1. Scope

This specification applies to SDNT0603C103F3380FTF of chip NTC thermistors.

2. Product Description and Identification (Part Number)

1) Description

Example:

SDNT0603C103F3380FTF of multi-layer chip NTC thermistors.

2) Product Identification (Part Number)

SDNT	0603	C	103	F	3380	F	T	F
①	②	③	④	⑤	⑥	⑦	⑧	⑨

① Type	
SDNT	Chip NTC Thermistor

② External Dimensions (L×W) [mm]	
0603 [0201]	0.6×0.3

③ Internal Code
C

④Nominal Zero-Power Resistance (KΩ)	
Example	Nominal Value
103	10

⑤ Resistance Tolerance	
F	±1%

⑥ Nominal B Constant (25℃ to 50℃)	
Example	Nominal
3380	3380K

⑦ B Constant Tolerance	
F	±1%

⑧ Packaging	
T	Tape & Reel

⑨ HSF Products
Hazardous Substance Free Products

3. Shape and Dimensions

1) Dimensions: See Fig.3-1 and Table 3-1.

2) Recommended PCB pattern for reflow soldering: See Fig.3-2 and Table 3-1.

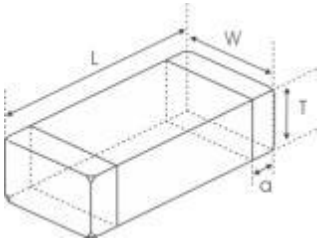


Fig. 3-1

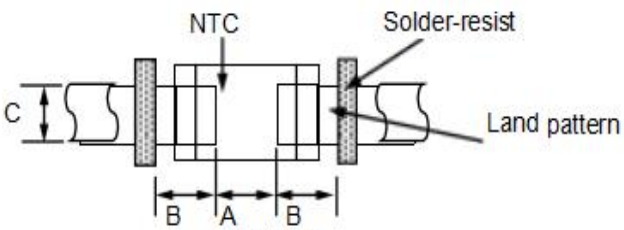


Fig. 3-2

Type	L	W	T	a	A	B	C
0603 [0201]	0.6±0.05 [0.024± 0.002]	0.3±0.05 [0.012± 0.002]	0.3±0.05 [0.012± 0.002]	0.15±0.05 [0.006±0.002]	0.20～0.30	0.20～0.30	0.30～0.35

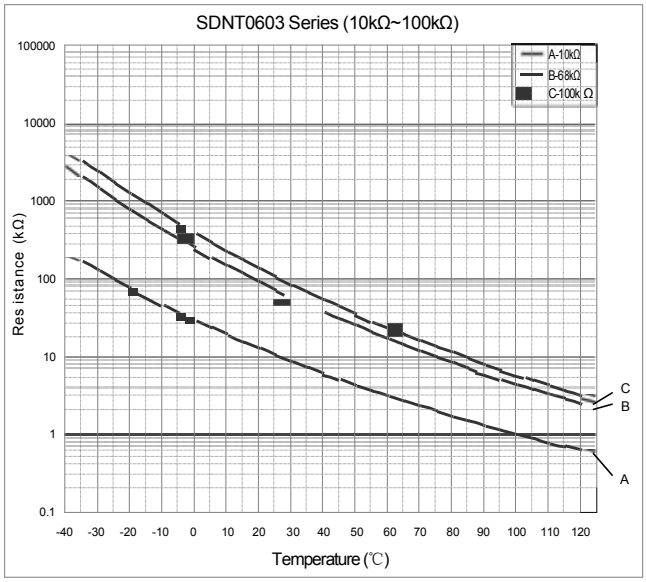
4. Electrical Characteristics

Part Number	Resistance at 25℃ R25 (kΩ)	B constant (25-50℃) (K)	Max. Permissive Operating Current (25℃) (mA)	Thermal Time Constant	Dissipation Factor (mW/℃)	Rated Electric Power (mW)
SDNT0603C103F3380FTF	10	3380	0.31	<3sec	1.0	100

1) Operating and storage temperature range (individual chip without packing): -55℃ ~ +125℃

2) Storage temperature range (packing conditions): -10℃~+40℃ and RH 75% (Max.)

