



Analysis Report - 2000-20058

| | | | |
|-----------------------|----------------------|--------------------------|------|
| Customer Name: | AS6081 SAMPLE REPORT | Purchase Order: | 3843 |
| Part Number: | MT28F128J3RP-12MET | Lot/Date Code: | 0534 |
| Manufacturer: | MICRON TECHNOLOGY | Devices Received: | 153 |

Summary Of Inspection Results

Results Summary

Devices are tested per AS6081 Level A and Level C testing.

Conclusion:

With respect to the observation of anomalies or evidence of counterfeiting, no inconsistencies were found with the lot or test samples during the AS6081 level A and level C electrical testing.

| Test-Process Operation | Quantity Inspected | Pass | Fail | Date | N/A | Comments / Observations |
|--|---|------|------|------------|----------------------|---|
| Documentation and Packaging (SAE AS6081, 4.2.6.4.1) (Non-destructive) | | | | | | |
| Condition Observed | 153 | 153 | 0 | 2016-12-09 | | Devices were received in acceptable condition. Total 153 devices with date code 0534. |
| External Visual Inspection (SAE AS6081)(Non-destructive) | | | | | | |
| Condition Observed | 153 | 153 | 0 | 2016-12-13 | | 153 devices from date code 0534 were visually inspected under 40x microscopy. No anomalies were observed. Devices passed visual inspection. |
| Package Inspection (SAE AS6081)(Non-destructive) | | | | | | |
| Dimensions | 3 | 3 | 0 | 2016-12-13 | | Dimensions match datasheet specification 56 PIN TSOP-I |
| Re-Marking / Re-Surfacing Testing (SAE AS6081) | | | | | | |
| Solvent Test for Re-marking - Permanency(Non-destructive) | 3 | 3 | 0 | 2016-12-15 | | Mark permanency test was performed on 3 devices from date code 0534 using 3 parts Mineral Spirits, 1 part Isopropyl Alcohol mixture. Devices were cotton swab with no marking removed during this process. Devices passed marking permanency testing. |
| Solvent Test for Re-Surfacing - Acetone (Destructive) | 3 | 3 | 0 | 2016-12-15 | | Acetone test was performed on 3 device from date code 0534. No secondary coating was removed during this process. Devices passed acetone testing. |
| Solvent Test for Re-Surfacing - 1M 2P (Destructive) | 3 | 3 | 0 | 2016-12-15 | | 1-Methyl 2-Pyrrolidinone was performed on 3 devices from date code 0534. Devices were immerse the in the solution and heat it to 115 to 120 °C for 2 to 5 min. No secondary coating was removed during this process. Devices passed 1-Methyl 2-Pyrrolidinone testing. |
| Solvent Test for Re-Surfacing - Heat Solvent (Destructive) | 3 | 3 | 0 | 2016-12-15 | | HST (Heated Solvent Test) was performed on 3 devices from date code 0534 using Dynasolve 750 solution. No secondary coating was removed during this process. Devices passed HST testing. |
| Delid/Decapsulation Internal Analysis (AS6081 4.2.6.4.6)(Destructive) | | | | | | |
| Die Verification | 3 | 3 | 0 | 2016-12-15 | | Internal inspection was performed on 3 devices with date code 0534. Devices revealed Micron Technology Inc logo with 2002 copyright. Die marking MT28F128J3 Rev 053A was also found. Die marking correlates with device's external family marking and confirmed to be correct Micron devices. |
| X-Ray Inspection (SAE AS6081 4.2.6.4.4)(Non-destructive) | | | | | | |
| Internal Construction | 45 | 45 | 0 | 2016-12-15 | | 45 samples of date code 0534 were X-rayed. Die construction and size are all the same. No anomalies were found. |
| XRF Inspection (SAE AS6081 4.2.6.4.5)(Non-destructive) | | | | | | |
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|---|---|-----|---|------------|--|
| RoHS Compliant | 3 | 3 | 0 | 2016-12-15 | 3 Samples of 0534 date code were checked for RoHS Compliance. These 3 devices are RoHS compliant with measurements of 0% Pb levels. Pb levels < 0.1% are RoHS compliant per EU RoHS Directive (2011/65/EU) restriction. |
| Electrical Test (MIL-STD-883 and Manufacturer Specification)(Non-destructive) | | | | | |
| Memory Function Test TA = 25°C | 116 | 116 | 0 | 2016-12-14 | MT28F128J3RP-12MET:Flash NAND Flash Parallel 3.3V 128M-bit 16M x 8/8M x 16 120ns 56-Pin TSOP-I Tested 116 functionally at 25C via Memory Test: Read, Verify, and Blank Check. Passed: 116. Checksum: FF000000. Sample Programming was performed and Part's erased afterwards at 25C. |
| Equipment Used | PROGRAMMER 6000 Asset Tag: 58 Calibration Due Date: Not Required Cert: CALIBRATION NOT REQUIRE | | | | |
| Final (Outgoing Packaging) (IPC/JEDEC J-STD-033B.1) | | | | | |
| Outgoing Package | 150 | 150 | 0 | 2016-12-15 | Devices were packaged at 50pcs per package. Total of 3 packages. |

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Documentation and Packaging (SAE AS6081, 4.2.6.4.1) (Non-destructive)

Results Summary

Devices were received in acceptable condition. Total 153 devices with date code 0534.

| Criteria | Acceptable | Suspect | Not Acceptable | N/A | Comments / Observations |
|----------------------------|------------|---------|----------------|-----|-------------------------|
| Incoming Conditions | | | | | |
| ESD Protection | X | | | | |
| Poor Syntax or Alterations | X | | | | |
| Correct MSL Packaging | X | | | | |
| Quantity Match Document | X | | | | |
| Box Damaged | X | | | | |
| Type of Package | X | | | | Cut tape |

Images For Documentation and Packaging .

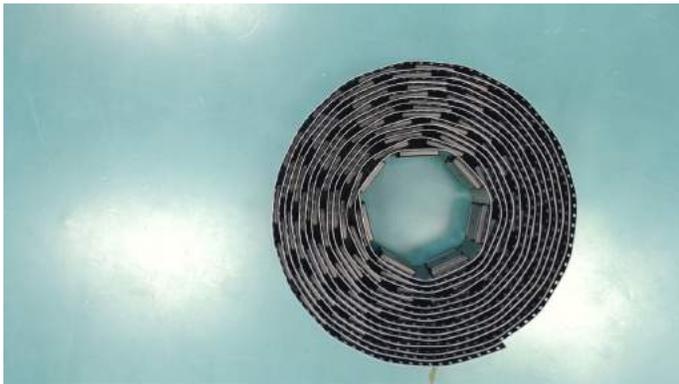


Figure 1. INCOMING



Figure 2. INCOMING

| | | |
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| Manufacturer: | MICRON TECHNOLOGY | Devices Received: | 153 |

External Visual Inspection (SAE AS6081 or MIL-STD-883, Method 2009.9)(Non-destructive)

Results Summary

153 devices from date code 0534 were visually inspected under 40x microscopy. No anomalies were observed. Devices passed visual inspection.

| Criteria | Acceptable | Suspect | Not Acceptable | N/A | Comments / Observations |
|--|------------|---------|----------------|-----|--|
| Suspect/Counterfeit Report(s) For Notification Purpose Only | | | | | |
| Status | | | | | Obsolete |
| Search of GIDEP database found suspect/counterfeit report(s) | | | | | High risk parts were found |
| Search of ERAI database found suspect/counterfeit report(s) | | | | | No high risk parts were found |
| Search of GETS database found suspect/counterfeit report(s) | | | | | No high risk parts were found |
| External Conditions | | | | | |
| Markings - Top | X | | | | 0534 MT 28F128J3 RP-12 MET A LY00 |
| Pin 1 Cavity - Top | X | | | | |
| Body Residue | X | | | | None was observed |
| Construction Quality | X | | | | Acceptable |
| Lead / BGA Conditions | | | | | |
| Lead Alignment | X | | | | Acceptable |
| Lead Formation / Scratches | X | | | | Acceptable |
| Lead Missing Pins | X | | | | None was observed |
| Lead Plating Composition | X | | | | Acceptable |
| Lead Excessive or Uneven Plating | X | | | | Acceptable |
| Lead Discoloration, Dirt or Residue | X | | | | None was observed |
| Lead Oxidation | X | | | | None was observed |

Images For External Visual Inspection.

