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Project Inspection Report

Company : NA
Address : NA
Sample Name : XC7Z020-2CLG484I
Manufacture : XILINX
Date Code : 2037,2117
Sample Number : 2 PCS
Check Number : 2 PCS
Date of Received : 2021/08/18
Date of Tested : 2021/08/18 11:30 - 2021/08/23 17:00

WE HEREBY CERTIFY THAT:

The test(s) shown in the attachment were conducted according to the indicating procedures. We assume full responsibility for the accuracy and completeness of these tests and vouch for the qualifications of all personnel performing them.

Inspected by Engineer
Cherry

Reviewed by Project Manager
Felix

Note:

1. This report will be invalid if reproduced in whole or in part.
2. This report refers only to the specimen(s) submitted to test, and is invalid if used separately.
3. This report is only valid with the examination seal and signature of this institute.
4. The tested specimen(s) will only be preserved for thirty days from the date issued, if not collected by the applicant.
5. This report is only responsible for the samples tested.



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Items test

- External visual inspection
- Pin Correlation Test
- Programming test
- Solder ability Analysis
- Radiography (X-ray)
- ROHS test
- Key Functional Testing (KFT)
- Baking
- Tape and Reel
- Internal visual inspection
- Top permanency test
- Ultrasonic scanning microscope (SAT)

Methods & Equipment

1.1 Applicable Standard

- MIL-STD-883L-2019 2009.14
- MIL-STD-883L-2019 2012.11
- MIL-STD-883L-2019 2030.2
- GJB 128A-1997
- MIL-STD-883L-2019 2010.14

1.2 Optical Microscope

- Equipment Spec.:
Top view: FINIAL Hi-scope System SEZ-260: X7 ~ X45
FJ-3A: X50-X500

1.3 Digital caliper

- Equipment Spec.:
MASTERPROOF: Standard digital display calipers 0—150mm

1.4 Functional testing Equipment

- Semiconductor tube characteristic diagram instrument XJ4822:
Display various characteristic curves of semiconductor devices with oscilloscope tube, and measure their static parameters, used for measuring transistors, diodes, MOSFET and other semiconductor devices.
Maximum collector voltage up to 3KV (optional).



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Step voltage $\pm 10V + \Delta VB \pm 5V$, low internal resistance, especially suitable for testing high power VMOS devices.

1.5 Radiography (X-ray)

- Equipment Spec:
Hardware: XiDAT Dage XD6500
Software: 11.56-DD6058
Magnification in excess of 2800x
Resolution below 2um
Energy: 60KV/40uA

1.6 Ultrasonic scanning microscope (SAT)

- Equipment Spec:
Hardware: Sonoscan
Maximum resolution: 16384X16384
Select sound wave width: 0.25 nanosecond to 1 microsecond
Z-axis resolution: 5 nm

1.7 Testing environment

- Ambient temperature: $25 \pm 5^{\circ}C$
Relative humidity: 45%-65%RH

1.8 Test Basis

- XILINX XC7Z020-2CLG484I:

https://www.xilinx.com/support/documentation/user_guides/ug865-Zynq-7000-Pkg-Pinout.pdf



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Analysis Summary

External Visual Inspection Result:

Applicable Standard: MIL-STD-883L-2019 2009.14

External Visual Inspection on 1 PCS original sample marked with D/C 2037. The part markings are laser-etched onto the top side of each device: XILINX ZYNQ XC7Z020 CLG484ABX2037 D6244405A. No secondary coating, sanding marks, crack or chips were observed on all inspected. BGA were in acceptable condition. Devices package and dimension matched to manufacturer's specification. All devices passed the external visual inspection.

Specification dimension:

D: 19.00 BSC MM

E: 19.00 BSC MM

A: 1.37-1.60 MM

Measurement dimension:

D: 19.02 MM

E: 19.02 MM

A: 1.48 MM

External Visual Inspection on 1 PCS testing sample marked with D/C 2117. The part markings are laser-etched onto the top side of each device: XILINX ZYNQ XC7Z020 CLG484ABX2117. No secondary coating, sanding marks, crack or chips were observed on all inspected. BGA were in acceptable condition. Devices package and dimension matched to manufacturer's specification. All devices passed the external visual inspection.

Specification dimension:

D: 19.00 BSC MM

E: 19.00 BSC MM

A: 1.37-1.60 MM

Measurement dimension:

D: 19.04 MM

E: 19.04 MM

A: 1.49 MM

Pin Correlation Test Result:

Pin Correlation Test	Result:
Total quantity tested:	2 pcs
Total quantity passed:	2 pcs
Total quantity failed:	0 pcs
Note:	Device pins correlated to the manufacturer's specification.



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X-ray Analysis:

Applicable Standard: MIL-STD-883L-2019 2012.11

X-ray Inspection on 1 PCS original sample marked with D/C 2037. No structure or bonding wire abnormal was found.

X-ray Inspection on 1 PCS testing sample marked with D/C 2117. No structure or bonding wire abnormal was found.

Ultrasonic scanning microscope Analysis:

Applicable Standard: MIL-STD-883L-2019 2030.2

Ultrasonic scanning microscope inspection on 1PCS original sample marked with D/C 2037. No anomaly such as stratification and cavity was found.

Ultrasonic scanning microscope inspection on 1PCS testing sample marked with D/C 2117. No anomaly such as stratification and cavity was found.

Internal Visual Inspection:

Applicable Standard: MIL-STD-883L-2019 2010.14

Internal Visual Inspection was verified on 2PCS (D/C 2037 & D/C 2117) samples.

2PCS samples show the same structures and marking. Manufacturer XILINX marking was found on the die surface. Die X1C50 was also found on the die surface. 2PCS samples confirmed to be a XILINX device.



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External Visual Inspection Result:

External Visual Criteria	Yes/No	Result
Mix-up	No	Pass
Top Scratches	No	Pass
Substrate Scratches and residues	No	Pass
Contamination	No	Pass
Cracks	No	Pass
Other defect	No	Pass
Oxidization	No	Pass
Indentation	No	Pass
Secondary Coating	No	Pass
Tool Marks	No	Pass
Residues	No	Pass
Coplanarity	Yes	Pass
Top permanency test	N/A	N/A

Pin Correlation Test:

Failure classification	Yes/No	Result
Damaged structure	No	Pass
Open structure	No	Pass
Short structure	No	Pass

1. Device Description:

The Zynq®-7000 family is based on the Xilinx SoC architecture. These products integrate a feature-rich dual-core or single-core ARM® Cortex™-A9 based processing system (PS) and 28 nm Xilinx programmable logic (PL) in a single device. The ARM Cortex-A9 CPUs are the heart of the PS and also include on-chip memory, external memory interfaces, and a rich set of peripheral connectivity interfaces.

