Are Electronics Date Code Practices Obsolete?

August 8, 2017 Leave a comment
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In the electronics supply chain, component date codes are ubiquitous. Similar in concept to the "use or sell by" date on perishable super-market items, date codes are an indicator that a part may be too old to perform to spec.

Electronic components do have a shelf-life. Metals in components can corrode. Moisture and electro-static discharge (ESD) can damage components. In addition to telling a component's "age," date codes are used by original component manufacturers (OCMs) for traceability, to indicate material or process changes in manufacturing; and

to show a batch of components performed consistently under testing.

Date code practices, however, haven't kept pace with electronics industry advancements. The optimum lifespan of a component has long been considered to be two years. "Historically, the concern about component aging was solderability," explains Keenan Evans, senior vice president for quality, EHS & CSR for ON Semiconductor. "After a couple of years components may not solder well or they'd develop tin whiskers." Since the 1980s, though, electronics component makers have adopted new materials; embraced total quality management; and set strict storage and handling standards. Components considered "fresh" for two years perform just as well after four.

Moreover, date codes may be contributing to one of the supply chain's biggest problems: excess or obsolete inventory. Components are rarely, if ever, consumed immediately by end customers. Finished products may sit on a warehouse shelf for months or even years. Date codes can expire if components aren't moving.

Expiration, in turn, drives up costs across the supply chain. Simply storing parts in a warehouse requires investment in facilities; ESD and climate control; and personnel. Shipping parts between warehouses is also an expense. Once a product expires, its value begins to decrease. If customers don't accept "expired" products, they can be returned to the OCM; sold in the secondary market; or written off/down on a balance sheet. None of these options recoup 100 percent of the component's original value.

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Even with these limitations, suppliers and distributor agree dates codes are essential. However, many OCM and distribution executives think it's time to reexamine date code practices and update them if necessary.

Why date codes?

Date codes are extremely important for component traceability on shipments from manufacturers to distributors and shipments from distributors to customers, according to a distribution industry executive. Along with manufacturer part numbers, date codes are an essential data element in verifying the specific components shipped, the validation of returns, the identification of product change notifications (PCN), and for recalling defective products. Date codes are also essential for FIFO (first in, first out) inventory management.

OCMs also use date codes to manage significant product changes without changing manufacturer part numbers, explained ON's Evans. Examples include transition to lead-free finishes, chemical composition changes, and quality improvements which do not meet the manufacturer's definition of "form, fit or function."

Many customers, especially those in mission-critical industries such as defense, aerospace and medical, specify date codes within their orders. "Customers feel they have the probability of improvement during the manufacturing process or in test programs," said Evans.

"Customers also believe that newer components may have been subject to less of the risks associated with transportation, handling and storage condition variables," added a distribution executive, "or that buying components from a single date code offers some potential for component consistency that may be an advantage to product performance." However, said Evans, minus any changes in an OCM's manufacturing process, a component that is four years old performs just as well as a two-year-old device.

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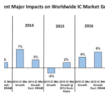
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Traceability has become a primary concern as the spot – or "gray"—market has become a force in the supply chain. Excess and obsolete inventory is often sold to non-authorized distributors that in turn re-sell it to other customers. In the past, counterfeit components have been mixed in with authentic goods; components have been re-marked and sold as higher-value devices; and damaged components have been sold as new. As a result, many OCMs won't honor the warrantees for parts that have passed through the gray market. Date codes are one way to verify a component came –or did not come -- from an OCM factory.

"Some customers believe that the longer that components are in the supply chain, the more opportunity there is for ownership transfers and the loss of uninterrupted traceability back to the original manufacturer," added Don Elario, senior director and global quality leader for Arrow Electronics Inc.

OCMs and distributors agree date codes play an important role in the supply chain, but they also point out the two-year "expiration" standard is a holdover from distribution's early days of the 1940s. A committee within the ECIA is spearheading an effort to bring date code practices – quite literally – up to date.

In our next article, we'll look at how dates codes are managed within the supply chain, where bottlenecks occur, and where costs are incurred.

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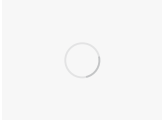

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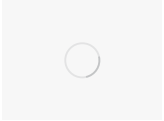

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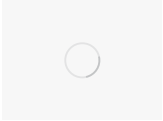

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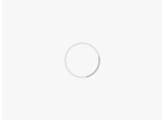

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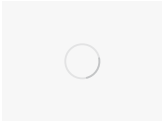

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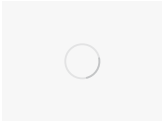

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