INCEL Electronic Component Center Laboratory

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Report No:	SZ07212021004
Date:	2021/07/21
Page:	1/28

Project Inspection Report

Company : NA

Address : NA

Sample Name : NTA7002NT1G

Manufacture : ON

Date Code : 2115+,2119+,2120+,2022+,2123+,2026+

Sample Number : 19 PCS

Check Number : 19 PCS

Date of Received : 2021/07/17

Date of Tested : 2021/07/19 11:30 - 2021/07/20 16:20

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	Reviewed by Project Manager
Cherry	Lucy

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

Methods & Equipment

1.1 Applicable Standard

- MIL-STD-883K-2017 2009.13
- MIL-STD-883K-2017 2037
- GJB 128A-1997
- MIL-STD-883K-2017 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 Test equipment and auxiliary materials

lDevice model: CM100S
lFlux model: PD-150

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 Functional testing Equipment

- Transistor curve tracer XJ4822

XJ4822 is a CRT readout transistor curve tracer, which is used to measure the static parameters of transistors, diodes, MOSFETS and other semiconductor devices.
MAX collector voltage up to 3KV(option)
Step voltage ± 10V +△VB ±5V with low internal resistance, especially for testing high power VMOS devices.

1.7 Testing environment

- Ambient temperature: 25±5℃
  Relative humidity: 45%-65%RH

1.8 Test Basis

- ON NTA7002NT1G:
  https://www.onsemi.com/pdf/datasheet/nta7002n-d.pdf

Analysis Summary

External Visual Inspection Result:

Applicable Standard: MIL-STD-883K-2017 2009.13

External Visual Inspection on 1 PCS original sample (#1). The part markings are laser-etched onto the top side of each device: Logo T6 5. No secondary coating, sanding marks, crack or chips were observed on all inspected. Leads were in acceptable condition. Devices package and dimension matched to manufacturer's specification. All devices passed the external visual inspection.
Specification dimension:
D: 1.55-1.65 MM
HE: 1.50-1.70 MM
A: 0.70-0.90 MM
Specification dimension:
D: 1.58 MM
HE: 1.54 MM
A: 0.83 MM

External Visual Inspection on 18 PCS testing samples (#2-#19).
The devices contain 3 PCS testing samples marked with D/C 2115+(#2-#4). The part markings are laser-etched onto the top side of each device: Logo T6 4.
The devices contain 3 PCS testing samples marked with D/C 2119+(#5-#7). The part markings are laser-etched onto the top side of each device: Logo T6 5.
The devices contain 3 PCS testing samples marked with D/C 2120+(#8-#10). The part markings are laser-etched onto the top side of each device: Logo T6 5.
The devices contain 3 PCS testing samples marked with D/C 2022+(#11-#13). The part markings are laser-etched onto the top side of each device: Logo T6 L.
The devices contain 3 PCS testing samples marked with D/C 2123+(#14-#16). The part markings are laser-etched onto the top side of each device: Logo T6 6.
The devices contain 3 PCS testing samples marked with D/C 2026+(#17-#19). The part markings are laser-etched onto the top side of each device: Logo T6 L.
No secondary coating, sanding marks, crack or chips were observed on all inspected. Leads were in acceptable condition. Devices package and dimension matched to manufacturer's specification. All devices passed the external visual inspection.
Specification dimension:
D: 1.55-1.65 MM
HE: 1.50-1.70 MM
A: 0.70-0.90 MM
Specification dimension:
D: 1.60 MM
HE: 1.55 MM
A: 0.82 MM

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

X-ray Analysis:

Applicable Standard: MIL-STD-883K-2017 2037

X-ray examination was performed on 19PCS(#1-#19) samples.

All devices contain 1 PCS original sample(#1) and 18 PCS testing samples (#2-#19).

Test samples contain 3 PCS (#2-#4) of D/C 2115+, 3 PCS (#5-#7) of D/C 2119+, 3 PCS (#8-#10)of D/C 2120+, 3 PCS (#11-#13)of D/C 2022+, 3 PCS (#14-#16)of D/C 2123+, 3 PCS (#17-#19)of D/C 2026+.

#1-#14,#16-#19 no abnormality detected.

#15 Die silver colloidal void rate is abnormal. The void rate is 37.362%.

Pin Correlation Test Results:

Pin Correlation Test	Results:
Total quantity tested:	19pcs
Total quantity passed:	19pcs
Total quantity failed:	0pcs
Note:	Devices pins correlated to the manufacturer’s specification.

Pin Correlation Test Results:		
Failure classification	**Yes/No**	**Result**
Damaged structure	**No**	**Pass**
Open structure	**No**	**Pass**
Short structure	**No**	**Pass**

Internal Visual Inspection:

Applicable Standard: MIL-STD-883K-2017 2010.14

Internal Visual Inspection was verified on 19PCS (#1-#19) samples. No manufacturer marking was found on the die, Die marking CK90 was found on the die surface.

Die size:

L1&L2：0.35mm×0.35mm

Summary: 19PCS (#1-#19) samples show the same die structures, die size and marking, they were made by the same manufacturer.

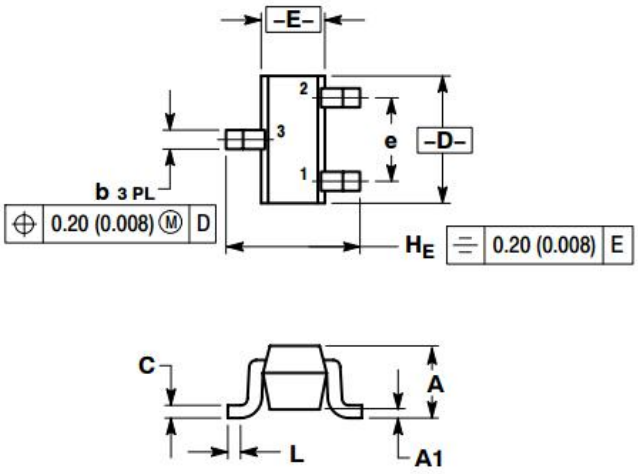
1.Device Description:

Power Management Load Switch

• Level Shift

• Portable Applications such as Cell Phones, Media Players, Digital Cameras, PDA's, Video Games, Hand−Held Computers, etc.

2.Package dimensions:



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.80	0.90	0.027	0.031	0.035
A1	0.00	0.05	0.10	0.000	0.002	0.004
b	0.15	0.20	0.30	0.006	0.008	0.012
C	0.10	0.15	0.25	0.004	0.006	0.010
D	1.55	1.60	1.65	0.061	0.063	0.065
E	0.70	0.80	0.90	0.027	0.031	0.035
e	1.00 BSC			0.04 BSC		
L	0.10	0.15	0.20	0.004	0.006	0.008
H_E	1.50	1.60	1.70	0.060	0.063	0.067

STYLE 1:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

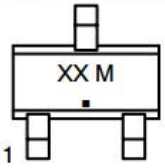
STYLE 2:
PIN 1. ANODE
2. N/C
3. CATHODE

STYLE 3:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 4:
PIN 1. CATHODE
2. CATHODE
3. ANODE

STYLE 5:
PIN 1. GATE
2. SOURCE
3. DRAIN

GENERIC MARKING DIAGRAM*



XX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, "G" or microdot " ▪", may or may not be present.

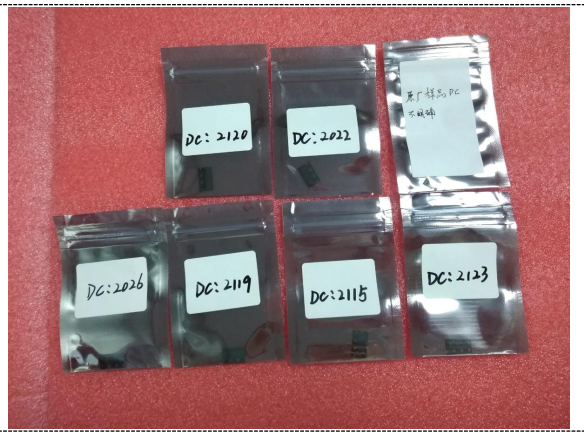
3.Receiving Inspection:

Gross Weight:	36.61g	Parts Total	19 PCS
Number Of Boxes	N/A	intact label	Non Present
Package type	Reel	Moisture protection	Acceptable
MSL	N/A	ESD protection	Acceptable
Country of Mfg	N/A	Package Type	SOT-416

Note: All devices contain 1 PCS original sample(#1) and 18 PCS testing samples (#2-#19).
Test samples contain 3 PCS (#2-#4) of D/C 2115+, 3 PCS (#5-#7) of D/C 2119+, 3 PCS (#8-#10)of D/C 2120+, 3 PCS (#11-#13)of D/C 2022+, 3 PCS (#14-#16)of D/C 2123+, 3 PCS (#17-#19)of D/C 2026+, Device was received in acceptable condition.

Received View-1

Received View-2



Received View-3

4. External Visual Inspection:

Applicable Standard: MIL-STD-883K-2017 2009.13

External Visual Inspection on 1 PCS original sample (#1). The part markings are laser-etched onto the top side of each device: Logo T6 5. No secondary coating, sanding marks, crack or chips were observed on all inspected. Leads were in acceptable condition. Devices package and dimension matched to manufacturer's specification. All devices passed the external visual inspection.
Specification dimension:
D: 1.55-1.65 MM
HE: 1.50-1.70 MM
A: 0.70-0.90 MM
Specification dimension:
D: 1.58 MM
HE: 1.54 MM
A: 0.83 MM

External Visual Inspection on 18 PCS testing samples (#2-#19).
The devices contain 3 PCS testing samples marked with D/C 2115+(#2-#4). The part markings are laser-etched onto the top side of each device: Logo T6 4.
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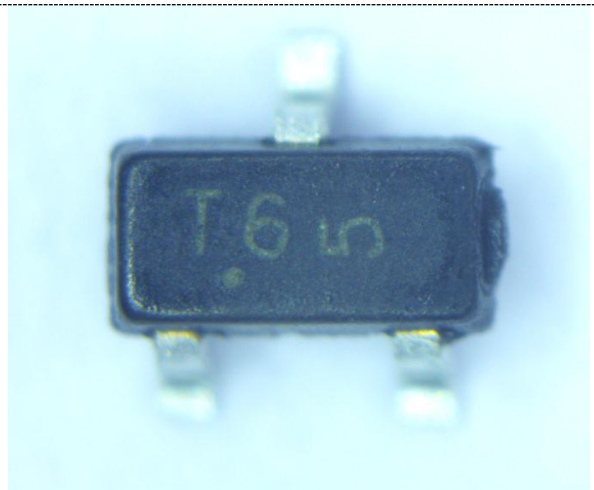
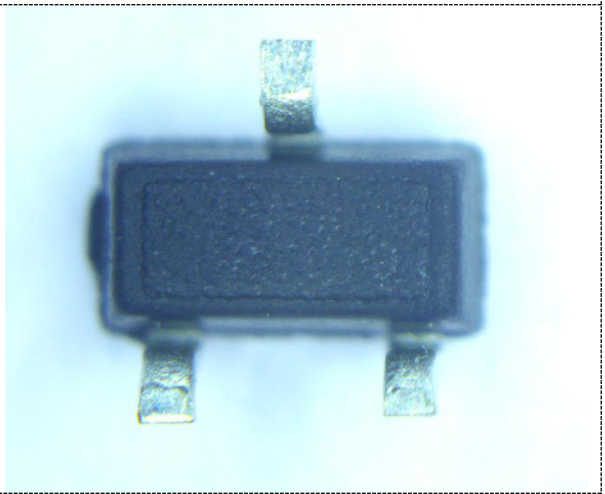
The devices contain 3 PCS testing samples marked with D/C 2120+(#8-#10). The part markings are laser-etched onto the top side of each device: Logo T6 5.
The devices contain 3 PCS testing samples marked with D/C 2022+(#11-#13). The part markings are laser-etched onto the top side of each device: Logo T6 L.
The devices contain 3 PCS testing samples marked with D/C 2123+(#14-#16). The part markings are laser-etched onto the top side of each device: Logo T6 6.
The devices contain 3 PCS testing samples marked with D/C 2026+(#17-#19). The part markings are laser-etched onto the top side of each device: Logo T6 L.
No secondary coating, sanding marks, crack or chips were observed on all inspected. Leads were in acceptable condition. Devices package and dimension matched to manufacturer's specification. All devices passed the external visual inspection.
Specification dimension:
D: 1.55-1.65 MM
HE: 1.50-1.70 MM
A: 0.70-0.90 MM
Specification dimension:
D: 1.60 MM
HE: 1.55 MM
A: 0.82 MM

