IDT

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

PRODUCT/PROCESS CHANGE NOTICE (PCN)

PCN #: **A-0501-01** DATE: 1/27/2005

Product Affected: PDIP package family (see attachment for affected part #s).

Date Effective: 4/26/2005

MEANS OF DISTINGUISHING CHANGED DEVICES:
- ☐ Product Mark
- ☒ Back Mark Lot number will have "N4" suffix
- ☐ Date Code
- ☐ Other

Contact: Geoffrey Cortes
Title: Manager, Corporate Quality & Reliability
Phone #: (408) 492-8321
Fax #: (408) 727-2328
E-mail: Geoffrey.Cortes@idt.com

Attachment: ☒ Yes ☐ No

Samples: See attachment

DESCRIPTION AND PURPOSE OF CHANGE:
- ☐ Die Technology
- ☐ Wafer Fabrication Process
- ☐ Assembly Process
- ☐ Equipment
- ☒ Material
- ☐ Testing
- ☐ Manufacturing Site
- ☐ Data Sheet
- ☐ Other

IDT has qualified the PDIP (Plastic Dual-In-Line Package) package family using a new mold compound material Tongjin DMC-2000 series and a new die attach material Ablestik 8390A. This notification is to advise our customer of qualification and addition of new assembly material. Please see attachment for qualification data and additional details.

RELIABILITY/QUALIFICATION SUMMARY:

Please see attachment for reliability/qualification data.

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 - PCN #: A-0501-01

PCN Type: Assembly Material Change

Data Sheet Change: None

Detail Of Change: A new mold compound material and a new die attach material has been qualified for PDIP (Plastic Dual-In-Line Package) package family.

Description	Material	
	Existing	Add
Mold Compound Material	Sumitomo EME-6300 series EME-9300 series	Tongjin DMC-2000 series
Die Attach Material	Ablestik 84-1LMISR4	Ablestik 8390A

Please see attachment for affected part #s (Appendix - 1).

Samples are not built ahead of the change and are limited to selective devices. Please contact your local field sales representative for sample availability and additional information.

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PRODUCT/PROCESS CHANGE NOTICE (PCN)

ATTACHMENT - PCN #: A-0501-01

Qualification Plan #: P04-05-01

Test Vehicle: IDT7134

Qualification Test Plan and Results:

Test Description	Test Method	Test Results - (SS / # of Fails) PDIP48 - IDT7134		
		1st Lot	2nd Lot	3rd Lot
High Accelerated Stress Test (Biased, 130°C/85% RH, 100 Hrs)	JESD22-A110-B	45/0	45/0	45/0
Temperature Cycling (-65°C to 150°C, 500 cycle)	JESD22-A104-B	45/0	45/0	45/0
Auto Clave (121°C, 2 ATM, 168 Hrs)	JESD22-A102-C	45/0	45/0	45/0
High Temperature Life Test (1000 Hrs @125°C or equivalent)	JESD22-A108-B	77/0	77/0	76/0*
High Temp Bake (1000 Hrs @150°C)	JESD22-A103-B	77/0	77/0	77/0
Internal Visual Inspection	MIL-STD-883, M2010	5/0	5/0	5/0
External Visual Inspection	JESD22-B101	25/0	25/0	25/0
X-ray Examination	MIL-STD-883, M2015	45/0	45/0	45/0
Bond Pull Test	MIL-STD-883, M2011	5/0	5/0	5/0
Resistance to Solvents	JESD22-B107	3/0	3/0	3/0
Solderability Test	JESD22-B102-C J-STD-002	5/0	5/0	5/0
Solder Heat Test	JESD22-B106-B	15/0	15/0	15/0
Bake & Ball Shear Strength	JESD22-B116	5/0	5/0	5/0
Physical Dimensions	JESD22-B100-B	5/0	5/0	5/0
Die Shear Strength	MIL-STD-883, M2019	5/0	5/0	5/0

Notes: * Mechanical reject - one unit with broken lead.

