12500 TI Boulevard, MS 8640, Dallas, Texas 75243

Final Notification of Qualification of New Environmentally Friendly (green) Mold Compound for TQFP/LQFP Packages Assembled at TI Philippines and TI Taiwan Assembly Sites

Change Notification Letter
PCN# 20040714001
August 12, 2004

Abstract

The purpose of this notification is to inform you of a change to Texas Instruments, Inc. (TI) products that will achieve environmental improvements through the use of new package material sets.

Texas Instruments has been a leader in the industry in implementing Pb-free solderable finishes such as nickel-palladium (NiPd) and nickel-palladium-gold (NiPdAu) on lead-frame based packages. In our continuing effort to meet the customers' need for environmentally friendly (i.e. "green") packages, we will also be offering to the customers products built with green mold compounds.

Extensive product qualifications have been completed to achieve this change with minimal risk.

This is the final notification, and applies to the specific products listed below.

Analysis

Please see the attached qualification information which summarizes the various test methods and conditions that TI has completed.

The products changed under this notice are fully compatible with both Lead-based (Pb-based) and Lead-free (Pb-free) soldering processes.

Lead (Pb)-Free Definition: TI defines "Lead (Pb)-Free" or "Pb-Free" to mean RoHS compatible, including a lead concentration that does not exceed 0.1% of total product weight, and, if designed to be soldered, suitable for use in specified lead-free soldering processes."

There is no requirement for any customers to make any changes in their soldering processes, provided they are in compliance with TI soldering recommendations as provided in the Application Notes listed at the following web site:

http://www.ti.com/leadfree

Customers who have not converted to Pb-free soldering processes and fluxes can use these parts without any changes to assembly or soldering processes. Customers who have converted to Pb-free soldering processes and fluxes can use these parts per the Moisture Sensitivity Levels (MSL) and Reflow temperatures listed below in the Summary of Change Section.

Conversion Schedule

These changes will be implemented beginning November 12, 2004. Due to inventory lag times between TI Product Distribution Centers and Distributor inventories, it will be possible for customers to receive either Pb-free or Pb-based products for some time after the conversion date. Pb-free materials will be marked on the box/bag/reel label with TI's Pb-free logo. Materials that do not meet the full Pb-free definition listed above will not have the Pb-free logo.

Customers who have changed their assembly processes to Pb-free soldering and need to receive only Pb-free materials should contact their local sales channel to be set up to just receive Pb-free materials.

Risk Assessment (Anticipated positive/negative impact on Fit, Form, Function and Reliability)

These materials have been developed to meet the environmental and reliability requirements of the new International environmental standards and regulations. Aside from any noted changes in Moisture Sensitivity Levels – there are no changes to the fit, form, function and reliability of the devices. Customers may notice minor cosmetic visual changes to the color or reflectivity of the mold compound and leads.

Affected Package List

Qualified Pin/Package Combinations					
Package Family	**Package Designator**	**Maximum Pin Count Qualified**	**Lead Frame Finish**	**Mold Compound Qualified**	**Moisture Level/Reflow Qualified**
TQFP LQFP	PFB, PAG, PZT, PDT, VF, PT, PM, PZ, PBK, PGE, PBL, PGF, PDV, PEF	256	NiPdAu	Hitachi CEL9200HF13 and CEL9200HF13 -U (low alpha version)	L1 – L4 / 260C

Specific Products Affected:

Available upon request

Product Identification

As with other material changes, since there is no change to functionality there will be no change to the TI Orderable part number. The shipping label, with the Pb-free logo and the dual MSL/Reflow information for both Pb-based and Pb-free solders is as per the example shown below. The label shown below is an example, not the actual label matching this notice. Dual MSL levels will only be shown if the devices qualify at two different moisture sensitivity levels.

Product that is completely Pb-free/Green will be shipped with the Pb-free logo on the box/bag/reel shipping label. TI will print the "G(N)" designator to indicate green/terminal finish. The devices affected by this PCN will have the "G4" designator to indicate a green/NiPdAu terminal finish.