2. Package dimensions:

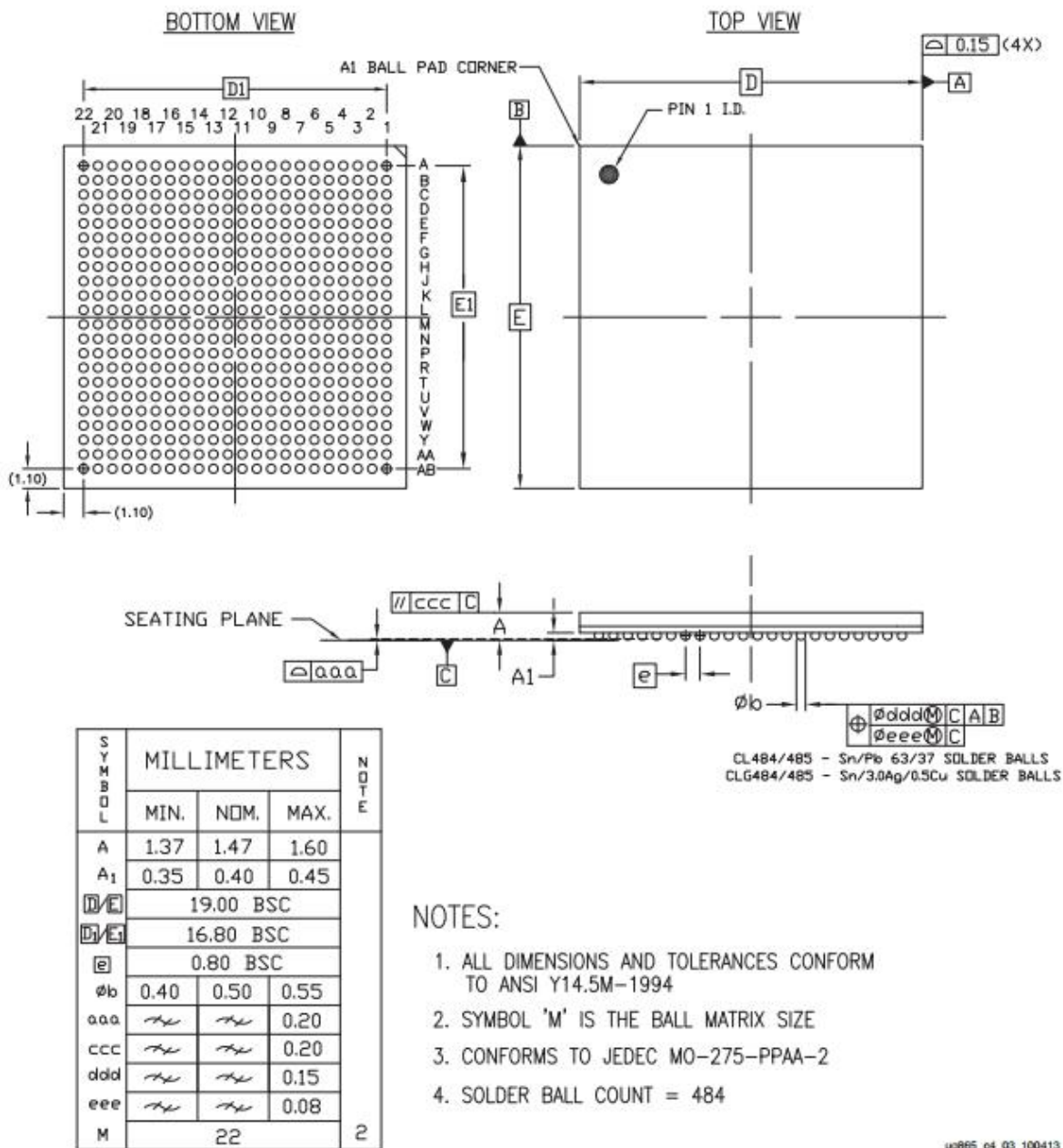


Figure 4-3: CLG484 (XC7Z0145, XC7Z020, and XA7Z020), CL484 (XQ7Z020), and CLG485 (XC7Z0125 and XC7Z015) Wire-Bond Chip-Scale BGA Package Specifications



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3.Receiving Inspection:

Gross Weight:	23.40g	Parts Total	2 PCS
Number Of Boxes	N/A	intact label	Non Present
Package type	Bulk	Moisture protection	Acceptable
MSL	N/A	ESD protection	Acceptable
Country of Mfg	TAIWAN	Package Type	BGA484

Note: All devices contain 1 PCS original sample of D/C 2037 and 1 PCS testing sample of D/C 2117.
 Device was received in acceptable condition.

Received View-1



Received View-2



Received View-3



Received View-4





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4. External Visual Inspection:

Applicable Standard: MIL-STD-883L-2019 2009.14

External Visual Inspection on 1 PCS original sample marked with D/C 2037. The part markings are laser-etched onto the top side of each device: XILINX ZYNQ XC7Z020 CLG484ABX2037 D6244405A. No secondary coating, sanding marks, crack or chips were observed on all inspected. BGA were in acceptable condition. Devices package and dimension matched to manufacturer's specification. All devices passed the external visual inspection.

Specification dimension:

D: 19.00 BSC MM

E: 19.00 BSC MM

A: 1.37-1.60 MM

Measurement dimension:

D: 19.02 MM

E: 19.02 MM

A: 1.48 MM

External Visual Inspection on 1 PCS testing sample marked with D/C 2117. The part markings are laser-etched onto the top side of each device: XILINX ZYNQ XC7Z020 CLG484ABX2117. No secondary coating, sanding marks, crack or chips were observed on all inspected. BGA were in acceptable condition. Devices package and dimension matched to manufacturer's specification. All devices passed the external visual inspection.

Specification dimension:

D: 19.00 BSC MM

E: 19.00 BSC MM

A: 1.37-1.60 MM

Measurement dimension:

D: 19.04 MM

E: 19.04 MM

A: 1.49 MM



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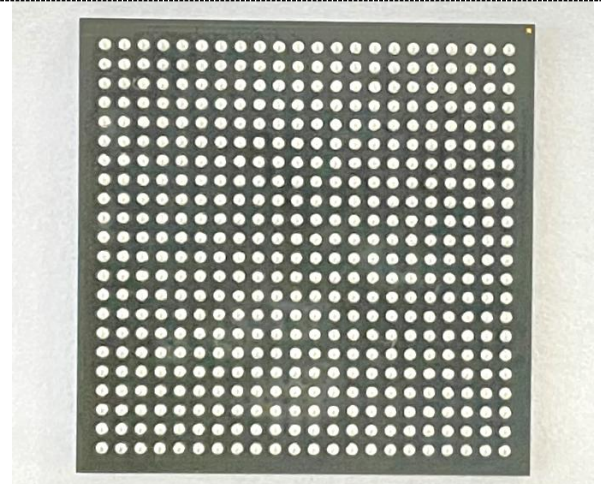


