SPECIFICATIONS

Customer	
Product Name	Multi-layer Common Mode Filter
Sunlord Part Number	SDMM0906H Series
Customer Part Number	

[☒New Released, ☐Revised] SPEC No.: SDMM09230000

【This SPEC is total 10 pages】

【ROHS, 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	/	New release	/	Chunlei Dai

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. The application with a long term direct-current voltage difference, which is greater than 1.5V, between D+ and D- of differential lines
12. Applications of similar complexity or with reliability requirements comparable to the applications listed in the above

1. Scope

This specification applies to SDMM Series of multi-layer common mode filter

2. Product Description and Identification (Part Number)

1) Description:

SDMM Series of multi-layer common mode filter.

2) Product Identification (Part Number)

SDMM	0906	H	-3	-□□□	T
①	②	③	④	⑤	⑥

①	Type
SDMM	multilayer common mode filter

②	External Dimensions (L X W) (mm)
0906	0.90 X 0.68

③	Feature Type
H	For High-Speed Differential Signal Lines

④	Number of Lines
-3	3 Lines

⑤	Common Mode Impedance (Ω)
Example	Nominal Value
-300	30

⑥	Number of Lines
T	Tape & Reel

3. Electrical Characteristics

Please refer to **Appendix A**.

1) Operating and storage temperature range (individual chip without packing): -40℃ ~ +85℃.

2) Storage temperature range (packaging conditions): -10℃~+40℃ and RH 70% (Max.).

Appendix A: Electrical Characteristics

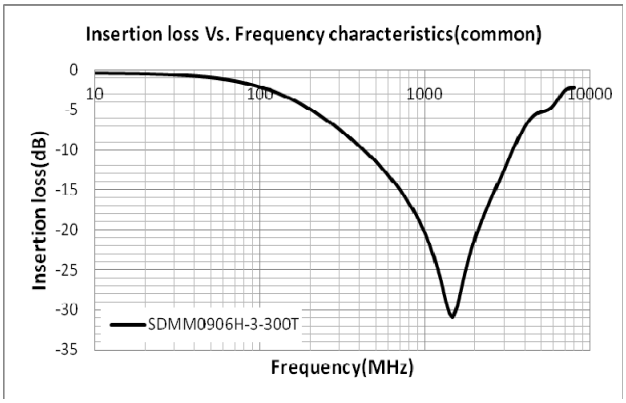
Part Number	Common mode Impedance @ 100MHz(Ω)	DC Resistance (Ω) Max.	Rated Current (mA) Max.	Withstand Voltage (V_P)	Insulation Resistance (MΩ) Min.
SDMM0906H-3-300T	30±20%	4.0	20	12.5	100

Note: Absolute maximum long term direct-current voltage between wire AB, AC or BC: 1.5V

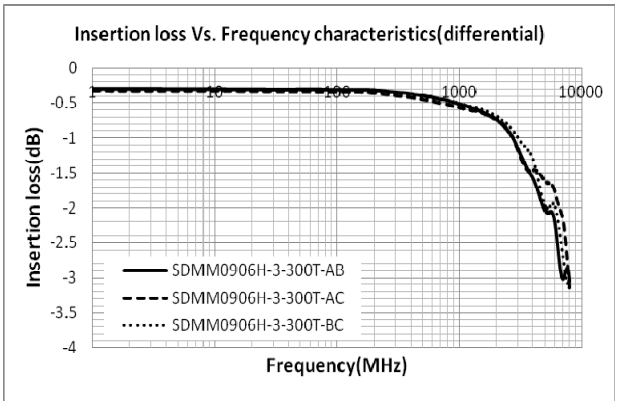
Typical Electrical Characteristics

SDMM0906H-3-300T

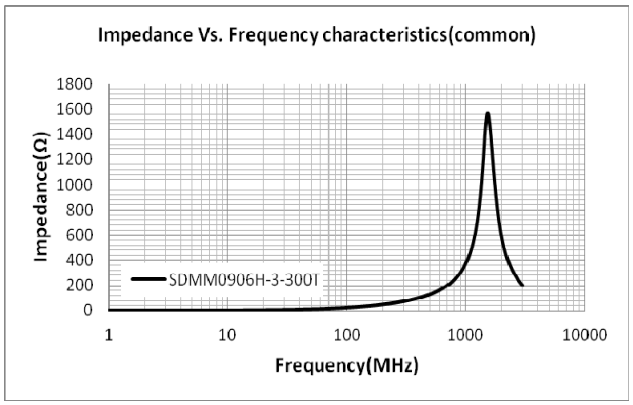
Insertion loss vs. Frequency (SDMM0906H-3-300T)