Customers may go to TI's Eco-Info & Lead (Pb)-Free web site and enter an individual part number or a list of part numbers and obtain the finish, MSL, reflow temperatures and planned conversion dates:

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http://focus.ti.com/quality/docs/prdcntsearch.jsp?templateId=5909&navigationId=11220

Summary of Changes:

Item	From	To
Mold Compound	Hitachi MC606-P2P24 (TQFP)	Hitachi CEL9200HF13 and HF13-U
	Shinetsu KMC178 (TQFP/LQFP)	Hitachi CEL9200HF13 and HF13-U
	Shinetsu KMC288P3 (LQFP)	Hitachi CEL9200HF13 and HF13-U
	Shinetsu KMC240 (LQFP)	Hitachi CEL9200HF13 and HF13-U
MSL	L1-L4 @ 220˚C	L1-L4 @ 260˚C

Sample Devices
If you need sample devices, please contact your local FIELD SALES OFFICE**.**
For questions regarding this notice, e-mails can be sent to the regional contacts shown below or your local Field Sales Representative.

Sincerely,

PCN Team
SC Business Services
12500 TI Blvd, MS 8640 Phone: (214) 480-2185
Dallas, TX. 75243 Fax: (214) 480-6659

Location	E-Mail
USA	PCNAmericasContact@list.ti.com
Europe	PCNEuropeContact@list.ti.com
Asia Pacific	PCNAsiaContact@list.ti.com
Japan	PCNJapanContact@list.ti.com

Affected Device List:

33P3721-CGTJ	F731727APAG	MSP430F449IPZ	SN105076PDV	TNETC4042APDV
CF43056PT	F731791CPBK-TEB	MSP430F449IPZR	SN105118BPDV	TNETD2011APZ
CF43155PZ	F731821APGE	MSP430FE423IPM	SN105118PDV	TNETD2013APZ
CF45101PZ	F731891PDV	MSP430FE425IPM	SN105123PDT	TNETD4020PZ
CF45517PZ-A	F731914CPBL	MSP430FE425IPMR	SN105210PDT	TNETD8200PGE-80
CF45702PGF	F731936PGF	MSP430FE427IPM	SN12LV01CPZT	TNETE110APGE
D172A4PZA92R	F731993APGE	MSP430FE427IPMR	SN2046BVFR	TNETE2101PZ
D731746BPGF-R	F741503APGF	MSP430FW423IPM	SP3721DAA0PM	TNETV1001DIWPEF
D741606DPGF	F741504/P	MSP430FW423IPMR	SP3721DBA0PM	TNETV100PZ
D741667APGF	F741504PAG	MSP430FW425IPM	SP3723CAB0PM	TNETV2402VIDPGE

D741667BPGF
D741667DPGF
D741708CPGF
DM041003APZ
DM043020BPZA
DM047001APZA
DM047001PZA
DM047002APZA
DM047002PZA
DM047004APZA
DM047005APZA
DM047006APZA
DM047020BPZA
DM067001APZA
F312746APZ
F312795PGE
F312872PBK
F312993PAG
F313230CPZ
F313315PGE
F313410PGE
F313625APGF
F313871BPGF
F422007BPGF
F422009PGE
F432009PM
F432177PDT
F432179APDT
F432179APDT-S
F432301PGF
F432522PBK
F432532APGF
F432535PGE
F432541APZ
F432615PZ
F433000PDT
F433101PGE
F433411PZ
F436005BPGF-S
F591606PZ
F642018APGF
F643845PZ
F711087PGF
F711109PGE
F711164PGE
F711217PGE
F711221PZT
F711264PGE
F711264PGER
F711274BPGF
F711309PGF
F711445PZT
F711533PGE
F741505A/A
F741505A/P
F741505APZT
F741521APGE
F741521BPGE
F741574APGF
F741580APZ
F741580APZ-TEB
F741583/A
F741583/P
F741583PGF
F741598/A
F741598/P
F741598PEF
F741779APGE
F741814APBL
F741814APBL-1
F741824PGF
F741890A/P
F741890APDV
HPC3130APBK
HPC3130APGE
HPC3130PBK
MSP430F133IPAG
MSP430F133IPM
MSP430F133IPMR
MSP430F135IPAG
MSP430F135IPM
MSP430F135IPMR
MSP430F1471IPM
MSP430F1471IPMR
MSP430F147IPAG
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MSP430F155IPM
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MSP430F157IPM
MSP430F157IPMR
MSP430F167IPM
MSP430F167IPMR
MSP430F168IPM
MSP430F169IPM
MSP430FW425IPMR
MSP430FW427IPM
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MSP430U132IPMR
MSP430U144IPM
MSP430U186IPM
MSP430U191IPM
MSP430U196IPM
MSP430U207IPM
MSP430U210IPM
MSP430U215IPM
MSP430U218IPM
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SP3723DBC0PM
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TI380C60APAH
TIR2000PAG
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TL16C550CIPT
TL16C550CIPTR
TL16C550CPFB
TL16C550CPFBR
TL16C550CPT
TL16C550CPTR
TL16C550DIPT
TL16C750IPM
TL16C750PM
TL16C752BPT
TL16C752BPTR
TL16C752PT
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TL16CFM700PGE
TL16PC564BLVPZ
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TLC320AD535IPM
TLC320AD535PM
TLC320AD535PM-MCI
TLV320AIC22CPT
TLV320AIC22CPTR
TLV320AIC22PT
TLV320AIC22PTR
TMP320F2810PBKA
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TMP320F2811PBKA
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MSP430F412IPMR
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TUSB3210PM
TUSB3410IVF
TUSB3410VF
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TUSB5152PZ
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XD741649BPDV
XF741521APGE
XF741521PGE
XF741814APBL
XMS430F169IPM
XMS430F169IPMR
XTNETC4042APDV
XTNETC4042PDV
XTNETV901APAG
XTNETV901PAG