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PRODUCT/PROCESS CHANGE NOTICE (PCN)

ATTACHMENT - PCN #: A-0501-01

Appendix - 1

IDT6116LA20P	IDT71256L35P	IDT7140LA55P	IDT7201LA25TPI	IDT7204L25TP	IDT72210L10TP
IDT6116LA20TP	IDT71256L35PI	IDT7140SA100P	IDT7201LA35P	IDT7204L25TPI	IDT72210L15TP
IDT6116LA20TPI	IDT71256SA12TP	IDT7140SA35P	IDT7201LA35TP	IDT7204L35P	IDT72210L25TP
IDT6116LA25P	IDT71256SA15TP	IDT7140SA55P	IDT7201LA50P	IDT7204L35TP	IDT72220L10TP
IDT6116LA25PI	IDT71256SA15TPI	IDT7142LA100P	IDT7201LA50TP	IDT7204L50P	IDT72220L15TP
IDT6116LA25TP	IDT71256SA20TP	IDT7142LA35P	IDT7202LA12P	IDT7204L50TP	IDT72220L25TP
IDT6116LA25TPI	IDT71256SA20TPI	IDT7142LA55P	IDT7202LA12TP	IDT7205L12P	IDT72230L10TP
IDT6116LA35P	IDT71256SA25P	IDT7142SA100P	IDT7202LA15P	IDT7205L12TP	IDT72230L15TP
IDT6116LA35PI	IDT71256SA25PI	IDT7142SA35P	IDT7202LA15PI	IDT7205L15P	IDT72230L25TP
IDT6116LA35TP	IDT71256SA25TP	IDT7142SA55P	IDT7202LA15TP	IDT7205L15TP	IDT72240L10TP
IDT6116LA35TPI	IDT71256SA25TPI	IDT7164L15P	IDT7202LA15TPI	IDT7205L20P	IDT72240L15TP
IDT6116LA45P	IDT7130LA100P	IDT7164L15PI	IDT7202LA20P	IDT7205L20TP	IDT72240L25TP
IDT6116LA45PI	IDT7130LA100PI	IDT7164L15TP	IDT7202LA20TP	IDT7205L25P	IDT72401L10P
IDT6116LA45TP	IDT7130LA35P	IDT7164L15TPI	IDT7202LA25P	IDT7205L25PI	IDT72401L15P
IDT6116LA45TPI	IDT7130LA55P	IDT7164L20PI	IDT7202LA25PI	IDT7205L25TP	IDT72401L25P
IDT6116SA15P	IDT7130LA55PI	IDT7164L20TP	IDT7202LA25TP	IDT7205L25TPI	IDT72401L35P
IDT6116SA15TP	IDT7130SA100P	IDT7164L20TPI	IDT7202LA25TPI	IDT7205L35P	IDT72401L45P
IDT6116SA20P	IDT7130SA100PI	IDT7164L25P	IDT7202LA35P	IDT7205L35TP	IDT72403L10P
IDT6116SA20PI	IDT7130SA35P	IDT7164L35P	IDT7202LA35TP	IDT7205L50P	IDT72403L15P
IDT6116SA20TP	IDT7130SA55P	IDT7164L35PI	IDT7202LA50P	IDT7205L50TP	IDT72403L25P
IDT6116SA20TPI	IDT7130SA55PI	IDT7164L45P	IDT7202LA50TP	IDT7206L15P	IDT72403L35P
IDT6116SA25P	IDT7132LA100P	IDT7164L45PI	IDT7203L12P	IDT7206L15TP	IDT72403L45P
IDT6116SA25PI	IDT7132LA35P	IDT7164S15TP	IDT7203L12TP	IDT7206L20P	IDT72413L25P
IDT6116SA25TP	IDT7132LA35PI	IDT7164S15TPI	IDT7203L15P	IDT7206L20TP	IDT72413L35P
IDT6116SA25TPI	IDT7132LA55P	IDT7164S20TP	IDT7203L15PI	IDT7206L25P	IDT72413L45P
IDT6116SA35P	IDT7132LA55PI	IDT7164S25P	IDT7203L15TP	IDT7206L25PI	IDT72420L10TP
IDT6116SA35PI	IDT7132SA100P	IDT7164S35P	IDT7203L15TPI	IDT7206L25TP	IDT72420L15TP
IDT6116SA35TP	IDT7132SA100PI	IDT7164S35PI	IDT7203L20P	IDT7206L25TPI	IDT72420L25TP
IDT6116SA35TPI	IDT7132SA35P	IDT7200L12TP	IDT7203L20TP	IDT7206L35P	IDT728980P
IDT6116SA45P	IDT7132SA55P	IDT7200L15TP	IDT7203L25P	IDT7206L35TP	IDT728981P
IDT6116SA45PI	IDT7132SA55PI	IDT7200L15TPI	IDT7203L25PI	IDT7206L50P	IDT728985P
IDT6116SA45TP	IDT7134LA20P	IDT7200L20TP	IDT7203L25TP	IDT7206L50TP	
IDT6116SA45TPI	IDT7134LA25P	IDT7200L25TP	IDT7203L25TPI	IDT7207L15P	
IDT6167LA20P	IDT7134LA35P	IDT7200L25TPI	IDT7203L35P	IDT7207L20P	
IDT6167LA25P	IDT7134LA45P	IDT7200L35TP	IDT7203L35TP	IDT7207L25P	
IDT6167SA15P	IDT7134LA55P	IDT7200L50TP	IDT7203L50P	IDT7207L25PI	
IDT6167SA20P	IDT7134LA70P	IDT7201LA12P	IDT7203L50TP	IDT7207L35P	
IDT6167SA25P	IDT7134LA70PI	IDT7201LA12TP	IDT7204L12P	IDT7207L50P	
IDT6168LA20P	IDT7134SA20P	IDT7201LA15P	IDT7204L12TP	IDT7208L20P	
IDT6168LA25P	IDT7134SA25P	IDT7201LA15PI	IDT7204L15P	IDT7208L25P	
IDT6168LA25PI	IDT7134SA35P	IDT7201LA15TP	IDT7204L15PI	IDT7208L25PI	
IDT6168SA15P	IDT7134SA35PI	IDT7201LA15TPI	IDT7204L15TP	IDT7208L35P	
IDT6168SA20P	IDT7134SA45P	IDT7201LA20P	IDT7204L15TPI	IDT72125L25TP	
IDT6168SA25P	IDT7134SA55P	IDT7201LA20TP	IDT7204L20P	IDT72125L50TP	
IDT6168SA25PI	IDT7134SA70P	IDT7201LA25P	IDT7204L20TP	IDT72200L10TP	
IDT71256L25P	IDT7140LA100P	IDT7201LA25PI	IDT7204L25P	IDT72200L15TP	
IDT71256L25PI	IDT7140LA35P	IDT7201LA25TP	IDT7204L25PI	IDT72200L25TP	