Insertion loss vs. Frequency (SDMM0906H-3-300T)



Impedance vs. Frequency (SDMM0906H-3-300T)



4. Shape and Dimensions

1) Dimensions: See **Fig.4-1** and **Table 4-1.**
2) Equivalent circuit: See **Fig. 4-2.**
3) Recommended PCB pattern for reflow soldering: See **Fig. 4-3**.

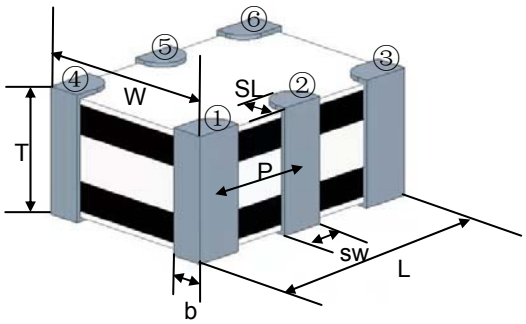


Fig.4-1

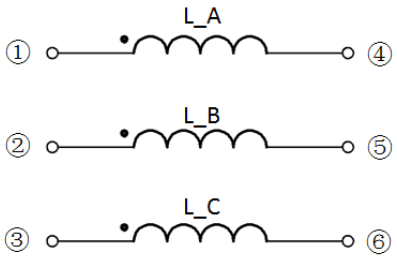


Fig.4-2

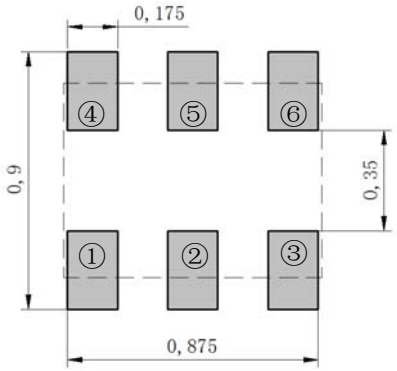


Fig.4-3

[Table 4-1] Unit: mm

Type	L	W	T	SL	SW	P	b
SDMM0906	0.90±0.05	0.68±0.05	0.40±0.05	0.12±0.10	0.15±0.10	0.35±0.10	SL

4) Structure: See **Fig. 4-4** and **Fig. 4-5**.
Material Information: See **Table 4-2**.

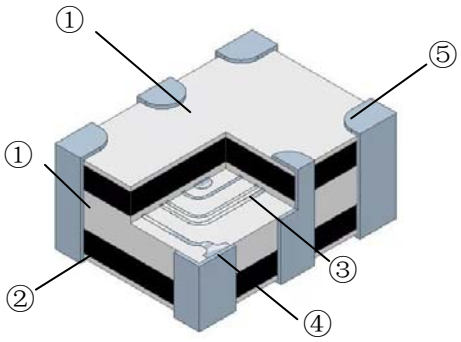


Fig. 4-4

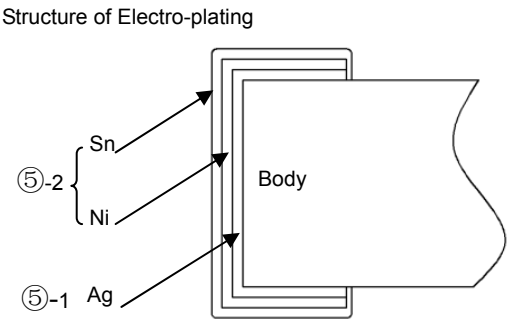


Fig.4-3

[Table 4-2]

