

# Surface Mount Specialty Polymer Solid Aluminum Electrolytic Capacitors

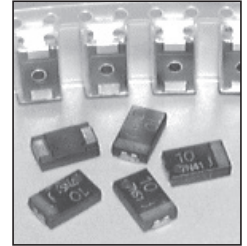
NSPX Series

## FEATURES

- HIGH VOLTAGE MULTILAYER SOLID POLYMER ALUMINUM CAPACITOR
- LOW PROFILE (1.1MM ~ 1.9MM HEIGHT), RESIN PACKAGE
- HIGH RIPPLE CURRENT AND SURGE VOLTAGE CAPABILITIES
- FITS EIA (7343) "D" AND "E" TANTALUM CHIP LAND PATTERNS
- Pb-FREE AND COMPATIBLE WITH REFLOW SOLDERING

**RoHS  
Compliant**  
includes all homogeneous materials

\*See Part Number System for Details



## CHARACTERISTICS

|                                                                               |                    |                                            |
|-------------------------------------------------------------------------------|--------------------|--------------------------------------------|
| Rated Working Range                                                           | 10 ~ 35VDC         |                                            |
| Rated Capacitance Range                                                       | 10 ~ 100µF         |                                            |
| Operating Temperature Range                                                   | -55 ~ +105°C       |                                            |
| Capacitance Tolerance                                                         | ± 20% (M)          |                                            |
| Max. Leakage Current (µA)<br>After 2 Minutes (+20°C)                          | ≤ 0.3CV            |                                            |
| Max. Tan δ, 120Hz, +20°C                                                      | 0.06               |                                            |
| High Temperature Load Life<br>2,000 Hours @ 105°C<br>at Rated Working Voltage | Capacitance Change | Within ±20% of initial measured value      |
|                                                                               | Tan δ              | Less than 200% specified max. value        |
|                                                                               | Leakage Current    | Less than specified max. value             |
| Damp Heat Test<br>500 Hours @ +60°C at 90% RH<br>without load                 | Capacitance Change | Within -20%/+60% of initial measured value |
|                                                                               | Tan δ              | Less than 200% of specified max. value     |
|                                                                               | Leakage Current    | ≤ 0.9CV                                    |

## STANDARD PRODUCTS AND SPECIFICATIONS

| NIC Part Number  | WV    | SV   | Cap. | Max. LC | Tan δ | Max. Ripple Current<br>+45°C & 100KHz (mArms) | Max. ESR<br>+20°C & 100KHz (Ω) | Height<br>H |
|------------------|-------|------|------|---------|-------|-----------------------------------------------|--------------------------------|-------------|
|                  | (Vdc) |      | (µF) | (µA)    |       |                                               |                                |             |
| NSPX470M10D5ATRF | 10    | 12.5 | 47   | 141.0   | 0.06  | 3200                                          | 0.04                           | 1.1±0.1     |
| NSPX470M10D6ATRF | 10    | 12.5 | 47   | 141.0   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX680M10D1ATRF | 10    | 12.5 | 68   | 204.0   | 0.06  | 3200                                          | 0.04                           | 1.4±0.1     |
| NSPX680M10D6ATRF | 10    | 12.5 | 68   | 204.0   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX101M10D6ATRF | 10    | 12.5 | 100  | 300.0   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX150M16D5ATRF | 16    | 20   | 15   | 72.0    | 0.06  | 3200                                          | 0.04                           | 1.1±0.1     |
| NSPX150M16D6ATRF | 16    | 20   | 15   | 72.0    | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX220M16D5ATRF | 16    | 20   | 22   | 105.6   | 0.06  | 3200                                          | 0.04                           | 1.1±0.1     |
| NSPX220M16D6ATRF | 16    | 20   | 22   | 105.6   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX330M16D5ATRF | 16    | 20   | 33   | 158.4   | 0.06  | 3200                                          | 0.04                           | 1.1±0.1     |
| NSPX330M16D6ATRF | 16    | 20   | 33   | 158.4   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX470M16D1ATRF | 16    | 20   | 47   | 225.6   | 0.06  | 3200                                          | 0.04                           | 1.4±0.1     |
| NSPX470M16D6ATRF | 16    | 20   | 47   | 225.6   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX680M16D6ATRF | 16    | 20   | 68   | 326.4   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX100M20D5ATRF | 20    | 23   | 10   | 60.0    | 0.06  | 3200                                          | 0.04                           | 1.1±0.1     |
| NSPX150M20D5ATRF | 20    | 23   | 15   | 90.0    | 0.06  | 3200                                          | 0.04                           | 1.1±0.1     |
| NSPX220M20D5ATRF | 20    | 23   | 22   | 132.0   | 0.06  | 3200                                          | 0.04                           | 1.1±0.1     |
| NSPX220M20D6ATRF | 20    | 23   | 22   | 132.0   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX330M20D1ATRF | 20    | 23   | 33   | 198.0   | 0.06  | 3200                                          | 0.04                           | 1.4±0.1     |
| NSPX330M20D6ATRF | 20    | 23   | 33   | 198.0   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX470M20D1ATRF | 20    | 23   | 47   | 282.0   | 0.06  | 3200                                          | 0.04                           | 1.4±0.1     |
| NSPX470M20D6ATRF | 20    | 23   | 47   | 282.0   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX560M20D6ATRF | 20    | 23   | 56   | 336.0   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX100M25D5ATRF | 25    | 29   | 10   | 75.0    | 0.06  | 3200                                          | 0.04                           | 1.1±0.1     |
| NSPX150M25D5ATRF | 25    | 29   | 15   | 112.5   | 0.06  | 3200                                          | 0.04                           | 1.1±0.1     |
| NSPX150M25D6ATRF | 25    | 29   | 15   | 112.5   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX220M25D1ATRF | 25    | 29   | 22   | 165.0   | 0.06  | 3200                                          | 0.04                           | 1.4±0.1     |
| NSPX220M25D6ATRF | 25    | 29   | 22   | 165.0   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX330M25D6ATRF | 25    | 29   | 33   | 247.5   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX100M35D5ATRF | 35    | 40   | 10   | 105.0   | 0.06  | 3200                                          | 0.04                           | 1.1±0.1     |
| NSPX150M35D1ATRF | 35    | 40   | 15   | 157.5   | 0.06  | 3200                                          | 0.04                           | 1.4±0.1     |
| NSPX150M35D6ATRF | 35    | 40   | 15   | 157.5   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |
| NSPX220M35D6ATRF | 35    | 40   | 22   | 231.0   | 0.06  | 3200                                          | 0.04                           | 1.9±0.1     |

