Integrated Device Technology, Inc.
2975 Stender Way, Santa Clara, CA - 95054

PRODUCT/PROCESS CHANGE NOTICE (PCN)

PCN #: I0303-03 **DATE:** 3/12/2003

Product Affected: IDT 79RC32V332-XXXDH/DHI,
IDT 79RC32V333-XXXDH/DHI
Y step only

Date Effective: 4/12/2003

MEANS OF DISTINGUISHING CHANGED DEVICES:

- ☐ Product Mark
- ☐ Back Mark
- ☐ Date Code
- ■ Other — Assembly Lot Number

Contact: Bimla Paul
Title: Product Assurance Manager
Phone #: 408-654-6419
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Attachment:: ■ Yes ☐ No

Samples: Available

DESCRIPTION AND PURPOSE OF CHANGE:

- ☐ Die Technology
- ☐ Wafer Fabrication Process
- ☐ Assembly Process
- ☐ Equipment
- ■ Material
- ☐ Testing
- ☐ Manufacturing Site
- ☐ Data Sheet
- ☐ Other

To qualify alternate die attach material ABLESTIK 8361J for 79RC32V332 and 79RC32V333 device types in PQFP package.

This material change is not expected to adversely affect customers as no changes were made to the actual device.

RELIABILITY/QUALIFICATION SUMMARY:

This material change is not expected to adversely affect customers as no changes were made to the actual device.
Both die attach materials (8390 and 8361J) are manufactured by ABELSTIK and both are silver-filled conductive die attach material.
Please see attached Qualification Results and comparative characteristics.

CUSTOMER ACKNOWLEDGMENT OF RECEIPT:

IDT records indicate that you require written notification of this change. Please use the acknowledgement below or E-Mail to grant approval or request additional information. If IDT does not receive acknowledgement within 30 days of this notice it will be assumed that this change is acceptable.
IDT reserves the right to ship either version manufactured after the process change effective date until the inventory on the earlier version has been depleted.

Customer: _____ ☐ ***Approval for shipments prior to effective date.***

Name/Date: _____ E-Mail Address: _____

Title: _____ Phone# /Fax# : _____

CUSTOMER COMMENTS: _____

IDT ACKNOWLEDGMENT OF RECEIPT:

RECD. BY: _____ DATE: _____

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ATTACHMENT 1 - PCN #: I0303-03

PCN Type: Qualification of alternate ABLESTIK 8361J die attach material

Data Sheet Change N/A

Detail of Change This change affects 79RC32VXXX in "Y step" only. The stepping is annotated as the first character of the date code line. This die attach material has been previously qualified, using a similar package, similar size (28 x 28 x 3.5 mm) within the PQFP package family. See the package qualification data for this die attach material below.

This change is being implemented to further improve the overall package reliability and manufacturing yields. The 8361J electrically conductive die attach adhesive is designed for high reliability packaging applications. This high purity adhesive incorporates improvements in epoxy resin and adhesion technology to maintain significant bond strength when exposed to elevated temperatures and humidity. This adhesive also exhibits minimal resin bleed and low condensable volatiles. These properties result in greater resistance to delamination and overall improvement in package reliability.

Both die attach materials (8390 and 8361J) are manufactured by ABELSTIK and both are silver-filled conductive die attach material. See attachment 2 for comparative characteristics.

Conversion Schedule

Device Type	Sample Availability	Production Shipment
IDT 79RC32V332-XXXDH/DHI	Available	April 14, 2003
IDT 79RC32V333-XXXDH/DHI	Available	April 14, 2003

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ATTACHMENT 1 - PCN #: I0303-03

Test Vehicle: IDT79R465

Qualification Test Plan and Results:

Test Description	Test Method	Sample Size/# Of Fails	Test Results (SS/# Of Fails
* Temperature Cycling (-65 °C to 150 °C, 500 cycle)	MIL-STD-883, M 1010	45/0	45/0
* Auto Clave (121 °C, 2 ATM, 168 Hrs)	EIA/JESD22-A102	45/0	45/0
Moisture Sensitivity Classification (Level 3)	JEDEC J-STD-020	11/0	11/0
Internal Visual Inspection	MIL-STD-883, M2010	5/0	5/0
External Visual Inspection	MIL-STD-883, M2009	25/0	25/0
X-ray Examination	Per IDT Specification	45/0	45/0
Bond Pull	MIL-STD-883, M2011	5/0	5/0
Bake & Ball Shear Strength	EIA/JESD22-B116	5/0	5/0
Physical Dimensions	MIL-STD-883, M2016	5/0	5/0
Resistance to Solvents	MIL-STD-883, M2015	3/0	3/0

Notes: * Test requires Moisture Pre-Conditioning sequence.

PRODUCT/PROCESS CHANGE NOTICE (PCN)

ATTACHMENT 2 - PCN #: I0303-03

ABLEBOND® 8361J

ELECTRICALLY CONDUCTIVE DIE ATTACH ADHESIVE

PHYSIOCHEMICAL PROPERTIES- POST CURE		TEST DESCRIPTION	TEST METHOD
Dynamic Tensile Modulus @ -65°C @ 25°C @ 150°C @ 250°C	5,400 MPa (780 Kpsi) 2,900 MPa (420 Kpsi) 120 MPa (18 Kpsi) 51 MPa (8 Kpsi)	Dynamic Tensile Modulus Thermal Analysis on < 0.5 thick specimen	MT-12
Moisture Absorption @ Saturation	0.65%	Dynamic Vapor Sorption after 85°C/85% RH Exposure	PT-65
THERMAL/ELECTRIC PROPERTIES- POST CURE			
Thermal Conductivity	2.2 W/mK	Laser Flash	PT-96
Bond Joint Resistance	0.02 ohm/cm²	Cu to Cu Joint @ 5x5 mm (200x200mil) area/25 µm bondline thickness	PT-81

The figures shown above are typical values only. If you need to write a specification, please request our current Standard Relese Specification.

PRODUCT/PROCESS CHANGE NOTICE (PCN)

ATTACHMENT 2 - PCN #: I0303-03

Ablebond® 8361J

MECHANICAL PROPERTIES- POST CURE	TEST DESCRIPTION	TEST METHOD
Die Shear Strength @ 25°C 17 kg_f/die	2x2 mm Si Die on Ag/Cu LF (80x80 mil)	MT-4
Die Shear Strength vs. Temperature (kg_f/die) *@ 25°C* *@ 200°C* *@ 250°C* 31 2.6 2.2 29 3.7 3.6 31 2.1 1.6	3x3 mm (120x120 mil) Si Die *Substrate* Ag/Cu Leadframe Bare Cu Leadframe Pd/Ni/Cu Leadframe	MT-4
Die Shear Strength After 85°C/85% RH Exposure for 168 Hours (kg_f/die) *@25°C* *@200°C* 25 1.7 24 2.5 27 1.7	3x3 mm (120x120 mil) Si Die *Substrate* Ag/Cu Leadframe Bare Cu Leadframe Pd/Ni/Cu Leadframe	MT-4
Chip Warpage @ 25°C vs. Chip Size *Chip Size* *Warpage* 7.6x7.6 mm (300 x 300 mil) 8 µm 10.2x10.2 mm (400 x 400 mil) 18 µm 12.7x12.7 mm (500 x 500 mil) 33 µm	0.38 mm (15 mil) thick Si Die 0.2 mm (8 mil) thick Ag/Cu Leadframe	MT-15
Chip Warpage vs. Post Cure Thermal Process *Post Cure* *+ Wirebond (1 min @ 250°C)* *+ Post Mold Bake (4 hrs @ 175°C)* 32 µm 36 µm 38 µm 34 µm 36 µm 39 µm	12.7 x 12.7 x 0.38 mm Si Die (500 x 500 x 15 mil) on 0.2 mm (8 mil) Thick Leadframe *Substrate* Ag/Cu Leadframe Bare Cu Leadframe	MT-15

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PRODUCT/PROCESS CHANGE NOTICE (PCN)

