



February 5, 2010

**Subject: PCN# 02A-10, Notification of Intent to Convert the 1020-ball Organic Flip Chip BGA to the 1020-ball Organic Flip Chip BGA Revision 2 and the Discontinuance of the Organic Flip Chip BGA for the LatticeSC/SCM Families of FPGAs**

Dear Lattice Customers:

In accordance with our Product Change Notification (PCN) policy, Lattice is providing this notification of our intent to convert the 1020-ball Organic Flip Chip Ball Grid Array (fcBGA) package for the LatticeSC™ and LatticeSCM™ families assembled at Fujitsu Japan to the 1020-ball Organic Flip Chip Ball Grid Array Revision 2 assembled at Advanced Semiconductor Engineering (ASE) Kaohsiung, Taiwan. Additionally, we plan to discontinue the Organic fcBGA package for the LatticeSC and LatticeSCM families.

### **AFFECTED DEVICES**

The Ordering Part Numbers (OPNs) affected by this PCN are listed in the Exhibit A.

### **PACKAGE COMPARISON**

The package characteristics comparison between the 1020-ball Organic fcBGA and 1020-ball Organic fcBGA Revision 2 are provided in Exhibit B. Package Outline Drawings of these packages are shown in Exhibit C and material set details are described in Exhibit D.

### **DATA SHEET SPECIFICATIONS**

The new 1020-ball Organic fcBGA Revision 2 devices meet all data sheet performance specifications. New version of the product data sheet will include the new / replacement OPNs; LatticeSC/M Family Data Sheet (DS1004 Version 02.3, January 2010).

### **QUALIFICATION DATA**

The new 1020-ball Organic fcBGA Revision 2 devices have passed all Lattice package qualification requirements. A summary of the qualification data is available [here](#).

## **CONVERSION / DISCONTINUANCE TIMING**

Conversion timing for this PCN is 90 days from the date of this Notice. Should samples be required to complete evaluation of this new package, such sample requests must be received **no later than March 5, 2010** (30 days after the date of this Notice).

Customers will have 4.5 months to place last time buy (LTB) orders for the 1020-ball Organic fcBGA devices (if needed). All LTB orders for the 1020-ball Organic fcBGA devices will be non-cancelable and non-returnable. All LTB orders must be placed no later than June 18, 2010 (4.5 months after the date of this Notice) with all deliveries taken no later than December 18, 2010 (10 months after the date of this Notice). Orders for the 1020-ball Organic fcBGA devices received after June 18, 2010 will only be accepted based upon available inventory.

## **CONVERSION TIMING – Summary**

- **Sample Request Cut-off Date: March 5, 2010**
- **Requested Conversion Date: May 5, 2010**
- **1020-ball Organic fcBGA Last Time Buy Order Date: June 18, 2010**
- **1020-ball Organic fcBGA Last Time Shipment Date: December 18, 2010**

## **RESPONSE**

In accordance with JESD46-C, this change is deemed accepted by the customer if no acknowledgement is received within 30 days from this Notice.

**Note:** Be sure to sign up for PCN “Web Alerts” (See [PCN#13A-09](#) for details) and receive all future Lattice PCNs via e-mail!

## **CONTACT**

If you have any questions or require additional information, please contact [pcn@latticesemi.com](mailto:pcn@latticesemi.com).

Sincerely,

Lattice Semiconductor PCN Administration

**EXHIBIT “A” – Affected Device List**

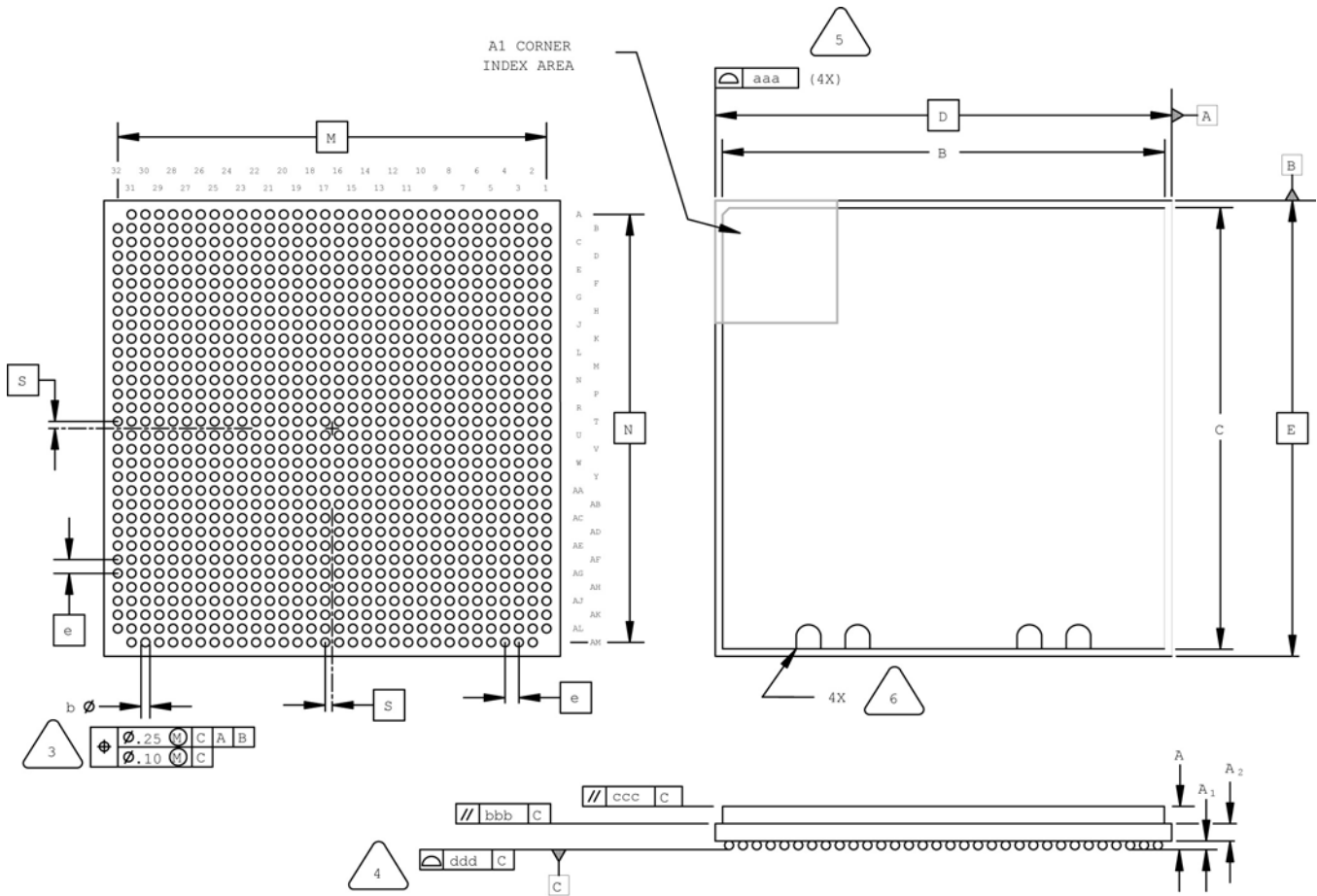
| Device                  | Discontinued Part Number | Discontinued Package       | New / Replacement Part Number            | New / Replacement Package                |
|-------------------------|--------------------------|----------------------------|--|--|
| SC25                    | LFSC3GA25E-7FF1020C      | Organic 1020-fcBGA         | LFSC3GA25E-7FFA1020C                     | Organic 1020-fcBGA<br>Revision 2         |
|                         | LFSC3GA25E-6FF1020C      |                            | LFSC3GA25E-6FFA1020C                     |  |
|                         | LFSC3GA25E-5FF1020C      |                            | LFSC3GA25E-5FFA1020C                     |  |
|                         | LFSC3GA25E-6FF1020I      |                            | LFSC3GA25E-6FFA1020I                     |  |
|                         | LFSC3GA25E-5FF1020I      |                            | LFSC3GA25E-5FFA1020I                     |  |
|                         | LFSC3GA25E-7FFN1020C     | Pb-Free Organic 1020-fcBGA | LFSC3GA25E-7FFAN1020C                    | Pb-Free Organic 1020-fcBGA<br>Revision 2 |
|                         | LFSC3GA25E-6FFN1020C     |                            | LFSC3GA25E-6FFAN1020C                    |  |
|                         | LFSC3GA25E-5FFN1020C     |                            | LFSC3GA25E-5FFAN1020C                    |  |
|                         | LFSC3GA25E-6FFN1020I     |                            | LFSC3GA25E-6FFAN1020I                    |  |
|                         | LFSC3GA25E-5FFN1020I     |                            | LFSC3GA25E-5FFAN1020I                    |  |
| SCM25                   | LFSCM3GA25EP1-7FF1020C   | Organic 1020-fcBGA         | LFSCM3GA25EP1-7FFA1020C                  | Organic 1020-fcBGA<br>Revision 2         |
|                         | LFSCM3GA25EP1-6FF1020C   |                            | LFSCM3GA25EP1-6FFA1020C                  |  |
|                         | LFSCM3GA25EP1-5FF1020C   |                            | LFSCM3GA25EP1-5FFA1020C                  |  |
|                         | LFSCM3GA25EP1-6FF1020I   |                            | LFSCM3GA25EP1-6FFA1020I                  |  |
|                         | LFSCM3GA25EP1-5FF1020I   | LFSCM3GA25EP1-5FFA1020I    | Pb-Free Organic 1020-fcBGA<br>Revision 2 |  |
|                         | LFSCM3GA25EP1-7FFN1020C  | LFSCM3GA25EP1-7FFAN1020C   |  |  |
|                         | LFSCM3GA25EP1-6FFN1020C  | LFSCM3GA25EP1-6FFAN1020C   |  |  |
|                         | LFSCM3GA25EP1-5FFN1020C  | LFSCM3GA25EP1-5FFAN1020C   |  |  |
| LFSCM3GA25EP1-6FFN1020I | LFSCM3GA25EP1-6FFAN1020I |                            |  |  |
| LFSCM3GA25EP1-5FFN1020I | LFSCM3GA25EP1-5FFAN1020I |                            |  |  |
| SC40                    | LFSC3GA40E-7FF1020C      | Organic 1020-fcBGA         | LFSC3GA40E-7FFA1020C                     | Organic 1020-fcBGA<br>Revision 2         |
|                         | LFSC3GA40E-6FF1020C      |                            | LFSC3GA40E-6FFA1020C                     |  |
|                         | LFSC3GA40E-5FF1020C      |                            | LFSC3GA40E-5FFA1020C                     |  |
|                         | LFSC3GA40E-6FF1020I      |                            | LFSC3GA40E-6FFA1020I                     |  |
|                         | LFSC3GA40E-5FF1020I      |                            | LFSC3GA40E-5FFA1020I                     |  |
|                         | LFSC3GA40E-7FFN1020C     | Pb-Free Organic 1020-fcBGA | LFSC3GA40E-7FFAN1020C                    | Pb-Free Organic 1020-fcBGA<br>Revision 2 |
|                         | LFSC3GA40E-6FFN1020C     |                            | LFSC3GA40E-6FFAN1020C                    |  |
|                         | LFSC3GA40E-5FFN1020C     |                            | LFSC3GA40E-5FFAN1020C                    |  |
|                         | LFSC3GA40E-6FFN1020I     |                            | LFSC3GA40E-6FFAN1020I                    |  |
|                         | LFSC3GA40E-5FFN1020I     |                            | LFSC3GA40E-5FFAN1020I                    |  |
| SCM40                   | LFSCM3GA40EP1-7FF1020C   | Organic 1020-fcBGA         | LFSCM3GA40EP1-7FFA1020C                  | Organic 1020-fcBGA<br>Revision 2         |
|                         | LFSCM3GA40EP1-6FF1020C   |                            | LFSCM3GA40EP1-6FFA1020C                  |  |
|                         | LFSCM3GA40EP1-5FF1020C   |                            | LFSCM3GA40EP1-5FFA1020C                  |  |
|                         | LFSCM3GA40EP1-6FF1020I   |                            | LFSCM3GA40EP1-6FFA1020I                  |  |
|                         | LFSCM3GA40EP1-5FF1020I   |                            | LFSCM3GA40EP1-5FFA1020I                  |  |
|                         | LFSCM3GA40EP1-7FFN1020C  | Pb-Free Organic 1020-fcBGA | LFSCM3GA40EP1-7FFAN1020C                 | Pb-Free Organic 1020-fcBGA<br>Revision 2 |
|                         | LFSCM3GA40EP1-6FFN1020C  |                            | LFSCM3GA40EP1-6FFAN1020C                 |  |
|                         | LFSCM3GA40EP1-5FFN1020C  |                            | LFSCM3GA40EP1-5FFAN1020C                 |  |
|                         | LFSCM3GA40EP1-6FFN1020I  |                            | LFSCM3GA40EP1-6FFAN1020I                 |  |
| LFSCM3GA40EP1-5FFN1020I | LFSCM3GA40EP1-5FFAN1020I |                            |  |  |

**Note:** This PCN also affects any custom devices (i.e. factory programmed, special test, etc.), which are derived from any of the devices listed above.

**EXHIBIT “B” – Package Characteristics Comparison**

| Package Characteristics |               | 1020-ball<br>Organic fcBGA | 1020-ball<br>Organic fcBGA<br>Revision 2 |
|-------------------------|---------------|----------------------------|--|
| $\theta_{JA}$ 0 LFM     | (°C/W)        | Same (9.5)                 |  |
| $\theta_{JA}$ 200 LFM   | (°C/W)        | Same (7.3)                 |  |
| $\theta_{JC}$           | (°C/W)        | Same (0.6)                 |  |
| Body Size               | (mm)          | Same (33 x 33)             |  |
| Height                  | (mm)          | Same (3.12) (nom)          |  |
| Weight                  | (gram)        | 12.3                       | 9.4                                      |
| Foot Print              | See Exhibit C | Same                       |  |
| Ball Assignment         | See Exhibit C | Same                       |  |
| Die Bump                |               | Pb                         | Pb - Free                                |

# EXHIBIT "C" – 1020-Ball Organic fcBGA Outline Drawing



NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
2. ALL DIMENSIONS ARE IN MILLIMETERS.



DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM **C**



PRIMARY DATUM **C** AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.



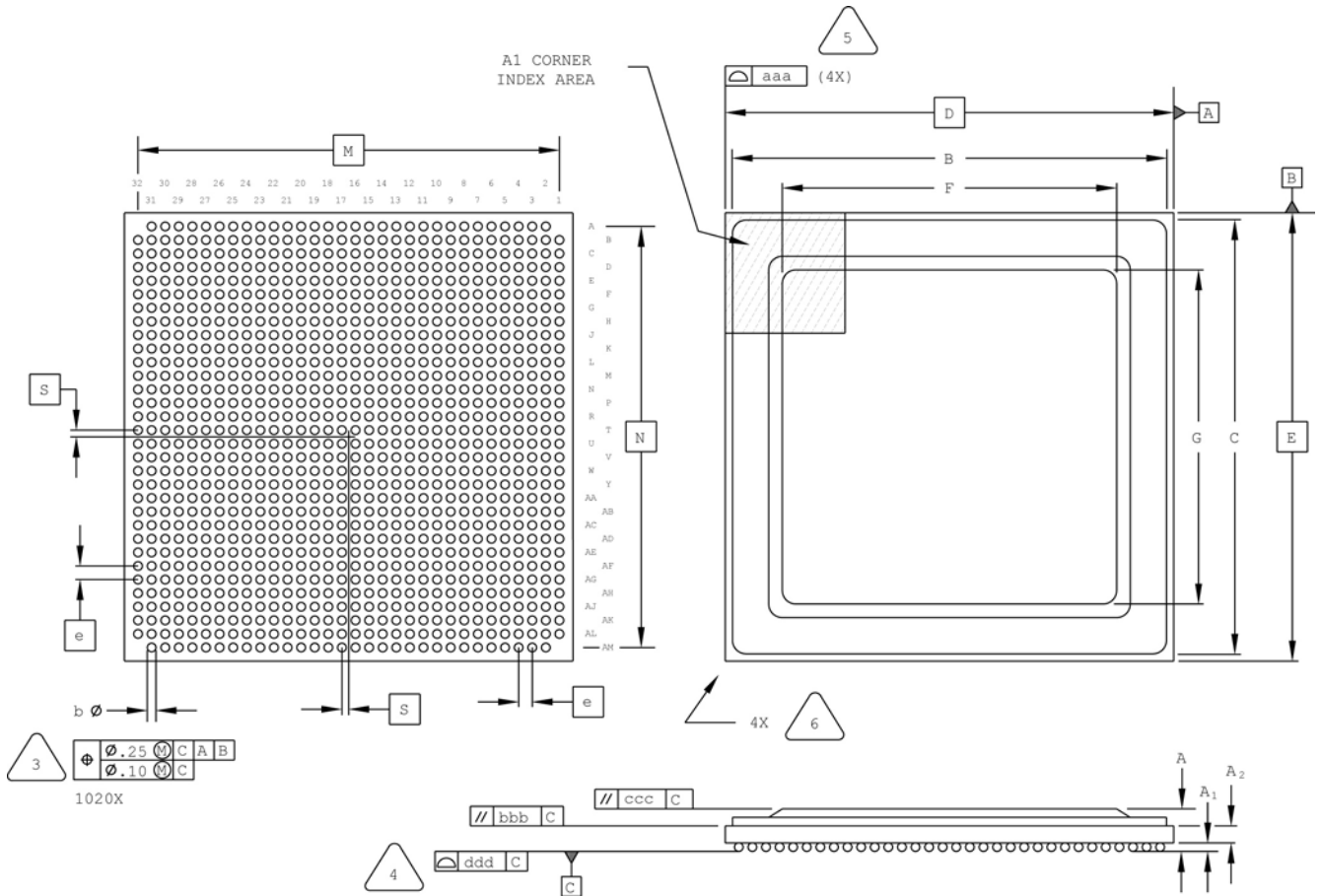
BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.



EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

| SYMBOL | MIN.      | NOM.  | MAX.  |
|--------|-----------|-------|-------|
| A      | 2.52      | 3.12  | 3.82  |
| A1     | 0.30      | 0.50  | 0.70  |
| A2     | 1.24 REF  |       |       |
| B/C    | 31.10     | 32.00 | 32.90 |
| D/E    | 33.00 BSC |       |       |
| M/N    | 31.00 BSC |       |       |
| S      | 0.50 BSC  |       |       |
| b      | 0.50      | 0.60  | 0.70  |
| e      | 1.00 BSC  |       |       |
| aaa    | -         | -     | 0.20  |
| bbb    | -         | -     | 0.25  |
| ccc    | -         | -     | 0.35  |
| ddd    | -         | -     | 0.20  |

# EXHIBIT "C" – 1020-Ball Organic fcBGA Revision 2 Outline Drawing



NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
2. ALL DIMENSIONS ARE IN MILLIMETERS.

- 3. DIMENSION "b" IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM [C]
- 4. PRIMARY DATUM [C] AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.
- 5. BILATERAL TOLERANCE ZONE IS APPLIED TO EACH SIDE OF THE PACKAGE BODY.
- 6. EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.

| SYMBOL | MIN.      | NOM.  | MAX.  |
|--------|-----------|-------|-------|
| A      | 2.55      | 2.90  | 3.25  |
| A1     | 0.40      | 0.50  | 0.60  |
| A2     | 1.20 REF  |       |       |
| B/C    | 32.40     | 32.60 | 32.80 |
| D/E    | 33.00 BSC |       |       |
| F/G    | 24.50     | 24.60 | 24.70 |
| M/N    | 31.00 BSC |       |       |
| S      | 0.50 BSC  |       |       |
| b      | 0.50      | 0.60  | 0.70  |
| e      | 1.00 BSC  |       |       |
| aaa    | -         | -     | 0.20  |
| bbb    | -         | -     | 0.25  |
| ccc    | -         | -     | 0.35  |
| ddd    | -         | -     | 0.20  |

**EXHIBIT “D” – ASE Kaohsiung, Taiwan Qualified Material Set**

| Package Type |          | 1020-ball Organic fcBGA |              |         |                  | 1020-ball Organic fcBGA Revision 2 |              |             |                  |
|--------------|----------|-------------------------|--------------|---------|------------------|------------------------------------|--------------|-------------|------------------|
|              |          | Assembly Site           | Material Set |         |                  | Assembly Site                      | Material Set |             |                  |
|              |          |                         | Underfill    | Bump    | Solder Ball      |                                    | Underfill    | Bump        | Solder Ball      |
| 1020-fcBGA   | Standard | Fujitsu                 | UF-01        | Pb95Sn5 | Sn63Pb37         | ASE Kaohsiung                      | UA           | Sn97.4Ag2.6 | Sn63Pb37         |
|              | Pb-Free  |                         |              |         | Sn96.5Ag3.0Cu0.5 |                                    |              |             | Sn96.5Ag3.0Cu0.5 |