TANDEX TEST LABS, INC.

15849 Business Ctr. Dr. Irwindale CA. 91706
Phone : (626)-962-7166 Fax : (626)-960-6896

SCANNING ELECTRON MICROSCOPE ANALYSIS

TANDEX TEST LABS, INC.
TTL # TAN-289-01-W
Date: October 4, 1999
Part Number: LM124K
Part Type: I.C.
Lot Date Code: 9938
Lot Number: 501-42 HMO98736
Manufacturer: NSC
Quantity: Eight (8)
Purchase Order: 9566

Prepared by:____________________
Rose Marie Escandon

Approved by: ___________________
John R. Espenschied

Sample DPA Page

TANDEX TEST LABS TTL # TAN-289-01-W

Summary

Eight (8) Integrated Circuits (P/N: LM124K) were submitted by Tandex Test Labs, Inc., for SEM Analysis per Mil-38534 Class K requirements. This Analysis was performed in accordance with Mil-Std-883,Method 2018. The devices were assigned sample number 1 through 8 by Tandex Test Labs.

1. **Plasma Etching** Carbon Tetraflouride Gas 92% and 8% Oxygen was used to remove the glassivation. This etching is destructive and uneven in the rates of glass removal in various areas of the die.

2. **Scanning Electron Microscope (SEM Inspection)** was performed on all of the devices.The devices have adequate metallization coverage.These devices meet the requirements of Mil-Std-883, Method 2018. See figures 1 through 3, for typical photographs.

Conclusion
The devices were inspected to the requirements of Mil-Std-883, Method 2018. No rejectable anomalies were noted which would affect device reliability, this lot is acceptable for use.

Sample DPA Page

TANDEX TEST LABS TTL # TAN-289-01-W
SEM EXAMINATION

TTL Job No.	Part Number	Part Type	Date
TAN-289-01-W	LM124K	Integrated Circuits	October 4, 1999
Lot Date Code	**Sample Qty.**	**Serial Numbers**	**Test Specifications**
9938	8	1 - 8	Mil-Std-883 Method 2018
Misc. ID	**Qty . Accept**	**Qty. Reject**	**Qty. Suspect**
Lot #501-42 HMO98736	8	0	0

Notes:

S/N	Investigation Findings / Comments	A/R/S
1	No Anomalies	A
2	No Anomalies	A
3	No Anomalies	A
4	No Anomalies	A
5	No Anomalies	A
6	No Anomalies	A
7	No Anomalies	A
8	No Anomalies	A

Each sample was inspected for the general metallization condition at a magnification between 1,000 X and 6,000 X over 25% of the total metallization (unless specified differently). Each sample was inspected from four (4) viewing directions at a magnification between 5,000 X and 20,000 X for metallization oxide step coverage (performed on at least one of each type of oxide step).

Devices constructed with expanded Metallization: Yes X No Inspection required: Yes **X** No

Sample Glassivated Yes **X** No Dual Level Metallization Yes No **X**

Glassivation Removed Using **PLASMA ETCHING**

Beam accelerating voltage 15 kV Viewing angle **60 deg**

____
TECHNICIAN STAMP:

Sample DPA Page

Photodocumentation

Sample DPA Page

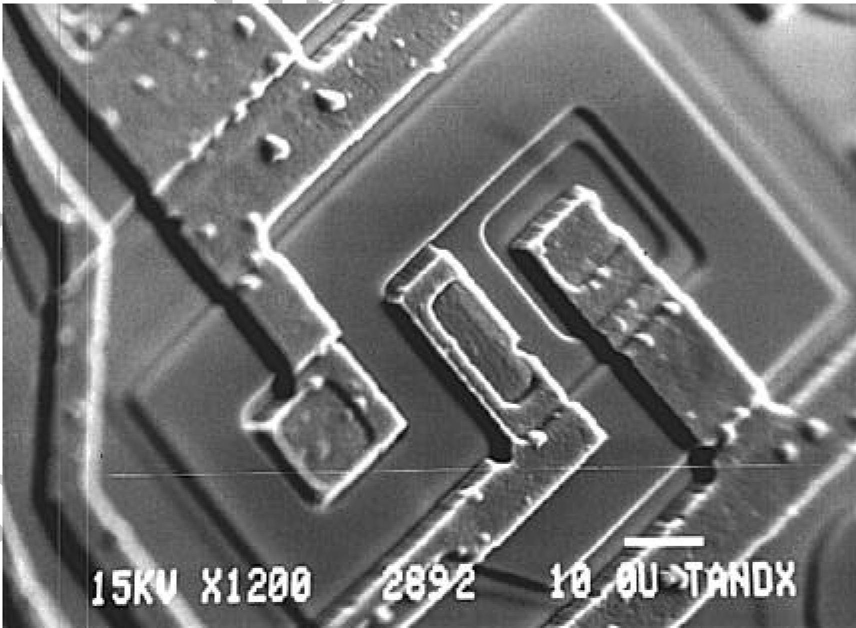

Fig: 1

Mag: 1200 X

S/N: 2

Description: SEM photograph of General Metallization.