#1-Top	#1-Bottom
	
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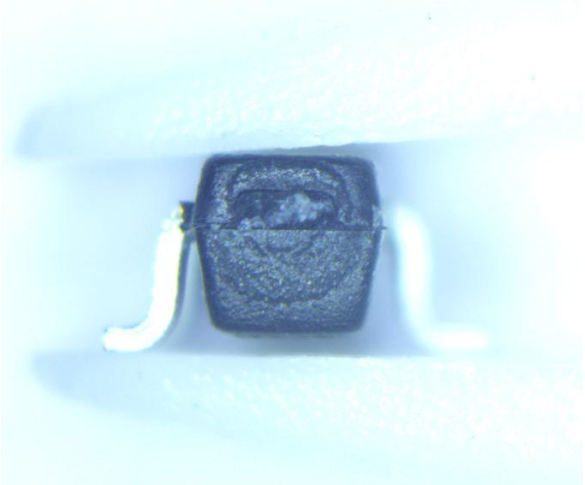
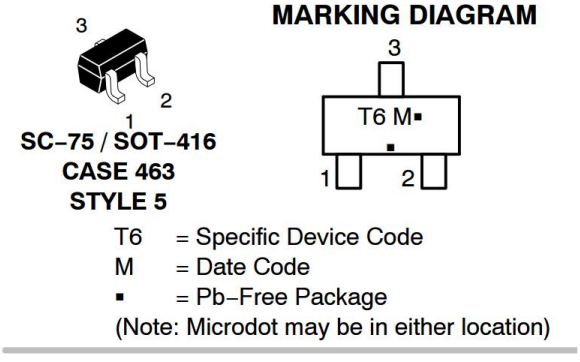
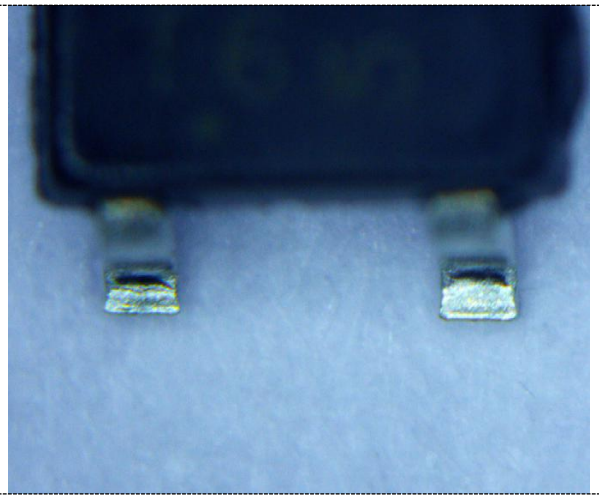
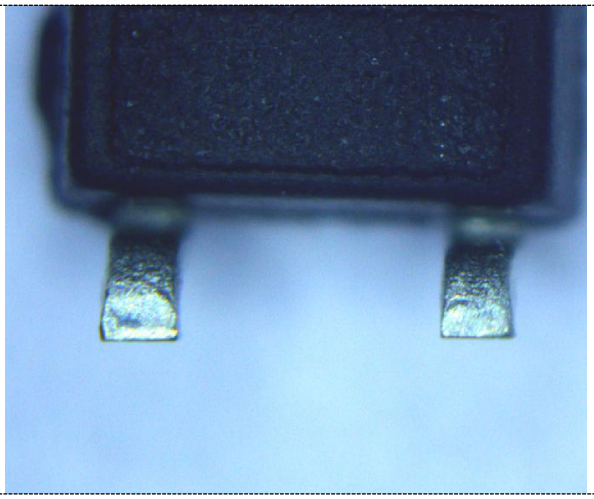
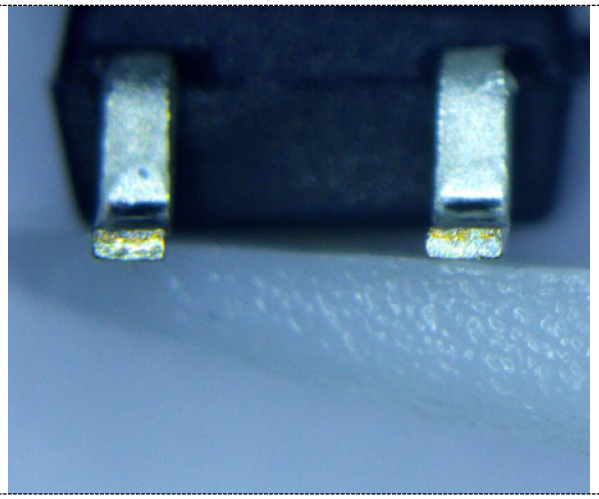
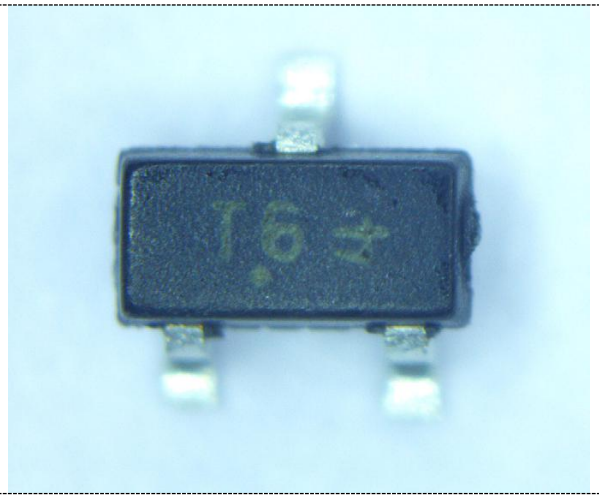
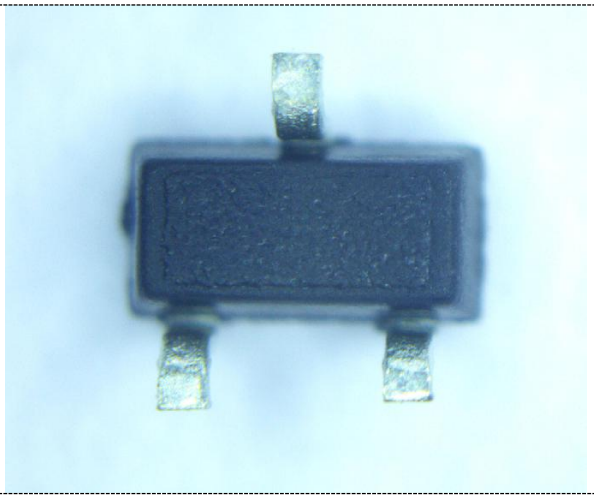
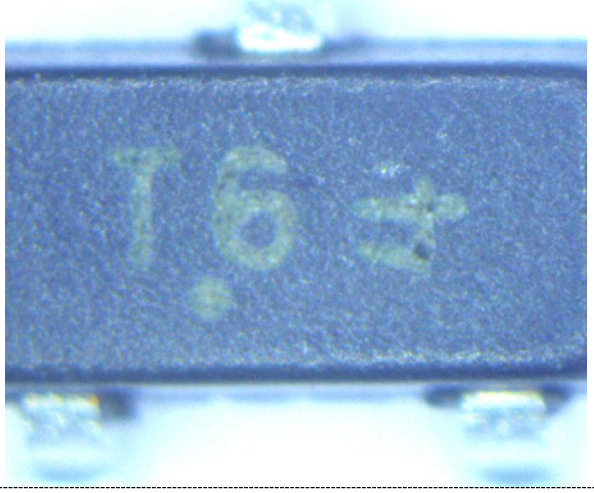
	
Part Marking Information	#1-Marking
	

#1-Top Leads	#1-Bottom Leads
	
#1- Leads End	#1- D=1.58 MM
	
#1- HE=1.54 MM	#1- A=0.83 MM
	

#2-Top	#2-Bottom
	
#2-Side	#2-Marking
	
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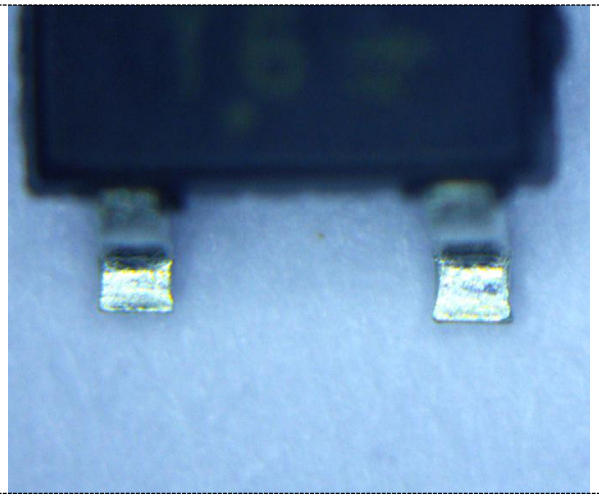	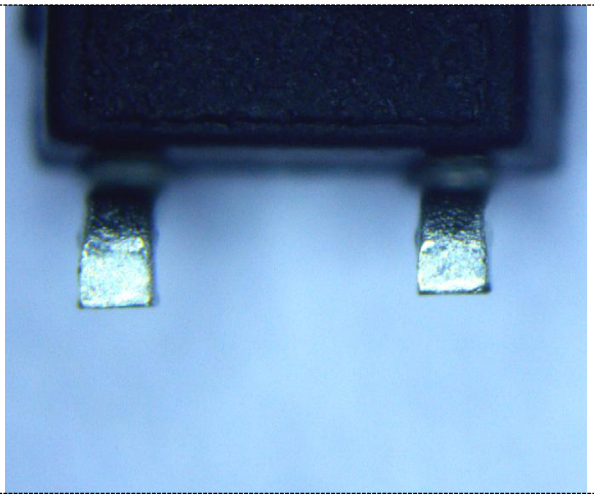