ANALYSIS DATA SHEET OF DMC-2000HGU

ITEM		UNIT	DMC-2000HGU
SPIRAL FLOW LENGTH		Inch	**32**
GEL TIME		sec	**33**
RESIN BLEED		mm	**1.2**
HOT HARDNESS		shore D	**84.0**
GEL CONTENT		mg/100g	**0.0**
FLEXURAL STRENGTH		kgf/mm^2	**16.2**
FLEXURAL MODULUS		kgf/mm^2	**1505**
MOLDED DENSITY		g/cm^3	**1.92**
TABLET DENSITY		g/cm^3	**1.67**
IONIC SODIUM		ppm	**1.0**
IONIC CHLORIDE		ppm	**1.5**
IONIC IRON		ppm	**1.0**
pH		-	**4.5**
C.T.E	α_1	$10^{-5}/^oC$	**1.2**
	α_2	$10^{-5}/^oC$	**4.1**
GLASS TRANSITION TEMP.		^oC	**145**
KOKA VISCOSITY		poise	**202**
UL 94		-	**V-0**

ANALYSIS MOLD CONDITION :

1. MOLD TEMPERATURE : 175°C
2. CURE TIME : 120 sec
3. TRANSFER PRESSURE : 1000 psi (on the compound)

DONG JIN SEMICHEM CO., LTD

K.H. KIM TECHNICAL MANAGER

ABLEBOND® 8390A

SNAP CURE, DIE ATTACH ADHESIVE

DESCRIPTION

Ablebond® 8390A snap cure, electrically conductive die attach adhesive is designed for high throughput semiconductor packaging applications. This high purity silver-filled epoxy is designed for snap cure processing or fast cure operations in conventional box ovens.

