



Certificate of Compliance

August 28, 2015

Elm Electronics Inc. programs and relabels integrated circuits that are manufactured by Microchip Technology Incorporated of Chandler Arizona, USA. As such, all Elm Electronics integrated circuits conform to the standards described in the Certificate of Compliance provided by Microchip Technology. Any custom laser etching of device numbers and logos are performed by Microchip Technology for Elm Electronics and also conforms to the Certificate of Compliance provided by them.

A copy of the latest release of the Microchip Technology Certificate of Compliance (file name 'Microchip EnvCoC_140827.pdf') is attached for your convenience. It is the most recent version as of the date of writing of this document, but you should always verify that it is by visiting Microchip Technology's 'Environmental Health & Safety' web page at <http://www.microchip.com/pagehandler/en-us/aboutus/ehs.html>.

When physical labels are applied to our integrated circuits, we use only type B-426 Thermal Transfer Printable Polyimide Label Stock, printed using an R4300 ribbon. Both of these products are manufactured by the Brady Corporation of Milwaukee Wisconsin, USA.

Copies of the current Brady Technical Data Sheets for both the B-426 Polyimide label stock and the R4300 printer ribbon material are also attached to this document. For the latest version, please visit the Technical Data Sheets section of the Brady web site. The current link on the US web site is <http://www.bradyid.com/bradyid/tds/searchView.do>.

All components have been handled in accordance with applicable standards and practices.

I certify that the above is true as of the 28th day of August, 2015.

James Nagy
Elm Electronics Inc.
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London, Ontario, Canada N6H 5N7



MICROCHIP

Certificate of Compliance

August 27, 2014

Plastic Packaged Semiconductors

Effective July 01, 2006, Microchip Technology Incorporated (Microchip) began shipping RoHS compliant semiconductor products to all distributors and customers. Microchip certifies, to the best of its knowledge and understanding, the Matte Tin, Nickel/Palladium/Gold (Ni/Pd/Au) and Tin/Silver/Copper (SAC) plated external pins (leads) of our Plastic and Chip Scale Packages (CSP) semiconductor products and modules do not contain the substances listed in the table below in amounts exceeding the Maximum Control Value (MCV)¹.

Our PDFN packaged type products utilize EU exemption 7(a) - Pb (lead) in high melting temperature type solders (i.e. lead-based alloys containing 85% by weight or more lead).


China Environmental Friendly Use Period (EFUP), logo 1 , applies when these plastic packaged pin finished semiconductor devices are shipped to the People's Republic of China. Logo 1 appears on the inner and outer shipping boxes. These packaged products are considered to be "RoHS - 6 of 6" complaint.

| EU RoHS ² / China RoHS / Korea RoHS Substances of concern: | Maximum Control Value |
|--|--|
| Lead | 0.10% by weight (1,000 ppm) ³ |
| Mercury | 0.10% by weight (1,000 ppm) |
| Cadmium | 0.01% by weight (100 ppm) |
| Hexavalent Chromium | 0.10% by weight (1,000 ppm) |
| Polybrominated Biphenyls (PBB) | 0.10% by weight (1,000 ppm) |
| Polybrominated diphenylethers (PBDEs) including Deca-BDE or pentaBDE or octaBDE | 0.10% by weight (1,000 ppm) |

Semiconductors (SnPb solder)

Customers must specifically order SnPb solder-plated semiconductor products to assure receipt of only Pb (leaded) solder-plated, plastic packaged semiconductor products.

Microchip certifies, to the best of its knowledge and understanding, that *EXCEPT* for the presence of lead (Pb) in the SnPb solder plating of the external pins (leads), our plastic packaged semiconductor devices with SnPb solder-plated external pins (leads) comply with the other content limitations in European Union Directive 2011/65/EU. Applications that are exempted from the prohibition and listed in ANNEX III may use these devices (see ANNEX III Applications exempted from the restriction in Article 4(1)). Microchip's SnPb solder-plated plastic packaged semiconductor devices are "RoHS - 5 of 6" compliant.

The Environmental Friendly Use Period (EFUP) logo 2 , and the associated declaration chart below applies when *SnPb plated and Ceramic* products are shipped to the People's Republic of China. The logo 2 and chart below appear on the shipping boxes.

¹ Maximum Control Value (MCV) is defined at the homogeneous material level. A homogeneous material is defined as either a raw material or a material applied during the construction of the product.