TYPICAL ELECTRICAL CHARACTERISTICS



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℃

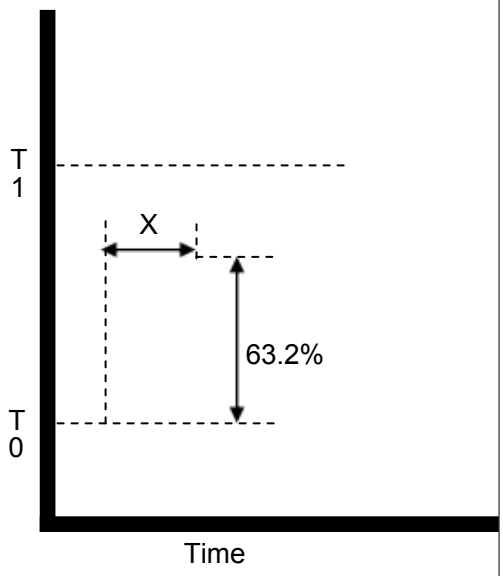
b. Relative Humidity: 65±5%

c. Air Pressure: 86kPa to 106kPa

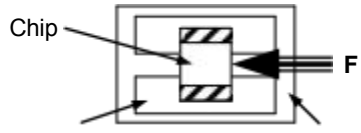
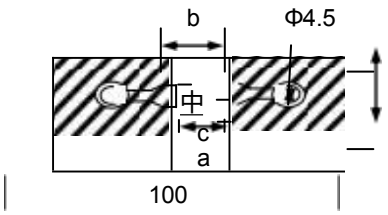
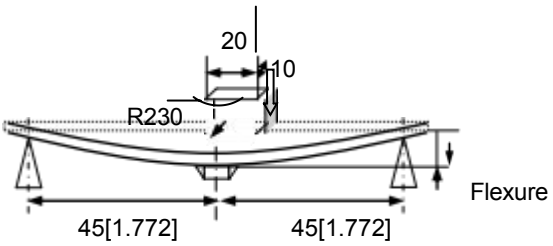
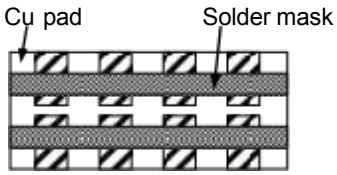
5.2 Visual Examination

a. Inspection Equipment: 20× magnifier

5.3 Electrical Test

Items	Requirements	Test Methods and Remarks
5.3.1 Nominal Zero-Power Resistance (R25)	Refer to **Item 4**	Ambient temperature: 25±0.2℃. Measuring electric power: 0.1mW Max.
5.3.2 Nomina l B Consta nt	Refer to **Item 4**	Measure the resistance at the ambient temperature of 25±0.2℃ and 50±0.2℃ $B=\frac{InR25-InR50}{1/T25-1/T50}$ T: absolute temperature (K)
5.3.3 Thermal Time Constant (single unit)	Refer to **Item 4** 	The total time for the temperature of the thermistor to change by 63.2% of the difference from ambient temperature T0 (℃) to T1 (℃) by the drastic change of the power applied to thermistor from Non-zero Power to Zero-Power state.
5.3.4 Dissipation Constant (single unit)	Refer to **Item 4**	The total electric power required to raise the temperature of the element by 1℃ through self-heating under thermal equilibrium. It calculates by next formula. $C=\frac{W}{T-T0}$.
5.3.5 Rated Power	Refer to **Item 4**	The necessary electric power makes thermistor's temperature rise 100℃ by self-heating at ambient temperature 25℃.
5.3.6 Permissive operating current	Refer to **Item 4**	The current that keeps body temperature of chip NTC on the PC board in still air rising 1°C by self-heating.

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 the following **Fig. 5.4.1-1**) using eutectic solder. Then apply a force in the direction of the arrow. ② 2N force for 0603 series, ③ Keep time: 10±1s.
5.4.2 Resistance to Flexure	No visible mechanical damage. Unit: mm [inch] Type / a / b / c 0603[0201] / 0.25 / 0.8 / 0.3  **Fig. 5.4.2-1**	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**
5.4.3 Vibration	No visible mechanical damage.  **Fig. 5.4.3-1**	① Solder the chip to the testing jig (glass epoxy board shown in **Fig. 5.4.3-1**) using eutectic solder. ② The chipshall 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 ranging from 10 to 55 Hz and returning 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).
5.4.4 Dropping	① No visible mechanical damage.	Drop chip inductor 10 times on a concrete floor from a height of 100 cm.
5.4.5 Solderability	① No visible mechanical damage. ② Wetting shall exceed 80% coverage.	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.
5.4.6 Resistance to Soldering Heat	① No visible mechanical damage. ② R25 change: within ±1%. ③ B Constant change: within ±1%.	① Solder temperature: 260±3℃ ② Duration: 5 sec. ③ Solder: Sn/3.0Ag/0.5Cu. ④ Flux: 25% Resin and 75% ethanol in weight. ⑤ The chipshall be stabilized at normal condition for 1~2 hours before measuring.

