



BROOKDALE'S ROHS COMPLIANCE ROAD MAP

BROOKDALE RoHS (Pb-Free) Compliance Roadmap

RoHS (Pb-Free) Overview

In December 2002, the European Union Parliament approved the content of [two directives](#) to better control the management of waste electronic equipment. The [two directives](#) are the Waste from Electrical and Electronic Equipment (WEEE) and the Restriction of Hazardous substances (RoHS). The WEEE addresses the collection and treatment requirements of waste electronic equipment for the member countries. The RoHS sets phase-out dates for the use of lead (Pb) and several other materials (Cd, Hg, Cr VI, etc) contained in electronic products. The RoHS states that the following six (6) hazardous substances are restricted for use in electrical and electronic equipment unless there is an exemption provided in the rule: Mercury (Hg), Lead (Pb), Hexavalent Chrome (CrVI), Cadmium (Ca), Poly-brominated bi-Phenol (PBB), and Poly-brominated di-Phenol Ether (PBDE).

Brookdale's RoHS (Pb-free) Program

The Brookdale Frequency Controls Pb-free program is implemented in accordance with European Union (EU) Legislation titled "Restriction of the use of certain Hazardous Substances (RoHS)" including banning the use of Pb and other five hazardous substances in electronic assemblies after July 1, 2006. It can also be classified as RoHS 6/6 Compliance.

Definitions

RoHS Compliance Classification: Component and Assembly shall be compliant to [Directive 2002/95/EC](#) of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Pb-Free Classification: Component and Assembly Pb content shall be less than 0.1% by weight of the device (in accordance to IPC/EIA J-STD-006) and shall not be intentionally introduced.

Components: Brookdale Frequency Controls Inc.'s definition of components apply to quartz crystal devices.

Assemblies: Brookdale Frequency Controls Inc.'s definition of assemblies apply to oscillator devices and modules (XO, TCXO, OCXO, VCXO and multi-pole MCF's)

Recommended Solder Composition

Brookdale Frequency Controls Inc.'s has qualified the following Pb-free solder composition recommended by the North American Electronics Manufacturing Initiative: Sn95.5Ag3.9Cu0.6

RoHS Compliant Part Number Identification:

When applicable, the Brookdale Frequency Controls Inc.'s specification sheet shall indicate if the device is classified as **RoHS compliant (Pb-free)**. The Part will be marked with a G after the Datecode when possible. Part number to be followed by a G on all in house company part number references.



RoHS 5/6 Compliance

RoHS 5/6 compliance indicates that 5 out of the 6 hazardous substances are not present in the device. However, these devices do contain Lead Pb, as permitted by the following exemptions specified in the Annex of the RoHS directive.

1. Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.
2. Lead in solders for servers, storage and storage array systems.
3. Lead in solders for network infrastructure equipment for switching, signaling, transmission as well as network management for telecommunication.

These parts can be identified by the blue RoHS 5/6 diamond above. And Date code, on device to be followed by R Process Compatibility

All Brookdale Frequency Controls Inc.'s RoHS compliant products are backwards compatible to earlier lower temperature solder reflow profiles.



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Marking and Labeling

Brookdale Frequency Controls Inc.'s has a Pb-free labeling method for the packaging of all Pb-free products. The lowest level shipping container will identify the products as Pb-free, if the customers desire. Parts will be marked with a suffix "G" following the date code where possible for RoHS Compliant, Pb Free. Parts will be marked with a suffix "R" following the date code when they are RoHS Compliant, RoHS 5/6. This will also be indicated on all in house references.

Brookdale's Two Phase Implementation Plan

Brookdale Frequency Controls Inc.'s is implementing their RoHS (Pb-free) Program in two phases. The details of the two phases are listed below.