Enterprise Qualification Report
For
Green/Pb-Free @ 260C Reflow in Taiwan & Philippines for TQFP/LQFP packages

07/28/2004

Prepared By: Joseph Pambid (ASP QRE) and Willis C. Chambers, Jr. (MAKE QRE HPA)
Approved By: Colin Martin (WW MAKE ASP/Wireless QRE) and Paul Danahy (WW MAKE HPA/HVALQRE)

The TQFP/LQFP packages at 260C Reflow temperature capability and green material sets are fully qualified and meet the Texas Instruments quality and reliability standards for ALL SC Products per the testing described below.

Qualification Description

New Material Set and Reflow Capability for TQFP/LQFP Packages

Includes Package Families:	5x5x1.0mm (32PBS); TQFP
	7x7x1.0mm (32PJT, 48PFB, 64PEG); TQFP
	10x10x1.0mm (52PAH, 64PAG); TQFP
	12x12x1.0mm (80PFC); TQFP
	14x14x1.0mm (100PZT, 128PDT); TQFP
	7x7x1.4mm (32VF, 48PT, 64PTA); LQFP
	10x10x1.4mm (64PM); LQFP
	12x12x1.4mm (80PN); LQFP
	14x14x1.4mm (80PZA, 100PZ, 128PBK); LQFP
	20x20x1.4mm (144PGE, 176PBL); LQFP
	24x24x1.4mm (176PGF); LQFP
	28x28x1.4mm (208PDV, 256PEF); LQFP

Device Attributes

Product & Process Related		Package Related	
Qualification Device:	TVP5150PBS	Assembly Site:	TAIWAN
Die Name:	CTVP5150AAIN	Package:	PBS
Die Revision:	A	Pin Count:	32
Die Size (mils):	110 X 110	Mold Compound:	CEL9200HF13
Transistor Count:		Mount Compound:	HIT EN-4085S2K3
Wafer Fab Site:	DM5	Bond Wire:	TS-0.95 Au
Fab Process:	1833C05.X4L	Leadframe Material:	Copper
		Leadframe Finish:	NiPdAu
		Moisture Sensitivity Level:	L3/260C
		Flammability Rating:	Class UL94-V0

Reliability Test Results for TVP5150PBS

		Sample Size/Results		
Test Type	Conditions/Duration	Lot#1	Lot#2	Lot#3
**Autoclave, 121C	240 Hours	77/0	77/0	77/0
**Thermal Shock, -65/150C	1000 Cycles	77/0	77/0	77/0
Temp Cycle, -65/+150C	2000 Cycles	77/0	77/0	77/0
**High-Temp Storage, 150C	1000 hours	77/0	77/0	77/0
Bond Strength		22/0	22/0	22/0
Manufacturability (Assembly)		Approved		
Preconditioning Information: ** Preconditioning sequence: JEDEC Level 3/260C				

