NIC Components Corp.

www.niccomp.com | Technical Support: tpmg@niccomp.com

POLYMER CATHODE TANTALUM

NTP SERIES: SMT TANTALUM ELECTROLYTIC CAPACITORS

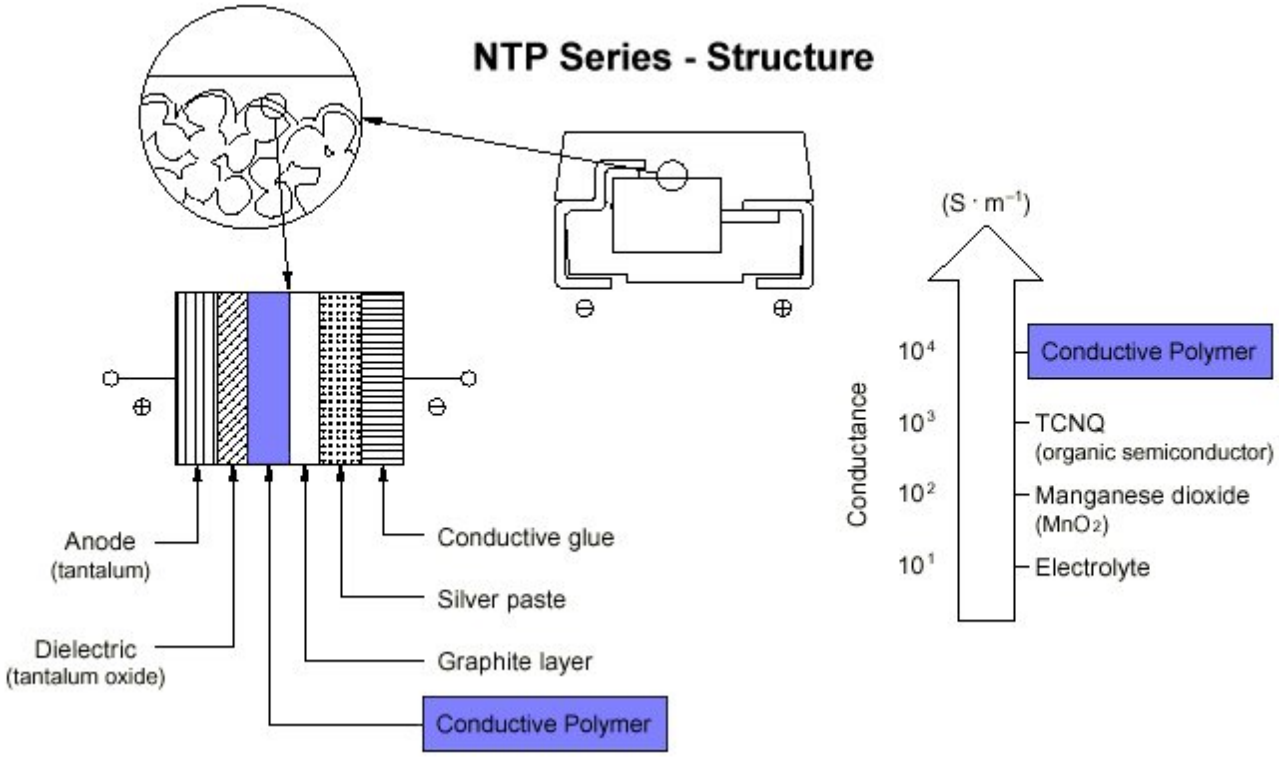
NTP series has the same structure as a conventional chip tantalum capacitor with a low-resistance cathode of conducting polymer as a substitute for manganese dioxide. It features high permissible ripple current and effective noise reduction in a high frequency application with its ultra low ESR (equivalent series resistance).

Features:

- Small size (the same as conventional chip)
- Ultra Low ESR/low impedance
- Suitability for surface mounting
- High permissible ripple current

Applications:

- DC / DC converter
- Voltage Regulators (VRM)
- Suppression of oscillation for general purpose regulator
- Video camera
- Portable cassette / CD player



NTP Series - Polymer Cathode Tantalum Electrolytic Capacitors

- Initial failure mode is short-circuit and high leakage current
- Joule heating at site of short-circuit typically results to increase polymer cathode resistance and limit the leakage current to prevent combustion

When using NTP series in electric circuit, please following the below guidance.

➔ If in doubt or uncertainty, please review your specific application & process details with NIC's technical support personnel: tpmg@niccomp.com

(1) Failure rate
NTP series failure rate depends upon applied voltage and operating temperature.

Use the following formula for estimating field failure rate.

