



## RoHS / Lead-Free Strategy – Lawrence

In the challenge to meet the RoHS guidelines and to understand the impact while simultaneously assuring our Military and Aerospace customers that reliability will not be compromised, it is necessary to first separate the Military product lines from the Commercial products lines and Industrial product lines that are derived from Military products.

### The Military Product Lines

#### **Military Products, Tin-Lead Terminal Finish**

Semiconductor products manufactured for the US government and its various defense contractors have specific guidelines pertaining to terminal and case finish. The use of pure tin is forbidden at this time for Military products and we currently supply a Sn10Pb finish. Therefore, it is not yet possible to buy Military products from Microsemi Lawrence that are RoHS compliant if that finish currently calls for the use of tin-lead alloy. Typically, the JAN, JANTX, JANTXV, and JANS prefixes identify these.

Customers that require RoHS commercial versions of product from these lines employing Sn10Pb finish can specify such product by adding the suffix e3 to the part number on the purchase order. For example, 1N5819 becomes 1N5819e3. This JEDEC code signifies a pure tin finish which, in this case, will be Matte Tin electroplate. Due to package size restrictions, the e3 may be missing from the package itself but it will be documented in the paperwork.

Microsemi will continue to support all Military customers and supply tin-lead surface finish on these products until the Military requests and authorizes a change.

#### **Military Products, Gold Terminal Finish**

Military components with gold plated finishes are already RoHS compliant. Since many customers request having these lead finishes hot solder dipped, it may be necessary to assure RoHS compliance by specifically asking that no hot solder dip be used. This would address previous inventory that may already have a tin-lead solder dip. This is the only flexibility afforded to us by the Defense Supply Center in Columbus, Ohio (DSCC). No product can be shipped with any JAN or DSCC designation unless compliant fully to government specifications.

Customers that require RoHS commercial versions of products from these lines employing a gold finish can specify such a product by adding the suffix e4 to the part number on the purchase order. For example, 2N2222A becomes 2N2222Ae4. This JEDEC code signifies a noble metal finish which, in this case, would be gold electroplate. Due to package size restrictions, the e4 may be missing from the package itself but it will be documented in the paperwork.

Microsemi will continue to support all our Military customers and supply hot solder dip surface finish on these products until the Military requests and authorizes a change.

# Commercial and Industrial Product Lines

## Commercial Products

Pure tin is allowed and is, in fact, being embraced by most commercial suppliers. To this end, Microsemi will be supplying 100% pure Matte Tin plate, including a 150°C 1 hour anneal to fully stabilize the finish. Most of our true commercial products are already converted or are being quickly converted to Matte Tin finish at our other divisions. Lawrence has very little product in this commercial category at the moment but that will change as our commercial lines expand. These parts would be designated with the e3 suffix using the same restrictions previously mentioned.

## Industrial Products

This category applies to commercial products that are derived from or otherwise taken from Military product lines. These may already have been plated to comply with Military product requirements and thus contain some lead in the finish. For these products, Microsemi is free from any Military restrictions to strip the old lead-bearing finish and replace it with the 100% Matte Tin finish. A minimum order would be required due to capacity requirements of the various plating and stripping equipment. These parts would be designated with the e3 suffix using the same restrictions previously mentioned.

# Chip-Only Products

## Chip Products

All chip sales, whether Military, Commercial, or Industrial, are naturally RoHS compliant. Typically backside metallization is either silver or gold and the front metallization is either silver or aluminum. The chips are made of silicon. This description covers virtually all the chips made in the Microsemi Lawrence Division. There are no part number changes required nor provided.



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