

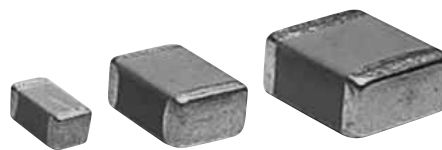
Upgrade!

## NTS Series

### Surface Mount Device

#### ◆FEATURES

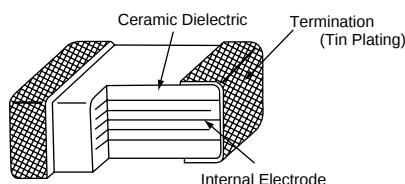
1. Large capacitance by small size.
2. Excellent noise absorption.
3. High permissible ripple current capability.
4. Pb-free design.
5. Tin plate terminations.



#### ◆APPLICATIONS

1. Smoothing circuit of DC-DC converters.
2. On-board power supplies.
3. Voltage regulators for computers.
4. Noise suppressor for various kinds of equipments.
5. High reliability equipments.

#### ◆CONSTRUCTION



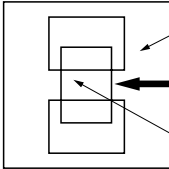
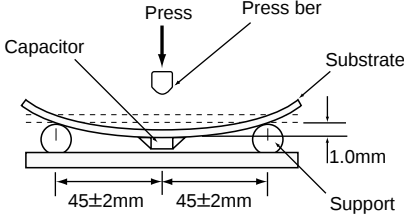
#### ◆RATINGS

|                                |                                 |
|--------------------------------|---------------------------------|
| 1. Category Temperature Range  | -55 to +125°C                   |
| 2. Rated Voltage Range         | 25, 50, 100, 250V <sub>dc</sub> |
| 3. Rated Capacitance Range     | 0.033 to 33μF                   |
| 4. Rated Capacitance Tolerance | K (±10%), M (±20%)              |
| 5. Temperature Characteristics | X5R, X7R                        |
| 6. Rated Ripple Current        | See No.5 on the following table |

#### ◆SPECIFICATIONS

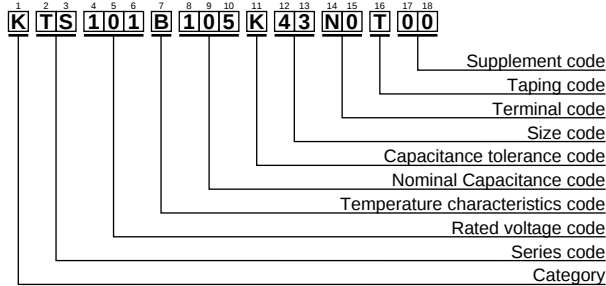
| No.       | Items                 | Specification                                                                                                                                                | Test Condition                                                         |                      |                      |    |    |      |     |     |     |     |                                                                                                |  |  |
|-----------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------|----------------------|----|----|------|-----|-----|-----|-----|------------------------------------------------------------------------------------------------|--|--|
| 1         | Withstand Voltage     | No abnormality.                                                                                                                                              | 250% of rated voltage shall be applied for 5 seconds.                  |                      |                      |    |    |      |     |     |     |     |                                                                                                |  |  |
| 2         | Insulation Resistance | 100/C <sub>R</sub> (MΩ) or 4000(MΩ) whichever is less.                                                                                                       | Rated voltage shall be applied for 60±5 seconds at temperature 25±2°C. |                      |                      |    |    |      |     |     |     |     |                                                                                                |  |  |
| 3         | Rated Capacitance     | Within specified tolerance.                                                                                                                                  |                                                                        | C <sub>R</sub> ≤10μF | C <sub>R</sub> >10μF |    |    |      |     |     |     |     |                                                                                                |  |  |
|           |                       |                                                                                                                                                              | Temperature                                                            | 25±2°C               |                      |    |    |      |     |     |     |     |                                                                                                |  |  |
| 4         | Dissipation Factor    | 5.0% maximum.                                                                                                                                                | Frequency                                                              | 1±0.1kHz             | 120±12Hz             |    |    |      |     |     |     |     |                                                                                                |  |  |
|           |                       |                                                                                                                                                              | Voltage                                                                | 1±0.2Vrms            | 0.5±0.2Vrms          |    |    |      |     |     |     |     |                                                                                                |  |  |
| 5         | Rated Ripple Current  | <table><tr><td>Size code</td><td>31</td><td>32</td><td>43</td><td>55</td></tr><tr><td>Arms</td><td>0.3</td><td>0.5</td><td>1.0</td><td>2.0</td></tr></table> | Size code                                                              | 31                   | 32                   | 43 | 55 | Arms | 0.3 | 0.5 | 1.0 | 2.0 | 10kHz~1MHz (sine curve)<br>Ripple voltage V <sub>p</sub> shall be less than the rated voltage. |  |  |
| Size code | 31                    | 32                                                                                                                                                           | 43                                                                     | 55                   |                      |    |    |      |     |     |     |     |                                                                                                |  |  |
| Arms      | 0.3                   | 0.5                                                                                                                                                          | 1.0                                                                    | 2.0                  |                      |    |    |      |     |     |     |     |                                                                                                |  |  |