ATTACHMENT 2 - PCN #: I0303-03

ABLEBOND® 8390

SNAP CURE DIE ATTACH ADHESIVE

PHYSIOCHEMICAL PROPERTIES - POST CURE			TEST DESCRIPTION	TEST METHOD
Ionics	Chloride	1 ppm	Teflon flask 5 gm sample/ 20-40 mesh 50 gm DI water 100°C for 24 hours	CT-13
	Sodium	2 ppm		
	Potassium	None Detected		
Water Extract Conductivity		18 µmhos/cm		CT-6
pH		6.2		CT-7
Weight Loss @ 300°C		0.6%	Thermogravimetric Analysis	PT-20
Glass Transition Temperature		73°C	TMA Penetration Mode	MT-14
Coefficient of Thermal Expansion			TMA Expansion Mode	MT-9
	Below Tg	60 ppm/°C		
	Above Tg	135 ppm/°C		
Dynamic Tensile Modulus			Dynamic Mechanical Thermal Analysis using <0.5mm thick specimen	MT-12
	@ -65°C	6,330 MPa (920 Kpsi)		
	@ 25°C	4,650 MPa (675 Kpsi)		
	@ 150°C	1,390 MPa (200 Kpsi)		
	@ 250°C	517 MPa (75 Kpsi)		
Moisture Absorption @ Saturation		1.1%	Dynamic Vapor Sorption after 85°C/85% RH exposure	PT-65
THERMAL ELECTRICAL PROPERTIES - POST CURE			**TEST DESCRIPTION**	**TEST METHOD**
Thermal conductivity @ 121°C		1.8 W/m°K	C-MATIC Conductance Tester	PT-40
Volume resistivity		0.0003 ohm-cm	4-Point Probe	PT-46

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PRODUCT/PROCESS CHANGE NOTICE (PCN)

ATTACHMENT 2 - PCN #: I0303-03

ABLEBOND® 8390

MECHANICAL PROPERTIES - POST CURE	TEST DESCRIPTION	TEST METHOD
Die Shear Strength @ 25°C 11 kg_f/die	**2x2mm Si die on Ag/Cu LF (80x80 mil)**	**MT-4**
Die Shear Strength (kg_f/die) vs. Temperature	**3x3mm (120x120 mil) Si die on**	**MT-4**
Snap Cured / ***Oven Cured***		
@25°C / *@200°C* / *@250°C* / *@25°C* / *@200°C* / *@250°C*	***Substrate***	
20 / 2.4 / 1.2 / 24 / 4.8 / 3.1	Ag/Cu leadframe	
13 / 3.0 / 2.7 / - / - / -	Bare Cu leadframe	
18 / 3.5 / 1.8 / - / - / -	Pd/Ni/Cu leadframe	
Die Shear Strength (kg_f/die) after 85°C/85% RH exposure for 168 hours	**3x3 mm Si die on Ag/Cu LF**	**MT-4**
Snap Cured / ***Oven Cured***		
@25°C / *@200°C* / *@25°C* / *@200°C*	***Substrate***	
17 / 1.0 / 14 / 3.0	Ag/Cu leadframe	
10 / 1.1 / - / -	Bare Cu leadframe	
18 / 1.3 / - / -	Pd/Ni/Cu leadframe	
Chip Warpage (µm) @ 25°C vs. Chip Size	**0.38mm (15mil) thick Si die on 0.2mm thick Ag/Cu leadframe**	**MT-15**
Snap Cured / ***Oven Cured***	***Chip Size***	
11 / 22	7.6 x 7.6mm (300x300mil)	
29 / 44	10.2 x 10.2mm (400x400mil)	
52 / 68	12.7 x 12.7mm (500x500mil)	
Chip Warpage (µm) vs. Post Cure Thermal Process	**7.6 x 7.6 x 0.38mm Si die (300 x 300 x 15 mil) on 0.2mm (8 mil) thick LF**	**MT-15**
Snap Cured		
Ag/Cu LF / *Bare Cu LF*	***Condition***	
11 / 8	Post Cure	
13 / 16	+Wirebond (1 min.@250°C)	
13 / 20	+Post Mold Bake (4 hours @ 175°C)	

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