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- Please contact Taiyo Yuden Co., Ltd. for further details of product specifications as the individual specification is available.

- Please conduct validation and verification of products in actual condition of mounting and operating environment before commercial shipment of the equipment.

- All electronic components or functional modules listed in this catalog are developed, designed and intended for use in general electronics equipment.(for AV, office automation, household, office supply, information service, telecommunications, (such as mobile phone or PC) etc.). Before incorporating the components or devices into any equipment in the field such as transportation,(automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network (telephone exchange, base station) etc. which may have direct influence to harm or injure a human body, please contact Taiyo Yuden Co., Ltd. for more detail in advance.

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- The contents of this catalog are applicable to the products which are purchased from our sales offices or distributors (so called "TAIYO YUDEN's official sales channel").

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Should you have any question or inquiry on this matter, please contact our sales staff.

積層チップNTCサーミスタ MULTILAYER CHIP NTC THERMISTORS



フロー／WAVE*

リフロー／REFLOW

* 1005TYPEを除く
* Except for 1005TYPE

OPERATING TEMP. -55～+125℃

特長 FEATURES

- ・125℃保証
- ・B定数が大きく温度検知能力が優れている
- ・表裏の区別がなくバルク、テーピングでの自動装着が可能
- ・寸法はEIAJ規格に準拠
- ・内部電極構造を採用することにより、信頼性向上を実現しています
- ・Guaranteed up to 125℃.
- ・Large B constant for higher temperature sensing capability.
- ・Ideal for automatic mounting in bulk or from tapes because of front-rear symmetry.
- ・Available in a standard EIA compatible case size.
- ・Improved reliability due to use of internal electrodes.

用途 APPLICATIONS

- ・通信機用
自動車電話、携帯電話、コードレス電話ほか
- ・OA機器用
プリンタ、ファクシミリ、ワードプロセッサほか
- ・民生機器用
ビデオ、カラーテレビ、液晶テレビ、CDプレーヤほか
- ・バッテリー保護回路用
- ・Telecommunications equipment : mobile telephones, cellular telephones, cordless telephones, etc.
- ・Office automation : printers, facsimiles, word processors, etc.
- ・Consumer electronics : VCRs, color television sets, LCD television sets, CD players, etc.
- ・Battery protection circuit

形名表記法 ORDERING CODE

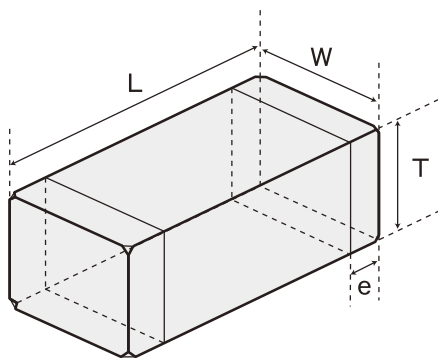
| | | | | |
|------------------------|--|---|---|---------------------------------|
| 1 形式 TB NTCサーミスタ | 3 寸法 [mm] S0 1.0×0.5 (0402) S1 1.6×0.8 (0603) | 5 公称零負荷抵抗 [Ω] 例 102 1000 154 150000 | 7 公称B定数 [K] 例 記号×10 295 2950 410 4100 | 9 最低温度 [℃] 5 -55 |
| 2 形状 P メッキ電極品 | 4 包装 R 紙テーピング S 単品 (袋づめ) | 6 抵抗許容差 [%] F ±1 G ±2 H ±3 J ±5 K ±10 | 8 B定数許容差 [%] F ±1 H ±3 | 10 最高温度 [℃] Q 125 |
| | | | | 11 当社管理記号 △ 標準品 △=スペース |