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D/C2037- Top



D/C2037-Bottom



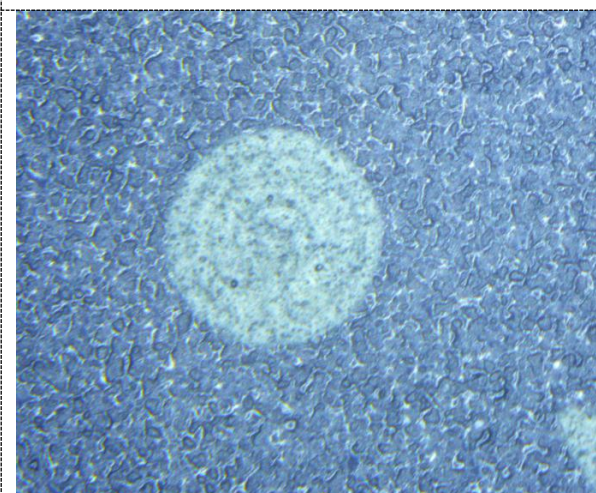
D/C2037-Side



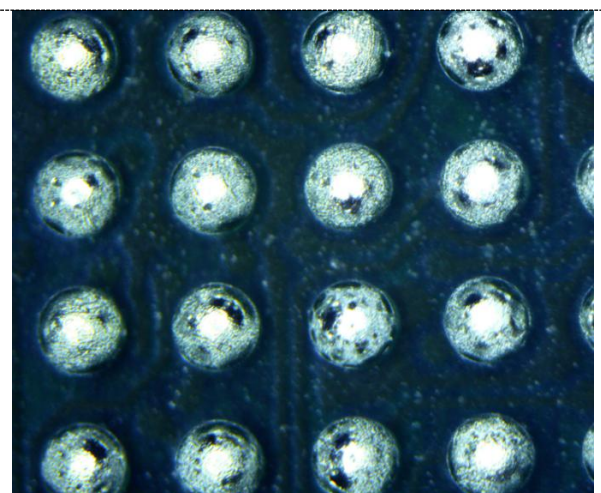
D/C2037- Marking



D/C2037- Pin 1

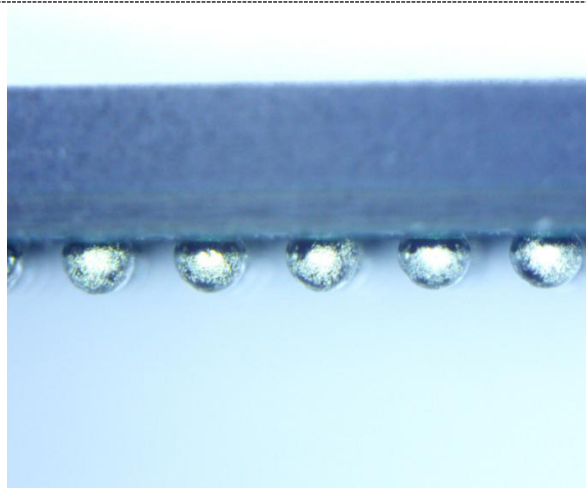


D/C2037- BGA



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D/C2037- BGA Side



D/C2037-D=19.02 MM



D/C2037- E=19.02 MM



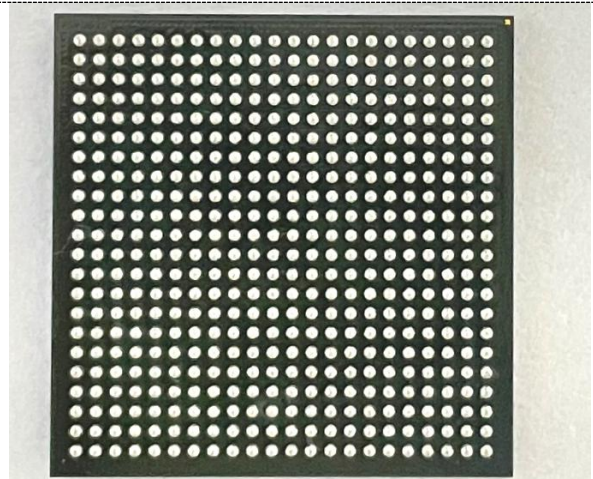
D/C2037- A=1.48 MM



D/C2117- Top



D/C2117-Bottom





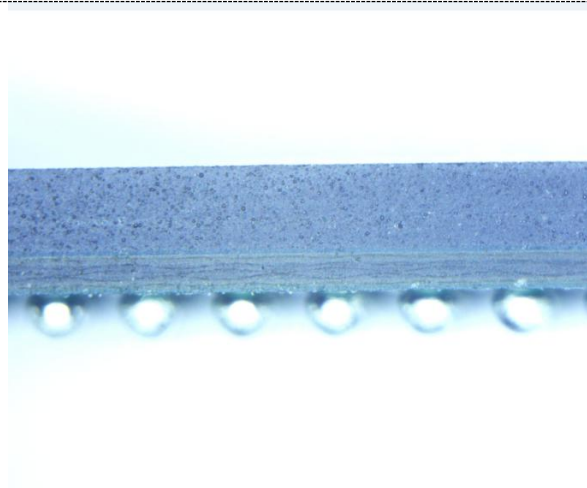
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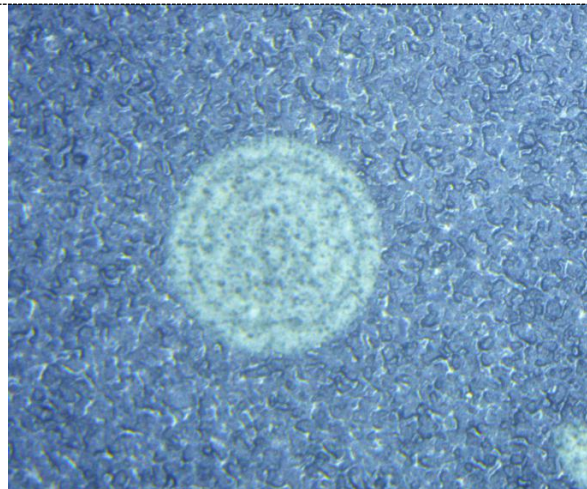
D/C2117- Side