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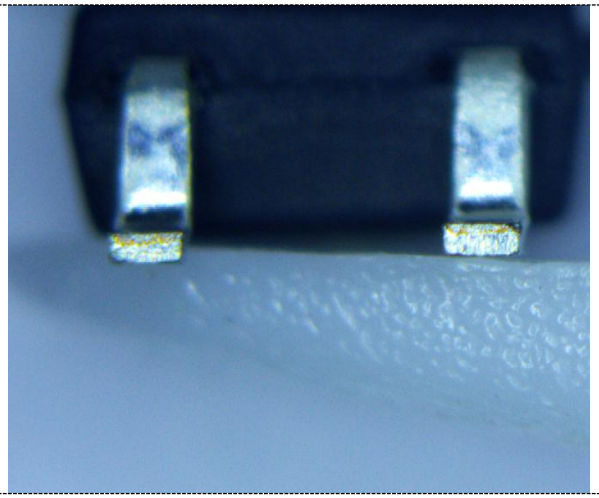
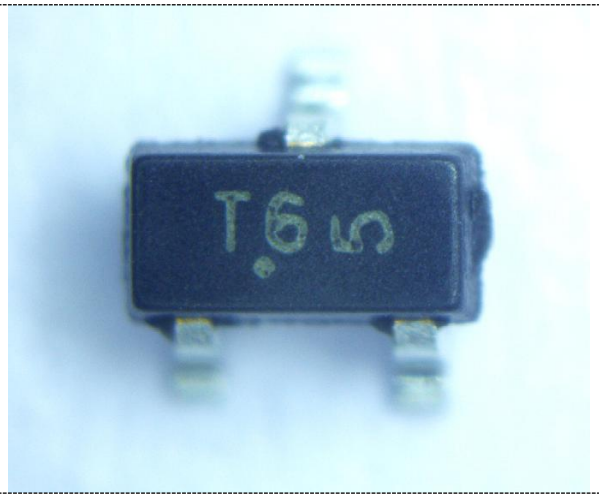
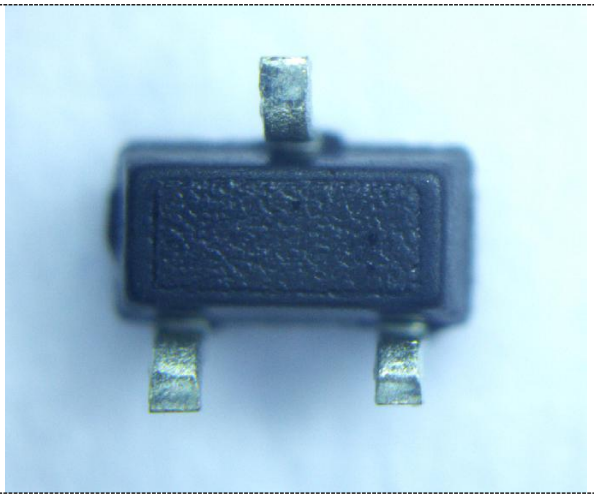
	
#2- HE=1.55 MM	#2- A=0.82 MM
	
#5-Top	#5-Bottom
	

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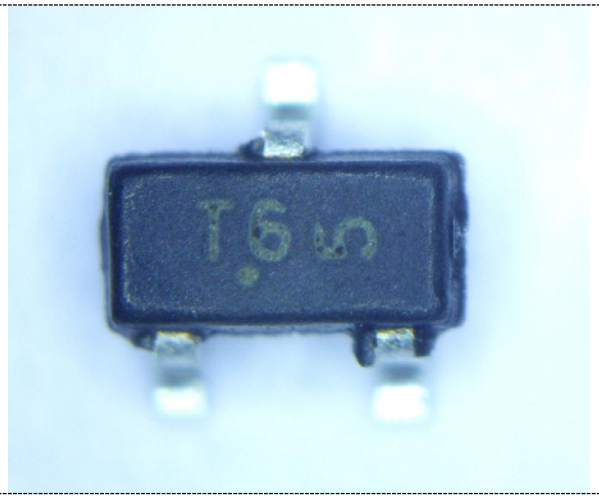	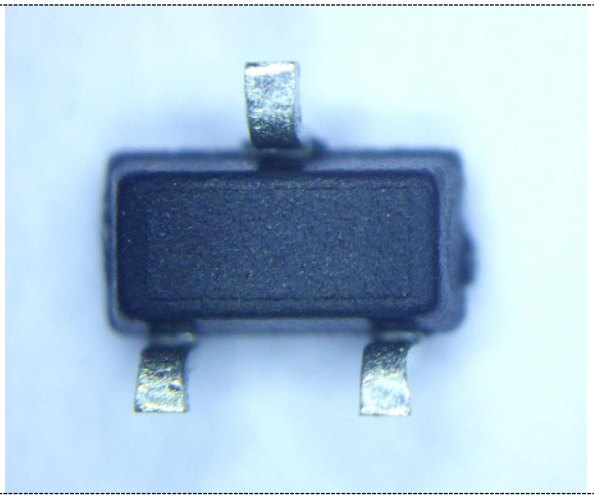
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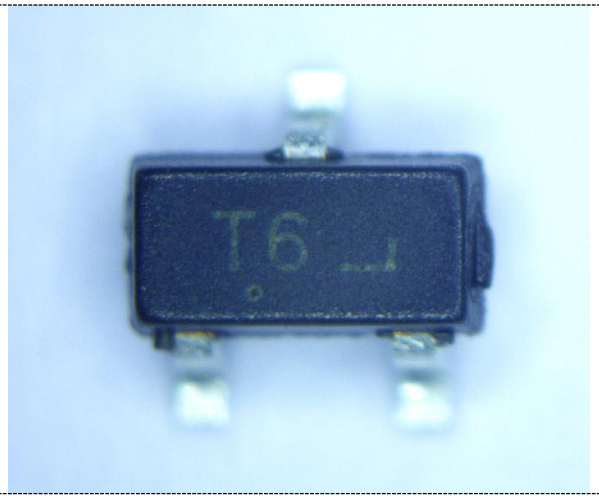	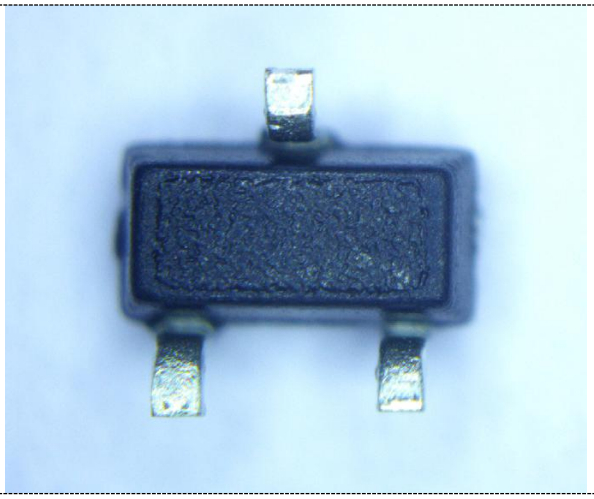
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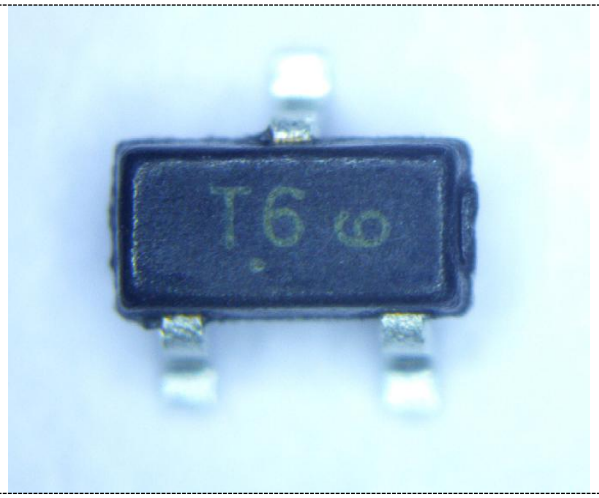
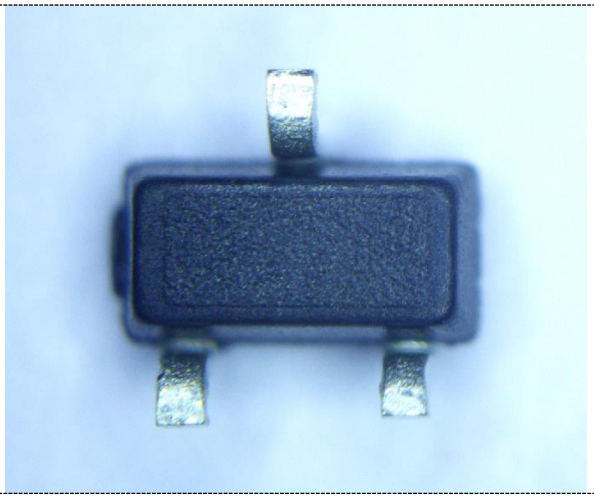
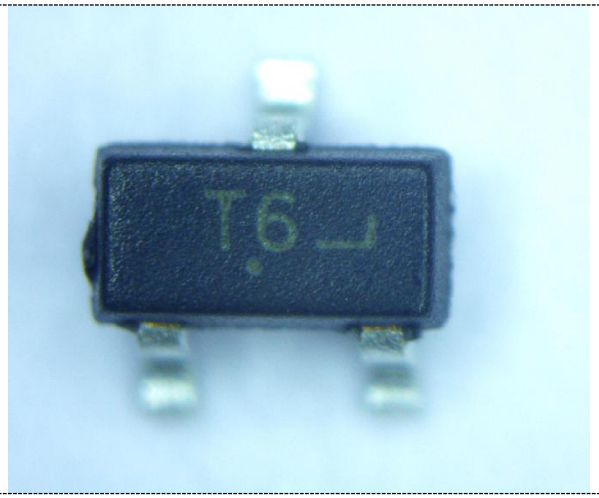
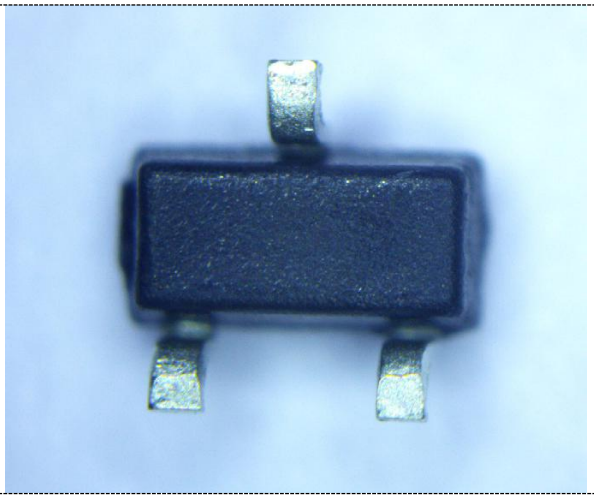
	

#17-Top	#17-Bottom
	

5.X-ray Analysis:

Applicable Standard: MIL-STD-883K-2017 2037

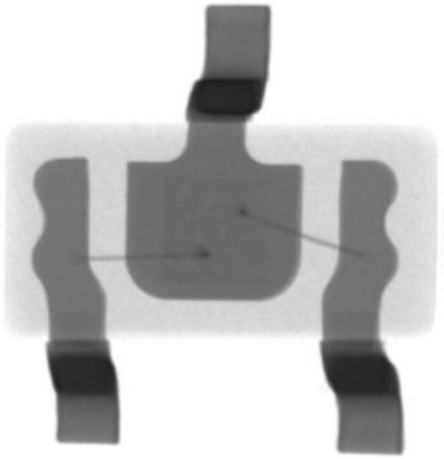
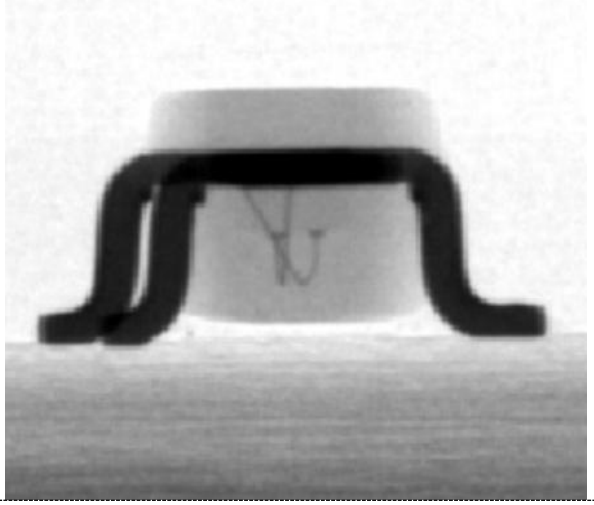
X-ray examination was performed on 19PCS(#1-#19) samples.