This high strength adhesive is moderately stress absorbing, and is intended for use with small to medium die and packages. It is suitable for use on silver-plated alloy lead frames, or for chip sizes up to 8mm x 8mm on bare copper, silver-plated or palladium-plated copper lead frames. Actual package performance will depend on die size, aspect ratio and package design.

Ablebond® 8390A adhesive has been engineered for use in high speed die bonders. The rheology of this adhesive provides minimum dispense and die placement times. It exhibits minimal tailing and stringing upon dispense. Other features include low resin bleed, low voiding during cure, and very low volume resistivity.

Ablebond® 8390A adhesive is engineered to facilitate the accurate control of bondline thickness and die tilt. Upon proper die bonder setup, incorporating adequate die placement pressure, a consistent bondline thickness of 1 mil can be achieved with minimal die tilt.

TYPICAL UNCURED PROPERTIES		TEST METHOD
Viscosity @ 25°C:	9,500 cps @ 5 rpm	PT-42
Thixotropic Index:	4.5	PT-61
Filler:	Silver	
Work Life @ 25°C:	24 hours	PT-59
Estimated Storage Life @ -40°C:	1 year	PT-13
Specific Gravity:	3.3 g/cc	PT-1

CURE PROCESS DATA		TEST METHOD
Recommended Cure Condition:	Minimum 60 seconds in Multi-Zone Snap Cure Oven in Contact or Off Contact Mode	

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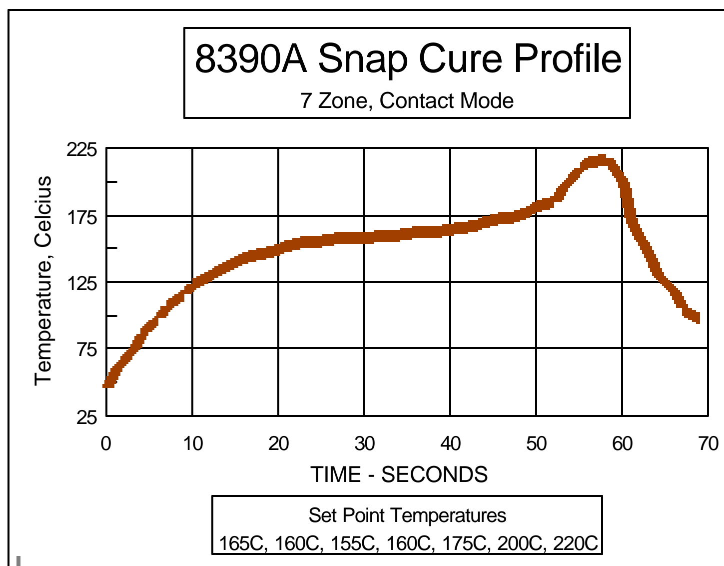
CURE PROCESS DATA (continued)			TEST METHOD
Suggested Cure Profile for 7 zone snap cure system in contact mode:*	Suggested set points,	Desired value	
Zone 1:	165°C,	137°C	
Zone 2:	160°C,	154°C	
Zone 3:	155°C,	153°C	
Zone 4:	160°C,	156°C	
Zone 5:	175°C,	172°C	
Zone 6:	200°C,	195°C	
Zone 7:	220°C,	218°C	
Nitrogen preheat temperature:	250°C minimum		
Nitrogen exhaust flow rate:	3 liters per minute		
Voiding during snap cure:	Bare copper	None	
	Ag/Cu	None	
Weight Loss on Cure:	0.9%		PT-80
Alternate Cure Condition (Box Oven):	15 minutes at 175°C		
*(Data Generated on an ASM CO109)			



CHEMICAL PROPERTIES		TEST METHOD
Ionic Data		CT-13
Chloride:	5 ppm	
Sodium:	5 ppm	
Potassium:	< 1 ppm	
Conductivity of Extract:	45 µmhos/cm	CT-6
pH:	6.6	CT-7