## ◆ SPECIFICATIONS

| No.  | Items                             | Specification                                                                                                                                                                   | Test Condition                                                                                                                                                                                                                                                                                                                                                                                 |      |                  |        |   |                              |      |   |                  |        |   |                              |      |   |                  |        |
|------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------|--------|---|------------------------------|------|---|------------------|--------|---|------------------------------|------|---|------------------|--------|
| 6    | Adhesion                          | No visible damage.                                                                                                                                                              | <div><p>Substrate</p><p>5N (0.51kgf)<br/>for 10±1 seconds</p><p>Capacitor</p></div>                                                                                                                                                                                                                         |      |                  |        |   |                              |      |   |                  |        |   |                              |      |   |                  |        |
| 7    | Bend strength of the face plating | Appearance : No visible damage.<br>ΔC/C : ±15%                                                                                                                                  | <p>The substrate shall be bend by 1mm at a rate of 1mm/s for 5 seconds.</p> <div><p>Press</p><p>Press ber</p><p>Capacitor</p><p>Substrate</p><p>1.0mm</p><p>Support</p><p>45±2mm</p><p>45±2mm</p></div>                                                                                                      |      |                  |        |   |                              |      |   |                  |        |   |                              |      |   |                  |        |
| 8    | Solderability                     | Min. 75% of surface of the termination shall be covered with new solder                                                                                                         | <p>Solder Temperature : 235±5°C<br/>Dipping Time : 2±0.5 sec.<br/>Solder : Eutectic solder containing Ag2.5 to 3wt%</p>                                                                                                                                                                                                                                                                        |      |                  |        |   |                              |      |   |                  |        |   |                              |      |   |                  |        |
| 9    | Resistance to Soldering Heat      | Appearance : No visible damage.<br>ΔC/C : ±15%<br>D.F. : To meet the initial specification.<br>I.R. : To meet the initial specification.<br>Withstand voltage : No abnormality. | <p>Solder Temperature : 260±5°C<br/>Dipping Time : 2±0.5 seconds<br/>Solder : Eutectic solder containing Ag2.5 to 3wt%</p>                                                                                                                                                                                                                                                                     |      |                  |        |   |                              |      |   |                  |        |   |                              |      |   |                  |        |
| 10   | Temperature Cycle                 | Appearance : No visible damage.<br>ΔC/C : ±15%<br>D.F. : To meet the initial specification.<br>I.R. : To meet the initial specification.<br>Withstand voltage : No abnormality. | <table><tr><th>Step</th><th>Temperature (°C)</th><th>(min.)</th></tr><tr><td>1</td><td>Min. Category temperature ±3</td><td>30±3</td></tr><tr><td>2</td><td>Room temperature</td><td>3 max.</td></tr><tr><td>3</td><td>Max. Category temperature ±2</td><td>30±3</td></tr><tr><td>4</td><td>Room temperature</td><td>3 max.</td></tr></table> <p>For 5 cycles for above temperature cycle.</p> | Step | Temperature (°C) | (min.) | 1 | Min. Category temperature ±3 | 30±3 | 2 | Room temperature | 3 max. | 3 | Max. Category temperature ±2 | 30±3 | 4 | Room temperature | 3 max. |
| Step | Temperature (°C)                  | (min.)                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                |      |                  |        |   |                              |      |   |                  |        |   |                              |      |   |                  |        |
| 1    | Min. Category temperature ±3      | 30±3                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                |      |                  |        |   |                              |      |   |                  |        |   |                              |      |   |                  |        |
| 2    | Room temperature                  | 3 max.                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                |      |                  |        |   |                              |      |   |                  |        |   |                              |      |   |                  |        |
| 3    | Max. Category temperature ±2      | 30±3                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                |      |                  |        |   |                              |      |   |                  |        |   |                              |      |   |                  |        |
| 4    | Room temperature                  | 3 max.                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                |      |                  |        |   |                              |      |   |                  |        |   |                              |      |   |                  |        |
| 11   | Humidity Load Life                | Appearance : No abnormality.<br>ΔC/C : ±15%<br>D.F. : 10% maximum<br>I.R. : 25/C <sub>R</sub> (MΩ) or 1000(MΩ)<br>                                                              |                                                                                                                                                                                                                                                                                                                                                                                                |      |                  |        |   |                              |      |   |                  |        |   |                              |      |   |                  |        |