All devices contain 1 PCS original sample(#1) and 18 PCS testing samples (#2-#19).

Test samples contain 3 PCS (#2-#4) of D/C 2115+, 3 PCS (#5-#7) of D/C 2119+, 3 PCS (#8-#10)of D/C 2120+, 3 PCS (#11-#13)of D/C 2022+, 3 PCS (#14-#16)of D/C 2123+, 3 PCS (#17-#19)of D/C 2026+.

#1-#14,#16-#19 no abnormality detected.

#15DIE silver colloidal void rate is abnormal. The void rate is 37.362%.

#1-Top View-All	#1-Side View-All
	
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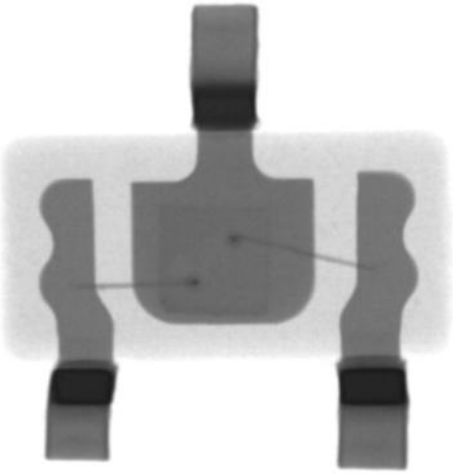
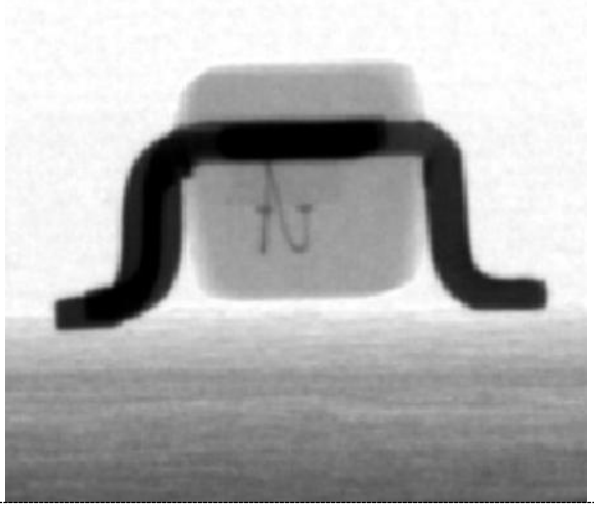
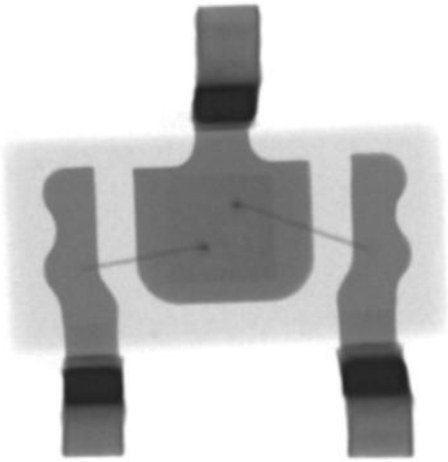
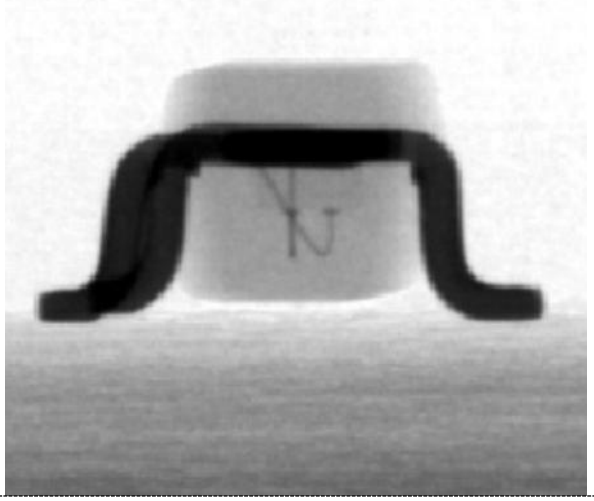
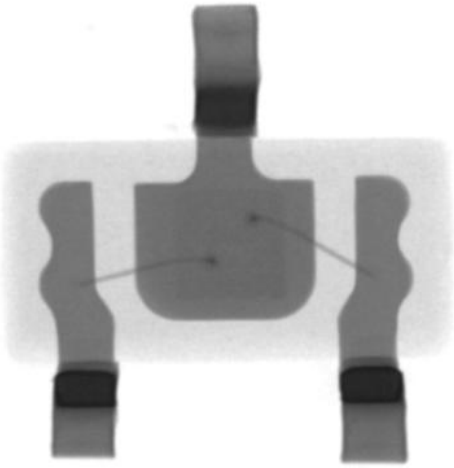
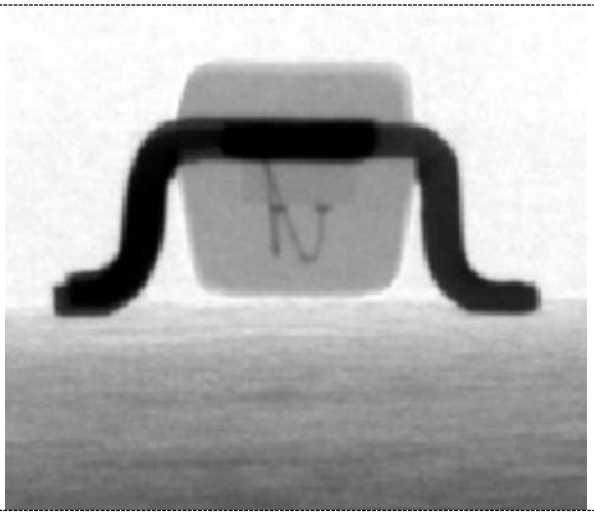
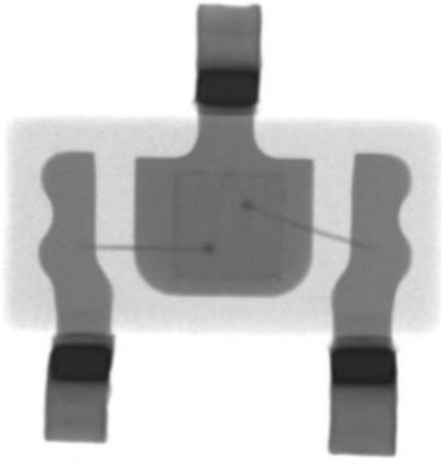
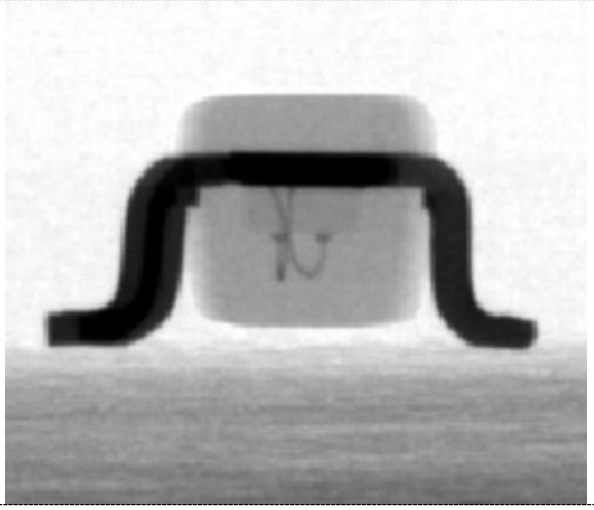
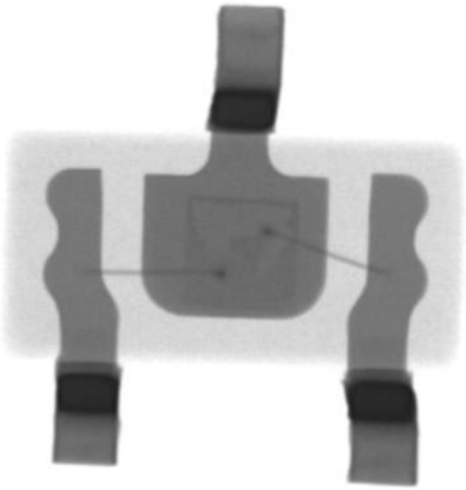
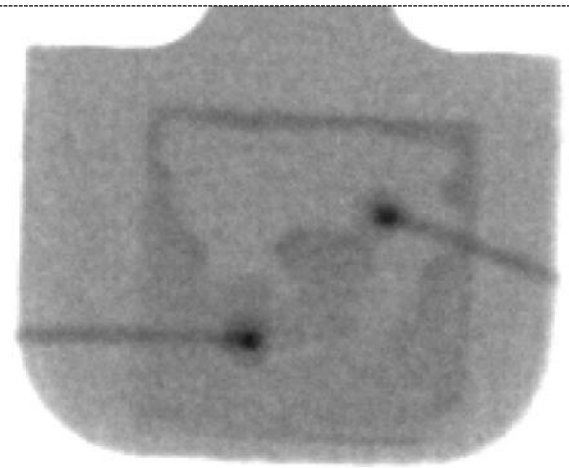
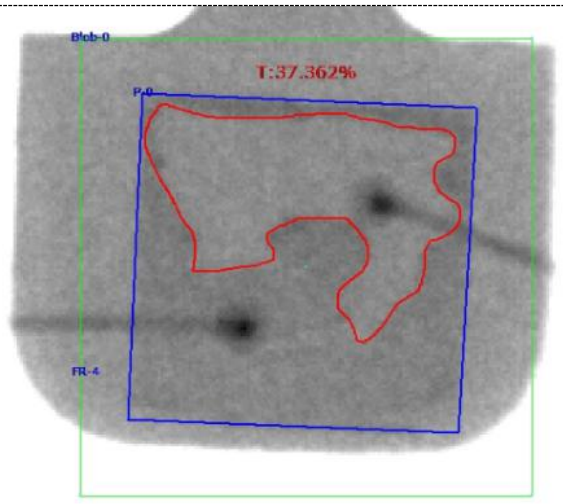
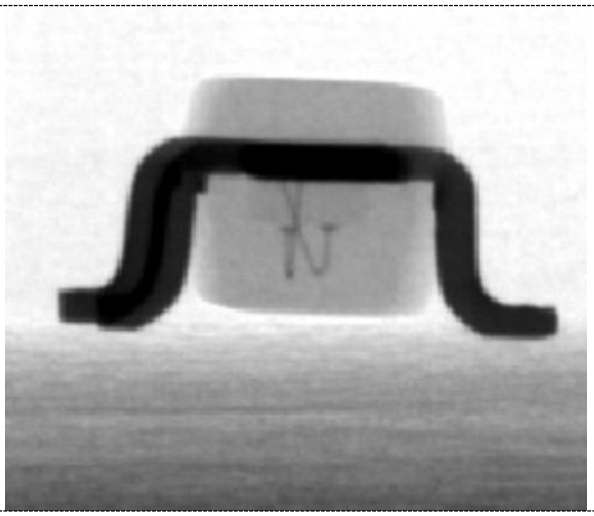
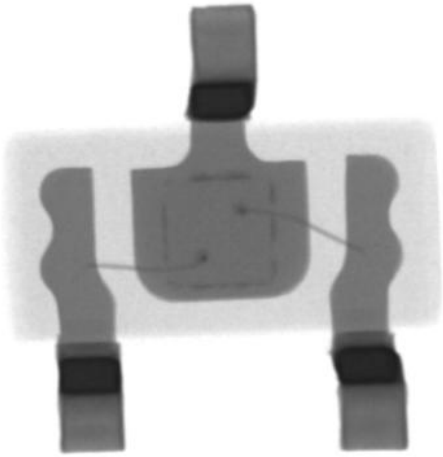
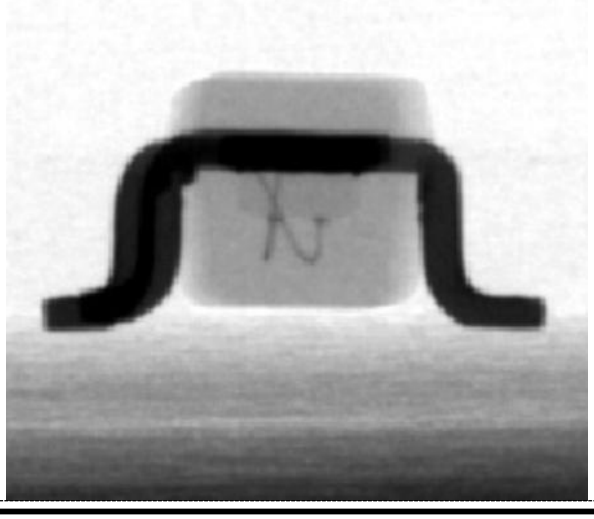
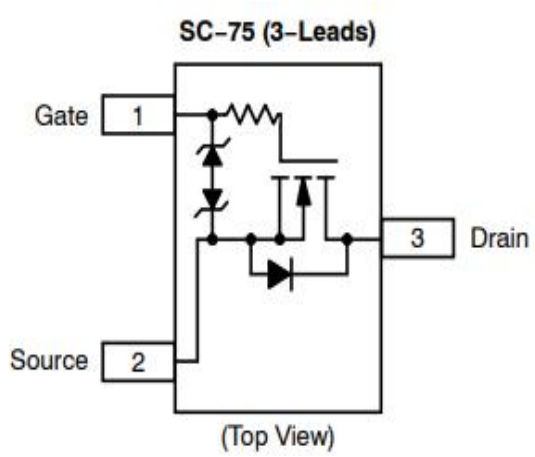
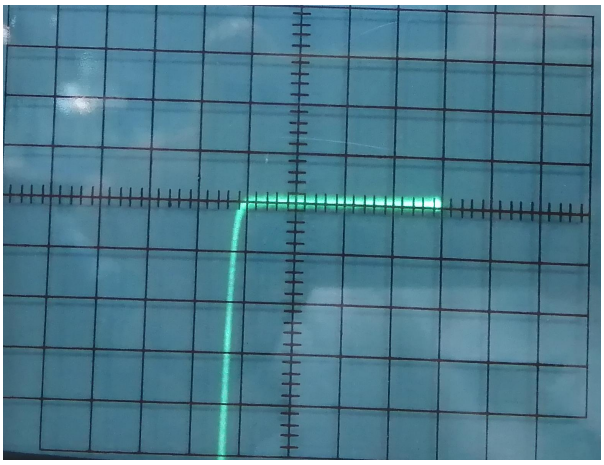
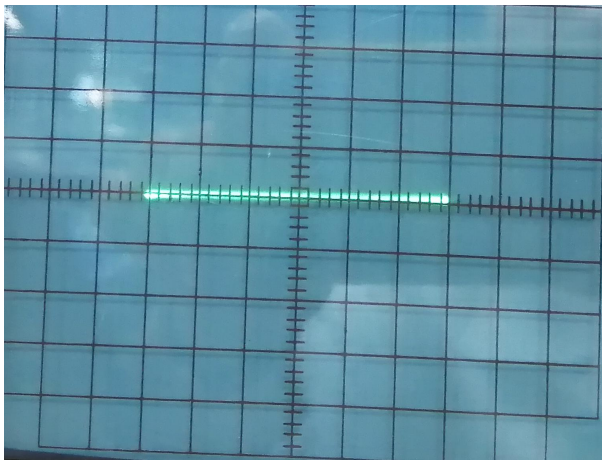
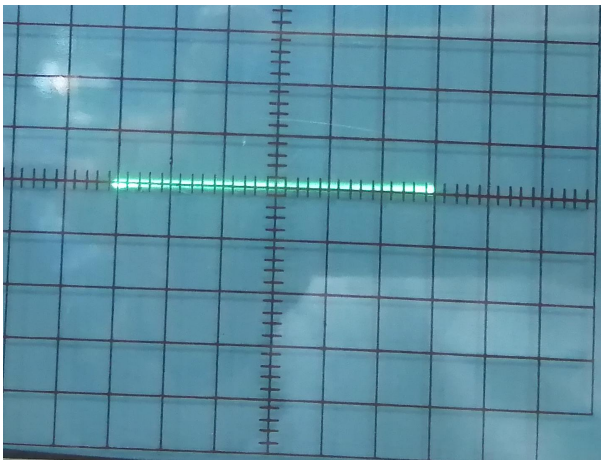
	

