

**Date:** Q404 Update  
**Products:** All PCSG Products

**Originator:** PCSG Business Operations  
**Type:** Product Update

## **PCSG Lead-Free (Pb-Free) Product Status & RoHS**

AMD is aware that the European Union Directive entitled “Restriction on the use of certain Hazardous Substances in Electrical and Electronics Products” (RoHS), 2002/95/EC, will become effective on 1 July 2006 and will restrict the use of six substances within electrical and electronic equipment. The substances are:

<b>Substance</b>	<b>Proposed EU limit (by weight)</b>
• Lead (Pb)	0.1%
• Mercury (Hg)	0.1%
• Cadmium (Cd)	0.01%
• Hexavalent Chromium (Cr6+)	0.1%
• Polybrominated biphenyls (PBB)	0.1%
• Polybrominated diphenyl ethers (PBDE).	0.1%

The only RoHS substance that is intentionally used in AMD Personal Connectivity Solutions Group (PCSG) processors is Lead (Pb), in certain products which will continue to be offered in a Pb-bearing version, as well as certain applications (e.g., AMD Geode™ NX devices having flip-chip style internal interconnects) that are in compliance with the RoHS Directive

**“Pb-free”** - AMD PCSG products which are designated as Pb-free contain materials with a maximum of 0.1% lead, and are otherwise compliant with the RoHS Directive.

**“Pb-reduced”** - AMD PCSG products which are designated as “Pb-reduced” have significantly reduced levels of Pb, but have at least one application of lead that is exempt from the RoHS lead restrictions and is otherwise compliant with the RoHS Directive.

AMD’s Lead-free (Pb-Free) and Lead-Reduced (Pb-Reduced) PCSG products are identified by unique Ordering Part Numbers (OPNs) which are explained in this document. OPNs are marked on the on the topside of the device, and on the shipping container labels. Company personnel are tracking the development and reconciliation of JEDEC and JEITA standards which cover Lead-Free (Pb-free) marking on products before implementing additional worldwide labeling methodologies for our products.

This bulletin contains information on the availability of Pb-Free and Pb-Reduced AMD PCSG products. It also includes the appropriate product line contacts for questions pertaining to specific PCSG products.

### **➤ Products/Package code which will be offered in a Lead-Free (Pb-free) version \***

\* A complete list of OPN's is listed on pp. 5-6.

**EPD**

ElanSC520 BGA  
 Am186CC PQR  
 Am186CH PQR  
 Am186CU PQR  
 Am186ER PQL

**NPD**

Am79C874 PQT  
 Am79C875 PQR  
 Am79C972B PQL  
 Am79C972B PQR  
 Am79C973B PQL  
 Am79C973B PQR  
 Am79C975B PQL  
 Am79C975B PQR  
 Am79C976 PQR

**MIP**

Au1000 LBB  
 Au1500 LBA  
 Au1100 LBA  
 Au1550 LBA

**GEO**

Geode GX BGD  
 Geode GX BGU  
 CS5535 BGA(UDC)  
 SC1100 BGA(UFH)  
 SC1200 BGU(UFH)  
 SC1201 BGU(UFH)  
 SC2200 BGU(UFH)  
 SC3200 BGU(UFH)

➤ **Products/Package code offered in a Lead Reduced (Pb-Reduced) version**

AMD Geode™ NX (Athlon) OGF

➤ **Products that will NOT be offered in a Lead-Free (Pb-Free) version \***

\* Reminder: AM186ED/EM/ES, ELANSC300, ELANSC400, AM486, AM29xxx, K6E, and Duron are obsolete and therefore, will not be offered in Pb-free.

**EPD**

AM186ER PQR  
 AM188ER PQR  
 G76101 BGA  
 G76601 BGA

**NPD**

AM79C901 PL  
 AM79C901 PQT  
 AM79C978A PQR  
 AM79C978A PQL

**GEO**

GX1 BGD  
 CS5530A BGA (UCE)  
 SC1200 BGD (UCL)  
 SC2200 BGD (UCL)  
 SC1201 BGD (UCL)  
 SC3200 BGD (UCL)

➤ **Product Marking/Identification**

All Lead-free (Pb-free) and Pb-Reduced products can be identified by their OPN and topside marking.