\*C<sub>R</sub> : Rated Capacitance(μF)

### ◆PART NUMBERING SYSTEM



### ◆NTS SERIES STANDARD RATINGS

| Part Number        | Rated voltage<br>(Vdc) | Rated Capacitance<br>(μF) | Dimensions(mm) |         |       |         | Previous Part Number<br>(Just for your reference) |
|--------------------|------------------------|---------------------------|----------------|---------|-------|---------|---------------------------------------------------|
|                    |                        |                           | L              | W       | Tmax. | a       |                                                   |
| KTS250C105M31N0T00 | 25                     | 1.0                       | 3.2±0.2        | 1.6±0.2 | 1.8   | 0.5±0.3 | NTS30X5R1E105MT                                   |
| KTS250C155M31N0T00 |                        | 1.5                       |                |         |       |         | NTS30X5R1E155MT                                   |
| KTS250C225M31N0T00 |                        | 2.2                       |                |         |       |         | NTS30X5R1E225MT                                   |
| KTS250C335M32N0T00 |                        | 3.3                       |                |         |       |         | NTS40X5R1E335MT                                   |
| KTS250C475M32N0T00 |                        | 4.7                       | 3.2±0.4        | 2.5±0.3 | 2.6   | 0.6±0.3 | NTS40X5R1E475MT                                   |
| KTS250C685M32N0T00 |                        | 6.8                       |                |         |       |         | NTS40X5R1E685MT                                   |
| KTS250C106M43N0T00 |                        | 10                        |                |         |       |         | NTS50X5R1E106MT                                   |
| KTS250C156M43N0T00 |                        | 15                        | 4.5±0.4        | 3.2±0.4 | 2.8   | 0.6±0.3 | NTS50X5R1E156MT                                   |
| KTS250C226M55N0T00 |                        | 22                        |                |         |       |         | NTS60X5R1E226MT                                   |
| KTS250C336M55N0T00 |                        | 33                        |                |         |       |         | NTS60X5R1E336MT                                   |
| KTS500C334M31N0T00 | 50                     | 0.33                      | 3.2±0.2        | 1.6±0.2 | 1.8   | 0.5±0.3 | NTS30X5R1H334MT                                   |
| KTS500C474M31N0T00 |                        | 0.47                      |                |         |       |         | NTS30X5R1H474MT                                   |
| KTS500C684M31N0T00 |                        | 0.68                      |                |         |       |         | NTS30X5R1H684MT                                   |
| KTS500C105M32N0T00 |                        | 1.0                       |                |         |       |         | NTS40X5R1H105MT                                   |
| KTS500C155M32N0T00 |                        | 1.5                       | 3.2±0.4        | 2.5±0.3 | 2.6   | 0.6±0.3 | NTS40X5R1H155MT                                   |
| KTS500C225M32N0T00 |                        | 2.2                       |                |         |       |         | NTS40X5R1H225MT                                   |
| KTS500C335M43N0T00 |                        | 3.3                       |                |         |       |         | NTS50X5R1H335MT                                   |
| KTS500C475M43N0T00 |                        | 4.7                       | 4.5±0.4        | 3.2±0.4 | 2.6   | 0.6±0.3 | NTS50X5R1H475MT                                   |
| KTS500C685M55N0T00 |                        | 6.8                       |                |         | 2.8   |         | NTS60X5R1H685MT                                   |
