CHANGE NOTIFICATION

Linear Technology Corporation
1630 McCarthy Blvd., Milpitas, CA 95035-7417
(408) 432-1900

April 4, 2011

PCN#: 040411

Dear Sir/Madam:

Subject: **Notification of Enhanced Internal Substrate Design and Design Change in LTM4612**

Please be advised that Linear Technology Corporation has made a minor change to the internal package substrate layout in the subject µModule in order to improve our package assembly process and to allow for higher peak reflow temperature during the PCB surface mount assembly process. In addition, bake requirements prior to board rework processes have been relaxed.

This change facilitates better process control in the package assembly process. While the package remains at MSL (Moisture Sensitivity Level) 3 per Jedec standards, the peak package body temperature during surface mount IR reflow is now increased to 250°C, which exceeds the lead free peak reflow requirement per JSTD-020 for this package size.

Moisture Sensitivity Level 3	
Peak Reflow Temperature of Package During Primary Reflow (Old)	Peak Reflow Temperature of Package During Primary Reflow (New)
245°C	**250°C**

Also, the bake requirement for PCB assemblies prior to part removal from the board has been reduced from 125°C / 24 hours to 70°C / 24 hours or 100°C / 12 hours:

Baking Temperature and Duration of PCB Assembly For Part Removal From the Board	
Baking Temperature and Duration (Old)	Baking Temperature and Duration (New)
125°C for 24 hours	**70°C for 24 hours OR 100°C for 12 hours**

Rework (reattach) processes can use up to 260°C peak reflow temperature provided the packages are reflowed within 8 hours after removal from sealed bag / dry storage or after baking at 125°C for 48 hours.

Additionally, several internal component changes have been made to reduce noise and EMI, and enhance regulator stability over temperature. Attached X-Ray pictures depict the differences between the new and old design.

No functional, parametric, mechanical or datasheet specifications are affected. There are no changes associated with the package footprint, PCB layout or product top marking, so customer applications will be unaffected.

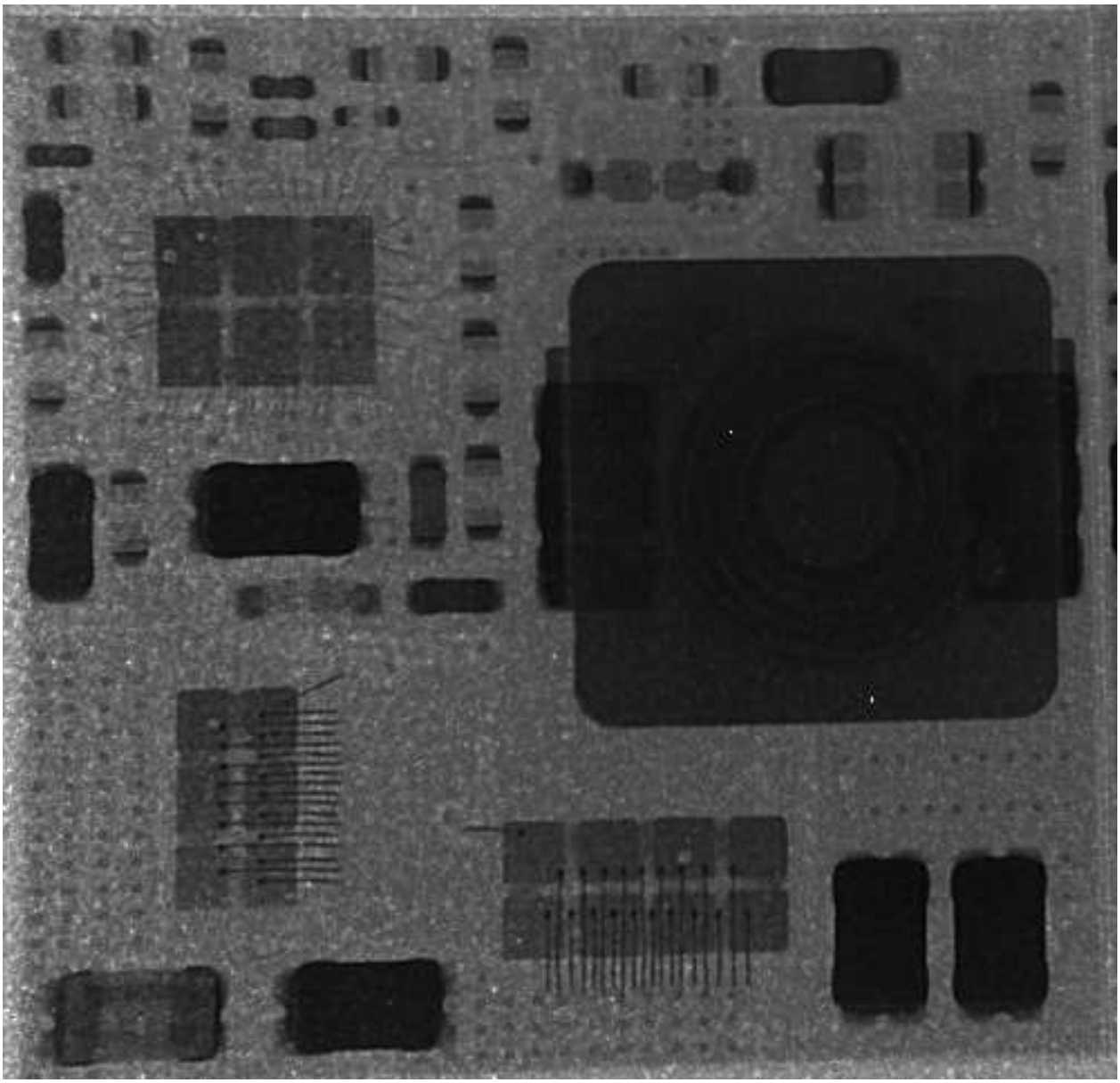
Parts incorporating the new substrate design have been fully characterized for electrical performance and tested for package level reliability. The change was qualified by performing extensive characterization over the full operating voltage and temperature ranges. The reliability data report is attached that shows all tests performed on the redesigned parts. Representative samples of similar products were also qualified by performing Power Cycle test up to 50,000 cycles. Products built using the improved design are targeted for shipment around late August 2011.