TLV320A10Q Attributes			
Product & Process Related		Package Related	
Qualification Device:	TLV320A10QPFB	Assembly Site:	TAIWAN
Die Name:	BLEFAC10BIN	Package:	PFB
Die Revision:		Pin Count:	48
Die Size (mils):	127 X 127	Mold Compound:	CEL9200HF13
Transistor Count:		Mount Compound:	HIT EN-4085S2K3
Wafer Fab Site:	DFAB	Bond Wire:	TS-0.95 Au
Fab Process:	A21	Leadframe Material:	Copper
		Leadframe Finish:	NiPdAu
		Moisture Sensitivity Level:	L2/260C
		Flammability Rating:	Class UL94-V0

Reliability Test Results for TLV320A10QPFB				
		Sample Size/Results		
Test Type	Conditions/Duration	Lot#1	Lot#2	Lot#3
**Autoclave, 121C	240 Hours	77/0	77/0	77/0
**Thermal Shock, -65/150C	1000 Cycles	77/0	77/0	77/0
Temp Cycle, -65/+150C	1000 Cycles	77/0	77/0	77/0
**High-Temp Storage, 150C	1000 hours	77/0	77/0	77/0
Bond Strength		22/0	22/0	22/0
Manufacturability (Assembly)		Approved		
Preconditioning Information:** Preconditioning sequence: JEDEC Level 2/260C				

SN105210 Attributes			
Product & Process Related		Package Related	
Qualification Device:	SN105210PDT	Assembly Site:	TAIWAN
Die Name:	H731972BIN	Package:	PDT
Die Revision:		Pin Count:	128
Die Size (mils):	239 X 239	Mold Compound:	CEL9200HF13
Transistor Count:		Mount Compound:	HIT EN-4085S2K3
Wafer Fab Site:	MIHO	Bond Wire:	TS- 0.95 Au
Fab Process:	C12	Leadframe Material:	Copper

		Leadframe Finish:	NiPdAu
		Moisture Sensitivity Level:	L3/260C
		Flammability Rating:	Class UL94-V0

Reliability Test Results for SN105210PDT				
		Sample Size/Results		
Test Type	Conditions/Duration	Lot#1	Lot#2	Lot#3
**Autoclave, 121C	240 Hours	77/0	77/0	77/0
**Thermal Shock, -65/150C	1000 Cycles	77/0	77/0	77/0
Temp Cycle, -65/+150C	2000 Cycles	77/0	77/0	77/0
**High-Temp Storage, 150C	1000 hours	77/0	77/0	77/0
Bond Strength		22/0	22/0	22/0
Moisture Sensitivity – L3	SAM/X-Section	12/0	12/0	12/0
Manufacturability (Assembly)		Approved		
Preconditioning Information:** Preconditioning sequence: JEDEC Level 3/260C				

TNETV901A Attributes			
Product & Process Related		Package Related	
Qualification Device:	TNETV901APAG	Assembly Site:	PHILIPPINES
Die Name:	D751874B	Package:	PAG
Die Revision:	B	Pin Count:	64
Die Size (mils):	206 X 192	Mold Compound:	CEL-9200HF13
Transistor Count:		Mount Compound:	HIT EN-4085S2K3
Wafer Fab Site:	KFAB	Bond Wire:	TS-0.95 Au
Fab Process:	EPIC.35 (C035)	Leadframe Material:	Copper
		Leadframe Finish:	NiPdAu
		Moisture Sensitivity Level:	L4/260C
		Flammability Rating:	Class UL94-V0

Reliability Test Results for TNETV901APAG				
		Sample Size/Results		
Test Type	Conditions/Duration	Lot#1	Lot#2	Lot#3
**Life Test, 125C	1000 Hours	40/0	40/0	40/0
**THB 85C/85%RH	1000 Hours	26/0	26/0	26/0
**Autoclave, 121C	240 Hours	77/0	77/0	77/0
**Thermal Shock, -65/150C	1000 Cycles	77/0	77/0	77/0
Temp Cycle, -65/+150C	1000 Cycles	77/0	77/0	77/0
**High-Temp Storage, 150C	1000 hours	77/0	77/0	77/0
ESD	CDM:750V	5/0	5/0	5/0
Bond Strength		22/0	22/0	22/0
Flammability	UL 94 V-0	5/0	5/0	5/0
	IEC 695-2-2	5/0	5/0	5/0
Manufacturability (Assembly)		Approved		