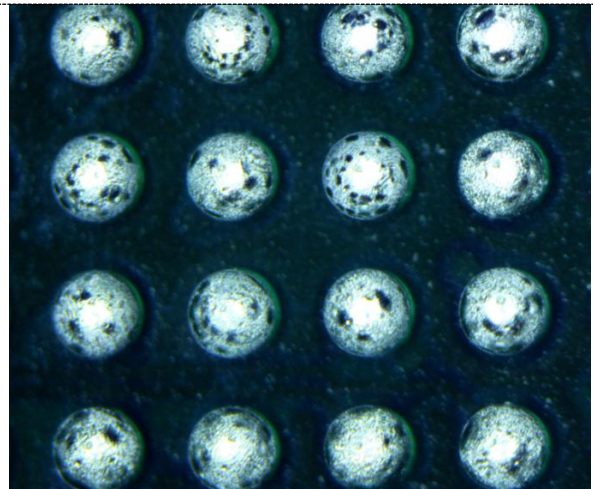
D/C2117-Marking



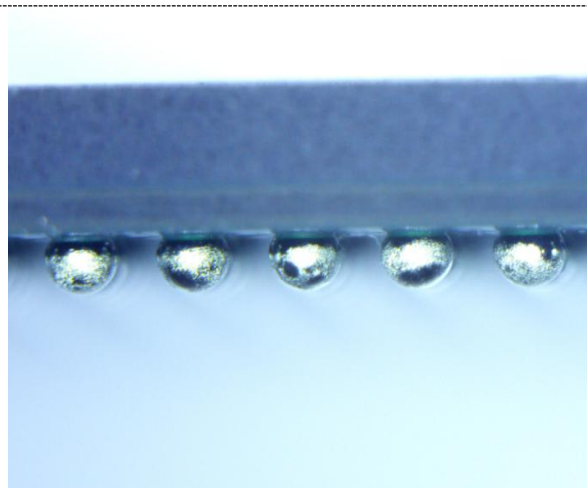
D/C2117- Pin 1



D/C2117-BGA



D/C2117- BGA Side



D/C2117- D=19.04 MM





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D/C2117- E=19.04 MM



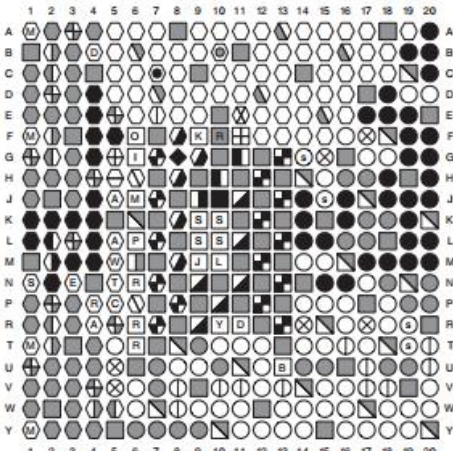
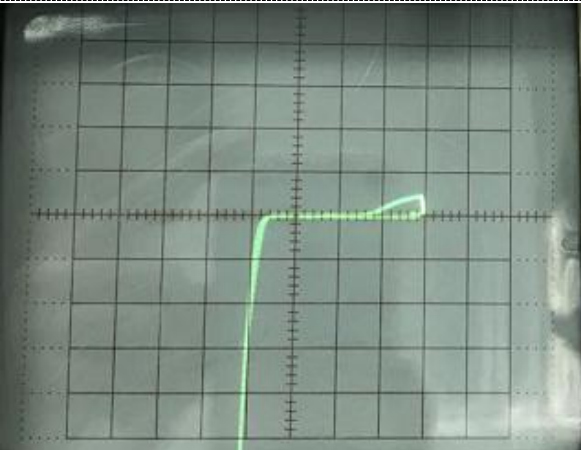
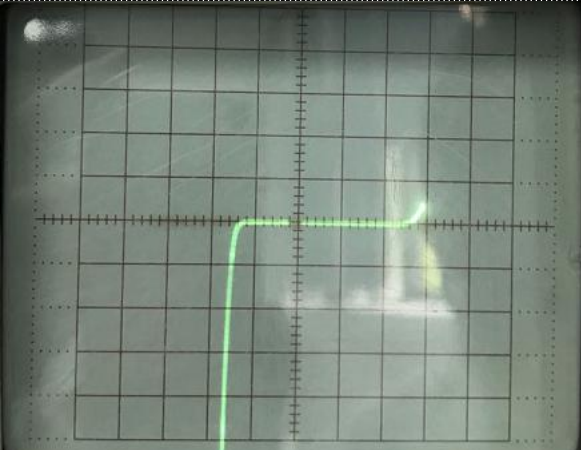
D/C2117- A=1.49 MM



5. Pin Correlation Test:

Applicable Standard: GJB 128A-1997

Device Pin Characteristics Correlated to Manufacture Datasheet specified Pin Descriptions. With use of Curve Tracer this verifies Device's Pin out and checks for damage to devices via Opens/Shorts Test.

Device Pinout (1)	Device Pinout (2)										
	<table border="1"> <thead> <tr> <th>User I/O Pins</th> <th>Dedicated Pins</th> <th>Other Pins</th> <th>PS MIO Pins</th> <th>PS DDR Pins</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> IO_XXY_# IO_XX_# </td> <td> <ul style="list-style-type: none"> CFGBV_B_0 DONE_0 DXP_0 DXN_0 GNDADC_0 INIT_B_0 PROGRAM_B_0 TCK_0 TDL_0 TDO_0 TMS_0 VCCADC_0 VCCBATT_0 VP_0 WL_0 VREFP_0 VREFN_0 </td> <td> <ul style="list-style-type: none"> GND VCCAUX_IO_0# VCCAUX VCCINT VCCO_# VCCBRAM VCCPINT VCCPAUX VCCO_MIO0 VCCO_MIO1 VCCO_DDR VCCPLL RSVDVCC(B1) RSVDGND NC </td> <td> <ul style="list-style-type: none"> PS_POR_B PS_CLK PS_SRST_B PS_MIO_VREF PS_MIO </td> <td> <ul style="list-style-type: none"> PS_DDR_CKP PS_DDR_CKN PS_DDR_CKE PS_DDR_CS_B PS_DDR_RAS_B PS_DDR_CAS_B PS_DDR_WE_B PS_DDR_BA PS_DDR_A PS_DDR_ODT PS_DDR_DRST_B PS_DDR_DO PS_DDR_DM PS_DDR_DQS_P PS_DDR_DQS_N PS_DDR_VRP PS_DDR_VRN PS_DDR_VREF </td> </tr> </tbody> </table> <p style="text-align: right; font-size: small;">ug865_c3_09_082212</p>	User I/O Pins	Dedicated Pins	Other Pins	PS MIO Pins	PS DDR Pins	<ul style="list-style-type: none"> IO_XXY_# IO_XX_# 	<ul style="list-style-type: none"> CFGBV_B_0 DONE_0 DXP_0 DXN_0 GNDADC_0 INIT_B_0 PROGRAM_B_0 TCK_0 TDL_0 TDO_0 TMS_0 VCCADC_0 VCCBATT_0 VP_0 WL_0 VREFP_0 VREFN_0 	<ul style="list-style-type: none"> GND VCCAUX_IO_0# VCCAUX VCCINT VCCO_# VCCBRAM VCCPINT VCCPAUX VCCO_MIO0 VCCO_MIO1 VCCO_DDR VCCPLL RSVDVCC(B1) RSVDGND NC 	<ul style="list-style-type: none"> PS_POR_B PS_CLK PS_SRST_B PS_MIO_VREF PS_MIO 	<ul style="list-style-type: none"> PS_DDR_CKP PS_DDR_CKN PS_DDR_CKE PS_DDR_CS_B PS_DDR_RAS_B PS_DDR_CAS_B PS_DDR_WE_B PS_DDR_BA PS_DDR_A PS_DDR_ODT PS_DDR_DRST_B PS_DDR_DO PS_DDR_DM PS_DDR_DQS_P PS_DDR_DQS_N PS_DDR_VRP PS_DDR_VRN PS_DDR_VREF
User I/O Pins	Dedicated Pins	Other Pins	PS MIO Pins	PS DDR Pins							
<ul style="list-style-type: none"> IO_XXY_# IO_XX_# 	<ul style="list-style-type: none"> CFGBV_B_0 DONE_0 DXP_0 DXN_0 GNDADC_0 INIT_B_0 PROGRAM_B_0 TCK_0 TDL_0 TDO_0 TMS_0 VCCADC_0 VCCBATT_0 VP_0 WL_0 VREFP_0 VREFN_0 	<ul style="list-style-type: none"> GND VCCAUX_IO_0# VCCAUX VCCINT VCCO_# VCCBRAM VCCPINT VCCPAUX VCCO_MIO0 VCCO_MIO1 VCCO_DDR VCCPLL RSVDVCC(B1) RSVDGND NC 	<ul style="list-style-type: none"> PS_POR_B PS_CLK PS_SRST_B PS_MIO_VREF PS_MIO 	<ul style="list-style-type: none"> PS_DDR_CKP PS_DDR_CKN PS_DDR_CKE PS_DDR_CS_B PS_DDR_RAS_B PS_DDR_CAS_B PS_DDR_WE_B PS_DDR_BA PS_DDR_A PS_DDR_ODT PS_DDR_DRST_B PS_DDR_DO PS_DDR_DM PS_DDR_DQS_P PS_DDR_DQS_N PS_DDR_VRP PS_DDR_VRN PS_DDR_VREF 							
GND-IO_XX_#	GND-PS_DDR_CKP										
											