## RIPPLE CURRENT TEMPERATURE

### CORRECTION FACTORS

| Correction Factor | ≤ 45°C | 45°C < T ≤ 85°C | 85°C < T ≤ 105°C |
|-------------------|--------|-----------------|------------------|
| All Values        | 1.0    | 0.80            | 0.50             |



NIC COMPONENTS CORP. [www.niccomp.com](http://www.niccomp.com) | [www.lowESR.com](http://www.lowESR.com) | [www.RFpassives.com](http://www.RFpassives.com) | [www.SMTmagnetics.com](http://www.SMTmagnetics.com)

SPECIFICATIONS ARE SUBJECT TO CHANGE

# Surface Mount Specialty Polymer Solid Aluminum Electrolytic Capacitors

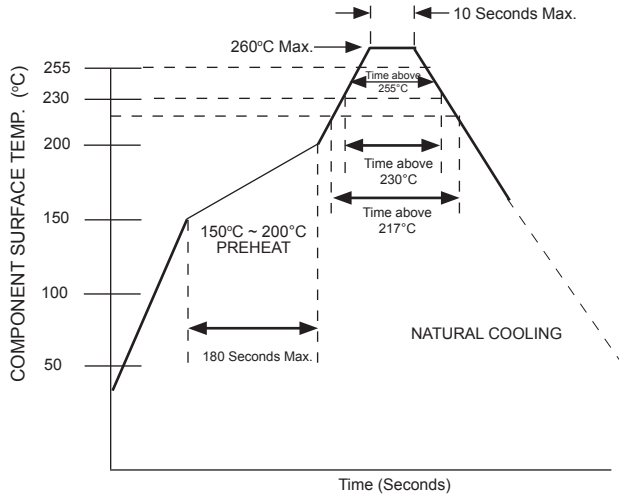
NSPX Series

## PART NUMBERING SYSTEM

NSPX 330 M 25 D6 A TR E

- Series
- Capacitance Code in  $\mu\text{F}$ , first 2 digits are significant, third digits no. of zeros
- Tolerance Code M=20%
- Working Voltage
- Case Size
- Peak Reflow Temperature Code (A = +260°C)
- Tape and Reel
- RoHS Compliant

## RECOMMENDED 260°C REFLOW SOLDERING PROFILE



| Item                    | Maximum Duration |
|-------------------------|------------------|
| Peak Temperature +260°C | 10 seconds max.  |
| Time above +255°C       | 30 seconds max.  |
| Time above +230°C       | 130 seconds max. |
| Time above +217°C       | 150 seconds max. |

Notes: Compliant to IPC/J-STD-020D standard

1. SAC alloy (+217°C) reflow soldering compatible
2. Soldering heat limits apply to the top surface of component
3. If you have concerns about your reflow soldering profile review them with NIC to insure compatible [tpmg@niccomp.com]
4. Three reflow passes are allowed (cooling down period to room temperature between each pass).

Storage Conditions:

Temperature: +5°C ~ +30°C

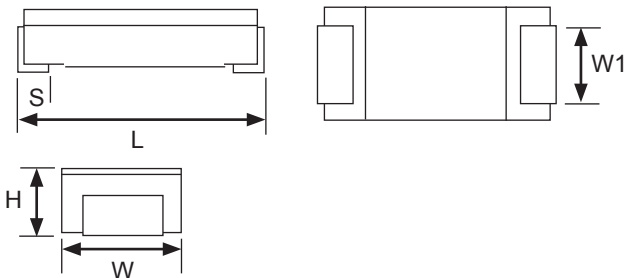
Humidity: <60% RH

Packaging: Moisture barrier bag

Storage Time: Parts should be soldered within 2 years of the production date and/or within 7 days of opening the moisture barrier bag.