T B P S 1 S 1 0 3 K 4 4 0 H 5 Q ○

1 2 3 4 5 6 7 8 9 10 11

| | | | | |
|---------------------------------|---|--|--|--|
| 1 Type TB NTC THERMISTOR | 3 Dimension [mm] S0 1.0×0.5 (0402) S1 1.6×0.8 (0603) | 5 Nominal Zero-Power Resistance [Ω] example 102 1000 154 150000 | 7 Nominal B constant [K] example Symbol×10 295 2950 410 4100 | 9 Min. temperature [℃] 5 -55 |
| 2 Shape P Plated terminal | 4 Packaging R Tape&Reel S Bulk | 6 Resistance tolerance [%] F ±1 G ±2 H ±3 J ±5 K ±10 | 8 B constant tolerance [%] F ±1 H ±3 | 10 Max. temperature [℃] Q 125 |
| | | | | 11 Internal code △ Standard product △=Blank space |

外形寸法 EXTERNAL DIMENSIONS

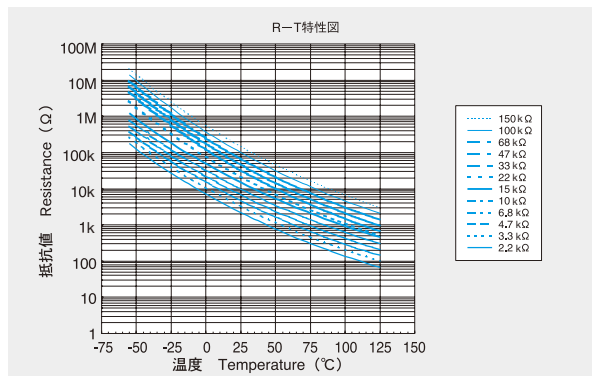


| Type | L | W | T | e |
|-------------|---|---|---|--|
| 1005 (0402) | 1.0 ± 0.05 (0.039 ± 0.002) | 0.5 ± 0.05 (0.020 ± 0.002) | 0.5 ± 0.05 (0.020 ± 0.002) | 0.25 ± 0.10 (0.010 ± 0.004) |
| 1608 (0603) | 1.6 ± 0.15 (0.063 ± 0.006) | 0.8 ± 0.15 (0.031 ± 0.006) | 0.8 ± 0.15 (0.031 ± 0.006) | 0.35 ± 0.25 (0.014 ± 0.010) |

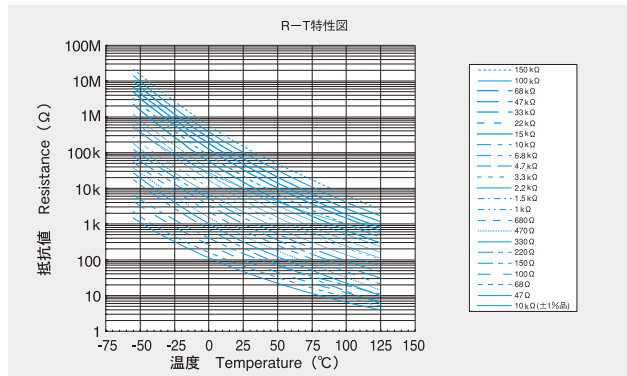
Unit : mm (Inch)

R-T特性図 R-T CHARACTERISTICS

1005type (0402)



1608type (0603)



9

THERMISTORS

仕様 SPECIFICATIONS

| | 許容差 (記号) Tolerance (Symbols) |
|-------------------|--|
| R25 | $\pm 1\%$ (F), $\pm 2\%$ (G), $\pm 3\%$ (H), $\pm 5\%$ (J), $\pm 10\%$ (K) |
| B定数 B Constant | $\pm 1\%$ (F), $\pm 3\%$ (H) |

セレクトションガイド
Selection Guide



etc

アイテム一覧
Part Numbers



特性図
Electrical Characteristics



梱包
Packaging



信頼性
Reliability Data



使用上の注意
Precautions



※営業窓口にご相談ください。Please contact our Sales Department.

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TAIYO YUDEN 2009

△ Please read the "Notice for TAIYO YUDEN products" before using this catalog.

