COMPONENT INSPECTION ANALYSIS

00003485

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www.smtcorp.com

Sales Order #	
Customer	L-3 Communications
Customer Part #	
Customer Lot #	FAILED ON CCA
SMT PO #	9995
Vendor Name	
Vendor/Lot #	
Date Received	11/5/10
Manufacturer	SAMSUNG ELECTRONICS INC
Cage Code	N/A
Part Number	KM4216C258G50
Description	Video RAM
Package	64-Pin SOP
Quantity Rec'd	2
Quantity Tested	2
Quantity Rejected	2
Sampling	100%
Lot Code	RMA100CB
Date Code	0813
Inspector	Neil Schultz and Jason Romano
Date	November 9, 2010
Report ID	00003485
Notes	

Analysis Performed

Task	QC Initials	Date	Result
Visual Inspection	NS/JR	11/5/10	FAIL
Resistance to Solvents (RTS) & Scrape Test	NS/JR	11/5/10	FAIL
MFG Spec Sheet Comparison	NS/JR	11/5/10	FAIL
XRF Elemental Analysis	NS/JR	11/7/10	PASS
Real-Time X-Ray Analysis	NS/JR	11/7/10	PASS
Scanning Electron Microscopy (SEM) Analysis			
Scanning Acoustic Microscopy (C-SAM) Analysis			
Solderability Test			
Dynasolve Test			
Decapsulation & Die Microscopy	NS/JR	11/9/10	PASS

Inspector's name (print)	Signature	Date
Neil Schultz		
Jason Romano		

	QC Initials	Date	Result
Suspect Counterfeit?	**NS/JR**	11/9/10	**YES**

SUMMARY

Multiple abnormalities were detected while testing these components. Some package measurements do not match the specifications found in the manufacturer datasheet. Foreign material was found on the top surface of one sample. The other sample's part markings are red. The top surface mold cavities of both samples and the bottom mold cavities of one sample were found to contain the same texture as the rest of the component surface, which is an indication of blacktopping. Variations in color and texture were found along the package edge which is further evidence of blacktopping. The bottom surface of one sample exhibits markings while the other sample does not. The condition of the leads is difficult to determine due to the excess solder remaining from having been pulled from a PCB for analysis. Testing these components for marking permanency with acetone lifted a large amount of black material, revealing fine scratches in the original surface and confirming these parts are blacktopped. Based on these abnormalities these components have failed inspection and are not considered to be factory original parts.

VISUAL INSPECTION

YES	NO	N/A	**Leads**
X			Corrosion or tarnish on pins
X			Pins have dissimilar gloss, shine, color, or texture
	X		Pin surface is inconsistent with date code
X			Dirty pins or leads
	X		Dents in leads indicate used parts
X			Excess solder on leads indicates used parts
		X	Leads are tinned
		X	Leads/Balls are refurbished
		X	Gold leads have been tinned

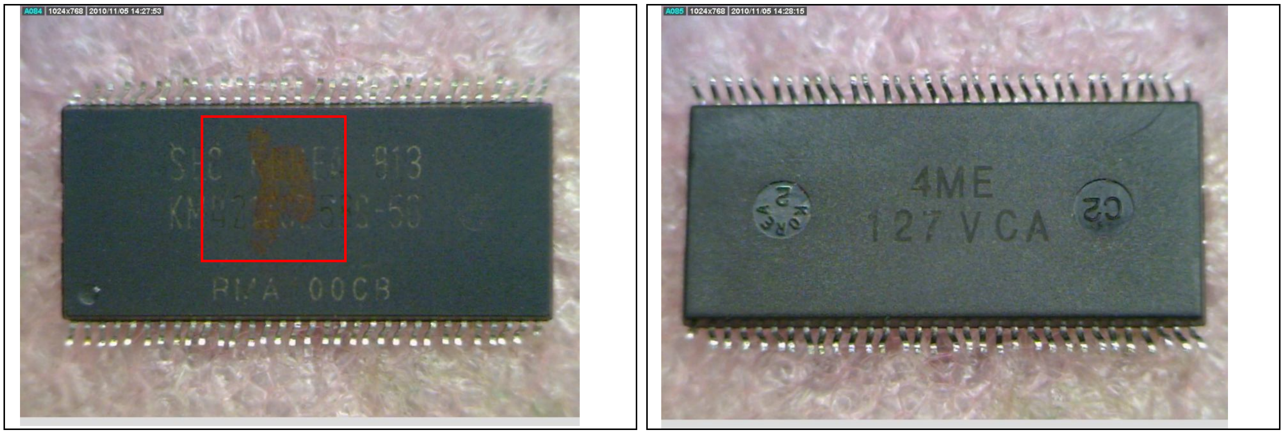
			Top Surface
X			Parts appear to be blacktopped and remarked
	X		Surface cracks
X			Directional scratches on top surface of part

			Markings
	X		Part numbers are blurry
X			Inconsistent part marking font, color, or placement
	X		Inconsistent date and lot codes in the package
	X		Inconsistent country of origin within date/lot code
X			Top and bottom markings are inconsistent
X			Colored dots or ink marks on component top