Preconditioning Information:
** Preconditioning sequence: JEDEC Level 4/260C
Note: C035 Devices shall be released at MSL4 at this time

SN104950 Attributes			
Product & Process Related		Package Related	
Qualification Device:	SN104950PAG	Assembly Site:	TAIWAN
Die Name:	H104950DIN	Package:	PAG
Die Revision:	D	Pin Count:	64
Die Size (mils):	191 X 158	Mold Compound:	CEL-9200HF13
Transistor Count:		Mount Compound:	HIT EN-4085S2K3
Wafer Fab Site:	MH6	Bond Wire:	TS-0.95 Au
Fab Process:	50A12.23LO	Leadframe Material:	Copper
		Leadframe Finish:	NiPdAu
		Moisture Sensitivity Level:	L2/260C
		Flammability Rating:	Class UL94-V0

Reliability Test Results for SN104950PAG				
		Sample Size/Results		
Test Type	Conditions/Duration	Lot#1	Lot#2	Lot#3
**Life Test, 155C	240 Hours	40/0	40/0	40/0
**HAST 130C/85%RH	96 Hours	40/0	40/0	40/0
ESD	CDM:750V	5/0	5/0	5/0
Bond Strength		22/0	22/0	22/0
Flammability	UL 94 V-0	5/0	5/0	5/0
	IEC 695-2-2	5/0	5/0	5/0
Manufacturability (Assembly)		Approved		
Preconditioning Information:** Preconditioning sequence: JEDEC Level 2/260C				

TMS320LF2401A Attributes			
Product & Process Related		Package Related	
Qualification Device:	DLF2401AVFA	Assembly Site:	PHILIPPINES
Die Name:	C721862C	Package:	VF
Die Revision:	C	Pin Count:	32
Die Size (mils):	181 x 192	Mold Compound:	CEL-9200HF13
Transistor Count:		Mount Compound:	HIT EN-4085S2K3
Wafer Fab Site:	DM5	Bond Wire:	24.3UM AU-TI
Fab Process:	EPIC.35 (F10)	Leadframe Material:	Copper
		Leadframe Finish:	NiPdAu
		Moisture Sensitivity Level:	L3/260C
		Flammability Rating:	Class UL94-V0

Reliability Test Results for TMS320LF2401AVF				
		Sample Size/Results		
Test Type	Conditions/Duration	Lot#1	Lot#2	Lot#3

**Autoclave, 121C	240 Hours	77/0	77/0	77/0
**Thermal Shock, -65/150C	1000 Cycles	77/0	77/0	77/0
**Temp Cycle, -65/+150C	1000 Cycles	77/0	77/0	77/0
**High-Temp Storage, 150C	1000 hours	77/0	77/0	77/0
Bond Strength		22/0	22/0	22/0
ESD	CDM:750V	5/0	5/0	5/0
Bond Strength		22/0	22/0	22/0
Flammability	UL 94 V-0	5/0	5/0	5/0
	IEC 695-2-2	5/0	5/0	5/0
Manufacturability (Assembly)		Approved		
Preconditioning Information: ** Preconditioning sequence: JEDEC Level 3/260C				

TLV320AIC22 Attributes			
Product & Process Related		Package Related	
Qualification Device:	TLV320AIC22PT	Assembly Site:	TAIWAN
Die Name:	HLV320AIC22BIN	Package:	PT
Die Revision:	B	Pin Count:	48
Die Size (mils):	185 X 182	Mold Compound:	CEL9200HF13
Transistor Count:		Mount Compound:	HIT EN-4085S2K3
Wafer Fab Site:	MH6	Bond Wire:	TS-0.95 Au
Fab Process:	33A12	Leadframe Material:	Copper
		Leadframe Finish:	NiPdAu
		Moisture Sensitivity Level:	L3/260C
		Flammability Rating:	Class UL94-V0

