

TI Low Halogen (Green) Statement

For TI Products, Green means the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709C low halogen requirements of ≤ 1000 ppm threshold; Antimony trioxide contained in halogen-based flame-retardant materials meets the ≤ 1000 ppm threshold requirement.

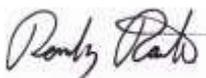
The IEC 61249-2-21 standard defines requirements for halogen-free printed circuit boards (PCB). It states a PCB is not halogen-free unless the brominated flame retardant (BFR) and chlorinated flame retardants (CFR) content of the PCB is < 900 ppm each, or the sum of both are < 1500 ppm. For components, requirements are defined in JEDEC and ECA joint standard JS709C 'Definition of "Low-Halogen" for Electronic Products'. Limits for chlorine or bromine contained within BFRs, CFRs and PVC are 1000ppm for each.

Companies have begun to demand adherence to low halogen requirements referencing these specs. To meet customer's needs, Texas Instruments Incorporated (TI) provides the following information about the chlorine and bromine halogen content of its integrated circuit products:

1. TI "Green" integrated circuits surpass regulatory requirements by meeting low halogen requirements for Brominated Flame Retardants in its plastics as defined by JS709C. They also meet the EU RoHS requirements for Polybrominated Biphenyls (PBB) and Polybrominated Diphenylether (PBDE). Any residues that may remain do not exceed a maximum concentration value of 1000ppm.
2. TI currently gathers bromine and chlorine 3rd party test data at the homogeneous level from its suppliers. Testing requirements are for plastics and epoxy type material sets since brominated and chlorinated flame retardants are not used within metals or ceramics.
 - a. For a typical lead frame package, testing applies to the die attach and mold compound.
 - b. For a typical ball grid array (BGA) package testing applies to the die attach, mold compound and substrate when used.
 - c. Testing by suppliers providing TI defined "Green" materials must pass the 1000ppm maximum threshold requirements.
3. Polyvinyl Chloride (PVC) is not used in standard integrated circuit packaging (leadframe) and is not present in TI integrated circuit products. However, PVC is the primary material in shipping tubes. Though not banned by law at this time, TI is researching replacement materials that are cost effective and comparable to the current PVC tubes.

Current Green compliance status of TI products can be found @ [ti.com/productcontent](https://www.ti.com/productcontent)

Sincerely,



Randy Rath
TI SC Product Stewardship Management

Important Information/Disclaimer

TI bases its material content information on information provided by third-party suppliers and has taken, and continues to take, reasonably diligent steps to provide any required or available information. TI may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers may consider certain information to be proprietary, and thus certain information may not be available for release by TI. The material content information is provided by TI "as is."

For additional information, please contact [TI customer support](#).

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to TI's Terms of Sale (www.ti.com/legal/termsofsale.html) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2020, Texas Instruments Incorporated

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to [TI's Terms of Sale](#) or other applicable terms available either on [ti.com](https://www.ti.com) or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2023, Texas Instruments Incorporated