Code	Part Name	Material Name
①	Ceramic Body	Ceramic Powder
②	Ferrite Body	Ferrite Powder
③	Inner Coils(Ag)	Silver Paste
④	Pull-out Electrode (Ag)	Silver Paste
⑤-1	Terminal Electrode: Inside Ag	Termination Silver Composition
⑤-2	Electro-Plating: Ni/Sn plating	Plating Chemicals

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

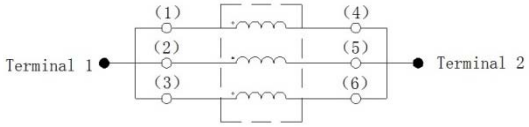
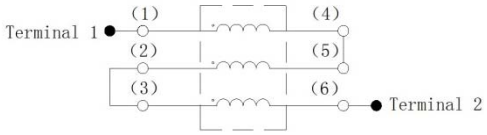
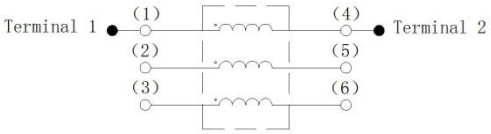
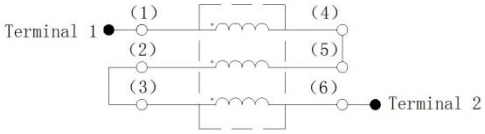
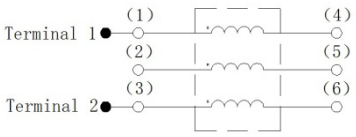
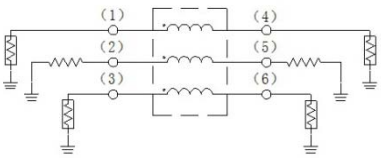
5.1.2 If any doubt on the results, measurements/tests should be made within the following limits:

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

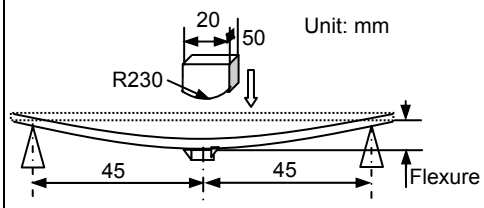
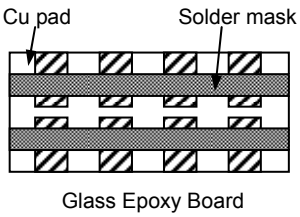
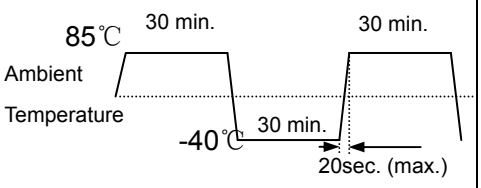
5.2 Visual Examination

a. Inspection Equipment: 20 X magnifier

5.3 Electrical Test

Items	Requirements	Test Methods and Remarks
5.3.1 Impedance (Common Mode)	Refer to **Appendix A**	Test equipment: High Accuracy RF LCR Meter Agilent4287A/E4991A or equivalent. Common Mode Impedance is tested according to the following circuit. 
5.3.2 Impedance (Differential Mode)	Refer to **Appendix A**	Test equipment: High Accuracy RF LCR Meter Agilent4287A/E4991A or equivalent. Differential Mode Impedance is tested according to the following circuit. 
5.3.3 DC Resistance	Refer to **Appendix A**	Test equipment: High Accuracy Milliohm meter Agilent4338B/34420 or equivalent. DC Resistance is tested according to the following circuit. 
5.3.4 Rated Current	Refer to **Appendix A**	Test equipment: Electric Power, Electric current meter, Thermometer. Definition of Rated Current (Ir): Ir is direct electric current as chip surface temperature rise just 20℃ against chip initial surface temperature. Rated Current is tested according to the following circuit. 
5.3.5 Insulation Resistance	Refer to **Appendix A**	Test equipment: High resistance meter Agilent4339B. Withstand Voltage:2.5 times rated voltage Application time:1~5 Seconds The charging and discharging current:Less than 1mA Insulation Resistance is tested according to the following circuit. 
5.3.6 Insertion Loss	Refer to **Appendix A**	Test equipment: S-parameter Network Analyzer AgilentE5071C or equivalent. Insertion Loss is S21mag tested according to the following circuit. 