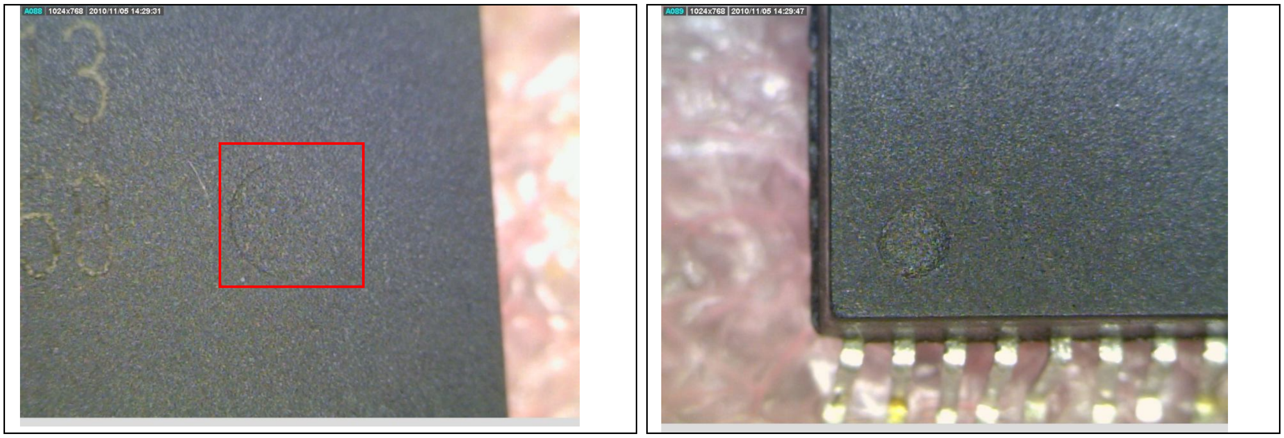
			Component Case
	X		Top and bottom color inconsistent
	X		Tool pull marks
	X		Heat sink witness marks
	X		Burn marks
		X	Parts in package not all facing the same way
	X		Glue or adhesive
	X		Circles on part bottoms are inconsistent
		X	Part does not match known good part

PART PHOTOGRAPHY

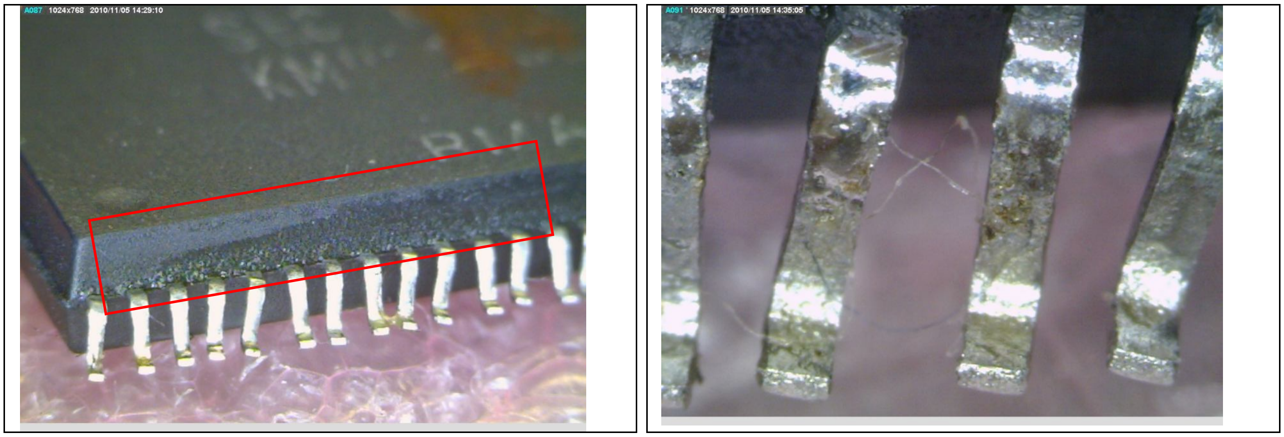
SAMPLE 1



Foreign material was found on the top surface of this sample.

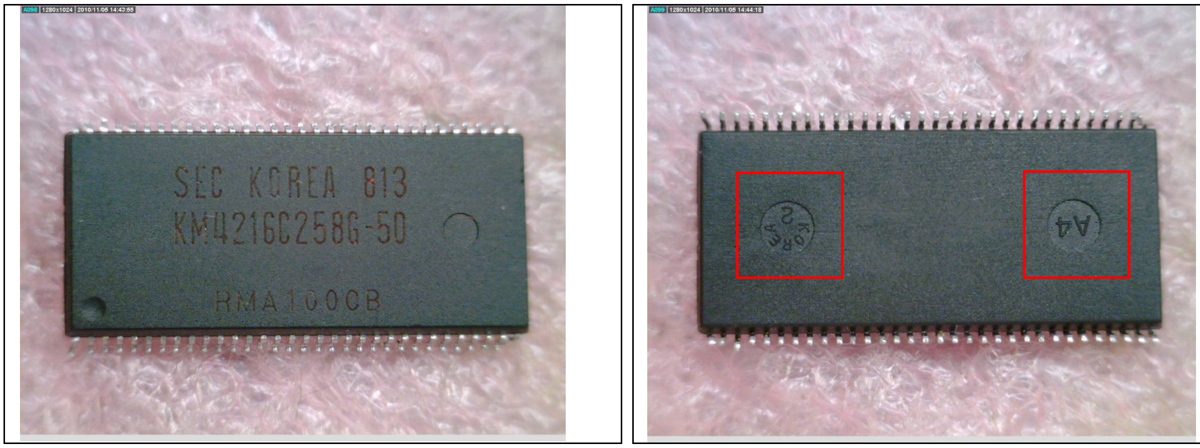


The top surface mold cavity is barely able to be seen and contains the same texture as the rest of the component surface.