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5.4.7 Thermal Shock	① No visible mechanical damage. ② R25 change: within ±1%. ③ B Constant change: within ±1%. 125℃ 30 min. 30 min. Ambient Temperature 30 min -55℃ 20sec. (max.) **Fig. 5.4.7-1**	① Temperature, Time: -55℃for 30±3 min→125℃ for 30±3min. ② Transforming interval: 20sec. Max. ③ Tested cycle: 100 cycles. ④ The chipshall be stabilized at normal condition for 1~2 hours before measuring.
5.4.8 Resistance to Low Temperature	① No visible mechanical damage. ② R25 change: within ±1%. ③ B Constant change: within ±1%.	① Temperature: -55±2℃ ② Duration: 1000^{+24} hours. ③ The chipshall be stabilized at normal condition for 1~2 hours before measuring.
5.4.9 Resistance to High Temperature	① No visible mechanical damage. ② R25 change: within ±1%. ③ B Constant change: within ±1%.	① Temperature: 125±2℃ ② Duration: 1000^{+24} hours. ③ The chipshall be stabilized at normal condition for 1~2 hours before measuring.
5.4.10 Damp Heat (Steady States)	① No visible mechanical damage. ② R25 change: within ±1%. ③ B Constant change: within ±1%.	① Temperature: 60±2℃ ② Humidity: 90% to 95% RH. ③ Duration: 1000^{+24} hours. ④ The chipshall 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 R25 change: Within ±1%. ③ B constant change: Within ±1%.	① Temperature: 85±2℃ ② Duration: 1000^{+24} hours. ③ Applied current: Max. Permissive Operating 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	0603[0201]
T(mm)	0.3±0.05
Tape	Paper Tape
Quantity	15K

(1). Taping Drawings (Unit: mm)

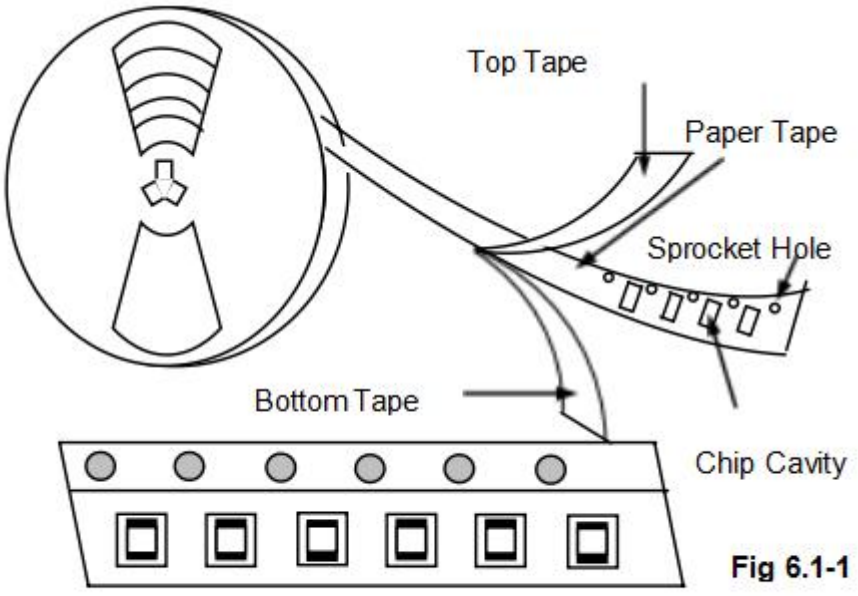


Fig 6.1-1

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

(2) Taping Dimensions (Unit: mm)