Should you have any further questions, please feel free to contact me at 408-432-1900 ext. 2519, or by E-mail at NGIRN@linear.com. If I do not hear from you by May 4th, 2011, we will consider this change to be approved by your company.

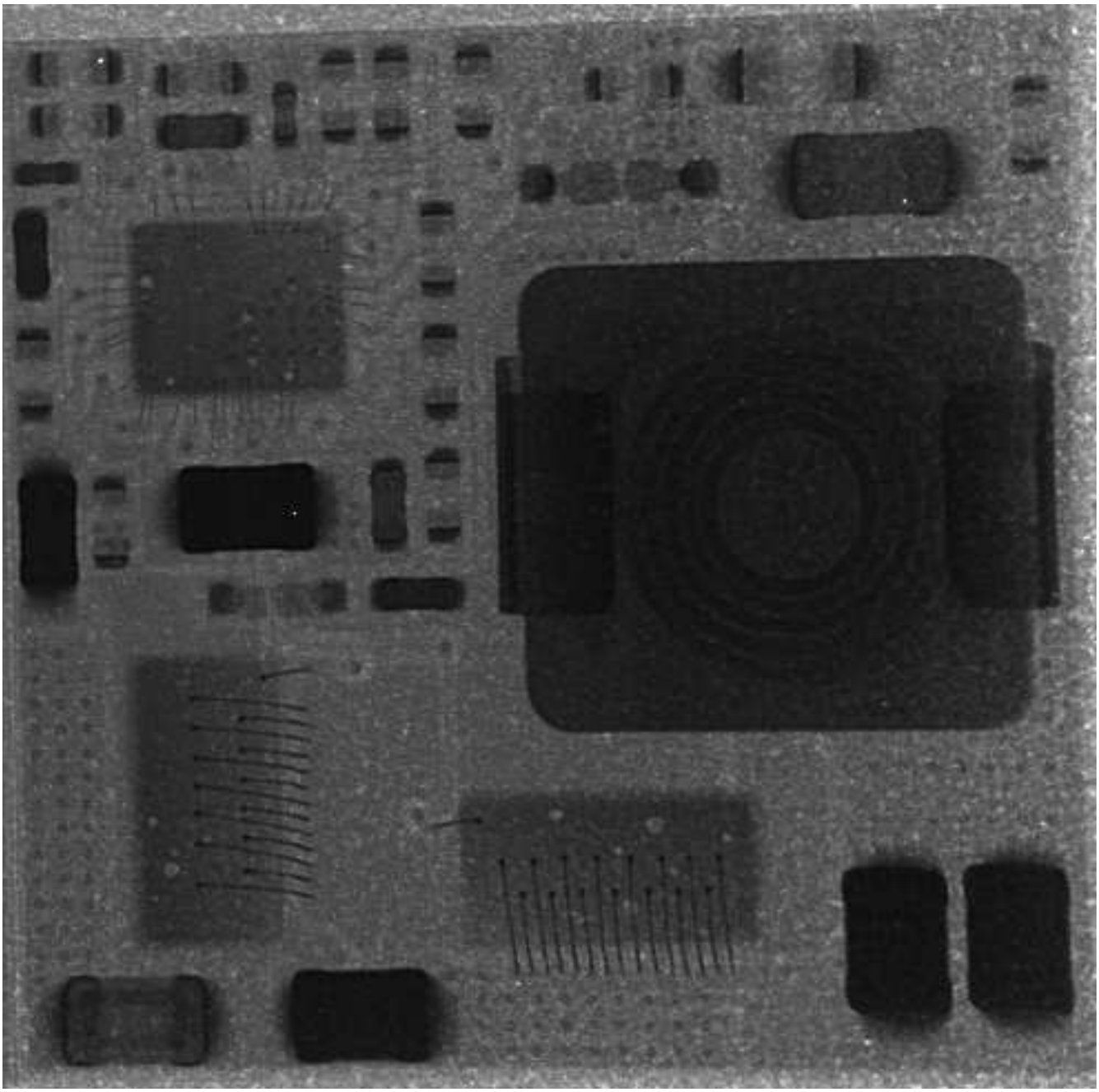
Sincerely,

Naib Girn
Quality Assurance Manager

New Design



Current Design



PACKAGE RELIABILITY DATA
LTM4612 Substrate Improvement Qualification
3/8/2011

• HIGH TEMPERATURE BAKE at 150°C

PACKAGE TYPE	SAMPLE SIZE	OLDEST DATE CODE	NEWEST DATE CODE	K DEVICE HOURS AT +150°C	NUMBER OF FAILURES
LTM4612	25	1028	1028	25.00	0
	25			25.00	0

• SOLDER SHOCK: 3h PCT plus 1x SOLDER IMMERSION at 245°C

PACKAGE TYPE	SAMPLE SIZE	OLDEST DATE CODE	NEWEST DATE CODE		NUMBER OF FAILURES
LTM4612	25	1028	1028		0
	25				0