1005TYPE

| 形 名 Ordering Code | | EHS (Environmental Hazardous Substances) | R25 [kΩ] | B定数 B constant | | 熱時定数 Thermal time constant | 熱放散定数 Dissipation factor | 定格電力 Rated Power | 備 考 Remark |
|----------------------|--|---|-------------|-------------------|--------------|----------------------------------|--------------------------------|---------------------|---------------|
| | | | | (K : 25/85℃) | (K : 25/50℃) | | | | |
| TBPS0○222△410H5Q | | RoHS | 2.2 | 4100 | 4034 | ≤3 sec | 0.5~2.0 mW/℃ | 35mW | |
| TBPS0○332△410H5Q | | RoHS | 3.3 | 4100 | 4034 | | | | |
| TBPS0○472△410H5Q | | RoHS | 4.7 | 4100 | 4034 | | | | |
| TBPS0○682△410H5Q | | RoHS | 6.8 | 4100 | 4034 | | | | |
| TBPS0○103△410H5Q | | RoHS | 10 | 4100 | 4034 | | | | |
| TBPS0○153△410H5Q | | RoHS | 15 | 4100 | 4034 | | | | |
| TBPS0○223△440H5Q | | RoHS | 22 | 4400 | 4336 | | | | |
| TBPS0○333△455H5Q | | RoHS | 33 | 4550 | 4483 | | | | |
| TBPS0○473△455H5Q | | RoHS | 47 | 4550 | 4483 | | | | |
| TBPS0○683△455H5Q | | RoHS | 68 | 4550 | 4483 | | | | |
| TBPS0○104△455H5Q | | RoHS | 100 | 4550 | 4483 | | | | |
| TBPS0○154△455H5Q | | RoHS | 150 | 4550 | 4483 | | | | |

形名の○には包装 (R=テーピング、S=単品)、△には抵抗値許容差記号 (J,K) が入ります。

○Please specify the packaging code (R : tape & reel, S : Bulk) and △ the resistance tolerance code (J, K).

1608TYPE

| 形 名 Ordering Code | | EHS (Environmental Hazardous Substances) | R25 [kΩ] | B定数 B constant | | 熱時定数 Thermal time constant | 熱放散定数 Dissipation factor | 定格電力 Rated Power | 備 考 Remark |
|----------------------|--|---|-------------|-------------------|--------------|----------------------------------|--------------------------------|---------------------|---------------|
| | | | | (K : 25/85℃) | (K : 25/50℃) | | | | |
| TBPS1○470△295H5Q | | RoHS | 0.047 | 2950 | 2934 | ≤5 sec | 1.0~2.5 mW/℃ | 63mW | |
| TBPS1○680△295H5Q | | RoHS | 0.068 | 2950 | 2934 | | | | |
| TBPS1○101△315H5Q | | RoHS | 0.100 | 3150 | 3157 | | | | |
| TBPS1○151△315H5Q | | RoHS | 0.150 | 3150 | 3157 | | | | |
| TBPS1○221△410H5Q | | RoHS | 0.22 | 4100 | 4034 | | | | |
| TBPS1○331△410H5Q | | RoHS | 0.33 | 4100 | 4034 | | | | |
| TBPS1○471△410H5Q | | RoHS | 0.47 | 4100 | 4034 | | | | |
| TBPS1○681△410H5Q | | RoHS | 0.68 | 4100 | 4034 | | | | |
| TBPS1○102△410H5Q | | RoHS | 1.0 | 4100 | 4034 | | | | |
| TBPS1○152△410H5Q | | RoHS | 1.5 | 4100 | 4034 | | | | |
| TBPS1○222△410H5Q | | RoHS | 2.2 | 4100 | 4034 | | | | |
| TBPS1○332△410H5Q | | RoHS | 3.3 | 4100 | 4034 | | | | |
| TBPS1○472△440H5Q | | RoHS | 4.7 | 4400 | 4336 | | | | |
| TBPS1○682△440H5Q | | RoHS | 6.8 | 4400 | 4336 | | | | |
| TBPS1○103△440H5Q | | RoHS | 10 | 4400 | 4336 | | | | |
| TBPS1○153△460H5Q | | RoHS | 15 | 4600 | 4533 | | | | |
| TBPS1○223△460H5Q | | RoHS | 22 | 4600 | 4533 | | | | |
| TBPS1○333△460H5Q | | RoHS | 33 | 4600 | 4533 | | | | |
| TBPS1○473△475H5Q | | RoHS | 47 | 4750 | 4642 | | | | |
| TBPS1○683△475H5Q | | RoHS | 68 | 4750 | 4642 | | | | |
| TBPS1○104△475H5Q | | RoHS | 100 | 4750 | 4642 | | | | |
| TBPS1○154△475H5Q | | RoHS | 150 | 4750 | 4642 | | | | |
| TBPS1○103△344F5Q | | RoHS | 10 | 3435 | 3395 | | | | |