$\lambda = \lambda o\ (V/Vo)^3 \bullet 2^{(T-To)/10}$

λ : Maximum field failure rate
λo : Basic failure rate (1% per 1000 Hours)
T : Operating temperature (°C)
V : Applied voltage of actual use (VDC)
To : +85°C
Vo : Rated voltage (VDC)

(2) Permissible ripple current
Permissible ripple current shall be de-rated as follows.

Temperature
25°C = Rated current value
85°C = 0.9 times rated current value
105°C = 0.4 times rated current value

Frequency
10 KHz = 0.75 times rated current value
100 KHz = Rated current value
500 kHz = 1.10 times rated current value
1 MHz = 1.30 times rated current value

(3) Reverse voltage
Do not apply reverse voltage since the capacitors are polarized.

(4) Voltage Derating
Apply appropriate voltage to the capacitors according to the failure rate estimation (see #1 above). It is recommended that the applied circuit voltage (VDC) **be less than 80% of the rated voltage (VDC).**

(5) PCB Processing
Recommended Land Patterns and Reflow Soldering Conditions: Per NTP Specification

(6) Cleaning

Types: Immersion cleaning, rinse cleaning, brush cleaning, shower cleaning, vapor cleaning, and ultrasonic cleaning

Potential issues:
- The component marking may be erased
- The appearance of the component may be damaged
- Worst case, the component may be functionally damaged

➔ If in doubt or uncertainty, please review your specific cleaning process details with NIC's technical support personnel: tpmg@niccomp.com

It is therefore recommended that if the NTP series must be cleaned, to do so under the following conditions:

[Recommended conditions of flux cleaning]
(1) Cleaning solvent ..... Chlorosen, isopropyl alcohol
(2) Cleaning method ..... Shower cleaning, rinse cleaning, and vapor cleaning
(3) Cleaning time ..... 5 minutes maximum

Ultrasonic cleaning
This cleaning method is extremely effective for eliminating dust that has been generated as a result of mechanical processes, but may pose a problem depending on the condition.
- As a result of experiments, it was confirmed the external terminals of the capacitor were damaged (cut) when cleaned with some ultrasonic cleaning machines.
- The cause of this phenomenon is considered metal fatigue of the capacitor terminals that occurred due to ultrasonic cleaning.
- To prevent damage to the terminal, decreasing the output power of the ultrasonic cleaning machine or decreasing the cleaning time may be possible solution.
- However, it is difficult to specify the safe cleaning conditions because there are many factors involved such as the conversion efficiency of the ultrasonic oscillator, transfer efficiency of the cleaning bath, difference in cleaning effect depending on the location in the cleaning bath, the size and quantity of the printed circuit boards to be cleaned, and the securing states of the components on the boards.
- It is therefore recommended that ultrasonic cleaning be avoided as much as possible.
- If ultrasonic cleaning is essential, make sure through experiments that no abnormality occurs as a result of the cleaning.

(7) General Precautions:

- Do not apply excessive vibration and shock to the capacitor.
- The solderability of the capacitor may be degraded by humidity. Store the capacitor at (–5 to +40°C) room temperature and (40 to 60% RH) humidity.
- Exercise care that no external force is applied to the tape packaged products (if the packaging material is deformed, the capacitor may not be automatically mounted by automatic insertion equipment).

NTP Series Performance Data Follows

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220uF / 6.3VDC

Capacitance over Temperature (-55°C ~ +105°C)
ESR change over Temperature (-55°C ~ +105°C)
ESR & Z over Frequency (100Hz ~ 40MHz)

Page 6 & 7 …

330uF / 6.3VDC

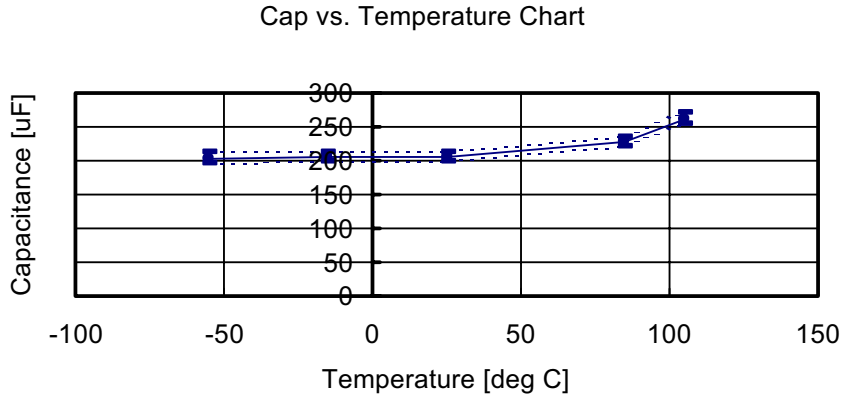
Thermal Shock Performance (-40°C ~ +85°C)
Humidity Testing (+70°C / 90% RH)