• TEMP CYCLE FROM -65°C to +150°C (1)

PACKAGE TYPE	SAMPLE SIZE	OLDEST DATE CODE	NEWEST DATE CODE	K DEVICE CYCLES	NUMBER OF FAILURES
LTM4612	77	1028	1028	77.00	0
	77			77.00	0

• THERMAL SHOCK FROM -65°C to +150°C (1)

PACKAGE TYPE	SAMPLE SIZE	OLDEST DATE CODE	NEWEST DATE CODE	K DEVICE CYCLES	NUMBER OF FAILURES
LTM4612	77	1028	1028	77.00	0
	77			77.00	0

• TEMP CYCLE FROM -55°C to +125°C (1)

PACKAGE TYPE	SAMPLE SIZE	OLDEST DATE CODE	NEWEST DATE CODE	K DEVICE CYCLES	NUMBER OF FAILURES
LTM4612	77	1028	1028	77.00	0
	77			77.00	0

• THERMAL SHOCK FROM -55°C to +125°C (1)

PACKAGE TYPE	SAMPLE SIZE	OLDEST DATE CODE	NEWEST DATE CODE	K DEVICE CYCLES	NUMBER OF FAILURES
LTM4612	77	1028	1028	77.00	0
	77			77.00	0

(1) Environmental stress are preceded by JEDEC Level 3 Preconditioning: 192h 30°C/60% R.H. plus 3x IR at 260°C