Reliability Test Results for TLV320AIC22PT				
		Sample Size/Results		
Test Type	Conditions/Duration	Lot#1	Lot#2	Lot#3
**Autoclave, 121C	240 Hours	77/0	77/0	77/0
**Thermal Shock, -65/150C	1000 Cycles	77/0	77/0	77/0
**Temp Cycle, -65/+150C	2000 Cycles	77/0	77/0	77/0
**High-Temp Storage, 150C	1000 hours	77/0	77/0	77/0
Bond Strength		22/0	22/0	22/0
Moisture Sensitivity – L3	SAM/X-Section	12/0	12/0	12/0
Manufacturability (Assembly)		Approved		
Preconditioning Information:** Preconditioning sequence: JEDEC Level 3/260C				

TLS1056A Attributes			
Product & Process Related		Package Related	
Qualification Device:	TLS1056APZ	Assembly Site:	TAIWAN
Die Name:	JTLS1056AIN	Package:	PZ
Die Revision:		Pin Count:	100
Die Size (mils):	232 X 242	Mold Compound:	CEL9200HF13

Transistor Count:		Mount Compound:	HIT EN-4085S2K3
Wafer Fab Site:	HIJI	Bond Wire:	TS-0.95mil Au
Fab Process:	Lin-ImpactC50	Leadframe Material:	Copper
		Leadframe Finish:	NiPdAu
		Moisture Sensitivity Level:	L3/260C
		Flammability Rating:	Class UL94-V0

Reliability Test Results for TLS1056APZ				
		Sample Size/Results		
Test Type	Conditions/Duration	Lot#1	Lot#2	Lot#3
**Autoclave, 121C	240 Hours	77/0	77/0	77/0
**Thermal Shock, -65/150C	1000 Cycles	77/0	77/0	77/0
**Temp Cycle, -65/+150C	1000 Cycles	77/0	77/0	77/0
**High-Temp Storage, 150C	1000 hours	77/0	77/0	77/0
Bond Strength		22/0	22/0	22/0
Moisture Sensitivity – L3	SAM/X-Section	12/0	12/0	12/0
Manufacturability (Assembly)		Approved		
Preconditioning Information:** Preconditioning sequence: JEDEC Level 3/260C				

TMS320F206 Attributes			
Product & Process Related		Package Related	
Qualification Device:	TMS320F206PZ	Assembly Site:	PHILIPPINES
Die Name:	F6EC2Z14T22	Package:	PZ
Die Revision:	2.2	Pin Count:	100
Die Size (mils):	384 X 326	Mold Compound:	CEL9200HF13
Transistor Count:		Mount Compound:	HIT EN-4085S2K3
Wafer Fab Site:	HOU	Bond Wire:	AU T1-24.3UM
Fab Process:	EPIC.70	Leadframe Material:	Copper
		Leadframe Finish:	NiPdAu
		Moisture Sensitivity Level:	L17/28/2004 6:03 PM/260C
		Flammability Rating:	Class UL94-V0

Reliability Test Results for TMS320F206PZ				
		Sample Size/Results		
Test Type	Conditions/Duration	Lot#1	Lot#2	Lot#3
**Autoclave, 121C	240 Hours	77/0	77/0	77/0
**Thermal Shock, -65/150C	1000 Cycles	77/0	77/0	77/0
**Temp Cycle, -65/+150C	1000 Cycles	77/0	77/0	77/0
**High-Temp Storage, 150C	1000 hours	77/0	77/0	77/0
ESD	CDM:750V	5/0	5/0	5/0
Bond Strength		22/0	22/0	22/0
Flammability	UL 94 V-0	5/0	5/0	5/0
	IEC 695-2-2	5/0	5/0	5/0

Manufacturability (Assembly)		Approved
Preconditioning Information:** Preconditioning sequence: JEDEC Level 1/260C. Note: Devices with a die area to package area ratio greater than 0.17 will be de-rated to MSL2 @260C		