**EPD, NPD, MIP**

Some typical OPN examples are listed below:

**Standard**

ELANSC520-100AC  
 ELANSC520-100AI  
 AU1500-333MBC  
 AU1500-333MBI

**Lead-Free**

ELANSC520-100AD  
 ELANSC520-100AF  
 AU1500-333MBD  
 AU1500-333MBF

**Standard**

ANXL1500FGC3S

**Lead-Reduced**

ANXL1500FGC3M

The last character of the OPN traditionally has been used to define the operating temperature ranges, such as commercial or industrial (details of temperature ranges are in the datasheet). For EPD, NPD, and MIP products this last character now shows

whether a part uses a standard or lead-free package. The common codes used within PCS are as follows:

C = Commercial Operating Temperature Range (see datasheet)  
**D = *Lead Free* Commercial Operating Temperature Range (see datasheet)**

I = Industrial Operating Temperature Range (see datasheet)  
**F = *Lead Free* Industrial Operating Temperature Range (see datasheet)**

I = MIP Extended Operating Temperature Range (see datasheet)  
**F = *Lead Free* MIP Extended Operating Temperature Range (see datasheet)**

S = Geode NX Commercial Operating Temperature Range (see datasheet)  
**M = *Pb-Reduced* Geode NX Commercial Operating Temperature Range (see datasheet)**

### **AMD Geode™ Processor**

Typical OPN examples are listed below:

#### **Standard**

CS5535-UDC  
SC1100UFH-266  
SC1201UFH-266  
AGXD533AAXF0CC

#### **Lead-free**

CS5535-UDCF  
SC1100UFH-266F  
SC1201UFH-266F  
AGXD533AAXF0CD

The last character of the OPN indicates whether the part uses a standard (eutectic) or lead-free package.

F = Lead Free on the Geode SCx20x processors, and the CS5535 companion chip

D = Lead Free on the Geode GX processors

➤ **Reminder: The GX2 processors have recently been rebranded. See below for new part #'s.**

Original Pb-Free Part Number	Clock MHz	Display	Package / Pins	New Pb-Free Part Number	Device Name
GX2-X18-CDF	333	CRT	BGD368	AGXD466AAXD0CD	Geode GX 466@0.9W
GX2-X18-TDF	333	TFT	BGD368	AGXD466AAXD0TD	Geode GX 466@0.9W
GX2-X28-CDF	366	CRT	BGD368	AGXD500AAXE0CD	Geode GX 500@1.0W
GX2-X28-TDF	366	TFT	BGD368	AGXD500AAXE0TD	Geode GX 500@1.0W
GX2-X38-CDF	400	CRT	BGD368	AGXD533AAXF0CD	Geode GX 533@1.1W
GX2-X38-TDF	400	TFT	BGD368	AGXD533AAXF0TD	Geode GX 533@1.1W

 **PCSG Lead-Free (Pb-Free) Products and Qualification Schedules as of Oct 2004**

Prod. Line	External Device	Package	Assembly Site	Lead-Free Plating or Ball Composition	Intended MSL/Temp Rating	Planned Eng. Samples Availability	Planned Mass Prod.
EPD	ElanSC520	BGA388 (ball grid array)	ASEKH	Sn95.5Ag4.0Cu0.5	MSL 4, 250+0/-5 C	Currently available	
EPD	Am186CC Am186CH Am186CU	PQR160 (leadframe)	ASEKH	Sn + Cu2.0	MSL 3, 250+0/-5 C	Q105	Q105
EPD	Am186ER Am188ER	PQL100 (leadframe)	ATK-K3	Sn	MSL 3, 250+0/-5 C	Q105	Q105
NPD	Am79C874	PQT080 (leadframe)	ASEKH	Sn + Cu2.0	MSL 3, 255+5/-0 C	Currently available	
NPD	Am79C875	PQR100 (leadframe)	ASEKH	Sn + Cu2.0	MSL 3, 250+0/-5 C	Currently available	
NPD	Am79C972B Am79C973B Am79C975B	PQR160 (leadframe)	ASEKH	Sn + Cu2.0	MSL 3, 250+0/-5 C	Currently available	
NPD	Am79C972B Am79C973B Am79C975B	PQL176 (leadframe)	ATK-K3	Sn	MSL 3, 250+0/-5 C	Currently available	

➤ **PCSG Lead-Free (Pb-Free) Products and Qualification Schedules as of Oct 2004 (cont.)**

