

# Company Profile: NIC Components

In 1982, NIC Components Corp. was licensed by Nippon Industries Co., Ltd. of Japan for the North American sales of its passive components. Nippon Industries was founded in 1975 by Yoshiharu Dangi and Gichu Sato with an initial investment into a small manufacturer of aluminum electrolytic capacitors. In the ensuing years, they continued to invest in small and medium-sized Asian makers of passive components. Nippon's philosophy was to provide an export market to those independent factories in return for a long term allocation. To further enhance this unique fabless model, Nippon provided its suppliers with financing, engineering and access to high quality raw material suppliers. All of Nippon's products were for export, and many of its customers initially were importers and distributors in both Europe and North America.

In 1982, Richard Schuster and several associates founded NIC Components Corp. NIC, headquartered in Farmingdale, New York, set up sales and marketing in the United States and Canada and procured most of its product from Nippon Industries. Some of its early distributors included Future Electronics, PUI, Belford, Capsco, Bell (now Arrow) and Brevan. In 1989, NIC opened its second sales and warehouse facility in San Jose, California. While the core business remained in aluminum electrolytics, new fabs manufacturing tantalum, film and ceramic capacitors were recruited to round out the package of passive components. NIC also ventured into the resistive and magnetic component markets with Nippon's new fab liaisons. In 1997, NIC Eurotech Ltd. was established in the United Kingdom as a wholly-owned subsidiary, and in 1999, NIC Asia PTE Ltd. was established in association with Nippon Industries and local management in Singapore. Today, NIC Components is approaching 200 million dollars in sales and has several thousand active customers worldwide, including top tier CEMs and OEMs. NIC's major distributors are Arrow, Future, Kent, Jaco, PUI, Capsco, Chris, Belford, Brevan, First Phase, Shannon, U-Tech and Hammond.

## Aluminum Electrolytic Capacitors

NIC's original product line encompassed through-hole construction in axial, radial and snap mount configurations. Most of the product was produced in Japan, but due to labor costs and exchange rate considerations, some production was moved to Taiwan and China in the late 80s. Raw material and engineering were still predominantly Japanese in order to assure quality and uniformity.

In the mid-80s, NIC introduced surface mount cylindrical can aluminum electrolytics to the U.S. market. At

first the going was slow, with designs coming primarily from the larger, more progressive OEMs. Surface mount was still relatively new and the larger size aluminums presented some challenges for the pick-and-place equipment. Sizes were not yet standardized, and both CV and characteristics were somewhat limited. Still, NIC had resolved that this was the technology of the future, as was evident from the rapid evolution of through-hole to surface mount in other passive components such as ceramic and tantalum capacitors and discrete resistors. Using both through-hole and surface mount components on the same PCB must utilize two soldering processes, which is very costly. Aluminum electrolytics in surface mount packages have only taken off in the last few years, and now they are truly coming into popularity. Expansive ranges of size, capacitance, voltage and special characteristics such as low ESR, extended temperature and low leakage current offer a multitude of design options.

Due to NIC's early entry into this technology and the fact that they have the most extensive line of surface mount types, they have established a very strong market position. They are now shipping over 40 million pieces per month, and this number is growing at a frenetic pace.

## NIC Aluminum Electrolytic Capacitor Technology and Trends

NIC's Aluminum Electrolytic Capacitor offering currently covers:

- 15-series: Types of surface mount (SMT) parts
- 25-series: Types of radial leaded parts
- 5-series: Types of axial leaded parts
- 4-series: Types of large can (snap-in) parts

### Temperature Ratings

- 40 to +85°C: General purpose (lowest cost)
- 55 to +105°C: Wide temperature (with 4X longer life than +85°C rated)
- 55 to +125°C: Extended temperature (with 4X longer life than +105°C rated)

### Capacitance Value and Voltage Ranges

- Surface mount (SMT): 0.1 to 6,800  $\mu$ F; 2.0 to 450 VDC
- Radial leaded: 0.1 to 15,000  $\mu$ F; 6.3 to 450 VDC
- Axial leaded: 0.47 to 22,000  $\mu$ F; 6.3 to 500 VDC
- Large can (snap-in) leaded: 56 to 68,000  $\mu$ F; 10 to 450 VDC

### Specialty Types

- Low impedance-low ESR styles: 3-series surface mount

(SMT) and 5-series radial lead for high frequency and high current switching power supplies; DC-DC converters and voltage regulator module applications. NIC has recently expanded the range of its NSP series specialty polymer electrolyte (solid aluminum) type in SMT package.

### **Low Leakage Current Styles**

1-series surface mount (SMT) and 3-series radial lead for leakage current sensitive applications (sensors and battery powered circuits).

### **Bi-Polar Styles**

1-series surface mount (SMT), 3-series radial lead and 1-series axial lead for applications where circuit voltage bias is unknown or may reverse.

### **Technology Trends**

#### **Alternates to Chip Tantalum**

In today's market, alternatives to tantalum chip technology, such as NIC SMT aluminum electrolytic capacitors, are becoming increasingly attractive to circuit designers and PCB manufacturers. Those users adopting easier-to-obtain SMT aluminum electrolytic capacitors, in place of long lead time tantalum

chips, have also found a number of performance and cost-related advantages. Aluminum electrolytic styles have featured improved immunity to unforeseen reserve voltage and over voltage transient conditions, as compared to tantalum electrolytic styles. Another nice advantage of aluminum electrolytic capacitors (SMT and lead) is their relative lower cost, when compared to tantalum solutions.

#### **Aluminum Electrolytic Capacitor Road Map**

Majority of development efforts have continued to focus on:

- SMT format development.
- Expanded range of values (introduction of larger case sizes and improved foils).
- Lower impedance-lower ESR styles for next generation lower voltage-higher current circuit designs.
- Improvement in longer life styles.
- Environmental impact issues (alternatives to PVC insulation sleeves of lead styles).

#### **Expectations**

- SMT style usage should exceed lead styles within the next two years.
- Further reduced pricing of SMT

styles is expected as other producers (outside Japan) enter market.

- Axial lead styles will continue to fall from usage, being replaced by SMT and radial lead styles.

NIC Components is well positioned in the North American market for passive electronic components. By maintaining a knowledgeable engineering group, an aggressive sales team, and a dedicated source for passive components, NIC Components will continue to grow rapidly in tier one accounts in telecom, computer and automotive end-use market segments. □

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