KNTC0201/10KF3380

1. Scope

This specification applies to KNTC0201/10KF3380 of chip NTC thermistors.

2. Shape and Dimensions

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

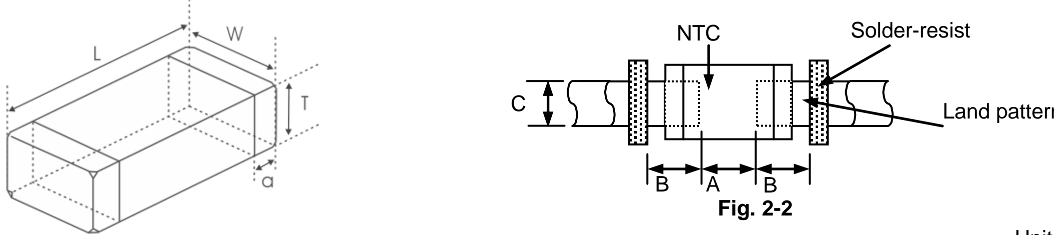


Fig. 2-1

Fig. 2-2

[Table 2-1]

Unit: mm [inch]

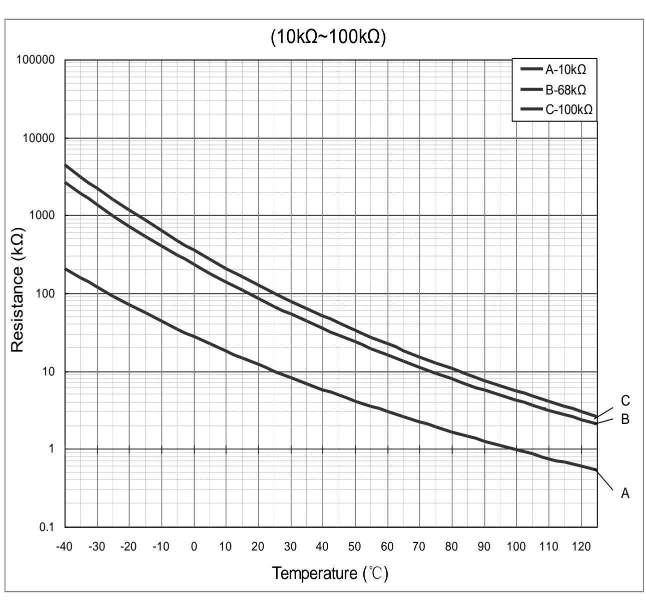
Type	L	W	T	a	A	B	C
0603 [0201]	0.6±0.05 [0.024±0.002]	0.3±0.05 [0.012±0.002]	0.3±0.05 [0.012±0.002]	0.15±0.05 [0.006±0.002]	0.20～0.30	0.20～0.30	0.30～0.35

3. 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)
KNTC0201/10KF3380	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



4. Test and Measurement Procedures

4.1 Test Conditions

4.1.1 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

4.1.2 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

4.2 Visual Examination

a. Inspection Equipment: 20× magnifier

4.3 Electrical Test

Items	Requirements	Test Methods and Remarks
4.3.1 Nominal Zero-Power Resistance (R25)	Refer to **Item 4**	Ambient temperature: 25±0.2℃. Measuring electric power: 0.1mW Max.
4.3.2 Nominal B Constant	Refer to **Item 4**	Measure the resistance at the ambient temperature of 25±0.2℃ and 50±0.2℃ $B = \frac{\ln R25 - \ln R50}{1/T_{25} - 1/T_{50}}$ T: absolute temperature (K)
4.3.3 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 T_0 (℃) to T_1 (℃) by the drastic change of the power applied to thermistor from Non-zero Power to Zero-Power state.
4.3.4 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. $C = \frac{W}{T - T_0}$
4.3.5 Rated Power	Refer to **Item 4**	The necessary electric power makes thermistor's temperature rise 100℃ by self-heating at ambient temperature 25℃.
4.3.6 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.

4.4 Reliability Test

Items	Requirements	Test Methods and Remarks
4.4.1. Terminal Strength	No removal or split of the termination or other defects shall occur. Chip F Mounting Pad Glass Epoxy Board **Fig.4.4.1-1**	① Solder the chip to the testing jig (glass epoxy board shown in the following **Fig. 4.4.1-1**) using eutectic solder. Then apply a force in the direction of the arrow. ② 2N force for 0603 series, ③ Keep time: 10±1s.
4.4.2 Resistance to Flexure	No visible mechanical damage. Unit: mm [inch] Type: 0603[0201]; a: 0.25; b: 0.8; c: 0.3 b Φ4.5 c a 40 100 **Fig. 4.4.2-1**	① Solder the chip to the test jig (glass epoxy board shown in **Fig. 4.4.2-1**) using a eutectic solder. Then apply a force in the direction shown in **Fig. 4.4.2-2**. ② Flexure: 2mm. ③ Pressurizing Speed: 0.5mm/sec. ④ Keep time: 30 sec. 20 10 R230 Flexure 45[1.772] 45[1.772] **Fig. 4.4.2-2**
4.4.3 Vibration	No visible mechanical damage. Cu pad Solder mask Glass Epoxy Board **Fig. 4.4.3-1**	① Solder the chip to the testing jig (glass epoxy board shown in **Fig. 4.4.3-1**) 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 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).
4.4.4 Dropping	① No visible mechanical damage.	Drop chip inductor 10 times on a concrete floor from a height of 100 cm.
4.4.5 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.
4.4.6 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 chip shall be stabilized at normal condition for 1~2 hours before measuring.

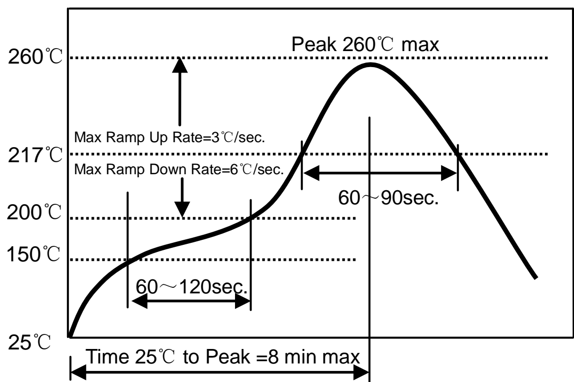
4.4.7 Thermal Shock	① No visible mechanical damage. ② R25 change: within ±1%. ③ B Constant change: within ±1%. 125℃ 30 min. 30 min. Ambient Temperature -55℃ 30 min. 20sec. (max.) **Fig. 4.4.7-1**	① Temperature, Time: -55℃for 30±3 min→125℃ for 30±3min. ② Transforming interval: 20sec. Max. ③ Tested cycle: 100 cycles. ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
4.4.8 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 chip shall be stabilized at normal condition for 1~2 hours before measuring.
4.4.9 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 chip shall be stabilized at normal condition for 1~2 hours before measuring.
4.4.10 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 chip shall be stabilized at normal condition for 1~2 hours before measuring.
4.4.11 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.

5. Recommended Soldering Technologies

5.1 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.]



5.2 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.]