Prod. Line	External Device	Package	Assembly Site	Lead-Free Plating or Ball Composition	Intended MSL/Temp Rating	Planned Eng. Samples Availability	Planned Mass Prod.
NPD	Am79C976 Am79C977	PQR208 (leadframe)	ATK-K1	Sn	MSL 3, 250+0/-5 C	Currently available	
MIP	Au1000	LBB324 (ball grid array)	ASEKH	Sn95.5Ag4.0Cu0.5	MSL3/260	Currently available	
MIP	Au1500	LBA424 (ball grid array)	ASEKH	Sn95.5Ag4.0Cu0.5	MSL3/260	Currently available	
MIP	Au1100	LBA399 (ball grid array)	ASEKH	Sn95.5Ag4.0Cu0.5	MSL3/260	Currently available	
MIP	AU1550	LBA483 (ball grid array)	ASEKH	Sn95.5Ag4.0Cu0.5	MSL3/260	Currently available	
GEO	GX	BGD368 (ball grid array)	ASEKH	Sn-Ag3.5	MSL3/260	Currently available	
GEO	GX	BGU396 (ball grid array)	ASEKH	Sn-Ag3.5	MSL3/260	Now	Mid Dec
GEO	CS5535	BGA208 (ball grid array)	ASEKH	Sn-Ag3.5	MSL3/260	Currently available	
GEO	SC1100	BGA388 (ball grid array)	NSSG	Sn-Ag3.5	MSL3/260	Currently available	
GEO	SC1200 SC1201 SC2200 SC3200	BGU481 (ball grid array)	ASEKH	Sn-Ag3.5	MSL3/260	Currently available	
EPD	Geode NX (Athlon) Thoroughbred	<b>OGF453</b> (pin grid array)	AMD	N/A Surface Mount	N/A	Q105	Q205



### Lead-free (Pb-Free) Product Offerings

Prod. Line	External Device	PKG	Standard OPN	Lead-free OPN
EPD	ElanSC520	BGA388	ELANSC520-133AC 8A	ELANSC520-133AD 8A
EPD	ElanSC520	BGA388	ELANSC520-100AC	ELANSC520-100AD
EPD	ElanSC520	BGA388	ELANSC520-100AI	ELANSC520-100AF
EPD	Am186CC	PQR160	Am186CC-25KC\W C	Am186CC-25KD\W C
EPD	Am186CC	PQR160	Am186CC-25KI\W C	Am186CC-25KF\W C
EPD	Am186CC	PQR160	Am186CC-40KC\W C	Am186CC-40KD\W C
EPD	Am186CC	PQR160	Am186CC-40KI\W C	Am186CC-40KF\W C
EPD	Am186CC	PQR160	Am186CC-50KC\W C	Am186CC-50KD\W C
EPD	Am186CH	PQR160	Am186CH-25KC\W C	Am186CH-25KD\W C
EPD	Am186CH	PQR160	Am186CH-25KI\W C	Am186CH-25KF\W C
EPD	Am186CH	PQR160	Am186CH-40KC\W C	Am186CH-40KD\W C
EPD	Am186CH	PQR160	Am186CH-40KI\W C	Am186CH-40KF\W C
EPD	Am186CH	PQR160	Am186CH-50KC\W C	Am186CH-50KD\W C
EPD	Am186CU	PQR160	Am186CU-25KC\W C	Am186CU-25KD\W C
EPD	Am186CU	PQR160	Am186CU-25KI\W C	Am186CU-25KF\W C
EPD	Am186CU	PQR160	Am186CU-40KC\W C	Am186CU-40KD\W C
EPD	Am186CU	PQR160	Am186CU-40KI\W C	Am186CU-40KF\W C
EPD	Am186CU	PQR160	Am186CU-50KC\W C	Am186CU-50KD\W C
EPD	Am186ER/Am188ER	PQL100	Am186ER/Am188ER-25VC\W	Am186ER/Am188ER-25VD\W
EPD	Am186ER/Am188ER	PQL100	Am186ER/Am188ER-25VI\W	Am186ER/Am188ER-25VF\W
EPD	Am186ER/Am188ER	PQL100	Am186ER/Am188ER-40VC\W	Am186ER/Am188ER-40VD\W
EPD	Am186ER/Am188ER	PQL100	Am186ER/Am188ER-40VI\W	Am186ER/Am188ER-40VF\W
EPD	Am186ER/Am188ER	PQL100	Am186ER/Am188ER-50VC\W	Am186ER/Am188ER-50VD\W
EPD	Am186ER/Am188ER	PQL100	Am186ER/Am188ER-50VI\W	Am186ER/Am188ER-50VF\W
NPD	AM79C874	PQT080	AM79C874VC	AM79C874VD
NPD	AM79C874	PQT080	AM79C874VI	AM79C874VF
NPD	AM79C875	PQR100	AM79C875KC	AM79C875KD
NPD	AM79C875	PQR100	AM79C875KI	AM79C875KF
NPD	AM79C972B	PQR160	AM79C972BKC\W	AM79C972BKD\W

Prod. Line	External Device	PKG	Standard OPN	Lead-free OPN
NPD	AM79C972B	PQR160	AM79C972BKI\W	AM79C972BKFI\W
NPD	AM79C972B	PQL176	AM79C972BVC\W	AM79C972BVD\W
NPD	AM79C972B	PQL176	AM79C972BVI\W	AM79C972BVF\W
NPD	AM79C973B	PQR160	AM79C973BKC\W	AM79C973BKD\W
NPD	AM79C973B	PQL176	AM79C973BVC\W	AM79C973BVD\W
NPD	AM79C975B	PQR160	AM79C975BKC\W	AM79C975BKD\W
NPD	AM79C975B	PQL176	AM79C975BVC\W	AM79C975BVD\W
NPD	AM79C976	PQR208	AM79C976KC	AM79C976KD
NPD	AM79C976	PQR208	AM79C976KI	AM79C976KF
NPD	AM79C977	PQR208	AM79C977KC	AM79C977KD
NPD	AM79C977	PQR208	AM79C977KI	AM79C977KF

