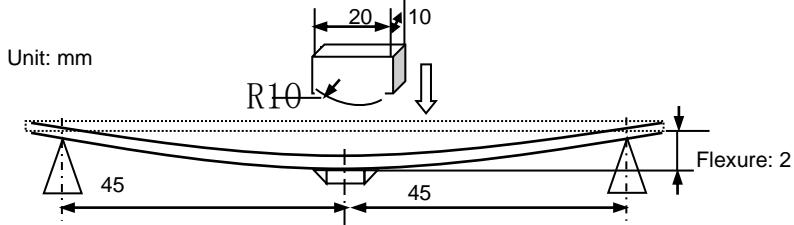
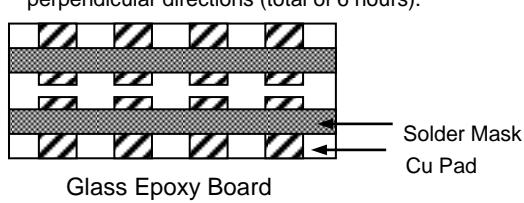
If any doubt on the results, measurements/tests should be made within the following limits:

- Ambient Temperature: $20\pm2^{\circ}\text{C}$
- Relative Humidity: $65\pm5\%$
- Air Pressure: 86KPa to 106 KPa

5.2 Visual Examination

- Inspection Equipment: 20 X magnifier

5.3 Reliability Test

Items	Requirements	Test Methods and Remarks
5.3.1 Terminal Strength	No visible mechanical damage.	<p>① Solder the inductor to the testing jig (glass epoxy board shown as the following figure) using leadfree solder. Then apply a force in the direction of the arrow.</p> <p>② 10N force for 3216 series.</p> <p>③ Keep time: 10 ± 1 sec.</p> 
5.3.2 Resistance to Flexure	No visible mechanical damage.	<p>① Solder the chip to the test jig (glass epoxy board) using a leadfree solder. Then apply a force in the direction shown as the following figure. Solder the chip to the test jig (glass epoxy board) using leadfree solder. Then apply a force in the direction.</p> <p>② Flexure: 2mm</p> <p>③ Pressurizing Speed: 0.5mm/sec</p> <p>④ Keep time: ≥ 30 sec</p> 
5.3.3 Vibration	No visible mechanical damage.	<p>① Solder the chip to the testing jig (glass epoxy board shown as the following figure) using leadfree solder.</p> <p>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.</p> <p>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).</p> 
5.3.4 Dropping	No visible mechanical damage.	Drop the chip 10 times on a concrete floor from a height of 100 cm.
5.3.5 Solderability	<p>① No visible mechanical damage.</p> <p>② Wetting shall be exceeded 75% coverage.</p>	<p>① Solder temperature: $240\pm2^\circ\text{C}$</p> <p>② Duration: 3sec</p> <p>③ Solder: Sn/3.0Ag/0.5Cu</p> <p>④ Flux: 25% Resin and 75% ethanol in weight</p>
5.3.6 Resistance to Soldering Heat	No visible mechanical damage.	<p>① Solder temperature: $260\pm5^\circ\text{C}$</p> <p>② Duration: 5 sec</p> <p>③ Solder: Sn/3.0Ag/0.5Cu</p> <p>④ Flux: 25% Resin and 75% ethanol in weight</p> <p>⑤ The chip shall be stabilized at normal condition for 1~2 hours before measuring.</p>