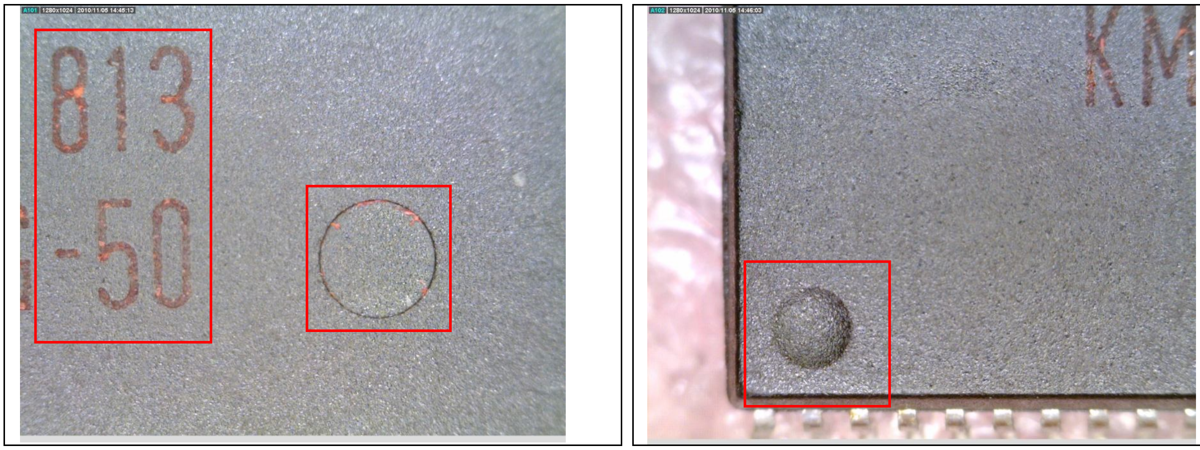


A variation in color and texture was found along the package edges. The condition of the leads is difficult to determine due to the fact that these parts were desoldered from PCBs for inspection.

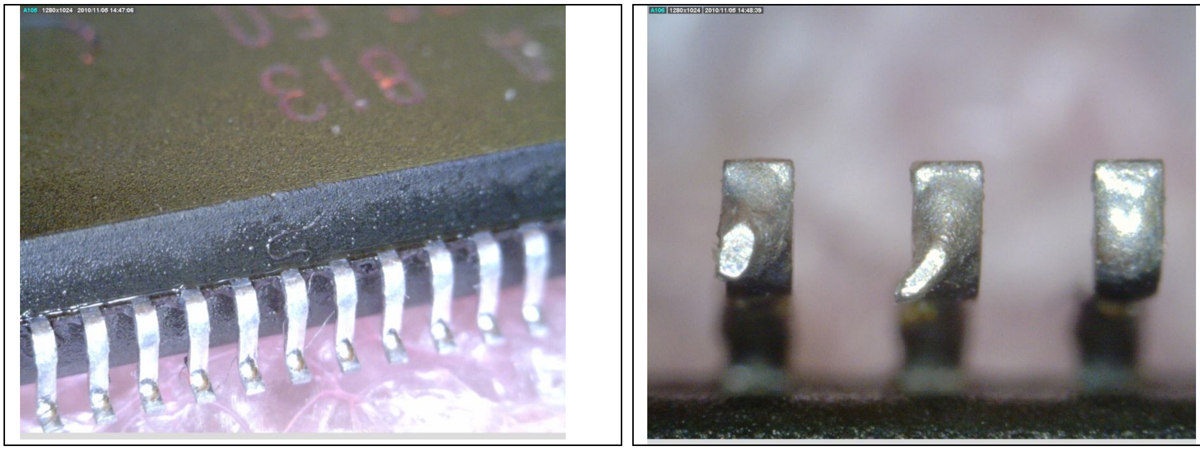
SAMPLE 2



The bottom surface mold cavities of this sample are not polished.



The part markings are red. The top surface mold dimple texture matches the rest of the component surface. The Pin-1 dimple is a different size than that of the first sample.

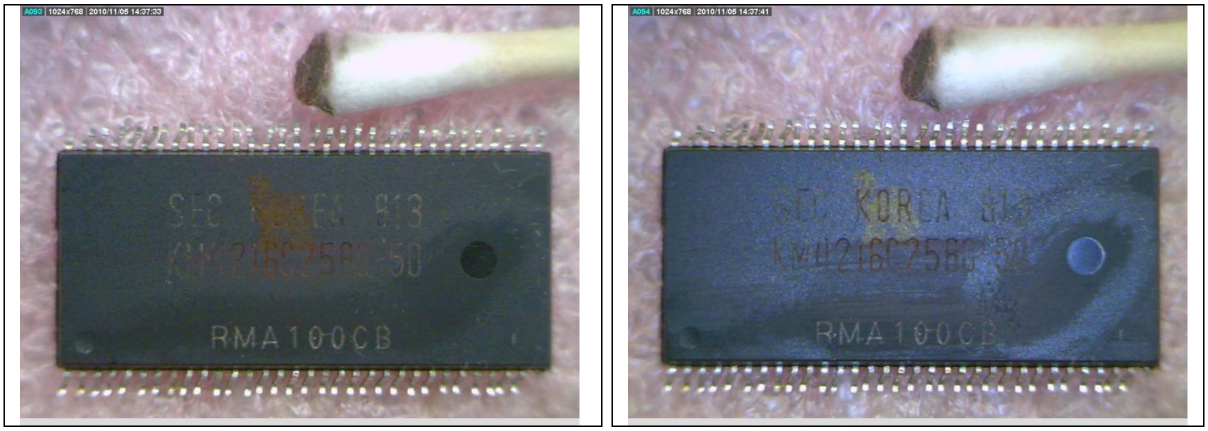


A variation in color and texture was found along the package edges. The condition of the leads is unable to be determined due to the excess solder that exists on them.