## DIMENSIONS (mm)

| Case Code   | L $\pm 0.2$ | W $\pm 0.2$ | H                | W1 $\pm 0.1$ | S $\pm 0.3$ |
|-------------|-------------|-------------|------------------|--------------|-------------|
| D1, D5 & D6 | 7.3         | 4.3         | see values table | 2.4          | 1.3         |

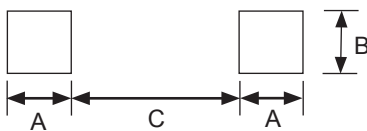


## VOLTAGE CODES

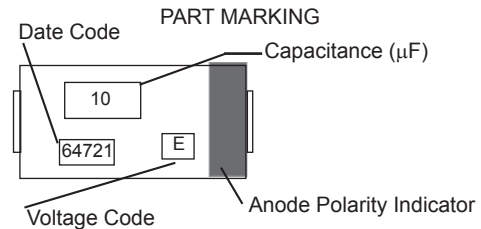
| Voltage | Code |
|---------|------|
| 10Vdc   | A    |
| 16Vdc   | C    |
| 20Vdc   | D    |
| 25Vdc   | E    |
| 35Vdc   | V    |

## RECOMMENDED LAND PATTERNS (mm)

| Case Code   | A   | B   | C   |
|-------------|-----|-----|-----|
| D1, D5 & D6 | 2.4 | 2.8 | 4.0 |



Please note the NSP series will fit on standard "D" and "E" size (7343) tantalum chip capacitor land patterns



## TERMINATION MATERIAL:

D1, D5 and D6 Case Sizes

Base: Fe (~ 100 $\mu\text{m}$ )

Under Plating: Cu (~ 5 $\mu\text{m}$ )

Finish Plating: Sn (5 ~ 9 $\mu\text{m}$ )

## PRECAUTIONS

Please review the notes on correct use, safety and precautions found on our website at [www.niccomp.com/precautions](http://www.niccomp.com/precautions)  
If in doubt or uncertainty, please review your specific application - process details with NIC's technical support personnel: [tpmg@niccomp.com](mailto:tpmg@niccomp.com)

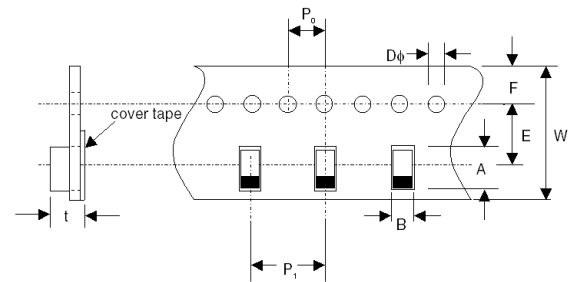


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NSPX Series

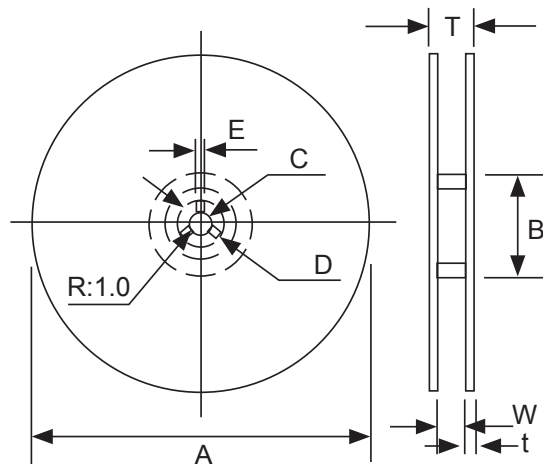
## CARRIER TAPE DIMENSIONS (mm)

| Case Code | A±0.2 | B±0.2 | Dφ                  | E±0.1 | F±0.1 | P <sub>0</sub> ±0.1 | P <sub>1</sub> ±0.1 | t±0.2 | W±0.3 |
|-----------|-------|-------|---------------------|-------|-------|---------------------|---------------------|-------|-------|
| D1        | 7.6   | 4.5   | 1.5 <sup>+0.1</sup> | 5.50  | 1.75  | 4.0                 | 8.0                 | 2.4   | 12.0  |
| D5        |       |       |                     |       |       |                     |                     | 1.5   |       |
| D6        |       |       |                     |       |       |                     |                     | 2.4   |       |



## REEL DIMENSIONS (mm)

| A±2.0 | B ±1.0 | C±0.5 | D±0.8 | E±0.5 | T±1.0 | t   | W±1.0 |
|-------|--------|-------|-------|-------|-------|-----|-------|
| φ330  | φ80    | φ13.0 | φ21.0 | 2.0   | 20.0  | 3.0 | 14    |



| Case Code    | Reel Quantity |
|--------------|---------------|
| D1, D5 & D6, | 3,500         |