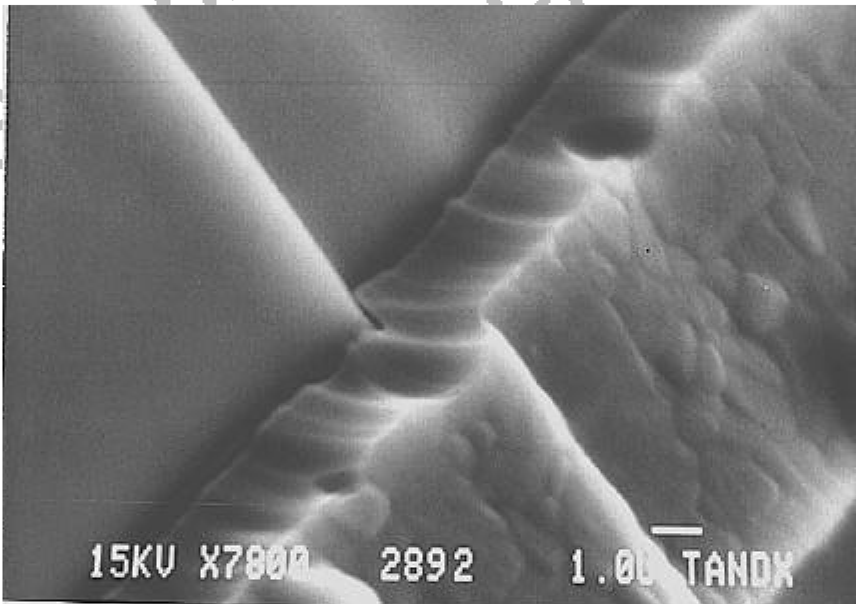

Fig: 2

Mag: 7800 X

S/N: 2

Description: SEM photograph of worst case typical step metallization.

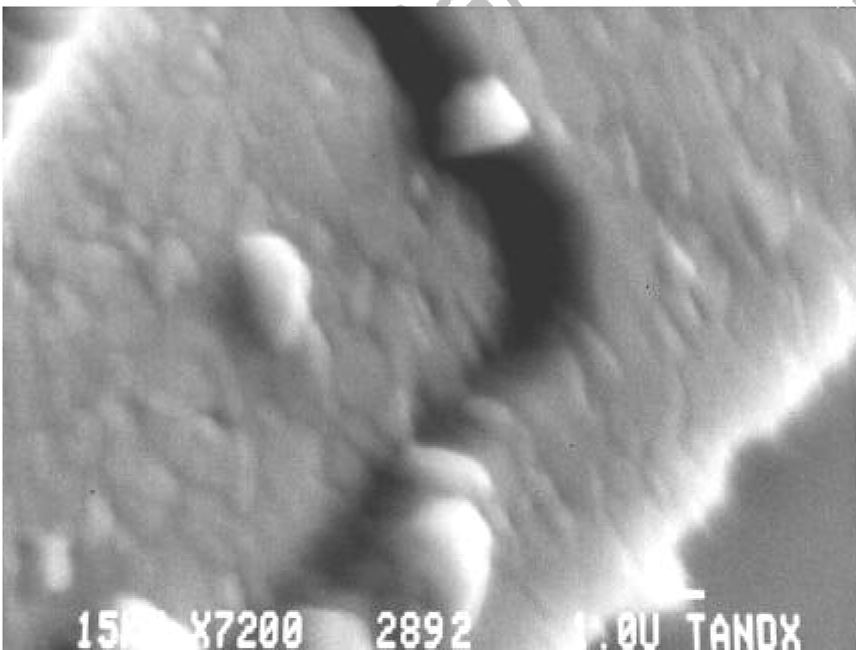

Fig: 3

Mag: 7200 X

S/N: 2

Description: SEM photograph of worst case typical contact window metallization device rotated 90°.

Sample DPA Page

TANDEX TEST LABS, INC.
15849 Business Ctr. Dr. , Irwindale CA. 91706
Phone: (626)-962-7166 FAX (626)-960-6896

TESTING CERTIFICATION

TEST REPORT: TAN-289-01-W

DATE: October 5,1999

P.O. NUMBER : 9566

DESCRIPTION: Integrated Circuits

CUSTOMER: TANDEX TEST LABS, INC.

ADDRESS: 15849 Business Center Drive
Irwindale, CA. 91706.

PART NUMBER: LM124

DATE CODE: 9938 LOT#501-42 HMO98736

MANUFACTURER: NSC

QUANTITY TESTED: 8

QUANTITY PASSED: 8

QUANTITY FAILED: 0

METHOD OF TESTING: SCANNING ELECTRON MICROSCOPE IN ACCORDANCE WITH MIL-STD-883, METHOD 2018.

I hereby certify that the subject components have been processed and inspected in accordance with instructions with specifications referenced in your purchase order. Physical records and/or data pertinent to applicable military, proprietary, and/or commercial specifications are on file and available upon request for inspection at this facility.

____

QUALITY ASSURANCE

Sample DPA Page