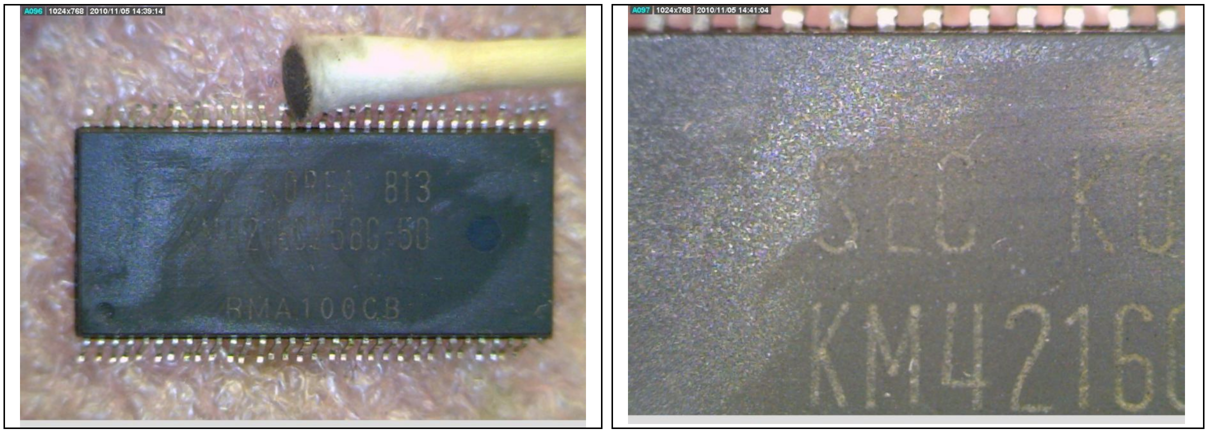
RESISTANCE TO SOLVENTS & SCRAPE TEST

PASS	FAIL	N/A	Wipe test with:
X			3:1 Mineral Spirits/Alcohol Solution
	X		Acetone
		X	Scrape Test

SAMPLE 1

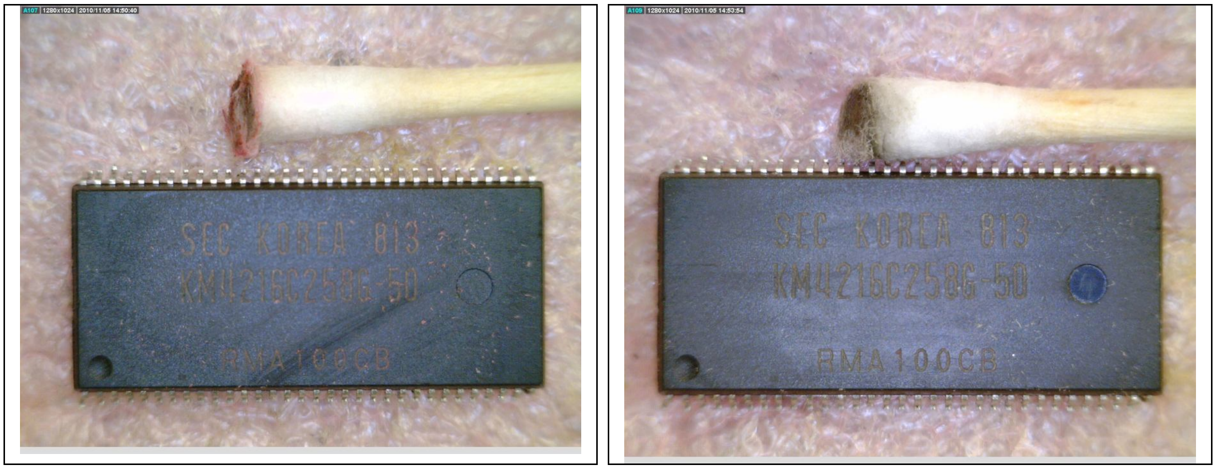


After vigorous wipe testing, the original polish of the top surface mold cavity can be seen.

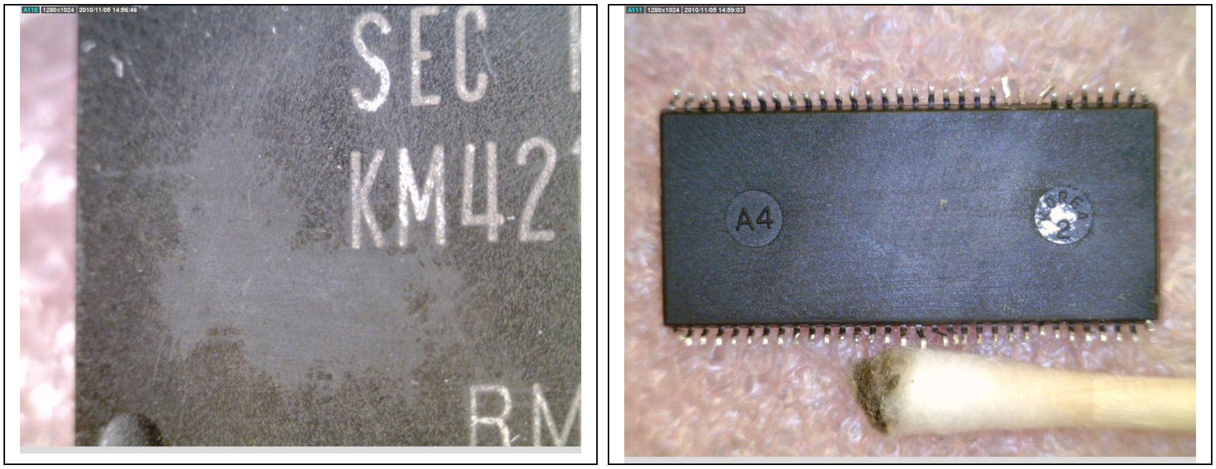


A clear distinction can be made between the original surface and the blacktop coating.