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| Manufacturer: | MICRON TECHNOLOGY | Devices Received: | 153 |



Figure 3. TOP

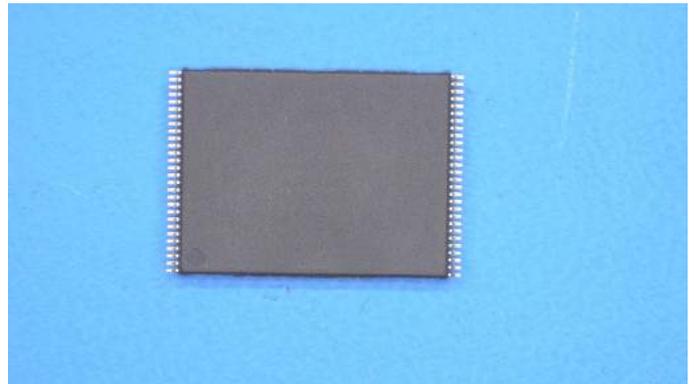


Figure 4. BOTTOM

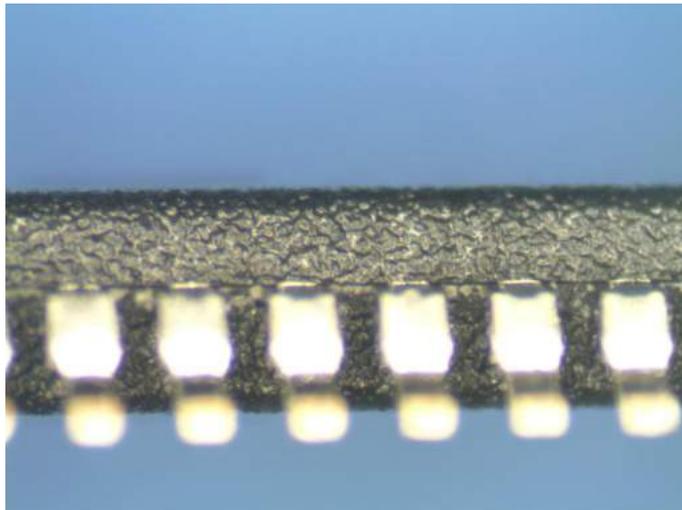


Figure 5. SIDE

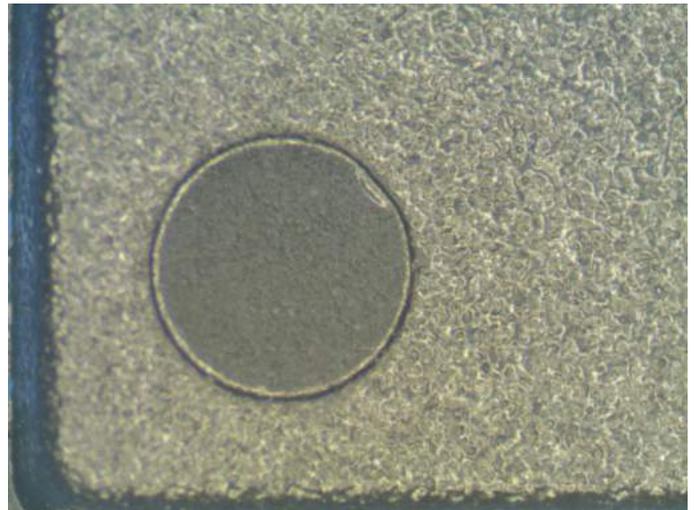


Figure 6. TOP PIN

| | |
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Purchase Order: 3843

Part Number: MT28F128J3RP-12MET

Lot/Date Code: 0534

Manufacturer: MICRON TECHNOLOGY

Devices Received: 153



Figure 7. BOTTOM PIN

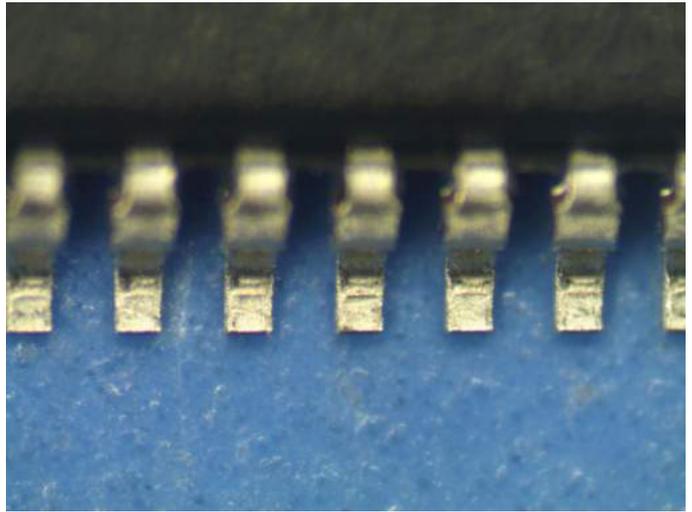


Figure 8. LEADS VIEW 1

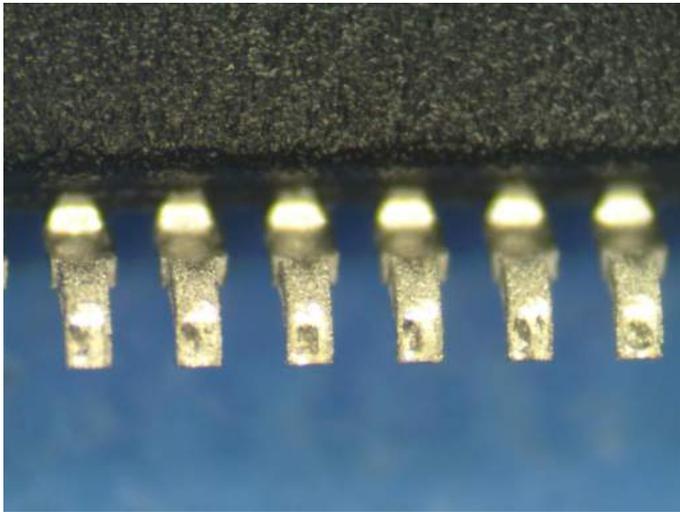


Figure 9. LEADS VIEW 2

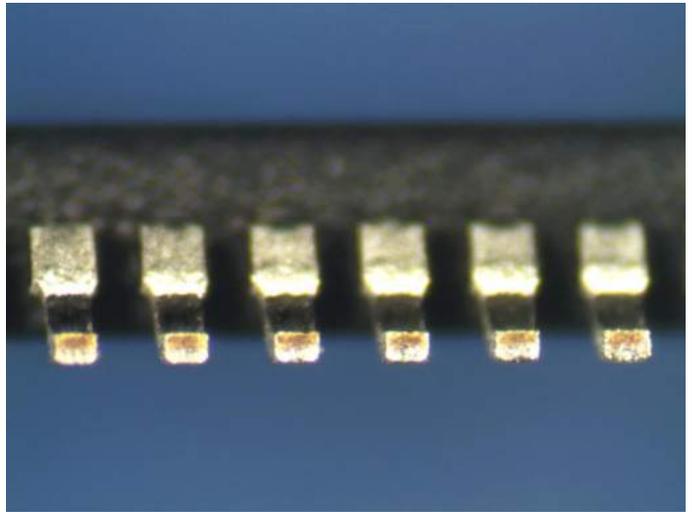


Figure 10. LEAD ENDS

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Device Package

Results Summary

SAMPLE 1 L=20.00mm, W=13.94mm, Thickness=1.10mm
 SAMPLE 2 L=19.99mm, W=13.92mm, Thickness=1.07mm
 SAMPLE 3 L=20.01mm, W=13.96mm, Thickness=1.10mm

| Criteria | Acceptable | Suspect | Not Acceptable | N/A | Comments / Observations |
|--------------------|------------|---------|----------------|-----|-------------------------|
| Package Dimensions | | | | | |
| Dimensions | X | | | | |

Images For Device Package.