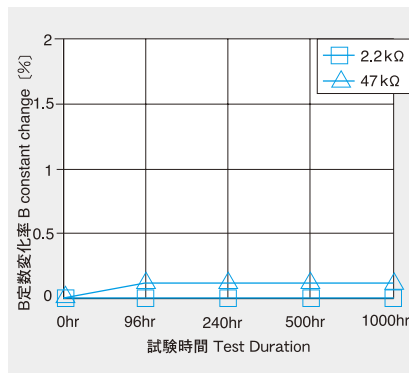
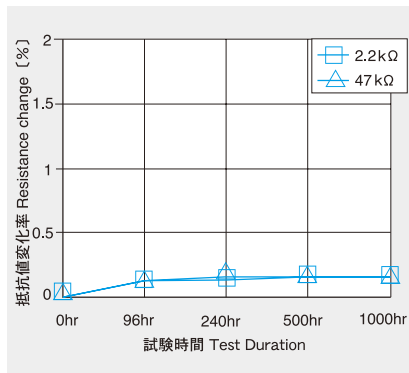
形名の○には包装 (R=テーピング、S=単品)、△には抵抗値許容差記号 (J, K (TBP S1 ○ 103 △ 344 F 5QはF,GまたはH)) が入ります。

○Please specify the packaging code (R : tape & reel, S : Bulk) and △ the resistance tolerance code (F,G or H for TBP S1 ○ 103 △ 344 F 5Q J, K for other part numbers).

1005type (0402)

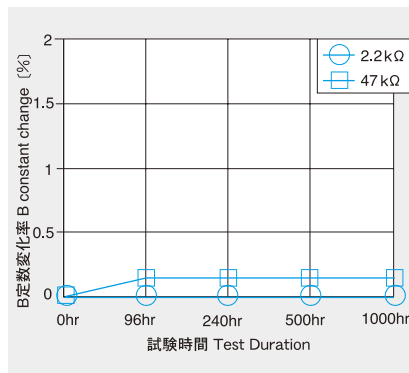
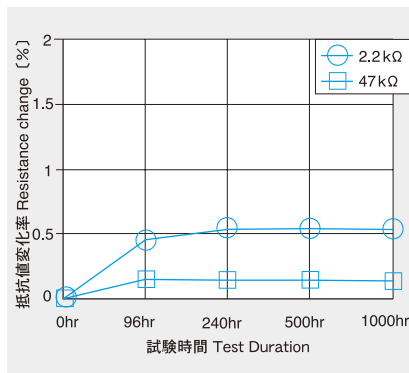
高温放置 High Temperature Life Test

試験条件 Test Condition 125°C



耐湿性 Damp Heat (steady state)

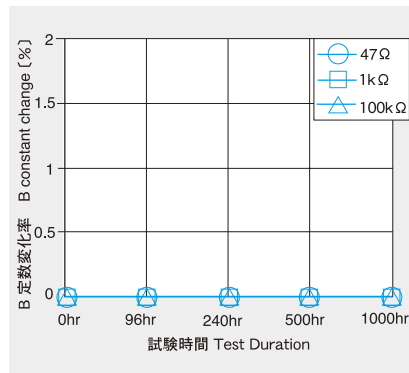
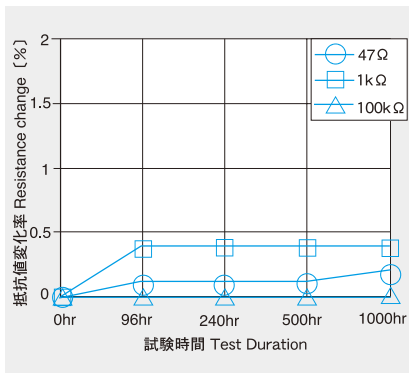
試験条件 Test Condition 85°C95%