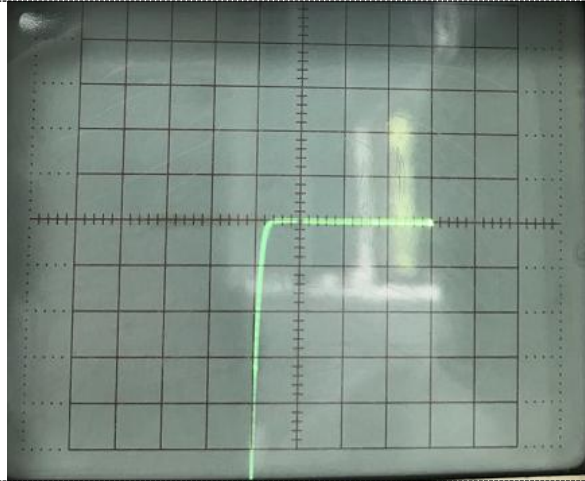
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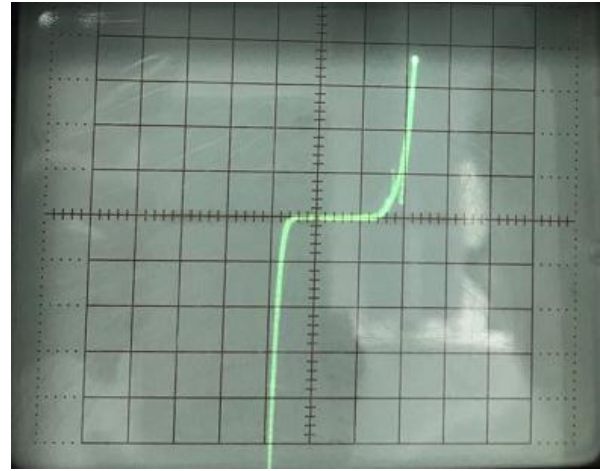


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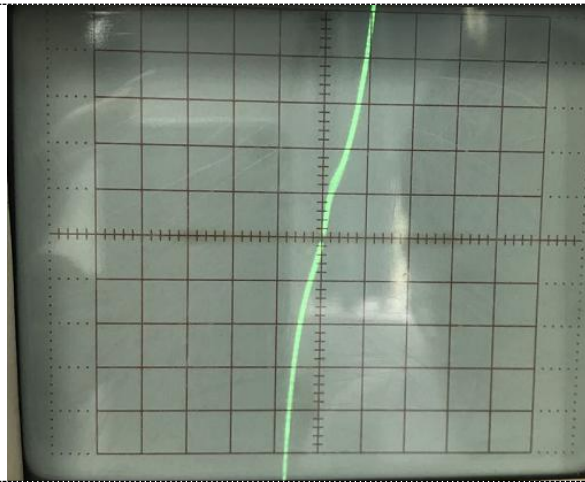
GND-DXP_O



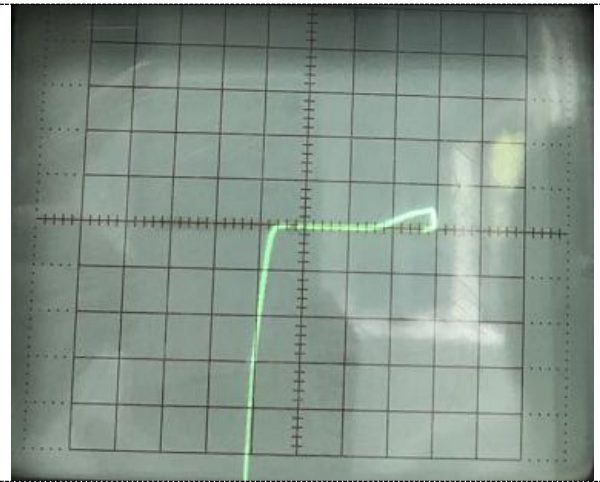
GND-PS_MIO



GND-VCCPINT



GND-VREF



Pin Correlation Test Results:

Pin Correlation Test	Result:
Total quantity tested:	2 pcs
Total quantity passed:	2 pcs
Total quantity failed:	0 pcs
Note:	Device pins correlated to the manufacturer's specification.



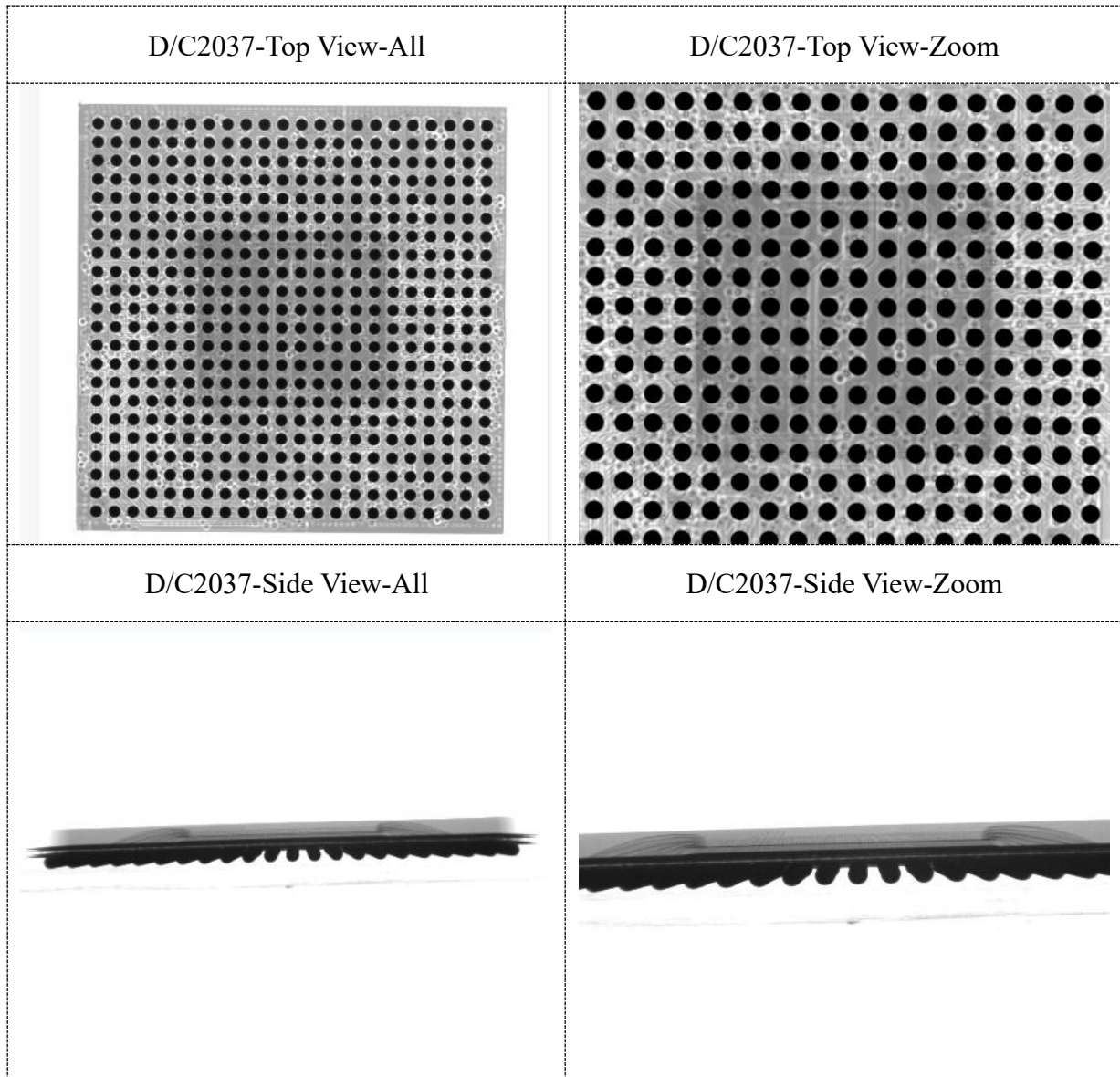
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6.X-ray Analysis:

Applicable Standard: MIL-STD-883L-2019 2012.11

X-ray Inspection on 1 PCS original sample marked with D/C 2037. No structure or bonding wire abnormal was found.

X-ray Inspection on 1 PCS testing sample marked with D/C 2117. No structure or bonding wire abnormal was found.





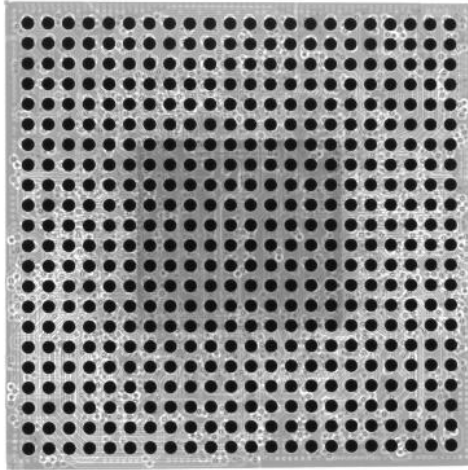
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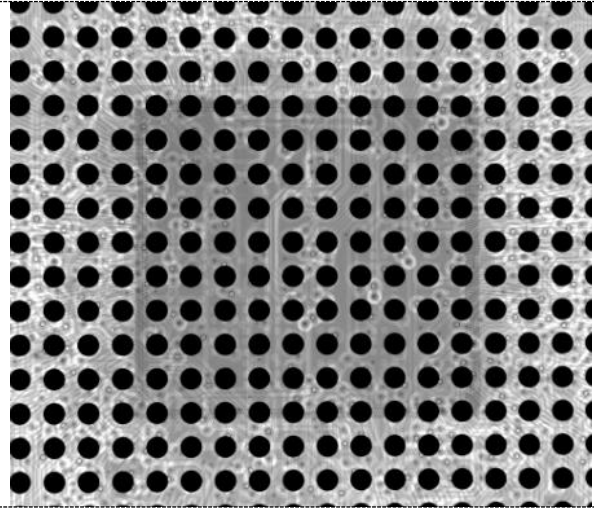


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D/C2117-Top View-All



D/C2117-Top View-Zoom



D/C2117-Side View-All



D/C2117-Side View-Zoom





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7. Ultrasonic scanning microscope Analysis:

Applicable Standard: MIL-STD-883L-2019 2030.2

Ultrasonic scanning microscope inspection on 1PCS original sample marked with D/C 2037. No anomaly such as stratification and cavity was found.

Ultrasonic scanning microscope inspection on 1PCS testing sample marked with D/C 2117. No anomaly such as stratification and cavity was found.

IC(DC2037-DC2117)-50MHz-Die-C





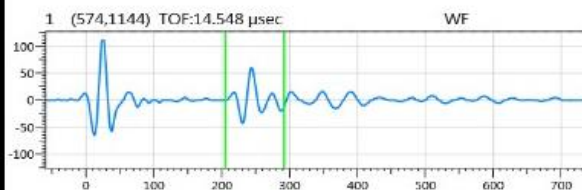
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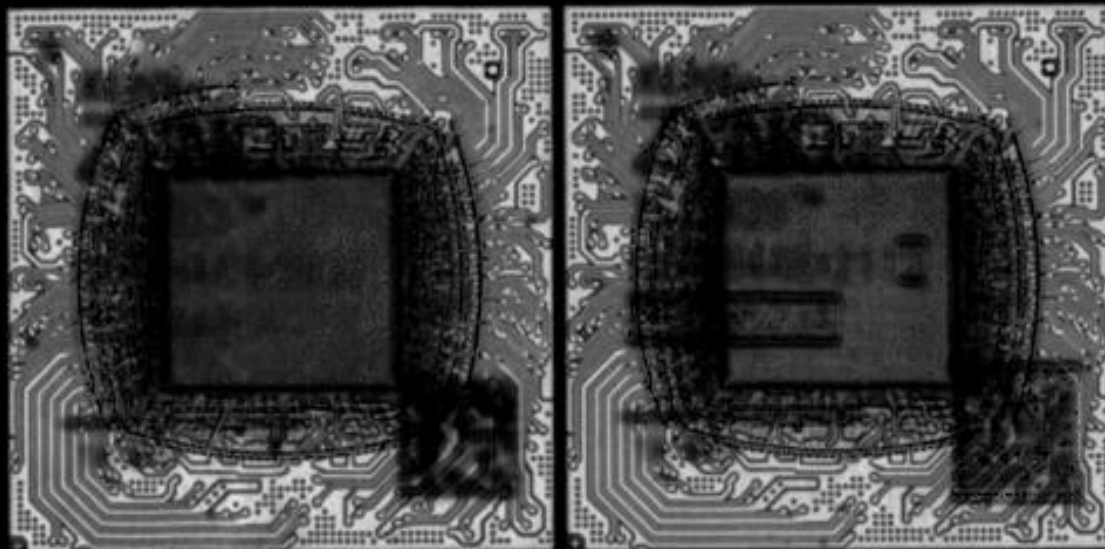
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IC(DC2037-DC2117)-50MHz-Die-A