Figure 11. LENGTH



Figure 12. WIDTH



Figure 13. THICKNESS

Images For Device Package. (Continued From Previous Page)

Figure 22: 56-Pin TSOP Type 1

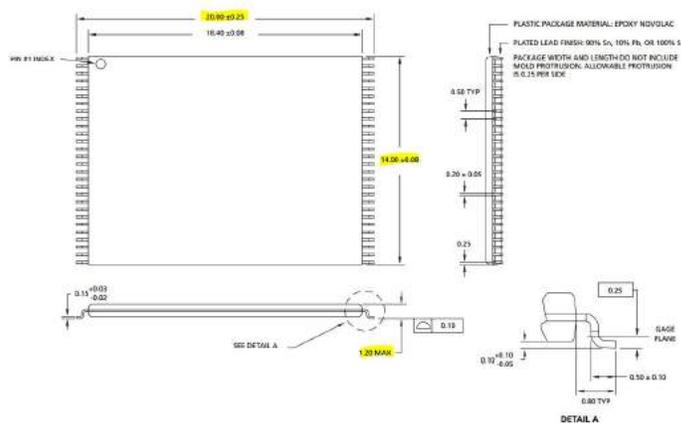


Figure 14. PHYSICAL DIMENSIONS

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| | Manufacturer: | MICRON TECHNOLOGY | Devices Received: | 153 |

Remarking and Resurfacing (SAE AS6081)

| Criteria | Acceptable | Suspect | Not Acceptable | N/A | Comments / Observations |
|---|------------|---------|----------------|-----|--|
| Re-Surfacing / Re-Marking Testing (SAE AS6081) | | | | | |
| Solvent Test for Re-marking - Permanency (Non-destructive) | X | | | | Mark permanency test was performed on 3 devices from date code 0534 using 3 parts Mineral Spirits, 1 part Isopropyl Alcohol mixture. Devices were cotton swab with no marking removed during this process. Devices passed marking permanency testing. |
| Solvent Test for Re-Surfacing - Acetone (Destructive)(CAS Registry 67-64-1) | X | | | | Acetone test was performed on 3 device from date code 0534. No secondary coating was removed during this process. Devices passed acetone testing. |
| Solvent Test for Re-Surfacing - 1M 2P (Destructive)(CAS Registry 872-50-4) | X | | | | 1-Methyl 2-Pyrrolidinone was performed on 3 devices from date code 0534. Devices were immerse the in the solution and heat to 115 to 120 °C for 2 to 5 min. No secondary coating was removed during this process. Devices passed 1-Methyl 2-Pyrrolidinone testing. |
| Solvent Test for Re-Surfacing - Heat Solvent (Destructive) Dynasolve 750 | X | | | | HST (Heated Solvent Test) was performed on 3 devices from date code 0534 using Dynasolve 750 solution. No secondary coating was removed during this process. Devices passed HST testing. |

Images For Remarking and Resurfacing.



Figure 15. SAMPLE 1 PERMANENCY



Figure 16. SAMPLE 2 PERMANENCY



Figure 17. SAMPLE 3 PERMANENCY



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Figure 18. SAMPLE 1 ACETONE

Figure 19. SAMPLE 2 ACETONE

Figure 20. SAMPLE 3 ACETONE



Figure 21. SAMPLE 1 1M2P



Figure 22. SAMPLE 2 1M2P



Figure 23. SAMPLE 3 1M2P



Figure 24. SAMPLE 1 HST



Figure 25. SAMPLE 2 HST



Figure 26. SAMPLE 3 HST

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Delid/Decapsulation Internal Analysis (AS6081 4.2.6.4.6) or (MIL-STD-883, Method 2014) (Destructive)

Results Summary

Internal inspection was performed on 3 devices with date code 0534. Devices revealed Micron Technology Inc logo with 2002 copyright. Die marking MT28F128J3 Rev 053A was also found. Die marking correlates with device's external family marking and confirmed to be correct Micron devices.

| Criteria | Acceptable | Suspect | Not Acceptable | N/A | Comments / Observations |
|----------------------------|------------|---------|----------------|-----|-------------------------|
| Internal Visual Inspection | | | | | |
| Die Topography | X | | | | |
| Die Markings | X | | | | |

Images For Delid/Decapsulation Internal Analysis.

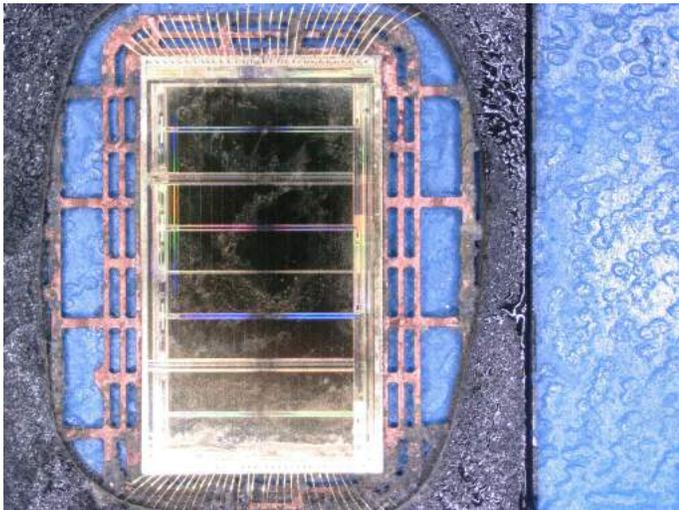


Figure 27. DIE-1-20058

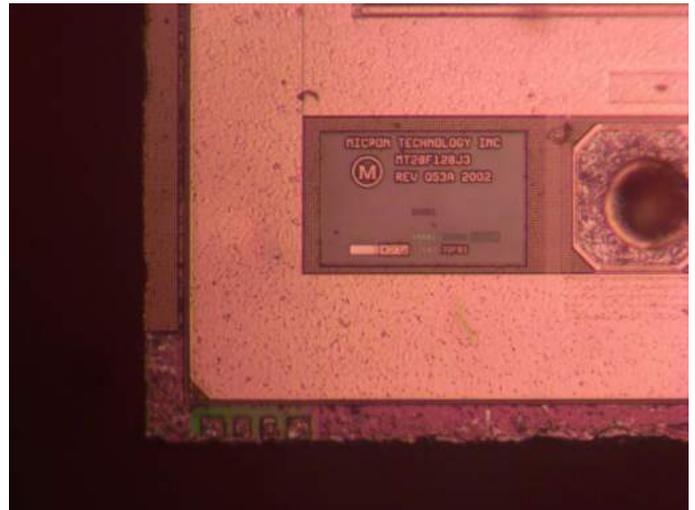


Figure 28. DIE MARKING - 1

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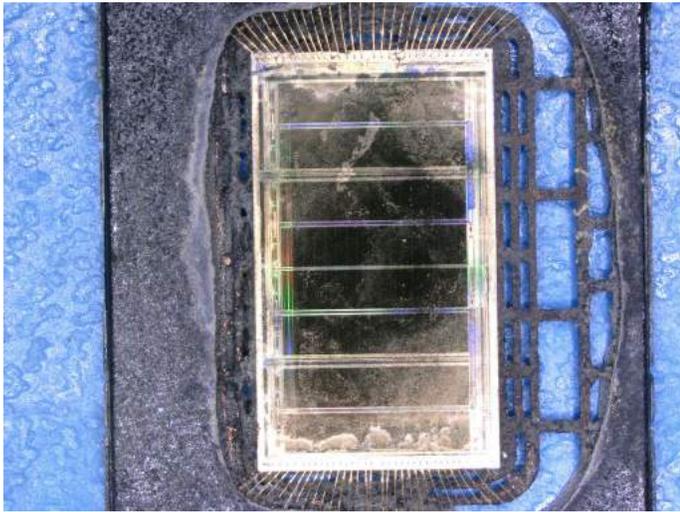