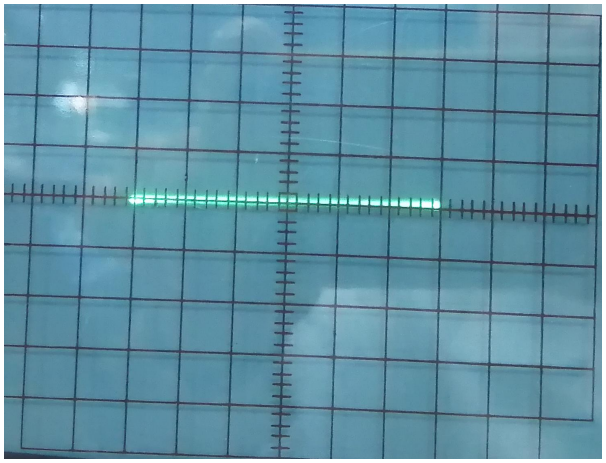
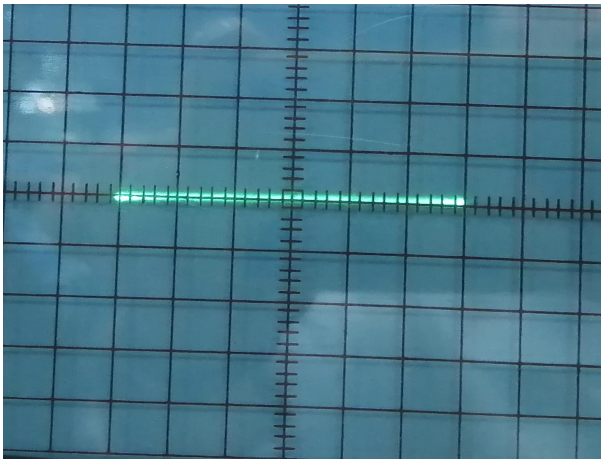
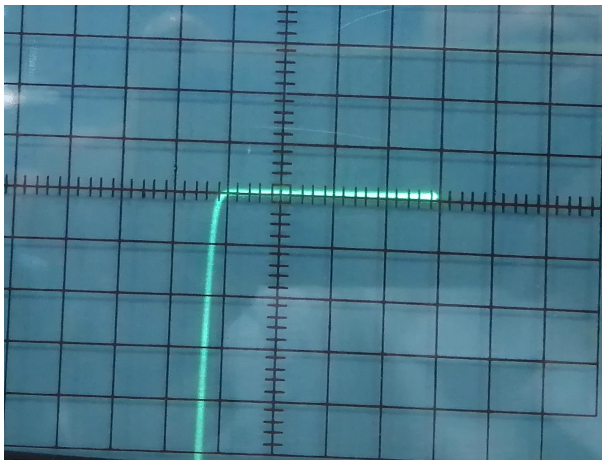
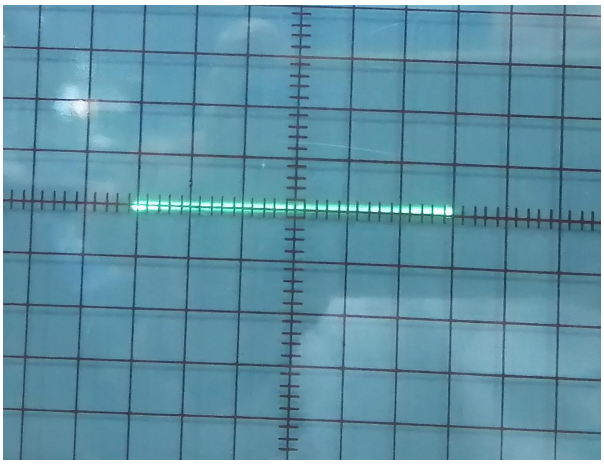
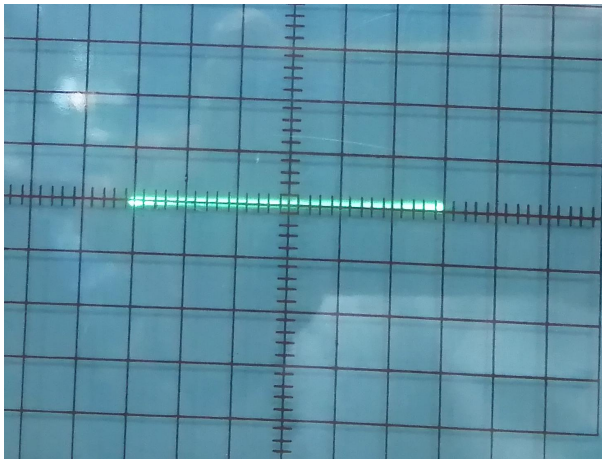
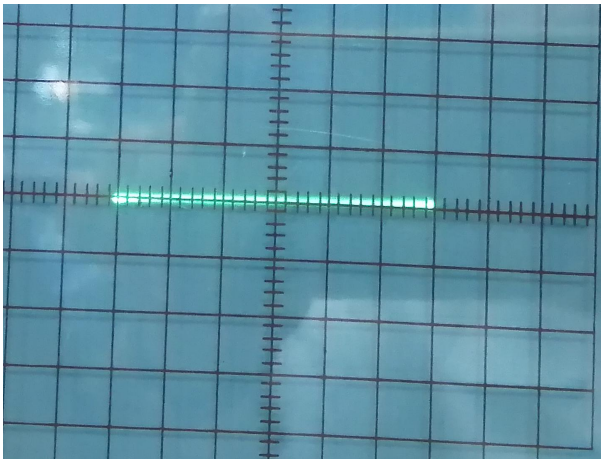
#5-Top View-All	#5-Side View-All
	
#8-Top View-All	#8-Side View-All
	
#11-Top View-All	#11-Side View-All
	

#15-Top View-All	#15-Side View-Zoom
	
#15-Top View-DIE silver colloidal void	#15-Side View-All
	
#17-Top View-All	#17-Side View-All
	

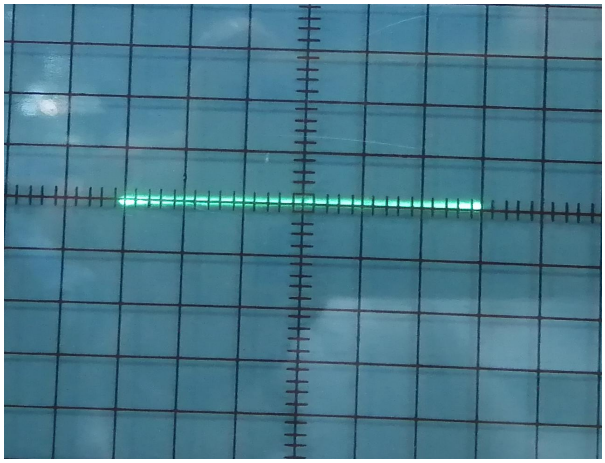
6. Pin Correlation Test

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 D TO S
	
#1 D TO G	#1 G TO S
	

#1 G TO D	#1 S TO G
	
#2-#19 D TO S	#2-#19 G TO D
	
#2-#19 D TO G	#2-#19 G TO S
	

#2-#19 S TO G



Pin Correlation Test Results:

Pin Correlation Test	Results:
Total quantity tested:	19pcs
Total quantity passed:	19pcs
Total quantity failed:	0pcs
Note:	Devices pins correlated to the manufacturer’s specification.