SAMPLE 2

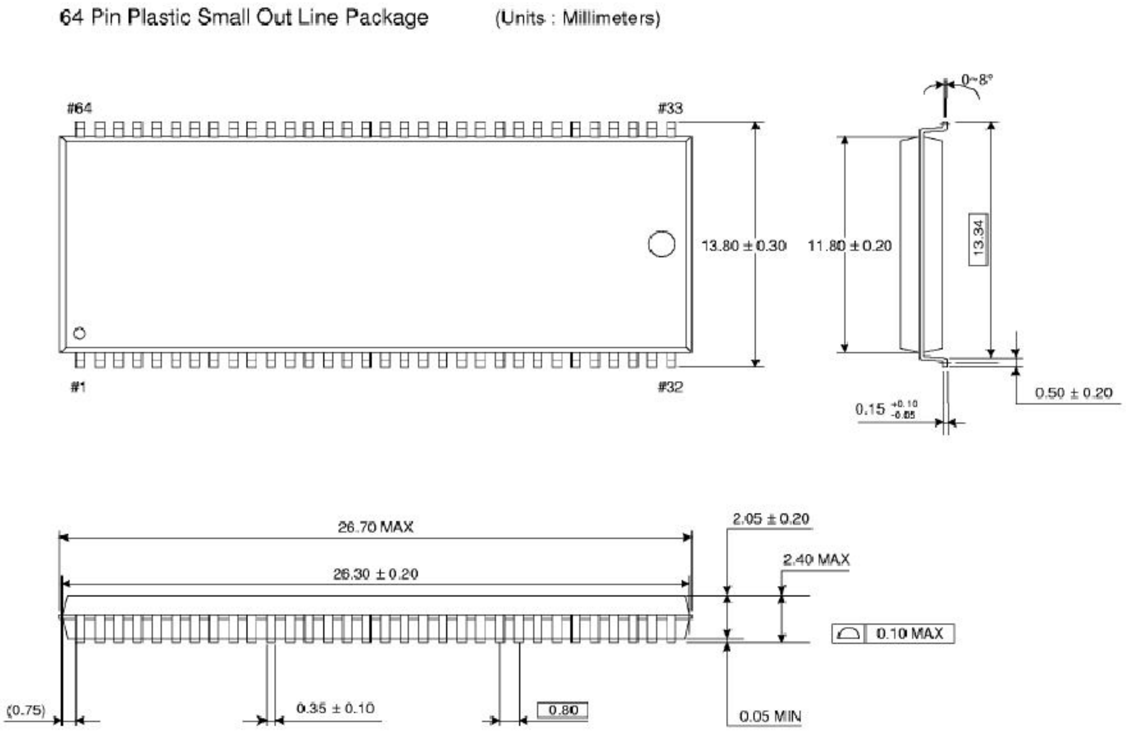


Testing for marking permanency lifted a large amount of red color from the part markings.



After vigorous wipe testing, the original surface can be seen beneath the blacktop coating. The bottom surface of this sample has also been blacktopped; the original polish of the country of origin dimple can be seen after much wipe testing.

MANUFACTURER'S SPEC SHEET COMPARISON



Measured Part dimensions (in mm, unless otherwise noted)

Designation	Spec	Value	In Spec?
Length	26.30 ± 0.20	26.11	Pass
Width	11.80 ± 0.20	11.41	Fail
Width Including Leads	13.80 ± 0.30	13.25	Fail
Package Thickness	2.05 ± 0.20	2.62	Fail
Thickness Including Seating Plane	2.40 Max	2.80	Fail
Lead Width	0.35 ± 0.10	0.29	Pass
Lead Thickness	0.15 +0.10, -0.05	0.15	Pass

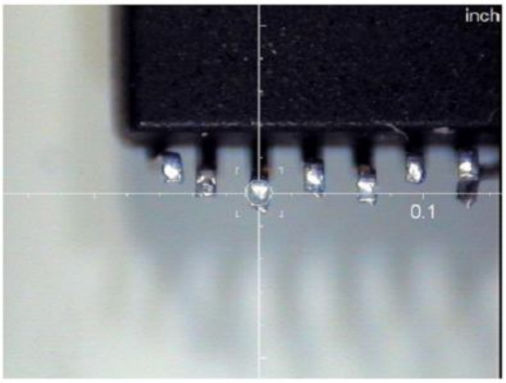
XRF ELEMENTAL ANALYSIS

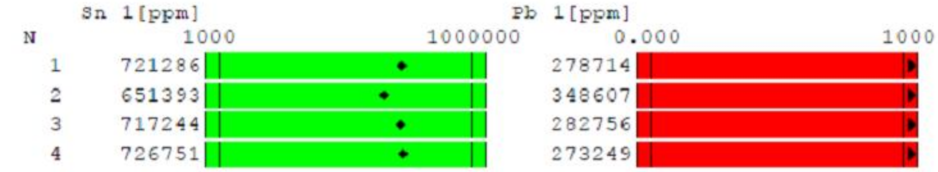
XRF test results

YES	NO	N/A	Parameter:
		X	RoHS compliant samples meet requirements

Fischerscope® **XRAY XDAL**
Calibration: Standard free
Date: 11/5/2010 **Time:** 4:31:08 PM
Operator: Neil Schultz
Application: 32 / SnPb/CuNiFe

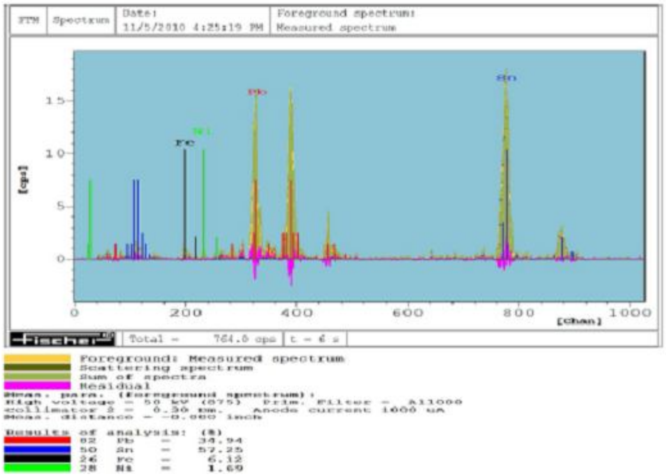
Part Number:	KM4216C258G50
Order/PO No:	9995
Date Code:	0813
Lot Code:	FAILED ON CCA
Sample:	1





N	Sn 1[ppm]	Pb 1[ppm]
1	721286	278714
2	651393	348607
3	717244	282756
4	726751	273249

Number of readings	4	4
Min. reading	651393 ppm	273249 ppm
Max. reading	726751 ppm	348607 ppm
Measuring time	60 sec	



🟨 Foreground: Measured spectrum
🟫 Scattering spectrum
🟩 Sum of spectra
🟪 Residual
Meas. para. (Foreground spectrum):
High voltage = 50 kV (875) Prim. Filter = Al1000
collimator 2 = 0.30 mm. Anode current 1000 uA
Meas. distance = -0.000 inch