Figure 29. DIE-2-20058



Figure 30. DIE MARKING - 2

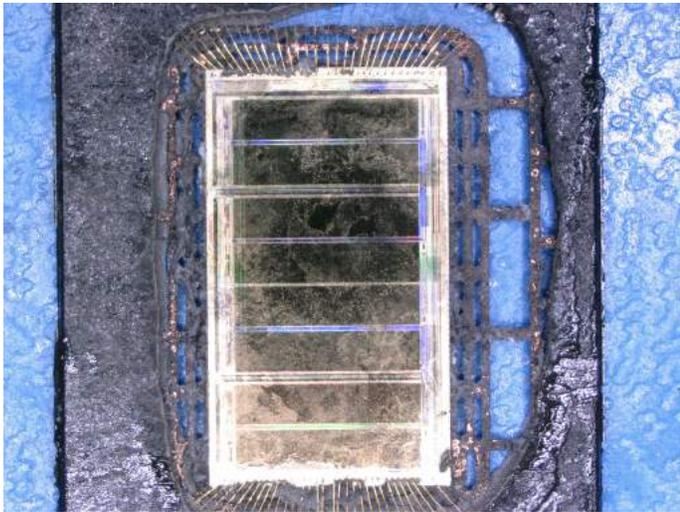


Figure 31. DIE-3-20058



Figure 32. DIE MARKING - 3

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X-Ray Analysis (SAE AS6081 4.2.6.4.4)(Non-destructive)

Results Summary

45 samples of date code 0534 were X-rayed. Die construction and size are all the same. No anomalies were found.

| Criteria | Acceptable | Suspect | Not Acceptable | N/A | Comments / Observations |
|--------------------------|------------|---------|----------------|-----|-------------------------|
| X-Ray Analysis | | | | | |
| Die Construction | X | | | | |
| Wire Bond Layout/Quality | X | | | | |
| Lead Frame Construction | X | | | | |

Images For X-Ray Analysis.

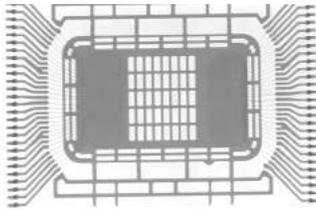


Figure 33. SO-20058_000001_XRAY

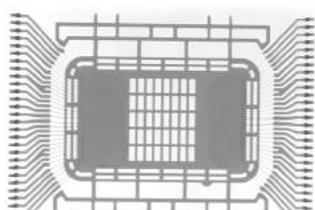


Figure 34. SO-20058_000002_XRAY

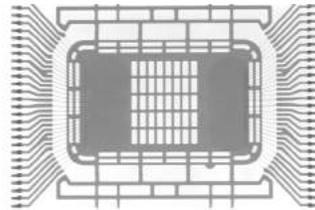


Figure 35. SO-20058_000003_XRAY

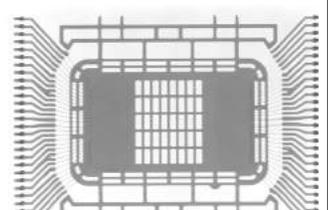


Figure 36. SO-20058_000004_XRAY

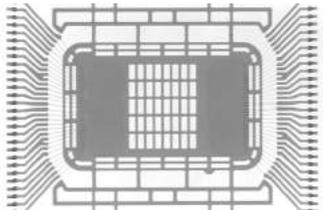


Figure 37. SO-20058_000005_XRAY

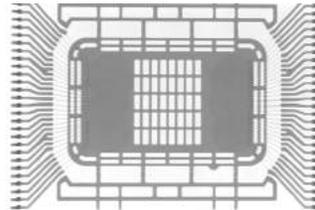


Figure 38. SO-20058_000006_XRAY

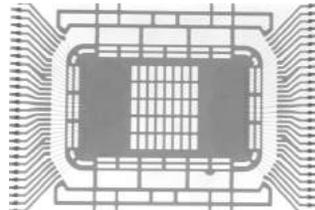


Figure 39. SO-20058_000007_XRAY

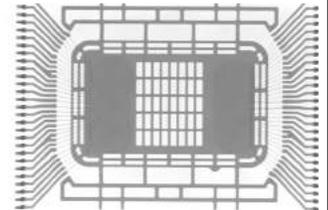


Figure 40. SO-20058_000008_XRAY

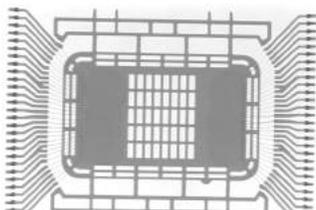


Figure 41. SO-20058_000009_XRAY

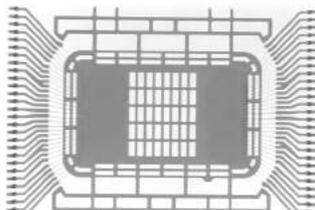


Figure 42. SO-20058_000010_XRAY

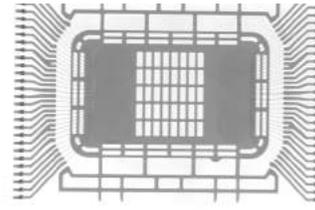


Figure 43. SO-20058_000011_XRAY

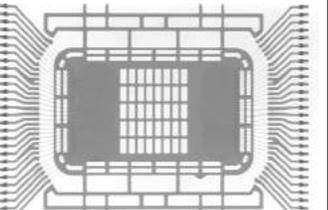


Figure 44. SO-20058_000012_XRAY

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| Part Number: | MT28F128J3RP-12MET | Lot/Date Code: | 0534 |
| Manufacturer: | MICRON TECHNOLOGY | Devices Received: | 153 |

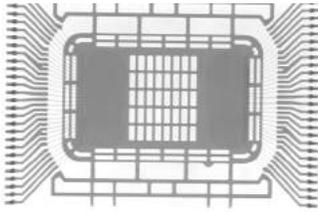


Figure 45. SO-20058_000013_XRAY

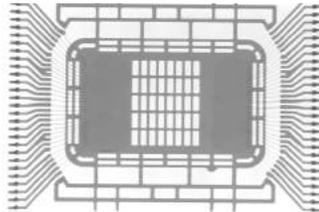


Figure 46. SO-20058_000014_XRAY

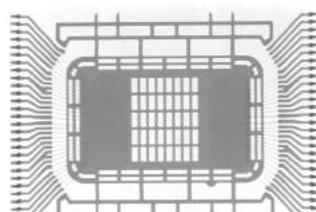


Figure 47. SO-20058_000015_XRAY

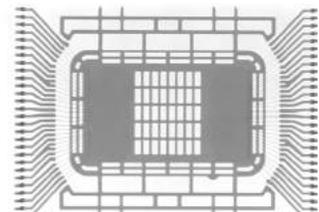


Figure 48. SO-20058_000016_XRAY

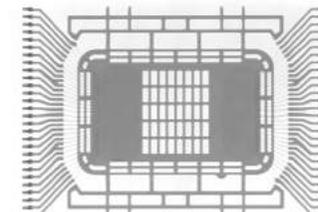


Figure 49. SO-20058_000017_XRAY

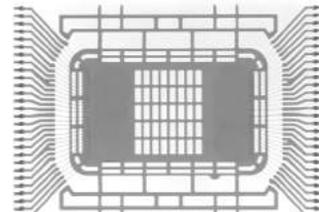


Figure 50. SO-20058_000018_XRAY

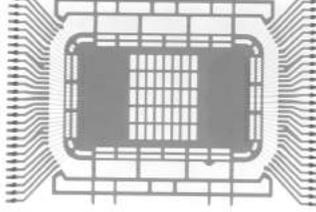


Figure 51. SO-20058_000019_XRAY

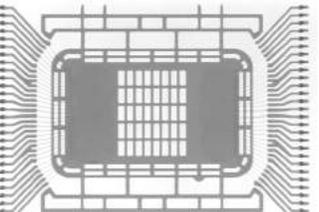


Figure 52. SO-20058_000020_XRAY

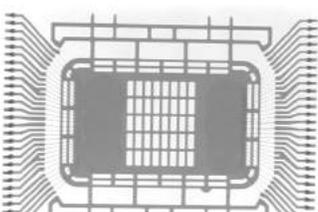


Figure 53. SO-20058_000021_XRAY

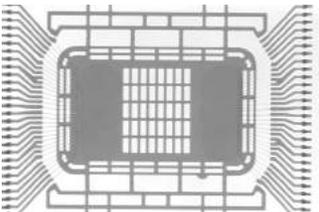


Figure 54. SO-20058_000022_XRAY

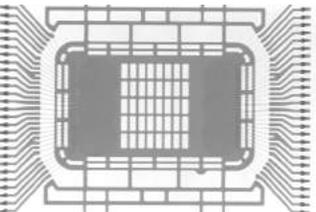


Figure 55. SO-20058_000023_XRAY

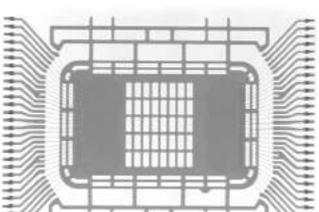


Figure 56. SO-20058_000024_XRAY

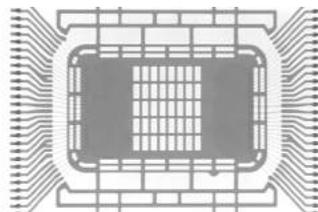


Figure 57. SO-20058_000025_XRAY

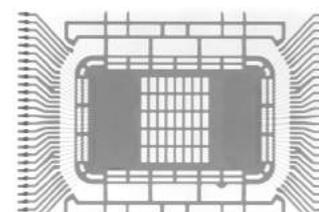


Figure 58. SO-20058_000026_XRAY

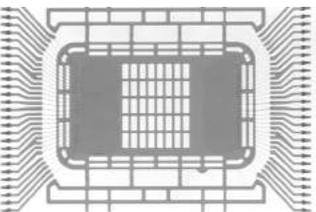


Figure 59. SO-20058_000027_XRAY

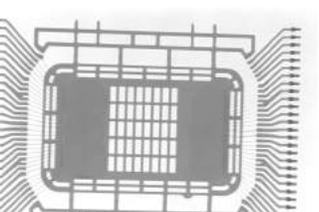


Figure 60. SO-20058_000028_XRAY

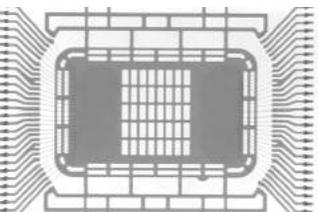


Figure 61. SO-20058_000029_XRAY

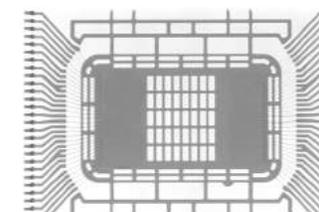


Figure 62. SO-20058_000030_XRAY

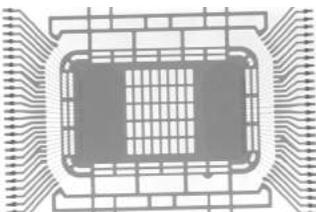


Figure 63. SO-20058_000031_XRAY

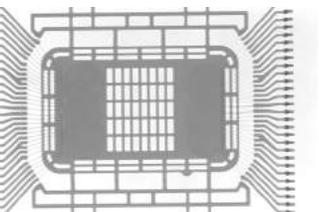


Figure 64. SO-20058_000032_XRAY

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| Approved by: | Tang, Dan C. |

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| Part Number: | MT28F128J3RP-12MET | Lot/Date Code: | 0534 |
| Manufacturer: | MICRON TECHNOLOGY | Devices Received: | 153 |

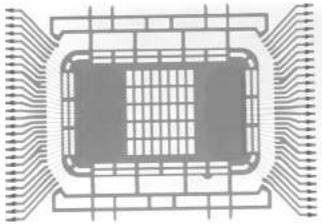


Figure 65. SO-20058_000033_XRAY

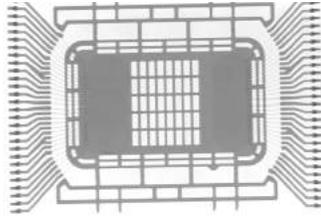


Figure 66. SO-20058_000034_XRAY

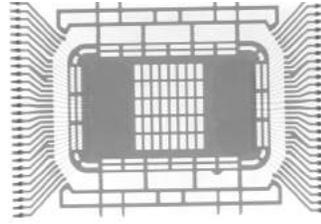


Figure 67. SO-20058_000035_XRAY

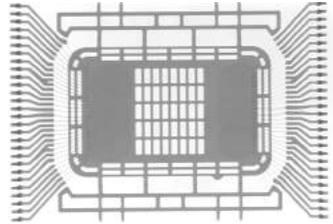


Figure 68. SO-20058_000036_XRAY

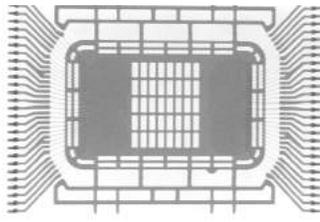


Figure 69. SO-20058_000037_XRAY

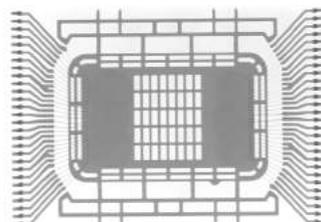


Figure 70. SO-20058_000038_XRAY

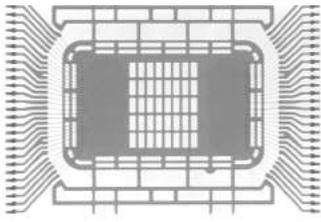


Figure 71. SO-20058_000039_XRAY

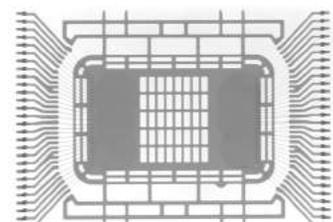


Figure 72. SO-20058_000040_XRAY

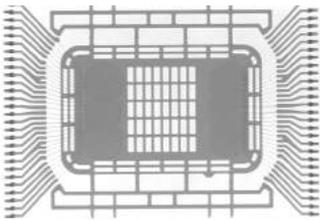


Figure 73. SO-20058_000041_XRAY

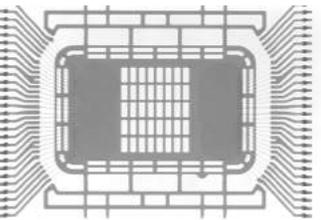


Figure 74. SO-20058_000042_XRAY

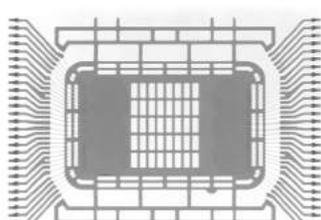


Figure 75. SO-20058_000043_XRAY

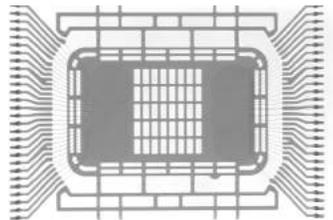


Figure 76. SO-20058_000044_XRAY

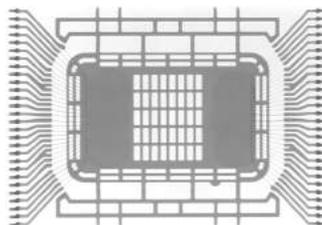


Figure 77. SO-20058_000045_XRAY

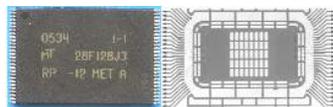


Figure 78. XRAY ORIENTATION

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| Manufacturer: | MICRON TECHNOLOGY | Devices Received: | 153 |

XRF Analysis (SAE AS6081 4.2.6.4.5)(Non-destructive)

Results Summary

3 Samples of 0534 date code were checked for RoHS Compliance. These 3 devices are RoHS compliant with measurements of 0% Pb levels. Pb levels < 0.1% are RoHS compliant per EU RoHS Directive (2011/65/EU) restriction.

| Criteria | Acceptable | Suspect | Not Acceptable | N/A | Comments / Observations |
|-----------------|------------|---------|----------------|-----|-------------------------|
| XRF Analysis | | | | | |
| RoHS Compliance | X | | | | |

Images For XRF Analysis.

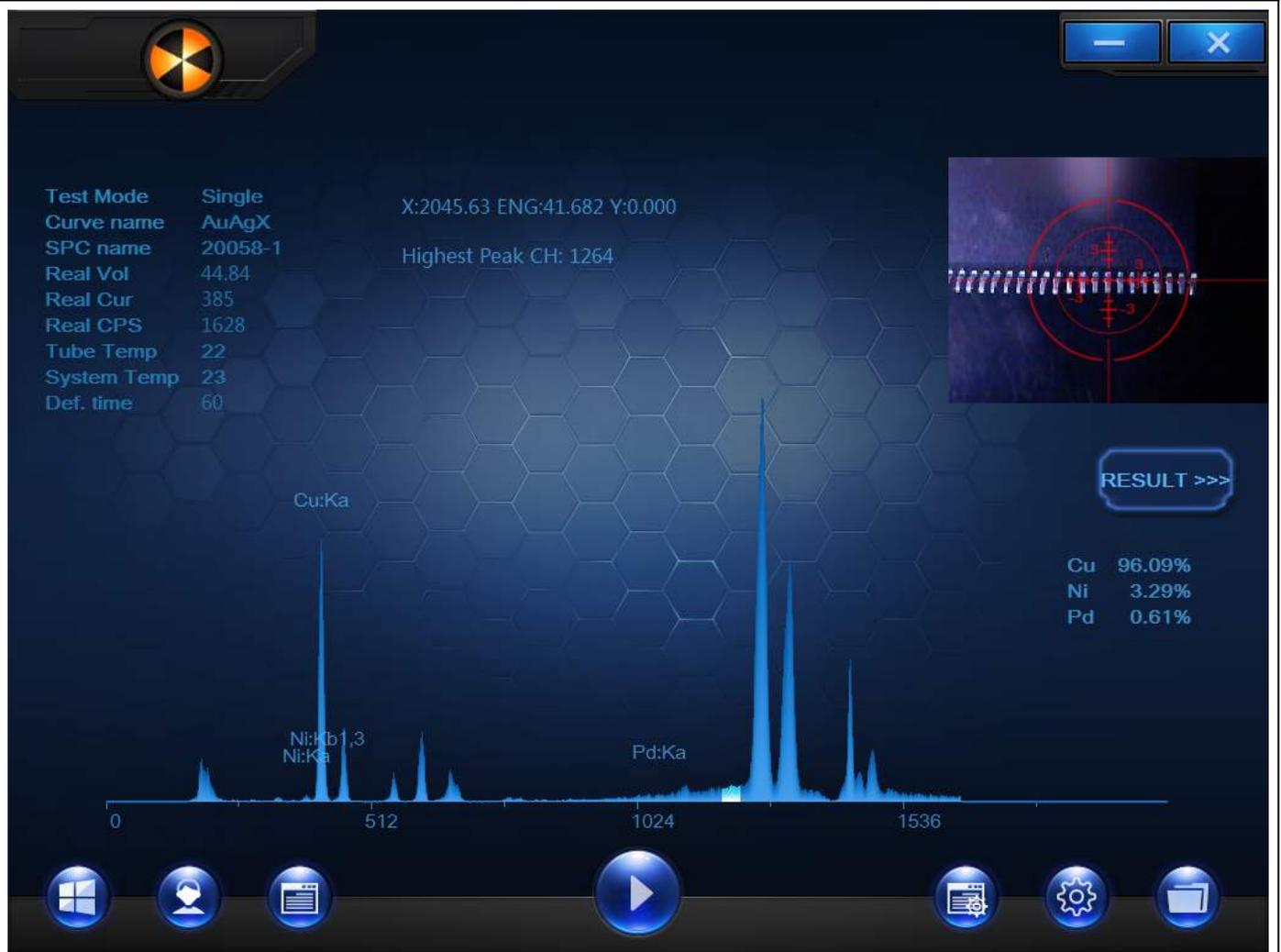


Figure 79. SAMPLE 1 XRF

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| Manufacturer: | MICRON TECHNOLOGY | Devices Received: | 153 |

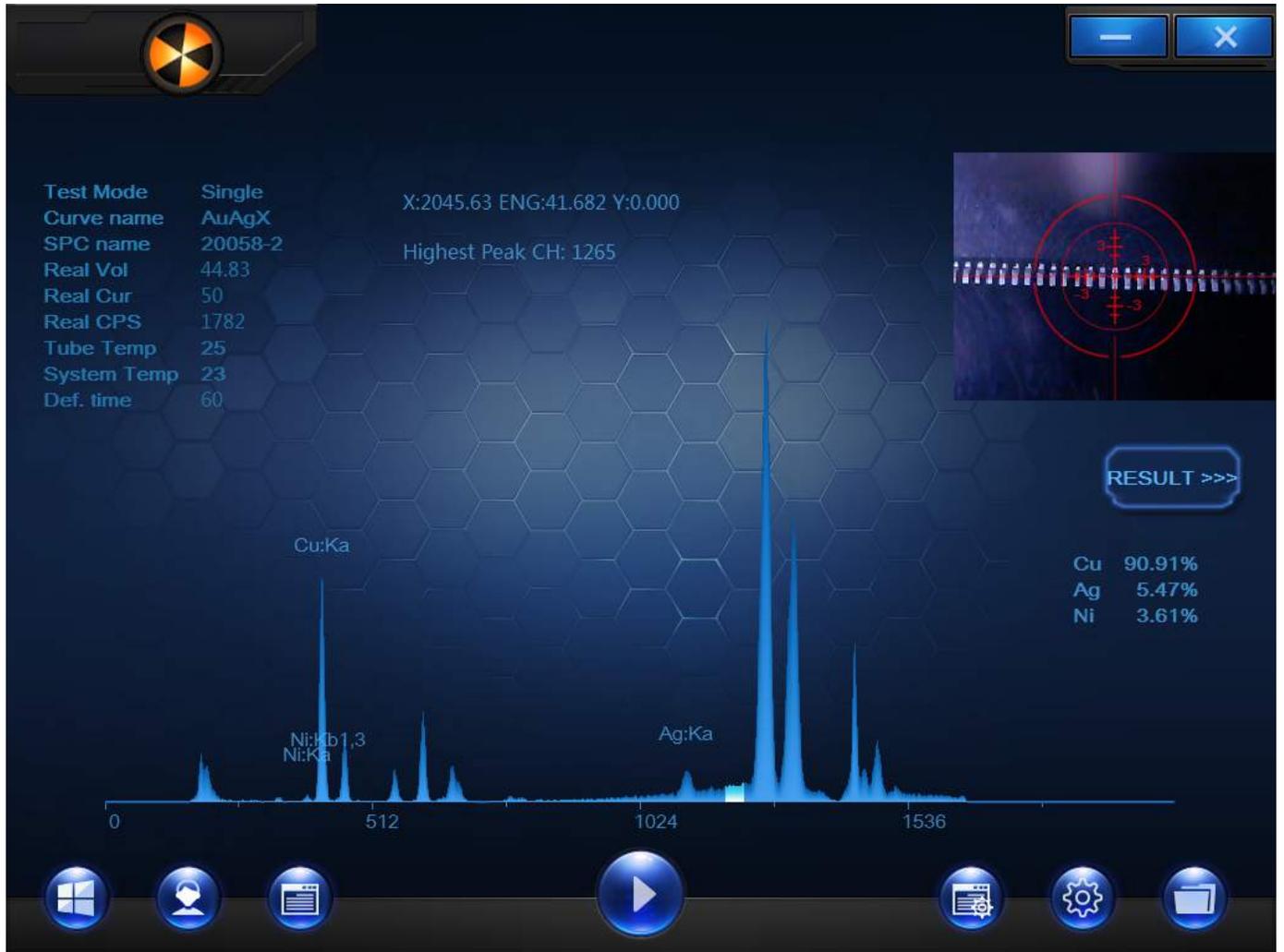


Figure 80. SAMPLE 2 XRF

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| Part Number: | MT28F128J3RP-12MET | Lot/Date Code: | 0534 |
| Manufacturer: | MICRON TECHNOLOGY | Devices Received: | 153 |

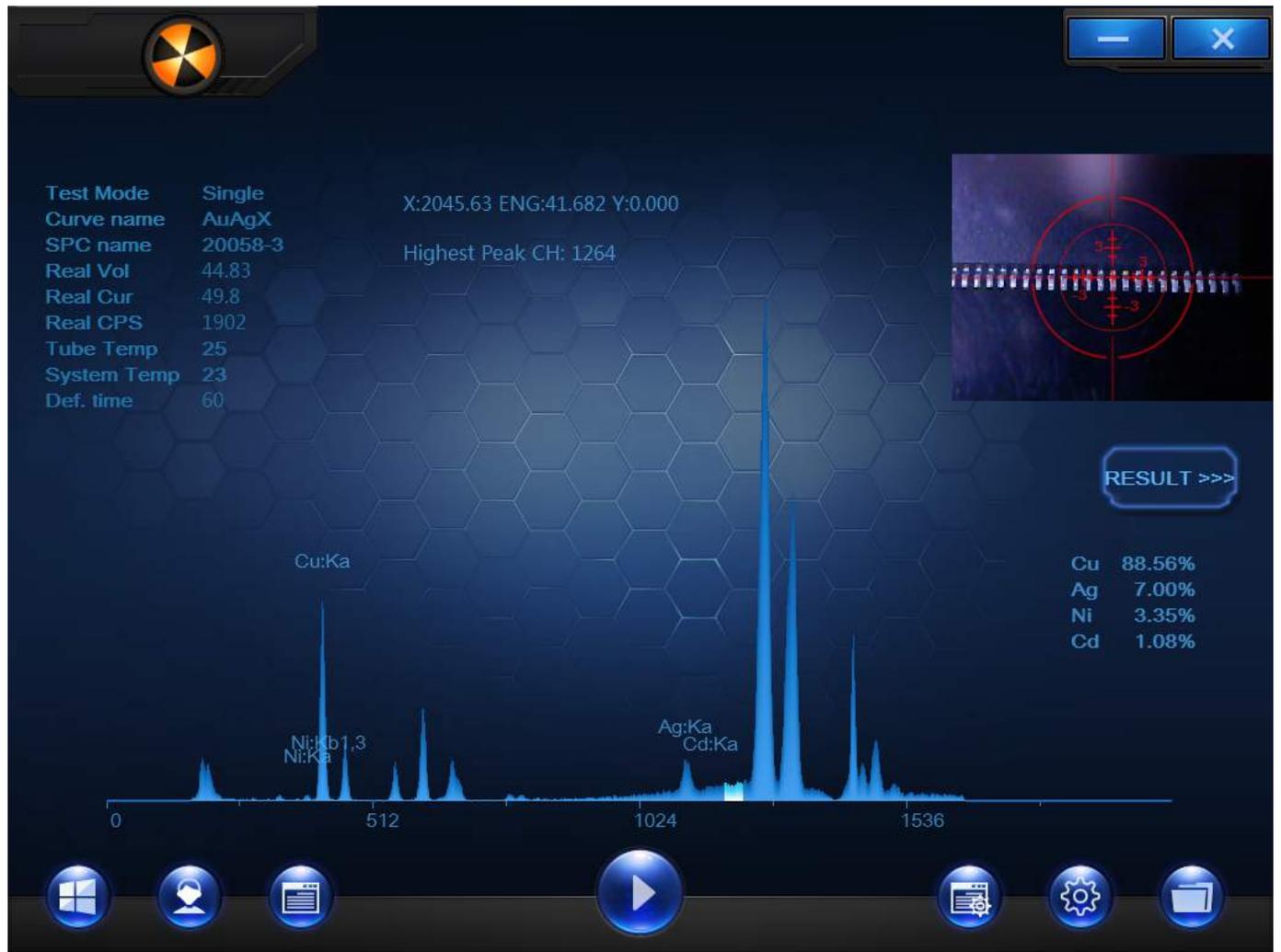


Figure 81. SAMPLE 3 XRF

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| Manufacturer: | MICRON TECHNOLOGY | Devices Received: | 153 |

Electrical Test (MIL-STD-883 and Manufacturer Specification)

Results Summary

MT28F128J3RP-12MET: Flash NAND Flash Parallel 3.3V
 128M-bit 16M x 8/8M x 16 120ns 56-Pin TSOP-I
 Tested 116 functionally at 25C via Memory Test:
 Read, Verify, and Blank Check. Passed: 116.
 Checksum: FF000000.
 Sample Programming was performed and Part's erased
 afterwards at 25C.

| Test-Process Operation | Quantity Inspected | Pass | Fail | Date | N/A | Comments / Observations |
|--|---|------|------|------------|-----|-------------------------|
| Electrical Test (MIL-STD-883 and Manufacturer Specification) | | | | | | |
| Memory Function Test TA = 25°C | 116 | 116 | 0 | 2016-12-14 | | |
| Equipment Used | PROGRAMMER 6000 Asset Tag: 58 Calibration Due Date: Not Required Cert: CALIBRATION NOT REQUIRE | | | | | |

Images For Electrical Test.

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| Manufacturer: | MICRON TECHNOLOGY | Devices Received: | 153 |

