

TI RoHS and Product Status Designation

TI certifies to the best of its knowledge that TI's semiconductor products designated as "Pb-Free", "RoHS Exempt" or "Green" (defined below):

- Are compliant with the threshold requirements of the European Union's Restriction on Use of Hazardous Substances
 Directive, 2002/95/EC ("RoHS1"), as well as the recast Directive 2011/65/EU ("RoHS 2")
- Do not exceed IEC 62474 dB (formerly the Joint Industry Guide ("JIG-101")) and the Global Automotive Declarable Substance List (GADSL) for regulated substance thresholds
- Meet the China Management Methods for controlling Pollution by Electronic Information Products ("China RoHS").
- Do not contain any of the Registration, Evaluation, Authorization and Restriction of Chemicals ("REACH") substances
 of very high concern (SVHC) above the regulatory threshold of 0.1% at the Article 33 level. (See
 TI REACH Statement.pdf for the latest TI REACH document)

TI defines "Pb-free", "RoHS Exempt" and "Green" products as follows:

- **Pb-Free:** TI defines "Pb-Free" or "RoHS Compliant" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 6 RoHS substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI "Pb-Free" and "RoHS Compliant" products are suitable for use in specified lead-free processes. Product is also fully compliant to GADSL and IEC 62474 database electronics requirements
- RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.
- **Green:** TI defines "Green" to mean Pb-Free/RoHS Compliant and content of Chlorine (CI), Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must meet the 1000ppm threshold requirement

Note: Proprietary materials must be in full compliance to known regulatory requirements as well

TI semiconductor products *not* designated as "Pb-Free" or "Green" complies with EU RoHS and China RoHS for all substances except Lead (Pb), which may be found in the leadframe plating or solder balls, or in one of the RoHS exempt applications, 7(a), 7(c)-IV or 15. For semiconductor products containing lead, the China RoHS EFUP is 50 years (www.ti.com/leadfree).

TI's position is that its semiconductor products are considered "components" under EU RoHS definition. Therefore, the CE marking, EU declaration of conformity, and internal product control provisions stipulated in Article 7 of RoHS 2 do not apply.

Evaluation modules (EVMs): Tl's EVMs are "equipment specifically designed solely for the purposes of research and development only made available on a business-to-business basis" and, per Article 2(4)(j) of RoHS 2, are not subject to RoHS 2.

To the best of TI's knowledge, its packing materials (boxes, trays, etc) comply with EU Directive 2013/2/EU for Packaging and Packaging Waste Material.

Signature:

Name/Title: Robert Furtaw, Vice President, Worldwide SC Quality

Date: 10/06/2015

1 Revised: October 2015

Important Warrantee and Disclaimer Information

TI bases its material content knowledge on information provided by third parties and has taken and continues to take commercially reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain limited information to be proprietary, and thus CAS numbers and other limited information may not be available for release. TI's standard warranty and limitation of provisions liability of TI's Standard Terms and Conditions (available http://www.ti.com/sc/docs/stdterms.htm) apply to the representations herein unless otherwise provided by a written contract or other agreement signed by the parties.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment. TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have *not* been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

2 Revised: October 2015

Products

Audio **Amplifiers Data Converters** DLP® Products **DSP**

Clocks and Timers Interface Logic

Power Mgmt

Microcontrollers **RFID**

OMAP Applications

Processors

Wireless Connectivity

www.ti.com/audio amplifier.ti.com dataconverter.ti.com www.dlp.com dsp.ti.com

www.ti.com/clocks interface.ti.com logic.ti.com

power.ti.com

microcontroller.ti.com www.ti-rfid.com www.ti.com/omap

www.ti.com/wirelesscon

nectivity

Applications

Automotive and Transportation Communications and Telecom Computers and Peripherals Consumer Electronics **Energy and Lighting**

Industrial Medical Security

Space, Avionics and Defense

Video and Imaging TI E2E Community

www.ti.com/automotive www.ti.com/communications

www.ti.com/computers www.ti.com/consumer-apps

www.ti.com/energy www.ti.com/industrial www.ti.com/medical www.ti.com/security

www.ti.com/space-avionics-

defense

www.ti.com/video

e2e.ti.com

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265 Copyright © 2014, Texas Instruments Incorporated

3 Revised: October 2015

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have *not* been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

Products	Applications
Products	Applications

Audio www.ti.com/audio Automotive and Transportation www.ti.com/automotive **Amplifiers** amplifier.ti.com Communications and Telecom www.ti.com/communications **Data Converters** dataconverter.ti.com Computers and Peripherals www.ti.com/computers **DLP® Products** www.dlp.com Consumer Electronics www.ti.com/consumer-apps DSP dsp.ti.com **Energy and Lighting** www.ti.com/energy Clocks and Timers www.ti.com/clocks Industrial www.ti.com/industrial Interface interface.ti.com Medical www.ti.com/medical Logic Security www.ti.com/security logic.ti.com

Power Mgmt power.ti.com Space, Avionics and Defense www.ti.com/space-avionics-defense

Microcontrollers microcontroller.ti.com Video and Imaging www.ti.com/video

RFID www.ti-rfid.com

OMAP Applications Processors www.ti.com/omap TI E2E Community e2e.ti.com

Wireless Connectivity www.ti.com/wirelessconnectivity