

## TI Low Halogen (Green) Statement

For TI Products, Green means the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of  $\leq 1000$ ppm threshold; Antimony trioxide contained in halogen based flame retardant materials meets the  $\leq 1000$ 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  $< 1000$ ppm each, or the sum of both are  $< 1500$ ppm. For components, requirements are defined in JEDEC and ECA joint standard JS709B '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 JS709B. 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 3<sup>rd</sup> 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

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