5.4 Reliability Test

Item	Requirements	Test Methods and Remarks
5.4.1 Resistance to Flexure	No visible mechanical damage. 	① Solder the chip to the 1.0mm test jig (glass epoxy board) using a eutectic solder. Then apply a force in the direction shown as left. ② Flexure: 2mm. ③ Pressurizing Speed: 0.5mm/sec. ④ Keep time: 5sec.
5.4.2 Vibration	① No visible mechanical damage. ② Impedance change: within ±20%. ③ Insulation Resistance: 100MΩ Min. 	① Solder the chip to the testing jig (glass epoxy board) 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 3mutually perpendicular directions (total of 6 hours).
5.4.3 Dropping	① No visible mechanical damage. ② Impedance change: within ±20%. ③ Insulation Resistance: 100MΩ Min.	Drop the chip 3 times on a concrete floor from a height of 100 cm.
5.4.4 Solderability	① No visible mechanical damage. ② Wetting shall be exceeded 90% coverage, except welding points.	① Solder temperature: 240±2℃. ② Duration: 3±1sec. ③ Solder: Sn/3.0Ag/0.5Cu. ④ Flux: 25% Resin and 75% ethanol in weight.
5.4.5 Resistance to soldering heat	① No visible mechanical damage. ② Impedance change: within ±20%. ③ Insulation Resistance: 100MΩ Min.	① Solder temperature :260±3℃ ② Duration: 5sec. ③ Solder: Sn/3.0Ag/0.5Cu. ④ Flux: 25% Resin and 75% ethanol in weight. ⑤ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
5.4.6 Temperature Characteristics	① No visible mechanical damage. ② Impedance change: within ±20%. ③ Insulation Resistance: 100MΩ Min.	① Temperature range: -40℃~+85℃. ② Reference temperature: +20℃.
5.4.7 Thermal shock	① No mechanical damage. ② Impedance change: within ±20%. ③ Insulation Resistance: 100MΩ Min. 	① Temperature, time: -40℃for 30±3 min →85℃ for 30±3min. ② Transforming interval: 20 sec(max.). ③ Tested cycle: 100 cycles. ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
5.4.8 Resistance to low temperature	① No mechanical damage. ② Impedance change: within ±20%. ③ Insulation Resistance: 100MΩ Min.	⑤ Temperature: -40±2℃ ⑥ Duration: 1000^{+12} hours. ⑦ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
5.4.9 Damp heat (Steady states)	① No visible mechanical damage. ② Impedance change: within ±20%. ③ Insulation Resistance: 100MΩ Min.	① Temperature: 60±2℃. ② Humidity: 90% to 95% RH. ③ Duration: 1000^{+12} hours. ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.

5.4.10 Loading under damp heat	① No visible mechanical damage. ② Impedance change: within ±20%. ③ Insulation Resistance: 100MΩ Min.	① Temperature: 60±2℃. ② Humidity: 90% to 95% RH. ③ Duration: 1000^{+12} hours. ④ Applied current: Rated current. 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 Impedance change: within ±20%. ③ Insulation Resistance: 100MΩ Min.	① Temperature: 85±2℃. ② Duration: 1000^{+12} hours. ③ Applied current: Rated current. ④ 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	0906
Tape	Paper Tape
Quantity	10K

d. Reel shall be packaged in vinyl bag.

e. Maximum of 5 or 10 reels bags shall be packaged in an inner box.

f. Maximum of 6 or 10 inner boxes shall be packaged in an outer case.

(1) Taping Drawings (Unit: mm)