IC(DC2037-DC2117)-50MHz-Sub-C

DC2037 DC2117



IC(DC2037-DC2117)-50MHz-Sub-A

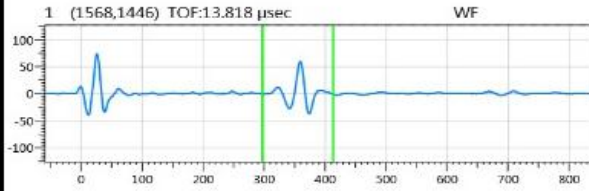


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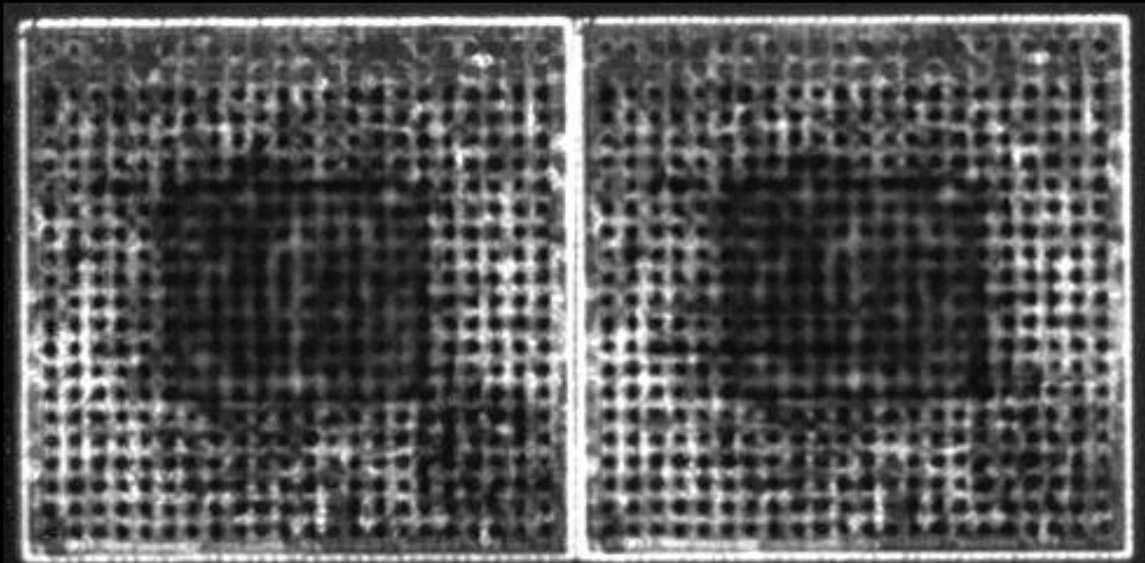


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IC(DC2037-DC2117)-50MHz-T

DC2037 DC2117





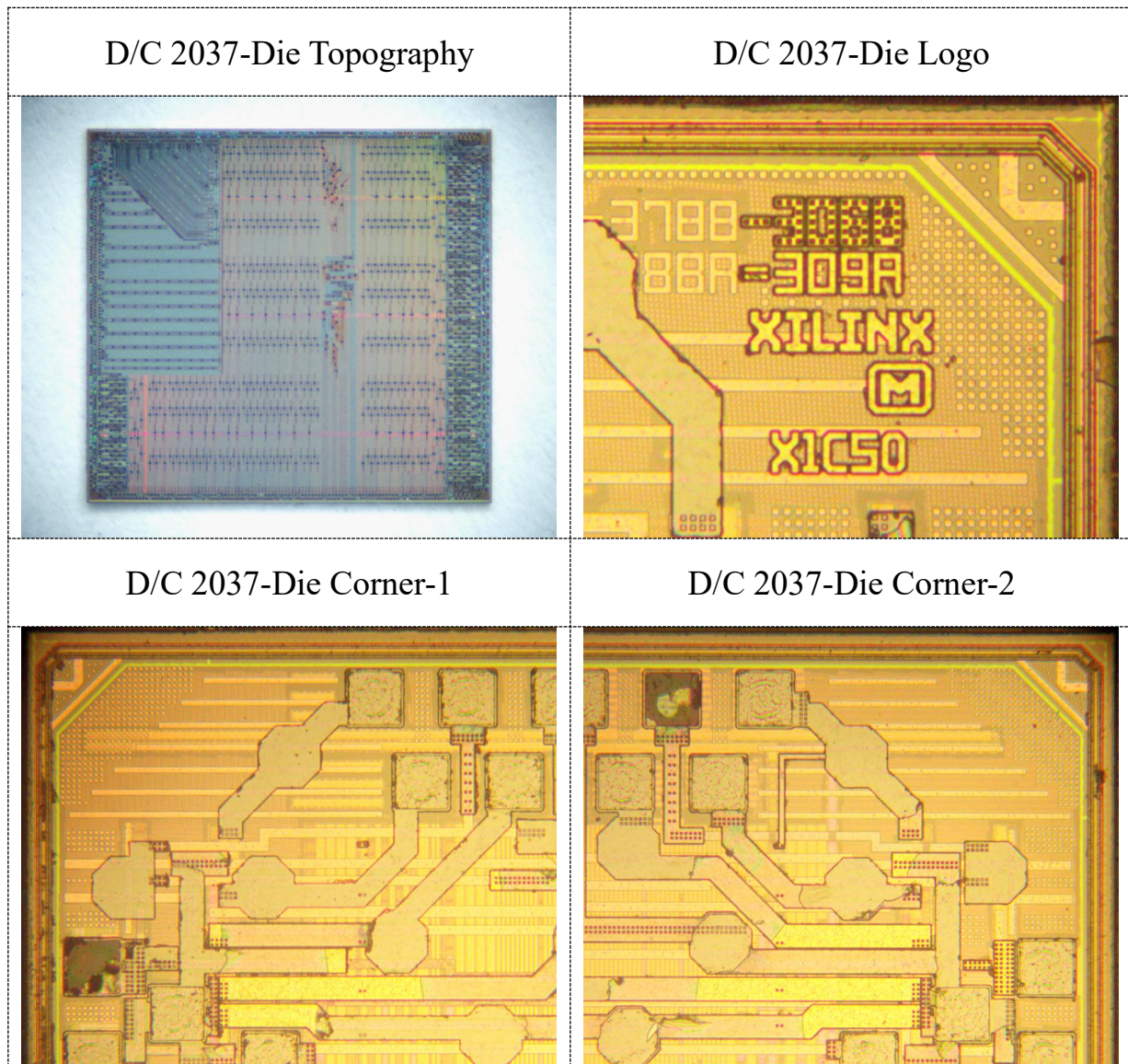
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8.Internal Visual Inspection:

Applicable Standard: MIL-STD-883L-2019 2010.14

Internal Visual Inspection was verified on 2PCS (D/C 2037 & D/C 2117) samples.

2PCS samples show the same structures and marking. Manufacturer XILINX marking was found on the die surface. Die X1C50 was also found on the die surface. 2PCS samples confirmed to be a XILINX device.