➤ (cont'd) Lead-free (Pb-Free) Product Offerings

MIP	Au1000	LBB324	AU1000-266MCC	AU1000-266MCD		
MIP	Au1000	LBB324	AU1000-266MCI	AU1000-266MCF		
MIP	Au1000	LBB324	AU1000-400MCC	AU1000-400MCD		
MIP	Au1000	LBB324	AU1000-500MCC	AU1000-500MCD		
MIP	Au1500	LBA424	AU1500-333MBC	AU1500-333MBD		
MIP	Au1500	LBA424	AU1500-333MBI	AU1500-333MBF		
MIP	Au1500	LBA424	AU1500-400MBC	AU1500-400MBD		
MIP	Au1500	LBA424	AU1500-500MBC	AU1500-500MBD		
MIP	Au1100	LBB399	AU1100-333MBC	AU1100-333MBD		
MIP	Au1100	LBB399	AU1100-333MBI	AU1100-333MBF		
MIP	Au1100	LBB399	AU1100-400MBC	AU1100-400MBD		
MIP	Au1100	LBB399	AU1100-500MBC	AU1100-500MBD		
MIP	Au1550	LBA483	AU1550-333MBC	AU1550-333MBD		
MIP	Au1550	LBA483	AU1550-333MBI	AU1550-333MBF		
MIP	Au1550	LBA483	AU1550-400MBC	AU1550-400MBD		
MIP	Au1550	LBA483	AU1550-500MBC	AU1550-500MBD		
GEO	GX	BGD368	AGXD466AAXD0CC	AGXD466AAXD0CD		
GEO	GX	BGD368	AGXD466AAXD0TC	AGXD466AAXD0TD		
GEO	GX	BGD368	AGXD500AAXE0CC	AGXD500AAXE0CD		
GEO	GX	BGD368	AGXD500AAXE0TC	AGXD500AAXE0TD		
GEO	GX	BGD368	AGXD533AAXF0CC	AGXD533AAXF0CD		
GEO	GX	BGD368	AGXD533AAXF0TC	AGXD533AAXF0TD		
GEO	GX	BGU396	AGXD466EEXD0BC	AGXD466EEXD0BD		
GEO	GX	BGU396	AGXD500EEXE0BC	AGXD500EEXE0BD		
GEO	CS5535	BGA208	CS5535-UDC	CS5535-UDCF		
GEO	SC1100	BGA388	SC1100UFH-233	B1	SC1100UFH-233F	B1
GEO	SC1100	BGA388	SC1100UFH-266	B1	SC1100UFH-266F	B1
GEO	SC1200	BGU481	SC1200UFH-266	D3	SC1200UFH-266F	33
GEO	SC1200	BGU481	SC1200UFH-266B	D3	SC1200UFH-266BF	33
GEO	SC1201	BGU481	SC1201UFH-266	D3	SC1201UFH-266F	33
GEO	SC1201	BGU481	SC1201UFH-266B	D3	SC1201UFH-266BF	33
GEO	SC2200	BGU481	SC2200UFH-233	D3	SC2200UFH-233F	33
GEO	SC2200	BGU481	SC2200UFH-266	D3	SC2200UFH-266F	33
GEO	SC2200	BGU481	SC2200UFH-266B	D3	SC2200UFH-266BF	33
GEO	SC2200	BGU481	SC2200UFH-300	D3	SC2200UFH-300F	33
GEO	SC3200	BGU481	SC3200UFH-233	D3	SC3200UFH-233F	33
GEO	SC3200	BGU481	SC3200UFH-266	D3	SC3200UFH-266F	33

➤ **Lead-Reduced (Pb-Reduced) Product Offerings**

<b>Prod. Line</b>	<b>External Device</b>	<b>PKG</b>	<b>Standard OPN</b>	<b>Lead-free OPN</b>
EPD	Geode NX 1250 (Athlon –Thoroughbred)	OGF453	ANXL1250FYC3S	ANXL1250FYC3M
EPD	Geode NX 1500 (Athlon –Thoroughbred)	OGF453	ANXL1500FGC3S	ANXL1500FGC3M
EPD	Geode NX 1750 (Athlon – Thoroughbred)	OGF453	ANXS1750FXC3S	ANXS1750FXC3M

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