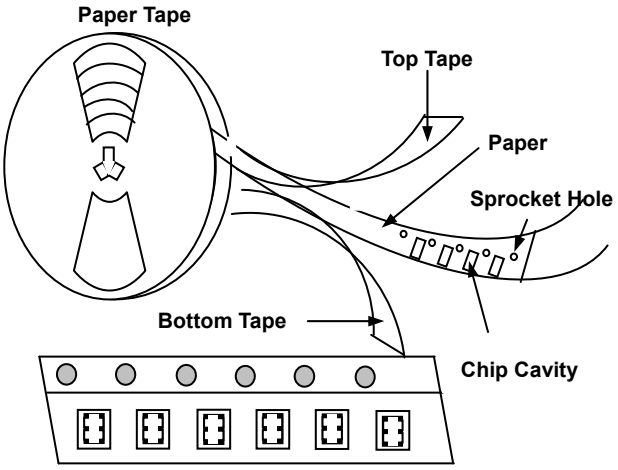
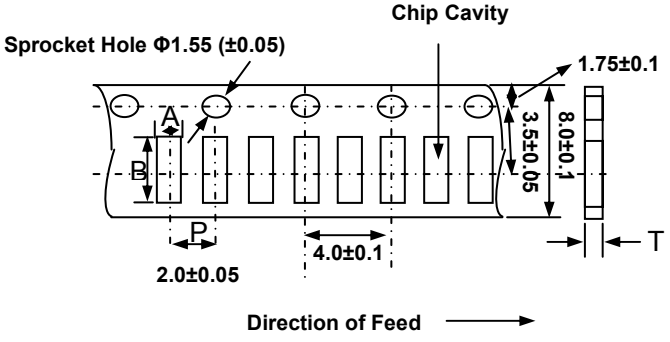


Fig 6.1-1

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

(2) Taping Dimensions (Unit: mm)



Type	A	B	P	Tmax
0906	0.85±0.03	1.08±0.03	2.0±0.05	0.63

Fig.6.1-2

(3) Reel Dimensions (Unit: mm)

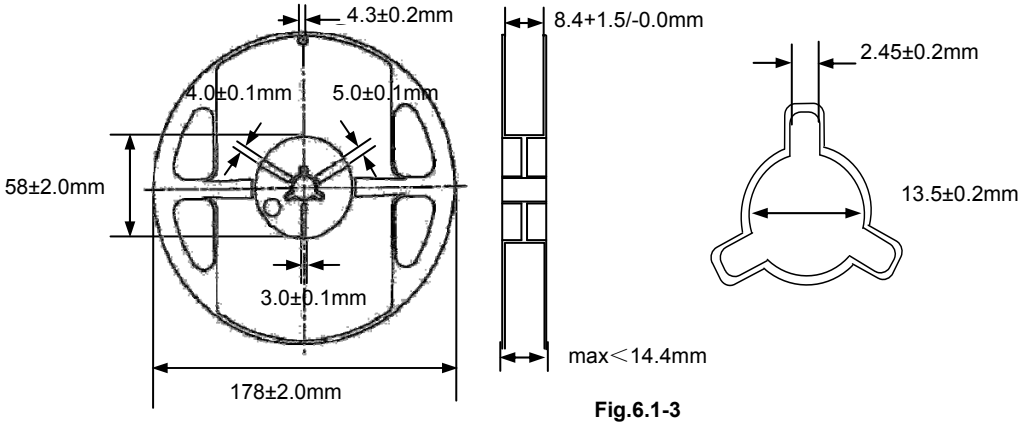


Fig.6.1-3

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.

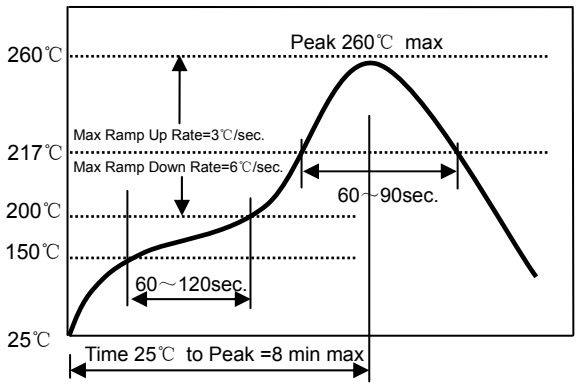
d. Solderability specified in **Clause 5.4.6**shall be guaranteed for 6 months from the date of delivery on condition that they are stored at the environment specified in **Clause 3** .For those parts, which passed more than 6 months shall be checked solder-ability before use.

7. Recommended Soldering Technologies

7.1 Re-flowing Profile:

△ Preheat condition: 150 ~200℃/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 ℃ / 60 sec.
△ Soldering Tip temperature: 350℃Max.
△ 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.]