1608type (0603)

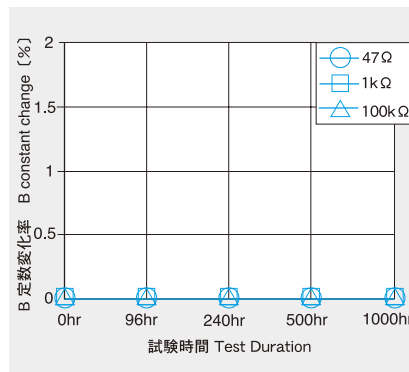
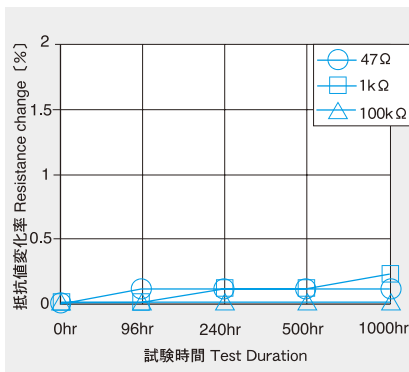
高温放置 High Temperature Life Test

試験条件 Test Condition 125°C



耐湿性 Damp Heat (steady state)

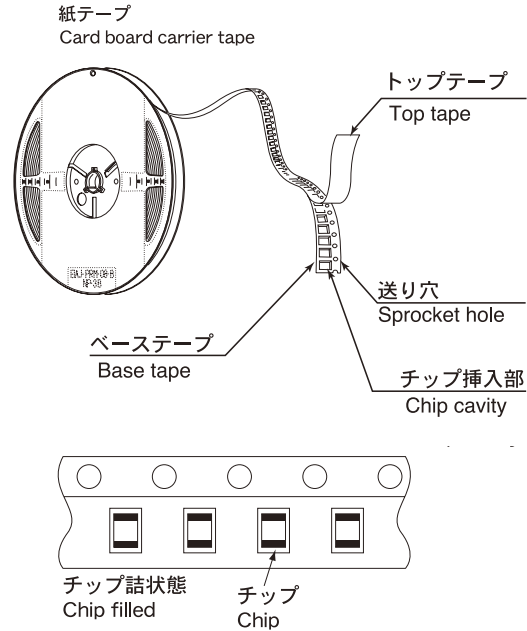
試験条件 Test Condition 85°C95%



①最小受注単位数 Minimum Quantity

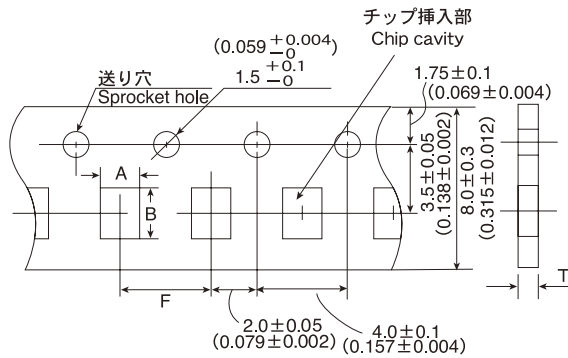
| 形 式 Type | 製品厚み Thickness [mm] | 標準数量 Standard quantity [pcs] | |
|-------------|---------------------------|------------------------------|-------------|
| | | 袋詰め Bulk | 紙テープ Taping |
| 1005 (0402) | 0.5 (0.020) | 10000 | 10000 |
| 1608 (0603) | 0.8 (0.031) | 2000 | 4000 |