F741719A Attributes			
Product & Process Related		Package Related	
Qualification Device:	F741719APDV-A	Assembly Site:	PHILIPPINES
Die Name:	C741719DINH	Package:	PDV
Die Revision:	D	Pin Count:	128
Die Size (mils):	142x142	Mold Compound:	CEL9200HF13
Transistor Count:		Mount Compound:	HIT EN-4085S2K3
Wafer Fab Site:	DM5	Bond Wire:	24.3 UM (0.95MILS)
Fab Process:	EPIC.15	Leadframe Material:	Copper
		Leadframe Finish:	NiPdAu
		Moisture Sensitivity Level:	L3/260C
		Flammability Rating:	Class UL94-V0

Reliability Test Results for F741719APDV				
		Sample Size/Results		
Test Type	Conditions/Duration	Lot#1	Lot#2	Lot#3
**Autoclave, 121C	240 Hours	77/0	77/0	77/0
**Thermal Shock, -65/150C	1000 Cycles	77/0	77/0	77/0
**Temp Cycle, -65/+150C	1000 Cycles	77/0	77/0	77/0
**High-Temp Storage, 150C	1000 hours	77/0	77/0	77/0
ESD	CDM:750V	5/0	5/0	5/0
Bond Strength		22/0	22/0	22/0
Flammability	UL 94 V-0	5/0	5/0	5/0
	IEC 695-2-2	5/0	5/0	5/0
Manufacturability (Assembly)		Approved		
Preconditioning Information:** Preconditioning sequence: JEDEC Level 3/260C				

F741598 Attributes			
Product & Process Related		Package Related	
Qualification Device:	F741598PEF	Assembly Site:	PHILIPPINES
Die Name:	E741598IN	Package:	PEF
Die Revision:	-	Pin Count:	256
Die Size (mils):	461 x 458	Mold Compound:	CEL9200HF13
Transistor Count:		Mount Compound:	HIT EN-4085S2K3
Wafer Fab Site:	DM4	Bond Wire:	24.3 UM
Fab Process:	EPIC.15	Leadframe Material:	Copper
		Leadframe Finish:	NiPdAu
		Moisture Sensitivity Level:	L1/260C
		Flammability Rating:	Class UL94-V0

Reliability Test Results for F741598PEF				
		Sample Size/Results		
Test Type	Conditions/Duration	Lot#1	Lot#2	Lot#3
**Autoclave, 121C	240 Hours	77/0	77/0	77/0
**Thermal Shock, -65/150C	1000 Cycles	77/0	77/0	77/0
**Temp Cycle, -65/+150C	1000 Cycles	77/0	77/0	77/0
**High-Temp Storage, 150C	1000 hours	77/0	77/0	77/0
ESD	CDM:750V	5/0	5/0	5/0
Bond Strength		22/0	22/0	22/0
Flammability	UL 94 V-0	5/0	5/0	5/0
	IEC 695-2-2	5/0	5/0	5/0
Manufacturability (Assembly)		Approved		
Preconditioning Information:** Preconditioning sequence: JEDEC Level 1/260C				

TMS471R1F138 Attributes			
Product & Process Related		Package Related	
Qualification Device:	S471AF138PZQR	Assembly Site:	PHILIPPINES
Die Name:	C721930E	Package:	PZ
Die Revision:	E	Pin Count:	100
Die Size (mils):	288x309	Mold Compound:	CEL 9200HF13
Transistor Count:		Mount Compound:	HIT EN-4085S2K3
Wafer Fab Site:	ANA	Bond Wire:	TS-0.96mils Au
Fab Process:	EPIC.40	Leadframe Material:	Copper
		Leadframe Finish:	NiPdAu
		Moisture Sensitivity Level:	L3/260C
		Flammability Rating:	Class UL94-V0

Reliability Test Results for TMS471R1F138				
		Sample Size/Results		
Test Type	Conditions/Duration	Lot#1	Lot#2	Lot#3
**Life Test, 125C	1000 Hours	40/0	40/0	40/0
**THB 85C/85%RH	1000 Hours	26/0	26/0	26/0
Bond Strength		22/0	22/0	22/0
Flammability	UL 94 V-0	5/0	5/0	5/0
	IEC 695-2-2	5/0	5/0	5/0
Manufacturability (Assembly)		Approved		
Preconditioning Information:** Preconditioning sequence: JEDEC Level 3/260C				