Phase 1:

SMD and Through-hole Components and Assemblies: Able to withstand the Pb-free 260°C solder reflow profiles shown below. Internal PCB, components, solders, and terminations may contain Pb. External packaging and terminations may contain Pb

SMD Components and Assemblies Reflow Methods

- Infrared/Convection Reflow (per IPC/JEDEC J-STD-020):
 - Average ramp-up rate of 3°C/second maximum
 - Pre-heat from 150°C to 200°C, 60 to 180 seconds
 - Time maintained above a reflow temperature of 217°C, 60 to 150 seconds
 - Target Peak Temperature of 250°C +0/-5°C, 20 to 40 seconds
 - Peak Temperature of 260°C maximum for 10 seconds maximum
 - Average ramp-down rate of 6°C/second maximum
 - Time from 25°C to Peak Temperature, 8 minutes maximum (one time)
- Manual Solder Reflow
 - Target Peak Temperature of 250°C +0/-5°C, 5 to 10 seconds
 - Peak Temperature of 260°C maximum for 10 seconds maximum

Through-hole Components and Assemblies Reflow Methods

- Wave Solder (Back of board Solder Bath Reflow)
 - Pre-heat from 150°C to 200°C, 60 to 180 seconds
 - Peak Temperature of 260°C maximum for 10 seconds maximum (one time)
- Manual Solder Reflow
 - Target Peak Temperature of 250°C +0/-5°C, 5 to 10 seconds
 - Peak Temperature of 260°C maximum for 10 seconds maximum

Phase 2:

SMD and Through-hole Components and Assemblies: Able to withstand Pb-free 260°C solder reflow profile below. Internal PCB, components, solders, and terminations are Pb-free. External packaging and terminations are Pb-free. The device is RoHS compliant.

SMD Components and Assemblies Reflow Methods

- Infrared/Convection Reflow (per IPC/JEDEC J-STD-020):
 - Average ramp-up rate of 3°C/second maximum
 - Pre-heat from 150°C to 200°C, 60 to 180 seconds
 - Time maintained above a reflow temperature of 217°C, 60 to 150 seconds
 - Target Peak Temperature of 250°C +0/-5°C, 20 to 40 seconds
 - Peak Temperature of 260°C maximum for 10 seconds maximum
 - Average ramp-down rate of 6°C/second maximum
 - Time from 25°C to Peak Temperature, 8 minutes maximum (one time)
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- Manual Solder Reflow
 - Target Peak Temperature of 250°C +0/-5°C, 5 to 10 seconds
 - Peak Temperature of 260°C maximum for 10 seconds maximum
- **Through-hole Components and Assemblies Reflow Methods**
 - Wave Solder (Back of board Solder Bath Reflow)
 - Pre-heat from 150°C to 200°C, 60 to 180 seconds
 - Peak Temperature of 260°C maximum for 10 seconds maximum (one time)
 - Manual Solder Reflow
 - Target Peak Temperature of 250°C +0/-5°C, 5 to 10 seconds
 - Peak Temperature of 260°C maximum for 10 seconds maximum

Product Phase Matrix

TH = Through-hole devices; SMD = Surface mount devices

Y = Available now; TBD = To Be Determined, Contact factory for future availability

Lead-Free = RoHS Compliant. Complies with both Phase 1 and 2.

Quartz Crystal Devices

Product Series	Pkg.	Phase 1	Phase 2	Internal Pb %	External Pb %	Lead Category
BFC3x8.2x6	TH	Y	Y	0% Pb	0% Pb	Lead-Free, Date Code "Feb 2006" & later
BFC HC49U	TH	Y	Y	0% Pb	0% Pb	Lead-Free
BFC HC49S/HC49SS	TH	Y	Y	0% Pb	0% Pb	Lead-Free
BFC UM1 Crystals	TH	Y	Y	0% Pb	0% Pb	Lead-Free
BFC UM5 Crystals	TH	Y	Y	0% Pb	0% Pb	Lead-Free
BCC Can Crystals	TH	Y	Y	0% Pb	0% Pb	Lead-Free, Date Code "Feb 2006" & later
BFC75 Crystals	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BFC64 Crystals	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BFC53 Crystals	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BFC42 Crystals	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BFC32 Crystals	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
HC49SM/HC49SSM	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
B506 Crystal	SMD	Y	TBD	0% Pb	<0.1% Pb	
HC49USMD Crystals	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
B306 Crystal	SMD	Y	Y	<0.1% Pb	0% Pb	RoHS

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Clock Oscillators (XO)