ABLEBOND® 8390A

SNAP CURE, DIE ATTACH ADHESIVE

PHYSICAL PROPERTIES, POST CURE		TEST METHOD
Volume Resistivity:	0.0003 ohm-cm	PT-46
Thermal Conductivity	1.1 W/m°K	PT-40
Weight Loss @ 300°C:	0.3%	PT-20

MECHANICAL PROPERTIES, POST CURE		TEST METHOD
Die Shear Strength (80 mil^2 IC)		MT-4
Si to Ag Plated Cu L/F @ 25°C:	6,100 psi	
Si to Bare Cu L/F @ 25°C:	6,600 psi	
Si to Pd Plated Cu L/F @ 25°C:	6,300 psi	
Si to Alloy 42 L/F @ 25°C:	7,700 psi	
Die Shear Strength - Hot (200 mil^2 IC)		MT-4
Si to Ag Plated Cu L/F @ 250°C:	540 psi	
Si to Bare Cu L/F @ 250°C:	470 psi	
Si to Pd Plated Cu L/F @ 250°C:	620 psi	
Si to Alloy 42 L/F @ 250°C:	990 psi	
Chip Warpage (300 mil^2 Silicon Die, 15 mil thick to 8 mil thick Ag plated CuL/F)		
Post Cure:	16 microns	
Post Wire Bond, +60 sec @ 250°C:	20 microns	
Post Mold Bake, +4 hours @ 175°C:	18 microns	
Glass Transition Temperature (Tg):	53°C	MT-14
Coefficient of Thermal Expansion (TMA)		MT-9
Below Tg:	59 ppm/°C	
Above Tg:	195 ppm/°C	
Tensile Modulus (Thin Film Sample)		MT-12
@ -65°C:	388,000 psi	
@ 25°C:	334,000 psi	
@ 150°C:	30,000 psi	
@ 250°C:	25,000 psi	

The figures shown above are typical values only. For development of specifications, please request our current Standard Release Specification.

INSTRUCTIONS

THAWING

Remove the container of adhesive from frozen storage and allow it to warm to room temperature. Warming time can be significantly reduced by blowing room temperature air across the syringe(s).

Do not open the container before the contents reach ambient temperature! Remove any moisture that collects on the thawed container before opening the container. This procedure will help to prevent the contamination of the adhesive from moisture condensation.

Do not re-freeze! Once a container of adhesive reaches room temperature, it should not be returned to the frozen storage. The product has a limited work life and dispense window. Once it is warmed, it should be used within the recommended 24 hour life.

ADHESIVE APPLICATION

Upon warming to ambient condition, adhesive should be quickly placed into use. If the adhesive is transferred to a final dispensing reservoir, care must be exercised to avoid entrapment of contaminants or air into the adhesive. This product should be completely used within a 24 hour period.

Apply enough adhesive to form a 1-2 mil wet bondline thickness and 25% - 50% fillet height on all sides of the die. Alternate dispense quantities and bondline thicknesses may be required depending on the application requirements. Star or cross shaped dispense patterns will yield fewer bondline voids than will the matrix style of dispense pattern.

CURE

Ablebond 8390A adhesive is capable of being cured in a box or snap cure ovens.

For snap cure processing, refer to the 8390A Snap Cure Profile graph for required bondline temperatures and suggested contact mode set points. The final 220°C temperature spike is important toward establishing the bond strength and thermal stability of the adhesive.

The recommended box oven cure temperature for Ablebond 8390A adhesive is 175°C. The oven should be preheated to this temperature before introducing the lead frame magazines. Being a reactive snap cure adhesive, this product cures quickly at temperatures above 150°C, and will be fully cured shortly after the bondline temperature of the adhesive reaches 175°C. A minimum residence time of 15 minutes is recommended for this adhesive, but thorough process testing should be conducted to determine the actual time required for all samples to reach the 175°C threshold. (Some systems may require more time to reach the final cure temperature.)

PACKAGING AND AVAILABILITY

Ablebond semiconductor die attach adhesives are packaged in a variety of sizes, ranging from 1cc to 1 pound.

STORAGE

This adhesive should be stored at -40°C or colder.