For specific PN data please contact NIC technical support:
at TPMG@niccomp.com

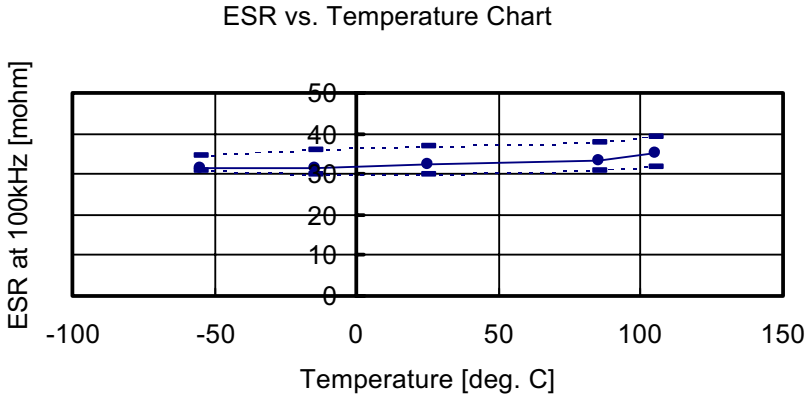
or via on-line Chat Support @ www.NICcomp.com

NIC part number: NTP227M6.3TRD(55)

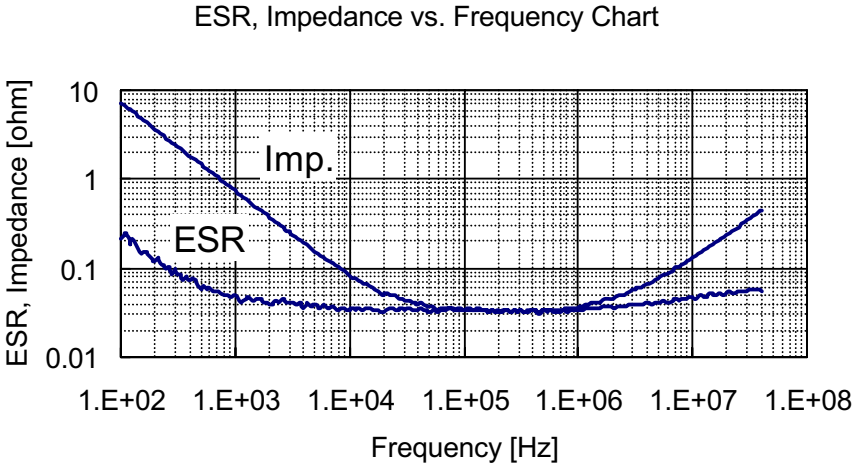
(1) Cap vs. temperature chart



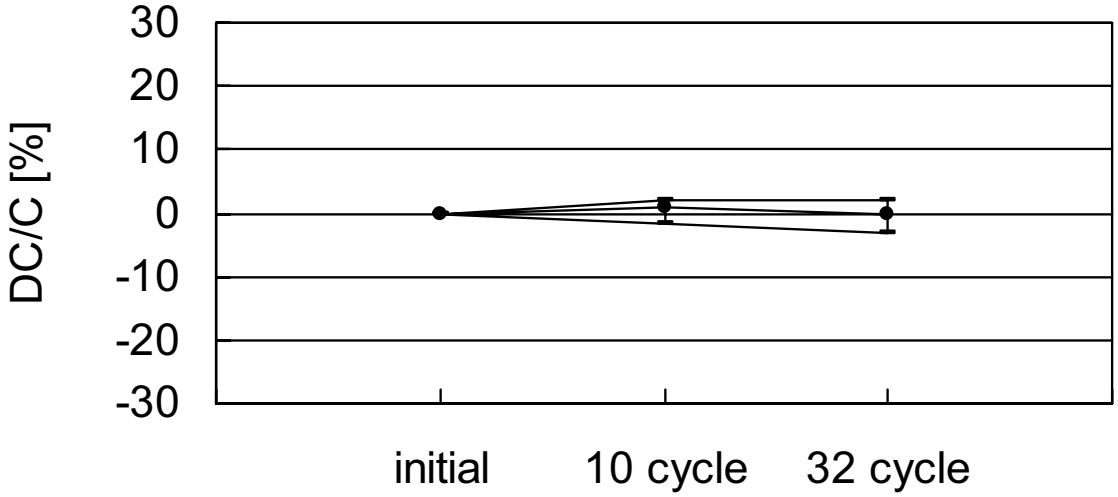