Product Series	Package	Phase 1	Phase 2	Internal Pb %	External Pb %	Lead Category
BSM53 Oscillator	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BSM99x Oscillator	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BSM87P Oscillator	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BSM87L Oscillator	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BSM615 Oscillator	SMD	Y	Y	<0.1% Pb	0% Pb	Lead-Free, Date Code "Feb 2006" & later
B1149 Oscillator	TH	Y	Y	0% Pb	0% Pb	Lead-Free, Date Code "Feb 2006" & later
B1100 Oscillator	TH	Y	Y	0% Pb	0% Pb	Lead-Free, Date Code "Feb 2006" & later
B500 Oscillator	TH	Y	Y	0% Pb	0% Pb	Lead-Free, Date Code "Feb 2006" & later
B1100W Oscillator	TH	Y	Y	0% Pb	0% Pb	Lead-Free, Date Code "Feb 2006" & later
BSM327KA	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BSW11	TH	Y	Y	0% Pb	0% Pb	Lead-Free, Date Code "Feb 2006" & later

TCXO/VCTCXOs

Product Series	Package	Phase 1	Phase 2	Internal Pb %	External Pb %	Lead Category
BT/BVT1657T	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BT/BVT1657CS	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BT/BVT1653T	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BT/BVT16xxT	TH	Y	Y	<0.1% Pb	<0.1% Pb	Lead-Free
BT/BVT16xxS	TH	Y	Y	<0.1% Pb	<0.1% Pb	Lead-Free
BT/BVT16xxCS	TH	Y	Y	<0.1% Pb	<0.1% Pb	Lead-Free
BTA/BVTA16xxT	TH	Y	Y	<0.1% Pb	<0.1% Pb	Lead-Free
BTA/BVTA16xxS	TH	Y	Y	<0.1% Pb	<0.1% Pb	Lead-Free
BTA/BVTA16xxCS	TH	Y	Y	<0.1% Pb	<0.1% Pb	Lead-Free

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VCXOs

Product Series	Pkg..	Phase 1	Phase 2	Internal Pb %	External Pb %	Lead Category
BMV3 VCXO	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BMV5 VCXO	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BMV53	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BMVPE3 VCXO	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BVFT VCXO	SMD	Y	Y	0% Pb	<0.1% Pb	Lead-Free, Date Code "Feb 2006" & later
BVFP VCXO	SMD	Y	Y	0% Pb	<0.1% Pb	Lead-Free, Date Code "Feb 2006" & later
BV1525 VCXO	TH	Y	Y	0% Pb	0% Pb	Lead-Free, Date Code "Feb 2006" & later
BV5xxT VCXO	TH	Y	Y	0% Pb	0% Pb	Lead-Free, Date Code "Feb 2006" & later
BV1523BA VCXO	TH	Y	Y	0% Pb	0% Pb	Lead-Free, Date Code "Feb 2006" & later
BV14xxS VCXO	TH	Y	Y	0% Pb	0% Pb	Lead-Free, Date Code "Feb 2006" & later

Ceramic Resonators

BZTT Resonator	TH	Y	Y	0% Pb	0% Pb	Lead-Free
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MCFs

BMFS1 MCF	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BMFS2 MCF	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BMUHF MCF	TH	Y	Y	0% Pb	0% Pb	Lead-Free
BMF12K MCF	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BMF20K MCF	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BMF25K MCF	SMD	Y	Y	0% Pb	0% Pb	Lead-Free
BMF50K MCF	TH	Y	Y	0% Pb	0% Pb	Lead-Free



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USE OF EXEMPTIONS/EXCEPTIONS

Some customers have indicated that they intend to use the permitted application exemption in the RoHS annex that allows, among others, the use of lead in solder used in equipment and components for network infrastructure. Customers have also indicated that they will continue to procure product with current lead-based assembly technology due to concern with the lead-free solder alternatives and have requested no change to the product. Brookdale will support such requests when possible. Customers are advised that maintenance of two different products in the future, both lead-based and its lead-free equivalent will result in significant logistical and operational costs that will be passed on to customers who wish to continue to order the older lead-based product. This cost would have to be passed on to the customer.

If you need any additional information regarding this notification, please contact your [Brookdale Marketing & Sales Representative](#).