| KTS500C106M55N0T00 |                        | 10                        |                |         | 2.8   |         | NTS60X5R1H106MT                                   |
| KTS101B104K31N0T00 | 100                    | 0.1                       | 3.2±0.2        | 1.6±0.2 | 1.8   | 0.5±0.3 | NTS30X7R2A104KT                                   |
| KTS101B154K31N0T00 |                        | 0.15                      |                |         |       |         | NTS30X7R2A154KT                                   |
| KTS101B224K31N0T00 |                        | 0.22                      |                |         |       |         | NTS30X7R2A224KT                                   |
| KTS101B334K31N0T00 |                        | 0.33                      |                |         |       |         | NTS30X7R2A334KT                                   |
| KTS101B474K32N0T00 |                        | 0.47                      | 3.2±0.4        | 2.5±0.3 | 2.6   | 0.6±0.3 | NTS40X7R2A474KT                                   |
| KTS101B684K32N0T00 |                        | 0.68                      |                |         |       |         | NTS40X7R2A684KT                                   |
| KTS101B105K32N0T00 |                        | 1.0                       |                |         |       |         | NTS40X7R2A105KT                                   |
| KTS101B155K43N0T00 |                        | 1.5                       | 4.5±0.4        | 3.2±0.4 | 2.8   | 0.6±0.3 | NTS50X7R2A155KT                                   |
| KTS101B225K43N0T00 |                        | 2.2                       |                |         |       |         | NTS50X7R2A225KT                                   |
| KTS101B335K55N0T00 |                        | 3.3                       |                |         |       |         | NTS60X7R2A335KT                                   |
| KTS101B475K55N0T00 | 250                    | 4.7                       | 5.7±0.4        | 5.0±0.4 | 2.8   | 0.8±0.5 | NTS60X7R2A475KT                                   |
| KTS251B333K31N0T00 |                        | 0.033                     |                |         |       |         | NTS30X7R2E333KT                                   |
| KTS251B473K31N0T00 |                        | 0.047                     |                |         |       |         | NTS30X7R2E473KT                                   |
| KTS251B683K31N0T00 |                        | 0.068                     |                |         |       |         | NTS30X7R2E683KT                                   |
| KTS251B104K32N0T00 |                        | 0.1                       | 3.2±0.4        | 2.5±0.3 | 2.6   | 0.6±0.3 | NTS40X7R2E104KT                                   |
| KTS251B154K32N0T00 |                        | 0.15                      |                |         |       |         | NTS40X7R2E154KT                                   |
| KTS251B224K32N0T00 |                        | 0.22                      |                |         |       |         | NTS40X7R2E224KT                                   |
| KTS251B334K43N0T00 |                        | 0.33                      |                |         |       |         | NTS50X7R2E334KT                                   |
| KTS251B474K43N0T00 |                        | 0.47                      | 4.5±0.4        | 3.2±0.4 | 2.6   | 0.6±0.3 | NTS50X7R2E474KT                                   |
| KTS251B684K55N0T00 |                        | 0.68                      |                |         | 2.8   |         | NTS60X7R2E684KT                                   |
| KTS251B105K55N0T00 |                        | 1.0                       |                |         | 2.8   |         | NTS60X7R2E105KT                                   |