56-Pin TSOP Type I

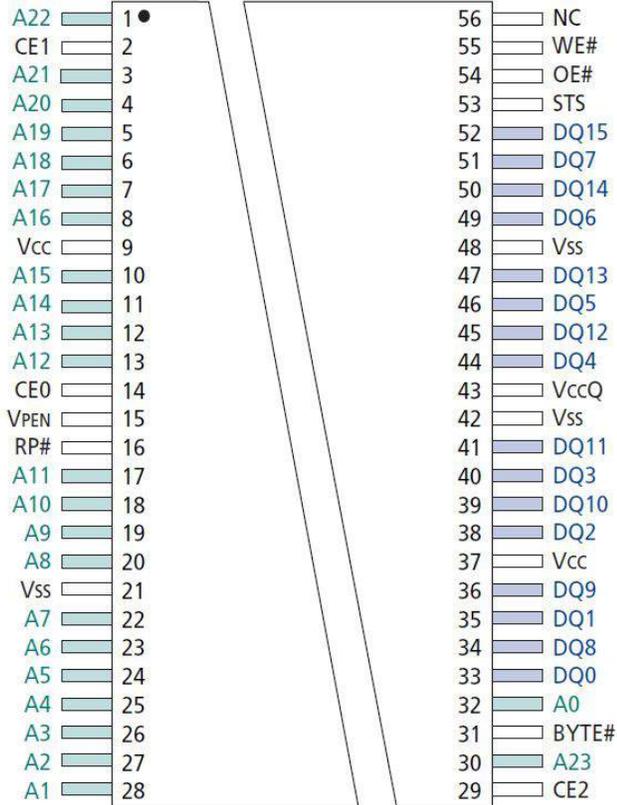


Figure 82. PIN DIAGRAM

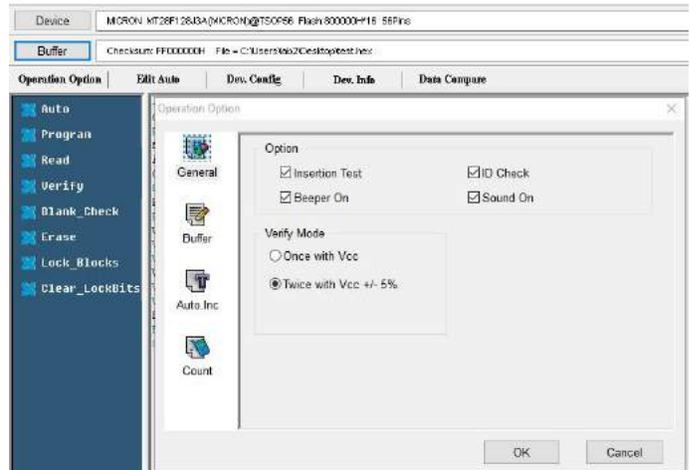


Figure 83. MT28F128J3RP-12MET CHECK ID

MT28F128J3RP-12MET:Flash NAND Flash Parallel 3.3V
 128M-bit 16M x 8/8M x 16 120ns 56-Pin TSOP-I
 Pin Diagram

DUT Test Features are turned on at 25C

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| | Part Number: | MT28F128J3RP-12MET | Lot/Date Code: | 0534 |
| | Manufacturer: | MICRON TECHNOLOGY | Devices Received: | 153 |

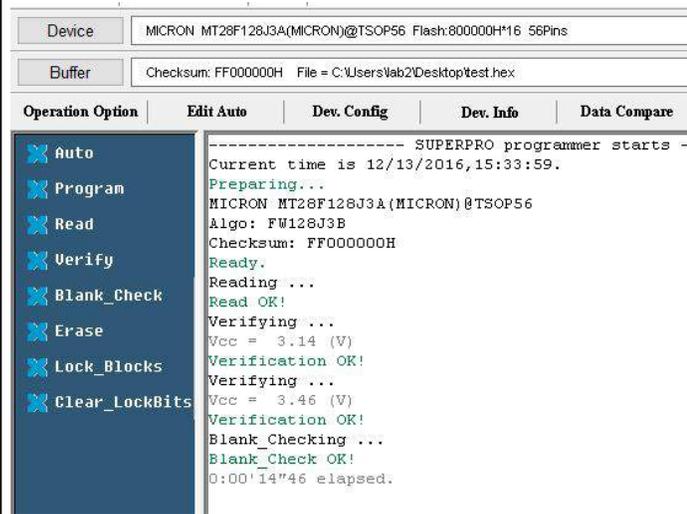


Figure 84. MT28F128J3RP-12MET BLANK CHECK 5 PERCENT

Memory Test Operations was performed passed at 25C: Read, Verify, and Blank Check.
Pass!
(with shown Vcc)

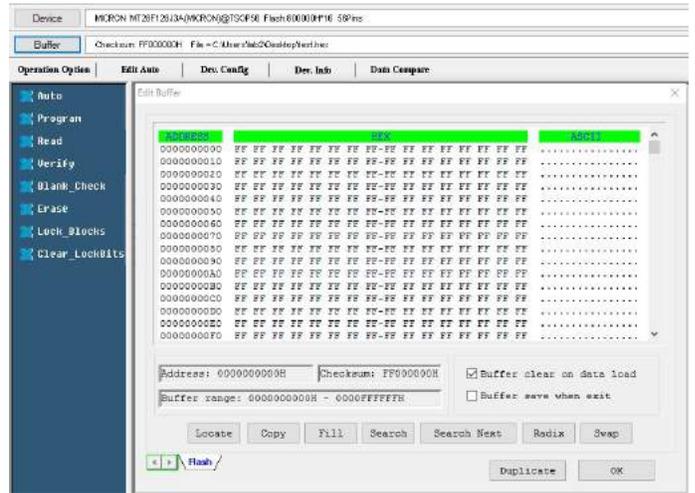


Figure 85. MT28F128J3RP-12MET BLANK CHECK BUFFER

DUT shown blank data buffer contents at 25C => Passed Blank Check (CS=0xFF000000)

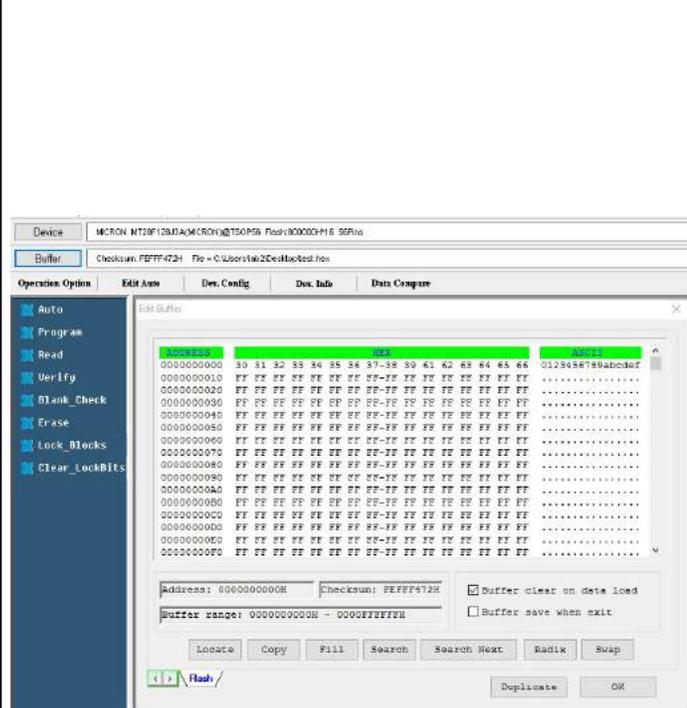


Figure 86. MT28F128J3RP-12MET PROGRAM TRIAL BUFFER

DUT shown data buffer contents at 25C after Sample Programming was performed and Part's erased afterwards at 25C. Pass!

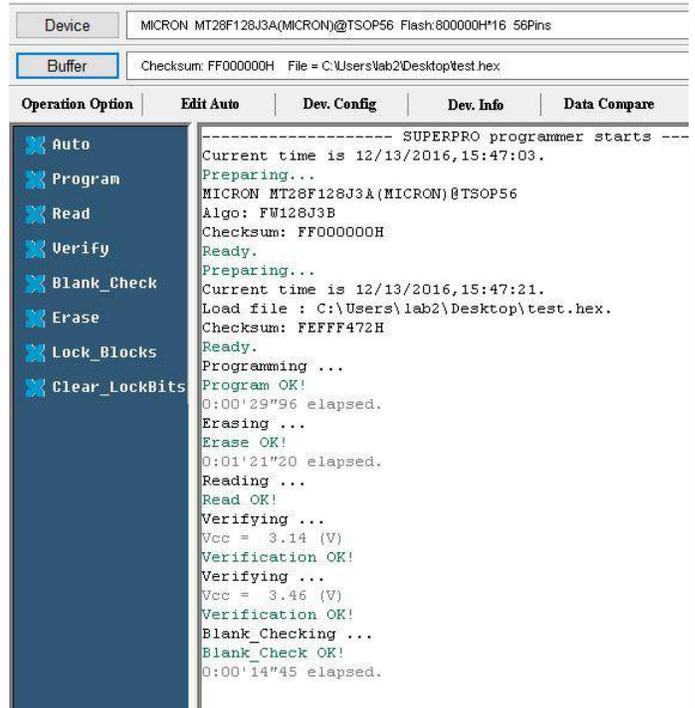


Figure 87. MT28F128J3RP-12MET BLANK CHECK ERASE

DUT was programmed,erased, and re-verified Blank Check. Pass!

| | | |
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