

**Fact Sheet**

# Texas Instruments Compliance to the Lead (Pb)-Free/RoHS Directive



- ✓ Nickel-Palladium-Gold RoHS Compliant Solutions (no "Tin Whiskering")
- ✓ Unique Part Numbers in addition to Standard Part Numbers
- ✓ Easy Access to Material Content Information

## Why Has TI Taken This So Seriously?

- There is an increasing need for environmentally friendly solutions in electronic components and systems.
- The European Union (EU) has adopted the Restriction on Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS) and the Waste Electrical and Electronic Equipment (WEEE) directives.
- **Effective July 1, 2006**, RoHS bans the use of certain materials such as lead, mercury and cadmium in electronics sold in Europe.
- Similar laws have been adopted in the United States (California and Maine) and are planned for China.

## TI's Position Regarding the RoHS and WEEE Directives

- TI is committed to manufacturing environmentally friendly products and has already completed most of the planned RoHS conversions.
- TI's primary solution for lead-frame devices is a **nickel-palladium-gold**

**(NiPdAu)** finish, which is the preferred solution in the industry. "Tin whiskering" is a concern of many OEMs that can occur with use of matte tin finishes, which raises reliability concerns not experienced with TI's NiPdAu solution.

- For customers wanting "leaded" parts, NiPdAu is an accepted alternative.
- TI has key information easily accessible online, including a material-content search tool with downloadable results, a Pb-Free Certificate and Application Notes. For details, visit:

[www.ti.com/ecoinfo](http://www.ti.com/ecoinfo)

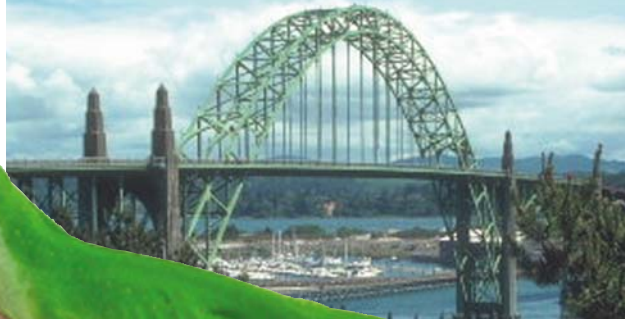


## TI's Method of Part Numbering/Nomenclature

- TI will set up **unique part numbers** for its RoHS-compliant products.
- TI standard part numbers will not become obsolete.
- For lead-frame-based devices, the RoHS-compliant solution is backward-compatible with lead-based processes; so the same part is shipped regardless of whether a unique part number or a standard part number is ordered.
- Lead-frame-based unique part numbers will consist of the standard P/N plus a two-character suffix (usually E4 or G4, sometimes E3, E6, G3 or G6):
  - Standard P/N = LM358DR; unique P/N = LM358DRG4.
  - Standard P/N = SN74HC00DR; unique P/N = SN74HC00DRE4.
  - "E" = RoHS-compliant; "G" = Green (RoHS-compliant and no Br/Sb).
- For BGA-based devices, the RoHS-compliant solution is not backward-compatible with lead-based processes. The standard part number has leaded solder balls; the unique part number has Pb-Free solder balls.

*(Continued on back)*





- BGA-based unique part numbers will use a different package-type designator that contains a "Z":
  - Leaded P/N = ADS5121IGHK; RoHS unique P/N = ADS5121IZHK.
  - Leaded P/N = OPA2347YEDR; RoHS unique P/N = OPA2347YZDR.
  - "Z" = RoHS-compliant.
- All unique part numbers will be set up after each device reaches its Available Supply Date (ASD). For ASD status, use the Search Tool at: [www.ti.com/productcontent](http://www.ti.com/productcontent)
- The Search Tool results will display any matching unique part numbers that have already been set up.
- For customers that want to place an order using a unique part number, but before the ASD, contact your local TI sales representative to see if the ASD can be expedited.

### TI's Pb-Free Packing Label and Symbolization

- Since June 1, 2004, TI has added the **JEDEC logo and a two-character finish code** to the packing labels to indicate RoHS-compliant products.
- The two-character finish code is now also included in the device symbolization, space permitting (~98% of TI parts have enough space).
- Examples of the packing label and symbolization can be found under the Pb-Free Logo link on the left at: [www.ti.com/leadfree](http://www.ti.com/leadfree)

### To Determine Part Status and Transition to RoHS Compliance

- The TI product content website [www.ti.com/productcontent](http://www.ti.com/productcontent) shows the **current RoHS status** of individual parts, including moisture level, peak reflow temperature, package finish, RoHS compliance, Green status and material content. TI's Pb-Free Certificate is included in the downloaded results.
- This same tool provides planned conversion dates for products that are not yet RoHS-compliant/Green.

### How Can a TI Part Be Quickly Identified as RoHS-Compliant?

- A TI part has a **unique Pb-Free part number** (i.e., G4, E4, Z suffix).
- Shipping paperwork/label includes the unique Pb-Free part number, JEDEC Pb-Free logo and two-character JEDEC-/IPC-based finish code.
- Part marked with two-character JEDEC-/IPC-based finish code, when space permits.

### For More Information

- **Customer Surveys** or Pb-Free/Green status of products may be directed to: [ezsurveys@list.ti.com](mailto:ezsurveys@list.ti.com)



### TI Definitions

- **Pb-Free:** "Lead-Free" or "Pb-Free" means semiconductor products that are compliant with current **RoHS requirements** for all six banned 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 products are suitable for use in specified lead-free processes.
- **Green: Pb-Free (RoHS-compatible) and free of bromine (Br)- and antimony (Sb)-based flame retardants** (Br or Sb does not exceed 0.1% by weight in homogeneous material).
- **Pb-Free (RoHS) Conversion Date:** The forecasted or actual conversion date for the specific device package, pin count and assembly site (not the date TI began shipping only RoHS-compliant parts).
- **RoHS ASD:** The forecasted or actual date the RoHS-compliant device will be available for **purchase** from TI (date TI began shipping only RoHS-compliant parts).

- For any other questions regarding TI's Pb-Free strategy, contact your local TI sales representative or the TI Product Information Center at (972) 644-5580.