² EU RoHS (Directive 2011/65/EU 8 JUNE 2011) Restricted Substance RoHS

³ FET/PDFN products and packages utilize EU exemption 7(a) - Pb (lead) in high melting temperature type solders (i.e. lead-based alloys containing 85% by weight or more lead) AS: [08 PDFN 5x6x0.9mm Matte Tin] & ES: [08 PDFN 3.3x3.3x0.9mm Matte Tin]



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| 表二 有毒有害物质或元素名称及含量标识样式 (Toxic Species or Toxic Element Name and Content Symbol) | | | | | | |
|---|---|-----------|-----------|-----------------|---------------|-----------------|
| 部件名称 (Name of Part) | 有毒有害物质或元素 (Toxic Species or Element) | | | | | |
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (Cr(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| | X | 0 | 0 | 0 | 0 | 0 |

0: 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T 11363-2006规定的限量要求以下
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T 11363-2006规定的限量要求
本产品仅于外部电子管脚部位含有锡镀层

Use only in accordance with Microchip Technology Incorporated's Technical Data Sheet for this product family.
Microchip鼓励并建议客户将本产品依据所在地的相关法令, 进行贵金属的回收及再利用。切勿随意与一般垃圾丢弃
Microchip Technology Incorporated encourages customers to recycle this product for precious metal value in accordance with local laws. Do not throw in trash.

Ceramic Semiconductor Products

Based upon information provided by our suppliers, these products contain Pb (lead) exceeding the Maximum Control Value (MCV) and are not recommended for RoHS required designs. Applications that are exempted from the prohibition and listed in European Union Directive 2011/65/EU may use these devices.

Substances of Concern:

Effective 1 July 2009, all of Microchip Semiconductor products became qualified as Halogen-Free as defined per IEC 61249-2-21:2003: Bromine (Br) ≤ 900 and Chlorine (Cl) ≤ 900 ppm by homogeneous material weight. With total Bromine (Br) plus Chlorine (Cl) content ≤ 1,500 ppm by homogeneous material weight. Additionally, Antimony Trioxide (Sb₂O₃) is also restricted to less than 1,000 ppm.

The mold compounds used by Microchip and its sub-contract assembly houses to assemble Microchip's semiconductor devices do not contain inorganic particulate red phosphorous.

Microchip Development Systems kits/boards, and RF, Bluetooth and Touch Screen modules do not meet the requirements of IEC 61249-2-21:2003 listed above.

Microchip's semiconductor products may contain Nickel (Ni) in one or more of three applications:

- Nickel is one of the three plating materials used on the pins of the semiconductor, hence, the term Nickel (Ni) / Palladium (Pd) / Gold (Au) pin finish. The plating order is determined by the physical properties (adhesiveness) between each substance; Copper to Nickel to Palladium to Gold. Gold is the outer most substance, forming a shield around the Nickel and protecting against skin contact;
- Nickel is an alloying element in three lead frame alloys used by Microchip – C194, C7025, and A42; and
- Nickel may be impurity in the matte tin plating.

Each occurrence is compliant with EU Directive 2011/65/EU. Please consult the specific Material Content Declaration (MCD) for the estimated substance content.

EU Directive 2006/122/EC of 12 December 2006 regarding PFOS

Microchip Technology's products and manufacturing processes are in compliance with the above referenced Directive restricting the use of perfluorooctane sulfonates (PFOS).

Rare Earth Metals

Microchip semiconductor products and modules do not contain or use any of the set of seventeen rare earth metals. However, Microchip does use cerium as cerium oxide during a manufacturing process of the integrated circuit. The supplier for this chemical has taken steps to mitigate the reduction of the availability of cerium oxide. There is no anticipation of a shortage of this substance.



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Polycyclic Aromatic Hydrocarbons (PAHs)

To the best of our knowledge as of the date of this statement, Microchip Technology's products comply with all National and International legislation relating to Polycyclic Aromatic Hydrocarbons (PAHs). Microchip Technology does not manufacture or sell any products in which PAHs are an intentionally added material ingredient. Microchip Technology does manufacture certain products which contain carbon black (used in certain plastics) which may contain trace levels of PAHs as a by-product of the carbon black manufacturing process. The trace PAHs are tightly bound to the carbon black surface which is then firmly bound into the polymer matrix and so are not "bio-available".

Packing Materials

To the best of our current knowledge and belief all product(s) shipment material(s) are compliant with Directive 2013/2/EU (Amending to EU 94/62/EC: Packaging and Packaging Waste and EU Directive)

Dimethyl Fumarate⁴ CAS # 624-49-7 and Einecs No 210-849-0 are not used and are not present in our products. Additionally, it is not used in the moisture absorbent pillows accompanying Microchip products. This information is provided based on reasonable inquiry of our suppliers and represents our current knowledge based on the information provided by our suppliers.