②テーピング材質 Tape material



③テーピング寸法 Taping Dimensions

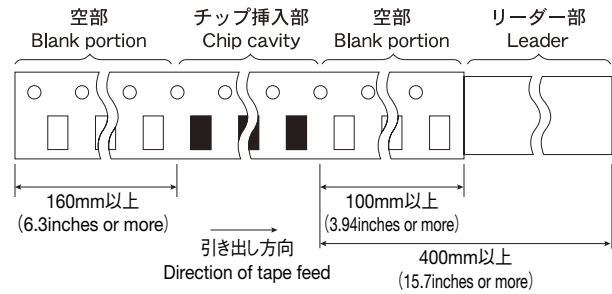
紙テープ (8mm幅) Paper tape (0.315inches wide)



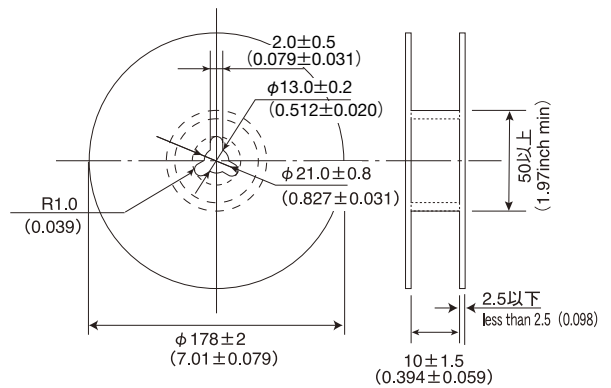
| 形 式 Type | チップ挿入部 Chip cavity | | 挿入ピッチ Insertion pitch | テープ厚み Tape thickness |
|-------------|---------------------------|---------------------------|---------------------------|-------------------------|
| | A | B | F | T |
| 1005 (0402) | 0.65±0.1 (0.026±0.004) | 1.15±0.1 (0.045±0.004) | 2.0±0.05 (0.079±0.002) | 0.8max (0.031max) |
| 1608 (0603) | 1.0±0.2 (0.039±0.008) | 1.8±0.2 (0.071±0.008) | 4.0±0.1 (0.157±0.004) | 1.1max (0.043max) |

Unit : mm (Inch)

④リーダー部・空部 Leader and Blank portion



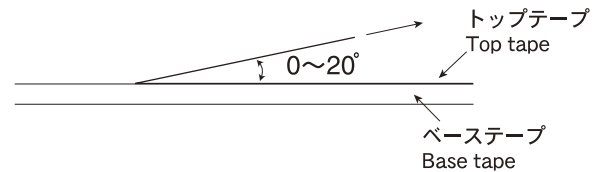
⑤リール寸法 Reel size



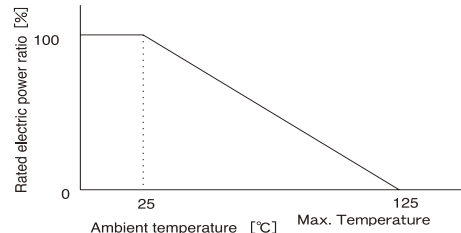
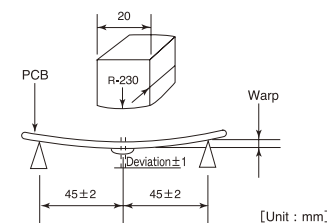
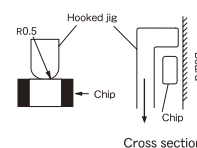
Unit : mm (Inch)

⑥トップテープ強度 Top Tape Strength

トップテープのはがし力とは下図矢印方向にて0.1~0.7Nとなります。
The top tape requires a peel;-off force of 0.1~0.7N in the direction of the arrow as illustrated below.