7.Internal Visual Inspection:

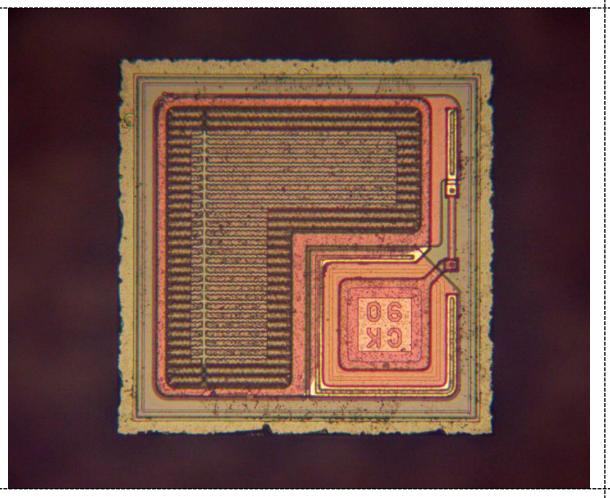
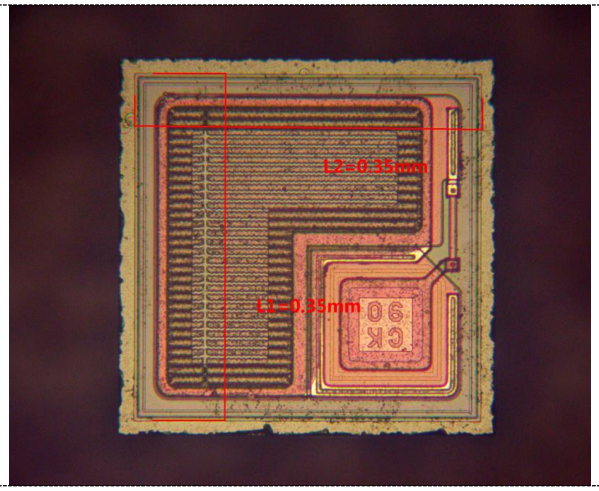
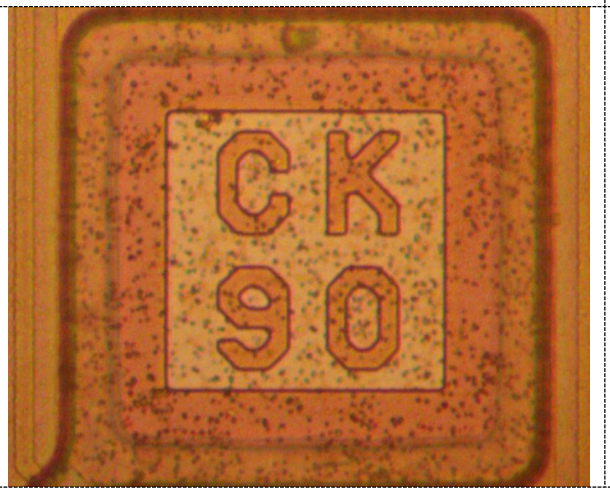
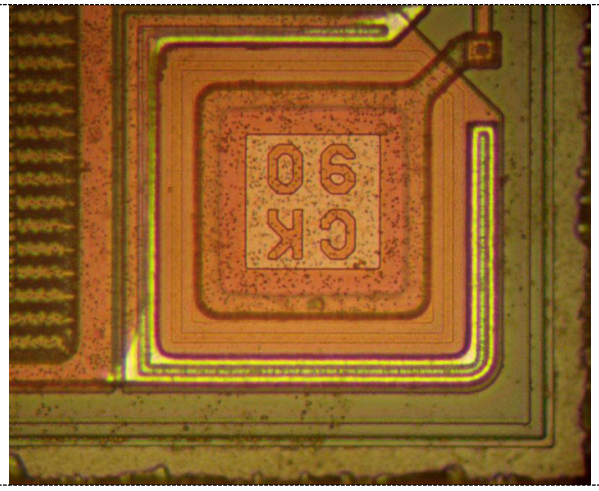
Applicable Standard: MIL-STD-883K-2017 2010.14

Internal Visual Inspection was verified on 19PCS (#1-#19) samples. No manufacturer marking was found on the die, Die marking CK90 was found on the die surface.

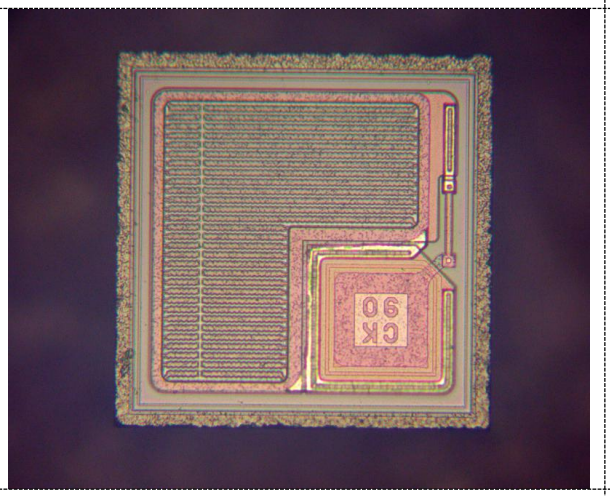
Die size:

L1&L2：0.35mm×0.35mm

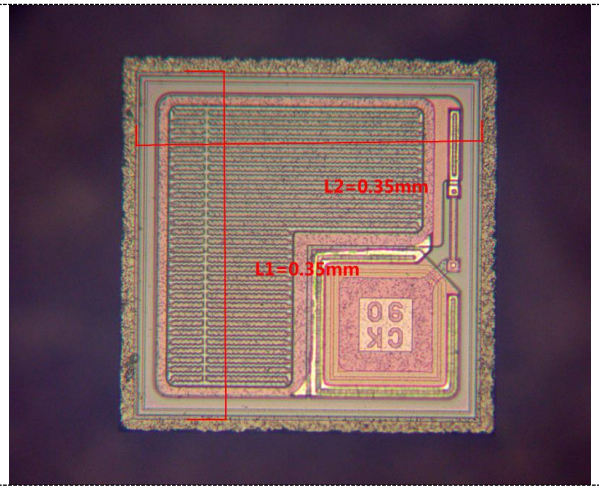
Summary: 19PCS (#1-#19) samples show the same die structures, die size and marking, they were made by the same manufacturer.