Implementation of copper wire bond

Palladium Copper (PdCu) Wire provides superior performance over (Au) Gold Wire. PdCu wire helps ensure a steady supply of components that can support your ongoing business needs. It is Microchip's intent to convert applicable products within the next 18 to 24 months from gold to palladium copper bonding wire. This switching of wire bond materials does not change the environmental compliance or reporting category of any product.

Microchip Technology Incorporated's General Statement of Warranty

Microchip Technology Incorporated has taken commercially reasonable steps to provide representative and accurate material content information. Microchip relies on information provided by third parties and may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontractor assemblers and raw material suppliers. Microchip may update this Certificate of Compliance from time to time by posting the updated Certificate of Compliance on its website. Microchip does not provide any warranty, express or implied, with respect to the information provided in this Certificate of Compliance. This Certificate of Compliance does not modify Microchip's terms and conditions of sale of its products or the terms of any agreement under which customers purchased Microchip's products. Microchip's terms and conditions of sale or the relevant agreement, as applicable, shall continue to apply.

Mike Finley
VP Fab Operations
Microchip Technology Inc.
2355 W. Chandler Blvd. Chandler, AZ 85224

⁴ European Commission Directive 2009/251/EC of 17 March 2009 regarding DMF



BRADY B-426 THERMAL TRANSFER PRINTABLE POLYIMIDE LABEL STOCK

TDS No. B-426
 Effective Date: 14-May-2013

Description:

GENERAL

Print Technology: Thermal Transfer
Material Type: Greenish/Amber Polyimide
Finish: Matte
Adhesive: Permanent Acrylic

APPLICATIONS

Printed circuit board and electronic component preprocess labeling

RECOMMENDED RIBBONS

Brady Series R4300

REGULATORY/AGENCY APPROVALS

Brady B-426 is RoHS compliant to 2005/618/EC MCV amendment to RoHS Directive 2002/95/EC.

SPECIAL FEATURES

B-426 in combination with the Series R4300 ribbon passes the requirements of:
 MIL-PRF-55110G General Specification for Printed Wiring Boards
 MIL-STD-202G, Notice 12, Method 215K
 SAE AS81531 Marking of Electrical Insulating Material

Details:

| PHYSICAL PROPERTIES | TEST METHODS | AVERAGE RESULTS |
|----------------------------------|---|--|
| Thickness | ASTM D 1000 -Substrate -Adhesive -Total | 0.0028 inch (0.072 mm) 0.0016 inch (0.039 mm) 0.0044 inch (0.111 mm) |
| Adhesion to: -Stainless Steel | ASTM D 1000 20 minute dwell 24 hour dwell | 30 oz/inch (33 N/100 mm) 35 oz/inch (38 N/100 mm) |
| -Epoxy PC Board | 20 minute dwell 24 hour dwell | 20 oz/inch (22 N/100 mm) 35 oz/inch (38 N/100 mm) |
| -Polypropylene | 20 minute dwell 24 hour dwell | 13 oz/inch (14 N/100 mm) 13 oz/inch (14 N/100 mm) |
| -Textured ABS | 20 minute dwell 24 hour dwell | 3 oz/inch (3 N/100 mm) 6 oz/inch (6 N/100 mm) |
| Tack | ASTM D 2979 Polyken™ Probe Tack (1 second dwell, 1 cm/sec separation) | 19 oz (600 grams) |
| Drop Shear | PSTC-7 (except use 1/2" x 1" sample) | Over 100 hours |
| Dielectric Strength | ASTM D 1000 | 9700 Volts |
| Flammability | ASTM D 1000 | Less than 5 seconds |

Average Burn Time

Performance properties tested on B-426 printed with Series R4300 on BradyPrinter™ THT Model 203X thermal transfer printer. Printed samples of B-426 were laminated to aluminum and allowed to dwell 24 hours before exposure to the indicated environmental conditions.