(2) ESR vs. temperature chart

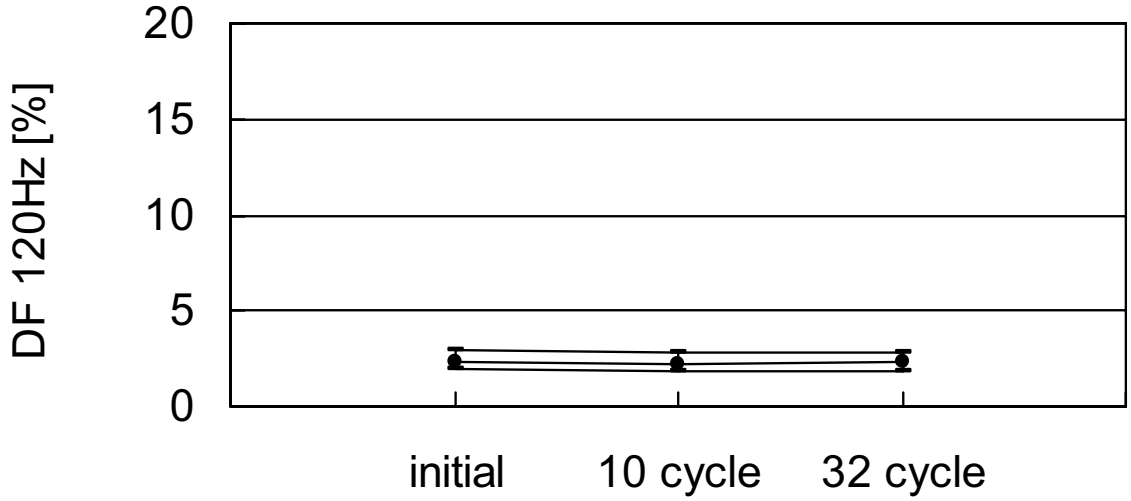


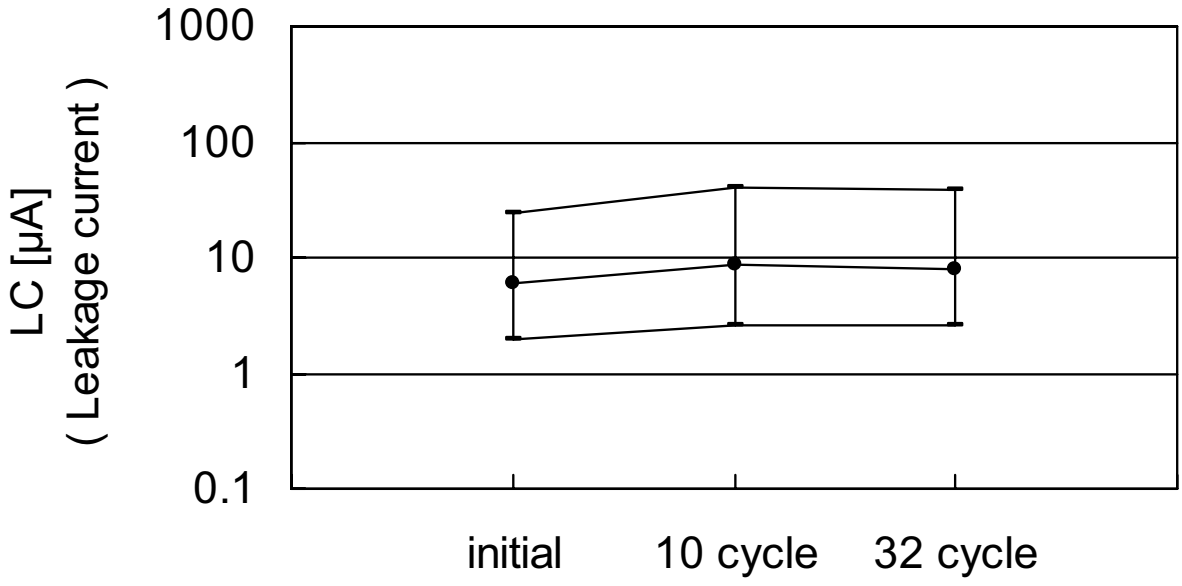
(3) ESR vs. frequency chart



Thermal Shock
-40 C to +85 C, 32 cycles,
NIC part number: NTP337M6.3TRD n = 50 pieces







Humidity
70 C 90%RH, 120 hours,
NIC part number: NTP337M6.3TRD n = 50 pieces