5.3.7 Thermal Shock	<ul style="list-style-type: none"> ① No visible mechanical damage. ② Satisfy electrical Characteristic. 	<ul style="list-style-type: none"> ① Temperature and time: -40°C for 30 ± 3 min $\rightarrow 85^{\circ}\text{C}$ for 30 ± 3 min ② Transforming interval: Max. 20 sec. ③ Tested cycle: 100 cycles ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
5.3.8 Damp Heat (Steady States)	<ul style="list-style-type: none"> ① No visible mechanical damage. ② Satisfy electrical Characteristic. 	<ul style="list-style-type: none"> ① Temperature: $60\pm 2^{\circ}\text{C}$ ② Humidity: 90% to 95% RH ③ Duration: 500^{+24} hours ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
5.3.9 Resistance to High temperature	<ul style="list-style-type: none"> ① No visible mechanical damage. ② Satisfy electrical Characteristic. 	<ul style="list-style-type: none"> ① Temperature: $85\pm 2^{\circ}\text{C}$ ② Duration: 500^{+24} hours ③ The chip shall be stabilized at normal condition for 1~2 hours before measuring.

6. Packaging and Storage

6.1 Packaging

There is one type of packaging for the Antenna. Please specify the packing code when ordering.

6.1.1 Tape Carrier Packaging:

Packaging code: T

- Tape carrier packaging are specified in attached figure **Fig. 6.1-1~3**
- Tape carrier packaging quantity please see the following table:

Type	3216[1206]
Tape	Embossed Tape
Quantity	3K

(1) Taping Drawings (Unit: mm)

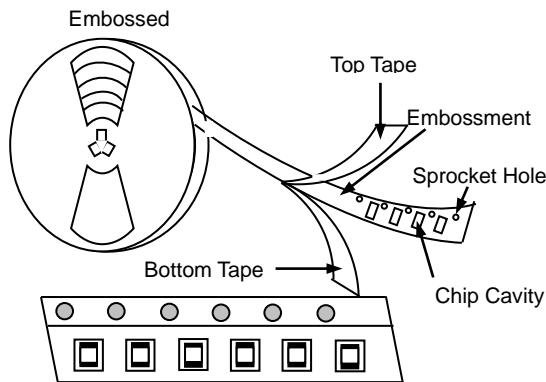


Fig. 6.1-1

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

(2) Taping Dimensions (Unit: mm)

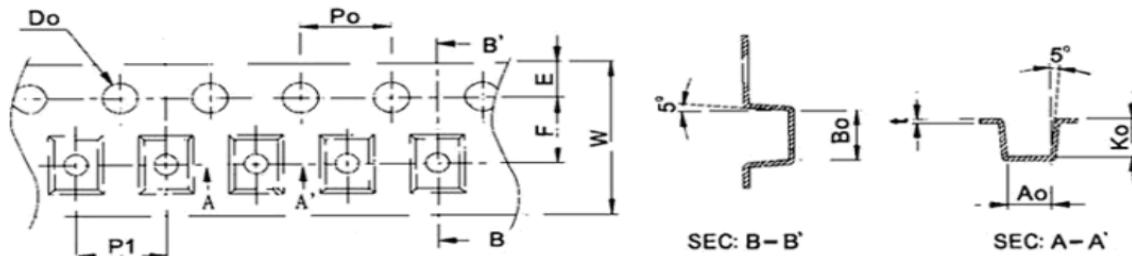


Fig. 6.1-2

Type	W	P1	E	F	D0	P0	K0	A0	B0	t
Tolerance	± 0.10	± 0.10	± 0.10	± 0.15	$+0.10/-0.0$	± 0.10	± 0.10	± 0.10	± 0.10	± 0.05
SLDA31	8.00	4.00	1.75	3.5	1.5	4.0	1.5	1.8	3.5	0.22

(3) Reel Dimensions (Unit: mm)