#1-Die Topography	#1-L1&L2：0.35mm×0.35mm
	
#1-Die Marking	#1-Die Corner
	

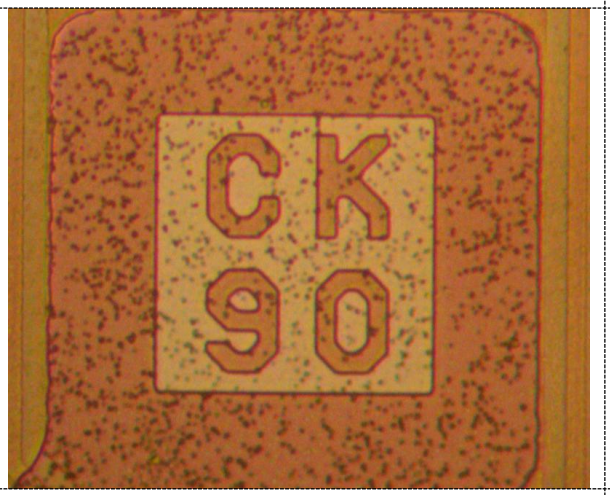
#2-Die Topography



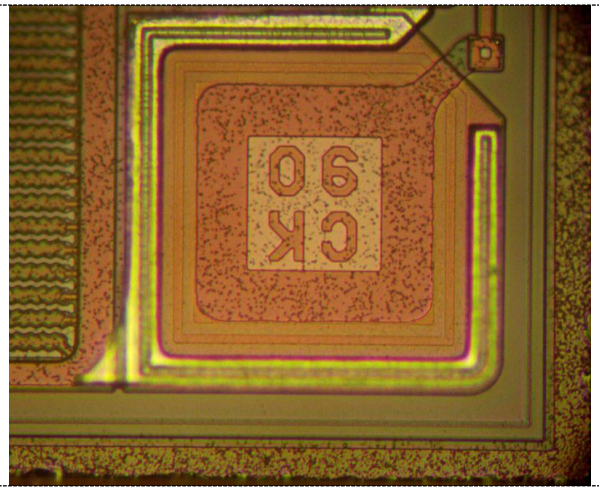
#2-L1&L2：0.35mm×0.35mm



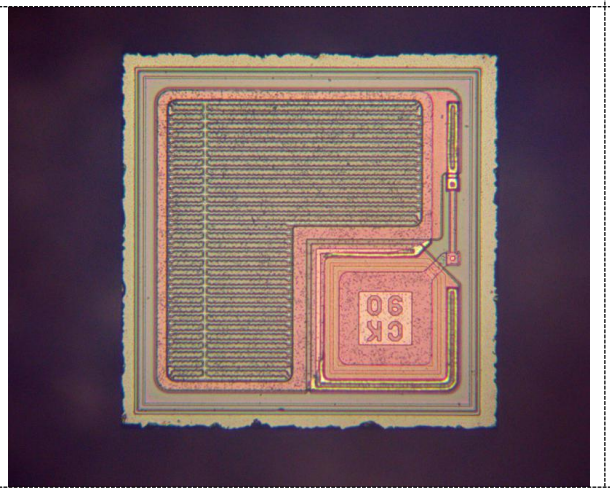
#2-Die Marking



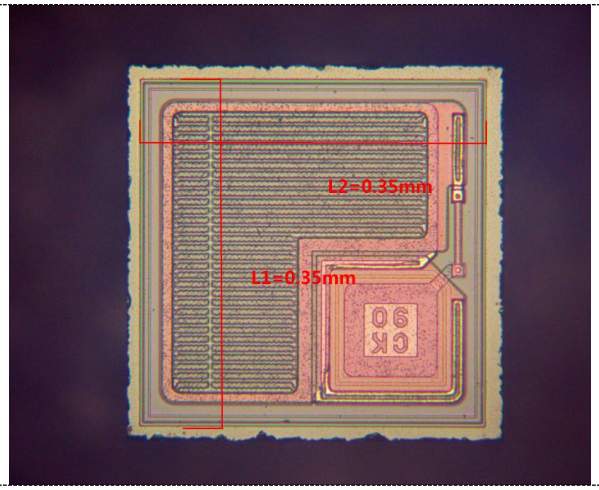
#2-Die Corner



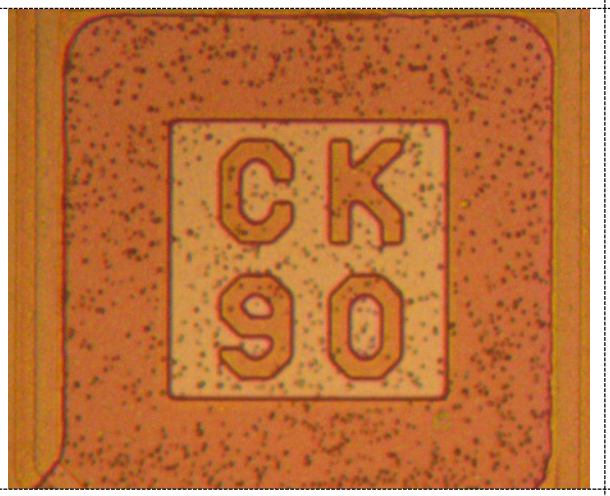
#5-Die Topography



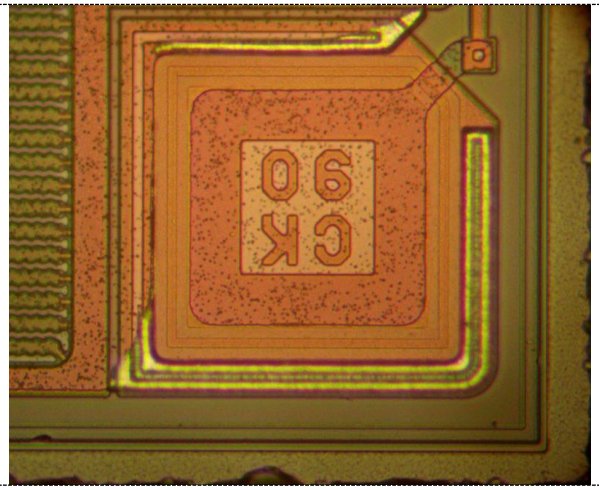
#5-L1&L2：0.35mm×0.35mm



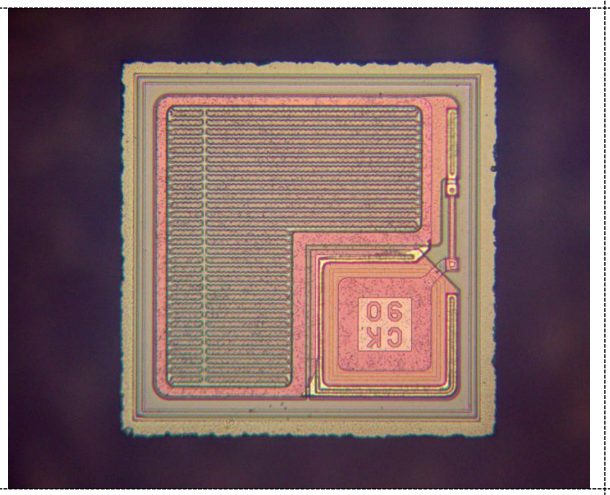
#5-Die Marking



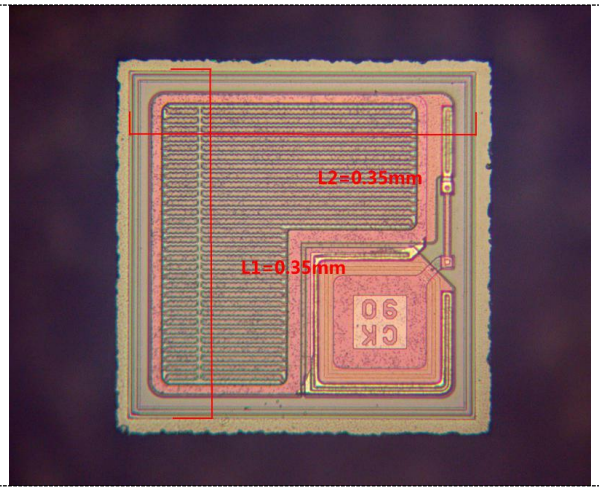
#5-Die Corner



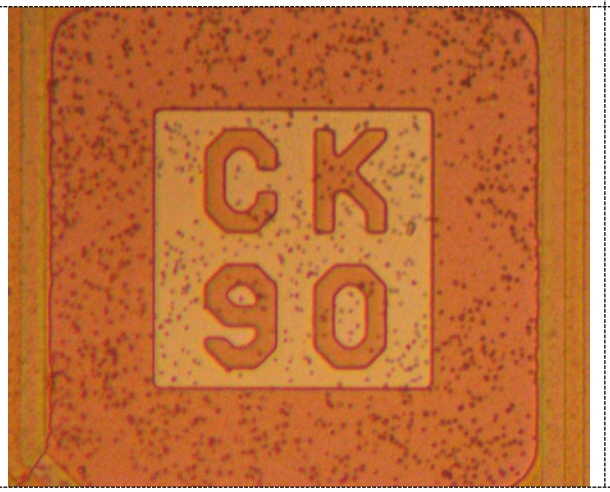
#8-Die Topography



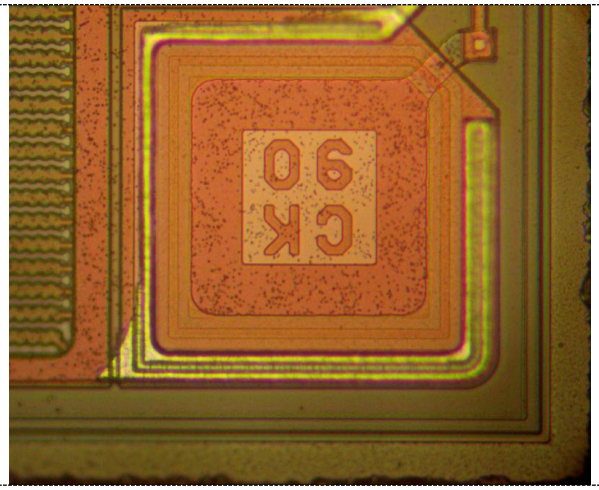
#8-L1&L2：0.35mm×0.35mm



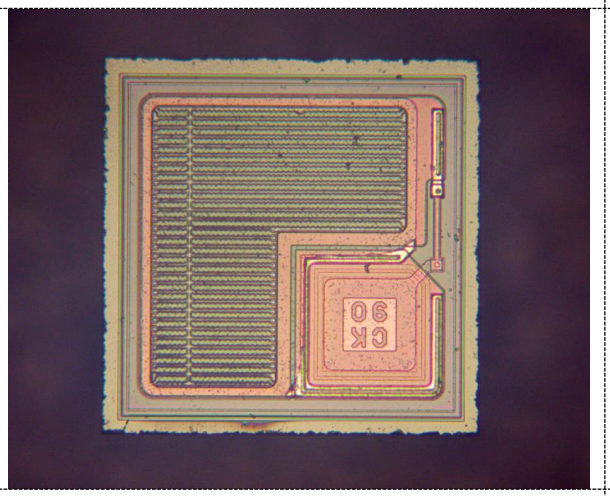
#8-Die Marking



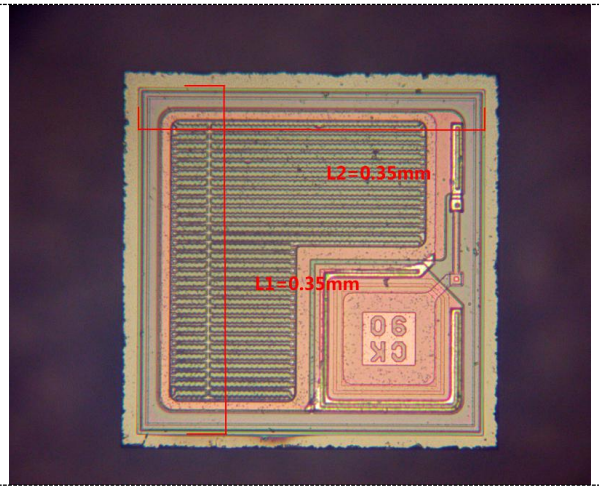
#8-Die Corner



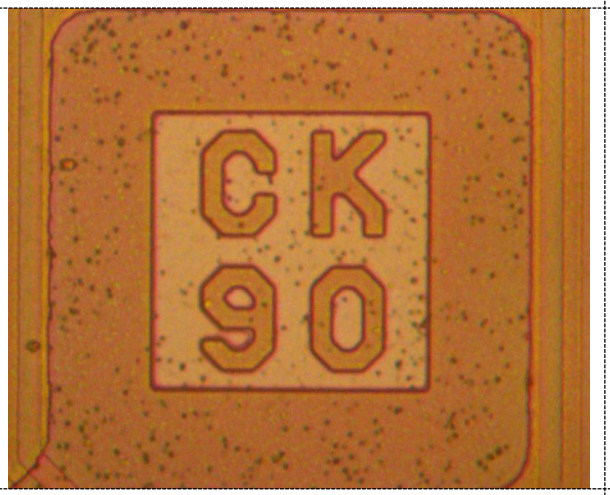