MULTILAYER CHIP NTC THERMISTORS

| Item | Specified Value | | Test Methods and Remarks |
|--|--|--|---|
| | 1005 (0402) | 1608 (0603) | |
| 1. Operating Temperature Range | -55 to +125°C | | |
| 2. Storage Temperature Range | -55 to +125°C | | |
| 3. Rated Power | 35mW | 63mW | |
| 4. Nominal Zero-Power Resistance | 2.2~150kΩ ±5% ±10% | 0.047~150kΩ ±5% ±10% | Ambient temperature : 25±0.2°C Measuring electric power : 0.1mW max. |
| 5. Nominal B Constant | 4100~4550K ±3% | 2950~4750K ±3% | Measure the resistance at the ambient temperatures of 25±0.2°C and +85±0.2°C. $B = \frac{\ln R_{25} - \ln R_{85}}{1/T_{25} - 1/T_{85}}$ T : Absolute temperature T ₀ : 273.15 |
| 6. Dissipation Constant (single unit) | 0.5 to 2.0mW/°C | 1.0 to 2.5mW/°C | This represents the amount of electric power required to raise the temperature of the element by 1°C through self-heating under thermal equilibrium. |
| 7. Thermal Time Constant (single unit) | Within 3 sec. | Within 5 sec. | This represents the amount of time for the temperature of the thermistor element to change by 63.2% of the difference between the initial temperature and the ambient temperature by the drastic change of power application into thermistor from non-zero-power to zero-power state. |
| 8. Rated Ambient Temperature | 25°C | | This represents the maximum ambient temperature at which rated power could be applied. |
| 9. Electric Power Derating Curve | As shown in the figure at right. | | This represents the relations between the ambient temperature and the maximum permissible power.  |
| 10. Resistance to Flexure of Substrate | R25 change : Within ±3% B constant change : Within ±1% | R25 change : Within ±5% B constant change : Within ±2% | Warp : 2mm Testing board : glass-epoxy-resin substrate Board thickness : 0.8mm Pressing speed : 0.5mm/sec. Duration : 30 sec.  [Unit : mm] |
| 11. Adhesion of Terminal Electrode | R25 change : Within ±3% B constant change : Within ±1% | R25 change : Within ±5% B constant change : Within ±2% | Applied force : 5N Duration : 10sec.  |

MULTILAYER CHIP NTC THERMISTORS

| Item | Specified Value | | Test Methods and Remarks |
|--------------------------------|--|--|--|
| | 1005 (0402) | 1608 (0603) | |
| 12. Solderability | At least 75% of terminal electrode is covered by new solder. | At least 80% of terminal electrode is covered by new solder. | According to JIS C5102 clause 8.4. Solder temperature : 230±5°C Duration : 4±1 sec. |
| 13. Resistance to Soldering | R25 change : Within ±3% B constant change : Within ±1% | R25 change : Within ±5% B constant change : Within ±2% | Reflow soldering : Solder temperature : 240°C Duration : 5 sec. Preheating temperature : 150°C Preheating time : 90 sec. Number of reflows : 3 times testing substrate : glass-epoxy-resin substrate |
| 14. Thermal Shock | R25 change : Within ±3% B Constant change : Within ±1% | R25 change : Within ±5% B Constant change : Within ±3% | Conditions for 1 cycle Step1 : Minimum operating temperature +0/-3°C 30±3 min Step2 : Room temperature 2 to 3 min Step3 : Maximum operating temperature +0/-3°C 30±3 min Step4 : Room temperature 2 to 3 min Number of cycles : 5 Recovery : 2 to 3 hrs of recovery under the standard condition after the test. |
| 15. High Temperature Life Test | R25 change : Within ±3% B Constant change : Within ±1% | R25 change : Within ±5% B Constant change : Within ±3% | Temperature : 125±2°C Duration : 1000±12 hrs Recovery : 2 hrs of recovery under the standard condition after the removal from test chamber. testing substrate : glass-epoxy-resin substrate |
| 16. Damp Heat (steady state) | R25 change : Within ±3% B Constant change : Within ±1% | R25 change : Within ±5% B Constant change : Within ±3% | Temperature : 85±2°C Humidity : 85±5% RH Duration : 1000±12 hrs Recovery : 2 hrs of recovery under the standard condition after the removal from test chamber. testing substrate : glass-epoxy-resin substrate |

Note on standard condition : "standard condition" referred to herein is defined as follows :

5 to 35°C of temperature, 45 to 85% relative humidity and 86 to 106kPa of air pressure.

When there are questions concerning measurement results :

In order to provide correlation data, the test shall be conducted under condition of 20±2°C of temperature, 60 to 70% relative humidity and 86 to 106kPa of air pressure.

Unless otherwise specified, all the tests are conducted under the "standard condition."