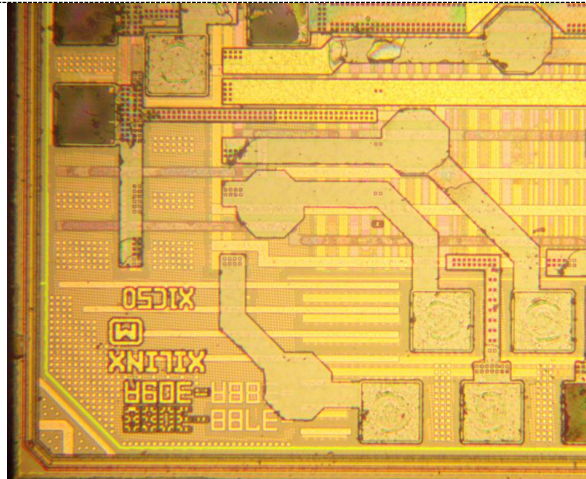
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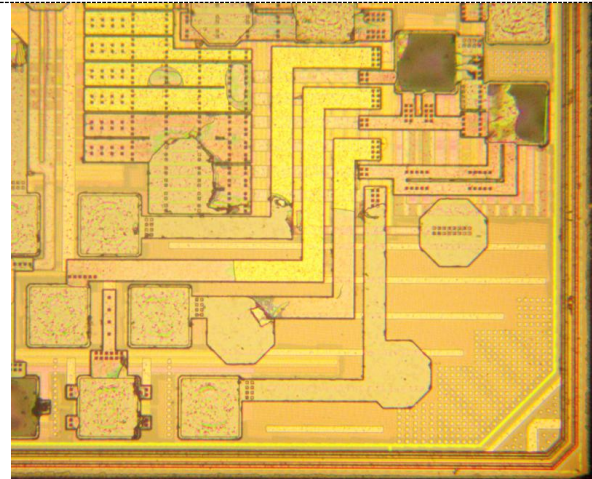


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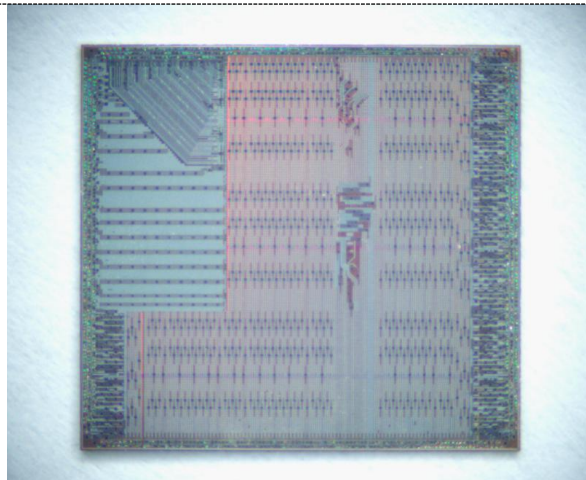
D/C 2037-Die Corner-3



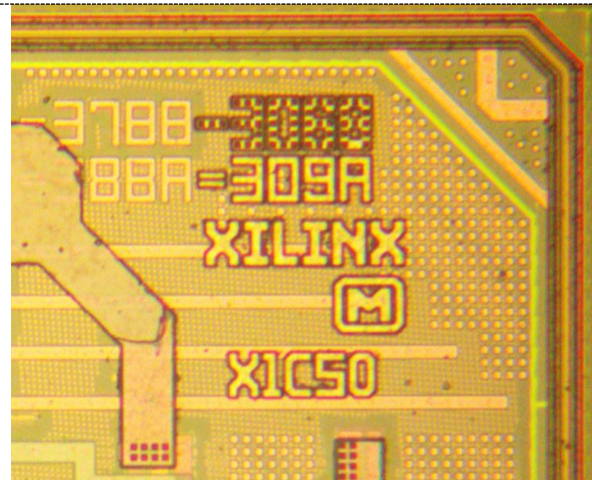
D/C 2037-Die Corner-4



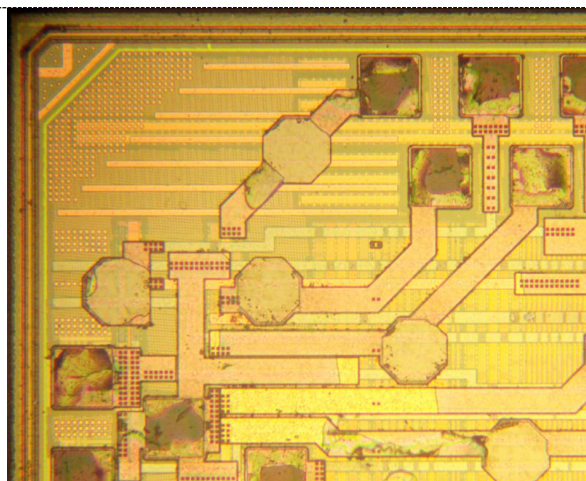
D/C 2117-Die Topography



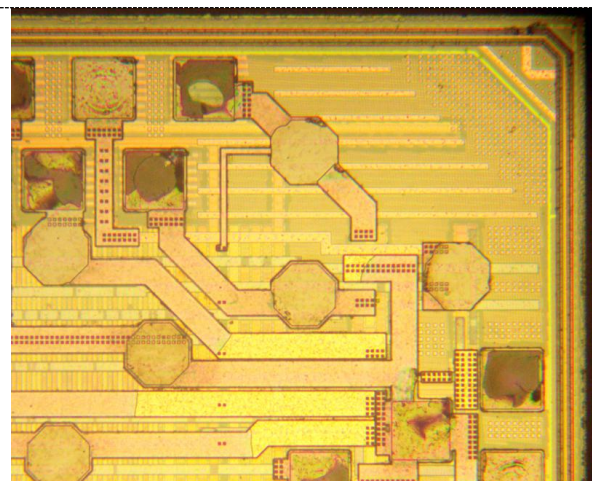
D/C 2117-Die Logo



D/C 2117-Die Corner-1



D/C 2117-Die Corner-2





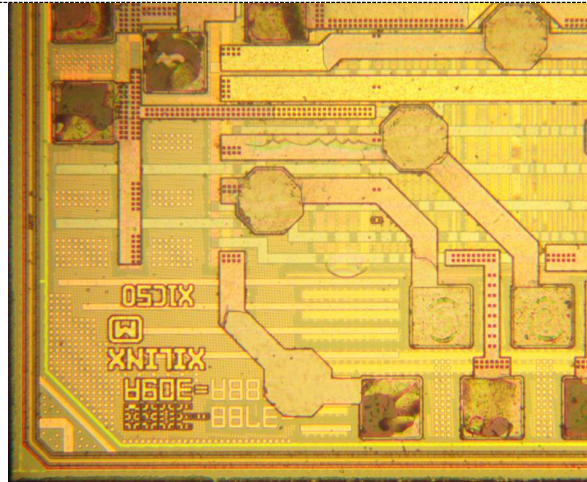
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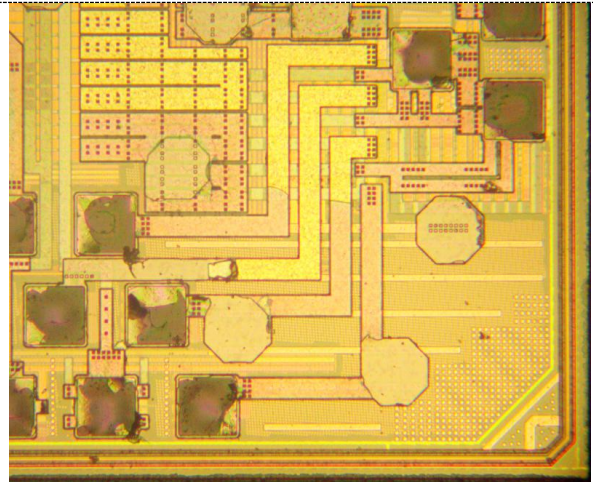


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D/C 2117-Die Corner-3



D/C 2117-Die Corner-4



END