Results of analysis: (%)
🟥 82 Pb = 34.94
🟦 50 Sn = 57.25
⬛ 26 Fe = 6.12
🟩 28 Ni = 1.69

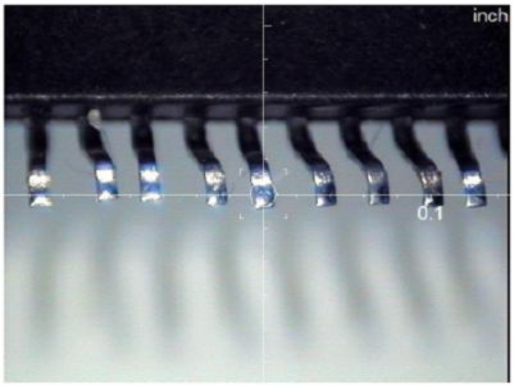
COMPONENT INSPECTION ANALYSIS

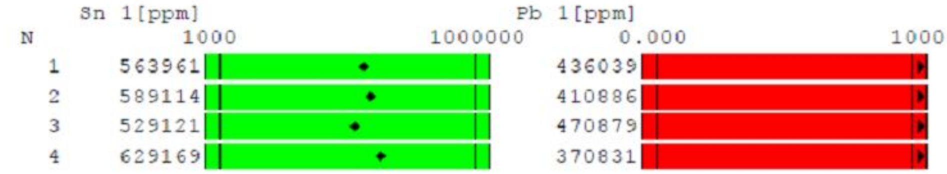
00003485

Manufacturer: SAMSUNG ELECTRONICS INC
Part Number: KM4216C258G50
Date Code: 0813 Lot Code: RMA100CB

Fischerscope® XRAY XDAL
Calibration: Standard free
Date: 11/7/2010 Time: 10:24:28 AM
Operator: Neil Schultz
Application: 32 / SnPb/CuNiFe

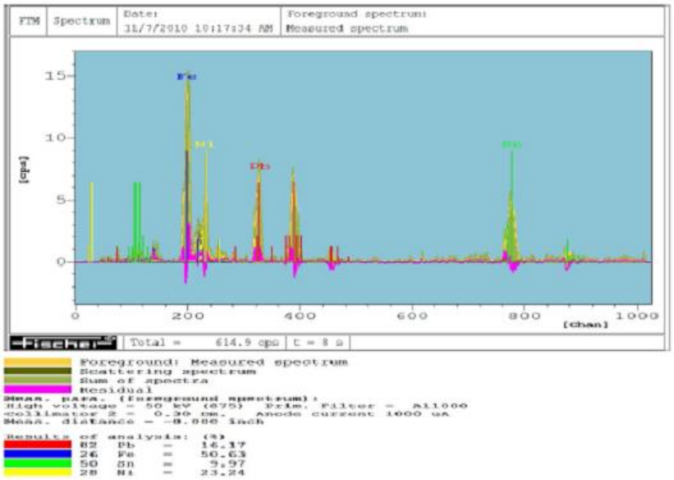
Part Number:	KM4216C258G50
Order/PO No:	9995
Date Code:	0813
Lot Code:	FAILED ON CCA
Sample:	1





N	Sn 1[ppm]	Pb 1[ppm]
1	563961	436039
2	589114	410886
3	529121	470879
4	629169	370831

Number of readings	4	4
Min. reading	529121 ppm	370831 ppm
Max. reading	629169 ppm	470879 ppm
Measuring time	60 sec	



🟨 Foreground: Measured spectrum
🟫 Scattering spectrum
🟩 Sum of spectra
🟪 Residual

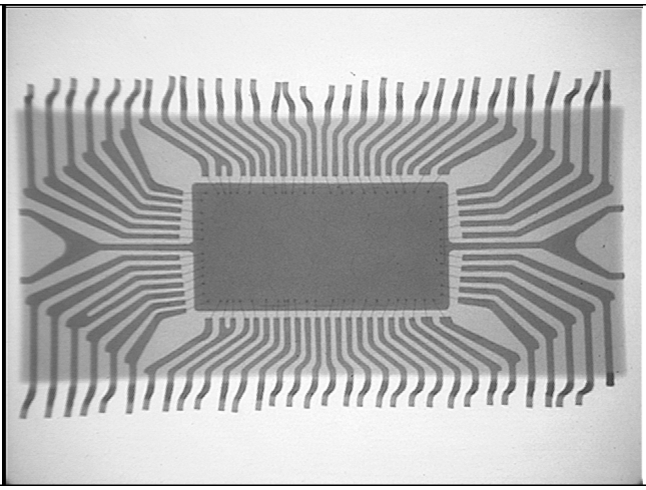
Meas. para. (Foreground spectrum):
High voltage = 50 kV (875) Prim. Filter = Al1000
collimator 2 = 0.30 mm. Anode current 1000 uA
Meas. distance = -0.000 inch

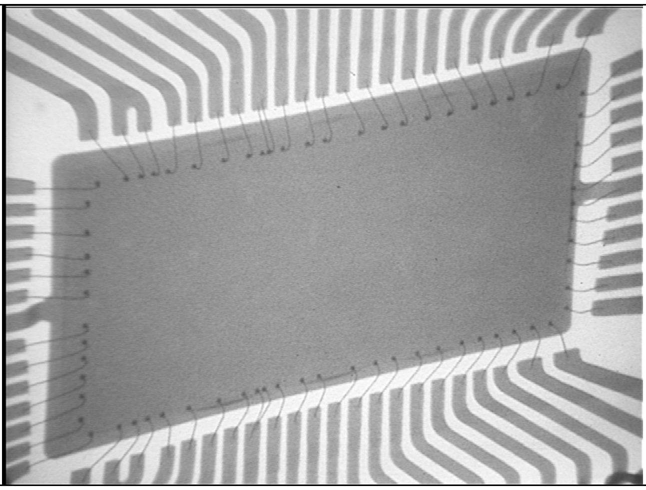
Results of analysis: (%)
🟥 82 Pb = 16.17
🟦 26 Fe = 50.63
🟩 50 Sn = 9.97
🟨 28 Ni = 23.24

REAL-TIME X-RAY ANALYSIS

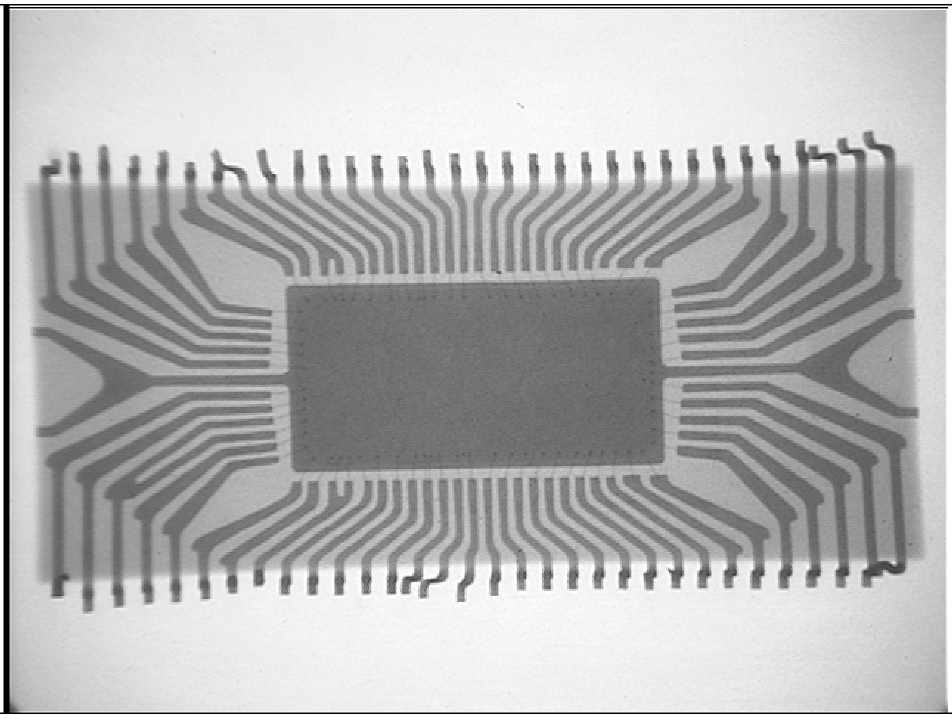
PASS	FAIL	N/A	**Check for:**
X			Extraneous matter (die attach, burrs, ball bonds)
X			Die attach incorrect (voids traverse die, misalignment)
X			Cracked, split, or chipped electrical elements
X			Broken bond wires or missing bonds
X			Excessive loop or sag in bond wires
X			Taut bond wires
X			Bond wires touch each other or case
			Consistency within:
X			Bond wire gauge
X			Die size and placement