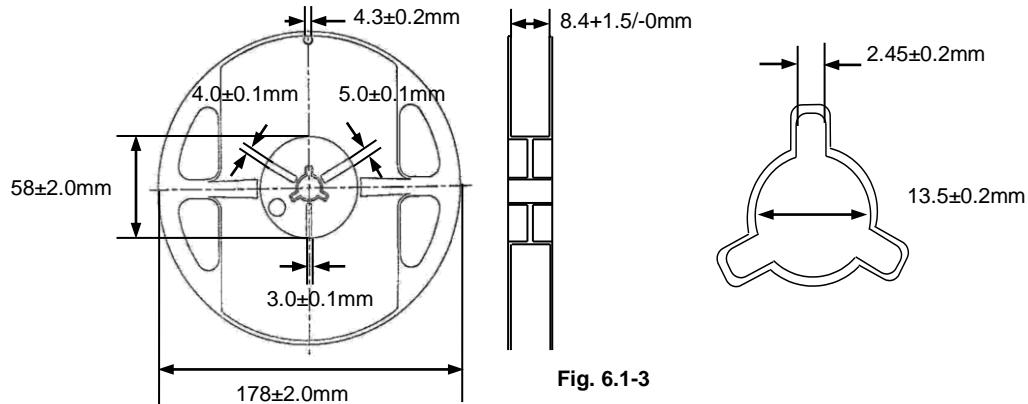


Fig. 6.1-3

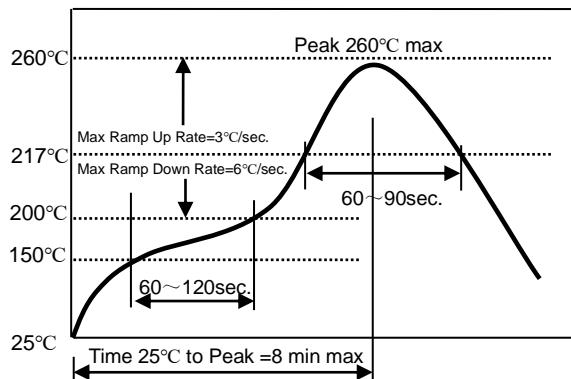
6.2 Storage

- 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°C or less and 70% RH or less.
- 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 H₂S).
- Packaging material may be deformed if package are stored where they are exposed to heat of direct sunlight.
- Solderability specified in **Clause 5.3.6** shall be guaranteed for 6 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 6 months shall be checked solder-ability before use.

7. Recommended Soldering Technologies**7.1 Re-flowing Profile**

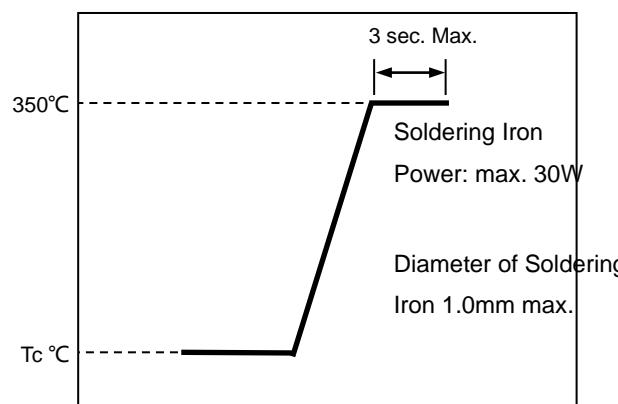
- △ Preheat condition: 150 ~200°C/60~120sec.
- △ Allowed time above 217°C: 60~90sec.
- △ Max temp: 260°C
- △ Max time at max temp: 10sec.
- △ Solder paste: Sn/3.0Ag/0.5Cu
- △ Allowed Reflow time: 2x max

[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 °C / 60 sec.
- △ Soldering Tip temperature: 350°CMax.
- △ Soldering time: 3 sec 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.]



1) Measured efficiency and gain at 2400~2500 MHz:

Frequency (MHz)	Efficiency (%)	Gain (dBi)
2400	37.47	0.18
2410	39.87	0.52
2420	43.00	0.91
2430	43.28	0.96
2440	45.49	1.16
2450	45.53	1.18
2460	45.93	1.20
2470	47.34	1.34
2480	46.59	1.25
2490	44.45	1.00
2500	41.58	0.79

2) Measured 2D radiation pattern at 2450 MHz:

