January 13, 2020

Subject: PCN#09A-19 Product Change Notification Alternate Additional Assembly / Test Supplier Qualification for Select Lattice Products

Overview

Lattice is providing this Product Change Notification (PCN) of our intent of using Advanced Semiconductor Engineering Inc., Kaohsiung (ASEK) as alternate assembly and test source for select Lattice Semiconductor products. Unless otherwise noted, there is no change in form, fit or function of the affected products.

Description

Founded in 1984, ASEK has a long history of innovation and technology leadership. ASEK's technology and manufacturing strengths cover processes that include Cu Wire Bonding, Wafer Bumping, Cu Pillar Bumping, Flip Chip Packaging, Wafer Level Chip Scale Packaging (WLCSP) and System in Package (SiP), MEMS & Sensor Packaging, Fan Out, 2.5D/3D IC Packaging, Green Packaging and 300mm turnkey backend solutions.

Since 2015 ASEK has been a primary site for majority of Lattice's products such as Cu-wire bonded BGA, QFP, WLCSP and flip chip BGA products. In order to improve supply chain flexibility and additional capacity, Lattice is now qualifying additional products at ASEK.

Effects to Customer Design

The iCE40UP5K-SG48 (48 QFN package) has a pad width change.

All other affected products have no change in form, fit and function. There will be no impact on customer designs.

Details of the iCE40UP5K-SG48 change and other cosmetic product differences are available here.

Affected Products

The Ordering Part Numbers (OPNs) affected by this PCN are listed in an Excel spreadsheet here. This PCN also affects any custom devices (i.e. factory programmed, special test, tape and reel, non-standard speed grade and package, etc.), which are derived from any of the devices listed in the table.

Material Set Changes

All devices to be qualified at ASEK will follow standard ASEK Bills of Materials (BOMs) or previously qualified and in use for existing production Lattice devices. This leverages actual Lattice reliability data available on current products that are already in production at ASEK as well as ASE's high volume production experience across their customer base for these BOMs. The use of ASE's standard BOM will provide high quality and manufacturability.

Please refer to the Excel spreadsheet here for details of material set changes associated with this PCN.

Data Sheet Specifications

This PCN has no impact on any electrical data sheet performance specifications.

Qualification Data

Qualification report is available upon request from custreq@latticesemi.com.

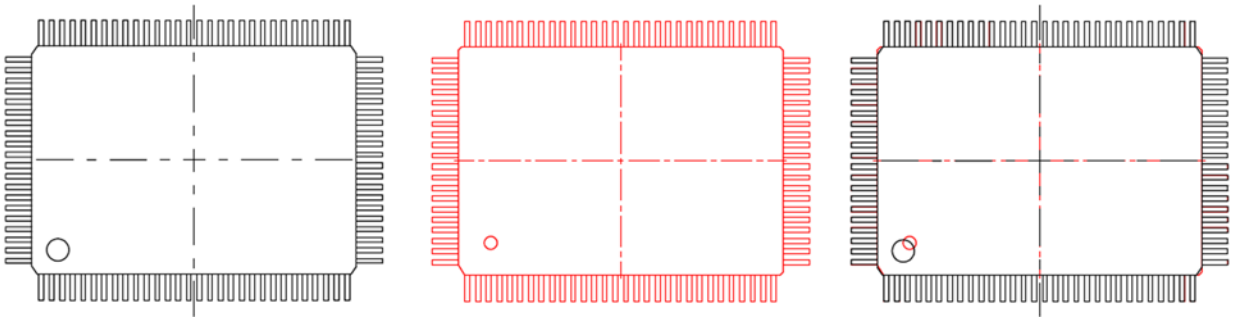
Device Identification

Devices manufactured at ASEK can be identified by a numeric value ("**2 or T**") in the fifth position of the datecode marked on the topside of the devices. This datecode is also marked on the label on the outside of the inventory box as well as on the anti-static moisture barrier bag within. See device topside marking example below:

Example: iCE40UP5K in 48 QFN

EXTERNAL CHANGES

M4A5-128/64-xYNx, PQFP, 14 X 20mm, 100 leads

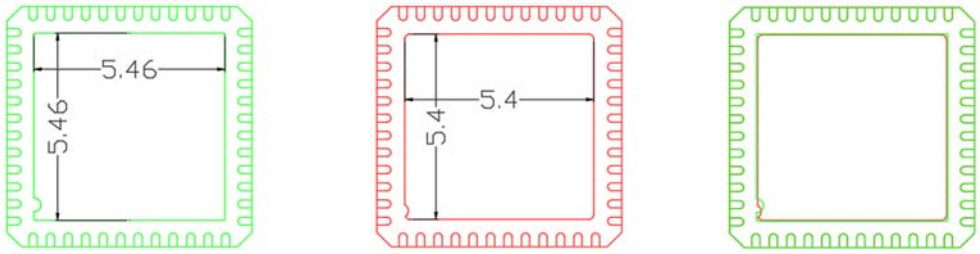


CURRENT (ATP) ALTERNATE (ASEK) Overlap

- Slight movement of pin 1 dot mark

	Lattice POD			ASEK POD		
Symbol	Min	Nom	Max	Min	Nom	Max
A	-	-	3.40	-	-	3.40
A1	0.25	-	0.50	0.25	-	0.50
A2	2.50	2.70	2.90	2.50	2.72	2.90
D		23.20 BSC			23.20 BSC	
D1		20.00 BSC			20 BSC	
E		17.20 BSC			17.20 BSC	
E1		14.00 BSC			14 BSC	
L	0.73	0.88	1.03	0.73	0.88	1.03
c	0.11	-	0.23	0.11	0.152	0.23

SII3531ACNU, Punched QFN, 7 X 7mm, 48 leads



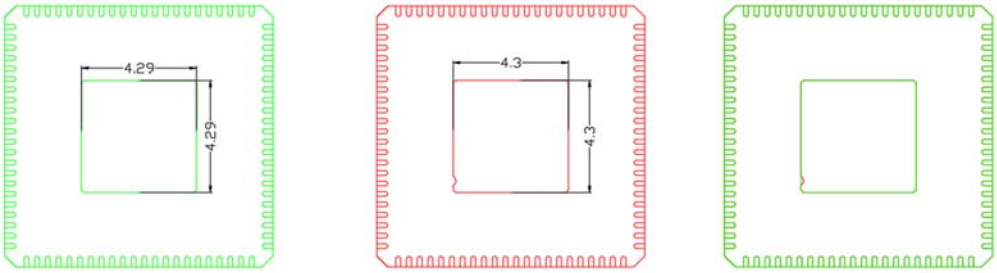
CURRENT (SPIL) ALTERNATE (ASEK) Overlap

- Slight difference on nominal e-pad dimensions

	Lattice POD			ASEK POD		
Symbol	Min	Nom	Max	Min	Nom	Max
e		0.50			0.50	
L	0.30	0.40	0.50	0.30	0.40	0.50
b	0.18	0.25	0.30	0.18	0.23	0.30
D2	5.31	5.46	5.61	5.31	5.40	5.50
E2	5.31	5.46	5.61	5.31	5.40	5.50
A	-	0.85	1.00	-	0.85	0.90

A1	0.00	0.02	0.05	0.00	0.02	0.05
A2	-	0.65	0.80	-	0.65	0.70
A3	0.20 REF			0.20 REF		
D	7.00 BSC			7.00 BSC		
D1	6.75 BSC			6.75 BSC		
E	7.00 BSC			7.00 BSC		
E1	6.75 BSC			6.75 BSC		
θ	14°			0°	-	14°

SII9533CNUC, Punched QFN, 10 X 10mm, 88 leads

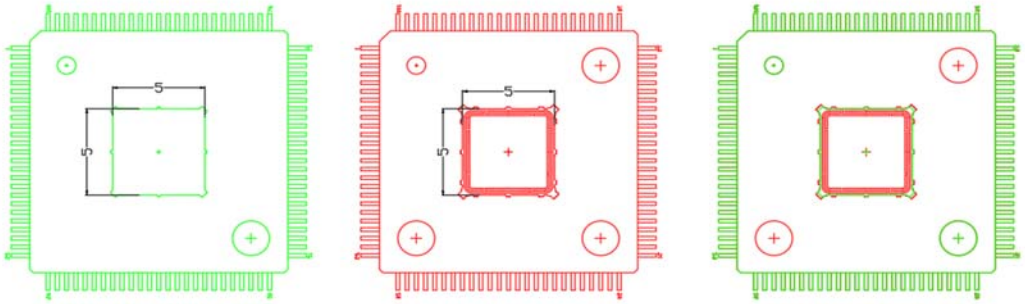


CURRENT (SPIL) ALTERNATE (ASEK) Overlap

- Slight difference on nominal e-pad dimensions

		Lattice POD			ASEK POD		
Item	Description	Min	Typ	Max	Min	Typ	Max
A	Thickness	0.80	0.85	0.90	0.80	0.85	0.90
A1	Stand-Off	0.00	0.02	0.05	0.00	0.02	0.05
A2	Body Thickness	0.60	0.65	0.70	0.60	0.65	0.70
A3	---	0.20 REF			0.20 REF		
b	Lead width (with plating)	0.15	0.20	0.25	0.15	0.18	0.25
D/E	Footprint	9.90	10.00	10.10		10 BSC	
D1/E1	Body size	9.75 BSC			9.75 BSC		
D2	---	4.14	4.29	4.44	4.20	4.30	4.40
E2	---	4.14	4.29	4.44	4.20	4.30	4.40
e	Lead pitch	0.40 BSC			0.40 BSC		
L	Lead foot length	0.30	0.40	0.50	0.30	0.40	0.50
θ	---	0°	---	14°	0°	---	14°
R	---	0.075	---	---	0.075	---	---
aaa	---	0.10			0.10		
bbb	---	0.07			0.07		
ccc	---	0.10			0.10		
ddd	---	0.05			0.05		
eee	---	0.08			0.08		
fff	---	0.10			0.10		

SII9535CTUC, TQFP, 14 X 14mm, 100 leads



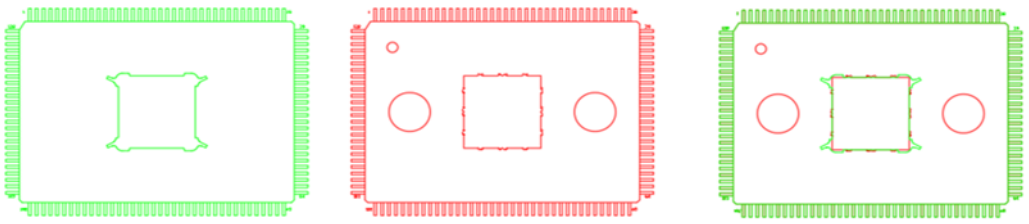
CURRENT (SPIL) ALTERNATE (ASEK) Overlap

- 2 additional ejector pin marks
- Minor difference on exposed pad periphery

		Lattice POD			ASEK POD		
Item	Description	Min	Typ	Max	Min	Typ	Max
A	Thickness	---	---	1.20	1.00	1.10	1.20
A1	Stand-Off	0.05	---	0.15	0.05	0.10	0.15
A2	Body Thickness	0.95	1.00	1.05	0.95	1.00	1.05
D	Footprint		16.00 BSC		15.90	16.00	16.10
D1	Body size		14.00 BSC		13.80	14.00	14.20
E	Footprint		16.00 BSC		15.90	16.00	16.10
E1	Body size		14.00 BSC		13.80	14.00	14.20
L	Lead foot length	0.45	0.60	0.75	0.45	0.60	0.75
L1	Total lead length		1.00 REF			1.00 REF	
R1	Lead radius, inside	0.08	---	---	0.08	---	---
R2	Lead radius, outside	0.08	---	0.20	0.08	---	0.20
S	Lead horizontal run	0.20	---	---	0.20	---	---
Θ	---	0°	3.5°	7°	0°	3.5°	7°
Θ1	---	0°	---	---	0°	---	---
Θ2	---	11°	12°	13°	11°	12°	13°
Θ3	---	11°	12°	13°	11°	12°	13°

SII7172CLU LQFP, 14 X 20mm, 128 leads

BOTTOM



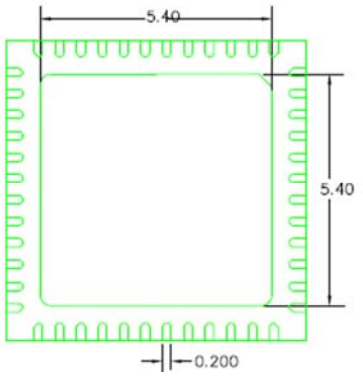
TOP

CURRENT (ASECL) ALTERNATE (ASEK) Overlap

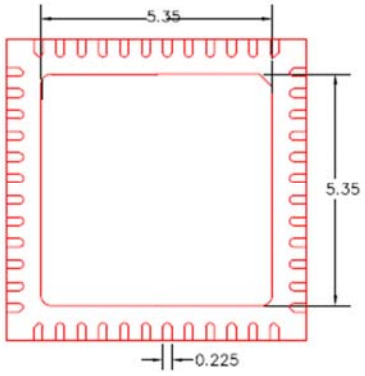
- Slight differences on exposed pad periphery
- Two additional ejector pin marks and pin 1 dot (bottom) on ASEK version

Item	Description	Min	Typ	Max	Min	Typ	Max
A	Thickness	---	---	1.60	---	---	1.60
A1	Stand-off	0.05	---	0.15	0.05	---	0.15
A2	Body thickness	1.35	1.4	1.45	1.35	1.4	1.45
D1	Body size	20 BSC			20 BSC		
E1	Body size	14 BSC			14 BSC		
F1	Footprint	16 BSC			16 BSC		
G1	Footprint	22 BSC			22 BSC		
L1	Lead length	1.00 REF			1.00 REF		
c	Lead thickness	0.09	---	0.2	0.09	0.127	0.2

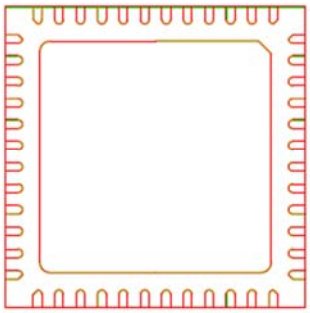
iCE40UP5K-SG48, Sawn QFN, 7 X 7mm, 48 leads



CURRENT (ASEM)



ALTERNATE (ASEK)



Overlap

- Minor lead width difference
- Slight difference on exposed pad dimension

	Lattice POD			ASEK POD		
Symbol	Min	Nom	Max	Min	Nom	Max
A	0.80	0.90	1.00	0.80	0.90	1.00
A1	0.00	0.02	0.05	0.00	0.02	0.05
A3	0.2 REF			0.2 REF		
D	7.0 BSC			6.9	7.0	7.1
D2	5.30	5.40	5.50	5.20	5.35	5.50
E	7.0 BSC			6.9	7.0	7.1
E2	5.30	5.40	5.50	5.20	5.35	5.50
b	0.15	0.20	0.25	0.15	0.225	0.30
e	0.50 BSC			0.50 BSC		
L	0.35	0.40	0.45	0.35	0.40	0.45

5th character in the Datecode will be "2" or "T" and 6th character will be "T" indicates devices built at ASEK

Sample Support

Conversion timing for this PCN is 90 days from the date of this Notice. No action is required (meaning no changes to OPNs, your internal Bills of Material, backlog or orders) unless you plan to do further evaluation.

Should samples be required to complete evaluation of this PCN, **they can be ordered now.**

Samples for this PCN will use the "**ANZ**" suffix appended to the standard OPNs as shown in the example below:

Example:

Standard OPN:	LCMXO3L-1300E-5MG121C
ASEK sample specific OPN:	LCMXO3L-1300E-5MG121CANZ

Conversion Timing Summary

- **Sample Request Cut-off Date: February 13, 2020**
- **PCN Expiration Date: April 13, 2020**

Recommended Actions

Please work closely with your normal Lattice Sales contact to provide further clarification on your sample needs.

Customers who have further questions regarding this specification change are encouraged to contact local field support or sales@latticesemi.com.

Response

In accordance with J-STD-46, this change is deemed accepted by the customer if no acknowledgement is received within 30 days from this Notice. Lattice PCNs are available on the Lattice PCN web page. Please sign up to receive e-mail PCN alerts by registering here. If

you already have a Lattice web account and wish to receive PCN alerts, you can do so by logging into your account and making edits to your subscription options.

Sincerely,

Lattice PCN Administrator

Affected Products - ASEK AQAS				
ICE40HX4K-BG121	LCMXO3L-4300E-5UWG81ITR	LCMXO3L-9400E-6BG256I	LCMXO3LF-4300E-6MG121I	LCMXO3LF-9400E-6BG256I
ICE40HX8K-BG121	LCMXO3L-4300E-6MG121C	LCMXO3L-9400E-6BG400C	LCMXO3LF-4300E-6MG256C	LCMXO3LF-9400E-6BG400C
ICE40LM1K-CM49	LCMXO3L-4300E-6MG121I	LCMXO3L-9400E-6BG400I	LCMXO3LF-4300E-6MG256I	LCMXO3LF-9400E-6BG400I
ICE40LM2K-CM49	LCMXO3L-4300E-6MG256C	LCMXO3L-9400E-6BG484C	LCMXO3LF-4300E-6MG324C	LCMXO3LF-9400E-6BG484C
ICE40LM4K-CM49	LCMXO3L-4300E-6MG256I	LCMXO3L-9400E-6BG484I	LCMXO3LF-4300E-6MG324I	LCMXO3LF-9400E-6BG484I
iCE40UP5K-SG48I	LCMXO3L-4300E-6MG324C	LCMXO3L-9400E-6MG256C	LCMXO3LF-640E-5MG121C	LCMXO3LF-9400E-6MG256C
LCMXO2-1200ZE-1UWG25ITR	LCMXO3L-4300E-6MG324I	LCMXO3L-9400E-6MG256I	LCMXO3LF-640E-5MG121C7U	LCMXO3LF-9400E-6MG256I
LCMXO2-2000ZE-1UWG49ITR	LCMXO3L-640E-5MG121C	LCMXO3LF-1300E-5MG121C	LCMXO3LF-640E-5MG121I	LFE5U-85F-6MG285C
LCMXO2-2000ZE-1UWG49ITR1K	LCMXO3L-640E-5MG121I	LCMXO3LF-1300E-5MG121I	LCMXO3LF-640E-5MG121I7U	LFE5U-85F-6MG285I
LCMXO3L-1300E-5MG121C	LCMXO3L-640E-6MG121C	LCMXO3LF-1300E-5MG256C	LCMXO3LF-640E-6MG121C	LFE5U-85F-7MG285C
LCMXO3L-1300E-5MG121I	LCMXO3L-640E-6MG121I	LCMXO3LF-1300E-5MG256I	LCMXO3LF-640E-6MG121I	LFE5U-85F-7MG285I
LCMXO3L-1300E-5MG256C	LCMXO3L-6900E-5MG256C	LCMXO3LF-1300E-5UWG36CTR	LCMXO3LF-6900E-5MG256C	LFE5U-85F-8MG285C
LCMXO3L-1300E-5MG256I	LCMXO3L-6900E-5MG256I	LCMXO3LF-1300E-5UWG36ITR	LCMXO3LF-6900E-5MG256I	LFE5U-85F-8MG285I
LCMXO3L-1300E-5UWG36CTR	LCMXO3L-6900E-5MG324C	LCMXO3LF-1300E-6MG121C	LCMXO3LF-6900E-5MG324C	LFE5UM5G-85F-8MG285C
LCMXO3L-1300E-5UWG36ITR	LCMXO3L-6900E-5MG324I	LCMXO3LF-1300E-6MG121I	LCMXO3LF-6900E-5MG324I	LFE5UM5G-85F-8MG285I
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LCMXO3L-1300E-6MG256I	LCMXO3L-6900E-6MG324I	LCMXO3LF-2100E-5MG121I	LCMXO3LF-6900E-6MG324I	LFE5UM-85F-7MG285I
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LCMXO3L-2100E-5MG121I	LCMXO3L-9400C-5BG256I	LCMXO3LF-2100E-5MG256I	LCMXO3LF-9400C-5BG256I	LFE5UM-85F-8MG285I
LCMXO3L-2100E-5MG256C	LCMXO3L-9400C-5BG400C	LCMXO3LF-2100E-5MG324C	LCMXO3LF-9400C-5BG400C	M4A5-128/64-10YNC
LCMXO3L-2100E-5MG256I	LCMXO3L-9400C-5BG400I	LCMXO3LF-2100E-5MG324I	LCMXO3LF-9400C-5BG400I	M4A5-128/64-10YNI
LCMXO3L-2100E-5MG324C	LCMXO3L-9400C-5BG484C	LCMXO3LF-2100E-5UWG49CTR	LCMXO3LF-9400C-5BG484C	M4A5-128/64-12YNI
LCMXO3L-2100E-5MG324I	LCMXO3L-9400C-5BG484I	LCMXO3LF-2100E-5UWG49ITR	LCMXO3LF-9400C-5BG484I	M4A5-128/64-55YNC
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LCMXO3L-2100E-6MG121I	LCMXO3L-9400C-6BG400I	LCMXO3LF-2100E-6MG256I	LCMXO3LF-9400C-6BG400I	SII3531ACNU
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