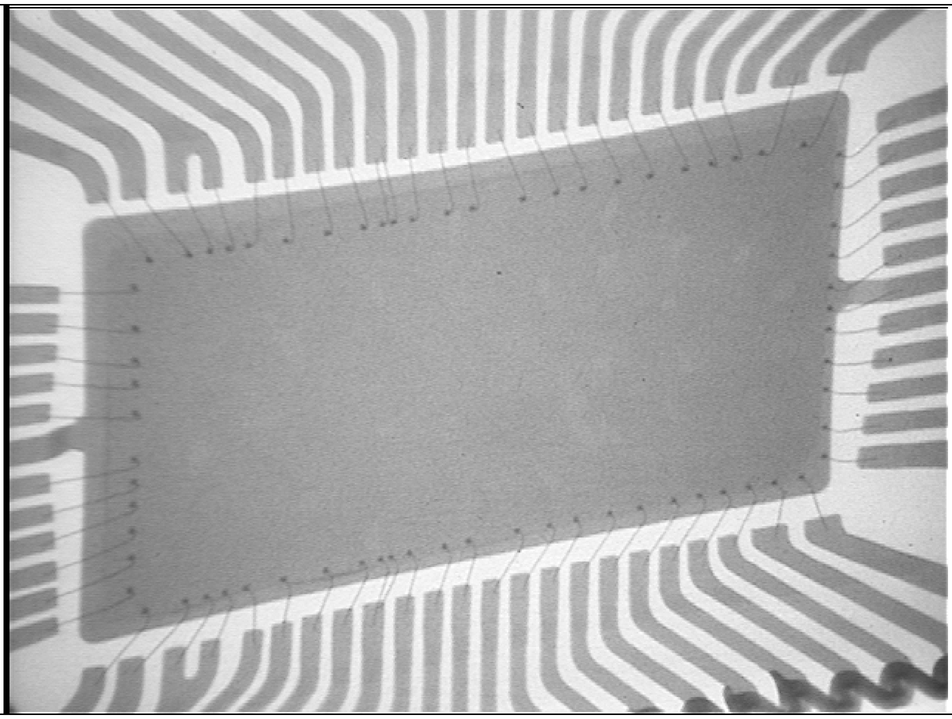
SAMPLE 1





SAMPLE 2

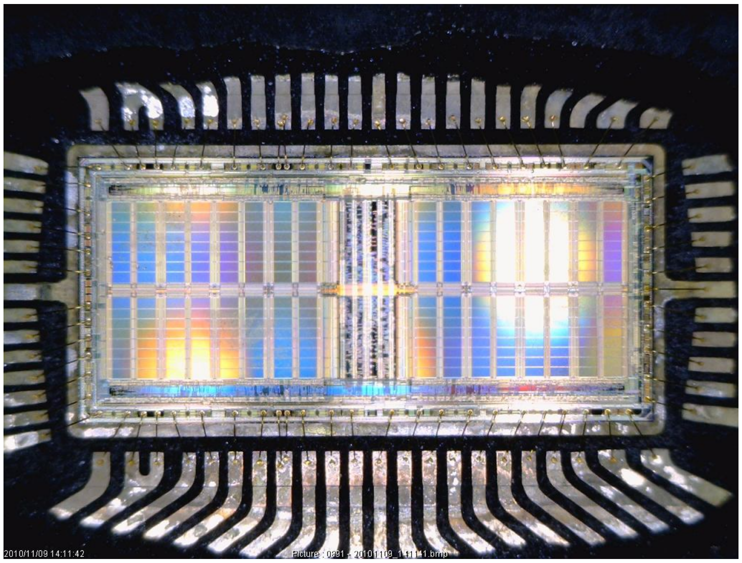




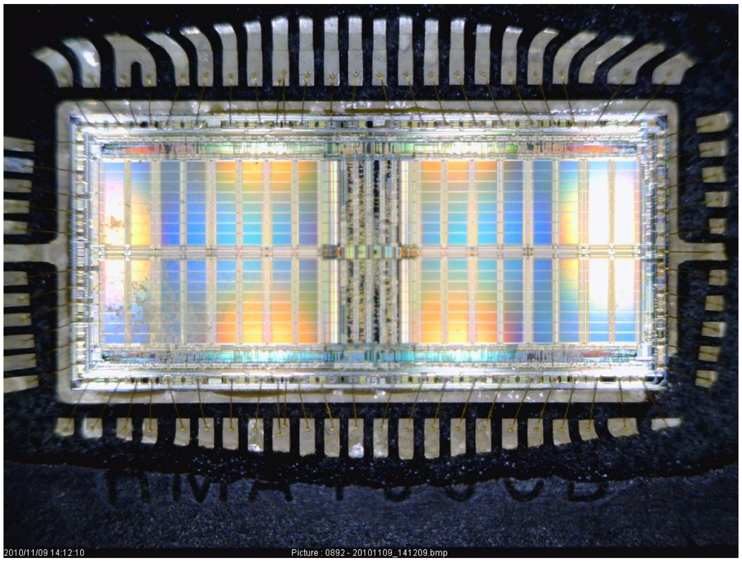
Die size, substrate type, lead frame design and bond out all match between both samples.

DECAPSULATION

N/A	Recipe for decapsulation:	Notes			
	Acid:	X	HNO_3	X	H_2SO_4
	Ratio of mixture	9:1			
	Temperature (ºC):	100			
	Time (seconds):	60			
	Mode:	X	Pulse		Vortex
	Flow (ml per minute):	3			
	Rinse (seconds):	3			



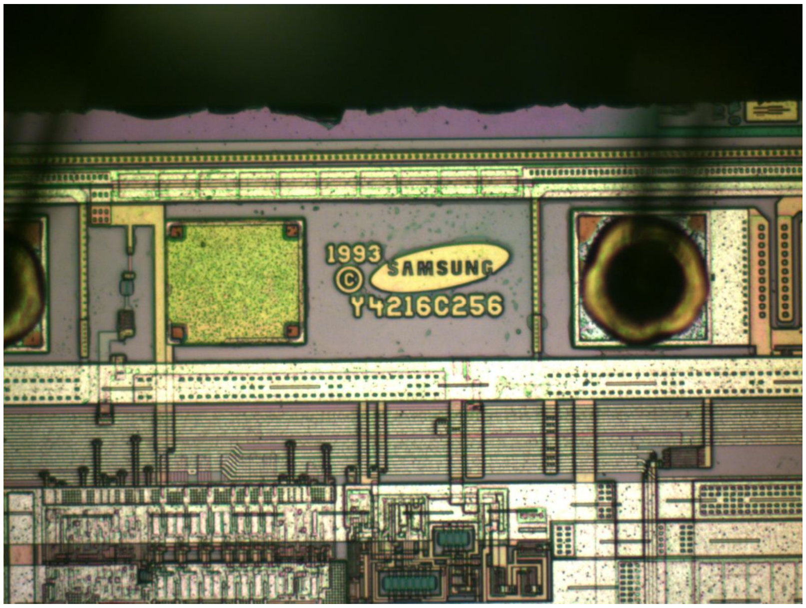
Sample 1



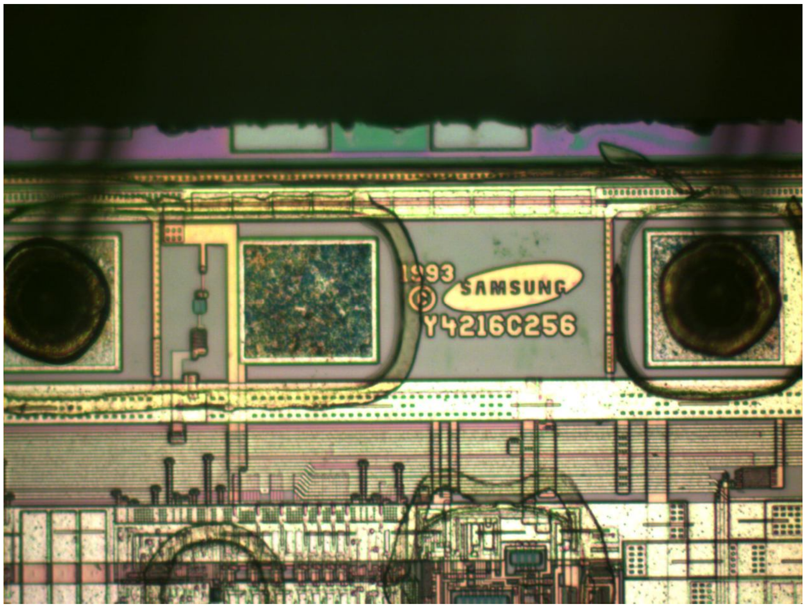
Sample 2

DIE MICROSCOPY

Look for:	Notes:
Are die consistent between samples?	Yes
Part Number:	Y4216C256
Date:	1993
Manufacturer Logo:	Samsung



Sample 1



Sample 2