| PERFORMANCE PROPERTIES | TEST METHOD | TYPICAL RESULTS |
|--|--|--|
| Short Term High Service Temperature | 80 seconds at 626°F (330°C) | No visible effect to label at 626°F (330°C), label discolors slightly at 644°F (340°C), but still functional, at 662°F (350°C) label still functional but slightly discolored and adhesive discolored at label edge. |
| | 5 minutes at 536°F (280°C) | No visible effect to label at 536°F (280°C), label discolors slightly at 572°F(300°C) but still functional, at 608°F (320°C) label still functional but slightly discolored and adhesive discolored at label edge |
| | 2 hours at 500°F (260°C) | No visible effect to label at 500°F (260°C), adhesive brown at edge of label at 536°F (280°C) |
| Long Term High Service Temperature | 1000 hours at 356°F (180°C) | No visible effect to label at 356°F(180°C), at 392°F (200°C) label still functional but slightly discolored and adhesive brown at edge |
| Low Service Temperature | 1000 hours at -94°F (-70°C) | No visible effect |
| Weatherability ¹ | ASTM G155, Cycle 1 (Xenon Arc 1000 hours) | Topcoat degraded |
| Humidity Resistance | 1000 hours at 100°F, 95% R.H. | No visible effect |
| UV Light Resistance | 1000 hours in Sunlighter™ 100 | Topcoat fades to light yellow, label still functional |
| Abrasion Resistance | Taber Abraser, CS-10 grinding wheels, 500 g/arm (Fed. Std. 191A, Method 5306) | Print legible to 150 cycles |
| Salt Fog Resistance | 30 days in 5% salt fog solution chamber (ASTM B 117) | No visible effect |
| Wave Solder and Vapor Phase Resistance | Label adhered to epoxy PC board and exposed to: 1. 10 second dip at 480°F (249°C) 2. 2 minutes in Fluorinert™ FC-5312 vapor phase at 420°F (216°C) | Solder Dip: No visible effect Vapor Phase: No visible effect with out rub, moderate print smear with rub |

¹B-426 is not recommended for outdoor use.

| PERFORMANCE PROPERTY | CHEMICAL RESISTANCE |
|----------------------|---------------------|
|----------------------|---------------------|

Samples printed with Series R4300 ribbon. Samples laminated to aluminum panels and allowed to dwell 24 hours prior to testing. Test was conducted at room temperature except where noted. Testing consisted of 5 cycles of 10 minute immersions in the specified test fluid followed by a 30 minute recovery period. After final immersion, samples rubbed 10 times with cotton swab saturated with test fluid.

| CHEMICAL REAGENT | SUBJECTIVE OBSERVATION OF VISUAL CHANGE | | |
|-----------------------|---|-------------------|----------------------|
| | EFFECT TO LABEL STOCK | R4300 NO RUB | R4300 WITH RUB |
| Methyl Ethyl Ketone | Slight adhesive ooze | No visible effect | Slight print removal |
| 1,1,1-Trichloroethane | Slight adhesive ooze | No visible effect | Slight print removal |
| Toluene | No visible effect | No visible effect | Slight print removal |
| Isopropyl Alcohol | No visible effect | No visible effect | Slight print removal |
| Mineral Spirits | No visible effect | No visible effect | Slight print removal |
| JP-8 Jet Fuel | Slight adhesive ooze | No visible effect | Slight print removal |
| SAE 20 WT Oil at 70°C | No visible effect | No visible effect | Slight print removal |

| | | | |
|--|----------------------|-------------------|------------------------|
| Mil 5606 Oil | No visible effect | No visible effect | No visible effect |
| Skydrol® 500B-4 | No visible effect | No visible effect | Slight print removal |
| BIOACT® EC-7R™ Terpene Cleaner | No visible effect | No visible effect | Slight print removal |
| 6% Alphametal 2110 Saponifier at 70°C | Topcoat removed | Topcoat removed | Topcoat removed |
| Axarel® 32 | No visible effect | No visible effect | Moderate print removal |
| RE-ENTRY® KNI Solvent 2000 Terpene Cleaner | No visible effect | No visible effect | Severe print removal |
| Deionized Water | No visible effect | No visible effect | No visible effect |
| 3% Alconox® Detergent | No visible effect | No visible effect | No visible effect |
| 10% Sodium Hydroxide Solution | Whitening of topcoat | Slight print fade | Slight print removal |
| 10% Sulfuric Acid Solution | No visible effect | No visible effect | No visible effect |

B-426 is not recommended for use with aqueous cleaning processes.

| | |
|-----------------------------|---|
| PERFORMANCE PROPERTY | MIL-STD-202G, NOTICE 12, METHOD 215K |
|-----------------------------|---|

Samples printed with R4300 ribbon. Printed labels subjected to 3 cycles of 3 minute immersions immediately followed by a toothbrush rub after each immersion.

| TEST FLUID | RESULTS |
|---|-------------------------------|
| Solvent A 1 part IPA, 1 part Mineral Spirits | No visible effect |
| Solvent B 1,1,1-Trichloroethane | Solvent deleted per Notice 12 |
| Solvent C Terpene Defluxer | No visible effect |
| Solvent D Saponifier at 70°C | No visible effect |

Product testing, customer feedback, and history of similar products, support a customer performance expectation of at least **two years from the date of receipt** for this product as long as this product is stored in its original packaging in an environment *below 80 degrees F (27 degrees C) and 60% RH*. We are confident that our product will perform well beyond this time frame. However, it remains the responsibility of the user to assess the risk of using such product. We encourage customers to develop functional testing protocols that will qualify a product's fitness for use, in their actual applications.