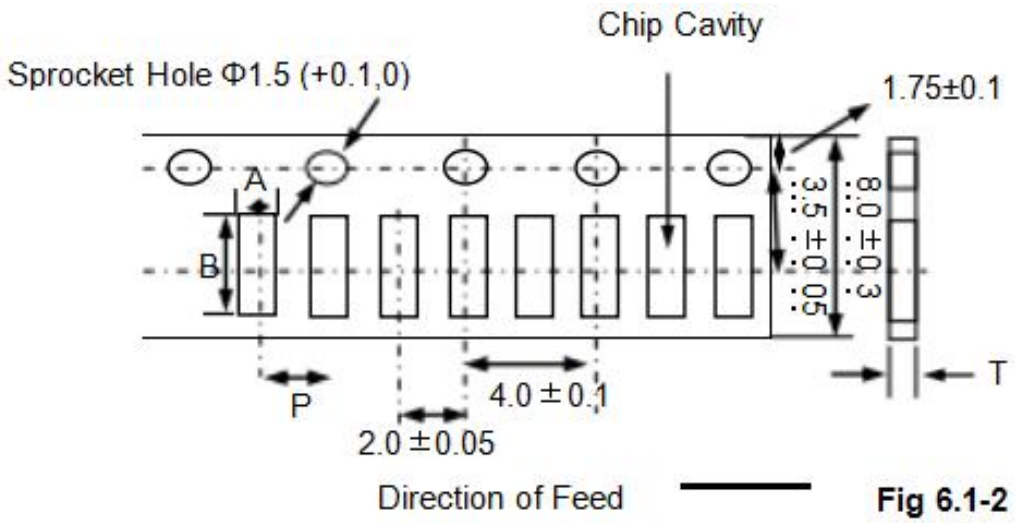


Fig 6.1-2

Type	A	B	P	Tmax
0603[0201]	0.40±0.1	0.70±0.1	2.0±0.05	0.55

(3) Reel Dimensions (Unit: mm)

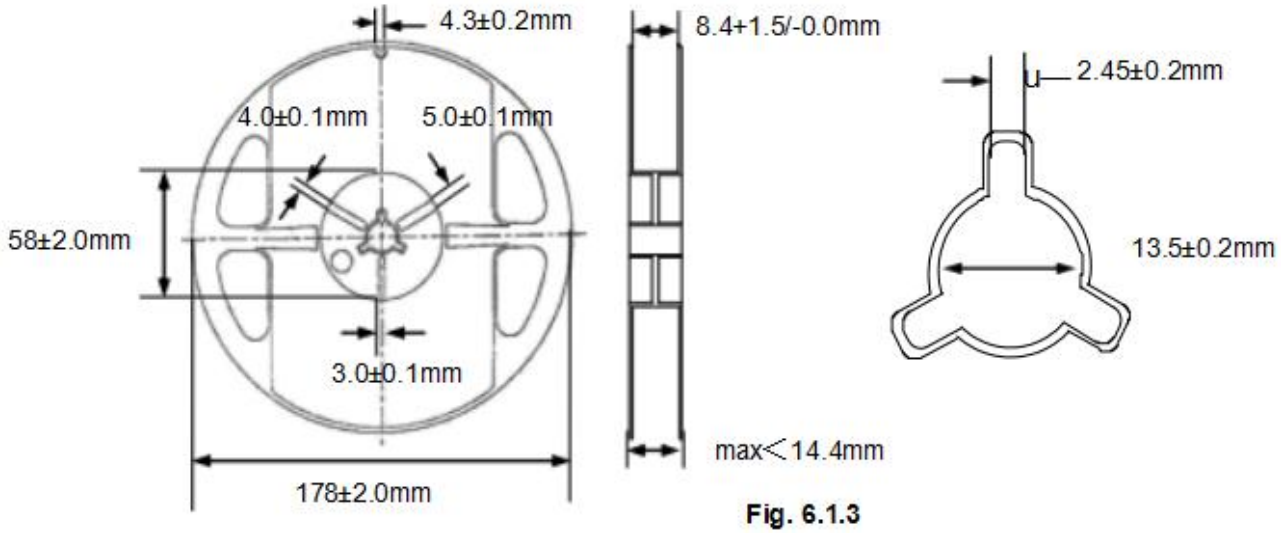


Fig. 6.1.3

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 H2S)

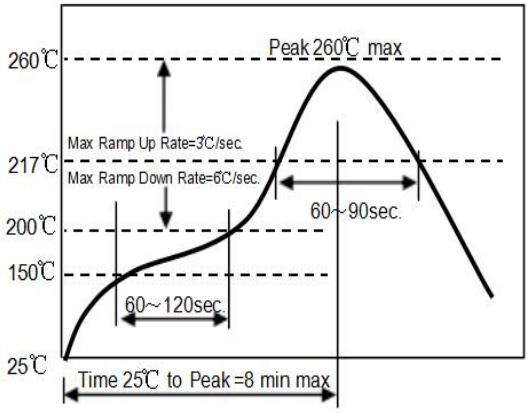
c. Packaging material may be deform-ed if package are stored where they are exposed to heat of direct sunlight.

c. Solderability specified in **Clause 5.4.6** 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 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



[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.]