#11-Die Topography



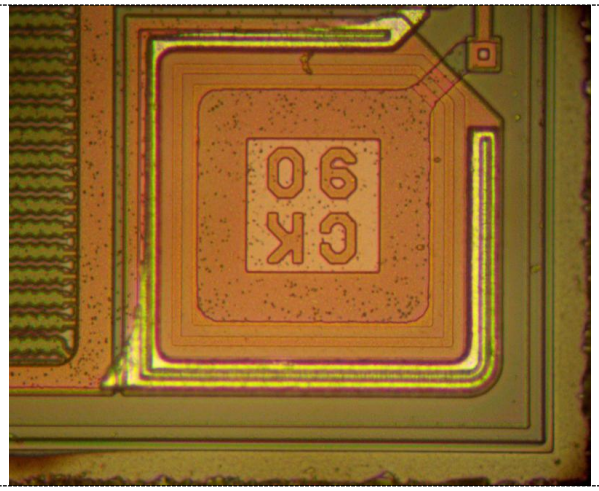
#11-L1&L2：0.35mm×0.35mm



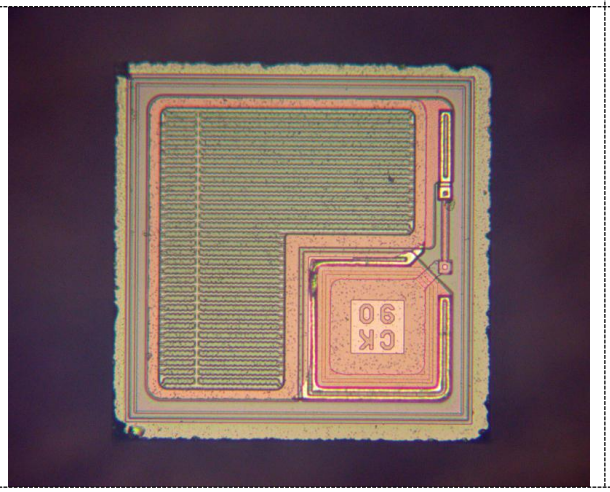
#11-Die Marking



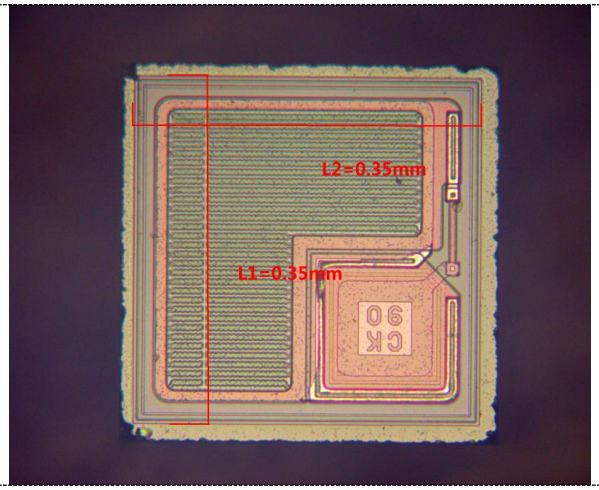
#11-Die Corner



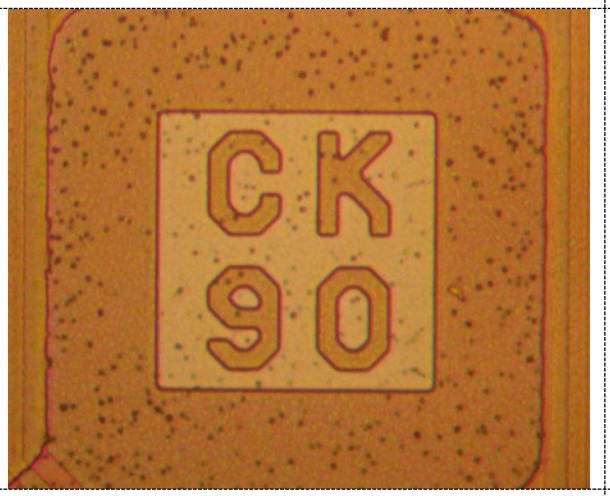
#14-Die Topography



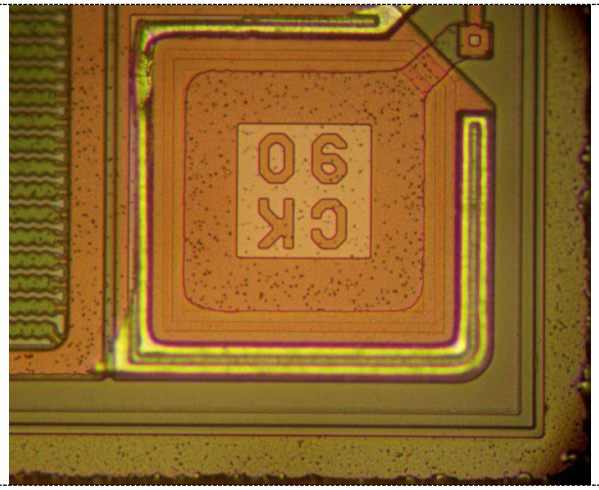
#14-L1&L2：0.35mm×0.35mm



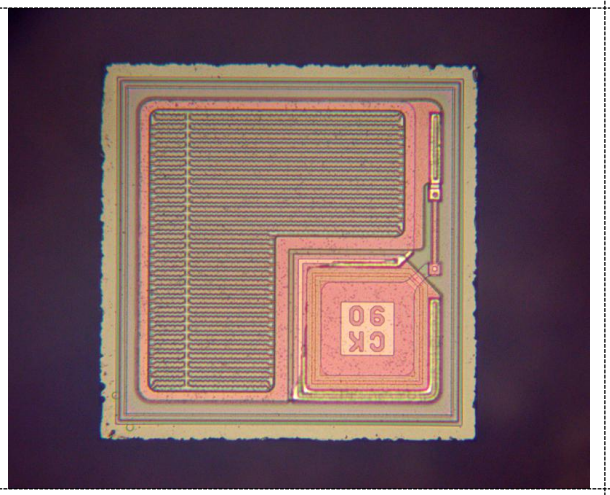
#14-Die Marking



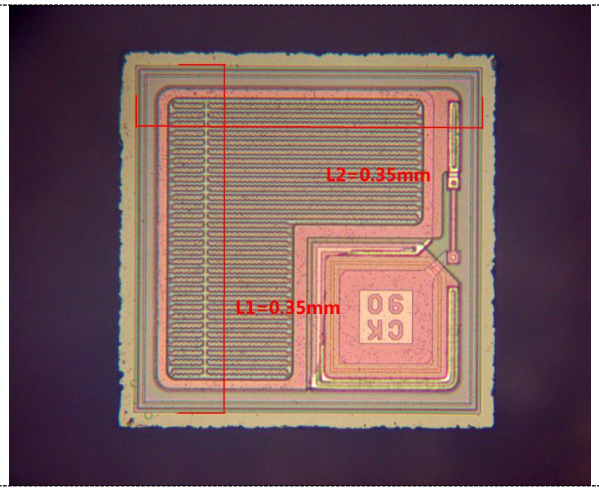
#14-Die Corner



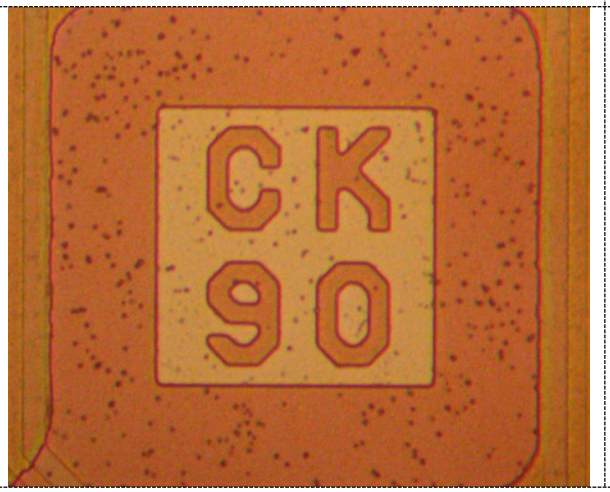
#15-Die Topography



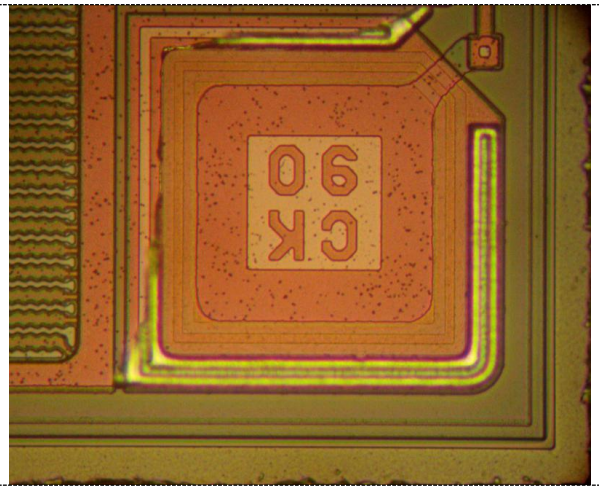
#15-L1&L2：0.35mm×0.35mm

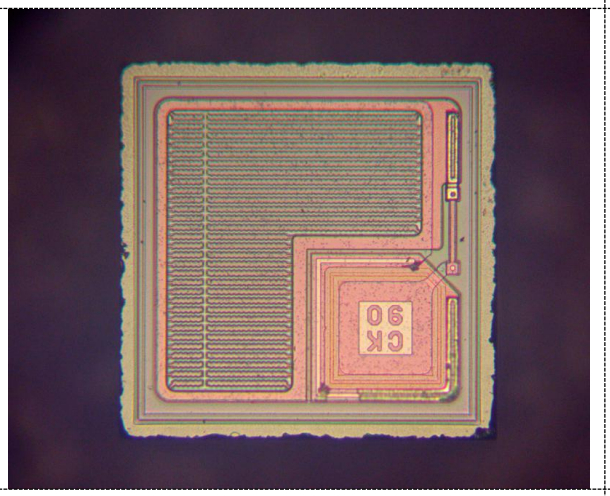
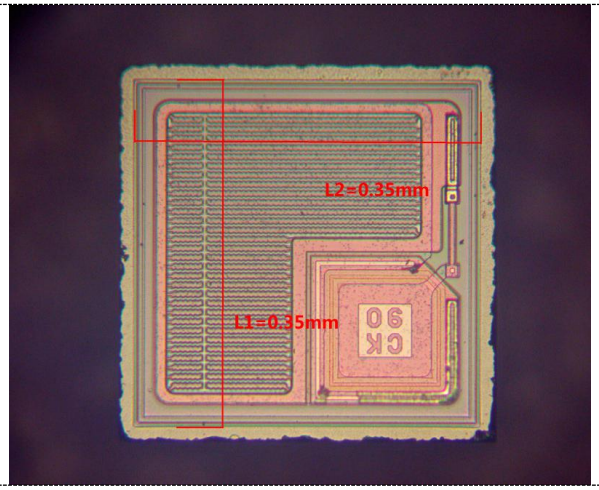
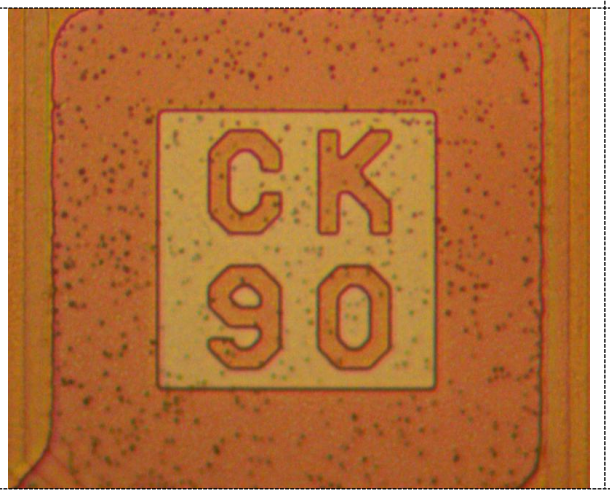
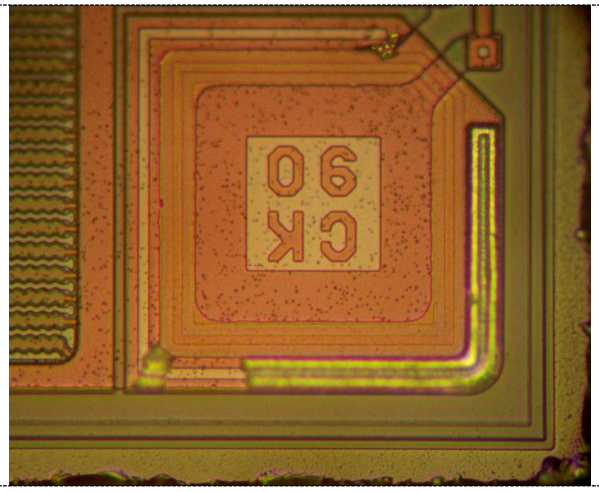


#15-Die Marking



#15-Die Corner



#17-Die Topography	#17-L1&L2：0.35mm×0.35mm
	
#17-Die Marking	#17-Die Corner
	

END