Trademarks:

Alconox® is a registered trademark of Alconox Co.
Axarel® is a registered trademark of Petroferm, Inc.
BIOACT® is a registered trademark of Petroferm, Inc.
BradyPrinter™ is a trademark of Brady Worldwide, Inc.
EC-7R™ is a trademark of Petroferm Inc.
Fluorinert™ is a trademark of the 3M Corporation.
Polyken™ is a trademark of Testing Machines Inc.
RE-ENTRY® is a registered trademark of Environsolv Inc.
Skydrol® is a registered trademark of the Monsanto Company
Sunlighter™ is a trademark of the Test Lab Apparatus Company
ASTM: American Society for Testing and Materials (U.S.A.)
PSTC: Pressure Sensitive Tape Council (U.S.A.)
SAE: Society of Automotive Engineers (U.S.A.)
All S.I. Units (metric) are mathematically derived from the U.S. Conventional Units.

Note: All values shown are averages and should not be used for specification purposes. Test data and test results contained in this document are for general information only and shall not be relied upon by

Brady customers for designs and specifications, or be relied on as meeting specified performance criteria. Customers desiring to develop specifications or performance criteria for specific product applications should contact Brady for further information.

Product compliance information is based upon information provided by suppliers of the raw materials used by Brady to manufacture this product or based on results of testing using recognized analytical methods performed by a third party, independent laboratory. As such, Brady makes no independent representations or warranties, express or implied, and assumes no liability in connection with the use of this information.

WARRANTY

Brady products are sold with the understanding that the buyers will test them in actual use and determine for themselves their adaptability to their intended uses. Brady warrants to the buyers that its products are free from defects in material and workmanship, but limits its obligation under this warranty to replacement of the product shown to Brady's satisfaction to have been defective at the time Brady sold it. This warranty does not extend to any persons obtaining the product from the buyers. This warranty is in lieu of any other warranty, express or implied, including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose, and of any other obligations or liability on Brady's part. Under no circumstances will Brady be liable for any loss, damage, expense, or consequential damages of any kind arising in connection with the use, or inability to use, Brady's products.

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Brady North America | 6555 W. Good Hope Rd | Milwaukee, WI 53223 | USA | Tel: 414-358-6600 | Fax: 800-292-2289



BRADY R4300 SERIES THERMAL TRANSFER RIBBON

TDS No. R-4300

Effective Date: 19-Nov-2010

Description:

Brady R4300 Series thermal transfer ribbon is based on a wax/resin formulation that offers the end user a high performance image when used with Brady label materials. Advantages of the R4300 Series ribbon, when printed on the appropriate Brady label, include smear, chemical and environmental resistance. Please refer to the appropriate product Technical Data Sheet for specific ribbon and label performance characteristics. This ribbon is recommended for printing on paper and films that have a matte or rough surface.

Brady's R4300 Series ribbon is UL Recognized and/or CSA Accepted on various Brady label stocks. Refer to UL file MH17154 and MH10939 and CSA Acceptance Record LS41833 for specific material and ribbon approvals.

This ribbon is available in several sizes to be used in Brady bench top thermal transfer printers.

Regulatory:

The R4300 Series ribbon is RoHS compliant to 2005/618/EC MCV amendment to RoHS Directive 2002/95/EC

Details:

Technical Specifications:

| | |
|-----------------------|--|
| Ink Color: | Black |
| Base Film: | Polyester |
| Base Film Thickness: | 4.5 micron |
| Ink Melt Temperature: | 70° - 90°C (158° - 194°F) |
| Usage Condition: | 5 - 35°C (41 - 95°F), 30 - 85% Relative Humidity |

Product testing, customer feedback, and history of similar products, support a customer performance expectation of at least **two years from the date of receipt** for this product as long as this product is stored in its original packaging in an environment *below 80°F (27°C) and 60% RH*. We are confident that our product will perform well beyond this time frame. However, it remains the responsibility of the user to assess the risk of using such product. We encourage customers to develop functional testing protocols that will qualify a product's fitness for use in their actual applications.

Exposure to high temperature, high humidity and direct sunlight should be avoided.

Trademarks:

Note: All values shown are averages and should not be used for specification purposes.

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